Chapter 9

COMBINED ARMS INTEGRATION

"I am persuaded that unless troops are properly supported in action, they will be defeated."

Maurice de Saxe, 1732

Combat support is fire support and operational assistance provided to combat units. For division cavalry, most of this support is provided by other units. Regimental cavalry has organic combat support assets and may also be augmented by additional corps combat support units. These support units are combat multipliers that significantly increase the relative combat strength of cavalry without any increase in maneuver strength. These limited assets must be well used to achieve maximum benefit. Knowing combat support unit capabilities, employing them appropriately, and synchronizing their operations are essential if cavalry is to accomplish its many missions on the battlefield.

CONTENTS

Section I. Relationships and Responsibilities

Combat support units support the regiment and squadron under established command or support relationships. These relationships define the responsibilities of both commanders and leaders and the authority of the cavalry unit commander over the supporting unit. Figure 9-1 illustrates these relationships.

UNIT	ATTACHED	OPCON	DS	GS
Under command/control of...	Sqdn/Regt Cdr	Sqdn/Regt Cdr	Parent Unit	Parent Unit
Task organized by...	Sqdn/Regt	Parent Unit	Parent Unit	Parent Unit
Receives missions, tasks, and priorities from...	Sqdn/Regt	Sqdn/Regt	Sqdn/Regt	Parent Unit
Positioned by...	Sqdn/Regt	Sqdn/Regt	DS Unit Cdr*	Parent Unit*
Maintains communications and liaison with...	Sqdn/Regt	Sqdn/Regt and Parent Unit	Sqdn/Regt and Parent Unit	Parent Unit
Receives CSS from...	Regt/Sqdn ***	Parent Unit**	Parent Unit**	Parent Unit

*With specific approval of the squadron commander if within the squadron area of operations.

**CSS requirements beyond the capability of the parent unit are provided by the squadron and regiment after specific request and coordination between the squadron, regiment, and parent unit have been made.

***Attached element will bring an appropriate slice of CSS equipment and personnel to supplement squadron and regiment assets.

Figure 9-1. Command and support relationships.

The regimental commander controls the combat support units organic to the regiment, as well as any attached, operationally controlled, or direct support combat support assets. He is responsible for integrating and synchronizing combat support with the regimental scheme of maneuver. He may retain control of the combat support assets, or place these assets with the cavalry squadrons as attachments, operationally controlled, or direct support. Regardless of the relationship used in a mission, squadron commanders remain responsible for integrating and synchronizing combat support with the scheme of maneuver to accomplish the mission.

The commander or leader of the combat support unit serves in a dual role. He serves as the unit leader and also as a special staff officer. This is especially true in

division cavalry, as the squadron has few organic special staff officers. Commanders of regimental combat support units, however, normally do not serve as regimental special staff since the regiment has field artillery, engineer, air defense artillery, and chemical staff officers assigned. When such expertise is already in place, the combat support unit leader advises the commander and staff about his unit. During planning and preparing for the mission, he provides assistance, advice, and recommendations on the employment of his unit to the commander and staff. During execution, he leads his unit in the assigned mission as directed by the commander while retaining his advisory role.

The squadron commander may retain control of combat support elements at squadron level or delegate support to subordinate troops. He retains control by specifying tasks to these units and by assigning priority of support to subordinate troops and companies. This technique provides centralized control and flexibility when required, and provides clear guidance to the combat support leader. In some circumstances, the mission may be best accomplished by delegating support of the combat support unit to a troop commander. When doing so, the squadron commander cannot designate a more restrictive relationship than that for the squadron itself. The squadron commander should not unnecessarily burden subordinate commanders with additional command and control responsibilities if squadron control is adequate for the mission.

Section II. Fire Support System

Fire support is the collective and coordinated use of indirect fire weapons, armed aircraft, and other lethal and nonlethal means in support of a battle plan. Fire support includes mortars, field artillery, naval gunfire, air defense artillery in secondary mission, and air-delivered weapons. Nonlethal means are electronic warfare capabilities of military intelligence organizations, illumination, and smoke. The force commander employs these means to support his scheme of maneuver, to mass firepower, and to delay, disrupt, or destroy enemy forces in depth.

The fire support system is the collective body of target acquisition; weapons and ammunition; and command, control, and coordination systems, facilities, and personnel required to provide and manage fire support. The fire support system consists of the following:

- Scouts.
- Troop/company fire support team (FIST).
- Fire support element.
- Tactical air control party.
- Combat observation lasing team (COLT).
- Troop mortars.

- Artillery battery (regimental cavalry).
- Supporting fire support assets.
- Target acquisition.
- Electronic warfare.

The fire support systems for divisional and regimental cavalry are similar, especially at troop level. The components of the three systems are illustrated in Figures 9-2, 9-3, and 9-4.
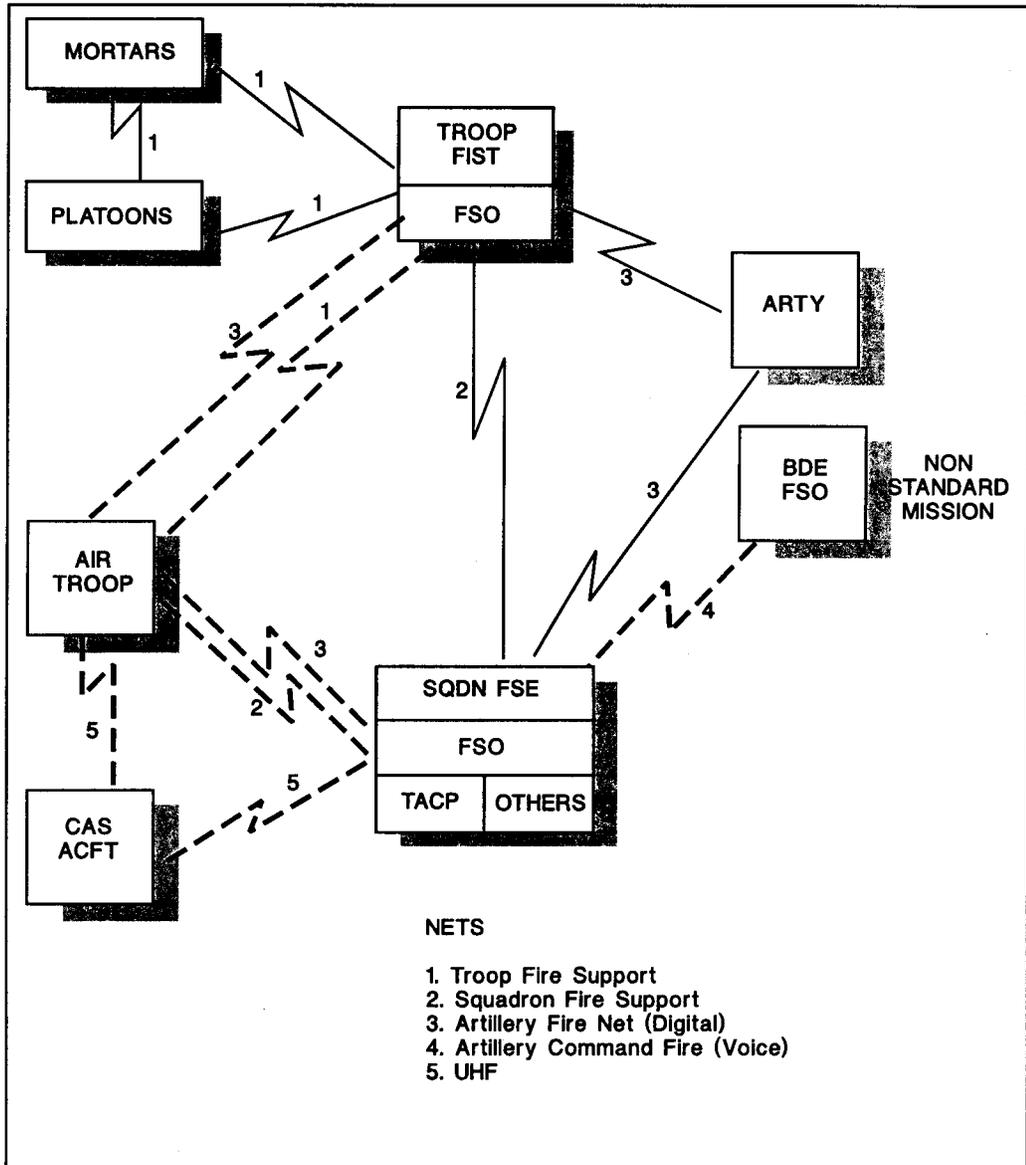
Figure 9-2. Division cavalry fire support system.
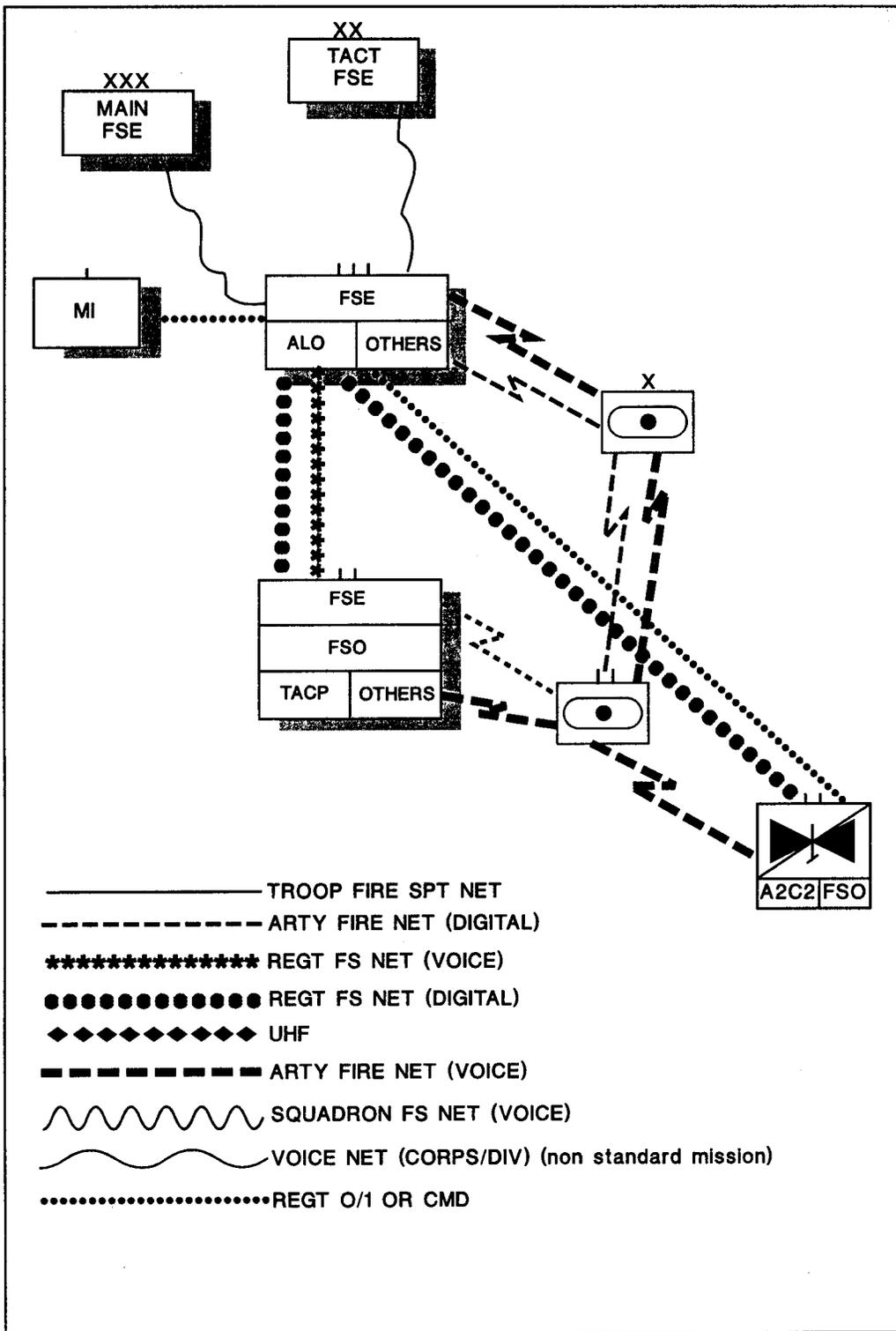
Figure 9-3. Cavalry regiment fire support system.

