AD-A134 308 FUNCTIONAL AREA REPRESENTATION OBJECTIVES (FAROS) FOR THE CORPS/DIVISION..(U) MITRE CORP MCLEAN VA MITRE C31 DIV R P BONASSO ET AL. AUG 83 MTR-82W00175-REV-1 1/1

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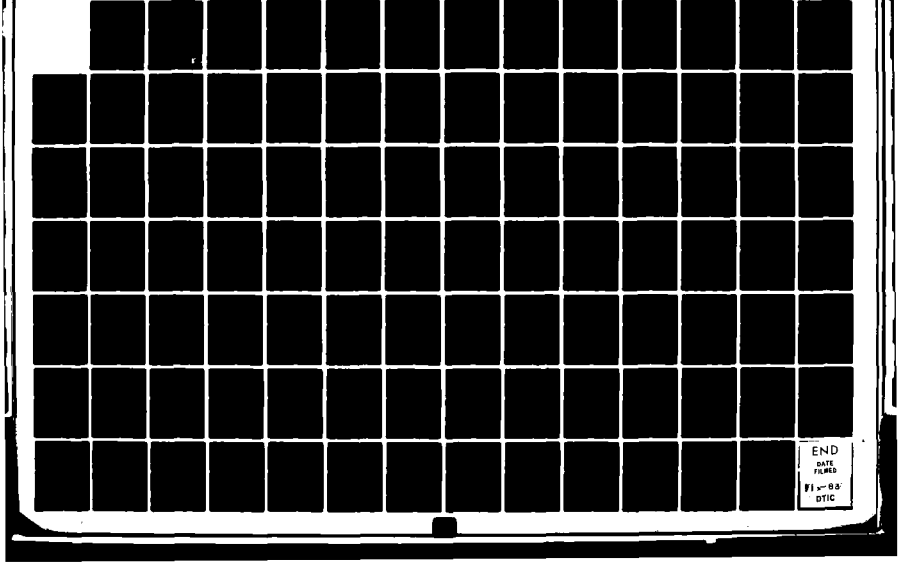

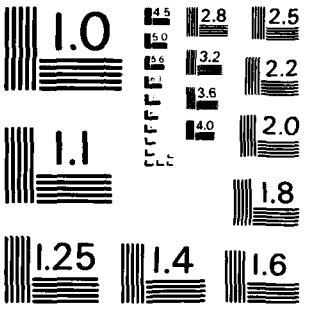

9 August 1983

Revision 1

CHANGES TO MTR-82W00175, FUNCTIONAL AREA REPRESENTATION OBJECTIVES (FAROs) FOR THE CORPS/DIVISION EVALUATION MODEL (CORDIVEM)
(replacement pages)

Changes were made to the maneuver control portions in response to written comments received from the US Army Aviation Center (USAAVNC) at Ft. Rucker, Alabama, detailing inconsistencies among the aviation element representations. The representations were altered to respect the baseline used for the rest of the functional area representation objectives; changes can be found in both the combat and combat support subfunctional areas of maneuver control.

The air defense portion was altered to include mention of the air mobility of some air defense units, also at the request of the USAAVNC.

Changes were made to the combat service support portion in response to USAAVNC comments and the results of MITRE's research into this area, chiefly the draft report Command Control Subordinate System Functional Analysis: Combat Service Support Functional Segment. These changes affected the organization of the COSCOM and the DISCOM, specifically in the areas of missile maintenance, aircraft maintenance, and helicopter transportation. In response to concerns expressed by personnel from the Soldier Support Center, non-combat casualties were added to the discussion of medical care.

Functional Area Representation Objectives (FAROs) for the Corps/Division Evaluation Model (CORDIVEM)

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Revision 1

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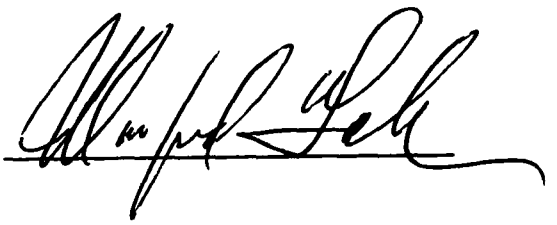
and Project Approval: 

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APPENDIX III

MANEUVER CONTROL FUNCTIONAL AREA REPRESENTATION OBJECTIVES

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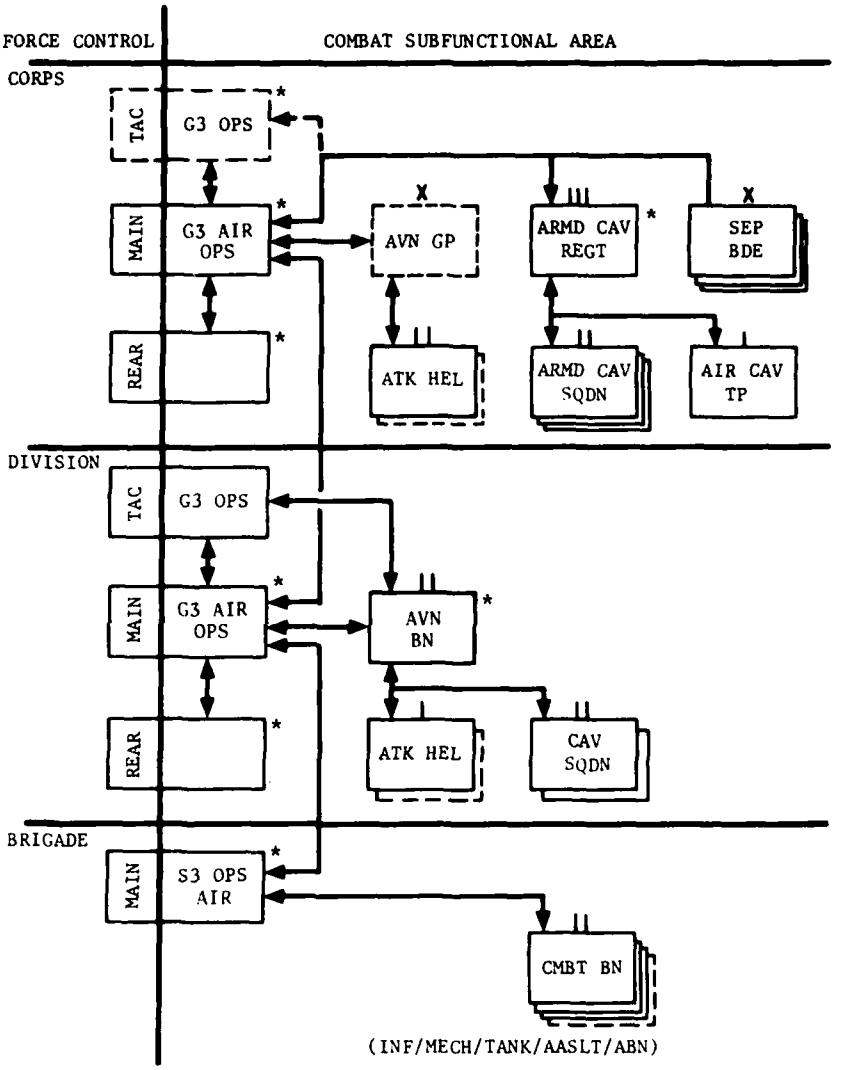
1.0 COMBAT SUBFUNCTIONAL AREA REPRESENTATION OBJECTIVES

Figure III-1 depicts the units described in the combat subfunctional area. At the corps echelon, the control units include the corps Main, Rear and Tactical (or forward) command posts (CPs). The action units at corps include the combat aviation elements (the Attack Helicopter Battalion), the covering force and rear area security elements (the Armored Cavalry Regiment) and the corps reserve (the separate brigades). The separate brigades are not detailed explicitly in the outline, although they should be modeled explicitly, because although they are usually augmented from corps assets they act and are controlled in a manner similar to the divisional brigades shown at the bottom of Figure III-1. The difference is the direct linkages to the corps Main CP.

At division, the three types of headquarters — main, tac, and rear — are all distinct actors and merit explicit modeling. Divisional action units for combat include the divisional aviation battalion with an attack helicopter battalion and the cavalry squadron with ground and air cavalry troops. The Divisional Aviation Battalion is treated here as an intermediate headquarters.(37)

At brigade, the main CP is shown as the principal control unit. While some brigades may employ a forward or tactical CP, they would be employed as an extension of the main through the use of a command group, not really constituting a long standing control unit with separate functions to perform. The brigade trains could also be considered for inclusion as a control unit except that their role is more that of combat service support. Brigade action units include the infantry, mechanized, tank, air assault and airborne battalions.

Signal units are not included per se in this paper due to the observation that the capability to communicate is the real issue, and not the capability to install or operate communications systems.



CONTROL UNITS = *

FIGURE III-1
COMBAT SUBFUNCTIONAL AREA

1.1 Effects

The following sections describe five major categories of effects which are caused by the execution of a capability, or which affect the execution of that capability.

1.1.1 Effects of Executing the Capability on Targets, the Environment, and Assets

This section deals with how the execution of a function or capability will have certain effects on the enemy, terrain, and friendly elements.

1.1.1.1 Planning/Direction/Situation Assessment. There are no direct immediate effects on the battlefield from these functions.

1.1.1.2 Communications. There are no direct effects on the battlefield by communications.

1.1.1.3 Movement. Moving units occupy space on roads, bridges and in fields which can delay other unit movements through that area, due to passage of lines considerations and traffic congestion. Movement also causes an operational degradation of the vehicles employed, and fuel is consumed. Heavier vehicles including tanks, armored personnel carriers, and trucks can seriously damage roads and bridges so that following traffic is delayed or even denied the use of a particular road, depending on the condition of the road to start with, the weight and speed of the vehicle, and the prevailing weather conditions.

1.1.1.4 Shooting. The principal effects of shooting on the battlefield are the suppression, damage or delay of the enemy forces, the "dirtying" of the battlefield due to smoke and dust caused by firing, the consumption of ammunition and POL, and the fact that other friendly units must consider the presence of fields of fire when moving. Shooting also causes operational degradation of the weapons.

1.1.2 Combat Effects on the Capability

This section details the effects of enemy action on friendly units ability to perform the capabilities listed.

1.1.2.1 Planning/Direction/Situation Assessment. Headquarters are subject to enemy attacks from both conventional and unconventional (nuclear/

chemical) means. In the conventional arena, they are subject to direct support and interdiction aircraft attack, direct ground attack, and indirect fire. They are also subject to the direct effects of an enemy nuclear attack including blast, thermal and radiation effects. Control functions can be severely degraded if personnel are required to wear protective garments either in anticipation of or response to a nuclear or chemical attack. [Transient radiation effects on electronics (TREE) and electromagnetic pulse (EMP) nuclear effects will degrade/destroy control units electronic gear, especially computers and communications gear.]

1.1.2.2 Communication. Communication is subject to both conventional and unconventional effects. Signal centers on the ground and satellites in space are both subject to direct attack and jamming. Signal centers can be attacked as well by direct support, and interdiction aircraft or indirect fire attack in the nuclear/chemical arena. [TREE and EMP can severely degrade communications facilities and equipment], and either radiation or chemical contamination will degrade the function of communications due to a requirement either to decontaminate the gear or to wear protective garments.

1.1.2.3 Movement. Moving friendly units are subject to conventional attack in the form of direct and indirect fire, direct support and interdiction aircraft attacks, and air to air or air defense attacks. Enemy emplaced counter-mobility obstacles will impact friendly unit movement. In the nuclear/chemical arena, blast, heat and radiation will directly affect moving vehicles and personnel [TREE and EMP will have detrimental effects on aircraft avionics and radiation/chemical agent contamination will induce personnel sickness] and indirectly degrade performance through requiring the use of protective garments.

1.1.2.4 Shooting. Enemy conventional attacks of all types can suppress, damage, or destroy a units' ability to deliver fires by affecting a unit's weapons, personnel and/or ammunition. Nuclear and chemical attacks will damage equipment and personnel due to blast, heat and radiation [and lingering contamination sickness for chemical attacks]. The use of protective gear will degrade shooting performance.

1.1.3 Environmental Effects on the Capability

This section describes both the effects on the capability caused by natural environmental conditions (weather, visibility, terrain, etc.) and by man-made alterations to the environment (nuclear/chemical) for each capability listed.

1.1.3.1 Planning/Direction/Situation Assessment. Control functions are basically independent of weather, visibility and/or terrain effects. The same nuclear and chemical effects described in section 1.1.2.1 apply here as well.

1.1.3.2 Communications. Communications signals are subject to attenuation due to range, atmospherics and terrain masking. [Particular concern is weather induced equipment failure which will delay or deny communications.]

1.1.3.3 Movement. The condition of roads and bridges will determine the speed, weight, and volume of traffic passable on selected routes. Lateral unit movements will depend greatly on the design of road network, which is basically fixed. Difficult terrain, and adverse weather will delay or deny ground movement and/or air flight. Adverse weather conditions can enhance combat unit mobility, i.e., frozen ground.

1.1.3.4 Shooting. Visibility restriction caused by darkness, or adverse weather conditions will hamper weapons effectiveness due to degraded target acquisition, classification and weapons guidance. Difficult terrain may cause degraded shooting performance while moving.

1.1.4 Situational Factors

This section deals with those status related factors which affect particular capabilities.

1.1.4.1 Planning/Direction/Situation Assessment. In most cases, control units are limited in their ability to perform their principal roles of planning, direction and situation assessment when forced to displace. This is particularly true in the case of the higher echelon command posts.

1.1.4.2 Communication. Communications on the move is restricted to tactical radios. Net congestion will determine a units ability to communicate.

1.1.4.3 Movement. The principal situational effects on movement are the availability of major end items (vehicles) and fuel.

1.1.4.4 Shooting. A units' ability to shoot depends on the number of weapons available and the ammunition available. Engaged units cannot be used elsewhere without involving a time delay to make the transition, and also some damage involved due to withdrawing from one battle to enter another. Sustained shooting operations are affected by the status of organic resupply elements, such as the FARP for combat aviation units.

1.1.5 Effects from Other Functional Areas

This section deals with the effects on the capabilities listed caused by non-combat functions.

1.1.5.1 Planning/Direction/Situation Assessment. Control units are usually dependent on combat support to establish or displace command posts. Fuel for power generators, maintenance, and personnel support is dependent on the combat service support (CSS) functional area.

1.1.5.2 Communication. For the purposes of a corps/division level model, the signal facilities used by combat control which are provided by signal units are assumed to be organic assets of the combat control units. Fuel and maintenance support, however, is dependent on the CSS functional area. [Replacement of satellites damaged or lost is dependent upon echelons above corps (EAC) support.]

1.1.5.3 Movement. Movement of combat units depend on vehicle supply, maintenance, and fuel supply from the CSS functional area. Tactical units can require engineer and/or aviation mobility support from the combat support functional area. [Aviation unit movements depend greatly on the supply of trained pilots from the CSS functional area, to fly the aircraft.]

1.1.5.4 Shooting. A combat units' ability to engage the enemy is dependent upon weapons supply, maintenance, and fuel supply from the CSS functional area. [Trained personnel are also required from the CSS area for replacement of dead or wounded personnel.]

1.2 Functional Representation

The following sections describe in detail the execution of the capabilities of essence to combat as they are performed by the control and action units shown.

1.2.1 Corps Echelon

1.2.1.1 Corps Control Units

1.2.1.1.1 The Corps Main Command Post

Battle Planning/Situation Assessment - The Corps Main CP uses the G3 Plans section for battle planning, and the G^2 section and Corps Tac CP for

situation assessment. Computers are used in both functions as reference aids concerning the action unit status and battle situation. There are no special effects to be noted here that have not been detailed in the above effects section.

Communications - The Corps Main CP uses the Corps Main CP Signal Center which includes satellite, multichannel and RATT systems, along with tactical radios and messengers.

Movement - The Corps Main CP uses its own staff and organic vehicles to displace. The Corps Tac CP is used as an alternate command post to provide continuity of operations while the Main is moving. The capability for battle planning, situation assessment and communications at corps during such a movement is limited by the level of support given by the Tac CP during this period.

Command and Control - In the exercise of command and control over the corps level combat action units, the Corps Main CP makes the following range of decisions:

- o The broad positioning of major action units
- o On-going adjustments to resource allocation, scheme of maneuver and task organization of major action units
- o Movements are planned and coordinated for major action units and their associated ADA and combat support elements.

These decisions are disseminated to the division Main CP's, the ACR, the Aviation Group, Separate Brigades, and the ADA and engineer groups at corps.

In making these decisions, the Corps Main CP considers the following:

- o The corps commander's guidance
- o Mission tasking from corps OPORD in effect
- o Action unit status reports from division Main CP's, ACR, Aviation Group, Separate Brigade Main CP's
- o Reported intelligence, weather, and terrain from Corps I/EW elements and EAC sources

- o Combat information from corps level action units
- o Requests for support from corps level action units and division Main CP's.

The following information is fed to higher or lateral headquarters as a result:

- o Requests for additional assets or intelligence support to EAC or adjacent corps
- o Condensed action unit status reports and corps OPLANS in effect to corps Rear CP, corps Tac CP, and/or COSCOM Headquarters.

