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DEPARTMENT OF THE ARMY FIELD MANUAL

SIGNAL BATTALION ARMORED, MECHANIZED AND INFANTRY DIVISIONS

HEADQUARTERS, DEPARTMENT OF THE ARMY
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SIGNAL BATTALION
ARMORED, MECHANIZED, AND INFANTRY DIVISIONS

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CHAPTER I INTRODUCTION

1. Purpose

This manual is a guide for the employment of personnel and the utilization of equipment in the infantry, mechanized, and armored division signal battalions.

2. Scope

a. This manual contains information relative to the mission, organization, administration, logistics, and tactical employment of a signal battalion as equipped under TOE 11-35 (). It presents essential guidelines which coupled with experience, judgment and foresight enable the battalion commander, the company commanders, and the key personnel of the signal battalion, to select courses of action which will insure effective communications-electronics and signal photographic support to the division.

b. The material presented herein is applicable, unless otherwise indicated, without modification, to both nuclear and nonnuclear warfare.

c. Communication-electronics (COMMEL) as referred to in this manual is defined as the management and systematic employment of devices and techniques designed to acquire or transmit information essential to the command control of friendly military forces, and to counteract the effectiveness of similar operations conducted by the enemy.

d. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which change is recommended. Reasons should be furnished with each comment. Comments should be forwarded direct to the U. S. Army Signal School, ATTN: Doctrine Division, Fort Monmouth, N. J.

3. References

Publications and other reference materials pertaining to subjects within the scope of this manual are listed in appendix I.

CHAPTER 2

ORGANIZATION OF THE SIGNAL BATTALION

4. General

A signal battalion organized under TOE 11-35 () is organic to each infantry, mechanized, and armored division. The signal battalion is a part of the combined arms team, providing communications support for the division. The signal battalion is capable of defending its installations against hostile ground attack, and each individual of the battalion is trained to fight as an infantryman. These latter capabilities, however, may be limited by factors of extended dispersion of battalion elements, mobility of the tactical elements, and urgency of requirements for communications support.

5. Subordinate Elements

The division signal battalion (fig. 1) consists of a headquarters and headquarters company, a command operations company referred to as Company A, and a forward communications company referred to as Company B.

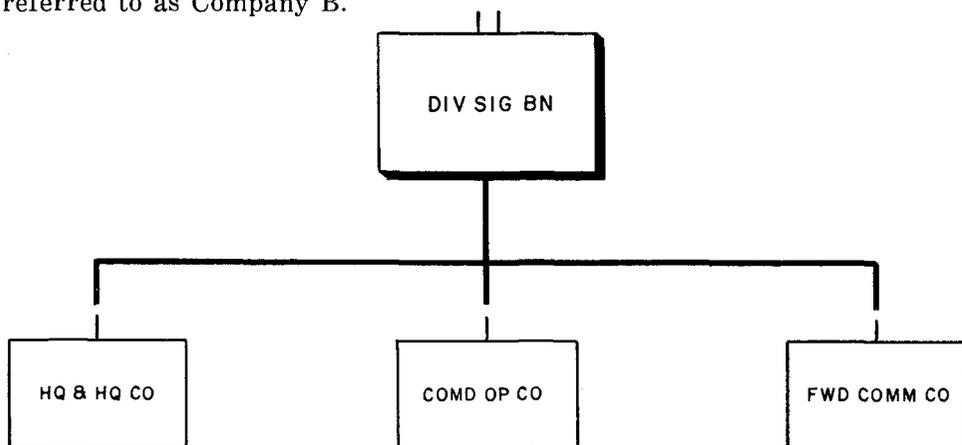


Figure 1. Infantry, mechanized, and armored division signal battalion.

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6. Mission

The mission of the division signal battalion is—

- a. To provide signal communications to include communications to subordinate units, for the—

- (1) Division headquarters and the division headquarters company, exclusive of internal radio nets.
 - (2) Headquarters and headquarters company, support command, exclusive of internal radio nets.
- b.* To establish and operate the division area communication system.
 - c.* To provide area signal center service to units located in the vicinity of the division area signal centers, supplemental to organic facilities.
 - d.* To establish and operate facilities to connect division artillery headquarters into the division area communication system.
 - e.* To operate the division area ground messenger service.
 - f.* To perform photography (except aerial photography) for the division and still picture laboratory service for all divisional units.
 - g.* To perform third echelon maintenance of all cryptographic equipment in the division, and organizational maintenance of signal equipment organic to the battalion.
 - h.* To provide each brigade headquarters with multichannel communications to each of the two command echelons of the division.

CHAPTER 3

ORGANIZATION OF HEADQUARTERS AND HEADQUARTERS COMPANY

7. General

The headquarters and headquarters company (fig. 2) contains the commander and staff necessary to control the signal battalion. It also contains certain operational elements which provide the commander with a field cable installation capability and radio relay capability to augment the operating companies.

8. Mission

The mission of the headquarters and headquarters company is—

a. To direct and coordinate operations and training of the signal battalion, and to provide the headquarters facilities with which the battalion commander exercises control.

b. To provide the division with a signal officer, his staff and staff facilities.

c. To provide supplemental supply and maintenance support for the battalion.

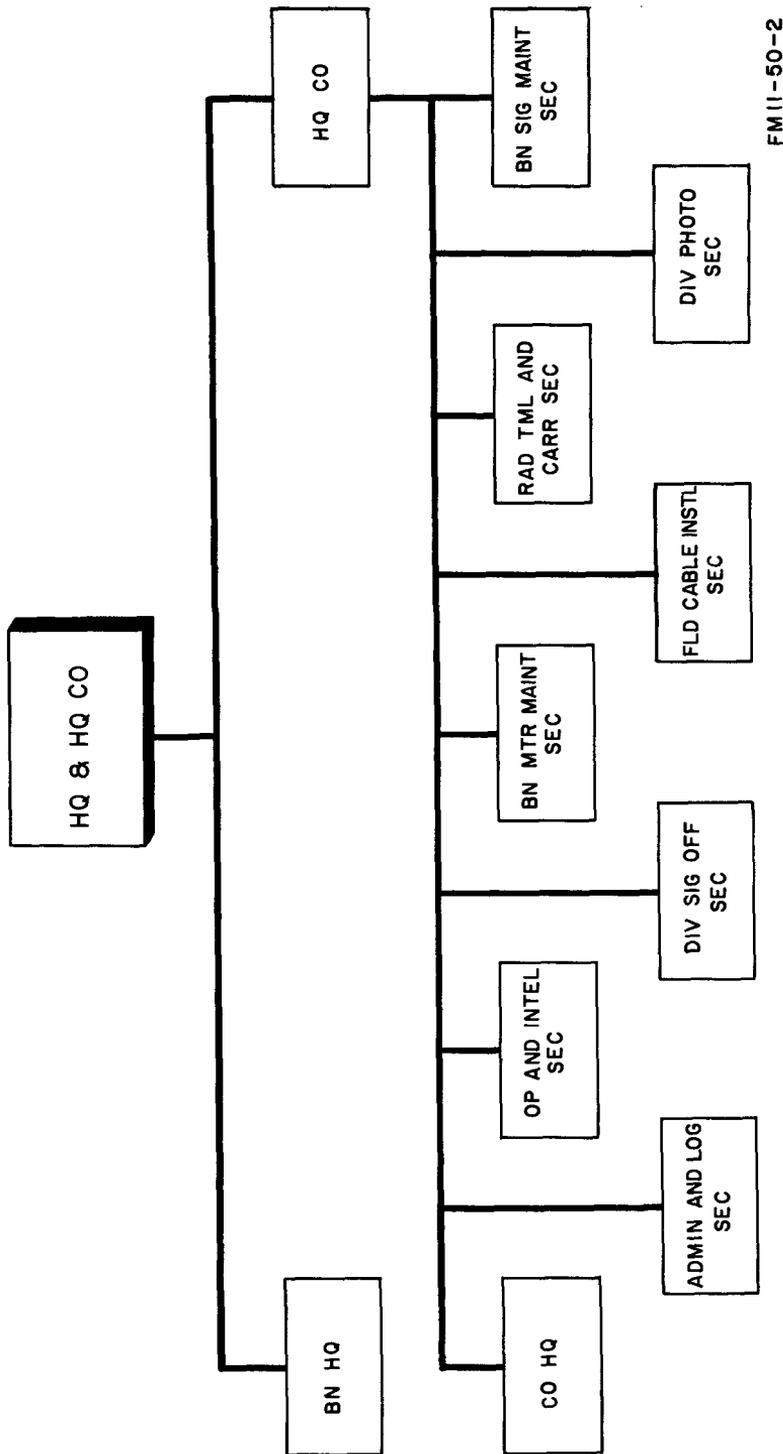
d. To perform field cable construction and provide an augmentation of radio relay terminal and repeater stations, and telephone carrier terminals for the battalion.

e. To perform photography (except aerial photography) for the division and to perform photographic still picture laboratory service for all divisional units.

f. To provide third echelon maintenance of cryptographic equipment for the division and organizational maintenance of organic signal equipment.

9. Battalion Headquarters

The battalion headquarters includes the battalion commanding officer (who is also the division signal officer (DSO)), and the battalion staff which assists the battalion commander in exercising command and supervision over the units assigned or attached to the battalion.



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Figure 2. Headquarters and headquarters company, infantry, mechanized, and armored division signal battalion.

10. Company Headquarters

The company headquarters provides the company commander, the enlisted staff and the equipment necessary to provide the administrative and logistic support for the company.

11. Division Signal Officer's Section

This section provides the officer and enlisted staff and the equipment for the division signal officer's staff. It advises the commander and the division staff on signal matters to include communications security. For details on the operation of the division signal officer's section, see paragraphs 64 through 69.

12. Administrative and Logistics Section

a. This section provides the enlisted personnel and equipment to support the battalion headquarters administrative and logistics functions. Personnel involved primarily in administration such as the legal clerk, information specialist, mail delivery clerk, and Personnel Staff NCO come under the general direction of the S1 and under the direct supervision of the sergeant major. Individuals involved primarily in logistics function such as the battalion supply sergeant, general supply specialist, signal parts specialist, and supply clerk come under the general supervision of the S4 and the direct supervision of the unit supply technician (warrant officer). Since the Personnel Staff NCO is the only member of this section whose duties are not common to most organizations only his function will be covered separately.

b. The Personnel Staff NCO will act as liaison between the battalion headquarters and the administrative company of the support command on personnel matters affecting the battalion. He will also perform liaison on personnel matters between the operating companies of the battalion and the battalion headquarters. Personnel records maintenance and associated activities for the signal battalion will be provided by the administrative company of the support command.

13. Operations and Intelligence Section

This section provides commissioned and enlisted personnel to support the battalions' operations and intelligence mission. The section operates under the supervision of the S3. It provides an assistant S3 officer who is assigned additional duty as battalion S2 intelligence officer. The section also provides chemical enlisted specialists. The section establishes the division systems control center which coordinates the communications activities of the operating elements of the battalion.

14. Battalion Signal Maintenance Section

This section provides the enlisted personnel and equipment to perform third echelon maintenance on all cryptographic equipment authorized to the division and organizational maintenance of the signal equipment organic to the signal battalion. For further details on signal maintenance operation see chapter 10.

15. Battalion Motor Maintenance Section

This section operates under the supervision of the battalion motor officer. It provides motor maintenance for the activities assigned to battalion headquarters and plans and supervises the battalion maintenance program. It provides supplemental second echelon motor and power generator maintenance for the operating companies of the battalion. For further details on battalion motor maintenance operations see chapter 10.

16. Field Cable Installation Section

This section installs, maintains, and recovers field cable in the division area, and assists the operating companies of the battalion, as required, in the installation and recovery of field wire and multiconductor cable. The section is organized to operate in four five-man teams. The section operates according to the battalion standing operating procedure (SOP) and mission-type orders issued orally or in writing, as authorized by the battalion commander (DSO). The section will be employed as needed to assist the wire teams of the battalion's operating companies with initial installation. The battalion SOP should specify the use of this team in detail, including a clear delineation of the staff section, sections or officer under which it will operate when not specifically attached to an operating company. This will assure a minimum of day-to-day orders and allow the section and the elements it supports to plan and prepare for its employment.

17. Radio Terminal and Carrier Section

a. The radio terminal and carrier section provides radio relay terminal and repeater station teams for augmentation of the radio relay terminal and repeater capability provided in the command operations company and the forward communications company. These teams provide additional built-in flexibility to the overall battalion capability.

b. The section operates according to the battalion SOP and mission type orders in the same manner as the field cable installation section (par. 16). It provides a pool of radio relay terminal and repeater stations for use in the division area as required to supplement capabilities organic to battalion operating companies.

Two radio relay terminals and two repeater stations are provided by this section. The stations are manned by four three-man teams. By colocation of the station employed by the radio terminal and carrier section with stations operated by the operating companies the station can be operated at a reduced strength.

18. Division Photographic Section

This section provides still and motion picture coverage for the division (except aerial photography) to include operating two mobile photographic laboratories for the purpose of processing ground and aerial still photographs. For further details on the division photographic operations see chapter 7.

CHAPTER 4

ORGANIZATION OF THE COMMAND OPERATIONS COMPANY

19. General

The command operations company (fig. 3) consists of a company headquarters, two command signal center platoon headquarters, a rear echelon operations platoon, a support command operations platoon, and five operating sections or teams. The company is capable of providing its own supply, mess, and first and second echelon motor maintenance. The company will establish and operate signal facilities for the division command post and its echelons simultaneously on a 24-hour basis.

20. Mission

The mission of the command operations company is—

a. To provide signal communications for the echelons of division headquarters, the division support command headquarters, and the division FSCC.

b. To provide signal communications (except internal radio nets) for headquarters and headquarters company, support command, exclusive of staff vehicle radios.

c. To provide area signal center service to units located in the vicinity of the division headquarters echelons and in the division rear area, supplemental to organic facilities of the units.

d. To establish and operate an assigned portion of the division area communications system.

e. To establish and operate facilities to connect division artillery headquarters into the division area communications system.

f. To provide and operate net control and other stations as required in division and higher echelon radio nets, to include division and army air request nets and a division warning net.