TROOP FIRE SPT NET
ARTY FIRE NET (DIGITAL)
REGT FS NET (VOICE)
REGT FS NET (DIGITAL)
UHF
ARTY FIRE NET (VOICE)
SQUADRON FS NET (VOICE)
VOICE NET (CORPS/DIV) (non standard mission)
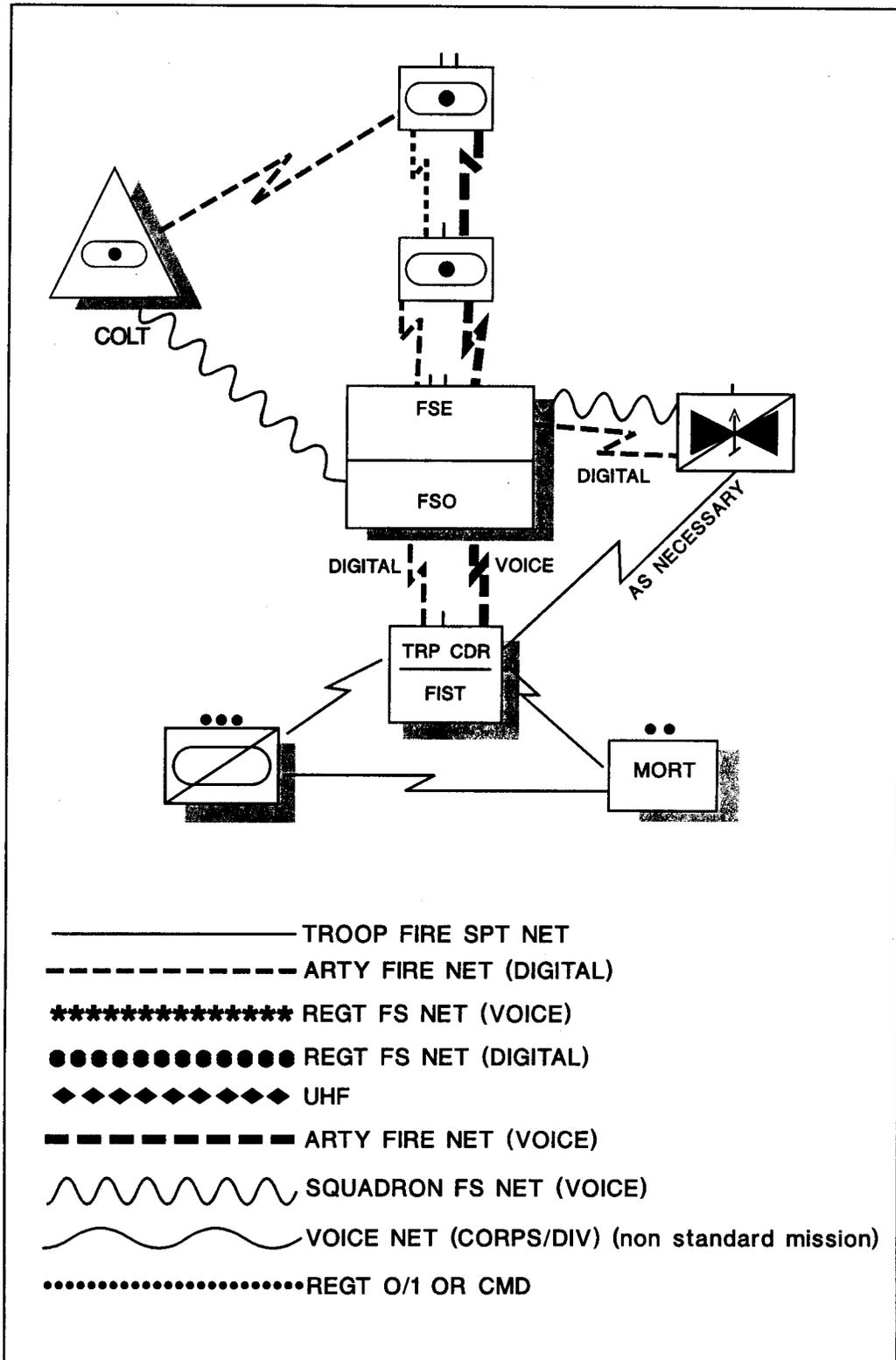REGT O/1 OR CMD

Figure 9-4. Regimental cavalry squadron fire support system.

SCOUTS

Scouts, ground and air, are the primary acquisition element in the system. The FIST or COLT can also acquire targets when so positioned. Additionally, field artillery target acquisition systems and intelligence-gathering systems provide targeting information that the fire support officer (FSO) uses. Information provided by artillery target acquisition systems is often useful to the S2 in preparing and analyzing situation templates. The FSO and the S2 coordinate closely to take advantage of information provided by both systems.

FIRE SUPPORT TEAMS

The troop and company FIST, led by the FSO, coordinates and controls fire support for the troop or company. As the troop commander's fire support coordinator, the FSO is the focal point for planning, integrating mortars and artillery, requesting air and naval gunfire support, and determining the method of target engagement. The FSO can be assigned responsibility for positioning the mortars to support the operation. He has an observation and laser designation capability and communication links to fire support means. The FIST is supported by and provides support to the fire support element in planning and executing fire support. The FIST operates on four nets:

- Troop command net.

- Troop fire support net.

- Supporting artillery digital fire net.

- Squadron fire support net.

Three basic methods of FIST employment are used. These methods are not fixed for the duration of a mission, but change as necessary. Whichever method is used must provide effective fire support. These methods are as follows:

- Accompany the troop commander.

- Position separately on the battlefield to control fires consistent with the commander's intent.

- Position the fire support team vehicle (FISTV) at one location and have the FSO ride with the commander. This is least preferred since the FSO is separated from the bulk of his communications and is limited in what he can do for the commander.

The FIST's capabilities are constrained by its ability to maintain communications with supporting artillery. The FIST should be positioned where it can maintain a digital communications link to supporting artillery. Therefore, the team may not be able to see the battlefield and use the laser designator capability in all situations. When the troop is operating across a large front, the FIST will be able to see only a small portion of the area. In these cases, the FIST may be positioned to observe the most critical area requiring fire support. Therefore, scouts must be proficient in requesting indirect fires. Their calls for fire will be relayed through the FIST to the appropriate fire support unit. When the FSO determines that the mortars will fire the mission, the scout talks directly to the mortar section for the remainder of the mission. When artillery fires the mission, the FSO acts as the middleman.

The FSO is not constrained by the location of the FISTV. Accompanying the commander in his FISTV is preferred since he retains access to all communications. He may ride with the commander when links to the fire support system dictate that the vehicle be positioned for communications, the commander wants the FSO with him to personally control a critical engagement, or when the vehicle must be positioned to control a special fire mission. When he does so, he must take a radio and digital message device to retain communications on the troop fire support and digital nets.

FIRE SUPPORT ELEMENT

The squadron FSO is responsible for directing the activity of the fire support element and for synchronizing the activities of the other fire support agencies. He is the commander's fire support coordinator and is assisted by the fire support section. If there is an artillery unit in direct support, that unit commander becomes the squadron fire support coordinator. The fire support section establishes and operates the squadron fire support element. The fire support element is not a fixed organization. As mission and available fire support assets dictate, other components of the fire support element include the following personnel:

- Representatives of the tactical air control party.

- Navy supporting arms liaison team (SALT) or shore fire control party (SFCP) personnel.

- Squadron chemical officer.

- Supporting engineer leader.

- Squadron flight operations officer (division cavalry).

Like the troop FSO, the squadron FSO is not restricted to the fire support element. The FSO often accompanies the commander as part of the command group.

He maintains communications with the fire support element to monitor fire support actions and to execute missions required by the squadron commander.

The fire support section maintains communications on four nets:

- Squadron command net.
- Squadron fire support net.
- Supporting artillery digital fire net.
- Supporting artillery battalion command net.

Other components of the fire support element maintain communications on their respective fire control nets and the squadron command net. They may also monitor the squadron fire support net when away from the fire support element.

The regimental FSO is responsible for directing the activity of the regimental fire support element, and his duties mirror those of the squadron FSO. If the regiment is augmented with a direct support brigade or battalion, the commander of that direct support unit serves as the regimental fire support coordinator.

The regimental fire support element is organized similar to the squadron fire support element. The only difference is that the regiment has an Air Force liaison officer organic to its fire support element. The members of the fire support element may vary depending on mission requirements.

The regimental fire support element maintains communication on four nets:
- Regimental command net.
- Regimental fire support net.
- Supporting artillery fire direction (digital) net.
- Supporting artillery headquarters command net.

The regimental fire support element must be able to communicate also with the corps or division fire support elements if the mission requires.

FIELD ARTILLERY MISSIONS

Field artillery is controlled through the assignment of standard tactical missions (see Figure 9-5). Tactical missions describe in detail the fire support responsibilities of a field artillery unit. They also establish the fire support relationship to the supported unit or to another field artillery unit. Tactical missions do not affect the organizational structure of the field artillery unit. They are normally assigned to a battalion-size or larger unit. These missions are assigned by the commander who owns the artillery on advice of his fire support coordinator.

INHERENT RESPONSIBILITIES OF FIELD ARTILLERY MISSIONS				
AN FA UNIT WITH A MISSION OF–	DIRECT SUPPORT	REINFORCING	GENERAL SUPPORT REINFORCING	GENERAL SUPPORT
1. Answers calls for fire in priority from–	1. Supported unit 2. Own observers* 3. Force FA HQ	1. Reinforced FA 2. Own observers* 3. Force FA HQ	1. Force FA HQ 2. Reinforced unit 3. Own observers*	1. Force FA HQ 2. Own observers*
2. Has as its zone of fire–	Zone of action of supported unit	Zone of fire of reinforced FA	Zone of action of supported unit to include zone of fire of reinforced FA unit	Zone of action of supported unit
3. Furnishes fire support team (FIST/FSS)**	Provides temporary replacements for casualty losses as required	No requirement	No requirement	No requirement
4. Furnishes liaison officer–	No requirement	To reinforced FA unit HQ	To reinforced FA unit HQ	No requirement
5. Establishes communications with–	FIST chiefs, FSOs, and supported maneuver unit HQ	Reinforced FA unit HQ	Reinforced FA unit HQ	No requirement
6. Is positioned by–	DS FA unit commander or as ordered by force FA HQ	Reinforced FA unit or as ordered by force FA HQ	Force FA HQ or reinforced FA unit if approved by force FA HQ	Force FA HQ
7. Has its fires planned by–	Develops own fire plans	Reinforced FA unit HQ	Force FA HQ	Force FA HQ

*Includes all target acquisition means not deployed with supported unit (radar, aerial observers, survey parties, etc.).
**A fire support section (FSS) for each maneuver brigade/battalion cavalry squadron and one FIST with each maneuver company/ground cavalry troop are trained and deployed by the FA unit authorized these assets by TOE. After deployment, FISTs and FSSs remain with the supported maneuver unit throughout the conflict.

Figure 9-5. Field artillery standard tactical missions.

Division cavalry may have an artillery battalion providing direct support for some operations. When this occurs, the artillery battalion commander becomes the squadron fire support coordinator. More often, the squadron receives support as a nonstandard mission. Nonstandard missions are assigned to artillery units when standard missions cannot adequately convey the commander's intent. For example, the squadron may receive priority of fire from a battalion providing general support to the force. When a nonstandard mission is assigned, the FSO ensures that coordination is accomplished. Problems or conflicts must be identified early and rectified to prevent problems in execution.

The regimental cavalry squadron contains an organic howitzer battery. Unless otherwise directed, the battery is in direct support to the squadron. The battery commander employs the battery to best support the squadron commander's intent. If the squadron has an artillery battalion in direct support, the howitzer battery will normally be placed under the operational control of that battalion. In this situation, the howitzer battery will be positioned by and receive its missions from the artillery battalion.

Section III. Fire Support Planning and Coordination

Fire support planning is a continuous process of analyzing, allocating, and scheduling. The goal is to effectively integrate fire support into battle plans to optimize combat power. Fire support coordination is the continuous process of implementing fire support planning and managing fire support assets available to the squadron. Fire support planning determines how to use resources, and coordination is the action needed to make the plan happen. The fire support coordinator is the key player in fire support planning and coordination (see Figure 9-6). The FM 6-series discusses fire support planning and coordination in detail.

PLANNING	COORDINATION
Anticipates mission requirements so he can advise the commander how to best use fire support.	Anticipates changes dictated by the developing battle and recommends revision of the fire support plan.
Assesses fire support means available, and on the basis of that assessment, recommends priorities of fire and allocations of fire support.	Directs the fire support attack of targets in the priority established by the commander.
Ensures that all agencies that can provide target information are used effectively.	Tasks the most effective fire support means to attack targets.
Studies the enemy situation and squadron mission and recommends what targets to attack and how.	Coordinates all fire support in the commander's zone or sector.
Makes necessary plans to offset the unexpected and to expedite changes.	Ensures the safeguarding of friendly elements.
Plans use of all fire support agencies as they contribute to the overall fire support plan.	Ensures continued flow of targeting information.
Determines coordinating measures that will best facilitate maneuver actions and provide safeguards to protect friendly elements.	Remains abreast of the tactical situation.
Develops and coordinates an efficient fully integrated fire support plan.	

Figure 9-6. Fire support coordinator responsibilities.

PRINCIPLES

Fire support planning and coordination are guided by principles to ensure the most effective use of fire support assets. These principles are considered by the regimental, squadron, and troop FSOs:

- Plan early and continuously.
- Exploit all available targeting assets.
- Consider the use of all lethal and nonlethal fire support means.
- Use lowest echelon capable of furnishing effective support.
- Use the most effective means.
- Furnish type of support requested.
- Avoid unnecessary duplication.
- Consider airspace coordination.
- Provide adequate support.
- Provide rapid coordination.
- Provide for flexibility.
- Provide for the safeguarding and survivability of friendly forces and installations.

