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Staff Reference Guide Volume I
Unclassified Resources

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Headquarters, Department of the Army

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Staff Reference Guide Volume I Unclassified Resources

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Preface

ATP 5-0.2 Volumes I and II provide staff members with a reference guide to assess, plan, prepare, and execute operations in large-scale combat operations. The guide provides a consolidated location for key planning tools and example techniques to help staff members perform their duties. Most of this guide's content is contained in other, more in-depth doctrinal publications, which are referenced within each topic.

ATP 5-0.2 Volumes I and II are applicable to all members of the Army profession: leaders, Soldiers and Army Civilians. The principal audience for ATP 5-0.2 Volumes I and II are staff members serving on battalion, brigade, or division staffs. Trainers and educators throughout the Army will also use this publication.

Commanders, staffs, and subordinates ensure that their decisions and actions comply with applicable United States, international, and in some cases host-nation laws and regulations. Commanders at all levels ensure their Soldiers operate in accordance with the law of war, rules of engagement (ROE), and moral and ethical principles inherent in the Army profession (see FM 6-27/MCTP 11-10C).

To comprehend the doctrine contained in ATP 5-0.2 Volumes I and II, readers must first understand the fundamentals of unified land operations described in ADP 3-0 and FM 3-0. They must understand the fundamentals of the offense and defense and the language of tactics described in ADP 3-90, FM 3-90-1, and FM 3-90-2. They must be familiar with both ADP 5-0 and ADP 6-0 as well as FM 6-0, ADP 1-02, and AR 25-50.

This publication references obsolete doctrine to provide context and data that is still relevant in large-scale combat operations.

ATP 5-0.2 Volumes I and II uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. For definitions shown in the text, the term is italicized and the number of the proponent publication follows the definition. This publication is not the proponent for any Army terms and is distinct in its use of bold text to emphasize key points. This publication contains copyrighted material.

This publication uses both metric and United States customary system measurements (see table J-1 on page 327 for conversions).

While this publication is unclassified and distribution unlimited, Volume II: Appendix O is Distribution D (restricted to Department of Defense and contractors only) and should be treated as such. Volume II: Appendix O is found on the Army Publishing Directorate's website and requires a common access card (CAC) to access.

ATP 5-0.2 Volumes I and II applies to the Active Army, Army National Guard, Army National Guard of the United States, and United States Army Reserve unless otherwise stated.

The proponent of ATP 5-0.2 Volumes I and II is the United States Army Combined Arms Center. The preparing agency is the Combined Arms Doctrine Directorate, United States Army Combined Arms Center. Send comments and recommendations on Department of the Army (DA) Form 2028 (*Recommended Changes to Publications and Blank Forms*) to Commander, United States Army Combined Arms Center and Fort Leavenworth, ATTN: ATZL-MCD (ATP 5-0.2), 300 McPherson Avenue, Fort Leavenworth, KS 66027-2337; by e-mail to: usarmy.leavenworth.mccoe.mbx.cadd-org-mailbox@mail.mil; or submit an electronic DA Form 2028.

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Acknowledgements

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This publication's presentation of factors for division opposed rates of advance is courtesy of Arnold C. Dupuy, Ph.D. from *Numbers, Predictions & War: Using History to Evaluate Combat Factors and Predict the Outcome of Battles,* by Colonel Trevor N. Dupuy, Ret. 1979.

This publication's discussion of casualty estimate tools is based on a modified version of a model used courtesy of Arnold C. Dupuy, Ph.D. from *Attrition: Forecasting Battle Casualties and Equipment Losses in Modern War,* by Colonel Trevor N. Dupuy, Ret. 1995.

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Introduction

Staff members are essential to the successful and efficient functioning of battalions and larger units. However, at any level, staff work can feel thankless and is often characterized by long hours, copious caffeine consumption, staring bleary-eyed at a white board or map, and endlessly fighting for information—only to have this hard work reversed by a commander's instinct. If staff members do things right, the unit functions as it should and no one notices. If staff members do something wrong, the unit reacts and suffers. Unfortunately, this publication does not break these expectations.

The staffs' role is to assist commanders with understanding situations, making and implementing decisions, controlling operations, and assessing progress all while keeping units and organizations outside the headquarters continuously informed. Successfully accomplishing these actions is difficult even for a well-trained staff that has long worked together, let alone a newly formed staff working together for the first time. These difficulties limit leaders' ability to train staffs on day-to-day unit operations and prepare them to execute large-scale combat operations. This experience gap increases a staff's operational tempo, which is further amplified by constant personnel changes, competing demands for staff attention, and always-limited time resources. To comprehend how the various warfighting functions work together, leaders must read and understand the breadth of doctrine.

This publication is not a replacement for current doctrine. It is a consolidated source of doctrine. This guide offers helpful techniques or "how's" to the doctrinally described "what's" for battalion, brigade, and division staffs. It provides a set of tools and planning factors to help with the "science of war." Finally, it can be a starting point for solving any unit's unique problem. This publication is organized slightly differently than other doctrinal publications with the assumption that staff members are already familiar with the topics herein. If unfamiliar, this publication lists references with each topic to enhance understanding.

Planning resources included in this guide set conditions for subordinate unit success. For example, for a deliberate decontamination point, this publication describes the space needed, water requirements, and throughput times. Subordinate units are assumed to have the skills, knowledge, and experience to proficiently conduct this action.

Some planning resources included in this guide come from obsolete doctrinal publications. While the art of war has changed over time, much of the science has not. The majority of these resources provide a starting point for planning that can be refined for each unique situation until updated planning factors are developed.

Chapter 1 overviews assessments, describes how the Army conducts assessments from the tactical to the strategic level, and provides examples and discussions on topics such as the after action review.

Chapter 2 overviews planning and provides techniques and resources for Army design methodology, the military decision-making process, intelligence preparation of the battlefield, information collection, and the targeting process.

Chapter 3 overviews preparation, discusses various techniques to prepare for future operations, describes the transition from planning to operations, and how to conduct rehearsals.

Chapter 4 overviews execution and offers techniques on creating shared understanding, developing a battle rhythm, and conducting the rapid decision-making and synchronization process.

Appendix A through Appendix C provide tactics, techniques, procedures, and considerations for offensive, defensive, and enabling operations.

Appendix D through Appendix I encompass the warfighting functions and provide detailed planning factors for each.

Appendix J through Appendix N provide additional information to modify the baseline operations process, as described in this book, and information that does not fit cleanly in any chapter or previous appendix.

Volume II: Appendix O is restricted to Distribution D (Department of Defense and its contractors only), a higher distribution level than the rest of the publication. Appendix O provides factors for brigade organization; engineer; fires; military; and chemical, biological, radiological, and nuclear planning. This information is grouped by warfighting function. Volume II: Appendix O is found on the Army Publishing Directorate's website and requires a common access card (CAC) to access.

Digital tools are difficult to replicate in a written manual and can quickly change. The Command and General Staff College's Department of Tactics has created a "for official use only" milSuite website that contains numerous digital tools. As new digital tools are developed, staff members can quickly share them on this milSuite site. The website is not a forum or blog; it is merely a repository for digital tools that fellow staff members want to share. These tools can help staff members in various stages of the operations process. The Department of Tactic's milSuite website is located at: https://www.milsuite.mil/book/community/spaces/cgsc/tactics-community/.

Chapter 1

Assessing

Everyone constantly assesses. The reader is assessing whether or not this introduction is worth reading. This chapter describes assessment activities, includes guides for performing an effective assessment, and describes how to conduct an effective after action review (AAR).

OVERVIEW OF ASSESSING

1-1. The information in this chapter is primarily from JP 3-0, ADP 5-0, ATP 5-0.3/MCRP 5-10.1/NTTP 5-01.3/AFTTP 3-2.87, FM 6-0, and the Joint Staff's J-7 *Commander's Handbook for Assessment Planning and Execution.*

1-2. *Assessment* is the determination of the progress toward accomplishing a task, creating a condition, or achieving an objective (JP 3-0). Assessment is a continuous activity of the operations process that supports decision making by ascertaining progress of the operation, developing and refining plans, and making operations more effective.

1-3. Assessment involves deliberately comparing intended outcomes with actual events to determine the overall effectiveness of progress toward attaining the desired end state, achieving objectives, and performing tasks. Through professional military judgement, assessment helps answer the following questions:

- Where are we?
- What happened?
- Why do we think it happened?
- So what?
- What are the likely future opportunities and risks?
- What needs to change? What needs to be done differently?

1-4. **Assessment precedes and guides the other activities of the operations process.** During planning, assessment focuses on understanding an operational environment (OE) and building an assessment plan. During preparation, the focus of assessment switches to discerning changes in the situation and the force's readiness to execute operations. During execution, assessment involves a deliberate comparison of forecasted outcomes to actual events, using indicators to judge operational progress towards success. Assessment during execution helps commanders determine whether changes in the operation are necessary to take advantage of opportunities or to counter unexpected threats.

1-5. No single way exists to conduct assessments. Every assessment is unique with its own challenges. The following steps can aid in developing an effective assessment plan and analyzing performance during execution:

- Develop the assessment approach.
- Develop the assessment plan.
- Collect information and intelligence.
- Analyze information and intelligence.
- Communicate feedback and recommendations.
- Adapt plans or operations.

See ATP 5-0.3/MCRP 5-10.1/NTTP 5-01.3/AFTTP 3-2.87 for a detailed discussion of each step of the assessment process (see FM 6-0 for developing an assessment plan).

1-6. Situations and echelons dictate the focus and methods leaders use to assess. Assessment occurs at all echelons. Normally, commanders assess those specific operations or tasks that they were directed to accomplish. This properly focuses collection and assessment at each echelon, reduces redundancy, and enhances the efficiency of the overall assessment process.

1-7. Assessment resources (to include staff officer expertise and time available) proportionally increase from battalion to brigade, division, corps, and theater army. Analytical resources and level of staff expertise available at higher echelon headquarters include a dedicated core group of analysts. This group specializes in operations research and systems analysis (ORSA), formal assessment plans, and various assessment products. For example, divisions and above have fully robust staffs that have either dedicated modified table of organization and equipment (MTOE) positions or they can create an assessment working group.

1-8. At brigade and below, assessments are usually less formal and often rely on direct observations and judgment of commanders and their staffs. **Leaders focus on assessing their unit's readiness (personnel, equipment, supplies, and morale) and their unit's ability to perform assigned tasks.** Leaders also determine whether a unit has completed assigned tasks. If those tasks have not produced the desired results, leaders explore why not and consider what improvements can be made. As they assess and learn, small units change tactics, techniques, and procedures. In this way, even the lowest echelons of the Army follow the assessment process.

ASSESSMENT ACTIVITIES

1-9. The situation and type of operation affect assessment characteristics. During large-scale combat, assessments tend to be rapid, focused on the level of destruction of enemy units, terrain gained or lost, objectives secured, and the status of friendly forces. In other situations, such as stability operations, assessment is more subjective. For example, assessing the level of security in an area or the level of the population's support for the government is challenging.

1-10. Whether conducting formal or informal assessments in large-scale combat or in operations dominated by stability operations, assessment comprises three major activities:

- **Monitoring** the current situation to collect relevant information.
- **Evaluating** progress toward attaining end state conditions, achieving objectives, and performing tasks.
- **Recommending** or directing action for improvement.

MONITORING

1-11. Monitoring is continuous observation of those conditions relevant to the current operation. Monitoring allows commanders and staffs to collect relevant information, specifically information about the current situation described in the commander's intent and concept of operations. Progress cannot be judged, nor effective decisions made, without an accurate understanding of the current situation.

1-12. Commander's critical information requirements (CCIRs) and associated information requirements focus the staff's monitoring activities and prioritize the unit's collection efforts. Information requirements concerning the enemy, terrain and weather, and civil considerations are identified and assigned priorities through reconnaissance and surveillance. Operations officers use friendly reports to coordinate other assessment-related information requirements.

1-13. Staffs monitor and collect information from the common operational picture (COP) and other friendly reports. This information includes operational and intelligence summaries from subordinate, higher, and adjacent headquarters and communications and reports from liaison teams. Staffs also identify information sources outside military channels and monitor their reports. These other channels might include products from civilian, host-nation, and other government agencies. Staffs apply knowledge management in the two focus areas of information management and foreign disclosure to facilitate disseminating this information to the right people at the right time.

1-14. Staff sections record relevant information in running estimates. Staff sections maintain a continuous assessment of current operations as a basis to determine if operations are proceeding according to the

commander's intent, mission, and concept of operations. In their running estimates, staff sections use this new information and these updated facts and assumptions as the basis for evaluation.

EVALUATING

1-15. Staffs analyze relevant information collected through monitoring to evaluate an operation's progress. Evaluation is using indicators to judge progress toward desired conditions and determining why the current degree of progress exists. Evaluating is the heart of the assessment process, where most analysis occurs. By evaluating, commanders determine what is working, what is not working, and how to better accomplish the mission.

1-16. An *indicator,* in the context of assessment, is a specific piece of information that infers the condition, state, or existence of something, and provides a reliable means to ascertain performance or effectiveness (JP 5-0). Indicators should be—

- Relevant—bear a direct relationship to a task, effect, object, or end state condition.
- Observable—collectable such that changes can be detected and measured or evaluated.
- Responsive—signify changes in the OE timely enough to enable effective decision making.
- Resourced—allocate collection assets and staff resources to observe and evaluate.

1-17. The two types of indicators commonly used in assessment include measures of performance and measures of effectiveness. A *measure of performance* is an indicator used to measure a friendly action that is tied to measuring task accomplishment. Also called MOP (JP 5-0). MOPs help answer questions such as "Was the action taken?" or "Were the tasks completed to standard?" A MOP confirms or denies proper task performance. **MOPs help to answer the question, "Are we doing things right?"**

1-18. At the basic level, every Soldier assigned a task maintains a formal or informal checklist to track task completion. The status of those tasks and subtasks are MOPs. Similarly, operations comprise a series of collective tasks sequenced in time, space, and purpose to accomplish missions. Current operations integration cells use MOPs in execution matrices and running estimates to track completed tasks. Staffs use MOPs as a primary element of battle tracking. MOPs focus on the friendly force. Evaluating task accomplishment using MOPs is relatively straightforward and often results in a "yes" or "no" answer.

1-19. A *measure of effectiveness* is an indicator used to measure a current system state, with change indicated by comparing multiple observations over time. Also called MOE (JP 5-0). MOEs assess changes in system behavior, capability, or operational environment that are tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect. MOEs help measure changes in conditions, both positive and negative. **MOEs help to answer the question, "Are we doing the right things?"**

1-20. Evaluating includes analyzing why progress is or is not being made. Commanders and staffs propose and consider possible causes. In particular, they address the question of whether or not changes in the situation can be attributed to friendly actions. Commanders and staffs consult subject matter experts, both internal and external to their unit, on whether they have identified the correct underlying causes for specific changes in the situation. Subject matter experts can also help evaluate the assumptions identified in the planning process by either turning the assumptions into facts or having them removed.

1-21. Evaluating also includes considering whether the desired conditions have changed, are no longer achievable, or are unachievable through the current operational approach. Staffs evaluate by continually challenging the key assumptions made when framing the problem. At any point, the staff may invalidate an assumption, which requires them to revisit their initial assessment.

RECOMMENDING OR DIRECTING ACTION

1-22. Monitoring and evaluating are critical activities; however, assessment is incomplete without recommending or directing action. Assessment may diagnose problems, but unless the assessment results in recommended adjustments, its use to the commander is limited. Ideally, recommendations highlight ways to improve the effectiveness of operations and plans and are considered in all decisions. Recommended actions can include—

- Update, change, add, or remove assumptions.

- Transition between phases.
- Execute branches and sequels.
- Realign resources.
- Change command and control relationships.
- Change priorities of effort.
- Adjust decision points (DPs).

1-23. Based on evaluating progress, staffs brainstorm possible improvements to a plan and make preliminary judgements about the relative merit of those changes. Staff members identify those changes possessing sufficient merit and recommend them to the commander or make adjustments within their delegated authority. Recommendations to the commander range from continuing the operation as planned, to executing a branch plan, or making unanticipated adjustments. Making adjustments includes assigning new tasks to subordinates, reprioritizing support, adjusting information collection assets, or significantly modifying the course of action (COA). Commanders integrate with their personal assessments with recommendations from the staff, subordinate commanders, and other partners. Using these recommendations, commanders decide if and how to modify the operation to better accomplish the mission.

1-24. Assessment diagnoses threats, suggests improvements to effectiveness, and reveals opportunities. Staffs present assessment conclusions and recommendations to the commander as an operation develops. Just as staffs devote time to analysis and evaluation, so too must they make timely, complete, and actionable recommendations. The chief of staff (COS) or executive officer (XO) ensures staffs complete their analyses and recommendations in time to affect the operation and for information to reach the commander when needed.

GUIDES TO EFFECTIVE ASSESSMENT

1-25. Throughout the conduct of operations, commanders integrate their own assessments with those of their staff, subordinate commanders, and other unified action partners in the area of operations (AO). The following guides aid in effective assessment:

- Commander involvement.
- Integration.
- Incorporation of the logic of the plan.
- Caution when establishing cause and effect.

COMMANDER INVOLVEMENT

1-26. Commander involvement in operation assessment is essential. The assessment plan should focus on the information and intelligence that directly support the commander's decision making. Commanders establish priorities for assessment in their planning guidance and CCIRs. By prioritizing the effort, commanders—

- Guide staffs' analysis efforts.
- Reject the tendency to measure something just because it is measurable.
- Avoid burdening subordinates and staffs with overly detailed assessments and collection tasks.
- **Do not** commit valuable time and energy to developing excessive and time-consuming assessment schemes that squander resources better devoted to other operations process activities.

Generally, the echelon at which a specific operation, task, or action is conducted should be the echelon at which it is assessed.

INTEGRATION

1-27. Assessment requires integration. Assessing progress is the responsibility of all staff sections and not the purview of any one staff section or command post (CP) cell. Each staff section assesses the operation in relation to its specific warfighting function. These staff sections, however, must coordinate and integrate their individual assessments and associated recommendations across the warfighting functions to produce

comprehensive assessments for the commander. This is particularly true for protracted operations. Staff sections can accomplish these comprehensive assessments via an assessment working group.

1-28. Most assessment working groups are at higher echelons (division and above) and are more likely to be required in protracted operations. Normally, the frequency of meetings is part of a unit's battle rhythm. Staffs do not wait, however, for a scheduled working group to inform the commander of issues that require immediate attention or to take action in those areas within their delegated authority.

1-29. The assessment working group is cross-functional by design and includes membership from across the staff, liaison personnel, and other unified action partners outside the headquarters. Commanders direct the COS, XO, or a staff section leader to run the group. Typically, the operations officer, plans officer, or senior ORSA staff section serves as the staff lead. The frequency with which the group meets depends on the situation.

1-30. Developing an assessment plan occurs as part of step 7 of the military decision-making process (MDMP). Subordinate commanders may participate along with staffs to provide operations assessments and recommendations. The assessment working group may ultimately present its findings and recommendations to the commander as well. Commanders combine these assessments with their personal assessment, consider recommendations, and then direct changes to improve performance and better accomplish the mission.

Incorporation of the Logic of the Plan

1-31. Effective assessment relies on an accurate understanding of the logic (reasoning) used to build a plan. Each plan is built on assumptions and an operational approach. The reasons why a commander believes the plan will produce the desired results become important considerations when staffs determine how to assess operations. Recording, understanding, and making this logic explicit helps staffs recommend the appropriate MOEs and MOPs for assessing the operation.

Caution when Establishing Cause and Effect

1-32. Although establishing cause and effect is sometimes difficult, it is crucial to effective assessment. Sometimes, establishing causality between actions and their effects can be relatively straightforward, such as in observing a bomb destroy a bridge. In other instances-especially regarding changes in human behavior, attitudes, and perception-establishing links between cause and effect proves difficult. Commanders and staffs must guard against drawing erroneous conclusions in these instances.

AFTER ACTION REVIEWS

1-33. The material in this section is derived from graphic training aid (GTA) 25-06-023 and FM 7-0. AARs comprise three types: formal, informal, and interim.

- Formal AARs are scheduled in advance, may have external observers, and take considerably longer to prepare and complete than informal and interim AARs. Formal AARs use complex training aids and are conducted where they are best supported.
- Informal AARs must remain professional and well organized, while encouraging open dialogue about events and details. Informal AARs—
  - Are conducted by the internal chain of command.
  - Take less time than formal AARs.
  - Use simple training aids.
  - Are conducted when needed.
- Interim AARs afford commanders the ability to capture details that might otherwise be forgotten and ensures the reporting of intelligence to higher and adjacent units. Details can be lost during an extended operation or event such as a convoy. If the operation covers multiple days, commanders should conduct AARs during rest periods, breaks in activity, or as often as required.

Technique: A "hot wash" is a type of interim AAR that can happen at any time, but usually follows immediately after any event (training or combat) and provides feedback that the unit can instantly incorporate before continuing its current operation. It is led by a leader who participated in the event. The results of the hot wash can be incorporated in a later, more all encompassing, AAR. A hot wash usually follows the format of reviewing with all personnel involved these four questions:

- What just happened?
- What went right?
- What went wrong?
- What should we do differently next time?

AAR STEPS

1-34. Conducting AARs requires three steps: plan, prepare, and conduct.

- Plan
  - Establish objectives.
  - Select observers.
  - Review the mission or plan.
  - Identify participants.
  - Plan times or triggers for AARs.
  - Determine AAR site locations.
  - Select training aids (maps, overlays, butcher paper, white boards, terrain models, and recording devices).
- Prepare
  - Review the applicable operations order (OPORD), execution order (EXORD), directives, and plans.
  - Observe the operation.
  - Organize the AAR site.
  - Collect information from observers and participants as available.
  - Develop the discussion outline.
  - Organize and rehearse.
- Conduct
  - Restate the mission and events in overview along with a summary of the outcome.
  - Generate discussion.
  - Orient the discussion to the objectives of the AAR (keep the discussion focused and on topic).
  - Seek maximum participation.
  - Summarize key learning points.

AAR DISCUSSION FORMAT

1-35. To assist in removing emotion from topics, organize discussions in the following format:

- **Issue.** State the issue that you are raising, without blame or praise: for example, "inadequate control measures."
- **Discussion.** Discuss in more detail what happened and what the result was. For example, "The OPORD did not specify what the boundaries of the AO were, resulting in subordinate units maneuvering across the boundaries of adjacent units."

- **Recommendation.** Discuss your recommended resolution to the problem. For example, "Ensure that control measures such as boundaries are well understood in the operations process of the unit. Adjust the standard operating procedure (SOP)."

Techniques: Another example agenda for each AAR discussion—

- Review what was supposed to happen.
- Establish what happened.
- Determine what was right or wrong with what happened.
- Determine how to perform the task differently next time.
- Determine who is responsible for implementing any changes.
- The last three steps can be done using the issue-discussion-recommendation format.

Other considerations—

- Ask leading and thought-provoking questions that focus on the mission objectives. Ask leaders what mission variables influenced their decisions. For example, ask, "Do you think that was a proper way to establish security?"
- Have unit members describe what happened in their own words and from their own point of view. They should be free to discuss not only what took place but also why it took place.
- Discuss “sustains” (positives) as well as “improves” (negatives), which reinforces what was done well and not just what needs improvement.
- Relate tactical events to subsequent results.
- Explore alternative courses of action that might have been more effective. For example, ask, “How could you have done it better?”
- Avoid detailed examination of events not directly related to major training objectives, unless the unit leader wants to go into greater detail.
- Cut off inappropriate discussions, particularly excuses and doctrinal debates.
- Encourage discussing solutions to problems that are controversial within the unit.
- Focus on improving the survivability and lethality of the unit on the next contact.
- Emphasize there will be no retribution for professional dialogue—even when it paints leadership in a negative light—so that Soldiers and observers will speak honestly and candidly.

AAR Recording

1-36. Importantly, each AAR session should be recorded and published. The audience for the published AAR is the same as the invitation plus one level up. Ensure the AAR is provided to the whole unit. Additionally, provide the AAR to the next higher echelon (for example, company to battalion) so lessons learned can be disseminated throughout the organization to help others avoid the same mistakes. The Center for Army Lessons Learned (CALL) is the Army's central repository for lessons learned. This center collects, analyzes and rapidly disseminates applicable lessons learned and tactics, techniques, and procedures (TTP) across the force. Units can both access and upload lessons learned to CALL at https://usacac.army.mil/organizations/mccoe/call.

Technique: Have the unit SOP readily available to assist in understanding and recording the changes the unit needs to implement.

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Chapter 2

Planning

Multiple processes are available for planning. This chapter covers the planning processes of Army design methodology (ADM) and the military decision-making process (MDMP). It also covers the integrating processes of intelligence preparation of the battlefield (IPB), information collection (IC), and targeting.

OVERVIEW OF PLANNING

2-1. *Planning* is the art and science of understanding a situation, envisioning a desired future, and determining effective ways to bring that future about (ADP 5-0). Planning helps leaders understand situations; develop solutions to problems; direct, coordinate, and synchronize actions; prioritize efforts; and anticipate events. Planning helps leaders determine how to move from the current state of affairs to a more desirable future state and assess what could go wrong along the way.

2-2. Planning is a continuous learning activity. While planning may start an iteration of the operations process, planning does not stop with the production of an order. During preparation and execution, the commanders continuously refine the order to account for changes in the situation. Subordinates and others provide assessments about what works, what does not work, and how the force can conduct operations better. In some circumstances, commanders may determine that the current order (to include associated branches and sequels) no longer applies. In these instances, instead of modifying the current order, commanders reframe the problem and develop a new plan.

2-3. Planning may be highly structured, involving the commander, staff, subordinate commanders, and others who develop a fully synchronized plan or order. Less structured planning may limit involvement to the commander and selected staff members, who quickly determine a scheme of maneuver for a hasty attack. Sometimes the planned activity is quite specific with very clear goals. At other times, planning must first determine the activity and the goals. Planning is conducted along various planning horizons, depending on the echelon and circumstances. Planning may be months and years out for some units, while others plan only hours or days ahead.

2-4. Planning techniques and methods vary based on circumstances. Most planners plan in reverse, starting with the envisioned end state and working backward in time to the present. Some planners may plan forward, starting with the present conditions and laying out potential decisions and actions forward in time. Planning methods may be more analytical, as in the ADM, or more systematic, as in the MDMP.

2-5. A product of planning is a plan or order-a directive for future action. Commanders issue plans and orders to subordinates to communicate their understanding of the situation and their direction for how the operation should unfold. Plans and orders synchronize the action of forces in time, space, and purpose to achieve objectives and accomplish the mission. They inform others outside the organization on how to cooperate and provide support.

2-6. Plans and orders describe a situation, define the mission, provide the commander's intent, establish a task organization, lay out a concept of operations, assign tasks to subordinate units, and provide essential coordinating instructions. The plan serves as a foundation that allows the force to rapidly adjust based on changing circumstances. **The measure of a good plan is not whether execution transpires as planned, but whether the plan facilitates effective action in the face of unforeseen events.**

2-7. Plans and orders come in many forms and vary in scope, complexity, and length of time they address. Generally, commanders and staffs develop an operation plan well in advance that is not executed until directed. An operation plan becomes an operation order (OPORD) when directed for execution based on a

specific time or event. A fragmentary order (FRAGORD) is an abbreviated OPORD, issued as needed, to change or modify an OPORD during the conduct of operations. Some planning results in written orders complete with attachments. Other planning produces brief FRAGORDs issued verbally and then followed in writing (see FM 6-0 for Army formats for plans and orders).

DESIGN

2-8. This section is derived from ADP 5-0, ATP 5-0.1, and *Army Design Methodology: Commander's Resource.*

2-9. *Army design methodology* is a methodology for applying critical and creative thinking to understand, visualize, and describe problems and approaches to solving them (ADP 5-0). ADM includes interconnected thinking activities that aid in conceptual planning and decision making. By first framing an operational environment and associated problems, ADM enables commanders and staffs to think about the situation in depth. From this understanding, commanders and staffs develop a more informed approach to solve or manage identified problems. During operations, ADM supports organizational learning through reframing- a maturing of understanding that leads to a new perspective on problems or their resolution.

2-10. Recognizing and solving problems is essential. When faced with unfamiliar or ambiguous situations, commanders and staffs may feel overwhelmed by uncertainty. This is where ADM can help. By first framing an operational environment and associated problems, ADM enables commanders and staffs to think about the situation before developing ways to solve those problems. Based on this understanding, commanders and staffs are better equipped to develop approaches to overcome identified problems.

2-11. Depending on the situation's complexity, hard-to-identify problem, or unclear operational end state, commanders can initiate ADM before or in parallel with the MDMP. ADM can facilitate the identification of objectives, creation of lines of operation and lines of effort, and increase understanding of the problem. **The understanding and products resulting from ADM do not replace the MDMP, but they help guide more detailed planning during the MDMP.**

2-12. No specific method or prescribed set of steps exists to employ ADM. Several activities associated with ADM, however, include framing an operational environment, framing problems, developing an operational approach, and reframing when necessary (see figure 2-1). ADM is particularly useful as an aid to conceptual planning when integrated with the detailed planning typically associated with the MDMP. Together, these processes produce executable plans. While planners complete some activities before others, the understanding and learning within one activity may require revisiting the learning from another activity. Thus, ADM is iterative in nature.

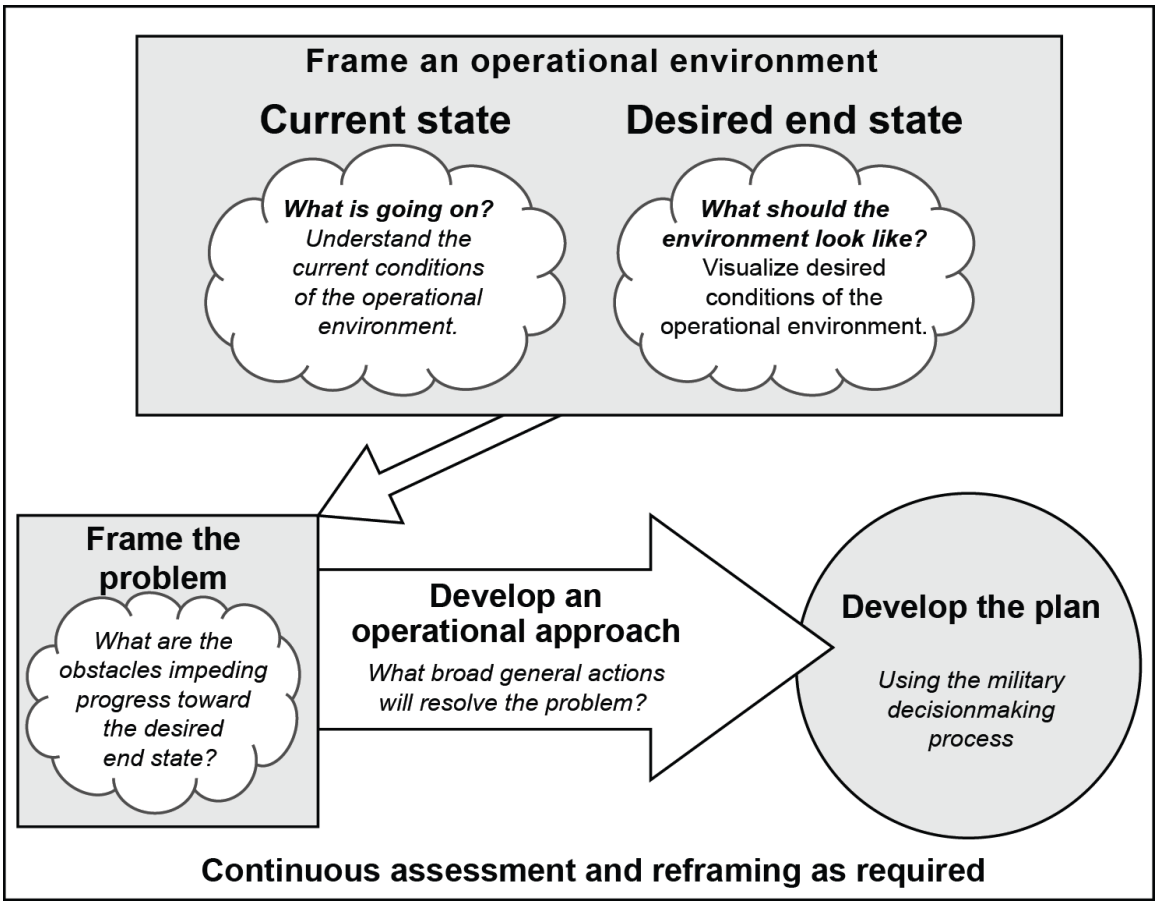


Figure 2-1. Army design methodology

STEP 1. CURRENT STATE

2-13. To use an operational approach in solving problems, commanders and planning teams seek to understand those conditions that make up the current state of an operational environment. A condition is the state of an essential factor in an operational environment. An example is a three-year drought in an area. Insurgent control of a certain province is another example. Not only do planning teams identify current conditions, they understand how those conditions came to be from a historical and cultural perspective. Teams identify and discern the relationships among relevant variables and actors in an operational environment.

2-14. An actor is an individual or group who acts to advance personal interests. Relevant actors may include states and governments, multinational actors such as coalitions, and regional groupings, alliances, terrorist networks, criminal organizations, military units, and cartels. Actors may also include multinational corporations, nongovernmental organizations, and other entities capable of influencing the situation either through, or in spite of, the appropriate civil, religious, or military authority.

2-15. Tendencies are models describing the thoughts or behaviors of certain actors. Tendencies identify the likely pattern of relationships between the actors, without external influences. Once identified, commanders and staffs evaluate the potential of these tendencies to manifest within an operational environment. Potential is the inherent ability or capacity for the growth or development of a specific interaction or relationship.

2-16. Often, learning the nature of a situation helps in understanding groupings, relationships, or interactions among relevant actors and operational variables. This learning typically involves analysis of

operational variables while examining the dynamic interaction and relationships among a myriad of other factors in an operational environment.

2-17. Some things to consider include, but are not limited to, the following:

- Guidance.
- Histories and cultures.
- Actors (such as persons, institutions, bureaucracies, organizations, groups, or communities that have relevant interests or influence).
- Actors' goals.
- Relationships among the actors.
- Operational variables.
- Elements of operational art.
- Tendencies: the likely pattern of relationships if we do not intervene (consider tendencies in light of specific relationships and in the aggregate).
- Potentials: the inherent ability or capacity for the growth or development of a specific interaction or relationship (consider potentials in light of specific relationships and in the aggregate).

2-18. Present findings as an answer to the question, "What is going on in the environment?" Use a graphic and a narrative to explain.

Note. Framing the operational environment requires simplifying reality to identify and understand key relationships between actors and other variables. Lives and resources depend on the accuracy of this analysis. Keeping in mind the need to simplify, considering a greater number of actors' perspectives leads to more accurate results. Similarly, considering greater numbers of relationships leads to more accurate results. Given the operational environment's complexity, the more expertise considered, the better. For example, if governance, economic development, or reconciliation will at some point constitute lines of effort (LOEs), input from persons knowledgeable in politics, economics, and sectarian conflict will be helpful and lead to greater accuracy.

STEP 2. DESIRED END STATE

2-19. The desired end state consists of those desired conditions that, if achieved, meet the objectives of policy, orders, guidance, and directives issued to the commander. A condition is a reflection of the existing state of the operational environment. Thus, a desired condition is a sought-after future state of the operational environment.

2-20. Since every operation focuses on a clearly defined, decisive, and attainable end state, success hinges on accurately describing these conditions. These conditions form the basis for decisions that ensure operations progress consistently toward the desired end state.

2-21. Time is a significant consideration when developing the desired end state. How time relates to the desired end state heavily influences not only the expectations of higher authorities but also how commanders use forces and capabilities to achieve desired conditions. Staffs exercise diligence throughout ADM to account for the time required to achieve the desired end state conditions. Staffs also qualify whether desired conditions are intended to be lasting or transient. This temporal dimension is essential to developing effective operational approaches.

2-22. Some things to consider include, but are not limited to, the following:

- Tangible and intangible conditions.
- Military and non-military conditions.
- Perceptions.
- Levels of comprehension.
- Cohesion among groups.
- Relationships between actors.

- Guidance from higher headquarters.
- Time available.
- Duration of desired end state.

2-23. Present findings as an answer to the question, "What do we want the environment to look like?" Use a graphic and a narrative to explain.

STEP 3. PROBLEM FRAME

2-24. The problem frame extends beyond analyzing the interactions and relationships in the operational environment. It identifies areas of tension and competition as well as opportunities and challenges that commanders must address to transform current conditions to achieve the desired end state. Tension is the resistance or friction among and between actors. The commander and staff identify tension by analyzing the relevant actors' tendencies, objectives, and potentials within the context of the operational environment.

2-25. The commander and staff challenge their hypotheses and models to identify motivations and agendas among the relevant actors and identify factors that influence these motivations and agendas. The commander and staff evaluate tendencies, potentials, trends, and tensions that influence the interactions among social, cultural, and ideological forces.

2-26. In the problem frame, analysis identifies positive, neutral, and negative implications of tensions in the operational environment given the differences between existing and desired conditions. When commanders and staffs take action within the operational environment, they may exacerbate latent tensions. Commanders exploit tensions to drive change; this exploitation is vital to transforming existing conditions. If left unchecked, tensions may undermine transformation. Because tensions arise from differences in perceptions, goals, and capabilities among relevant actors, they are inherently problematic and can both foster and impede transformation. **By deciding how to address these tensions, the commander identifies the problem that the design will ultimately solve.**

2-27. Some things to consider include, but are not limited to, the following:

- Root causes.
- Tendencies.
- Potentials.
- Areas of tension and competition within the environment.
- Tensions that are positive, neutral, or negative relative to a desired end state.
- Tensions that can be exploited to drive change.
- Tensions that must be mitigated.

2-28. Present findings as an answer to the question, "Where, conceptually, in the environment should we act to achieve our desired end state?" This creates a problem statement and graphic.

2-29. The problem statement reflects differences between current and desired conditions. Judgement is important! The problem statement describes where, conceptually, and in the current environment, the organization should act to achieve a more desirable state.

2-30. The problem statement is presented as a declarative sentence—not as a problem question—and remains conceptual, since the details are developed in the MDMP.

STEP 4. OPERATIONAL APPROACH

2-31. An operational approach enables commanders to begin visualizing and describing possible combinations of actions to reach the desired end state given the tensions identified in the environmental and problem frames. Courses of action are developed during detailed planning, the operational approach provides the logic that underpins the unique combinations of tasks required to achieve the desired end state.

2-32. One method to depict the operational approach is using LOEs to provide a graphic that articulates links among tasks, objectives, conditions, and the desired end state. A design portrays an operational approach in a manner that best communicates its vision and structure. Ultimately, the commander determines the optimal method to articulate the operational approach.

2-33. Some things to consider include, but are not limited to, the following:

- Desired conditions.
- Objectives.
- Tasks.
- LOEs.
- Resource estimates.
- Acceptable level of risk.
- Risk-mitigation measures.
- Combinations of actions.
- Broad, general actions that might facilitate movement toward a desired state.
- Logic or rationale behind why these broad, general actions will work.

2-34. Present findings as an answer to the question, such as "How do we get from the current state to the desired end state?" Use a graphic and a narrative to explain. Once the commander approves the concept, planners can use the MDMP to create a plan for subordinate units to execute.

2-35. Some final thoughts on ADM—

- Design is not a linear process. Without exception, commanders and staffs move back and forth between frames when they develop a design, plan, prepare, and execute. Design's four questions do not comprise a procedure.
- Adopt the virtue of humility. Expect error and try to anticipate change.
- Be aware of the need to reframe.
- Staff members cannot develop a design alone. Staffs must work in groups. A rule of thumb is to include six to nine people on the core team, and bring in other subject-matter experts as needed.
- Attempt to capture all relevant perspectives through personal or group narratives. Use their words and images.
- Employ multiple disciplines, frameworks, theories, and models.
- Prevent "paralysis by analysis" by having a leader in charge.
- Keep in mind that clashing perspectives are desirable, because opposing perspectives result in integration of relevant variables, relationships, and dynamics into the frames. Disagreements ultimately result in a shared understanding of the environment, the problem, and the solution.
- To have a clash of perspectives and the creation of a shared narrative, leaders and design practitioners must cultivate the free, open exchange of perspectives to create a shared narrative.
- Struggle to find the right amount of detail in your frames. Both too much and too little detail is unhelpful.
- Keep in mind that the whole is likely greater than the sum of its parts. Many activities are simultaneously transpiring in the environment. The goal is to understand how the variables and relationships between them interact to affect the whole.
- Keep in mind the environment is dynamic, not static.
- Ask, "How will our interventions affect the environment?"
- Be aware of feedback loops.
- Plan actions to learn more about the environment.
- Plan actions that create opportunities.
- Understand that, in human affairs, "end states" are not the goal. Achieving a desired state for a certain duration is the objective.

THE MILITARY DECISION-MAKING PROCESS

2-36. The material in this topic is derived from ADP 5-0 and FM 6-0.

2-37. The *military decision-making process* is an iterative planning methodology to understand the situation and mission, develop a course of action, and produce an operation plan or order (ADP 5-0). The MDMP facilitates parallel and collaborative planning and helps leaders apply thoroughness, clarity, sound judgement, logic, and professional knowledge to develop situational understanding and produce a plan or order. *Situational understanding* is the product of applying analysis and judgment to relevant information to determine the relationships among the operational and mission variables (ADP 5-0). *Collaborative planning* is two or more echelons planning together in real time, sharing information, perceptions, and ideas to develop their respective plans simultaneously (ADP 5-0). *Parallel planning* is two or more echelons planning for the same operations nearly simultaneously facilitated by the use of warning orders by the higher headquarters (ADP 5-0).

2-38. The MDMP consists of seven steps as shown in table 2-1 on page 16. Each step of the MDMP has a purpose, inputs, substeps, and outputs. The step outputs lead to an increased understanding of the situation and facilitate the next step of the MDMP. Commanders and staffs generally perform these steps and substeps sequentially; however, they may revisit several steps in an iterative fashion as they learn more about the situation before producing the plan or order. **Ultimately, the MDMP is a means to an end. The actual decisions a commander makes is more important than the decision-making process.**

2-39. Commanders initiate the MDMP upon receipt of, or in anticipation of, a mission. Commanders and staffs often begin planning in the absence of an approved higher headquarters' operation plan (OPLAN) or OPORD. In these instances, they start planning based on a warning order (WARNORD), a planning order, or an alert order from higher headquarters. This requires active collaboration with the higher headquarters and parallel planning among echelons as the plan or order is developed.

2-40. Depending on the situation's complexity, commanders can initiate ADM before or in parallel with the MDMP. If the problem is hard to identify or the operation's end state is unclear, commanders may initiate ADM before engaging in detailed planning. ADM can assist commanders and staffs in understanding an operational environment, framing the problem, and considering an operational approach to solve or manage the problem. In time-constrained conditions, or when the problem is straightforward, commanders may conduct the MDMP without incorporating formal ADM efforts (see discussion of the rapid decision-making and synchronization process (RDSP) beginning in paragraph 4-29).

Note. The techniques described in this section assume that proper time is allocated and multiple courses of action will be developed.

Table 2-1. Steps of the MDMP

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
	Mission Receipt	**Mission Analysis**	**COA Development**	**COA Analysis**	**COA Comparison**	**COA Approval**	**Orders Production, Dissemination, and Transition**
Sub-steps	1. Alert staff 2. Gather tools 3. Update running estimates 4. Conduct initial assessment 5. Prepare CDR's initial guidance 6. Prepare initial WARNORD	1. Analyze higher headquarter's plan or order 2. Perform initial IPB: 2.1. Define the battlefield 2.2. Describe the battlefield's effects 2.3. Evaluate the threat 2.4. Develop threat COAs 3. Specified, implied, and essential tasks 4. Review available assets and ID shortfalls 5. Determine constraints 6. Identify critical facts and assumptions 7. Begin risk management 8. Develop initial CCIRs and EEFIs 9. Develop initial information collection plan 10. Update plan for use of available time 11. Develop proposed problem statement 12. Develop proposed mission statement 13. Present a mission analysis briefing 14. Develop and issue initial CDR's intent 15. Develop and issue initial planning guidance 16. Develop COA evaluation criteria 17. Issue warning order #2	1. Assess situation 1.1. Begin sketch 1.2. Evaluate combat power/effect 2. Generate options 2.1 Determine focus (ENY or terrain) 2.2 Determine decisive operation 2.2 Determine shaping operations 2.3 Determine sustainment feasibility 2.4 Determine form of maneuver 2.5 Add graphic control measures 3. Array forces 3.1 Refine combat power for each action 3.2 Allocate combat power to decisive operation 3.3 Assign forces to other efforts 3.4 Refine sequence and phase as required 3.5 Determine sustainment actions 3.6 Add graphic control measures 4. Refine concept 4.1 Determine scheme of intel 4.2 Determine scheme of fire 4.3 Determine scheme of protection 4.4 Determine scheme of MC 4.5 Add graphic control measures 4.6 ID potential decision points 5. Assign headquarters 6. Prepare sketch and create statement 6.1 Make sketch presentable 6.2 Prepare statement 7. Conduct COA briefing 8. Select or modify COAs for analysis	1. Provide COA analysis guidance 2. Gather tools 3. Execution 4. COA analysis brief (optional)	1. Conduct advantages and disadvantages analysis 2. Compare COAs 3. Develop COA decision brief	1. Commander approves a COA 2. Commander issues the final planning guidance	1. Complete the plan 2. Develop the order 3. Ensure understanding 4. Transition to preparation
Briefing		1. Introduction and agenda 2. Mission and intent, HQ 2-levels up 3. Mission, CDR's intent, and concept of operation of HQ 1-level up 4. Review of CDR's initial guidance 5. Initial IPB 6. Specified, implied, and essential tasks 7. Pertinent facts and assumptions 8. Constraints 9. Forces available and resource shortfalls 10. Proposed problem statement 11. Proposed mission statement 12. Proposed CDR's intent or issuance 13. Proposed CCIRs and EEFIs 14. Initial information collection plan 15. Initial risk to mission assessment 16. Review evaluation criteria 17. Issue commander's planning guidance 18. Timeline review	1. Introduction and agenda 2. Updated IPB, facts, assumptions 3. Staff Responses to CDR's RFIs 4. Quick Review of – • Approved problem statement • Mission statement • CDR's and higher CDR's intent • Threat COA • Results from combat power analysis 5. For each COA statement and sketch • Task organization • Concept of operations • Scheme of maneuver • Concept of intelligence • Concept of fires • Concept of protection • Concept of sustainment • Concept of command and control • Risk 6. Refined COA evaluation criteria 7. CDR's comments, decision, guidance	1. Introduction and agenda 2. Updated IPB, facts, assumptions 3. Quick review of – • Approved problem statement • Mission statement • CDR's and higher CDR's intent • Threat COA(s) used for analysis • War-game technique (if used) 4. For each Friendly COA analyzed: • Assumptions used • Quick review of concept of operation • COA analysis results • Modifications made 5. CDR's comments and guidance	1. Updated IPB, facts, assumptions 2. Staff responses to CDR's RFIs 3. Quick Review of – • Approved problem statement • Mission statement • CDR's and higher CDR's intent • Threat COA(s) used for analysis 4. Friendly COAs analyzed • Assumptions used • Quick review of the concept of operations • COA analysis results • Modifications made to friendly COA • Evaluation criteria results 5. COA comparison with recommended staff COA		ANNEXES A—Task organization B—Intelligence C—Operations D—Fires E—Protection F—Sustainment G—Engineer H—Signal I—Not used J—Public affairs K—Civil affairs L—Information collection M—Assessment N—Space operations O—Not used P—Host-nation support Q—Knowledge management R—Reports S—Special technical operations T—Spare U—Inspector general V—Interagency coordination W—Operational contract support X—Spare Y—Spare Z—Distribution
Products	1. Initial planning guidance 2. Initial allocation of time 3. Warning order #1	1. Approved problem and mission statement 2. Initial CDR's intent 3. CDR's planning guidance 4. Current IPB products 5. Initial information collection plan 6. Initial CCIRs and EEFIs 7. Specified, implied, and essential tasks 8. Approved facts, assumptions, constraints 9. Updated timeline 10. Identification of resource shortfalls 11. Approved COA evaluation criteria 12. Warning order #2	1. CDR's selected COA(s) with COA statement and sketch 2. CDR's refined planning guidance 3. Updated running estimates and IPB 4. Updated assumptions	1. Refined COA(s) 2. Draft DST and DSM 3. COA synchronization matrix or set of sketch notes 4. Refined task organization 5. Potential branches and sequels 6. Updated running estimates and IPB 7. Updated assumptions	1. Staff recommended COA 2. Cost and benefits between COAs 3. COA selection rationale 4. Updated running estimates and IPB 5. Updated assumptions	1. Approved COA with any modifications 2. Commander's final planning guidance 3. Refined CDR intent, CCIRs, and EEFIs 4. Warning order #3	

STEP 1. RECEIPT OF MISSION

2-41. Receipt of mission is the first step of the MDMP. It alerts the organization, staff, and subordinate units to initiate planning preparation. Planning preparation includes everything needed to conduct planning and describes the end result of planning. This includes determining the timeline for the operation and planning process, deciding what portions of the OPORD to develop, updating running estimates, and gathering tools. Figure 2-2 lists the purpose, inputs, processes, and outputs of receipt of mission.