21. Company Headquarters

The company headquarters provides command control and coordination of the company operations, to include a separate mess, motor maintenance, and supply.

22. Command Signal Center Platoon Headquarters

a. Two command signal center platoon headquarters provide command control over functional groupings of teams from the separate operating sections of the command operations company. Teams from the operating sections are assigned to platoon headquarters to establish and operate a signal center in support of the division main command post, and to establish and operate one or more of the following *based on the resources of the operating sections not committed to support of the division main command post*.

- (1) A signal center in support of a separate alternate division command post established by elements of the division headquarters.
- (2) A jump signal center to be committed when the division main command post displaces.
- (3) Augmentation to any element of the division which has been designated as the alternate division command post (Div Arty, Brigade, Spt Cmd).
- (4) A small mobile communication element to support a division forward command post (when established).

b. Each platoon leader is provided an FM radio set for operation in the battalion command radio net.

23. Message Center Section

a. This section provides communication center facilities, including message center, cryptographic, facsimile and teletypewriter service, and motor messenger service for those command post installations discussed in paragraph 22. The section is equipped and manned to operate three mobile teletypewriter-cryptographic vans and three van mounted message centers. One of the message center vans (normally associated with the division main signal center) also contains a facsimile station.

b. The division signal messenger service is operated by the message center section. Air messenger service is employed between dispersed signal centers and between the division main and alternate command posts and the major subordinate elements of the command. Aircraft are provided from the division aviation battalion based on priorities established by the division commander. Motor messengers are used when conditions prohibit the use of aircraft and when locations are most easily serviced by vehicle. Normally, motor messengers operate in pairs (one as driver and one as guard) on all messenger runs.

24. Telephone Section

This section operates the telephone switchboard and circuit control facilities for those command post installations as indicated in

paragraph 22. It is capable of manning and operating three mobile manual telephone central offices, and three mobile communications patching facilities. In addition, the section has four small manual telephone switchboards for use as required.

25. Radio Section

This section operates the net control stations (NCS's) in division headquarters radio nets and subordinate stations at echelons of division headquarters. It also operates radio/wire integration stations at the signal center supporting the main division CP and the division alternate CP. The section is manned and equipped to operate the following sets:

- a. Four mobile high-power tactical radio teletypewriter stations, one equipped with ground-to-air radio equipment.
- b. Five mobile medium-power tactical radio teletypewriter stations.
- c. Two mobile medium power tactical voice/continuous wave (CW) radio stations.
- d. Two mobile stations in shelters, each containing two FM radio stations and one ultra-high frequency receiver.

26. Radio Terminal and Carrier Section

This section installs and operates the terminals of the radio relay system and associated carrier equipment at the division main command post signal center for those installations indicated in paragraph 22. It also installs and operates radio relay and carrier terminal facilities at division artillery. The section provides ten radio terminal and carrier stations.

27. Installation Section

The installation section installs interconnecting cable between signal center components, wire and cable in division echelon command post areas, and wire locals to other units in the immediate vicinity of division echelon signal centers. This section will provide the field cable and field wire operation required to support the installations indicated in paragraph 22.

28. Air Support Signal Team

The air support signal team provides communications at the division fire support coordination center (FSCC). It installs a telephone switchboard at the FSCC, provides a cryptographic facility, operates the net control station (NCS) in the division air request net, and operates the division radio station in the army air request net. It also operates an ultra-high frequency (UHF) receiver in the spot report receiver system for monitoring UHF

equipped tactical air support aircraft operating in the division area. This section also operates a radio receiver station in the division warning net.

29. Rear Echelon Operations Platoon

This platoon establishes and operates a signal center at the division rear echelon. It provides communications for that echelon, for the administration company, and for the administration center. Radio relay and carrier terminal facilities are not provided in the platoon. This signal center may be connected into the nearest army area signal center by field cable if operating in the field army area, or to the nearest division signal center if operating in the division rear area.

a. Platoon Headquarters. Platoon headquarters provides command control and coordination of platoon operations. The platoon leader serves as signal officer for the division rear echelon.

b. Message Center Section. This section provides communications center facilities for the division rear echelon. This includes message center, cryptographic, and teletypewriter. It also operates the rear echelon signal radio receiving station in either the division or army warning nets. This section is manned and equipped to operate in one echelon only. When displacing, the section must be furnished a displacement capability or close out at the old location and open at the new location after the equipment has been moved.

c. Telephone Section. This section is organized to install the telephone system and to install and operate a single position manual telephone switchboard for the division rear echelon, administration center and the administration company.

d. Radio Section. This section provides and operates a high power tactical radio teletypewriter station as the division rear echelon station in the division rear net.

30. Support Command Operations Platoon

The support command operations platoon establishes and operates a signal center which provides signal support for the headquarters and headquarters company, support command, and to other units and installations in the support command area. This signal center also supports the ADSOC (when established).

a. Platoon Headquarters. Platoon headquarters provides command control and coordination of platoon operations. The platoon leader functions as signal officer for the support command headquarters and maintains close coordination with the communications officers and commanders of the units served by the platoon.

b. Message Center Section. This section provides communications center facilities, including message center, cryptographic, and teletypewriter service. It also operates the support command receiving station in the division warning net. This section is manned and equipped to operate in one echelon only. The section is equipped with a teletypewriter central office which is mounted on a $\frac{3}{4}$ -ton truck. It is also equipped with a shelter mounted on a $\frac{3}{4}$ -ton truck. This facility may be used to mount the message center off-line crypto device and the receiving station in the warning net.

c. Telephone Section. This section operates a single-position manual telephone central office in the support command signal center. The switchboard provides telephone service for the support command headquarters and for units in the support command area. It also provides trunk switching service in the division area communication system. A second smaller manual switchboard is provided for utility purposes. This section performs the communication control function in the support command signal center, to include patching and termination of trunklines, circuit testing, and maintenance. The circuit control operation is performed by means of a communication patching panel, mounted in a shelter.

d. Radio Section. This section operates a medium-power tactical radio teletypewriter station in the division administrative/logistical net. It also operates the support command signal center FM radio-wire integration station and an FM radio station either in the support command command net or in the division CG/command net as required.

e. Radio Terminal and Carrier Section. This section installs and operates support command signal center terminals of the radio relay systems and associated carrier equipment in the division area communication system. The section is manned and equipped to operate three radio relay terminal sets (including associated carrier equipment).

f. Installation Section. The section consists of a five-man wire installation team. It installs and maintains the wire system for the support command signal center and field wire links from the support command signal center to units in the area. The team is equipped with a $2\frac{1}{2}$ -ton truck and wire laying equipment.

CHAPTER 5

ORGANIZATION OF THE FORWARD COMMUNICATIONS COMPANY

31. General

The forward communications company (fig. 4) consists of a company headquarters, a forward command communication platoon and three forward area signal center platoons.

32. Mission

The mission of the forward communications company is to—

a. Provide direct and general support signal center service to units in the forward area of the division zone, supplemental to organic capabilities.

b. To establish and operate an assigned portion of the division area communication system.

c. To provide the brigade headquarters with multichannel communications to the two command echelons of the division.

d. To connect the brigade headquarters and other units into the division area communication system.

33. Company Headquarters

The company headquarters provides command control and coordination of the company operations to include providing a company mess, supply and organizational motor maintenance. The company commander is provided with an FM radio set to enter the battalion command net and for NCS of the forward communications company net.

34. Forward Command Communications Platoon

The forward command communications platoon is composed of a platoon headquarters and three forward command communication signal sections. This platoon provides radio relay and associated carrier terminals at the brigade headquarters to connect the brigade headquarters with the two main echelons of division headquarters through multichannel communication systems. It also provides a medium-power tactical radio teletypewriter station for the brigade in the division command/operations net (RATT).

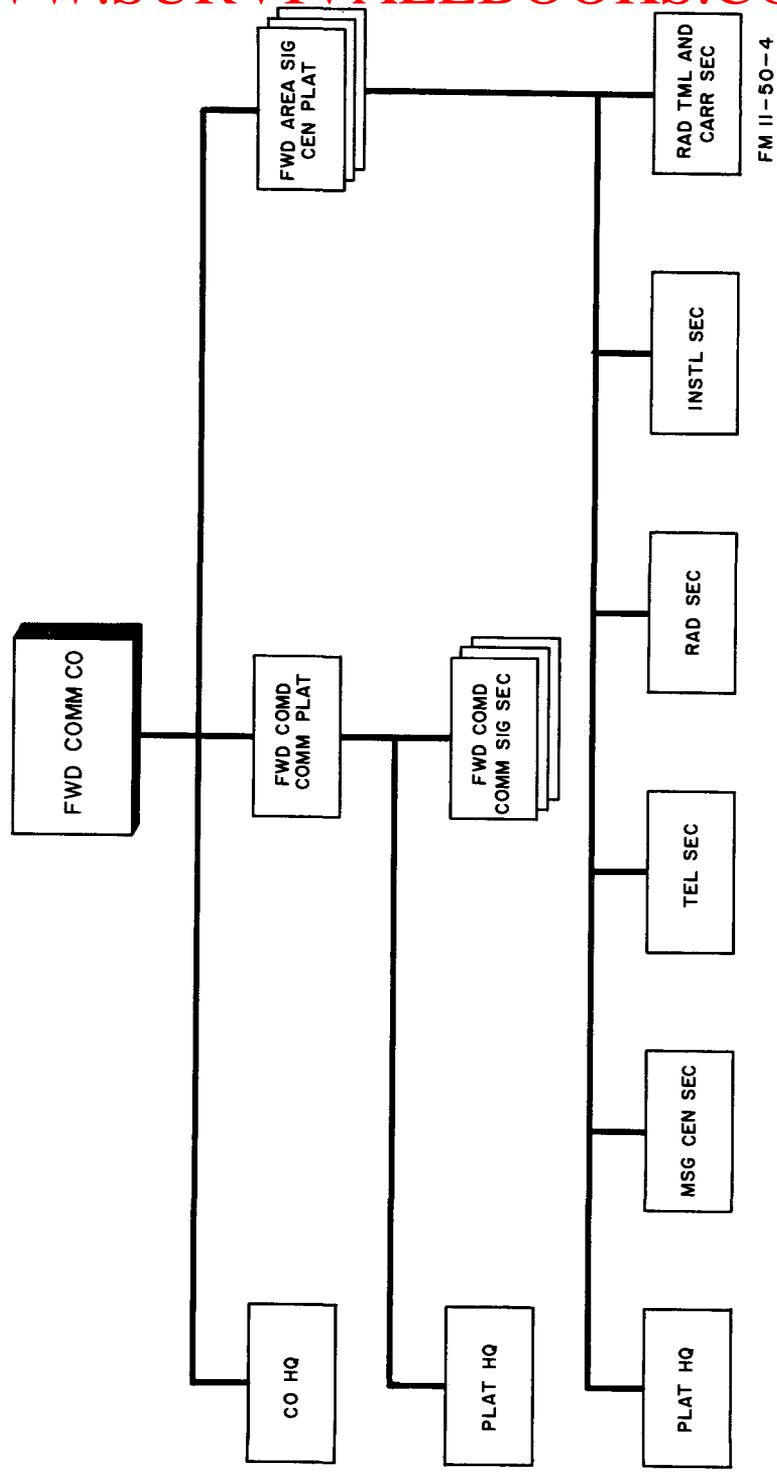


Figure 4. Forward communications company, infantry, mechanized and armored division signal battalions.

a. Forward Command Communications Platoon Headquarters. The forward command communications platoon headquarters provides command control and coordination of the operations of the platoon. The platoon leader is provided an FM radio set to enter the battalion command net and the forward command communications company net.

b. Forward Command Communications Section. The three forward command communication sections compose the operating elements of the forward command communications platoon. The section chief is responsible for the installation and operation of a radio teletypewriter station and up to six radio relay carrier systems. The section is normally placed in direct support of a brigade headquarters. The sections are each manned and equipped to operate one medium-power tactical radio-teletypewriter station and three double terminal radio relay terminal sets. The section chief is equipped with an FM radio set to operate a station in the signal battalion command net.

c. Brigade Trains. These trains are provided entry into the area communication system through the nearest area signal center by wire or, in the vicinity of brigade headquarters, entry is gained through the radio relay system provided at that headquarters. When the brigade trains are at a distance too great for a wire tie-in to either the brigade headquarters or the nearest area signal center, arrangements will be made by division systems control center to provide a separate radio relay link between the trains headquarters and the nearest area signal center.

35. Forward Area Signal Center Platoon

The three forward area signal center platoons are each composed of a platoon headquarters, message center section, telephone section, radio team, installation section and a radio terminal and carrier section. The platoons are organized along functional lines. Each platoon is assigned the task of establishing and operating a forward area signal center in support of units within a designated geographical area. Signal support provided by the signal center is supplemental to any organic capability of the units served. The signal center provides access into the division area communication system for the units it serves. For further details on the operation of forward area signal centers, see chapter 6.

a. Platoon Headquarters. The platoon headquarters provides command control and coordination of platoon operations. The platoon leader maintains close coordination with the units supported by the platoon. The platoon leader is provided an FM radio set to enter the battalion command net.

b. Message Center Section. The message center section provides communication center facilities, including message center, cryptographic, and teletypewriter service for units located in the signal center's area of responsibility. This service is supplemental to the organic capability of the supported units. The section has one motor messenger team. Supported units will pick up and deliver messages as required. The section operates a radio receiver station in the division warning net. A mobile teletypewriter central office provides teletypewriter terminal and switching and cryptographic facilities for the signal center. A shelter mounted on a $\frac{3}{4}$ -ton truck provides a message center facility.

c. Telephone Section.