TARGETING OBJECTIVES

Targeting objectives combined with desired target effects are articulated by the maneuver commander in his intent for fires. Targeting objectives are defined as the desired outcome resulting from the placement of indirect fires on the enemy in terms of his maneuverability and objective. Terms such as disrupt, divert, delay, limit, and isolate are used by the commander to convey his intent and objectives for the use of indirect fires against enemy targets. These enemy targets may be known targets that are identified through IPB and intelligence collection efforts at all levels. Enemy targets may also be unknown until contact is made. This is particularly true during reconnaissance and security operations when information about the enemy is vague. In cases where the intelligence information about the enemy does not identify known targets, targeting objectives allow the commander to clearly articulate how he plans to use artillery once contact is made with a particular enemy force, command and control node, or support system.

TARGET EFFECT

The commander may issue guidance on the target effect desired on designated targets, particularly those that are of higher priority. The effects on a target are expressed, by category as harassing, suppression, neutralization, or destruction.

Harassing

These are fires designated to disturb the rest of enemy troops, to curtail movement, and to lower morale by the threat of losses. The decision to employ harassing fires needs careful consideration. Harassing fires have little effect on the enemy, subjects gun crews to additional workload, and increases the threat of counterbattery fires. However, harassing fires may be a combat multiplier in some situations. Consider their use in stability and support operations, delaying actions, and missions conducted as an economy of force.

Suppression

Suppression of a target limits the ability of personnel in the target area to perform their jobs. The effect of suppressive fire lasts only as long as the fires continue. They are used against known or suspected enemy positions.

Neutralization

Neutralization of a target knocks it out of action temporarily. Ten percent or more casualties is considered neutralizing a target. Neutralization fires are used against accurately located targets unless otherwise specified.

Destruction

Destruction puts the target out of action for a prolonged period of time. Thirty percent or more casualties is normally considered rendering a unit ineffective. Direct hits are required to destroy hard materiel targets. These targets must be accurately located. Destruction requires large quantities of ammunition or special munitions.

FIRE SUPPORT PLANNING

Fire support planning begins upon receipt of the order and is integrated with the development of the scheme of maneuver. The FSO must understand the commander's intent and what targets to attack and when to attack them. At regimental and squadron level, all members of the fire support element are involved in the process. The best use of fire support resources to support the chosen scheme of maneuver is determined by the following considerations:

- Priority of fire for subordinate units.
- What targets to attack.
- What the targeting objective is.
- What target effect to achieve.
- What fire support means to use.
- Priorities for engaging targets.
- Allocating fires.
- Ammunition restrictions.

The fire support plan outlines the way fire support assets will be used to complement the scheme of maneuver, and it provides instructions for executing those fires. It ranks targets in priority order, matches them with the available fire support systems, and eliminates duplicate targets. It allows fires to be executed quickly, without specific direction from the commander, once the operation is underway. The fire support plan may include the following:

- A general concept of how fires will support the battle.

- A target list that includes locations where fires are expected or likely to be used. Known enemy locations should be carefully targeted, but too many targets complicate the fire plan and delay fires.

- A priority of fires that tells which element will receive fire support in case of conflicting needs.

- A priority of targets that tells which type of mission to fire first.

- An allocation of priority targets and final protective fires, if available.

- A fire support execution matrix for indirect fire weapons.

- Informal airspace coordination areas.

- Coordination measures for providing troop safety and synchronizing supporting fires.

- A target overlay.

- An attack guidance matrix.

The fire plan is constantly refined or modified as the operation is underway to continue providing responsive fires wherever they are needed.

The depth and complexity of fire support planning depend on how much time is available and the echelon at which the planning occurs. Formal planning is the deliberate process when adequate time is available and usually flows from higher to lower echelons. Informal fire support planning is a far more dynamic process that responds to the immediate problems on the battlefield and generally flows from lower to higher echelons. Informal planning is common within the squadron and should be facilitated by the SOP.

At squadron level, the FSO disseminates in the OPORD a fire plan to support the squadron. This plan usually contains all the elements listed above, and it is modified as troop fire plans are received. Updated fire plans are sent back to FISTS and disseminated to all concerned elements of the fire support system. During more informal fire planning, the squadron FSO may issue a concept and guidance to the troop FSOs. They in turn develop and submit fire plans. The squadron FSO then integrates them with his plan to produce the final squadron plan.

The regimental FSO consolidates the squadron fire support plans, eliminates duplications, and ensures that targets of interest to the regimental commander are included. He coordinates with the air liaison officer to determine targets appropriate for attack by close air support and with other liaison officers as appropriate.

Hasty fire planning is necessary when the regiment, squadron, or troop commander receives a FRAGO requiring immediate execution. The FSO immediately collocates with the commander, if not already with him, to conduct planning, using the troop-leading procedures. As much of the current fire plan as possible is used. Target effects and priority targets may be redesignated as necessary. Additional targets are designated and orally disseminated through the fire support system.

The fire support plan is tied closely to IPB. IPB identifies critical terrain or avenues of approach that should be targeted, target areas of interest, and risks for friendly fire support assets. It also provides templates of known or suspected enemy positions or likely offensive actions.

Fire planning is accomplished in depth. During both reconnaissance and security missions, the FSO plans fire support throughout the assigned squadron and troop areas of operation.   This allows execution with minimal additional coordination, accommodates changing situations, and provides fire support assets a clear concept for planning their internal operations.

Troop FSOs accompany troop commanders to receive the squadron OPORD. This permits the troop FSOs to hear the concept of the operation simultaneously with their commanders. Within minutes after the OPORD is given, they can get together to develop their fire support plans. This arrangement also allows the squadron FSO to brief the troop FSOs on plans the squadron commander wants implemented. Written fire plans are disseminated, questions answered quickly, and conflicts resolved with minimum confusion.

The squadron commander and FSO may develop an event-oriented scheme of fire support in conjunction with developing the selected course of action. This fire support plan will require a specific scout, troop FSO, or other element to fire a specific indirect fire system at a designated target when or if a specific event occurs. Such a fire support plan is ideally suited for inclusion in an execution matrix.

SPECIALIZED CONVENTIONAL MUNITIONS

There are several specialized munitions available that the squadron and troop commanders must understand. These munitions include smoke, illumination, scatterable mines, and laser guided.

Smoke

Artillery or mortar delivered smoke is used to obscure or screen. Either white phosphorous or hydrogen chloride may be used. White phosphorous provides a quick build-up and hexachlorethane chloride provides sustained cover. Because the effectiveness of smoke is subject to weather and wind conditions, it is planned for

probable conditions but adjusted when employed. Use is coordinated with all affected commanders. Troop commanders use mortars for smoke as noted below.

- Obscuration fire uses smoke on or near enemy positions to isolate the enemy and obscure his view. White phosphorous used in this mode blinds the enemy and inflicts damage. Obscuring smoke and high explosive should be planned on known and suspected enemy locations in sector. Obscuration smoke is useful to support a hasty attack on an identified enemy position.

- Screening fire uses smoke to mask friendly maneuvering elements to disguise the nature of their operations. Screening fire has the disadvantage of alerting the enemy to friendly activity, even when he cannot determine exact dispositions. Squadron and troop commanders will seldom use screening fire during reconnaissance, but it is often essential in security missions to assist in disengagement and repositioning. Screening fires used during deception operations create the impression of a greater force or major effort.

Illumination

Illumination can be delivered by artillery and mortars. Illumination fires are planned to assist command and control and target acquisition. Illumination should be considered a supplement to available thermal and night-vision equipment and used to the extent required. It is always planned, especially during security missions, but normally fired only with approval of the squadron commander. The following considerations guide employment:

- Illumination is often limited in basic loads and expenditure is carefully monitored.

- Flares are timed to burn out before hitting the ground to preclude washing out sights.

- Atmospheric conditions can greatly affect illumination, requiring constant adjustment.

- Smoke and dust on the battlefield may still obscure the enemy.

- Illumination is planned to backlight or highlight enemy positions or enemy moving through named areas of interest, target areas of interest, or engagement areas. Ensure friendly positions are not illuminated for the enemy.

FASCAM

Area denial artillery munition (ADAM) and remote antiarmor mine system (RAAMS) are subsets of the family of scatterable mines (FASCAM). The ADAM projectile contains bounding fragmentation antipersonnel mines. The RAAMS projectile contains magnetically fused antitank mines. Self-destruct mines for both types are factory set at either four or forty-eight hours and cannot be changed in the field. Emplacing an ADAM/RAAMS minefield is a resource-intensive operation that can take from 15 minutes for a planned mission up to 30 minutes if unplanned. During this time, the firing unit is not able to provide indirect fire support and the unit must move upon completion of the mission. Emplacement considerations for FASCAM in general are discussed in Section VII, Engineer Support.

Laser Guided

The laser-guided Copperhead round is a precision, point target munition effective out to 7,000 meters from the designator. It is not a very responsive munition. The fire mission takes from 45 seconds to 2 1/2 minutes (plus time of flight), based on whether the target is preplanned or one of opportunity. The designator must also track the target for the final 13 seconds of flight. These and other limiting constraints make this round much less effective against targets of opportunity. The Copperhead round can also be guided using the laser designator on the OH-58D (Kiowa Warrior). Additionally, the ground/vehicle laser locator designator (G/VLLD) can be used to guide Hellfire and Maverick missiles. The troop FIST has a target designation capability, but employment in this role reduces overall troop fire support management during the engagement.

Division artillery may employ COLTS in the divisional squadron's area of operations, particularly during security missions. These teams are best employed attached or under the squadron's operational control for a coordinated effort. In any case, when operating in the squadron area of operations, the COLT must coordinate with the squadron and gain positioning approval.

The howitzer batteries in the armored cavalry regiment have an organic COLT. The squadron commander uses the COLT to support his main effort. He may retain control of the COLT, using it to designate critical targets, or attach the team to one of his armored cavalry troops.

CONTROL MEASURES

The fire support plan is portrayed by and executed off the fire support overlay. FM 101-5-1 and the FM 6-series discuss control and coordinating measures in detail. A fire support execution matrix should be used in conjunction with the overlay.

Every target can be classified as either a target of opportunity or a planned target. A target of opportunity is one that has not been planned, taking longer to fire. Planned targets are ones on which fires are prearranged. Artillery and mortars precalculate firing data to expedite the execution of fires. A planned target may be scheduled or on-call.

- A scheduled target is a planned target on which fire is delivered at a specific time or upon occurrence of a specific event. They are most appropriate during defensive security missions or when assigned missions as an economy of force.
- An on-call target is a planned target to be fired on request rather than according to a time schedule or event. Cavalry will predominantly use this type of target during reconnaissance missions.

Priority targets are planned targets that take priority over other targets. They are normally assigned on the basis of one per mortar section and artillery battery. A

designated firing unit is prepared to engage it whenever the unit is not firing another mission. The maneuver commander designates priority targets, when they change, and guidance on target effect. The final protective fire used in the defense is a form of priority target.

A target overlay shows the locations of friendly artillery units, targets, boundaries, and fire support coordination measures. It enables the fire support coordinator to view graphically all targets planned in support of the squadron and determine the best fire support agency to engage the listed targets. Targets are indicated using a variety of symbols to express the intent of the planned fire. FM 101-5-1 and FM 6-20 discuss target symbols. Target overlays should never be overplanned to the point of clutter, causing needless effort on the part of fire direction center personnel who must precalculate firing data. The FSO, understanding the commander's intent, coordinates higher and lower fire plans with his own to produce an overlay that has only essential targets planned. Targets can be indicated using—

- Target reference points.

- Linear targets.

- Rectangular targets.

- Area targets.

- Groups.

- Series.

Fire support coordinating measures are reflected on operations graphics and on fire support plans. The basic coordinating measure identifies maneuver unit boundaries. Within assigned boundaries, commanders retain complete freedom of action on the employment of fires. No fire support means, however, may deliver fires across a boundary without first coordinating with the responsible ground maneuver unit. Field artillery and naval gunfire units are also assigned zones of fire for the control of fires laterally and in depth. These zones are dictated by the assigned tactical mission (see Figure 9-5). A direct support unit has the zone of action of the supported maneuver unit as its zone of fire.

Additional coordinating measures are considered either permissive or restrictive. Permissive measures require no further coordination and facilitate the attack of targets. Restrictive measures impose specific coordination before targets are engaged and provide safeguards for friendly forces.

Permissive coordinating measures include the coordinated fire line (CFL), fire support coordination line, and free fire area.

Restrictive coordinating measures include the restrictive fire line, (RFL) airspace coordination area (ACA), no fire area, and restrictive fire area (RFA).

Several measures are frequently used by cavalry during combat operations:

- The CFL is a line beyond which conventional surface fire support means may fire at any time within the zone of the establishing headquarters without additional coordination. The regiment and squadron use externally and internally designated CFLs.