1.2.1.1.2 The Corps Aviation Group. The Corps Aviation Group is a parent organization for many aviation units, including the corps Attack Helicopter Battalion(s).

Combat/Reconnaissance/Surveillance - The principal asset of the corps Aviation Group CP for planning and force direction is its own staff.

Communications - The Corps Aviation Group CP communications assets are tactical radios.

Command and Control - The Corps Aviation Group main CP is responsible for the following decisions:

- o Placement of corps aviation combat elements
- o Planning for future operations to include resource allocation, scheme of maneuver, task organization, combat support requirements
- o Decisions concerning additional resources required to complete current missions (requests made to corps main CP)

In making these decisions, the following considerations are used:

- o Corps commander's guidance
- o Corps Aviation group commander's guidance
- o Planned mission tasking (from corps OPORD)

- o Immediate mission direction (FRAGORDS) from corps main CP
- o Action unit status (from Corps Aviation Group action units)
- o Enemy situation/status (from Corps CP and from Corps Aviation Group action units)
- o Anticipated missions (from corps main CP)
- o SITREPS and immediate requests for support (from Corps Aviation Group action units)
- o Action unit status reports (from Corps Aviation Group units)
- o Reported enemy intelligence (from corps main CP)
- o Immediate combat information (from Corps Aviation Group action units and corps main CP)

The following items are reported or requested to the Corps main and Tac CPs:

- o Reports of observed enemy activity
- o Action unit status reports
- o Requirements for additional support to carry out immediate mission
- o Corps Aviation Group operations plans or upcoming missions forwarded for approval along with requests for future additional support (if needed)

1.2.1.1.3 The Corps Tac CP. As noted in the introduction, the Corps Tactical CP is currently envisioned as an intermediate headquarters for the Corps Main CP for the purposes of situation assessment and movement. The Tac basically maintains a dual records system alongside the Main in the event of the loss or damage to the Main. The Tac also serves as a temporary Main during the Main's displacement. Current modeling needs do not require the explicit representation of a TAC CP, although there are indications that the TAC CP's role is growing and thus will require detailed representation.

1.2.1.1.4 The Corps Rear Command Post

Rear Area Combat Planning/Direction - In the planning for and direction of rear area combat operations (RACO) the Corps Rear CP uses its own staff as its principal asset. In those cases where the Rear CP is collocated with the COSCOM Headquarters, the COSCOM HQ staff should be considered as an augmentation to the Rear CP for planning purposes.

Reconstitution Planning/Coordination - The assets used for this function are identical to those used above (except for a greater use of computer data bases to aid in unit reconstitution monitoring). Again the COSCOM HQ staff is heavily involved in reconstitution efforts and can be considered, when collocated with the Rear CP, as an asset of the Rear CP for reconstitution planning and coordination.

Communications - The Corps Rear CP relies on the COSCOM Signal Center which includes multichannel and RATT systems, and tactical radios.

Command and Control - The Corps Rear CP makes the following range of decisions in RACO planning/direction and Reconstitution Planning/ Coordination:

- o Resource allocation to the force designated as the rear area security element
- o Requests to CSS functional area and EAC sources of supply for personnel replacement, major end item replacement/maintenance, medical evacuation.
- o Coordination of refugee movement and traffic control in the corps rear area.

In making these decisions, the Corps Rear CP considers the following:

- o Corps OPORD in effect
- o Corps commanders guidance
- o Major action unit status reports from the Corps Main CP
- o Reported intelligence, weather and terrain from I/EW elements at Corps Main CP.

The following items are fed back to higher or lateral headquarters:

- o RACO situation reports to Corps Main CP
- o Reconstitution reports to Corps Main CP
- o RACO mission plans to Corps Main CP for approval.

1.2.1.1.5 The Armored Cavalry Regiment Main CP

Reconnaissance/Surveillance/Covering Force Planning and Direction - The principal asset of the ACR Main CP for planning and force direction is its own staff.

Communications - The ACR Main CP communications assets are tactical radios. In the covering force role, the ACR will require special communications support (typically radio relays) to maintain the tasking/reporting link to the Corps Main CP.

Command and Control - The ACR Main CP has the following range of decisions:

- o Placement of ACR action units
- o Timing of the R/S effort including direction to push ahead, withdraw, hold, etc.
- o Planning for future operations to include resource allocation, scheme of maneuver, task organization, combat support requirements. (Sent to corps main CP for approval and then to ACR action units for implementation.)
- o Decisions concerning additional resources required to complete current mission (requests made to corps Main CP).

In making these decisions, the ARC considers the following:

- o Corps commander's guidance
- o ACR commander's guidance
- o Planned mission tasking (from corps OPORD)
- o Immediate mission direction (FRAGORDS) (from corps main CP)
- o Action unit status (from ACR action units)
- o Enemy situation/status (from ACR action units)
- o Anticipated missions (from corps Main CP)
- o Sit reps and immediate requests for support (from ACR action units)
- o Action unit status reports (from ACR action units)
- o Reported enemy intelligence (from corps main CP)
- o Immediate combat information (from ACR action units and corps main CP)

The following items are reported or requested as a result:

- o Reports of observed enemy activity
- o Action unit status reports
- o Requirements for additional support to carry out immediate mission
- o ACR operations plans for upcoming missions forwarded for approval, along with requests for future additional support (if needed)

1.2.1.2 Corps Action Units

1.2.1.2.1 Armored Cavalry Squadrons (ACR)

Reconnaissance/Surveillance - In the execution of reconnaissance/surveillance (R/S) efforts, the Armored Cavalry Squadrons of the ACR use armored reconnaissance vehicles and tanks, armored personnel carriers (APC's) vehicle fuel and tactical radios. R/S efforts are initiated by both planned mission tasking (OPORDs) and fragmentary orders of a more unplanned nature from the ACR Main CP. The Armored Cavalry Squadrons report mission status, enemy status, action unit status, NBC and obstacle reports to the ACR Main CP as information feedback from R/S.

Shooting - The Armored Cavalry Squadrons of the ACR use organic 155mm SP howitzers, mortars, machine guns mounted on armored reconnaissance vehicles, tanks, APC's, and the attendant ammunition when called upon to engage the enemy. Usually this level of engagement is light and focuses on economy of force. Considerable maneuvering takes place during shooting, and in this sense, vehicle fuel is essential for the use of the Armored Cavalry Squadrons in an engagement.

The Armored Cavalry Squadrons engage the enemy in response to planned (OPORD) mission tasking and unplanned FRAGORDs from the ACR Main CP. In addition, the squadrons will engage defensively if attacked during a R/S effort. In order to use the howitzer battery for nuclear or chemical fires, nuclear or chemical release must be in effect (which comes from the corps commander).

An engaged Armored Cavalry Squadron will report known enemy status, action unit status, tactical nuclear or chemical fire mission confirmation, and POWs captured to the ACR Main CP.

1.2.1.2.2 Air Cavalry Troop (ACR)

Reconnaissance/Surveillance - The ACR has an Air Cavalry Troop which uses observation and attack helicopters and aviation fuel for R/S efforts. The Air Cavalry Troop does R/S in response to planned mission tasking (OPORDs) and unplanned tasking (FRAGORDs) from the ACR Main CP. In addition, the Air Cavalry Troop will exercise some degree of autonomy in the R/S effort as discovered enemy elements will spark immediate R/S efforts by the troop to bound enemy locations without specific directives from the ACR Main CP.

The Air Cavalry Troop sends mission status, enemy status, action unit status, NBC and obstacle reports to the ACR Main CP as information feedback from R/S efforts.

Shooting - The Air Cavalry Troop uses attack helicopters with antipersonnel and anti-armor weapons, and the attendant ammunition and aircraft fuel to engage enemy elements as directed. Engagements are initiated by planned tasking (OPORDs), and unplanned tasking (FRAGORDs) from the ACR Main CP. In addition, air cavalry assets which receive fire from overflown enemy elements will return defensive fire. The information feedback to the ACR Main CP includes known enemy status, action unit status and mission status.

1.2.1.2.3 Attack Helicopter Battalion(s)

Movement - The attack helicopter battalion(s) under corps control will move as a unit using organic trucks; attack, observation, and utility helicopters; and fuel to carry ground support and mission equipment. Movement is initiated either by planned or unplanned tasking from the Corps Aviation Group CP (OPORD/FRAGORD) or by the receipt of enemy fire which requires defensive repositioning. In the case of the attack helicopter battalion(s), tasking and reporting will flow through the Corps Aviation Group as a tactical headquarters. Information sent this way to the Corps Aviation Group includes checkpoint and route coordination, new location, action unit status upon arrival, any enemy information gathered during the move, and NBC and obstacle reports.

Shooting - Attack helicopter battalion(s) give the corps commander a responsive combat arm. They use attack helicopters with antipersonnel and antiarmor weapons, observation helicopters (for target location and description), aviation fuel, and ammunition in order to engage the enemy. These units engage the enemy in response to planned/unplanned mission tasking

(OPORDs/FRAGORDs) from the Corps Aviation Group CP. In addition, they will employ defensive fires against enemy attacks while positioning without any specific tasking to do so. The attack helicopter battalion(s) report back to the Corps Aviation Group CP.

1.2.1.2.4 Attack Helicopter Companies. The Attack Helicopter Companies of a Corps Attack Helicopter Battalion have identical capabilities as their parent battalion, albeit at a third (usually) of their size. The companies are the fighting elements of the battalions, and can fight independently.

1.2.1.2.5 Separate Brigade(s). The Corps level separate brigade(s) are task organized by the corps force control elements and used primarily as a corps reserve force or for special deep battle operations. While they are normally larger than a divisional brigade, their functions and the command and control within the brigade are similar. For these reasons, the separate brigades are not detailed here. For modeling, an augmented divisional brigade with command and control links directly to the Corps Main CP will suffice.

1.2.2 Division Echelon

1.2.2.1 Control Units

1.2.2.1.1 The Division Tactical Command Post

Battle Direction/Situation Assessment - The Division Tactical CP is responsible for the direction of the immediate battle and the main training of an up to date situation assessment to support that direction. In these functions, it relies on the Division Tac CP staff as its sole asset.

Communications - The Division Tac CP uses tactical radios to maintain communications contact with the divisional action units and the Division Main CP.

The range of decisions made by the Division Tac CP include:

- o On-going adjustments to resource allocation to brigades in support of the immediate battle (directives sent to divisional action units and brigade Main CP's involved)
- o Positioning of divisional R/S action units (cavalry squadron)

The Division Tac CP considers the following in making these decisions:

- o Division OPORD in effect
- o Division commander's guidance
- o Disposition of corps R/S assets (ACR) (from corps main CP/OPORDS)
- o Action unit critical status reports (from brigade main CP's and cavalry squadron TOC's)
- o Requests for immediate support (from division action units and brigade CP's)
- o Combat information of immediate concern (from corps/division main CP's)
- o Reports on operations of brigades to the side of the area of immediate concern to the division Tac CP (from the division main CP)

The Division Tac CP reports the following to higher/lateral headquarters as a result:

- o Combat information reported by action units sent to Corps/Division/ Brigade Main CP's
- o Requests for immediate support to Corps Main CP

1.2.2.1.2 The Division Main Command Post

Battle Planning/Situation Assessment - The Division Main CP uses its staff and computer assets to plan for the future battle and situation assessment. The Division Main CP is responsible for taking the broad guidance from the Division commander, and the current Corps OPORD and developing an OPLAN for the division. In doing so, it draws on information from the divisional action units and its own computer data bases.

Communications - The Division Main uses its own signal center which includes satellite, multichannel and RATT systems. In addition, the main can use messengers and tactical radios for communications.

Command and Control - The Division Main CP develops divisional operations plans (OPLANS) for the direction of the division and brigade echelon action units. These plans include resource allocation decisions, task

organization down to the battalion level, and scheme of maneuver. The Main also coordinates future division operations support with the Corps Main CP and develops coordinated movement plans for major action units and their associated ADA and combat support elements. In making these decisions, the division Main uses the following considerations:

- o Division commander's guidance
- o Division mission tasking (OPORD in effect from corps main CP)
- o Division Tac CP decisions (monitored)
- o Action unit non-critical status reports (from action units)
- o Proposed operations plans (from brigade main CP's and cavalry squadrons)
- o Combat reports from divisional action units and the division Tac CP

The division Main will send the following items to higher or lateral headquarters as information feedback as a result:

- o Division oplans reported for approval along with requests for additional support (to corps main CP)
- o Action unit non-critical status reports (to corps main CP and division rear CP)
- o Division OPLANS sent to division rear CP for coordination of reconstitution, and rear area combat operations
- o Movement plans are sent to action units and ADA and Engineer battalions at division

1.2.2.1.3 The Division Rear Command Post

Battle Planning/Direction of Rear Area Combat Operations (RACO) - The Division Rear is responsible for contingency planning and direction of rear area security forces in the event of an enemy attack in the rear areas of the division. The division rear uses its own staff for both planning and direction of RACO. If the division Rear CP and the DISCOM headquarters are colocated, the division Rear will use the DISCOM headquarters staff in support of these functions.

Reconstitution Planning and Coordination - Again the Division Rear CP uses its staff for planning and coordination of reconstitution efforts for the

division. If colocated with the DISCOM HQ, the division Rear CP may use the DISCOM headquarters as support staff.

Communications - The Division Rear CP uses the DISCOM signal center for multichannel and RATT communications. In addition, it may use messengers and tactical radios.

Command and Control - The Division Rear CP makes the following decisions in the process of planning and directing both RACO and reconstitution efforts:

- o Rear area combat operations contingency plans are developed which include resource allocation to the force designated by the division OPORD as the rear area security force.
- o Reconstitution directives are formulated which include requests to the Combat Service Support functional area (DISCOM HQ), and corps Rear CP for personnel and major end item replacement.

The following considerations are taken into account:

- o The division commander's guidance
- o Action unit non-critical status reports and operations plans from the division Main CP
- o Reported intelligence, weather, terrain from I/EW elements at division Main CP
- o Status of the units' to be reconstituted.

The division Rear reports to the division Main the rear area security plan, situation reports on rear area combat operations, and the progress of on-going reconstitution efforts to include the readiness posture of units being reconstituted.

1.2.2.1.4 The Divisional Aviation Battalion.

This organization aggregates divisional aviation assets from all functional areas in a parent organization principally for supply and maintenance considerations. Aviation Combat Missions are directed at the division main and tactical command posts utilizing the Divisional Aviation Battalion as an intermediate control asset. It is therefore presented as a C^2 asset of the Division G3 Air.

1.2.2.2 Divisional Action Units

1.2.2.2.1 Divisional Attack Helicopter Companies. The divisional attack helicopter units are identical in makeup and operation to those at corps echelon. Because the corps uses the Main as the principal focal point for battle direction and for planning, command and control of these units at the corps level is a function of the Main CP. At division, planning is done at the Main CP and the Tactical CP handles immediate battle direction. Accordingly, the command and control links to the divisional Attack Helicopter Company are also divided between the Main and Tactical CPs, with the Aviation Battalion augmenting both planning and direction functions. Since there are no other substantive changes from the corps units descriptions, the divisional Attack Helicopter Companies are not explicitly detailed here.

1.2.2.2.2 Divisional Cavalry Squadrons

Reconnaissance/Surveillance - The divisional R/S assets are consolidated into the integrated air and ground cavalry troops in the Cavalry Squadron. In the execution of R/S, these troops use organic observation and attack helicopters, cavalry fighting vehicles or scout cars, both aviation and ground vehicle fuel, and tactical radios. R/S efforts are initiated by both planned and unplanned mission tasking from the Cavalry Squadron.

The Cavalry Troops report mission status, enemy status, action unit status, NBC conditions and obstacles encountered to the Cavalry Squadron and the division Tactical CP. Administrative and logistical reports are sent to the division Main CP.

Shooting - The divisional Cavalry Troops use organic attack helicopters with anti-personnel and anti-armor weapons, cavalry fighting vehicles or scout cars, mortars, fuel and ammunition to engage the enemy when directed. Such engagements can be initiated by either preplanned or unplanned taskings from the Cavalry Squadron TOC, or in direct response to enemy fire. The troops report known enemy status, action unit status, POW's captured, and other information of relevance to the immediate battle (such as weather, terrain, etc.) to the Cavalry Squadron TOC. Administrative and logistic reports relevant to shooting are sent to the division Main CP through the Cavalry Squadron TOC.

1.2.3 Brigade Echelon

1.2.3.1 Brigade Control Units

1.2.3.1.1 The Brigade Main Command Post

Battle Planning/Direction/Situation Assessment - The Brigade Main CP is the principal command and control node for the brigade echelon. It relies on its own staff to do battle planning, and direction and situation assessment in support of the near-term battle.

Communications - The brigade Main CP relies on the Forward Area Signal Center (FASC) in the brigade rear area for satellite, multichannel and RATT communications support. Messengers and tactical radios are also used extensively.