- (1) The telephone section operates a mobile manual telephone central office. It is also provided with a small manual switchboard for use in displacement or for establishing a forward switch for limited periods as required. The telephone central office is designed to handle both the local and trunkline switching requirements of the signal center.
- (2) The section is also responsible for the communications control functions in the signal center, to include patching and termination of trunklines, circuit testing and maintenance. For this purpose a mobile communications patch panel is provided.

d. Radio Section. The radio section installs and operates a medium power tactical radio teletypewriter station in the signal center RATT net. It also operates two FM radio sets, one set in the infantry (or armored band) of frequencies and the other set in the artillery band. The FM radios provide radio/wire integration stations at the forward area signal center.

e. Installation Section. The section is organized into two wire teams, one with four men and the other with three men. One team is equipped with a $2\frac{1}{2}$ -ton truck mounting an engine-driven cable reeling machine, and the other team with a $\frac{3}{4}$ -ton truck mounting a manually operated reel unit. The section installs interconnecting cable for components of the signal center and is responsible for wire laying, maintenance, and furnishing telephone instruments to supported units as required. Since the section has many responsibilities and limited personnel and equipment with which to perform its missions, priority should be established for connecting units into the system. Priorities will depend upon the immediate situation and should be coordinated by the DSO with the division staff. An SOP should be established to specify the number of circuits each unit will receive initially and the necessary augmentation at a later date if time and equipment permit.

f. Radio Terminal and Carrier Section. The radio terminal and carrier section provides personnel and equipment to install and operate three mobile radio relay and carrier terminal sets. These sets provide six multichannel terminals at the forward area signal center to terminate multichannel systems connecting the signal center into the division multichannel network. The section is equipped with a portable switchboard for establishing a forward switch or a terminating point on an extension link from the signal center. The terminal sets normally will be positioned as close to the signal center patch panel facility as is consistent with security and dispersion, to facilitate cable/wire laying from the terminal to the patch panel. If feasible, terminals should be colocated to operate most effectively with the personnel available and to reduce the number of wire routes to be installed and maintained.

CHAPTER 6

DIVISION AREA COMMUNICATION SYSTEM

36. General

The division employs a division area communication system designed to assure rapid and responsive communications to meet the requirements of command control. The division area communication system provides—

- a.* Communication service to widely dispersed units.
- b.* Flexibility to meet changes in division task organization and, at the same time, facilitate relocation of units, command posts and installations.
- c.* Patching facilities to permit the electrical rerouting and physical relocation of circuits with a minimum of system changes.
- d.* Facilities for transmission of classified information.
- e.* Reliability of signal communications.
- f.* Common-user circuits to provide communication for installations and units that would otherwise require more extensive organic systems.
- g.* Sole-user and through trunk circuits for coordination of the employment of weapons and for other special operations.
- h.* A high-capacity potential to meet the demands likely to be placed on it.
- i.* A high-quality communication system capable of operating at extended distances.
- j.* Integration with the corps command communication systems and the field army communication system.

37. Responsibility

The establishment of communications is a command responsibility. The division signal officer is responsible to the division commander for the installation and operation of the division communication system. He operates in a dual capacity, as staff signal officer and as the commanding officer of the division signal battalion. The division signal battalion provides the division with the necessary personnel and equipment to establish and operate the division area communication system.

38. Composition

The division area communication system (fig. 5) consists of—

a. Command and area signal centers established by the division signal battalion.

b. A multichannel multiaxis network of radio relay and wire carrier systems linking the signal centers and major subordinate elements of the division.

c. A signal messenger service linking the division main CP and its echelons with the division major subordinate commands.

d. AM and FM radio nets.

e. Radio/wire integration stations capable of linking mobile FM radio stations with the telephone system at signal centers.

39. Employment

The many variations of the operational environment in which the signal battalion provides combat signal support to the division preclude a fixed employment of personnel and equipment authorized by TOE or a fixed pattern of operation. The system will vary in configuration, size, and composition, according to the following factors:

a. Division mission and organization for combat.

b. Location and disposition of the division units.

c. Characteristics of the division area of operations.

d. Enemy capabilities.

e. Attachment of forces by higher headquarters.

40. Flexibility

The use of mobile multichannel radio relay and associated carrier systems, mobile high power and medium power radio teletypewriter, CW and voice radio sets, FM vehicular radio sets, and mobile telephone and teletypewriter switching centrals allows the signal officer great flexibility in the design of the communication system and in the employment of the signal battalion.

41. Multichannel Network

Through the employment of the radio terminal and carrier teams and equipment organic to the signal battalion the signal officer establishes a multichannel communication network linking the division headquarters and its echelons with the subordinate elements of the division. The configuration of this network may vary with each operation. It is designed to support the operation at hand and at the same time facilitate transition to future operations. Figure 5 shows a type basic employment of the multichannel equipment of the signal battalion. Figures 6 through 8 show type

employments of the multichannel equipment in support of particular type tactical operations. Although each figure represents only one method of employing the division multichannel capability, many variations of the methods shown might prove equally effective. The figures are designed to provide the DSO and his staff with guidance to build a multichannel network tailored to support the division mission.

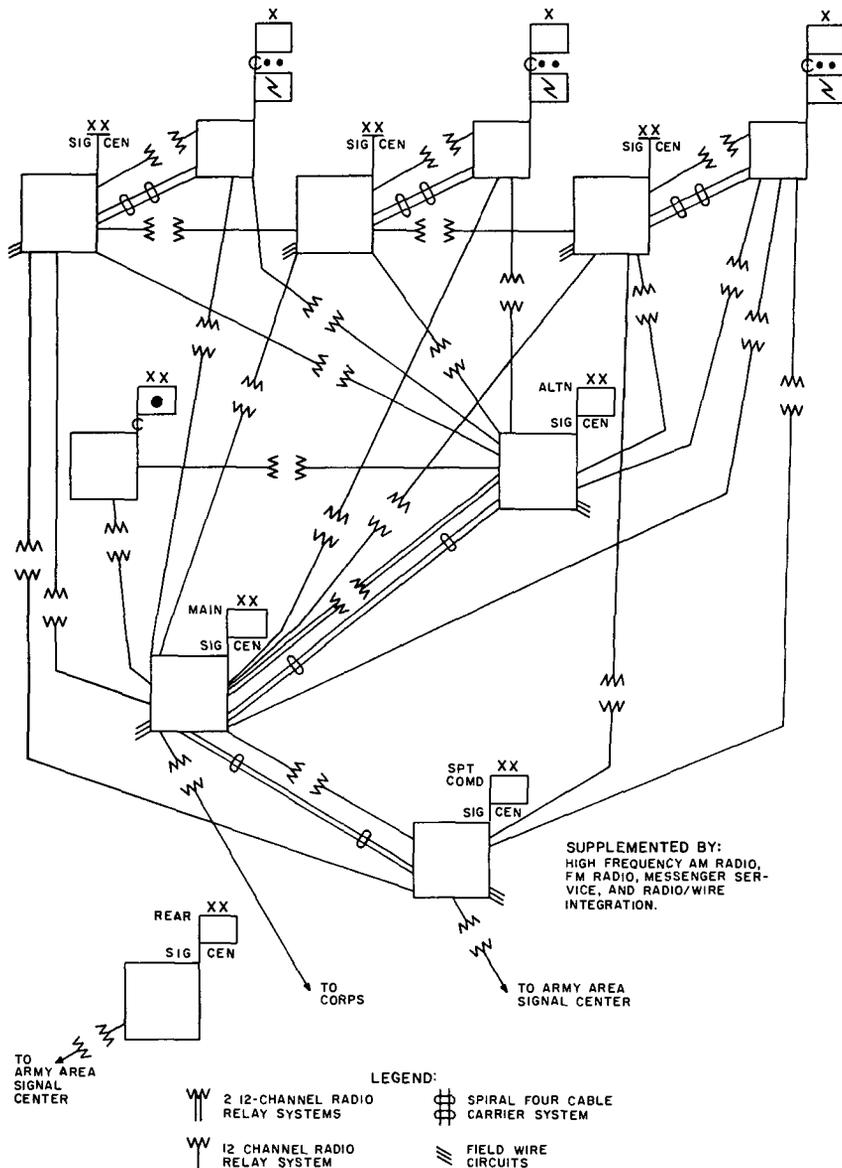


Figure 5. Type division area communication system.

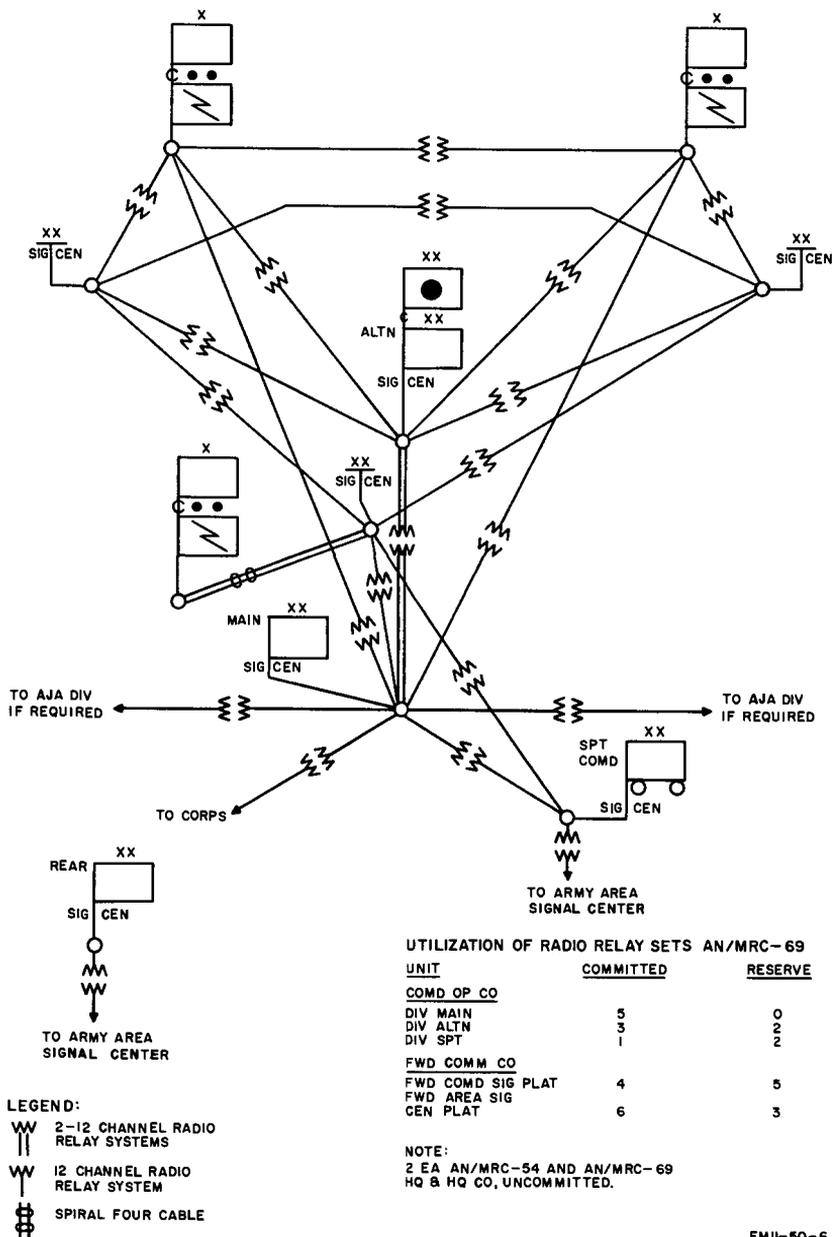
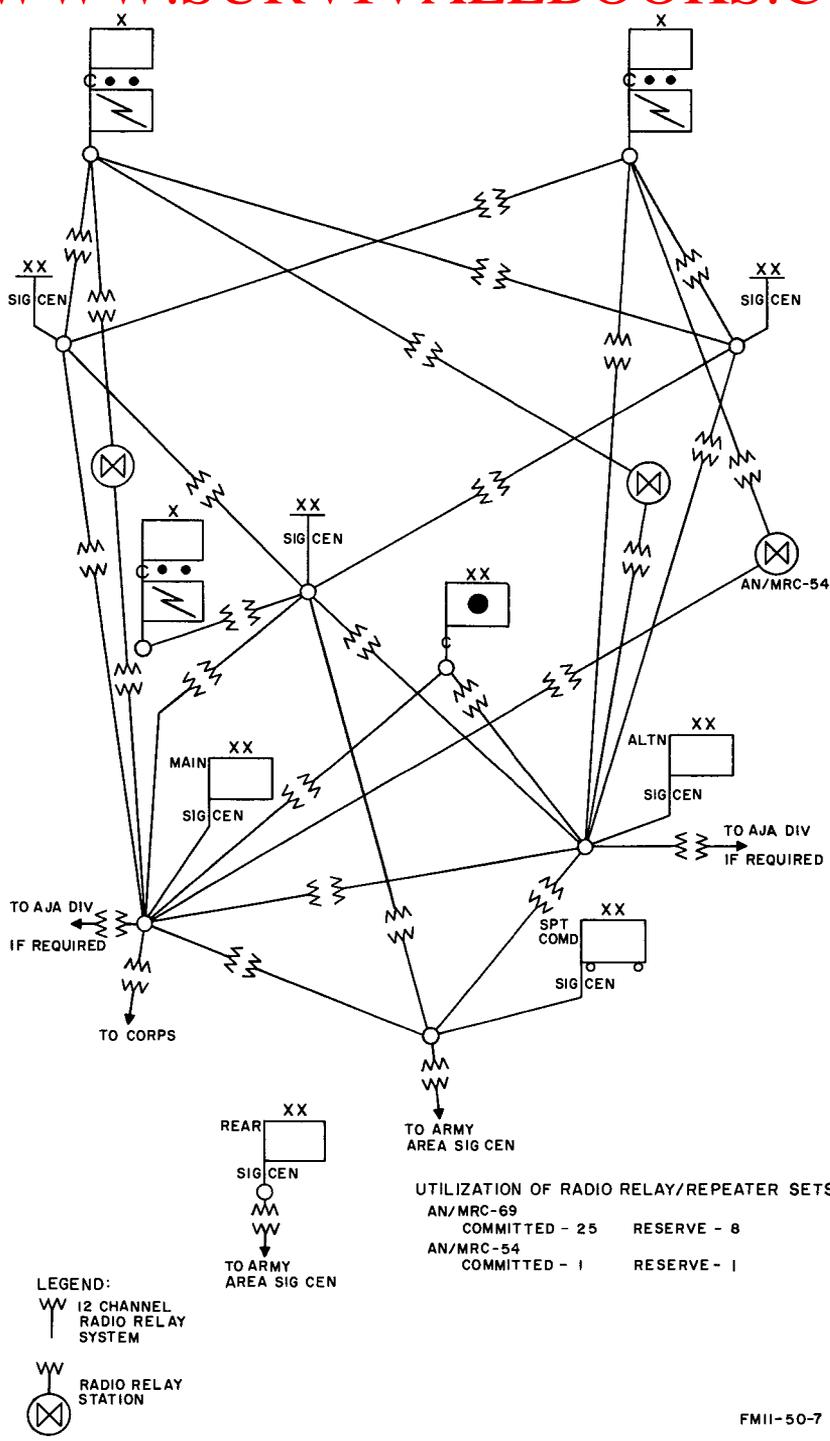


Figure 6. Type division multichannel communication network for the offense.