- The ACA is a block of airspace in the target area in which friendly aircraft are reasonably safe from friendly surface fires. The purpose of an ACA is to allow the simultaneous attack of targets near each other by multiple fire support means, one of which is air. It may occasionally be a formal three-dimensional measure but more often is informal. The regiment or squadron can establish informal ACAs to facilitate integrated close air support and ground attack. An informal ACA can be established by using a time and distance separation or by designating a specific recognizable terrain feature to separate surface and air-delivered fires. ACAs are coordinated by the FSO, air liaison officer, and commander. They are most easily emplaced when these leaders are together in the command group.

AIR AND GROUND COORDINATION

Coordinating fire support for both air and ground cavalry, especially in division cavalry, is a continuous and essential requirement. This necessity is critical since air cavalry troops are often operating over the assigned zone or sector of ground troops. The coordinating measures used must reduce the risk of engaging each other without unnecessarily restricting engagement opportunities of either troop.

During planning, air cavalry troop commanders and the flight operations officer coordinate targeting to cover the extended distances at which they may operate forward or to the flank of the squadron. The squadron fire support section serves as the planning center for air cavalry fire support. Fires can be planned outside the assigned area of the squadron. Coordination is necessary if there is another friendly unit in the affected area. Normally, there is no friendly unit in the area when the air cavalry is operating at those distances. These targets may be called by both air and ground troops.

During the mission various methods can be used to coordinate fire support. Phase lines can be used as CFLs within the squadron to allow the air cavalry troops freedom of action to engage targets forward of the ground troops. As ground troops move, the CFL is shifted to the next phase line. Priority of fire can be designated to an air or ground troop during a certain period or in a certain area.

When calling for fire, the aeroscouts can call either the squadron FSO or the ground troop FIST. When the air cavalry is operating beyond the ground troop, and a squadron CFL allows engagement, it calls the squadron FSO or the FSE to initiate fires. When the air cavalry is calling fire inside the squadron CFL or in close proximity to the ground troop, the troop FIST is called. The FIST processes the mission like any call for fire after verifying that it does not endanger troop elements. The FIST can support the aeroscout with mortars or artillery.

The regimental aviation squadron has an organic fire support element that plans fires for the squadron. If one of the air cavalry troops of the aviation squadron is OPCON to an armored cavalry squadron (ACS), it may call for fire through one of the following:

- The cavalry troop FIST.
- The ACS fire support element.
- The supporting unit fire direction center (the howitzer battery or field artillery battalion).

The aviation squadron may coordinate for artillery forward observers (FO) for the air cavalry. These FOs are attached to the squadron fire support section. They ride with the air troops to call fires. Aircraft normally require minor modification to mount the digital message device (DMD). This arrangement provides the air cavalry troops with a trained observer and direct access either to the tactical fire direction system (TACFIRE), initial fire support automated system (IFSAS), or advanced field artillery tactical data system (AFATDS). The squadron fire support element monitors and reviews the FO's calls for fire.

SOPs must clearly delineate the procedures to coordinate fire support. The intent is to achieve automatic coordination at the lowest level in a responsive manner.

Section IV. Indirect Fire Support

MORTARS

Mortars are organic to most ground cavalry troops and belong to the troop commander. They provide an immediately responsive indirect fire capability to ground, and in some cases, air cavalry troops. Mortars provide a heavy volume of accurate, sustained fires. Their high angle of fire makes them ideal to attack targets difficult to attack with low-angle direct-fire weapons. They are effective in covering obstacles, engaging dismounted infantry, marking targets for air attack, providing support in urban areas, or conducting reconnaissance by fire. Mortars are limited mainly by their range, ammunition types, and ammunition carrying capacity. Like all indirect fire means, there is a delay between the call for fire and impact of rounds. The scout observer and FIST factor this delay into the target engagement. Engaging moving targets is difficult because of this delay. Mortars are most effective for—

- Obscuration smoke.
- Screening smoke.
- Illumination.
- Harassing.
- Suppression.

The mortar section is employed by the troop commander as a separate element during combat operations. Because of its size and the need to mass fires for effective engagement, it predominantly operates as a section. It moves independently of the platoons, establishing firing positions according to the commander's guidance. (See FM 17-97.)

FIELD ARTILLERY

Field artillery is the principal fire support asset available to the cavalry squadron. It provides accurate fires with a wide variety of munitions. Field artillery adds a powerful dimension to the squadron's direct fire and maneuver capabilities, but its own capabilities and limitations must be understood. The divisional squadron is supported by the artillery assets of its parent division. The regimental squadron is supported by its organic battery and additional direct support assets, normally from a corps artillery brigade. These weapons possess varying capabilities largely dependent upon caliber, range, and munitions.

Artillery has the following capabilities:

- Provide fire support under all weather conditions and types of terrain.
- Shift and mass fires rapidly without the requirement to displace.
- Support the battle in depth with long-range fires.
- Deliver high-angle fires over terrain not covered with flat-trajectory direct fire.
- Provide a variety of conventional shell and fuze combinations.
- Deliver chemical and nuclear fires.
- Provide continuous support by careful displacement.
- Be as mobile as the supported unit.

Artillery has the following limitations:

- Limited capability against moving vehicle targets.
- Limited self-defense capability against ground and air attack.
- Limited ability to destroy point targets (Copperhead is an exception).
- Vulnerability to detection by enemy target acquisition systems.
- Low rate of sustained fire.

The link to effective artillery support for the troop and squadron is the FSO. With TACFIRE, IFSAS, or AFATDS, the digital FM connection between the FIST and the supporting artillery is critical.

Field artillery has a wide variety of munitions tailored for the engagement of different types of targets. The specific type of munitions available depends on the supporting weapon system. The FSO advises the commander on the type of munition most effective to engage a specific target. Scouts, as forward observers, must be

familiar with artillery munitions to call effective fires. The FIST or the fire direction center amends the requested munition, if necessary, based on target description and availability.

The artillery commander, in close coordination with the squadron S3 and the FSO, positions artillery assets in the zone or sector of the squadron. The battery commander positions the howitzer battery organic to the armored cavalry squadron. If the squadron has a field artillery battalion in direct support, the howitzer battery is normally placed under the battalion's operational control. The field artillery battalion commander, as the fire support coordinator, positions the field artillery units in coordination with the squadron S3 and the FSO.

Artillery positions are planned in depth to ensure support is continuous and provided at critical times and to accomplish the squadron commander's concept of fire support. Positioning artillery often involves give and take with other elements of the squadron over available terrain. The squadron S3, as terrain manager, resolves these issues in a way that best supports the commander's intent. Artillery positions, though preplanned, are adjusted as required during the mission.

NAVAL GUNFIRE SUPPORT

Naval gunfire provides large volumes of immediately available, responsive support when cavalry is operating close to coastal waters. Naval gunfire ships are assigned one of two missions-direct support or general support—in much the same way that field artillery is organized for combat. Ships providing these fires are referred to as direct support ships and general support ships. Relationships between assigned ships and supported ground force units are on a basis of limited, delegated responsibility. Support ships provide the requested support within their capability, but ship positioning and method of delivery are left to the discretion of the ship captains. The supported ground unit selects the targets, the timing of fires on the targets, and the adjustment of fires.

A ship in direct support of a ground unit delivers both planned and on-call fires. On-call fires are to the ship what targets of opportunity are to artillery units. General support ships are assigned to support units of regimental size or larger. Normally, their fires are assigned to a shore fire control party for fire missions after which they revert to general support.

Naval gunfire has the following capabilities:
- Mobility to reach best firing position.
- Accurate precision fires.
- Weapon and ammunition variety.
- High muzzle velocity for direct fire and point target destruction.
- High sustained rates of fire.
- Deflection pattern narrow in spread and long in range, permitting very close supporting fires when the gun-target line is parallel to the FLOT.

Naval gunfire has the following limitations:

- Flat trajectory results in large range probable error.
- Hydrographic conditions along the shoreline may result in unfavorable gun-target line or range.
- Accuracy of fixing ship position affects gunfire accuracy.
- Bad weather and poor visibility affect position determination and may force ships out to sea.
- Changing gun-target line during a fire mission if the ship is underway.
- Communications dependent upon radio.
- Vulnerable to enemy air and naval attack.

Army units do not have the organic capability to control naval gunfire. This capability is provided by a US Marine Corps air and naval gunfire liaison company (ANGLICO). Depending on availability, the squadron will be supported by either a shore fire control party or a battalion SALT and firepower control teams (FCT). These ANGLICO elements are responsible for requesting, coordinating, and controlling naval air and naval gunfire. The ANGLICO liaison officer becomes part of the squadron fire support element and FCTs locate with the troops. When an FCT cannot call a fire mission, a troop FIST may do so through the liaison officer.

Section V. Army Airspace Command and Control

A2C2 consists of those actions that ensure the synchronized use of airspace and enhance the command and control of all forces using airspace. The objective of A2C2 is to ensure the most effective employment of combat power by those airspace users whose unrestricted use of airspace might result in the loss of friendly air assets. Conversely, A2C2 must integrate air assets in the ground battle without unduly inhibiting the use of ground-based combat power. JP 3-52, FM 100-103, FM 100-103-1, and FM 100-103-2 discuss A2C2.

A2C2, from the aspect of planning and coordinating, must ensure the best utilization of airspace assets. To attain this capability, A2C2 elements are required in the special staff sections at the regiment, division, corps, and echelons above corps. Direct information access is required to input and receive information from joint, multinational, and interagency forces contributing to the overall operational effort. A2C2 elements must become more robust and their interests must be integrated into the airspace control authority's decision cycle. Army and joint users of the airspace are subordinate to the joint forces commander. Their requirements, with respect to airspace, are coordinated in the development of the airspace control plan and promulgated in the airspace control order. This coordination ensures an equal footing with other airspace users to accomplish the Army's missions, roles, and functions.

STAFF ELEMENTS

The capability to plan, coordinate, and execute airspace command and control must extend to echelons below the regiment. Therefore, direct interfaces for A2C2 information must exist from the regiment to the squadron TOCs.

Current staffing for the regimental command post may preclude all required staff representation to the A2C2 element. Minimum staffing of this element includes the S3 Air, an aviation officer or NCO, the air liaison officer, the fire support officer or FSE NCO, and a representative of air defense. Other members should include, if available, the air traffic service liaison NCO, the S2, and the S4. This staff allows for the implementation and dissemination of the airspace control order and air tasking order to the lowest levels, a means for planning and deconfliction of airspace measures at the user level, and direct input into the airspace control system for immediate airspace measures.

As there is no formalized A2C2 element at squadron, the squadron staff performs the required A2C2 functions by extracting information from various sources. The A2C2 staff elements include the S2, the S3 Air, the fire support officer, liaison officers from aviation and air defense artillery, and the air liaison officer.

The command post where each of these personnel is located varies according to the tactical situation. To conduct squadron A2C2, these personnel must be collocated or have a real-time communications capability. A2C2 planning is accomplished as part of the normal operational planning. A2C2 requirements that require approval by regimental level or higher are forwarded for approval.

CONTROL MEASURES

Airspace control measures used on the battlefield are published daily in the theater airspace control order. These airspace control measures are different, yet closely related to, fire support coordination and air defense control measures that may or may not appear in the airspace control order.

Airspace control measures are broadly divided into joint, Army, and special purpose airspace categories. The following are jointly recognized airspace control measures:

- Coordinating altitude.

- High-density airspace control zone.

- Restricted operations areas and restricted operations zones.

- Minimum risk routes.

- Standard use Army aircraft flight routes.

Coordinating Altitude

Coordinating (or coordination) altitude (CA) is a procedural method to separate fixed- and rotary-wing aircraft by determining an altitude below which fixed-wing aircraft *normally* will not fly and above which rotary-wing aircraft *normally* will not fly. Coordinating altitude may include a buffer zone for small altitude deviations and extend from the forward edge of the communications zone to the forward line of own troops (FLOT). In specific theaters of operations, the CA may be extended to the forward limit of the ground commander's area of operations.

Fixed- or rotary-wing aircraft planning extended penetration of this altitude will notify the appropriate airspace control facility. However, approval acknowledgment is not required prior to fixed-wing aircraft operating below the coordinating altitude or rotary-wing aircraft operating above the coordinating altitude.

High-Density Airspace Control Zone

A high-density airspace control zone (HIDACZ) is a defined area of airspace in which concentrated employment of weapons and airspace users exist. The zone has defined dimensions that usually coincide with geographical features or navigational aids. The requesting authority normally controls access to air defense weapons control status within the HIDACZ.

Restricted Operations Area and Restricted Operations Zone

Restricted operations area (ROA) and restricted operations zone (ROZ) are synonymous terms for defining a volume of airspace set aside for a specific operational mission or requirement. These areas and zones restrict some or all airspace users until termination of the mission. The airspace is normally used for drop or landing zone activity, search and rescue operations, special electronic mission aircraft, etc. Controlling authority requirements for the ROA/ROZ are similar to those required for a HIDACZ.

Minimum Risk Route

A minimum risk route (MRR) is a temporary corridor of defined dimension recommended for use by high-speed, fixed-wing aircraft that present minimum known hazards to low-flying aircraft transiting the theater airspace. MRRs normally extend from the corps rear boundary to the fire support coordination line (FSCL). Low level transient routes are employed in a similar fashion in NATO. The Army submits proposed MRRs to the airspace control authority for approval.