Command and Control - In the planning for the near-term battle and direction of the immediate battle, the brigade Main CP makes the following range of decisions:

- o Action unit (battalion), ADA and combat support element positioning for the immediate battle
- o Resource allocation in support of the immediate battle (to brigade action units)
- o Task organization of brigade action units for anticipated operations

The following are considerations of use in making the decisions above:

- o Brigade commander's guidance
- o Mission tasking (from Div Main and Tac CP's)
- o Action unit status (from battalion TOC's)
- o Requests for support (from action units)
- o Intelligence reported (by corps/division main CP I/EW elements)
- o Combat information reported (by battalion action units)

The brigade Main CP sends the following information to higher headquarters as information feedback:

- o Requests for immediate support (to division Tac CP)
- o Combat information of immediate nature (to division Tac CP)
- o Action unit critical status reports (to division Tac CP)
- o Proposed operations plans (to division main CP)

1.2.3.2 Brigade Action Units

1.2.3.2.1 The Maneuver Battalions.[27] There are six types of maneuver battalions applicable to a corps/division level model. They are:

- o Infantry
- o Mechanized Infantry
- o Tank
- o Air Assault Infantry
- o Airborne Infantry
- o Attack Helicopter (when OPCON from Division/Corps)

They are all similar in operation, the major differences being in the assets involved in each use.

Shooting - In engaging the enemy, Infantry, Mechanized Infantry, Air Assault, and Airborne Infantry battalions use:

- o Anti-armor weapons
- o Anti-personnel weapons
- o Mortars
- o Ammunition
- o Ground surveillance radars

Tank and Attack Helicopter battalions use:

- o Anti-armor weapons (tanks and attack helicopters)
- o Anti-personnel weapons (tanks, APC's, and attack helicopters)
- o Ammunition

Maneuver battalions engage the enemy on order from the brigade Main CP, or in response to enemy contact. They report the battle situation to the brigade Main CP, including:

- o Known enemy status
- o Action unit status
- o NBC conditions encountered
- o POW's captured

Movement - In moving, Infantry battalions use jeeps and trucks. Mechanized battalions have in addition, armored personnel carriers (APC's) and recovery vehicles. Tank battalions have APC's, main battle tanks, jeeps, trucks, recovery vehicles and bridging vehicles. Air assault and airborne battalions have jeeps and light trucks, as they rely on helicopter lift for major movements. Attack helicopter battalions use attack, scout, and utility helicopters, jeeps and trucks for movements.

Air Assault and Airborne battalions rely heavily on the availability of landing and drop zones for movement. When they are being transported, and during delivery, these forces are fragmented and as a result are especially vulnerable. They cannot be used to engage the enemy until sufficient forces are massed in the landing areas to serve as a fighting unit. Air Assault battalions depend on the availability of lift helicopters from the combat support functional area while Airborne battalions depend upon the capability of USAF transport for airborne insertions.

Movement of a battalion is initiated either by a mission tasking (either OPORDs or FRAGORDs) from the brigade Main CP, or in a defensive response to taking enemy fire. The information feedback to the brigade Main CP as a

result includes the coordination of checkpoints and routes, the new unit location and time of arrival, action unit status upon arrival, enemy information gathered during movement, NBC conditions and/or obstacles encountered during the move.

2.0 COMBAT SUPPORT SUBFUNCTIONAL AREA REPRESENTATION OBJECTIVES

Figure III-2 shows the combat support units considered in this paper. At each echelon, the principal control elements are located at the main command posts. At corps, these include both the engineer and aviation sections of the G3 staff. There are two intermediate headquarters at corps, the Engineer Brigade and the Corps Aviation Group, shown as dashed boxes. The Atomic Demolition Munitions (ADM) Company at corps is a special company capable of using tactical nuclear weapons for countermobility operations. The use of the ADM teams at division, as shown in the figure, is a force level decision of the corps commander, and the munitions are tightly controlled by the corps and division commanders.

At division, the same separation between engineer and aviation support exists in the division main CP, with the two intermediate headquarters of the divisional Engineer Combat Battalion and the Divisional Aviation Battalion. Engineer assets passed down from corps join the divisional assets under the Engineer Combat Battalion's control. That control is exercised from the Main CP through the engineer battalion. Aviation lift companies at division may be augmented from corps assets as well.

At brigade, there are few combat support assets available for direct brigade control. The Engineer Combat Company is habitually assigned from division to the brigades and is controlled by the brigade engineer at the main CP.

2.1 Effects

The following sections describe five major categories of effects which are either caused by or which impact on the execution of a particular capability. As stated above, the capabilities examined are:

- o Combat support planning/direction
- o Air mobility support (aviation)
- o Engineer mobility/countermobility support
- o Engineer general engineering support

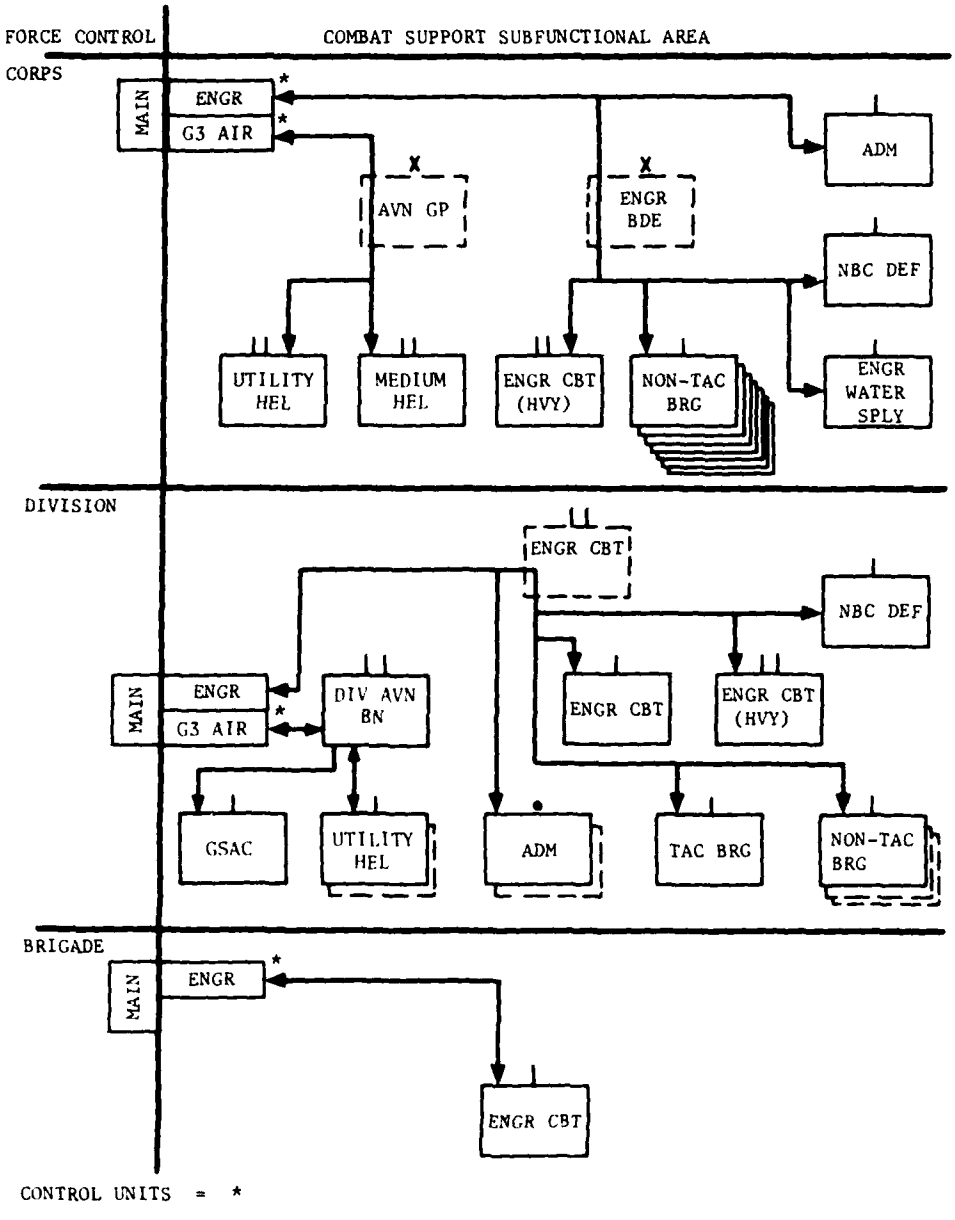


FIGURE III-2
COMBAT SUPPORT SUBFUNCTIONAL AREA

- o Engineer survivability support
- o Movement
- o Communications

2.1.1 Effects of Executing the Capability on Targets, the Environment, and Assets

2.1.1.1 Combat Support Planning and Direction. There are no immediate effects on the battlefield from the performance of these functions, though their execution has indirect effects through the action units.

2.1.1.2 Airmobility Support. The principal results of airmobility support are the displacement of ground maneuver and field artillery units from one location to another. Fuel is consumed by the aircraft involved.

2.1.1.3 Engineer Mobility/Countermobility Support. In this category, roads and bridges are constructed, repaired or destroyed. Obstacles of all types (mines, abatis, craters, rubble) are created, emplaced, maintained, or removed. Both fuel and bulk (construction/materiel) supplies are consumed at a high rate for tactical engineer support of this kind.

2.1.1.4 General Engineering Support. Airfields and major complexes are built, repaired, maintained, improved, or destroyed according to the requirements of the battle. Roads and bridges are improved (and minefield lanes are widened). There is no direct effect on the enemy. Fuel and bulk supplies are consumed in these operations.

2.1.1.5 Survivability Support. This capability effects the battlefield by improving friendly units ability to fight through decontamination, providing a supply of potable water (and building defensive positions for fighting elements). Fuel for power is consumed in these functions.

2.1.1.6 Movement. (Roads and bridges are damaged due to the movement and use of heavy (especially tracked) engineer equipment.) Again, fuel is consumed in order to move.

2.1.1.7 Communications. There are no direct battlefield effects of communications, except the consumption of fuel to power communications equipment.

2.1.2 Combat Effects on the Capability

2.1.2.1 Combat Support Planning/Direction. Control units can be damaged or destroyed by enemy conventional attacks including direct support and interdiction air attack, indirect fire, direct ground fire and jamming of communications equipment. The enemy can also disrupt or deny planning and direction of combat support with nuclear attacks which cause blast, fires and radiation contamination of both personnel and equipment. Nuclear radiation and/or chemical attacks will cause short and long term personnel sickness, if not death. An indirect effect is the degradation of performance caused by the imposition of protective gear use either in anticipation of or in response to nuclear/chemical attack. [TREE and EMP will severely degrade electronic equipment used in these functions.]

2.1.2.2 Airmobility Support. Enemy conventional attacks from direct support or interdiction aircraft, air defense weapons, or indirect fire can delay, deny or destroy airmobile support aircraft, and the transported friendly unit. Unconventional attacks incur the same basic effects as above (blast, thermal, radiation, protective gear employment). [Both TREE and EMP will severely degrade aircraft performance due to the high reliability on electronic navigation, flight and communications equipment.]

2.1.2.3 Engineer Mobility/Countermobility Support. Enemy conventional attacks (from direct support or interdiction aircraft, indirect fire, direct ground fire, and jamming) can delay, deny, or destroy engineer elements involved in mobility or countermobility operations. Enemy nuclear attacks cause the same basic effects to this function as to any other: blast, thermal and radiation effects on personnel and equipment. [Protective gear employment severely degrades engineer performance.]

2.1.2.4 General Engineering. Same as 2.1.2.3 above.

2.1.2.5 Survivability Support. Same as 2.1.2.3 above.

2.1.2.6 Movement. Enemy direct support or interdiction aircraft can attack moving combat support elements. Aircraft are particularly vulnerable to air defense fires. In the nuclear and chemical arenas, blast, thermal, [and radiation contamination] effects severely degrade a unit's ability to move, [and the use of protective garments will further impede movement].

2.1.2.7 Communications. Radiating communications equipment is subject to detection, jamming, direction finding and targeting by the enemy.

Communicating elements are subject to all types of conventional attack. [In the nuclear/chemical environment, TREE and EMP will severely degrade if not destroy communications equipment.] Contaminated communications equipment requires special care to decontaminate without further damaging the internal components. [The use of protective garments will degrade responsiveness and intelligibility in communications.]

2.1.3 Environmental Effects on the Capability

2.1.3.1 Combat Support Planning/Direction. There are no environmental effects of note for the control functions in combat support.

2.1.3.2 Airmobility Support. Adverse weather can delay, deny or disrupt flight. In some cases, adverse weather can enhance flight where helicopters rely on ground effect (frozen marsh areas).

2.1.3.3 Engineer Mobility/Countermobility Support. Difficult terrain can delay or deny construction or demolition efforts. Adverse weather will also degrade engineer performance in these areas.

2.1.3.4 General Engineering. Refer to 2.1.3.3.

2.1.3.5 Survivability Support. Refer to 2.1.3.3.

2.1.3.6 Movement. Adverse weather can delay or disrupt both ground and aerial movement. In some cases, weather can enhance movement, for example, heavy vehicles moving over frozen ground.

2.1.3.7 Communications. Communications signals are subject to (atmospheric attenuation and/or) terrain masking.

2.1.4 Situational Factors

2.1.4.1 Combat Support Planning/Direction. Control units which perform these functions must suspend operations when the command post they share displaces. Communications is particularly limited at the higher echelons (division, corps) when moving.

2.1.4.2 Airmobility Support. The status of the aircraft used in the lift, both from a maintenance and fuel point of view, determines the responsiveness of a particular unit. [Pilot availability is also an important status related factor, especially during sustained operations.] Aviation lift units cannot be

dynamically re-tasked in the middle of a mission without incuring a substantial time delay to regroup for the new mission.

2.1.4.3 Engineer Mobility/Countermobility Support. The status of special heavy construction equipment, in regard to both maintenance and fuel, determines a unit's availability for a mission. [Operator availability is also a factor for sustained operations.] Because engineers work in sections, or teams, and are often spread out over large areas in the performance of their functions, re-tasking of working elements will require a substantial delay for regrouping, especially if the unit is to be reconfigured for a different type of function (i.e., from breaching a minefield to road repair).

2.1.4.4 General Engineering. Refer to 2.1.4.3.

2.1.4.5 Survivability Support. Refer to 2.1.4.3.

2.1.4.6 Movement. Moving engineer or aviation units cannot perform their primary function of providing combat support to maneuver forces while they move, because working vehicles will be required to carry support equipment for the unit during the move. A unit must complete its move, then unpack its vehicles before operations can resume. Unit vehicles may need to refuel prior to starting a new mission.

2.1.4.7 Communications. Tactical radio nets can be congested and delay communications if too many users are on the system.

2.1.5 Effects from Other Functional Areas

2.1.5.1 Combat Support Planning/Direction. There are no major restrictions caused by a lack of other functional area support to the combat support control functions.

2.1.5.2 Airmobility Support. The lack of non-organic maintenance support and fuel supply from the combat service support (CSS) functional area will severely limit sustained aviation operations. [Supply of trained pilots is also dependent on the CSS segment.]

2.1.5.3 Engineer Mobility/Countermobility Support. Combat engineer operations depend heavily on non-organic maintenance support, fuel supply and construction materials supply from the CSS functional area.

2.1.5.4 General Engineering. Refer to section 2.1.5.3.

2.1.5.5 Survivability Support. Decontamination efforts require large amounts of decontaminated water to wash irradiated particles from personnel and/or equipment. While water supply is currently an engineer function at the corps echelon, divisional water supply depends on DISCOM in the CSS area.

2.1.5.6 Movement. Movement of combat support units requires fuel supply from the CSS functional area.

2.1.5.7 Communications. Combat support units use their organic tactical radios for the bulk of their communications needs. Access to satellite multichannel and RATT equipment as needed will depend on access to those signal centers belonging to the control units in the combat subfunctional area of maneuver control.

2.2 Functional Representation

The following sections detail the execution of combat support by the major control and action units at each echelon.

2.2.1 Corps Echelon

2.2.1.1 Corps Control Units

2.2.1.1.1 The Corps Engineer

Engineer Combat Support Planning and Direction - The Corps Engineer provides the corps commander and operations staff with engineer related planning and direction.[32] The assets used are the personnel in the section.

Communications - The Corps Engineer has access to messengers, tactical radios, and the Corps Main CP Signal Center, which provides multichannel, satellite, and RATT communications support.

Command and Control - The Corps Engineer makes the following range of decisions:

- o Task organization of engineer support to corps
- o Resource allocation of engineer assets/units to division control on a direct support (DS) basis
- o Mission tasking to corps engineer units

In making these decisions, the corps engineer considers the following:

- o Corps commander's guidance
- o Corps operational plans/orders both current and future (from corps G3)
- o Requests for engineer support (from division main CP's and/or corps rear elements)
- o Engineer action units status (from corps engineer action units)

The Corps Engineer makes requests to engineer organizations at echelons above corps (EAC) for further engineer support not available within the corps area.