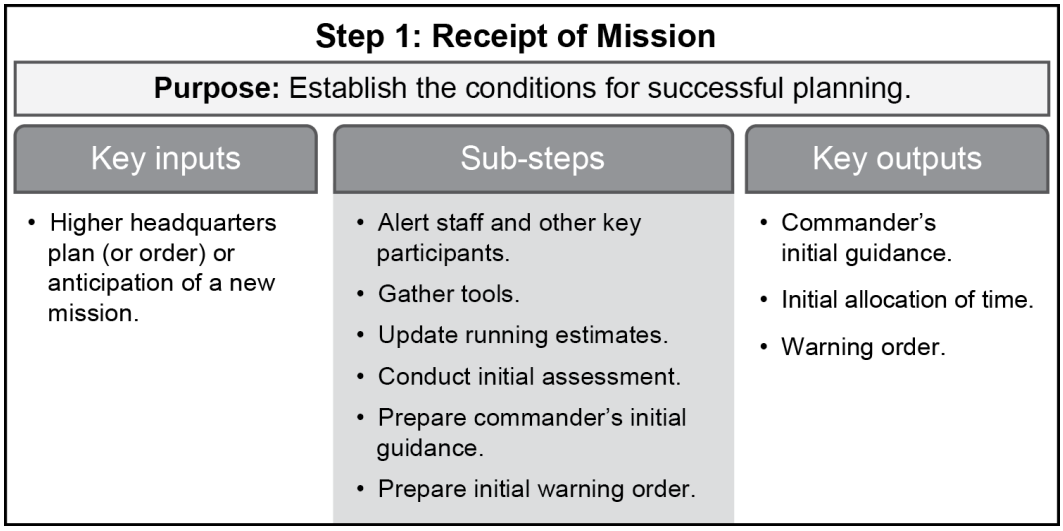


Figure 2-2. The MDMP Step 1. Receipt of mission overview

Step 1.1. Alert Staff and Other Key Participants

2-42. When a commander directs, a unit receives a new mission, or the staff anticipates a branch or sequel, someone must alert the staff to begin planning. Usually the current operations or planning lead alerts the staff of the pending planning requirement. The planning team typically includes a representative from each warfighting function and, as necessary, additional staff members by functional area of expertise. As required, other military, civilian, and host-nation organizations are notified of future planning events.

Step 1.2. Gather Tools

2-43. Once notified of a new planning requirement, the staff prepares for the MDMP by gathering the tools needed to perform it. These tools include, but are not limited to—

- Appropriate doctrinal publications such as ATP 5-0.2-1, ATP 5-0.2-2, FM 3-0, FM 3-90-1, FM 3-90-2, FM 6-0, or ADP 1-02.
- All documents related to the mission and area of operations (AO) including the higher headquarters' OPLAN or OPORD, maps and terrain products, and operational graphics.
- Higher headquarters' and other organizations' intelligence and assessment products.
- Estimates and products of other military and civilian agencies and organizations.
- Unit's standard operating procedures (SOPs) and the higher headquarters' SOPs.
- Current running estimates.
- Any design products, including products describing the operational environment, problem, and operational approach (if applicable).

2-44. Gathering tools continues throughout the MDMP. Staff officers carefully review references—located at the beginning of an OPLAN or OPORD before paragraph 1, Situation, of the higher headquarters' OPLAN or OPORD—to identify documents such as theater policies and memorandums related to the upcoming operation.

Step 1.3. Update Running Estimates

2-45. While gathering the necessary tools for planning, staff sections continue updating running estimates-especially the status of friendly units and resources available that affect each functional area. Running estimates compile critical facts and assumptions from the perspective of each staff section, to include information from other military and civilian organizations. While this task is listed at the beginning of the MDMP, developing and updating running estimates continues throughout the MDMP and the operations process.

Technique. A technique to help determine the "so what" of any fact, assumption, or constraint is to use a factor-deduction-conclusion process, which is also known as a "3-column drill" (see table 2-2). In the first column, list the fact, assumption, or constraint you want to analyze. In the second column, list why the factor is important (the so what). In the conclusion column, list all necessary additional actions or products (for example: planning guidance, tasks, and graphic control measures).

Table 2-2. Example "3-column drill"

Factor "what"	*Deduction "so what"*	*Conclusion "recommendation"*
Currently have 200,000 gallons of fuel on hand for the brigade.	The brigade is able to maneuver for only an additional 24 hours.	• Request from higher headquarters an additional 400,000 gallons of fuel for the upcoming operation. • Create a limit of advance in case fuel does not arrive in time to avoid culmination.

Step 1.4. Conduct Initial Assessment

2-46. During receipt of mission, the commander and staff conduct an initial assessment of time and resources available to plan, prepare, and begin execution of an operation. This initial assessment helps commanders determine—

- Time available from mission receipt to mission execution.
- Time needed to plan and prepare for the mission for both the headquarters and subordinate units.
- The staff's experience, cohesiveness, and level of rest or stress.
- Guidance on a planning approach, including conducting ADM, abbreviating the MDMP, or using the RDSP.
- Whether abbreviating the MDMP is required.
- Planning team composition, including which outside agencies and organizations to contact and incorporate.
- Time required to position critical elements, including command and control (C2) nodes for the upcoming operations.

2-47. This initial assessment determines the initial allocation of available time. The commander and staff balance the desire for detailed planning against the need for immediate action. The commander provides initial guidance to subordinate units as early as possible to allow subordinates the maximum quantity of time for their own planning and preparation of operations. As a rule, the commander allocates a minimum of two-thirds of available time for subordinate units to conduct their planning and preparation. The Commander and staff use the remaining one-third of available time to plan (planning time is defined as the time from receipt of order to issue of the OPORD). Time, more than any other factor, determines the level of detail to which commanders and staffs can plan.

2-48. An initial assessment helps determine when certain actions should begin to ensure forces are ready and in position before execution. This may require commanders to direct subordinates to start necessary movements, conduct task organization changes, begin IC, and execute other preparation activities before completing the plan.

2-49. Based on the commander's initial allocation of time, the chief of staff (COS) or executive officer (XO) develops a planning timeline, also known as the "plan to plan" or P2P that outlines how long the headquarters can spend on each step and substep of the MDMP. It includes times and locations for meetings and briefings and issuance of orders. It serves as a benchmark for the commander and staff throughout the MDMP. The staff's planning timeline indicates what products are due, who is responsible for them, and who receives them.

Techniques: To develop a realistic and attainable planning timeline, a COS or XO can use multiple techniques. One technique is HOPE(L) (higher headquarters, operational, planning, templated enemy, and light and weather timelines). Each HOPE(L) timeline identifies several key events. By holistically evaluating unit planning timelines with key events identified in a HOPE(L) format, units can synchronize their planning timelines with the key events. HOPE(L) also ensures a plan is developed in sufficient time before execution.

A second technique for use when dedicated planners are unavailable, is to allow sufficient time for contingencies and for staff members to meet other requirements. For example, leave three to four hours between steps in the process for the staff to address current war fighting function operational requirements.

A technique for use with the one-third, two-third rule for allocating time is to remove an additional 25% of allocated time off the top before determining allocations. This provides for contingencies, planning timeline shifts, or analyzing branches and sequels.

Other items to consider in developing realistic planning timelines include rest cycles, time of day, means of OPORD delivery, and subordinate unit travel times. For example, if the one-third, two-third rule indicates that the OPORD brief should be conducted at 0200 hours, the commander wants to do it in person, and subordinate commanders require a few hours to get both to and from the unit's headquarters, the planning timeline will most likely need to be adjusted. Table 2-3 depicts a technique for allocating time for the MDMP.

Table 2-3. Rule of thumb for the MDMP timelines

The MDMP step	*Overall time allocation*	*Refined time allocation*
Receipt of mission	50%	30-35%
Mission analysis		
COA development		15-20%
COA analysis	50%	30-35%
COA comparison		
COA approval		
Orders production		15-20%

See table I-10 on page 325 for generic planning timelines.

Step 1.5. Issue Commander's Initial Planning Guidance

2-50. Having determined the time available together with the scope and scale of the planning effort, commanders issue initial planning guidance. If commanders are unable to issue guidance, the COS, XO, or lead planner can issue initial guidance to initiate the planning process. Initial guidance begins the

visualization process, identifies the tactical problem, defines the AO, and lists the initial challenges. Although brief, initial guidance includes—

- Initial time allocations.
- Guidance on the planning approach (initiate ADM, conduct the full MDMP, abbreviate the MDMP, or conduct the RDSP).
- How to abbreviate the MDMP, if required.
- Necessary coordination to perform, including exchanging liaison officers.
- Authorized movements to initiate.
- Known specified and implied tasks.
- Information collection guidance to include reconnaissance and surveillance guidance (if tasking units are to conduct reconnaissance and surveillance).
- Collaborative planning times and locations.
- Initial information requirements (IRs).
- Things not to waste time on.
- Additional staff tasks.

Techniques. Have an initial commander's guidance template that can facilitate the planning process (see figure I-2 on page 315 for an example). A template helps commanders organize their thoughts and ensures they do not forget any key guidance. It allows the staff to anticipate what to expect from the commander before beginning the MDMP. Lastly, a template helps a commander issue initial guidance—a step that is easily forgotten in a time-constrained environment.

Immediately after a commander issues initial planning guidance, the COS, XO, or planning team lead refines the guidance by describing the type of order the staff will create, what annexes are required, and which staff section is responsible for which part of the order (if an SOP specifying this does not exist).

Step 1.6. Issue WARNORD #1

2-51. The last substep in receipt of mission is to issue a WARNORD to subordinate and supporting units. This order includes as much information as the staff knows and, at a minimum, it specifies the type of operation, general location of the operation, initial timeline, higher headquarter's mission and intent, general enemy situation, and any movement or IC to initiate. An example WARNORD follows:

- Paragraph 1
  - Area of operations.
  - General enemy situation.
  - Higher headquarter's two levels up mission and intent.
  - Higher headquarter's mission and intent.
- Paragraph 2
  - Nothing required.
- Paragraph 3
  - Initial timeline.
  - Required movements.
- Paragraph 4
  - Nothing required.
- Paragraph 5
  - Nothing required
- Annex A.
  - Changes to task organization.

- Annex C
  - Unit AO (sketch, overlay, or some other description).
- Annex L
  - Information collection to initiate.

Technique. Another tool that can assist commanders and staffs in understanding a higher headquarter's OPORD is—within the first 10 minutes of receiving an order from a higher headquarters—the commander can conduct a quick confirmation brief with the staff. Staff members quickly describe major specified or implied tasks (no more than 1–2 minutes per staff section) and constraints or limitations that they think the rest of the staff needs to know before beginning mission analysis. Commanders can also issue their initial guidance and the COS, XO, or lead planner can issue the next couple of key events of the plan to plan. This meeting should last no more than 10 minutes, with 5–7 minutes for staff discussion and 3–5 minutes for issuing commander's initial guidance.

Techniques. The following time-saving techniques for the MDMP come from FM 6-0, Chapter 9.

Increase commander's involvement
While commanders cannot spend all their time with their planning staffs, the greater the commander's involvement in planning, the faster the staff can plan. In time-constrained conditions, commanders who participate in the planning process can make decisions (such as course of action (COA) selection) without waiting for a detailed briefing from the staff.

Limit the number of COAs to develop
Limiting the number of COAs that are developed and analyzed can save planning time. If time is extremely limited, a commander can direct that only one COA be developed. In this case, the goal is an acceptable COA that meets mission requirements in the time available. This technique saves the most time. The fastest way to develop a plan is if a commander directs development of one COA with branches against the most likely enemy COA. This technique should only be used, however, when time is severely limited. In these cases, the COA is often intuitive, relying on the commander's experience and judgement. The commander determines which staff officers are essential to assist in COA development. Normally commanders require the intelligence officer, operations officer, plans officer, chief of fires (fire support officer), engineer officer, civil affairs operations officer, information operations officer, military information support operations officer, electromagnetic warfare officer, and COS or XO. Commanders may also include subordinate commanders, if available, either in person or by video teleconference. The team quickly develops a flexible COA that it feels will accomplish the mission. The commander mentally war-games this COA and gives it to the staff to refine.

Maximize parallel planning
Staffs must use every opportunity to perform parallel planning with higher headquarters and share information with subordinates. Although parallel planning is the norm, maximizing its use in time constrained environments is critical. The importance of WARNORDs increases as available time decreases. A verbal WARNORD now, followed by a written order later, saves more time than a written order one hour from now. When abbreviating the process, the staff issues the same WARNORDs used in the full MDMP. In addition to WARNORDs, units must share all available information with subordinates, especially IPB products, as early as possible.

Increase collaborative planning
Planning in real time with higher headquarters and subordinates improves the overall planning effort of the organization. Modern information systems and a common operational picture shared electronically can allow collaboration with subordinates from distant locations, increase information sharing, and improve a commander's visualization. Taking advantage of subordinates' input and knowledge of their areas of operations often results in developing better COAs faster.

Time saving techniques (continued)

Use liaison officers
Liaison officers assigned to higher headquarters and unified action partners' headquarters allow commanders to have representation in their higher headquarters' planning session. These officers assist in passing timely information to their parent headquarters and directly to the commander. Effective liaison officers have the commander's full confidence and the necessary rank and experience for the mission. Commanders may elect to use a single individual or a liaison team. As representatives, liaison officers must—

- Understand how their commander thinks and interpret verbal and written guidance.
- Convey their commander's intent, planning guidance, mission, and concept of operations.
- Represent their commander's position.
- Know the unit's mission; tactics, techniques, and procedures; organization; capabilities; and communications equipment.
- Observe the established channels of command and staff functions.
- Be trained in their functional responsibilities.
- Be tactful.
- Possess the necessary language expertise.

STEP 2. MISSION ANALYSIS

2-52. The MDMP continues with an assessment of the situation called mission analysis. Mission analysis helps commanders and staffs understand the situation and mission. The situation (paragraph 1 of the OPORD) includes describing the current status of enemy forces, friendly forces, and the terrain and effects for the assigned mission. It also examines the assigned task and purpose and defines the problem the unit has been directed to solve. With this improved understanding, commanders provide guidance for further planning. All mission analysis substeps must be performed, although not sequentially, and all substeps must be completed before moving to Step 3, COA development. Figure 2-3 depicts the purpose, inputs, processes, and outputs of mission analysis.

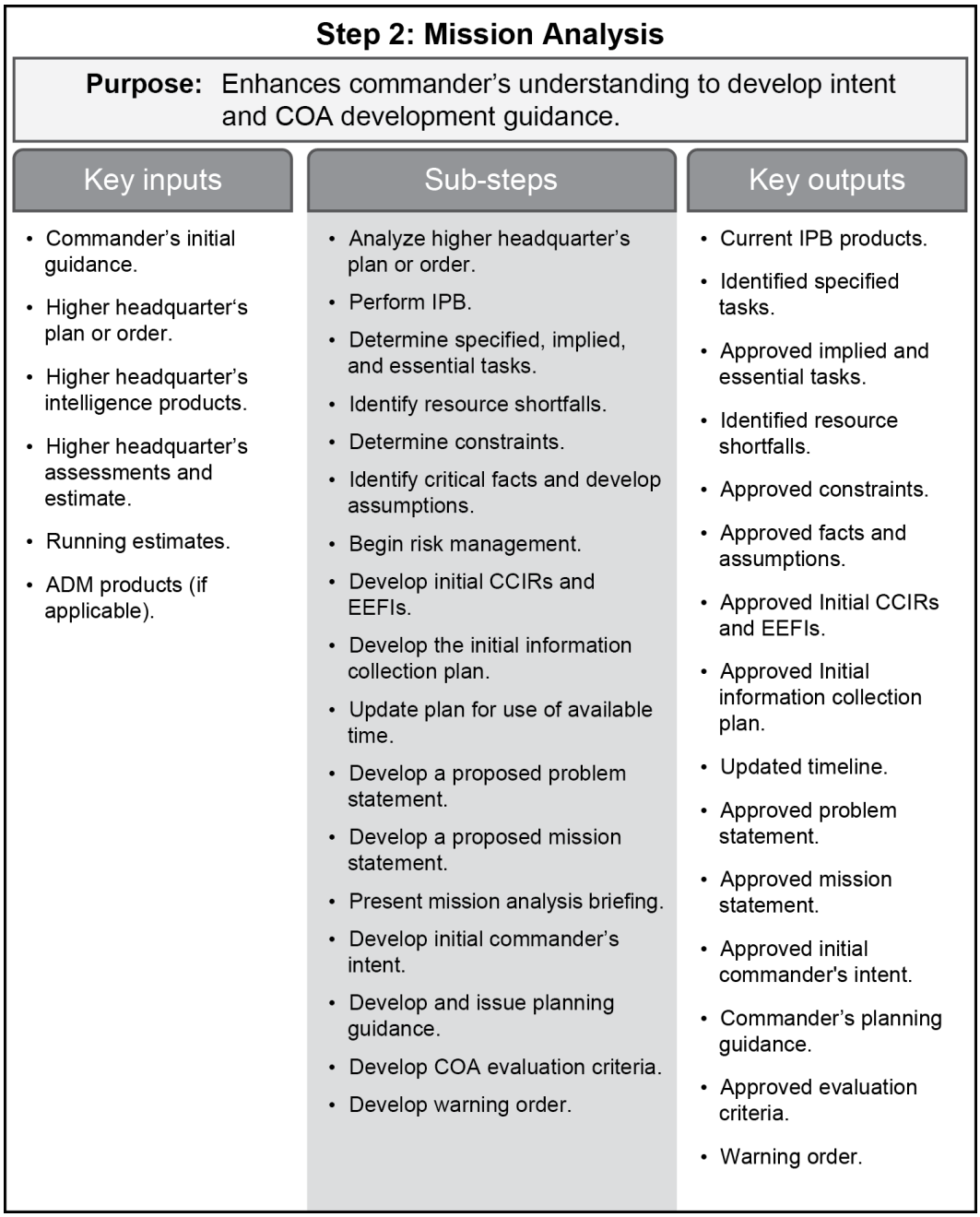


Figure 2-3. The MDMP Step 2. Mission analysis overview

Step 2.1. Analyze the Higher Headquarter's Plan or Order

2-53. Commanders and staffs thoroughly analyze the higher headquarter's plan or order. They determine how their unit, by task and purpose, contributes to the mission, commander's intent, and concept of operations of the higher headquarters. The commander and staff seek to completely understand—

- Commander's intent and mission of the higher headquarters two levels up.
- The higher headquarter's—
  - Commander's intent.

  - Mission.
  - Concept of operations.
  - Available assets.
  - Timeline.
- Their assigned AO.
- Missions of adjacent, supporting, and supported units and their relationships to the higher headquarter's plan.
- Missions or goals of unified action partners that work in operational areas.

2-54. If the commander and staff misinterprets the higher headquarter's plan, time is lost. Additionally, when analyzing a higher order, the commander and staff may identify difficulties and contradictions in the higher order. If confused by the higher headquarter's order or guidance, commanders must seek immediate clarification. Liaison officers familiar with the higher headquarter's plan can clarify issues. Collaborative planning with the higher headquarters also facilitates this task. Staffs use requests for information to clarify or obtain additional information from a higher headquarters.

Step 2.2. Perform Initial Intelligence Preparation of the Battlefield

2-55. *Intelligence preparation of the battlefield* is the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations (ATP 2-01.3). The IPB process identifies critical gaps in a commander's knowledge of an operational environment. As part of initial planning guidance, commanders use these gaps as a guide to establish their initial intelligence requirements. IPB products enable the commander and staff to assess facts about an operational environment and make assumptions about how friendly and threat forces will interact in an operational environment. The description of an operational environment identifies key aspects of, and constraints on, an operational environment—such as avenues of approach, potential engagement areas (EAs), and potential landing zones—which the staff integrates into potential friendly COAs and their running estimates. The intelligence staff, in collaboration with the rest of the staff, develops other IPB products during mission analysis. That collaboration results in draft initial priority intelligence requirements (PIRs), the production of a complete modified combined obstacle overlay (MCOO), a list of high-value targets (HVTs), and unrefined event templates and matrices (see paragraph 2-240 for additional details on IPB).

Note. IPB is the fundamental assumption that the rest of a plan is based on. It becomes the main portion of the intelligence officer’s running estimate. To keep IPB current, intelligence sections rely on help and expertise from the rest of the staff.

Step 2.3. Determine Specified, Implied, and Essential Tasks

2-56. Staffs analyze a higher headquarters' order and guidance to determine their specified and implied tasks. A *task* is a clearly defined action or activity specifically assigned to an individual or organization that must be done as it is imposed by an appropriate authority (JP 1). The "what" of a mission statement is always a task. From a list of specified and implied tasks, the staff determines essential tasks for inclusion in a recommended mission statement (see table I-5 on page 307 for a listing of tactical tasks and definitions).

2-57. A *specified task* is a task specifically assigned to a unit by its higher headquarters (FM 6-0). Paragraphs 2 and 3 of the OPORD usually list specified tasks, but they can be found elsewhere, such as Paragraph 4 or in an annex. A higher commander may assign specified tasks verbally or in written directives. Specified tasks may include a trigger such as "on-order" or "be-prepared."

2-58. An *on-order mission* is a mission to be executed at an unspecified time (FM 6-0). A unit with an on-order mission is a committed force. Commanders envision task execution in the concept of operations; however, they may not know the exact time or place of execution. Subordinate commanders develop plans and orders, allocate resources, task-organize, and position forces for execution.

2-59. A *be-prepared mission* is a mission assigned to a unit that might be executed (FM 6-0). Generally with a contingency mission, commanders execute a be-prepared mission because something planned has or has not been successful. When planning priorities, commanders plan a be-prepared mission after any on-order mission. A be-prepared mission can never be an essential task.

2-60. An *implied task* is a task that must be performed to accomplish a specified task or mission but is not stated in the higher headquarters' order (FM 6-0). Detailed analysis of the higher headquarters' order, the enemy situation, the terrain, and civil considerations helps staffs derive implied tasks. Additionally, analysis of doctrinal requirements for each specified task might disclose implied tasks.

2-61. Once staff members have identified specified and implied tasks, they ensure they understand each task's requirements and purpose. Staff members then identify an essential task or tasks. An *essential task* is a specified or implied task that must be executed to accomplish the mission (FM 6-0). Essential tasks are always included in the unit's mission statement.

Technique. When writing an order, present in paragraphs 2 and 3 (ideally) of the base order all specified tasks that could impact a subordinate's COA. Avoid burying these tasks in paragraphs 4 and 5 or the annexes.

Essential tasks are tasks that already have been identified. They are not different or additional types of tasks and are not included on a separate list. Tasks can be marked by an (S) or (I) on a task list (specified or implied). Then either bold or asterisk the tasks that are essential—tasks that must be in the mission statement.

Step 2.4. Review Available Assets and Identify Resource Shortfalls

2-62. The commander and staff examine additions to and deletions from the current task organization; command and support relationships; and status (current capabilities and limitations) of all units. This analysis also includes capabilities of civilian and military organizations (joint, special operations, and multinational) that operate within their unit's AO. They consider relationships among specified, implied, and essential tasks, and between those tasks and available assets. From this analysis, staffs determine if they have the assets needed to complete all tasks. If shortages occur, the staff identifies to higher headquarters additional resources needed for mission success. Staffs also identify any deviations from the normal task organization and provide these deviations for commanders to consider when developing their planning guidance. A more detailed analysis of available assets occurs during COA development.

Note. Simply stated, during this step, update the task organization and perform an analysis of tasks and available assets to identify any obvious capability shortfalls. For example if tasked to conduct a wet-gap crossing, but bridging assets are unavailable, discuss with higher headquarters whether to change the mission or allocate additional resources.

Step 2.5. Determine Constraints

2-63. Commanders and staffs identify any constraints placed on their command. A *constraint* is a restriction placed on the command by a higher command. A constraint dictates an action or inaction, thus restricting the freedom of action of a subordinate commander (FM 6-0). Paragraph 3 of the OPLAN or OPORD usually identifies constraints. Other paragraphs and annexes to the order may also include constraints. The fires overlay, for example, may contain a restrictive fire line or a no fire area. Constraints may also be verbal, included in WARNORDs, or policy memoranda. Many operational constraints are commonly expressed as rules of engagement, laws, and authorities. Constraints can also be resource limitations within the command, such as organic fuel transport capacity, or physical characteristics of the operational environment, such as the number of vehicles that can cross a bridge in a specified time.

Step 2.6. Identify Critical Facts and Develop Assumptions

2-64. Facts and assumptions are the basis for plans and orders. Commanders and staffs gather facts and develop assumptions as they build their plan. A fact is a statement of truth or a statement thought to be true at the time that affects planning. Facts concerning operational and mission variables serve as the basis for situational understanding, continual planning, and assessing progress during preparation and execution.

2-65. An *assumption* is a specific supposition of the operational environment that is assumed to be true, in the absence of positive proof, essential for the continuation of planning (JP 5-0). In other words, an assumption is information that is accepted as true in the absence of facts. Appropriate assumptions used in decision making have two characteristics:

- They are valid; they are likely to be true.
- They are necessary; they are essential to continuing the problem solving process.

As long as an assumption is both valid and necessary, leaders treat it as a fact. Problem solvers continually seek to confirm or deny the validity of their assumptions.

2-66. Commanders and staffs use care with assumptions to ensure they are not based on preconceptions, bias, false historical analogies, or wishful thinking. Effective planners also recognize any unstated assumptions. Accepting a broad assumption without understanding its sublevel components often leads to other faulty assumptions. For example, a division commander might assume a combined arms battalion from the continental United States is available in 30 days. This commander must also understand the sublevel components: adequate preparation, load and travel time, viable ports and airfields, favorable weather, and enemy encumbrance. The commander considers how the sublevel components hinder or aid the battalion's ability to be available. Commanders and staffs continuously question whether their assumptions are valid throughout planning and the operations process. Key points concerning the use of assumptions include—

- List and understand all assumptions received from higher headquarters.
- State expected conditions over which the commander has no control but are relevant to the plan.
- Assumptions must be logical, realistic, and considered likely to be true.
- Assumptions are necessary for continued planning.
- Too many assumptions result in a higher probability that the plan or proposed solution may be invalid.
- Using assumptions requires staffs to develop branches to execute if one or more key assumptions prove false.
- Often, an unstated assumption may prove more dangerous than a stated assumption proven wrong.

2-67. Commanders and staffs continually try to replace assumptions with facts. Throughout the MDMP, The commander and staff should list and review key assumptions on which fundamental judgements rest. Rechecking assumptions is valuable at any time during the operations process prior to rendering judgements and making decisions.

Step 2.7. Begin Risk Management

2-68. Risk is the exposure of someone or something valued to danger, harm, or loss and is inherent in all operations. Because risk is part of all military operations, it cannot be avoided. Identifying, mitigating, and accepting risk is a function of command and a key consideration during planning.

2-69. Planners conducting a preliminary risk assessment must identify the obstacles or actions that may preclude mission accomplishment and then assess the impact of these impediments to the upcoming mission. Determining military risk is more an art than an exact science. Planners use historical data, intuitive analysis, and judgment. Based on judgment, military risk assessment is an integration of probability and consequence of an identified impediment.

2-70. Risk is characterized by both the probability and severity of a potential loss that may result from the presence of an adversary or a hazardous condition. The probability is generally categorized as—

- Very likely—occurs often, continuously experienced.

- Likely—occurs several times.
- Questionable—unlikely, but could occur at some time.
- Unlikely—can assume it will not occur.

2-71. Military risk (consequence) may be—

- High—unable to achieve critical objectives.
- Significant—achieve only the most critical objectives.
- Moderate—partially achieve all objectives.
- Low—fully achieve all objectives.

2-72. Planners and commanders must be able to explain risk to both military commanders and civilian leadership as necessary. Since military risk is often a matter of perspective and personal experience, commanders must be able to describe the sources of risk, how they characterized these risks, and how they evaluated the probability of accomplishing objectives.

2-73. *Risk management* is the process to identify, assess, and control risks and make decisions that balance risk cost with mission benefits (JP 3-0). During mission analysis, the commander and staff focus on identifying and assessing operational hazards. Developing specific control measures to mitigate those hazards occurs during COA development.

2-74. Risk management consists of the following steps:

- Identify hazards.
- Assess hazards.
- Develop controls.
- Implement controls.
- Supervise and evaluate.

Note. Planners are usually comfortable in identifying risk to force, but they need to focus on identifying risk to mission.

Step 2.8. Develop Initial Commander's Critical Information Requirements and Essential Elements of Friendly Information

2-75. Mission analysis, to include IPB, identifies gaps in information required for further planning and decision making. During mission analysis, the staff develops information requirements (IRs). Certain information requirements are of such importance to the commander that staffs nominate them to the commander to become a commander's critical information requirement (CCIR).

2-76. A *commander's critical information requirement* is an information requirement identified by the commander as being critical to facilitating timely decision making (JP 3-0). The two key elements of CCIR are friendly force information requirements (FFIRs) and PIRs. A CCIR is—

- Specified by a commander for a specific operation.
- Applicable only to the commander who specifies it.
- Situation dependent-directly linked to a current or future mission.
- Time-sensitive.

2-77. Commanders consider staff input when determining their CCIRs. Commanders continuously review CCIRs during the planning process and adjust them as situations change. The initial CCIRs developed during mission analysis normally focus on decisions a commander needs to make to focus planning. Once the commander selects a COA, the CCIRs shift to information the commander needs in order to make decisions during preparation and execution. Commanders designate CCIRs to inform the staff and subordinates of information they deem essential to making decisions. Typically, commanders identify ten or fewer CCIRs; minimizing the number of CCIRs assists in prioritizing the allocation of limited resources.

2-78. A *priority intelligence requirement* is an intelligence requirement that the commander and staff need to understand the threat and other aspects of the operational environment (JP 2-01). PIRs identify

information about the threat and other aspects of the operational environment that the commander considers most important. Lessons from recent operations show that intelligence about civil considerations may be as critical as intelligence about the enemy. The intelligence officer, in coordination with the staff, manages PIRs for the commander. PIR serve as the framework for the information collection plan.

2-79. A *friendly force information requirement* is information the commander and staff need to understand the status of friendly force and supporting capabilities (JP 3-0). FFIRs identify information about a mission; troops and support available; and time available for friendly forces that the commander considers most important. In coordination with the staff, the operations officer manages FFIRs for the commander.

2-80. An *essential element of friendly information* is a critical aspect of a friendly operation that, if known by a threat would subsequently compromise, lead to failure, or limit success of the operation and therefore should be protected from enemy detection (ADP 6-0). In addition to nominating CCIRs to the commander, the staff also identifies and nominates essential elements of friendly information (EEFIs). Although EEFIs are not CCIRs, they have the same priority as CCIRs and require approval by the commander. Like CCIRs, EEFIs change as an operation progresses.

Technique. CCIRs and EEFIs should always be current and relevant to the operation. To accomplish this, recommend different CCIRs and EEFIs for each phase of an operation. Alternatively, list all CCIRs and EEFIs, and designate when each is active or inactive, depending on the latest time information is of value (LTIOV).

2-81. Depending on the situation, the commander and selected staff members meet prior to the mission analysis brief to approve initial CCIRs and EEFIs. This is especially important if the commander intends to conduct IC early in the planning process. Early approval of initial CCIRs assists the staff in developing the initial IC plan. Early approval of EEFIs allows the staff to begin planning and implementing measures to protect friendly force information, such as military deception and operations security.

Note. Once in the execution phase, every CCIR must be tied to a decision and be focused enough for use in the decision support matrix (DSM) and template.

Step 2.9. Develop the Initial Information Collection Plan

2-82. *Information collection* is an activity that synchronizes and integrates the planning and employment of sensors and assets as well as the processing, exploitation, and dissemination systems in direct support of current and future operations (FM 3-55). The initial IC plan is crucial to beginning or adjusting the IC effort and sets in motion intelligence operations, surveillance, and reconnaissance. The plan may be part of a WARNORD, a FRAGORD, or an OPORD. Available information is incorporated into a complete IC plan (Annex L) to the OPORD (see the section on IC beginning in paragraph 2-312 for more details about the initial IC plan).

2-83. The intelligence staff creates the requirements management tools for the IC plan, but responsibility for a plan resides with the operations officer. This is because only a commander and an operations officer can task subordinates and allocate resources. The operations officer reviews the risk for each named area of interest (NAI) and the collection assets assigned to them. Committing assets to reconnaissance potentially constrains a COA by reducing capabilities that could be used later. The operations and intelligence staff must work closely to ensure they fully synchronize and integrate IC activities into the overall plan.

2-84. An operations officer considers several factors when developing an initial IC plan, including—

- Requirements for collection assets in subsequent missions.
- Time available to develop and refine the initial IC plan.
- Risk the commander is willing to accept if IC missions begin before the IC plan is fully integrated into the scheme of maneuver.
- Insertion and extraction methods for reconnaissance, security, surveillance, and intelligence operations assets.

- Contingencies for inclement weather to ensure coverage of key NAI or target areas of interest (TAIs).
- The communications plan for transmission of reports from assets to command posts (CPs).
- Inclusion of collection asset locations and movements into the fire support plan.
- Reconnaissance handover to higher or subordinate echelons.
- Sustainment support.
- Legal support requirements.

Step 2.10. Update Plan for the Use of Available Time

2-85. As more information becomes available, the commander and staff refine their initial planning timeline or plan to plan. They compare the time needed to complete tasks to the higher headquarters' timeline to ensure the mission can be accomplished in the allotted time.

2-86. The commander and COS, XO, or planning lead refine the staff's planning timeline. The refined timeline includes the—

- Subject, time, and location of briefings the commander requires.
- Times of collaborative planning sessions and the medium over which they will take place.
- Times, locations, and forms of rehearsals.

Step 2.11. Develop a Proposed Problem Statement

2-87. A problem statement is the description of the primary issue or issues that may impede commanders from achieving their desired end states. How the problem is formulated leads to particular solutions. Commanders must take the time to identify the right problem and describe it clearly in a problem statement. Ideally, the commander and staff meet to share their analysis of the situation. They talk with each other, synthesize the results of the current mission analysis, and determine the problem. If the commander is unavailable, staff members talk among themselves and develop a draft problem statement for the commander to approve later.

Note. If the staff conducted ADM, they already may have developed a problem statement. In that case, they can conduct a quick review to determine if the statement needs revising based on the increased understanding of the situation. If ADM activities did not precede mission analysis, then the commander and staff need to develop a problem statement prior to moving to Step 3, COA development.

2-88. As part of the discussion to help identify and understand the problem, the staff compares the current situation to the desired end state. They then brainstorm and list issues that impede the commander from achieving the desired end state. Based on their analysis, the staff prepare a proposed problem statement for the commander's approval.

Step 2.12. Develop a Proposed Mission Statement

2-89. A *mission statement* is a short sentence or paragraph that describes the organization's essential task(s), purpose, and action containing the elements of who, what, when, where, and why (JP 5-0). The COS, XO, operations officer, or planning lead prepares a proposed mission statement for the unit based on mission analysis. The commander receives and approves the unit's mission statement normally during the mission analysis brief or commanders sometimes provide their own statement. The five elements of a mission statement answer these questions:

- Who will execute the operation (unit or organization)?
- What is the unit's essential task?
- When will the operation begin?
- Where will the operation occur?
- Why will the force conduct the operations (for what purpose)?

Example 1. Not later than 22 0400 Aug 09 (when), 1st Brigade (who) secures (what or task) ROUTE SOUTH DAKOTA (where) to enable the movement of humanitarian assistance materials (why/purpose).

Example 2. 1-505th Parachute Infantry Regiment (who) seizes (what or task) JACKSON INTERNATIONAL AIRPORT (where) not later than D-day, H+3 (when) to allow follow-on forces to air-land into AO SPARTAN (why or purpose).

2-90. The **who, where, and when** of a mission statement are straightforward. The what and why are more challenging to write and can confuse subordinates if not stated clearly. The why provides the mission's purpose-the reason the unit is to perform the task-and thereby puts the task into context (see table I-6 on page 311 for a list of common purposes).

2-91. The **what** is a task and is expressed in terms of action verbs. Commanders should use tactical mission tasks, tactical enabling tasks, or other doctrinally approved tasks contained in doctrinal publications in the mission statements. These tasks have specific military definitions that differ from standard dictionary definitions (see table I-5 on page 307 for a list of tactical tasks).

Step 2.13. Present the Mission Analysis Briefing

2-92. A mission analysis briefing informs the commander of the results of the staff's situational analysis. It helps the commander understand, visualize, and describe the operation. Throughout the mission analysis briefing, the commander, staff, and other partners discuss the various facts and assumptions about the situation. Staff officers present a summary of their running estimates from their specific functional area and how their findings impact or are impacted by other areas. This helps the commander and staff as a whole focus on the relationships among mission variables and develop a deeper understanding of the situation. The commander issues guidance to the staff for continued planning based on situational understanding gained from the mission analysis briefing.

2-93. Ideally, the commander holds several informal meetings with key staff members before the mission analysis briefing, including meetings to assist the commander in developing CCIRs and the mission statement. These meetings enable commanders to issue guidance for activities (such as information collection, targeting, and protection) and develop their initial commander's intent and planning guidance.

2-94. A comprehensive mission analysis briefing helps the commander, staff, subordinates, and other partners develop a shared understanding of the requirements for the upcoming operation. Time permitting, the staff briefs the commander on their mission analysis using the following outline:

- Introduction.
- Agenda.
- Higher headquarter's two levels up mission and commander's intent.
- Higher headquarter's mission, commander's intent, and concept of operations.
- Commander's initial guidance review.
- Initial IPB products, including civil considerations that impact the conduct of operations.
- Specified, implied, and essential tasks.
- Pertinent facts and assumptions.
- Constraints.
- Forces available and resource shortfalls.
- Proposed problem statement for approval.
- Proposed mission statement for approval.
- Proposed commander's intent for approval or commander's intent issuance.
- Proposed CCIRs and EEFIs for planning and approval.
- Initial IC plan for approval.
- Initial risk to mission assessment.

- Proposed COA evaluation criteria for approval.
- Commander's planning guidance issuance.
- Timeline review.

2-95. During the mission analysis briefing or shortly thereafter, commanders approve the CCIRs, EEFIs, IC plan, problem statement, mission statement, and COA evaluation criteria. They then develop and issue their initial commander's intent and planning guidance.

Techniques. To enable an earlier understanding of the enemy, the staff can brief IPB separately from the mission analysis brief. This technique allows commanders and staffs to achieve greater understanding of an enemy before assessing themselves. Both briefs then require less time as well, which allows for greater focus and understanding than one time-consuming brief.

Present information in a way that is best suited to improve a commander's understanding (commanders process information differently). For example, tasks, facts, assumptions, and constraints can be briefed using two different methods:

Method 1. Each warfighting function briefs their tasks, facts, assumptions, and constraints.
Method 2. The staff briefs a consolidated (specified, implied, and essential) task list from all warfighting functions and the XO or S3 highlights the most important tasks for a commander. Continue the consolidated list briefings for facts, assumptions, and constraints.

Note. A mission analysis brief is a discussion between the staff and the commander. Commanders should ask questions to gain understanding or provide their personal thoughts that clarify or refine briefing products. The staff should encourage these questions and insights because they lead to greater understanding. A commander and staff should leave the brief with the same visualization of the problem at hand and what direction the commander wants to take in solving the problem.

Step 2.14. Develop and Issue Initial Commander's Intent

2-96. *Commander's intent* is a clear and concise expression of the purpose of the operation and the desired military end state that supports mission command, provides focus to the staff, and helps subordinate and supporting commanders act to achieve the commander's desired results without further orders, even when the operation does not unfold as planned (JP 3-0). It includes initial key tasks. In addition to the expanded purpose of the operation and the desired end state, it includes initial key tasks.

2-97. The higher commander's intent provides the basis for unity of effort throughout the force. Each commander's intent nests within the higher commander's intent. The commander's intent explains the broader purpose of the operation beyond that of the mission statement. This explanation allows subordinate commanders and Soldiers to gain insight into what is expected, what constraints apply, and most importantly, why the mission is being conducted.

2-98. Based on their situational understanding, commanders summarize their visualization in their initial commander's intent statement. The initial commander's intent links the operation's purpose with conditions that define the desired end state. Commanders may change their intent statement as planning progresses and more information becomes available. A commander's intent must be easy to remember and clearly understood by leaders two echelons lower in the chain of command. The more concise a commander's intent, the better it serves these purposes. Typically, a commander's intent statement is three to five sentences long and contains a purpose, key tasks, and end state and is briefed at the end of a mission analysis brief.

Note. At the brigade and below level, commanders write their own intent and usually provide it to the staff after the mission analysis brief. In some cases, a commander, especially at higher echelons where planners conduct multiple planning efforts simultaneously, needs the staff to develop and present a draft commander's intent for commander approval or edit. If so, the draft intent is included in the mission analysis brief.

Step 2.15. Develop and Issue Planning Guidance

2-99. Commanders provide planning guidance along with their initial commander's intent. Planning guidance conveys the essence of the commander's visualization. *Commander's visualization* is the mental process of developing situational understanding, determining desired end state, and envisioning an operational approach by which the force will achieve that end state (ADP 5-0). This guidance may be broad or detailed, depending on the situation. The initial planning guidance outlines specific COAs the commander desires the staff to review as well as voids any COAs the commander will not accept. This clear guidance allows the staff to develop several COAs without wasting effort on things the commander will not consider and reflects how the commander sees the operation unfolding. It broadly describes when, where, and how the commander intends to employ combat power to accomplish the mission within the higher commander's intent.

2-100. Commanders use their experience and judgement to add depth and clarity to their planning guidance. They ensure staffs understand the broad outline of their visualization while allowing the latitude necessary to explore different options. This guidance provides the basis for a detailed concept of operations without dictating specifics of the final plan. As with their intent, commanders may modify planning guidance based on staffs' and subordinates' input and changing conditions. Commanders typically issue planning guidance at the end of a mission analysis brief.

2-101. Table 2-4 shows commander's planning guidance by warfighting function. This list is not all inclusive and does not meet the needs of all situations; also, other methods exist for organizing guidance in addition to warfighting functions. **Commanders tailor planning guidance to meet specific needs based on the situation rather than addressing each item.** Each item does not always fit neatly into a particular warfighting function, as it may be shared by more than one warfighting function. For example, although rules of engagement fall under the protection warfighting function, each warfighting function chief has a vested interest in gaining guidance on rules of engagement.

Technique. Use a commander's guidance worksheet (see figures I-3 and I-4 on page 316) to facilitate the planning process. This worksheet accomplishes several things. It helps commanders organize their thoughts and ensures they do not forget any key guidance. It allows the staff to anticipate what to expect from the commander before beginning the MDMP. Finally, a worksheet helps a commander issue guidance, which they can easily forget in a time-constrained environment.

Note. If a unit employs Soldiers in a reconnaissance or security role, the commander issues specific guidance to aid in their planning and execution. While this guidance is slightly different for reconnaissance and security operations, the overall topics to cover are the same. This guidance, at a minimum, covers: focus, tempo, and engagement and disengagement criteria (if needed), both lethal and nonlethal (see paragraph C-2 for additional information on reconnaissance and security guidance).

Table 2-4. Commander's planning guidance by warfighting function

Command and Control	• Commander's critical information requirements. • Rules of engagement. • CP positioning. • Commander's location. • Succession of command	• Liaison officer guidance. • Planning and operational guidance timeline. • Type of order and rehearsal. • Communications guidance. • Civil affairs operations. • Cyberspace electromagnetic considerations.
Intelligence	• Information collection guidance. • Information gaps. • Most likely and most dangerous enemy courses of action. • Priority intelligence requirements.	• Most critical terrain and weather factors. • Critical local environment and civil considerations • Intelligence requests for information. • Intelligence focus during phased operations.
Movement and Maneuver	• Commander's intent. • COA development guidance. • Number of courses of action to consider or not consider. • Critical events. • Task organization. • Task and purpose of subordinate units. • Forms of maneuver. • Reserve composition, mission, priorities, and control measures. • Passage of lines	• Reconnaissance and security. • Friendly decision points. • Branches and sequels. • Information collection. • Military deception. • Risk acceptance. • Collateral damage or civilian casualties. • Any condition that affects achievement of end state. • Information operations. • Mobility/Countermobility
Fires	• Synchronization and focus of fires with maneuver. • Priority of fires. • High priority targets. • Special munitions. • Target acquisition zones. • Observer plan. • Air and missile defense positioning. • High-value targets.	• Task and purpose of fires. • Scheme of fires. • Suppression of enemy air defenses. • Fire support coordination measures. • Attack guidance. • Branches and sequels. • No strike list. • Restricted target list.
Protection	• Protection priorities. • Priorities for survivability assets. • Terrain and weather factors. • Intelligence focus and limitations for security. • Acceptable risk. • Protected targets and areas. • Anti-fratricide measures. • Personnel recovery.	• Vehicle and equipment safety or security constraints. • Environmental considerations. • Unexploded ordnance. • Operations security risk tolerance. • Rules of engagement. • Escalation of force and nonlethal weapons. • Counterintelligence.
Sustainment	• Sustainment priorities—manning, fueling, fixing, arming, moving the force, and sustaining Soldiers and systems. • Health system support. • Sustainment of detainee and resettlement operations.	• Construction and provision of facilities and installations. • Detainee movement. • Anticipated requirements of Classes III, IV, and V. • Controlled supply rates.

Step 2.16. Develop Course of Action Evaluation Criteria

2-102. If staffs are developing more than one COA, they need to develop evaluation criteria. Evaluation criteria are standards commanders and staffs later use to measure the relative effectiveness and efficiency of one COA relative to another. Developing these criteria during mission analysis or as part of a commander's planning guidance helps to eliminate a source of bias prior to COA analysis and comparison. Evaluation criteria address factors that affect success and those that can cause failure. Criteria change from mission to mission and must be clearly defined and understood by all staff members before starting analysis to test the proposed COAs. Normally, the COS, XO, or planning team lead initially determines each proposed criterion with weights (if needed) based on the assessment of its relative importance and the commander's guidance. Commanders adjust criterion selection and weighting according to their own experience and vision. Staffs present the proposed evaluation criteria to a commander for approval at the mission analysis brief.

2-103. Well-defined evaluation criteria have five elements:

- Short title—the criterion name.
- Definition—a clear description of the feature being evaluated.
- Unit of measure—a standard element used to quantify the criterion. Examples of units of measure are U.S. dollars, miles per gallon, and feet.
- Benchmark—a value that defines the desired state for a solution in terms of a particular criterion.
- Formula—an expression of how changes in the value of the criterion affect the desirability of the possible solution. Planners state the formula in comparative terms (for example, less is better) or absolute terms (for example, a night movement is better than a day movement).

2-104. Evaluation criteria must be measurable and easily and clearly defined. For example—

- Good evaluation criterion: mass-the number of tanks attacking at the decisive point.
- Bad evaluation criterion: mass-number of platoons (this criterion leaves unanswered when and where regarding the platoons and whether non-maneuver platoons count).

Table 2-5 shows example evaluation criteria.

Table 2-5. Example evaluation criteria

Short Title	*Definition*	*Unit of Measure*	*Benchmark*	*Formula*
Casualties	Casualties taken during the entire operation	# of Casualties	136 Casualties	< 136 is an advantage, > 136 is a disadvantage, less is better
Tempo	How long will it take for enemy forces to reach PL RED	Hours	3 hours	< 3 hours is a disadvantage, > 3 hours is an advantage, longer is better
Complexity	# of task organization changes required	# of task organization changes	7 task organization changes	< 7 is an advantage, > 7 is a disadvantage, less is better

2-105. Benchmarks, prescribed by regulations or by guidance from the decision maker, are critical standards for meaningful analysis. Decision makers judge a solution against a standard, thereby determining whether that solution is good in an objective sense. This process differs from comparison, where decision makers judge possible solutions against each other, determining whether a solution is better or worse in a relative sense. Sometimes, a decision maker can infer a benchmark by the tangible return expected from a problem's solution. Often, however, leaders establish benchmarks themselves. Four common methods for establishing benchmarks are—

- Reasoning-based on personal experience and judgement regarding what is good.
- Historical precedent-based on relevant examples of prior success.

- Current example-based on an existing condition that is considered desirable.
- Averaging-based on the mathematical average of the solutions being considered. Averaging is the least preferred of all methods because it essentially duplicates the process of comparison.

2-106. In practice, the criteria by which choices are made are almost never of equal importance. Because of this, assigning weights to each evaluation criterion is often useful. Weighting criteria establishes the relative importance of each one with respect to the others. Weighting should reflect the judgement of the decision maker or acknowledged experts as closely as possible. For example, a decision maker or expert might judge that two criteria are equal in importance, or that one criterion is slightly favored in importance, or is moderately or strongly favored. If decision makers assign numerical values to these verbal assessments, they can use mathematical techniques to produce meaningful weighted criteria.

Note. The problem statement is a good place to start to develop evaluation criteria. Other places to look for ideas are any of the various lists—for example, principles of war, characteristics of the offense, characteristics of the defense, principles of joint operations, and elements of operational art. Evaluation criteria that show no difference do not help the decision maker. Good evaluation criteria clearly identify costs and benefits between each COA—which is key—thereby helping a commander weigh various COAs.

Step 2.17. Issue WARNORD #2

2-107. Following a mission analysis brief and after a commander provides planning guidance, staffs send subordinate and supporting units a WARNORD. A WARNORD contains, at a minimum—

- Paragraph 1
  - Key findings and results of IPB.
- Paragraph 2
  - An approved mission statement.
- Paragraph 3
  - Commander's intent.
  - Specific priorities or tasks.
  - Updated timeline.
  - Required movements.
  - Risk guidance.
  - Military deception guidance, if needed.
- Paragraph 4
  - TBD.
- Paragraph 5
  - CCIRs and EEFIs.
- Annex A
  - Changes to task organization.
- Annex B
  - IPB results.
- Annex C
  - Unit AO (sketch, overlay, or some other description).
- Annex L (Information collection).

Note. This WARNORD is traditionally known as WARNORD #2. It does not have to be the second WARNORD published, but Soldiers might use the term.

Do not wait until after the brief to put together this WARNORD. To save time, a staff member must be assigned to compile it. Publish as soon as possible after the mission analysis brief.

For Soldiers conducting reconnaissance and security operations, this WARNORD serves as their OPORD. They will begin conducting operations soon after WARNORD #2 is issued and well before the remainder of the unit.

