***FM 100-103**

Field Manual
No. 100-103

HEADQUARTERS
DEPARTMENT OF ARMY
Washington, DC, 7 October 1987

ARMY AIRSPACE COMMAND AND CONTROL IN A COMBAT ZONE

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*This publication supersedes Chapters 1, 2, 3, Appendix A, Section I of Appendix B, Appendix E, and the Glossary of FM 1-103, 30 December 1981.

PREFACE

A characteristic of the US Army's warfighting doctrine is its offensive spirit. To conduct successful battles and engagements, US forces must gain the initiative and thus set the terms of battle. This requires an increased emphasis on the principle of maneuver.

The ability to maneuver allows the Army to place the enemy in a position of disadvantage through the flexible application of combat power. Airspace provides an added dimension to maneuver by supporting firepower, protection, intelligence, and air operations. The use of airspace to enhance maneuver requires its unconstrained use by all elements of the combined arms and supporting services.

Airspace control promotes the effective, unconstrained, safe, and flexible use of airspace. The Army airspace command and control (A^2C^2) system is responsible for accomplishing the airspace control function.

FM 100-103 embodies the Army's doctrinal tenets for airspace control. It establishes the requirements, principles, and methodology governing the conduct of the airspace control function. It also describes the A^2C^2 system in terms of its organization, staff functions, and techniques and procedures, as well as its information and interface requirements. This manual is consistent with, and expands on, joint service doctrine.

This FM focuses on the Army's requirements, procedures, and command and control tasks involved in the planning, coordination, and execution of the airspace control function. It covers each echelon of command from maneuver battalion through the theater land component. This manual applies to US Army forces in varying levels of conflict and geographical environments. Within selected theaters and commands, specific factors such as command and control, and host nation arrangements with allies, may require local modification to the A^2C^2 system and its procedures.

Army airspace command and control replaces the term "airspace management." The use of the term "Army airspace" does not denote that any airspace contiguous to the battlefield, or any other geographical dimension of airspace, is designated Army airspace. Airspace is considered a joint medium for all friendly combatants. Accordingly, each component of the joint force may operate aerial vehicles and weapons systems within the airspace with maximum freedom consistent with the priorities, degree of risk that is operationally acceptable, and intentions and warfighting perspective of the joint force commander.

This publication implements the following standardization agreements:

STANAG 3805 (TA) Doctrine and Procedures for Airspace Control in the Combat Zone, Edition 2.

ASCC AIR STD 45/6A Airspace Control in the Combat Zone.

The proponent of this publication is HQ TRADOC. Submit changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward to Commander, Combined Arms Center and Fort Leavenworth, ATTN: ATZL-SWA-DL, Fort Leavenworth, Kansas 66027-6900.

Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

CHAPTER 1

Army Airspace Command and Control

Successful battles and engagements may depend on how effectively airspace over the air-land battlefield is utilized. Within this airspace, a high density of friendly weapons systems and aerial vehicles, with overlapping operating envelopes and flight profiles, must contribute to maximum combat effectiveness without interfering with each other. Airspace control maximizes force effectiveness without hindering the combat power of any friendly combatant.

EXPLANATION OF A²C²

Army airspace command and control consists of those actions that ensure the synchronized use of airspace and enhance the command and control of those forces using airspace. The A²C² system includes those organizations, personnel, facilities, and procedures required to perform the airspace control function. The A²C² system, when linked with the airspace control authority (ACA) by communications, standardized procedures, and liaison, becomes part of the theater integrated airspace control system.

The airspace control function consists of coordination, integration, and regulation of the use of airspace of defined dimensions. It also provides for identification of all airspace users. Coordination is that degree of authority necessary to achieve effective, efficient, and flexible use of airspace. Through integration, requirements for the use of this airspace are consolidated to achieve a common objective at the lowest possible level. Through regulation, activities in this airspace are supervised to prevent real-time conflicts among the various airspace users while achieving the necessary flexibility to ensure the greatest combat effectiveness. Identification promotes timely engagement of enemy aircraft while reducing the potential of fratricide.

IMPORTANCE TO AIRLAND BATTLE

AirLand Battle, the US Army's basic warfighting doctrine, prescribes the use of all weapons, arms, and services fighting to the full width and depth of the battlefield. The very term AirLand Battle recognizes the inherent third dimension of modern warfare. The basic tenets of the Army's warfighting doctrine--initiative, agility, depth, and synchronization--describe the characteristics of successful combat operations. These four tenets, especially synchronization, require airspace control and an effective airspace control system.

Synchronization begins by determining the desired effect or outcome to be achieved. Synchronization achieves the commander's desired effect by combining various elements of diverse, concurrent, or sequential combat power and actions integrated across the width, depth, and vertical dimensions of the battlefield to defeat enemy strengths throughout the area of operations. This synchronized application of combat power is planned and coordinated around the commander's concept of operations. Coordination, the adjustment of activities to one another, is a primary requirement for synchronized operations, as is concentration, the application of combat power at a specific place and time.

Army airspace command and control is the Army's operational approach to accomplishing the functional activity of airspace coordination. A²C² maximizes joint force effectiveness by ensuring the concurrent employment of airspace users, synchronized in time, space, and purpose to produce maximum combat power at the decisive point. The commander and his staff must address airspace control considerations during the planning for and the conduct of offensive and defensive operations. The commander's tactical plan must address the effective utilization of airspace above a unit's area of operations. It must coordinate air and ground movements in support of the scheme of maneuver with supporting fires, reconnaissance and surveillance operations, air defense operations, supporting tactical air operations, and sustainment operations, where such operations require the shared and synchronized use of airspace.

The Army exercises command and control over its forces in an area of operations assigned by the joint force commander (JFC). The airspace above the joint force area of operations and the Army's area of operations is the airspace control area. This is the basic geographical element of airspace. An airspace control sector is a subelement of the airspace control area and is established to facilitate the control of the overall area. Airspace control sector boundaries normally coincide with the air defense organization subdivision

boundaries. Airspace may be further divided by airspace control measures and restricted areas.

Within a joint force area of operations, the JFC assigns overall responsibility and authority for airspace control to a single component commander. Normally, this is the joint force air component commander (JFACC). The mission of the airspace control authority (ACA) is to coordinate and integrate the use of airspace within the joint area of operations (airspace control area). Because of the close relationship between airspace control and air defense, the ACA normally is also the area air defense commander (AADC). Subject to the authority of the JFC, the ACA establishes the broad policies and procedures for the employment of airspace control operations and the coordination, as required, among units operating in the area of operations. As the JFC assigns missions to subordinate component commanders, he also determines priorities for the use of airspace, when required, and resolves conflicts over the use of that airspace which can not be resolved through coordination. (For further discussion of duties of the ACA, refer to FM 100-42.)

Airspace control involves four basic functional activities--command and control, air defense, some aspects of fire support coordination, and air traffic control. The A^2C^2 system must--

- Expedite accomplishment of the tactical and operational mission by providing the procedures and current directives necessary to accomplish the mission, while minimizing the potential hazards due to friendly air defense, indirect fires, Army aircraft, unmanned air vehicles, and tactical air operations. This is a basic command and control task.
- Ensure that air defense weapons are free to engage all hostile aircraft within prescribed rules of engagement while avoiding engagement of friendly aircraft. Airspace control must facilitate identification of aircraft through procedures easily executed by the pilot and identified by the air defense system. Air defense operations must not cause delays in air support by creating complicated or lengthy air route structure.
- Ensure that ground-based fire support weapons systems are responsive to the maneuver commander and free to fire without posing an operational hazard to friendly aircraft operations.
- Provide air traffic regulation and identification within assigned area of operations or designated areas. Air traffic regulation is a corollary of air defense. The commander of the unified command, theater, or joint task force establishes the general priorities and restraints with due regard for the requirements of all users of the airspace. The air defense commander must have the capability to ensure that friendly aircraft may enter, depart, or move within the defended areas without undue restrictions upon their movements and with the least adverse impact upon the offensive and defensive capabilities of the command. The regulation of air traffic facilitates identification of aerial platforms, promotes air safety, and contributes to the optimum use of air defense weapons against hostile targets.

Ground tactical commanders must have the freedom to use the airspace over their forces and must have maximum flexibility to use organic and supporting assets within that airspace within the limitations imposed by the JFC. Key to this requirement is a responsive A^2C^2 system, standardization, minimal restrictions, and close and continuous coordination among all airspace users.

COORDINATION IN THE AIRLAND BATTLE

To be successful in future conflicts, the Army requires a system that permits commanders to execute their battles unhindered by other operations. The AirLand battle will be fought in all three dimensions. In addition, the ground commander must plan to execute deep, rear, and close operations. The ground commander will be required to coordinate combat, combat support, and combat service support (CSS)

forces simultaneously. Potential users of the airspace include fire support assets, Army aviation, air defense (AD), and US and allied air forces. Each must be permitted to maximize its combat potential. Just as the ground commander must anticipate and coordinate his requirements for ground maneuver elements, he must also anticipate and coordinate requirements for users of airspace in his area of operations.

The objective of A^2C^2 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, A^2C^2 must integrate air assets into the ground battle without unduly inhibiting the application of ground-based combat power.

The accuracy and lethality of enemy AD systems will force many airspace users to seek protection by operating at very low altitudes when they are near the forward line of own troops (FLOT). The resulting high density of airspace users in confined airspace near the FLOT will require a command and control (C^2) system that facilitates the concurrent employment of aircraft in areas where they can be separated from other airspace users in time and space or at least be ensured of minimum risk from conflicting with other airspace users.

Functional operations which require airspace and must be integrated and synchronized with other friendly combatant forces by means of the A^2C^2 system include--

- Fire support operations,
- Air defense artillery (ADA) operations,
- Army aviation operations,
- Special electronic mission aircraft (SEMA)operations,
- Heliborne electronic warfare operations,
- Remotely piloted vehicle operations,
- Intratheater airlift operations,
- Amphibious operations, and
- Joint and combined arms operations.

ARMY AVIATION OPERATIONS

Aviation provides an unprecedented capability to the commander. The mobility of aviation forces allows Army aviation to be highly responsive across the entire battlefield in a wide variety of combat, combat support, and combat service support roles.

Aviation is virtually dependent upon the unforgiving medium of airspace to accomplish its roles and missions. The medium of airspace is used by other forces to conduct high-speed maneuver, deliver fires, and employ FAAD weapons. The unrestricted use of airspace by all forces poses an operational hazard. Airspace control is required basically to reduce the potential loss of friendly air assets, and to enhance the flexible and effective use of this operational medium by all forces.

Air vehicles achieve their agility by virtue of their freedom from restrictions of the terrain. To achieve the protective advantages of terrain, air movement and maneuver are fitted to the terrain in much the same manner as ground forces. Army aviation operations are generally conducted in the terrain flight dimension of the battlefield, which is fundamentally linked to ground maneuver at all echelons. Through airspace command and control, the commander fully synchronizes his combat activities and employs his aviation assets and air maneuver to contribute decisively to the outcome of the battle.

Aviation units are organized to conduct attack, air assault, reconnaissance, intelligence, and logistical operations. They are assigned to echelons above corps, corps, divisions, and armored cavalry regiments. Airspace requirements for Army aviation cover a broad category of units and special requirements. Aircraft assigned to the aerial exploitation battalion (AEB) and operating out of the corps rear area have unique airspace requirements. Aviation units operating primarily in the communications zone (COMMZ) and corps rear areas have different requirements than those operating in the division area and forward.

In forward portions of the area of operations where close and deep operations are conducted (division rear boundary forward), airspace requirements are normally governed by the threat. Aviation units maneuver over the battlefield, operating below the coordinating altitude, using terrain flight and standardized movement techniques. Attack helicopters and air cavalry, and aviation companies involved in air assault operations, normally conduct combat operations as a tactical formation (unit) and respond to the tactical directions of an aviation command and control system. As such, ACA policy and procedures concerning air traffic management, identification of airspace users, and flight following are implemented differently than for aircraft operating in the COMMZ and corps rear area, or in an area designated as controlled airspace. Aviation elements of corps and echelons above corps normally conduct combat service support missions as small elements or individual flight crews. As such, they operate under their own control rather than under the control of their parent command and control system. When operating in the main battle area, these aircraft must communicate and coordinate with the commander of the area of operations that they are transiting over, or that they are supporting.

In the main battle area, air traffic generally operates in the terrain flight environment. Aircraft must be free to provide rapid, flexible response to the requirements of the commander. This mandates tactical flexibility in airspace control procedures. Aviation units in this area employ procedural control measures. Attack helicopter battalions and air cavalry units exercise procedural control over forces through the command and control system. They use such techniques as assignment of objectives and use of sectors or zones, axis of advance, phase lines, boundaries, battle positions, assembly areas, forward arming and refueling points (FARPs), attack positions, and other standard operational procedures.

In the rear operations area (division rear boundary to corps rear boundary), air traffic usually transits along axes perpendicular to the FLOT between division support areas, key corps support command facilities (major base clusters), airfields, and command and control sites. Movement is usually predictable, follows routes which afford ease of navigation, provides masking from the threat, avoids restricted areas and other hazards, and is at greater flight altitudes. Aircraft operations are managed primarily by adhering to standard airspace control measures and more positive means of control. Adherence to IFF procedures, flight following requirements, and monitoring air traffic services facilities has greater emphasis in this area. Additional coordination is required when transiting through airspace subsectors. (For further information on aviation operations, refer to FM 1-100.)

FIRE SUPPORT OPERATIONS

Fires from mortars, cannon and rocket artillery, and guided missiles pose a potential hazard to friendly aircraft activities. The highest probability of conflict between aircraft and surface-to-surface indirect weapons fire occurs at relatively low altitudes in the immediate vicinity of firing battery (platoon) locations and target impact areas.

The field artillery facilitates the rapid engagement of targets and, at the same time, provides safeguards for friendly forces by using fire support coordination measures and a network of fire support teams, liaison

parties, and fire support elements (FSEs). Fire support coordination measures allow fire support systems to discriminate friendly from enemy employ fires across boundaries, and coordinate the joint engagement of targets. Interface between FSE and A²C² element representatives ensures requirements are coordinated rapidly and information exchanged.

To reduce potential conflicts between surface-to-surface indirect fires and aircraft, information pertaining to firing battery locations and fire support plans and activities is provided to the A²C² element. The A²C² element disseminates this information to all aviation, air traffic services (ATS), and tactical air elements. Additionally, the close interface between the FSE and the A²C² element ensures that planned artillery fires are routinely coordinated with air operations, and planned air activities are coordinated with ground operations. Such coordination is essential so that fires, air operations, and ground operations do not interfere with each other. For example, an uncoordinated deep attack by the Army fire support system against an enemy force could result in an unexpected repositioning of threat air defense just prior to a planned air strike. Similarly, an uncoordinated air mission beyond the fire support coordination line (FSCL) could disrupt and delay precisely the wrong enemy force and, in the process, interfere with the ground scheme of maneuver. (For further information on fire support coordination and coordination measures, refer to FM 6-20).

AIR DEFENSE ARTILLERY OPERATIONS

Air defense artillery fires are controlled by rules and procedures established by the area air defense commander. The AADC manages the air battle and the integrated air defense system through a combination of command and control systems (positive control) and procedures (procedural control). Two categories of air defense command and control procedures that impact on A²C² are rules of engagement and supplemental fire control measures.

Rules of engagement are the positive and procedural management directives which specify the circumstances and limitations under which air defense artillery forces initiate or continue combat engagements. There are seven components of rules of engagement. These components are--

- Right of self-defense,
- Hostile criteria,
- Level of control,
- Weapons control status,
- Modes of control,
- Autonomous operations, and
- Fire control orders.

Supplemental fire control measures for air defense artillery include--

- Air defense operations area,
- Weapons engagement zone,
- High-density airspace control zone (HIDACZ), and
- Temporary airspace restrictions.

Air battle management includes airspace control as well as air defense command and control. Generally, two basic methods have been established to exercise air battle management--positive management and procedural management. Positive management relies upon real-time data from radars; identification, friend

or foe (IFF); computers; digital data links; and communications equipment. Procedural management relies upon the use of tactics, techniques, and procedures, such as airspace segmented by volume and time, and use of rules of engagement and weapons control statuses.

In forward area air defense (FAAD), the primary goal of airspace control is to avoid engaging friendly fixed-wing or rotary-wing aircraft while imposing as few constraints as possible on both aircraft and FAAD systems. Achieving this goal involves the development of procedures to be employed by FAAD and aircraft as well as a command and control system to support the timely dissemination of procedural information.

Army ADA operations are controlled from command posts (CPs) established at Army AD command through platoon levels. The fire direction centers (FDCs) coordinating the fire of Hawk and Patriot fire units are located at ADA brigade and battalion levels. The FDCs are supported by local radars and automated C^2 systems tied either to the Air Force control and reporting center (CRC) or the control and reporting post (CRP) of the sector. Chaparral, Vulcan, and Stinger CPs operate manually and depend on voice communications and procedural methods of control. The FDCs and CPs are key ADA control facilities in the corps and division areas and are integral parts of the A^2C^2 system. (For further information on ADA operations, refer to FM 44-1.)

SPECIAL ELECTRONIC MISSION AIRCRAFT OPERATIONS

The corps relies on the military intelligence (MI) brigade to satisfy much of its information needs. Brigade ground-based systems support the divisions and focus on close-in targets. Aerial SEMA collection assets provide general support to the corps concentrating on deeper targets.

The SEMA assets of the MI brigade are assigned to the aerial exploitation battalion. These SEMA assets include the Guardrail and Quick Look systems of the aviation company (electronic warfare), and side-looking airborne radar (SLAR) aircraft of the aviation company (aerial surveillance). (For additional information on the AEB, refer to FM 34-22.)

The AEB SEMA assets conduct flight operations in airspace generally within the corps area of operations, well behind the FLOT and above the coordinating altitude. Flight profiles for these aircraft are situationally dependent and are based on mission requirements, aircraft and sensor capabilities, weather, and the threat from surface-to-air missiles and fighter aircraft.

HELIBORNE ELECTRONIC WARFARE OPERATIONS

Quick Fix is a tactical, heliborne intercept and electronic countermeasures system deployed on a modified utility helicopter. Quick Fix helicopters are organic to the division, separate brigade, and armored cavalry regiment.

As with SEMA airspace requirements, Quick Fix flight profiles are situationally dependent on mission requirements, aircraft and system capabilities, air defense threat, and weather. A flight profile requires airspace within the division or corps area of operations and at altitudes above the coordinating altitude. In addition to its airspace requirements, Quick Fix requires the monitoring of electronic warfare (EW) operations to coordinate the use of the electromagnetic spectrum by all forces.

REMOTELY PILOTED VEHICLE OPERATIONS

Remotely piloted vehicles (RPVs) are assigned to RPV batteries, which are assigned to the corps field

artillery. RPV batteries are normally attached to a division to support target acquisition and intelligence missions.

The RPV battery contains the air vehicles, ground forward control stations (FCSs), central launch and recovery sections (CLRSs), and battery headquarters elements. When the battery is attached to a division, the allocation of CLRSs and FCSs, as well as RPV time, is determined by the division G3 in coordination with the G2, fire support officer, and RPV battery commander.

The CLRS is normally positioned near the brigade rear boundary. The CLRS conducts the launch, recovery, and hand off to the FCS of the air vehicles. The FCS controls the RPV flight from a forward position near the FLOT. Employment depth, altitude, and mission duration (flight profile) are governed by weather mission requirements, visibility, fuel capacity of the air vehicle, and data link limitations between the FCS and the vehicle.

Because of their small size, agility, and limited ability to see-and-avoid other aircraft, RPVs pose a limited operational hazard to manned aircraft operating within the same general area. Army helicopters and low-flying close air support (CAS) aircraft generally operate at altitudes below the RPV flight profile. The only area they must avoid is that airspace within the general area of the CLRS. There are situations where CAS, battlefield air interdiction (BAI)/air interdiction (AI), and tactical reconnaissance aircraft may be operating at the same altitude and within the same area as the RPV. Resolution of airspace conflicts must be accomplished to avoid operational conflicts, and procedural or positive measures employed as appropriate. If an RPV unit is supporting the division, the RPV battery commander must be an on-call member of the division A^2C^2 element.

Unmanned aerial vehicles (UAVs) are being introduced into the Army force structure. The intelligence and electronic warfare (IEW) unmanned aerial vehicle is designed to satisfy IEW requirements. The IEW UAV will be organic to the corps military intelligence brigade and to selected commands. The IEW UAV differs from the fire support system RPV in that the IEW UAV system will operate out of the corps or division rear area; it will operate at greater depths forward of the FLOT, and for longer durations; and it will have different launch and recovery procedures.

Airspace control considerations and requirements for IEW UAV operations are generally similar to those addressed for RPV operations. The A^2C^2 system coordinates and integrates UAV airspace requirements through close and continuous interface among the A^2C^2 element, the IEW UAV element and its parent headquarters, and the intelligence cell of the corps main CP.

INTRATHEATER AIRLIFT OPERATIONS

Airlift refers to air transport of supplies, personnel, and equipment by Army rotary wing aircraft and by Air Force intratheater fixed-wing aircraft. Airlift operations include all missions except those involving the movement of combat forces to contact in an objective area. Airlift operations support requirements of all components of a joint force. Airlift forces, Army and Air Force, have airspace utilization requirements which must be considered by airlift planners and by airspace control systems of supported and supporting elements.

The theater COMMZ normally has main and intermediate operating bases (airfields) capable of accepting large intertheater aircraft of the Air Force Military Airlift Command. While the Air Force controls the air terminals, Army aviation may also use these airfields for their airlift operations.

The corps area normally contains small austere airfields that handle intratheater Air Force aircraft as well as

Army aviation forces supporting airlift requirements. Unless the division area is relatively fixed, it normally does not have airfields that can accept Air Force aircraft conducting routine airlift support. Intratheater fixed-wing aircraft fly airlift missions in support of close and deep operations using air-land or airdrop delivery methods. The employment of airlift forward of the brigade rear boundary is a command decision based on available assets, mission priority, and factors of mission, enemy, terrain, troops and time available (METT-T). Army rotary-wing aircraft of the corps and division aviation brigade conduct airlift operations throughout the division area, and in support of deep operations.

Airspace requirements for airlift missions within the corps or division area require coordination between airlift managers and planners and members of the A²C² team. These key individuals include the corps and division movement control officer (MCO), transportation officer, liaison officer provided by the aviation brigade (when aviation assets are under operational control (OPCON) of the MCO for logistical missions), tactical airlift liaison officer, and members of the appropriate A²C² elements. The A²C² system, as part of the theater integrated airspace control system, coordinates airspace requirements, establishes the necessary routes and such measures as drop zone restricted operating areas, and provides navigational aids (NAVAIDS) and air traffic services. Air Force combat control teams (CCTs) support the conduct of deep airlift operations. The mission of the CCT is to establish assault drop zones, landing zones, and extraction zones in austere and high threat environments. This mission includes placing initial en route and terminal navigation aids and providing air traffic control. Army ATS units and facilities within the corps and division area also provide this support for all intratheater airlift aircraft. (For further information on airlift operations, refer to FM 100-27 and FM 55-40.)

AMPHIBIOUS OPERATIONS

Army forces participating in amphibious operations exercise airspace control techniques and procedures under the guidance and direction of the commander, amphibious task force (CATF). The joint force commander assigns to the CATF the amphibious objective area, which includes airspace of defined proportions. To ensure unity of effort in overall airspace control, the CATF coordinates airspace control operations within the defined airspace with the ACA responsible for airspace control in the surrounding airspace control area. At the termination of the amphibious operation, the assigned airspace is disestablished, and the airspace control functions are transferred to the ACA for that designated area or sector.

The naval tactical air control system (NTACS) contains those naval command, control, and communications facilities responsible for airspace control functions during amphibious operations. The major elements of the NTACS include:

- Tactical air control center (TACC).
- Tactical air direction center (TADC).
- Supporting arms coordination center (SACC) (similar to the Army's fire support element).
- Air support control section (ASCS) (similar functions as the Air Force's air support operations center).
- Antiair warfare section (AWS) (similar functions as the control and reporting center).
- Helicopter direction center.

Army forces operating within the amphibious objective area with requirements to use airspace interface with the CATF's tactical air control system through the elements of the A²C² system in the same manner as with the Air Force tactical air control system (TACS). Liaison and the collocation of functional elements

provide timely coordination and integration of airspace users.

As the tactical situation develops and command and control agencies of the amphibious task force are established ashore, control of gunfire and missile support transfers from the CATF to the landing force commander. At the discretion of the CATF, control of air operations in the amphibious objective area passes to the appropriate commander ashore.

With selected control functions transferred to the landing force, Army forces ashore in the amphibious objective area coordinate fire support, air operations, and air defense, as these functions affect airspace, with the appropriate command and control elements of the landing force commander.

If the landing force commander is the commander of a Marine Air-Ground Task Force (MAGTF), the two airspace control facilities within the MAGTF with which the A²C² system must interface are the direct air support center (DASC) and the tactical air operations center (TAOC). The TAOC is the senior facility responsible for air defense and air traffic control. The DASC is equivalent to the division A²C² element and the air support operations center at corps. The DASC is collocated with the MAGTF fire support coordination center; aircraft conducting close air support missions are controlled by this element. (For further information on amphibious operations, refer to FM 31-11.)

JOINT AND COMBINED ARMS OPERATIONS

Coordination and integration of Army airspace operational requirements with those of other component and national forces are conducted at all echelons of command. This coordination and integration effort is accomplished primarily through the interface by the A²C² system with the tactical air control systems of the other component and national forces.

THE INTEGRATED AIRSPACE CONTROL SYSTEM

The integrated airspace control system within a joint force is an arrangement of those organizations, personnel, facilities policies, and procedures required to perform airspace control functions. The ACA fulfills his responsibilities through the integrated airspace control system. This system is structured around the Air Force tactical air control system (TACS) and includes the Army airspace command and control system (A²C²). If the joint force includes US Marine Corps or US Navy Forces, their air command and control systems are integrated into the airspace control system.

US AIR FORCE TACTICAL AIR CONTROL SYSTEM

The USAF TACS (Figure 1-1) is the organization, personnel, procedures, and equipment necessary to plan, direct, and control tactical air operations and to coordinate air operations with other services and allied forces. It is comprised of control agencies and communications-electronics facilities that provide the means for centralized control and decentralized execution of combat operations. Airspace control is a function of many elements of the TACS. The following paragraphs describe the organization and responsibilities of the generic TACS elements to illustrate the various functions of airspace control in a combat zone. Within established theaters, elements of the TACS may be given different names, or their functions may be performed by different organizations, but all basic airspace control functions are provided.

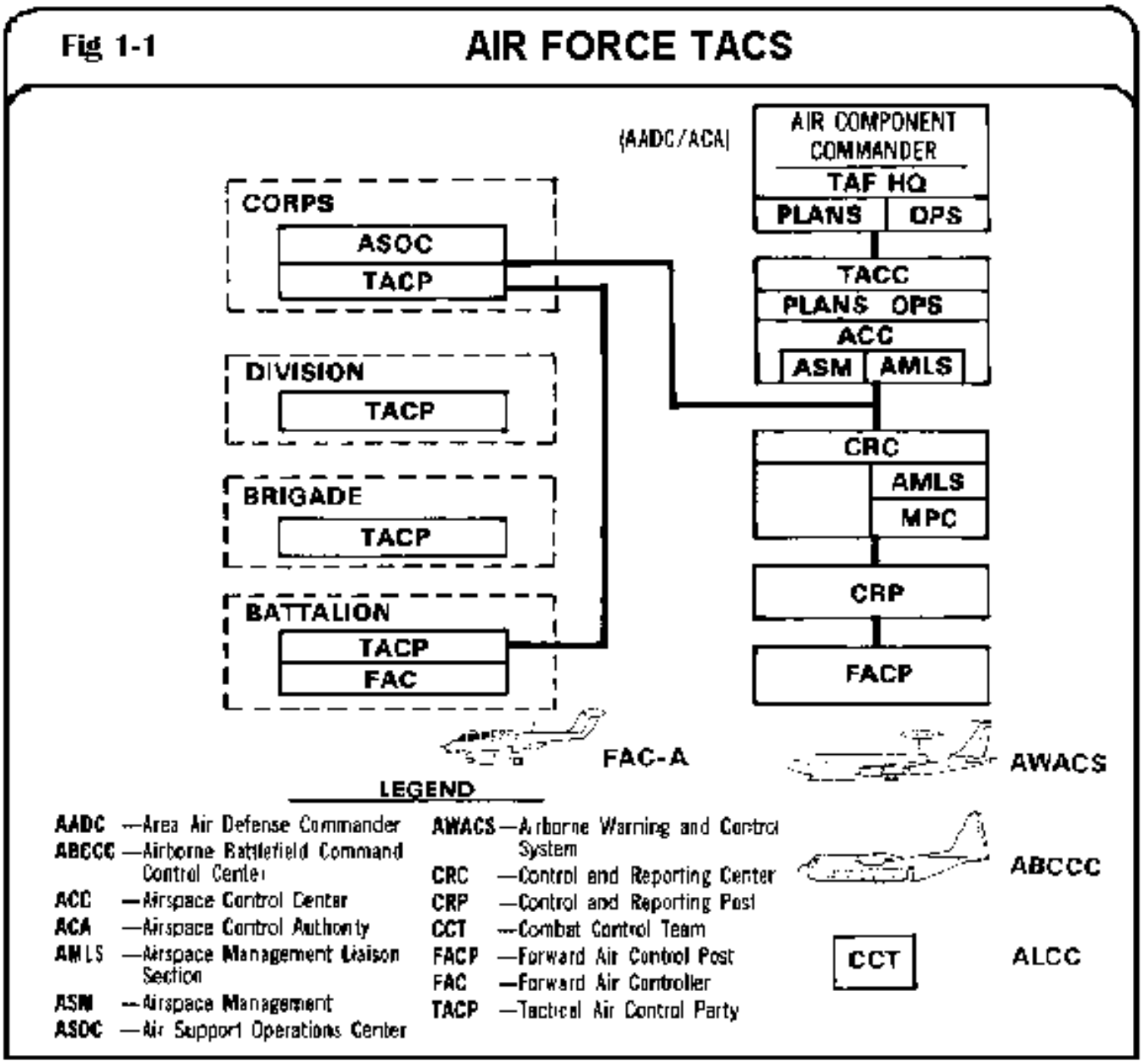
Tactical Air Control Center. The TACC is the senior air operations element of the TACS. Its functions include the centralized planning, directing, controlling, and coordinating of air operations for the JFACC within the designated area of operations. Within the TACC, the airspace control center is the focus for the

ACA responsibilities.