FMII-50-7

Figure 7. Type division multichannel communication network for the defense.

42. Radio Relay

a. Radio relay is the primary means of telephone service between the major headquarters in the division. Radio relay terminal and repeater sets provide the equipment used in the division multichannel network. Individual companies of the signal battalion are assigned areas of responsibility for installing radio relay and associated carrier equipment.

- (1) The command operations company installs and operates terminals at the signal centers supporting the division headquarters and its echelons, at the support command headquarters and at the division artillery headquarters.
- (2) The forward communications company installs terminals at the forward area signal centers and at the brigade headquarters.
- (3) Headquarters and headquarters company maintains a pool of terminal and repeater equipment for installation or augmentation as needed in the system.

b. Division terminal equipment and operating personnel for the radio relay system in the corps/army communication systems are provided by corps/army signal units.

43. Trunk Lines

The trunk lines in the division area communication system provide a means of communication from the echelons of division headquarters to immediate subordinate elements and between these elements. They also provide a means of communication for the use of other divisional elements in lieu of, or to supplement, the organic communications of these elements on a common-user or sole-user basis as required.

44. Common- and Sole-User Circuits

The division area communication system primarily utilizes common-user circuits. To meet special requirements, sole-user circuits are provided. For maximum utilization of the area communication systems sole-user circuits should be held to a minimum. Sole-user circuits are those that are allocated for full-time use to provide point-to-point communication. Sole-user circuits are provided on a basis of traffic volume or traffic precedence. In the first instance, traffic volume must be great enough to keep the circuit in full-time use; that is, the circuit must be required so much of the time as to be impracticable to attempt further use of the circuit for other purposes. In the second instance the tactical urgency of certain types of traffic warrant sole-user service, as in fire direction, air traffic regulation and identification and air request circuits where even short delays cannot be tolerated.

45. Signal Centers

A signal center is a grouping of signal communications facilities installed, operated and maintained by signal corps units. A signal center provides communications center, messenger service, telephone and teletypewriter switching and circuit testing and rerouting facilities. Other facilities, such as facsimile and automatic data processing, may be provided when authorized. Facilities consist of shelter mounted equipment electronically interconnected by field cable. The shelters are grouped to provide the most efficient use of the facilities and at the same time provide maximum security. The signal officer in command of each signal center is responsible for the security of the installation. A minimum of 50 meters should be maintained between shelters in the signal center, if practicable. Radio and radio-relay transmitters should be located as far from division command posts as time and the capability of the equipment will allow. The physical location of operating elements of the signal center may be within the CP proper or as much as 200 to 400 meters outside the CP proper. This will depend upon the size of the signal center, the tactical situation and the personal desires of the commander. If the signal center supports a small complex such as at the rear echelon it should be a part of the command post proper. Two types of signal centers used in the division are—

a. Command Signal Centers. The command signal centers are installed and operated by the command operations company of the division signal battalion. They provide signal support for the echelons of division headquarters and for the support command headquarters. In addition, these command signal centers provide signal support to units located in their immediate vicinity, supplemental to the organic capability of the units. See figures 5 through 8 for type employment of command signal centers.

b. Forward Area Signal Centers. Forward area signal centers are installed and operated by the forward communications company of the division signal battalion. These centers are established at points selected by the DSO in coordination with the division staff to provide signal support to divisional units and nondivisional units requiring signal support. Each signal center is responsible for providing signal support to all units within a geographical area designated by the DSO. The signal support provided by the forward area signal center is supplemental to any organic capability of the unit served. The forward communications company is equipped to install and operate three forward area signal centers. See figure 5 through 8 for type employment of forward area signal centers.

46. Division Radio Nets

a. General. The division AM and FM radio nets form an integral part of the division area communication system. Radio nets of the division headquarters and divisional units provide communication channels between major divisional units.

- (1) In some situations, such as emergencies or during movement, radio communications can be used to supplement a segment of the multichannel links connecting signal centers.
- (2) FM and AM radios are used to establish initial communications between headquarters, particularly when other means, such as wire or radio relay, are unfavorable or unsuitable. As other means become available, radio stations operating in nets, that can adequately be covered by other means, should revert to standby or listening silence.
- (3) A typical arrangement of nets in which radio stations operate for division headquarters is shown in figure 9.
- (4) Although radio nets are designed functionally (command, intelligence, etc.) traffic and other conditions will frequently dictate that the nets be combined and used for more than one type of traffic, or divided (*b(4)* below).

b. Internal Radio Nets. The division's radio nets are described below:

- (1) *Division CG/command net FM-voice.* This net provides a direct channel of communication between the division commander and the commanders of all units operating directly under division control. The use of this net is restricted because of its large number of stations, but staff officers and subordinate unit commanders may monitor or operate in it if necessary. In addition, liaison officers of the division, when operating with adjacent or higher headquarters, may operate in this net to facilitate close coordination between units. The division signal battalion furnishes on a full time operational basis the net control station at division main. The signal battalion may establish relays in this net through the radio/wire integration stations operated by the battalion throughout the division area. Aerial relay stations, when required, are established by coordination with the division aviation battalion.
- (2) *Division command/operations net RATT.* This net is used for the operational command control of the division. The NCS is located at the division main command post. The NCS and its operating personnel are furnished by the signal battalion. The signal battalion also provides

UNITS	ARMY AIR REQ RATT	ARMY LOG RATT	CORPS COMD/ OP RATT	DIV COMD/ OP RATT	DIV INTEL RATT	DIV CG/ COMD FM **	DIV ADMIN/ LOG RATT	SIGNAL CENTER RATT	DIV AIR REQ AM	DIV WARN- ING AM	AIR FORCE NETS
DIV ALTN			GRC 26 (S)	GRC 46 (S)	GRC 46 (S)	VRQ 3 (S)				GRC 19 (S)	
DIV MAIN		GRC 26 (S)	GRC 26 (S)	GRC 46 (S)	GRC 46 (S)	VRQ 3 (S)	GRC 46 (S)	GRC 26 (S)		GRC 19 (S)	VRC 24 (S)
DIV REAR								GRC 26 (S)		GRR 5 (S)	
DIV FSCC	GRC 26 (S)								GRC 19 (S)	GRR 5 (3-S)	VRC 24 (S)
BDE (3 EA)				GRC* 46 (S)	GRC* 46	VRQ 3	GRC* 46		GRC 19	GRR 5 (1)	VRC 24
DIV ARTY				GRC 46	GRC 46	VRC 10	GRC 46 (2)			GRC 19	VRC 24
CAV SQDN				VRC 29	VRC 29	VRQ 3	VRC 29		GRC 19	GRR 5 (1)	VRC 24
AVN BN				GRC 46 (2)	GRC 46	VRC 10	GRC 46 (2)			GRR 5 (3)	
DIV SPT COMD				GRC 46 (2-S)		VRC 18 (S)	GRC 46 (S)			GRR 5 (3-S)	
ENGR BN				GRC 46		VRC 10	GRC 46 (2)			GRR 5 (3)	
TAC BNS							GRC* 46		GRC 19	GRR 5 (3)	VRC 24
AREA SIG CEN (3 EA)								GRC 46 (S)		GRR 5 (3)	
DIV SIG BN						VRC 10					
MAINT BN							GRC 46			GRR 5 (3)	
SUP & TRANS BN							GRC 46			GRR 5 (3)	
MED BN							GRC 46				

NOTES:

1. MONITORS NET WITH GRR-5 RECEIVER; ENTERS NET BY SWITCHING RADIO SET FROM ANOTHER NET.
2. ENTERS NET AS REQUIRED BY SWITCHING FROM ANOTHER NET.
3. MONITORS ONLY.
- * SUBSTITUTE AN/VRC-29 RADIO SET IN MECHANIZED AND ARMORED DIVISIONS.
- ** SUBSTITUTE THE FOLLOWING RADIO SETS IN ARMORED DIVISION FOR THOSE SHOWN: AN/VRC-8 FOR AN/VRC-10, AN/VRC-16 FOR AN/VRC-18, AN/VRQ-1 FOR AN/VRQ-3
- (S) PERSONNEL AND EQUIPMENT FURNISHED BY DIV SIG BN.

FM 11-50-9

Figure 9. Typical division radio nets.

the personnel and equipment to operate the stations at brigade headquarters and the division alternate command post.

- (3) *Division intelligence net RATT*. This net is for transmission of information and intelligence of the enemy. The NCS is located at the division main command post and serves primarily as a means of communication for G2 message traffic. It may also pass command or logistical message traffic if the command or logistical nets are either inoperative or overloaded. The operating personnel and equipment for the NCS are provided by the signal battalion.
- (4) *Division administrative/logistics net (RATT)*. This net is used for transmission of administrative and logistical message traffic. The NCS is located at the division main command post and serves primarily as a means of communication for G1 and G4 traffic. The NCS and its operating personnel are furnished by the signal battalion. The signal battalion also furnishes the personnel and equipment to operate the stations at Division Alternate, Support Command and the Forward Area Signal Centers. Due to the volume of traffic handled by the division admin/logistic net and the number of stations involved, it may be necessary to shift some of the elements to the division rear net forming a division administrative net consisting of such elements as division rear, division main, three brigades, eleven tactical battalions, and the armored cavalry squadron, and a division logistics net consisting of such units as support command, division main, division ammunition officer (at ADSOC), brigade trains and forward area signal centers. The SOI will prescribe the exact net composition, based on requirements.
- (5) *Division air request net (AM, CW-voice)*. This net is used to forward request for immediate tactical air support directly to the division FSCC and for disseminating information and instructions to units on all types of air-strikes that may affect the command. The NCS is operated by personnel of the signal battalion at the division FSCC, where it is located with G3 air. The radio sets used in this net have secondary roles, such as the transmission of information in the division warning broadcast net (fig. 9).
- (6) *Division warning broadcast net (AM-voice)*. This net is used to broadcast air alerts, chemical, biological, and

radiological warfare (CBR) attack warning, fallout warning, rad-safe-data, nuclear strike warnings. and similar information of an urgent operational nature. This information is required by all divisional units, and the requirement for timeliness prohibits handling through command channels. The NCS operates at division main command post with personnel and equipment furnished by the division signal battalion. Radio receiving sets are provided throughout the division for monitoring this net. Each battalion and separate company, and in some instances, subordinate elements of these units, are either equipped with a radio receiver to monitor broadcasts over this net or, as with the division headquarters and headquarters company, administration company and headquarters and headquarters company support command, are provided this service by the signal center supporting their unit. Certain organizations may switch radio equipment from other nets to transmit in this net (fig. 9). Division artillery usually broadcasts all air alerts; the cavalry squadron usually broadcasts urgent reconnaissance information of immediate interest to elements of the division.

- (7) *Division rear net (RATT)*. This net is used to pass command and administrative message traffic between the division main command post and the division rear echelon. The signal battalion provides a high power tactical radio set at the main and rear command posts. The NCS is located at the main command post. The equipment used in this net is also used in a secondary role to support the displacement of other RATT stations in the division.

c. External Radio Nets. The external radio nets in which the division operates are described below:

- (1) *Corps command net (RATT)*. This net is used by the corps commander for the command and operational control of his subordinate units. The signal battalion furnishes stations at the division main and alternate command posts. The radio sets used in this net are high power tactical radio sets capable of operating radio teletypewriter, CW or voice transmission.
- (2) *Army logistics net (RATT)*. The division signal battalion furnishes a radio teletypewriter station that operates in this net. The net is used for administrative and logistical message traffic between the division and army headquarters. The equipment used in this net is also used, as required, in a secondary role to support the dis-

placement of other radio-teletypewriter stations in the division. Since other means of communication with logistical support agencies are normally available, this station is used to a great extent in its secondary role. The division station operating in this net will normally be located at the division main command post. It may be located with the support command headquarters.