Standard Use Army Aircraft Flight Routes

Standard use Army aircraft flight routes (SAAFR) are routes established below the coordinating altitude to allow the Army commander safe movement of his aviation assets performing combat support and combat service support missions. Although jointly recognized, these routes do not require airspace control authority approval. SAAFRs are normally located in corps through regiment rear areas, but may be extended to the FSCL to support logistics missions or cross FLOT missions.

Army aviation operations rely on freedom of movement to and from the forward area and lean heavily toward procedural verses positive control. In addition to joint airspace control procedures, Army aviation has developed specific measures to support their operational requirements. These procedures areas follows:

- Air corridor.
- Air axis.
- Air control point and aerial checkpoint.
- Start point and release point.
- Battle position.

AIR CORRIDOR

An air corridor is a restricted air route of travel specified for use by friendly Army aircraft and established to prevent friendly forces from firing on friendly aircraft. An air corridor is more temporary in time than is an SAAFR and may be used to provide protection from friendly fires when operating deep missions cross the FLOT.

AIR AXIS

An air axis is similar to a ground axis of advance and is assigned for control, which graphically depicts a commander's intentions. This procedure should be used in conjunction with a procedure that provides the protection for the route of flight (e.g., air corridor).

AIR CONTROL POINT AND AERIAL CHECKPOINT

An air control point or aerial checkpoint is a predetermined point on the ground used as a means of coordinating or controlling friendly Army aircraft movement.

START POINT AND RELEASE POINT

A start point (SP) and a release point (RP) are predetermined points on the ground used to initiate a control procedure (SP) or to terminate the conduct of a control procedure (RP).

BATTLE POSITION

A battle position is a defensive location oriented on the most likely enemy avenue of approach from which a unit may defend or attack. A unit assigned a battle position is located within the general outline of the battle position. A battle position does not constitute an airspace control measure, and should be used in conjunction with a joint or other Army airspace control measure.

AIRSPACE CONTROL ORDER

While the airspace control plan provides the general guidance on the airspace control function, the airspace control order (ACO) institutes the airspace control procedures for specified periods of time. Normally the ACO is published and distributed daily. It contains modifications to guidance and/or the procedures found in the airspace control plan and activates/deactivates procedural control measures that include IFF procedures for that time period.

ACO Development

The procedures for the development of the ACO are included in the airspace control plan. Normally component commanders consolidate, deconflict, and forward their airspace requests to the airspace control authority's Joint Airspace Control Center (JACC) by a specified time for further consolidation with other theater-wide inputs. The JACC then integrates all inputs, resolves any conflicts between the components, and prepares the ACO for distribution (see Figure 9-7). If through the airspace control plan, the joint forces commander delegates airspace control authority to the component commanders, he may additionally task the component commanders to generate an ACO for providing the continuity along sector boundaries and ensuring the integration of each sector authority's ACO within the guidelines established in the airspace control plan.
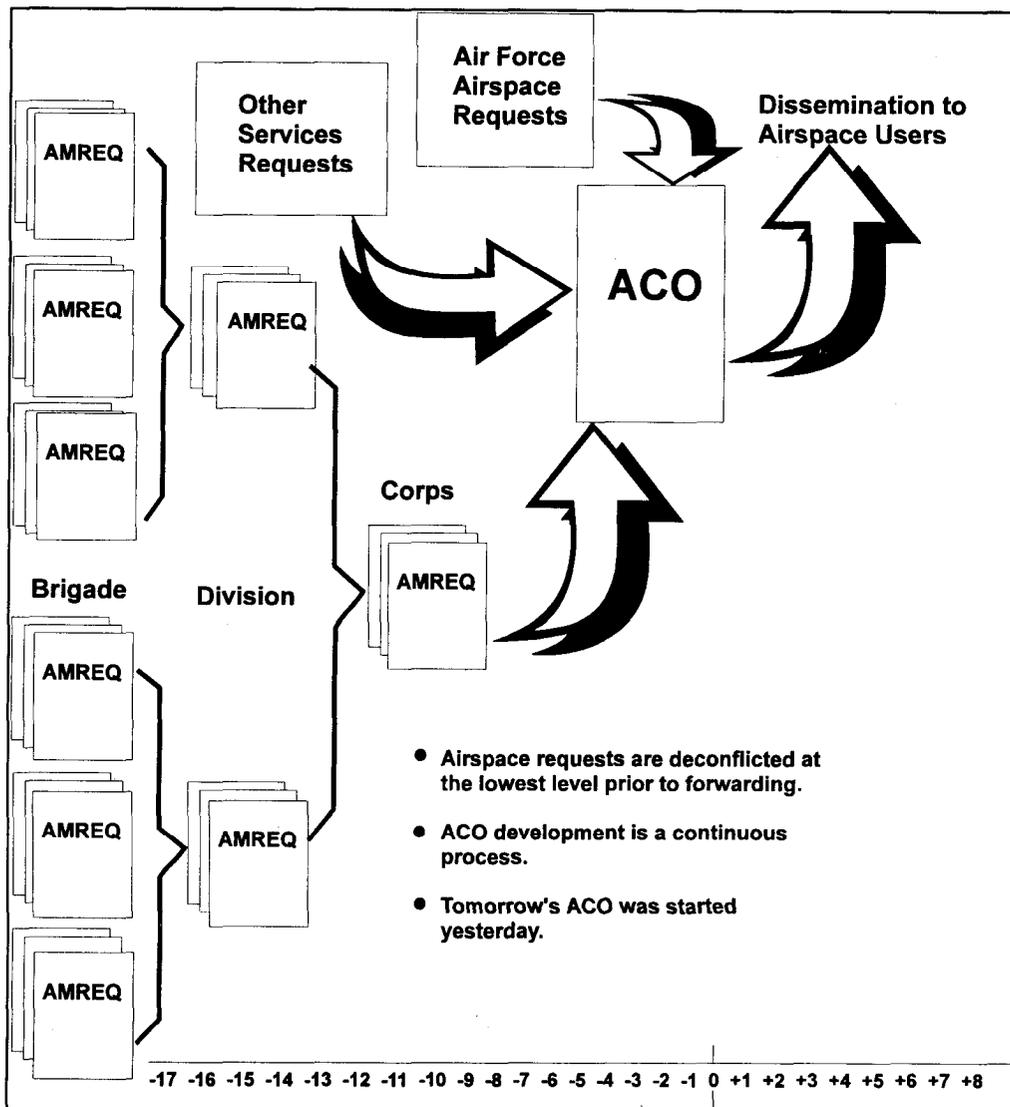
Figure 9-7. ACO cycle.

ACO Distribution

Two important considerations of the ACO are timing and the means of dissemination. The ACO cycle must be tied to the air tasking order (ATO) cycle as many of the airspace measures in effect at any time will be tied to activities outlined in the ATO. If tied to the ATO, the same timing that is required for inputs to the ATO is required for preplanned airspace control requests. In a small area of operations, this method may be convenient and efficient. In a larger area of operations, adding the ACO to the ATO may produce a document that is cumbersome and unwieldy.

If the ACO is published separately, the ACA will establish a "not later than" time to allow sufficient time for adequate processing and deconfliction of requested

airspace measures. ACO publishing and suspense times should be included in the airspace control plan or ATO's "General Remarks." Whatever means are used, it is important that the airspace users receive pertinent airspace information as soon as possible to include it in their mission planning efforts.

ACO Execution

Clear, simple instructions in the ACO provide the basis for its decentralized execution, minimizing the impact on operations while maximizing the safe, efficient and flexible use of airspace in the combat zone. This unimpeded flow of essential information to the component operational units and control elements provides the airspace users a guide to follow and gives each control, or airspace management, element the means to regulate the airspace control function and resolve real-time conflicts.

Section VI. Air Support

Tactical air support is air operations carried out in coordination with surface forces to directly assist land or maritime operations. It is provided primarily by the Air Force, but Navy and Marine air units can also provide this support. When cavalry is supported by elements of the ANGLICO, the team or party controls Navy and Marine air. Tactical air support involves the six functions of close air support (CAS), air interdiction, tactical surveillance and reconnaissance, tactical airlift, counterair, and special operations.

Tactical support aircraft have the following capabilities:

- High speed and long range.
- Versatility in aircraft, weapons, and munitions.
- Accurate ordnance delivery.
- Air and ground communications through the air and ground operations system.
- Attack hard and moving targets.

Tactical support aircraft limitations include the following:

- Limited availability of resources.
- Delivery restrictions imposed by limited visibility and weather.
- Delivery restrictions imposed by enemy air defense.
- Variable aircraft loiter times on station.
- Delayed response.

CLOSE AIR SUPPORT

CAS is air action against hostile targets that are in close proximity to friendly forces. It requires detailed integration of each air mission with the fire and movement of those forces. CAS is the tactical air support function most often available to cavalry. CAS is normally controlled at squadron level. The regiment also retains some CAS at its level to influence ongoing operations.

CAS missions are normally conducted by a flight of at least two aircraft under the mission command of one pilot. This mission commander is the one with whom the squadron air liaison officer or forward air controller coordinates during the strike. Some close support aircraft have FM radio capability, but most have only UHF radios.

TACTICAL AIR CONTROL PARTY

An Air Force TACP operates with the squadron to advise, to assist the commander, to request and coordinate tactical air support, and to meet other requirements. A TACP consists of experienced air crews and technicians, ground vehicles, and the communications equipment required to obtain, coordinate, and control tactical air support of squadron operations. The squadron often provides the TACP with an armored vehicle for protection when operating forward. The TACP becomes part of the fire support element. A portion of the party, to include soft-skinned vehicles, collocates with the TOC. The TACP is normally a dedicated asset with which the squadron can develop a close working relationship. Once deployed, the TACP normally remains with the squadron.

The air liaison officer (ALO) is the senior member of the TACP. He advises the commander, operates the Air Force request net, coordinates close air support, and assists in synchronizing air action with the commander's operation. At squadron level, the ALO may also serve as a forward air controller (FAC). The TACP may also contain a dedicated FAC. Occasionally an airborne FAC is available. The ALO operates out of the fire support element during planning to coordinate, and forward with the command group during the mission to control air support. The ALO bridges the gap between Air Force and Army operations. He is a fighter pilot versed in employment of airpower to support ground operations. At the same time, he must understand how the squadron operates so he can provide effective support. The uniqueness of cavalry operations places a premium on establishing a solid working relationship with an ALO.

The regimental TACP and ALO perform the same functions for the regimental commander. In addition, the regimental ALO is responsible for reviewing the squadron CAS requests and coordinating them with the regimental fire support element and fire support coordinator to ensure effective employment of CAS assets.

Tactical air strikes are normally controlled by a FAC. To do so effectively, he is positioned forward to observe the target. When an airborne FAC is available, the

squadron ALO will work with him to control the strike. When no airborne FAC is available, the ALO or ground FAC controls the mission.

Squadron operations over extended distances can result in the ALO or FAC not being in position to control a strike. In his absence, the FIST or a troop commander can perform the FAC function. The basic requirement is to locate and describe the target and friendly positions for the mission commander. This information may be relayed through the ALO who has UHF radios. An ACT commander is ideally suited to conduct this control since he possesses both FM and UHF radios. Squadron SOP should define the procedures to accomplish this control to preclude confusion or mission cancellation.

PREPLANNED MISSIONS

Preplanned missions are those for which a requirement is anticipated. They permit detailed planning, coordination, and integration with the ground commander's scheme of maneuver and fire support plan. They are normally requested a day ahead in accordance with SOP. Preplanned missions allow ordnance loads to be tailored precisely to the target being attacked. Flexibility exists during execution allowing the ALO to shift the location of the target. Cavalry seldom conducts operations that allow preplanned missions to be submitted. They are most appropriate during missions assigned as an economy of force.

IMMEDIATE MISSIONS

Immediate missions are most frequently used by cavalry. Immediate requests are filled by aircraft on ground alert, loitering on station, or diverted from other missions. Aircraft ordnance loads may not be optimum to attack the target. Requests for immediate close air support go directly from the squadron ALO through Air Force channels and are processed unless intermediate monitoring headquarters disapproves the request. Details of the mission are generally coordinated while aircraft are airborne. Response may be rapid if airborne aircraft are assigned the mission, or it may take up to 30 minutes for aircraft on ground alert.

SUPPRESSION OF ENEMY AIR DEFENSE

Suppression of enemy air defenses (SEAD) is the activity that neutralizes, destroys, or temporarily degrades enemy air defense systems in a specific area by physical attack and electronic warfare to enable tactical air operations to be successfully conducted. Cavalry is seldom afforded the opportunity to plan and execute elaborate SEAD operations. Successful SEAD is simple, using the means available synchronized for maximum effectiveness. SEAD is tied closely to the target area and the airspace coordination area.

The S2, the fire support element, the flight operations officer, and the tactical air control party are key to development of the SEAD plan. The S2 identifies, from all available sources, the nature of the air defense threat and known or suspected locations of weapon systems. The fire support element evaluates indirect fire assets and munitions to effectively suppress the enemy air defense, and the tactical air control party identifies vulnerabilities and flight paths of mission aircraft.