The TACC is responsible for formulating airspace control procedures and coordinating airspace control activities that complement planned tactical mission requirements. The TACC also coordinates airspace use and ensures that airspace control plans are compatible with current operational requirements and capabilities. In joint operations, the TACC includes the battlefield coordination element (BCE) representing the LCC.

Fig 1-1

AIR FORCE TACS



Airspace Control Center. The airspace control center is the element within the TACC through which the ACA coordinates and integrates the use of airspace in a combat area. The airspace control center is manned with Air Force AD and air traffic control (ATC) personnel. This allows for the development of an airspace control plan that integrates air defense and ATC. The airspace control center is responsible for--

- Formulating ATC policies, plans, and procedures and coordinating ATC activities that complement

planned tactical mission requirements.

- Coordinating airspace utilization with other component air traffic control agencies.
- Ensuring that air traffic control plans are compatible with current operational capabilities.
- Obtaining appropriate representation from the other agencies and components to man and operate the airspace management liaison section (AMLS) of the airspace control center. Army personnel from the BCE's A^2C^2 section provide this representation.
- Evaluating requests and establishing airspace restrictions and special procedures for the use of airspace.
- Coordinating and publishing the airspace control order (ACO).

Control and Reporting Center. The CRC is directly subordinate to the TACC and is the primary TACS radar element concerned with decentralized execution of air defense and airspace control functions. Within its area of responsibility, the CRC directs the region or sector air defense; provides threat warnings to friendly aircraft; provides aircraft guidance or monitoring for both offensive and defensive missions; relays mission changes to airborne aircraft; coordinates control of missions with subordinate TACS elements and other agencies; and provides positive identification of aircraft.

Liaison is established with other components to secure airspace usage data from related control systems. For example, the Army flight operations center (FOC) liaison element is collocated or electronically linked with the CRC.

The CRC detects and identifies hostile airborne objects, recommends changes in air defense warning conditions, specifies weapons status, and scrambles or diverts air defense capable aircraft. During joint operations, the CRC assigns appropriate hostile airborne targets to the Army air defense system through the air defense liaison officer (ADLO) located within the CRC.

Airspace control is a function of the CRC. As the manager of the airspace control function, the CRC battle commander has the following specific responsibilities:

- Implement guidance from higher authority on airspace and tactical control procedures and advise the TACC of necessary changes to current operating procedures.
- Coordinate the use of airspace with appropriate air defense agencies.
- Coordinate procedures with terminal air traffic control elements within his assigned sector.

Message Processing Center. The TACS MPC provides the automatic transfer of tactical data over digital data links between elements of the TACS, including airborne warning and control system (AWACS), and other component command and control systems.

Control and Reporting Post. The CRP is subordinate to the CRC and provides radar surveillance and control within an assigned subsector. The CRP has capabilities similar to the CRC and may assume CRC functions when directed. One or more CRPs may be employed, depending on area size, terrain features, and anticipated level of air operations.

Airspace Management Liaison Section. Airspace management liaison sections are established at appropriate elements within the airspace control system and are manned by Army personnel along with representatives from other components involved to include Allied representation. The AMLS coordinates for operational commanders airspace requirements and requests for establishment of special procedures for the use of airspace. These sections also assist the ACA in coordinating and integrating flight operations and

air warning information of the components.

Forward Air Control Post. The FACP is a mobile radar element subordinate to the CRCC or CRP. It normally deploys into forward areas to extend radar coverage and to provide control of air operations, early warning, and gap-filler service. Because of its mobile and compact design the FACP can move quickly to provide required radar coverage in changing tactical situations.

Airborne Elements of the Tactical Air Control System. The AETACS consists of the airborne battlefield command control center (ABCCC) and the AWACS. The ABCCC is an airborne control element of the TACS which provides the capability to control and coordinate the execution of tactical air operations in forward battle areas, normally to extend control beyond the range of ground-based TACS elements. The ABCCC may also function as an airborne air support operations center (ASOC) or as a limited TACC during the early stages of a contingency until the TACC is employed.

The AWACS is an airborne control element of a TACS that provides global mobility and a high degree of command and control flexibility. The AWACS may be used during the deployment, employment, or redeployment phases of tactical air operations. The AWACS extends radar and radio coverage beyond that attainable by ground elements. This permits air defense warning, aircraft control navigational assistance, coordination of air rescue efforts, and changes to tactical missions at distances well beyond the FLOT. In addition, AWACS can perform airspace control functions until ground-based TACS facilities are positioned, or during degraded operations. The AWACS may also be used in operations of short duration that do not warrant the use of ground elements or when the tactical, political, or geographic situation denies access to secure land areas. The TACC normally manages the employment of AWACS assets in support of both offensive and defensive operations.

Tactical Air Control Party. The TACP requests, coordinates, and controls tactical air support for ground forces, advises and assists ground commanders, and meets other related tactical air support special requirements of individual ground force echelons. TACPs above brigade do not normally perform forward air controller functions.

Forward Air Controller. The FAC is a member of the TACP who controls close air support aircraft and integrates air attacks with fire and maneuver of supported ground forces. He may operate from airborne or ground positions. The FAC will maintain contact with attack aircraft, other TACS elements, and the appropriate fire support coordinator or ground commander. His airspace functions include coordination of air attacks with field artillery, ADA, and appropriate aviation elements of the supported force in the target area.

Combat Control Team. The CCT provides airspace control services in a theater of operations at remote assault zones (such as drop or landing zones). It also deploys clandestinely ahead of main assault forces, providing a variety of services such as weather observations, reconnaissance and intelligence reports, en route and terminal NAVAIDs, and communications. Additionally, it moves with the main ground force to provide terminal assistance to airlift forces engaged in resupply or extraction operations. When assigned to Air Force special operations forces, the CCT accomplishes other missions unique to unconventional warfare. CCTs may not be available to support all airlift missions in the corps and division area. Army tactical ATS elements or pathfinders may be required to provide airspace control services as required. Such requirements will be coordinated with the airlift liaison officer, G4, movement control center, and corps or division A^2C^2 element.

ARMY AIRSPACE COMMAND AND CONTROL SYSTEM

The land component commander exercises command of all assigned land forces and is responsible for planning and executing ground combat operations. Subject to the operational C^2 of the joint force commander, the land component commander (LCC) is responsible for merging C^2 and A^2C^2 for assigned forces. The LCC's responsibilities for accomplishing the functional activity of A^2C^2 include--

- Tactically employing ground forces.
- Using FAAD weapons systems according to the policies and procedures established by the area air defense commander.
- Coordinating the employment of his forces, aircraft, and weapons with other service components as required by the tactical situation.
- Providing airspace control in designated special use airspace under policies and procedures established by the ACA.
- Forwarding requests for establishment of airspace control measures to the ACA for approval.
- Developing airspace control plans and procedures for assigned forces under the policies and procedures of the ACA.
- Establishing and maintaining interface with the ACA and the integrated airspace control system.

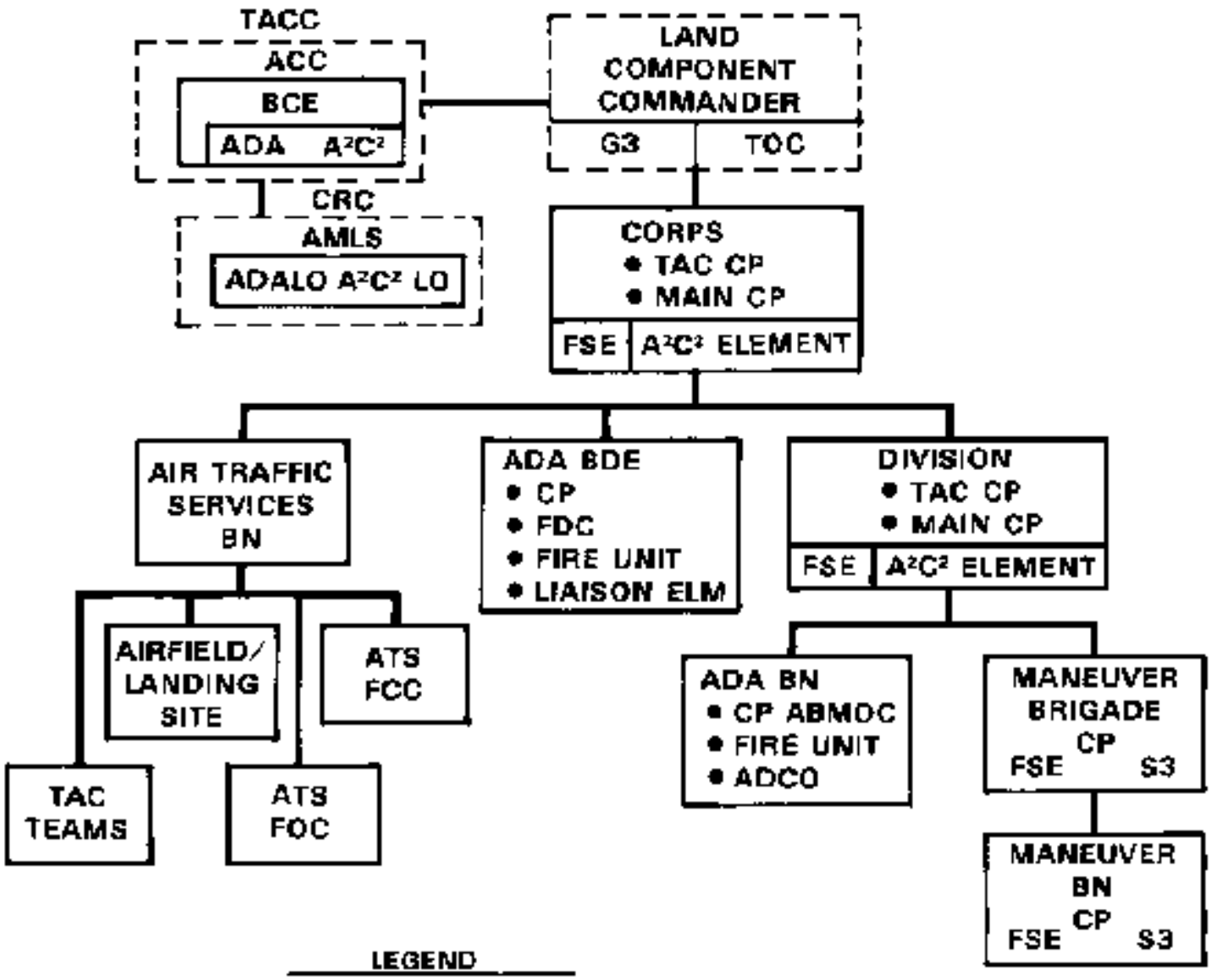
The land component commander of a theater of operations is assigned the responsibility to design and direct major ground operations for the theater of operations. A theater army as the Army service component command has support responsibilities and is responsible for the COMMZ.

The LCC exercises control over assigned forces through a tactical operations center. The assigned land assets of the LCC are controlled and directed through the land component or army group, corps, and division headquarters.

The A^2C^2 system (Figure 1-2) is an arrangement of A^2C^2 staff elements of each command echelon from maneuver battalion through theater army. It includes ADA command and control elements, fire support coordination elements, Army air traffic services facilities, and airspace control liaison personnel with key facilities of the ACA. These staff elements, command and control facilities, and liaison elements are linked by communications and standing operating procedures and by a common understanding of the situation, the mission, and the commander's intent and concept of operations.

Fig 1-2

A²C² SYSTEM



LEGEND

ACC —Airspace Control Center
AMLS —Airspace Management Liaison Section
ATS —Air Traffic Services
ADCO —Air Defense Coordination Officer
BCE —Battlefield Coordination Element
CRC —Control and Reporting Center
FCC —Flight Coordination Center
FOC —Flight Operation Center
FSE —Fire Support Element
ABMOC—Air Battle Management Operations Center

CHAPTER 2

Procedures

Procedures for A²C² are designed to specify airspace control responsibility, define the methods of accomplishing the airspace control function, ensure unity, and standardize the airspace control effort. To be effective, airspace control procedures must be sufficiently flexible and responsive to accommodate rapid changes to planned and ongoing operations.

OBJECT OF A²C² IN C²

Command and control (C²) synchronizes and coordinates combat power on the battlefield and provides the direction to fight. Command and control is defined in JCS Pub 1 as the exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. A command and control system is the means by which commanders employ forces. JCS Pub 1 defines it as a collection of facilities, equipment (to include automation), communications, procedures, and personnel essential to a commander for planning, directing, coordinating, and controlling forces and operations. Another dimension of the battlefield that the commander resources to support him in these efforts is the intelligence production process. The object of A²C² in the C² system is to support the planning process and, during the conduct of operations, link the coordination, integration, regulation, and identification tasks, present the information for decision, and timely distribute information and airspace utilization requirements to all forces.

PLANNING THE BATTLE

A²C² planning is accomplished as part of the normal decision-making process. Staff functions and tasks in support of the planning process are discussed in Chapter 3 of this manual and in FM 101-5. The following points are reinforced: planning must take a forward-looking approach, the planning cycle is continuous, and the commander's intent must be understood.

The tenets of AirLand Battle dictate that staff planners follow certain considerations in developing A²C² plans. They include:

- Limit A²C² plans and associated control measures employed to those necessary to ensure conformity with the tactical plan.
- Make maximum use of procedural means of control. Command and control systems and voice communications provide the means to react to changes.
- Ensure the scheme of maneuver and commander's intent determine and govern the design of the supporting plan.
- Use airspace with maximum freedom consistent with the degree of risk that is acceptable to the commander.
- Structure airspace control measures to facilitate recognition by either aircrews or ground-based weapons crews.
- Where possible, ensure temporary airspace control measures (such as restricted operations zones (ROZs and HIDACZs) are encompassed by the boundaries of the level of command requesting the measure.
- Use coordinating altitudes.
- To enhance mission-oriented command and control for subordinate commanders, structure A²C² plans on the concept of management by exception.
- Provide air traffic services according to the airspace control plan.
- Devise and implement airspace control procedures for two distinct areas. These are the close and deep operations area (division rear boundary and forward to the FSCL), and the rear operations area (corps rear area and COMMZ).

The goal of A²C² planning is to identify the potential for conflicts among airspace users, and to establish the

tactics, techniques, and procedures required to resolve or minimize the potential for these conflicts. These techniques and procedures are reflected in the A²C² plan. This plan may be an A²C² annex to an operation plan (OPLAN) or operation order (OPORD), or it may be an A²C² overlay with a fragmentary order (FRAGO).

Planning will be as detailed as necessary and as the situation and time allows. The urgency of the situation and the time available will dictate whether an A²C² annex is produced. In the development of an A²C² annex only that information required to clarify or amplify what is in the unit SOPs, or to specify the actions and procedures necessary to synchronize the effective use of airspace, is included. In many situations, the fast-paced and dynamic tempo of combat operations causes the A²C² staff to use an A²C² overlay and to issue verbal directives to subordinate forces.

The use of field SOPs, airspace control orders, and the airspace control plan standardizes procedures, reduces the amount of coordination, and provides implementing instructions. The need for an A²C² annex is thus minimized in many situations.

CONDUCTING THE BATTLE

As battles are dynamic they will rarely proceed as foreseen. If the situation is altered, new decisions must be quickly formed, then coordinated and disseminated in order to synchronize subordinate and supporting actions. Once the battle is in progress the A²C² elements at the main and tactical CP continue to monitor the situations of subordinate and parent units and modify plans as required. Agility and initiative are promoted by effective coordination, rapid exchange of information, timely decision making, and rapid issue of orders.

A²C² actions required during the conduct of the battle are the same as those performed during the planning phase. The orientation during the conduct of the battle is reacting to changes in the tactical situation, anticipating future requirements based on the progress of the battle, and facilitating the ability of the commander to influence the battle by the allocation of air assets. This orientation translates into identifying potential airspace conflicts and taking immediate action to resolve the conflict. Conflict resolution is discussed in greater detail later in this chapter.

Organization of the A²C² system facilitates coordination and exchange of information and permits the A²C² elements at the tactical CP and main CP to respond to changing airspace requirements. Electronic means of communications are used in conjunction with the messenger system to disseminate information, airspace control orders, and requests for special restrictive measures. Voice, facsimile, and data systems are available to move information quickly between staff cells and command posts.

With the maneuver control system (MCS), the A²C² system has the capability, via the workstation assigned to the G3/S3 Air, to conduct the battle more effectively and timely. MCS assists the A²C² element by linking all maneuver element CPs and by integrating the AD, intelligence and EW, fire support, and CSS functional areas. MCS decision graphics provide operational data to include selected airspace control measures. Potential for growth within MCS, and fielding of automated systems for each battlefield functional area, greatly enhance near real-time airspace coordination and integration.

Airspace utilization and information displays maintained by the A²C² element within the CP include an airspace utilization and situation map and status boards and charts. Information displayed is keyed to the commander's critical information requirements.

PLANNING CONSIDERATIONS

At corps and echelons above corps (EAC), matters pertaining to the use of airspace, or the requirements of forces to use airspace, must receive prompt attention by the A²C² elements and the current operations cell. At these echelons, particularly the corps, the ability of the commander to influence the conduct of the battle is largely accomplished by the use of air assets. Because air assets can be employed in a relatively short lead time, requirements to coordinate and integrate their airspace requirements with the ongoing ground battle require immediate attention. Current operations actions at the corps (and EAC) are also required when--

- Conflicts that require resolution develop in the corps rear area and COMMZ.
- Corps is directing a specific operation, such as a deep operation.
- Changes to the corps OPORD affecting the use of, or users of, the airspace are directed in response to the tactical situation.
- Conflicts cannot be resolved at a lower echelon.

The discussion of the division A²C² element which follows is also suitable to most functions of the corps A²C² element. The division A²C² element, located at the tactical and main command post, is responsible for the A²C² function within the division's assigned area of operations. Like the corps A²C² element, it operates under the staff supervision of the G3 and conducts both future planning and current execution.

By coordinating with other staff cells within the main CP, the division A²C² element determines which combat, combat support, and CSS activities, requirements, and missions impact on effective A²C². The division A²C² element conducts planning activities and develops the appropriate plans.

The division A²C² element maintains data on ATS facilities, current and planned restrictive measures, and special joint use requirements. Conflicts that cannot be resolved per command guidance, orders, and SOP are sent to the G3 for resolution. The division A²C² element also maintains data on the AD situation, including ADA coverage for use by other tactical operations center (TOC) elements. Hostile air activity data obtained through the G2 and AD channels are provided to the division A²C² element and other elements of the division main CP. When specific details are required, information is requested from the appropriate ADA unit headquarters. The division A²C² element assists the division commander by making recommendations concerning the impact that the ADA weapons control status will have on air operations.

With the supporting ATS unit, the division A²C² element develops plans to provide ATS assistance to aircraft operating within the division area of operations and to those units conducting tactical operations. ATS units supporting the division operate under the operational control of the G3 and may be attached to the aviation brigade for logistical support.

The ATS unit supporting the division is linked with the A²C² system, the host nation ATS, and the TACS. The ATS system supports Army aircraft and aircraft of other component forces operating in the division area of operations, and divisional aviation brigade units conducting tactical operations. It also is the interface between aircraft in flight and the A²C² element at the command post. ATS support includes a broad scope of services such as navigational assistance, flight following assistance, air threat warnings, weather information, notice to airmen, artillery advisories, airfield and landing site terminal control, and other assistance as required to ensure near realtime coordination and integration of air traffic.

The division A²C² element obtains nuclear, biological, and chemical (NBC); field artillery; weather; air threat; and other air operations information that affects the control of airspace. It disseminates this information directly to the appropriate airspace users and ATS facilities.

Aircrews monitor ATS frequencies and may request flight assistance, including flight following and current information on weather, NBC, airspace restrictions, and air operations. When necessary, the division commander may direct mandatory flight following for all aircraft flights in the division rear. Flight following may be accomplished with a unit's flight operations section or with an ATS facility. Each division A²C² element maintains coordination with adjacent division A²C² elements.

Brigades and battalions focus primarily on the execution of the plan or operation. The maneuver brigade commander manages the airspace over his area of responsibility through his staff and through liaison officers (LOs) from the Air Force, Army ADA, and Army aviation. The brigade commander can form a brigade A²C² element from the ADA LO and the Army aviation LO, the brigade fire support officer (FSO), the air liaison officer (ALO), and the brigade S3 Air.

The LOs function as the brigade special staff officers for their specific functional area. They advise the brigade commander and staff on their areas and on related A²C² matters. The LOs receive information from their parent battalion TOC or from the LO at the division A²C² element.

The brigade may retain responsibility for control of battalion airspace. If not, this responsibility is assumed by the battalion staff. The maneuver battalion commander is responsible for control of airspace in the battalion area and coordinates with airspace users directly supporting battalion operations. At battalion, no special staff element is dedicated to A²C². The commander routinely coordinates with the staff, primarily the S3, who is assisted by the S3 Air, the ALO, the fire support coordinator (FSCOORD), the subordinate unit commanders, and the representatives from any supporting units (for example, an ADA platoon placed in support of the battalion). To assign responsibility, the S3 Air is designated as the principal staff executor for battalion A²C² matters.

METHODS OF AIRSPACE CONTROL

The purpose of airspace control is to maximize the effectiveness of combat operations. Airspace control systems are established to allow all joint force members use of the airspace in order to apply timely efficient, and mutually supporting combat power. The ACA and joint force integrated airspace control system require the means to provide air traffic control services, identification, and coordination of airspace use. Accordingly such means may be in the form of positive control, procedural control, or a combination of positive and procedural control.

Positive control is a method of airspace control that uses electronic means. It relies on positive identification, tracking, and direction of aircraft within an airspace. Positive control is provided by--

- Radar control, the continuous control of aircraft using radar and identification friend or foe (IFF)/selective identification feature (SIF) authentication procedure returns.
- Monitoring service, the general surveillance of known air traffic movements by reference to radar scope presentations or other means.

Procedural control is a method of airspace control that relies on a combination of previously agreed on and promulgated orders and procedures. It is not accomplished by electronic means.

The precise definitions of the methods of airspace control are meaningful only when taken in the context that airspace control in the combat zone varies between the two extremes of positive and procedural. The two methods of control are fully compatible. Their relative significance at any time depends on the airspace control facilities available and the degree of threat interference. The tactical situation demands a mixture of

the two methods. The Army's primary methodology is for the use of procedural control with positive control employed in those situations where such control is required and possible.

For Army purposes, positive control of assigned forces and airspace users depends on the command and control system. In airspace control, for a commander to exercise positive control, two conditions must exist:

- Means must exist to identify and locate airspace users, and
- Continuous communications must be maintained with airspace users.

A Guardrail mission flown by the AEB, for example, normally operates in a positive control environment. The control and reporting center, or a subordinate radar facility, provides a monitoring service to the aircraft and passes advisory information, resolves air traffic conflict, or provides navigation assistance. Two A-10 aircraft flying a CAS mission, operating within a battalion area of operation and in direct contact with the forward air controller, are integrated into the airspace through the battalion commander's A²C² cell. They are under the positive control of the air-ground operations team. Aircraft operating from an airfield in the corps area are under positive control of the ATS unit providing terminal control services at the airfield.

If positive control cannot be used, or is inappropriate to the situation, then procedural airspace control must be employed. Means of procedural control available to the A²C² element include ACOs, special instructions in the air tasking order (ATO), and ACA techniques, procedures, and rules promulgated by the airspace control plans. Airspace control annexes to OPLANS (OPORDS) and field SOPs provide additional techniques and procedures by which procedural control can be employed and executed for various situations.

Operations such as fire support, air defense artillery, tactical air, attack helicopter, and air assault have standardized operational tactics, techniques, and procedures. They provide the command and control system and the A²C² system a full scope of procedural control methods to facilitate airspace control for assigned Army forces. FM 101-5-1 provides standardized graphics used to represent the intent of the commander and to procedurally control forces.

In the example of two attack helicopter battalions conducting a deliberate attack of an armored column within a brigade's sector of operations, the commander uses standardized operational control measures. Such measures include designation of assembly areas, FARPS, axes or routes of attack phase lines, boundaries, attack positions, and engagement areas. These standardized operational measures procedurally control attack helicopters in the brigade's airspace. When the command and control system for these forces is added, commanders (through direct voice communications with all elements) are using a mix of positive and procedural measures to control airspace users.

Consider the example of a BAI force package, transiting from operating bases in the COMMZ through the corps and division areas, crossing the FLOT, en route to a target area. An interconnecting series of air routes, transit corridors, low-level transit routes, and altitude and airspeed restrictions procedurally accommodate the airspace requirements of this force. Synchronized with this BAI mission, ADA units operating within the area may have their operations largely controlled by rules and procedures established by the AADC. These procedural control measures, known as rules of engagement, when used in conjunction with weapons control status and weapons engagement zones, are also available to procedurally control airspace.

PROCEDURAL METHODS OF AIRSPACE CONTROL

Tactical operations require the commander to employ a combination of positive and procedural methods of control. The C^2 system, A^2C^2 system, and Air Force TACS provide the necessary organization and facilities to exercise positive control. Joint, Army-specific, and theater-specific airspace control measures, plus standard Army operational procedures, afford the necessary methods for the procedural control of airspace. The Army's airspace control methodology emphasizes the procedural control of airspace, particularly in the main battle area (division rear boundary and forward).

AIRSPACE CONTROL MEASURES

This subparagraph implements NATO STANAG 3805 (Edition Two) and ASCC AIR STD 45/6

Airspace control measures (means) afford the commander a variety of procedural methods of controlling airspace users and airspace. Airspace control measures are the rules and mechanisms promulgated by joint and allied doctrine, and defined by the theater airspace control plan. They are defined in general terms according to the normal usage associated with the control measure. The precise dimension of various control measures (for example, low-level transit routes), and those techniques used in their arrangement and application, are specified and defined by the theater airspace control plan and ACA directives.

Airspace control measures (means) available to provide procedural control for airspace users include the following:

MEASURES	USAGE
● **Corridors and routes**:	
Air route	NATO/ASCC
Low-level transit route (LLTR)	NATO/ASCC
Minimum risk rout IMRR)	US
Standard use Army aviation flight route (SAAFR)	US
Special corridor	NATO
Transit corridor	NATO
● **Zones**	
Base defense zone (BDZ)	NATO
High-density airspace control zone (HIDACZ)	US/NATO/ASCC
Restricted operations zone (ROZ)	US/NATO/ASCC
Weapons free zone (WFZ)	NATO
● **Flight levels:**	US/NATO
Coordinating altitude (level)	US/NATO
Traverse level	US/NATO
● **Other airspace subdivisions or control measures**:	US/NATO
Airspace coordination area	US/NATO
Amphibious objective area	US/NATO
Terminal control area (zone)	US/NATO
Weapons engagement zone	US/NATO

Control point Way-point Time slot	NATO/ASCC

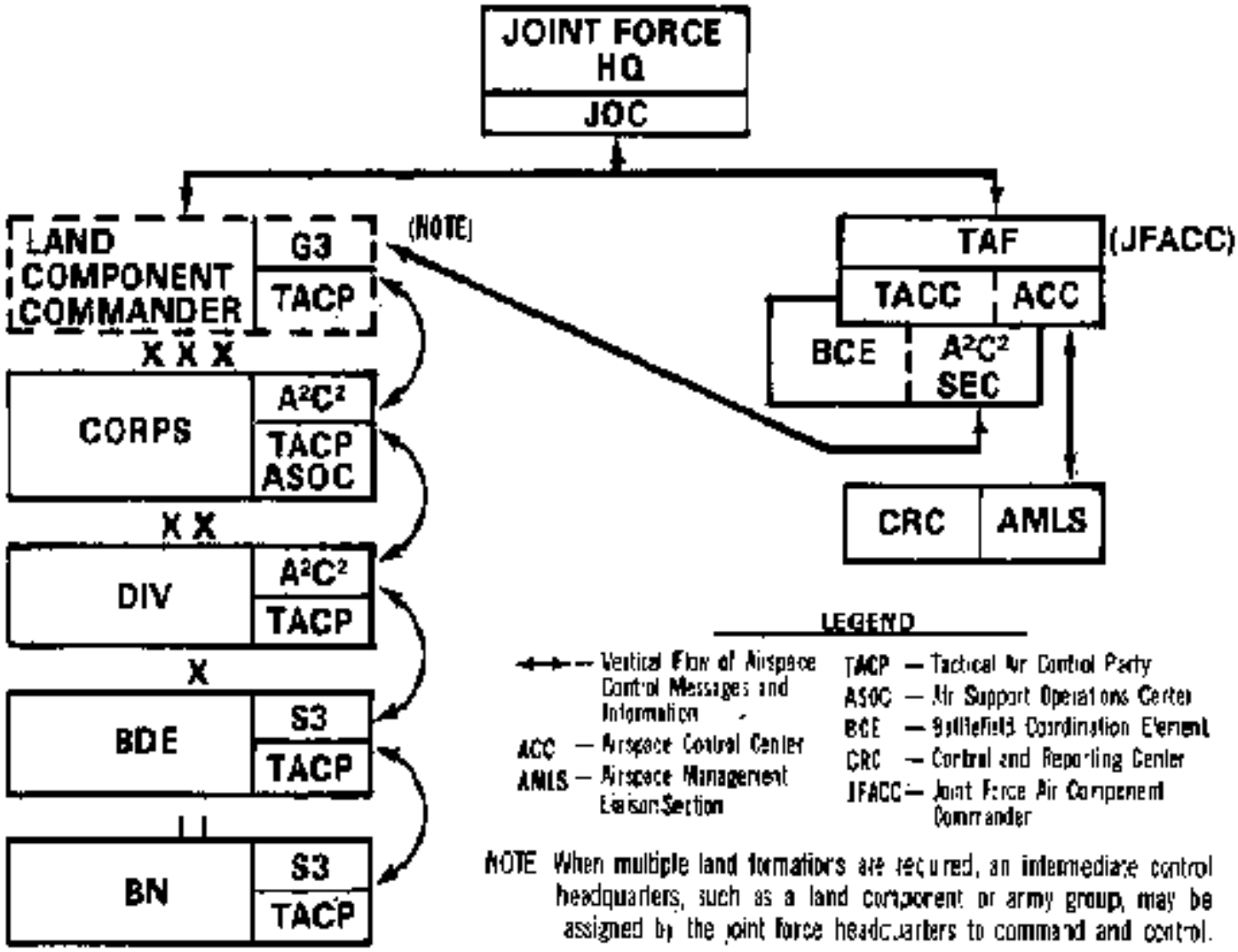
Airspace control measures established by the airspace control plan may be preplanned to support various OPLANS of the joint and combined force. For example, preplanned corridors, high-density airspace control zones, base defense zones, way-points, and other control points are established to support operational requirements and anticipated changes to the tactical situation. They are assigned code names or numbers keyed to key terrain features or named areas of interest. These preplanned control measures, available on call, allow rapid adjustments to changes in the tactical situation.