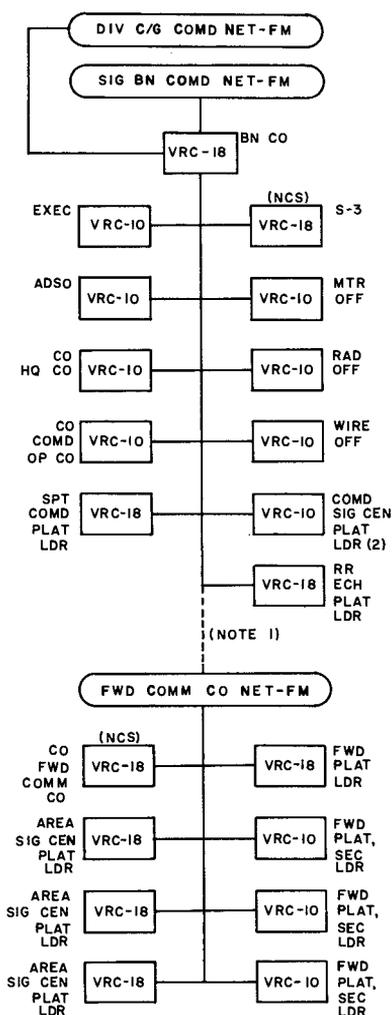
- (3) *Army air request net (RATT)*. This net is used to obtain air support for the division. A radio set is used in this net to provide communication between the division G2 and G3 air at the division FSCC and the field army tactical operations center (FATOC). The radio set and operating personnel at the FSCC are furnished by the signal battalion.
- (4) *Air force nets*. The signal battalion is equipped to operate a UHF voice radio station in the spot report receiver system for monitoring Air Force close support missions flown for the division. The station is mounted in the same vehicle as the division station in the army air request net. A station is also operated in the tactical air observation net, for G2 to monitor Air Force reconnaissance missions flown for the division. The Div Arty and the Brigades operate radios in the spot report receiver system or the tactical air observation net (UHF Voice) as required. The Div Arty, the Cav Sqdn and the Tac Bns provide radios for the Air Liaison Officer and the Forward Air Controllers to use in the tactical air direction nets (UHF Voice) and the air force control and coordination net (AM and FM Voice).

d. Signal Battalion Radio Nets (FM-Voice). These nets are used to enable the Bn CO/DSO and unit commanders to maintain direct contact with all elements of the signal battalion (fig. 10).

47. FM Radio/Wire Integration

a. Radio/wire integration stations (fig. 11) form an important part of the division area communication system.

b. At division level, an FM-voice radio/wire integration station is operated at each signal center (except at division rear) to connect FM radio stations into the division area communication system on a push-to-talk basis. The interconnection between the radio set at a division radio/wire integration station and an area communication system switchboard is made through a remote control unit and an SB-22/PT switchboard in the integration station vehicle. The operation of radio/wire integration systems is standardized throughout the division by SOP's for radio oper-



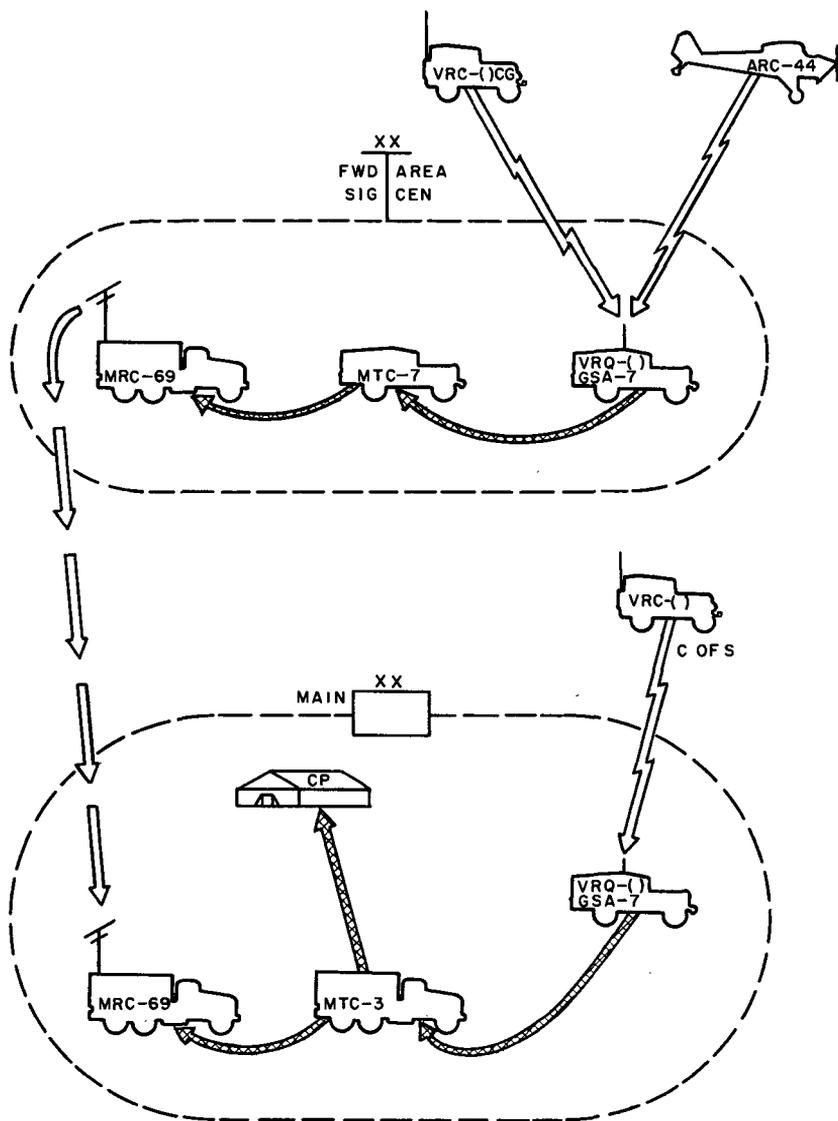
NOTES:

1. RADIO STATIONS OF THE FWD COMM CO MONITOR SIGNAL BATTALION COMMAND NET WITH AUX RCVR AND ENTER NET AS REQUIRED.
2. S-3 MONITORS DIV C/G COMD NET-FM WITH AUX RCVR AND ENTERS NET AS REQUIRED.
3. SUBSTITUTE THE FOLLOWING RADIO SETS IN ARMORED DIVISION FOR THOSE SHOWN: AN/VRC-8 FOR AN/VRC-10, AN/VRC-16 FOR AN/VRC-18.

FM 11-50-10

Figure 10. Typical signal battalion radio nets.

ators, radio/wire integration station operators, and switchboard operators; it is standardized for users by division standing signal instructions (SSI). The signal operation instructions (SOI) refer to controls, such as radio station call signs and telephone directory



- LEGEND:**
- MRC-69 RADIO TERMINAL SET
12 CHANNEL SYSTEM
 - MTC-3 SB-86, 120 DROP
2 POSITION
 - MTC-7 SB-86, 60 DROP
SINGLE POSITION
 - GSA-7 B RADIO/WIRE INTEGRATION
 - VRQ-() REMOTE CONTROL STATION

- RADIO RELAY
- FM RADIO
- FIELD WIRE OR CABLE

FMII-50-11

Figure 11. Type utilization of radio/wire integration stations.

names. The radio/wire integration system is provided to the commanding general, division staff, and other designated key personnel in the division to contact division elements connected to the division area communication system. Whenever circumstances dictate it may also be used—

- (1) To establish emergency communication by telephone between mobile FM radio stations and elements connected to the division area telephone system.
- (2) To establish communication between FM radio stations separated by distances that are beyond the direct operating range of their FM radio sets.
- (3) For initial establishment (until wire links can be installed) of telephone service from the division area communication system to using units.
- (4) For voice communication between mobile combat elements in the division forward area and supporting division logistic elements in the rear area.
- (5) For communications between low-flying army aircraft operating in distant parts of the division area and airfields or flight control elements connected to the division area communication system, when direct FM radio contact cannot be maintained.
- (6) For communication between forward air controllers and the air liaison officers' communication facilities, normally at the division FSCC, when these facilities are connected with the division area communication system.
- (7) To keep commanders and staffs in contact with subordinate and higher headquarters, as required, during the displacement of command posts.
- (8) To connect two switchboards and to span a break in a wire line between units.
- (9) For communication in river crossings.

48. Signal Messenger Service

The division signal messenger service is also an important part of the division area communication system. It consists of scheduled and special messenger motor and air runs. The motor messenger teams are organic to the division signal battalion. Air messengers are provided by the division aviation battalion. Messenger service is normally provided from higher headquarters to subordinate units. However, special messengers may be dispatched from lower to higher echelons when the situation warrants. Special messengers are reserved for delivery of high precedence message traffic. Due to the limited number of messenger teams available the battalion SOP should clearly indicate

those situations in which special messengers will be used. Whenever the tactical situation permits, messengers operating the division signal messenger service make deliveries directly to the headquarters message centers of the brigades and to other major divisional elements, as well as to forward signal centers operated by the signal battalion. The forward signal centers serve only as messenger pickup and delivery points for the miscellaneous divisional unit elements in their respective areas. The division signal messenger service is normally provided by motor messengers operating in pairs for optimum security and by aviators provided by the division aviation battalion. If additional messenger service is required, messengers may be required to operate separately, provided additional motor vehicles can be obtained. In this case, other personnel should be assigned to each messenger as security guards.

CHAPTER 7

DIVISION SIGNAL PHOTOGRAPHIC SUPPORT

49. General

Division signal photographic services are provided by the photographic section of headquarters and headquarters company. These services include still and motion picture photography (except aerial photography) for the division, and still photographic laboratory service for all divisional units. The primary mission of the photographic section is to perform tactical ground photography. It will also be required to support division information officer (IO) activities as well as all other needs within the division for photographic support. Usually requirements for photographic support emanate regularly from the G2, the G3, the G4, the Provost Marshal, the Aviation Company, the Ordnance Officer, and the Engineer Officer. In addition, there will be occasions when various other divisional activities will have photographic requirements. Aerial photography may be performed by the photographic section's use of ground-type cameras when aerial cameras are not essential or available. This mission, however, normally will be performed by U.S. Army Aviation or Air Force aircraft, properly equipped with air-type cameras.

50. Mobile Photographic Laboratories

Two mobile photographic laboratories are provided for the processing of still pictures. These laboratories will be employed to process coverage by photographers of the photographic section, aerial photographic coverage by the division aviation company, and coverage by other photographers operating in the division area. One of these laboratories will normally be located at a designated division airfield, and the other will usually be located at the signal battalion CP.

51. Processing Motion Picture Film

The photographic section is equipped to record but not process motion pictures. The processing of motion picture film is performed at theater army level. The division photographic section is not equipped to process U.S. Air Force aerial photography utilized by the division.

52. Color Photography

Color photography may be performed by the photographic section when materials are available. Exposed color film will be sent to the nearest color processing facility, usually located at theater army level.

53. Photographic Operational Record

The division photographic section is responsible for providing continuous operational record photographic coverage. The section should not depend on incoming requests as the sole basis for this coverage. The signal officer, or his pictorial assistant should maintain close liaison with staff and operations personnel to obtain information upon which to base a plan for obtaining record coverage of the division's operations.

CHAPTER 8

TACTICAL APPLICATION OF SIGNAL BATTALION'S COMMUNICATION CAPABILITY

54. Communications in the Assembly Area

a. General. An assembly area for a division is an area in which its organic units assemble to organize and prepare for further action. Unit dispositions are normally influenced by the tactical situation, and contact with the enemy is either probable or imminent. Effective control of the assembly area depends on the prompt establishment of signal communications.

b. Planning Communications for Assembly Areas. During the preparation for the assembly, the division signal officer and his staff—

- (1) Conduct a reconnaissance of the assembly area to obtain detailed information concerning the location of command post sites, messenger routes, and all existing military and civilian signal facilities.
- (2) Prepare a signal plan for communication during the movement of the division into the assembly area.
- (3) Coordinate the installation of all signal systems within the assembly area. This insures an integrated system for the division as a whole.
- (4) Provide communication security during the movement into, and occupation of, the assembly area.

c. Communication Activities During Assembly. During the assembly, the signal officer and all personnel of the division signal battalion are engaged in training and in performing signal supply and other signal activities. The extent to which these activities are carried on depends on the state of training, the adequacy of equipment, the number and capabilities of personnel and other factors peculiar to the contemplated operation. The more important signal activities include—

- (1) Revising the SOP or preparing a new one to meet the requirements of anticipated operations.
- (2) Training personnel in the installation, operation, and maintenance of new or special equipment provided for the operation. This includes training in modified or new operating techniques.

- (3) Studying enemy characteristics and adopting special precautions required by the planned operation to insure the successful performance of missions.
- (4) Formulating specific communication security measures for the anticipated operation. These are in addition to all normal security measures.
- (5) Insuring technical inspection of all signal equipment in the signal battalion to determine its operating condition and adequacy.
- (6) Replenishing shortages and replacing unserviceable items.
- (7) Installing, operating and maintaining the division area communication system (*d* below).
- (8) Preparing SOI and SSI.
- (9) Making a detailed reconnaissance for the purpose of establishing an area communication system capable of meeting foreseeable future requirements.
- (10) Drafting tentative plans for future operations and making preliminary provisions for their execution.

d. Application of Communication. Signal communication normally is required from the command post in the assembly area to landing zones and debarking, detraining, and detrucking points; division security and reconnaissance forces; division support command and rear echelon; and the headquarters of division units.

- (1) *Communication centers.* Communication centers are operated at each echelon of division headquarters, and others may be located at sites such as entraining and detraining points.
- (2) *Messengers.* Messengers are employed at each established communication center. The volume of message traffic and the location of communication centers serving the division and its elements will warrant the establishment of scheduled messenger service.
- (3) *Radio communication.* Radios in the assembly area are silenced when secrecy and surprise are essential to the success of the operation, except as needed to broadcast warnings and as needed by reconnaissance forces in contact with the enemy.
- (4) *Wire communication.* The installation of wire in an assembly area should be limited, but should suffice for assembly operations and provide for future use of the area.
- (5) *Radio relay.* Radio relay teams are deployed, but remain on listening silence to insure secrecy during the assembly. As soon as the tactical situation permits, listening silence will be lifted.

55. Communication During Marches and Halts

a. General. Marches by a division may be made in one or more stages, in one or more columns, and on one or more routes. They may be motor marches or combined foot and motor marches. In either case, minimum essential communication must be provided for control of the moving columns. The signal officer is given information of the march plan in time for the signal battalion to provide the required communication facilities.

b. Communication While Columns are Forming. While units are moving to their march positions, communication from the division command post to unit command posts may be maintained by radio and special messengers. Radio can be used advantageously for communication between staff officers supervising the organization of march columns, especially when the different units are widely separated. However, the use of radio is subject to security restrictions and should be limited to short range low power sets with any relays located as far to the rear as practicable.

c. Communication During Marches. Communication is provided from division main to reconnaissance and security elements operating under division control, to column commanders, to command posts of the other echelons of division headquarters, and to control points. Communication within the various reconnaissance and security elements of any column is the responsibility of the column commander.