Available direct and indirect fires are used to execute the plan. SEAD is normally executed largely with indirect fire, especially when the target is not very close to squadron elements. Direct fire assets, such as tanks or attack helicopters, can engage identified air defense weapons. Regimental electronic warfare assets may also assist.

SEAD is massed in the target area or against air defense weapons that may attack the aircraft from outside the target area. The tactical air control party recommends aircraft approach routes to minimize exposure. Ideally, SEAD is fired immediately before the airspace coordination area is implemented and the aircraft attack the target. Enemy air defense weapons outside the airspace coordination area can continue to be suppressed during the strike.

MISSION CONTROL

Control of the mission follows a general process that can be standardized to the extent possible in SOP. This process includes the following actions:

- Alert the squadron. When the air liaison officer is notified that aircraft are inbound, he immediately notifies the squadron to allow maximum time for coordination.

- Establish communications. **The air liaison officer establishes** communications with the mission commander. He determines the type of aircraft, ordnance, and direction of approach. He also begins briefing the aircrews and coordinating the airspace coordination area (ACA).

- Change weapons control status. The squadron commander changes the air defense weapons control status to a more restrictive condition, if necessary.

- Coordinate SEAD and ACA. The fire support element coordinates SEAD and the ACA. The actual dimensions of the coordination area are often coordinated face to face by the squadron commander, the fire support officer, and the air liaison officer in the command group.

- Mark target location. The target may already be adequately identified by ongoing friendly fires. If not, it is marked to ease identification for the aircrews and to preclude inadvertent attack of squadron units. Enemy positions are marked by mortar or artillery delivered smoke or an airborne forward air controller. In some cases, marking of friendly locations can be done with colored smoke.

- Execute SEAD.

- Implement the ACA. The informal ACA is often a two-dimensional block of airspace following prominent terrain features to facilitate recognition from the ground and air. It may be made three-dimensional by establishing maximum and minimum altitudes. The size of the ACA is a function of the type of aircraft, terrain, and close air support tactics used. It should be no larger than necessary to allow the target attack. Ingress and egress routes for aircraft can be designated along prominent terrain as part of the ACA.

- Execute the air strike. The air liaison officer remains in contact with the aircrews throughout the mission.

- Cancel the ACA immediately upon departure of the aircraft.

- Debrief the aircrews. The aircrews are a valuable source of combat information. The air liaison officer must immediately debrief them on assessment of target effect achieved and any other observations made during the strike. A clear situation brief before the strike allows aircrews to assess the significance of enemy activity sighted and report it to the squadron. The slant angle of observation by pilots often allows them to see through obscuration that units on the ground cannot.

JOINT AIR ATTACK TEAM

A JAAT is a combination of Army attack and observation helicopters and close air support aircraft operating together to locate and attack high-value, high-payoff targets. It normally operates in a coordinated effort with fire support, air defense artillery, and ground maneuver forces against enemy armored formations, command vehicles, and air defense weapons. Simultaneously employing attack helicopters and close air support aircraft against the same target array increases the lethality and survivability of both systems.

The JAAT provides the commander with a highly maneuverable, antiarmor force capable of engaging enemy forces at extended ranges. It is most effective against massed, moving armor formations and least effective against dug-in, prepared defensive positions.

A JAAT operation can be structured, planned with sufficient time to mass the combat power required. Close air support can be preplanned specifically for the JAAT. The more formal JAATs are run at regimental level. Squadrons seldom have the opportunity to organize and execute a detailed JAAT.

The aviation squadron plays the major role in coordinating JAAT missions in the regiment. The air liaison officer, the fire support officer, and the S3 do most of the coordination for JAAT aircraft, working with their regimental counterparts and US Air Force personnel. The aviation squadron or troop commander on the scene assumes control of the JAAT execution. The fire support officer concentrates on conducting SEAD and fire support for the JAAT. During a regimental JAAT, the aviation squadron receives direct support or priority of fires of available artillery

within range, to include squadron howitzer batteries. The fire support officers in the armored cavalry squadron assist in fire support, as necessary.

An informal JAAT is much more dynamic, formed as attack helicopters and close air support aircraft are available and the situation is favorable. This is the normal occurrence in division cavalry. The opportunity to organize a JAAT may be the decision point to surge an air cavalry troop. Squadron SOP should establish the procedures for operating a JAAT to facilitate organization during a mission.

A successful JAAT involves several key players. They are the ground commander (regiment or squadron), the air cavalry commander, the air liaison officer, and the fire support officer. The ground commander is responsible for the mission, determines the target to attack, and allocates resources. The air liaison officer coordinates as he would for a close air support mission and turns the aircraft flight over to the air cavalry commander when ready to execute. The fire support officer coordinates SEAD, shifts priorities of supporting fires, and provides fire support as directed. The air cavalry commander organizes his assets and assumes control of executing the JAAT.

Planning an informal JAAT must be simple. The commander identifies the target and may assign control measures to synchronize the operation with ground units. These control measures can include engagement areas and permissive and restrictive fire support coordinating measures. SEAD is planned and executed as in a close air support mission. Priority of fire is given to the air cavalry commander. Both ground troop mortars and artillery should support the JAAT when within range. An ACA can be established if necessary to control fire support to the JAAT.

In division cavalry, the squadron fire support officer can coordinate fires for the air cavalry troop. If advantageously located, a ground troop FIST may be designated as the air troop FIST for the duration of the JAAT.

Section VII. Air Defense Support

Air defense is all measures designed to nullify or reduce the effectiveness of an enemy attack or surveillance by aircraft, theater missiles in flight, or unmanned aerial vehicles. Air defense measures reduce the possibility of attack by making the cavalry unit a less detectable and lucrative target. In the event of attack, air defense counters the threat to destroy the aircraft or disrupt its attack. Air defense involves both passive and active measures.

PASSIVE AIR DEFENSE

Passive air defense includes all measures, other than active air defense, taken to minimize the effects of hostile air action. All cavalry units are responsible for these measures. These measures are continuous in nature and suitable for unit SOPs.

Maneuver formations and techniques for accomplishing tactical tasks include passive air defense. A pilot moving at high speed, often low to the ground to avoid high-altitude air defense systems, will have difficulty detecting a target that is not obvious. If he has detected the target, passive measures make his attack more difficult. Some passive measures are listed below.

- Cover and concealment for stationary vehicles.
- Camouflage to conceal exposed vehicles or reflective surfaces.
- Covered and concealed routes during movement.
- Vehicle dispersion when stationary and moving.
- Concealed track marks and terrain disturbances around stationary positions.
- Prepared positions for stationary vehicles or elements.
- Not engaging a passing fixed-wing aircraft unless it assumes an attack profile.
- Establishing and maintaining air guards.
- Establishing an air warning system in the squadron.
- Establishing drills to execute immediately upon air attack.

ACTIVE AIR DEFENSE

Active air defense is direct defensive action taken to destroy enemy air platforms or to reduce their effectiveness. It includes the use of organic weapons as well as supporting ADA systems.

While the first line of defense against enemy air is the constant application of passive air defense measures, squadrons must be prepared to actively engage air threats. Engagement can be by volume fire, using all available weapons to put up a curtain of massed fire into which the aircraft flies. The techniques for controlling this fire depend on the weapons available and the type of aircraft. When engaging helicopters involved in reconnaissance or air assualt operations, precision engagement by appropriate weapons can be used. Air-to-air engagement by air cavalry is part of this response.

The air defense artillery battery in the armored cavalry regiment provides an organic air defense capability to the regiment. Based on the factors of METT-T, IPB, and his intent, the regimental commander may allocate air defense assets to the squadrons or use them to protect critical sites or installations. The regiment may be reinforced with additional air defense assets. This is particularly true during economy-of-force missions to preclude a gap or lightly defended area in overall corps air defense coverage.

Division cavalry may receive both incidental and direct protection from ADA units. Collateral protection is provided when the squadron is operating under the protection of high-to-medium-altitude air defense (HIMAD) systems providing area coverage. The nature of reconnaissance and security operations may take the

squadron out from under HIMAD coverage. To provide close protection, complementing or when outside HIMAD protection, the squadron may receive support from short range air defense (SHORAD) systems. These are tracked, wheeled, and man portable missile systems from the division air defense battalion. They can support the squadron using any of the command and support relationships discussed in Section I.

AIR DEFENSE COMMAND AND CONTROL

Air defense warning procedures provide measures to alert, prepare, or increase unit readiness for air attack. Air defense warnings are commonly issued throughout the division or regiment for this purpose. Air defense warnings provide a degree of air attack probability (red, yellow, or white) based on the commander's evaluation of the threat in his area of operations.

Air defense warnings are routinely issued by the area air defense commander for dissemination throughout the theater of war or operations. Air defense warnings describe the general state of the probable air threat and apply to the entire area. Any commander may issue a higher level of warning, but not a lower level. Raising the level of air defense warning should be based on actual threat observations or intelligence on threat activity rather than a simple threat template. The chain of command must ensure that every soldier knows the current air defense warning. Air defense warnings will be sent out on air defense command nets and early warning nets at every level. It is the responsibility of the air defense officer at regiment or squadron level to inform their respective supported commanders of the current air defense warning.

While air defense warnings describe the probability of hostile air action over the entire theater of war or operations, local air defense warnings tell with certainty what the air threat is for a specific part of the battlefield. Air defense units use local air defense warnings to units as to the state of the air threat in terms of right here and right now. See Figure 9-8 for the three local air defense warnings.

LOCAL AIR DEFENSE WARNINGS	MEANING
Dynamite	Air platforms are in-bound or are attacking now. Response is immediate.
Lookout	Air platforms are in the area of interest but are not in-bound, or are in-bound but there is time to react.
Snowman	No air platforms pose a threat at this time.

Figure 9-8. Local air defense warnings.

Local air defense warnings do more than describe the current level of air threat in the immediate area. They also require specific air defense reactions from receiving units. Unit commanders must establish in their tactical SOP what they want their units to do when a local air defense warning is received.

Air defense control is exercised by rules of engagement that delineate the circumstances under which weapons can fire at an aircraft. These rules are issued by the area air defense commander or subordinate region air defense commander to provide the degree of centralized control required. These rules allow for decentralized execution. Subordinate commanders can issue more restrictive rules of engagement than those imposed by the area air defense commander, but not more permissive ones. The right of self-defense is always preserved. The rules of engagement important to cavalry are as follows:

- Hostile criteria. Hostile criteria describe the conditions under which an aircraft may be identified as hostile for engagement purposes. Examples of this include speed, altitude, heading, or other requirements within specified volumes of airspace. At squadron level these criteria include visual recognition of specific enemy characteristics or hostile acts.

- Weapons control status. Weapons control status describes the degree of fire control imposed (hold, tight, or free) on air defense weapons.

Centralized air defense control is maintained within the division and regiment by air defense digital and voice communications nets. The principal net is the early warning net. This net is used to issue changes to air defense warnings and rules of engagement and to alert units to approaching air threats. ADA units supporting squadrons maintain constant communications on this net. Changes and alerts that affect the squadron are relayed by the ADA unit leader to the squadron. Air defense units also operate on internal nets for command and control.

PLANNING AND EMPLOYMENT

ADA employment is governed by four basic principles—mass, mix, mobility, and integration. Considering these principles, the normal method of employing supporting ADA is under the centralized control of the ADA leader at squadron level. Occasionally, ADA squads and/or teams may be delegated to troop commanders if the ADA leader cannot maintain effective centralized control. The ADA leader is integrated into the fire support element as a special staff officer. The S2 determines air avenues of approach and air attack threats during IPB. The squadron commander or the S3 provides the ADA officer with the commander's intent, scheme of maneuver, and priorities of protection. The ADA officer recommends initial allocation of ADA assets and scheme of maneuver based on this guidance. Priority is normally given to those elements of the squadron at greatest risk of attack because of criticality, vulnerability, recoupability, and threat. These high risk elements can include the following:

- Reserve.

- Trains.

- Regimental support area (cavalry regiment).
- Command posts.
- ACT forward assembly area.
- FARPs.
- Squadron assembly areas.

Based on the commander's guidance, the ADA leader formulates the ADA plan. He coordinates the plan with the fire support element and troop commanders. Weapons are positioned considering the following guidelines:

- Balanced fires.
- Weighted coverage against the most likely approach.
- Early engagement.
- Defense in depth.
- Mutual support.
- Overlapping fires.
- Observation and field of fire.

ADA weapon systems can consume large quantities of ammunition. Class V resupply should be well forward with the squadron combat trains. This resupply may be on vehicles provided by the ADA unit or on organic squadron vehicles.

Section VIII. Engineer Support

Combat engineers increase the combat power of maneuver units by accomplishing mobility, countermobility, and survivability tasks. Additionally, they perform infantry combat missions when required. The three basic tasks are often used in combination. They are integrated with the commander's maneuver and fires to increase or afford opportunities for the commander to successfully accomplish the mission.

MOBILITY

Mobility operations maintain the freedom of movement for maneuver units and critical supplies. Engineers accomplish this by reducing the effects of existing or reinforcing obstacles, by crossing gaps, and by constructing and maintaining combat roads and trails. Engineers often support a squadron during reconnaissance to perform mobility tasks supporting the movement or maneuver of follow-on forces.