2.2.1.1.2 The Engineer Brigade. The Engineer Brigade at corps is considered in this paper as an intermediate headquarters because it has the role of a parent unit. It provides organic maintenance, supply and administration for the engineer units in its charge, but has no real tactical command and control activity. For these reasons, it is represented as C^2 asset of the Corps Engineer.

2.2.1.1.3 The Corps G3 Air

Aviation Support Planning/Direction - The Corps G3 Air uses its own staff personnel to conduct aviation planning and coordination in support of the corps echelon.[32]

Communications - The G3 Air uses the Corps Main CP Signal Center, an asset of the maneuver control functional area. In addition it uses messenger and tactical radios.

Command and Control - The Corps G3 Air makes the following range of decisions:

- o Task organization of corps level aviation support
- o Resource allocation of corps aviation units/assets to division control on a direct support (DS) basis
- o Mission tasking to corps aviation units

The Corps G3 Air considers the following in making these decisions:

- o Corps commander's guidance
- o Corps operational plans and orders current/future (from corps main CP)
- o Aviation action units status (from corps aviation action units)
- o Requests for future aviation support (from corps action units)

The Corps G3 Air will send requests for additional support to EAC aviation organizations.

2.2.1.1.4 The Corps Aviation Group. The Aviation Group found at the corps echelon is a parent organization for both combat, combat support and combat service support aviation units. It performs command and control functions in response to specific tasking from the Corps Main CP. Tasking of and reporting from corps combat support aviation units flow through the Aviation Group, which for the purposes of the corps/division level model is transparent. For these reasons, it is considered as a C2 asset of the G3 Air.

2.2.1.2 Corps Action Units

2.2.1.2.1 Utility Helicopter Battalion

Transport Small/Medium Tactical Units - The Utility Helicopter Battalion uses utility helicopters, aviation fuel, tactical radios, and pilots. An airmobile lift is triggered by mission tasking from the Corps G3 Air via the Aviation Group. Upon receipt of the tasking, the battalion passes the following information to the Corps Main CP:

- o Route and checkpoint coordination
- o Mission status
- o Action unit status report
- o Combat information gathered during the mission

2.2.1.2.2 Medium Helicopter Battalion

Transport Medium/Large Tactical Units - The Medium Helicopter Bn uses medium cargo helicopters, utility helicopters, tactical radios, aviation

fuel and pilots to transport larger tactical units. When used in a combat support role this unit will operate in conjunction with the Utility Helicopter Battalion for an airmobile mission. Artillery batteries can also be transported by this unit.

Mission tasking and reporting is identical to that for the Utility Helicopter Battalion.

2.2.1.2.3 Engineer Combat Battalion (Heavy)

General Engineering - This corps engineer battalion uses heavy earthmoving equipment, mine detectors, supporting tractors and trucks, bulk engineering supplies, tactical radios and fuel to do general engineering tasks at the corps echelon. This includes road/bridge repair [and improvement, widening minefield lanes], airfield construction [and repair, and command post support].

Mission tasking comes from the Corps Engineer Section via the Engineer Brigade. The information reported to the Corps Engineer as a result includes:

- o Mission status
- o Action unit status report
- o Information gathered during the mission

2.2.1.2.4 Non-Tactical Bridge Companies

Emplace/Remove Non-Tactical Bridges - There are a number of different bridging companies at the corps echelon each with a different type of bridge set. In general, however, these companies use bridge laying trucks or cranes, bridges, earthmoving equipment and supporting trucks, fuel and tactical radios to emplace or remove bridges. This capability does not include a capability to operate in the forward areas, as this equipment is not armored.

[Mission tasking and reporting parallels those discussed above for the Engineer Combat Battalion (Heavy), section 2.2.1.2.3.]

2.2.1.2.5 Atomic Demolition Company (ADM)

Emplace/Remove ADMs to Create Mobility Restrictions for Enemy Forces - ADM companies at Corps have atomic demolition teams, atomic

munitions and tactical radios as their primary assets. A particular note concerning the need for other functional area support is that the ADM teams do not normally carry the munitions with them until after nuclear release is in effect. Upon receipt of the nuclear release, the ADM teams depend on aviation or truck transport from the combat support or combat service support functional areas for delivery of the munitions to the forward areas where the teams operate.

Mission tasking comes directly from the Corps Main CP, as does nuclear release when it is approved. Information feedback from the ADM company is sent directly to the Corps Main CP including:

- o Mission status (and nuclear fire confirmation)
- o Action unit status report (including munition status)
- o Information gathered during the mission (NBC reports on contaminated areas)

2.2.1.2.6 NBC Defense Company

Nuclear/Biological/Chemical Reconnaissance - The NBC Defense Company provides NBC recon to the maneuver forces at corps to bound areas of contamination. The assets used are the NBC defense platoons, chemical agent/radiation detection equipment, jeeps, fuel and tactical radios.

Mission tasking comes from the Corps Engineer via the Engineer Brigade. The NBC Defense Company reports NBC reconnaissance results and unit status reports back through the Engineer Brigade to the Corps Engineer as a result.

Personnel Decontamination - The NBC Defense Company uses the NBC defense platoons, decontamination equipment, supporting trucks, water tankers and pumps, fuel and tactical radios to provide personnel decontamination points in the corps area. In the process, an effect of performing this capability is the contamination of the area of operation, since decontamination efforts require the spraying of water, which once contaminated must drain somewhere. This unit also has a high dependency on a water supply source provided by the corps Engineer Water Supply Company (to be discussed below).

Mission tasking includes directives to establish personnel decontamina-

tion stations, and it comes from the Corps Engineer via the Engineer Brigade. The NBC Defense Company reports along the same channels the following information feedback:

- o Mission status
- o Action unit status
- o NBC reports

2.2.1.2.7 Engineer Water Supply Company

Potable Water Reconnaissance/Purification/Supply - The Corps Engineer Water Supply Company uses water purification and decontamination equipment, water storage tanks, pumps and tank trucks, water supply and water distribution platoons, fuel and tactical radios in their mission to find, clean and supply potable water in the corps area.

Mission tasking comes from the Corps Engineer via the Engineer Brigade. The information feedback includes the action unit status reports, NBC reports, the location of water supply points, the volume of water available,[and the rate of flow available at each supply point].

2.2.2 Division Echelon

2.2.2.1 Divisional Control Units

2.2.2.1.1 The Division Engineer

Engineer Support Planning/Direction - The Division Engineer uses its staff and the Engineer Combat Battalion HQ to do planning and tasking for *engineer support to the division.*[32]

Communications - The Division Engineer uses the communications facilities of the Main CP, (which belong to the maneuver control functional area). In addition, messengers and tactical radios may be used.

Command and Control - The Division Engineer is involved in the following decisions:

- o Resource allocation of divisional engineer action units among brigades
- o Requests for additional engineer support to Corps Engineer
- o Mission tasking for divisional engineer units

The following considerations are pertinent during the decision process:

- o Division commander's guidance
- o Corps/division current/future operations orders and plans (from division main CP)
- o Corps engineer units available to division and their status (from corps engineer action units at division)
- o Divisional engineer action unit status reports
- o Requests for engineer support (from division and brigade level action units)

This unit sends requests for additional engineer support either to corps or EAC.

2.2.2.1.2 The Engineer Combat Battalion HQ. The divisional Engineer Combat Battalion HQ is considered an intermediate headquarters for divisional control of engineer efforts in the corps/division level modeling effort. It is represented as a C^2 asset of the Division Engineer. The line companies and bridge company found in this battalion are separately detailed as action units in the following sections.

2.2.2.1.3 The Division G3 Air

Aviation Support Planning/Direction - The Division G3 Air has parallel responsibilities to those at corps. The assets used are the staff and the Divisional Aviation Battalion. Aviation support planning and tasking is done in response to the general division requirements for aviation combat support.[32]

Communications - The G3 Air relies on the Main CP Signal Center which belongs to maneuver control for multichannel, satellite and RATT support. Organic messengers and tactical radios may also be used.

Command and Control - The Division G3 Air makes the following range of decisions:

- o Task organization of divisional aviation support elements
- o Resource allocation of divisions aviation elements to brigades
- o Mission tasking to divisional aviation assets (through the intermediate headquarters, the Divisional Aviation Battalion).

The following considerations are used:

- o Division commander's guidance
- o Division operational plans current/future (from division main CP)
- o Aviation action units status (from division aviation action units)
- o Requests for future aviation support (from division action units)

Requests for additional aviation support will be sent to the Corps G3 Air for its consideration and review.

2.2.2.1.4 The Divisional Aviation Battalion. This is an organization which aggregates divisional aviation assets from all functional areas to form a parent organization. Aviation combat support missions are directed at the division main and tactical command posts utilizing the Divisional Aviation Battalion as an intermediate control asset. It is therefore represented as a C^2 asset of the Division G3 Air.

2.2.2.2 Divisional Action Units

2.2.2.2.1 Utility Helicopter Company

Transport Small/Medium Tactical Units - The Utility Helicopter Company uses utility helicopters, aviation fuel, tactical radios and pilots to air lift small and medium sized tactical units when used in a combat support role. Its combat service support role is covered in the CSS FARO. An airmobile lift is initiated by mission tasking from the Division G3 Air via the Divisional Aviation Battalion.

The Utility Helicopter Company sends route and checkpoint coordination reports, mission status, action unit status and combat information gathered as a result of operating in the forward area.

2.2.2.2.2 Engineer Combat Battalion (Heavy) (DS). This corps level asset has already been detailed above (section 2.2.1.2.3). This battalion can be assigned on a direct support basis to a division, in which case it is controlled by the Division Engineer.

2.2.2.2.3 Non-Tactical Bridge Company (DS). In a similar fashion, non-tactical bridging companies can be assigned from corps to division on a direct support basis. The control link would then be transferred to the Division Engineer. Refer to section 2.2.1.2.4 for a description of these units.

2.2.2.2.4 Atomic Demolition Team(s). The corps may assign one or more ADM teams from the ADM Company down to the division on a direct support basis. In this case, control would be transferred to the division commander directly because of the nuclear munitions of this unit. Refer to section 2.2.1.2.5 for a description of the corps level asset.

2.2.2.2.5 Engineer Combat Company

Emplace/Remove Countermobility Obstacles (Mines/Abatis/Boobytraps/Craters/Etc.) - Typically a division will retain one of the four Engineer Combat Companies at division, while assigning the other three to the brigades. The assets used in these companies to emplace or remove countermobility obstacles are mine detectors and rollers, heavy earthmoving equipment, supporting trucks, scooploaders, chain saws, backhoes, mines, fuel, bulk materials, tactical radios, and the operational personnel.

Mission tasking comes from the Division Engineer via the Engineer Combat Battalion HQ as an intermediate headquarters. Information feedback from the company to the Division Engineer includes mission status, action unit status, and information gathered during the mission.

General Engineering - This company uses heavy earthmoving equipment, fuel, personnel, bulk supplies, and tactical radios to do the many general engineering tasks required to support the division. Mission tasking and reporting follows the pattern found in the paragraph above on countermobility obstacles.

2.2.2.2.6 Tactical Bridge Company

Emplace/Remove Tactical Bridges - This company comes from the divisional Engineer Combat Battalion and it uses bridge sets, launchers, assault boats, personnel, fuel and tactical radios to emplace and/or remove bridges in the forward areas. This equipment is armored and can operate in a hostile environment (forward areas).

Mission tasking to support a particular maneuver unit comes from the Division Engineer. Information feedback is sent back to includes the mission status, action unit status report, and any combat information gathered during the mission.

2.2.3 Brigade Echelon

2.2.3.1 Brigade Control Units

2.2.3.1.1 The Brigade Engineer

Engineer Support Planning/Direction - The Brigade Engineer uses its staff as the principal asset for engineer support planning and direction.[32]

Communications - The Brigade Engineer uses the brigade Main CP's Forward Area Signal Center for satellite, multichannel and RATT communications support. Messengers and tactical radios may also be used.

Command and Control - The Brigade Engineer makes the following range of decisions:

- o Resource allocation of engineer assets among the maneuver battalions
- o Mission tasking of engineers to support the brigade scheme of maneuver.

In making these decisions, the Brigade Engineer uses the following:

- o Brigade commander's guidance
- o Current/future brigade/division opords and oplans (from brigade main CP)

- o Immediate requests for engineer support (from battalion action units)
- o Engineer action units status reports

Requests for additional engineer support are sent to the Division Engineer for consideration and approval.

2.2.3.2 Brigade Action Units

2.2.3.2.1 Engineer Combat Company. Each brigade receives one of four engineer companies from the divisional Engineer Combat Battalion. Refer to the divisional company (section 3.2.2.2.5) for a detailed description of the company. The direct support company at brigade is controlled by the Brigade Engineer in the same manner as at the division.

Command and Control - The decisions made by the SHORAD BN TOC are planning and ordering movements for its batteries and firing units, and establishing sectors of fire and PTL for SHORAD weapons.

In arriving at these decisions, the SHORAD BN TOC considers the following information:

- Information on enemy and friendly aircraft, supplied by the GS HIMAD BOC
- Its mission and fire control orders, received from the TOC
- Reports of location and unit situation status from the SHORAD batteries
- Reports of equipment status from the SHORAD platoon and FAAR platoon through the SHORAD batteries
- Reports of engaging a target or sighting a target which was not engaged, from the SHORAD squads or Stinger teams.

Information feedback includes reports on unit operational status and progress of the air battle, sent to the GOC.

1.2.1.2 Corps Action Units. The action units presented here are the HIMAD battery and the SHORAD battery. Squads, platoons, and sections are not treated separately as action units, but are represented as assets of their respective batteries.

1.2.1.2.1 GS HIMAD Battery

Delivery of Fires - The assets which the GS HIMAD battery uses for delivery of fires are its firing units, communications equipment, HAWK/PATRIOT missiles,[17] HAWK/PATRIOT launchers, Information Coordination Center (ICC), tracking radars (High Powered Illuminating radar (HPI)) and Range Only Radar (ROR) when the HPI is being jammed, acquisition radars (Pulse Acquisition radar (PAR) and Improved Continuous Wave Acquisition Radar (ICWAR)), [and its specially trained personnel].

The events which cause delivery of fires to occur include the following:

- The GOC determines sectors of fire and PTL for HIMAD weapons and transmits them to the BOC; the BOC passes them on to the battery.

- o The GS HIMAD battery receives its target assignment from the GS HIMAD BOC, identifies the target as hostile, then passes the target assignment on to the appropriate firing unit.

- o The HIMAD battery does target acquisition and tracking with its own radars.

The HIMAD battery reports on its mission results and the progress of the air battle to the GS HIMAD BOC.

Movement - The assets which the HIMAD battery uses for movement are its vehicles and communications personnel.

The fire units of a HIMAD battery move when the battery is ordered to move by the HIMAD BN TOC or when movement is necessary for self-protection. When the battery has moved, it reports its new location to its BOC.

1.2.1.2.2 SHORAD Battery

Delivery of Fires - The assets which the SHORAD battery uses in delivery of fires are the SHORAD platoon and squad; the FAAR platoon and section; the Stinger section and team; missiles (Chaparral, and Stinger[1]), FAAR radars; [its specially trained personnel], and communications equipment.

Delivery of fires is initiated at the squad level, when the SHORAD squad leader or Stinger team leader authorizes engagement, based on hostile criteria and visual confirmation; he is influenced in making this authorization by the sectors of fire and PTL established by the SHORAD BN TOC and the alerting from the FAAR section.

At the completion of the mission, the SHORAD battery reports its mission status to the SHORAD BN TOC.

Movement - Movement of a SHORAD battery requires vehicles and personnel. (Stinger teams may be emplaced by aircraft.)

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[1]Stinger is man-portable.

1.2.2.2.1 GSR HIMAD Battery

Delivery of Fires - The assets that the GSR HIMAD battery uses for this capability are its firing units, communications equipment, HAWK/PATRIOT[17] missiles, HAWK/PATRIOT launchers, ICC, tracking radars (HPI, or ROR when HPI is being jammed), acquisition radars (PAR, ICWAR), [and its specially trained personnel].

Events which cause delivery of fires to occur include the following:

- The GOC determines sectors of fire and PTL for HIMAD weapons and transmits them to the BOC; the BOC passes them on to the battery.
- The GSR HIMAD battery receives its target assignment from the GSR HIMAD BOC, identifies the target as hostile, then passes the target assignment on to the appropriate firing units.
- The GSR HIMAD battery conducts target acquisition and tracking with its own radars.

The GSR HIMAD battery reports on its mission results and the progress of the air battle to the GSR HIMAD BOC.

Movement - The assets which the GSR HIMAD battery uses in its movement are its vehicles and personnel.

Fire units of the GSR HIMAD battery move when the battery is ordered to move by its BOC, or when movement is necessary for self-protection. When the battery has moved, it reports its new location to its BOC.

1.2.2.2.2 SHORAD Battery

Delivery of Fires - Assets used by the SHORAD battery in the delivery of fires include its [specially trained personnel]; SHORAD platoon and squad; FAAR platoon and section; Stinger section and team; missiles (Chaparral and Stinger); and communications equipment.