- (1) *Communication centers.* Communication centers are established at division main, support command, and rear echelon command posts, and at control points and advance locations designated in the march plan. When the division commander accompanies the division on the march, communication center operations are conducted in a vehicle moving with the march command post.
- (2) *Messengers.* The number of messengers and the type of service provided at each communication center varies with the size of the echelon served. Motor messengers are indispensable at the communication center of the march command post. At least one messenger vehicle is detailed to follow the division commander's vehicle. Motor messengers also may be detailed to follow designated staff vehicles, the communication center vehicle, and the operating radio vehicles. When aircraft are available, air messenger service is used to supplement motor messenger service.
- (3) *Radio communication.* The employment of radio communication during the march is determined by such factors as security, the speed of movement, the importance

of surprise, and the necessity for rapid communication. Frequently, radio is the only adequate means for communication between rapidly moving or distant units, and between air and ground elements. The division CG/command net includes stations at division main, at the march command post of each column and, on occasion, at control points and advance message centers. The division intelligence net includes stations at division main, with the reconnaissance and security elements under division control, and with elements of the aviation battalion observing for the division.

- (4) *Visual communication.* Panels, hand signals, and pyrotechnics, including colored smoke, are the principal means of visual communication used during the march. Friendly aircraft may warn marching troops of impending hostile attacks by flying over and alerting the columns with prearranged signals. Panels are used to mark specified vehicles in column and to transmit short prearranged messages. These panels are displayed by either message center or radio teams. A special prearranged pyrotechnic code may be prescribed for use on the march. If higher commanders have designated the code, the division requests authority to assign additional special meanings that are needed.
- (5) *Wire communication.* When control points or advance communication centers are located near existing wire circuits, arrangements are made to use the circuits. When columns march on roads that are paralleled by commercial wire lines, arrangements may be made to establish wire communication over such lines at specified times, such as during periodic halts.
- (6) *Radio relay.* Radio relay is utilized during a march whenever the dictates of security, surprise and speed of movement permit. Where the tactical situation does not permit multiaxis radio relay, a single axis along the division's axis of advance will be established. Maximum use is made of commanding heights which permit installation of a base radio relay station, and continuous contact with the advancing units over long distances. Particular care is exercised to provide for the defense of such stations. Helicopter movement of radio relay equipment is utilized wherever practicable.

d. Communication During Extended Halts. Plans must be made in advance for the communication system to be used during a halt. Factors that are considered in formulating the plans in-

clude the location of communication installations and elements of the division signal battalion in the area, availability of indigenous communication facilities, the volume of traffic and types of communication required by the division commander for reconnaissance, security activities, and administration; and the conservation of signal supplies to insure the availability of sufficient quantities for the next operation.

- (1) *Communication centers.* The schedule for reliefs at communication centers is arranged to cover the time the command post is expected to remain in the bivouac area.
- (2) *Messengers.* The signal officer determines whether special or scheduled messenger service, or both are to be provided. The duties of some messengers on the march are tiring, and the need for rest during the halt must be considered. Normally, special messenger service is adequate during halts. Local messengers are informed of the locations of the various offices at the command post and are given the names of the officers on duty at each site. During the halt, messengers must reconnoiter the routes from the communication center to the other installations in the vicinity.
- (3) *Radio communication.* Radio stations are located as near as practicable to the signal message center. The restrictions placed on the use of radio during a march usually are applicable during a halt. When security permits, the division intelligence net continues to operate. Stations in the command nets, although normally prohibited from transmitting, usually remain in a standby status (ready for operation). Radio operation in corps and army nets continues to be as directed by corps and army commanders.
- (4) *Visual communication.* When observation aviation is working with the division during a daylight halt, a panel station is established. The panel station, combined with a message drop and pickup point, is located so as to preserve maximum security for the command post against observation by hostile aircraft.
- (5) *Wire communication.* The telephone system installed in the bivouac area is held to a minimum. When wire facilities already exist, arrangements may be made for their use to reduce the requirement for new telephone lines.
- (6) *Radio relay.* Where security aspects permit, radio relay systems are established during extended halts to interconnect all signal centers.

56. Communication During Development

a. General. During development, columns break up into smaller groups and move on assigned march objectives, or move to assembly positions preliminary to deploying for attack or defense. The signal battalion must be prepared to meet the communication requirements created by the changing tactical situation.

b. Application of Communication. There is no break in the operation of the communication system during development. A properly planned operation insures a communication system flexible enough to meet the requirements of development and deployment.

- (1) *Communication centers.* The march command post communication center may continue operation during development. If a communication center does not accompany the headquarters on the march, one must be established at the new command post by signal center personnel of the advance party.
- (2) *Messengers.* With units changing locations during development and with several of them possibly using the same routes, close coordination is required to permit the continuation of adequate messenger service. Units should notify the division communication center of the locations of their command posts, and all messengers should be instructed concerning the routes to, and the locations of, the units to which they are dispatched. Scheduled messengers make their deliveries to unit rear echelons or old command post locations until new locations are established, at which time the messengers are rerouted to the unit command posts.
- (3) *Radio communication.* The extent to which radio is used depends on the requirements for secrecy and surprise as balanced against the urgency for radio communication. When security permits, the division command net is operated during the development. The operation of secondary stations in this net may be limited to combat units in contact with the enemy. Usually, there is no reason to curtail radio operation in the division intelligence net during the development. The commander needs this channel of communication to receive timely information concerning the enemy.
- (4) *Visual communication.* The use of visual communication during the development is governed by the enemy's ability to observe the visual signals. It may be necessary to

curtail the use of visual communication if enemy air observation is active.

- (5) *Wire communication.* Every effort is made during the development to establish the wire system required for combat. The installation of lines that will not be used during combat is held to a minimum.
- (6) *Radio relay.* An extensive radio relay system is planned for use during a development, including extensions of the systems to support exploitations. Where, during early phases of the development, security dictates, radio relay listening silence will be imposed. Teams will be deployed for earliest possible use, and displacement equipments will be designated and held well forward to support tactical successes. Equipments and radio relay teams will be predesignated and deployed for possible air-mobile operations.

57. Communication During Attacks

a. General. During an attack, combat troops of the division normally are organized into three tactical forces: the main attack force, the secondary attack force, and the division reserve force. Since the main attack force requires the maximum of signal communication support, the division signal officer and division signal battalion personnel are particularly concerned with the location and direction of the main attack.

- (1) *Orders and instructions.* When time permits, the signal officer obtains approval of his plan for signal communication, completes the detailed signal plan, and issues orders to the signal battalion. However, the installation of the area communication system is not delayed to await the detailed signal plan. If any delay is contemplated, the signal officer orders the advance party to proceed to the designated location of the command post; there they install the communication system. Fragmentary orders and SOP's are used in the absence of other orders.
- (2) *Instructions to subordinate units.* The necessary instructions on signal matters are communicated to all units requiring them. These instructions may be issued at a conference of the division signal officer and the unit signal/communication officers, or they may be sent in messages or issued in the signal annex of the division operation order. These instructions may concern messenger service, use of radio, use of the wire system, and any other information of a coordinating nature. The

division SOP tends to reduce the volume of such instructions.

b. Application of Communication. Time factors govern the extent to which the installation of signal communication facilities may be carried out. In addition, the elaborateness of the signal installation is limited by the quantities of signal supplies and equipments available to the division.

- (1) *Communication centers.* The operation of a communication center at a division command post may involve displacement from a temporary location (used during the development) to a more advanced location. Displacement is made by leapfrogging the teams of the communication center. The communication center must be prepared to displace on short notice.
- (2) *Messengers.* Normally, after the attack has been launched, special messengers are used forward of the division main or forward command post, as the case may be.
- (3) *Radio communication.* When surprise is important, radio operation is limited initially to those units in contact with the enemy. In some instances, to increase deception and surprise, the operation of dummy stations may be directed by higher commanders. When the division is moving into an area just prior to attack, it maintains listening silence until the attack is launched. When the division already is occupying a sector from which it is to launch an attack, and its radio stations are already in operation, normal radio operation is continued without substantial change in traffic load until the attack is launched. If the division is moved to another sector or relieved by another unit, it may be required to provide dummy stations to remain in the area and continue normal operation until the attack is fully under way. Once the attack is launched, the special restrictions on radio operations are, as a rule, removed.
- (4) *Wire communication.* The initial wire system installed for the attack is limited in extent by time and by the amount of wire and wire personnel available. The minimum essential circuits are installed first and the system expanded as required.
- (5) *Radio relay.* Prior to attack, the same restrictions and deception requirements specified for radio communications also apply to radio relay communications. Extensive plans are made, however, and teams deployed, to provide communications support when these restrictions

are lifted. Reserve equipments and teams are held well forward in the attack area. Provision is made for helicopter movement of radio relay teams and equipment.

58. Communication During Pursuit

a. General. When an enemy is forced to retreat, an immediate and relentless pursuit may be launched to exploit the advantage. During pursuit, all units are pushed to the extreme limit of physical endurance. Direct pressure against the retreating forces is combined with an encircling force to prevent them from sustaining a successful retrograde action. Maintenance of communication during the pursuit requires maximum effort on the part of all signal troops and maximum use of all available facilities including civilian.

b. Application of Communication. The speed of vigorous pursuit necessitates rapid and numerous displacements of command posts. Continuous message center operations must be maintained during the pursuit.

- (1) *Messengers.* All available messengers are used at established communication centers. When distances become extended among elements of division headquarters, messenger relay points will have to be established. Aircraft can be used to great advantage in the messenger service.
- (2) *Radio communication.* Radio is the most suitable means of communication for pursuing forces. The distance between these forces and the nearest division signal center may become so great that the most powerful radio sets available will be needed to maintain communication.
- (3) *Visual communication.* Direct pressure and encircling forces use panels to identify themselves to friendly aircraft. They may also use panels to communicate with their division air support.
- (4) *Wire communication.* Rapid pursuit does not permit the construction of wire lines. Existing facilities along the routes may be used when practicable.
- (5) *Radio relay.* Use of radio relay during a pursuit is often limited by the speed of the advance. Where possible, radio relay systems will be installed, using the same criteria as applied for use during a march.

59. Communication During Defense

a. General. The time available to organize a defense position and existing communication facilities determine the elaborateness of signal installations. The organization for defense dictates the

type of communication system required. When the mission requires the retention of specific terrain, the commander places primary reliance on the ability of fires and forces deployed on position. With this organization for defense, wire communication is emphasized. A mobile defense is adopted when the commander places primary reliance on maneuver and fire to accomplish defensive mission. With this organization for defense, greater dependence is placed on radio communication and messenger service. For a hastily adopted defense, the communication system currently in use is continued. It is supplemented with speedily constructed wire circuits as needed. When enough time is available, channels of communication are increased and alternate channels are provided.

b. Application of Communication. The division communication system provides communication to division units, to covering forces, to division outposts, and to other units and activities as required. Other units and activities include the division reserve, division airfields, attached troops, supply and evacuation activities, and the echelons of division headquarters.

- (1) *Communication center.* Normally, division signal centers do not move frequently when the division is engaged in defensive operations. Nevertheless, communication center personnel must be prepared to displace at any time.
- (2) *Messengers.* Special messengers are required during the organization of a defensive position. When the position has become organized, the messenger service normally reverts to scheduled messenger runs.
- (3) *Radio communication.* Radio nets are subordinated to multichannel communication and messenger service. Radio nets remain operative as a supplement to the multichannel systems.
- (4) *Visual communication.* Visual signals may be used in defense as in other situations. Their use, however, is attended by the disadvantages of security risk and a possibility of misunderstanding. A panel station is established for very brief messages. Usually, air-to-ground radio communication is less time-consuming than panel systems.
- (5) *Wire communication.* The wire system is made as elaborate as time and facilities permit. High priority circuits are established as rapidly as possible to meet immediate requirements. Thereafter, additional circuits are installed to increase traffic capacity and flexibility.
- (6) *Radio relay.* During initial phases of a defensive operation, where security aspects allow, extensive radio relay

systems are installed to provide the large circuit capacity required. As the wire system is expanded, radio relay systems are placed on listening silence where possible.

60. Communication During Retrograde Movement

a. General.

- (1) Retrograde movements include delaying action, withdrawal and retirement. Communications required to support a retrograde operation are similar to the communications required to support a defensive operation. However, a delaying action or other retrograde operations which include a disengagement may require a series of communication systems. Communications during a retirement are similar to the communications used during marches and halts.
- (2) Disengagement may be executed either under pressure or not under pressure. Successful disengagement when not under pressure is normally limited to periods of darkness or poor visibility. Disengagement under pressure depends on maneuver, firepower, and control, with the forward units moving to the rear by employing aggressive small unit delaying tactics.

b. *Application of Communication.* Communication operation in the area communication system continues while preparations are made for rearward displacement of the division command post. New installation at the old location is limited to the absolute minimum, while maximum use is made of existing facilities.

- (1) *Radio communication.* Radio operation is regulated during the disengagement. Dummy stations may be used to maintain the normal level of message traffic in the old positions when authorized or required by the corps or army commander. Listening silence may be enforced on the other radio stations, both while withdrawing and on reaching the new locations. Transmission may be resumed when the operation has been completed.
- (2) *Messengers.* During the disengagement, the need for special messengers is increased. Advance communication centers are established where required and special messengers are assigned to them. Elements of the communication center left at the old command post location may be required to remain after the establishment of the new command post to insure messenger service for the forces remaining in contact with the enemy.
- (3) *Wire communication.* The wire system that is in operation prior to the disengagement is used as required to

initiate the retrograde movement. The installation of new wire lines is held to a minimum, both as to number and length. As units disengage, the wire lines not required by them or by the elements left in contact are recovered. All wire lines that cannot be recovered for any reason are made useless by removing random sections.