When established, airspace control measures accomplish one or more of the following functions:

- Reserve airspace for specific airspace users.
- Restrict actions of airspace users.
- Control actions of specific airspace
- Require airspace users to accomplish specific actions.

Establishing airspace control measures requires the approval of the ACA. Commanders inform the ACA of their requirements for temporary airspace control measures through the appropriate airspace control system. The use of airspace request formats facilitates and standardizes the process of requesting the establishment of airspace control measures. Airspace request formats include a statement of requirements to include the location, lateral and vertical limits of the affected airspace, and time period during which the airspace restrictions apply. Appropriate remarks may be included to amplify or clarify unique operational requirements or conditions governing the use of the requested airspace. The airspace control plan describes specific procedures for requesting and activating special use airspace. The Army forwards requests through the operational chain as depicted at Figure 2-1.

Fig 2-1 AIRSPACE CONTROL CHANNELS



The A²C² element at each command echelon reviews requests to ensure that information is complete and requested control measure(s) support the commander's concept of operations. It also determines if the activated measure will impact on other airspace users in the area of operations.

The A²C² section within the TACC's airspace control center coordinates all Army requirements for airspace control measures with the appropriate staff elements. Army liaison officers from each corps at the TACC are sources of additional information related to the corps' concept of operations. If needed, they can clarify or negotiate adjustments to requirements for airspace control measures in the corps area. Once the airspace control measure is approved by the ACA, it will be activated at the requested effective time.

Approved airspace control measures are disseminated to all appropriate elements of the joint force in accord with procedures identified in the airspace control plan. Methods for disseminating airspace control measures and other airspace control operational directives and information are discussed in Appendix B. These methods include:

- JINTACCS, US, and NATO message formats.
- Airspace tasking order (Section I, SPINS).

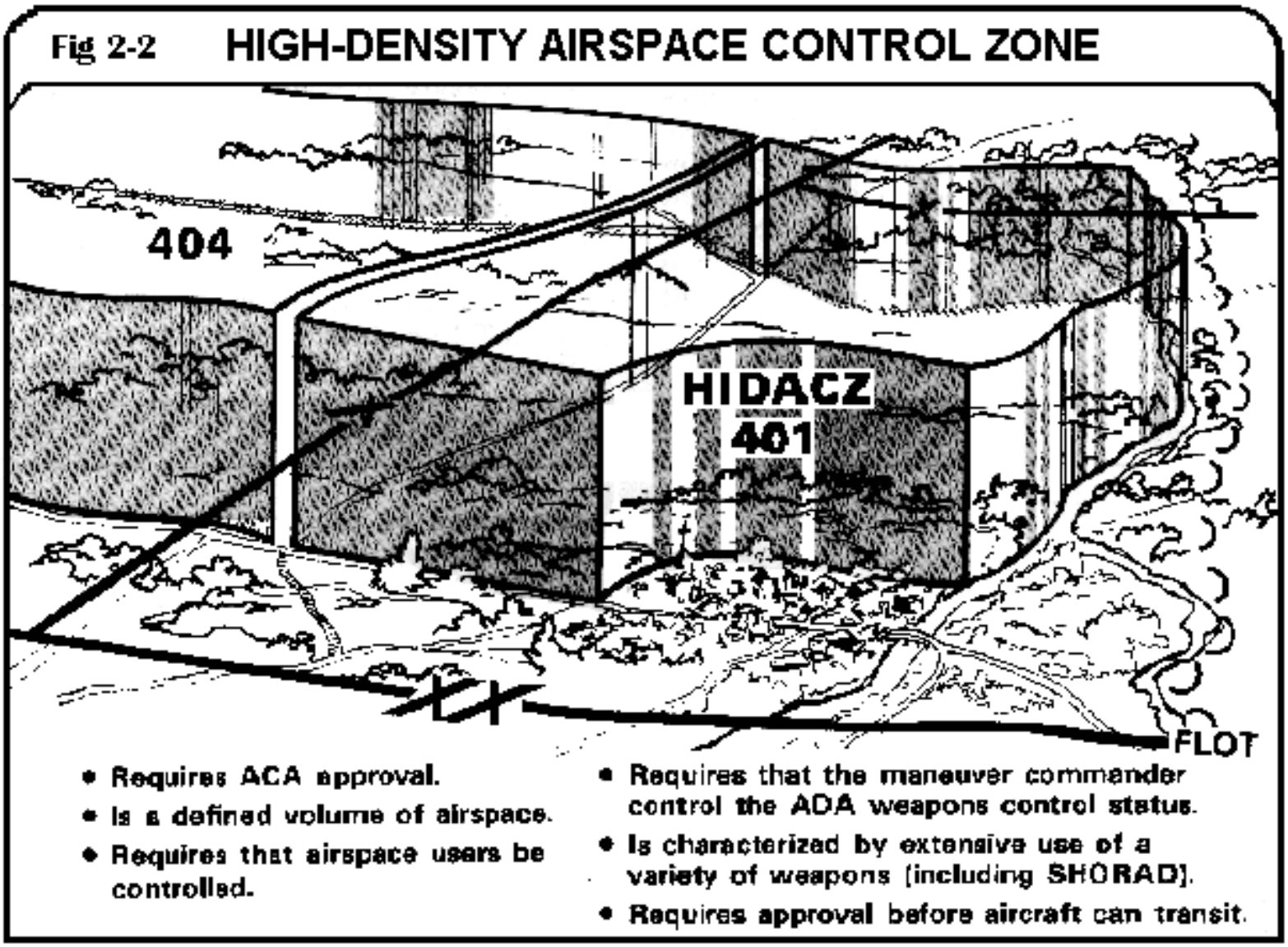
- Airspace control order.
- Airspace control annex, with overlay, to an operations plan or order.

Nine commonly used airspace control measures are utilized by members of the combined arms team and services. These airspace control measures and the techniques governing their use are discussed in the following paragraphs.

High-Density Airspace Control Zone. A HIDACZ (see Figure 2-2) is a defined area of airspace that is requested by the maneuver force commander, normally division and above. A HIDACZ reserves airspace and controls which airspace users have access to the zone. The HIDACZ allows the commander to restrict a volume of airspace from users not involved with his operations. The specific authority he is allowed to exercise within the HIDACZ depends on the maneuver commander's request, the situation, and the theater. By establishing the HIDACZ, the commander forces other airspace users to operate elsewhere or under the conditions and restrictions requested by the maneuver commander and imposed by the ACA. Other operations, specifically those involved in deep operations, could be adversely affected by the establishment of a HIDACZ.

The commander requests the establishment of a HIDACZ using the process previously outlined. The airspace control boundaries of the HIDACZ must fall within the area of operations (sector or zone) of a brigade, division, or covering force to allow effective command and control of operational forces. Additionally, HIDACZ airspace control boundaries, where possible, are defined in relation to appropriate geographical features to assist aviation crews and ground elements in locating and identifying HIDACZ boundaries. Combat operations during periods of limited visibility (smoke, darkness) or during poor weather may require that HIDACZ boundaries be defined in relationship to navigational aids if terrain features prove unsatisfactory.

Aircraft operations within an activated HIDACZ are governed by the procedures established by the ACA and by the operation order, operation graphics, and control measures of the appropriate commander controlling the HIDACZ. The activation of a HIDACZ at the request of a maneuver brigade commander (and approved by the division commander and ACA) within a brigade sector requires that the brigade control all airspace use within the HIDACZ. The brigade A^2C^2 staff within the CP may serve as controlling element, or the brigade commander may request that the division attach an air traffic service's element to the brigade headquarters to assist the brigade S3 with airspace control responsibilities. The brigade's TACP is the controlling element for all Air Force operational elements which require entry into the HIDACZ.



The A^2C^2 element of the controlling headquarters for a HIDACZ must be prepared to provide the following guidance and directions:

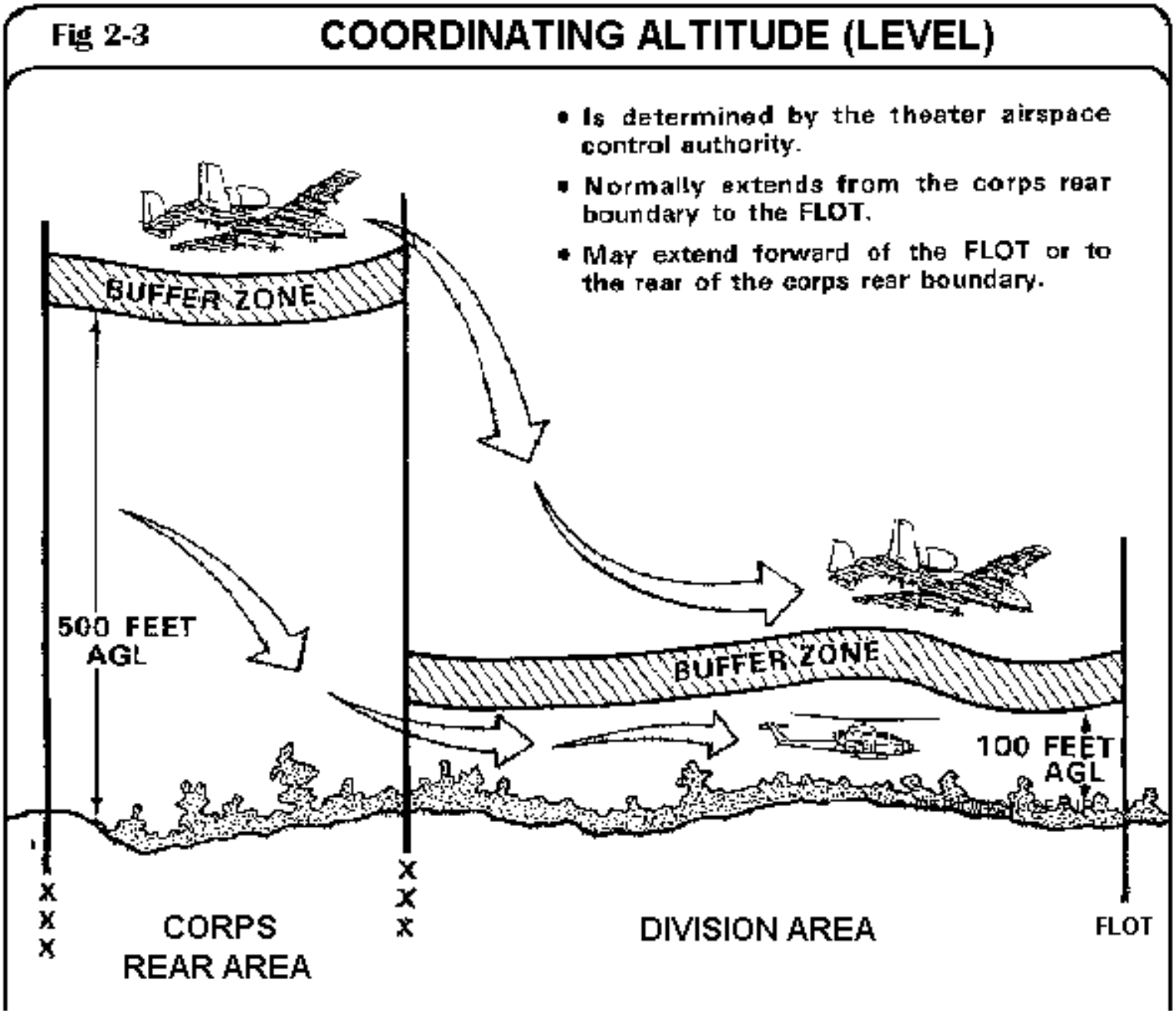
- Minimum risk routing into and out of the HIDACZ, and to the target area.
- Coordination of fire support.
- Air traffic advisory as required.
- Coordination of air defense weapons control status.
- Location of enemy units.

Coordinating Altitude (Level). The coordinating altitude (level) (see Figure 2-3) is a procedural method designed to separate fixed-wing and rotary-wing aircraft. The coordinating altitude varies from theater to theater and even within a theater. The coordinating altitude does not prohibit either fixed-wing or rotary-wing aircraft in the use of airspace above or below the coordinating altitude. Aircraft that need to pass through the coordinating altitude for operational requirements coordinate with the appropriate Army or Air Force controlling agency before they penetrate the coordinating altitude. When an aircraft passes into the airspace above or below this coordinating altitude, control, either positive or procedural, always reverts to the controlling authority for that airspace.

The coordinating altitude is specified by the theater airspace control authority. Coordinating altitudes are

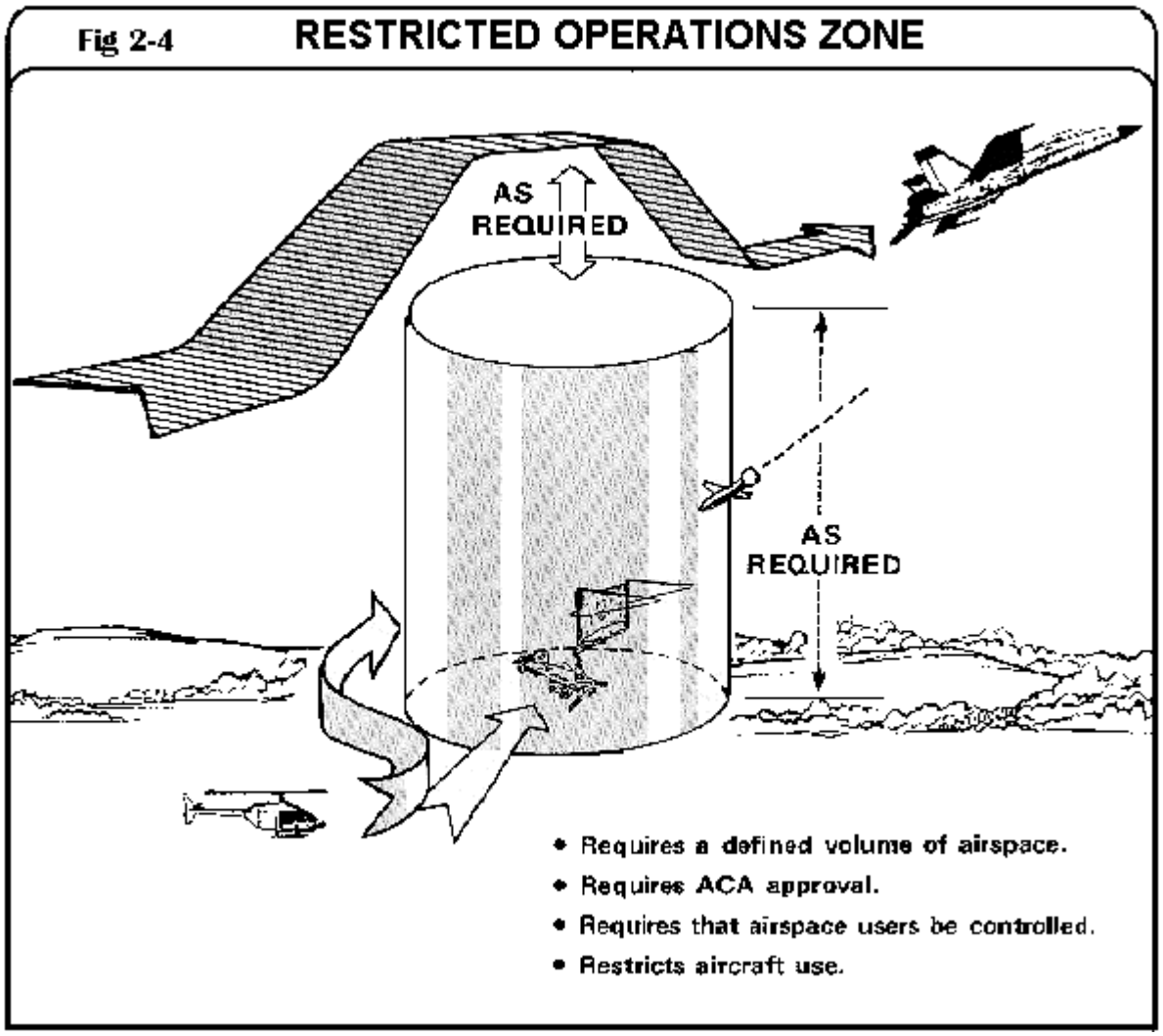
normally specified in the airspace eontrol plan, unit SOP, or OPORD. If the Army commander requires more or less airspace to conduct his operation, he may request a change to the coordinating altitude through his A²C² element to the airspace control authority. The commander exercises care in requesting a change, especially if it increases the height of the coordinating altitude. This change may endanger all aircraft operating above the coordinating altitude in high-threat environments. The coordinating altitude also defines the upper limit of the terrain flight environment. However, this procedural control measure does not define operational control or "ownership" of airspace above or below this altitude. Some airspace control measures may eliminate the requirement for the airspace user to make notification of the penetration of the coordinating altitude.

For example, an Air Force pilot following an LLTR or other similar route is not required to make notification of passing through the coordinating altitude if the LLTR has specified altitudes established for air traffic within the route. Conversely, depending on the theater airspace control plan, Army aviation on ACA-approved Army routes above the coordinating altitude, or on an approved flight plan, may not be required to make notification of passing through the coordinating altitude.



Coordinating altitudes do not apply to air defense artillery or field artillery operations. Coordinating altitudes may be higher during hours of darkness and within the corps area and COMMZ than in the division area and forward. During low-intensity conflict operations, when the primary threat to aircraft is ground-based direct-fire weapons, the coordinating altitude may be established at higher altitudes.

Restricted Operations Zone. The terms airspace restricted area and ROZ are synonymous. A ROZ (see Figure 2-4) is a volume of airspace of defined dimensions developed for a specific operational mission or requirement. A ROZ procedurally restricts some or all airspace users from this area until the end of the mission. A ROZ is normally activated to support drop zones, search and rescue operations, SEMA orbits, and RPV launch and recovery sites. Additionally, a ROZ may facilitate air defense operations in a given area by preventing friendly aircraft from entering a volume of airspace. The commander requiring a ROZ sends his request through the appropriate A^2C^2 facility to the airspace control authority using those procedures previously outlined. The airspace control authority coordinates requirements for temporary restricted operations zones and considers the impact of such restrictions on other airspace users.



Before using a ROZ, the commander considers its impact on the freedom of action of others and weighs that impact against its advantages. For example, a ROZ (or a HIDACZ) that is too large may make it impossible for aircraft to get to certain target areas. Controlling authority requirements for the ROZ are similar to those required for a HIDACZ. For further information on controlling authority requirements, see Designation of Controlling Authorities. Normally, the requesting commander is the controlling authority.

Minimum Risk Route. An MRR is a temporary route of flight recommended for Air Force use which presents the minimum known hazards to low-flying aircraft transiting the combat zone. It normally extends from the air route structure in COMMZ through the Army, corps, and division area, across the FLOT, and terminates in the vicinity of the FSCL. In common practice the term MRR is synonymous with the term low-level transit route. These titles are used interchangeably because these two temporary routes are defined similarly and are employed in the same manner. To achieve standardization with international agreements, this FM utilizes the term low-level transit route.

Low-Level Transit Route. An LLTR (see Figure 2-5)is a temporary corridor of defined dimensions which allows the low-level passage of friendly aircraft through friendly air defenses and controlled or restricted airspace. The ACA specifies the number of LLTRs (active and on-call) to be established to accommodate air operations. The actual trace on the ground which the LLTR follows is nominated by the divisions and corps and planned by the A^2C^2 element with Air Force coordination and assistance. The routing accommodates transiting aircraft while avoiding critical areas and assets defended by ADA, and areas of anticipated intense combat operations (for example, axis of main attack). Additionally, airspace planners establish the corridor (route) trace to avoid such areas as--

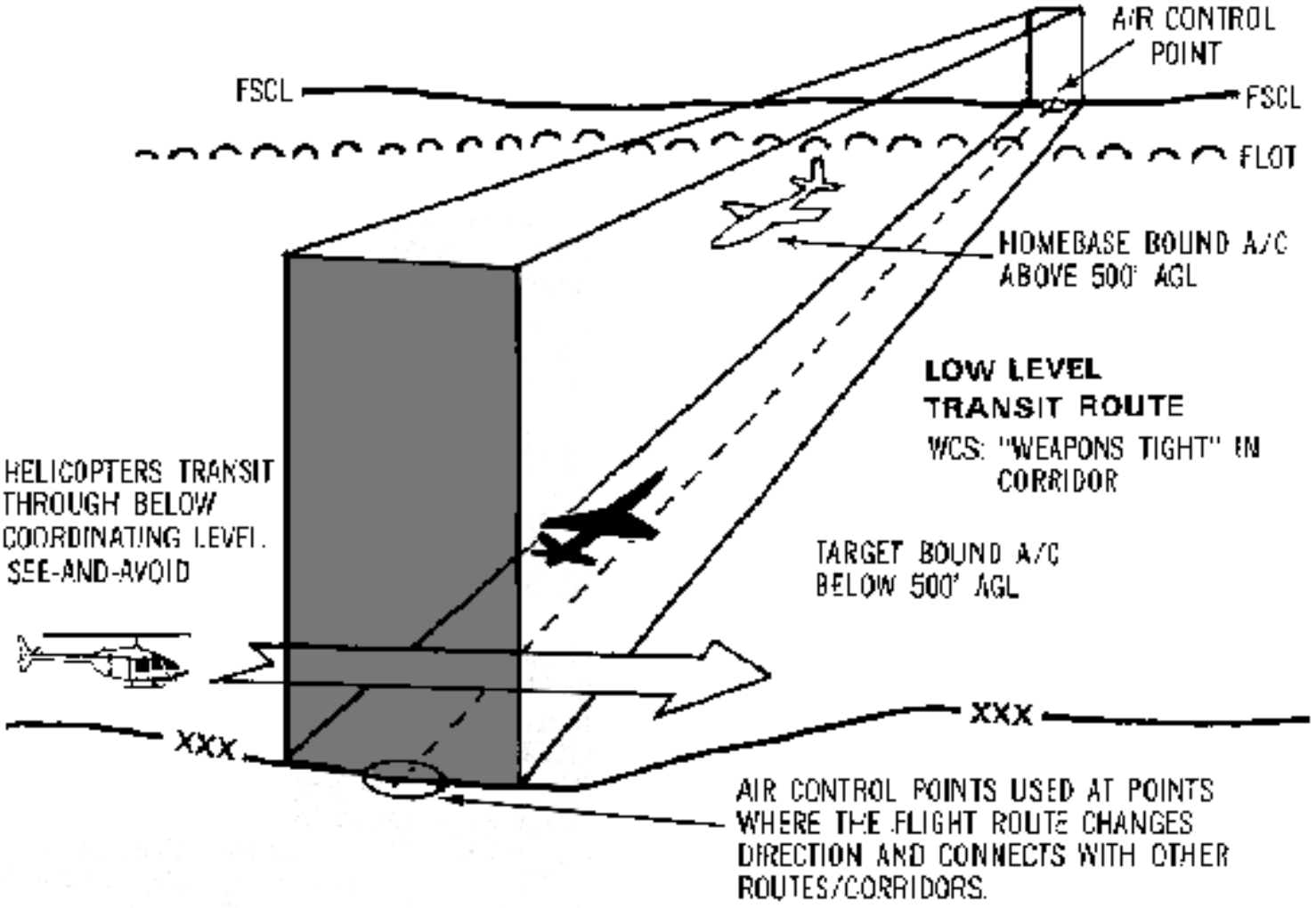
- Concentrations of field artillery units.
- Significant groups of fire support targets.
- Landing zones, drop zones, forward arming and refueling points,landing sites, and airfields.
- Known enemy air defense artillery systems.
- Other planned or active special use airspace (for example, ROZs, HIDACZs, special corridors).

The exact dimensions, and the techniques for employing LLTRs, are governed by the theater airspace control plan and included in unit SOPs. LLTRs are normally bidirectional and activated for short periods of time. To prevent enemy forces from exploiting an LLTR, routes are activated for specified times only and changed frequently. LLTRs normally have their

start points and terminating points designated by an air control point. Air control points also designate where the corridor joins other corridors or changes direction. Points may be easily identifiable terrain features or electronic navigational aids, preplanned at random throughout the area of operations and assigned code names or numbers. Such techniques aid in restructuring LLTRs to accommodate changing tactical situations.

Airspace planners at corps and division anticipate requirements for LLTRs to support planned combat operations. Following the allocation of air assets to support Army requirements, corps and division know how many sorties are available for CAS, AI (including BAI), tactical air reconnaissance and offensive counterair. Accordingly, airspace planners should be able to anticipate the number of corridors required and, generally, which corps and division areas the corridors must transit to support the allocated sorties and Army plans for air support.

Fig 2-5 **LOW-LEVEL TRANSIT ROUTE**



- Is recommended by corps.
- Is approved by the air component commander.
- Has dimensions that may vary.
- Should be changed frequently.
- May extend below the coordinating altitude.
- Represents minimum hazard to friendly aircraft.
- Incorporates consideration of the ground tactical plan.
- Avoids areas of high airspace use.

LLTRs may be established for different air missions. Air Force aircraft conducting air missions such as interdiction, tactical air reconnaissance, and offensive counterair may use a separate LLTR than aircraft supporting intratheater airlift and CAS. LLTRs require air defense weapons in the corridor, or with a sector of fire which includes the corridor, to be placed in a weapons control status of weapons tight.

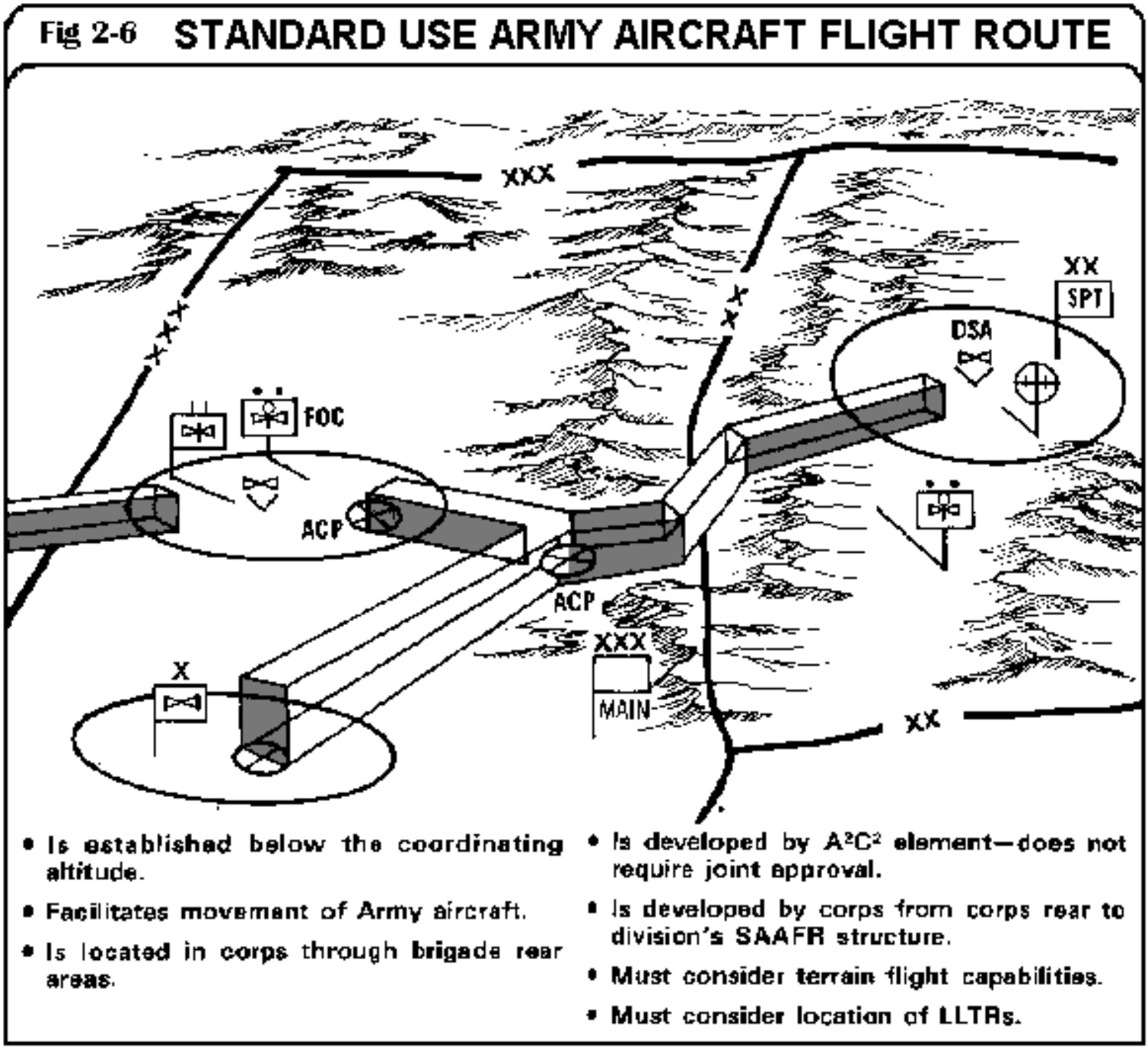
Standard Use Army Aircraft Flight Route. A SAAFR (see Figure 2-6) is a route established below the coordinating altitude to facilitate the movement of Army aviation assets. Normally located in the corps and division rear area of operations, it is a recognized Army airspace control measure that does not require joint approval. SAAFRs are developed by the A^2C^2 element to safely route Army helicopters conducting combat support and combat service support missions in the terrain flight environment. They are primarily intended

for single aircraft or for small flights of aircraft operating routinely between base clusters in the division support area and in the corps rear area. Their establishment is similar to the techniques used for LLTRs, except SAAFRs do not require ACA approval.

Routes in the division rear area should provide terrain masking from enemy air defense systems to avoid compromising the SAAFR structure and key base cluster facilities. Air control points, or communication check points, assist in defining the routing and control of helicopters. Aircraft using SAAFR monitor the appropriate ATS facilities. Extending a SAAFR to the brigade support area should be considered if numerous logistic missions will be flown into the brigade support area/forward support battalion. If numerous aviation missions are expected to cross division lateral boundaries, SAAFRs can be used to procedurally control such movement.

The corps A^2C^2 element is responsible for developing the SAAFR structure for the corps rear area and ensuring that the corps structure links to its subordinate division's SAAFR structure. The corps A^2C^2 element also ensures that adjacent division rear area structures are linked. Division A^2C^2 elements develop their own rear area structure.