STEP 3. COA DEVELOPMENT

2-108. A COA is a broad potential solution to an identified problem. The staff, with guidance from the commander, develops valid COA(s) to provide visual representation of the COA(s), synchronize the warfighting functions, and meet the commander's guidance. Valid COAs are COAs that meet the screening criteria-feasible, acceptable, suitable, distinguishable, and complete. The COA begins conceptually, but by the end of COA development, the COA starts to develop details necessary for subordinates to take action. Figure 2-4 depicts the purpose, inputs, processes, and outputs of COA development.

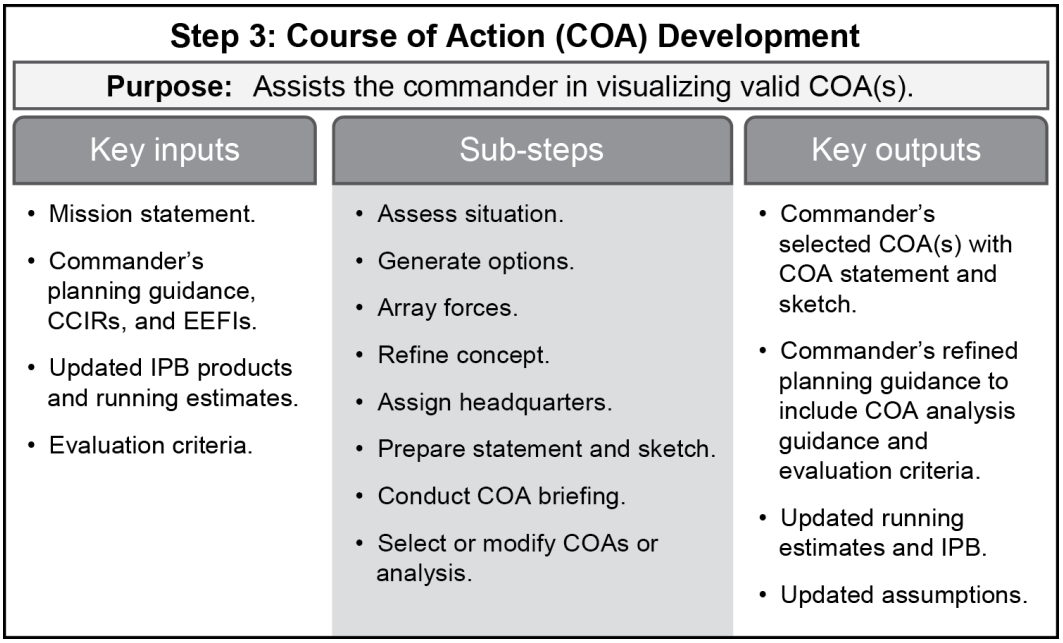


Figure 2-4. The MDMP Step 3. COA development overview

2-109. In COA development, commanders and staffs must appreciate the unpredictable, uncertain, and ambiguous nature of an operational environment. Staffs tend to focus on particular COAs for specific sets of circumstances, but flexible COAs that provide the greatest options for a wide range of circumstances are best.

2-110. Commanders and staffs should focus on known variables, which often provide sufficient guidance, to analyze COAs that provide flexible options to a commander during execution. Clearly identifying which variables a unit can control, which are outside of its control, and the implications of each is important. Even with few facts available, reducing key issues to either an ability to do "X" or an inability to do "X" is a starting point. Such a reduction is preferred over trying to derive a wide range of possibilities. Additionally, seeing facts as generating flexibility rather than constraining flexibility is more productive. Staffs work to confirm or deny assumptions before developing options. Staffs must also determine risks associated with

various COAs. A commander's direct involvement in COA development greatly aids in producing comprehensive and flexible COAs within the time available.

Technique. For problems that are unfamiliar or ambiguous, ADM assists commanders and staff to better understand the nature of the problem and affords them a level of comfort necessary to effectively advance through COA development. Commanders and staffs that are comfortable with ambiguity will often find the ADM provides flexibility in developing COAs that contain multiple options for dealing with changing circumstances.

2-111. As an example, a commander may know with reasonable certainty that an enemy force is positioned on the outskirts of a town. The commander may not be certain of the exact size of the enemy force, all the resources available to the enemy force, or actions the enemy may take over time. Such unknowns are a reality in an ambiguous operational environment. However, by focusing on the known information, such as the position of the enemy at a point in time, staffs can develop COAs that provide maximum flexibility for the commander. Known information can also apply to friendly actions, such as an established time for crossing a line of departure or transition to a subsequent phase of an operation. As additional information on the enemy, as well as friendly forces, becomes available, COAs should allow for variances in timelines and resources. Staffs identify risks associated with both friendly and enemy actions; who is accepting the risks; and what resources to allocate against risks.

2-112. To provide a commander with additional time before making a decision, COA development should also identify DPs, the authority responsible for making the decision, and what measures to take. Capture this information in a decision support template (DST) and DSM (see table 2-16 on page 49 for an example). Good COAs provide commanders with options based on anticipated and unanticipated changes in the situation. Staffs should highlight options that may be critical to mission success, identify when options may no longer be viable, and work to keep options open as long as possible. In all cases, staffs provide commanders with options that are flexible, while clearly identifying risks associated with each option. Staffs also assess how each option may affect the options of commanders at higher echelons.

2-113. The unpredictable and uncertain nature of an operational environment should not result in paralysis or hesitancy in military operations. By focusing COA development around known information, staffs can develop COAs that provide maximum flexibility and are viable options in the execution of military operations.

2-114. A COA does not substitute for an OPORD, which provides the necessary details to conduct operations. In a worst-case scenario, a COA is something that subordinate units could use to execute the mission. Table 2-6 on page 38 details the steps and substeps of COA development. A common pneumonic to remember these steps is "AGARAP."

Table 2-6. Steps and substeps of COA development

	Steps of COA development	***Substeps of COA development***					
Apply screening criteria	Step 3.1 Assess situation	Begin sketch	Add higher graphics	Draw terrain	Add threat COA	Add current friendly situation	Evaluate combat power and effectiveness
	Step 3.2 Generate options	Determine focus (enemy or terrain)	Determine purpose, then tasks, of the decisive operation	Determine the shaping purpose, then tasks, of shaping operations	Determine sustainment feasibility	Determine form of maneuver to connect the COA together	Add graphic control measures as required
	Step 3.3 Array forces	Refine combat power analysis for each action	Allocate combat power at the decisive operation	Work backwards and assign forces to other efforts	Refine sequence, phase, ME/SE as required	Determine sustainment actions to support COA	Add graphic control measures as required
	Step 3.4 Refine concept	Determine intelligence actions to support COA	Determine fire actions to support COA	Determine protection actions to support COA	Determine command and control actions to support COA	Add graphic control measures as required	Identify potential decision points
	Step 3.5 Assign headquarters	Assign headquarters	Add final graphic control measures				
	Step 3.6 Prepare sketch and create statement	Make sketch presentable	Create statement				
	Step 3.7 Conduct brief and select COA						

Step 3.1. Assess the Situation

2-115. Several variables can stand between a unit and mission accomplishment, such as enemy forces, restrictive terrain, or unit limitations. The best way for visualizing the interaction of these variables is to create a sketch. A sketch may be on any medium, and what it portrays is more important than its form. The sketch can be on a white board, command post of the future (CPOF), PowerPoint slide, overlay on a map, chalk on the side of a vehicle, or any combination. For example, project a PowerPoint slide on a wall to show the terrain and lay acetate on the projection. Planners can then sketch the COA on the acetate which can be quickly copied and distributed to subordinates. Table 2-7 shows substeps for assessing a situation.

Table 2-7. Substeps of Step 3.1, Assess the situation

Substeps of assess the situation						
Step 3.1 Assess the situation	Begin sketch	Add higher graphics	Draw terrain	Add threat COA	Add current friendly situation	Evaluate combat power or effectiveness

Technique. Use the same format for the COA brief and COA sketch. This saves time because reproducing it in a different format is not required. Ideally, this format is easy to send out to subordinates once COA analysis is complete. Another technique uses the terrain on and off feature of CPOF to provide clarity. If done properly, the graphic control measures are then prepared for immediate digital distribution.

Note. Always choose a format that is easy to change. As planners develop and sketch ideas, task organizations and effects constantly change. The inability to completely erase or remove elements hinders a planner's ability to clearly and accurately present their concept.

2-116. With a medium chosen, staffs first determine what area the sketch is to cover (for example, AO, area of influence (AI), or area of interest (AOI)). This decision determines the boundaries of the sketch. A method for determining how much terrain to cover with the sketch is to define where action is taking place. Include actions outside the AO that affect the COA in the sketch. Some outside actions will not be identified until after beginning; therefore, make a best guess. At a minimum, include unit boundaries.

Note. The key to a good sketch is to have enough room to clearly and accurately show what actions a unit will conduct in their assigned AO. If the scale is too large, clarity is lost.

2-117. The next substep in assessing the situation is to draw terrain. The sketch should show enough physical terrain to show the reader where activity is taking place. Consider including a rough scale so the reader can make time and distance inferences from the sketch. Use caution if the background is a map, because the sketch can look cluttered quickly. Ensure terrain with identifying features such as non-fordable rivers, valleys, natural choke points, restricted terrain, major roads, urban centers, or bridges are highlighted.

2-118. Next, add other key higher graphics to the sketch. This includes, but is not limited to, phase lines, objectives, support areas, the fire support coordination line (FSCL), and the coordinated fire line (CFL).

Technique. If possible, add key graphics of adjacent units as this will likely show how your unit's operation relates to other units' operations and where deconfliction may be required.

2-119. The next substep in assessing the situation is adding to the sketch the threat COA being planned against. The threat must be represented two levels lower than the unit. For example, for a brigade, the threat is represented down to the company level. Depicting specific equipment or capabilities—such as radars or air defense artillery (ADA), which often become HVTs—might be required. If the threat is moving, the sketch should indicate the direction of travel. Include any known or suspected obstacles and any neutral organization or populations that could influence planning. COA teams receive this information as output from the IPB process.

2-120. The next substep in assessing the situation is to identify the current friendly situation. This helps in understanding the starting point for the operation and shows the challenges the unit faces in accomplishing the mission. Friendly forces should be shown using task organization graphics (see table 2-8 on page 40).

Table 2-8. Task organization symbols

Function	*Symbol*	*Function*	*Symbol*
Air assault infantry		Attack helicopter	
Airborne infantry		Combined arms	
Air defense		Engineer	
Air reconnaissance (cavalry)		Field artillery	
Antitank		Infantry	
Armored reconnaissance (cavalry) ***Note***. This reconnaissance (cavalry) unit is both armored and tracked.		Mechanized infantry ***Note.*** This infantry unit is both armored and tracked.	
Armor		Medium infantry (Stryker)	
Assault or lift helicopter		Mountain infantry	
		Reconnaissance (cavalry or scout)	

Technique: Because a combined arms battalion can be either infantry heavy or armor heavy, a means to differentiate between them is needed. To indicate which type of CAB it is, write the type of unit above the symbol (see table 2-9).

Table 2-9. Example type unit and symbol combination

Unit	*Symbol*
Armor “heavy” combined arms battalion	AR 
Infantry “heavy” combined arms battalion	IN 

2-121. Lastly, with the initial sketch developed, the staff can conduct an initial evaluation of relative combat power. *Combat power* is the total means of destructive, constructive, and information capabilities that a military unit or formation can apply at a given time (ADP 3-0). It combines the elements of intelligence, movement and maneuver, fires, sustainment, protection, command and control, information, and leadership. The goal is to generate overwhelming combat power to accomplish the mission at minimal cost.

2-122. To assess relative combat power, planners estimate maneuver unit force ratios two levels below their echelon. Planners then compare friendly strengths against enemy weaknesses and vice versa for each element of combat power. From these comparisons, planners may deduce particular vulnerabilities for each force that might be exploited or need protection. These comparisons provide planners with insight into employing forces effectively.

2-123. Assessing relative combat power is difficult; it requires applying both military art and science. Relative combat power analysis evaluates tangible factors (such as equipment, weapon systems, and units) and intangible factors (such as morale and training levels). It also considers the factors of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC) that directly or indirectly affect the potential outcome of operations. Although relative combat power analysis uses some numerical relationships, assessing relative combat power is not only a mathematical correlation

of forces and means; it is an estimate that incorporates both objective and subjective factors. Comparing the significant strengths and weaknesses of each force in terms of combat power gives planners insight into—

- Friendly capabilities that pertain to the operation.
- Types of operations possible from both friendly and enemy perspectives.
- How and where the enemy may be vulnerable.
- How and where friendly forces are vulnerable.
- Additional resources needed to execute the mission.
- How to allocate existing resources.

Technique. A relative combat power assessment identifies exploitable enemy weaknesses, identifies unprotected friendly weaknesses, and determines the combat power necessary to conduct decisive action tasks. This assessment provides insight into options available and identifies resource shortfalls. In such operations, the elements of maneuver, fires, leadership, and information may dominate. Figure 2-5 shows an initial way of comparing combat power using the elements of combat power.

Elements of combat power		*Friendly*	*Enemy*	*Advantage*		*So what?*
				Friendly	*Threat*	
Intelligence	Strength:					
	Weakness:					
Movement and maneuver	Strength:					
	Weakness:					
Fires	Strength:					
	Weakness:					
Protection	Strength:					
	Weakness:					
Sustainment	Strength:					
	Weakness:					
Command and Control	Strength:					
	Weakness:					
Leadership	Strength:					
	Weakness:					
Information	Strength:					
	Weakness:					

EXAMPLE

Figure 2-5. Example relative combat power assessment

Step 3.2. Generate Options

2-124. Based on the commander's initial guidance and initial results of the relative combat power assessment, the staff generates options. The commander, COS, XO, or planning lead can direct the number and types of COAs to develop. If time is constrained, the commander's guidance may limit the number of options or direct options to the planners. In an unconstrained environment, planners strive to develop several possible COAs. For the remainder of the discussion of this step, assume the commander asked for the development of multiple COAs (see table 2-10 on page 42 for substeps to Step 3.2, generate options).

Table 2-10. Substeps of Step 3.2., Generate options

Substeps of generate options						
Step 3.2, Generate options	Determine focus (enemy or terrain)	Determine purpose, then tasks, of the decisive operation	Determine the shaping purpose, then tasks, of shaping operations	Determine sustainment feasibility	Determine form of maneuver to connect the COA together	Add graphic control measures as required

Technique. If vague guidance is given, a way to quickly generate options is to make a list of all the offensive or defensive tasks, forms of maneuver, and forms of defense. Then based on terrain, enemy forces, and friendly forces available, determine which tasks can be accomplished. This can be the starting point for creating different COAs.

Note. When developing more than one COA, the staff has two organizational options. With the first option, the staff forms separate teams and each team works on a different COA. Multiple COAs are produced more quickly with this option. The disadvantage is that each COA team has various levels of expertise and experience and members of each COA team are unaware of what the other teams are doing.

Alternatively, the entire staff can work together on each COA. With this option, subject matter experts and staff that are aware of every COA are available to develop the COAs. However, this can be a much more time-consuming process.

2-125. A good COA positions the force for sequels and provides flexibility in meeting unanticipated events during execution. It also provides subordinates maximum latitude for disciplined initiative. Each option follows the same procedures for developing into a COA.

2-126. The commander's intent helps determine whether the force is terrain or enemy focused. The focus helps determine which is more important, but does not exclude the other. For example, if the enemy element located on the objective suddenly moves away, an enemy focused force would follow the enemy, whereas, a terrain-focused force would take action on the objective area.

2-127. Focusing on the terrain or enemy helps clarify the decisive operation (DO). The *decisive operation* is the operation that directly accomplishes the mission (ADP 3-0). This task and purpose is usually the mission statement for a unit. Once the DO is identified, the staff ensures the purpose of the DO matches the purpose of its higher headquarters and the appropriate planning graphic is placed on the sketch. The DO may have more than one unit with the same mission and purpose; **it is the operation that is decisive, not the unit.**

2-128. With the DO identified, planners now determine shaping operations (SO). A *shaping operation* is an operation at any echelon that creates and preserves conditions for success of the decisive operation through effects on the enemy, other actors, and the terrain (ADP 3-0). Shaping operations occur before, during, and even after the DO and usually set the conditions for DO success. Shaping operations set conditions for DO success, and once the DO is complete, shaping operations set conditions for the next phase or operation. List the purpose of each SO against an enemy, piece of terrain, or other actor. With the purposes listed out, identify the appropriate task and place the appropriate planning graphic for that task on the sketch.

Technique. A way to abbreviate decisive operation and shaping operation is DO and SO, respectively. To quickly designate a unit as the decisive operation, planners can write it next to the unit name (for example: 4-23 IN (DO)) in both the concept of operations and tasks to subordinate unit section of the COA statement and eventually the OPORD. Planners can do the same for shaping operations. Multiple shaping operations can be differentiated by their priority. For example, the second priority shaping operation is listed as SO2.

2-129. After attributing tasks and purposes, the COA team sequences separate effects together to ensure the DO is successful. To help with this, the COA team picks a form of maneuver (if one was not directed in the planning guidance) and determines if a requirement exists to phase the operation. A *phase* is a planning and execution tool used to divide an operation in duration or activity (ADP 3-0). A phase typically only occurs when there is a change in mission, task organization, priority of support, or rules of engagement. Evaluating the conditions required for a successful DO and planning backwards ensures the right conditions are in place for the DO.

2-130. Offensive tasks, defensive tasks, forms of maneuver, and forms of defense provide linkage on what order various actions should be processed for the DO to be successful. This knowledge enables the refining and placing of additional graphic control measures on the sketch. Placing graphic control measures can be done as soon as a need is identified. For example, an objective is immediately placed on the sketch to help orient the force once the DO's task and purpose is identified. Chapter 8 of ADP 1-02 includes additional information on control measures.

Step 3.3. Array Forces

2-131. The next step is to array friendly forces. When arraying forces, planners first create a pool of all available units two levels below their echelon. Planners also may want to include key equipment or capabilities (for example ADA systems or bridging assets) in the pool. Planners array friendly forces for two reasons. First, this allows planners to see exactly how much combat power is available. Second, it helps planners remember to use all available units and capabilities in COA development. Table 2-11 shows substeps for array forces.

Table 2-11. Substeps of Step 3.3, Array forces

	Substeps of array forces					
Step 3.3, Array forces	Refine combat power analysis for each action	Allocate combat power at the decisive operation	Work backwards and assign forces to other efforts	Refine sequence, phase, ME, and SE as required	Determine sustainment actions to support COA	Add graphic control measures as required

Technique. When placing forces in the availability pool, use an icon that has to be physically moved, such as a Post-It note. This technique is preferable to drawing icons in the pool, erasing them, and then placing them on a sketch. The first array of forces is never the final array, and corrections will need to be made on the sketch. Using an icon prevents erasing on the sketch multiple times. Once the array of forces is set, a planner can neatly transfer the final set to the sketch. Showing forces as an icon also ensures all units are used, and none are forgotten, because accidental erasure, or forgetting to add a unit to a sketch, can otherwise easily occur.

2-132. With friendly forces identified, planners assign combat power against the DO. This is accomplished by taking the most appropriate movement and maneuver forces out of the pool and placing them on the sketch near the task and the threat forces they will engage. Once the forces required to accomplish a DO are assigned, perform the same process with each shaping effort in order of priority. Once complete, planners use excess forces in the pool to either improve the combat ratios of the DO and the various SOs or establish a reserve.

Note. COA development focuses mainly on the movement and maneuver warfighting function with the other war fighting functions supporting.

2-133. Calculate a correlation of forces and means (COFM) at each location where friendly forces affect the threat. Base COFMs on minimum historical planning ratios. For example, defenders have over a 51% probability of defeating an attacking force approximately three times their equivalent strength. Therefore, as a starting point, commanders should defend with at least a 1:3 force ratio (see table 2-12 for historical minimum planning ratios).

Table 2-12. Historical minimum planning ratios

FM 6-0, FM 3-90-1

Friendly Mission	*Friendly : Enemy*
Hasty defend	1 : 2.5
Deliberate defend	1 : 3
Hasty attack	2.5 : 1
Deliberate attack	3 : 1
Delay	1 : 6
Counterattack	1 : 1
Penetration (lead element)	18 : 1

2-134. Combat power comparisons are subjective at best. Arraying forces is complex, inexact work affected by factors that are difficult to gauge, such as—

- Impact of past engagements.
- Quality of leaders.
- Morale.
- Maintenance of equipment.
- Time in position.

2-135. Planners determine whether these factors, along with other lethal and non-lethal effects, increase the relative combat power of the unit assigned the task to the point that it exceeds the historical planning ratio for that task. If not, planners determine how to either increase friendly unit combat power or decrease enemy combat power.

2-136. If planners are still not able to reach historical planning ratios, the staff determine if the COA is feasible. To ensure feasibility, the staff needs to either request additional resources from higher echelons; determine if the commander is willing to accept risk in low priority SOs; or, if applicable, execute tasks sequentially rather than simultaneously. These options might create or modify phases or changes to the main and supporting effort(s).

2-137. Once all combat power has been allocated and arrayed in the AO, planners determine the sustaining operations required to ensure the operation is successful and still feasible. Upon completion, planners place any required graphic control measures on the sketch.

2-138. **Continually check screening criteria throughout COA development.** After confirming sustaining operations requirements, do a final check on whether the COA meets screening criteria. If not, change or eliminate the COA.

2-139. Leaders use screening criteria to ensure COAs considered can solve the problem. Screening criteria define the limits of an acceptable COA. They are tools to establish baseline products for analysis. Leaders may reject a COA based solely on the application of screening criteria. Leaders commonly ask five questions as screening criteria to test a possible COA:

- Is it **feasible?** Can it be accomplished within available resources?
- Is it **acceptable?** Is it worth the cost or risk?

- Is it **suitable?** Does it solve the problem and is it legal and ethical?
- Is it **distinguishable?** Does it differ significantly from other solutions?
- Is it **complete?** Does it contain the critical aspects of solving the problem from start to finish?

A useful pneumonic to remember these criteria is "FAS-DC".

Step 3.4. Refine the Concept

2-140. With the initial actions for a COA now feasible and complete, consider all warfighting functions to ensure unity of action required to achieve mission success. When developing a COA, the movement and maneuver warfighting function is typically the dominate aspect of the COA. The other warfighting functions support movement and maneuver to ensure feasibility. Part of this process is drawing graphic control measures on the sketch to enhance understanding of the COA. Be careful not to clutter the sketch to the point where clarity is reduced. Table 2-13 shows substeps for Step 3.4, refine the concept.

Table 2-13. Substeps for Step 3.4, Refine the concept

Substeps of refine the concept						
Step 3.4, refine the concept	Determine intelligence actions to support COA	Determine fire actions to support COA	Determine protection actions to support COA	Determine command and control actions to support COA	Add graphic control measures as required	Identify potential decision points

Note. Placing all relevant information on a sketch while ensuring the COA remains clear and understandable creates constant tension. A good method for resolving this is to place on a sketch only graphic control measures that will be referenced in the COA statement.

2-141. Once all warfighting functions have refined the COA, the staff can identify potential decisions and capture those on a DSM and DST (see paragraphs 2-148 through 2-155 for more detail on DST and DSM). The staff does not have to wait until this substep to capture decisions because decisions can be identified throughout the process. However, this substep provides an additional opportunity to conduct a quick review and ensure all decisions are identified and captured.

Step 3.5. Assign Headquarters

2-142. After refining a concept, planners create a task organization by assigning headquarters to groupings of forces. They consider the types of units to be assigned to a headquarters and the ability of that headquarters to control those units. Generally, a headquarters controls two to five subordinate maneuver units for large-scale combat operations (LSCO). If planners need additional headquarters, create a task force headquarters and create options for the commander to approve on how to fill that command and control element. Task organization takes into account an entire operational organization. It also accounts for special command requirements for operations, such as a passage of lines or an air assault. Ensure all available headquarters are accounted for in this substep. Table 2-14 shows substeps for Step 3.5, Assign headquarters.

Table 2-14. Substeps of Step 3.5, Assign headquarters

Substeps of assign headquarters		
Step 3.5, Assign headquarters	Assign headquarters	Add final graphic control measures

2-143. Add final graphic control measures (usually boundaries) once headquarters are assigned. Ensure all required graphic control measures are on the sketch as a final check.

Step 3.6. Prepare Statement and Sketch

2-144. The staff prepares the sketches for presentation along with a COA statement for each COA. A COA statement clearly portrays how the organization will accomplish the mission and briefly expresses how the organization will conduct the combined arms concept. The sketch provides a picture of the movement and maneuver aspects of the concept, including the positioning of forces. Together, the statement and sketch cover the who (generic task organization), what (tasks), when, where, and why (purpose) for each subordinate unit. Link all elements together in a coherent narrative, showing the relationship between actions. Conciseness is a goal for both products, but each must be clear and accurately convey the concept developed. Table 2-15 shows the substeps for Step 3.6, Prepare sketch and create statement.

Table 2-15. Substeps of Step 3.6, Prepare sketch and create statement

Substeps of prepare sketch and create statement		
Step 3.6, Prepare sketch and create statement	Make sketch presentable	Create statement

2-145. A finalized COA sketch includes the array of generic forces and control measures, such as—

- The unit and subordinate unit boundaries.
- Known or suspected enemy locations.
- Population concentrations.
- The line of departure or line of contact and phase lines, if used.
- Ground and air axes of advance.
- Assembly areas, battle positions, strong points, EAs, and objectives.
- Obstacle control measures and tactical mission graphics.
- Fire support coordination and airspace coordinating measures.
- Main effort.
- Location of CPs and critical communications nodes.

2-146. A finalized COA statement is typically formatted as follows:

- Mission.
- Commander's intent.
- Concept of operations.
  - Operational framework.
  - Phases and transitions.
  - Scheme of maneuver.
- Tasks to subordinate units.
- Information collection priorities.
- Concept of fires.
- Concept of protection.
- Concept of sustainment.
- Task and purpose of subordinate units, including the reserve.
- Concept of command and control.
- Operational risk with potential mitigation.

Step 3.7. Conduct Brief and Select a COA

2-147. After developing COAs, the staff briefs them to the commander. A collaborative session might facilitate subordinate planning. A COA briefing includes—

- Introduction.
- Agenda.
- Updated IPB, facts, assumptions (if there are significant changes).

- Staffs' responses to commander's requests for information.
- Quick review of—
  - Approved problem statement and mission statement.
  - Commander's and higher commander's intents.
  - Threat COA.
  - Deductions resulting from the relative combat power analysis.
- For each COA statement and sketch, brief the following—
  - Assumptions used.
  - Task organization.
  - Concept of operations briefed either chronologically or using the decisive-shaping-sustaining framework.
  - Scheme of maneuver.
  - Concept of intelligence.
  - Concept of fires.
  - Concept of protection.
  - Concept of sustainment.
  - Concept of command and control.
  - Risk.
- Refined COA evaluation criteria.
- Commander's comments, decisions, or guidance.

Decision Support Template and Matrix

2-148. This section is derived from ATP 6-0.5 and FM 6-0.

2-149. Several decision support tools assist the commander and staff during execution. Among the most important are the DST and DSM. Both the DST and DSM assist the commander and staff in determining execution decisions the commander must make. During planning, the staff develops a DST and DSM for each COA. Once the commander selects a COA, the selected DST and DSM are refined and then published. The commander and the current operations integrating cell use these tools to control operations and anticipate decisions.

2-150. A *decision point* is a point in space and time when the commander or staff anticipates making a key decision concerning a specific course of action (JP 5-0). The location of DPs depends on the availability and response time of friendly forces and the anticipated activity, capabilities, and movement rates of enemy and friendly forces. Execution decisions, normally tied to a DP, implement a planned action under circumstances anticipated in the order.

2-151. A *decision support template* is a combined intelligence and operations graphic based on the results of wargaming that depicts decision points, timelines associated with movement of forces and the flow of the operation, and other key items of information required to execute a specific friendly course of action. Also called DST (JP 2-01.3). A DST graphically represents DPs (by a star) and projected situations. It also indicates when, where, and under what conditions a decision is most likely required to initiate a specific activity or event. A DST may contain time phase lines, NAIs, targeted areas of interest (TAIs), and DPs.

2-152. A *decision support matrix* is a written record of a war-gamed course of action that describes decision points and associated actions at those decision points (ADP 5-0). A DSM lists DPs, locations of DPs, evaluation criteria at DPs, actions that occur at DPs, and units responsible for acting on the DPs. It also lists units responsible for observing and reporting information affecting the criteria for decisions (see table 2-16 on page 49 for an example of a DSM).

2-153. During COA development, planners note where the commander needs to make key decisions concerning the COA. A key decision is different from all the normal decisions that subordinates and staffs make as part of executing a plan. Key decisions are decisions that only a commander can make based on

risk, allocation of forces, or commander guidance. Examples of key decisions include, but are not limited to, the following:

- Commitment of the reserve.
- Task organization changes.
- Change of unit boundary.
- Transition between phases.
- Execution of a branch or sequel.
- Change of mission.
- Change of concept of operations.
- Transitions between forms of maneuver.
- Transitions between forms of decisive action.
- Commitment of limited capabilities.
- Execution of a high-risk operation.
- Commitment of irreplaceable resources.
- Any decision a commander directs in guidance.

2-154. Once a decision by a commander is determined to be necessary, planners develop criteria for the decision to take place. These criteria consist of both friendly and enemy conditions. To determine these criteria, staff members are assigned CCIR in order to gather relevant information; PIR to determine enemy conditions; and FFIR to determine friendly conditions required to make key decisions. Once a decision, and conditions required for the decision are determined, staffs decide an action to take with those conditions. Staffs develop one action per decision.

2-155. Commanders develop CCIRs for two reasons. CCIRs developed during mission analysis focus on information the commander needs to enable planning. Once the commander selects a COA, CCIRs are adjusted to collect information the commander needs to make decisions during the preparation and execution portion of the operation.

Technique: There might be a time delay between reaching a decision and executing the movement of friendly assets. This delay is represented on the DST by a diamond-shaped execution point with a decision number inside. The movement and maneuver and intelligence warfighting functions work together in identifying decision points that support the overall concept.

Sufficient time must be available between the decision point and its associated NAI or TAI to synchronize friendly actions before the adversary reaches the engagement area. Specifically, the distance between a decision point and its engagement area must allow for collecting, processing, and disseminating intelligence to the commander and moving friendly forces to engage the enemy.

Note. Planners can list all the decisions a commander must make during the operation in a single DSM and only show the ones that could potentially happen, or they could have a separate DSM for each phase. Table 2-16 shows an example DSM.

Table 2-16. Decision support matrix example

Decision support matrix for operation XXX, COA 2					
Decision Point (DP) #	Decision. What decision must be made?	Condition. The CCIR(s) that, when met, require the decision to be made. IF the enemy does . . . AND my forces are . . .	CCIR #. What CCIR(s) are linked to the DP?	NAI #. What NAI(s) are linked to the DP?	Action. The action is the response to the criteria once the decision has been made. THEN we . . .
1	Commit the reserve	If the enemy penetrates PL BLACK and 1st Battalion is at 60% combat power	2	201, 202, 203	Commit the reserve to 1st Battalion's AO
2	Transition to the defense	If greater than a reinforced CO of enemy forces on OBJ DALLAS	3	301, 302, 303	1st and 2nd Battalion go into a hasty defense until DIV Attack AVN sets conditions for the attack
3	Initiate the attack	If OBJ DALLAS is at less than a CO strength and CAV SQDN is prepared to screen along PL GREEN, 1st and 2nd battalion are in their AAs and FA BN is established in PAA #2	5	304, 205	1st and 2nd Battalion begin their attack

Step 3.8. Select or Modify Courses of Action for Continued Analysis

2-156. At the end of a COA briefing or after a short break, the commander selects or modifies COAs for continued analysis and issues COA analysis guidance. This guidance tells the staff what the commander wants them to focus on during COA analysis. If the commander rejects all COAs, the staff begins again. If the commander accepts one or more of the COAs, staff members begin COA analysis. The commander may create a new COA by incorporating elements of one or more COAs developed by the staff. The staff incorporates those modifications, resynchronizes the new COA, and ensures all staff members understand the changed COA. The staff then analyzes the new COA.

STEP 4. COA ANALYSIS

2-157. The staff, with guidance from the commander, analyzes COA(s) to synchronize combat power and resources, identify and mitigate risk, exploit opportunities, reduce friction, and ultimately develop and improve the COA. The staff also attempts to identify probable consequences for each COA, which helps them think through the tentative plan and add much needed details to a concept. COA analysis may require commanders and staffs to reevaluate parts of a COA as discrepancies arise. The analysis appraises the quality of each COA and uncovers potential execution problems, decisions, and contingencies, which ultimately improve each COA. Additionally, COA analysis influences how commanders and staffs understand a problem. Sometimes, their increased understanding requires a restart of the planning process. Figure 2-6 on page 50 depicts the purpose, inputs, processes, and outputs of COA analysis.

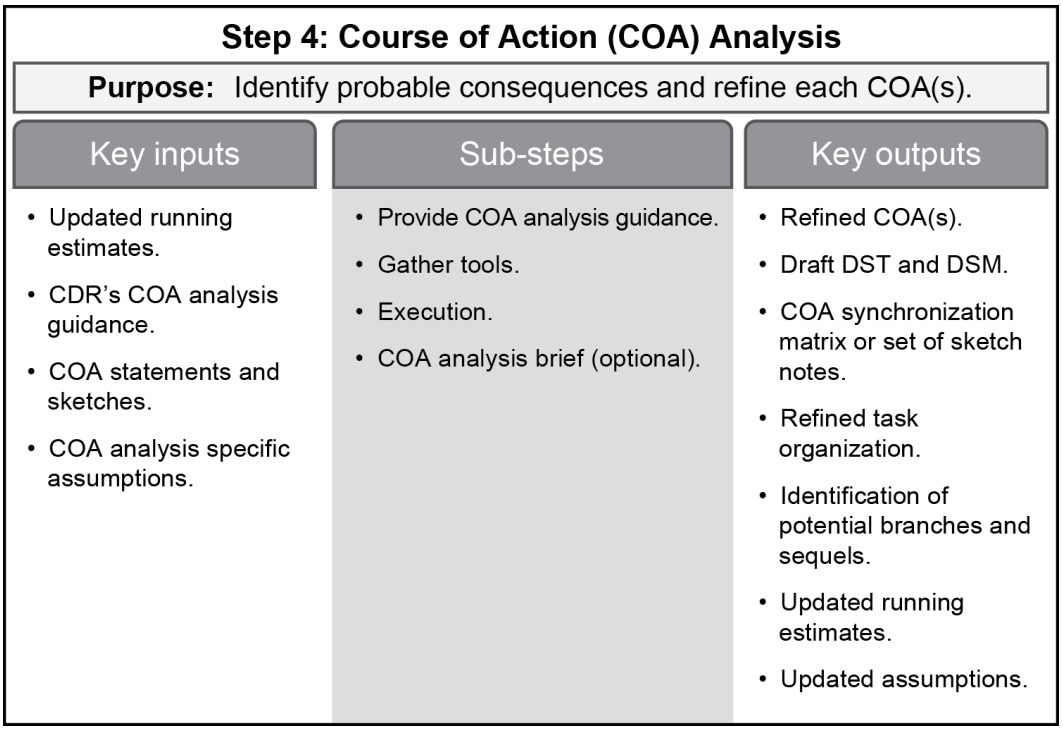


Figure 2-6. The MDMP Step 4. COA analysis overview

2-158. COA analysis attempts to visualize the flow of the operation, given the force's strengths and dispositions, the enemy's capabilities, terrain, and possible COAs. The simplest form of COA analysis is a few key leaders talking through the operation, deconflicting potential friction points, and identifying the required level of control to ensure mission success. The most sophisticated form of COA analysis is computer-aided modeling and simulation. The forms have different time requirements and produce a different level of results.

2-159. COA analysis should result in refined COAs, a DST, and a DSM for each COA. COA analysis also results in a completed COA analysis synchronization matrix. A COA analysis synchronization matrix is different from an operational synchronization matrix. A COA analysis synchronization matrix records the results of COA analysis, and depicts the synchronization of friendly forces for each COA in time, space, and purpose in relation to an enemy COA and terrain (see figure 2-10 on page 56 for an example COA analysis synchronization matrix). COA analysis allows the staff to synchronize the warfighting functions for each COA. It also helps the commander and staff to—

- Determine how to maximize the effects of combat power while protecting friendly forces and minimizing collateral damage.
- Further develop a shared understanding of the operation.
- Anticipate operational events and decisions.
- Refine conditions and resources required for success.
- Refine when and where to apply force capabilities.
- Identify coordination needed to produce synchronized results.

2-160. COA analysis has four main steps with several substeps. The four steps are:

- Issue guidance.
- Gather tools.
- Execute.
- Conduct a COA analysis brief (optional).

Step 4.1. Issue Guidance

2-161. Whoever is in charge of COA analysis, whether it is a COS, XO, or a lead planner, must provide specific initial guidance to the staff so they can gather proper tools. The most important guidance a leader develops is a time estimate for COA analysis. Time is a limited resource and constrains planning processes. If only 3 hours are available for COA analysis, war gaming three different COAs, each with multiple turns, is ineffective. A leader first determines what technique-key leader discussion, war game, or computer simulation-to use for COA analysis. If the leader wants to war game, the leader first needs to figure out how many turns (action-reaction-counteraction) the staff can run. A reasonable planning factor for a moderately trained staff is 30-45 minutes for describing an initial set (starting point in time and space), 30-45 minutes for the first turn, and 30 minutes for each additional turn. As staff experience grows, these times can decrease or even increase, depending on the complexity of each turn. Before COA analysis begins, the staff needs a clearly delineated schedule to know where to focus their efforts. A leader decides if the technique chosen is accomplishing the goal of COA analysis in the allocated time.

2-162. With the time constraint understood, the leader can then issue the following guidance to the staff:

- Technique used to conduct COA analysis-full staff, key leaders only, war game (analog or digital), or simulation.
- Number of COAs to analyze.
- Objective of the analysis-whether to synchronize actions of the decisive point, DO, critical event, DP, phase of the operation, or the entire operation.
- Type of visual representation-whiteboard, map, CPOF, terrain model, or other.
- Staff members responsible for creating the visual representation.
- Method-box, belt, avenue-in-depth (see COA analysis methods beginning in paragraph 2-163).
- Recording technique-synchronization matrix or sketch note (see figure 2-10 on page 56 for an example synchronization matrix and table 2-18 on page 57 for an example sketch note).
- Units or capabilities that will be listed.
- Participant's roles and responsibilities.
- Initial set.
- COA and COA analysis-specific assumptions.
- If war gaming, the time period each turn covers.
- Anything else the staff needs to focus on, or prepare, for the analysis.

Techniques: If war gaming, the time period the war-gaming turn covers depends on unit echelon, level of detail required, time available, and staff experience. A rule of thumb for turn lengths is: 4–6 hours for a battalion, 6–8 hours for a brigade, 8–24 hours for a division, and 12–48 hours for a corps.

To maintain focus and brevity during a war-gaming turn, an effective briefing format is task-purpose-actions-orders-reports. This format applies to both friendly and enemy forces. Most units, after the first turn, will probably state "no change to task and purpose" and only describe the actions, orders, and reports they will do during the turn (see table 2-17 for definitions and examples of the format).

Table 2-17. Example war gaming briefing format

Term	*Definition*	*Example*
Task	"What" the unit is to do using approved doctrinal tasks	Destroy enemy armor unit
Purpose	"Why" the unit is conducting the task	Prevent enemy penetration of PL GREEN
Action	"How" the unit will actually accomplish the task in the time period of the turn	We will move along AXIS IRON, in the following order of march. . .
Orders	Any orders the unit will issue to subordinate units	Upon reaching PL PURPLE I direct a change to our movement technique from travelling to travelling overwatch
Reports	Any reports the unit will send to their higher headquarters.	We will report crossing PL PURPLE to our higher headquarters

COA Analysis Methods

2-163. Three COA analysis methods exist: belt, avenue-in-depth, and box. Each considers an AOI and all enemy forces that can affect the outcome of the operation. Planners use these methods separately or in combination, and sometimes modify them for long-term operations dominated by stability.

2-164. The belt method divides the AO into belts (areas) running the width of the AO. METT-TC shape each belt. The belt method works best when conducting offensive and defensive tasks on terrain divided into well-defined cross-compartments, during phased operations (such as gap crossings, air assaults, or airborne operations), or when the enemy is deployed in clearly defined belts or echelons. Belts can be adjacent to or overlap each other.

2-165. The basis of the belt method is the sequential analysis of events in each belt. Commanders prefer this method because it focuses simultaneously on all forces affecting a particular event. A belt might include more than one critical event. Under time-constrained conditions, the commander and staff can use a modified belt method that divides the AO into not more than three sequential belts. These belts are not necessarily adjacent or overlapping but focus on the critical actions throughout the depth of the AO (see figure 2-7 for an example of the belt method).

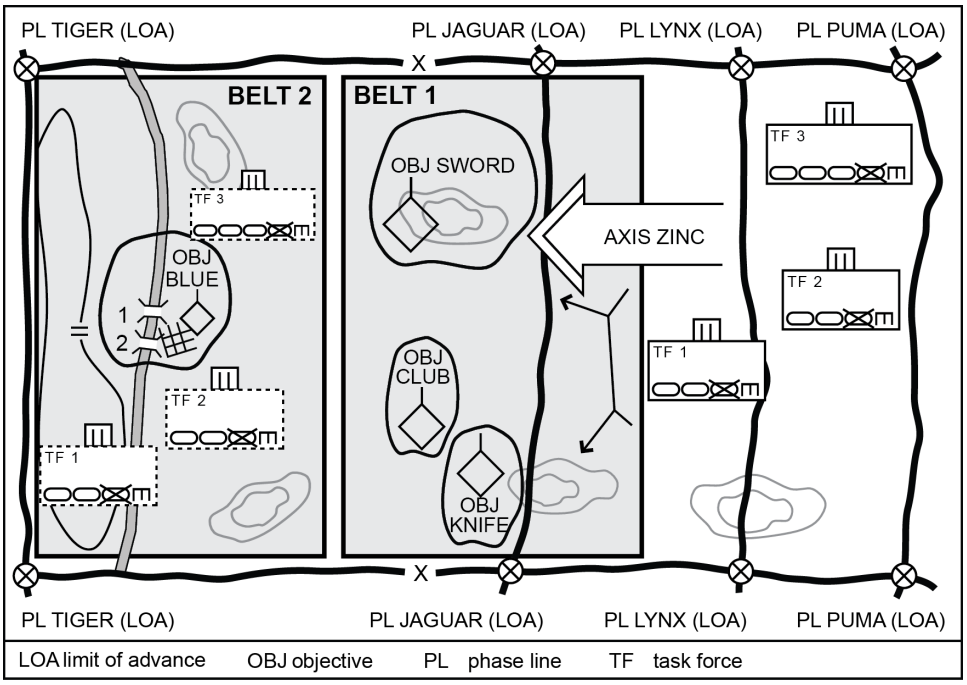


Figure 2-7. Belt method

2-166. The avenue-in-depth method focuses on one avenue of approach at a time, beginning with the DO. This method is good for offensive COAs or for defense when canalizing terrain inhibits mutual support (see figure 2-8 for an example of the avenue-in-depth method).

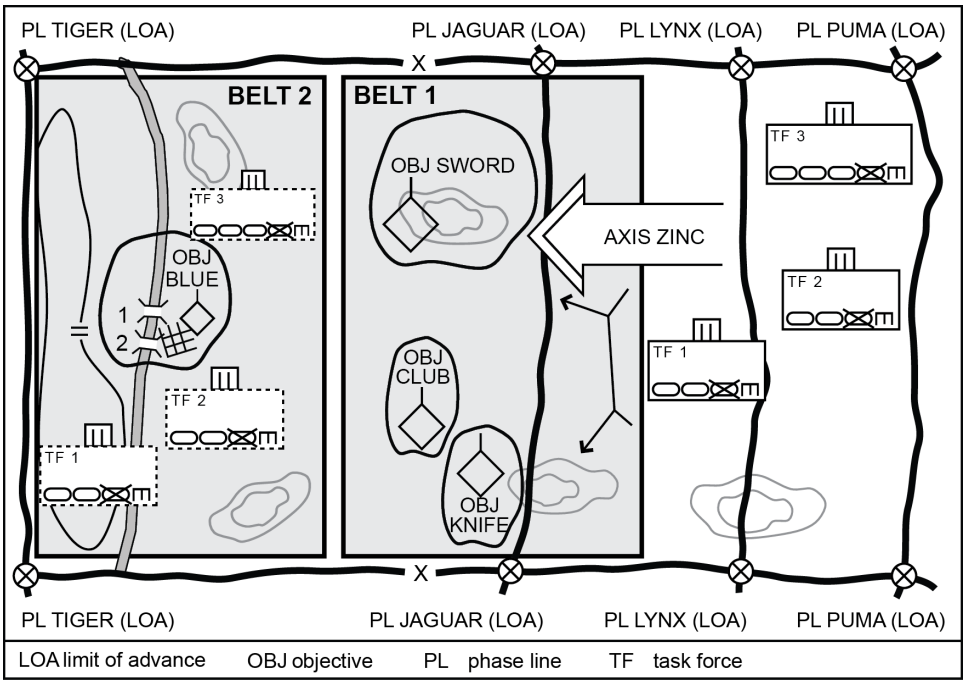


Figure 2-8. Avenue-in-depth method

2-167. The box method is a detailed analysis of a critical area, such as an EA, a wet-gap crossing site, or a landing zone. It works best in a time-constrained environment, such as a hasty attack. The box method is particularly useful when planning operations in noncontiguous areas of operation. When using this method, the staff isolates an area and focuses on critical events therein. Staff members assume that friendly units can handle most situations in the AO and therefore focus their attention on essential tasks (see figure 2-9 for an example of the box method).

Note. COA analysis leaders often use the term "critical event" to focus on what to analyze. Critical event is a box method applied to a certain area while units are conducting complex operations that require synchronization and deconfliction. Examples include actions on the objective, wet-gap crossings, and unit movement through restricted terrain. Care must be taken with this version of the box method because the critical event does not typically last for the entire duration of the operation. Therefore, assumptions need to be made to position forces into the initial set of the critical event.

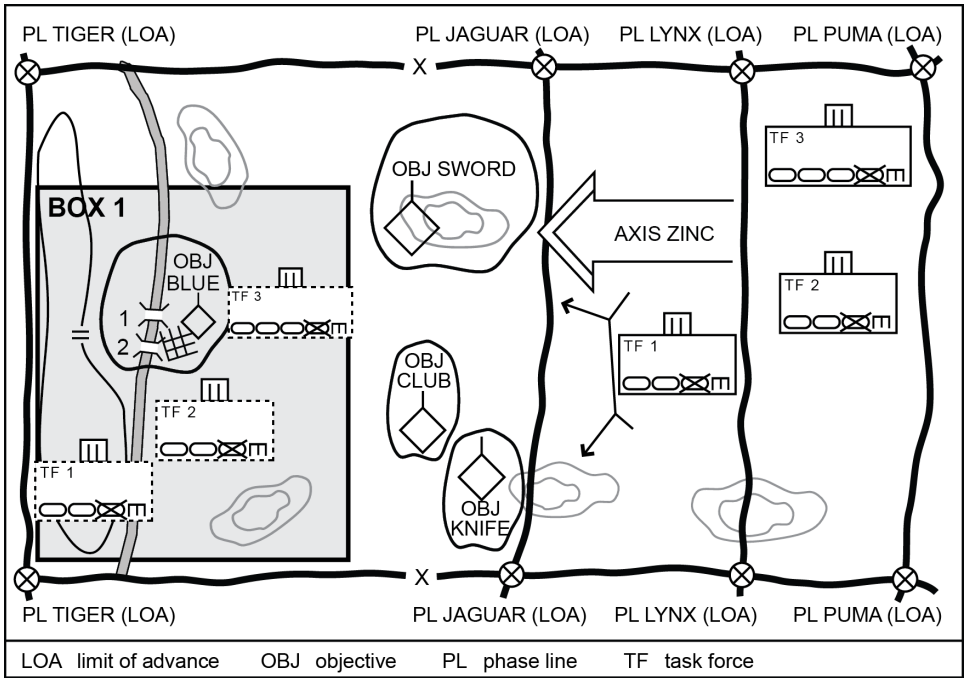


Figure 2-9. Box method

COA Analysis Techniques

2-168. Staffs use three different techniques to conduct COA analysis: key leader or full staff discussion, war gaming, and modeling and simulation. While war gaming is the most well-known, it is not the only way to analyze a COA.

Key Leader or Full Staff Discussion

2-169. When time is limited, key leaders, staff members, and subject matter experts can gather around a sketch or map with graphics and talk through a COA. The lead planner quickly describes the scheme of maneuver in as much detail as possible followed by the other warfighting functions (typically by phase). As the group discusses the actions, key leaders use their skills, knowledge, and experience to fill in details or provide guidance on how to prevent friction. If time constraints prevent completing these actions, key leaders and subject matter experts discuss actions at critical events. This technique is less time consuming

than others, but the level of detail reached and synchronization across the staff is minimal, especially if analyzing only a critical event.

War game

2-170. War gaming is a disciplined process with rules and steps that attempt to visualize the flow of the operation, given the force's strengths and dispositions, the threat's capabilities, and possible friendly COAs. A war game gathers the staff around a visual tool that represents friendly, threat, and relevant terrain and uses an action-reaction-counteraction method to assess friendly and threat interaction. A visual tool can be a paper map, a terrain model, a CPOF screen, a PowerPoint slide, a white board, or a sketch. Friendly and threat icons are represented by models, cut-outs, Post-it notes, "stickies," or icons drawn on the visual tool. Having a visual representation that everyone can follow and understand is key. The staff then uses the action reaction-counteraction process to refine the COA. Establishing this method and integrating new members who are unfamiliar with a unit's SOPs can take time. An advantage of war gaming is that it is a known process that planners conduct in analog or digital form.