- (4) *Radio relay.* Use of radio relay during a retrograde movement may be dictated by deception plans and prior practices. Since the intent of the commander during a retrograde movement is to deceive the enemy, radio relay systems must assume the pattern normally employed during the maneuver the commander intends to imitate. Thus, if the commander wishes to convey the thought of a long-term defense, the radio relay systems actually installed must comply with the division's habitual electronic pattern for a defensive situation. Such activities as these may entail loss of radio relay equipments. Radio relay sites to the rear which allow long-range control of divisional elements are reconnoitered early, and where the tactical situation permits, equipments are installed prior to the retrograde operation.

61. Communication During Passage of Lines

a. General. To achieve a successful passage of lines or withdrawal from action, close coordination in communication-electronics must be made between the signal officers of the unit making the passage or withdrawal through lines and of the unit being passed through.

b. Application of Communication. Communications of the unit passing through will be limited to the extent possible. Full use will be made by the unit passing through of circuits made available to them from the system of the unit being passed through.

- (1) *Radio.* Radio nets of both units will be operated with the nets of the unit passing through limiting operation to the maximum practicable. Frequencies used during the passage must be carefully coordinated and procedures agreed upon to insure communication between the unit passing through and the unit being passed through.
- (2) *Wire.* Wire communications of the unit passed through will be relatively unaffected. The wire communication system of the unit being relieved will initially serve as the basic system of the element executing the passage of lines.
- (3) *Messenger.* Messengers for both units will be employed. Those of the unit being passed through will operate on

a normal SOP basis. Messengers of the unit passing through will be confined to special messenger service during the pass through.

- (4) *Radio relay.* During passage of lines security becomes an outstanding consideration. Units making the passage of lines will not deploy their radio relay equipment until they have completed the passage. The unit through which the passage is being made will establish radio relay systems in accordance with their normal pattern for radio relay deployment. Units making the passage of lines will be provided control and command circuits through the area system of the unit through which they are passing.

62. Communication During Relief in Place

a. General. Here, as in the passage of lines, close coordination between the signal officers of the unit's concerned is absolutely essential to a successful relief in place. During a relief in place, communications-electronics facilities of the relieved unit are taken over by the relieving unit so far as possible. This is particularly true of wire circuits and possibly installed switching facilities. Before the relief, the relieving signal officer coordinates with the unit to be relieved and when practicable, arranges for the signal personnel of the relieving unit to precede the main force into battle positions.

b. Application of Communication. Communications facilities of the unit being relieved will remain in place until an orderly relief is accomplished. All communications normally employed will continue operation until taken over by the relieving unit or the requirement no longer exists. The exchange of TOE equipment will be made only when the urgency of the situation dictates, or by mutual agreement between the signal officers of the commands concerned.

- (1) *Radio.* Radio nets of the unit being relieved will continue operation until a time agreed upon by the signal officers of the units concerned. Consideration should be given, for security purposes, to having the relieved unit continue to operate its normal radio nets for a limited period of time after the relief has been completed. This should be coordinated by the signal officers concerned with the intelligence officers of their respective commands. Radio liaison nets may be established or, frequencies utilized in existing nets will be used to allow liaison officers of the two units to communicate using their organic radio equipment. It may be necessary, due

to frequency congestion, for one unit to provide liaison radio sets to the other unit involved in the relief, when the organic equipment of the two units cannot be netted.

- (2) *Wire*. The wire circuits of the relieved unit will be taken over by the relieving unit.
- (3) *Messenger*. Messenger service will be taken over on a jointly established schedule from the relieved unit by the relieving unit.
- (4) *Radio relay*. During relief in place the employment of radio relay by the units involved is guided by the same considerations as for a passage of lines.

63. Air-Landed and Air-Mobile Operations

a. Air-Landed Operations. The techniques of the airborne division signal battalion are generally applicable to the infantry, mechanized and armored division signal battalion in the conduct of air landed operations. For details on the techniques of the airborne division signal battalion, refer to FM 11-57.

b. Air-Mobile Operations. The division signal battalion should cover, in its standing operating procedure and planning, data for the full use of all types of aircraft, those organic to the division as well as those made available to the division by higher headquarters. SOP and planning data should cover at least the following:

- (1) Requirement for a provisional signal center both air-portable and air-mobile.
- (2) Weight requirements for planning techniques for crossing obstacles by use of airlift.
- (3) Use of aircraft for laying wire and cable into an air-mobile objective.
- (4) Use of radio repeater stations.
- (5) Communications for aviation movement control centers.
- (6) Use of air-mobile signal elements in rear area defense and damage control activities.

CHAPTER 9

COMMAND AND STAFF RELATIONSHIPS

Section I. DIVISION SIGNAL STAFF

64. General

The DSO's staff is provided by TOE 11-36, Headquarters and Headquarters Company, Infantry, Mechanized and Armored Division Signal Battalion. The assistant DSO, radio officer, wire officer, and enlisted staff members are organic to the DSO's section, headquarters and headquarters company. Detailed functions of the DSO and his staff members are covered below.

65. Division Signal Officer

To assist the division commander in the communications and electronics functions of command, the signal officer serves as a member of his staff. The DSO advises the commander on communications-electronics matters, pictorial matters, and is responsible for the installation, operation and maintenance of the command's signal communication system and for electronics and pictorial operations. The DSO exercises the dual functions of staff and command. These two functions, although vested in a single individual, are separate and distinct in that each involves different responsibilities and duties and the exercise of one should not be confused with the exercise of the other. See FM 101-5.

66. Staff Relationships

a. General. As a member of the division commander's special staff, the DSO is included in all staff planning actions so that he can present to the commander and the other members of the staff the communications-electronics aspects of projected operations.

b. Coordination. The duties and responsibilities of the DSO cut across the general as well as the special staff. The DSO usually has free access to the Chief of Staff and deals with him on overall communications-electronics matters which affect the command.

c. Functions. There are seven broad functions of a DSO :

- (1) Advice.
- (2) Plans and orders.
- (3) Technical supervision.

- (4) Liaison.
- (5) Training.
- (6) Command.
- (7) Operation of the tactical data processing system.

d. Advice. The DSO advises, informs, and makes recommendations to—

- (1) The commanding general on all communications-electronics matters, including matters involving communications security, electronic warfare, combat surveillance, automatic data processing, signal logistics, signal training, and other matters of signal services available such as pictorial matters; requirements for and the employment of signal troops; use of signal activities for deception; and location of the headquarters of CP's as they affect signal communications.
- (2) All members of the general and special staff on all aspects of signal matters as pertain to their specific areas of responsibility, such as—

(a) *ACofS G1.*

1. Personnel activities with respect to strength, replacements and morale.
2. Movement, organization, operation, internal arrangement, and allocation of space for the headquarters or CP's.
3. Internal operation and other administrative functioning of the headquarters.
4. Communications-electronics activities pertaining to personnel and administration.

(b) *ACofS G2.*

1. Communication and electronic signal intelligence and counterintelligence.
2. Interpretation of captured enemy signal documents.
3. Evaluation of captured enemy signal equipment.
4. Photographic support for intelligence activities.
5. Other special support in signal matters for intelligence operations.

(c) *ACofS G3.*

1. Overall communications-electronics activities pertaining to the tactical mission.
2. Electronic warfare, as pertains to the tactical mission.
3. Organization and signal equipment of units assigned or attached to the division.
4. Training of personnel engaged in signal communication activities.

5. Signal employment in combat operations.
 6. Selection of CP's for the headquarters.
 7. Physical security for signal installations.
 8. Preparation of orders as pertains to signal activities, including paragraph 5 of the division operations order.
 9. Preparation of the electronic warfare annex to the division operations order.
 10. Priorities for the issue of signal supplies and equipment in critical supply.
- (d) *ACofS G4 and support command commander.*
1. Procurement, storage and distribution of signal supplies and equipment.
 2. Maintenance and evacuation of signal supplies and equipment.
 3. Allocation of critical signal supplies and equipment.
 4. Preparation of the signal portion of the division administrative order.
 5. Communications-electronics activities pertaining to logistics.
- (e) *ACofS G5.* (When civil affairs augmentation to the division is provided, and if not, to the ACofS G3.)
1. Indigenous signal communications facilities.
 2. Indigenous labor.
 3. Signal communications aspects of treaties.
 4. Military use of local civilian communications facilities, supplies and equipment, and military support of civilian communications.
- (f) *Special staff.* The DSO must advise all members of the special staff on signal support requirements for their activities.
- (3) All units of the command on all signal matters pertaining to—
- (a) Training of communications personnel.
 - (b) Communications-electronics security
 - (c) Inspection of signal equipment.
 - (d) Other technical aspects as pertain to signal activities of their unit.

e. Plans and Orders. Every combat operation requires detailed signal planning and coordination in the early planning phases. To accomplish his planning, coordination, and basic supervision of signal matters, the DSO uses the techniques and orders given below. Subparagraphs (1) through (8) below are recurring for each operation; (9) through (12) below are kept current at all times.

- (1) Signal estimate.
- (2) Signal plan.
- (3) Signal portion, paragraph 4, division operation order.
- (4) Paragraph 5, division operation order.
- (5) Signal annex to division operation order.
- (6) Signal portion of the division administrative order.
- (7) Signal battalion operation order.
- (8) EW Annex to division operation order.
- (9) Division memoranda.
- (10) Standing signal instructions.
- (11) Signal operations instructions.
- (12) Standing operating procedures.

f. Staff Supervision. The DSO also has responsibility for the staff supervision of the following matters:

- (1) Installation and operation of signal communication facilities.
- (2) Compliance with established communications security regulations.
- (3) Signal aspects of combat surveillance systems.
- (4) Coordination with the G2 to insure that all intelligence requirements for signal support are fully complied with.
- (5) Signal aspects of electronic warfare operations.
- (6) Ground and air still and motion picture photographic coverage in support of combat and intelligence operations.
- (7) The division portion of the integrated field army automatic data processing system.

g. Liaison. In addition to the liaison and coordination between the DSO and members of the general and special staffs and units of the command, the DSO must also conduct *active continuous* liaison with signal officers of—

- (1) Higher headquarters on matters pertaining to—
 - (a) Technical directives.
 - (b) SOP, SOI and SSI matters.
 - (c) Routes of signal communications and location of signal centers of the communication systems.
 - (d) Tactical plans and impending operations.
 - (e) Requirements for signal personnel.
 - (f) Signal supply and maintenance activities.
 - (g) Use of indigenous signal communications facilities.
 - (h) Electronic warfare and combat surveillance activities.
 - (i) Technical reports.
- (2) Adjacent headquarters (units and signal officers) on matters pertaining to—
 - (a) Signal support for the operation.
 - (b) Establishment of lateral signal communications.

(c) Tactical plans and impending operations.

(d) Changes anticipated in current operations.

h. Training. The training function of the DSO includes the responsibility for—

(1) Assigned signal units.

(2) Schools for the training of signal communications personnel for units of the command.

i. Data Processing. Operates the tactical data processing system which furnishes data and service concerning:

(1) Equipment status reports.

(2) Other data processing services as required.

j. References. Further details on the staff relationships of the signal officer can be found in FM 101-5, Staff Officers' Field Manual, Staff Organization and Procedure, FM 100-1, Doctrinal Guidance and FM 24-150, Electronic Warfare.

67. Assistant Division Signal Officer

The functions of the assistant division signal officer include the following:

a. Assists the DSO on planning future communications operations of the division.

b. Is responsible for publication of the division SSI and SOI.

c. Directs the integration of all signal communications in the division.

d. Prepares the signal annex of the division operations order.

e. Acts as team chief of the communications-electronics element of the division tactical operations center when a Division Tactical Operations Center (DTOC) is established.

f. Is responsible for the efficient operation of the division signal office.

g. Acts for the DSO in his absence.

68. Radio Officer

The radio officer will normally work in the division systems control center under the supervision of the battalion S3. The radio officer normally is assigned such functions as—

a. Staff supervision over all radio communications established within the division.

b. Preparation and dissemination of radio net diagrams of the nets directed or controlled by the division.

c. Keeping radio frequency utilization register and map to assure accurate and up-to-date radio frequency assignment data.

d. Preparation of items of the division SOI and SSI relating to radio matters.

e. Preparation and dissemination of the division radio relay system map overlays.

f. Coordination for the reduction of radio frequency interference within the division and adjacent divisions.

69. Wire Officer

The wire officer will normally work in the division systems control center under the supervision of the battalion S3. The wire officer is normally assigned such functions as—

a. Establishment of and staff supervision over wire cable installation and maintenance practices to be employed by the units assigned or attached to the division.

b. Preparation and dissemination of—

(1) Telephone and teletypewriter traffic diagrams used by the division.

(2) Telephone and teletypewriter directories used by the division.

(3) Systems and circuit diagrams for the division communication system.

(4) Line route maps.

c. Conducting communication traffic studies of the load on all types of communication systems used by the division and making recommendations to the communications control officer (signal battalion S3) for the increase or decrease of facilities as required.

d. Compilation of factual and experience data for future reference on communications installations.

e. Preparation of those items of the division SOI and SSI which pertain to wire operations.

Section II. SIGNAL BATTALION STAFF

70. General

The battalion headquarters element of the headquarters and headquarters company provides the officer staff that assists the commander in controlling the employment and operation of equipment and personnel of the companies organic to the signal battalion. *Battalion staff officers do not exercise command authority.* They may be authorized to issue orders or directives in the commander's name to subordinate units, when operating within clearly established policies and decisions laid down by the battalion commander. Some of the duties and functions of the battalion commander and his staff are covered below.

71. Battalion Commander

The battalion commander, as previously stated, exercises the dual functions of DSO and signal battalion commander. The battalion commander directs his staff and issues SOP and mission-type orders to the operating companies of the battalion. He exercises control through command channels. Certain technical instructions, such as circuit allocations and changes, frequency assignments and changes, adjustments to the communication system, and similar instructions pertaining to communications-electronics, may, when so delegated by the commander, go directly from the responsible staff activity to operating agencies. These instructions are defined as technical control and should be well defined by the battalion commander in SOP. In accomplishing his command function, the battalion commander must concern himself with—

- a. Organization and control.
- b. Personnel strength, morale, discipline, and training.
- c. Administration and housekeeping.
- d. Logistical matters.

