

# CHAPTER 1

## INTRODUCTION

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### 1-1. Purpose

This manual provides doctrinal guidance for the employment and operations of the Signal Troposcatter (Tropo) Companies (Light and Heavy) at echelons above corps (EAC) in a theater of operations. The manual is oriented toward communications support operations behind the corps rear boundary in a large theater of operations. However, it is not limited in scope to any particular theater of operations.

### 1-2. References

Required and related publications are listed in the appendix.

### 1-3. Related manuals

This field manual is one of seven manuals prepared by the U.S. Army Information Systems Command (USAISC) for communications doctrine at EAC. The seven manuals provide a comprehensive understanding of theater-level communications.

*a.* FM 11-23 is the keystone manual, which contains an overview of EAC communications. It provides a structure for a type Theater Communications Command (ARMY) (TCC(A)) and introduces the "building block" units which may be assigned to a TCC(A). The TCC(A) installs, operates, and maintains the Army's Theater Communications System.

*b.* FMs 11-24 through 11-29 provide specific doctrinal guidance for the employment and operations of individual building block units (battalion and company size).

### 1-4. Explanation of abbreviations and terms

Abbreviations and special terms used in this manual are explained in the glossary.

### 1-5. The AirLand Battle

*a.* The U.S. Army must be prepared to meet a variety of challenges on battlefields worldwide. It must be prepared to fight both highly mechanized forces and light, well-equipped forces. In the areas of greatest strategic concern, the Army must expect battles of greater scope and intensity than ever fought before. It must anticipate battles that include the use of nuclear, biological, and chemical (NBC) warfare and electronic warfare (EW). To win, all available military forces must be coordinated in pursuit of common objectives. AirLand Battle doctrine provides the Army's

basic operational concepts to meet these challenges. FM 100-5 describes the AirLand Battle doctrine.

*b.* AirLand Battle doctrine fuses the separate geographical areas of combat into one battle. It extends from our own rear areas, across the forward line of own troops (FLOT), deep into the enemy's second echelons and rear areas. The theater commander plans and directs the major campaigns, emphasizing maneuver as opposed to close combat. Four basic characteristics express the essence of the AirLand Battle: initiative, depth, agility, and synchronization. They apply to all levels of command and are summarized below.

(1) Initiative is the ability to set the terms of battle by action. Commanders must seize and preserve the initiative. This generates an offensive spirit in the conduct of all operations.

(2) Depth refers to time, space, and resources. Commanders need to use the entire depth of the battlefield to strike the enemy. Depth of resources provides the commander great flexibility over large areas. These resources include the integration of ground and air operations.

(3) Agility means acting faster than the enemy. Commanders must learn of critical events as they occur and act swiftly to avoid enemy strength and exploit enemy weaknesses. This must be done repeatedly.

(4) Synchronization of combat power assists in achieving maximum results. Commanders must waste no effort, initially or as an operation develops. Operations must be synchronized with other services and allies.

*c.* Communicators must be aware that decision-making by battle commanders is extremely time critical. Our decision cycle must be less than that of any enemy. The range, scope, and support of operations is thus highly dependent on command and control. The AirLand Battle requires immediately responsive and highly reliable communications involving signal commanders and officers at all levels.

### 1-6. Theater Army communications

*a.* *Theater Communications System (Army).*

(1) When the Army must operate on a large land mass, the scope of combat forces, support services, and duration of involvement is increased significantly. Extended operations also introduce requirements for Navy and Air Force support, as well as an expanded administrative and logistical base. Each service usually provides its own support services and command structure to ensure the best possible support of

its tactical commanders. The Army headquarters which provides this support is the Theater Army (TA). The TA Headquarters and its support units generally operate in the area to the rear of the corps boundary called the communications zone (COMMZ). (One exception to this doctrine is that a troposcatter terminal (light or heavy) may be used to provide connection into the corps tactical system.) The COMMZ can extend to the water's edge in a large land mass, across a major water body to another land mass, or even to the Continental United States. FM 100-16 provides a detailed discussion of support operations in EAC. It is the source of concepts and doctrine for EAC communications-electronics (C-E) TA operations. It relates the C-E role to the command and control requirements of the theater.