Note. The war-gaming process can overwhelm staffs, causing them to lose focus on solving the problem. Leaders must clearly define desired outputs and how to conduct the war game, which removes some of the friction associated with this process and allows leaders to focus on the problem.

Modeling and Simulation

2-171. Modeling and simulation can be used to enhance COA analysis. A given COA can be represented in a physical model or computer aided simulation and evaluated against multiple conditions in the operating environment. A key planning consideration related to modeling and simulation is understanding what exactly needs to be modeled and simulated. Advantages of this technique include the ability of modeling and simulation to provide quantitative data to inform decision making. A disadvantage includes the limited availability of resident modeling and simulation tools and expertise across organizations, installations, and staffs to consult and advise on modeling and simulation options.

Select a Technique to Record and Display Results

2-172. Analysis results provide a record from which to build task organizations, synchronize activities, develop DSTs, confirm and refine event templates, prepare plans or orders, and compare COAs. Two techniques are commonly used to record and display results: the synchronization matrix technique and the sketch note technique. In both techniques, staff members record any remarks regarding strengths and weaknesses they discover. The amount of detail depends on the time available. Unit SOPs address details and methods of recording and displaying analysis results.

COA Synchronization Matrix

2-173. A COA synchronization matrix is a tool staffs use to record the results of war gaming. This matrix helps staffs synchronize a COA across time, space, and purpose in relation to potential enemy and civil actions (see figure 2-10 on page 56 for an example of a COA synchronization matrix).

	Turn:	Initial set	Turn 1			Turn 2		
	H-hour:	H-hour	H+0 – H+6			H+6 – H+12		
	DTG:	18 0400 JUN 18	18 0401–1000 JUN 18			18 1001–1600 JUN 18		
	Step:	Initial set	Action	Reaction	Counteraction	Action	Reaction	Counteraction
Area of influence	Weather and light							
	Division fires							
	USAF							
	Adjacent units							
	Enemy decision points							
Enemy	9-63 BN							
	3-641 BDET							
	1-63 BDET							
	2-63 BDET							
	3-63 BDET							
	5-63 BDET							
	640 AR BN							
	Fires							
	55 EN BN							
Civilian reaction								
Decision points								
Risk to mission identified								
Movement and maneuver	1-16 IN (DO)							
	2-34 AR (SO1)							
	3-66 AR (SO2)							
	1-4 CAV (SO3)							
	A/1-6 CAB							
	C/3-66 AR (Reserve)							
Intel	Shadow #1							
	HUMINT Team #124							
	SIGINT Asset #1							
Fires	1-5 FA							
	CAS							
	360 POG							
	A/407 CA							
Protection	1 EN BN							
	62 EN Co							
	287 MP Co							
	63 CM							
	704 EOD Tm							
	A/1-188 AD							
Sustain-ment	101 BSB							
	Brigade Support Area (BSA)							
Command and control	MAIN							
	TAC							
	RETRANS #1							
	IDP							

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Figure 2-10. Example brigade COA synchronization matrix

Sketch Note

2-174. The sketch note method uses brief notes concerning critical locations or tasks and purposes. These notes refer to specific locations or relate to general considerations covering broad areas. Commanders and staffs mark locations on a map and on a separate war-game worksheet. Staff members use sequential numbers to link the notes to the corresponding locations on a map or overlay. Staff members also identify actions by placing them in sequential action groups, assigning each subtask a separate number. They use the war game worksheet to identify all pertinent data for a critical event (see table 2-18 for a sketch note example). Staffs assign each event a number and title and use the columns on the worksheet to identify the following:

- Sequence of events.
- Units and assigned tasks.
- Expected enemy actions and reactions.
- Friendly counteractions and assets.
- Total assets needed for the task.
- Estimated time to accomplish the task.
- Decision point tied to executing the task.
- CCIRs.
- Control measures.
- Remarks.

Table 2-18. Sketch note example

Critical event	*Seize OBJ Sword*
Sequence number	1
Action	TF 3 attacks to destroy enemy company on OBJ SWORD
Reaction	Enemy company on OBJ CLUB counterattacks
Counteraction	TF 1 suppresses enemy company on OBJ CLUB
Assets	TF 3, TF 1, and TF 2
Time	H+1 to H+4
Decision point	DP 3a and 3b
Commander's critical information requirements	Location of enemy armor reserve west of PL JAGUAR
Control measures	AXIS ZINC and support by fire position 1
Remarks	None

Step 4.2. Gather Tools

2-175. Staffs gather various tools to assist with the first three steps of the MDMP. With initial guidance from their leader, the staff ensure they bring the right products, tools, and level of detail to conduct COA analysis. While no formal checklist exists regarding what to bring, staffs should bring all relevant information on their warfighting function that covers the topics of the war game. This information should be detailed enough to ensure that all capabilities on the synchronization matrix or sketch note have what they require for a turn. For example, if a turn length is six hours, the sustainment staff bases consumption rates on six-hour increments. Staff members bring, at a minimum, their running estimates—to include facts, assumptions, constraints, limitations, specified tasks, implied tasks, and status of key capabilities.

2-176. Other examples of tools include, but are not limited to—

- Map or sketch of the AO.
- Threat templates and models.
- Civil considerations overlays, databases, and data files.
- MCOO and terrain effects matrices.
- Recording method.

- Completed COAs, including graphics.
- Means to post or display enemy and friendly unit symbols and other organizations.

Step 4.3. Execution

2-177. During war-game execution, the commander and staff try to foresee actions, reactions, and counteractions of all actors, including civilians. Staff members analyze each selected event and identify tasks that the unit, one echelon below, must accomplish using assets two echelons below the staff's echelon. Identifying strengths and weaknesses of each COA allows staffs to adjust COAs as necessary. An effective war game results in the commander and staff refining, identifying, analyzing, developing, and determining several effects.

2-178. A war game focuses on actors rather than tools used. Staff members who participate in war gaming should be the same individuals that developed the COAs. If available, red team members (trained and educated organizational members that provide an independent analytical capability) can provide valuable alternative points of view and challenging facts and assumptions throughout the planning process.

2-179. The commander and staff examine many areas during a war game. These include, but are not limited to—

- All friendly capabilities.
- All enemy capabilities and critical civil considerations that impact operations.
- Global media responses to proposed actions.
- Movement considerations.
- Closure rates.
- Lengths of columns.
- Formation depths.
- Ranges and capabilities of weapon systems.
- Desired effects of fires.
- Templated enemy forces outside of the AO.
- Branches and sequels.

2-180. The commander and staff consider how to create conditions for success, protect the force, and shape the operational environment. Experience, historical data, SOPs, and doctrinal literature provide much of the necessary information. During a war game, staff officers propose appropriate control measures.

2-181. Staffs continually assess risks to friendly forces. When assessing risks of weapons of mass destruction to friendly forces, planners view the target that the force presents through the eyes of an enemy target analyst. Planners consider ways to reduce vulnerability and determine an appropriate level of mission-oriented protective posture consistent with mission accomplishment.

2-182. Staffs identify required assets of the warfighting functions to support the concept of operations, including those needed to synchronize sustaining operations. If requirements exceed available assets, staffs recommend priorities based on the situation, commander's intent, and planning guidance. To maintain flexibility, the commander may decide to create a reserve to maintain assets for unforeseen tasks or opportunities.

2-183. With the staff gathered around a visual representation of the COA and fully prepared to discuss it, the leader sets the tone for the war game and ensures the staff is prepared. The leader (or designated representative) orients staff members to the visual representation and explains the rules of the war game:

- Remain objective. Do not allow personalities or a sense of "what the commander wants" to influence the analysis.
- Avoid drawing premature conclusions and gathering facts to support such conclusions.
- Avoid defending a COA simply because you personally developed it.
- Record advantages and disadvantages of each COA accurately as they emerge.
- Continually assess feasibility, acceptability, completeness, distinguishability, and suitability of each COA. If a COA fails any of these tests, reject it.

- Concluding a COA is "infeasible" is completely acceptable, but be sure to apply an appropriate amount of effort to try and make it feasible. Do not encounter a minor issue and conclude a COA is infeasible.
- Avoid comparing one COA with another during the war game; this occurs during COA comparison.
- Do not get frustrated with the intelligence officer for effectively role playing the threat.
- Be prepared for COA analysis. High quality input results in optimal solutions.
- Avoid off-topic discussions to reduce distraction.
- Briefing "no change" is an acceptable response.
- Explain how adjudication works.
- Remind everyone that the war game's purpose is to improve the plan by synchronizing actions in time, space, and purpose.

2-184. The first turn is an explanation of the initial set in time and space of the action being war gamed and uses the synchronization matrix as a guide. All assets brief current location, task, purpose, task organization updates, and actions they are conducting at the start. If, after the initial set, enablers are completely task-organized to other units (for example, air defense or engineer), those assets are briefed by the element that now controls them, not the parent organization.

2-185. After the initial set is complete, the staff conduct turn 1. First, the **action** is conducted by the side with the initiative-usually the attacking side. For this example, friendly forces are attacking. First, brief environmental factors such as light and weather followed by friendly higher echelon and adjacent assets that could impact the AO. Friendly forces then brief-by warfighting function and from DO to the lowest priority SO-what they would like to accomplish during the turn. If using a synchronization matrix, the order that the units are listed in the matrix should be the briefing order.

2-186. The threat then briefs the **reaction** for turn 1. The intelligence officer briefs the threat's higher assets that could impact the AO and then, by warfighting function, briefs what actions the threat would like to take during the turn.

2-187. Then, for the first turn, friendly forces brief the **counteraction**. In the offense, the goal of the counteraction step is to ensure the friendly COA is the best it can be. Understanding how the threat will react to friendly action, the counteraction allows friendly forces to go back and adjust their previous actions in the turn to provide the most favorable outcome, while still meeting the COA guidance.

2-188. Once the action, reaction, and counteractions for turn 1 are complete, the leader adjudicates what actually happened and how it affected friendly forces, threat, population, and terrain. The most common technique to adjudicate friendly forces and threat effects is the COFM calculator. Numerous versions exist, but they all accomplish the same thing. After inputting each side's combat power, the calculator estimates relative combat power and casualties. Leaders still apply judgement and experience to account for factors such as unit morale and environmental considerations.

2-189. If a COFM calculator is unavailable, leaders rely solely on their experience and judgement to assess how friendly forces and the threat were effected. Adjudicating impacts on population, terrain, unit morale, and environment is more difficult and always relies on a leader's judgement and experience only. Once adjudication is complete, the turn is complete. Continue conducting turns until you meet your war-game objective or as time allows.

2-190. When friendly forces are in the defense, the only difference for the turn is the threat takes the action step; friendly forces react; and the threat describes any adjustments, based on their event template, they would make during the turn as the counteraction step before adjudication begins. The intelligence officer does not improve the threat COA, but they continue to refine the threat event template. Staffs brief neutral environmental factors, such as population and nongovernmental organizations, during the reaction and counteraction phases, regardless of who is attacking.

Note. During an operation, if a side loses the initiative, the briefer of the action step can change.

2-191. To ensure effective war game results, the commander and staff **refine (or modify)**—

- Each COA to include identifying branches and sequels that become on-order or be-prepared missions.
- Locations and times of decisive points.
- Enemy event template and matrix.
- Task organization, including forces retained in general support.
- Control requirements, including control measures and updated operational graphics.
- Deception operations.
- CCIRs and other information requirements, including the LTIOV, and incorporate them into the IC plan.

2-192. The commander and staff **identify**—

- Key or decisive terrain and determine how to use it.
- Tasks the unit retains and tasks assigned to subordinates.
- Likely times and areas for enemy use of weapons of mass destruction and friendly chemical, biological, radiological, and nuclear defense requirements.
- Potential times or locations for committing the reserve.
- Most dangerous enemy COA.
- Most likely enemy COA.
- Most dangerous civilian reaction.
- Locations for the commander and CPs.
- Critical events.
- Requirements for support of each warfighting function.
- Effects of friendly and enemy actions on civilians and infrastructure and on military operations.
- Locations of NAIs, target areas of interest (TAIs), and DPs and intelligence requirements needed to support them.
- Strengths and weaknesses of each COA.
- Hazards. Assess their risk, develop control measures, and determine residual risk.
- Coordination required for integrating and synchronizing interagency, host-nation, and nongovernmental organization involvement.

2-193. The commander and staff **analyze—**

- Potential civilian reactions to operations.
- Potential media reaction to operations.
- Potential impacts on civil security, civil control, and essential services in the AO.

2-194. The commander and staff **develop**—

- Decision points.
- COA analysis synchronization matrix.
- DST and DSM.
- Solutions to achieving minimum essential stability tasks in the AO.
- Information collection plan and graphics.
- Themes and messages.
- Fires, protection, and sustainment plans and graphic control measures.

2-195. The commander and staff **determine**—

- Requirements for military deception and surprise.
- Timing for concentrating forces and starting the attack or counterattack.
- Movement times and tables for critical assets, including information systems nodes.
- Estimated duration of the entire operation and each critical event.
- Projected percentage of enemy forces defeated in each critical event and overall.

- Percentage of minimum essential tasks that the unit can or must accomplish.
- Media coverage and impact on key audiences.
- Targeting requirements in the operation, to include identifying or confirming high-payoff targets (HPTs) and establishing attack guidance.
- Allocation of assets to subordinate commanders to accomplish their missions.

Step 4.4. COA Analysis Brief (Optional)

2-196. Time permitting, and if the commander desires, the staff delivers a briefing to all affected elements to ensure everyone understands the results of COA analysis. The staff uses the briefing for review and ensures that it captures all relevant points of COA analysis for presentation to the decision maker. In a collaborative environment, the briefing may include selected subordinate staffs. A COA analysis briefing includes the following:

- Introduction.
- Agenda.
- Updated IPB, facts, and assumptions (if there are significant changes).
- Commander requests for information from the staff.
- Quick review of—
  - Approved problem statement and mission statement.
  - Commander's and higher commander's intents.
  - Threat COA(s) used for COA analysis.
  - War-game technique used (if applicable).
- Friendly COA—
  - Assumptions used.
  - Concept of operation (brief review).
  - Analysis results.
  - Modifications.
  - Additional commander's guidance
  - Additional COA analysis responsibilities by warfighting function.

Helpful COA Analysis Techniques:
The following techniques can reduce the friction of the COA analysis process:

- During COA development, designate a lead for COA analysis and have that individual, with personnel from across the staff, prepare the location and visual representation. As soon as all staffs complete COA development, they can break and immediately begin COA analysis without losing momentum.
- Prepare written notes for the recorder. Task, purpose, actions, orders, and reports are verbally presented, but a briefer also should hand written notes to the recorder with all information, including unit, turn number, and step (action, reaction, or counteraction). Written notes speed the COA process because the recorder has all information in front of them. A note stating "no change" ensures information is not accidently omitted.
- To avoid surprises, and if time allows, the intelligence officer should brief the leader on the threat's plan before beginning the war game. Optimally, they brief the event matrix to ensure the threat uses the same matrix when war gaming multiple COAs.
- Avoid pre-filling the synchronization matrix. Pre-filling saves time, but a change in the COA requires that all related cells be updated; if this does not occur because cells are pre filled, the error is compounded. An alternative is to pre-fill only the initial set and the action portion.
- To synchronize the operation in time, space, and purpose, tie turns to a date-time group. Stating that a turn lasts from a certain h-hour to another, or lasts an entire phase, creates confusion. Remove confusion by stating a turn period in time only. For example, turn 1 lasts from 0601 hours to 1000 hours.
- Have a facilitator in charge of the war game so the leader can remain objective. A facilitator ensures the war-game process runs smoothly while the leader focuses on the problem.
- The best person to brief actions of a unit or capability is either a liaison officer or a planner for that unit or capability.
- During COA development, COA analysis, and COA rehearsal—and given alternative threat COAs—spend one-third of available time on the base plan and two-thirds of available time on branches and sequels. A battle never progresses according to plan, therefore additional time spent on branches and sequels is value added.
- Although a properly executed war game resembles a rehearsal, with a counteraction step included, do not wait until the rehearsal to identify and reduce friction points.
- If time allows, take a friendly COA (or all friendly COAs) and analyze it against several different threat COAs.

COA Analysis Responsibilities by Warfighting Function

2-197. This section describes what each warfighting function brings to COA analysis and what outputs the function should refine or develop once COA analysis is complete. The list is not all inclusive, but serves as an initial starting point.

Command and Control Responsibilities

2-198. **Commanders** have overall responsibility for the COA analysis process. They also provide guidance to assist the staff in analyzing COAs.

2-199. The **COS, XO, or lead planner** coordinates the staffs' actions during COA analysis. This officer is the unbiased controller of the process, ensuring the staff stays on a timeline and achieves the goals of the

COA analysis session. In a time-constrained environment, this officer ensures that, at a minimum, the DO is analyzed.

2-200. The **signal officer** assesses network operations, spectrum management operations, network defense, and information protection feasibility for each analyzed COA. The signal officer determines communications systems requirements and compares them to available assets, identifies potential shortfalls, and recommends actions to eliminate or reduce their effects.

2-201. The following staff officers and sections are not available to all units. If unavailable to units, leaders can assign some or all of the responsibilities below to their own staffs.

2-202. The **information operations officer** assesses the information operations concept of support against the ability of information-related capabilities to execute tasks in support of each analyzed COA. The officer also evaluates the effectiveness of integrated information-related capabilities to impact various audiences and populations in and outside of the AO. The information operations officer, in coordination with the electromagnetic warfare officer, integrates information operations with cyberspace electromagnetic activities.

2-203. The **civil affairs officer** assesses how operations affect civilians. Host-nation support and care of dislocated civilians are of particular concern. The civil affairs officer's analysis considers how operations affect public order and safety, the potential for disaster relief requirements, noncombatant evacuation operations, emergency services, and the protection of culturally significant sites. This officer provides feedback on how the culture in the AO affects each COA.

2-204. The **red team** provides the commander and intelligence officer with an independent capability to fully explore alternatives. The staff looks at plans, operations, concepts, organizations, and capabilities of the operational environment from the perspectives of enemies, unified action partners, and others.

2-205. The **electromagnetic warfare officer** provides information on the electromagnetic warfare target list, electromagnetic attack taskings, electromagnetic attack requests, and the electromagnetic warfare portions of the collection matrix and the attack guidance matrix. Additionally, the electromagnetic warfare officer assesses threat vulnerabilities, friendly electromagnetic warfare capabilities, friendly actions relative to electromagnetic warfare activities, and other cyberspace electromagnetic activities not covered by the signal or intelligence officer.

2-206. The **legal advisor** advises the commander on all matters pertaining to law, policy, regulation, good order, and discipline for each analyzed COA. This officer provides legal advice across the range of military operations on law of war, rules of engagement, international agreements, Geneva conventions, treatment and disposition of noncombatants, and legal aspects of targeting.

2-207. The **operations research and systems analysis** (ORSA) staff section provides analytic support to the commander to plan and assess operations. Specific responsibilities include—

- Providing quantitative analytic support, including regression and trend analysis, to planning and assessment activities.
- Assisting other staff members in developing customized analytical tools for specific requirements, providing quality control capabilities, and conducting assessments to measure the effectiveness of operations.

Intelligence Responsibilities

2-208. During COA analysis, the intelligence section has two functions. One is to role play the enemy commander, other threat organizations in the AO, and critical civil considerations in the AO (if no civil affairs representative exists). The other is to lead friendly intelligence activities.

2-209. When role playing the enemy commander, intelligence officers execute threat maneuver as outlined in the event template and enemy DSM. They also project enemy reactions to friendly actions and project enemy losses. While trying to realistically win the war game for the enemy, the intelligence section ensures that the staff fully addresses friendly responses for each enemy COA.

2-210. For the friendly force, the intelligence section—

- Refines intelligence and information requirements and planning requirements tools.

- Refines situation and event templates, including NAIs that support DPs.
- Refines the event template with corresponding DPs, TAIs, and HVTs.
- Participates in targeting to nominate HPTs from HVTs identified during IPB.
- Recommends PIRs that correspond to DPs.
- Refines civil considerations overlays, databases, and data files.
- Refines the MCOO and terrain effects matrices.
- Refines weather products that outline critical weather impacts on operations.

Techniques. For COA analysis, the lead intelligence officer should assign responsibilities to available staff members within the section (such as enemy commander and friendly intelligence officer), and then assist each in their briefs, instead of trying to accomplish it all themselves.

Have liaison officers role play their units, since they are the most knowledgeable about them.

Movement and Maneuver Responsibilities

2-211. The operations officer or maneuver lead planner assists the commander with the rehearsal. The operations officer—

- Portrays the friendly scheme of maneuver, including the employment of information-related capabilities.
- Ensures subordinate unit actions comply with the commander's intent.

2-212. During COA analysis, either the plans officer, lead maneuver planner, or the operations officer assumes the role of lead movement and maneuver planner and represents the movement and maneuver warfighting function. The lead movement and maneuver planner role plays the friendly maneuver commander. Various staff officers assist the lead movement and maneuver planner, such as the aviation officer and engineer officer. The lead movement and maneuver planner executes friendly maneuver as outlined in the COA sketch and statement. The movement and maneuver planner and team assesses warfighting function requirements, solutions, and concepts for each COA; develops plans and orders; and determines potential branches and sequels arising from the various COAs analyzed. They confirm friendly actions are physically possible. For example, they ensure planners are using the appropriate rates of march when moving over restricted terrain and make sure areas, such as the position areas for artillery and the brigade support areas, are suitable for the terrain. **Planning staffs ensure that, if COA analysis does not cover every operational aspect of the mission, the omitted details are determined before publishing an order.** Planning staffs complete the DST and DSM for each COA.

Fires Responsibilities

2-213. The fires section assesses the fire support feasibility of each analyzed COA. This section develops a proposed HPT list, target selection standards, and attack guidance matrix. The fires section works with the intelligence section to identify NAIs and TAIs for enemy indirect fire weapon systems, and identifies HPTs and additional events that may influence the positioning of field artillery and ADA assets. The fires section also lists possible defended assets for ADA forces and assists the commander in making a final determination about asset priority.

Protection Responsibilities

2-214. The chief of protection or commander's designated representative assesses protection element requirements, refines EEFIs, and develops a scheme of protection for each analyzed COA. The chief of protection—

- Refines the critical asset list and the defended asset list.
- Assesses hazards.
- Develops risk control measures and mitigation measures for threats and hazards.
- Establishes personnel recovery coordination measures.

- Implements operational area security to include securing lines of communications, antiterrorism measures, detention operations, and law enforcement operations.
- Ensures survivability measures to reduce vulnerabilities.
- Refines chemical, biological, radiological, and nuclear operations.

Sustainment Responsibilities

2-215. During COA analysis, the personnel section assesses the personnel aspect of building and maintaining combat power of units. This section identifies potential shortfalls and recommends COAs to ensure units maintain adequate manning to accomplish their mission. The personnel section is also responsible for providing initial and updated casualty estimates, with the assistance of the surgeon.

2-216. The logistics section assesses the status of all logistics functions, determines the logistics feasibility of each COA, determines critical requirements for each supply class, and identifies potential problems and deficiencies. This section compares requirements to available assets to identify potential shortfalls. The logistics officer recommends actions to eliminate shortfalls or reduce their effects and ensures that available movement times and assets support each COA. While improvising can contribute to responsiveness, only accurately forecasting requirements can ensure effective sustainment.

2-217. To ensure a fit and healthy force, a surgeon section coordinates, monitors, and synchronizes execution of health system activities for the command for each analyzed COA. A surgeon works with the human resources section to develop a casualty estimate and derives required medical support from the updated estimates (see paragraph G-158).

2-218. During COA analysis, the financial management section assesses the commander's AO to determine the best COA for resource use. The assessment includes core functions of financial management: resource management and finance operations. This section determines partner relationships (joint, interagency, intergovernmental, and multinational) and requirements for special funding and supports the logistics section in the procurement process.

STEP 5. COA COMPARISON

2-219. COA comparison is an objective process that evaluates COAs independently and against set evaluation criteria recommended by the staff and approved by the commander to identify advantages and disadvantages. The staff then compares the COAs advantages and disadvantages against each other to determine the difference between each COA in terms of cost and benefit of the various evaluation criteria. The comparison enables the commander to make a better-informed decision. Figure 2-11 on page 66 depicts the purpose, inputs, processes, and outputs of COA comparison.

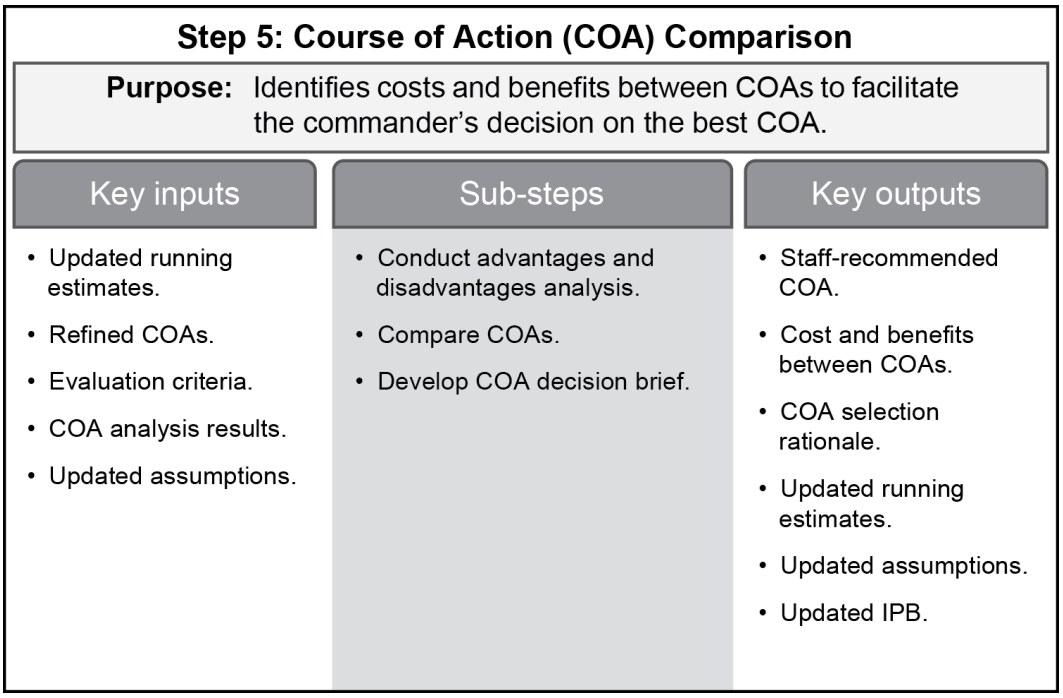


Figure 2-11. The MDMP Step 5. COA comparison overview

COA Comparison Techniques

2-220. Planners use several techniques when comparing COAs. They all vary in subjectivity and objectivity. Choose a technique that best captures benefits and risk to assist the commander with decision making. While each technique is different, a decision matrix is the best way to present and compare information. Figure 2-12 is an example decision matrix that planners can use as a starting point and can modify to meet the commander's needs.

Evaluation criteria name	*Evaluation criteria definition*	*COA 1 raw data*	*COA 1 score*	*COA 2 raw data*	*COA 2 score*
Total/Result:					

EXAMPLE

Figure 2-12. Example decision matrix

Note. No "best way" exists to score evaluation criteria. The key is deciding which of several techniques best helps the commander determine benefits and risks to enable decision making. Regardless of the technique used, remind the commander of the definitions the staff used to analyze the COAs along with the raw score resulting from their analysis. This helps commanders understand the staffs' analysis and assists with their own mental calculations.

A decision matrix is a starting point for dialogue between the commander and their staff.

Planners can weight the scores if the commander wants certain evaluation criteria to have a stronger effect on the overall decision.

2-221. The following list of COA comparison techniques are presented in no particular order. These techniques serve as a starting point, but other methods also exist for comparing COAs. The critical thing to do is present the information using a technique that best allows the commander to understand the costs and benefits between each COA.

COA Comparison Techniques:
Descriptive. Instead of listing a numeric score for each COA, this technique relies on a few short sentences or bullets to convey advantages and disadvantages. Advantage: this is a good tool for starting dialogue. Disadvantages: comparing advantages and disadvantages in a time-constrained environment can be difficult, which can force limited dialogue and an incorrect decision.

Comparison. Based on the number of COAs, each evaluation criterion receives a value from 1 to 10 with "1" being best. When all evaluation criterion are added together, the COA with the lowest value is chosen. Advantages: the comparison is easy to perform. Disadvantages: the comparison can distort differences between COAs. For example, if a potential operation has two evaluation criteria of "Fuel Used" and "Casualties," comparing COAs using this technique potentially results in: one gallon of fuel equal to one casualty.

Plus or Minus. For each evaluation criterion, instead of assigning a value, assign a "+" or "-" to signify the COA is either favorable or unfavorable. Add plusses and minuses for the criteria, with a plus neutralizing a minus for an overall score. For example, 3 "+"s and 2 "-"s results in a score of +1. Advantages: this technique is fast and provides an easy way to understand the information. Disadvantages: complex evaluation criteria might be over simplified.

Relative Value. The raw score for each evaluation criterion is assigned a relative score of 0–100; the worst raw score receives a "0" and the best receives a "100." The rest of the COAs raw scores receive a proportion of the score. Add scores together. The highest score is the recommended COA. Advantages: this technique better captures the advantages and disadvantages of each evaluation criterion. Disadvantages: the conversion to a score takes a stronger understanding of mathematics and ratios; therefore, this technique can be difficult to use initially.

Conduct COA Decision Briefing

2-222. After analysis and comparison, the staff identifies and recommend their preferred COA. If the staff cannot reach a decision, the COS or XO decides which COA to recommend. The staff then delivers a decision briefing to the commander. The COS or XO highlights any changes to each COA resulting from the COA analysis. The decision briefing includes—

- Introduction.
- Agenda.
- An updated IPB, facts, and assumptions (if there are significant changes).
- Commander requests for information from the staff.
- Brief review of—
  - Approved problem statement and mission statement.
  - Commander's and higher commander's intents.
  - Threat COA(s) used for COA analysis.
  - COA analysis technique used (if applicable).
- For each friendly COA—
  - Assumptions used.
  - Concept of operation brief review.
  - COA analysis results.
  - Modifications to friendly COA.

- Evaluation criteria results.
- COA comparison with recommended staff COA.
- COA decision and guidance.

Note. If significant disagreement exists, the staff should inform the commander and discuss the disagreement.

STEP 6. COA APPROVAL

2-223. With the staff recommendation, the commander picks the COA the commander thinks is best. The best COA meets the commander's intent and risk tolerances, and reflects an acceptable relationship between the evaluation criteria. Resources are then committed according to the commander's decision. If the commander rejects all COAs, the staff starts COA development again. If the commander modifies a proposed COA or gives the staff an entirely different one, the staff develops and analyzes the new COA and presents the results to the commander with a recommendation. Figure 2-13 depicts the purpose, inputs, processes, and outputs of COA approval.

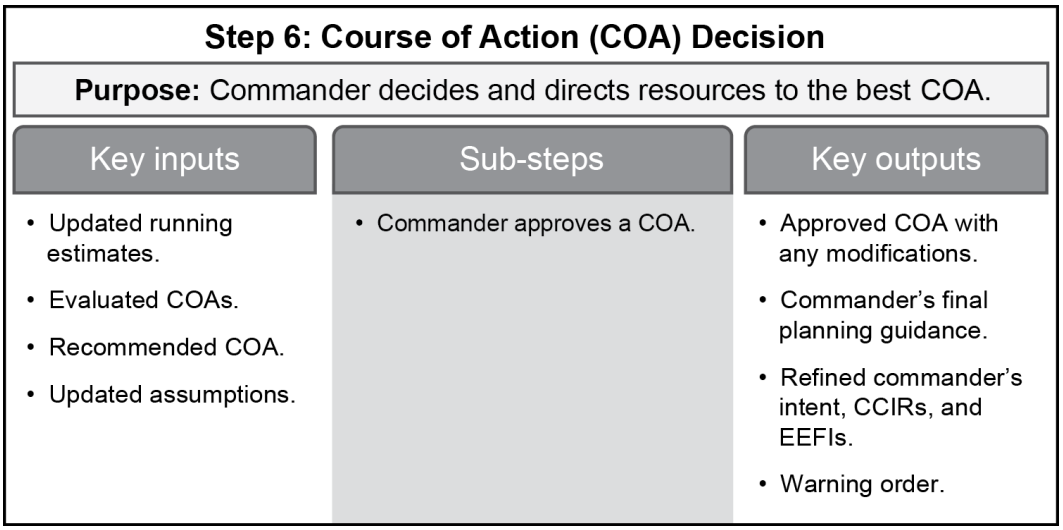


Figure 2-13. The MDMP Step 6. COA approval overview

2-224. After approving a COA, the commander issues final planning guidance. This guidance includes a refined commander's intent (if necessary); revised CCIRs to support execution; any additional guidance on priorities for warfighting functions, orders preparation, rehearsal, preparation, and resources to preserve freedom of action and ensure continuous sustainment.

2-225. In final planning guidance, commanders include the risk they are willing to accept. If time allows, commanders discuss acceptable risk with adjacent, subordinate, and senior commanders. However, commanders obtain their higher commander's approval for risks that might imperil accomplishing the higher commander's mission.

2-226. Based on the commander's decision and final planning guidance, the staff issues a WARNORD to subordinate headquarters. This WARNORD contains information subordinate units need to create or refine their plans. It confirms guidance issued and expands on details not covered by the commander personally. The WARNORD issued after COA approval normally contains—

- Paragraph 1
  - Complete situation paragraph.
- Paragraph 2
  - Approved mission statement.

- Paragraph 3
  - Commander's intent.
  - Concept of operation.
  - Warfighting function concepts.
  - Principal task to subordinate units.
  - Updated operational timeline.
  - Coordinating instructions covering preparation and rehearsal instructions not included in SOPs.
- Paragraph 4
  - Initial sustainment paragraph.
- Paragraph 5
  - New CCIRs and EEFIs.
- Annex A
  - Updated task organization.
- Annex B
  - Updates only.
- Annex C
  - Updated graphics.
- Any other annexes created before publishing the WARNORD.

Note. This WARNORD is traditionally known as WARNORD #3. It might not be the third WARNORD published, but Soldiers might use this term.

Perfection is the enemy of good enough for WARNORD #3. Competing priorities will exist to: (1) get WARNORD #3 out in enough time to be useful, and (2) put a lot of information into it. Reach the minimum standard listed above, and get it to subordinates as quickly as possible. The complete OPORD follows shortly, with the final details.

Technique. Staffs must constantly work on the WARNORDs and the OPORD to get both WARNORD #3 and the OPORD produced as quickly as possible. Any products created throughout the process must be in a format that can easily transfer into the WARNORD and OPORD. Making a product twice, such as one for the MDMP and one for publication, is usually time prohibitive.

STEP 7. ORDER PRODUCTION, DISSEMINATION, AND TRANSITION

2-227. The purpose of the MDMP is to enable commanders and staffs to develop situational understanding and produce an operation plan or order. The previous six steps of the MDMP helped the commander and staff visualize a problem, create a concept to solve it, and refine a plan. With the selected COA, the staff completes the plan (anything not covered in COA analysis); issues the order; ensures understanding by subordinates, supporting units, and higher headquarters; and begins the transition from planning to preparation in the operations process. Figure 2-14 on page 70 depicts the purpose, inputs, processes, and outputs of orders production, dissemination, and transition.

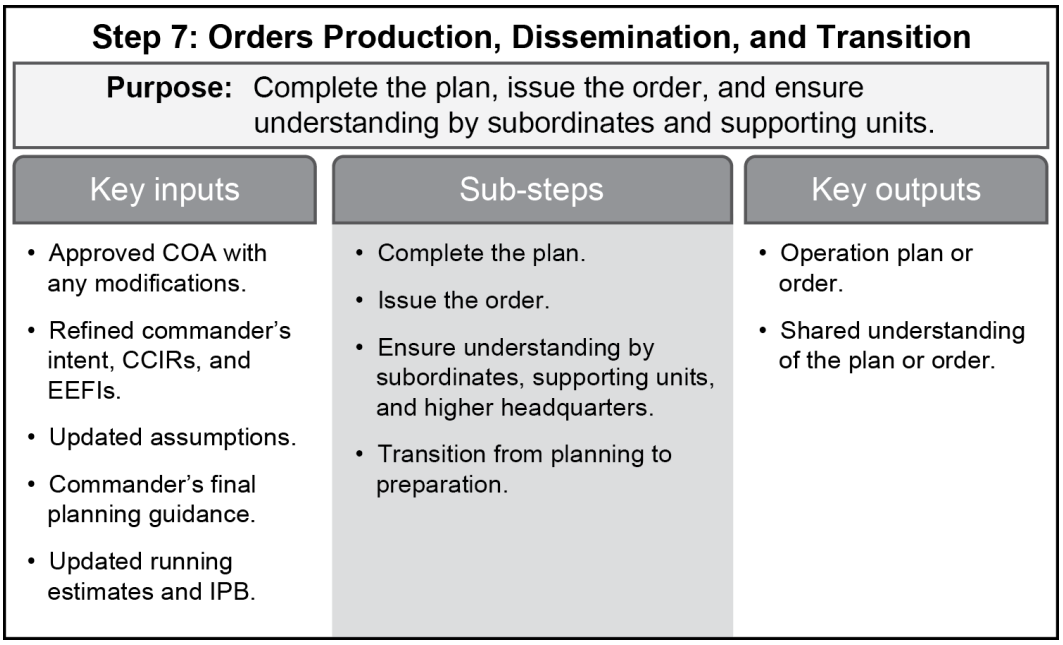


Figure 2-14. The MDMP Step 7. Orders production, dissemination and transition

2-228. The staff prepares an order or plan by molding the selected COA into a clear, concise OPORD. The COA statement becomes the concept of operations for the plan. The COA sketch becomes the basis for the operation overlay. The staff's running estimates become the starting point for the required annexes and input into the OPORD. **Planners use their knowledge, experience, skills, and judgement to fill in missing details for any part of the operation not analyzed during COA analysis** (see table 2-19 on page 73 for an example list of products required by a staff section). If time permits, the staff may conduct a more detailed COA analysis of the selected COA to synchronize the operation and complete the plan. This step is not done sequentially, and the staff needs to constantly work on the various WARNORDs and the OPORD to get them published in a timely manner.

Techniques: An *execution matrix* is a visual representation of subordinate tasks in relationship to each other over time (ADP 5-0). Planners use an execution matrix to ensure an entire operation is synchronized in time, space, and purpose. An execution matrix then helps planners develop tasks to subordinate units according to the timeline they have synchronized and deconflicted. Once an execution matrix is developed, planners or members of the current operations section take key information off the matrix, place the information on an execution checklist. The checklist is a shortcut that allows leaders to quickly see if an operation is developing in accordance with a commander's vision or if an operation is off course. If something is awry, leaders refer back to the execution matrix to determine what actions are needed to get the plan back on course. Figure I-5 on page 318 is an example of a blank execution matrix and table I-8 on page 319 is an example of a completed execution checklist.

2-229. Normally, the COS or XO coordinates with staff principals in assisting the operations or plans officer to develop the plan or order. Typically, the operations officer appoints one planner from the operations or plans section to compile all the staff's inputs. The COS, XO, or lead planner guides mission analysis regarding what the order should look like and what staff sections need to produce. **Staff sections ensure that critical information everyone needs to know is included in the base OPORD. Technical data, instructions, and specific guidance for subordinate staff members belong in their respective annexes.**

2-230. Prior to the commander approving of a plan or order, the staff ensures the plan or order is internally consistent and nests within the higher commander's intent. Staffs accomplish this through plans and order reconciliation and a plans and order crosswalk.

Plans and Orders Reconciliation

2-231. Plans and orders reconciliation occurs internally as the staff conducts a detailed review of the entire plan or order. Reconciliation ensures that the base plan or order, and all attachments, are complete and in agreement. It identifies discrepancies or gaps in planning. If staff members find discrepancies or gaps, they take corrective actions. Specifically, the staff compares the commander's intent, mission statement, and CCIRs against the concept of operations and schemes of support (such as scheme of fires or scheme of sustainment). Staffs ensure attachments are consistent with information in the base plan or order.

Technique. Staffs reconcile an order using two techniques. The first technique requires a key leader (operations officer, COS, XO, or lead planner) to read an order to ensure no discrepancies or gaps exist. The leader provides immediate guidance on how to fix any identified discrepancies or gaps. The second technique requires staff members to convene and brief the OPORD to a key leader. Each warfighting function briefs its part of the OPORD, and the key leader checks for consistency.

Plans and Orders Crosswalk

2-232. During a plans and orders crosswalk, the staff compares the plan or order with those of higher and adjacent commanders to achieve unity of effort and ensure the plan meets the superior commander's intent. The crosswalk identifies discrepancies or gaps in planning and, if found, staffs implement corrective actions.

Technique. During the MDMP, planners can collect plans of adjacent units to ensure plan synchronization. They inform a key leader of any identified discrepancies or gaps so the leader can assist in making appropriate decisions on corrective actions. A corrective action could be for a planner to change the plan or have an adjacent unit change theirs.

Approving a Plan or Order

2-233. The final action in developing a plan or order is approval of the plan or order by the commander. Commanders normally do not sign attachments, but they should review the attachments before signing the base plan or order. Commanders review and approve orders before the staff reproduces and disseminates them, unless commanders have delegated that authority.

Dissemination

2-234. Upon order approval, the staff disseminates the order to subordinate, higher, and adjacent units as appropriate. Dissemination can happen through several different mediums depending on time, security requirements, and technology capabilities. Ideally, the commander and staff brief-and provide a written copy of-an order in person to subordinate commanders.

2-235. If unable to brief subordinate commanders in person, the staff can send a digital copy of the order to subordinates; a written copy of the order via a special runner; or via normal logistics package (LOGPAC) operations. Once subordinate commanders have a copy of the order, the higher commander and staff conduct an OPORD brief via some form of technology such as CPOF, radio, or chat. The least preferred dissemination method for an order is voice only. An OPORD brief follows the format of the base OPORD, and the amount of detail included is tailored to the amount of time given to both prepare and brief.

Technique. Cutting and pasting the OPORD into slides is not the best technique for giving an OPORD brief. The brief should focus on maps, overlays, graphics, images, interactions between units, and critical events that increase the unit's shared understanding. While some direct lifts will be required (for example, tasks to subordinate units section), the staff should treat this like any other brief.

2-236. Upon receipt of the higher order, subordinates immediately acknowledge receipt. Usually, subordinates conduct confirmation briefings with the commander and staff immediately afterwards. A *confirmation brief* is a brief subordinate leaders give to the higher commander immediately after the operation order is given to confirm understanding (ADP 5-0). Subordinate leaders give a confirmation brief to the commander immediately after receiving the operation order. A confirmation brief ensures the commander that subordinate leaders understand—

- Commander's intent, mission, and concept of operations.
- Their unit's tasks and associated purposes.
- Relationship between their unit's mission and those of other units in the operation. Ideally, the commander conducts confirmation briefs in person with selected staff members of the higher headquarters present.

Transition

2-237. Orders production begins the transition between planning and preparation. The plans-to-operations transition is a preparation activity that occurs within a headquarters. It ensures that members of the current operations cell fully understand the plan before execution. During preparation, responsibility for developing and maintaining the plan shifts from the plans or future operations cell to the current operations cell. This transition is the point at which the current operations cell becomes responsible for controlling execution of the operation order. This transition enables the plans cell to focus its planning efforts on sequels, branches, and other planning requirements directed by the commander.

Table 2-19. The MDMP product overview

	Step 1		Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
	Mission receipt		**Mission analysis**	**COA development**	**COA analysis**	**COA comparison**	**COA approval**	**Produce order, dissemination, transition**
	Input	Output	Output	Output	Output	Output	Output	Output
Order products	Higher order or initial planning guidance	WARNORD #1	MA brief, WARNORD #2	COA DEV brief, COA statement and sketches	COA analysis brief (optional)	COA decision brief	COA approval brief, WARNORD #3	Order with appropriate annexes as directed by the leadership in receipt of mission
Leadership (CDR, XO/CoS, OPT lead)		Initial planning guidance, draft timeline	COA planning guidance, refined timeline	Draft DSM/DST per COA	Refined DSM/DST per COA		Approved DSM/DST	
Movement and maneuver		Initial running estimates	Initial FFIR, initial task org	Initial annex L, refined FFIR, task org per COA, scheme of maneuver per COA	Refined COA, refined annex L		Approved: COA, task org, FFIR, annex L	
Intelligence		Initial running estimates	MCOO, enemy SITEMP, IPB, initial PIR, information collection Plan	Updated information collection matrix, IC plan	Refined IC synch matrix, IC plan		Approved IC synch matrix, IC plan, approved concept of intel	
Fires		Initial running estimates	Initial fire support tasks	Draft HVT, HPTL, target selection standards, attack guidance matrix, targeting synchronization matrix, FSCMs	Refined HVT, HPTL, target selection standards, scheme of fires, draft fire support execution matrix	Draft: scheme of fires, fire support execution matrix, target list worksheet, target overlay, observer plan, target synchronization matrix, FSCMs, NAI/TAIs	Scheme of fires, fire support execution matrix, target list worksheet, target overlay, observer plan, target synchronization matrix, FSCMs, NAI/TAIs	
Protection		Initial running estimates	Initial EEFI, draft risk management, recommended CAL	Updated CAL, draft DAL, initial protection priorities	Initial DAL, refined EEFI, initial risk management and tolerance decision point matrix		DAL, EEFI, protection priorities, Approved concept of protection	
Sustainment		Initial running estimates		Initial concept of sustainment	Refined concept of sustainment		Approved concept of sustainment	
Command and Control		Initial running estimates		Initial concept of C2	Refined concept of C2		Approved concept of C2	
Other			Evaluation criteria					

Notes:
- Running estimates are developed and enduring for the entire operations process, which includes planning
- Fires may prepare a targeting synchronization matrix for each course of action or may use the high-payoff target list, target selection standards, and attack guidance matrix for COA analysis and prepare a combined targeting synchronization matrix for only the approved course of action

INTEGRATING PROCESSES

2-238. Commanders and staffs integrate the warfighting functions and synchronize the force to adapt to changing circumstances throughout the operations process. They use several integrating processes to do this. An integrating process consists of a series of steps that incorporate multiple disciplines to achieve a specific end. For example, during planning, the MDMP integrates the commander and staff in a series of steps to produce a plan or order. Key integrating processes that occur throughout the operations process include—

- Intelligence preparation of the battlefield.
- Information collection.
- Targeting.
- Risk management.
- Knowledge management.

2-239. This publication describes in further detail intelligence preparation of the battlefield (see paragraph 2-240), IC (see paragraph 2-312), and targeting (see paragraph 2-348). For more information on risk management see ATP 5-19. For additional information on knowledge management see ATP 6-01.1. Figure 2-15 shows key products developed from the MDMP, IPB, IC, and targeting and how the processes interrelate.

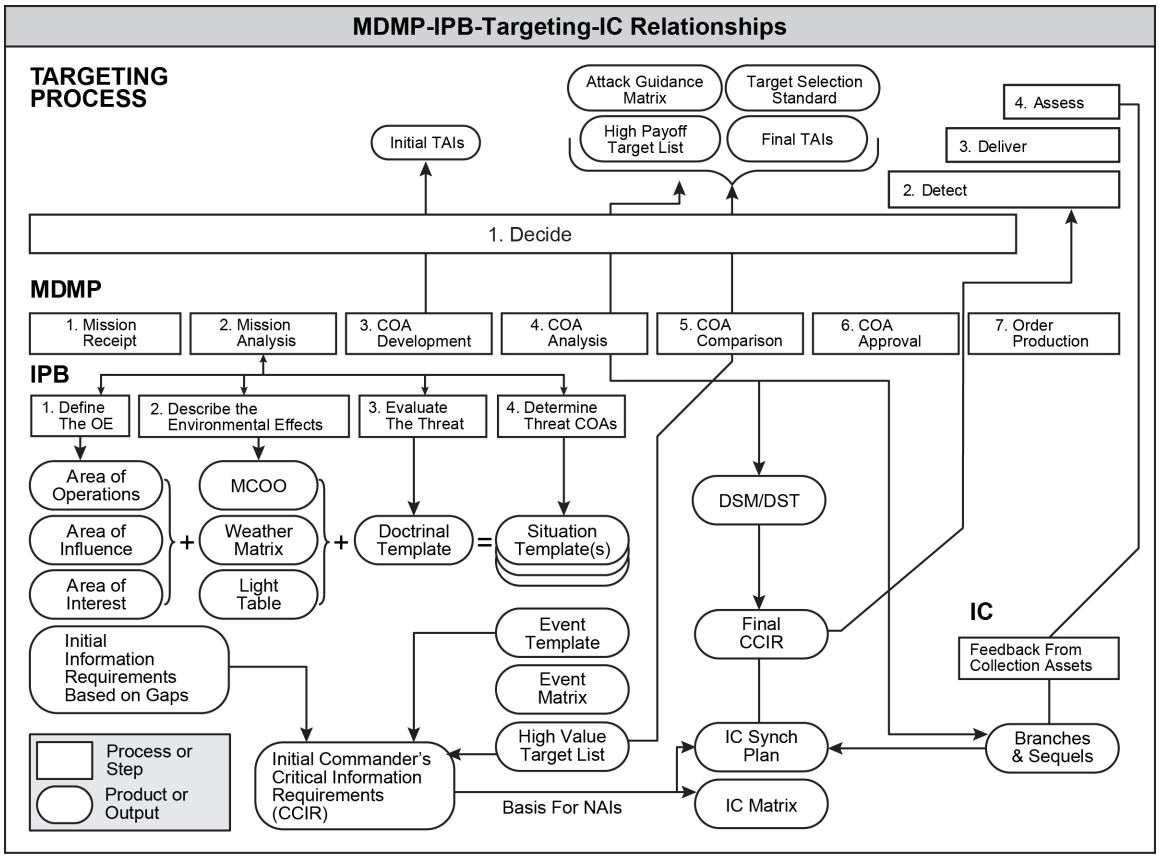


Figure 2-15. The MDMP-IPB-Targeting-IC relationships

INTELLIGENCE PREPARATION OF THE BATTLEFIELD

2-240. IPB is an iterative process consisting of four steps: (1) define the operational environment, (2) describe environmental effects on operations, (3) evaluate the threat, and (4) determine threat COAs. The intelligence officer leads the staff through the IPB process.