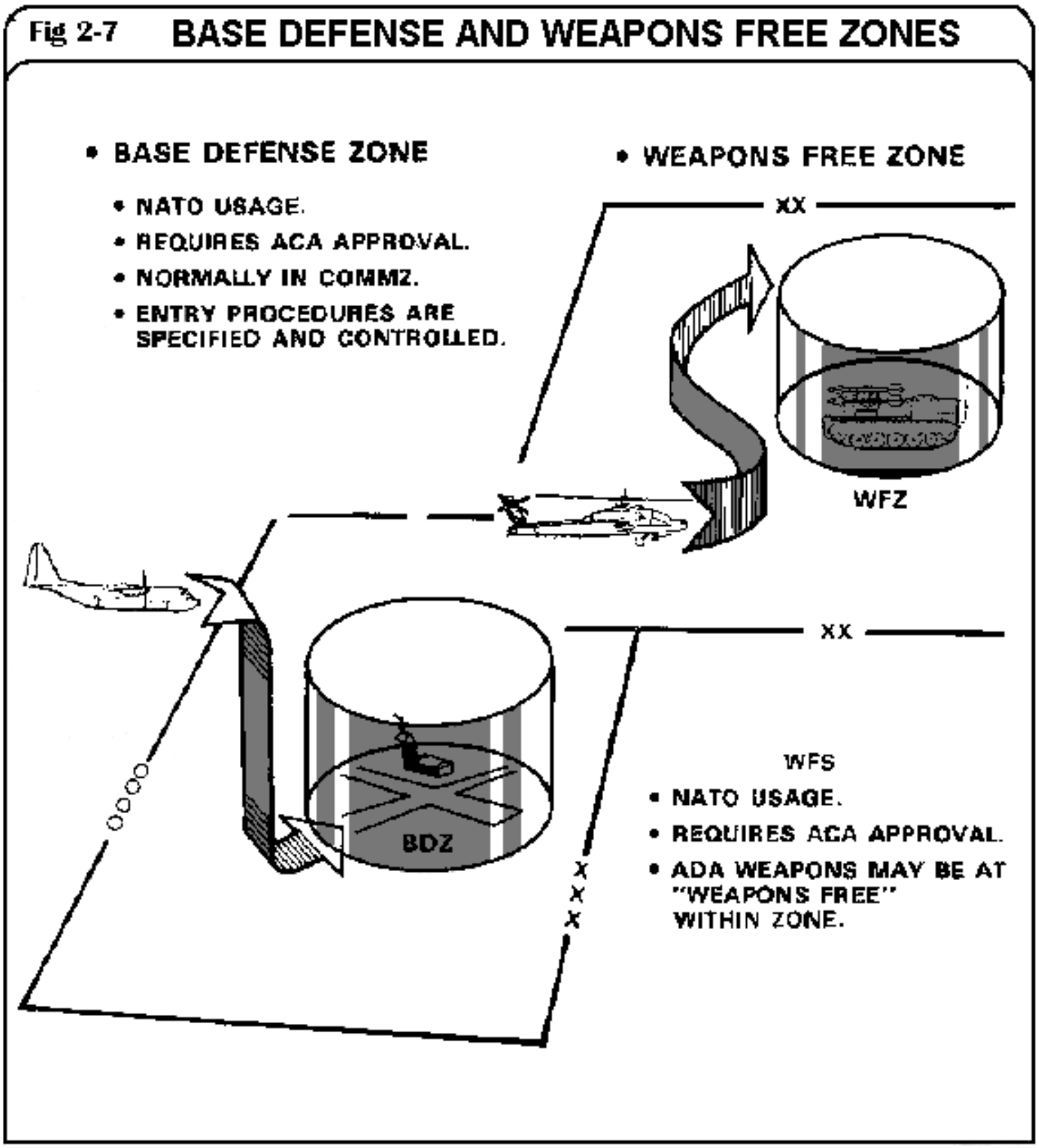
Brigade A^2C^2 elements must specify the termination points in each forward brigade. If a SAAFR is required between adjacent brigades, the division A^2C^2 element is responsible for developing the required route. Terrain flight tactics and techniques are normally employed by helicopters using these routes.



Base Defense Zone and Weapons Free Zone. These are airspace procedural control measures employed in some theaters. A BDZ (see Figure 2-7) is an air defense zone established around an air base and limited to the engagement envelope of the short-range air defense (SHORAD) weapon system defending that base. Theater army aviation elements, such as the theater aviation group operating in the Army area and COMMZ, may encounter these control measures during airlift operations. BDZs have specified entry, exit, and IFF procedures which aircrews must follow. Airspace control plans provide necessary information for flight planning.

A WFZ (see Figure 2-7) is an air defense zone established for the protection of key assets or facilities of the joint force other within a WFZ are normally maintained at a weapons control status of weapons free. Aircrews must avoid active WFZs, or coordinate with the designated control authority prior to entry or prior to transit through a WFZ.

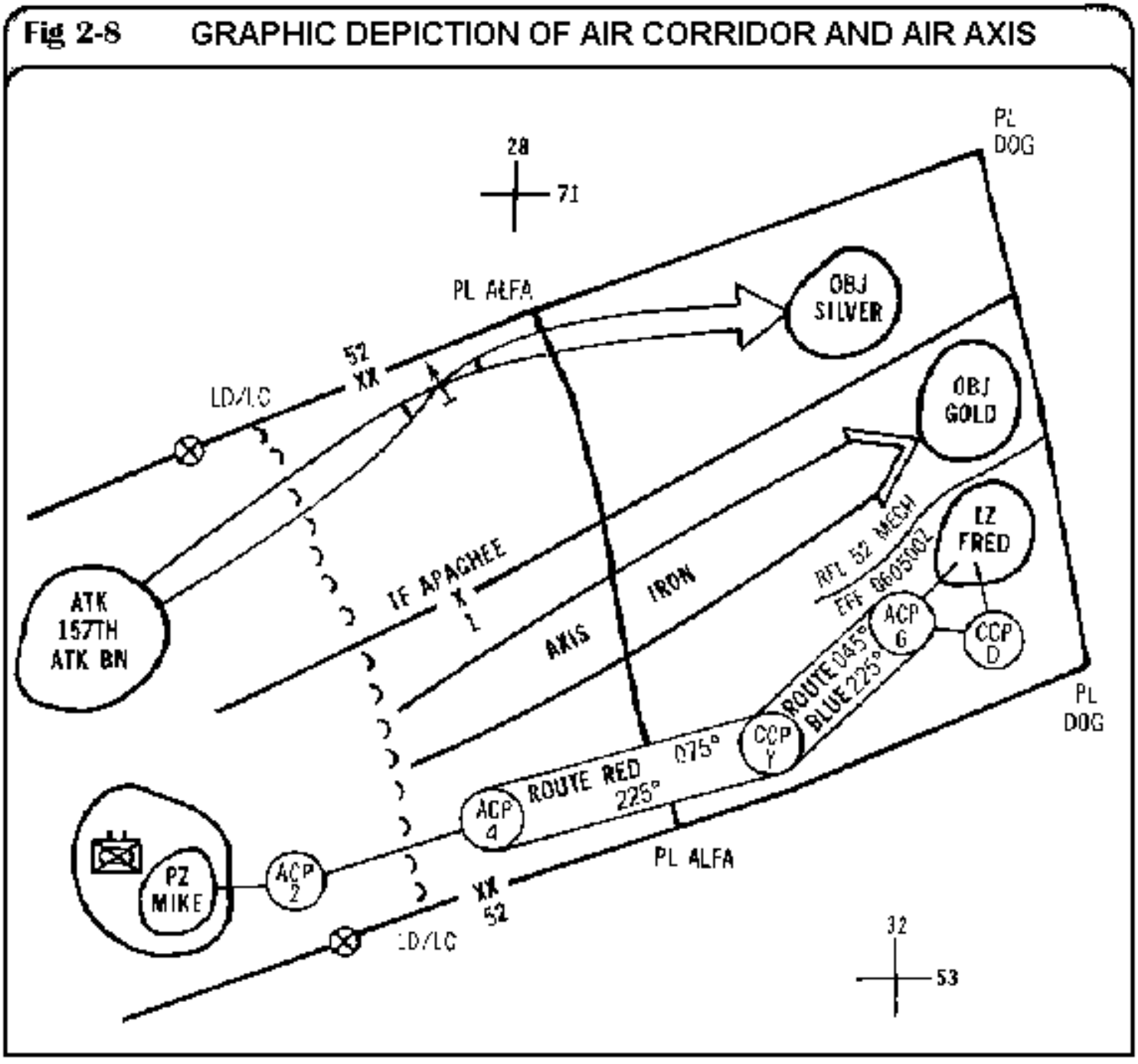
Fig 2-7 BASE DEFENSE AND WEAPONS FREE ZONES



Air Corridor. An air corridor (see Figure 2-8) 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. Air corridors are standard Army operational procedures. They do not require ACA approval as they are employed within the terrain flight environment, normally in the division area of operations and the deep operations area. Air corridors are temporary in nature, established as required to route combat elements of the division and corps aviation brigade between such areas as assembly areas, holding areas, battle positions, FARPs, and target

engagement areas.

Air corridors are employed as control measures during air assault operations to designate routes for air assault forces during the air movement phase. They can be used to route helicopters conducting air movement operations within the corps and division rear areas. Standard operational measures used with air corridors include: air control points, communications check points, magnetic azimuths of the routes of flight, pick-up zones, landing zones, and initial points. The ground trace of an air route is selected by the aviation liaison officer in coordination with the A²C² element and depicted graphically in the operation order overlay. Terrain, enemy air defenses, and ground maneuver plans are key factors that influence the need for and location of air corridors. An Army air corridor should not be confused with an air route. The Army air corridor is a standard Army control measure while an air route is an airspace procedural control measure normally employed in the COMMZ and corps rear area to support the movement of Air Force and host nation air traffic.



Additional Measures. Additional operational measures routinely used to assist in controlling and resolving conflicts of airspace users include selected fire support coordination measures, air defense artillery supplementary fire control measures, and air control measures. Examples of these measures include the following:

- Airspace coordination area,
- Fire support coordination line,
- Weapons engagement zone,
- Air control point,
- Communications check point,
- Initial point, and
- Way-point.

STANDARD OPERATIONAL PROCEDURES

Commanders, staffs, and airspace users utilize an array of standardized control measures to assign responsibility, ensure conformity with the tactical plan, describe and illustrate the concept, maintain separation of forces, concentrate effort, coordinate fires with maneuver, and assist in the command and control of forces. When airspace procedural control measures are incorporated with these standard operational measures, Army forces have the means to graphically depict the integration, coordination, regulation, and identification of Army airspace users in a given area of operations. FM 101-5-1, combined arms manuals such as FM 71-100 and FM 71-3, and functional manuals such as FM 44-1 and FM 6-20 provide further guidance pertaining to applying these operational procedures in various tactical operations.

The Army relies upon procedural control as the primary means of synchronizing airspace users in the main battle area. The Army's methodology for airspace control in this area is based on the use of coordinating altitude, standard operational procedures and graphics, fire support coordination measures, and air defense rules of engagement (see Figure 2-9).

Standard operational procedures and graphics control maneuver in the area of operations. For the vertical dimension of the area of operations, Army aircraft, except for SEMA, operate largely in the terrain flight environment below the coordinating altitude. Accordingly, as with other maneuver elements, standard operational procedures provide the most effective control techniques for this environment. Fire support coordination measures ensure that fire support systems interface and that fires do not jeopardize troop safety or disrupt adjacent unit operations. Air defense rules of engagement, chiefly hostile criteria, weapons control status, and weapons engagement zones, ensure identification and control of airspace users. Joint airspace procedural control measures are used only as required to supplement Army control measures and to facilitate the employment of joint forces in the airspace. The decision to use such measures is based on a case-by-case evaluation, using the factors of METT-T and duly considering the requirements of other service components.

Army command and control systems, specifically those of the major functional areas of maneuver (MCS), fire support (AFATDS), and air defense (FAAD C^2) provide an important adjunct to the use of procedural control.

Fig 2-9. AIRSPACE CONTROL METHODOLOGY	
ADVANTAGES	**DOCTRINAL APPROACH**

• Supports air-land battle C². • Minimizes requirements for ACA approval. • Assures conformity with the tactical plan. • Prevents interference among units. • Describes and illustrates the concept. • Adds flexibility. • Allows for maximum freedom of action of supporting forces. • Is responsive to the commander.	• Selected airspace control measures.* Coordinating altitude Standards use Army flight routes Others as required • Standard operational procedures and tactics. Control and coordination measures Graphics • Fire support coordination measures. Permissive Restricted • Air defense rules of engagement and control measures. Hostile criteria Weapons control status Weapons engagement areas • C² system provides adjunct.
***Use of theater airspace control measures is based on consideration of time required to put into effect, restrictions on other users, and airspace controlling authority responsibilities.**	

CONFLICT RESOLUTION

Determining the exact combination and type of operational procedure, fire support coordination measure, air defense procedural control technique, airspace procedural control measure, or positive control means required to synchronize airspace users and activities in a given tactical operation is a key part of the A²C² process. Representatives of the A²C² element at each command echelon, with expertise in their respective branches and functional areas, perform this A²C² activity.

DURING PLANNING

During the planning process the A²C² staff identifies potential airspace conflicts among the various airspace users. It then establishes appropriate procedures to resolve the conflict or reduce the risk. During the analysis of situation and concept of operations, the focus is directed to the scheme of maneuver, plan for fires, and counterair operations. This focus is upon the use of airspace by the members of the combined arms team conducting combat, combat support, or combat service support tasks. Early in the planning phase, the A²C² staff reviews supporting plans, overlays, and graphics and sketches that depict and illustrate maneuver, fires, air defense, reconnaissance and surveillance, EW, and sustainment operations. This review identifies geographically where the intended actions of two or more airspace users, or other combatants, come into contact, or are in close proximity. These are the areas of potential airspace conflict.

Each potential conflict is then further evaluated by looking at the altitude and time. If the airspace users

involved have an altitude separation that is determined to be sufficient to provide adequate safety, then a conflict does not exist. If the airspace users are operating at the same altitude, the evaluation process must continue. If the airspace users are separated by time, then a conflict does not exist. However, if the airspace users are conducting operations at the same time, then a potential for conflict exists.

To resolve each identified airspace conflict, the A²C² element selects one or more of the following options:

- Establish procedural control employing standard operational procedures.
- Change the time sequence, or relocate the airspace user or another element.
- Establish an airspace procedural control measure.
- Eliminate an airspace user, or restrict the operation of an airspace user.
- Make the decision to accept the risk.

The A²C² element first selects the appropriate means of ensuring conformity with the tactical plan, preventing interference among units, and synchronizing the effective use of airspace. It then ensures these means are established and communicated to and coordinated with all members of the combined arms team. Map overlays, operation overlays and sketches, coordinating instructions, and annexes to operation orders (plans) are the means of illustrating and communicating the required control measures.

There may be situations in which conflicts between airspace users or requirements for the use of airspace cannot be resolved at a particular echelon. The conflict is then forwarded through operational channels to the A²C² element of the next higher headquarter for resolution. Conflicts involving only Army forces are normally resolved at division or corps level. Conflicts involving joint and combined forces may have to be resolved between the LCC and ACC at the airspace coordination center within the TACC. Normally, coordination and negotiations between the A²C² section of the BCE and the staff of the airspace management element in the combat plans division result in a satisfactory solution. Major airspace control conflicts which cannot be resolved at the LCC and ACC levels are referred to the Joint Operations Center (JOC) at the Joint Force headquarters for resolution. Examples of conflict and potential conflict resolutions include:

- An LLTR positioned over a fire support unit(s). If a single fire support unit is involved, move the unit or accept the risk. If multiple fire support units are involved, move the LLTR.
- A SAAFR crossing an LLTR. Develop procedures to cross the LLTR or accept the risk.
- A FARP or aviation unit located in front of a fire support unit/ADA unit that is in a weapons free control status or located in such a manner that aircraft overfly the fire support or ADA unit. Move the FARP or move the unit. If an AD unit, place the unit on weapons tight.
- An air control point and an AD unit in weapons free control status both located in the same area. Move the air control point or the AD unit or put the AD system on weapons tight (if appropriate).
- An air assault/movement operation overflying AD or fire support weapon systems that is in a weapons free control status (going and, or returning). If moving all systems is impractical, place all AD systems in or near the route on weapons tight during the outbound and inbound flight times. Cease fire on all fire support weapon systems during the flight times. Exercise positive C² over the AD or fire support weapon systems. Any combination of the above options may be used.
- An airdrop operation being conducted without restricting other air traffic from the area. Establish a ROZ over the drop zone.
- A major ground battle projected for a specific area. The commander expects the battle to be his decisive fight and he will be required to use all of his assets in the area without interference. Create a

HIDACZ over the battle area.

DURING THE BATTLE

A^2C^2 actions taken during the planning cycle are one aspect of the A^2C^2 process. Reacting to changes in the tactical situation during the conduct of the battle requires similar A^2C^2 actions. During the execution of tactical missions, changes in missions are received, the situation is evaluated, and requirements for airspace and potential conflicts between airspace users are identified. Then options are selected, coordinated, and implemented to resolve the conflicts and synchronize forces.

For example, during the conduct of a successful defensive mission, the division has issued a fragmentary order (FRAGO) to the aviation brigade directing the brigade to conduct a hasty attack against an enemy uncommitted reserve force. The A^2C^2 staff element within the brigade, in concert with the division A^2C^2 element, begins to monitor development of the proposed scheme of maneuver and supporting plan for fires. Operational measures to support the scheme of maneuver are compared with those of supporting air force elements. Routing of CAS aircraft is plotted; contact points, initial points, pop-up points, and other airspace control measures are established and coordinated as required. Fire support plans, priorities, targets, fire support coordination measures, and artillery unit locations are reviewed and coordinated with all appropriate forces. Air defense artillery unit locations, sectors of fire, weapons control status, and identification procedures are reviewed and coordinated and changes directed as required. Sustainment plans, such as aerial movement of class III and V products to FARPs, are reviewed; the routing of aircraft conducting logistical support missions is coordinated with other operational plans.

Special air traffic service support requirements are identified and requirements coordinated. Command, control, and communications requirements unique to the synchronization of airspace are established. One such requirement is designation of the communications net and element that will serve as the control authority for any airspace control measures established.

The difference between A^2C^2 actions taken during the planning cycle and those performed during the conduct of operations is in the time available to establish selected control measures through the ACA and to coordinate and disseminate information. The use of positive means of control allows rapid response to changes and may be the only option in some situations. For example, greater reliance on positive control techniques and procedures is necessary during the execution of a joint air attack team (JAAT) mission. Direct communications and personal observation of the target area and friendly forces are required by the FAC, CAS flight leader, attack helicopter commander, and field artillery air observer in order to synchronize all elements of combat power. The employment of CAS normally relies on a high degree of positive control techniques and procedures because of the proximity of friendly forces and the target.

The Army air-ground operations system is structured to interface with the tactical air control system and this joint system provides the means to provide positive control of CAS missions.

DESIGNATION OF CONTROLLING AUTHORITIES

One aspect of procedural control which commanders and the A^2C^2 staff must consider concerns the responsibility to serve as the controlling authority for designated temporary airspace control measures. The approval to establish a HIDACZ or ROZ within a division area of operations requires the designation of a controlling authority for that airspace.

To serve as the controlling authority for a ROZ or HIDACZ, the establishing organization must be able to

communicate with all airspace users. There are three basic options to fulfill this requirement for Army airspace users:

(1) ***Use an existing radio network.*** The advantage of this option is that the necessary radios, frequencies, and existing personnel are in place. If a brigade is the controlling authority, use of the command net may be the best solution. At corps/ division, the G3 or A²C² element operating on an existing radio network may be suitable. The disadvantage is that the radio network being used may be overburdened by the control requirement and not support passage of time-sensitive information.

(2) ***Create a new radio network.*** This option eliminates the disadvantage of the first option. However, obtaining the radios, frequencies, and personnel to accomplish this mission may be difficult.

(3) ***Utilize ATS facilities (FOC or flight coordination center (FCC) or special task-organized mobile tactical teams.*** Mobile tactical teams collocated with a brigade A²C² element provide an organization which can perform controlling authority responsibilities.

Control of Air Force airspace users by the controlling authority requires special considerations. Air Force assets provide the best means of controlling Air Force assets; however, Army ATS facilities have the necessary communications systems and can be used. Key elements of the TACS which offer the organization and material to assist the designated Army organization perform controlling authority functions are the corps ASOC, and the TACP at division and maneuver brigade levels. The collocation and continuous interface between the corps ASOC and A²C² element, and between the division and brigade TACP and their respective A²C² elements, ensure rapid coordination and sharing of information.

The airspace control request forwarded to the ACA to establish the temporary airspace control measures includes information concerning what organization will be designated the controlling authority. This information is included in the ACO, thereby giving potential airspace users the identity of the controlling authority.

SPECIAL AIRSPACE USERS

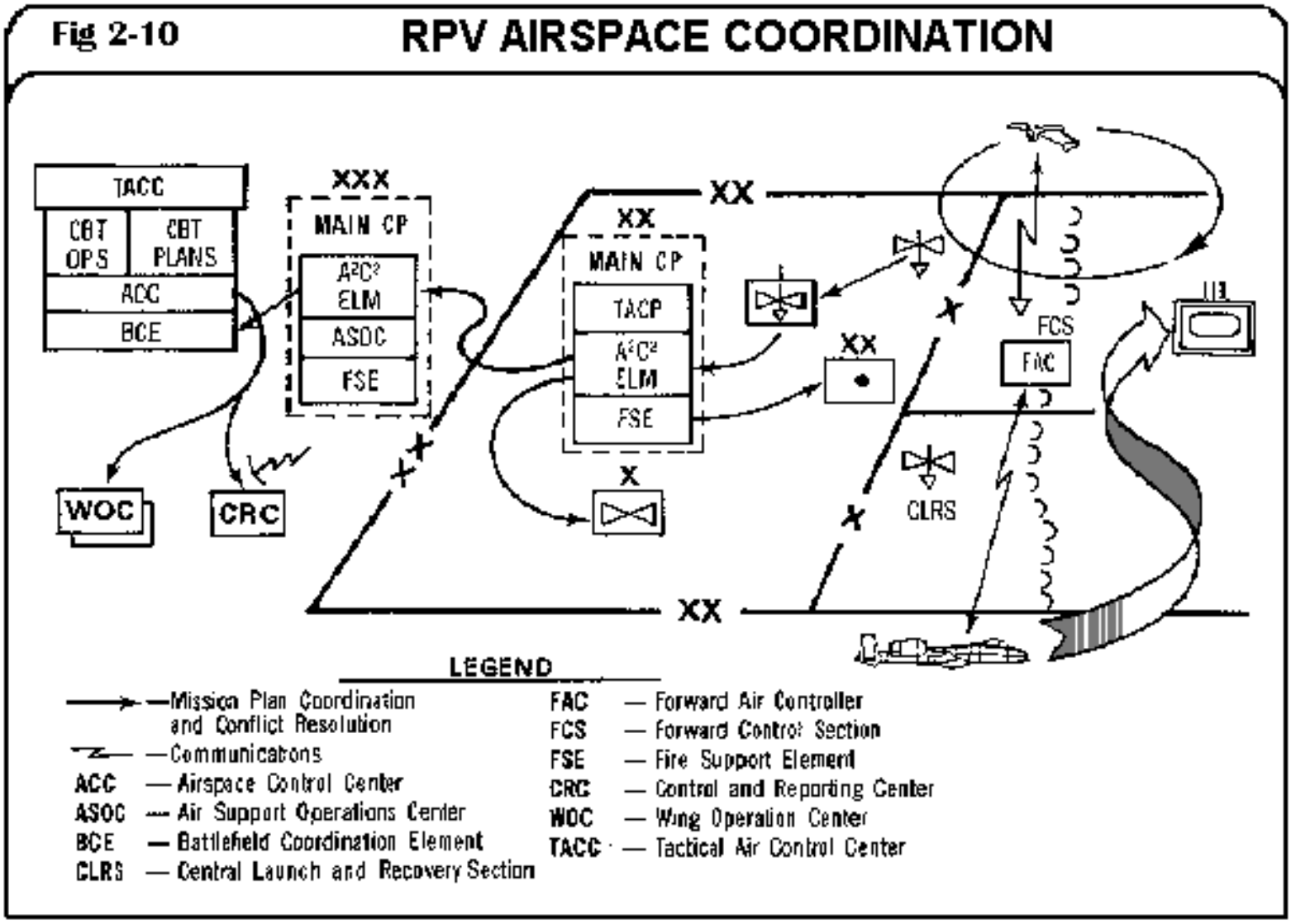
Remotely piloted vehicles, special electronic mission aircraft flights, and heliborne electronic warfare flights have special requirements for airspace above the coordinating altitude. These special airspace users utilize airspace control measures, require a mix of positive and procedural controls, and must interface with the combined arms team and the Tactical Air Force.

RPV FLIGHTS

These flights require airspace conflict resolution, establishment of necessary control measures, and coordination of missions with the Tactical Air Force. Airspace conflict resolution is accomplished by separating in time and altitude, and by sector (zone), the RPV from other aerial platforms and missions. Establishing airspace control measures provides the procedural control to ensure conflicts are reduced.

Airspace procedural control measures such as ROZs and special corridors can be employed. ROZs support RPV launch and recovery sites and large mission areas; special corridors are useful for RPV flights in a narrow corridor (route). A ROZ in the vicinity of the FLOT and extending forward to the FSCL can restrict tactical air operations. This situation may cause air force missions to weigh the risk and request clearance from the controlling authority to transit through the RPV ROZ using the principle of see-and-avoid. The airspace control authority may require that RPV mission areas be noted in the air tasking order, thus

eliminating the need for airspace control measures.



Positive control, to a limited degree, can be established for those RPVs under direct control of a RPV forward control station. Communications between the control station, A²C² element, fire support personnel, and FAC permit the integration of the RPV mission with other airspace users.

Timely dissemination of information concerning RPV operations to TACS elements is accomplished through the A²C² system (see Figure 2-10). RPV operational information coordinated with other airspace users includes--

- Location of CLRS elements, and the altitude and radius around the launch site which must be avoided.
- Flight times.
- Operational altitudes (flight profile).
- Ingress and egress routes from the CLRS to the FCS hand-off point.
- Area (route) of the intended flight.

SEMA FLIGHTS

These flights require airspace conflict resolution, establishment of control means coordination of

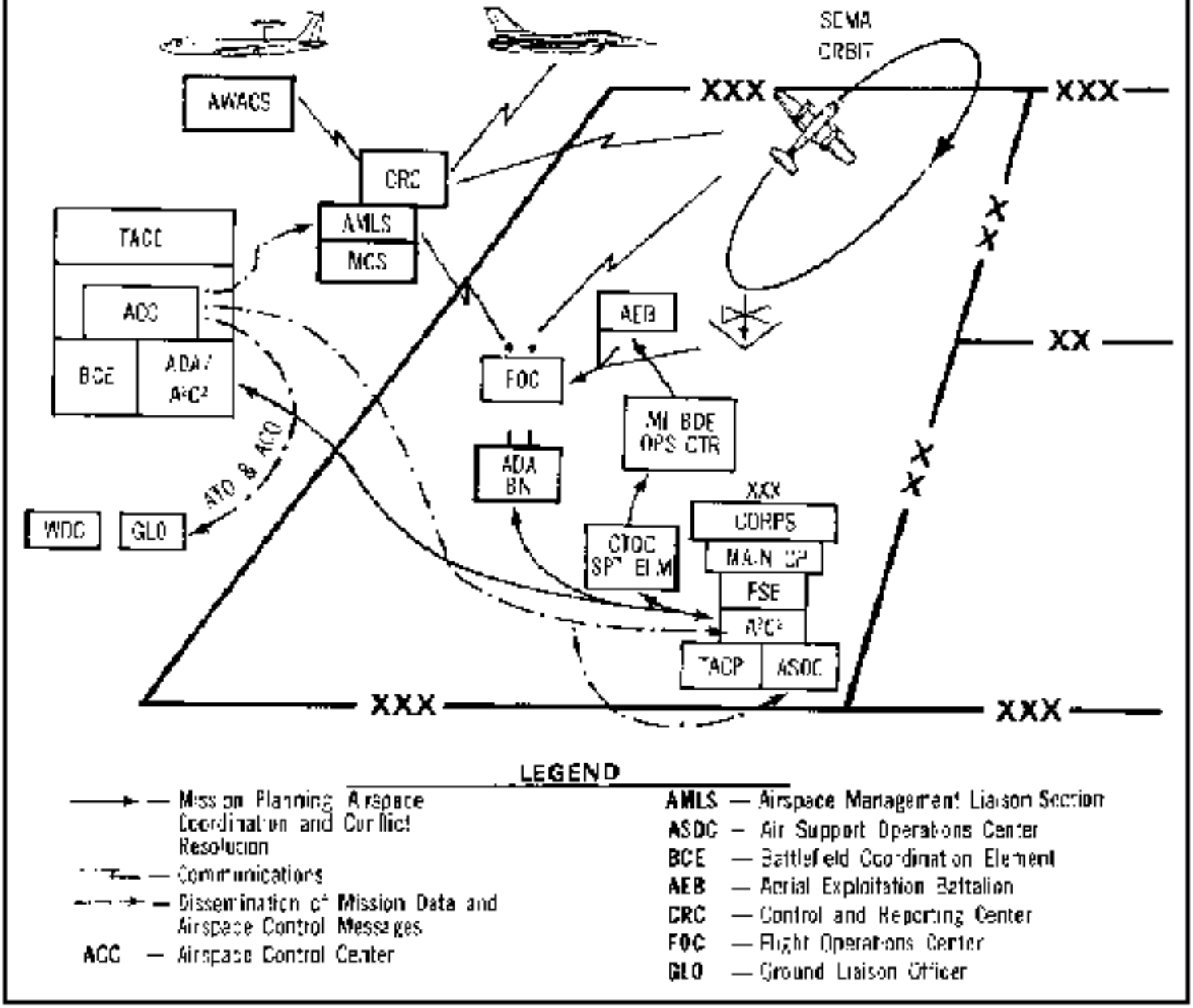
information, and interface with the appropriate elements of the integrated airspace control system. Airspace required to accommodate typical flight profiles is significant. Normally a ROZ provides the airspace control measures to support the operational requirements of a SEMA mission.

To establish a restricted operations zone, an airspace request is submitted to the airspace control authority for approval. This airspace request is submitted through the airspace coordination channels of the corps A²C² system to the A²C² section of the BCE. This section submits the request to the airspace control center of the TACC for approval. When approved, the airspace control center will include the designated restricted operations zone in the airspace control order which is disseminated throughout the integrated airspace control system. (See Figure 2-11.)