(2) FM 11-23 describes the Army's overall telecommunications system for command and control. The system is called the Army Automation Communications Network (AUTOCOMM). The AUTOCOMM provides tactical, strategic, general support, and theater subnets. The theater subnet is called the Theater Communications System (Army) (TCS(A)). The Signal Tropo Companies (Light and Heavy) are employed in the TCS(A). As indicated above, they may also be employed in the communications system of the tactical subnet.

(3) For many years, the concepts and doctrine for a theater have been focused on Europe with its combined and joint command structures. This has led to heavy reliance on C-E support from the commercial services and facilities which exist in industrially developed central Europe. In this case, communications plans and forces have become very dependent on such host nation support (HNS).

(4) Vietnam and other recent experiences have demonstrated the tremendous resources required to support ground combat in undeveloped regions. Multichannel radio played a major role in providing communications to dispersed units. Troposcatter and satellite radio also proved themselves important to theater command and control.

(5) The new tactical troposcatter radio systems greatly enhance the flexibility and capacity of the Theater Communications System. They can be moved and put in operation more rapidly than their predecessors. Their area of coverage is excellent when compared to other multichannel radio systems. A signal path may be as much as 150 miles (241 kilometers) long for the heavy troposcatter system. A troposcatter system creates a common volume in the troposphere which refracts and scatters the signal, causing it to return to earth and complete the link. Figure 1-1 depicts this effect.

*b. Army Command and Area Communications System.*

(1) The TCS(A) provides both command and area

communications. It consists primarily of command and area links in a nodal configuration called the Army Command and Area Communications System (ACACS).

(2) The ACACS provides service to the TA in the COMMZ on a common-user, geographical basis. TA Headquarters is supported by the Signal Command Operations Battalion (Theater) and accesses the ACACS through at least two area signal nodes. Major functional headquarters are interconnected with TA Headquarters through the ACACS. This is accomplished through an extension node provided from the supporting major area node. The major area nodes and extension nodes are provided by the Signal Telecommunications Battalion (Area). The area nodal portion of the ACACS also provides C-E services to other units assigned to or transiting through the COMMZ.

(3) Figure 1-2 shows a representative ACACS found in the TCS(A). The ACACS can provide the high-volume telephone, radio, and record copy services required by larger headquarters. Troposcatter and tactical satellite radio may be employed in either the command or the area portion of the system. They can connect the TCS(A) to the strategic or tactical subnets of the AUTOCOMM network. The ACACS is required to interface with the Defense Communications System (DCS) in at least two locations. The corps area signal system will also interface with the ACACS. See FM 11-23 for a more complete description of the services provided by the TCS(A).

*c. Theater Communications Command (Army)*

(1) The TCC(A) is under the operational control of the TA commander. It provides communications for U. S. Army units throughout the COMMZ. It may be directed to provide C-E support to other U.S. and non-U.S. units and to provide some or all of the strategic subnets in the theater. It also is responsible for supply and maintenance support for TCC(A) unique C-E, air traffic control (ATC), and navigational aids (NAVAIDS) equipment. The TCC(A) is designed on a building block principle.

(2) Figure 1-3 shows a typical TCC(A). The types and number of units assigned can be changed to meet C-E requirements. If a major conflict should occur, available resources will be severely taxed by current force restrictions. Very important, also, is the fact that our major opponent has made known its intention of disrupting the Army's support areas. C-E units will be primary targets of this threat and must be prepared to combat it effectively. A future war will not be fought only at the front. It will cover the breadth and depth of the entire theater in a simultaneous or nearly simultaneous series of actions.

(3) All these factors emphasize the need for detailed planning at every level within the TCC(A). Thorough planning and frequent practice is the only way to prepare for the surprises which occur in wartime. FM 11-23 provides detailed doctrine for the