2-241. The outputs, or products, from the IPB process are the intelligence staff's running estimates. These estimates are continuously updated based on changes in the operating environment. The other staff sections assist the intelligence staff in developing the IPB products required for planning. IPB supports the MDMP, targeting, and other warfighting functions. This section is primarily derived from FM 2-0 and ATP 2-01.3 (see table 2-20 on pages 75–76 for an overview of the IPB process).

Table 2-20. Intelligence preparation of the battlefield steps

ATP 2-01.3

Step 1. Define the operational environment
Identify the limits of the commander's AO: • Generally identified by higher headquarters. • Identified by the operations officer.
Identify the limits of the commander's AOI: • Intelligence officer recommends changes. • Commander approves or disapproves. • Higher headquarters approves or disapproves.
Identify significant characteristics within the AO and AOI for further analysis: • Enemy. • Terrain. • Weather. • Civil Considerations.
Evaluate current operations and holdings to determine additional information needed to complete IPB: • Staff identifies information gaps. • Staff develops assumptions for information gaps.
Initiate process necessary to acquire the information needed to complete IPB: Staff sections submit requests for information and IC.
Note. An operational environment encompasses physical areas and factors of the air, land, maritime, space, and cyberspace, and the information environment. IPB applies to the full range of Army operations. Ensure to consider all domains when defining the operational environment.
Step 2. Describe environmental effects on operations
Describe how the threat can affect friendly operations (IBP products—threat overlay, threat description table): • Regular. • Irregular. • Hybrid.
Describe how terrain can affect friendly and threat operations (IPB products—MCOO, terrain effects matrix): • Observation and fields of fire. • Avenues of approach. • Key terrain. • Obstacles. • Cover and concealment.

Table 2-20. Intelligence preparation of the battlefield steps *(continued)*

Describe how weather can affect friendly and threat operations (IPB products—operational climatology and weather forecast chart, light and illumination data table, weather effects matrix, and operational impacts chart): • Visibility. • Precipitation. • Temperature. • Atmospheric pressure. • Wind. • Cloud cover and ceiling. • Humidity. • Sea State
Describe how civil considerations (ASCOPE and PMESII-PT) can affect friendly and threat operations (IPB products—civil considerations data file, civil considerations overlay, civil considerations assessment): Areas Structures Capabilities Organization People Events Political Military Economic Social Information Infrastructure Physical Environment Time
Step 3. Evaluate the threat
Identify threat characteristics and order of battle (IBP products—threat characteristics and order of battle files).
Create or refine threat models (IPB products—threat template, high-value target list): • Convert threat doctrine or patterns of operations to graphics. • Describe the threat's tactics, options, and peculiarities. • Identify high-value targets.
Identify threat capabilities and limitations (IPB products—threat capability statement): • Identify threat capabilities by creating statements. • Identify other threat capabilities.
Step 4. Determine threat courses of action
Develop threat courses of action (IPB products—SITEMP, threat COA statement).
Develop the event template and matrix (IPB products—event template, event matrix).

STAFF COLLABORATION

2-242. Intelligence officers facilitate IPB, but these intelligence officers and their staff members cannot provide all IPB information the commander requires for situational understanding. Other staff sections or supporting elements also help the intelligence staff produce and continually refine IPB products. Total staff integration reduces the initial time required for IPB development, assists the commander in timely decision making, improves the quality and accuracy of IPB products, and creates a better understanding of how threats may execute certain COAs and how friendly forces can counter threat actions.

Technique. A technique for total staff integration is known as reverse IPB. Generally, the intelligence officer (with the COS or XO) identifies areas of emphasis among the staff that need coverage during IPB steps 1-3. Prior to starting IPB, the intelligence officer provides the staff with a general scheme the enemy is likely to employ, based on analysis from higher headquarters and initial discussions with the operations officer and the commander. This initial "IPB guidance" does not need to be provided immediately but should be given as soon as possible. This guidance includes—

- Terrain factors (observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment—OAKOC), to include in the MCOO.
- Population factors (political, military, economic, social, information, infrastructure, physical environment, and time (PMESII-PT)), to include culture and history.
- Enemy factors (task, purpose, and capabilities by warfighting function and nesting diagram).
- Neutral force factors such as task and purpose, capabilities, and disposition.
- Friendly non-U.S. forces to include task and purpose, capabilities, and disposition.

The operations section concurrently begins substeps 3–6 of mission analysis to examine friendly disposition; specified, implied, and essential tasks; constraints; facts; and assumptions. After a designated period of time, the IPB guidance is briefed to the commander in the following format (unless noted, the agenda below is briefed by the intelligence section):

- Orientation to AO and terrain (briefed by the terrain team or intelligence section).
- Orientation to neutral and friendly forces.
- Enemy higher headquarter's two levels up task and purpose.
- Enemy higher headquarter's task and purpose.
- Enemy general scheme of maneuver.
- Subject matter experts brief the enemy's main capabilities (strengths) and vulnerabilities. They also provide their analysis of how enemy capabilities will get incorporated into the enemy COA. Subject matter experts brief in the following order:
  - Movement and maneuver.
  - Fires.
  - Air (rotary and fixed wing).
  - Intelligence.
  - Protection.
  - Sustainment.
  - Command and control.
  - Integration with irregular forces.
  - Information and messaging.
- Enemy event matrix and template.

Following the brief, the intelligence section develops the enemy commander's DSM, confirms the task and purpose nesting diagram, and synthesizes the enemy COA. The intelligence section then finalizes mission analysis briefing products while the rest of the staff shifts to "blue" planning. The COS or XO ensures that staffs' collaborative IPB becomes part of the unit SOP and is included during mission analysis of the MDMP. Table 2-21 on page 78 depicts example staff sections' input to IPB products (staffs' input is mission dependent and not all-inclusive).

Table 2-21. Example staffs' input to IPB products

FM 2-0

Staff section	*Intelligence preparation of the battlefield input*
All staff sections. Provide subject matter expertise to assist in determining (but not limited to) the following:	Enemy objectives and desired end state. Named areas of interest. High-value targets. High-payoff targets. Decision points.
Intelligence officer. Leads the IPB effort and has staff responsibility for analyzing the mission variables of enemy, terrain and weather, and civil considerations.	Threat doctrine, tactics, equipment, capabilities, vulnerabilities, and intent. Threat systems. Identification of areas of interest and areas of influence. Terrain analysis. Determination of threat courses of action.
Operations officer. Provides subject matter expertise on the art and science of military operations. Evaluates IPB products to ensure they support friendly COA development and analysis.	Operational experience. Assistance in determining— Target areas of interest. Engagement areas. Time phase lines. Relative combat power matrices for friendly and enemy forces.
Chief of fires (division and above) **Fires support officer** (brigade and below). Provides subject matter expertise on fires.	Threat fires doctrine, tactics, equipment, capabilities, vulnerabilities, and intent. Assistance in selecting— Target areas of interest. Electromagnetic attack. Decision points. Time phase lines.
Engineer officer. Provides subject matter expertise on mobility and countermobility and assists the intelligence section in developing enemy obstacle plans for the enemy SITEMP.	Threat engineer doctrine, tactics, equipment, capabilities, vulnerabilities, and intent. Terrain analysis. Mobility corridors. OAKOC (observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment) factors. Obstacle locations.
Logistics Officer. Provides subject matter expertise on sustainment operations.	Threat logistics doctrine, tactics, equipment, capabilities, vulnerabilities, and intent. Threat supply and resupply routes and points.
Signal Officer. Provides subject matter expertise on friendly communications systems and assists the intelligence section in identifying and evaluating friendly communications systems' vulnerabilities to cyberspace and electromagnetic attack. Threat employment of communications systems.	Threat communications networks and nodes. Threat communications vulnerabilities. Line of sight analysis.
Civil Affairs Officer. Provides subject matter expertise on civil affairs operations.	Evaluation of civil considerations on military operations. ASCOPE (areas, structures, capabilities, organizations, people, and events) analysis. PMESII-PT (political, military, economic, social, information, infrastructure, physical environment, and time) analysis. Civil considerations overlays.

STEP 1. DEFINE THE OPERATIONAL ENVIRONMENT

2-243. Defining the operational environment results in the identification of significant characteristics of the operational environment that can affect friendly and enemy operations. This step also results in the identification of gaps in current intelligence.

2-244. **Step 1 of IPB is important because it assists the commander in defining relative aspects of the operational environment in time and space.** During Step 1, the intelligence staff identify those significant characteristics related to the mission variables of enemy, terrain, weather, and civil considerations relevant to the mission and justify that analysis to the commander. Misidentifying or failing

to identify the effect these variables may have on operations can hinder decision making and result in an ineffective IC strategy and targeting effort.

2-245. In addition to understanding friendly and enemy forces, defining significant characteristics of an operational environment is essential to completing IPB. Factors such as culture, languages, social (tribal) affiliations, and operational and mission variables can be equally important. Once approved by the commander, this information becomes the command's initial intelligence requirements and focuses the command's initial IC efforts and the remaining steps of the IPB process (see figure 2-16 for a depiction of Step 1 of the IPB process and how it sets the basis for continuing to Step 2 of the IPB process).

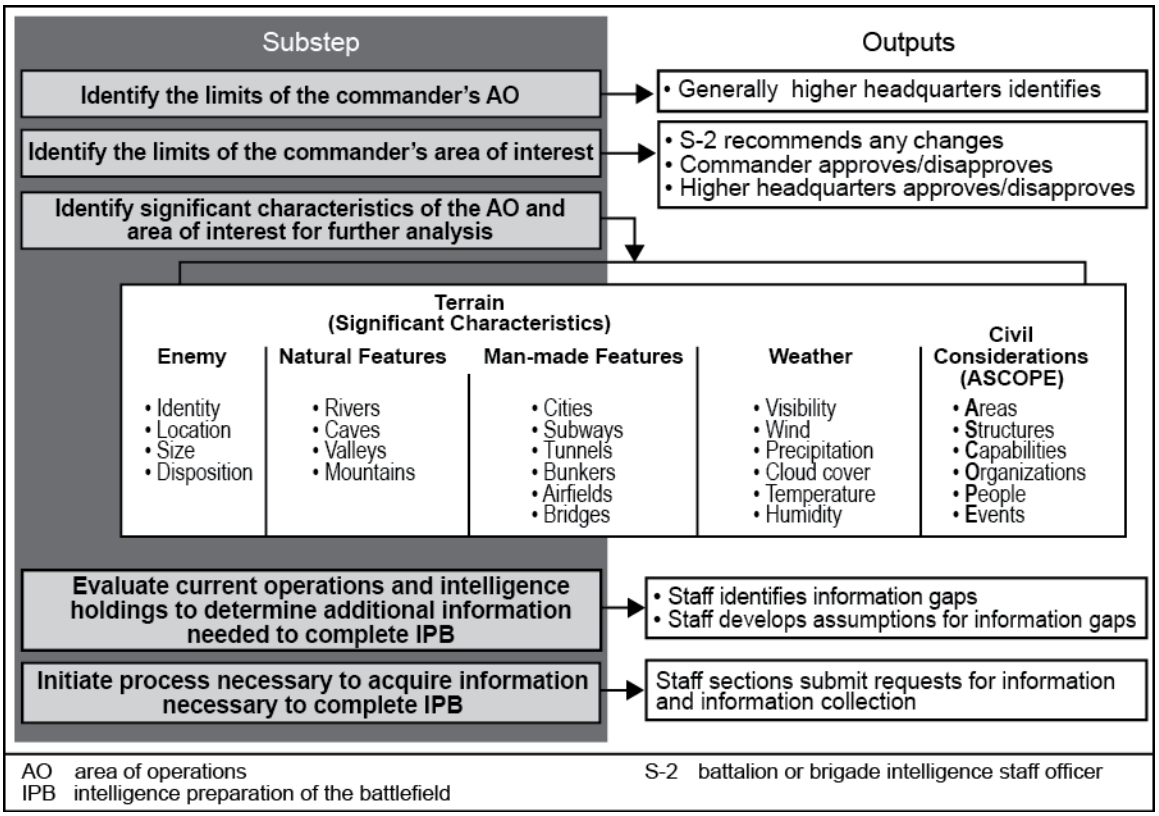


Figure 2-16. Step 1 of the IPB process

2-246. An *area of operations* is an operational area defined by a commander for land and maritime forces that should be large enough to accomplish their missions and protect their forces. Also called AO (JP 3-0). The AO comprises an external boundary that delineates the AO from adjacent units and includes subordinate unit AOs. A subordinate unit AO may be contiguous or noncontiguous. Figure 2-17 on page 80 depicts an AO. To describe the physical arrangement of forces in time, space, and purpose, commanders can designate the following:

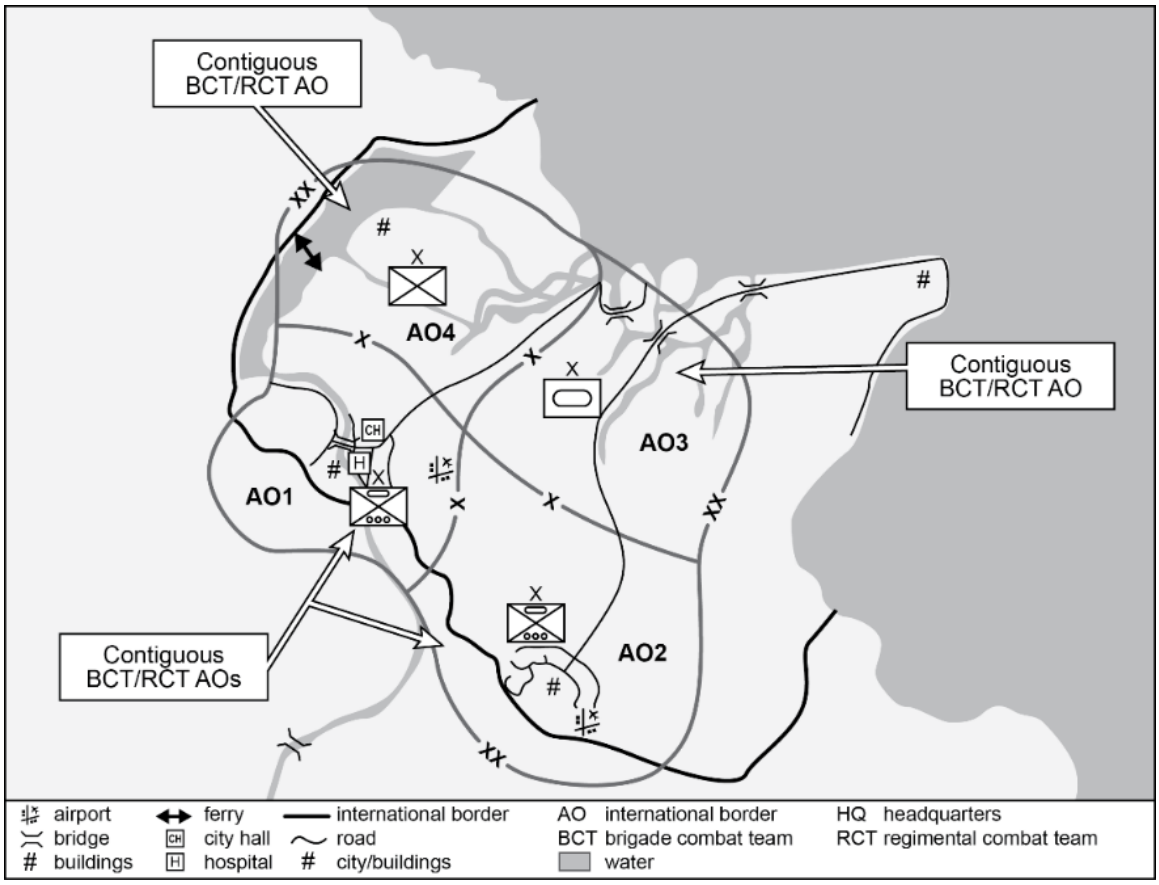
- The *deep area* is where the commander sets conditions for future success in close combat (ADP 3-0).
- The *close area* is the portion of the commander's area of operations where the majority of subordinate maneuver forces conduct close combat (ADP 3-0).
- The *consolidation area* is the portion of the land commander's area of operations that may be designated to facilitate freedom of action, consolidate gains through decisive action, and set conditions to transition the area of operations to follow on forces or other legitimate authorities (ADP 3-0).

- The *support area* is the portion of the commander's area of operations that is designated to facilitate the positioning, employment, and protection of base sustainment assets required to sustain, enable, and control operations (ADP 3-0).

2-247. An *area of influence* is a geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control (JP 3-0). The intelligence and operations officers determine the area of influence, which includes terrain inside and outside the AO (see figure 2-17).

2-248. An *area of interest* is that area of concern to the commander, including the area of influence, areas adjacent thereto, and extending into enemy territory. Also called AOI (JP 3-0). This area also includes areas occupied by enemy forces who could jeopardize the accomplishment of the mission. The AOI is—

- Established by the commander with input from the intelligence or operations sections that consider mission variables in the selection of AOIs.
- Normally, an area larger than or outside the area of influence that directly impacts the AO, possibly requiring more intelligence assets to monitor. It may include staging areas.
- An area that may be irregular in shape and overlaps the areas of adjacent and subordinate unit AOs.
- An area that assists in determining NAIs during Step 4 of the IPB process.



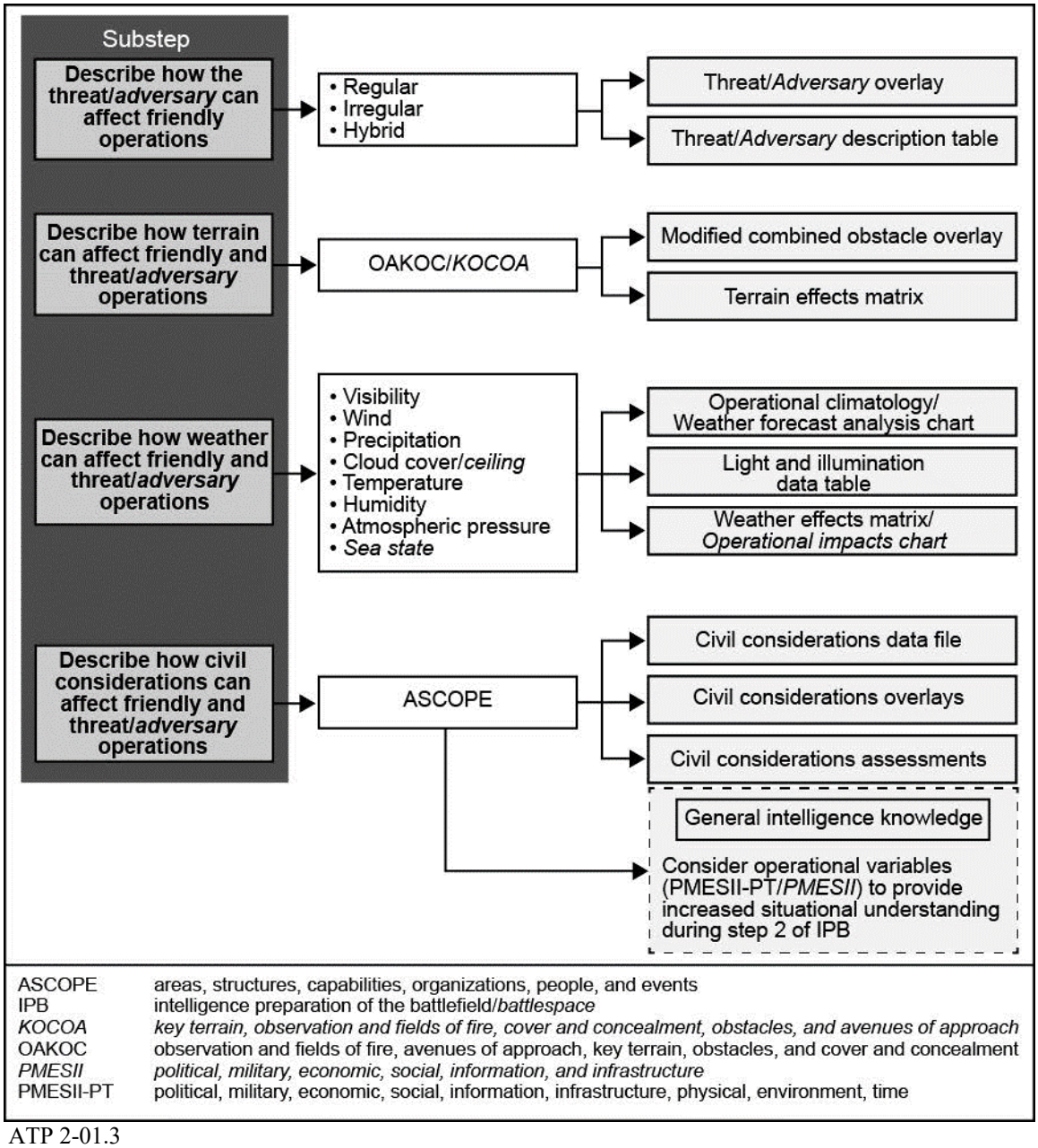
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Figure 2-17. Area of operations example

STEP 2. DESCRIBE THE ENVIRONMENTAL EFFECTS ON OPERATIONS AND DESCRIBE THE EFFECTS ON OPERATIONS

2-249. Once the intelligence staff has completed Step 1 of IPB, the staff identifies significant characteristics of an operational environment related to enemy, terrain, weather, and civil considerations. **Step 2 of IPB describes how these characteristics affect friendly operations.** The intelligence staff also describes how terrain, weather, civil considerations, and friendly forces affect enemy forces. Their evaluation focuses on the general capabilities of each force until threat COAs are developed in Step 4 of IPB. Friendly COAs are developed later in the MDMP. Finally, the entire staff determines the impact and effects of friendly and enemy force actions on a population.

2-250. If the intelligence staff does not have the information it needs to form conclusions, it uses assumptions to fill information gaps, while ensuring the commander understands when assumptions are used in place of fact to form conclusions and when those assumptions are expected to be confirmed (see figure 2-18 on page 82 for a depiction of Step 2 of the IPB process).

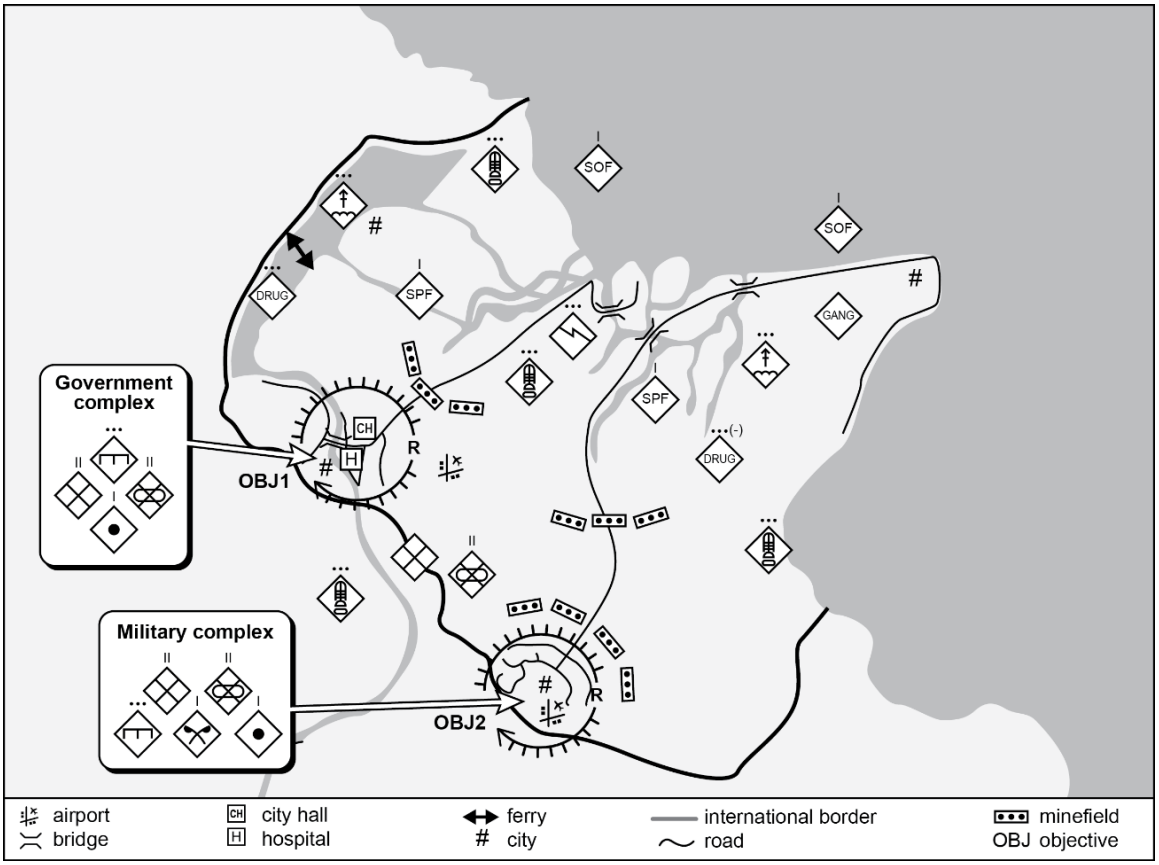


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Figure 2-18. Step 2 of the IPB process

Threat Overlay

2-251. The threat overlay depicts the current physical location of all potential threats in the AO and an AOI. It includes the identity, size, location, strength, and AO for each known enemy location. Figure 2-19 is an example of a threat overlay.



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Figure 2-19. Threat overlay example

Modified Combined Obstacle Overlay

2-252. The *modified combined obstacle overlay* is a joint intelligence preparation of the operational environment product used to portray the militarily significant aspects of the operational environment, such as obstacles restricting military movement, key geography, and military objectives. Also called MCOO (JP 2-01.3). Although not all inclusive, some specific aspects are—

- Friendly and enemy avenues of approach.
- Mobility corridors.
- Natural and constructed obstacles.
- Terrain mobility classifications.
- Key terrain.

2-253. An MCOO provides a basis for identifying mobility corridors and ground avenues of approach. An MCOO integrates all obstacles to vehicular movement—such as built-up areas, slope, soils, vegetation, and hydrology—into one overlay. It depicts areas that impede movement (severely restricted and restricted areas) and those areas where friendly and enemy forces can move unimpeded (unrestricted areas). The mission and a collaborative effort involving input from each staff section helps tailor the MCOO. Terrain is classified as severely restricted, restricted, and unrestricted. These terrain mobility classifications follow:

- **Severely restricted terrain** severely hinders or slows movement in combat formations without mobility enhancement. Mobility enhancement could consist of committing engineer assets to improve routes; deviating from doctrinal tactics, such as moving in columns instead of line formations; or maneuvering at speeds much lower than those preferred. Steep slopes and large or densely spaced obstacles with little or no supporting roads typically characterize severely

restricted terrain for armored and mechanized forces. Common techniques for depicting this type of terrain on overlays and sketches are to mark the areas with green cross-hatched diagonal lines or color-code them in red.

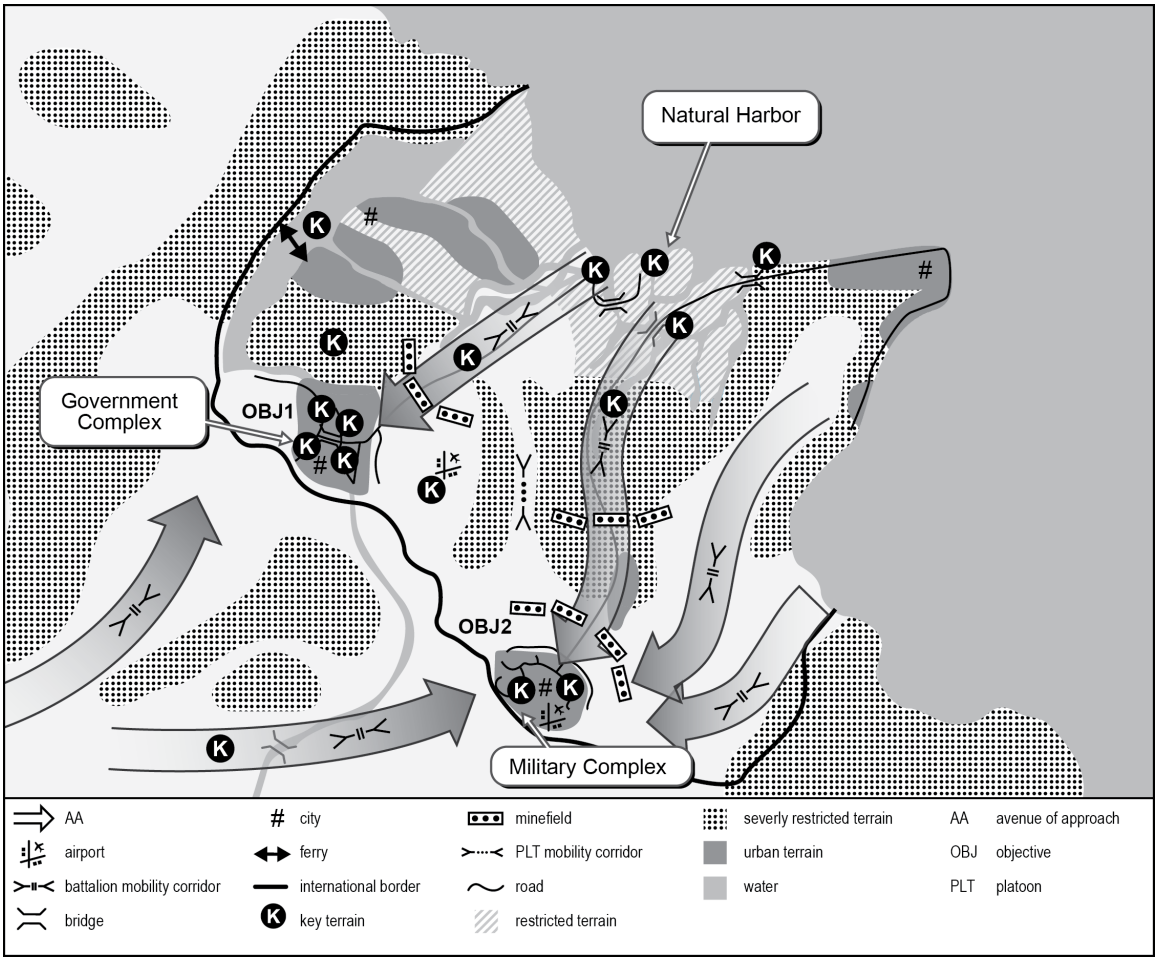
- **Restricted terrain** hinders movement to some degree. Improving mobility in restricted terrain takes little effort, but units may have difficulty maintaining preferred speeds, moving in combat formations, or transitioning from one formation to another. Restricted terrain slows movement by requiring zigzagging or frequent detours. Restricted terrain for armored or mechanized forces typically consists of moderate-to-steep slopes or moderate-to-densely spaced obstacles such as trees, rocks, or buildings. Swamps or rugged terrain are examples of restricted terrain for dismounted infantry forces. Logistical or sustainment area movement may be supported by poorly developed road systems. Common techniques for depicting restricted terrain on overlays and sketches is marking the areas with green diagonal lines or color-coding them in yellow.
- **Unrestricted terrain** is free from any restriction to movement. No mobility enhancements are needed. Unrestricted terrain for armored or mechanized forces is typically flat to moderately sloping terrain with scattered or widely spaced obstacles such as trees or rocks. Unrestricted terrain allows wide maneuver by forces and unlimited travel supported by well-developed road networks. No symbology is needed to show unrestricted terrain on overlays and sketches (see table D-3 on page 218 for examples of movement rates for mechanized or armored forces in severely restricted, restricted, and unrestricted terrain).

2-254. Terrain mobility classifications reflect the relative effect of terrain on the different types and sizes of movement formations. The classifications reflect the ability of forces to maneuver in combat formations or transition from one type of formation to another. Consider the following:

- Obstacles are only effective if they are covered by observation and fires. However, even undefended obstacles may canalize an attacker into concentrations, which are easier to detect and target or defend against. Obstacles are often shown in green on map overlays.
- When evaluating the terrain's effect on more than one type of organization (for example, mounted or dismounted), obstacle overlays reflect the mobility of the particular force.
- Cumulative effects of individual obstacles should be considered in the final evaluation. For example, individually, a gentle slope or a moderately dense forest may be an unrestrictive obstacle to vehicular traffic. Together, the combination of the slope and dense forest might be restrictive.
- Account for how weather affects mobility (beginning in paragraph 2-257—how to evaluate weather effects).
- Classifying terrain into various obstacle types reflects only its relative impact on force mobility. Examples abound of forces surprising an enemy by negotiating supposedly "impassable" terrain.

2-255. Figure 2-20 is an example of an MCOO developed for natural terrain. For urban terrain, graphics typically depict—

- Population status overlays (population centers, urban areas, political boundaries).
- Logistics sustainability overlays.
- LOCs
- Route overlays (street names, patterns, and widths).
- Bridges (underpass and overpass information).
- Potential sniper and ambush locations (this data will likely be a separate overlay).
- Key navigational landmarks.



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Figure 2-20. Modified combined obstacle overlay example

Terrain Effects Matrix

2-256. A terrain effects matrix is helpful in explaining an analysis of the terrain. Using the MCOO as a guide, a terrain matrix describes the military aspects of terrain on friendly and threat operations. The military aspects of terrain are evaluated by identifying OAKOC. Key terrain is often selected as a decisive point and a tactical-level or operational-level objective. Evaluate the other four military aspects of terrain first; then integrate those results to identify and assess key terrain. For example, key terrain might include a range of hills with good observation and fields of fire overlooking an area providing adversary forces a number of high-speed avenues of approach (see table 2-22 on page 86 for an example terrain effects matrix).

Table 2-22. Terrain effects matrix example

OAKOC factor (military aspects of terrain)	*Terrain effects examples*
Observation and fields of fire	Sparse vegetation on generally flat desert terrain with observation of 3 to 5 kilometers. There are 10 kilometers between intervisibility lines. Limited air support observation due to sparse terrain and the Earth's curvature. Fields of fire for direct fire are 300 to 500 meters for small arms. Intermediate breaks in observation and fields of fire due to runoffs and cuts. Likely engagement areas.
Avenues of approach (AAs)	Primary and secondary road systems for high AAs. Generally flat terrain with brigade-sized mobility corridors between small villages. Railroad in the north running east to west. AA2 is the recommended AA due to its ability to place organic weapon systems in range before observation from the enemy in the defense.
Key terrain	Airfield used as resupply and troop movements. Dam controls water flow on the river and is the primary objective of the threat.
Obstacles	Restrictive runoffs and cuts run throughout the AO with an average depth of 5 to 10 feet and an average width of 20 feet that runs 6 to 10 kilometers long. Above-ground oil and transport pipeline (on severely restrictive terrain) that runs through the central width of the AO.
Cover and concealment	Cover by direct fire systems is provided by intervisibility lines. Concealment is limited by the open terrain and sparse vegetation.

Analyze the Military Aspects of Weather

2-257. Weather parameters (or weather variables) that may impact military operations include, but are not limited to, visibility, wind, precipitation, clouds, temperature, humidity, atmospheric pressure, and sea state. Planners must understand the weather-limiting thresholds across the Army warfighting functions and based on current and forecast weather parameters, determine the specific weather-associated effects on Army warfighting capabilities and integrate these limits into the MDMP.

Visibility

2-258. Visibility refers to the greatest distance that prominent objects can be seen and identified by the unaided, normal eye. Available light is used to evaluate visibility considering the following factors:

- *Begin morning nautical twilight* is the start of that period where, in good conditions and in the absence of other illumination, the sun is 12 degrees below the eastern horizon and enough light is available to identify the general outlines of ground objects and conduct limited military operations. Also called BMNT (JP 3-09.3). Light intensification devices are still effective and may have enhanced capabilities.
- Sunrise is the apparent rising of the sun above the horizon. Rising times depend on latitude.
- Sunset is the apparent descent of the sun below the horizon. Setting times depend on latitude.
- *End of evening nautical twilight* is the point in time when the sun has dropped 12 degrees below the western horizon, and is the instant of last available daylight for the visual control of limited military operations. Also called EENT (JP 2-01.3). At end of evening nautical twilight, no further sunlight is available.
- Moonrise is the time at which the moon first rises above the horizon. Rising times depend on latitude.
- Moonset is the time at which the moon sets below the horizon. Setting times depend on latitude.

2-259. Other weather conditions can affect visibility as well. Temperature can affect the use of thermal sights. Cloud cover and ceiling can negate illumination provided by the moon. Precipitation and other obscurants have varying effects as well. Low visibility is beneficial to offensive and retrograde operations because it conceals maneuver forces, thus enhancing the possibility of surprise. Low visibility hinders the defense because cohesion and control become difficult to maintain, it impedes reconnaissance operations and it degrades target acquisition.

Wind

2-260. Wind of sufficient speed from any direction can reduce the combat effectiveness of a force as a result of blowing dust, smoke, sand, or precipitation. **Wind direction is the direction from which the wind is blowing.** For example, a southerly wind blows from south to north. Strong winds and wind turbulence limit airborne, air assault, and aviation operations. High winds near the ground can lower visibility due to blowing dust; they also can affect movement or stability of some vehicles. Blowing sand, dust, rain, or snow reduces the effectiveness and stability of radars, antennas, communications, and other electronic devices. High winds can also affect persistent friendly and threat detection systems like an aerostat or unmanned aircraft systems (UASs). Evaluation of weather to support operations requires information on the wind at the surface as well as at varying altitudes and elevations. Winds also affects the use of smoke for obscuration and chemical, biological, radiological, and nuclear effects (CBRN).

Precipitation

2-261. Precipitation is any moisture falling from a cloud in frozen or liquid form. Rain, snow, hail, drizzle, sleet, and freezing rain are common types. Precipitation affects soil trafficability, visibility, and the functioning of many electro-optical systems needed for IC. Heavy precipitation can have an effect on all types of military operations.

Cloud Cover and Ceiling

2-262. Cloud cover and ceiling affects ground operations by limiting illumination and can affect the thermal signature of targets. Heavy cloud cover and ceiling can degrade many intelligence sensors, target acquisition systems, and general aviation operations. Conversely, low cloud cover and ceiling may increase the available level of light where ground-based light exists, such as urban areas. Excessive low cloud cover and ceiling may restrict visibility and limit safe aviation operations.

2-263. Cloud cover and ceiling means the height above the Earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as broken, overcast, or obscured and not classified as thin or partial. A ceiling listed as "unlimited" means that the sky is clear or is free of any substantial cloud cover.

Temperature

2-264. Temperature extremes can reduce the effectiveness of troops and equipment capabilities and affect the timing of combat operations and major operations. Extremely high temperatures in a desert environment may require dismounted troops to operate at night. High temperatures can affect the lift capability of medium-rotary-lift assets in high altitudes and elevations. High temperatures can increase fuel consumption in vehicles, cause overheating, and affect the muzzle velocity of both direct and indirect fire weapons (155 millimeter howitzers, sniper rifles, and tanks).

2-265. *Thermal crossover* is the natural phenomenon that normally occurs twice daily when temperature conditions are such that there is a loss of contrast between two adjacent objects on infrared imagery (JP 3-09.3). Stated another way, thermal crossover is the condition in which the temperature of a ground-based vehicle is close to, if not the same as, the surrounding land. As a result of this condition, thermal optics are unable to detect enemy vehicles until a temperature disparity exists between the land and the vehicles. Using target acquisition weather software, meteorological and oceanographic personnel can forecast for thermal crossover and determine specific times that the phenomenon will occur.

Humidity

2-266. Humidity is the water vapor content of the atmosphere, usually expressed as either relative humidity or absolute humidity. High humidity affects the human body's ability to cool off. Troops in tropical areas may become less effective due to higher humidity levels.

Atmospheric Pressure (as Required)

2-267. Atmospheric pressure significantly impacts aviation operations. Based on the elevation of the operational area, atmospheric pressure affects the lift capacity of aircraft, especially rotary-wing and

tiltrotor aircraft in mountainous terrain. When combined with extreme temperatures, atmospheric pressure increases the amount of runway an aircraft requires for takeoff (see FM 3-04 for information on aircraft operations).

Sea State

2-268. *Sea state* is a scale that categorizes the force of progressively higher seas by wave height (JP 4-01.6). Stated another way, sea state is the general condition of the surface on a large body of water with respect to wind waves and swell at a certain location and moment. The sea state—

- Is characterized by statistics, including the wave height, period, and power spectrum.
- Varies with time, as the wind conditions or swell conditions change.
- Can either be assessed by an experienced observer, like a trained mariner, or through instruments such as weather buoys, wave radar, or remote sensing satellites.

See table 2-23 for sea state data.

Table 2-23. Douglas sea state scale

World Meteorological Organization

Douglas sea scale degree	*Height (m)*	*Description*	*Douglas sea scale degree*	*Height (m)*	*Description*
0	No wave	Calm (glassy)	5	2.5–4	Rough
1	0–0.1	Calm (rippled)	6	4–6	Very Rough
2	0.5	Smooth	7	6–9	High
3	0.5–1.25	Slight	8	9–14	Very High
4	1.25–2.5	Moderate	9	14+	Phenomenal

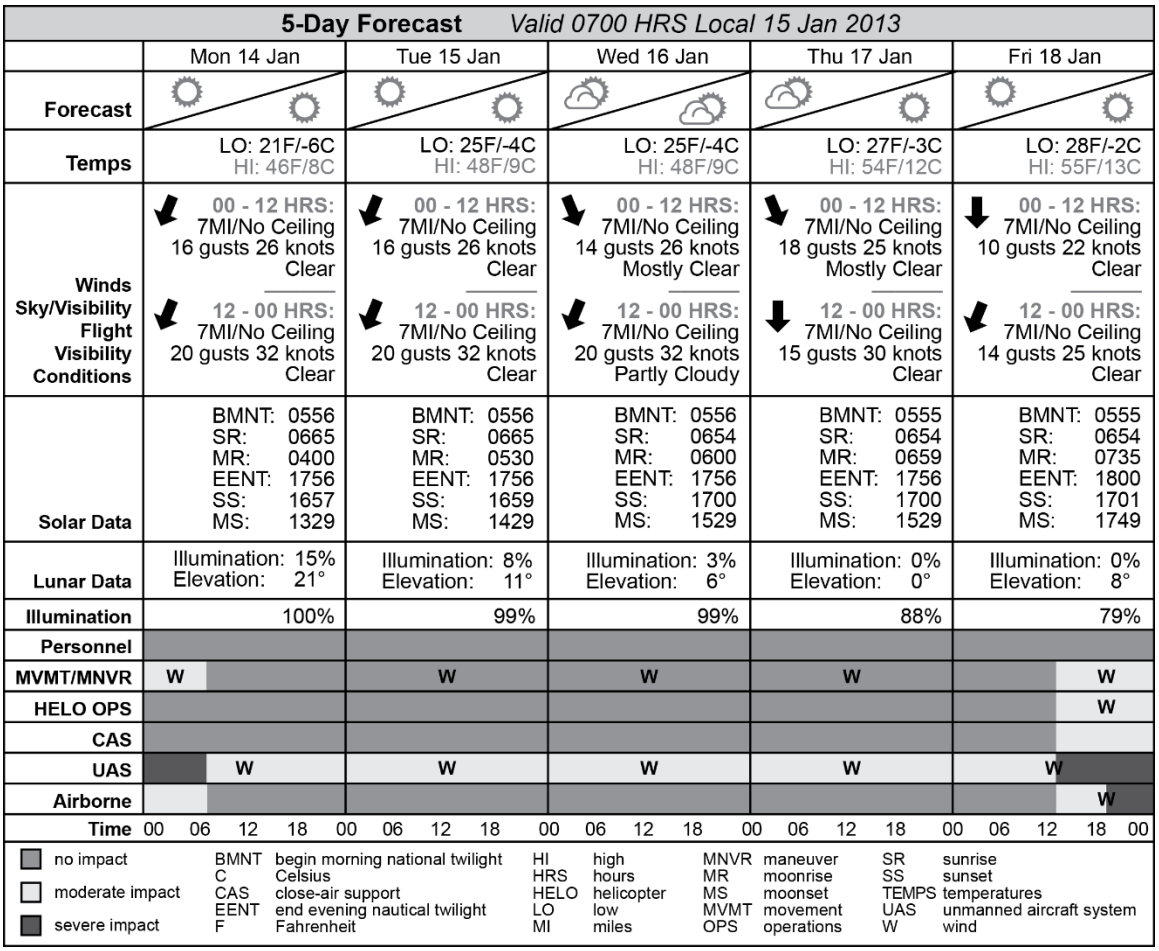
Evaluate the Effects of Weather on Military Operations

2-269. Weather and climate have direct and indirect effects on military operations. The following are examples of direct and indirect effects on military operations:

- Temperature inversions might cause some battle positions to be more at risk to the effects of chemical agents as a result of atmospheric ducting, a process that occurs when strong high pressure influences an area and prevents particulates from dispersing into the upper atmosphere.
- Local visibility restrictions, such as fog, can have an effect on observation for both friendly and threat forces. Severe restrictions to visibility often restrict aviation operations.
- Hot, dry weather might force friendly and threat forces to consider water sources as key terrain.
- Wind determines all CBRNE planning for avoiding dirty sites and establishing clean sites.
- Dense, humid air limits the range of loudspeaker broadcasts affecting sonic deception, surrender appeals to enemy forces, and the ability to provide instruction to friendly or neutral audiences.
- Sandstorms with high silica content may decrease the strength and clarity of radio and television signals.
- Altitude and high heat can affect the ability of military equipment to operate at maximum (or optimal) capacity. For example, in some locations during the summer months of Operation Enduring Freedom in Afghanistan, the UH-60 helicopter was unable to carry its full complement of passengers.

See appendix N for more discussion on environmental considerations.

2-270. Weather effects matrices and operational impacts charts are guides for determining weather effects on personnel, weapons, and equipment needed for planning and operations (figure 2-21 is an example of a weather forecast and impacts chart).



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Figure 2-21. Weather forecast and impacts chart example

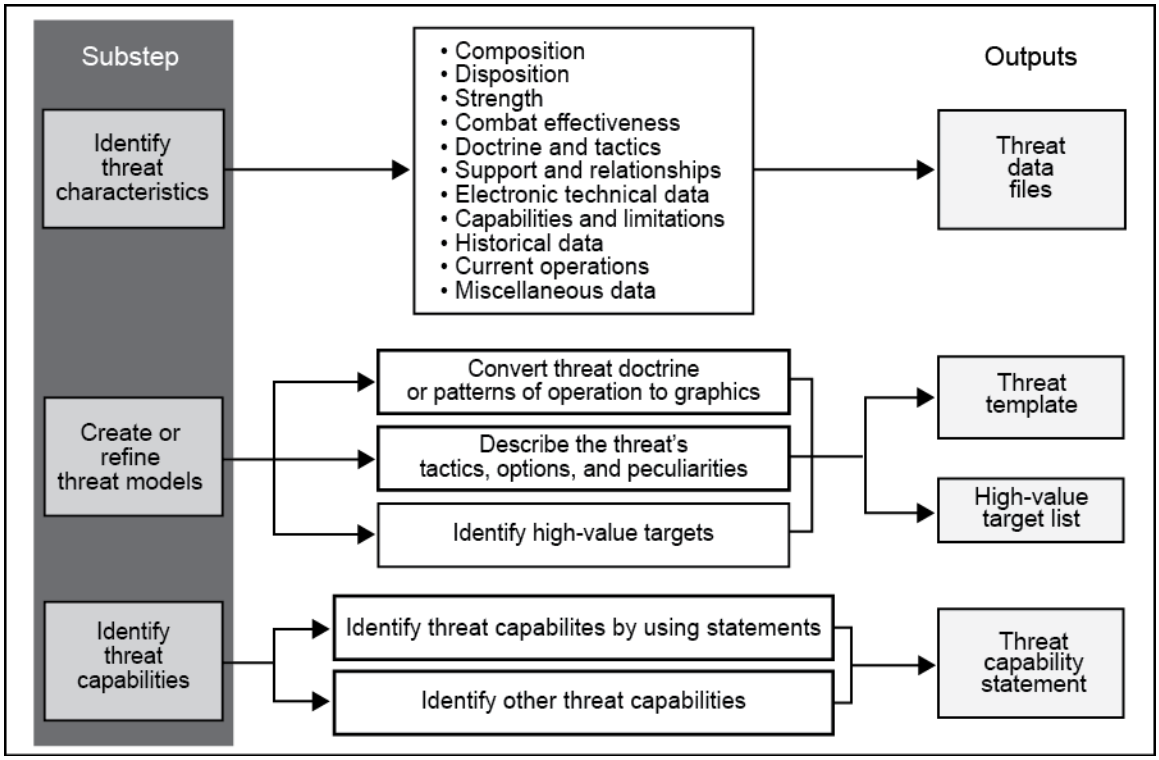
Analyzing Civil Impacts on Operations

2-271. Analyzing civil considerations impacts several aspects of operations, including selection of objectives; location, movement, and control of forces; use of weapons; and protection measures. The intelligence staff should leverage the rest of the staff, and outside agencies who have expertise in civil considerations to analyze intelligence in this area. Leverage nonorganic units, agencies, organizations, or Services that are not deploying with the unit, but have relevant regional knowledge, to assist in generating intelligence. These assets can be especially useful when analyzing cyberspace considerations, which may not be an organic area of expertise in intelligence staffs.