In addition to obtaining the required airspace to support SEMA flights, a sequence of coordination actions must be accomplished. When the corps tasks the AEB to conduct an EW or surveillance mission, the flight operations element and crew of the aviation company supporting the mission conduct the necessary flight planning and submit the request for airspace as previously described. Other information related to the scheduled mission is disseminated and coordinated through the corps A²C² system and the theater integrated airspace control system. The SEMA mission may be reflected in the air component commander's ATO. The dissemination of the ATO ensures that all users of the airspace have pertinent information relevant to the SEMA mission thus ensuring safety and mutual operational efficiency.

Having the SEMA mission listed in the ATO is one option to achieve advanced airspace coordination. Another course of action might be required when time is not available to get into the ATO and ACO planning cycle. For example, in response to a SEMA mission tasking, the aviation company flight operations section and aircraft crew file a flight plan with an appropriate corps air traffic services unit (FOC or FCC) and notify the corps A²C² element. When the aircraft takes off, the pilot opens the flight plan by contacting the FOC or FCC and continues to monitor the designated FOC frequency until directed otherwise. Penetration of the coordinating altitude requires coordination only among the appropriate airspace control elements and users; it does not imply that prior approval must be obtained.

Fig 2-11 SEMA AIRSPACE COORDINATION PROCESSING



The FOC contacts the control and reporting center and passes all required information related to the SEMA mission. If operational requirements require positive control of the SEMA mission by the control and reporting center, the aircraft may be directed to maintain radio contact. This positive control link permits other tactical air force elements to transit safely through the ROZ in proximity to the Army aircraft. It also allows the CRC to pass threat warnings in near real-time.

HELIBORNE ELECTRONIC WARFARE FLIGHTS

Restricted operations zones to support heliborne EW missions are established with approval of the ACA. The request procedures and coordination required are similar to the actions described for SEMA airspace. In addition to the airspace control measures required by the heliborne EW system, EW operations must be synchronized with operational plans of both the combined arms team and the Tactical Air Force.

IDENTIFICATION OF AIRSPACE USERS

To effectively integrate friendly air assets and air operations with air defense operations and combined arms team weapons employment, the airspace control function must closely conform with joint force air defense operations. Effective performance of the active air defense mission requires a capability to correctly identify aircraft commensurate with the ability of the air defense system and combined arms team to employ their weapons under the most optimum conditions. This requirement is particularly acute in those theaters where large numbers of friendly aircraft and enemy aircraft are part of the tactical air environment (for example, NATO Central Region), and where air defense and combined arms team weapons are employed in conditions or at ranges beyond which positive visual identification can be performed.

Airspace control measures and the A^2C^2 system must complement and support the air defense identification requirement. This ensures timely engagement of enemy aircraft, conserves air defense assets, and reduces risk to friendly forces. Through airspace control methods, air defense weapons systems or other combined arms team members can identify aircraft as friendly or hostile without unduly restricting friendly air maneuver or their ability to engage hostile aircraft. The A^2C^2 system, in concert with the C^2 system, provides sufficient information to all airspace users and air defense and combined arms team organizations to facilitate IFF.

Identifying air assets in the forward combat zone and terrain flight environment is difficult. Identification largely depends on a mix of procedural and positive control measures. Minimum risk procedures and practices afforded by selected airspace control measures are procedural and complement visual identification and IFF/SIF procedures, the primary positive means of identification.

Army forces employ standard operational procedures, ADA rules of engagement and control measures, indirect information (such as flight plans, OPORDs, and other intelligence data), selected airspace control measures, and IFF/SIF procedures to assist in the identification process. C^2 systems such as the FAAD C^2I, the MCS, and the A^2C^2 system coordinate, process, disseminate, and facilitate identification requirements. The following planning factors can assist in the identification requirement during the conduct of combat operations:

- Coordination between air and ground units, particularly ADA units.
- Establishment of passage points and crossing times by the aviation unit and ground maneuver unit.
- Use of both verbal and nonverbal recognition signals, particularly at night.
- Coordination of routes to and from the area of operations. The establishment of SAAFRs, special corridors, air control points, and communication check points will aid in control and identification.
- Inclusion of IFF/SIF codes and procedures.
- Coordination of hostile criteria, weapons control status, and weapons engagement zones.
- Use of flight plans, and flight following by assets operating above the coordinating altitude.
- Coordination and standardization of identification procedures with allied and host nation force capabilities.

CHAPTER 3

Army Airspace Command and Control Tasks

The commander is responsible for developing and implementing the A^2C^2 system for his assigned area of responsibility. To assist him in this effort, the commander utilizes his staff.

The basic staff tasks to be accomplished are the same for A^2C^2 as for any other function. These tasks are:

- Facilitate and monitor the accomplishment of command decisions;
- Provide timely and accurate information to the commander and subordinate units;
- Anticipate requirements and provide estimates of the situation;
- Determine various courses of action and recommend one course of action that will best accomplish the mission;
- Prepare plans and orders; and

● Integrate and implement ACA-directed airspace control measures.

This chapter discusses basic staff tasks, modified to address A²C², and identifies the A²C² element or cell responsible for each task. In all cases, the tasks are divided into subtasks. The tasks and subtasks shown in the following matrix support the current and future operations discussed in Chapter 2. The specific information and staff officer required to complete the tasks depend on the organization level and these are discussed in Chapter 5. The chief of the A²C² staff section (echelon-dependent) is responsible for ensuring that the appropriate staff officers accomplish the tasks or provide the information required.

	BCE*	CORPS	DIV	BDE	BN
1.Identify and resolve airspace conflicts					
a. Current Operations					
(1) Monitor operations of airspace users. Spot reports, situations reports, and radio traffic are some of the means available.		X	X	X	X
(2) Monitor intelligence reports	X	X	X	X	X
(3) Disseminate unscheduled, high-volume use of airspace.	X	X	X	X	X
(4) Inform airspace users at each echelon of any loss of communication affecting any airspace user.		X	X	X	X
(5) Identify and correlate situations affecting airspace use for unscheduled events. Aviation missions should receive first priority for this action.		X	X	X	X
(6) Analyze airspace use on the situations map to determine and resolve conflicts.	X	X	X	X	
(7) Recommend shifting/ending fires when affecting high priority aviation missions.			X	X	X

(8) Disseminate changes of control or restriction measures, weapons control status, and NBC information which affect airspace users.	X	X	X	X	X
(9) Review immediate air request (Army) for conflicts with current operations.		X	X	X	X
b. Future Operations (more fully developed under task 4). Analyze the OPLANs and OPORDs for possible conflicts among flight routes, control measures, artillery/ADA locations, and flight obstructions.					
(1) Determine the impact.	X	X	X	X	X
(2) Develop and recommend alternatives.	X	X	X	X	X
2. Develop and maintain airspace utilization and situation overlays (At brigade/battalion these may not be maintained on the operations overlay)					
a. Air Defense Artillery					
(1) Unit locations	X	X	X	X	X
(2) Weapons control statuses	X	X	X	X	X
(3) Weapon system coverage (high-to-medium-altitude air defense (HIMAD) primary/SHORAD, as required)	X	X	X	X	
b. Fire Support					
(1) Coordinate measures		X	X	X	X
(2) Significant planned targets			X	X	X
(3) Significant ongoing fires		X	X	X	X
(4) Firing battery locations		X	X	X	
(5) RPV launch/recovery sites		X	X	X	

(6) RPV flight paths		above CA	below CA	below CA	below CA
c. Aviation					
(1) Battle positions (current/preplanned)			X	X	X
(2) Assembly area/unit locations (company size and larger)		X	X	X	
(3) FARPs		X	X	X	
d. A^2C^2/ATS					
(1) A^2C^2 control measures and restrictions	X	X	X	X	
(2) Friendly aircraft locations (airborne tactical formations)	X	X	X	X	X
(3) Instrumented landing sites	X	X	X		
(4) NAVAIDs		X	X		
e. Intelligence					
(1) Contaminated areas	X	X	X	X	X
(2) Massed enemy aircraft locations		X	X		
(3) Areas affected by friendly electronic countermeasures	X	X	X	X	
(4) Flight obstructions		X	X		
(5) SEMA aircraft missions (current/preplanned)	X	X	X		
(6) RPV and UAV launch and recovery sites, and flight routes.	X	X	X	X	
3. Request/maintain/disseminate A^2C^2 measures or restrictions.					
a. Request					

(1) Joint measures or restrictions	X	X	X		
(2) Army-specific measures (only affects Army users below coordinating altitude)		X	X	X	X
b. Maintain					
(1) Joint measures or restrictions	X	X	X		
(2) Army-specific measures		X	X	X	X
c. Disseminate					
(1) Joint Measures or restrictions	X	X	X	X	
(2) Army-specific measures (overlay if possible)		X	X	X	X
4. Develop/coordinate A^2C^2 annex to tactical operation plan					
a. Determine the mission.					
(1) Receive higher headquarters' operation plan.	X	X	X	X	X
(2) Extract required information from the plan.					
(a) Task organization	X	X	X	X	X
(b) Mission statement	X	X	X	X	X
(c) Concept of operation	X	X	X	X	X
(d) A2C2 annex (in some cases ATO or ACO, if provided)		X	X	X	
(3) Identify the following:					
(a) Area for which the commander is responsible, to include:					
(1) Vertical limits	X	X	X	X	X

(2) Left and right limits	X	X	X	X	X
(3) Front and rear limits	X	X	X	X	X
(b) The degree of authority which has been vested in the ground commander	X	X	X	X	X
(c) The users of airspace:					
(1) Army aviation		X	X	X	X
(2) Air forces	X	X	X	X	X
(3) Fire support	X	X	X	X	X
(4) Air defense	X	X	X	X	X
(5) Air traffic		X	X	Opt*	Opt*
(d) Requirements for the uses of the airspace:					
(1) Combat		X	X	X	X
(2) Combat support		X	X	X	X
(3) Combat service support		X	X	X	X
(e) A^2C^2 control measures imposed by higher headquarters	X	X	X	X	X
(4) Receive commander's guidance or concept.		X	X	X	X
b. From information internal to the CP, determine:					
(1) A^2C^2 priorities	X	X	X	X	
(2) All airspace user requirements:					
(a) Combat missions		X	X	X	X
(b) Combat support missions		X	X	X	

(c) Combat service support missions		X	X	X	
c. Prepare staff estimates.					
(1) Consolidate airspace use requirements for each course of action. Integrate requirements when possible. Identify conflicts.		X	X	X	X
(2) For each course of action determine the requirements to resolve conflict (control measures), the difficulty of solving conflict, and how the requirements to solve conflict affect the concept of the operations.		X	X	X	X
(3) Recommend a specific course of action.		X	X	X	X
(4) Receive commander's decision and guidance for implementation.		X	X	X	X
d. Develop A2C2 annex (utilize format provided) including the following as a minimum				*	*
(1) Delineate the airspace subsector:					
(a) Upper limits		X	X		
(b) Left and right limits.		X	X		
(c) Front and rear limits.		X	X		
(2) Describe authority to be exercised by each echelon concerning:					
(a) Army users		X	X		
(b) Other service users		X	X		
(c) Establishment of control measures	X	X	X	X	X
(d) Positive control and procedural control requirements		X	X	X	X

(3) State the commander's airspace priorities.		X	X	X	X
(4) State the A^2C^2 mission.		X	X		
(5) Explain the concept of operations/scheme of maneuver, to include A^2C^2 overlay.		X	X	X	X
(6) Write subunit paragraphs for each airspace user (fire support, Air Force, aviation, AD, ATS). Discuss for each user:					
(a) Type of control required (positive or procedural, when and where)		X	X	X	X
(b) A^2C^2 responsibilities not covered in SOP (such as peculiar information requirements, changes to responsibility for management of subsectors, weapon control orders/autonomous operation procedures (if changed), times of operation/restrictions)		X	X	X	X
(7) Delineate information affecting more than two users:					
(a) All procedural A^2C^2 control measures and restrictions (include fire support); information not included in the overlay(s)		X	X	X	X
(b) Flight rules (IMC/VMC)		X	X		
(c) Airspace control order issuing times.		X	X	X	
(d) High-use areas		X	X	X	
(e) Friendly EW operations which affect airspace users.		X	X	X	X
(f) FARP locations (active/preplanned)		X	X	X	

(g) Airfield locations/operations		X	X	If Req	
(h) NAVAIDs locations (active/preplanned time of operation)		X	X	If Req	If in bn area
(i) FOC/FCC location/operations		X	X		
(8) Address service support and command and signal as required.		X	X	X	X
e. Generate A^2C^2 control measure requests to support the annex and forward for approval (theater requirements and means to accomplish this may vary).		X	X	X	X

*** In those commands where a BCE does not exist due to command and control arrangements and organization, the functions performed by the BCE are performed by the appropriate staff element.**

***Noted information should appear in brigade/battalion order as it affects brigade/battalion operations. Separate annexes are normally not required.**

***Opt-optional**

***Noted information should appear in brigade/battalion order as it affects brigade/battalion operations. Separate annexes are normally not required.**

CHAPTER 4

Army Airspace Command and Control Elements

The A²C² staff elements are organized at each command echelon from maneuver battalion through land component commander (LCC). They are located within the command post (tactical and main) and are collocated with the fire support cell. These A²C² elements form a vertical and horizontal channel through which airspace control information and requirements are coordinated and disseminated.

The LCC coordinates airspace control issues with the theater army for those requirements that overlap the rear combat zone and COMMZ. The theater army, theater ATS assets, and theater army air defense command units positioned in the COMMZ perform the airspace control function within the COMMZ.

LAND COMPONENT COMMANDER LEVEL

Airspace coordination and integration at the LCC level are accomplished by the G3 who is the A²C² staff proponent. The G3 relies upon an A²C² element within each command post to interface with the airspace planners of the Tactical Air Force (TAF).

At this command echelon (Figure 4-1), airspace coordination and integration are focused on assisting the TAF airspace planners develop a theater (joint force) airspace control plan and on defining the broad policies and procedures for operation of the integrated airspace control system.

As the air-land campaign and major operations are planned and implementing orders written, coordination and integration are achieved. The Airspace Control/Utilization Annex to the OPLAN/OPORD provides implementing direction to subordinate forces related to the coordination and integration of Army forces using airspace within the area of operations.

FIGURE 4-1. LAND COMPONENT LEVEL

BATTLEFIELD COORDINATION ELEMENT

The battlefield coordination element is provided by the LCC and is collocated with the TACC or theater equivalent. The BCE expedites the exchange of information through face-to-face coordination with elements of the TACC (see Figure 4-2).

The TACC is the operational facility in which the ACC has centralized the planning, directing, and controlling functions over all tactical air (TACAIR) resources. The BCE's basic missions include processing land forces requests for TACAIR support, monitoring and interpreting the land battle situation for the TACC, providing the necessary interface for the exchange of current intelligence and operational data, and coordinating air defense and airspace control matters.

Fig 4-1

LAND COMPONENT LEVEL

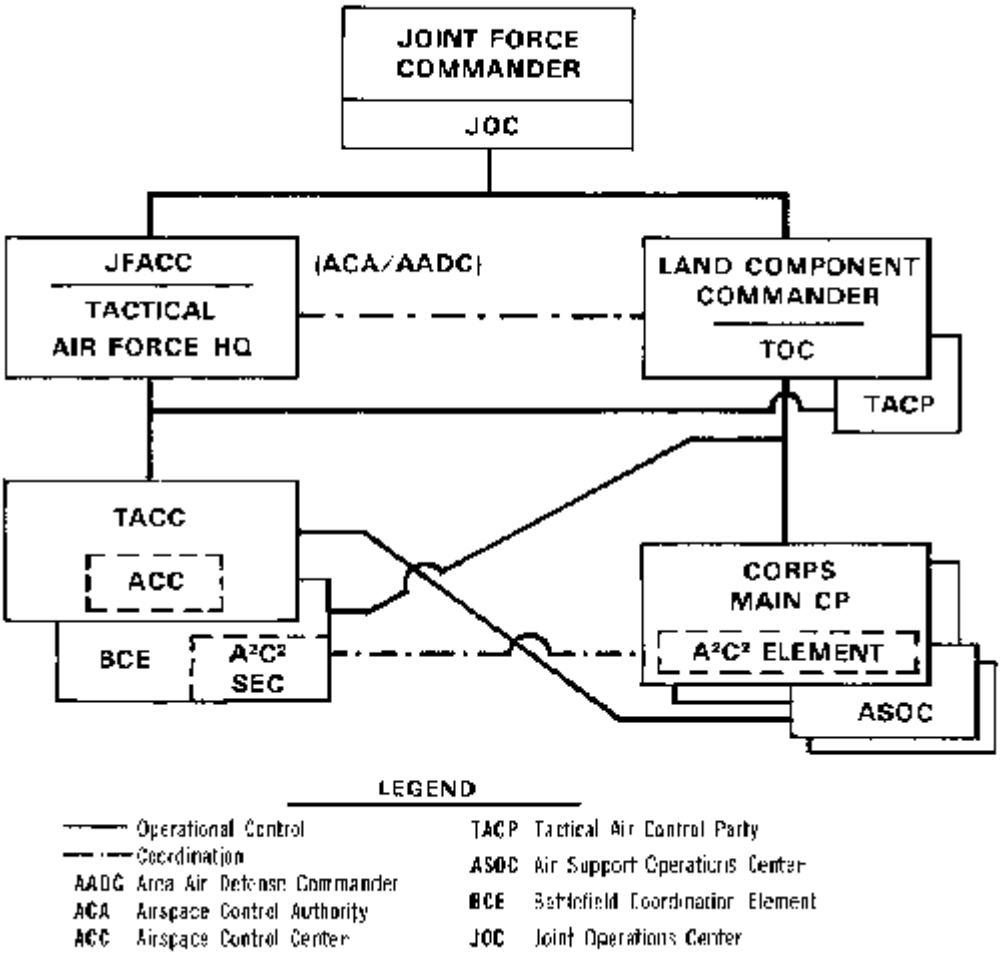
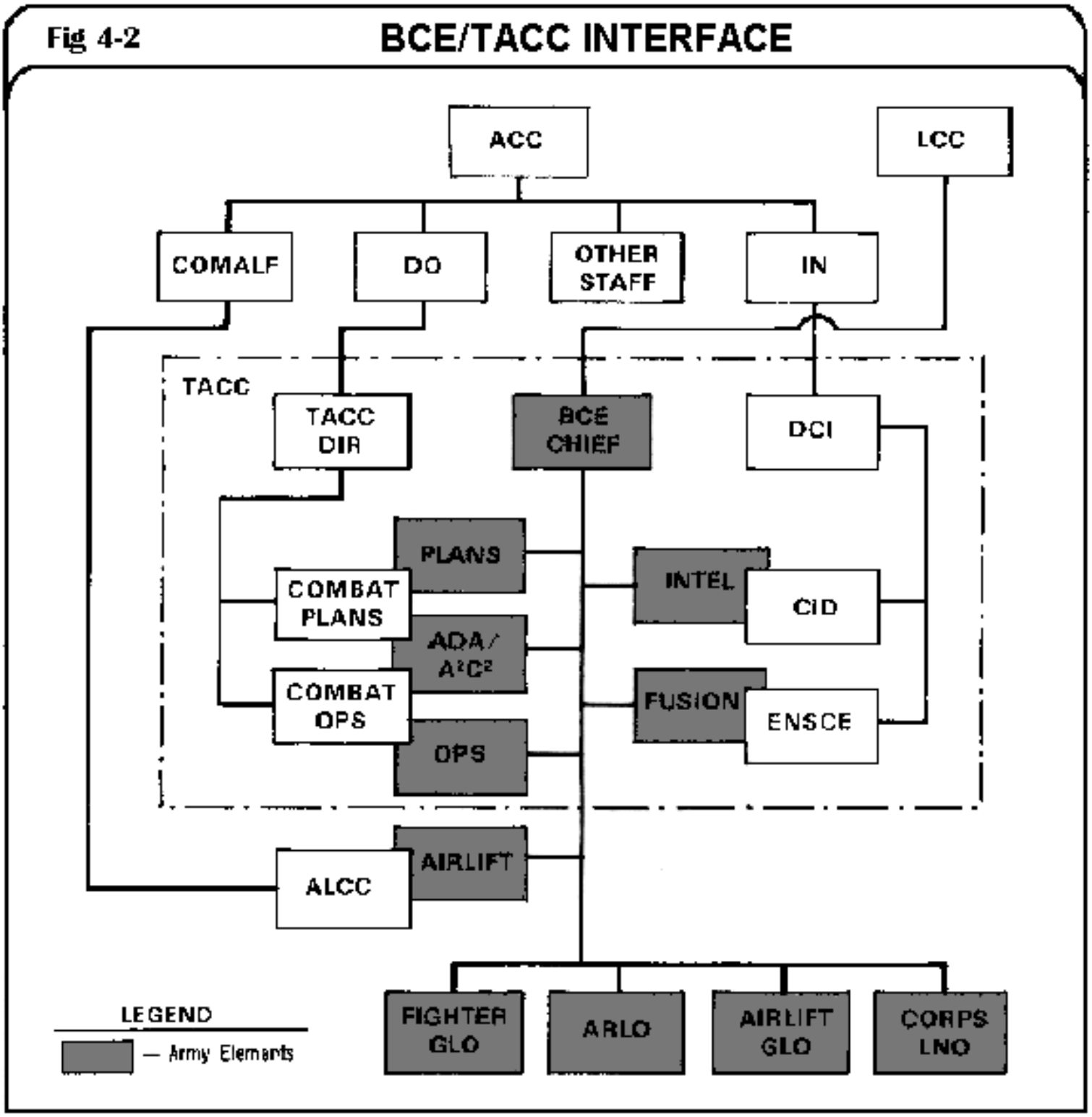


Fig 4-2 BCE/TACC INTERFACE



BCE ORGANIZATION AND FUNCTIONS

One BCE is authorized per TACC. The BCE is assigned to the LCC's headquarters. The BCE is organized with six sections: plans, operations, intelligence, fusion, air defense and A^2C^2, and airlift. The sections represent the LCC and are collocated with the TACC's combat plans, combat operations, combat intelligence, and enemy situation and intelligence divisions and the airlift coordination center.

The Army organizes the BCE as required with manning requirements varying from theater to theater based upon TACC facility limitations, and the command and control architecture of the Tactical Air Force. The

ground liaison officers and air reconnaissance liaison officers located at the various Tactical Air Force wings are assigned to the BCE. In the event a single corps conducts independent operations, there may not be a fully staffed BCE available; however, manning must be sufficient to accomplish all BCE functions.

The BCE operations section collocates with the TACC combat operations division. This section keeps the TACC combat operations division updated on land component operations and coordinates changes to land component targets and priorities that occur during the battle. It also stays abreast of the TACAIR effort by monitoring the missions being executed in support of the land component and the results of those missions when flown.

The BCE fusion section is collocated with the enemy situation correlation element (ENSCE) of the TACC. This section is responsible for maintaining current ground threat information from all available sources. This section keeps the ENSCE updated on current ground and air intelligence.

The BCE ADA and A²C² section coordinates Army air defense and airspace activities with the plans and operations staffs within the TACC's airspace control center. Additionally, this section exchanges information with the ADLO at the CRC, land component headquarters, and ADA headquarters. Specific A²C² duties include--

- Coordinating Army airspace use requirements within the airspace control authority subarea with, as a minimum, TACC combat operations and TACC combat plans.
- Coordinating Air Force airspace use requirements with the appropriate land component command, or corps G3 Air and, or A²C² elements and ATS elements.
- Integrating Army airspace user activities with the TACC A²C² plans.
- Advising the TACC about combat plans, combat operations, other BCE sections, G3 Airs, A²C² elements, and ATS elements of significant activities which affect the joint use of airspace.
- Advising the airspace control authority on the impact of joint airspace control measures or restrictions on the conduct of the ground battle.
- Representing ground force interests in the development and approval of airspace control measures and restrictions.
- Receiving, for staffing and approval, Army requests for airspace control measures and restrictions.
- Monitoring the integration of ground commander's A²C² SOPs into the TACC's airspace control system.
- Monitoring the integration of Army ATS facilities into the TACC's airspace control system.
- Providing the location and status of Army airfields, NAVAIDs, SAAFRs, and ATS facilities.

The BCE plans section is located in the TACC combat plans division. This section's representatives must integrate the ground battle planning with the TACC's TACAIR support planning process. To do this, needs and air support priorities of land component forces must be clearly stated. This section provides the TACC with planned land component schemes of maneuver to help synchronize ground and TACAIR support activities.

The BCE intelligence section works in the collection management, targets intelligence, and operations intelligence branches within the TACC combat intelligence division (CID). This section coordinates with the land component G2 collection management and dissemination section to obtain intelligence reports and collection requirements. This section provides the TACC combat intelligence division with the enemy ground order of battle, ensures proper interpretation of that information, and assists the TACC targets

intelligence branch in the target development process.

The airlift section coordinates airlift support at the airlift control center (ALCC). This section is the point of contact for joint airlift operations being performed for supported land component units.

BCE OPERATIONS

Under the current TOE, the BCE is authorized three officers and three noncommissioned officers (NCOs) for the ADA and A²C² section. One officer and one NCO are specifically allocated for A²C² functions. This manning allows a very limited 24-hour operational capability by dedicated airspace managers. The ADA and A²C² section interfaces with both combat operations and combat plans. Positioning of the ADA and A²C² section personnel can be difficult because of the separate and distinct tasks each TACC internal division must accomplish. Tactical Air Force command and control arrangements within NATO require the positioning of ADA and A²C² personnel with the appropriate TACS organization. Two recommendations for positioning, structuring, and establishing communications for the ADA and A²C² section of the BCE are a dispersed TACC and a consolidated TACC.

A Dispersed TACC. Within some theaters, the classical TACC's organization and operation have been modified. These modifications may consist of using several dispersed headquarters to accomplish all the TACC functions and, or reorganizing the missions and functions of the sections within the TACC. These modifications may include separating the functions of defensive air and offensive air operations into individual sections. Each individual section completes the missions of current operations execution and future operational planning. Additionally, while the command functions of both offensive and defensive air operations are retained in a single headquarters or center, separate centers are established for controlling the offensive and defensive air battles.

Because these headquarters or centers are in dispersed locations, no single Air Force section is charged with A²C². A²C² requirements are handled by each section as needed and consolidated at the headquarters exercising command.

The BCE organization must be modified to operate within the C² structure as described above. The ADA and A²C² section within the BCE must be split. The ADA personnel locate with the defensive air operations section and, or the defensive air control centers. Since current operations execution and future operational planning are combined, the A²C² personnel of the BCE locate with the offensive air operations section of the command headquarters.

Locating the A²C² personnel with the offensive air operations section is preferred because offensive air operations have greater direct impact on the ground commander's battle and airspace than does defensive air operations. This does not eliminate the requirement for close and continuous coordination between the defensive air operations section and the A²C² section. With only two personnel (one officer and one NCO) authorized, the A²C² section requires additional personnel to provide the 24-hour operational capability. These additional personnel allow the section to monitor both future operational planning and current operations execution of the offensive air battle while maintaining the required coordination with the defensive air planners and executors. Other sections of the BCE located with the offensive air section may provide these personnel. To accomplish A²C², they must understand theater procedures (Chapter 2), A²C² tasks (Chapter 3), and information networking (Chapter 5). With this knowledge, they can accomplish A²C² as part of their normal operations. The dedicated A²C² personnel serve as the subject matter experts and as the coordinators for A²C² requirements for all TACC sections (such as defensive air and airlift).

A Consolidated TACC. Under this organization, the ADA and A²C² section may remain together or may be split. If the section remains together, all assigned section personnel must be capable of accomplishing both AD and A²C² tasks. If the section is split, the A²C² personnel require some type of augmentation. Again, a 24-hour operational capability for future operational planning and current operations execution is necessary. This capability could be accomplished as described for the dispersed TACC. The A²C² section should be located with the Air Force A²C² section. If such a section does not exist, the A²C² section should locate with the BCE plans section since most A²C² tasks accomplished at the BCE consist of future operational planning. Regardless of its location, the A²C² section must maintain continuous coordination with all BCE sections.

Linkage between the land component commander's headquarters, the corps, and the BCE at the air component commander's TACC depends on a reliable and responsive communications system. Communications to the BCE is provided through the theater army communications system and includes secure voice, data, facsimile, and message communications. Land forces' requests for airspace control measures, and airspace control information such as the ATO and the ACO, must have priority within the theater communications system to ensure their timely transmission. BCE automation and communications systems must interface with the Tactical Air Force Computer Assisted Force Management System (CAFMS) and those theater-specific automated command and control systems.

A²C² ELEMENTS ORGANIZATION AT COMMAND ECHELONS

The Army's principal organization charged with the responsibility of airspace control is the A²C² staff element. The A²C² element is located within the command posts (CPs) established by each tactical echelon. Current doctrine requires that corps through brigades establish three CPs: tactical, main, and rear. The functions of each CP vary; however, generic functions (Figure 4-3) are usually accomplished at each CP.

As A²C² elements are normally manned by personnel from other staff sections within each CP, they are constrained by personnel and equipment authorization. Only corps and division have dedicated A²C² elements to accomplish A²C² tasks. The A²C² elements are responsible for determining how the commander's A²C² needs can be met. The A²C² elements at corps (designated corps A²C² element) and division (designated division A²C² element) are under the staff responsibility of the ACofS, G3, and supervised by the G3 Air. The A²C² elements consist of representatives from, but not limited to, the ADA element, the aviation element, the air liaison officer, the FSE, the ATS unit assigned to the corps or division, the combat electronic warfare and intelligence (CEWI) unit or the G2 section, the G4 section (corps and division), and, when required, the air and naval gunfire liaison company (ANGLICO).

Fig 4-3. COMMAND POST FUNCTIONS

TATICAL	MAIN	REAR
Primary ● Conduct the close fight.	**Primary** ● Synchronize the battle. ● Conduct the deep fight ● Plan.	**Primary** ● Sustain the battle. ● Conduct rear area operations.

Secondary	Secondary	Secondary
• Monitor the deep and rear fights. • Plan.	• Coordinate combat service support. • Monitor the battle.	• Serve as the backup to the main. • Plan.

A²C² element tasks are specified in Chapter 3 and include:

- Identifying and resolving airspace user conflicts.
- Maintaining A²C² overlays and information displays.
- Developing A²C² procedures, plans, SOPs, and annexes.
- Coordinating and integrating airspace user requirements within the area of operations.
- Coordinating Army airspace use with other components of the joint force and with adjacent units.
- Advising subordinate and higher headquarters of significant activities affecting airspace use.
- Advising subordinate and higher headquarters of the impact of airspace control measures or restrictions on the ground battle.
- Approving or staffing of requests for special use airspace.