Movement - The assets used in moving are vehicles and personnel. (Stinger team may be emplaced by aircraft.)

Fire units of the SHORAD battery move when the battery receives a movement order from the BOC, or when movement is necessary for self-protection. When it completes its move, the battery reports its new location to its TOC.

1.2.3 Brigade

The typical air defense unit supporting the brigade level is the DIVAD Gun/Stinger battery, an action unit. Command and control of this unit is accomplished by the SHORAD BN TOC and the maneuver brigade TOC.

1.2.3.1 Brigade Control Units. There are no air defense control units to be considered at this level.

1.2.3.2 Brigade Action Units

1.2.3.2.1 DIVAD Gun/Stinger Battery

Delivery of Fires - The assets used by the DIVAD Gun/Stinger battery in its delivery of fires are the DIVAD Gun/Stinger platoon and squad, DIVAD gun and Stinger missile systems, communications equipment and [specially trained personnel].

A DIVAD Gun/Stinger battery can fire when a hostile target is identified visually; the SHORAD BN TOC provides sectors of fire and PTL as well as alerting and target location. In addition, a ground force threat will trigger direct fire use of DIVAD Gun/Stinger weapons.

Movement - The assets used for movement are vehicles and personnel.

A DIVAD Gun/Stinger battery moves when the brigade TOC informs it of the relocation of the maneuver unit it is supporting, or when movement is necessary for self-protection.

When relocation is completed, the DIVAD Gun/Stinger battery reports its new location to the brigade TOC.

APPENDIX VII

COMBAT SERVICE SUPPORT FUNCTIONAL AREA REPRESENTATION
OBJECTIVES

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(Concluded)

1.0 COMBAT SERVICE SUPPORT FUNCTIONAL AREA REPRESENTATION OBJECTIVES

Figure VII-1 is a representation of the connectivity relationships among the combat service support control units and action units considered here.10,11,35,26

The activities of the combat service support functional area can be considered in terms of the capabilities of the control units and action units. The primary capabilities of combat service support control units are those of control units in other functional areas - planning and situation assessment, communications, and command and control (C^2). The seven capabilities of combat service support action units are generally peculiar to that functional area, and are described below.

POL Supply

Bulk POL travels from the theater to the COSCOM's POL Supply Battalion by pipelines or bulk carriers. The Transportation Medium Truck Company of COSCOM's POL Supply Battalion then transports it to Class III supply points in the division and brigade support areas (unit distribution), or tankers from DISCOM's Supply and Transport BN go to the corps area to pick up the POL and transport it to the Class III distribution points in the division support area (supply point distribution).35

From the division Class III supply point, DISCOM tankers take the POL to Class III distribution points in the brigade support area. Here again, either supply point or unit distribution may be used: the using unit may travel to the direct support unit/brigade supply point, or vehicles of the direct support unit/brigade supply point may take the POL to the user.

Under the Direct Support System (DSS), packaged POL may be shipped directly from CONUS to the direct support unit (supply company).

Supported units in the division area submit periodic POL requests through their S4 to the Division Materiel Management Center; the DMMC sends a replenishment request to the COSCOM MMC. Large stocks of POL are not normally kept at distribution points; POL is resupplied as needed.

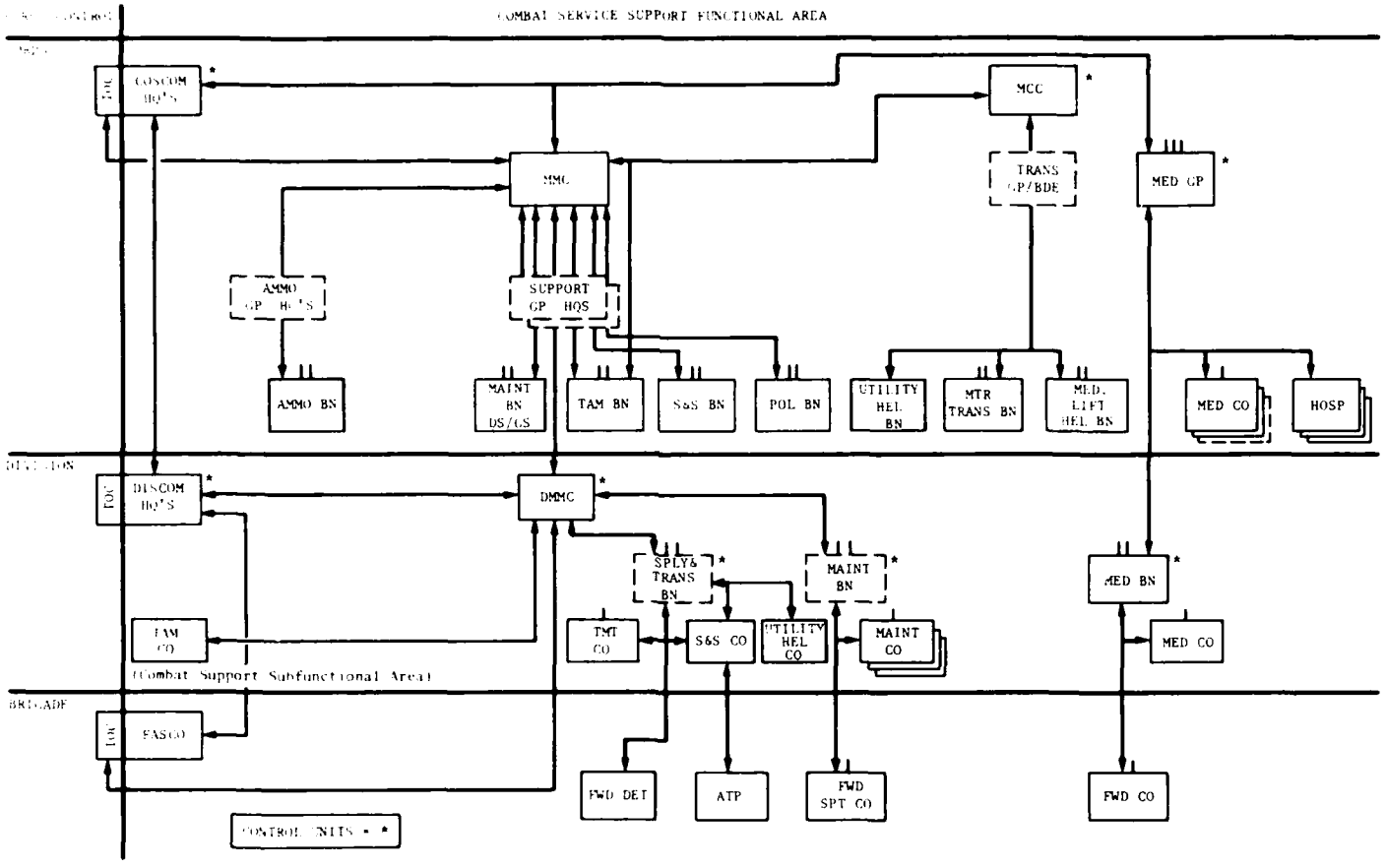


FIGURE VII-1
COMBAT SERVICE SUPPORT FUNCTIONAL AREA

Ammunition Supply

Ammunition supply is primarily a function of the COSCOM. Ammunition is shipped from CONUS to the ammunition supply points (ASP's) in the corps and division support areas in three ways: 1) from CONUS to corps storage areas (CSA), then to the ASP's; 2) from CONUS to theater storage areas, then to the ASP's; or 3) from CONUS directly to the ASP's.[35] The first method is the one generally used; when the tactical situation permits, ammunition may be moved by the second or third method to bypass intermediate points and reduce handling. The Supply and Service Company of the division Supply and Transportation BN also operates supply points in the brigade area; these are termed ammunition transfer points (ATP's).

Generally, supply point distribution is used from the ASP's; using units in the division and brigade areas present their requests to the Division Materiel Management Center (DMMC) for validation, then proceed, in their own trucks, to the ASP/ATP to pick up ammunition. Like POL, ammunition is not normally stocked in large quantities at the supply points; it is resupplied as needed, within the controlled supply rate (CSR) as announced by tactical commanders and the ammunition allocation as announced by the corps commander.

Corps Field Storage Locations (FSL's) supply nuclear ammunition to special ammunition supply points (SASP's), which, upon presentation of proper authorization, supply the using units in the corps and division areas.

Maintenance

There are three types of maintenance service - general support, direct support, and organizational. General support is the highest level of maintenance support and handles the overflow from direct support units; direct support is provided to specific units as a backup for organizational maintenance; and organizational maintenance is that which is performed by the using units.

Maintenance services covered in this paper are concerned with equipment other than COMSEC, automatic data processing equipment (ADPE), medical, airdrop equipment, light textiles, and explosives. The Division Data Center (DDC) repairs ADPE organic to the DISCOM.

COSCOM units perform general support, direct support, and organizational maintenance. The Maintenance BN DS/GS services items which could not be quickly repaired by COSCOM's Direct Support Maintenance BN and DISCOM's Maintenance Companies (the repairs generally take 72-96 hours) and services items which could not be repaired by corps-level using units; organizational maintenance is done when possible for combat service support units by the units themselves. COSCOM AVIM (Aviation Intermediate Maintenance) companies of the Transportation Aviation Maintenance BN (TAM) provide backup aviation maintenance and parts for corps and division AVUM (Aviation Unit Maintenance) units, at corps or on-site by maintenance support teams.

DISCOM units perform direct support and organizational maintenance. The Maintenance Battalion services items which could not be repaired by using units, usually completing repairs within 24-36 hours. [In addition, the Maintenance Battalion maintains a repair parts stock for its own use and for supported units.]

Personnel Replacement

Personnel replacement detachments of COSCOM coordinate with the Movement Control Center (MCC) for transportation to the new unit. This transportation is usually provided by the Transportation Composite Group/Brigade, with its Motor Transport Battalion and the Medium Lift Helicopter Battalion.

Medical Care

Corps level medical care includes the evacuation of patients from division level clearing stations and their hospital treatment; further evacuation to Communications Zone (COMMZ) hospitals is provided by the Medical Command (MEDCOM) at theater.

Responsibilities of division-level medical facilities are [to operate clearing stations for short-term treatment of patients], to evacuate patients from unit aid stations, [and to provide division-wide medical supply]. The support company provides medical support for troops in the division rear area, while the forward medical companies support the combat brigades. The medical companies operate clearing stations in the brigade support area, and use ambulances to evacuate patients from maneuver battalion aid stations. In

airmobile divisions, aircraft from the aviation group transport personnel of the medical battalion to brigade or division bases or support areas.

Personnel casualties, combat-related and non-combat-related, are of three types: 1) those not replaced, 2) those evacuated and then returned, and 3) those evacuated and replaced. These types will have different effects on the CSS function, and should be differentiated in CORDIVEM.

Water Supply

At the corps level, water supply is a function of the maneuver control functional area (combat support); transportation is arranged in coordination with the COSCOM's MCC.

At the division level, water purification and distribution is performed by the Supply and Service Company of the DISCOM's Supply and Transport Battalion. Using units of the division and brigade come to water supply points in their respective support areas for water.

Class VII and Class IV Supply

Supply of major end items and engineer building materials is a function of the General Supply Company and Heavy Supply Company of the COSCOM's Supply and Service Battalion. Supply points may be established in corps and division areas, as needed. Users in the division area requests materials from the supply points, which advise the supply service company of the DISCOM Supply and Transportation BN on supply status at the supply points. The Supply and Transportation BN in turn advises the DMMC.(38)

Using units in the corps area send requests for items to corps headquarters. If the request is approved corps headquarters directs the COSCOM MMC to release the items; the MMC then instructs the appropriate supply company to issue the items to the using unit.

1.1 Standard Effects

1.1.1 Effects of Executing the Capability on Targets, the Environment, and Assets

Since the combat service support functional area is not concerned with affecting enemy targets, this section describes the effects on the environment

and on combat service support assets resulting from the performance of each of the previously discussed capabilities of control and action units. (Command and control is not broken out as a distinct capability here since the effects on command and control are included in the effects on planning and situation assessment and communications.)

1.1.1.1 Planning and Situation Assessment. The only effect of performing planning and situation assessment is that the staff is being used.

1.1.1.2 Communications. The primary effect of communicating is that communications links are loaded.

1.1.1.3 POL Supply. Supplying POL will result in supply depletion at supply points, and an increase of the supply of the users. Transporting the POL causes operational degradation of supply vehicles as well as POL consumption by those vehicles; POL supply traffic increases congestion of roads.

1.1.1.4 Ammunition Supply. The effects of executing ammunition supply are similar to those of executing POL supply - a need for resupply of supply points, operational degradation of supply vehicles, POL consumption of supply vehicles, and increased road congestion from supply traffic.

1.1.1.5 Maintenance. [The execution of maintenance service results in a reduced stock of repair parts at supply units; operational degradation and POL consumption of maintenance team vehicles, and of supply vehicles when they are used to return repaired items to the user; and congestion of roads.]

1.1.1.6 Personnel Replacement. The execution of personnel replacement activities causes operational degradation of vehicles transporting personnel, POL consumption of those vehicles, road congestion, and an increase in the level of personnel at the using unit.

1.1.1.7 Medical Care. Providing medical treatment and evacuation causes [a reduced stock of medical supplies], operational degradation of evacuation vehicles, POL consumption by evacuation vehicles, road congestion caused by those vehicles, and results in personnel being available for duty.

1.1.1.8 Water Supply. Since the water supply is from natural sources and using units are responsible for transporting it, the main effect of water supply of concern here is the operational degradation of purification equipment and pipelines.

1.1.1.9 Class VII and Class IV Supply. Supply of Class VII items (major

end items) and Class IV (engineer building materials) causes reduced stocks at supply points, operational degradation of and POL consumption by supply vehicles, congestion of roads, and an increase of repair parts at the using units.

1.1.2 Combat Effects on the Capability

This section describes how the conditions of combat will affect the performance of each of the nine capabilities of control and action units.

1.1.2.1 Planning and Situation Assessment. Command and control nodes are high-priority targets for enemy nuclear attack; for this reason, most of the combat effects on planning and situation assessment are nuclear-related. These effects can degrade the performance of equipment or personnel.

The equipment effects include the loss or degradation of entire command and control nodes through enemy air or artillery attack, especially nuclear attack. The loss of computer hardware, software, or data bases is likely through conventional or nuclear attack [(software and data bases are vulnerable to electromagnetic pulse (EMP) and transient radiation effects on electronics (TREE) in a nuclear environment)]. This loss of automatic data processing function is critical because of the lack of backup manual systems.[35]

Combat effects on personnel include degraded performance due to [stress and fatigue], the difficulty of working in Mission Oriented Protective Posture (MOPP) status, and casualties from blast, radiation, and chemical contamination.

1.1.2.2 Communications. The communications capability is subject to many of the same factors which affect planning and situation assessment: entire communication nodes can be destroyed or degraded through air or artillery attack, especially nuclear; equipment can be destroyed or degraded by air or artillery attack, or jamming; personnel performance can be degraded by [stress, fatigue], the difficulty of working in MOPP status, and combat casualties.

1.1.2.3 POL Supply. Combat effects on POL supply include enemy destruction of supply points, with heavy losses due to nuclear attack; destruction of POL tankers; delay of tankers by combat or by nuclear, biological, and chemical (NBC) contamination; and slowdown of procedures at supply points because of the difficulty of working in MOPP gear. In addition, combat can cause an increased need for POL resupply.

1.1.2.4 Ammunition Supply. The effects of combat on ammunition supply are essentially the same as those on POL supply: supply points, ASPs and SASPs, can be destroyed with heavy losses due to nuclear attack; vehicles traveling to or from ASPs and SASPs can be destroyed; vehicles can be delayed by combat in the area; supply can be delayed by nuclear or chemical effects on ammunition or equipment and the resulting need for decontamination; the use of MOPP gear will slow procedures at supply points; and combat can cause an increased need for ammunition resupply.

1.1.2.5 Maintenance. Combat can disrupt maintenance service by causing destruction or chemical contamination of repair parts, vehicles, personnel, tools, test equipment, and items being repaired; service will be impaired if personnel are working in MOPP gear. [In addition to these delays, maintenance service can be made less efficient by the combat loss of trained personnel and the frequent movement of maintenance teams necessary in combat.] Combat will cause an increased need for maintenance service.

1.1.2.6 Personnel Replacement. [Combat will cause an increased need for personnel replacement, especially in a nuclear attack when mass casualties will result; transport of replacements may be interdicted by enemy attack.]

1.1.2.7 Medical Care. Chemical contamination of patients, personnel, supplies, and equipment can cause delay of treatment due to decontamination procedures or working in MOPP gear; this delay of treatment will cause greater loss of life. Enemy attacks can delay or prevent ground and air evacuation of patients; equipment, including ambulances and helicopters, will be destroyed. [Efficiency will be reduced by personnel stress and fatigue, and by the loss of personnel with highly specialized skills]. Combat will cause an increased need for medical care, especially nuclear attack which causes a large number of casualties, including those from heat and flash.