STEP 3. EVALUATE THE THREAT

2-272. **The purpose of evaluating the threat is to understand how it can affect friendly operations.** Although threat forces may conform to some of the fundamental principles of warfare that guide Army operations, these forces have obvious, or subtle, differences in how they approach situations and problem solving. Understanding these differences is essential to understanding how a threat force will react in a given situation. Threat evaluation does not begin with IPB. The intelligence staff conducts threat evaluation and develops models as part of the generate intelligence knowledge task of support to force generation. Intelligence staffs refine these models as necessary to support IPB.

2-273. When analyzing a well-known threat, intelligence staffs may rely on previously developed models. When analyzing a new or less well-known threat, intelligence staffs may need to evaluate and develop models during the mission analysis step of the MDMP. When this occurs, the intelligence staff relies heavily on the threat evaluation conducted by higher headquarters and other intelligence agencies (see figure 2-22 for a depiction of Step 3 of the IPB process).



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Figure 2-22. Step 3 of the IPB process

Identify Threat Characteristics Order of Battle

2-274. During Steps 1 and 2 of the IPB process, the intelligence staff identifies and defines each individual threat within the AOI. During Step 3, the intelligence staff analyzes characteristics of, and develops threat models for, each of these threats.

2-275. Intelligence staffs consider 11 broad areas when analyzing threat characteristics order of battle: composition, disposition, strength, combat effectiveness, doctrine and tactics, support and relationships, electronic technical data, capabilities and limitations, current operations, historical data, and miscellaneous data (see MCTP 2-10B for a discussion on threat order of battle factors).

Technique: When operating against a new or emerging threat, the intelligence staff develops new data files for each of these threats. Other units' and organizations' data files may also assist the intelligence staff in developing products.

Composition

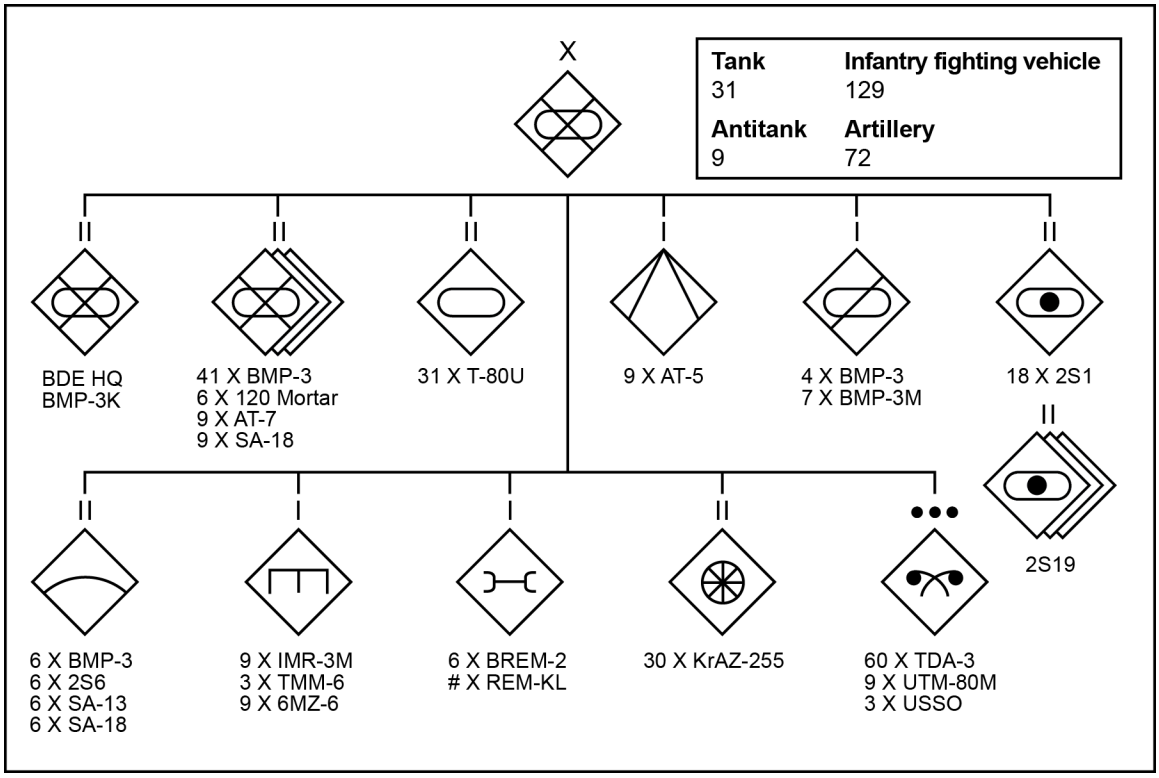
2-276. Composition describes a threat's identity, how it is commanded and controlled, and how it is organized and equipped: the number and types of personnel, weapons, and equipment available for a given operation. Staffs use line and block chart products to visually see a threat's composition. Understanding a threat's composition—

- Is essential in determining its capabilities and limitations.
- Assists in constructing threat models that assist in developing valid enemy COAs and friendly counteractions.
- Assists in determining a threat's combat effectiveness.
- Assists in conducting combat assessment.

2-277. Composition applies to specific units or commands, as opposed to types of units, and how an entity is commanded and controlled. Military forces have distinct and well-defined organizational structures generally built around a linear chain of command. These forces include air and ground forces that, regardless of national origin, generally follow a modern or contemporary military organizational model. Regular forces are normally self-identified and organized similarly to friendly forces. Irregular forces also have distinct and well-defined organizational structures, but are generally cellular in nature and directed through a decentralized chain of command usually unique to the area or conflict. Regardless of the type of threat, knowing its structure assists in understanding its capabilities and limitations.

Identifying Threat Forces

2-278. The identity and organization of forces belonging to the world's various nation-states are generally known by the U.S. intelligence community and maintained by the National Ground Intelligence Center. The National Ground Intelligence Center also maintains databases on non-state military capabilities such as paramilitary forces. Army special operations forces are able to provide information and intelligence on foreign paramilitary, conventional military, partisan, and non-state actor capabilities due to their unique and enduring placement and access in support of globally integrated operations and combatant commander campaign plans. This intelligence holding is vital to understanding the threat prior to armed conflict. U.S. intelligence staffs can access these data, as needed, to support respective commands. The composition of these different types of forces and threats can vary greatly from being well organized around a central command structure to being a highly decentralized and autonomous organization. While state military forces are easily illustrated via organizational charts depicting numbers and types of units, personnel, weapon systems, and equipment associated with those units, organizational charts also can be adapted to depict other threats. Figure 2-23 on page 92 is an example organization of a conventional threat force.



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Figure 2-23. Threat force organizational chart example

Create or Refine Threat Models

2-279. Threat models accurately portray how those forces normally execute operations and how they have reacted to similar situations in the past. This also includes knowledge of threat capabilities based on the current situation. Threat models are initially created by analyzing information in various databases concerning normal organization, equipment, doctrine, and tactics, techniques and procedures. Higher agencies and organizations create some threat models. In immature operational environments or when new threats emerge, intelligence staffs develop new models. Developers use all available sources to update and refine the models.

2-280. Threat characteristic files with information that assists intelligence analysts in making conclusions about operations, capabilities, and vulnerabilities are the most useful sources for updating. Integrating staffs while developing threat models is essential to achieving the most accurate depiction of how a threat conducts operations in ideal situations with no terrain constraints.

2-281. A threat model is an analytical tool that assists in developing situation templates (SITEMPs) during Step 4 of the IPB process. Developing threat models consists of three steps:

- Convert threat doctrine or patterns of operations to graphics (threat template).
- Describe the threat's preferred tactics, options, and peculiarities.
- Identify HVTs.

Convert Threat Doctrine or Patterns of Operations to Graphics

2-282. Threat templates graphically portray how the threat might use its capabilities to accomplish its objectives when not constrained by the effects of the operational environment. Threat templates are developed to depict a threat's disposition and actions for a particular type of operation (for example,

offense, defense, insurgent ambush, or terrorist kidnapping). When possible, templates should be graphically depicted as an overlay, on a command and control system, or through some other means.

2-283. Threat templates are tailored to the needs of the unit or staff creating them. For example, an intelligence section's threat template differs in scope from a brigade or battalion intelligence section's template. Some threat templates consider threat forces as a whole while others focus on a single warfighting function, such as intelligence or fires support. Other products depict pattern analysis, time event charts, and association matrices. Threat templates may depict, but are not limited to, unit frontages, unit depths, boundaries, EAs, and obstacles.

2-284. When creating threat templates—

- Construct templates by analyzing the intelligence database and evaluating the threat's past operations.
- Determine how the threat normally organizes for combat and how it deploys and employs its forces and assets.
- Look for patterns in how the threat organizes its forces and uses time, distance, relative locations, groupings, and terrain and weather.

2-285. Templating requires continuous refinement to accurately portray threat patterns, activities, and practices. Because implementation time is a consistent planning factor, an analyst can evaluate implementation time to determine the likelihood of location or participants. Figure 2-24 on page 94 depicts a threat template.

Describe the Threat's Tactics, Options, and Peculiarities

2-286. When creating the threat model, consider the threat's tactics, options, and peculiarities.

Tactics

2-287. A threat model describes a threat's preferred tactics, including, but not limited to, defend, reinforce or retrograde, attack, withdraw, and disrupt. A description is required even if preferred tactics are depicted in graphic form. This allows the template to become more than a "snapshot in time"; the template assists in mentally war gaming the operation during the development of threat COAs and SITEMPs.

Options

2-288. List options in a description such as identified threat capabilities, branches, and sequels. Branches and sequels are used primarily for changing deployments or direction of movement and accepting or declining combat. Branches provide a range of alternatives often built into the basic plan. Sequels anticipate and plan for subsequent operations based on the possible outcomes of the current operation. List branches and sequels available to the threat in success or failure. For example, the threat might sequel a successful attack with a pursuit, or if an attack begins to fail, a branch plan might include committing reserves or shifting the main effort. Should a threat attack fail, a preferred sequel might be a hasty defense.

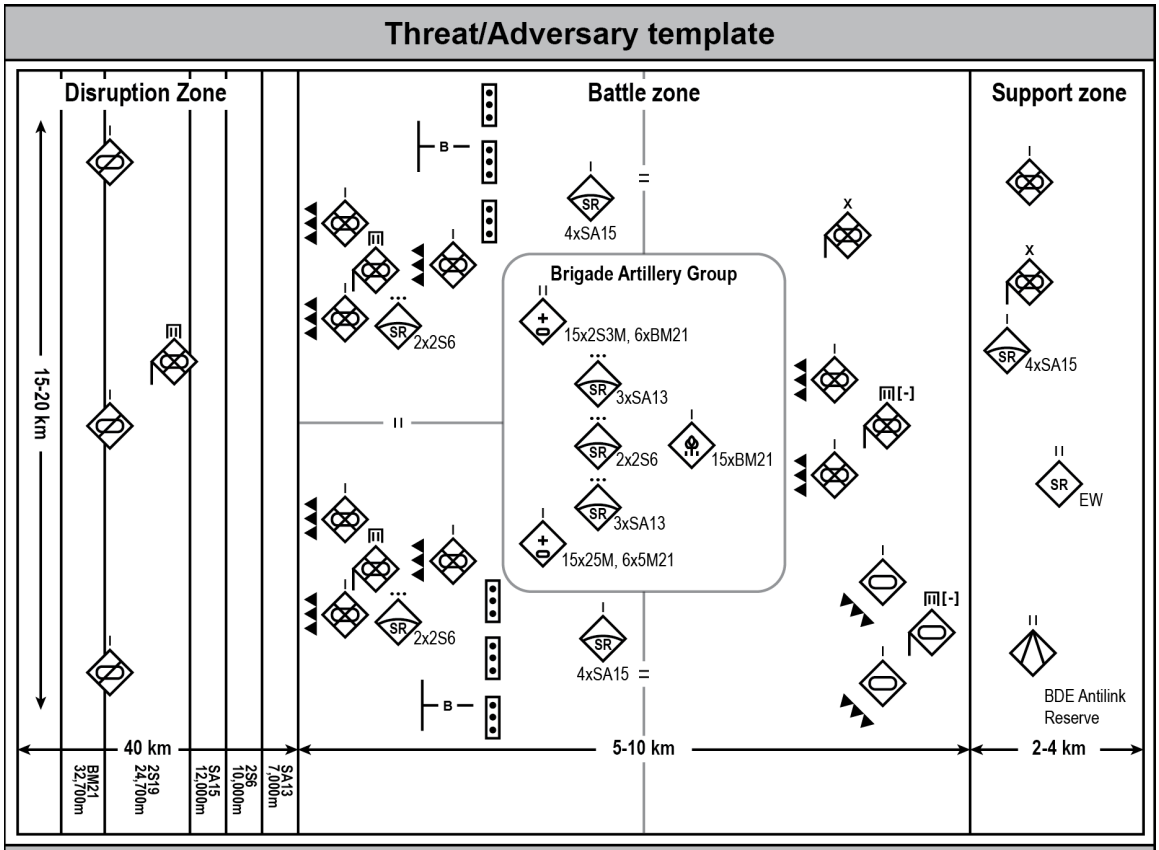
2-289. Also describe—

- Supporting warfighting functions' relevant actions in order to identify and develop HVTs and examine timelines and phases of operations because target values may change from phase to phase.
- Threat objectives. Threat objectives are often, but not always, what the unit's mission tries to prevent. Threat objectives also are actions the threat takes to prevent a unit from accomplishing its mission. Threat objectives are specific to the type of threat, the AO, the unit's composition and mission, and other factors, such as when and where a unit transitions from one form of maneuver to another. Threat objectives are explained in terms of task, purpose, and end state. A number of different functions must be executed each time a threat force attempts to achieve a goal.

Peculiarities

2-290. Planners research and annotate any threat peculiarities pertaining to the operation, which can help friendly commanders. For instance, if research shows that threat forces lack sufficient armor-piercing 120-millimeter tank rounds, a friendly commander can use this information to formulate when and where to use armored assets. Other peculiarities include, but are not limited to—

- Fuel shortages.
- Insufficient obstacles to protect defensive sites.
- Lack of IC assets to collect on specific avenues of approach.
- Lack of leadership and training to conduct simultaneous counterattacks in multiple locations.



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Figure 2-24. Description of a threat model example

Identify High-Value Targets

2-291. A *high-value target* is a target the enemy commander requires for the successful completion of the mission. Also called HVT (JP 3-60). The following techniques may be useful in identifying and evaluating HVTs:

- Identify HVTs from—
  - Existing intelligence studies.
  - Evaluation of databases.
  - Size, activity, location, unit, time, and equipment reports.
  - Patrol debriefs.
  - Threat templates and threat capabilities statements.
  - Use of tactical judgement.
- Review threat TTP and previous threat operations and also understand the threat's task, purpose, method, and end state.
- Consider that HVTs usually, but not always, fall within non-maneuver warfighting functions (command and control, intelligence, fires, sustainment, and protection).
- Identify key assets to executing the primary operation or sequels.
- Determine how the threat might react to the loss of each identified HVT. Consider the threat's ability to substitute other assets as well as adopt branches or sequels.
- Conduct mental war gaming, think through the operation, and consider how the threat will use assets (such as fires support; chemical, biological, radiological, nuclear, and high-yield explosives; and engineers) from each of the warfighting functions.

2-292. As analysts identify key assets (see table 2-24 on page 94), they group them into categories to identify threat objectives. Categories include, but are not limited to, the warfighting functions and cyberspace:

- Command and control.
- Movement and maneuver.
- Intelligence.
- Fires.
- Sustainment.
- Protection.
- Cyberspace.

Table 2-24. High-value target list developed in Step 3 of IPB (example)

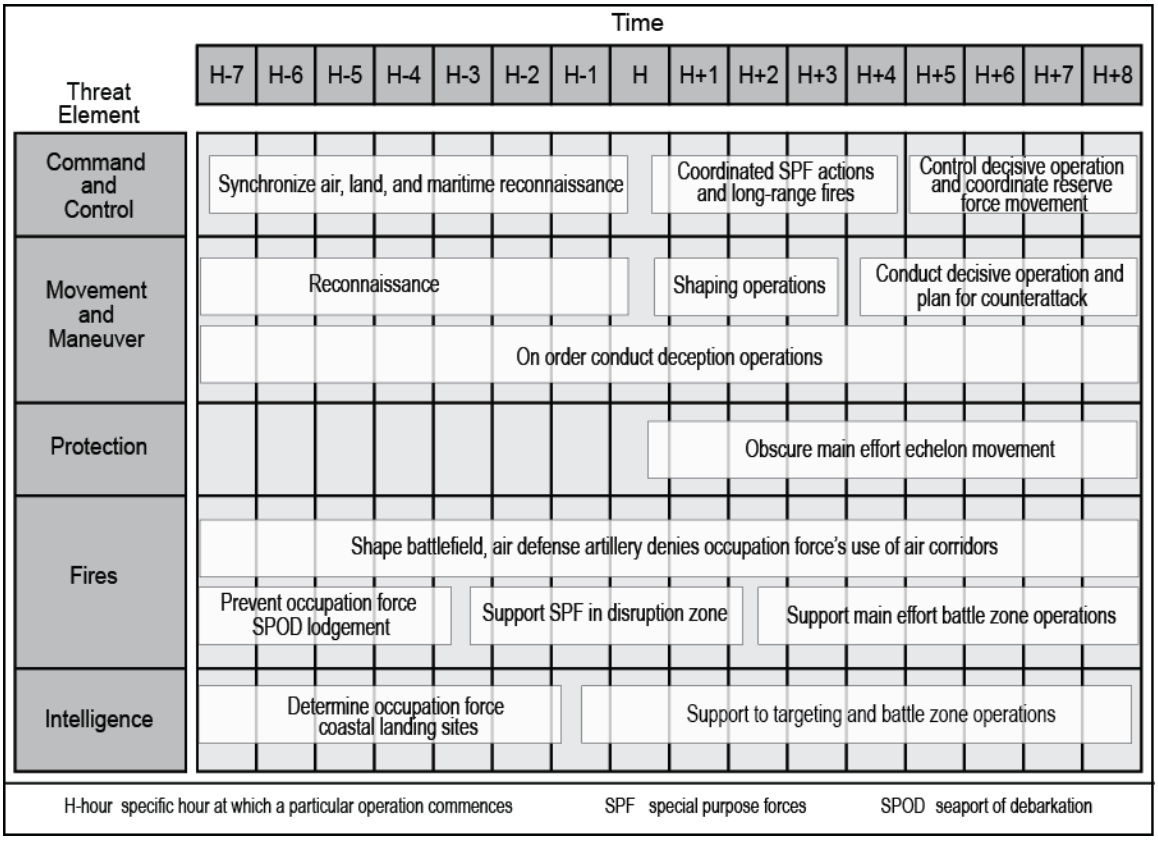
ATP 2-01.3

Threat element	*Example high-value targets*	
Command and control	Commander's variant main battle tank (T-72 BK) Command and staff vehicle (BMP 1KShM) SAM system fire control (SA-15b)	Artillery command and reconnaissance vehicle (1V14-3) Command infantry fighting vehicle (BMP-3K)
Movement and maneuver	Main battle tank (T-72B) Excavating vehicle (MDK-3) Tracked minelaying vehicle (GMZ-3) Infantry fighting vehicle (BMP-3)	Towed mechanical minelayer (PMZ-4) Mine-clearing plow attached (KMT-8) Armored personnel carrier (BTR-80)
Protection	NBC reconnaissance vehicle (RKhm 4-01)	NBC reconnaissance vehicle (BRDM-2RKh)
Fires	122-mm multiple rocket launcher (BM 21) 30-mm self-propelled antiaircraft gun/missile system (2S6M1) 152-mm self-propelled howitzer (2S19M1)	120-mm self-propelled mortar (2S12) Man-portable SAM system (SA-18) SAM system (SA-15b) SAM system (SA-13b)
Intelligence	Signal van (GAZ-66) Battlefield surveillance radar (SNAR-10) Armored scout car (BRDM)	Short range drone (ORLAN-10) SAM system radar system (SA-15b) Artillery locating radar (ARK-1M)
Sustainment	Tactical utility vehicle (UAZ-469) 2-mT 4x4 cargo truck (GAZ-66)	4.5-mT 6x6 cargo truck (URAL-4320)

mT metric ton SAM surface-to-air missile

Time Event Chart

2-293. After identifying HVTs, analysts place them in order of their relative value to a threat's operation and record them as part of a threat model. The value of the HVTs varies over the course of an operation. Analysts can use a time event chart (see figure 2-25) to assist in identifying HVTs over the course of an operation. A time event chart provides a method for visualizing individual or group actions chronologically. The chart helps analysts identify which assets threat forces need to conduct certain operations. Staffs should identify and annotate changes in the value of HVTs over time (see ATP 2-33.4 for more information on time event charts).



ATP 2-01.3

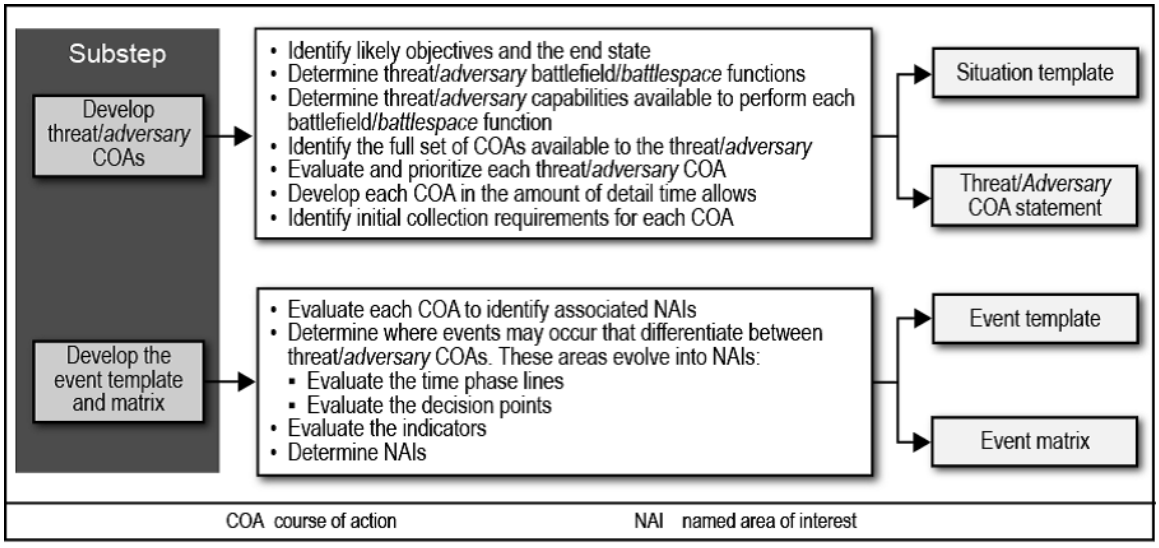
Figure 2-25. Time event chart example

2-294. Identifying HVTs helps staffs create HPTs. HPTs can include various threat considerations potentially detrimental to the success of friendly missions. HPTs are incorporated into the scheme of fires and then used to create target selection standards and attack guidance matrices.

STEP 4. DETERMINE THREAT COURSES OF ACTION

2-295. During Step 4, the intelligence staff identifies and develops possible threat COAs that can affect accomplishing the friendly mission. The potential of an unanticipated enemy action surprising a commander is minimized when all valid threat COAs are identified and developed. The threat COAs aid in developing friendly COAs since it is the "problem" that friendly forces must solve.

2-296. Failure to develop all valid threat COAs may lead to the development of an IC strategy that does not provide the information necessary to determine what COA the enemy has taken and, therefore, may result in the enemy surprising the commander. When needed, the staff identify all significant civil considerations (this refers to civil considerations identified as significant characteristics of the operational environment) so that the interrelationship of threat and friendly forces, as well as population activities, is portrayed. Figure 2-26 on page 98 depicts Step 4 of the IPB process (see ATP 2-01.3 for further detail on how to execute each step of IPB).



ATP 2-01.3

Figure 2-26. Step 4 of the IPB process

Technique: Staffs develop threat COAs in the same manner friendly COAs are developed. Although written specifically as a guide to develop friendly COAs, the COA development discussion in ADP 5-0 is consistent with threat doctrine and can be an excellent model to use in developing valid threat COAs (feasible, acceptable, suitable, distinguishable, and complete). Although the intelligence staff has primary responsibility for developing threat COAs, they need assistance from other staffs to ensure the most accurate and complete analysis is presented to the commander.

Develop Each COA in the Amount of Detail Time Allows

2-297. A threat COA consists of the following products—

- Situation template for the threat COA.
- Threat COA statement.

Situation Template for the Threat COA

2-298. A *situation template* is a depiction of assumed adversary dispositions, based on that adversary's preferred method of operations and the impact of the operational environment if the adversary should adopt a particular course of action (JP 2-01.3). A SITEMP graphic depicts a potential threat COA as part of a particular threat operation. It usually depicts the most critical point in the operation as agreed upon by the commander, the operations officer, and the intelligence officer (see figure 2-27 on page 100 for an example SITEMP graphic). An operation may require, however, the preparation of several templates as overlays representing different "snapshots in time," starting with the threat's initial array of forces. These snapshots in time are useful for depicting—

- Points where the threat might adopt branches or sequels to the main COA.
- Places where the threat is especially vulnerable.
- Other key points in the battle, such as initial contact with friendly forces.

2-299. SITEMPs are developed using the threat's current situation and are based on threat doctrine and the effects of terrain, weather, and civil considerations. SITEMPs can include—

- Doctrinal rates of march (see appendix E).
- Time phase lines.
- Graphic control measures, including, but not limited to—

- Obstacles (natural and reinforcing).
- EAs.
- Enemy disposition, composition, disposition, and strength.
- Task, purpose, method, and end state.
- Key enemy weapon systems range fans.
- Avenues of approach.
- NAIs and TAIs.

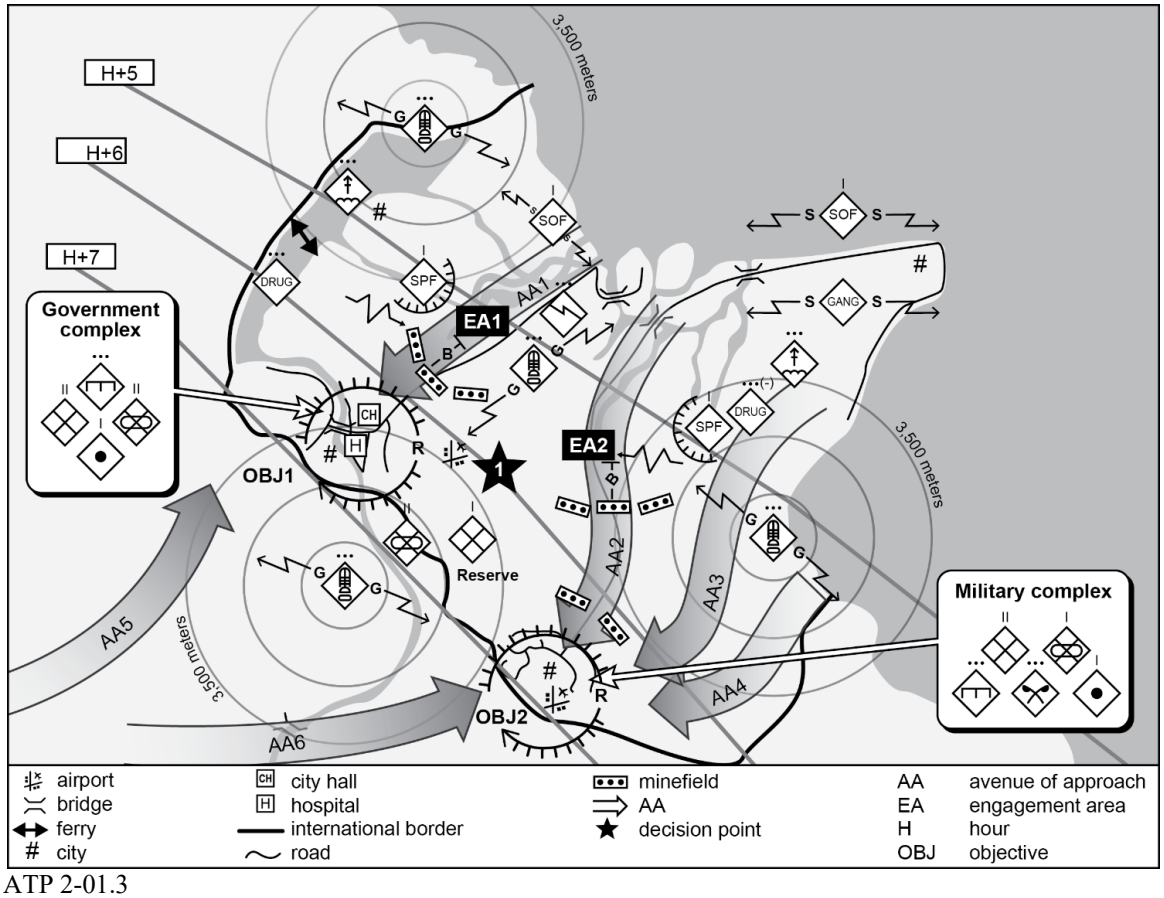
2-300. The threat SITEMP is modified based on significant effects the operational environment may have on the threat COA. For example, the threat may prefer to establish battle positions 1 to 1.5 kilometers apart, but terrain may force the threat to increase this distance to protect its flanks (see figure 2-27 on page 100).

2-301. To construct a SITEMP, analysts can use the following process:

- Begin with the threat template developed as part of the threat model during Step 3 of the IPB process. Overlay the threat template on those products depicting operational environment effects on operations (typically, the MCOO, but this may vary depending on the operation and situation).
- Adjust the dispositions portrayed on the threat template to account for operational environment effects.
  - Since many options are available, use judgement and knowledge of the threat's preferred tactics and doctrine as depicted in the threat model.
  - Attempt to view the situation from the point of view of the threat commander when selecting from threat templates. Additionally, orient the map from the threat point of view.
  - Consider the operational environment, including but not limited to terrain, weather, and civil considerations.
- Check the SITEMP. Account for all threat major assets, ensuring no inadvertent duplications.
- Ensure the template reflects the main effort identified for the COA.
  - Compare depicted dispositions to the threat's known doctrine and check for consistency.
  - Consider the threat's capability to present an ambiguous situation in order to achieve surprise.
- Include as much detail on the SITEMP as time and the situation warrant. For example, if the threat is defending.
  - Identify likely engagement areas, reinforcing obstacle systems, and counterattack objectives that form part of the defensive COA.
  - Depict the locations and activities of the HVTs listed in the threat model.
- Use the description of preferred tactics that accompanies the threat model as a guide.
  - Think through the threat COA scheme of maneuver.
  - Visualize how the threat may transition from its current positions to those depicted on the template.
- Mentally war-game the scheme of maneuver from positions depicted on the template through the COA's success or failure.
  - Identify points where forces may transition from one formation to another.
  - Identify how each threat characteristic fits in and supports the operation.
- Evaluate time and space factors to develop time phase lines depicting threat movement. Draw time phase lines on the template depicting the expected progress of attacking forces and movement of forces in the deep and support battle areas.
- Base time phase lines on the threat's doctrinal rates of movement, with some modification.
  - Evaluate actual movement rates, as revealed in the database, with written doctrine.
  - Consider operational environment effects on mobility.
  - If contact with friendly forces is expected, mentally war-game the effects this may have on the threat's speed.

- When placing time phase lines (assuming that time-consuming planning, issuance of orders, reconnaissance, and logistical preparations may occur during movement), consider only the time—
  - Required to adopt movement formations.
  - To conduct movement to the selected location.
  - For the unit to close after arrival.
- During COA analysis of the SITEMPs against potential friendly COAs, update time phase lines to consider when threat movement may be triggered or how the threat might be influenced by friendly actions.

Note. Analysts may need to reach out to outside organizations such as the National Ground Intelligence Center to attain accurate and up-to-date doctrinal rates.



ATP 2-01.3

Figure 2-27. Situation template example

Threat COA Statement

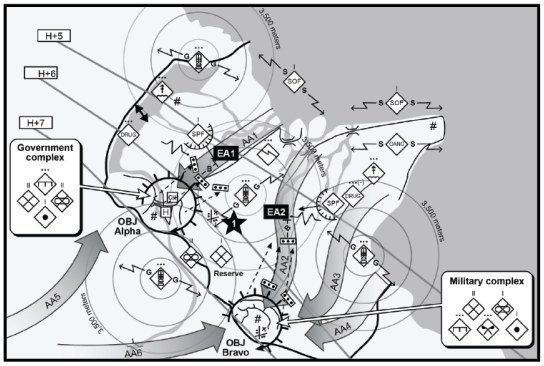
2-302. Every threat COA includes a threat COA SITEMP and a threat COA statement, which is a narrative that describes the SITEMP. Figure 2-28 illustrates a threat COA statement.

Mission: 37th Brigade Tactical Group conducts an area defense at OBJ1 and OBJ2 no later than 110900NOV16 to prevent occupation force seizure of government and military infrastructure.

Enemy Commander's Intent: Retain control of OBJ1 and OBJ2 with minimal key infrastructure losses.

End State:
Enemy: Occupation force denied seizure of OBJ1 and OBJ2.
Friendly: Maintain combat effectiveness of 75% until negotiations of regional partner assistance obtained.
Terrain: Key coastal and inland infrastructure remain intact.

Decisive Operations: 65th and 72d Mechanized BNs conduct area defense no later than 110900NOV16 to deny occupation force seizure of OBJ1 and OBJ2.



Shaping Operations:
Shaping Operation 1: Special purpose forces conduct ambushes along high-speed AAs to disrupt occupation force freedom of movement toward southern infrastructure.
Shaping Operation 2: Engineer emplacement of minefields along high-speed AAs to block occupation force.

Movement and Maneuver
Disruption Zone:
85th Special Purpose Force
Task: Disrupt occupation force in vicinity EA1 and EA2.
Purpose: Delay occupation force movement to the south.
Method: Conduct ambushes on occupation force using complex terrain features and hasty defensive positions.
End State: Occupation force ground movement is delayed in vicinity EA1 and EA2.

Battle Zone:
65th Mechanized BN
Task: Prevent western movement of occupation force.
Purpose: Protect southern flank of 72d Mechanized BN.
Method: Use of obstacle belts and attack by fire positions.
End State: Occupation force is unable to turn west to OBJ1.

72d Mechanized BN
Task: Prevent occupation of OBJ1.
Purpose: Retain control of government.
Method: Use of obstacle belts and attack by fire position.
End State: Government status quo is maintained.

Support Zone:
97th Mechanized BN and 10th Infantry BN (Reserve)
Task: Reinforce 65th and 72d Mechanized BNs.
Purpose: Prevent occupation force flanking of 65th and 72d Mechanized BNs.
Method: Conduct a counterattack.
End State: Occupation force is prevented from seizing OBJ1 and OBJ2.

AA	avenue of approach	EA	engagement area
BN	battalion	OBJ	objective
C2	command and control		

Fires
Disruption Zone:
Task: Disrupt occupation force coastal lodgement.
Purpose: Delay movement to the south.
Method: Long-range precision fires.
End State: 65th and 72d Mechanized BNs are afforded additional time to prepare defenses.

Battle Zone:
Task: Disrupt air AAs.
Purpose: Prevent light infantry air assault in vicinity OBJ1 and OBJ2.
Method: Use SA-13s to close air corridors.
End State: Occupation force unable to control friendly rear.

Sustainment:
Task: Conduct resupply operations across all zones.
Purpose: Maintain the initiative.
Method: Support echelons aligned to support main and supporting efforts.
End State: Friendly forces are able to maintain momentum of battle to repel occupation force.

Reconnaissance
Disruption Zone:
Task: Identify coastal landing areas.
Purpose: Direct long-range precision fires.
Method: Special purpose forces.
End State: Occupation force lodgement is contested and delayed.

Battle Zone:
Task: Identify occupation force AAs.
Purpose: Direct long-range precision fires.
Method: Special purpose forces.
End State: C2 elements are able to direct the main effort.

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Figure 2-28. Division threat COA statement example

Refine High-Value Targets for Each COA

2-303. Refining HVTs involves mentally war gaming a threat COA to determine the assets required to complete the mission. This process—

- Uses the high-value target list developed in Step 3 of the IPB process as a guide.
- Determines the effects on the threat COA if the targets are lost.
- Identifies possible threat responses if the target is lost.

2-304. Based on the situation, one or more targets from the threat model may be validated as HVTs. Targets that were not identified in the threat model may also be HVTs. During planning, the staff uses the HVT list developed for each threat COA to construct the HPT list.

Identify Initial Collection Requirements for Each COA

2-305. After identifying the full set of potential threat COAs, the staff develops the tools necessary to determine which COA the threat may implement. Because the threat has not acted yet, this determination cannot be made during IPB. However, the staff can develop the information requirements and indicators necessary to support construction of an information collection plan that can provide the information necessary to confirm or deny threat COAs and locate enemy targets (see the IC section, starting in paragraph 2-312 and FM 3-55, for more on IC).

2-306. *Information requirements,* in intelligence usage, are those items of information regarding the adversary and other relevant aspects of the operational environment that need to be collected and processed in order to meet the intelligence requirements of a commander. Also called IR (JP 2-0). Identifying and monitoring indicators are fundamental tasks of intelligence analysis, because indicators are the principal means of avoiding surprise. Indicators are often described as being forward looking or predictive in the way they are developed and applied to a specific situation. Table 2-25 is an example of offensive indicators.

Table 2-25. Offensive indicators example

ATP 2-01.3

Activity	*Explanation*
Massing of maneuver elements, armor, artillery, and logistic support.	May indicate the main effort by weakening areas of secondary importance.
Deployment of combat elements on relatively narrow frontage (not forced by terrain).	May provide maximum combat power at attacking point by reducing frontages. Likely threat decisive effort.
Massing of indirect fire support assets.	May indicate initiation of main effort.
Extensive artillery preparation of up to 50 minutes in duration or longer.	Initiates preparation preceding an attack.
Dispersal of tanks and self-propelled artillery to forward units.	Can indicate formation of combined arms assault formations with tanks accompanying the leading maneuver elements and artillery following in bounds.
Surface-to-surface missile units located forward.	Provides depth to threat offensive operations. Places friendly support and unassigned areas in range. May also indicate, when employed alone, harassing or special weapons (chemical) delivery.
Antiaircraft artillery and mobile surface-to-surface missiles located well forward with maneuver elements.	Provides increased protection to massed forces before attack. Extends air defense umbrella forward as units advance.
Demonstrations and feints.	May precede an attack. May deceive actual point of attack.
Establishment and strengthening of counterreconnaissance screen.	Protects assembly areas and forces as they prepare for attack. May be effort to prevent friendly forces from seeing attack preparations.
Concentration of mass toward one or both flanks within the forward area.	May indicate intent for single or double envelopment, particularly if massing units are armor heavy.
Increased patrolling or ground reconnaissance.	May indicate efforts to gather detailed intelligence regarding friendly dispositions before attack.
CPs located well forward; mobile CPs identified.	Indicates preparation to command an offensive operation from as far forward as possible.
Movement of noncombatants from the AO.	Indicates preparation for rapid forward advance of troops and follow-on forces.
Extensive conduct of drills and rehearsals in unassigned areas.	Often indicates major attacks, particularly against fortified positions or strongly defended natural or constructed barriers, which require rehearsal of specialized tactics and skills.
Cessation of drills and rehearsals.	Unit completes rehearsals. Unit prepares for offensive operations.
Increased activity in supply, maintenance, and motor transportation areas.	May indicate movement of additional forces to the front to sustain a major attack. Stocking of sustainment items, such as ammunition and medical supplies, before an attack.
Increased aerial reconnaissance (including unmanned aircraft systems).	Threat effort to collect further intelligence on friendly dispositions or defensive positions.
Establishment of forward arming and refueling points, auxiliary airfields, or activation of inactive airfields.	Indicates preparation for increased sorties for aircraft and faster turnaround time and aviation sustainment. Indicates preparation to support offensive operations with aircraft as far forward as possible.
Clearing lanes through own obstacles.	Facilitates forward movement and grouping of assault units, particularly at night, and usually immediately precedes an attack.
Reconnaissance, marking, and destruction of defending force's obstacles.	Indicates where assaults will occur.
Gap-crossing equipment (swimming vehicles, bridging, ferries, assault boats) located in forward areas (provides large water obstacle or gap).	Expect a substantial effort to cross a water obstacle during a main attack.
Staging of airborne, air assault, or Special Forces with transportation assets such as transport aircraft or helicopters.	Airborne or air assault operations likely indicates efforts to attack friendly commands, communications, or sustainment nodes. May indicate a main effort in which airborne forces will link with ground maneuver forces.
Increased signals traffic or radio silence.	May indicate intent to conduct offensive operations, but increased traffic could also be an attempt to deceive. Radio silence denies information derived from signals intelligence.
Signals intelligence and electromagnetic warfare assets located forward.	Provides electromagnetic attack and surveillance support for the attack.

Develop the Event Template and Matrix

2-307. Intelligence staffs develop event templates and event matrices as analytical planning tools. An initial event template and event matrix are normally developed before COA analysis, refined during COA analysis, and further refined during execution as the situation changes. In addition to using the event template and matrix to support their own planning, the staff normally disseminates the event template to subordinate units to assist them in developing their IC plans.

2-308. An *event template* is a guide for collection planning that depicts the named areas of interest where activity, or its lack of activity, will indicate which course of action the adversary has adopted (JP 2-01.3). It is a graphic overlay used during the COA analysis step of the MDMP to confirm or deny enemy COAs. An event template also is used to develop an IC overlay or matrix and a DST during COA analysis. The event template is used during the execution phase of the operations process to assist in determining which COA the enemy has adopted. An event template is accompanied by an event matrix.

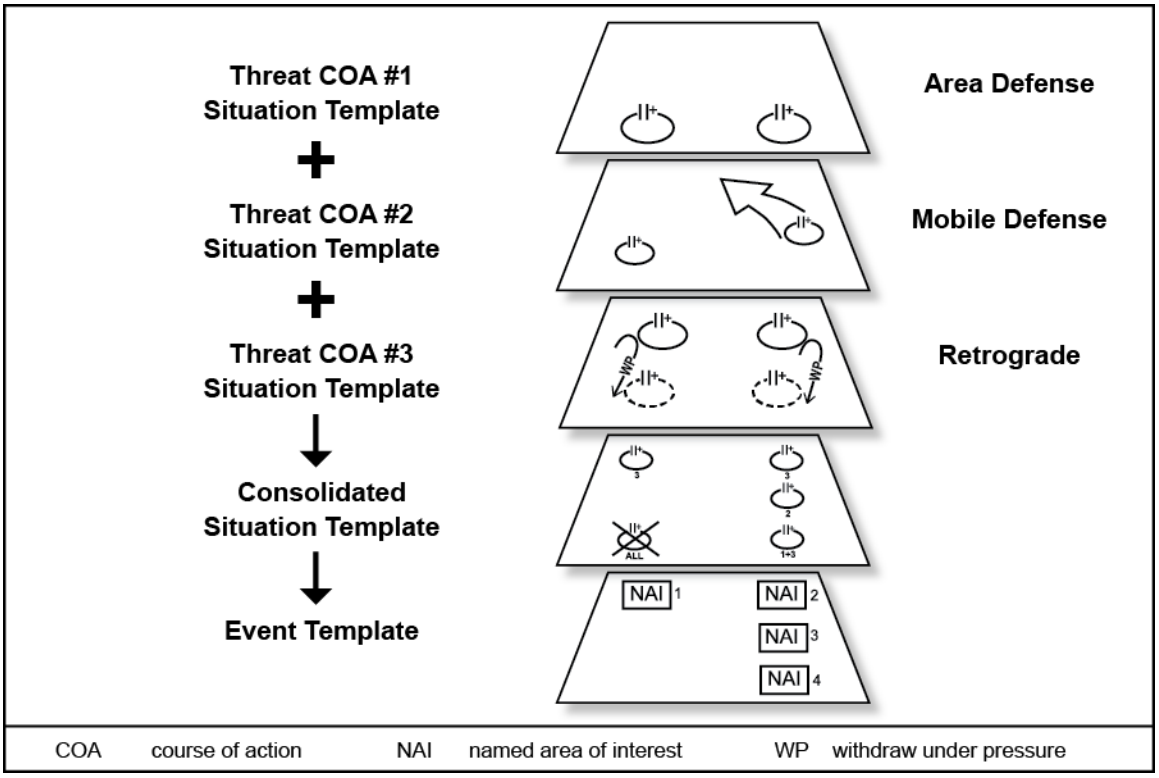
2-309. An event template consists of—

- **Time phase lines.** Time phase lines are linear geographic areas depicting when enemy activity may occur.
- **NAIs.** A *named area of interest* is a geospatial area or systems node or link against which information that will satisfy a specific information requirement can be collected, usually to capture indications of adversary courses of action. Also called NAI (JP 2-01.3). Although NAIs are usually selected to capture indications of threat COAs, they may also be related to conditions of the operational environment.
- **Enemy decision points.** A decision point is a point in space and time when the commander or staff anticipates making a key decision concerning a specific course of action.

2-310. Constructing an event template is an analytical process that involves comparing multiple threat COAs developed earlier in Step 4 of the IPB process to determine the time or event and the place or condition in which a threat commander must make a decision on a particular COA. To create an event template—

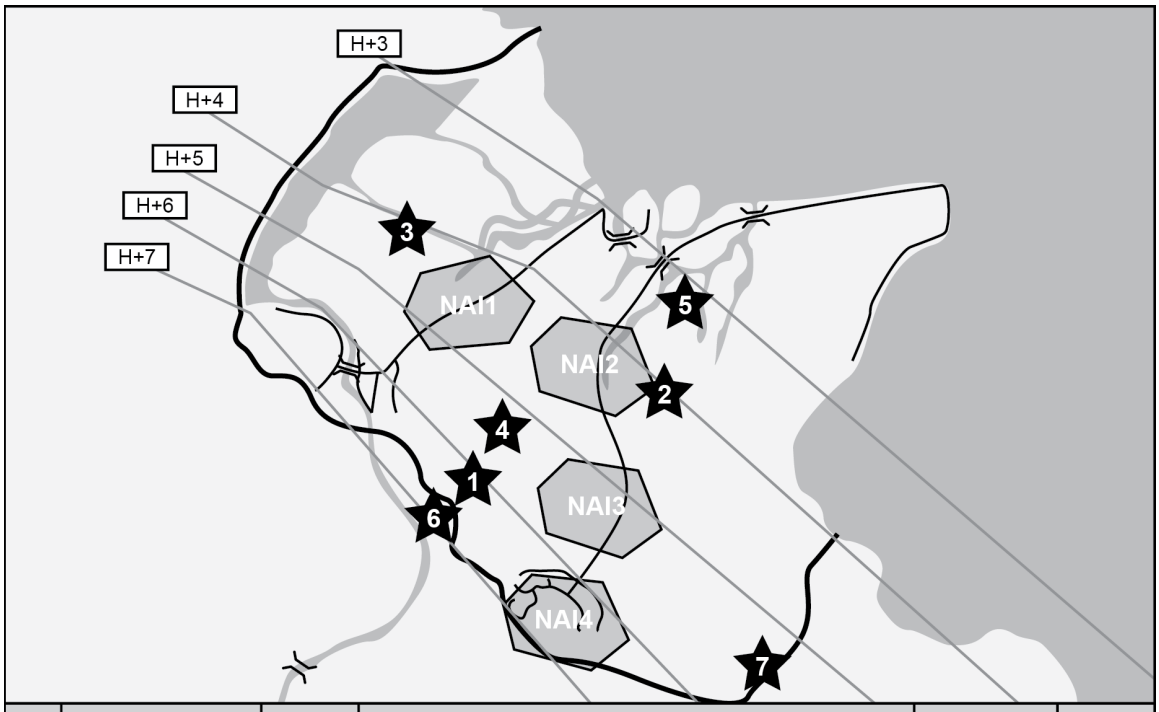
- Begin with the SITEMP.
- Evaluate each COA to identify associated NAIs.
- Determine where events may occur that differentiate between threat COAs. These areas evolve into NAIs. Evaluate both time phase lines and DPs.
- Determine what action confirms or denies a particular threat COA (indicators).
- Determine the specific hour at which a particular event occurs (H-hour).
- Compare and contrast NAIs and indicators associated with each COA against the others and identify their differences.
- Focus on the differences that may provide the most reliable indicators of the adoption of each unique COA.
- Mark the selected NAIs on the event template.
- Upon refining, overlay the threat COAs with DPs and NAIs.

2-311. Figure 2-29 and Figure 2-30 on pages 105–106 provide examples of how to illustrate the mechanics of this process. The figures display minimal (not all-inclusive) information on the event template. In threat doctrine, these types of defensive tasks are tactical methods and guides to the design of operational COAs.



ATP 2-01.3

Figure 2-29. Constructing an event template



Nai	Grid Location	EN COA	Indicators	HVT	NET/NLT
1	10A BC 12345 67891	COA1	1. SPF in hasty defensive positions in vicinity EA1 2. Blocking obstacles on southern portion of AA1	BMP-1KshM T-72B SPF SA-18	H+4/H+5
2	10A BC 2345678910	COA2	1. SPF in hasty defensive positions in vicinity EA2 2. Blocking obstacles on southern portion of AA2	BMP-1KshM T-72B SPF SA-18	H+4/H+5
4	10A BC 2122324252	COA3	1. Staging of 65th Mechanized Battalion north of OBJ2 2. 72d Mechanized Battalion is positioned as fixing force in vicinity minefields on AA1 3. Presence of turning obstacles on northern portion of AA2	BMP-1KshM T-72B SPF SA-18	H+3/H+4
4	10A BC 2345678910	COA4	1. Presence of 72d and 65th Mechanized Battalions in forward defensive positions 2. 2S191s remain in southern urban areas	BMP-1KshM T-72B SA-18 TDA-2K UMZ-K 2ST91	H+3/H+7

AA avenue of approach EA engagement area H hour NAI named area of interest NLT no later than
COA course of action EN enemy HVT high-value target NET no earlier than SPF special purpose forces

ATP 2-01.3

Figure 2-30. Completed event template and associated event matrix example

INFORMATION COLLECTION

2-312. This topic information is derived from ATP 2-01 and FM 3-55.