Specialized engineer equipment allows the engineer unit to perform obstacle reduction and gap crossing for the squadron in a more efficient and timely manner

than might otherwise be possible. The effort, however, is a responsibility of the squadron or troop commander. The engineer is part of the team employed after the commander has secured the obstacle, performed reconnaissance, and placed supporting forces in position.

Construction and maintenance of routes are accomplished to the extent necessary to support the momentum of the cavalry unit. Improving existing routes is the first choice and construction of short bypasses is second. Movement of service support assets is considered when constructing combat roads and trails. These assets are the most in need of this support.

COUNTERMOBILITY

Countermobility operations are those operations that attack the enemy's ability to maneuver. This is accomplished by enhancing existing natural impediments to movement with planned obstacles. Obstacles are classified as either existing or reinforcing.

Existing obstacles are those natural or cultural restrictions to maneuver that are part of the terrain when the battle begins.

Reinforcing obstacles are specifically constructed, emplaced, or detonated to tie together, strengthen, and extend existing obstacles. Existing restrictions can often be rapidly turned into effective obstacles with minimal effort. Each obstacle or group of obstacles is emplaced to achieve a specific effect (block, fix, turn, disrupt) on the enemy.

The two types of reinforcing obstacles are tactical and protective. Tactical obstacles are placed to achieve one of the above effects on enemy maneuver and are generally within or at the front of an engagement area. Maneuver units may assist engineers in placing tactical obstacles when speed is essential or engineer assets are limited.

Protective obstacles are placed close to friendly positions to provide unit security. They are typically placed by maneuver units without engineer support. Protective obstacles can normally be place outside planned obstacle zones and belts unless specified otherwise by higher headquarters or if the obstacles are not intended to be recovered.

Engineers use manpower and specialized equipment and demolitions in constructing obstacles. Availability of this equipment determines what a supporting engineer unit can accomplish. The staff engineer at the appropriate echelon prioritizes this effort to best support the commander's intent.

Standard obstacles are designed to help simplify and expedite planning and logistics; however, they are employed in multiples as necessary to conform to a specific target site. They are often established in SOP by the division or regimental

engineer. The obstacle guide lists all the types of obstacles the unit may employ and includes a drawing, a list of materials, and special instructions.

The family of scatterable mines (FASCAM) gives the commander a rapid, flexible, and effective means of delaying, canalizing, harassing, or wearing down enemy forces. FASCAM provides a method of emplacing obstacles to support contingencies or unforeseen situations. As with any reinforcing obstacle, it is integrated into the obstacle plan and supports the scheme of maneuver. FASCAM is normally employed as a situational obstacle; that is, it requires detailed planning and a trigger or decision point that determines when the minefield is executed. These triggers depend on the desired obstacle effect and the delivery system employed. Delivery systems include fixed-wing tactical aircraft (Gator), rotary-wing aircraft (Air Volcano), ground (Volcano delivered by 5-ton truck or M548 tracked cargo vehicle), tube artillery (ADAM/RAAMS), and man-pack (MOPMS). Each system has different self-destruct times, emplacement authorities, and risks associated with its use. Consult FM 20-32 for details.

The following considerations govern obstacle employment:

- Observe restrictions imposed by higher headquarters.
- Integrate with scheme of maneuver.
- Cover by observed fires.
- Integrate with existing obstacles.
- Employ in depth.
- Employ surprise.
- Guard to prevent prebreaching or infiltration by enemy.
- Final siting of obstacles must be done on the ground by the responsible maneuver commander and the emplacing engineer.

Additional guidance on obstacle employment may be found in FM 90-7.

SURVIVABILITY

Survivability operations are the development and construction of protective positions to reduce the effectiveness of enemy weapon systems. Engineers construct survivability positions for command and control elements and for critical equipment and supplies. They dig individual and crew-served weapon positions, vehicle fighting positions, and may provide cover for personnel and vehicles. The greatest survivability effort is expended in the defense.

Engineers use much of the same equipment in survivability tasks that is used in obstacle preparation. There is seldom enough time or equipment for the engineers to do all the tasks desired. Soldiers, vehicle crews, and units must do all they can to

prepare survivability positions. The squadron commander designates the priority for engineer effort in survivability work.

Responsibility for constructing the position rests with the soldier who is going to occupy and fight from it. The engineer constructs it as directed. Soldiers must be proficient in supervising the construction of fighting and survivability positions. The soldier or crew occupying the position is responsible for camouflage after construction is complete.

In a hasty defense, survivability tasks are normally not started until after obstacles are emplaced.

COMBAT ENGINEER EMPLOYMENT

The combat engineer company in the armored cavalry regiment provides a significant engineer capability. The regiment may also be augmented with corps engineer assets (normally an engineer battalion). The regimental commander allocates these engineer assets based on METT-T factors.

The division cavalry squadron is often supported by a combat engineer platoon from the division combat engineer brigade. This platoon is often task organized with mobility and countermobility equipment from the engineer company. In some missions where facilitating the movement of other forces is critical, more engineers may be assigned to initiate mobility tasks at the earliest possible moment. When engineers are limited, they are best employed under squadron control to keep their efforts focused where most critical. Priority of effort for engineer tasks is specified by the squadron commander. He may also specify priority of support to subordinate units. During countermobility operations, priority can also be specified to designated portions of the obstacle plan.

The engineer unit may be placed in a supporting relationship with a specific subordinate ground troop for an operation where this arrangement best accomplishes the mission. Seldom should an engineer unit be delegated at less than platoon size. The engineer platoon leader can best manage the collective effort of the entire platoon and supporting equipment using them as needed to accomplish the commander's intent. Zone or area reconnaissance missions may, on occasion, require an engineer platoon to delegate squads to scout platoons.

Engineer effort or equipment may shift from supporting one troop to another. Troops may be given priority of equipment or support for certain tasks or periods of time. Units are responsible for picking the engineers up at designated locations and escorting them through the zone or sector during their work. Doing so ensures timely transfer and rapid employment of the engineer on his assigned tasks. Squadron units provide security to engineers while working on their tasks so the engineer's effort is focused. This security is often inherently accomplished by unit formations and engineer placement. In other situations, it may require positive action on the part of the squadron or troop commander.

The squadron must be prepared to provide combat service support to the engineers. This may range from coordinating support for an operationally controlled unit to providing support to an attached unit. The S4 and the engineer unit leader develop and coordinate a plan that ensures the supply of Class I, III, IV, V, and IX to support the engineer effort.

RECONNAISSANCE OPERATIONS SUPPORT

During reconnaissance operations priority of tasks is normally mobility, countermobility, and survivability. Priority of mobility effort is along a designated route used by the squadron or follow-on forces.

The following tasks guide the employment of engineers during reconnaissance or offensive security missions:

- Normally move well forward with or immediately behind a lead ground troop.

- Supplement troop route reconnaissance by reconnoitering specific roadway features that are damaged or require more technical engineer analysis.

- Create bypasses around obstacles.

- Reduce obstacles beyond troop capability. Every obstacle encountered during a reconnaissance mission may not require reduction by the engineers supporting the squadron. Those that may significantly impact on the mission of follow-on forces deserve attention. Others are marked and reported. Main body engineers must be prepared to supplement the efforts of the squadron's engineers by improving breaches and conducting breaches of other obstacles.

- Emplace tactical bridging.

- Improve ford sites.

- Improve embankments at swim sites.

- Emplace protective minefield on exposed flanks.

- Construct combat trails.

SECURITY OPERATIONS SUPPORT

During security operations priority of effort is normally countermobility, survivability, and mobility. The following tasks guide employment of engineers during defensive security missions:

- Begin work as early as possible and proceed continuously throughout the mission within constraints imposed by crew rest and equipment maintenance.

- Task specific pieces of engineer equipment to construct survivability positions while obstacles are being emplaced.

- Prioritize countermobility effort to specific portions of the obstacle plan, normally starting in the forward areas and working back.

- Ensure tanks or weapon systems placed in fighting positions are dug in. Scout observation posts seldom require survivability positions.

- Emplace tactical bridging to improve mobility of squadron assets in sector.

- Build combat trails to support the execution of reserve contingencies and troop displacements.

- Emplace hasty obstacles during the mission in support of squadron FRAGOs.

- Create bypasses around obstacles created by battle damage during the mission.

INFANTRY ROLE

Combat engineers prepare to fight as infantry as a secondary mission; however, the decision to employ an engineer unit as infantry is made only in critical circumstances. Using engineers as infantry must be weighed against the loss of their greater capabilities as a combat multiplier performing their primary missions. Their combat capabilities are limited to their organic weapons. Squadron commanders should not develop a plan that hinges on supporting engineers fighting as infantry. Engineers are prepared to fight during their normal missions. When forced to do so, the squadron must support them with maneuver units and fire support.

Section IX. Nuclear, Biological, and Chemical Support

Chapter 8 discusses unit NBC defense measures. This section discusses support available from or provided by the division to the division cavalry squadron, and the support provided to the regiment by the regimental chemical company.

The division chemical company provides decontamination, reconnaissance, and smoke support to the division. These elements may provide area support to the squadron based on support relationships with brigades. In some situations, they can directly support the squadron.

The regimental chemical company provides the same support to units of the regiment. It contains a reconnaissance platoon and a smoke/decontamination platoon. Generally, the smoke/decontamination assets are kept under regimental control while reconnaissance assets are decentralized. The dual purpose platoon has

limitations. The smoke track and wheeled vehicles are operated by the same troopers. When the regiment is spread across a corps frontage and uses the smoke/decontamination platoon for smoke purposes, additional decontamination assets from corps will be required.

DECONTAMINATION SUPPORT

Squadrons receive support from a decontamination platoon when thorough decontamination is required. Thorough decontamination is normally required after contamination with a persistent agent or prolonged exposure to other agents. Thorough decontamination requires detailed planning and increased manpower and equipment resources. It is conducted in a forward area to limit contamination spread, but out of likely contact with the enemy throughout the operation.

The squadron may be relieved by other units to conduct thorough decontamination. Decontamination may proceed by troop or the entire squadron may report to the decontamination site. If the decontamination proceeds by troop and the squadron remains committed in a mission, the decontamination unit may be placed under the operational control of the squadron. More often, the affected troop or the entire squadron moves to the established site and conducts thorough decontamination under division or regimental control. This method permits the best use of decontamination assets and an expedited decontamination effort.

RECONNAISSANCE SUPPORT

The NBC reconnaissance platoon minimizes the effects of enemy NBC attacks by detecting, identifying, marking, and reporting NBC contamination hazards. The NBC reconnaissance platoon supports the entire division or regiment. The platoon supplements organic capabilities of the cavalry squadron. It may be employed by the chemical company or directly support maneuver units.

The squadron may receive support from reconnaissance teams during reconnaissance and when involved in rear operations. They should be treated as specialized scouts and not used to replace troop scouts. NBC reconnaissance teams allow squadron reconnaissance to proceed faster by relieving troop scouts of the requirement to identify and mark a contaminated area. The squadron may begin a mission with known locations of contamination identified by IPB. The NBC reconnaissance elements are then organized to focus on that area when the squadron reaches it. In other cases, NBC contamination may only be suspected or possible. The NBC reconnaissance element is then deployed to support the squadron as a whole and reacts to contamination reports.

NBC reconnaissance elements can be integrated into the combat formations of ground troops to provide a rapid response. They should not lead the troop; they are not trained for that task. If contamination is identified in advance, the team moves forward as the troop approaches the area. Scouts bypass known or suspected

contaminated areas and the NBC reconnaissance element performs an area reconnaissance. The NBC reconnaissance element may have to lead the scouts while seeking a bypass. Support by NBC reconnaissance elements does not relieve the scouts from performing NBC tasks established in SOP.

Section X. Smoke Operations

Smoke is used to conceal friendly activities, to blind enemy observation and fire control, to deceive the enemy concerning friendly intentions, and to provide visual marking. It is an artificially produced aerosol of solid, liquid, or vapor in the atmosphere that weakens the passage of visible light or other forms of electromagnetic radiation. Smoke can have both psychological and physiological effects on individuals, and it may defeat or degrade optical or electro-optical sights and target acquisition devices. Laser range finders are degraded in smoke. It can disrupt command and control and the maneuver of unit formations. The squadron and regimental commanders must consider using smoke to aid the scheme of maneuver and plan to counter enemy use of smoke.

SOURCES

Smoke sources range from those readily available to squadrons but limited in capacity to supporting assets capable of large volumes of smoke. The more substantial the requirement for smoke, the more planning and coordination required.

Sources of smoke include the following:

- Vehicle-mounted grenade launchers are employed at crew level to screen the vehicle from the enemy during an engagement. They can be used defensively or to mask movement to a better engagement position.

- Vehicle engine exhaust smoke system (VEESS) is mounted on some combat vehicles. It produces a dense cloud of smoke from the exhaust. It can be used in conjunction with the vehicle smoke grenade launcher or separately. It consumes fuel, which is a factor that must be considered in the decision to employ it. VEESS can screen an individual vehicle or unit. Wind conditions must favor its use to place the cloud between the friendly and enemy units. The plume of smoke generated by VEESS makes the vehicle readily identifiable from the air.