One or more of the command posts must accomplish all procedures described in Chapter 2 and tasks explained in Chapter 3 to support future operational planning and execution of current operations.

Heavy and light units of the Army from corps through battalion differ in their organizational configuration. Therefore staff sections and liaison elements from which the A²C² element is organized vary in personnel, grade structure, and equipment authorizations. The principal staff sections and liaison elements that represent the major functional users of airspace, and from which the G3 organizes the A²C² element, include the G3 section, ADA element, aviation element, fire support element, ATS element, and Air Force TACP. An Air Defense Operations Liaison Team (ADOLT) is included in NATO. The ADOLT provides the interface between the corps and the theater integrated air defense system elements operating in the corps area of operations.

These staff sections and liaison elements are represented within both the tactical and main command posts and, to a limited degree, at the rear command post. These principal staff elements are included in the fire support cell, facilitating its organization and collocation with the A²C² element.

Personnel from these sections and elements assigned A²C² staff responsibilities accomplish two separate tasks. First, they assist the echelon commander in the proper application of their parent units' assets, provide the necessary functional area (technical) expertise, and serve as liaisons between the commander, his headquarters, and their parent units. Second, they assist in the A²C² process by synchronizing the airspace requirements of their parent units with other airspace users of the combined arms team and services.

Personnel performing A²C² staff functions require an in-depth knowledge of Army airspace control doctrine and procedures, the theater airspace control plan, and the unit's airspace control SOPs. Such expertise requires personnel assigned fulltime staff duties within the A²C² element.

CORPS A²C² ELEMENT

This section describes the organization of a corps A²C² element. The organization is based on the requirements to conduct A²C² tasks to support future operational planning, conduct current operations, and perform the specified functions of each CP.

Tactical. The corps A²C² element representatives at the tactical CP should consist of, as a minimum, a FSO, an aviation officer or an NCO, an ADA officer or an NCO, and an ALO from the TACP. The FSO or Army aviation LO should serve as corps A²C² element chief at the tactical CP. These personnel may require augmentation from the corps main to conduct 24-hour operations. These personnel will accomplish A²C² tasks as part of their normal duties. The corps A²C² element's responsibilities at the tactical CP should normally be limited to the A²C² tasks of monitoring current operations execution of all three fights. The corps A²C² element at the tactical CP will use the operational communications channels at the TAC.

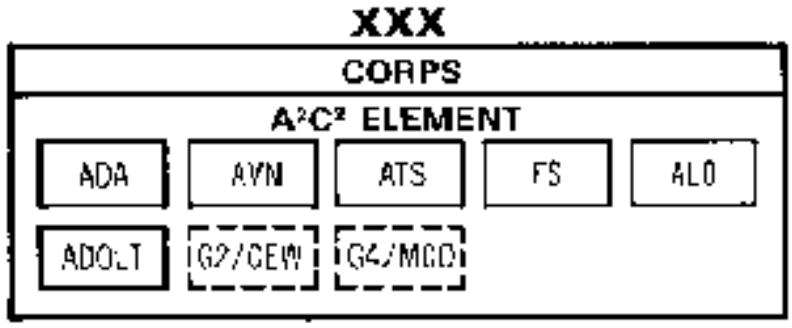
Main. The A²C² element at the main CP accomplishes all future operational planning tasks. It exercises airspace control responsibilities for the deep fight and corps rear area airspace users as specified in Chapter 2. These dedicated airspace managers accomplish specified A²C² tasks as their first priority.

The corps A²C² element at the main CP works for the G3. The day-to-day activities of the A²C² element are supervised by the corps A²C² officer (Chief, A²C² Element) usually the G3 Air. The G3 may designate the senior ADA operations officer or the senior aviation officer to be the corps A²C² officer. Selection is based on functional responsibilities and on airspace control experience and training. Factors that influence the composition and staffing of the A²C² element at the main command post include: 24-hour operational capability facility limitations, operational requirements of the force, and composition of the force. A²C² staff representatives at the main CP (Figure 4-4) include:

- G3 operations section (G3 Air).
- ADA element.
- Aviation element.
- ATS liaison element.
- Fire support element.
- G2 CM&D section (as required).
- G4 section (as required).
- Air Force TACP.
- ANGLICO.

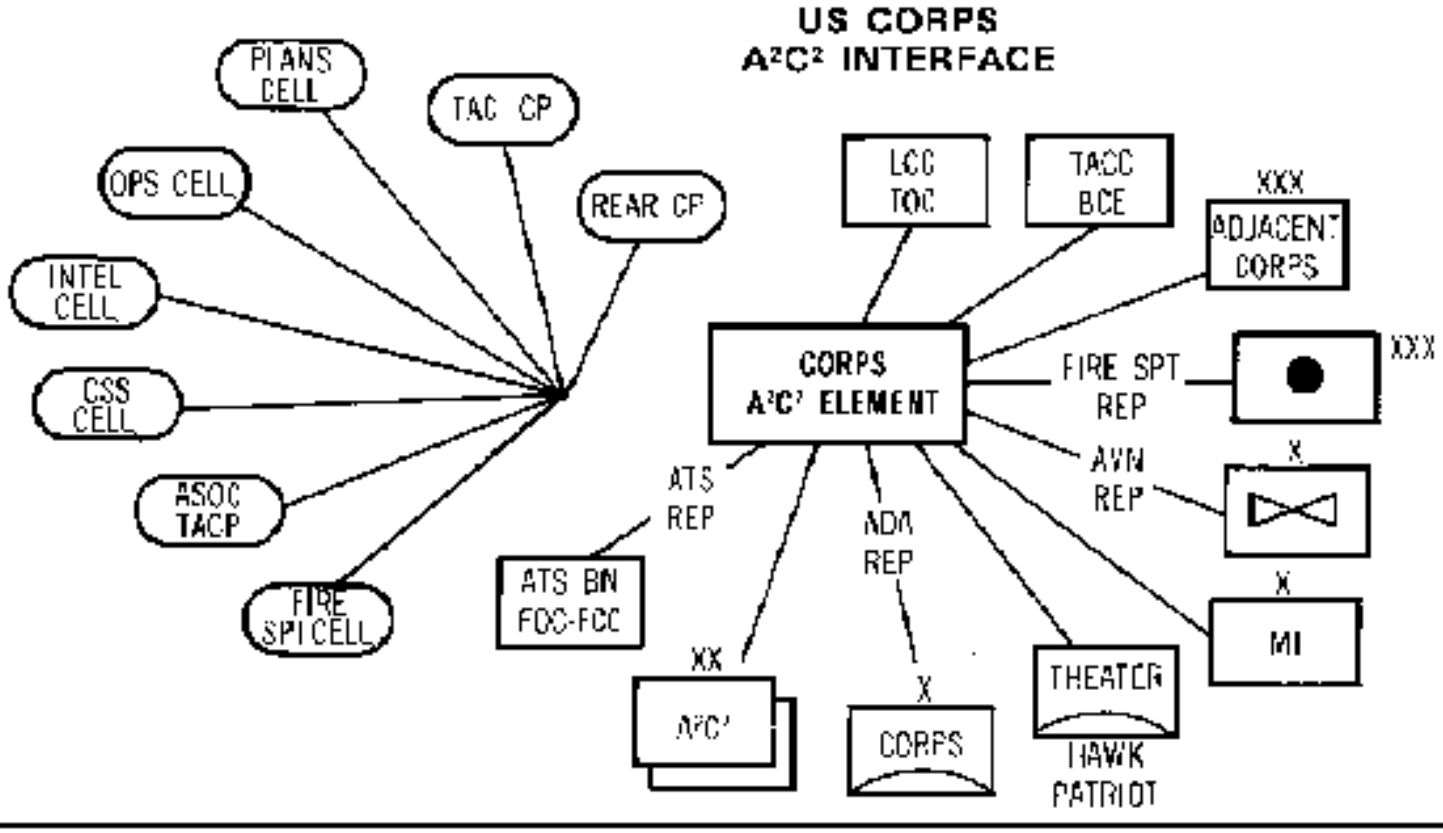
Fig 4-4

CORPS A²C² ELEMENT



- G3 OPERATIONS SECTION REP
- ADA ELEMENT REP
- AVIATION ELEMENT REP
- FIRE SUPPORT ELEMENT REP
- TACP REP
- ATS LO
- C2 CM&D REP
- G4 OR MCO REP

NOTE: ADOLT IS UNIQUE TO NATO.
ADOLT—AIR DEFENSE OPERATIONS LIAISON TEAM



The corps A²C² element representatives are collocated and provided a common work area. The corps A²C² element is collocated with the fire support cell and sufficiently close or electronically connected to the ASOC to allow for continuous coordination. The corps A²C² element is provided, as a minimum, a secure voice capability to higher, lower, and adjacent headquarters. Secure communications means is also required to the tactical CP and rear CP. The capability for record traffic and data is also necessary. This capability may be a separate net or an existing net. These nets should have the same importance as any other command or operations net. The corps A²C² element is linked to the maneuver control system through the G3 Air's tactical computer terminal with additional work stations for the ATS representative, fire support representative, and ADA representative.

Rear. Because of personnel and equipment constraints, the rear CP has no A²C² staff element. Rear CP

requirements are handled at the main CP by the A²C² element. The corps A²C² element coordinates with the rear CP operations and intelligence section and plans section as appropriate to satisfy rear operations airspace command and control requirements. The corps OPLAN may identify a tactical combat force (TCF) with an on order mission to conduct rear operations. The corps A²C² element, with the TCF's A²C² staff and the rear CP plans section, develops and coordinates all airspace requirements to support the commander's plan for rear operations.

The organization and staffing of the corps rear CP are very austere. Individuals in the operations and intelligence section (fire support, ADA, operations), concurrently with their other duties, also address airspace control and utilization issues. These individuals in the rear CP work with their counterpart within the corps main CP A²C² element to accomplish airspace control planning for the rear area.

The A²C² element at the main CP works with the combat service support cell at the main CP and the staff at the rear CP to satisfy airspace control requirements for sustainment operations. For example airlift operations involving Air Force intratheater airlift assets require airspace control coordination as discussed in Chapter 1. The corps movement control officer, transportation officer, tactical airlift liaison officer, and A²C² staff interface as required.

During the conduct of rear operations, the A²C² element at the main CP, and the operations and intelligence section of the rear CP, monitor changes in the tactical situation. Tactical changes may require changes to airspace control measures established in the rear combat zone. Primarily low-level transit routes, and other air corridors that transit through the rear area, are affected by level III combat operations.

DIVISION A²C² ELEMENT

The organization of the A²C² elements within the tactical and main command posts at division is similar to that at corps. The location and the airspace control tasks to be accomplished are the same as the corps with the following modifications.

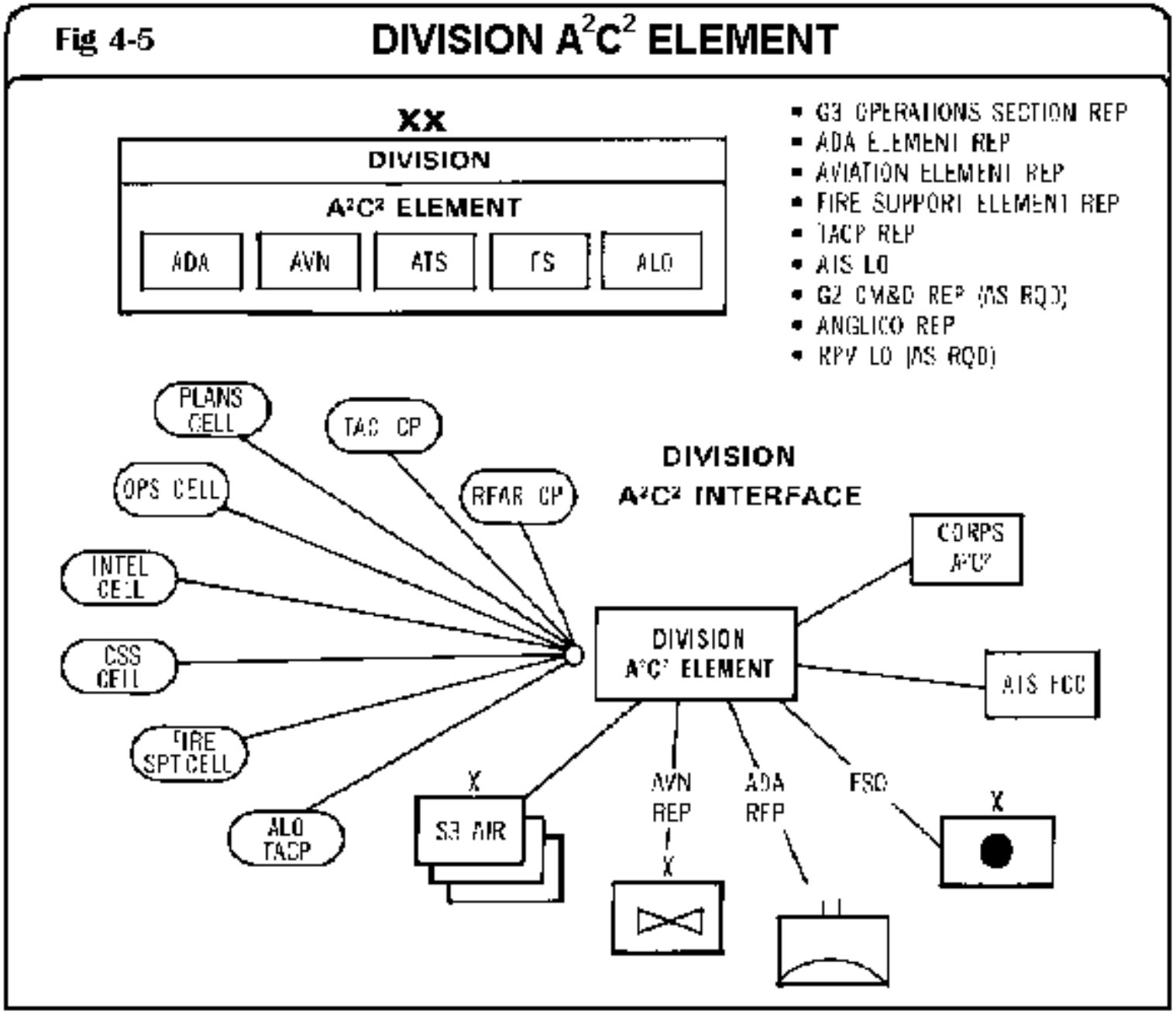
The division's primary focus is on the conduct of battles and engagements in the forward portion of the combat zone (division rear boundary and forward). Accordingly, airspace control tasks are primarily those required to synchronize all airspace users of the combined arms team and supporting sister services with the close battle.

Division airspace control methodology stresses the use of procedural control, relying on standard operational procedures selected use of theater airspace control measures, and compliance with the theater airspace control plan and unit SOPs. While airspace control tasks of the corps and division A²C² elements are similar, the geographical orientation (forward combat zone vs rear area) results in minor differences in the airspace control procedures employed, and the degree of interface with the theater integrated airspace control system.

A²C² staff representatives at the division main CP (Figure 4-5) include:

- G3 operations section (G3 Air).
- ADA element.
- Aviation element.
- ATS liaison element (as required).
- Fire support element.

- G2 CM&D section (as required).
- G4 section (as required).
- RPV unit commander (as required).
- Air Force TACP.
- ANGLICO.



BRIGADE AND BATTALION A²C² ELEMENTS

At brigade and battalion levels, no special staff elements exist to perform the A²C² element function. Consequently, the A²C² function must be performed by existing staff personnel, supporting liaison representatives, and fire support representatives. Although the A²C² function at brigade and battalion levels is the staff responsibility of the S3, it is supervised by the S3 Air.

These A²C² staff elements (Figure 4-6) include the following personnel:

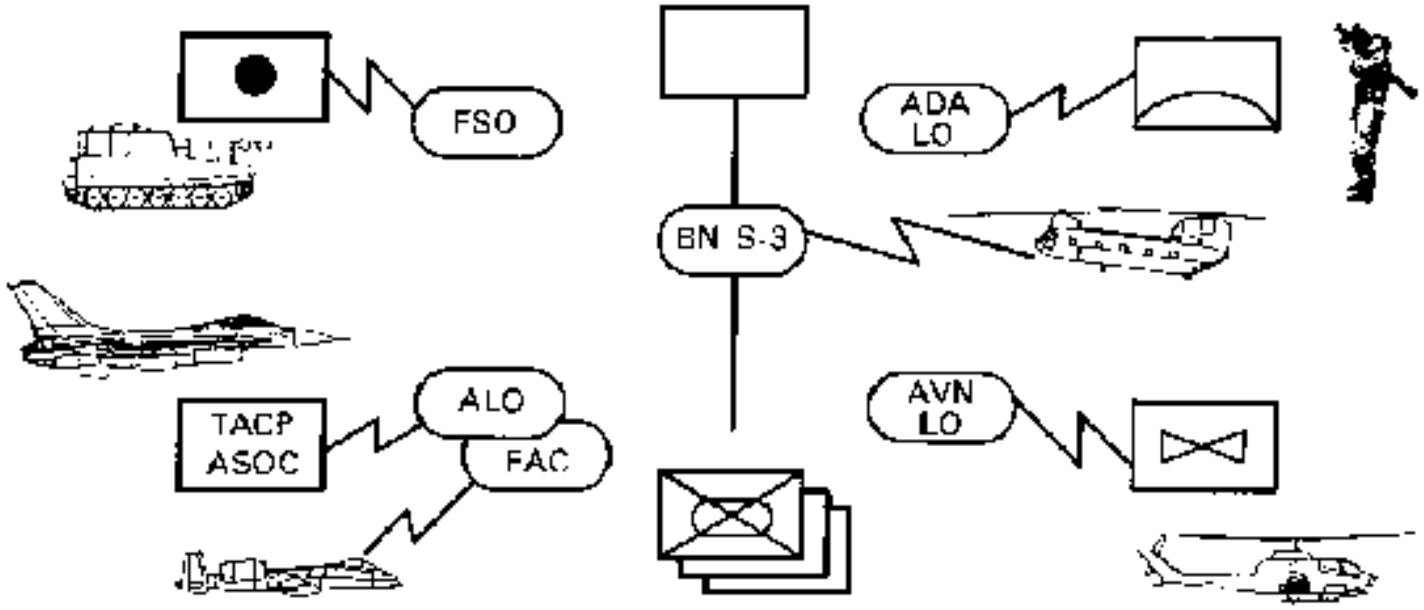
- S2, brigade and battalion operations,
- S3 Air, brigade and battalion operations,
- FSO,
- LOs from supporting Army aviation and air defense units, and
- ALOs from the TACP.

Fig 4-6 BATTALION A²C² ORGANIZATION

- NO DEDICATED A²C² ELEMENT
- MANEUVER BDE/BN COMMANDER CONTROLS AIRSPACE OVER HIS AOR THROUGH HIS STAFF AND SUBORDINATE COMMANDERS
- BDE/BN COMMAND OR OPERATIONS NET. SUPPORTED BY THOSE COMMUNICATIONS NETS OF SUPPORTING LIAISON SECTIONS ARE USED TO IMPLEMENT A²C²

- A²C² STAFF MAY INCLUDE
  - -- S 3 AIR
  - — FIRE SUPPORT OFFICER (FSO)
  - — AIR LIAISON OFFICER (ALO)
  - — AIR DEFENSE ARTILLERY (ADA) LIAISON OFFICER
  - ···· ARMY AVIATION LIAISON OFFICER
  - — FORWARD AIR CONTROLLER (FAC)

BATTALION A²C² INTERFACE



The CP where each of these personnel is located varies according to the tactical situation. To conduct brigade and battalion A²C² (executing current operations tasks and exercising procedural and positive C²), these personnel must be collocated or have a real-time communications capability. These personnel must be at that CP (normally the Tactical Air Command (TAC) CP) which is conducting the close fight. A²C² planning is accomplished as part of the normal operational planning. A²C² requirements identified that require approval by division or higher are forwarded for approval by the main CP.

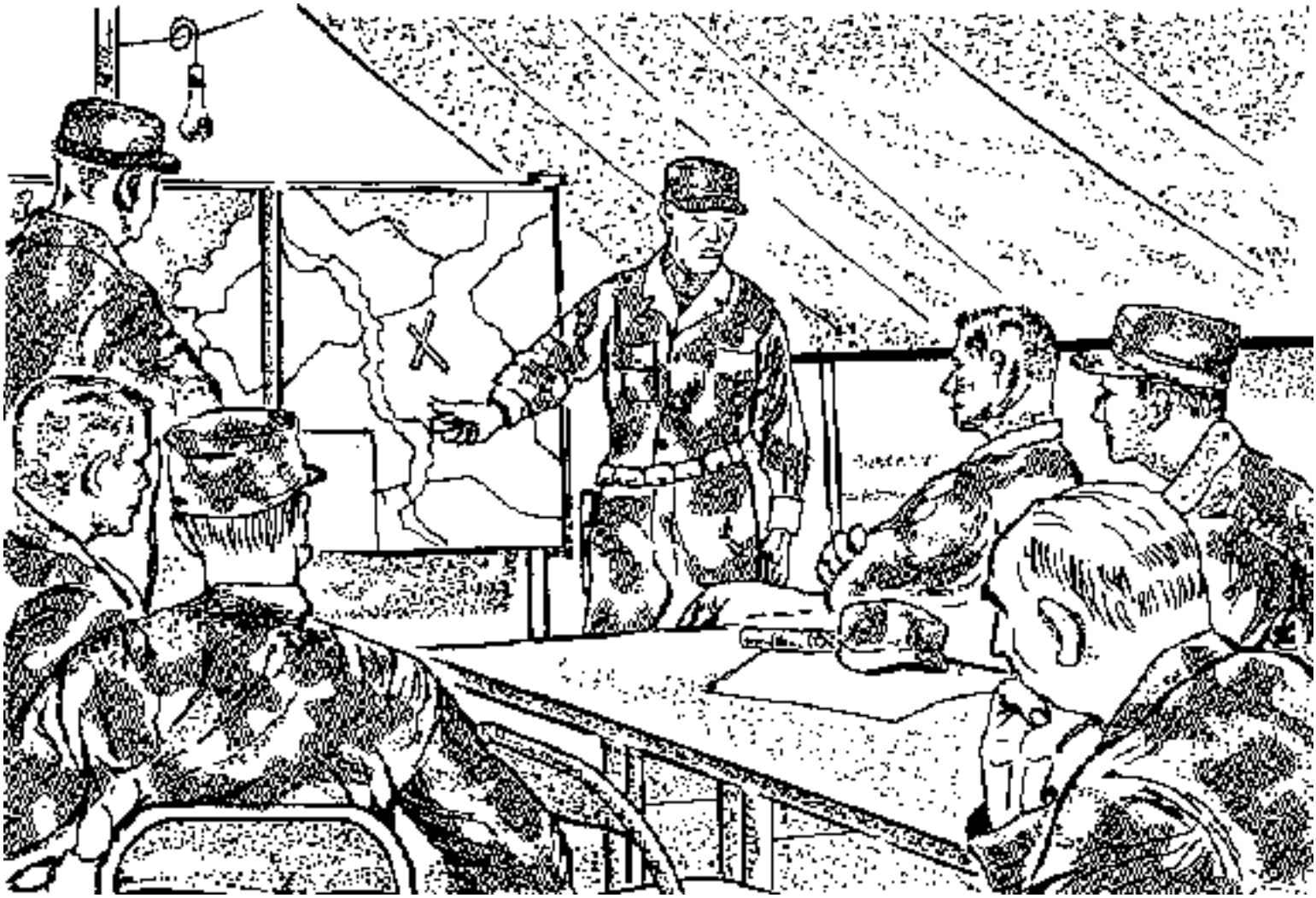
A²C², air defense, and fire support coordination functions are closely interwoven. These functions involve the detailed coordination and integration of TACAIR, indirect fire, organic and augmenting AD, and tactical fire and maneuver operations (to include Army aviation). Those individuals directly involved in the

conduct of localized combat operations--battalion and company commanders, fire support coordinators, ALOs, and forward air controllers--perform A²C² functions established at other echelons (for example, division A²C² element).

Existing command or operational nets and those nets provided by the support or liaison sections are used to implement A²C². Aviators and flight leaders coordinate with the operations center using the brigade air-to-ground or command nets. The maneuver brigade and battalion S3 are linked via the MCS to the division, thus the S3 Air has a communications and automation link with the division A²C² element and S3 Air.

CHAPTER 5

Information Networking



This chapter outlines the information required to operate an A²C² system. The matrixes depict the primary players at the various headquarters organizations--ranging from the BCE to the maneuver battalion. The information required, the source of the information, the element of the staff using the information, and the expected uses of the information are shown at the matrixes. The information shown is not all inclusive, nor will all of it be required in every scenario; it is situation dependent.

BATTLEFIELD COORDINATION ELEMENT

The A²C² element representing the LCC is located in the BCE. A plans division and an operations division are part of the BCE.

PLANS DIVISION

The BCE representative in the plans division needs information on all requests for control measures and restrictions to interface within the TACC's airspace control center. (See Chapter 2 for control measures and restrictions.) This information is provided by the appropriate corps A²C² elements. Other information required by the BCE representative in the plans division includes:

- FLOT location and FSCL location.
- Friendly surface-to-air missile location and associated coverage.
- AD weapons control status.
- Significant planned indirect fires, particularly fires forward of the FSCL.
- Planned RPV operations and launch sites.
- A²C² priorities.
- ATO and ACO.
- Disposition of Army airfields and principal landing sites.

The BCE A²C² representative, in coordination with the TACC combat plans division, provides approval or disapproval notification for Army airspace requests, orders, and recommendations to the appropriate requesting corps A²C² element (G3), corps FSE, or CRC. Additionally, the BCE representative provides the current Air Force airspace utilization priorities, control measures or restrictions, and all other elements of information necessary for the corps to maintain a complete A²C² picture.

OPERATIONS DIVISION

To interface with the TACC combat operations division, the BCE representative in the operations division needs information concerning the following:

- Requests for immediate changes to the current A²C² plan (as established in the control plan, ATO, or ACO).
- Changes to the weapons control status.
- Changes to the ADA HIMAD locations.
- Changes to FLOT and, or boundaries.
- Additions or changes to the significant planned indirect fires.
- Procedural changes to IFF or SIF.
- ATO and ACO.
- RPV or UAV missions above the coordinating altitude.
- Locations of instrumented airfields.
- Movement of Army airfields.
- Reduction or suspension of Army air traffic management services.

The matrix at Figure 5-1 depicts BCE vertical informational requirements.

Fig. 5-1. BCE VERTICAL INFORMATION NETWORKING

Information Required	Received From	Action Officer	Action/Output*

OPORD/OPLAN (includes A²C² annex) --Corps	Corps A²C² Elements Corps G3s	BCE A²C² Element	P, C
A²C² Control Measures/Restrictions --Requests --Approval	Corps A²C² Elements TACC, ACC	BCE A²C² Element BCE A²C² Element	C, A D --Corps A²C² Elements --ADA Bde
FLOT	Corps A²C² Elements Corps G3s	BCE A²C² Element	P, C, D
A²C² Priorities --Army --Air Forces	Corps A²C² Elements Combat Ops	BCE A²C² Element BCE A²C² Element	P, C, D --TACC Combat Ops P, C, D --Corps A²C² Elements
ATO/Airspace Control Order	TACC Combat Ops	BCE A²C² Element	P,C
ATO Issuing Times	Corps A²C² Elements	BCE A²C² Element	P, C, D
IFF/SIF Procedures	CRC	BCE A²C² Element	D --Corps A²C² Elements --TACC, A²C²
Unscheduled, Large Formation Missions	TACC Combat Ops	BCE A²C² Element	C, D, --Corps A²C² Elements --ADA Bde
NBC Contaminated Areas	Corps A²C² Elements	BCE A²C² Element	P, C, D --TACC Combat Ops
Friendly ECM Activities (affecting avionics)	Corps A²C² Elements/ G2	BCE A²C² Element	P, C, D --TACC Combat Ops and Plans

SEMA/RPVs/UAVs (above coordinating altitude)	Corps A²C² Elements/ G2/Corps FSE	BCE A²C² Element	P, C, D --TACC Combat Ops and Plans
ADA Locations/Status (HIMAD)	Corps A²C² Elements ADA Bde	BCE A²C² Element	P, C
ADA Weapons Control Status --Requests --Approvals	 Corps A²C² Elements/ G3 CRC	 BCE A²C² Element BCE A²C² Element	 P, C, A D --Corps A²C² Elements
Army ADA Priorities	Corps A²C² Elements/ G3	BCE A²C² Element	C, D --TACC Combat Ops
AD Warnings	CRC Corps A²C² Elements	BCE A²C² Element	C, D --Corps A²C² Elements --ADA Bde --TACC Defensive Duty Officer
ADA Weapons Engagement Zones/Weapons Coverage	CRC TACC Plans ADA Bde	BCE A²C² Element	P,C, D --Corps A²C² Elements
Significant Planned Indirect Fires	Corps FSE/ Corps A²C² Elements	BCE A²C² Element	P, C
Fire Support Coordination Measures	Corps FSE Corps A²C² Elements	BCE A²C² Element	C
Locations and Status --Army Articles --NAVAIDs --FOC/FCC	 Corps A²C² Elements Corps Avn Units Corps A²C² Elements ATS Group/Bn Corps A²C² Elements ATS Group/Bn	 BCE A²C² Element BCE A²C² Element BCE A²C² Element	 P, C, D --TACC ACC P, C, D --TACC ACC P, C, D --TACC ACC
SAAFRs	Corps A²C² Elements	BCE A²C² Element	P, C, A (if above coordinating altitude

P-Planning
D-Distribution
C-Coordination
ACC-Airspace Control Center
A-Approval
***Action/output assumes each A²C² element section passes information it obtains to its parent unit.**

CORPS A²C² ELEMENT

The corps A²C² element has staff responsibility for A²C² within the corps area. The corps A²C² element staff function requires information provided from the sources listed in Figure 5-2. The staff elements utilizing this information are shown by duty position.