2-313. *Information collection* is an activity that synchronizes and integrates the planning and employment of sensors and assets as well as the processing, exploitation, and dissemination systems in direct support of current and future operations (FM 3-55). Information collection activities provide commanders with detailed, timely, and accurate intelligence, enabling them to visualize threat capabilities and vulnerabilities and to gain situational understanding. Information collected from multiple sources and analyzed becomes intelligence that provides answers to CCIRs as part of an evolving understanding of the AO. These activities contribute to the achievement of a timely and accurate common operational picture (COP). By answering the CCIRs, IC commanders can make informed decisions. This includes plan requirements and assess collection, task and direct collection, and execute collection.

PLAN REQUIREMENTS AND ASSESS COLLECTION

2-314. The intelligence staff collaborates with the operations officer and the entire staff to receive and validate requirements for collection, prepare requirements planning tools, recommend collection assets and capabilities to the operations staff, and maintain synchronization as operations progress (see ATP 2-01 for a detailed discussion of this topic).

TASK AND DIRECT COLLECTION

2-315. The operations officer, based on recommendations from the staff and guidance from the commander, tasks, directs, and when necessary, re-tasks IC assets (see chapter 4 of FM 3-55 for more information on tasking and directing IC).

EXECUTE COLLECTION

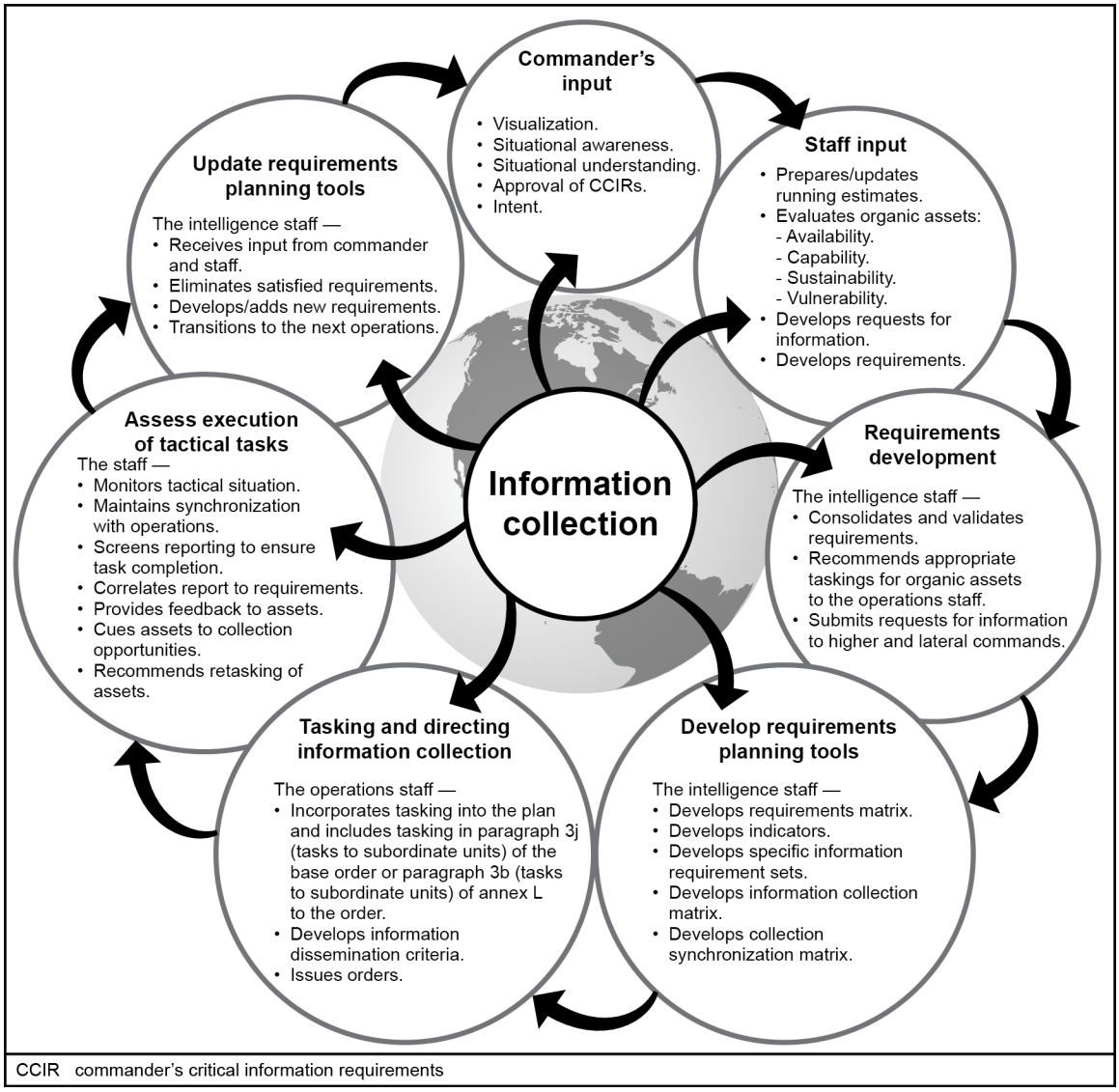
2-316. Execute collection focuses on requirements tied to the execution of tactical missions, such as reconnaissance, surveillance, security, and other intelligence operations and based on the CCIRs. Collection activities acquire information about the threat and the AO and provide that information to intelligence processing and exploitation elements. Collection activities begin soon after receipt of mission and continue throughout preparation and execution of the operation. These activities do not cease at the end of a mission but continue as required. This allows the commander to focus combat power, execute current operations, and prepare for future operations simultaneously. Subtasks of collection execution are—

- Establish technical channels and provide guidance.
- Collect and report information.
- Establish a mission intelligence briefing and debriefing program.

INFORMATION COLLECTION ACTIVITIES

2-317. Like many other staff processes, IC to close intelligence gaps is cyclical in nature and never complete. Identification of information still undiscovered, combined with a continuous influx of new information requirements, leads to continuous collection planning. In a similar vein, the gaps or new requirements that cause new collection planning lead to repositioning or re-tasking of collection assets. Reports resulting from an IC process are analyzed by the operations and intelligence sections, leading to "intelligence." Figure 2-31 on page 108 depicts IC activities.

2-318. *Intelligence* is the product resulting from the collection, processing, integration, evaluation, analysis, and interpretation of available information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations (JP 2-0). The term is also applied to activities that result in the product and to organizations engaged in those activities. Reconnaissance, security, intelligence operations, and surveillance are ways of gathering information, with the means ranging from national and joint collection capabilities to individual Soldier observations and reports. Intelligence products assist commanders and staffs in the decision-making process.



FM 3-55

Figure 2-31. Information collection activities

2-319. The result of the IC effort is a coordinated plan that supports the operation. Assessment of information and intelligence will cause the staff to refine the plan via FRAGORDs to the current plan to re-task or re-mission assets and units.

2-320. Effective IC activities—

- Provide relevant information and intelligence products to commanders and staffs.
- Provide combat information to commanders.
- Contribute to situational awareness and facilitate continuous situational understanding.
- Develop a significant portion of the COP, vertically and horizontally, for organizations, commanders, and staffs.
- Support the commander's visualization, permitting more effective command and control.
- Answer the CCIRs.

- Facilitate information preparation of the battlefield.
- Support effective, efficient, and accurate targeting.
- Identify risks and opportunities.

INFORMATION COLLECTION PLANNING

2-321. Commanders and staffs continuously plan, task, and employ collection assets and forces to collect information. They request information and resources through higher echelons. This information and intelligence helps commanders turn decisions into actions.

2-322. Information collection planning is crucial to mission success. Four fundamentals required to plan, synchronize, and integrate IC activities are—

- Information collection effort driven by the commander.
- Full staff participation in synchronizing and integrating IC.
- Collection capability, either organic or augmented by nonorganic resources, to conduct IC.
- Capability to analyze and produce intelligence to conduct IC.

2-323. Commanders must quickly and clearly articulate their CCIRs to the staff during the IC planning process. This enables the staff to facilitate the commander's vision and decision making by focusing on the CCIRs.

PRIMARY INFORMATION COLLECTION TASKS AND MISSIONS

2-324. Information collection includes all activities and operations that gather data and information used to create knowledge and support the commander's requirements, situational understanding, and visualization. Commanders achieve IC when they conduct all collection tasks together with an operation. The appropriate mix of collection tasks and operations helps satisfy many different requirements. It also ensures that the operations and intelligence working group does not favor or become too reliant on one particular unit, discipline, or system. The Army has four tasks it conducts primarily in support of the IC plan (see appendix C for more details):

- Reconnaissance.
- Surveillance.
- Security operations.
- Intelligence operations.

ROLE OF THE COMMANDER AND STAFF IN INFORMATION COLLECTION

2-325. The commander and staff are as important to the IC process as a coaching staff is to a professional football team. Success or failure of a team is directly related, not only to the vision of the coaching staff, but also to their ability to communicate a commander's visualization and provide team members with the proper tools and training to accomplish that vision. While collection is ongoing, the commander and staff plan, prepare, and assess that collection; monitor the status of collection assets; and provide the assets with life support needs.

The Role of the Commander

2-326. Commanders must understand, visualize, describe, direct, lead, and assess all operations. Understanding is fundamental to a commander's ability to establish the situation's context. Understanding involves analyzing and comprehending operational and mission variables in an operational environment. It is derived from applying judgement to a COP through the filter of commander's knowledge and experience.

2-327. Numerous factors determine a commander's depth of understanding. Information collection and the resulting intelligence products help a commander understand the AO. Formulating CCIRs and keeping them current also contributes. Maintaining understanding is a dynamic ability; a commander's situational understanding changes as an operation progresses.

2-328. Commanders participate in IC planning and direct IC activities by-

- Asking the right questions to focus the efforts of the staff.
- Knowing the enemy. Personal involvement and knowledge have no substitutes.
- Stating intent clearly and designating clear CCIRs.
- Understanding IC assets and resources to exploit the assets' full effectiveness.

2-329. Commanders prioritize collection activities by providing their guidance and commander's intent early in a planning process. Commanders-

- Identify and update CCIRs.
- Ensure CCIRs are tied directly to the scheme of maneuver and decisions.
- Limit CCIRs to only their most critical needs.
- Aggressively seek out, through intelligence reach, higher echelon's collection analysis.
- Ensure CCIRs include LTIOV or the event by which the information is required.

Technique: A key to effective staff synchronization of the operations and intelligence processes is to ensure that the IPB process and the IC process are integrated. Staff members play an important role in each of these staff processes. Gaps discovered during initial IPB form the basis for information requirements; which drive IC activities; which answer and ultimately close those information gaps. Ultimately, this cyclic function aids the commander in developing and maintaining a better understanding of the battlefield situation.

Commander's Needs

2-330. Staffs synchronize and integrate information activities with warfighting functions based on the higher commander's guidance and decisions. A commander's knowledge of collection activities enables them to focus staff and subordinate commanders in planning, preparing, executing, and assessing IC activities for the operation.

2-331. Commanders must understand the overall concept of operations from higher headquarters to determine specified and implied tasks and information requirements. There are a finite number of assets and resources for information collection activities, therefore, commanders must prioritize these assets. Commanders communicate this as guidance for planners and the staff. Commanders visualize how multiple collection components work together and understand how their unit's activities fit into and contribute to those of higher, adjacent, and lower echelons.

Commander's Guidance

2-332. Commanders aid planning by providing guidance. This includes guidance on acceptable levels of risk for IC planning and guidance for collection assets and collection tasks. Commanders issue formal guidance at three points in the planning process:

- Commander's initial guidance is provided following receipt of mission.
- Initial planning guidance follows mission analysis to guide COA development.
- Refined commander's intent, CCIRs and EEFIs after the COA decision but before the final WARNORD.

Commander's Initial Guidance

2-333. For IC planning, initial guidance includes—

- Initial timeline for IC planning.
- Initial IC focus.
- Initial information requirements.
- Authorized movement.
- Collection and product development timelines.

2-334. An initial WARNORD can alert IC assets to begin collection activities. If this is the case, the initial WARNORD includes—

- Named areas of interest covered.
- Collection tasks and specific information requirements.
- Precise guidance on the infiltration method, reporting criteria, timelines, fire support, and casualty evacuation (CASEVAC) plan.

See appendix C for details on commander's initial guidance required for reconnaissance operations.

Initial Planning Guidance

2-335. Commanders issue planning guidance following the approval of the restated mission and mission analysis brief. Part of a commander's planning guidance, the initial CCIR and any portion that concerns IC guidance, is directly related to collection activities. The guidance for planning should contain sufficient information for the operations and intelligence sections to develop and draft the IC plan. If the commander does not present the required information, the operations officer must ask for it. At a minimum, a commander's planning guidance includes—

- Current CCIRs.
- Focus and tempo.
- Engagement criteria.
- Acceptable risk to assets.

2-336. Commanders issue their intent with their initial planning guidance. The staff verifies that the draft IC plan is synchronized with the commander's intent and assess any ongoing IC activities. The staff recommends changes to support the commander's intent, CCIRs, and concept of operations.

Refined Commander's Intent, CCIR, and EEFI

2-337. After the decision brief, the commander selects a COA and issues final planning guidance. Final planning guidance includes any new CCIRs, including the LTIOV and rehearsals.

The Role of the Staff

2-338. The COS or XO directs the efforts of coordinating and special staff officers, integrates and synchronizes plans and orders, and supervises management of the CCIRs. Intelligence officers work with the entire staff to identify collection requirements, including those assets and resources that provide answers to the CCIRs, and implement the IC plan. Intelligence staffs determine collection requirements (based on input from the commander and staff), develop an information matrix, and continue to work with the staff to create the IC plan.

2-339. The operations and intelligence officers collaboratively develop an IC plan and ensure its synchronization with the operations plan. Throughout the planning process, staffs develop requirements, including CCIRs, and put those into the IC plan. Staffs also monitor the situation and progress of the operation toward the commander's desired goal. They prepare and update running estimates and determine if adjustments to the operation are required. Throughout the process, the staff continually updates an IC plan when the situation changes, requirements are answered, or new requirements emerge.

2-340. The 2X is the counterintelligence and human intelligence operations manager who works directly for the intelligence officer. The 2X manages counterintelligence and human intelligence operations in support of the overall unit operation. By coordinating with the intelligence officer, a 2X helps to plan IC, task human intelligence collection assets, and determine which assets would best answer information requirements. This information aids in developing requirements planning tools and the overall collection plan. Not all echelons have a 2X.

IMPORTANCE OF TASKING AND DIRECTING

2-341. The operations staff integrates collection assets through a deliberate and coordinated effort across all warfighting functions. Tasking and directing IC is vital to control limited collection assets. During

tasking and directing IC, the staff recommends redundancy, mix, and cue as appropriate. *Redundancy* is using two or more like assets to collect against the same intelligence requirement (FM 3-90-2). *Mixing* is using two or more different assets to collect against the same intelligence requirement (FM 3-90-2). *Cueing* is the integration of one or more types of reconnaissance or surveillance systems to provide information that directs follow-on collecting of more detailed information by another system (FM 3-90-2).

2-342. Planning IC activities begins once requirements are established, validated, and prioritized. Staffs accomplish tasking IC by issuing WARNORDs, FRAGORDS, and OPORDs. They accomplish directing IC assets by continuously monitoring the operation. Staffs conduct re-tasking to refine, update, or create new requirements.

WORKING GROUP INPUT TO INFORMATION COLLECTION

2-343. Working groups comprise groupings of predetermined staff representatives who analyze, coordinate, and recommend a particular purpose or function. Their contributions are synchronized across multiple CP cells and staff sections. Boards, while similar to working groups, maintain decision authority for that purpose or function.

Operations and Intelligence Working Group

2-344. Many working groups exist only at division and higher echelons, but their functions must still be performed by brigades and battalions. For example, no structured operations and intelligence working group exists at brigade and battalion levels. Depending on personnel availability, commanders may designate an ad hoc working group. Because a primary staff officer's responsibilities cannot be delegated, an XO or COS should direct and manage the efforts of that working group to achieve a fully synchronized and integrated IC plan.

2-345. Units' SOPs and internal battle rhythms determine when, and how often, an operations and intelligence working group meets. The group must be closely aligned with current and future operational planning to ensure requirements planning tools are properly integrated into the overall OPORD or OPLAN. This working group's function is to bring together staff sections and validate requirements while deconflicting missions and taskings of both organic and attached collection assets. Expected outputs of an operations and intelligence working group include:

- Understanding how the enemy will fight.
- Refined list of requirements.
- Confirmation on the disposition of all collection assets.
- FFIRs, PIRs, and EEFIs.
- Validation of outputs of other working groups.
- Critical NAIs and TAIs.

FINAL INFORMATION COLLECTION PLAN

2-346. Staffs must complete several important activities and review several considerations to achieve a fully synchronized, efficient, and effective final IC plan. Updating IC activities while executing and assessing activities of the operations process is crucial to an IC plan. An IC plan is implemented through asset tasking. The tasking process provides selected collection assets with prioritized requirements. When collection tasks or requests are passed to units, the staff provides details clearly defining collection requirements. These requirements identify—

- What to collect-information requirements and essential elements of information.
- Where to collect-NAIs and TAIs.
- When and how long to collect.
- Why to collect.

2-347. An IC plan becomes an execution order when published as a separate order or annex (annex L of an OPORD (see FM 6-0 for an example)). It should be published in the five-paragraph OPORD format as an OPORD or a FRAGORD. Staffs use the IC plan to task, direct, and manage collection assets (both

assigned and attached). The operations officer tasks and directs IC activities (see figure 2-32 and figure 2-33 on pages 113–114 for examples of an IC matrix and overlay). The intelligence staff helps the staff develop the IC plan by providing requirements planning tools (see ATP 2-01 for additional information on developing planning requirements tools). Staffs—

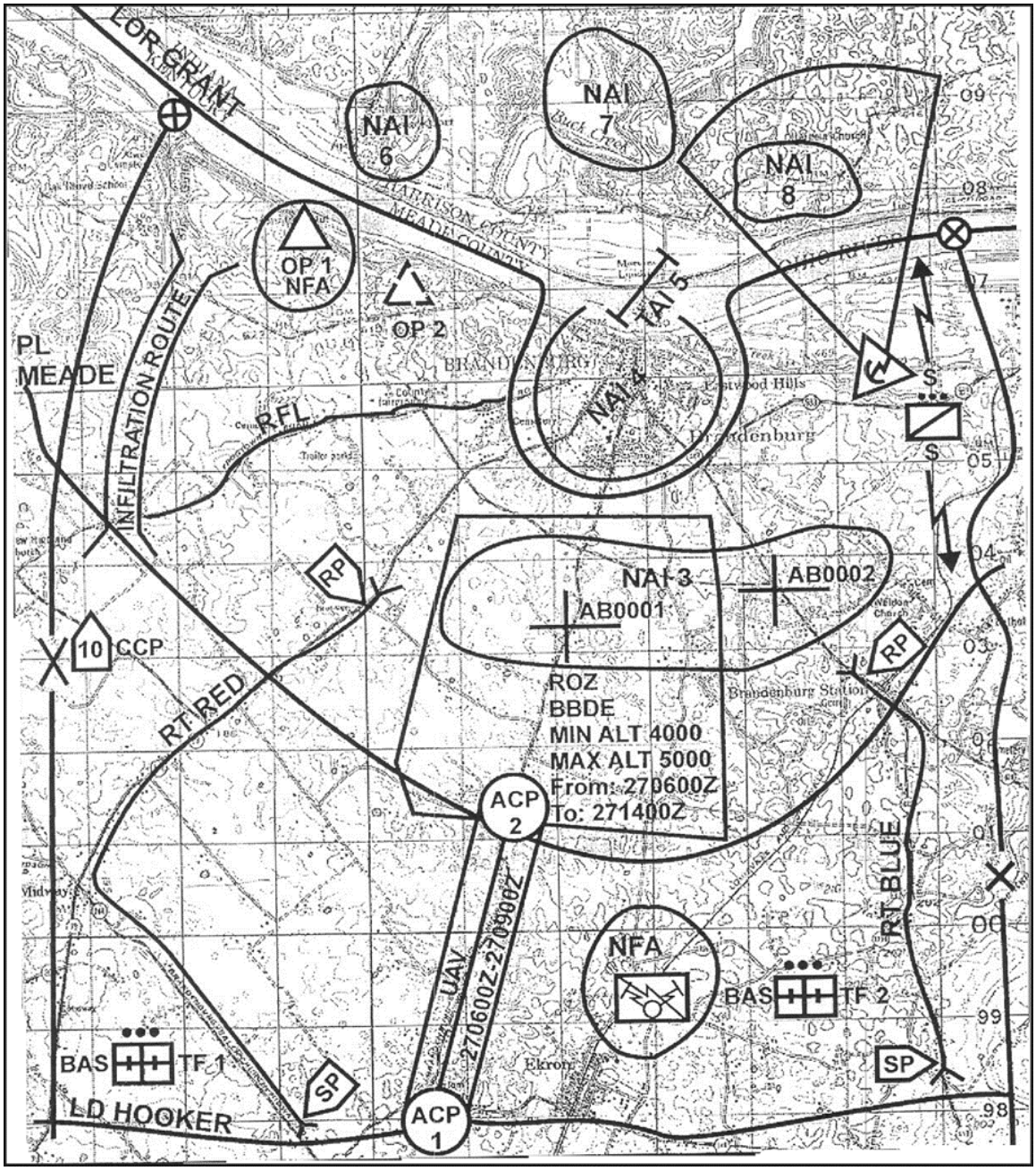
- Integrate the IC plan into the scheme of maneuver.
- Publish annex L (IC) to the operation order that tasks assets to begin the collection effort.
- Ensure the IC plan addresses all of the commander's requirements.
- Ensure assigned and attached assets have been evaluated and recommended for IC tasks within their capabilities.
- Ensure collection tasks outside the capabilities of assigned and attached assets have been prepared as requests for information to appropriate higher or lateral headquarters.
- Publish any FRAGORDS and WARNORDs associated with IC.

Priority intelligence requirement	*Essential elements of information*	*Indicators*	*Specific information requirement*	*Named area of interest*	*Start time*	*End time*	*Brigade combat teams*										*Division and higher*					
							1st battalion	*2d battalion*	*3d battalion*	*Q-36/Q-37*	*Engineer*	*Low-cost countermortar radar*	*Reconnaissance*	*Shadow full-motion video*	*BCT human intelligence*	*BCT counterintelligence*	*Prophet*	*Full-motion video*	*Human intelligence*	*Counterintelligence*	*Communications intelligence*	*Imagery intelligence*	*Moving target indicator*
Normally one sheet per priority intelligence requirement	A subset requirement that is related to, and would answer, a PIR	Positive or negative evidence of threat activity or any characteristic of the AO that: –Points toward threat vulnerabilities –Points toward the adoption or rejection by the treat of a particular activity. –May influence the commander's selection of a course of action.	Facilitate tasking by matching requirement to assets.				XX											R	R	R	R	R	R
R request for collection submitted by the intelligence staff to nonorganic assets XX organic assets nominated to the operations staff for tasking																							

EXAMPLE

FM 3-55

Figure 2-32. Example information collection matrix



FM 3-55

Figure 2-33. Information collection overlay example

TARGETING

2-348. This section is derived from JP 3-60, ADP 3-19, FM 3-09, and ATP 3-60.

2-349. *Targeting* is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities (JP 3-0). Targeting is continuously refined and adjusted between the commander and staff as an operation unfolds. A *target* is an entity or object that performs a function for the threat considered for possible engagement or other action (JP 3-60). Targets include a wide array of mobile and stationary forces, equipment, and capabilities that a threat can use to conduct operations.

2-350. Targeting creates effects systematically. A targeting methodology is a rational and iterative process that methodically analyzes, prioritizes, and assigns assets against targets systematically to create those effects that contribute to achieving the commander's objectives. If the desired effects are not created, targets may be considered again in the process or operations may be modified.

2-351. **The Army uses the decide, detect, deliver, assess (D3A) methodology as the primary targeting methodology.** D3A optimizes integration and synchronization of maneuver, fire support, intelligence, command and control, and information-related capabilities from task force through corps level operations. Successful targeting requires the commander and staff understand the functions and ethical decision making associated with targeting.

2-352. The joint force uses the joint targeting cycle, which is a six-phase iterative process that is not time-constrained nor rigidly sequential, as some steps in various phases may be conducted concurrently. Phases of the joint targeting cycle are—

- Phase 1—Commander's objectives, targeting guidance, and intent
- Phase 2—Target development and prioritization
- Phase 3—Capabilities analysis
- Phase 4—Commander's decision and force assignment
- Phase 5—Mission planning and force execution
- Phase 6—Combat assessment

TARGETING GUIDELINES

2-353. Targeting focuses on efficiently achieving the commander's objectives within parameters set at the operational level, such as directed limitations, rules of engagement, rules for the use of force, the law of war, and other guidance given by the commander. Every target nominated must contribute to the mission.

2-354. Targeting seeks to create specific desired effects through lethal and nonlethal actions. Target analysis encompasses all possible means to create desired effects, drawing from all available capabilities. The art of targeting seeks to create desired effects with the least risk and expenditure of time and resources. It directs lethal and nonlethal actions to create desired effects. Targeting is a fundamental task of the fires warfighting function that encompasses many disciplines and requires participation from many staff elements and components.

TARGET GUIDANCE

2-355. A commander's targeting guidance must be clear and simple to enhance understanding. The guidance must be easily understood by all warfighting functions. Targeting guidance must focus on essential threat capabilities and functions that could interfere with achieving friendly objectives.

2-356. A commander's targeting guidance describes the desired effects from fires, physical attack, cyberspace electromagnetic activities, and other information-related capabilities against threat operations. An *effect* is 1. The physical or behavioral state of a system that results from an action, a set of actions, or another effect. 2. The result, outcome, or consequence of an action. 3. A change to a condition, behavior, or degree of freedom (JP 3-0). Targeting enables the commander—through various lethal and nonlethal capabilities—the ability to produce the desired effects. Capabilities associated with one desired effect may also contribute to other desired effects. For example, delay can result from disrupting, diverting, or

destroying enemy capabilities or targets. Table 2-26 provides a list of desired targeting effects (see ATP 3-60 for the definitions of these terms and more information on desired targeting effects).

Table 2-26. Desired targeting effects

ATP 3-60

Desired targeting effects						
Deceive	Defeat	Degrade	Delay	Deny	Destroy	Destruction
Disrupt	Divert	Exploitation	Interdict	Neutralize	Neutralization	Suppress

2-357. Commanders can also provide restrictions as part of their targeting guidance. Targeting restrictions fall into two categories: the no-strike list and the restricted target list.

2-358. The no-strike list consists of objects or entities protected by—

- Law of war.
- International laws.
- Rules of engagement.
- Other considerations.

2-359. A restricted target list is a valid target that has specific restrictions placed on the actions authorized against it due to operational considerations, such as—

- Limit collateral damage.
- Preserve select ammunition for final protective fires.
- Strike only at night.
- Strike only with a certain weapon.
- Do not strike targets within a specified distance of protected facilities and locations.

See FM 1-04, FM 3-57, JP 3-84, JP 3-57, JP 2-0, and JP 3-60 for additional information on legal considerations and restrictions for targeting.

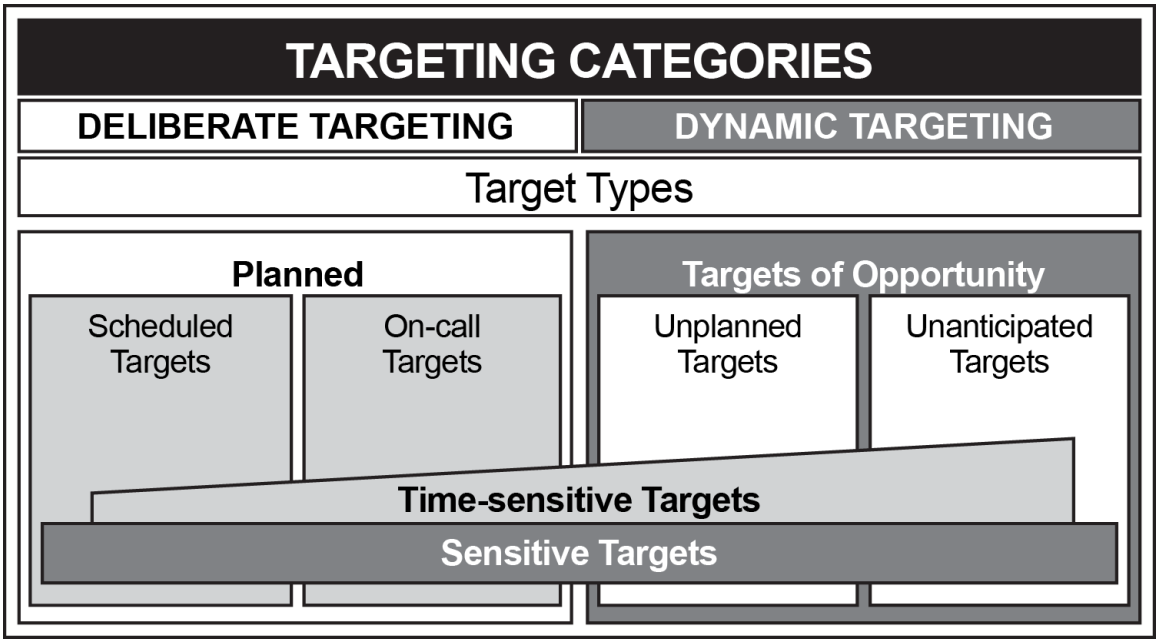
TARGETING CATEGORIES AND TYPES

2-360. Two types of targeting categories exist: deliberate and dynamic. Deliberate targeting prosecutes planned targets. Dynamic targeting prosecutes targets of opportunity and changes to planned targets or objectives (see figure 2-34).

2-361. Two types of deliberate targeting exist-scheduled and on-call-with six steps of execution. Scheduled targets are present in an AO and found in sufficient time so that fires or other actions against them can be engaged at a specific, planned time. On-call targets have actions planned, but not at a specific delivery time. A commander expects to locate these targets in sufficient time to execute planned actions. Examples of deliberate targeting are targets on target lists in the applicable plan or order and targets detected in sufficient time to be placed in the joint air tasking cycle, mission type orders, or fire support plans. Six steps to execute deliberate targeting are: find, fix, track, target, engage, and assess.

2-362. Two types of dynamic targeting (targets of opportunity) exist as well-unplanned and unanticipated. Unplanned targets are known to exist in an AO, but no action has been planned against them. The target may not have been detected or located in sufficient time to meet planning deadlines. Alternatively, the target may have been located, but not previously considered of sufficient importance to engage. Unanticipated targets are unknown or not expected to exist in an AO.

2-363. For the execution of dynamic targeting, find, fix, finish, exploit, analyze, and disseminate (F3EAD) provides commanders with a methodology for organizing resources and arraying forces during LSCO. F3EAD is consistent with the D3A methodology and provides a commander with an additional tool to address certain challenges. **F3EAD is not a replacement for D3A nor is it exclusive to targeting; rather it is a technique that works at all levels for leaders to understand their operational environment and visualize the effects they want to achieve.**



ATP 3-60

Figure 2-34. Targeting categories and types

TARGETING AND THE MILITARY DECISION-MAKING PROCESS

2-364. D3A methodology is an integral part of the MDMP. Targeting begins with receipt of mission and continues through operation order execution and assessment activities. Like the MDMP, targeting is a leadership driven process. During the MDMP, targeting becomes more focused on the commander's guidance and intent (see figure 2-35 on how to integrate the targeting process into the MDMP along with products generated during targeting).

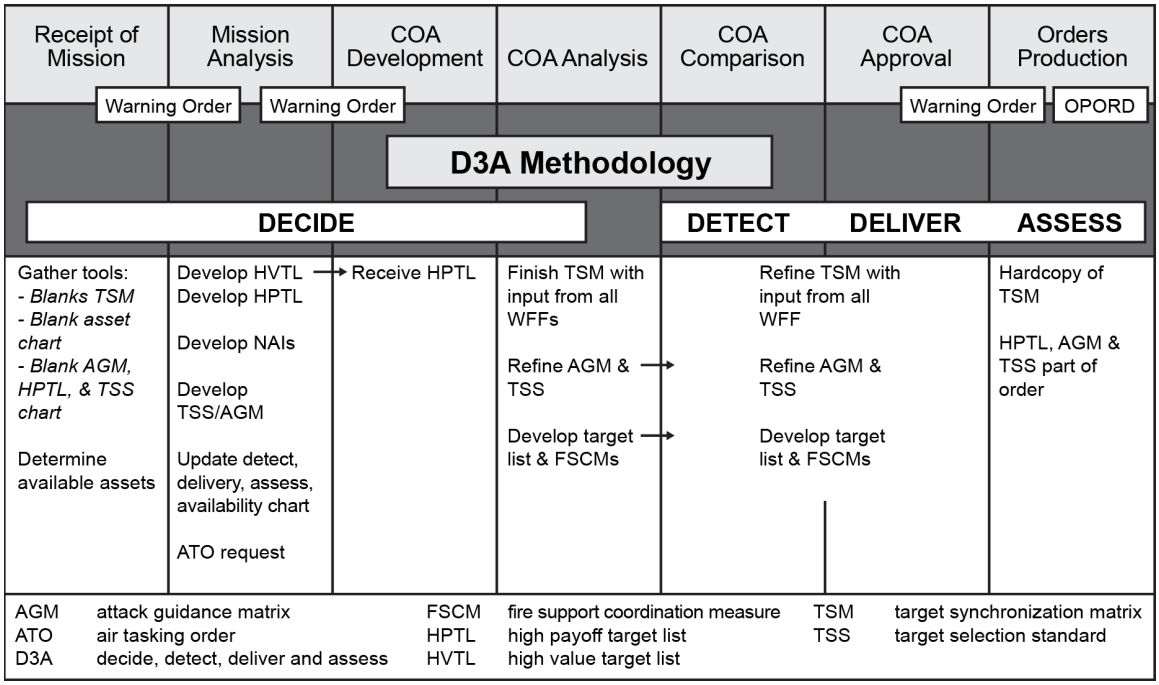


Figure 2-35. Integration of targeting into the MDMP

D3A IN THE MILITARY DECISION-MAKING PROCESS

2-365. D3A methodology functions occur simultaneously and sequentially during an operations process. During planning, decisions are made for future operations. Current operations simultaneously detect, deliver, and assess targets based on current targeting decisions.

Decide

2-366. The decide function coincides with the MDMP from receipt of mission through issuance of the approved plan or order. The detect function is a continuing function that starts with the commander's approval of the plan or order and is accomplished during execution of the plan or order. Once detected, targets are attacked and assessed as required. Targeting working groups focus the targeting process on the following:

- What targets should be acquired and engaged?
- When and where are the targets likely to be found?
- How do the rules of engagement impact target selection?
- How long will the target remain once acquired?
- Who or what can locate or track the targets?
- What accuracy of target location will be required to engage the target?
- What are the priorities for reconnaissance, surveillance, target acquisition, sensor allocation, and employment?

- What intelligence requirements are essential to the targeting effort and how and when must the information be collected, processed, and disseminated?
- When, where, how, and in what priority should targets be attacked or engaged?
- What are the measures of performance and measures of effectiveness that determine whether the target has been successfully attacked or engaged and whether the commander's desired effects have been generated by doing so?
- Who or what can attack or engage the targets, how should the attack or engagement be conducted-for example, number, type of attack or engagement assets and the ammunition to be used-to generate desired effects, and what are required assets and resources based on the commander's guidance?
- What or who will obtain assessment or other information required to determine the success or failure of each attack or engagement? Who must receive and process that information, how rapidly, and in what format?
- Who has the decision-making authority to determine success or failure, and how rapidly must the decision be made and disseminated?
- What actions will be required if an attack or engagement is unsuccessful, and who has the authority to direct those actions?

2-367. Staffs use information from the targeting working group to develop the following products:

- High-payoff target list (HPTL).
- Information collection plan.
- Target selection standards.
- Attack guidance matrix.

High-Payoff Target List

2-368. A *high-payoff target list* is a prioritized list of high-payoff targets by phase of the operation (FM 3-09). High-payoff targets are targets whose loss to the enemy will significantly contribute to the success of the friendly course of action (JP 3-60) (see table 2-27 for an example of an HPTL). Considerations for the HPTL include—

- Sequence or order of appearance.
- Ability to detect, identify, classify, locate, and track the target (this decision must include sensor availability and processing timeline considerations.
- Degree of accuracy available from acquisition system(s).
- Ability to engage the target.
- Ability to achieve the desired effects on the basis of attack guidance.

Table 2-27. High-payoff target list example

High-payoff target list		
Event or Phase:_____		
Priority	***Category***	***Target***
1	Fire Support	Artillery
2	Maneuver	Enemy Patrol
3	Command and Control	Enemy Operations Cell

Target Selection Standards

2-369. Target selection standards usually comprise the essential elements listed in a target selection standards matrix. Units may develop their own target selection format, but a matrix normally includes the following standards:

- **High-payoff target.** This refers to the designated HPT that the collection manager is tasked to acquire.
- **Timeliness.** Valid targets are reported to weapon systems within designated timeliness criteria.

- **Accuracy.** Valid targets must be reported to the weapon system meeting the required target location error criteria. The criteria are the least restrictive target location errors allowed considering capabilities of available weapon systems.

Technique: Organize a high-payoff target list into target sets that reflect the capabilities and functions the commander has decided to engage. Target sets are identified and prioritized for each phase of an operation. Within sets, rank order individual targets by target value, sequence of appearance, importance, or other criteria that satisfy the commander's desired effects. In this way, the targeting working group reduces, modifies, and reprioritizes HVTs while ensuring that HPTs support the concept of operations.

Attack Guidance Matrix

2-370. An attack guidance matrix (AGM) provides specific targeting guidance for each HPT. For example, the matrix might state that a target is out of range or undesirable or out of range but moving toward an advantageous location for an attack. At a minimum, an attack guidance matrix includes—

- Specific HPTs.
- Timing of engagement.
- How targets are engaged.
- Desired effects.
- Remarks to include restrictions.

Table 2-28 depicts an example attack guidance matrix.

Table 2-28. Example attack guidance matrix

Phase/Event				
HPTL	***When***	***How***	***Effect***	***Remarks***
COPS	P	GS ARTY	N	Plan in initial prep
RECON and Ops	P	GS ARTY	N	Plan in initial prep
2S1 and 2S3	P	MLRS	N	Plan in initial prep
2S6, SA9, and SA13	P	GS ARTY	S	SEAD for AVN OPS
REGT CP	A	MLRS	N	
Reserve BN	P	AVN BDE	D	Intent to attack reserve BN in EA HOT
When (I) Immediate When (A) As acquired When (P) Planned COPS Close observation patrol		Effect (S) Suppress Effect (N) Neutralize Effect (D) Destroy	prep OPS SEAD	prepare operations suppression of enemy air defense
Notes. 1. This is only an example of an AGM. Actual matrices are developed based on the situation. 2. An H for harassing fires may be included in the Effect column.				

Detect

2-371. The detect function is conducted from COA comparison through execution of an operation. Target acquisition assets gather information and report their findings back to their controlling headquarters, which in turn pass pertinent information to the tasking agency. Some collection assets provide actual targets, while other assets provide information that must be processed to produce valid targets. Not all of the information reported would benefit the targeting effort, but it may be valuable to developing the overall situation. The target priorities developed in the decide function are used to expedite the processing of targets. Situations arise where engaging a target, upon location and identification, is either impossible (for example, the target is out of range) or undesirable (the target is out of range but moving toward an

advantageous location for an attack). An example of the latter is repositioning of threat ADA systems from outside of weapon systems range to within. Critical targets that friendly forces cannot or choose not to attack, in accordance with attack guidance, should be tracked to ensure they are not lost. Tracking suspected targets expedites execution of the attack guidance. Tracking suspected targets keeps them in view while they are validated. Planners and executers must keep in mind that assets used for target tracking may be unavailable for target acquisition.

2-372. Detect is the next critical function in the targeting process. The intelligence officer is the main figure in directing the effort to detect HPTs identified in the decide function. To identify specific who, what, when, and how for target acquisition, the intelligence officer works closely with the following:

- Analysis and control element.
- Field artillery unit intelligence officer.
- Targeting officer or fire support officer.
- Space support element.

2-373. Targets are detected and tracked by maximizing use of available assets. The intelligence officer focuses intelligence acquisition efforts on designated HPTs and PIRs. The collection manager considers the availability and capability of all collection assets.

2-374. Intelligence factors of the operational environment that affect the populace require particular attention. Such intelligence is important for developing political, social, and economic programs. Intelligence personnel continuously analyze large quantities of all-source intelligence reporting to determine—

- Threat validity.
- Actual importance of potential targets.
- Best means to engage the target.
- Expected effects of engaging the targets (which will guide actions to mitigate negative effects).

Detection Procedures

2-375. HPTs must be detected in a timely, accurate manner. Clear and concise tasks must be given to reconnaissance units or surveillance systems that can detect a given target. Target tracking is inherent to detection. Mobile HPTs are detected and tracked to maintain a current target location. Tracking priorities are based on the commander's concept of the operation and targeting priorities. The fires cell tells the intelligence section the degree of accuracy required and dwell time for a target to be eligible for engagement. The intelligence section matches accuracy requirements to the target location error of collection system. If a target type and its associated signatures (for example, electronic, visual, and thermal) are known, the most capable collection asset can be directed against the target. The asset can be placed in the best position according to estimates of when and where the enemy target will be located.

Deliver

2-376. The third function (which is conducted from COA comparison through execution of an operation) in targeting is "deliver." The deliver function's main objective is to attack or engage targets in accordance with a commander's guidance and attack guidance.

2-377. Engagement of targets must satisfy the engagement guidance developed in the decide function. Target engagement requires several decisions and actions that fall into two categories: tactical and technical. Tactical decisions determine—

- Time of the engagement.
- Desired effect, degree of damage, or both.
- Asset to be used.
- Potential for collateral damage.

These decisions result in the physical engagement of the target (see ATP 3-60 for more detail on tactical decisions).

2-378. Tactical decisions (the selection of a weapon system or a combination of weapons systems) lead to a technical solution for the selected weapon. Technical decisions include the following—

- Systems or assets availability.
- Desired effects
- Any special restraints or requests for particular munitions types

2-379. There are various reasons a delivery system or asset may not be able to meet the requirements, including the following—

- Systems or asset unavailable at a specified time.
- Required munitions or asset unavailable.
- Targets out of range.

A fires cell must decide if the selected delivery system or asset should engage under different criteria or if a different delivery system or asset should be used.

Assess

2-380. Assess (conducted from COA comparison through execution of the operation) is the fourth function of targeting. Commanders continuously assess the operational environment and the progress of operations, comparing them to their initial vision and intent. Commanders adjust operations based on assessments to ensure objectives are met and the military end state is achieved. Staffs, in addition to commanders, assess the results of mission execution. Key considerations in assessing targeting include: assessing results, continuous assessments, assessing at all levels, and conducting combat assessments.

Assessing Results

2-381. Staffs assess the results of mission execution. If the assessment reveals that the commander's guidance has not been met, targeting must continue to focus on the target(s) involved. This feedback may result in changes to original decisions made during target selection. These changes may influence the continued execution of the plan.

Continuous Assessment

2-382. The assessment process is continuous and directly tied to a commander's decisions throughout planning, preparation, and execution of operations. Staffs help a commander by monitoring numerous aspects that can influence the outcome of operations and provide a commander with information needed for decisions in a timely manner. Planning for assessment helps staffs by identifying a commander's DPs and key aspects of the operation requiring close monitoring.

Assess at all Levels

2-383. Assessment occurs at all levels and across the spectrum of conflict. Even in operations that do not include combat, assessment of progress is just as important and can be more complex than traditional combat assessment. As a rule, the level at which a specific operation, task, or action is directed should be the level at which such activity is assessed.

COMBAT ASSESSMENT

2-384. Combat assessment is the determination of the effectiveness of force employment during military operations. Combat assessment is composed of three elements:

- Battle damage assessment (BDA).
- Munitions effectiveness assessment.
- Reengagement recommendation.

2-385. In combination, BDA and munitions effectiveness assessments inform the commander of effects against targets and target sets. Based on this information, an enemy's ability to make and sustain war and centers of gravity are continuously estimated. During the review of the effectiveness of operations, redirect recommendations are proposed or executed.

Battle Damage Assessment

2-386. BDA includes known or estimated enemy unit strengths; degraded, neutralized, or destroyed enemy weapon systems; and all known captured, wounded, or killed enemy personnel during a reporting period. BDA in targeting pertains to results of lethal and nonlethal engagements on targets designated by the commander. BDA accomplishes the following:

- Commanders use BDA to get a series of timely and accurate snapshots of effects on the enemy. Assessment provides commanders an estimate of an enemy's combat effectiveness, capabilities, and intentions. This helps the staff determine when, or if, their targeting effort is accomplishing their objectives.
- As part of targeting, BDA helps to determine if a reengagement is necessary. The information is used to allocate or redirect weapon systems to make the best use of available combat power.

2-387. BDA must measure things that are important to a commander and must be objective. Each BDA has three components:

- Physical damage assessment—estimates the quantitative extent of physical damage through munitions blast, fragmentation, and fire damage effects to a target.
- Functional damage assessment—estimates the effects of engagement on a target's ability to perform its intended mission compared to the mission objective established against the target.
- Target system assessment—estimates the overall impact and effectiveness of all types of engagement against an entire target system capability.

See ATP 3-60 for more information on physical damage, functional damage, and target system assessments.

Munitions Effectiveness Assessment

2-388. The operations officer, in coordination with the fires cell and targeting working group, conducts munitions effectiveness assessment concurrently and interactively with BDA as a function of combat assessment. Munitions effectiveness assessment is an assessment of military force in terms of weapon systems and munitions effectiveness. Munitions effectiveness assessment is conducted using approved weaponeering software and provides the basis for recommendations to increase the effectiveness of—

- Methodology.
- Tactics.
- Weapon systems.
- Munitions.
- Weapon delivery parameters.

2-389. The targeting working group may recommend modifying commander's guidance concerning the unit basic load, required supply rate, and controlled supply rate based on munitions requirements to achieve the desired effects.

Reengagement Recommendation

2-390. Failure to achieve desired effects requires a decision from the commander regarding whether to continue as planned. The targeting team and current operations cell assess operational risks associated with the HPT and provide options to mitigate the risks. One option is reengagement. Based on the BDA and munitions effectiveness assessment, the intelligence officer in conjunction with the fire support coordinator or deputy fire support coordinator and operations officer consider the degree to which objectives have been achieved and make recommendations to the commander. Reengagement and other recommendations should address objectives relative to—

- Targets.
- Target critical elements.
- Target systems.
- Enemy combat force strengths.
- Friendly maneuver.

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Chapter 3

Preparing

Preparing occurs simultaneously with planning. This chapter covers the various activities a unit does to improve its ability to execute operations.

OVERVIEW OF PREPARING

3-1. Information for this section came from ADP 5-0 and FM 6-0.

3-2. *Preparation* is those activities performed by units and Soldiers to improve their ability to execute an operation (ADP 5-0). Preparation creates conditions that improve friendly forces' opportunities for success. It requires commander, staff, unit, and Soldier actions to ensure the force is trained, equipped, and ready to execute operations. Preparation activities help commanders, staffs, and Soldiers understand a situation and their roles in upcoming operations.

PREPARATION ACTIVITIES

3-3. Mission success depends as much on preparation as on planning. Higher headquarters may develop the best of plans, but plans serve little purpose if subordinates do not receive them in time. Subordinates need enough time to understand plans well enough to execute them. Subordinates develop their own plans and preparations for an operation. After they fully comprehend the plan, subordinate leaders rehearse key portions of it and ensure Soldiers and equipment are positioned and ready to execute the operation. Commanders, units, and Soldiers conduct the activities listed in table 3-1 to help ensure the force is protected and prepared for execution.

Table 3-1. Preparation activities

ADP 5-0

Continue to coordinate and conduct liaison	Conduct confirmation briefs
Initiate information collection	Conduct Rehearsals
Initiate security operations	Conduct plans-to-operations transitions
Initiate troop movement	Refine the plan
Initiate sustainment preparations	Integrate new Soldiers and units
Initiate network preparations	Complete task organization
Manage terrain	Train
Prepare terrain	Perform pre-operations checks and inspections
	Supervise

CONTINUE TO COORDINATE AND CONDUCT LIAISON

3-4. Coordinating and conducting liaison helps ensure that leaders internal and external to the headquarters understand their unit's role in upcoming operations, and they are prepared to perform that role. In addition to military forces, many civilian organizations may operate in the operational area. Their presence can both affect and be affected by the commander's operations. Continuous coordination and liaison between the command and unified action partners helps build unity of effort.

3-5. During preparation, commanders continue to coordinate with higher, lower, adjacent, supporting, and supported units and civilian organizations. Coordination includes, but is not limited, to the following—

- Sending and receiving liaison teams.
- Establishing communication links that ensure continuous contact during execution.
- Exchanging standard operating procedures (SOPs).

- Synchronizing security operations with reconnaissance and surveillance plans to prevent breaks in coverage.
- Facilitating civil-military coordination among those involved.

3-6. Establishing and maintaining liaison is vital to external coordination. Liaison enables direct communications between a sending and receiving headquarters. It may begin with planning and continue through preparing and executing, or it may start as late as execution. Available resources and the need for direct contact between sending and receiving headquarters determine when to establish liaison. Establishing liaisons with civilian organizations is especially important in stability operations because of the variety of external organizations and the inherent coordination challenges.