# TROPOSPHERIC SCATTER

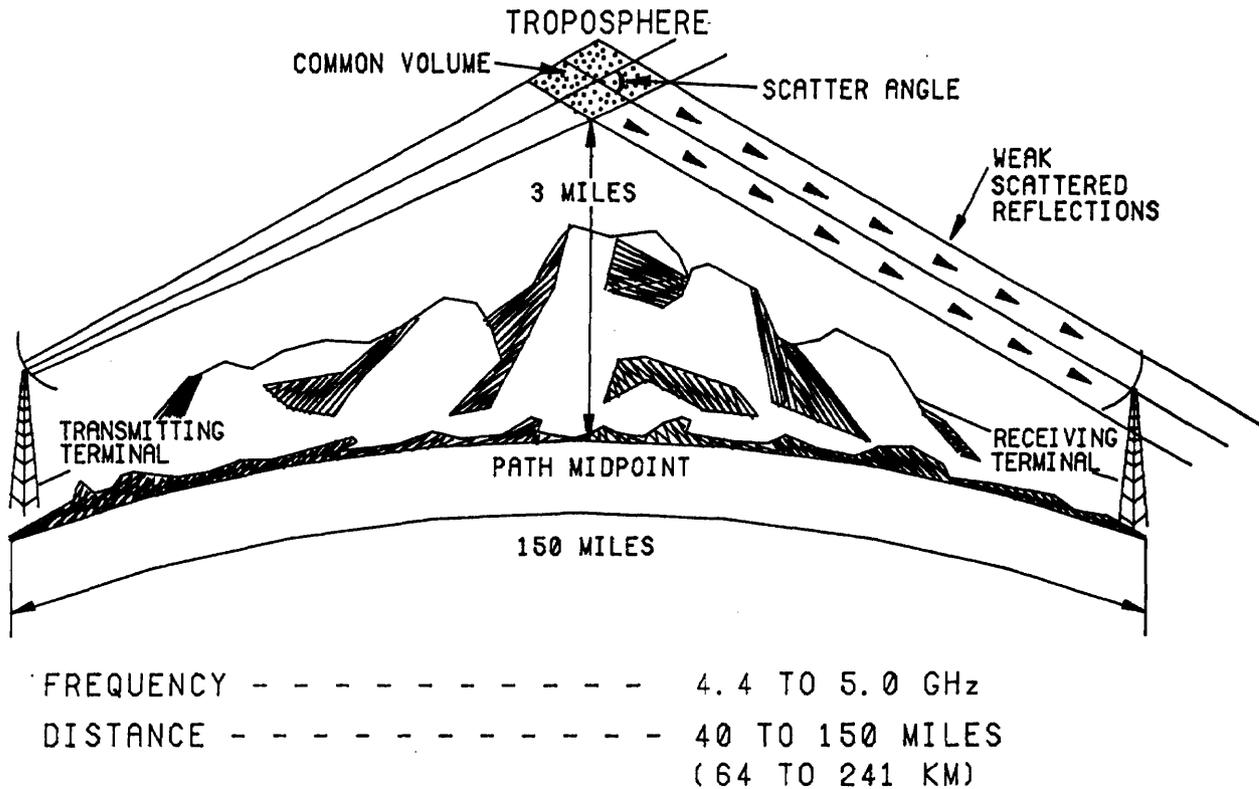


Figure 1-1 Tropospheric scatter radio system.

TCC(A). Generally, one Tropo Company (Heavy), up to 144-channel capability at a planning range of 150 miles (241 kilometers), is assigned to a TCC(A). Also, one Tropo Company (Light), up to 144-channel capability at a planning range of 100 miles (160 kilometers), is usually assigned to each TCC(A) Theater Signal Brigade. Each Company is an essential element in the TCS(A).

## 1-7. Echelons above corps support

EAC commanders must be prepared to operate in both joint and combined operations on the AirLand Battlefield. FM 100-16 includes broad doctrine concerning EAC support in both type operations and contingency deployment. Particularly in combined operations, command and control, as well as intelligence collection and dissemination, present unique problems. Nations are reluctant to relinquish sovereign rights in these areas. In all cases, C-E support must be specifically tailored to meet the support and operational requirements of the type theater of operations. Signal commanders and planners must be aware of this. These requirements are best understood in terms of the two typical EAC

situations explained in FM 100-16. The two major scenarios in which the TCC(A) will be called upon to provide EAC support are support to forward-deployed forces and support to nonforward-deployed forces. The two scenarios are briefly described below/ FM 100-16 can be consulted for a more detailed discussion of each.