1.1.2.8 Water Supply. The capability of water supply is susceptible to the combat effects of chemical contamination of water and equipment, and the destruction of that equipment.

1.1.2.9 Class VII and Class IV Supply. Combat effects on Class VII and Class IV supply are similar to those on POL and ammunition supply, that is, destruction of supply points, vehicles, or supplies, and delay of vehicles caused by enemy interdiction.

1.1.3 Environmental Effects on the Capability

This section addresses the effects that factors such as weather, terrain, and nuclear and chemical effects produced by friendly or enemy forces will have on the performance of the capabilities of combat service support units.

1.1.3.1 Planning and Situation Assessment. [Weather conditions such as electrical storms can cause power surge or power failure which will interrupt computer operation.] Environmental effects for which control units must plan include nuclear and chemical effects which alter terrain features, cross country trafficability, and lines of communication.

1.1.3.2 Communications. [Weather conditions such as electrical storms can degrade the performance of radios.]

1.1.3.3 POL Supply. Rough terrain will slow ground movement; icy roads, snow, storms, flooding, and extreme cold will slow ground movement and operations at supply points as well. Tree blowdown, nuclear and chemical effects on supply routes, and the difficulty of retrieving supplies from nuclear "hot" areas will also impede POL supply. Frozen ground will improve trafficability of muddy areas.

1.1.3.4 Ammunition Supply. Rough terrain will slow the movement of supplies to ASPs and SASPs; ice, snow, storms, flooding, and extreme cold will slow operations at the ASPs and SASPs as well. Tree blowdown, nuclear and chemical effects on supply routes, and the difficulty of retrieving supplies from nuclear "hot" areas will impede ammunition supply.

1.1.3.5 Maintenance. Snow and storms will delay movement of maintenance teams, and will increase repair times; rough terrain, flooding, and icy roads will slow movement of maintenance teams and will complicate recovery and evacuation. Frozen ground will improve the trafficability in muddy areas.

1.1.3.6 Personnel Replacement. Rough terrain, icy roads, and flooding will slow the ground transportation of personnel replacements; snow and storms will slow transportation by ground and delay transportation by air. Extremely cold weather will increase casualties due to exposure, thus increasing the need for personnel replacements. Frozen ground will improve trafficability in muddy areas.

1.1.3.7 Medical Care. Casualties due to weather exposure will increase the workload of medical units. Snow and storms will delay or prevent air

evacuation of patients, travel of medical teams, and delivery of supplies; rough terrain, icy roads, and flooding will slow evacuation and travel of medical teams by ground as well as ground transport of supplies. Frozen ground will improve trafficability of muddy areas.

1.1.3.8 Water Supply. [Flooding can contribute to contamination of water]; lack of a conveniently located water source will necessitate the use of pipelines or other means of transporting water to distribution points. A nuclear or chemical environment will increase the need for water both for drinking (MOPP gear increases the need for drinking water) and for decontamination.

1.1.3.9 Class VII and Class IV Supply. Rough terrain, icy roads, snow, storms, and flooding all can delay or prevent movement to and from supply units. Nuclear blowdown and nuclear or chemical effects on supply points, vehicles, supplies, and supply routes can delay major end item supply. Frozen ground will improve trafficability of muddy areas.

1.1.4 Situational Factors

This section describes those situational factors such as unit operational status and availablity of supplies or information which affect the performance of the nine combat service support capabilities addressed in this appendix.

1.1.4.1 Planning and Situation Assessment. Planning and situation assessment depend on the availability of accurate and timely information, which is determined in part by the operational status of the unit's computers. The availability of trained personnel and their level of training are also factors in the performance of planning and situation assessment.

1.1.4.2 Communications. An excessive amount of communications traffic for the available equipment will degrade performance, as will a reduced operational status of the equipment. [Communication is affected by the availability of trained personnel as well as their level of training.]

1.1.4.3 POL Supply. POL supply is affected by the operational status of the POL supply vehicles, the availability of POL from theater pipelines, and the operational status of supply points.

1.1.4.4 Ammunition Supply. Ammunition supply is affected by the availability of ammunition from theater as well as the operational status of ASPs and SASPs. In addition, the rate of ammunition resupply is regulated by

the announced controlled supply rate (CSR) from the tactical commander and the ammunition allocation from the corps commander.

1.1.4.5 Maintenance. Maintenance will be affected by the availability of [trained personnel and their level of training], the operational status of maintenance team vehicles, [the availability of repair parts], and the operational status of tools and test equipment .

1.1.4.6 Personnel Replacement. Personnel replacement is chiefly affected by the operational status of vehicles transporting troops.

1.1.4.7 Medical Care. Medical care depends on the [availability of medical supplies and specialized personnel], and the operational status of equipment and hospitals.

1.1.4.8 Water Supply. Situational factors affecting water supply include the operational status of equipment and distribution points.

1.1.4.9 Class VII and Class IV Supply. Class VII and Class IV supply depends on the availability of items and the operational status of supply points, when used.

1.1.5 Effects from Other Functional Areas

The following subparagraphs will describe the ways in which each of the combat service support capabilities can be affected by factors from the other functional areas of fire support, maneuver control, intelligence/electronic warfare, and air defense. Although the combat service support functional area generally supports itself rather than depending on other functional areas, the exceptions are noted here.

1.1.5.1 Planning and Situation Assessment. This capability depends on the availability of information from the division G1, G3, and G4. This availability is a function of the operational status of the G1, G3, and G4, and communications.

1.1.5.2 Communications. Communications depends on the signal centers of the maneuver control functional area.

1.1.5.3 POL Supply. There are no significant effects on POL supply from other functional areas.

1.1.5.4 Ammunition Supply. The maneuver control functional area affects ammunition supply in the form of the CSR from tactical commanders and ammunition allocation from the corps commander.

1.1.5.5 Maintenance. There are no significant effects on maintenance from other functional areas.

1.1.5.6 Personnel Replacement. There are no significant effects on personnel replacement from other functional areas.

1.1.5.7 Medical Care. Medical care depends on the availability of aircraft from the Aviation Brigade in the maneuver control functional area (combat support), for airlifting elements of the Medical Battalion to combat areas; and the availability of aircraft organic to the division for emergency evacuation when requested by the Medical Battalion commander (this effect is primarily from the maneuver control area, but may involve any divisional unit).

1.1.5.8 Water Supply. Water supply depends on engineer support from the maneuver control functional area (combat support) for construction of pipelines, when necessary.

1.1.5.9 Class VII and Class IV Supply. Class VII and Class IV supply are not significantly affected by other functional areas.

1.2 Functional Representation

This section addresses the operations performed at each control and action unit by echelon (corps, division, brigade) and unit type (control or action). Each unit will be discussed in terms of its major capabilities; for control units these capabilities are planning/situation assessment and communications, with a description of their associated assets and any non-standard effects, and command and control, with a discussion of the unit's associated range of decisions, considerations used in making those decisions and information feedback to higher control units. For action units, the capabilities are the applicable ones from the previously discussed capabilities, with a discussion of their associated assets, non-standard effects, initiating events and information feedback. Personnel are implicit as assets of the actio· units.

1.2.1 Corps

1.2.1.1 Corps Control Units

1.2.1.1.1 COSCOM Headquarters

Planning and Situation Assessment - The assets of this unit are its staff and the Automated Data Processing Center (ADPC).

Communications - This unit's assets are its staff, communications links, and its signal center with multi-channel and tactical radios as well as radio teletype (RATT) and wire capabilities.

Command and Control - The COSCOM Headquarters is responsible for developing plans and policies for combat service support to corps units, and recommending priorities of support and allocation to corps headquarters and DISCOM. Both these activities involve coordination with corps and DISCOM commanders.

In particular, the COSCOM Headquartes coordinates reconstitution and Rear Area Combat Operations (RACO) efforts with the Corps Rear CP. The specific tasks involved in reconsitution and RACO — personnel or unit replacement, and various types of resupply — are discussed in this appendix under 1.2.1.2 Corps Action Units.

In making these decisions, COSCOM headquarters considers supply, maintenance and transportation information from the MMC and MCC, as well as action unit operational status reports and requests for further evacuation from the Medical Group/Brigade. Information feedback takes the form of reports to the CTOC on CSS unit activities for its use in planning support priorities and allocations.

1.2.1.1.2 Materiel Management Center (MMC)

Planning and Situation Assessment - The assets used by this unit are its staff and the ADPC.

Communications - The assets used are communications links and staff.

Command and Control - The MMC makes decisions in two main areas:

1) It directs the storage and distribution of supplies, coordinating with the MCC for supply transport. This includes ordering issue of Class VII items from available stocks or sending a requisition to CONUS wholesale level, upon receipt of requisition from supported units, and directing POL battalions to release supplies to POL supply companies.
2) It provides tasking to supported maintenance units.

In making the above decisions, the MMC considers requests from using units for Class VII items; direction from corps headquarters to release controlled Class VII supplies; direction and policies from COSCOM Headquarters including the Controlled Supply Rate for Ammunition; requests from the DMMC for additional POL and POL requirement forecasts from POL supply companies; ammunition allocations from COSCOM Headquarters, based on the decision of the corps commander; maintenance and materiel status reports from maintenance battalions, [and requests for backup aviation maintenance for the division, through the DMMC]. Information feedback consists of reports to the COSCOM Headquarters on maintenance activities and supply levels.

1.2.1.1.3 Support Group Headquarters. The Maintenance Battalion DS/GS, the Supply and Service Battalion, and the TAM Battalion belong to one of several support groups. The Support Group Headquarters serves as an intermediate command and control headquarters between these units and the MMC; therefore, it is sufficient to represent the Support Group Headquarters as a control asset of the MMC.

1.2.1.1.4 Ammunition Group Headquarters. The Ammunition Group Headquarters serves as an intermediate command and control headquarters between the Ammunition Battalion and the MMC; for this reason, it is sufficient to represent the Ammunition Group Headquarters as a control asset of the MMC.

1.2.1.1.5 Movement Control Center (MCC)

Planning and Situation Assessment - The only asset of concern here is the MCC staff; the associated effects are standard, except for the need for coordination with the corps engineer units (combat support in maneuver control).

Communications - The assets used are the MCC staff and communication links.

Command and Control - The MCC's decisions are to coordinate the movement of personnel and materiel [and backup aviation maintenance for the division] with the MMC, and to assign movement tasks to the Transportation Group. In making these decisions the MCC considers unit status reports from corps action units. Information feedback from the MCC includes reports on transportation activities to COSCOM Headquarters.

1.2.1.1.6 Transportation Composite Group/Brigade Headquarters. Although the Transportation Composite Group/Brigade Headquarters is a separate unit from the MCC, it chiefly serves as an intermediate command and control headquarters between the MCC and the Motor Transport and Aviation Battalions; therefore, for the purposes of a modeling effort, it is sufficient to represent the Transportation Composite Group/Brigade Headquarters as a command and control asset of the MCC.

1.2.1.1.7 Medical Group Headquarters

Planning and Situation Assessment - This unit's assets for this capability are its staff.

Communications - The assets of concern here are the staff and communication links.

Command and Control - The decisions made by this unit are in tasking the ambulance companies to perform medical evacuation in the corps and division areas. The Medical Group Headquarters receives requests from supported units in the corps area through the COSCOM Headquarters, or from the division Medical Battalion for medical evacuation of patients to corps medical facilities.

Information feedback includes reports to COSCOM Headquarters on the operational status of medical units and requests for further evacuation to COMMZ hospitals, [provided by the Medical Command (MEDCOM) at theater].

1.2.1.2 Corps Action Units

1.2.1.2.1 POL Supply Battalion

POL Supply - The battalion's assets are personnel, the Petroleum Supply Companies with their supply points, the Transportation Medium Truck

Companies, and communications equipment. (There are 2 - 6 Petroleum Supply Companies or Medium Truck Companies, or a combination of the two types.)26

The POL Supply Battalion receives POL from theater by pipeline or bulk carriers; when so directed by the MMC, the battalion releases supplies to the POL Supply Company. The Transportation Medium Truck Company delivers the POL to supply points in corps, division, and brigade areas; up to four of these supply points are operated by each Petroleum Supply Company. The Petroleum Supply Company requests POL through the MMC, and sends unit status reports to the MMC.

1.2.1.2.2 Ammunition Battalion

Ammunition Supply - The assets of the Ammunition Battalion are personnel , the two Ammunition Supply Companies, with their ASP's (two per company); the Special Ammunition DS Company with its SASP's (two per corps); the FSL's (one for every two SASP's) and communications equipment.

The sequence of initiating events is as follows: ammunition is shipped from CONUS to ASP's or CSA's at corps; using units in the corps and division areas travel in their own trucks to the ASP's or CSA's to pick up the ammunition. The FSL resupplies its two SASP's.

Ammunition supply companies do not report levels of ammunition issue, since they routinely issue the current CSR, determined by the corps commander and transmitted through COSCOM HQ's and the MMC. The Ammunition BN sends unit status reports to the MMC.

1.2.1.2.3 Motor Transport Battalion

Personnel Replacement - The assets of the battalion are [personnel]; its communications equipment, and its Transportation Light Truck Company.

The following is the sequence of events which initiates the combat service support portion of personnel replacement: using units request transportation from the MCC; the MCC notifies the Transportation Composite Group/Brigade Headquarters; the headquarters assigns the transportation task

to the Motor Transport Battalion; the Motor Transport Battalion assigns the Light Truck Company the task of transporting personnel to their new units. *Information feedback* consists of unit status reports sent to the MCC (through the Transportation Composite Group/Brigade Headquarters).

1.2.1.2.4 Utility Helicopter BN and Medium Lift Helicopter BN

These helicopter units belong organizationally to the Aviation Group at Corps (Maneuver Control Functional Area),[38] but are included here because they perform Combat Service Support functions.

Personnel Replacement - The assets used are personnel, helicopter companies, and communications equipment.

The events which initiate personnel replacement transportation by air are similar to those which initiate personnel replacement transportation by ground: the receiving unit requests transportation through the MCC; the MCC notifies the Transportation Composite Group/Brigade Headquarters; the headquarters assigns the transportation task to the Helicopter Battalion; the battalion tasks the Helicopter Company, which transports the personnel. Information feedback consists of unit status reports to the MCC.

POL Supply, Ammunition Supply, Class IV and VII Supply - The helicopter units are used for these tasks basically as an alternative to ground transportation when greater speed is necessary. (See section on Motor Transport BN.)[37]

1.2.1.2.5 Maintenance Battalion, DS/GS

Maintenance - The assets used are the Headquarters and Headquarters Detachment; the maintenance companies (Heavy Equipment Maintenance Company or Companies, Light Equipment Maintenance Company or Companies, Collection and Classification Company, Tire Repair Company, and the Missile Support Co., DS/GS); the personnel of maintenance support teams; and communications equipment.

Maintenance service is initiated by using units in the corps area, which either request on-site maintenance by the augmentation maintenance teams or send personnel to the Maintenance Battalion to exchange non-usable items for usable ones of the Operational Readiness Float.

Unserviceable equipment is evacuated from direct support maintenance units and from supported units in the corps area for direct exchange at the appropriate general support company; or, direct support units and supported

units may request on-site repair by maintenance support teams. The Maintenance Battalion sends periodic reports of maintenance and materiel status as well as unit status to the ADPC of the MMC.

1.2.1.2.6 Transportation Aircraft Maintenance (TAM) Battalion

Maintenance - Assets of the TAM Battalion are the Headquarters and Headquarters Detachment; two to eight TAM Companies for intermediate aircraft maintenance and repair parts supply in corps area, as well as backup maintenance and direct exchange service to the division TAM Company the personnel in maintenance support teams ; and communications equipment.

[AVUM units organic to the corps request support from maintenance support teams for recovery, cannibalization, and on-site repair of aircraft; supported units in the corps area travel to the TAM Battalion for repair parts. Division aircraft maintenance companies may request backup aviation maintenance from the COSCOM TAM Battalion, through the DMMC to the MMC, to the MCC, then to the TAM BN.] The TAM Battalion sends unit status reports to the MMC, and coordinates with the MCC to determine which AVIM companies will accomplish the repairs, then tasks the appropriate companies.

1.2.1.2.7 Ambulance Companies (Air and Ground)

Medical Care - The assets used by these units in medical care are aircraft, [personnel], communications equipment, and vehicles. The ambulance companies receive orders from the Medical Group Headquarters to transport patients to corps hospitals; after completing the transport, the companies report the task status to the Medical Group Headquarters. Unit status reports are sent to the Medical Group Headquarters.

1.2.1.2.8 Corps Hospitals

Medical Care - The assets used by the hospitals are the hospitals themselves (one Corps Support Hospital, two Evacuation Hospitals, and one MASH Hospital per supported division), [personnel with critical MOS's], medical supplies and equipment, and communications equipment.

Patients are brought to the hospitals by the ambulance companies; the hospitals send operational status reports to the Medical Group Headquarters, as well as requests for further evacuation to COMMZ hospitals of patients who cannot return to duty within a specified number of days.