Fig 5-2. COPRS A²C² ELEMENT LATERAL INFORMATION NETWORKING

	CORPS A²C² ELEMENT STAFF ELEMENTS					
INFORMATION ITEMS	**G3 Air**	**Corps Aviation Officer**	**Corps ADA Liaison Officer**	**Air Traffic Services Liaison Officer**	**Fire Support Coordinator**	**Air Liaison Officer**
OPORDS/OPLANS (includes A²C² annex)	X	X	X	X	X	X
ATO/airspace control order	X	X	X	X	X	
Airspace control issuing times	X	X	X	X	X	X
Airspace user priorities	X	X	X	X	X	
A²C² restrictions/control measures (current and requested)	X	X	X	X	X	X
Army AD priorities	X	X	X			
AD warnings		X	X	X	X	X
AD weapons control status (current and requested)	X	X	X	X		X
Friendly ADA locations and coverage	X	X	X	X		X
ADA weapon engagement zones		X	X	X		
FARPs						
Location and status of airfields (includes FARPs)	X	X		X		X
Field artillery locations	X	X		X	X	X
Fire support coordination measures	X	X		X	X	
Significant planned/ongoing fires (assumes no fires in rear areas)	X	X		X	X	

Army aviation airspace requirements (includes SEMA)	X	X	X			
Army aviation unit locations (company and larger)	X	X		X		
Aviation battle positions		X	X		X	X
Massed enemy aircraft locations			X			
IFF/SIF procedures		X	X	X		
SAARFs		X	X	X	X	
RPV flight paths/routes		X		X	X	
RPV launch sites		X		X	X	
Flight obstructions		X		X		
Sortie allocation	X				X	
FLOT		X	X	X	X	
Positions of instrument landing systems		X		X		
Location and status of NAVAIDs		X		X		X
Intelligence summaries	X	X	X		X	X
Air support requests/requirements (includes EMA and RPV)		X	X	X	X	
Air support requests/requirements (includes Air Force only)					X	
NBC contaminated areas		X		X		
Unscheduled large formation missions				X		
Airborne tactical formations		X		X		
Friendly ECM activities		X		X		
Location of FCCs				X		X
Location of FOCs				X		X
NBC Reports		X		X	X	
Weather Reports	X	X		X		X

The matrix at Figure 5-3 depicts corps A²C² element informational requirements such as:

- Where information from outside the corps A²C² element originates.
- Who the primary corps A²C² element action officer is.
- Where the information is sent when going outside the corps A²C² element.
- What the information is used for.

CORPS A²C² ELEMENT
Fig 5-3. VERTICAL INFORMATION NETWORKING

Information Required	Received From	Action Officer	Action/Output*
OPORD/OPLAN (includes A²C² annex)			
--Corps	G3	G3 Air/ A²C² Officer	P, C, D --BCE
--Division	G3s	G3 Air/ A²C² Officer	P, C, A
A²C² Control Measures/Restrictions			
--Requests	Corps G3, Div A²C² Elements	G3 Air/ A²C² Officer	P, C, A, D --BCE
--Approvals	BCE A²C² Element	G3 Air/ A²C² Officer	P , C, D --Div A²C² Elements
FLOT	G3	G3 AIR/ A²C² Officer	P, D --BCE
A²C² Priorities			
--Army	G3	G3 Air/ A²C² Officer	P, C, D --BCE --Div A²C² Elements
--Air Forces	BCE A²C² Element	G3 Air/ A²C² Officer	P, C, D --Div A²C² Elements
ATO/Airspace Control Order	BCE ASOC	G3 Air/ A²C² Officer	P, C --Div A²C² Element
ATO Issuing Times	BCE	G3 Air/ A²C² Officer	P, C, D
IFF/SIF Procedures	BCE A²C² Element	G3 Air/ A²C² Officer	P, D--Div A²C² Elements
Unscheduled, Large Formation Missions	BCE ASOC	G3 Air/ A²C² Officer	D --Div A²C² Elements

NBC Contaminated Areas	Corps NBC Element	G3 Air/ A²C² Officer	P, C, D --Div A²C² Elements --All A²C² Elements Sections
Air Support Requirements/Requests			
--Army Aviation Attack	G3 Corps Avn Units Div A²C² Elements	Avn LO	P, C, D --Div A²C² Elements
Airlift	G4/G3 Corps Avn Units Div A²C² Elements	Avn LO	P, C, D --Div A²C² Elements
SEMA	G2/G3 Corps Avn Units Div A²C² Elements	Avn LO	P, C, D --Div A²C² Elements
--Air Forces CAS	G3	G3 Air/ A²C² Officer	P, C
Recon	G2/G3	G3 Air/ A²C² Officer	P, C
Airlift	G4/G3	G3 Air/ A²C² Officer	P, C
ADA Locations and Coverage	Corps ADA Units Div A²C² Elements	ADA LO	P, C, D --BCE A²C² Elements
ADA Weapons Control Status			
--Requests	G3 Div A²C² Elements	ADA LO	P, C, D --BCE A²C² Element
--Approvals/ Modifications	Corps A²C² Element	ADA LO	P, D --Div A²C² Elements
Army ADA Priorities	G3	ADA LO	P, D --Div A²C² Elements

AD Warnings	BCE Subordinate Units Div A²C² Elements	ADA LO	C, D --BCE --Div A²C² Elements
ADA Weapons Engagement Zones/Weapons Coverage	BCE ATO	ADA LO	P
Significant Planned/ Ongoing Indirect Fires	Corps Arty	FSCOORD	P, C
Fire Support Coordination Measures	Corps FSE	FSCOORD	P, C, D --Div A²C² Elements --BCE
Field Artillery Locations	Corps Arty	FSCOORD	P, C , D --Div A²C² Elements
RPV Launch Sites	Div A²C² Elements	FSCOORD	P, C, D --Div A²C² Elements
RPV Flight Routes	Div A²C² Elements	G3 Air/ A²C² Officer	P, C, A, D --Div A²C² Elements --RPV Units
SAAFRs	Div A²C² Elements Corps Avn	G3 Air/ A²C² Officer	P, C, A, D --Div A²C² Elements --BCE (if above coordinating altitude)
Army Avn Unit Locations	Corps Avn Units G3	Avn LO	P, C, D --Div A²C² Elements
Airborne Tactical Formations	Corps Avn Units G3	Avn LO	C

Locations and Status --Army Articles	Corps Avn Units G3 Div A²C² Elements	Avn LO G3 Air/ A²C² Officer	P, C, D --Div A²C² Elements --BCE
--FARPS	Corps Avn Div A²C² Elements	Avn LO G3 Air/ A²C² Officer	P, C, D --Div A²C² Elements P, C, D
--NAVAIDs	ATS Bn/Co G3	ATS LO	--Div A²C² Elements --BCE
--FOC/FCC	ATS Bn/Co	ATS LO	P, C, D --Div A²C² Elements --BCE
Flight Obstructions	ATS Bn/Co Corps Avn Units Div A²C² Elements	ATS LO	P, C, D --Div A²C² Officers
Intelligence Summaries	G2	G3 Air/ A²C² Officer	P, C
Friendly ECM Activities	G2	G3 Air/ A²C² Officer	P, C
Massed Enemy Aircraft Formations	G2 ADA Units	G3 Air/ A²C² Officer	P, C, D --Div A²C² Officers

P-Planning
D-Distribution
C-Coordination
ACC-Airspace Control Center
A-Approval
***Action/output assumes each A²C² element section passes information it obtains to its parent unit.**

DIVISION A²C² ELEMENT

The division A²C² element has staff responsibility for A²C² within the division area, requiring information provided from the sources listed in Figure 5-4. The staff elements utilizing this information are shown by duty position.

DIVISION A²C² ELEMENT **Fig 5-4. LATERAL INFORMATION NETWORKING**
DIVISION A²C² ELEMENT STAFF ELEMENTS

INFORMATION ITEMS	C3 Air/ A^2C^2 Officer	Aviation Officer	ADA Liaison Officer	Air Traffic Services Liaison Officer	Fire Support Coordinator	Air Liaison Officer
OPORDS/OPLANS (includes A^2C^2 annex)	X	X	X	X	X	X
ATO/airspace control order	X	X			X	
Airspace control issuing times	X	X	X	X	X	X
Airspace user priorities	X	X	X	X	X	
A^2C^2 restrictions/control measures (current and requested)	X	X	X	X	X	
Army AD priorities	X		X			
AD warnings	X	X	X	X	X	X
AD weapons control status (current and requested)	X	X	X	X		X
Army AD priorities	X	X	X	X		X
ADA weapon engagement zones	X		X	X		X
FARPs	X	X		X		X
Location and status of airfields (includes FARPs)		X				
Field artillery locations	X			X	X	X
Fire support coordination measures	X	X		X	X	X
Significant planned/ongoing fires (assumes no fires in rear areas)	X	X		X	X	X
Army aviation airspace requirements (includes SEMA)	X	X	X			
Army aviation unit locations (company and larger)	X	X		X		X
Aviation battle positions	X					
Massed enemy aircraft locations	X					
IFF/SIF procedures		X	X	X		X
SAARFs	X	X	X	X	X	X
RPV flight paths/routes		X		X	X	
RPV launch sites		X		X	X	

Flight obstructions		X		X		
Sortie allocation	X				X	X
FLOT	X	X	X	X	X	X
Positions of instrument landing systems		X		X		
Location and status of NAVAIDs		X				
Intelligence summaries	X					
Air support requests/requirements (includes	X	X			X	
SEMA and RPV)	X					
Air support requests/requirements (includes Air Force only)				X		X
NBC contaminated areas	X	X		X		
Unscheduled large formation missions	X					
Airborne tactical formations		X		X		
Friendly ECM activities		X		X		
Location of FCCs						
Location of FOCs						
Logistic Resupply Requests		X		X		

The following matrix depicts division A²C² element informational requirements such as:

- Where the information is transmitted when going outside the division A²C² element.
- Where information from outside the division A²C² element originates.
- What the information is used for.
- Who the primary division A²C² element action officer is.

DIVISION A²C² ELEMENT
Fig 5-5. VERTICAL INFORMATION NETWORKING

Information Required	Received From	Action Officer	Action/Output*
OPORD/OPLAN (includes A²C² annex)			
--Corps	G3	G3 Air/ A²C² Officer	P, C
--Division	G3	G3 Air/ A²C² Officer	P, C, D --Corps A²C² Element
--Brigade	G3	G3 Air/ A²C² Officer	P, C, A

A²C² Control Measures/Restrictions --Requests	G3 Bde S3	G3 Air/ A²C² Officer	P, C, A, D --Corps A²C² Element
--Approvals	Corps A²C² Element	G3 Air/ A²C² Officer	P, C, D --Bdes S3 Air
--Directed (current)	Corps A²C² Element	G3 Air/ A²C² Officer	P, C, D --Bdes S3 Air
FLOT	G3	G3 Air/ A²C² Officer	P, D --Corps A²C² Element
A²C² Priorities --Army	Corps A²C² Annex G3	G3 Air/ A²C² Officer	P, C, D --Corps A²C² Element --Bdes S3 Air
--Air Forces	Corps A²C² Annex	G3 Air/ A²C² Officer	P, C
Sortie Allocation	ASOC G3 Air	G3 Air/ A²C² Officer	P, C, D --Bdes S3 Air
IFF/SIF Procedures	Corps A²C² Element	G3 Air/ A²C² Officer	P, D
Unscheduled, Large Formation Missions	Corps A²C² Element G3	G3 Air/ A²C² Officer	C, D
NBC Contaminated Areas	Corps A²C² Element Div NBC Element	G3 Air/ A²C² Officer	P, C, D --Bdes S3 Air
Air Support Requirements/Requests --Army Aviation Attack	G3 Div Avn Units Bdes S3 Air	Avn LO	P, C, D --S3 Air
Airlift	G4/G3 Div Avn Units Bdes S3 Air	Avn LO	P, C, D --S3 Air
SEMA	G2/G3 Div Avn Units Bdes S3 Air	Avn LO	P, C, D --S3 Air

--Air Forces CAS Recon Airlift	G3 S3 Air G3/G2 G4/G3	G3 Air/ A²C² Officer G3 Air/ A²C² Officer G3 Air/ A²C² Officer	P, C, D --Corps A²C² Element P, C, D --Corps A²C² Element C, D --Corps A²C² Element
ADA Locations and Coverage	Div ADA Corps ADA Corps A²C² Element	ADA LO	P, C --Division Aviation Brigade
ADA Weapons Control Status --Requests --Approvals/ Modifications	 G3 Bdes S3 S3 Air Corps A²C² Elements	 ADA LO ADA LO	 P, C, D --Corps A²C² Element P, D --Bdes S3 Air
Army ADA Priorities	G3 Corps A²C² Element	ADA LO	P, C, D --S3 Air
AD Warnings	Corps A²C² Element Subordinate Units	ADA LO	C, D --Corps A²C² Element S3 Air
Significant Planned/ Ongoing Indirect Fires	Div Arty	FSCOORD	P, C, D --Div A²C² Element
Fire Support Coordination Measures	Corps A²C² Element Div Arty	FSCOORD	P, C, D --Corps A²C² Element --Bdes FSO
Field Artillery Locations	Div Arty	FSCOORD	P, C, D --Corps A²C² Element
RPV Launch Sites	RPV Units	FSCOORD	P, C, D --Corps A²C² Element

RPV Flight Routes	N/A	G3 Air/ A²C² Officer	P, C, D --Corps A²C² Element
SAAFRs	Div Avn	G3 Air/ A²C² Officer	P, C, A, D --Corps A²C² Element --S3 Air
Army Avn Unit Locations	Div Avn Units Corps A²C² Element	Avn LO	P, C, D --Corps A²C² Element
Airborne Tactical Formations	Div Avn Units Corps A²C² Element S3 Air	Avn LO	P, C, D --Corps A²C² Element --S3 Air
Avn Battle Positions	Div Avn Units Corps A²C² Element Bdes S3	Avn LO	P, C, D --Corps A²C² Element
Location and Status --Army Airfields --FARPs --FOC/FCC	 Corps A²C² Element G3 Div Avn Units Div Avn Units S3 Air ATS Co/Pit Corps A²C² Element	Avn LO G3 Air/ A²C² Officer Avn LO G3 Air/ A²C² Officer ATS LO	P, C, D --Corps A²C² Element P, C, D --Corps A²C² Element P, C, D --Corps A²C² Element
Flight Obstructions	Div Avn Units S3 Air ATS Co/Pit	ATS LO	P, C, D --Corps A²C² Element
Intelligence Summaries	G2	G3 Air/ A²C² Officer	P, C, D --S3 Air --Corps A²C² Element
Friendly ECM Activities	G2	G3 Air/ A²C² Officer	P, C, D --Corps A²C² Element --S3 Air
Massed Enemy Aircraft Formations	G2 Corps A²C² Element ADA Units	G3 Air/ A²C² Officer	P, C, D --Corps A²C² Element --S3 Air

P-Planning
D-Distribution
C-Coordination
ACC-Airspace Control Center
A-Approval
***Action/output assumes each A²C² element section passes information it obtains to its parent unit.**

BRIGADE A²C² ELEMENT

A²C² at brigade is performed by members of the brigade staff. As there is no formalized A²C² element at brigade, the brigade staff performs A²C² by extracting information from various sources. The brigade commander may form a brigade A²C² element from the ADA LO, the brigade FSO, the ALO, and the Army aviation LO when available. When the Army aviation LO is not present, his duties are assumed by the S3 Air. When present, the Army aviation LO performs the following functions in accomplishing coordination on the brigade staff:

- Reviews the airspace utilization and Army aviation plans and graphics from the division OPORD and OPLAN; advises the brigade commander and staff on actions required at the brigade to follow or to implement the required A²C² measures.
- Receives the division aviation battalion OPORD or OPLAN; advises the brigade commander and staff on Army aviation support in the brigade area.
- Receives brigade OPLAN or OPORD; advises on Army aviation annex when necessary; assists in planning operations requiring Army aviation support.

A²C² priorities are established and coordination is accomplished on the brigade staff as follows:

- Division A²C² priorities are received from the division A²C² element for implementation at the brigade.
- Significant planned indirect fires are received from the FSO and sent to aviation unit operations. Significant indirect fires that are immediate are sent to the FCC either direct or through the division A²C² element.
- Requests for brigade A²C² priorities are received from the brigade S3 Air and forwarded to the division A²C² element for approval.
- Field artillery locations are received from the FSO and sent to aviation unit operations.
- Fire support coordination measures are received from the FSO and sent to aviation unit operations.
- ADA weapons control status is received from the ADA LO and sent to aviation unit operations.
- A²C² restrictions received from the division A²C² element are passed to the FSO, S3 Air, ALO, and ADA LO for fire support planning. A²C² restrictions originating at brigade to facilitate fire support planning are sent to aviation unit operations and the division A²C² element.
- FLOT information is received from the brigade S3 and sent to aviation unit operations.
- AD warnings are received from the ADA LO and sent to aviation unit operations.
- Requests for Air Force air support are received from the S3 Air. Once requests are approved and scheduled, the information is sent to aviation unit operations.

- Requests for Army aviation support are received from the S3 Air and sent to the division A²C² element and supporting aviation unit.

The brigade staff function requires information provided from the sources listed in Figure 5-6. The staff elements utilizing this information are shown by duty position.

Fig 5-6. BRIGADE A²C² LATERAL INFORMATION NETWORKING

	BRIGADE STAFF ELEMENTS				
INFORMATION ITEMS	**ADA Liaison Officer**	**Army Aviation Officer**	**Fire Support Officer**	**Air Liaison Officer**	**S3/ G3 Air**
OPORDS/OPLANS (includes A²C² annex)	X	X	X	X	X
ATO/airspace control order	X	X	X	X	X
Airspace control issuing times				X	X
Airspace user priorities		X			X
A²C² restrictions/control measures (current and requested)	X	X		X	X
Army AD priorities	X			X	X
AD warnings	X			X	X
AD weapons control status (current and requested)	X	X		X	X
Friendly ADA locations and coverage	X	X		X	X
ADA weapon engagement zones	X			X	X
FARPs		X			X
Location and status of airfields (includes FARPs)	X	X		X	X
Field artillery locations	X	X	X	X	X
Fire support coordination measures		X	X	X	X
Significant planned/ongoing fires (assumes no fires in rear areas)		X	X	X	X
Army aviation airspace requirements (includes SEMA)		X		X	
Army aviation unit locations (company and larger)		X			X
Aviation battle positions		X	X		X
Massed enemy aircraft locations					X
IFF/SIF procedures	X	X		X	
SAAFRs	X	X	X		
RPV flight paths/routes		X	X		
RPV launch sites		X	X		
Flight obstructions		X			X
Sortie allocation					X

FLOT Positions of instrument landing systems Location and status of NAVAIDs Intelligence summaries	X	X X X	X	X X X	X X
Air support requests/requirements (includes SEMA and RPV) Air support requests/requirements (includes Air Force only)	X X	X	X X	X	X X
NBC contaminated areas Unscheduled large formation missions Airborne tactical formations	 X	X			X X X
Friendly ECM activities Location of FCCs Location of FOCs		 X X X		 X X	X

The matrix at Figure 5-7 depicts the brigade staff's informational requirements such as:

- Where information from outside the brigade originates.
- Who the primary brigade action officer is.
- Where the information is transmitted when going outside the brigade staff.
- What the information is used for.

Fig 5-7. BRIGADE STAFF VERTICAL INFORMATION NETWORKING

Information Required	Received From	Action Officer	Action/Output*
OPORD/OPLAN (includes A²C² annex) --Division --Brigade --Battalion	 G3 S3 S3	 S3 Air S3 Air S3 Air	 P, C P, C, D --Bns S3 --Div G3 P, C, A
A²C² Control Measures/Restrictions --Requests --Approvals --Directed (Current)	 S3 Bns S3 Div A²C² Element Div A²C² Element	 S3 Air S3 Air S3 Air	 P, C, A, D --Div A²C² Element P, C, D --Bns S3 P, C, D --Bns S3

FLOT	S3	S3 Air	C, D --Div A²C² Element
A²C² Priorities --Army --Air Forces (if affects Bde)	 S3 Div A²C² Annex Div A²C² Annex	 S3 Air S3 Air	 P, C, D --Bns S3 P
Sortie Allocation	G3 Air	S3 Air	P, C, D --Bns S3 Air
Unscheduled, Large Formation Missions	Div A²C² Element G3 Air	S3 Air	C, D
NBC Contaminated Areas	Div A²C² Elements Bde NBC Officer	S3 Air	P, C, D --Div A²C² Element
Air Support Requirements/Requests --Army Aviation Attack Airlift SEMA --Air Forces CAS Recon Airlift	 S3 S3/S4 S2/S3 S3 S3/S2 S3/S4	 S3 Air/Avn LO S3 Air/Avn LO S3 Air S3 Air ALO S3 Air ALO S3 Air ALO	 P, C, D --Bns S3 Air --Div A²C² Elements P, C, D --Div A²C² Elements P, C, D --Div A²C² Elements P, C, D --Bns S3 Air --Div A²C² Element P, C, D --Bns S3 Air --Div A²C² Element P, C, D --Div A²C² Element
Airspace Control Order Issuing Times	Div A²C² Element	S3 Air	P
ADA Locations and Coverage	ADA Bn/Btry	ADA LO	P, C

ADA Weapons Control Status --Requests	S3	ADA LO	C, D --Div A²C² Element
--Approvals/ Modifications	Div A²C² Element	ADA LO	P, D --Bns S3 Air
AD Warnings	Div A²C² Element Subordinate Units	ADA LO	C, D --Div A²C² Element --Bns S3 Air
Significant Planned/ Ongoing Indirect Fires	Div Arty DS Arty	FSO	P, C, D --Div A²C² Element
Fire Support Coordination Measures	Div Arty DS Arty	FSO	P, C, D S3 Air
Field Artillery Locations	Div Arty DS Arty	FSO	P, C , D --Div A²C² Element
RPV Launch Sites	RPV Units	FSO	P, C, D --Div A²C² Element
RPV Flight Routes	Div A²C² Element	S3 Air	P, C
Army Avn Unit Locations	Div A²C² Element Avn Units	S3 Air Avn LO	P, C, D --Div A²C² Element
Airborne Tactical Formations	Avn Units S3	S3 Air Avn LO	C
FARPs	Div A²C² Element Avn Unit	S3 Air Avn LO	P, C, D --Div A²C² Element
Avn Battle Positions	Avn Unit	S3 Air Avn LO	P, C, D --Div A²C² Element
Intelligence Summaries	S2	S3 Air	P, C
Friendly ECM Activities	S2 Div A²C² Element	S3 Air	P, C
Massed Enemy Aircraft Formations	Div A²C² Element/ ADA Units	S3 Air	C

P-Planning
D-Distribution
C-Coordination
ACC-Airspace Control Center
A-Approval
***Action/output assumes each A²C² element section passes information it obtains to its parent unit.**

BATTALION A²C² ELEMENT

As with the brigade staff, there is no formalized A²C² element at battalion. The commander is the airspace manager and his staff performs the coordination. The information requirements by duty position are the same from brigade to battalion with one exception. The S3/S3 Air generates the ADA and aviation information if either the ADA or aviation LO is not present.

The matrix at Figure 5-8 depicts the battalion staff's informational requirements such as:

- Where information from outside the battalion originates.
- Who the primary battalion action officer is.
- Where the information is transmitted when going outside the battalion staff.
- What the information is used for.

BATTALION STAFF
Fig 5-8. VERTICAL INFORMATION NETWORKING

Information Required	Received From	Action Officer	Action/Output*
OPORD/OPLAN (includes A²C² annex) --Brigade --Battalion	 S3 S3	 S3 Air S3 Air	 P, C P, C
A²C² Control Measures/Restrictions --Current --Required	 S3 Air N/A	 S3 Air S3 Air	 P, C, P, C, D --Bde S3 Air
FLOT	S3	S3 Air	P, C
A²C² Priorities (Army only)	S3 Bde S3 Air	S3 Air	P, C
AD Warnings	Bde S3 Air	S3 Air	C
Sortie Allocation	Bde S3 Air	S3 Air	P

Air Support Requirements/Requests --Army Aviation			
Attack	Subordinate Units S3	S3 Air	C, D --Bde S3 Air
Airlift	S4/S3	S3 Air	C, D --Bde S3 Air
--SEMA	S2/S3	S3 Air	C, D --Bde S3 Air
--Air Forces			
CAS	S3	S3 Air ALO	C, D --Bde S3 Air
Recon	S2/S3	S3 Air ALO	C, D --Bde S3 Air
Airlift	S4/S3	S3 Air	C, D --Bde S3 Air
Unscheduled, Large Formation Missions	Bde S3 Air	S3 Air	C
ADA Locations	ADA Unit	S3	C
ADA Weapons Control Status Status	S3	S3	C, D --Bde
Significant Planned/ Ongoing Indirect Fires	Div Arty	FSO	C, D --Bde S3 Air
Fire Support Coordination Measures	Div Arty DS Arty	FSO	C
Field Artillery Locations	DS Arty	FSO	C
Army Avn Locations and Coverage	Avn Units	S3 Air	C, D --Bde S3 Air
Avn Battle Positions	Avn Units	S3 Air	C, D --Bde S3 Air
P-Planning **D-Distribution** **C-Coordination** **A-Approval**			

A²C² COMMUNICATIONS

Communications nets for each echelon of command from corps through maneuver battalion are established to facilitate command and control activities. The A²C² system does not have a separate communications system or net. The A²C² system utilizes existing communications systems from each major functional airspace user-- maneuver, air defense, fire support, intelligence and electronic warfare, combat service support--to link the system. A²C² elements are linked horizontally and vertically by maneuver functional area communications and automation systems, principally those of the G3 and, or S3 staff section. A²C² elements use secure and nonsecure voice record copy, messenger, and host nation channels to communicate with all airspace members of the combined arms team and supporting services. A²C² elements operate on the operations net as required. Multichannel communications systems provide the primary means of communications for the A²C² system. Figure 5-9 depicts the communications connectivity established throughout a theater.

FIGURE 5-9. COMMUNICATIONS CONNECTIVITY FROM BATTALION T0 EAC.

The various staff and liaison elements represented in the A²C² element maintain contact with their parent organizations with the multichannel communications system. As an alternate means of communications with their unit, and with coordination and approval from the appropriate CE staff officer, selected representatives may install, operate, and maintain FM communications provided by their parent unit.

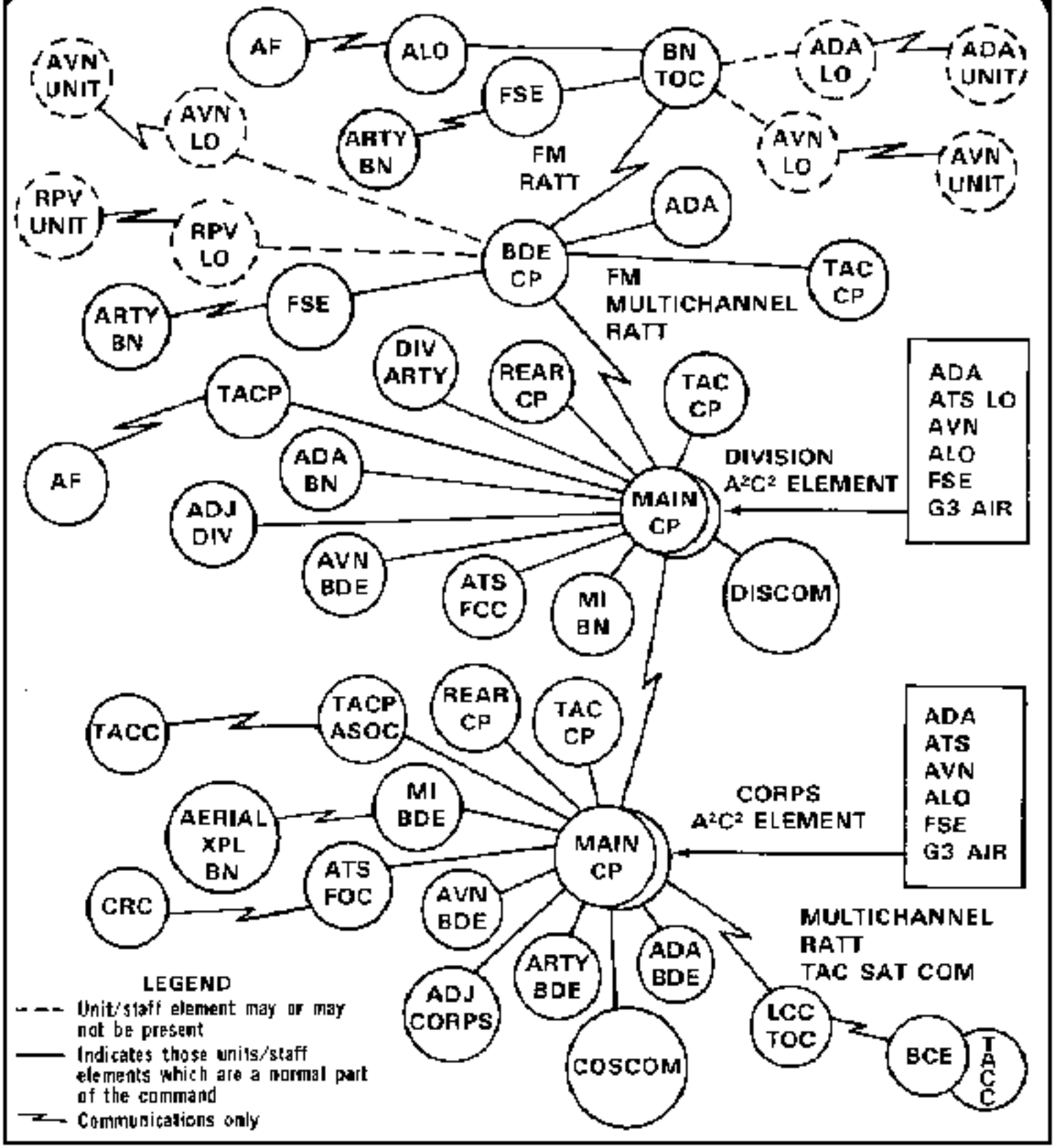
For example, the ADA representative in the division main CP A²C² element employs an FM radio to communicate directly with the divisional ADA battalion's air battle management operations center (ABMOC). Internal CP communications link the A²C² element within the fire support cell to the operations, plans, intelligence, and combat service support cells.

Communications linkage between the A²C² system and airborne airspace users is primarily achieved through Army ATS elements such as the FOC and FCC. ATS liaison elements at division and corps establish communications with the appropriate FOCs and FCCs. The A²C² element then communicates through the FCC or FOC with the airborne assets. The FOC interfaces with the CRC either by collocating with the CRC or by communications linkage. This interface with the CRC provides the A²C² element and other airspace users a communications channel to the airspace management liaison section within the CRC.

A²C² elements at each command echelon may use Air Force communications systems to provide alternate channels for coordinating airspace control information with the AMLS at the CRC, and with the airspace coordination center at the TACC. Air tasking orders, airspace control orders, and other airspace control-related messages are disseminated through Air Force channels and communications systems to the ASOC at corps, and often to the TACP at division level.