- Smoke grenades may be used for identifying and signaling and for producing small localized obscuration.

- Smoke pots generate a great amount of smoke in a short time. They are small, can be carried on vehicles, and ignited manually or electrically from a remote position. They also can be lit individually or sequentially in a long-burning chain. There are a wide variety of uses because of this flexibility.

- Mortar and artillery smoke was discussed in Section III and Section IV.

- Air-delivered systems may be available from tactical air support aircraft for critical mission requirements.

- Mechanical smoke generators are located in the division and regiment chemical companies. They produce the largest volume of smoke, but also take longer to get into position and initiate the screen. They are primarily used to screen large areas and to produce deceptive screens.

TYPES

Four forms of smoke employment support squadron operations:

- Screening.

- Obscuring.

- Deceiving.

- Identifying and signaling.

Screening smoke is employed in areas of friendly operations or in areas between friendly and enemy forces to conceal ground movement, breaching, recovery operations, key assembly areas, supply routes, and logistic facilities. The enemy may be aware of the friendly unit presence, but will not be able to detect actual activity or intent. There are three types of screening smoke:

- Curtain. A smoke curtain is a dense vertical cloud placed between the friendly and enemy locations, normally along the leading edge of the unit. Aircraft may be forced to climb high to see over the top or risk penetrating the curtain for observation.

- Blanket. A smoke blanket is a dense horizontal layer of smoke that can all but cover up a unit. It is a heavy smoke concentration usually used over friendly areas to screen them from enemy ground or aerial observation. The maximum, visibility within a smoke blanket should be no more than 50 meters. A blanket could have the undesirable effect of grounding squadron aircraft.

- Haze. A smoke haze is similar to a blanket. It is a light concentration of smoke placed over friendly areas to restrict accurate enemy observation and fire. The maximum visibility within a small haze should be 50 to 150 meters. It does not completely hide a unit, but a haze makes it difficult for the enemy to see targets partly hidden by smoke.

Obscuring smoke is employed on or near the enemy to minimize his vision both within and beyond his position area, or to cause an enemy force to vary speed, inadvertently change direction, deploy prematurely, or rely on nonoptical means of communication. Effective obscuring smoke must have well-identified enemy locations.

Deceiving smoke is used to mislead the enemy on friendly intentions. It should be considered a part of all deception plans. Deceptive smoke can draw enemy attention and firepower away from the main effort underway elsewhere. Deceptive smoke should be planned for every operation in which screening smoke is used to prevent the enemy from immediately determining friendly intentions. During a directed deception operation, the squadron may be directly supported by elements of the division smoke platoon or by part or all the smoke/decontamination platoon in the regiment.

Identifying and signaling smoke is used to identify targets and friendly units. Signaling smoke may assist in medical evacuation and vehicle recovery operations. It can be also be used for preplanned visual battlefield communications. When used as such, it should be established in SOP.

PLANNING CONSIDERATIONS

Like illumination, smoke should be planned for every operation. It is better to plan for contingencies and have smoke available than to react to situations without being prepared. Smoke is limited, especially in indirect fire basic loads. It is used only when needed, never indiscriminately.

Screening and obscuring smoke is useless unless employed in quantity. The smoke cloud must be large and dense enough to meet the needs of the mission.

Smoke effectiveness depends on weather conditions and on wind direction and speed. If conditions are not advantageous, it may preclude effective use of smoke. Conditions can also dictate changes in the type of smoke planned for the operation.

The S3 is responsible for integrating smoke into the scheme of maneuver. The chemical officer has functional responsibility. When planning the use of smoke, the degradation of enemy combat effectiveness must be weighed against possible degradation of the squadron's combat power and command and control.

The impact on other friendly units, particularly air cavalry, must be considered and coordinated during planning and execution.

Smoke is valuable during limited visibility. Smoke adversely affects night vision equipment of all types and a relatively small amount can significantly reinforce the other limited visibility conditions. Incendiary smoke may also blind thermal sights.

To put smoke where it is wanted and to keep it there, all smoke sources must be controlled and adjusted like indirect fires. During an extended smoke operation, adjustments must continue as wind conditions change.

Smoke will frequently be present on the battlefield as a natural by-product of combat. Squadron and troop commanders should take advantage of this obscuration during operations to conserve available resources of smoke.

Smoke is a limited visibility factor. Commanders and leaders counter the enemy's use of smoke by taking the limited visibility actions appropriate for the mission. These actions are discussed in Chapters 3, 4, 5, and 6. The capability of the squadron's observation, target acquisition, navigation, and rangefinding equipment dictates how much adjustment is required.

SMOKE IN RECONNAISSANCE OPERATIONS

The use of smoke during reconnaissance operations must be carefully controlled. Smoke is a signal to the enemy that something is occurring. It naturally causes him to increase his security and reconnaissance effort. Surprise maintained up to that point is lost. Smoke is planned, however, so that it can be used immediately when the situation demands. The squadron SOP establishes procedures for restricting use of on-board smoke devices to preclude inadvertent use. Permission of the troop commander may be required before use. Smoke may be used to—

- Obscure vehicles from enemy gunners.
- Blind enemy observers.
- Cover a breaching operation.
- Conceal a bypass.
- Screen a hasty attack.
- Disorient the enemy in his defensive positions.
- Defeat guided weapon tracking systems.
- Screen a passage of lines.
- Create a deception.
- Assist in crossing water obstacles.
- Mark enemy positions.

SMOKE IN SECURITY OPERATIONS

Smoke is a significant combat multiplier for the squadron during security missions. The degradation of enemy command and control and disruption of timetables and formations that smoke can cause are valuable tools for the squadron. Smoke can be used in the following ways:

- Separate and isolate attacking echelons of reconnaissance and main body forces.
- Slow the advance of enemy formations.

- Obscure obstacles.
- Deceive the enemy on the size of force being faced.
- Support the disengagement of troops.
- Obscure enemy reconnaissance and surveillance efforts.
- Degrade the effectiveness of enemy direct and indirect fires.
- Conceal movement and concentration of troops and company teams.
- Screen a counterattack.
- Mark enemy positions.
- Isolate portions of an enemy force for destruction in an engagement area.

Section XI. Intelligence and Electronic Warfare

The intelligence and electronic warfare (IEW) system produces both combat information and intelligence. Combat information is unevaluated data gathered by or provided directly to the tactical commander that, because of its highly perishable nature or the criticality of the situation, cannot be processed into tactical intelligence in time to satisfy the user's tactical intelligence requirements. Intelligence is the product resulting from the collection, evaluation, analysis, integration, and interpretation of all available information concerning an enemy force, foreign nations, or area of operations. Intelligence is immediately or potentially significant to military planning and operations. The IEW system supports the commander by accomplishing six major   tasks—indications and warning, IPB, situation development, target development and support to targeting, force protection, battle damage assessment.

Cavalry is a critical component of the division and corps all-source intelligence systems. Cavalry units are both users and providers of information. During planning, the regiment and squadrons use IPB products to assist in planning the assigned mission. During reconnaissance and security operations, they provide fresh combat information both to the commander and to the IEW system. As the corps and division commanders' eyes and ears, cavalry responds to their information needs. These needs may be clarified by the G2 with information requirements specifying those items of information regarding the enemy and his environment that need to be collected and processed. The squadron or regiment should not receive conflicting guidance from the commander and the G2. The G2 should understand the capabilities and limitations of the cavalry unit and develop a special relationship with the cavalry unit commander to facilitate the flow and use of combat information.

DIVISION INTELLIGENCE AND ELECTRONIC WARFARE

The bulk of the special purpose IEW assets in the division is either organic to or controlled by the military intelligence (MI) battalion during combat operations. These assets include information analysis and intelligence dissemination, electronic warfare equipment, interrogation support, and ground surveillance radar (GSR). MI companies are in direct support to maneuver brigades and could be tasked to provide support to the cavalry squadron. The squadron S2 must be aware of the assets that are employed in the area and any support that may be available. When the situation dictates, the S2 automatically requests support from available assets.

REGIMENTAL INTELLIGENCE AND ELECTRONIC WARFARE SUPPORT

The regimental MI company provides the regiment with organic IEW assets similar to those of a division MI battalion, but on a smaller scale. The regimental MI company contains IEW assets, interrogation support, and GSRs. In addition, the regimental S2 has an analysis and control element from the MI company under his operational control during tactical operations. This analysis and control element provides intelligence collection management, analysis, and dissemination. The regimental MI company maintains continuous contact with the corps MI brigade to ensure timely reporting and dissemination of all combat information and intelligence.

INTELLIGENCE AND ELECTRONIC WARFARE SUPPORT

IPB is important to the division cavalry squadron for planning and executing missions. The S2 must aggressively seek IPB products and updates from the G2 element of the division TOC throughout an operation. He must likewise constantly report combat information as it is generated by the squadron. He analyzes information for use at squadron level by combining available information from division and cavalry troops. During operations under division control, the squadron S2 operates on the division OI net. Maneuver brigade S2s collect information by eavesdropping, speeding the dissemination process.

The regimental S2 has a variety of sources to draw on for IEW support. He has access to the corps intelligence assets controlled by the MI brigade. He must constantly seek IPB products and information from the corps G2 and the corps analytical control element. He is also responsible for combining and analyzing the massive amounts of information generated by the squadrons and MI company, reporting this information quickly and accurately to corps, and disseminating combat information and intelligence back to the squadrons.

The division cavalry squadron may be supported by GSRs from the division MI battalion. The regimental squadron is normally augmented with GSRs from the regimental MI company. GSR equipment can be vehicle or ground mounted to

provide a line-of-sight capability to detect moving objects against a background at extended ranges. It is particularly useful as a supplementary observation device, especially during periods of limited visibility. As a surveillance asset, GSR is integrated with the reconnaissance effort or troop OPs. The S2 normally directs the employment of GSR in coordination with the S3 and ground troop commanders. GSR can be employed under squadron control and report on the OI net, but is normally attached to ground troops. Even when attached, the S2 may direct general positioning or priorities of surveillance for the GSR.

GSR employment is guided by the following considerations:

- It is vulnerable to enemy direction finding and jamming.

- It should be positioned in an area that is free of ground clutter and affords long-range observation and wide field of view.

- The GSR team leader, like a scout section leader, determines the exact position for siting the radar based on general positioning guidance and desired surveillance activity.

- The radar can be operated on a time schedule, randomly, or continuously as required. Continuous operation increases the risk of location by the enemy and possible destruction or jamming.

- GSR can search avenues of approach or possible enemy positions.

- GSR can monitor point targets such as bridges, defiles, and road junctions.

- Observation of scouts can be extended by enabling them to survey distant points and areas of special interest.

- It can assist in guiding patrols and units moving during limited visibility.

- Target areas of interest, engagement areas, and obstacles can be searched for the presence of enemy and control of friendly direct and indirect fires.

The division cavalry squadron is seldom augmented with other IEW assets. The regimental MI company has an organic collection and jamming (C&J) capability. The regimental commander normally maintains control of these C&J assets. The regimental S2 advises the commander on their employment.

Section XII. Military Police Support

Military police (MP) operations play a significant role in assisting the tactical commander to meet the challenges associated with combat. They provide support to the mobility and survivability functions of the regiment by enhancing circulation control, conducting security (to include area security, physical security, VIP security, law and order operations, and populace and resource control), and conducting internment and resettlement operations for EPW/CI, US military

prisoners, and dislocated civilians. Additionally, MPs provide HUMINT consequence to their police intelligence role and their interface with the host-nation military police and constabulary. Corps MP units provide support to the regiment. Division cavalry seldom has MP task organized, but receives support as a divisional unit. This is particularly the case during rear operations when close coordination is necessary.

MPs undertake continuous coordination with host-nation civilian police to maintain control of the civilian population and to enforce law and order. Additionally, MP units frequently take measures to support area damage control. The enemy's damage to the terrain determines the degree and kind of MP support needed and where to place priority of effort. MPs report damaged or destroyed road networks, bridges, and contaminated areas, allowing main supply route activities to reroute. They secure critical activities, such as communications centers and water and electrical supply sources. MPs are also responsible to secure critical cells within the corps and Theater Army Area Command main command posts, which often use existing "hardstand" structures located in built-up areas.

MPs are tasked with EPW operations and will collect them as far forward as possible. MPs also operate collecting points and holding areas to briefly retain EPW and civilian internees. EPW operations relieve the maneuver commander from the responsibility of controlling EPW. This is often the most essential MP support provided to the regiment to preclude diversion of cavalry troops.

Commanders must realize that MP support may not be available and that other soldiers may have to assume certain MP missions, such as the following:

- Route reconnaissance, selection of routes/alternate routes, convoy escort, and security of lines of contact.

- Control of roads, waterways, and railroad terminals, which are critical choke points in the main supply route.

- Security of critical sites/facilities/units, to include—

  — Communication centers.

  — Government buildings.

  — Water and electrical supply sources.

  — Command, control, and communication nodes.

  — Nuclear/chemical delivery means and storage facilities.

  — Other mission-essential areas.

- Refugee control in close cooperation with host-nation civil authorities.

- Collection and escort of EPW.

- Straggler control.