72. Executive Officer

The executive officer performs those functions as defined for this office in FM 101-5. So far as regulations permit, he will act for the battalion commander on all battalion matters to afford the commander maximum freedom to devote his attention to his responsibilities as DSO.

73. Battalion S1

The S1 is the administrative chief for the battalion. He performs those functions as defined for this office in FM 101-5.

74. Battalion S2-S3

The battalion S3 performs those functions as defined for the S2-S3 in FM 101-5. The S2-S3 is normally delegated authority by the commander to issue directly to operating activities (signal centers) certain technical instructions such as frequency assignment and change, circuit assignment and change, and other adjustment to the communication system. This is called technical control. The technical control authority delegated by the commander must be well defined and should generally be limited as indicated above. All other orders or instructions to the operating units prepared by the S2-S3 must be issued in the name of the battalion commander. The S2-S3 is charged with the establishment and operation of the division systems control center. An assistant S2-S3 is usually assigned additional duties as the S2 intelligence officer.

75. Battalion S4

The battalion S4 performs those functions as defined in FM 101-5 for this office. (For details on battalion supply operation, see chapter 10.)

76. Battalion Motor Officer

The battalion motor officer advises the commander and staff on motor transportation in the battalion and the training of motor transportation personnel. He exercises staff supervision over the battalion motor maintenance section. He must assure, in coordination with the S4, adequate petroleum, oil and lubricants support for all signal battalion units.

77. Battalion Staff Relationship with Company Commanders

a. The command of headquarters and headquarters company requires a great deal of cooperation and coordination between the unit commander and the battalion staff. It is, therefore, important that the battalion commander in his selection of a headquarters company commander choose the type of leader who can achieve the best possible staff relationship without subordinating the control of his company. A majority of the personnel assigned to headquarters and headquarters company are employed in the staff sections and will be required to spend most of their time with these activities. At the same time, there exists many functions which are the responsibility of the company commander such as guard, security, and mess detail, which must also be performed by members of the company. Only through realization of the responsibilities of all personnel can the staff and the unit commander operate most efficiently. To preclude denuding the company commander of his authority, while retaining responsibility, requires the wholehearted cooperation of the battalion staff. In general, the battalion commander should assure that unit command functions are left to the headquarters company commander and that the staff sections involve themselves only with staff operations. The company commander should be kept informed of the status of personnel and equipment assigned to his company and employed by staff or operating sections. He must be kept informed of present and future plans in order that he may render the most effective support both as a unit commander and headquarters commandant for the battalion.

b. The commanding officer of the command operations company has a normal staff relationship with the battalion staff. Orders are received through command channels. Technical channels are used in the manner prescribed by the battalion commander for technical instructions not involving variation from command

policies. Technical instructions are issued direct, when necessary, to operating command signal centers by the battalion S3. Since the command signal centers operated by the battalion are provided by the command operation company, this direct contact may bypass normal command channels. It will not, however, prevent the company commander from effectively controlling his unit.

c. The commanding officer of the forward communications company has the same type of relationship with the battalion staff as does the command operations company commander. Here the battalion S3 issues technical instructions direct to the forward signal centers, and the forward command communications sections.

Section III. SIGNAL COMMUNICATIONS CONTROL

78. General

a. Signal communications control involves the fitting of signal communications resources to the tactical requirements. One of the functions of the DSO is to adjust the available circuit capacity and facilities to meet the specific requirements of the situation. Since the division area communication system is widely dispersed and constantly subject to change, only through effective control can the communication system be made to offer immediate response to changes in the tactical situation. Control of the division area communication system is accomplished by establishing a systems control center at the division main signal center, and subordinate facilities control centers at all other division signal centers.

b. All control centers are delegated authority to make changes in the communication system to respond to the needs of its users. This authority is properly implemented through the promulgation of a sound, understandable, and workable SOP. In addition, control centers must have a current list of priorities for establishing, routing, and rerouting circuits within the signal system. This schedule is established and kept current through constant staff coordination between the DSO and division general and special staff. When a division tactical operations center (DTC) is established, the DSO, assistant DSO, or designated representative will remain in the communications-electronics element of the DTC, keeping pace with the tactical situation as it develops and advising the signal systems control center of actions required to respond to the immediate requirements of the tactical situation, and to plan and anticipate future requirements.

79. Division Systems Control Center

The division systems control center is supervised by the signal battalion S3. Engineering, planning, and determination of requirements for the division area communications system are performed by the division signal staff; however, the actual control of the systems and circuits is the responsibility of the division systems control center. This control includes circuit routing assignment, emergency rerouting, and designation of control terminals. It also includes general supervision of signal installation, operation, maintenance and fault location and correction within the system. The systems control center exercises control of the division area communication system through direct signal communication with the division signal centers. The division systems control center requires engineering circuits to each forward signal center. Detailed information on division signal communication control is found in FM 11-21, which should be used as a reference guide on signal control matters.

CHAPTER 10

BATTALION SUPPORT FUNCTIONS

80. Battalion Mess Operations

The method of providing mess support in the division signal battalion is a matter of command choice and will vary with the unit and the battalion mission. Staff responsibility for coordinating mess operation falls under the S4. The signal battalion has a capability to operate three company size mess facilities. In garrison-type operations, each unit will operate a company mess to support its assigned personnel. In combat operations, the company mess capabilities are used to support selected areas where the largest groups of battalion personnel will be employed. The following types of employment of company mess facilities may be used:

a. Headquarters and headquarters company responsible for establishing and operating a mess at the battalion CP. This mess may be augmented by the command operations company mess section to support the battalion headquarters, division signal section, and all signal battalion personnel operating in or near the division main signal center.

b. Command operations company responsible for establishing and operating a company mess facility at the division alternate signal center to provide mess support to all signal battalion personnel located in the vicinity.

c. The forward communications company, depending upon the situation, will either augment the command operations company mess at division alternate, supporting as many of its personnel from this point as practicable, or establish a separate mess facility at a point which will afford a better capability for messing a majority of the personnel assigned.

d. Since the mess capability of the signal battalion is not large enough to support a mess facility at each location where battalion personnel will be operating, it will be necessary for signal battalion personnel employed at division rear, support command and the brigades to ration with the unit providing mess support for these echelons of the command.

e. Because of the limited number of cooks assigned to the companies of the signal battalion, it will not normally be practicable to augment a unit providing a mess supporting signal battalion personnel with cooks from the signal battalion.

81. Battalion Supply Operations

Battalion supply operations are governed by the provisions of AR 735-35. Supply operations are under the staff supervision of the battalion S4. The battalion supply operation is conducted on the basis that a minimum of supplies will be held in the battalion and that rations and water will be delivered directly to the using elements. The organization of the battalion supply system also takes into account that all company elements will be refueled directly by mobile filling stations, operated by the signal battalion. It is expected that the battalion supply section will make supply runs to requiring battalion elements consistent with the requirements and the supply sections' capability to provide this service.

82. Battalion Motor Maintenance Operations

Battalion motor maintenance operations come under the general supervision of the battalion motor officer and under the direct supervision of the battalion motor maintenance officer. Motor and general maintenance is performed on site so far as practicable. The battalion motor maintenance section of headquarters and headquarters company provides tool sets, a wrecker, and a maintenance shelter for the establishment of a battalion motor repair facility. The battalion maintenance operation is confined to organizational maintenance on motor vehicles and power generators supplemental to the capability of the battalion's organic companies.

83. Battalion Command Post

The battalion CP will normally be located in the vicinity of the division main CP. Selecting the CP is a responsibility of the commanding officer of the headquarters and headquarters company, subject to approval of the selected location by the battalion commander. The battalion CP will displace in one echelon on orders of the battalion commander. In addition to selecting the location for the battalion CP, the headquarters and headquarters company commander is normally assigned the duties and functions of headquarters commandant for the battalion.

84. Signal Maintenance

The battalion signal maintenance section of headquarters and headquarters company, division signal battalion, performs organizational maintenance on the signal equipment organic to the signal battalion and third echelon maintenance on all cryptographic equipment assigned to the division. Signal maintenance within the signal battalion operates under the general supervision of the signal battalion S4.

a. The maintenance of the signal battalion's organic signal equipment is performed by radio repairmen, carrier repairmen, electrical generator repairman, manual central office repairman, and teletypewriter repairman. These specialists are organized into working elements as determined by the S4 to perform the battalion's signal maintenance function. The mobile repair teams are formed utilizing the signal repair shop trucks provided by TOE. Tent shelter is available as necessary for additional shop elements. Consideration should be given to utilizing mobile repair teams for on-site and preventive maintenance, and for establishing an initial repair facility during the displacement of the main or alternate command post. To assure the most effective use of the limited maintenance force available, subordinate unit commanders must take aggressive action to see that all maintenance which can be performed at unit level is performed to the maximum extent possible.

b. For cryptographic maintenance the cryptographic repairmen assigned to the signal maintenance section must perform the third echelon repair of all cryptographic equipment authorized the division. These specialists equipped with a $\frac{3}{4}$ -ton truck and necessary tool equipments may be assigned to operate under the supervision of the division cryptographic officer or may be retained as a separate operating element of the repair facility under the control of the Battalion S4.

c. Third echelon maintenance for signal equipment within the division with the exception of cryptographic equipment is a function of the Division Support Command.

APPENDIX

REFERENCES

1. General

This appendix contains a list of numbers and titles of selected publications pertinent to the operations of the division signal battalion. For availability of items listed and publications on additional subjects, refer to DA Pamphlets 310-1, 310-3, 310-4, 310-5, and 310-7.

2. Administration

AR 220-60	Battalions, Battle Groups, Squadrons; General Provisions
AR 220-70	General Provisions
AR 230-5	Nonappropriated Funds and Related Activities; General Policies
AR 320-5	Dictionary of United States Army Terms
AR 320-50	Military Terms, Abbreviations and Symbols
AR 340-15	Correspondence
AR 380-5	Safeguarding Defense Information
FM 100-10	Field Service Regulations; Administration
FM 101-5	Staff Officers' Field Manual: Staff Organization and Procedure
FM 101-10	Staff Officers' Field Manual: Organization, Technical, and Logistical Data
TOE 11-35()	Division Signal Battalion

3. Operations and Training

FM 11-8	Field Radio Relay Techniques
FM 11-16	Signal Orders, Records and Reports
FM 11-21	Tactical Signal Communication Systems, Army, Corps and Division
FM 11-40	Signal Corps Pictorial Operations
FM 11-57	Signal Battalion, Airborne Division
FM 21-5	Military Training
FM 21-6	Techniques of Military Instruction
FM 21-30	Military Symbols
FM 24-18	Field Radio Techniques

FM 24-20	Field Wire and Field Cable Techniques
FM 24-150	Electronic Warfare (U)
FM 31-21	Guerrilla Warfare and Special Forces Operations
FM 31-25	Desert Operations
FM 31-30	Jungle Operations
FM 31-71	Northern Operations
FM 41-10	Civil Affairs Operations
FM 61-100	The Division
FM 100-1	Doctrinal Guidance (U)
FM 100-5	Field Service Regulations; Operations
FM 100-11	Signal Communications Doctrine
FM 101-5	Staff Officers' Field Manual: Staff Organization and Procedure
AR 350-1	Army Training Policies
AR 380-40	Safeguarding Cryptomatter
AR 380-41	Control of Cryptomaterial
TM 57-210	Air Movement of Troops and Equipment

4. Supply and Maintenance

AR 711-16	Installation Stock Control and Supply Procedures
AR 735-2	Transfer of Property Accountability and Responsibility
AR 735-4	Expendable Property
AR 735-5	Property Accountability; General Principles and Policies
AR 735-11	Accounting for Lost, Damaged, and Destroyed Property
AR 735-35	Property Accountability: Supply Procedures for TOE Units, Organizations and Non-TOE Activities
AR 750-5	Maintenance Responsibilities and Shop Operation
AR 750-8	Command Maintenance Inspections
AR 750-610	Communications Security Equipment Maintenance
AR 750-625	Maintenance Inspections and Reports; Signal Equipment
DA Pam 310-21	Military Publications: Index of Supply Manuals; Signal Corps
FM 9-30	Maintenance Battalion, Division Support Command
FM 10-50	Supply and Transport Battalion, Division Support Command

- FM 54-2 Division Logistics and the Support Command
- SB 11-100 Serviceability Standards for Signal Equipment in Hands of Troops

5. Fortifications, Camouflage, and Demolitions

- FM 5-15 Field Fortifications
- FM 5-20 Camouflage, Basic Principles and Field Camouflage
- FM 5-25 Explosives and Demolitions

6. Miscellaneous

- DA Pam 108-1 Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings
- DA Pam 310-1 Military Publications: Index of Administrative Publications (Army Regulations, Special Regulations, Department of the Army Pamphlets, Commercial Traffic Bulletins, Military Traffic Management Bulletins, General Orders, Bulletins, and Circulars)
- DA Pam 310-2 Military Publications: Index of Blank Forms
- DA Pam 310-3 Military Publications: Index of Training Publications (Field Manuals, Reserve Officers' Training Corps Manuals, Training Circulars, Army Training Programs, Army Subject Schedules, Army Training Tests, War Department and Department of the Army Posters, and Firing Tables and Trajectory Charts)
- DA Pam 310-4 Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
- DA Pam 310-5 Military Publications: Index of Graphic Training Aids and Devices.
- DA Pam 310-7 Military Publications: Index of Tables of Organization and Equipment, Tables of Organization, Type Tables of Distribution, and Tables of Allowances.

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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ACSI (2)	Div Abn Bn (none)
DCSOPS (10)	TOE 11-35 (20)
DCSLOG (10)	Div Co/Btry/Trp (1) except
ACSRC (2)	Div Abn Co (none)
CRD (2)	TOE 11-37 (5)
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TIG (1)	USATC Inf (10)
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NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: Same as Active Army except allowance is one copy to each unit.

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