Fig 5-9

COMMUNICATIONS CONNECTIVITY FROM BATTALION TO EAC.



APPENDIX A
Example of Army Airspace Command and Control Annex to Operation Order

(Classification)
(Change from oral orders, if any)

Copy no____ of____ copies
Issuing headquarters
Place of issue (may be in code)
Date-time group of signature
Message reference number

Annex____(Army Airspace Command and Control) (A^2C^2) to Operation Order No____

References: Maps, charts, and other relevant documents.

1. SITUATION. Items of information affecting A^2C^2 and air traffic services not included in paragraph 1 of the operations order or which need to be expanded.

a. Enemy Forces.

(1) Reference intelligence annex, if applicable.

(2) Enemy air defense and radio electronic combat capabilities.

b. Friendly Forces.

(1) Outline higher headquarters plan.

(2) Outline higher and adjacent unit A^2C^2 plans.

(3) Note additional Army aviation resources supporting the unit and supporting air resources (for example, Air Force, Navy, Allied).

c. Attachments and Detachments. Army aviation resources attached and detached to include effective times, if appropriate.

2. MISSION. A clear, concise statement of the A^2C^2 requirements to support the operation.

ANNEX____ (A^2C^2) to OPORD No_____

3. EXECUTION.

a. Intent. State the commander's intent.

b. Concept of Operations. Appendix____(A^2C^2 Overlay). A brief statement of the A^2C^2 and air traffic services plan, to include the airspace user priorities, authority to be exercised by the maneuver commander, and the A^2C^2

overlay if required.

c. A²C² Organization/Tasks.

d. Air Traffic Services Organization/Tasks, and Flight Rules (IMC/VMC).

e. Coordinating Instructions.

(1) Instructions applicable to two or more subordinate units, such as positive and procedural control requirements and establishment of control measures and restrictions.

(2) Reference to supporting appendixes not referenced elsewhere in the annex.

(3) Air defense instructions/information such as ADA warnings, weapons control statuses, hostile criteria.

(4) ATS instructions/information such as FOC/FCC locations, location of NAVAIDs.

(5) Army aviation instructions/information such as FARP locations, airfield location and operating times, and in-flight reporting procedures.

(6) Fire support instructions/information such as fire support coordination line, restricted fire areas.

(7) A²C² control measures or restrictions such as low-level transit routes, standard Army aircraft flight routes, coordinating altitudes.

(8) Hostile and friendly aircraft data.

(9) Liaison requirements.

4. SERVICE SUPPORT.

5. COMMAND AND SIGNAL. Acknowledgment instructions.

Last name of Commander
Rank

Authentication.
Appendixes:
Distribution:

(Classification)

APPENDIX B

Airspace Control Message Formats

JCS Publication 12, Volume IV, Part V, "Message Text Formats," and DA PAM 25-7 provide guidance concerning the use of JINTACCS messages to communicate airspace control information among key addressees of a joint force. Airspace control information is disseminated by the following JINTACCS message formats:

- Designated area message (DESSIGAREA).
- Tactical operational data (TACOPDAT).
- Technical operational data (TECHOPDAT).

The ***DESIGAREA message*** (record and voice) is used by the AADC/ACA to establish or cancel airspace control measures. The primary method of transmission to the corps is record with voice as an alternate. This message may also be used as an interim change for the TACOPDAT to define missile engagement zones and air defense sectors.

The ***TACOPDAT message*** permits the joint force commander to establish air defense responsibilities in a tactical area, and permits an area air defense commander to provide supplementary orders. This message may be used to report permanent changes to an OPORD or to update missile engagement zones, surveillance and defense sectors and communications nets. The voice message template may be used in lieu of record transmission.

The ***TECHOPDAT message*** (voice and record) provides technical data to permit the joint force commander to establish a tactical interface among joint tactical air operations (JTAO) elements. It permits an area air defense commander to provide supplementary information for his area of responsibility. The voice message template may be used in lieu of the record transmission of the TECHOPDAT.

The ***airspace control order*** (ACO) is the primary means of the airspace control authority in various theaters (such as NATO Central Region) to desseminate approved airspace control measures. The ACO complements the ATO cycle and may be published several times daily. The ACO is developed by the airspace control center of the TACC. The A^2C^2 personnel within the BCE may assist as required in the development.

Airspace control formats (airspace management formats) are standardized formats employed by the ACA in various theaters to request airspace control measures. Airspace control requests are submitted by any airspace user, through normal operational channels, to the airspace control center at the TACC. Army requests are submitted according to guidance published in the airspace control plan.

APPENDIX C

Application of A²C² in Low-intensity Conflict

US Army forces must be ready to undertake a variety of missions on the unique battlefields of low-intensity conflict (LIC). Low-intensity conflict is generally confined to a specific geographic area and is often characterized by constraints on the forces, weapons, and tactics employed and the level of violence.

The US Army's mission in low-intensity conflict is divided into four general missions: foreign internal defense, peacekeeping operations, terrorism counteraction, and peacetime contingency operations. These general missions are not mutually exclusive, but often overlap. Low-intensity conflict operations present Army forces with a changing set of situations as each operation faces a specific situation within a specific environment. Accordingly, the airspace control function is different in each operation. For further information on low-intensity conflict operations, refer to FC 100-20.

The four general missions of low intensity conflict have environmental characteristics which impact on the airspace control function. The commander and staff must adapt the doctrine, techniques, and procedures presented in this manual to the specific situation.

FOREIGN INTERNAL DEFENSE

Foreign internal defense is the participation by civilian and military agencies of the United States in any of the action programs taken by another government to free and protect its society from subversion, lawlessness, and insurgency. This is basically a nation-building effort. The focus is on supporting the host nation in such a way that the host nation becomes the primary agent in most actions.

Airspace control generally centers around air traffic regulation and control of civil and military airspace users. In foreign internal defense, the ATC system of the host nation frequently provides the framework around which most of the airspace control function takes place. A tactical air control system may or may not be established. The A²C² system will require some modification as it consists largely of A²C² elements at the appropriate CPs, liaison elements with the host nation, and Army tactical ATS units that are task organized as the situation requires.

Bilateral and international agreements often establish regulatory guidance affecting the use of airspace and the conduct of air traffic control activities. Any required changes or waivers to national regulations, as well as problems which result from restrictions to military operations, should be forwarded to the commander, and may be referred to diplomatic channels for resolution.

Combat service support units are primary players in many foreign internal defense situations, and their activities may govern airspace control operations. Airspace control procedures and priorities will be established to support airlift activities. Establishment of SAAFRs, air routes, FARPs, landing sites and airfields, and supporting ATS facilities to facilitate the sustainment effort requires continuous and timely

interface between the host nation, A²C² element, CSS cell, and supporting CSS, aviation, and ATS units.

Tactical operations are the most violent and extreme of all activities employed in foreign internal defense. A²C² functions within this context differ in minor ways from the procedures currently outlined.

Procedural airspace control plans and measures, such as weapons free zones, base defense zones, low-level transit routes, and identification requirements may or may not be required. Although the threat, friendly ADA system minimum risk passage requirements, and density of friendly air operations are not significant airspace control factors in foreign internal defense, A²C² remains as important as in any other military operation. First consideration must be given to national sovereignty and host nation laws and procedures. A²C² must be coordinated and integrated with these national procedures. Where these procedures are inadequate to support military operations, either training should be conducted, or host nation capabilities must be augmented by equipment or personnel or both. Augmentation is the least desirable course of action. Wherever possible, the host nation must solve its problems within its own resources, reinforcing its sovereignty and legitimacy.

Threat air defense capabilities generally do not force friendly air assets into the terrain flight environment. Aircraft operations at altitudes above the effective range of small arms and crew-served direct fire weapons may be the general rule. The requirement to establish a coordinating altitude is situationally dependent.

Airspace control in this environment primarily focuses on providing air traffic services, coordinating military airspace requirements with host nation civil air operations, and integrating and coordinating air operations with fires and the ground activities. Air traffic services may be expanded to provide greater positive control of airspace users.

Small unit operations typical in this environment require the focus of A²C² to be at the brigade and battalion levels. In these operations, the key to airspace control is the timely exchange of information to higher, lower, adjacent, and host nation units.

PEACEKEEPING OPERATIONS

Peacekeeping forces provide the conditions that permit the establishment of stability and the political resolution of international or internal conflicts. Peacekeeping forces are interposed between two or more belligerents. This force may be composed of international contingents.

Terms of reference govern Army participation in the peacekeeping mission. They dictate how the airspace control function is 'accomplished and establish the policies and procedures governing the use of airspace. Of fundamental importance is that the airspace belongs to the belligerent entities involved. Use of that airspace by the peacekeeping force is governed by the terms of reference between the belligerents.

Airspace control activities in this environment are largely related to air traffic regulation and control. Special identification procedures and air traffic regulation may require that all flight operations are planned and coordinated with the appropriate ATC systems of the nations involved. Adherence to international civil aviation organization regulatory procedures must be considered.

TERRORISM COUNTERACTION

The Army's primary role in terrorism counteraction lies in protecting personnel units, and facilities from terrorist acts. The measures adopted and implemented by command directives dictate how airspace is

used and what airspace control functions are performed. Terrorism counteraction operations will overlap all aspects of military operations to some degree.

The impact of terrorism counteraction measures on the airspace control function is situationally dependent. Terrorism counteraction generally impacts on aspects of air traffic control and operations of air terminals, aerial ports, and Army airfields and heliports. The use of restricted areas around sensitive facilities is commonplace.

PEACETIME CONTINGENCY OPERATIONS

Army forces may be called on to participate in operations to resolve situations that involve US security for intelligence missions, raids, rescue missions, or other limited uses of force. These operations are characterized by the employment of specially tailored forces on short duration missions. These operations are typically joint in nature and may be combined. Army forces will encounter enemies whose capabilities vary widely, thus the airspace control function will to a large extent be governed accordingly.

The key to effective airspace control is an airspace control plan that supports the commander's concept of operations and intent. This planning must include joint representation and will typically be conducted under the leadership of the air component (airspace control authority) for the joint or combined force.

As with other low-intensity conflict environments, joint or combined airspace coordination and planning must address the following factors:

- Transfer of airspace control responsibilities.
- Air defense warning procedures.
- Remotely piloted vehicle operations.
- Air traffic control procedures.
- Tactical air support plans.
- Methods of positive and procedural control.
- Airspace priorities.
- Identification procedures.
- Airspace control facilities.
- Risk considerations.
- Tactical plans.
- Interoperability issues.
- Language requirements.
- Host nation civil ATC system interface.
- International civil aviation organization interface.

GLOSSARY

ACRONYMS AND ABBREVIATIONS

AADC -- area air defense commander
ABCCC -- airborne battlefield command control center
ABMOC -- air battle management operations center
A^2C^2 -- Army airspace command and control
ACA -- airspace control authority
ACC -- air component commander; airspace control center
ACO -- airspace control order
ACofS -- assistant chief of staff
ACP -- air control point
AD -- air defense
ADA -- air defense artillery
ADCO -- air defense coordination officer
adj -- adjutant
ADLO -- air defense liaison officer
ADOLT -- Air Defense Operations Liaison Team
AEB -- aerial exploitation battalion
AETACS -- airborne elements of the tactical air control system
AF -- Air Force (USAF)
AFATDS -- advanced field artillery tactical data system
AGL -- above ground level
AI -- air interdiction
ALCC -- airlift control center
ALO -- air liaison officer
AMLS -- airspace management liaison section
ANGLICO -- air and naval gunfire liaison company
AOR -- area of responsibility
AR -- Army regulation
ARLO -- air reconnaissance liaison officer
arty -- artillery
ASCC -- Air Standardization Coordinating Committee
ASCS -- air support control section
ASM -- airspace management element
ASOC -- air support operations center
ATC -- air traffic control
atk -- attack

ATO -- air tasking order
ATS -- air traffic services
avn -- aviation
AWACS -- airborne warning and control system
AWS -- antiair warfare section

BAI -- battlefield air interdiction
BCE -- battlefield coordination element
bde -- brigade
BDZ -- base defense zone
bn -- battalion

C² -- command and control
CA -- coordinating altitude
CAFMS -- Computer Assisted Force Management System
CATF -- commander, amphibious task force
CAS -- close air support
cbt -- combat
CCP -- communications check point
CCT -- combat control team
CEWI -- combat electronic warfare and intelligence
C²I -- command, control, and intelligence
CID -- combat intelligence division
CLRS -- central launch and recovery section
CM&D -- collection management and dissemination
co -- company
COMALF -- Commander of Airlift Forces
COMMZ -- communications zone
COSCOM -- corps support command
CP -- command post
CRC -- control and reporting center
CRP -- control and reporting post
CSS -- combat service support
CTOC -- corps tactical operations center

DA -- Department of the Army
DASC -- direct air support center
DCI -- deputy for combat intelligence
DCSOPS -- Deputy Chief of Staff for Operations and Plans
DESIGAREA -- designated area message
dir -- director
DISCOM -- division support command
div -- division
DO -- deputy for operation
DS -- direct support
DSA -- division support area

EAC -- echelons above corps
ECM -- electronic countermeasures
elm -- element
ENSCE -- enemy situation correlation element
EW -- electronic warfare

FAAD -- forward area air defense
FAC -- forward air controller
FACP -- forward air control post
FARP -- forward arming and refueling point
FC -- field circular
FCC -- flight coordination center
FCS -- forward control station
FDC -- fire direction center
FLOT -- forward line of own troops
FM -- frequency modulated; field manual
FOC -- flight operations center
FRAGO -- fragmentary order
FS -- fire support
FSCL -- fire support coordination line
FSCOORD -- fire support coordinator
FSE -- fire support element
FSO -- fire support officer

G2 -- Assistant Chief of Staff, G2 (Intelligence)
G3 -- Assistant Chief of Staff, G3 (Operations and Plans)
G4 -- Assistant Chief of staff, G4 (Logistics)
GLO -- ground liaison officer

HIDACZ -- high-density airspace control zone
HIMAD -- high-to-medium-altitude air defense
hq -- headquarters

IEW -- intelligence and electronic warfare
IFF -- identification, friend or foe
IMC -- instrument meteorological conditions
IN -- deputy for intelligence
intel -- intelligence

JAAT -- joint air attack team
JCS -- Joint Chiefs of Staff
JFACC -- joint force air component commander
JFC -- joint force commander
JINTACCS -- joint interoperability of tactical command and control systems
JOC -- Joint Operations Center

JTAO -- joint tactical air operations

LCC -- land component commander
LD/LC -- line of departure/line of contact
LIC -- low-intensity conflict
LLTR -- low-level transit route
LO -- liaison officer

MAGTF -- Marine Air-Ground Task Force
MCO -- movement control officer
MCS -- maneuver control system
METT-T -- mission, enemy, terrain, troops and time available
MI -- military intelligence
MPC -- message processing center
MRR -- minimum risk route

NATO -- North Atlantic Treaty Organization
NAVAID -- navigational aid
NBC -- nuclear, biological, and chemical
NCO -- noncommissioned officer
NCOIC -- noncommissioned officer in charge
NTACS -- naval tactical air control system

obj -- objective
op(s) -- operation(s)
OPCON -- operational control
OPLAN -- operation plan
OPORD -- operation order
pam -- pamphlet
PZ -- pick-up zone

RATT -- radio teletypewriter
recon -- reconnaissance
rep -- representative
ROZ -- restricted operations zone
RPV -- remotely piloted vehicle

S2 -- Intelligence Officer (US Army)
S3 -- Operations and Training Officer (US Army)
SAAFR -- standard use Army aircraft flight route
SACC -- supporting arms coordination center
SEMA -- special electronic mission aircraft
SHORAD -- short-range air defense
SIF -- selective identification feature
SLAR -- side-looking airborne radar
SOP -- standing operating procedure

SPINS -- special instructions
spt -- support
std -- standard
STANAG -- Standardization Agreement

TAC -- Tactical Air Command
TACAIR -- tactical air
TACC -- tactical air control center
TACOPDAT -- tactical operational data
TACP -- tactical air control party
TACS -- tactical air control system
TACSATCOM -- tactical satellite communications
TADC -- tactical air direction center
TAF -- Tactical Air Force
TAOC -- tactical air operations center
TCF -- tactical combat force
TECHOPDAT -- technical operational data
TF -- task force
TOC -- tactical operations center
TOE -- table(s) of organization and equipment
TRADOC -- Training and Doctrine Command

UAV -- unmanned aerial vehicle
US -- United States
USA -- United States Army
USAF -- United States Air Force

vs -- versus
VMC -- visual meteorological conditions

WCS -- weapons control status
WFZ -- weapons free zone
WOC -- Wing Operation Center

DEFINITIONS

Air defense artillery fire unit locations. The position or site occupied by air defense units that are capable of delivering fires at enemy targets. Fire units which are reported include batteries, platoons, sections, and squads/teams.
Air defense artillery fire unit status. The condition or current state of affairs of a unit which provides air defense fires. The status can include maintenance, classes III and V availability, and state of alert. The state of alert is the combat readiness maintained by a fire unit expressed in terms of the period of time within which the unit must be capable of engaging a target. The status is reported by battery platoon, squad, or section, whichever is the smallest unit capable of delivering fires.
Air defense artillery priorities. The commander's prioritized list of selected assets to be defended by the

supporting ADA commander. This list is used to determine mission requirements for ADA units.
Air defense warning. Warnings issued which represent the AD commander's evaluation of the probability of air attack. Standard AD warnings are white--attack not probable; yellow -- attack probable; and red -- attack imminent or in progress.
Airfields/assembly areas/laager sites. A location, normally company size, where an aviation unit assembles, prepares for future operations, conducts maintenance, and rearms/refuels.
Airspace control. A service provided within the combat zone to maximize combat effectiveness by promoting the safe, efficient, and flexible use of airspace. Airspace control permits flexibility of actions in controlled airspace while authority to approve, disapprove, or deny combat operations is vested only in the joint force commander.
Airspace control area. Airspace laterally defined by the boundaries of the area of operations. The airspace control area may be subdivided into airspace control subareas.
Airspace control authority. The commander designated to assume overall responsibility for the operation of the airspace control system in the airspace control area. Airspace control boundary. The lateral limits of an airspace control area, a high density airspace control zone, or an airspace restricted area.
Airspace control measures. Rules, mechanisms, and directions governed by joint doctrine and defined by the airspace control plan that control the use of airspace of defined dimensions. All control measures can be graphically depicted. Examples of control measures are low-level transit routes, high density airspace control zones, aircraft check points, and standard use Army aircraft flight routes.
Airspace control plan. The document providing specific procedures for the airspace control system for a particular area of operation. It is prepared by the airspace control authority.
Airspace control system. An arrangement of those organizations, personnel, policies, procedures, and facilities required to perform airspace control functions.
Airspace coordination area. In fire support operations a restrictive fire support coordination measure that establishes a three-dimensional area reasonably safe from friendly surface-delivered fires. An airspace coordination area is either formal or informal in nature.
Airspace control order. The airspace document that details all approved airspace requests.
Airspace restrictions. Special restrictive measures applied to segments of airspace of defined dimensions.
Airspace user priorities. A ranking by the commander to establish an order of importance for the use of airspace by all airspace users. These priorities may vary from airspace subsector to subsector. These priorities will be used to resolve conflicts and determine the need for A^2C^2 measures. A subsector refers to the division of the Army airspace control sector into separate areas. Subsectors are usually established along unit boundaries.
Air support priorities. A ranking by the commander to establish an order of importance for employment of available air support. This priority may be expressed in any number of ways but must, as a minimum, include combat, combat support, and combat service support requirements.
Air support requirements/requests. Those requirements or requests expressed by a unit or activity for air support for either Army or other service assets. Requirements/requests can cover combat, combat support, and combat service support missions.
Air tasking order. The order published by the air component commander that specifies which missions will be flown and which aircraft will fly the missions. The ATO includes all jointly approved airspace control measures or restrictions.
Air traffic identification. The use of electronic devices, operational procedures, visual observation, and flight plan correlation for the purpose of identifying and locating aircraft flying within the airspace control area.

Air traffic service units/navigational aids status. The condition or current state of affairs of ATS units and NAVAIDs.

Apportionment of tactical air resources. The division of tactical air resources by the joint force commander to accomplish the counterair, air interdiction, and close air support missions. This apportionment is usually expressed in a percentage and is based on recommendations by the Army and Air Force component commanders.

Aviation battle/firing positions. Covered and concealed battle positions, containing several firing positions, that are used by attack helicopter units for engagement of targets. Firing positions are the locations normally selected by aircraft commanders at which the aircraft fires its weapon system(s). Preplanned and currently occupied positions must be reported for coordination and control with supported units.

Aviation flight rules. The regulations, directives, or procedures that govern the conduct and operation of manned and remotely piloted aircraft. These rules are normally established for IMC and VMC.

Concept of operations. A concise graphic, verbal, or written statement that gives an overall picture of a commander's scheme with regard to an operation or series of operations and includes the scheme of maneuver and fire support plan. It is frequently referred to as the commander's concept. It is described in sufficient detail for the staff and subordinate commanders to understand what they are to do and how to fight the plan in the absence of further instructions.

Controlled airspace. Airspace of defined dimensions within which air traffic control service is provided to controlled flights.

Control point. A position marked by an electronic device, a conspicuous terrain feature, or other identifiable object which is given a name or number and used as an aid to navigation or control of aircraft. (Also known as air control point.)

Coordinating instructions. Orders or information that applies to two or more units.

Effective wind message. Information on wind speed and direction used for predicting NBC contamination.

Enemy aircraft low level avenues of approach. An air route which allows threat forces to fly sufficiently close to ground level so that detection or engagement is avoided or minimized. It is usually associated with routes that allow flight below the altitude of the surrounding terrain, for example, valleys, river basins.

Fire support coordination measures. Procedures or directives used to manage fire support assets. Some examples are coordinated fire line, free fire zone, and fire support coordination line. All control measures can be depicted graphically.

Fire support priorities. The ranking by the commander to establish an order of importance for the collective employment of mortars, field artillery, close air support, and naval gunfire.

Fire support unit locations. The position or site occupied by fire support elements which are capable of delivering fires. Normally, battery-sized elements are reported, but they may include platoon/sections if they are separated from their battery.

Fire support unit status. The condition or current state of affairs of a unit which provides supporting indirect fires. Normally, for field artillery a fire unit is considered a battery-sized element, but the unit may include platoons if firing batteries are split.

Flight coordination center location. The position or site occupied by the FCC.

Flight operations center location. The position or site occupied by the FOC.

Flight plan. Specified information provided to air traffic services units relative to an intended flight or a portion of a flight of an aircraft.

Forward arming and refueling point. A temporary facility organized and deployed by an aviation unit

located closer to the area of operations than the aviation unit's normal service area. FARPs are established to provide classes III and V to aviation units conducting combat operations. Report FARPs for A^2C^2 purposes when they are not collocated with an airfield/assembly area/ laager site.

Forward line of own troops. A line which indicates the most forward positions of friendly forces in any military operation at a specific time.

Friendly aircraft location. A report on the location of friendly aircraft expressed in altitude and relative ground position. Reports are used to accomplish regulation and resolve conflicts. Friendly aircraft location is also used to improve aircraft identification.

Friendly jamming/electronic warfare operations. Any use of the electromagnetic spectrum by friendly forces directed against threat forces which will adversely affect friendly avionics, ATS facilities, communications, sensors, or navigational aids.

High-to-medium-altitude air defense coverage. A description, normally graphic, that depicts the altitude and range at which aircraft may be acquired/engaged by Hawk and Patriot units. Normally, several coverages are provided based on the altitude that the aircraft may fly.

Hostile criteria. Description of conditions under which an aircraft may be identified as hostile for engagement purposes. The conditions (rules) are promulgated by the commanders of unified or specified commands (or their equivalent) or by other appropriate commanders.

Identification friend or foe/selective identification feature procedures. The directives which govern the use of IFF/SIF equipment.

Instrument meteorological conditions. Conditions expressed in terms of visibility, distance from cloud, and ceiling less than the minimal specified for visual meteorological conditions.

Instrumented airfield location. The site or position occupied by an airfield that has ATS assets operating at that location.

Navigational aids location. The site or position occupied by a NAVAID. Information should include type of NAVAID, its capabilities (or purpose), and its operating time (if not continuous).

Positive control. A method of airspace control that relies on positive identification, tracking, and direction of aircraft within an airspace, conducted with electronic means by an agency having the authority and responsibility therein.

Preplanned targets (groups). An area or object designated and numbered for future firing that is submitted according to a schedule that permits detailed coordination and planning.

Procedural control. A method of airspace control which relies on a combination of previously agreed on and promulgated orders and procedures.

Rules of engagement. Directives that delineate the circumstances under which weapons may fire at an aircraft. The right of self-defense is never denied.

Significant on-going fires or calls for fire. Request for or active indirect fires of such magnitude that the volume of projectiles creates a high probability of interference with other airspace users.

Sortie allocation. The procedure that translates apportionment decisions into the number of sorties to be allocated in support of Army forces. Army commands may suballocate to subordinate commands. Allocation is expressed in specific numbers and types of assigned sorties. Sorties available refers to the initial allocation of sorties at the beginning of each allocation cycle. Sorties remaining expresses the number of available sorties which have not been used during the allocation cycle.

Standard use Army aircraft flight routes. Routes which are established below the coordinating altitude to facilitate the movement of Army aviation assets. Normally, these routes are located in the corps through brigade rear area of operations.

Strike warning. A warning of friendly use of nuclear or chemical munitions.

Terminal control area. A control area or a portion thereof normally situated at the confluence of air

traffic services routes in the vicinity of one or more major airfields.

Terrain flight environment. In airspace control usage, that airspace close to the earth's surface where vegetation, man-made objects, and terrain contours degrade the enemy's ability to detect or locate helicopters and permit friendly helicopters to use terrain flight tactics and techniques. The terrain flight environment is a vertical extension of the area of operations and is defined by the area of operations and coordinating altitude.

Time slot. A period of time during which certain airspace activities are restricted to permit one or more users greater freedom of operation.

Unit mission. The primary task assigned to a unit. The mission statement usually contains the elements of who, what, when, where, and why, but it seldom specifies how to accomplish the mission.

Unit task organization. A temporary grouping of forces designed to accomplish a particular mission. Task organization involves the distribution of available assets to subordinate control headquarters by attachment or by placing assets in direct support, general support, or under the operational control of the subordinate.

Visual meteorological conditions. Conditions expressed in terms of visibility, cloud distance, and ceiling equal to or better than the specified minimum.

Way-point. In air operations, a point in space to which an aircraft may be vectored.

Weapons control status. The three types of weapons control used by a commander to control the fires of air defense artillery weapons. Different status may be applied to fixed-wing and rotary-wing aircraft. These are weapons free -- engage all aircraft not positively identified as friendly; weapons tight -- engage all aircraft positively identified as hostile; and weapons hold -- engage aircraft for self-defense.

REFERENCES

REQUIRED PUBLICATIONS

Required publications are sources that users read in order to understand or to comply with this publication.

Field Manuals (FMs)

FM 100-28 Doctrine and Procedures for Airspace Control in the Combat Zone

FM 100-42 US Air Force and US Army Airspace Management in an Area of Operations

FM 101-5-1 Operational Terms and Symbols

Department of the Army Pamphlet (DA Pam)

DA PAM 25-7 Joint User Handbook for Message Text Formats

RELATED PUBLICATIONS

Related publications are sources of additional information. They are not required in order to understand this publication.

Joint Chiefs of Staff Publications (JCS Pubs)

JCS Pub 1 Dictionary of Military and Associated Terms

JCS Pub 8 Doctrine for Air Defense from Oversea Land Areas

JCS Pub 12 VOL IV; PT IV Air Control/Air Defense Procedures for Joint Services Operations

JCS Pub 26 Joint Doctrine for Theater Counterair Operations

Field Manuals (FMs)

FM 1-100 Combat Aviation Operations

FM 1-111 Aviation Brigade

FM 6-20 Fire Support in Combined Arms Operations

FM 31-11	Doctrine for Amphibious Operations
FM 34-22	Military Intelligence Battalion (CEWI)(Aerial Exploitation)(Corps)
FM 44-1	US Army Air Defense Artillery Employment
FM 55-40	Army Combat Service Support and Transport Operations
FM 71-3	Armored and Mechanized Brigade Operations
FM 71-100	Armored and Mechanized Division Operations
FM 71-101	Infantry, Airborne, and Air Assault Division Operations
FM 90-4	Airmobile Operations
FM 100-5	Operations
FM 100-26	The Air-Ground Operations System
FM 100-27	USA/USAF Doctrine for Joint Airborne and Tactical Airlift Operations
FM 101-5	Staff Organization and Operations

Allied Tactical Publication (ATP)

ATP 40	Doctrine and Procedures for Airspace Control in the Combat Zone

PROJECTED PUBLICATIONS

Projected publications are sources of additional information that are scheduled for printing but not yet available.

Field Manual (FM)

FM 100-15	Corps Operations

COMMAND PUBLICATIONS

Command publications cannot be obtained through Armywide resupply channels. Determine availability by contacting the address shown. Field circulars expire three years from the date of publication unless sooner rescinded .

	Title
Field Circular 55-40	Intratheater Airlift Operations. June 1986. Commandant, US Army Transportation School, ATTN: ATSP-TDL, Fort Eustis, VA 23604-5399.

Field Circular 100-20	Low-Intensity Conflict. July 1986. Commandant, US Army Command and General Staff College, ATTN: ATZL-SWD-DL, Fort Leavenworth, KS 66027-6900.
TRADOC Training Text 17-50-3	Joint Air Attack Team (JAAT) Operations. October 1983. Commander, US Army Aviation Center, ATTN: ATZQ-OSS-TS, Fort Rucker, AL 26362-5341.
TRADOC Pamphlet 34-4	AWACS-ARMY Contingency Voice Operating Procedures. March 1986. Commander, TRADOC, ATTN: ATDO-C, Fort Monroe, VA 23651-5341.
TRADOC Pamphlet 525-45	General Operating Procedures for Joint Attack of the Second Echelon (J-SAK). December, 1984. Commander, TRADOC, ATTN: ATDO-C, Fort Monroe, VA 23651-5341 or Headquarters, TAC, ATTN: XPJ-ALPO Langley AFB, VA 23665-5001.

STANDARDIZATION AGREEMENTS (STANAG)

3805 (TA)	Doctrine and Procedures for Airspace Control in the Combat Zone, Edition 2.
ASCC AIR STD 45/6A	Airspace Control in the Control Zone.

FM 100-103
7 OCTOBER 1987

By Order of the Secretary of the Army:

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General, United States Army
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