*a. Support to forward-deployed forces.* Support to forward-deployed forces normally involves combined operations. U.S. forces are predeployed in a foreign country and operate with allied nations in an established theater. The European North Atlantic Treaty Organization (NATO) and Korean Combined Forces Command (CFC) are examples where U.S. forces are forward-deployed in foreign countries. In both cases, an established formal allied command structure exists, HNS agreements exist, and a TCS(A) is in place. A forward-deployed situation provides the benefits of time, planning, and experience in a specific theater of operations prior to an outbreak of hostilities.

*b. Support to nonforward-deployed forces.* Support to nonforward-deployed forces involves a contingency situation. A joint U.S. contingency force, with or without allied assistance, deploys to an area without a significant preestablished U.S. support base. It is anticipated that prepositioned war material stocks and

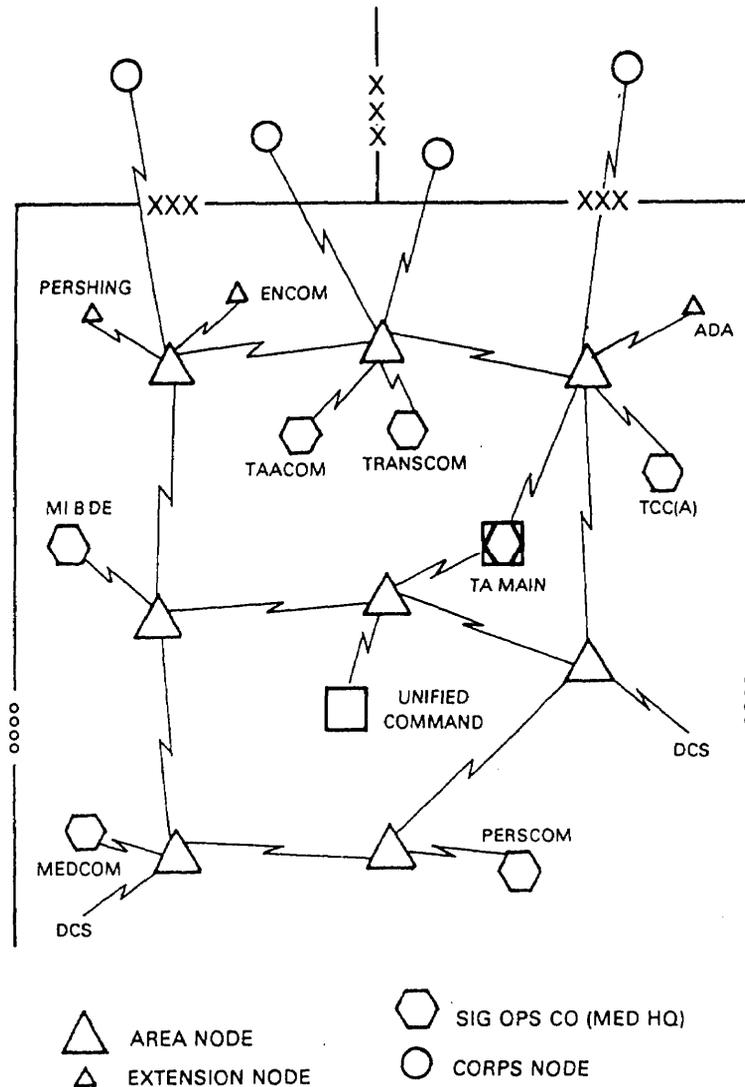


Figure 1-2 Army Command and Area Communications System.

HNS agreements will be minimal or nonexistent. Initial objectives will be limited. Planning must include a follow-on buildup and sustainment capability. The TCC(A) building block concept permits situation-dependent growth and maturity of the TCS(A).

### 1-8. Role of the Signal Troopscatter Companies (Light and Heavy)

The Signal Troop Companies (Light and Heavy) provide the theater commander with flexible, reliable, and secure communications. Their troposcatter radio systems consist of equipment that can span great dis-

tances for command and control of theater forces. Each member of a Troop Company plays a significant role in the unit's important mission. The focus of this manual is on the employment and operations of the Troop Companies. Associated subjects essential to successful accomplishment of the Troop Companies' mission also are discussed. Chapters 10 through 13 provide a ready reference in communications planning, NBC and electronic warfare, rear battle operations, and training. This manual does not tell all one needs to know in these areas. It does serve as a point of departure and leads to an array of documents which provide the detail required. FM 100-16 and FM 11-23 provide information on the functional and organizational environment in which the Troop Companies operate.