1.2.1.2.9 Supply and Service Battalion

Class VII and Class IV Supply - The assets used are the Heavy Materiel Supply Company, the General Supply Company, [personnel], and communications equipment.

Class VII and Class IV supply at the COSCOM level is initiated when the MCC, upon corps approval, directs the appropriate supply company to issue the items to using units in the corps, division, and brigade areas. The Supply and Service Battalion reports to the MMC on its maintenance and materiel status.

1.2.2 Division

1.2.2.1 Division Control Units

1.2.2.1.1 DISCOM Headquarters

Planning and Situation Assessment - The assets used in this capability are the headquarters staff, the Division Data Center (DDC), and the FASCO (Forward Area Support Coordinating Officer).

Communications - The communications assets are the staff, the DDC, communications links and a signal center with multi-channel and tactical radios as well as RATT and wire capabilities.

Command and Control - The DISCOM Headquarters makes such decisions as allocation of POL transportation assets (done by the Movement Control Officer in coordination with the DMMC); and the organization of DISCOM unit movement, in coordination with the division G-4. The DISCOM Headquarters also coordinates reconstitution and RACO efforts with the Division Rear CP; the specific tasks included in reconstitution and RACO (personnel or unit replacement and various types of supply) are discussed in this appendix under section 1.2.2.2 Division Action Units. Considerations used in making these decisions include policy guidance on transportation movement from the Division Transportation Officer at Division Headquarters, information on the logistics situation in the brigade area from the FASCO (the FASCO coordinates with the brigade headquarters) and information from the Division G-3 and G-4 on the division's tactical plan. Information feedback from the DISCOM Headquarters includes advice to the division commander

and G-4 (DTOC) on logistics, advice to the division commander on airdrop operations in airmobile and airborne divisions, and coordination with COSCOM Headquarters.

1.2.2.1.2 Division Materiel Management Center (DMMC)

Planning and Situation Assessment - The assets used are the DLOGS (Division Logistics System) and MRM (Maintenance Reporting and Management System) (automated systems from DDC), computer terminals, and the DMMC Staff.

Communications - The assets used are [trained personnel] and communications links.

Command and Control - Decisions made by the DMMC are to develop authorized stockage lists (ASL), and prescribed load lists (PLL) for supplies; procure and direct distribution of division supplies; authenticate ammunition requests of user units, based on replacement of the basic load and the controlled supply rate from tactical unit commanders; to plan the operation and location of supply distribution points; and to coordinate with the Movement Control Officer at DISCOM Headquarters on POL distribution and personnel transport.

Considerations used in making these decisions include ammunition request from using units, POL needs from using the unit's G-4, and Brigade S4, POL status reports from Class III distribution points, the CSR from tactical commanders, [and requests for backup aviation maintenance from the division TAM Company]. Information feedback includes requests for additional POL through the corps MMC.

1.2.2.1.3 Supply and Transportation BN Headquarters and Maintenance BN Headquarters

Although the Supply and Transportation Battalion Headquarters (or the Supply and Service Battalion Headquarters of the Airmobile and Airborne DISCOM's) and the Maintenance Battalion Headquarters are separate units from the DMMC, they chiefly serve as intermediate command and control headquarters between the DMMC and the Transportation Motor Transport Company, Supply and Service Company, Utility Helicopter Companies, and the Maintenance Companies; therefore, for modeling purposes, it is sufficient to represent these units as command and control assets of the DMMC.

1.2.2.1.4 Medical BN

Planning and Situation Assessment - The staff is the battalion asset for planning and situation assessment.

Communications - The battalion's assets are its staff and communications links.

Command and Control - The decisions for which the Medical Battalion has responsibility include determining which patients should be reported to the Medical Group as needing evacuation to corps hospitals, and tasking the support company and the forward companies. The battalion receives status reports and evacuation requests from the support company and the forward companies. Information feedback from the Medical BN consists of reports of operational status of its units and requests for further evacuation of patients, both of which are sent to the Medical Group at corps.

1.2.2.2 Division Action Units

1.2.2.2.1 Supply and Service Company

POL Supply - The company's assets used in POL supply are [personnel], the POL distribution points in the division and brigade support areas, division POL reserves in the division support area, and communications equipment. The associated effects are standard, with the additional effect from other functional areas of the availability of Air Force aircraft for unit distribution in airmobile divisions.

POL supply is done routinely, and is caused by POL consumption by supported units. The Supply and Service Company requests POL for its distribution points through the DMMC (Supply and Transportation BN Headquarters) from the MMC. The Supply and Service Company receives daily POL status reports from its distribution points and passes a consolidated report as well as a unit status report on to the DMMC (Supply and Transportation BN Headquarters).

Water Supply - The assets used for water supply are purification equipment, communications equipment, water distribution points in the division and brigade support areas [and personnel].

Water supply is done routinely and is caused by the need for water at supported units; the Supply and Service Company sends reports to the DMMC

(Supply and Transportation BN Headquarters) on its operational status and that of its supply points.

1.2.2.2.2 Transportation Motor Transport Company

Personnel Replacement - Vehicles, [personnel], and communications equipment are the personnel replacement assets used by this unit.

Replacement personnel arrive at the Adjutant General Company of the DISCOM, where they are processed and prepared for transport to their new units in the division or brigade areas. This transportation is requested by the receiving units through the DMMC; the DMMC notifies the Supply and Transportation BN, who in turn tasks its Transportation Motor Transport (TMT) Company. The TMT Company sends periodic status reports to the DMMC (Supply and Transport BN Headquarters).

1.2.2.2.3 Utility Helicopter Company

POL Supply, Ammunition Supply, Class IV and VII Supply Personnel Replacement - Similarly to the helicopter companies at corps, this unit is used as a faster alternative to ground transportation for these tasks. (See section on Transportation Motor Transport Company.)(37)

It belongs organizationally to the Utility Helicopter BN at corps (Maneuver Control Functional Area), but is included here because it performs a Combat Service Support function.

1.2.2.2.4 Maintenance Companies (Light, Heavy, and Missile Support)

Maintenance - Maintenance assets of these companies are [personnel], maintenance support teams, [maintenance parts stock (including missile maintenance parts in the Missile Support Company)], an Operational Readiness Float of usable items, communications equipment, and vehicles.

Maintenance service by the companies is initiated by tasking from the DMMC (Maintenance Battalion Headquarters). The companies send periodic status reports to the DMMC (Battalion Headquarters); in addition, the Missile Maintenance Company may request backup missile maintenance support from the COSCOM Missile Support Company, through the DMMC (Maintenance BN Headquarters).

1.2.2.2.5 Transportation Aircraft Maintenance (TAM) Company (Combat Support Subfunctional Area)

While the TAM company is organic to the Divisional Aviation Battalion, it is included here because it performs a maintenance function. Its assets are [a stock of aircraft repair parts,]aircraft maintenance teams, [personnel], and communications equipment. The TAM company repairs aircraft as requested by division users, or requests backup aviation maintenance from the COSCOM TAM Battalion, through the DMMC, the MMC, and the MCC.

1.2.2.2.6 Medical Support Company

Medical Care - This unit's assets for medical care are [trained personnel], vehicles (including ground transport, air ambulances, and helicopters), [medical supplies], clearing stations for short-term treatment in division and brigade areas, communications equipment, and the Air Ambulance Platoon in airmobile divisions.

Medical care is initiated by tasking from the Medical Battalion Headquarters, and by requests from unit aid stations for evacuation of patients to division clearing stations (this evacuation is done by air in airmobile divisions). The medical support company sends reports on its operational status to the Medical Battalion Headquarters, as well as requests for further evacuation of patients.

1.2.3 Brigade

1.2.3.1 Control Units. There is no distinct support command at the brigade level; brigade units are serviced by units of DISCOM and in some cases COSCOM (e.g., unit distribution of POL). Liaison between DISCOM elements and the brigade is supplied by the FASCO, which is organic to the DISCOM Headquarters. Therefore, there are no combat service support control units of interest at this level.

A group of personnel, vehicles, and equipment operating together to provide combat service support is called a train. Brigade trains consist of the Brigade S4 section and any organic support units, plus those COSCOM and DISCOM units outlined below.

1.2.3.2 Action Units

1.2.3.2.1 Ammunition Transfer Points

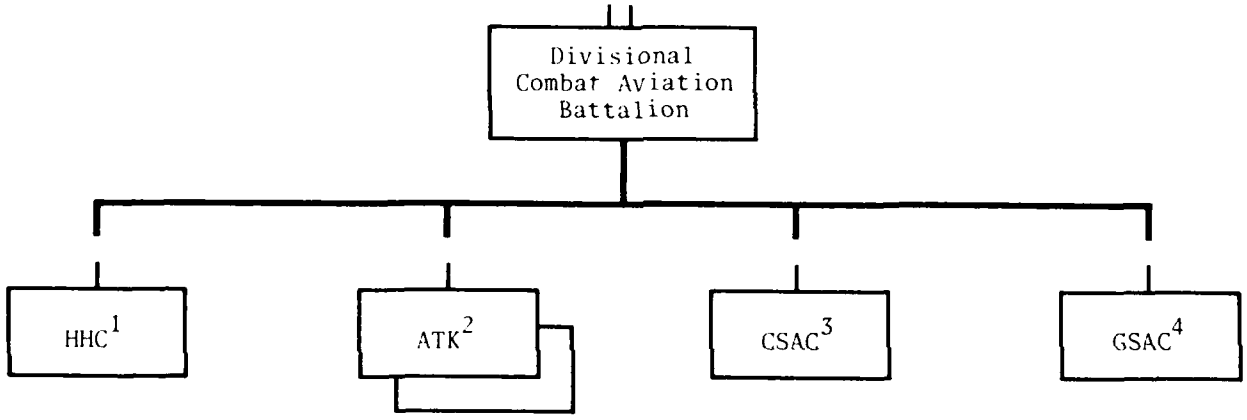
Ammunition Supply - Vehicles, [personnel], and communications equipment are the assets of the ATP's.

The ATP is under the operational control of the DMMC, and thus receives tasking from the DMMC (Supply and Transportation Battalion Headquarters and Supply and Service Company); it passes status information to the DMMC through the Supply and Service Company (and the Supply and Transportation Battalion Headquarters).

1.2.3.2.2 Forward Detachment of Supply and Transport Battalion. Activities are the same as those of the Supply and Service Company at division level, except that brigade units are supported.

1.2.3.2.3 Forward Company of the Maintenance Battalion. Activities are the same as those of the Maintenance Companies at division level, except that brigade units are supported.

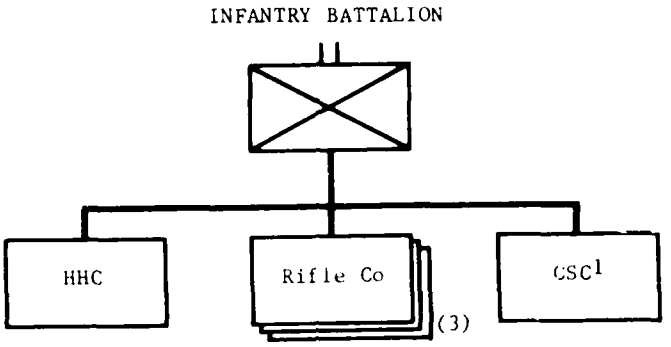
1.2.3.2.4 Forward Support Medical Company. Activities are the same as the Medical Company at division level, except that brigade units are supported and patients are evacuated to division clearing stations.



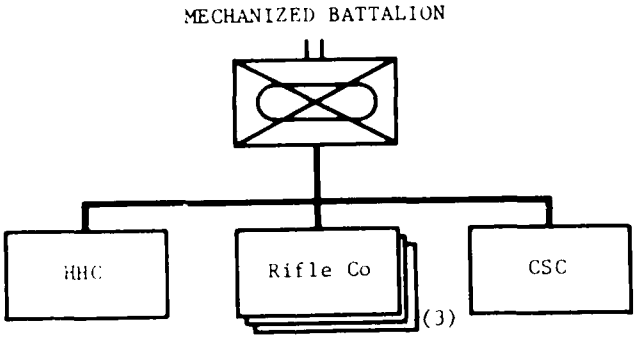
NOTES

1. Headquarters and Headquarters Company
2. Attack Helicopter Company
3. General Support Aviation Company (Utility Helicopters)
4. General Support Aviation Company (Utility and Observation Helicopters)

FIGURE IX-5
DIVISIONAL AVIATION BATTALION



[1]Combat support company



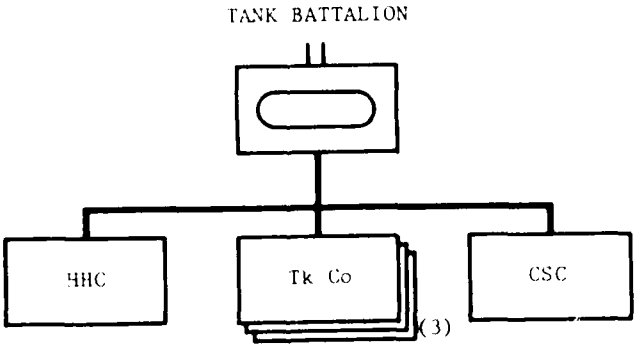
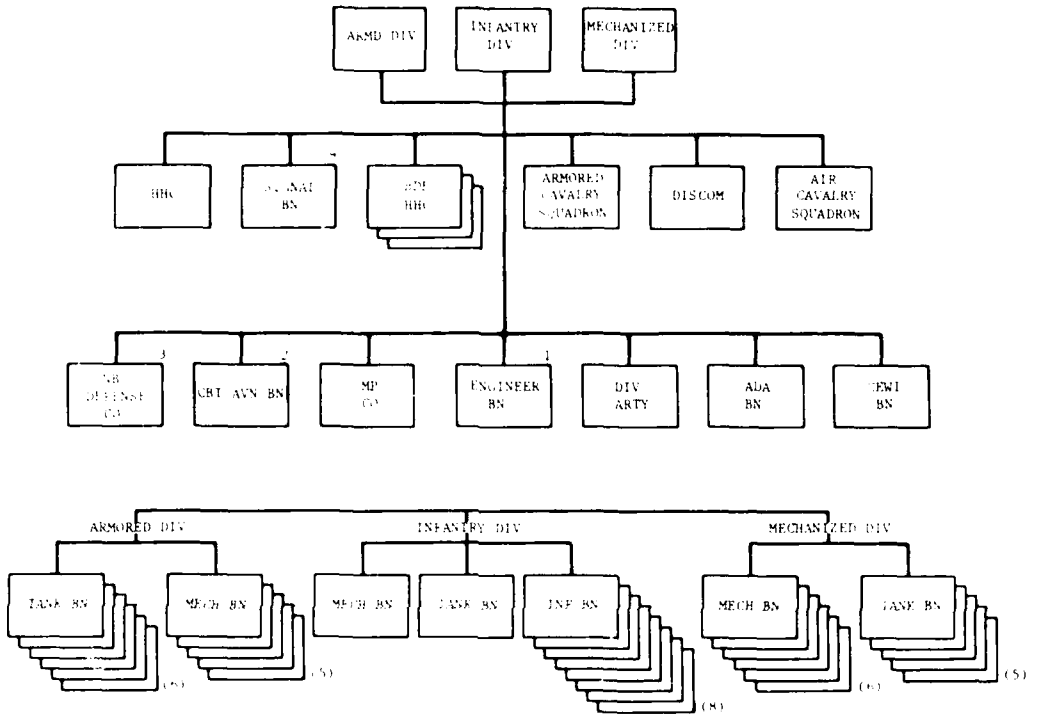


FIGURE IX-6
INFANTRY, MECHANIZED, AND TANK BATTALIONS

ARMORED, INFANTRY, AND MECHANIZED DIVISIONS



Engineer Battalion, Armored Division
or Infantry Div (Mechanized)

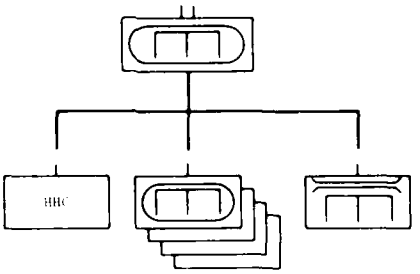
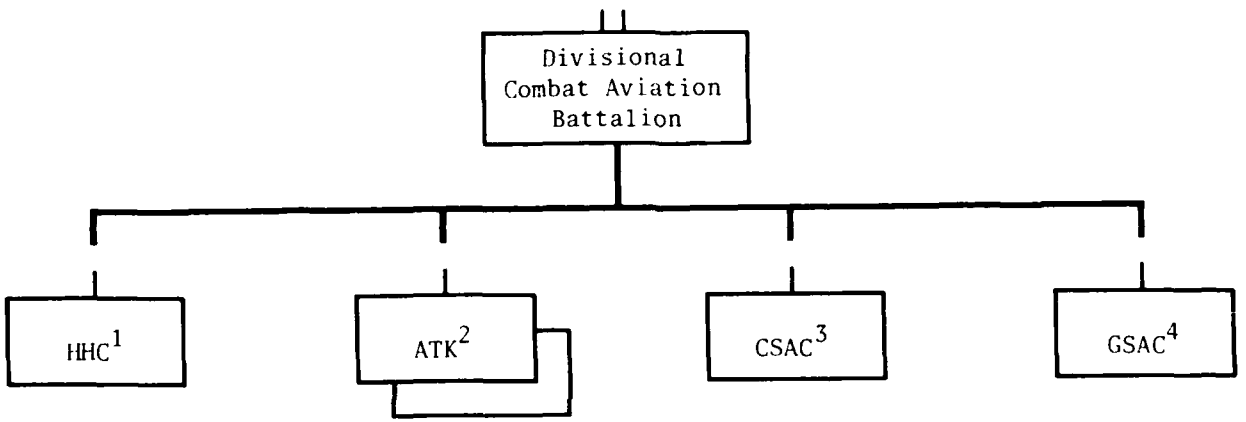