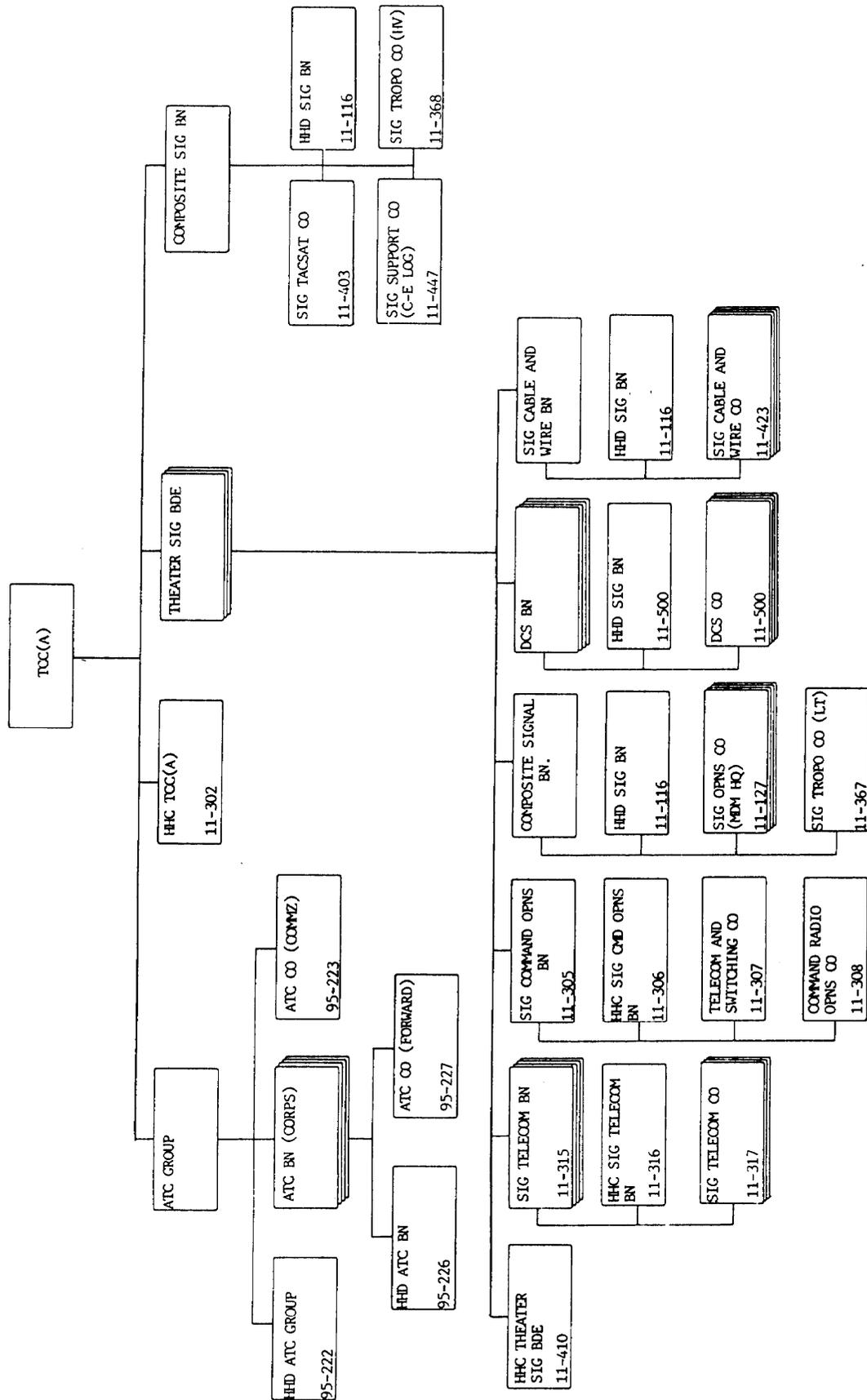


Figure 1-8. Type Theater Communications Command (Army).