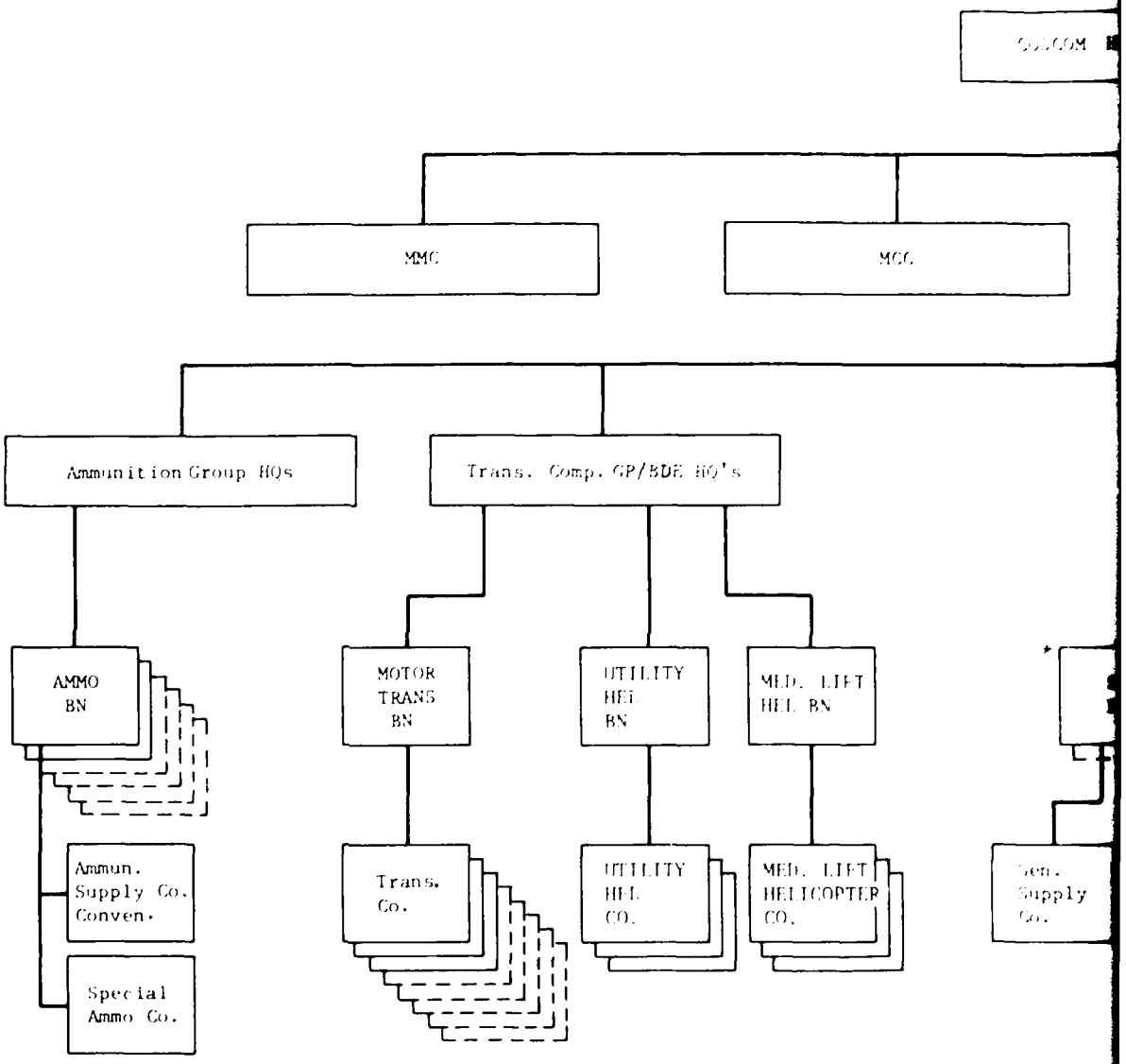
FIGURE IX-14
NOTIONAL DIVISION LAYOUT, COMBAT SUPPORT



NOTES

1. Headquarters and Headquarters Company
2. Attack Helicopter Company
3. General Support Aviation Company (Utility Helicopters)
4. General Support Aviation Company (Utility and Observation Helicopters)

FIGURE IX-15
DIVISIONAL AVIATION BATTALION



*There are 5-7 S&S or POL BN's, or a combination of the 2 types.

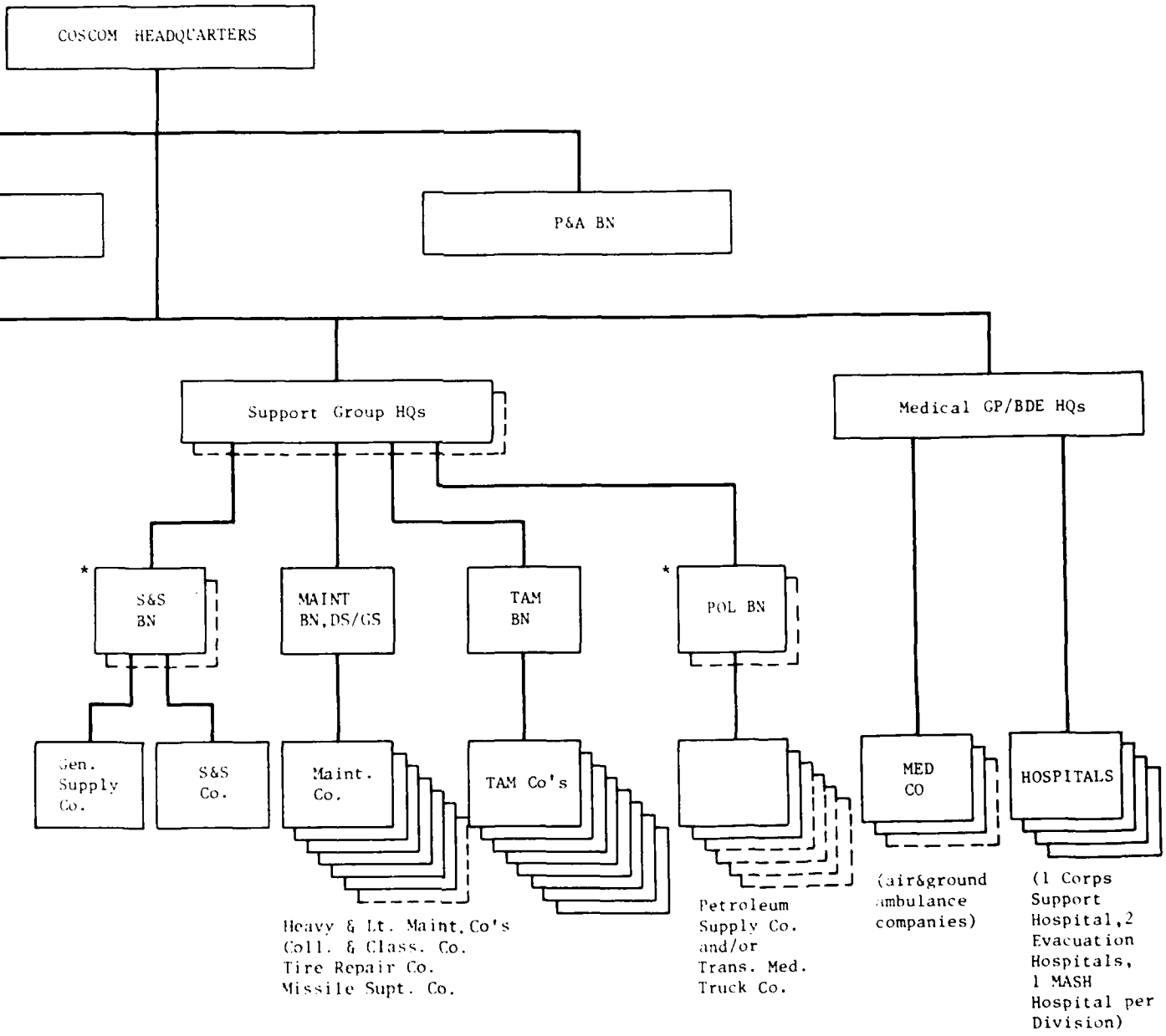


FIGURE IX-21
COSCOM ORGANIZATION

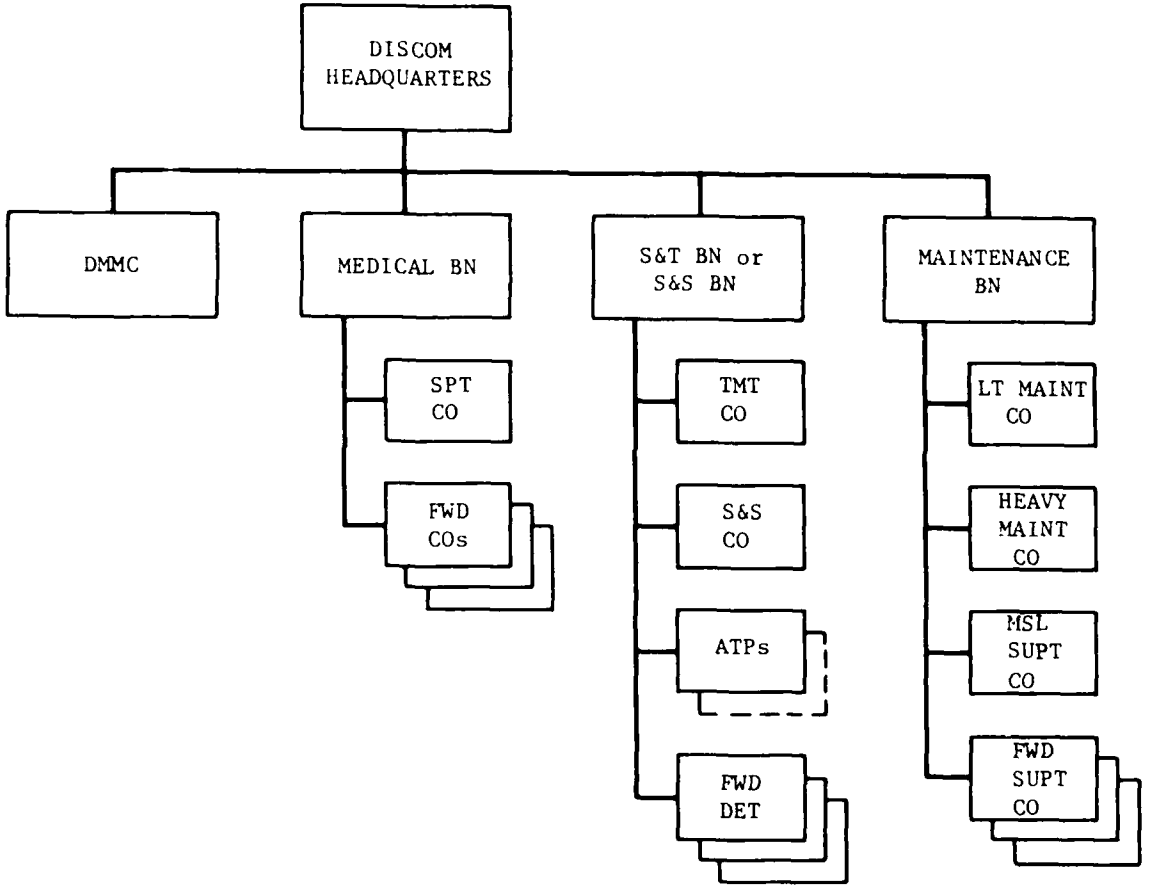


FIGURE IX-22
DISCOM ORGANIZATION

REFERENCES

1. BDM Corporation, TOS Case Study, April 1980.

2. Combined Arms Center, The Master Plan for the Army Model Improvement Program, Ft. Leavenworth, KS, 12 June 1981.

3. C^3I Directorate, Combined Arms Concept Development Activity, Ft. Leavenworth, KS, meetings, February 10-12, 1982, May 13, 14, 20-21, and 27-28, 1982.

4. Department of the Army, Air Defense Artillery Employment, HAWK, FM 44-90, November 1977.

5. Department of the Army, Airmobile Operations, FM 90-4, 8 October 1980.

6. Department of the Army, Artillery Sound Ranging and Flash Ranging, FM 6-122, October 1964.

7. Department of the Army, Attack Helicopter Operations, FM 17-50, 1 July 1977.

8. Department of the Army, Cavalry, FM 17-95, 1 July 1977.

9. Department of the Army, Combat Service Support Mission Area Analysis, Level 1, Chapter 2 (unclassified chapter of SECRET document), DRAFT.

10. Department of the Army, Combat Service Support Operations - Corps, (coordinating draft), FM 63-3, October 1981.

11. Department of the Army, Combat Service Support Operations - Division, (coordinating draft), FM 63-2, December 1981.

12. Department of the Army, Employment of Army Aviation in a High Threat Environment, FM 90-1, 30 September 1976.

13. Department of the Army, Engineer Combat Operations, FM 5-100, 30 March 1979.

14. Department of the Army, Field Artillery Cannon Battalion, FM 6-20-1, May 1979.

REFERENCES

(Continued)

15. Department of the Army, Field Artillery Organization, FM 6-140, April 1973.

16. Department of the Army, Fire Support in Combined Arms Operations, FM 6-20, September 1977.

17. Department of the Army, Headquarters, US Army Air Defense School, Ft. Bliss, TX, letter dated 1 September 1982.

18. Department of the Army, Headquarters, US Army Field Artillery School, Ft. Sill, OK, letter dated 27 July 1982.

19. Department of the Army, Operational and Organizational Concept Air Cavalry Attack Brigade, November 1980.

20. Department of the Army, Operations, FM 100-5, (final draft), September 1981.

21. Department of the Army, Organizational Data for the Army in the Field USACGSC, RB 101-1, Ft. Leavenworth, KS, February 1981.

22. Department of the Army, Review of Army Analysis, Volumes I and II, Special Study Group, DA, Washington D.C., April 1979.

23. Department of the Army, Staff Officers Field Manual Staff Organization and Procedure, FM 101-5, July 1982.

24. Department of the Army, US Army Infantry School, Ft. Benning, GA, letter dated 20 July 1982.

25. Department of the Army, US Army Intelligence Center and School, Ft. Huachuca, AZ, CONFIDENTIAL letter dated 15 July 1982.

26. Department of the Army, US Army Logistics Center, Ft. Lee, VA, letter dated 26 July 1982.

27. Department of the Army, US Army Special Security Group, Ft. Rucker, AL, letter dated 20 July 1982.

28. Intelligence and Threat Analysis Center, Arlington Hall Station, VA, meetings, 29 March and 1 April 1982.

REFERENCES

(Concluded)

29. The MITRE Corporation, A Technical Assessment of Selected Army Models, Richard O. Nugent, Washington C^3 Operations, McLean, VA, (Draft), 1982.

30. The MITRE Corporation, Command and Control Subordinate System Functional Analysis, Air Defense Functional Segment, N. C. Singer, MTR-81W00072, June 1981.

31. The MITRE Corporation, Command Control Subordinate System Functional Analysis, Fire Support Functional Segment, MTR-81W00050, T. T. Bean, et. al., Washington C^3I Operations, McLean, VA, January 1982.

32. The MITRE Corporation, Command Control Subordinate System Functional Analysis: Force Level and Maneuver Control Functional Segment, (DRAFT) WP-82W00159, R. Mukherjee, M. Ottenberg, May 1982.

33. The MITRE Corporation, I/EW Functional Segment Analysis, *WP-82W00278(II), M. Grinder, J. Gasparotti,* 24 May 1982.

34. US Air Force representatives, Ft. Leavenworth, KS, coordination meetings, 11 February and 13-14 September 1982.

35. US Army Logistics Center, Ft. Lee, VA, meeting 30 April 1982.

36. US Army Nuclear and Chemical Agency, Ft. Belvoir, VA, meetings, May 21-22, 1982.

37. US Army Aviation Center, Ft. Rucker, Alabama, written comments dated 16 December, 1982.

38. The MITRE Corporation, Command Control Subordinate System Functional Analysis: Combat Service Support Functional Segment - DRAFT, WP83W00151, J. Blondell, M. Hennings, Washington C^3I Operations, McLean, VA, April 1983.

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