INITIATE INFORMATION COLLECTION

3-7. During preparation, commanders take every opportunity to improve their situational understanding. This requires aggressive and continuous information collection. Commanders often direct information collection (to include reconnaissance operations) early in planning that continues in preparation and execution. Through information collection, commanders and staffs continuously plan, task, and employ collection assets and forces to collect timely and accurate information to help satisfy the commander's critical information requirements (CCIRs) and other information requirements. Refer to paragraph 2-312 of this guide or FM 3-55 for more information on information collection.

INITIATE SECURITY OPERATIONS

3-8. The force as a whole is often most vulnerable to surprise and enemy attack during preparation, when forces are often concentrated in assembly areas. Leaders are away from their units and concentrated together during rehearsals. Parts of the force could be moving to task-organize. Required supplies may be unavailable or being repositioned. **Security operations—screen, guard, cover, area security, and local security—are essential during preparation.** Units assigned security missions execute these missions while the rest of the force prepares for the overall operation (see appendix C for more information on security operations).

INITIATE TROOP MOVEMENTS

3-9. The repositioning of forces prior to execution is a significant activity of preparation. Commanders position or reposition units to the right starting places before execution. Commanders integrate operations security measures with troop movements to ensure these movements do not reveal any intentions to the enemy. Troop movements include assembly area reconnaissance by advance parties and route reconnaissance. They also include movements required by changes to the task organization. Commanders can use warning orders to direct troop movements before they issue the operation order (OPORD).

INITIATE SUSTAINMENT PREPARATION

3-10. Resupplying, maintaining, and issuing supplies or equipment and repositioning sustainment assets, as needed, occurs during preparation. In addition, sustainment elements need to accomplish many other activities such as port opening and contracting.

3-11. During preparation, sustainment planners at all levels take action to optimize means (force structure and resources) for supporting the commander's plan. These actions include, but are not limited to, identifying and preparing bases, host-nation infrastructure and capabilities, contract support requirements, and lines of communication (LOCs). They also include forecasting and building operational stocks and identifying endemic health and environmental factors. Integrating environmental considerations sustains vital resources and help to reduce the logistics footprint.

3-12. Planners focus on identifying resources currently available and ensuring access to them. During preparation, sustainment planning continues to support operational planning (branch and sequel development) and the targeting process.

INITIATE NETWORK PREPARATION

3-13. During preparation, the information network is tailored and engineered to meet the specific needs of each operation. This includes not only communications, but also how the commander expects information to move between, and be available for, leaders and units within an area of operations (AO).

3-14. During preparation, commanders and staffs prepare and rehearse the information network to support the plan in the following areas:

- Management of available bandwidth.
- Availability and location of data and information.
- Positioning and structure of network assets.
- Tracking status of key network systems.
- Arraying sensors, weapons, and the information network to support the concept of the operation.

MANAGE TERRAIN

3-15. *Terrain management* is the process of allocating terrain by establishing areas of operations, designating assembly areas, and specifying locations for units and activities to deconflict activities that might interfere with each other (ADP 3-90). Terrain management is an important activity during preparation as units reposition and stage prior to execution. Commanders who are assigned an AO are responsible for managing terrain within their boundaries. Through terrain management, commanders identify and locate units in the area. The operations officer, with support from others in the staff, can then deconflict operations, control movements, and deter fratricide as units get in position to execute planned missions. Commanders also consider unified action partners located in their AO and coordinate with them for the use of terrain.

PREPARE TERRAIN

3-16. Terrain preparation starts with a situational understanding of terrain through proper terrain analysis. It involves shaping the terrain to gain an advantage, such as improving cover, concealment and observation, fields of fire, new obstacle effects through reinforcing obstacles, or mobility operations for initial positioning of forces. It can make the difference between an operation's success and failure. Commanders must understand the terrain and the infrastructure of their AO as early as possible to identify potential for improvement, establish priorities of work, and begin preparing the area.

CONDUCT CONFIRMATION BRIEFS

3-17. The confirmation brief is a key part of preparation. Subordinate leaders give a confirmation brief to the commander immediately after receiving the OPORD. A confirmation brief ensures the commander that subordinate leaders understand—

- The commander's intent, mission, and concept of operations.
- Their unit's tasks and associated purposes.
- The relationship between their unit's mission and those of other units in the operation.

Ideally, the commander conducts confirmation briefs in person with selected staff members of the higher headquarters present.

REVISE AND REFINE THE PLAN

3-18. Revising and refining the plan is a key activity of preparation. The commander's situational understanding may change over the course of operations, enemy actions may require revision of the plan, or unforeseen opportunities may arise. During preparation, assumptions made during planning may be proven true or false. Intelligence analysis may confirm or deny enemy actions or show changed conditions in the AO because of SOs. The status of friendly forces may change as the situation changes. In any of these cases, commanders identify the changed conditions and assess how the changes might affect the upcoming operation. Significant new information requires commanders to make one of three assessments regarding the plan—

- The new information validates the plan with no further changes.
- The new information requires adjustments to the plan.
- The new information invalidates the plan, requiring the commander to reframe and develop a new plan.

The earlier the commander identifies the need for adjustments, the more easily the staff can incorporate changes to the plan and modify preparation activities.

COMPLETE TASK ORGANIZATION

3-19. During preparation, commanders complete task-organizing their force to obtain the right mix of capabilities and expertise to accomplish a specific mission. The receiving commander integrates units that are attached, placed under operational control, or placed in direct support. The commander directing the task organization also makes provisions for sustainment and may direct that task organization to occur immediately before the OPORD is issued. Task-organizing is done with a warning order, which gives units more time to execute tasks needed to affect the new task organization. Early task-organizing allows affected units to become better integrated and more familiar with all elements involved. This is especially important with inherently time-consuming tasks, such as planning technical network support for an organization.

INTEGRATE NEW SOLDIERS AND UNITS

3-20. Commanders, command sergeants major, and staffs help assimilate new Soldiers into their units and new units into the force. They also prepare Soldiers and new units to properly perform their duties and smoothly integrate into an upcoming operation. Integration for new Soldiers includes training on unit SOPs and mission-essential tasks for the operation. It also means orienting new Soldiers to their places and roles in the force and during the operation. This integration for units includes, but is not limited to—

- Receiving and introducing new units to the force and the AO.
- Exchanging SOPs.
- Conducting briefings and rehearsals.
- Establishing communications links.
- Exchanging liaison teams (if required).

TRAIN

3-21. Training prepares forces and Soldiers to conduct operations according to doctrine, SOPs, and the unit's mission. Training develops the teamwork, trust, and mutual understanding that commanders need to exercise mission command and that forces need to achieve unity of effort. Training does not stop when a unit deploys. If a unit is not conducting operations or recovering from operations, it is training. While deployed, unit training focuses on fundamental skills, current SOPs, and skills for a specific mission.

CONDUCT PRE-OPERATIONS CHECK AND INSPECTIONS

3-22. Unit preparation includes completing pre-operations checks and inspections; these are precombat checks (PCCs) and precombat inspections (PCIs). A PCI is an inspection that leaders conduct on subordinates before the mission. Its goal is to ensure Soldiers understand the mission, they have the necessary equipment and resources, and are fully prepared to execute the upcoming mission. A PCC is what individual Soldiers do to ensure the equipment they are responsible for is in working order and they have the required resources to execute the mission.

SUPERVISE

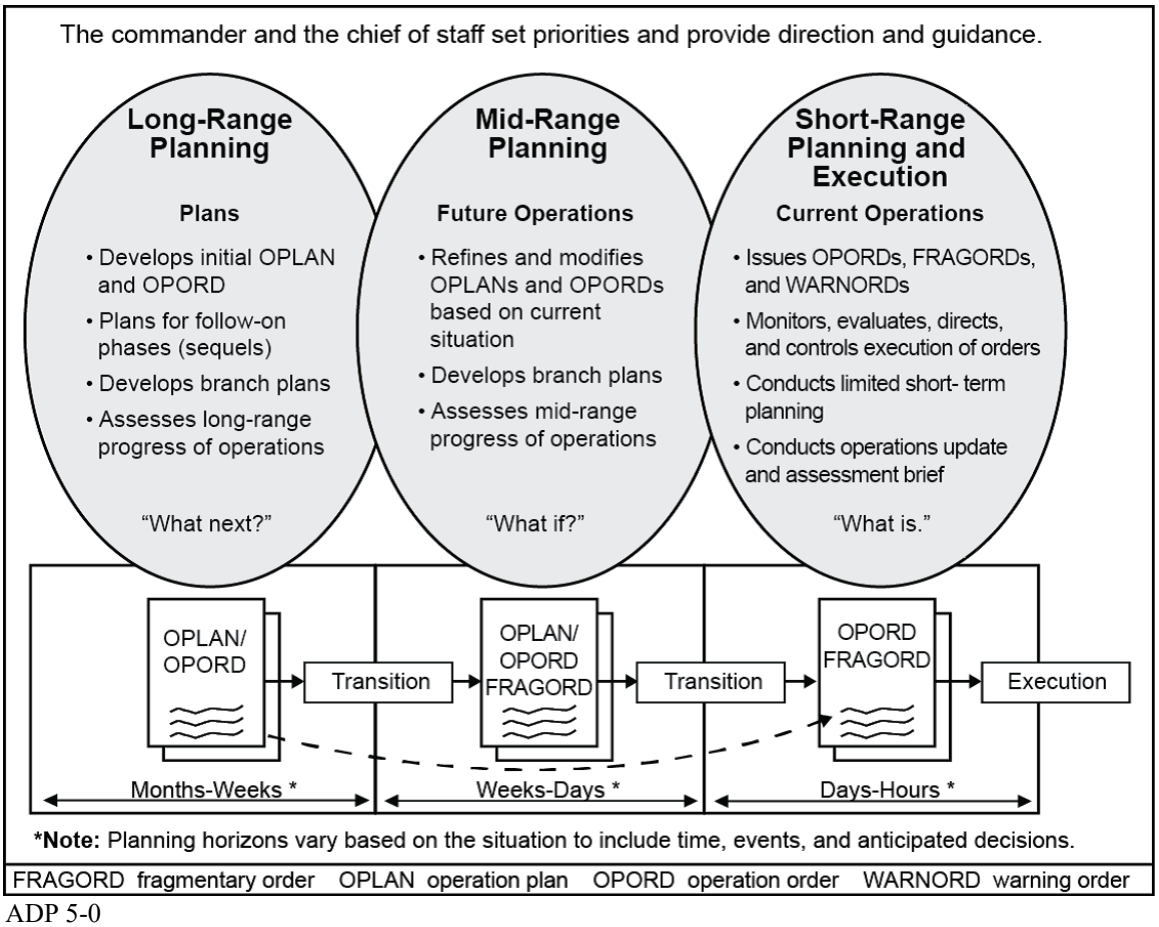
3-23. Attention to detail is critical to effective preparation. Leaders monitor and supervise activities to ensure the unit is ready for the mission. Leaders supervise subordinates and inspect their personnel and equipment. Rehearsals allow leaders to assess their subordinates' preparations. They may identify areas that require more supervision.

TRANSITIONS

3-24. The source for this section is ADP 5-0.

3-25. Transitions mark a change of focus between phases, execution of a branch or sequel, or between elements of decisive action, such as from offense to stability. Transitions require planning and preparation well before their execution to maintain momentum and tempo of operations. The force is vulnerable during transitions and commanders should therefore establish clear conditions for their execution. Transitions may create unexpected opportunities but they may also make forces vulnerable to a threat.

3-26. The plans-to-operations transition is a preparation activity that occurs within the headquarters. It ensures members of the current operations cell fully understand the plan before execution. During preparation, responsibility for developing and maintaining the plan shifts from the plans (or future operations) cell to the current operations cell (see figure 3-1). This transition is the point at which the current operations cell becomes responsible for controlling execution of the OPORD. This responsibility includes answering requests for information concerning the order and maintaining the order through fragmentary orders (FRAGORDs). This transition enables the plans cell to focus its planning efforts on sequels, branches, and other planning requirements directed by the commander.



ADP 5-0

Figure 3-1. Transition among integrating cells

3-27. The timing of the plans-to-operations transition requires careful consideration. It must allow enough time for members of the current operations cell to understand the plan well enough to coordinate and synchronize its execution. Ideally, the plans cell briefs the members of the current operations cell on the plans-to-operations transition before the combined arms rehearsal. This briefing enables members of the

current operations cell to understand the upcoming operation as well as identify friction points and issues to solve prior to its execution. The transition briefing is a mission briefing that generally follows the five paragraph OPORD format. Specific areas addressed include, but are not limited to—

- Task organization.
- Situation.
- Higher headquarters' mission (one and two echelons up in the chain of command).
- Mission.
- Commander's intent (one and two echelons up in the chain of command).
- Concept of operations.
- Commander's critical information requirements.
- Decision support template (DST) and matrix.
- Branches and sequels.
- Sustainment.
- Command and signal.
- Outstanding requests for information and outstanding issues.

3-28. Following the combined arms rehearsal, planners and members of the current operations cell review additional planning guidance issued by the commander and modify the plan as necessary. Significant changes may require assistance from the plans cell to include moving a lead planner to the current operations cell.

Note. Although an order has transitioned to the current operations cell for execution, planners continue planning sequels, branches, and other planning requirements for that base order. The current operations cell maintains, deconflicts, and synchronizes the order so the operation progresses. Planners have a longer planning horizon and focus on sequels and branches. Both the plans cell and current operations cell can publish FRAGORDs that affect different parts of the operation through the unit's order publication section.

REHEARSALS

3-29. A *rehearsal* is a session in which the commander and staff or unit practices expected actions to improve performance during execution (ADP 5-0). Rehearsals allow leaders and their Soldiers to practice key aspects of the concept of operations. These actions help Soldiers orient themselves to their environment and other units before executing the operation. Rehearsals help Soldiers build a lasting mental picture of the sequence of key actions within the operation.

3-30. Rehearsals are the commander's tool to ensure staffs and subordinates understand the commander's intent and the concept of operations. They allow commanders and staffs to identify shortcomings in the plan not previously recognized. Rehearsals also contribute to external and internal coordination, as the staff identifies additional coordinating requirements.

3-31. The rehearsal is a coordination event, not an analysis. It does not replace course of action (COA) analysis. Adequate time is essential when conducting rehearsals. The time required varies with the complexity of the mission, the type and technique of rehearsal, and the level of participation. Units conduct rehearsals at the lowest possible level, using the most thorough technique possible, given the time available. Under time-constrained conditions, leaders conduct abbreviated rehearsals, focusing on critical events determined by reverse planning. Each unit will have different critical events based on the mission, unit readiness, and the commander's assessment.

Rehearsal Types

3-32. Each rehearsal type achieves a different result and has a specific place in the preparation timeline. The four types of rehearsals are—

- Backbrief.
- Combined arms rehearsal.
- Support rehearsal.
- Battle drill or SOP rehearsal.

Backbrief

3-33. A *backbrief* is a briefing by subordinates to the commander to review how subordinates intend to accomplish their mission (FM 6-0). Normally, subordinates perform backbriefs throughout preparation. These briefs allow commanders to clarify the commander's intent early in subordinate planning. Commanders use the backbrief to identify any problems in the concept of operations.

3-34. A backbrief differs from a confirmation brief (a briefing subordinates give their higher commander immediately following receipt of an order to confirm understanding) in that subordinate leaders are given time to complete their plan. Backbriefs require the fewest resources and are often the only option under time-constrained conditions. Subordinate leaders explain their actions from the start to the finish of the mission. Backbriefs are performed sequentially, with all leaders reviewing their tasks. When time is available, backbriefs can be combined with other types of rehearsals. Doing this allows subordinate leaders to coordinate their plans before performing more elaborate rehearsals.

Combined Arms Rehearsal

3-35. A combined arms rehearsal (CAR) is a rehearsal in which subordinate units synchronize their plans with each other. A maneuver unit headquarters normally executes a combined arms rehearsal after subordinate units issue their OPORD. This rehearsal type helps ensure that subordinate commanders' plans achieve the higher commander's intent.

Support Rehearsal

3-36. The support rehearsal helps synchronize each warfighting function with the overall operation. This rehearsal supports the operation so units can accomplish their missions. Throughout preparation, units conduct support rehearsals within the framework of a single or limited number of warfighting functions. These rehearsals typically involve coordination and procedure drills for aviation, fires, engineer support, or casualty evacuation (CASEVAC). Support rehearsals and combined arms rehearsals complement preparations for the operation. Units may conduct rehearsals separately and then combine them into full-dress rehearsals. Although these rehearsals differ slightly by warfighting function, they achieve the same result.

Battle Drill or Standard Operating Procedure Rehearsal

3-37. A battle drill is a collective action rapidly executed without applying a deliberate decision-making process. A battle drill or SOP rehearsal ensures that all participants understand a technique or a specific set of procedures. Throughout preparation, units and staffs rehearse battle drills and SOPs. These rehearsals do not need a completed order from higher headquarters. Leaders place priority on those drills or actions they anticipate occurring during the operation. For example, a transportation platoon may rehearse a battle drill on reacting to an ambush while waiting to begin movement.

3-38. All echelons use these rehearsal types, but they are most common for platoons, squads, and sections. They are conducted throughout preparation and are not limited to published battle drills. All echelons can rehearse such actions as a command post (CP) shift change, an obstacle breach lane-marking SOP, or a refuel-on-the-move site operation.

Rehearsal Methods

3-39. Methods for conducting rehearsals are limited only by a commander's imagination and available resources. Some methods include full dress, key leader, terrain model, digital terrain model, sketch map, map, and network rehearsals. Resources required for each method range from broad to narrow, and some methods take more time and resources. Each rehearsal method also imparts a different level of understanding to participants. The implications for each method include—

- Time—the amount of time required to conduct (plan, prepare, execute, and assess) the rehearsal.
- Echelons involved—the number of echelons that can participate in the rehearsal.
- Operations security (OPSEC) risks—the ease by which an enemy can exploit friendly actions from the rehearsal.
- Terrain—the amount of space needed for the rehearsal.

Different methods of conducting rehearsals based on these implications are described below.

Full-Dress Rehearsal

3-40. A full-dress rehearsal produces the most detailed understanding of an operation. It includes every participating Soldier and system. Leaders conduct the rehearsal on the actual, or similar terrain of the AO, initially under good light conditions, and then in limited visibility. Leaders repeat small-unit actions until units execute them to standard. A full-dress rehearsal helps Soldiers clearly understand what commanders expect of them. It helps them gain confidence in their ability to accomplish the mission. Supporting elements, such as aviation crews, meet and rehearse with Soldiers to synchronize the operation.

3-41. The higher headquarters may support full-dress rehearsals. The full-dress rehearsal is most difficult to accomplish at higher echelons. At those levels, commanders may develop an alternate rehearsal plan that mirrors the actual plan but fits the terrain available for the rehearsal.

3-42. Full-dress rehearsals consume more time than any other rehearsal type. For companies and smaller units, full-dress rehearsals most effectively ensure all units in the operation understand their roles. However, brigade and task force commanders consider how much time their subordinates need to plan and prepare when deciding whether to conduct a full-dress rehearsal.

3-43. All echelons involved in the operation participate in the full-dress rehearsal. Moving a large part of the force may create an OPSEC risk by attracting unwanted enemy attention. Commanders develop a plan to protect the rehearsal from enemy information collection. Sometimes commanders develop an alternate plan, including graphics and radio frequencies, where subordinates rehearse selected actions without compromising the actual OPORD. Commanders take care not to confuse subordinates when doing this. Terrain management for a full-dress rehearsal is challenging. Units identify, secure, clear, and maintain the rehearsal area throughout the rehearsal.

Key Leader Rehearsal

3-44. Circumstances may prohibit a rehearsal with all members of a unit. A key leader rehearsal involves only key leaders of the organization and its subordinate units. This type of rehearsal normally requires fewer resources than a full-dress rehearsal. Terrain requirements mirror those of a full-dress rehearsal, even though fewer Soldiers participate. The commander first decides the level of leader involvement. Then the selected leaders rehearse the plan while traversing the actual or similar terrain. Often commanders use this technique to rehearse fire control measures for an EA during defensive tasks. Commanders often use a key leader rehearsal to prepare key leaders for a full-dress rehearsal. The key leader rehearsal may require developing a rehearsal plan that mirrors the actual plan but fits the terrain of the rehearsal.

3-45. Often, small-scale replicas of terrain or buildings substitute for the actual AO. Leaders not only explain their plans, but also walk through their actions or move replicas across the rehearsal area or sand table. This is called a rehearsal of concept (ROC) drill. It reinforces the backbrief given by subordinates, since everyone can see the concept of operations and sequence of tasks.

3-46. A key leader rehearsal normally requires less time than a full-dress rehearsal. Commanders consider how much time their subordinates need to plan and prepare when deciding whether to conduct a reduced-

force rehearsal. A small unit from the echelons involved can perform a full-dress rehearsal as part of a larger organization's key leader rehearsal.

3-47. A key leader rehearsal is less likely to present OPSEC risks than a full-dress rehearsal because it has fewer participants. However, it requires the same number of radio transmissions as a full-dress rehearsal. Terrain management for the key leader rehearsal can be as difficult as for the full-dress rehearsal. Units identify, secure, clear, and maintain the rehearsal area throughout the rehearsal.

Terrain-Model Rehearsal

3-48. The terrain-model rehearsal is the most popular rehearsal method. It takes less time and fewer resources than full-dress or other rehearsals. An accurately constructed terrain model helps subordinate leaders visualize the commander's intent and concept of operations. When possible, commanders place the terrain model where it overlooks the actual terrain of the AO. The model's orientation coincides with that of the terrain. The size of the terrain model can vary from small (using markers to represent units) to large (on which the participants can walk). A large model helps reinforce the participants' perception of unit positions on the terrain.

3-49. Constructing the terrain model often consumes the most time. Units require a clear SOP that states how to build the model so it is accurate, large, and detailed enough to conduct the rehearsal. A good SOP also establishes staff responsibility for building the terrain model and a timeline for its completion. Because a terrain model is geared to the echelon conducting the rehearsal, multi-echelon rehearsals using this technique are difficult.

3-50. This rehearsal can present OPSEC risks if the area around the rehearsal site is not secured. Assembled commanders and their vehicles can draw enemy attention. Units must sanitize the terrain model after completing the rehearsal. Terrain management is less difficult than with previous rehearsal types. A good site is easy for participants to find, yet it is concealed from the enemy. An optimal location overlooks the terrain where the unit will execute the operation.

Digital Terrain-Model Rehearsal

3-51. Digital terrain models are virtual representations of the AO. Units drape high-resolution imagery over elevation data thereby creating a fly-through or walk-through. Holographic imagery produces the view in three dimensions. Often, the model hot links graphics, detailed information, unmanned aircraft systems, and ground imagery to key points providing more insight into the plan. The unit geospatial engineers can assist in digital model creation. Detailed city models already exist for many world cities.

3-52. The time required for creating a digital three-dimensional model depends on the amount of available data on the terrain being modeled. Of all the echelons involved, this type of rehearsal best suits small units, although with a good local area network, a wider audience can view the graphics. All echelons may be provided copies of the digital model to take back to their headquarters for a more detailed examination.

3-53. If not placed on a computer network, the OPSEC risk is limited because the model does not use a large physical site that requires securing and leaders can conduct the rehearsal under cover. However, if placed on a computer network, digital terrain models can be subject to enemy exploitation due to inherent vulnerabilities of networks. This type of rehearsal requires the least amount of terrain. Using tents or enclosed areas conceals the rehearsal from the enemy.

Sketch-Map Rehearsal

3-54. Commanders can use the sketch-map technique almost anywhere, day or night. The procedures are the same as for a terrain-model rehearsal except the commander uses a sketch map in place of a terrain model. Large sketches ensure all participants can see everyone’s actions as each participant walks through execution of the operation. Participants move markers on the sketch to represent unit locations and maneuvers. Sketch-map rehearsals take less time than terrain-model rehearsals and more time than map rehearsals.

3-55. Units tailor a sketch map to the echelon conducting the rehearsal. Multi-echelon rehearsals using this technique are difficult. This rehearsal can present OPSEC risks, if the area around the rehearsal site is not

secured. Assembled commanders and their vehicles can draw enemy attention. Units must sanitize, secure, or destroy the sketch map after use.

3-56. This technique requires less terrain than a terrain-model rehearsal. A good site ensures participants can easily find it yet stay concealed from the enemy. An optimal location overlooks the terrain where the unit will execute the operation.

Map Rehearsal

3-57. A map rehearsal is similar to a sketch-map rehearsal except the commander uses a map and operation overlay on the same scale used to plan the operation. The map rehearsal itself consumes the most time. A map rehearsal is normally the easiest technique to set up since it requires only maps and graphics for current operations. Units tailor a map rehearsal's operation overlay to the echelon conducting the rehearsal. Multi-echelon rehearsals using this technique are difficult.

3-58. This rehearsal can present OPSEC risks, if the area around the rehearsal site is not secured. Assembled commanders and their vehicles can draw enemy attention. This technique requires the least terrain of all rehearsals. A good site ensures participants can easily find it yet stay concealed from the enemy. An optimal location overlooks the terrain where the unit will execute the operation.

Network Rehearsal

3-59. Units conduct network rehearsals over wide-area networks or local area networks. Commanders and staffs practice these rehearsals by talking through critical portions of the operation over communications networks in a sequence the commander establishes. The organization rehearses only critical parts of the operation. These rehearsals require all information systems needed to execute that portion of the operation. All participants require working information systems, the OPORD, and graphics. Command posts can rehearse battle tracking during network rehearsals.

3-60. This technique can be time efficient, if units provide clear SOPs. However, if the organization has unclear SOPs, has units not operating on the network, or has units without working communications, this technique can be time-consuming.

3-61. This technique lends itself to multi-echelon rehearsals. Participation is limited only by the commander's intent and the capabilities of the command's information systems. If a unit executes a network rehearsal from current unit locations, the OPSEC risk may increase. The enemy may monitor the increased volume of transmissions and potentially compromise information. To avoid compromise, organizations use different frequencies for the rehearsal and for the operation. Using wire systems is an option, but this does not exercise the network systems, which is the strong point of this technique. If a network rehearsal is executed from unit locations, terrain considerations are minimal. If a separate rehearsal area is required, considerations are similar to those of a reduced-force rehearsal.

After the Rehearsal

3-62. After the rehearsal, the commander leads an after action review. The commander reviews lessons learned and makes the minimum required modifications to the existing plan (normally, a FRAGORD effects these changes). Changes should be refinements to the OPORD. Noncritical changes to the operation's execution may confuse subordinates and hinder synchronization of the plan. The commander issues any last minute instructions or reminders and reiterates the commander's intent.

3-63. Based on the commander's instructions, the staff make necessary changes to the OPORD, DST, and execution matrix based on rehearsal results. Subordinate commanders incorporate these changes into their units' OPORDs. The chief of staff (COS) or executive officer (XO) ensures the changes are briefed to all leaders or liaison officers who did not participate in the rehearsal.

3-64. A rehearsal provides the final opportunity for subordinates to identify and fix unresolved problems. The staff ensures that all participants understand any changes to the OPORD and that the recorder captures all coordination done at the rehearsal. All changes to the published OPORD are, in effect, verbal FRAGORDs. As soon as possible, the staff publishes these verbal FRAGORDs as a written FRAGORD that changes the OPORD.

PRECOMBAT INSPECTIONS

3-65. A unit commander or leader conducts a PCI to determine the force's readiness to execute its assigned tactical missions. These inspections may be formal or informal and may be announced or unannounced. All leaders and commanders conduct some type of PCI of their unit. Formal PCIs are meticulous inspections by the commander of all areas within the unit. Formal inspections consume an extraordinary amount of time and preclude working inspections because troops are standing down waiting to be inspected. Units in combat rarely have the luxury of time required for a formal PCI. During these preparations, subordinate commanders and unit leaders routinely make the same exacting, rigorous inspections of their personnel and equipment that would be repeated by the unit commander. Therefore, unit leaders seldom conduct formal PCIs during combat operations, including during assembly area occupation.

3-66. Informal PCIs are the commander's inspection of particular areas, activities, units of special interest, or concern. The informal PCI resembles a series of deliberate spot checks of key items. At the commander's discretion, the areas inspected and the method and depth of the inspection may vary from unit to unit or even from one vehicle to another. A commander's experience, in-depth knowledge of the unit and its equipment, and estimation of the status of subordinate elements dictate the particular details of the inspection. The commander may spend more time and look in greater depth at units newly task-organized into the command or units whose officer replacements are new to combat. Units that experience habitual shortcomings deserve more of the commander's time. The commander may designate one or more staff members or the XO to check certain items.

3-67. The informal PCI serves several purposes. First, it allows the commander to ensure, personally or through subordinates, that actions taken are in accordance with the commander's intent and applicable SOPs or standards. It also physically allows the commander to determine the readiness of the unit from a subjective viewpoint. The commander's personal knowledge and experience with Soldiers allows the commander to assess the intangible elements of combat power such as cohesion, morale, and esprit not reflected in formatted reports and briefings. This process of checking also enables the commander to exercise personal leadership, something not easily done when the unit is in combat and dispersed over a wide area.

3-68. In the informal PCI, the commander, staff, or other subordinates are physically at the site where assembly area activities are taking place—it is a working inspection. This allows them to take positive action to expedite actions, fix problems, and set standards as the need arises. Planned PCIs are most efficient and effective. Planning the PCI does not imply formal inspections or rigid adherence to schedules. Leaders planning the PCI determine what to check, who will check it, when it will be checked, and in what sequence it will be checked. Then, as quickly as possible, leaders notify subordinates to ensure everyone understands the expectations and purpose of the inspection.

3-69. Generally, the PCI covers those points that could mean the difference between mission success or failure and those points that serve as indicators of maintenance, readiness, or morale trends within the unit. Ideally, given enough time, the commander would check everything in the unit. However, with the general scarcity of time in combat and other competing demands on leaders' time during combat preparation, the commander must prioritize what to check. The number and competence of subordinate leaders or staff members available to assist the commander in inspections also influence what to check. Lacking sufficient time and without the same level of expertise in certain technical matters as subordinates or staff members, the commander habitually delegates some checks to subordinate leaders.

3-70. The PCI also frees the commander to devote time to inspecting vital areas, to spend more time with Soldiers, to become more fully involved in planning, or to conduct personal reconnaissance and coordination. The delegation and execution of PCI tasks must not interfere with troop-leading procedures by removing too many subordinate leaders and staff members from tactical planning. Commanders should avoid allowing subordinate leaders to trail behind them in ever-growing numbers during the inspection.

3-71. In prioritizing what to inspect, commanders focus on units, not equipment. The commander may assign staff inspections of units or activities within the staff's respective areas of expertise. In selecting units for inspection, the commander's judgment, experience, time available, and knowledge of the subordinate units serve as the commander's guide. The commander may invest more time and effort in those units whose combat performance is key to the upcoming operation or constitutes the main effort.

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Chapter 4
Executing

This chapter defines, describes, and offers guidelines for effective execution. It discusses the common operational picture (COP), battle rhythms, battle drills, the rapid decision-making and synchronization process, and meetings.

OVERVIEW OF EXECUTION

4-1. *Execution* is the act of putting a plan into action by applying combat power to accomplish the mission and adjusting operations based on changes in the situation (ADP 5-0). In execution, commanders, staffs, and subordinate commanders focus their efforts on translating decisions into actions. They apply combat power to seize, retain, and exploit the initiative to gain and maintain positions of relative advantage. This is the essence of unified land operations.

4-2. Commanders fight the enemy, not the plan. A plan provides a reasonable forecast of execution, but it is a starting point, not an exact script.

4-3. During execution, a situation may change rapidly. Operations the commander envisioned in the plan may bear little resemblance to actual events in execution. Subordinate commanders need maximum latitude to take advantage of situations and meet the higher commander's intent when the original order no longer applies. Effective execution requires leaders trained in independent decision making, aggressiveness, and risk taking in an environment of mission command. During execution, leaders must be able and willing to solve problems within the commander's intent without constantly referring to higher headquarters. Subordinates need not wait for top-down synchronization to act. Guides for effective execution include-

- Seize, retain, and exploit the initiative.
- Accept risk to exploit opportunities.

4-4. With action, commanders and their subordinate commanders create conditions for seizing the initiative. Without action, seizing the initiative is impossible. Retaining the initiative involves applying unrelenting pressure on the enemy. Commanders gain and retain the initiative by synchronizing the warfighting functions to present enemy commanders with continuously changing combinations of combat power at a tempo they cannot effectively counter. Exploiting the initiative means following through on initial successes to realize long-term decisive success. Once friendly forces seize the initiative, they immediately plan to exploit it by conducting continuous operations to accelerate the enemy's complete defeat.

4-5. Success during operations depends on a willingness to embrace risk as opportunity rather than treating it as something to avoid. By its very nature, military activity is about understanding, balancing, and taking risks. Risk is the probability and implication that an activity or event, with its associated positive or negative consequences, will take place. Risk is neutral. It is a measure of the likelihood of something going right or wrong, and its associated impact, good or bad. Commanders and subordinate commanders should not avoid risk or simply apply a process to it, but rather accept risk as a part of the essence of military operations.

COMMON OPERATIONAL PICTURE

4-6. A *common operational picture* is a display of relevant information within a commander's area of interest tailored to the user's requirements and based on common data and information shared by more than one command (ADP 6-0). Commanders choose any appropriate technique to develop and display the COP, such as graphical representations, verbal narratives, or written reports. A COP develops throughout the

operations process-it supports developing knowledge and understanding. Information in running estimates also helps build the COP.

4-7. In a command post (CP), the COP is the end product of knowledge and information activities, running estimates, and battle tracking. The COP is a single, identical display of relevant information shared by more than one command. It is the operational picture tailored to the commander's requirements, based on common data and shared information, and facilitates collaborative planning and the achievement of situational understanding.

4-8. The COP is key to each step within the operations process: plan, prepare, execute, and assess. Incorporating a relevant and comprehensive COP into a CP provides the following advantages to the operations process—

- Assists the commander in providing the intent and issuing planning guidance.
- Helps the commander, staff, and subordinate leaders focus on relevant information for an operation.
- Enhances collaboration and thus allows more efficient planning, directing, and brief-backs.
- Promotes subordinate unit parallel planning.
- Reduces the need for production of extensive control measures to coordinate maneuver.
- Helps ensure that rules of engagement are disseminated uniformly down to the lowest echelons.
- Allows for rapid response to evolving tactical situations and allows commanders to make informed decisions, synchronize forces and fires, and seize and retain the initiative.
- Reduces the chance of fratricide with enhanced situational understanding.
- Supports the commander who is rapidly communicating changes to ongoing operations.
- Promotes better battle tracking and helps leaders measure, analyze, and report unit performance during operations.
- Promotes subordinate unit and staff focus on the commander's critical information requirements (CCIRs), if depicted on the COP.
- Supports pre-planning to react to anticipated change.

COMMON OPERATIONAL PICTURE CHECKLIST

4-9. A technique for establishing an effective COP is to develop a checklist for the items to be displayed on the COP at all times. The checklist should include only relevant information tailored to the commander's requirements. Table 4-1 is an example of a COP checklist that should be included in the CP standard operating procedures (SOPs).

Table 4-1. Example common operational picture checklist

Number	*Items checked*
1	Significant activities including unit boundaries and current locations within the AO
2	Maneuver graphics (unit locations and graphic control measures)
3	Active and planned fire support coordination measures
4	Active and on-order airspace coordinating measures as published in the airspace control order
5	CCIRs and EEFIs
6	Sustainment nodes and major supply routes
7	Civil considerations
8	Known and templated threats, hazards and enemy locations and activities
9	Protection priorities
10	Risk assessment

COMMON OPERATIONAL PICTURE VISIBILITY

4-10. COP visibility is the degree to which all displays within the CP are visible, familiar, and available to those attempting to gain and maintain situational awareness. COP visibility sets the condition for effective

battle tracking and decision making. CP personnel should prioritize and emplace COP displays—**both digital and analog**—because of their relevancy to facilitating situational awareness for all CP members, especially radio-telephone operators. A common misconception is that COP visibility only pertains to the commander, primary staff members, and the battle captain.

4-11. A common function of all CPs is to build and maintain situational understanding. Conducting knowledge and information activities such as maintaining running estimates, performing focused battle tracking, and managing the COP enables staffs to make recommendations to commanders. These recommendations help commanders build and maintain their situational understanding while exercising command and control.

COMMON OPERATIONAL PICTURE MANAGER

4-12. An effective technique for managing the COP is to designate a COP manager. The COP manager is a person selected and designated to serve in this position due to their attention to detail; command and control information systems experience; computer skills; knowledge of ADP 5-0, ADP 1-02, and FM 6-0; intelligence expertise; and experience working in a CP. The COP manager works for the battle captain. The COP manager's duties include—

- Being responsible for all information displayed as the COP.
- Updating unit locations and events through the digital component of the COP.
- Updating unit locations and events on the analog COP.
- Coordinating with other staff sections for COP manipulation during briefings.
- Receiving guidance from the command group on specific views or manipulations of the COP for situational understanding purposes.

4-13. During continuous operations, a CP receives large amounts of data and information. In turn, CP staff perform knowledge and information activities to find relevant information from the large amounts of data and information available. Through analysis and running estimates, staffs perform battle tracking and COP management to help commanders understand situations, make and implement decisions, control operations, and assess progress. Units facilitate situational understanding through knowledge and information management when they create, organize, apply, and transfer knowledge to help develop a COP.

BATTLE RHYTHM

4-14. A headquarter's battle rhythm consists of a series of meetings (to include working groups and boards), briefings, and other activities synchronized by time and purpose. A *battle rhythm* is a deliberate daily cycle of command, staff, and unit activities intended to synchronize current and future operations (FM 6-0). The chief of staff (COS) or executive officer (XO) oversees the unit's battle rhythm. The COS or XO ensures activities are logically sequenced to ensure that the output of one activity informs another activity's inputs. Not only is this important internally within the headquarters, the unit's battle rhythm must nest with the higher headquarters. This ensures that the information pertinent to decisions and the recommendations on decisions made in the headquarters are provided in a timely manner to influence the decision making of the higher headquarters, where appropriate. Understanding the purpose and potential decisions of each meeting and activity is equally important.

4-15. Understanding allows the staff and subordinate commanders to provide appropriate input to influence decisions. The COS or XO balances other staff duties and responsibilities with the time required to plan, prepare for, and hold meetings and conduct briefings. The COS or XO also critically examines attendance requirements. Some staff sections and CP cells may lack personnel to attend all events. The COS or XO and staff members constantly look for ways to combine meetings and eliminate unproductive ones. The battle rhythm enables—

- Establishing a routine for staff interaction and coordination.
- Facilitating interaction between the commander and staff.
- Synchronizing activities of the staff in time and purpose.
- Facilitating planning by the staff and decision making by the commander.

4-16. The battle rhythm changes during execution as operations progress. For example, early in an operation a commander may require a daily plans update briefing. As the situation changes, the commander may only require a plans update every three days. Some factors that determine a unit's battle rhythm may include the staff's proficiency, higher headquarters' battle rhythm, and current mission. In developing the unit's battle rhythm, the chief COS or XO considers—

- Higher headquarters' battle rhythm and reporting requirements.
- Subordinate headquarters' battle rhythm requirements.
- The duration and intensity of the operation.
- Integrating cells' planning requirements.

4-17. An effective battle rhythm requires the COS's active management and the staff's meeting discipline. Battle rhythm is consistently adjusted based on the environment. The COS should establish a deliberate battle rhythm control process and structure that achieves and maintains effective decision support for the commander and shared understanding for the staff. The COS accomplishes this by—

- Establishing a battle rhythm management and change control process that requires the staff to justify event establishment (for example, purpose and authority, agenda, proposed membership, event location and timing, required product inputs and outputs) or modification. The COS can impose a "seven-minute drill" requirement on proponents of prospective cross-functional staff elements for this purpose.
- Documenting and routinely evaluating critical path information flows and identifying opportunities to streamline or eliminate unnecessary or redundant events and processes.
- Regularly checking battle rhythm events to ensure the staff's or command group's time is in support of the commander's decision cycle and staff shared understanding. Meeting chairpersons should research and understand techniques for effective meeting discipline, such as establishing a clear agenda that supports processing inputs in support of the commander's decision cycle and selectively limiting attendance to essential personnel.
- Placing accountability on staff leads for developing effective critical path information exchange flows with clear inputs and outputs for their respective functions and supporting cross-functional battle rhythm events.
- Maintaining awareness of critical staff positions that are in high demand for event participation. Additionally, staff leads should not automatically be assigned to participate in every cross-functional battle rhythm event. Instead, event membership should be based on who has the delegated authority to make decisions. For example, some high demand subject matter experts (such as the political advisor and staff judge advocate) are important members of events but will likely not be able to support multiple events at the same time.
- Providing discipline in battle rhythm execution necessary to maintain sufficient unscheduled time. Without a conscious effort to preserve valuable time for both the commander and staff to think and work, the battle rhythm can become overwhelming and counterproductive.

Table 4-3 depicts a sample headquarter's battle rhythm.

Technique: The name "seven-minute drill" refers to the fact that the proponent staff officer has about seven minutes to explain to the COS or XO "why" that particular meeting is necessary and how it supports the commander's decision cycle. The seven-minute drill provides a format by which the staff proponent summarizes the purpose for a prospective meeting. For example, each meeting lead presents a quad chart to the COS or XO that explains the meeting's purpose, attendees, and how it supports decision making. The approved quad charts are used later to assess meeting effectiveness and ensure the meeting accomplishes its intended purpose. Effective use of the seven-minute drill facilitates synchronized meetings and prevents arbitrary changes. Leaders can also use the quad chart to quickly inform new staff members about meeting expectations and determine if a meeting is still necessary. Variations of the seven minute drill quad chart can be used to quickly update decision makers (see ATP 6-01.1 for additional details on a seven-minute drill. See table 4-2 for an example seven-minute drill quad chart).

Table 4-2. Example seven-minute drill quad chart

General	Participants
Title Purpose Frequency Duration Location Medium	Staff lead Chair Members
Inputs and Outputs	**Agenda**
Inputs Outputs	First item Second item

Table 4-3. Sample headquarters battle rhythm

Time	*Event*	*Location*	*Participants*
Note. Event Time is Situationally Dependent			
0600	Shift Change	CP Ops Center	Entire staff
0800	Situation Update to CDR	Briefing Room	CDR, Deputy CDR, COS, G-1, G-2, G-3, G-4, G-5, G-6, CDR's Personal and Special Staffs, Subordinate Liaison, others as required
0900	CDR VTC with subordinate commanders	Briefing Room	CDR, Subordinate CDRs
1000	Targeting Board Meeting	Briefing Room	Deputy CDR, G-2, G-3, Subordinate Liaison, others as required
1100	IO working Group	Briefing Room	IO Staff, CA, PA, G-1, G-2, G-3, G-4, G-5, G-6, Subordinate Liaison, others as required
1200	Battle Update Assessment	Briefing Room	CDR, Deputy CDR, COS, G-1, G-2, G-3, G-4, G-5, G-6, CDR's Personal and Special Staffs, Subordinate Liaison, others as required
1300	Protection Working Group	CP Ops Center	FP Officer, G-1, G-2, G-3, G-4, G-5,G-6, Subordinate Liaison, others as required
1800	Shift Change	CP Ops Center	Entire staff
2000	Combat Assessment Board	Briefing Room	CDR, Deputy CDR, COS, G-1, G-2, G-3, G-4, G-5, G-6, CDR's Personal and Special Staffs, Subordinate Liaison, others as required

4-18. Each event has an event name typically describing its function, as well as a chairperson, purpose, location, time, frequency, facilitator, review date, members, and key tasks (agenda). Each named staff section must bring their specified input and products. It may also be important to specify the delivery time of these inputs to provide time to act or analyze the input prior to the event. These inputs lead to specified output products. Determination must be made as to when outputs are required and to whom or for what future event.

BATTLE DRILLS

4-19. A battle drill is a collective action rapidly executed without applying a deliberate decision-making process. A battle drill or SOP rehearsal ensures that all participants understand a technique or a specific set

of procedures. Throughout preparation, units and staffs rehearse battle drills and SOPs. Leaders place priority on drills or actions they anticipate occurring during the operation. For example, a transportation platoon may rehearse a battle drill on reacting to an ambush while waiting to begin movement.

4-20. All echelons use battle drills, but they are most common for platoons, squads, and sections. The rehearsals are conducted throughout preparation and are not limited to published battle drills. All echelons can rehearse such actions as a CP shift change, an obstacle breach lane-marking SOP, or a refuel-on-the-move site operation.

COMMAND POST BATTLE DRILLS

4-21. Each CP requires the implementation of battle drills to react to a variety of situations that may be encountered while conducting operations. A battle drill is initiated on a cue, such as enemy action or a leader's command, and is a trained response to the given stimulus. A battle drill requires minimal leader orders to accomplish. Synchronization and reaction speed are enhanced when battle drills are identified and the required reactions are defined in the unit SOP and rehearsed during training. Typical CP battle drills include, but are not limited to—

- React to an air, ground, or chemical, biological, radiological, or nuclear attack.
- React to indirect fire.
- React to jamming or suspected communications compromise.
- Execute dynamic targeting.
- Execute a close air support mission.
- React to a cyber intrusion or attack.
- React to a mass casualty incident.
- React to a civil riot or incident.
- React to significant collateral damage.
- React to incorrect information affecting an operational environment.
- React to a degraded network.
- React to a duty status and whereabouts unknown incident.

4-22. CP battle drills are very similar to SOPs, however, there is a key difference in that battle drills require an immediate response when the trigger is initiated for a given stimulus. For example, a CP has an SOP that guides the execution of CP security operations. A battle drill addresses the immediate actions required in reacting to an enemy attack when conducting security operations.

4-23. Situations that require the implementation of CP battle drills generally fall into two categories: (1) direct action against the CP itself and (2) actions that occur away from the CP that require rapid decision making and collective support across the CP functional cells. To understand battle drills and how to employ them, it is important to know their purpose and characteristics.

PURPOSE OF COMMAND POST BATTLE DRILLS

4-24. The purpose of conducting CP battle drills is to achieve an advantage in controlling the tempo of routine collective tasks routinely executed in a time-constrained environment. CP battle drills allow units to perform basic functions without hesitation or need for further coordination, assistance, or delay. CP battle drills are not designed for a specific unit type but rather represent a common methodology for executing common recurring tasks.

CHARACTERISTICS OF COMMAND POST BATTLE DRILLS

4-25. CP battle drills have the following characteristics:

- Require speed in execution.
- Require minimal leader orders to accomplish.
- Based on mission variables and can be changed to fit the needs of the unit.
- Sequential actions vital to success in combat or critical to preserving life.

- Trained responses to enemy actions or leaders' orders.

4-26. Rehearsals are key to the success of CP battle drills. Each drill should be practiced until CP personnel can execute to standard. Rehearsing the CP battle drills ensures—

- All CP personnel understand and demonstrate the capability to execute the battle drill.
- Improper execution of battle drills is discovered and corrected.
- All assets within the CP and any planned potential support from other elements in the area of operations (AO) are fully integrated.
- CP personnel have confidence in their abilities and are fully prepared to execute command post battle drills.

Table 4-4 details a command post battle drill method.

Table 4-4. Command post battle drill method

Step	*CP Battle Drill Method*
Step 1. Identify the initiating trigger.	Every CP battle drill has a key event or events that start the drill. Trainers identify and clearly define the event or events based on their mission analysis of the operational environment. Based on the echelon of the HQ executing the CP battle drill, the initiating event may have qualifying criteria such as a specific number of individuals or organizational size (for example, 500 demonstrators, four tanks, a battalion, and three aircraft). Those elements of the initiating event must be included in the CP battle drill format.
Step 2. Identify the ending trigger.	Just as every CP battle drill has an initiating trigger, it also has an ending trigger. The ending trigger is best described as a set of clearly defined conditions that, once achieved, trigger a decision to end the drill and resume steady state operations. Continue the drill until a new set of conditions or effects are achieved (must be defined by drill leader if not part of the established battle drill), or hand off any remaining tasks to a specified organization or agency.
Step 3. Establish an alert procedure.	Alerting the organization that a CP battle drill initiating event has occurred may be standardized for all CP battle drills such as “attention in the CP” or, a unique alert for each drill. Regardless of the method chosen, the battle drill should include in its published format the method for alerting all participating members.
Step 4. Establish a method that provides current common situational awareness.	There must be a defined technique for ensuring the “who, what, when, where, and why” (5 W’s) of the initiating event is known by all. This is in order to cross level all existing information and provide a cognitive foundation for participating drill members to receive guidance and other relevant information and data. The more standardized this procedure is the more foundational it becomes. For example, key CP cell members report to the current operations integrating cell once the alert is given.
Step 5. Identify key information requirements, necessary decisions, and the decision authority to achieve the ending trigger for the CP battle drill.	This is the most important element of the CP battle drill. The first step for identifying tasks is to identify key actions, information, and necessary decisions as well as who reserves, is delegated, or needs to have decision authority. The outcome of these tasks identifies the decision makers that choose the actions, decisions, and information required.
Step 6. Assign responsibilities and decision authority.	Responsibilities for who does what during each drill must be defined. Consider establishing responsibilities for who leads the drill, who records the drill, and who has the authority to determine when the appropriate actions have been taken to achieve the ending trigger conditions.
Step 7. Establish a CP battle drill process.	The CP battle drill process is unique to every organization. The specific process should be an SOP recorded item and must be rehearsed along with the individual battle drills to be of any value. An example of a battle drill process follows— Develop a CP battle drill template (a standard format for the SOP). Develop reporting and recording tools. Develop an AAR procedure for executing and rehearsing CP battle drills. Develop a process for capturing information and extrapolating decisions.

FLOWCHART FORMAT

4-27. One of the most common CP battle drill format found in unit SOPs is the flowchart format. A flowchart is a type of diagram that represents a workflow or process, showing the steps as boxes and their order by connecting them with arrows. This diagrammatic representation illustrates a solution model to a given problem or CP battle drill. Figure 4-1 shows an example of a command post battle drill flowchart format.

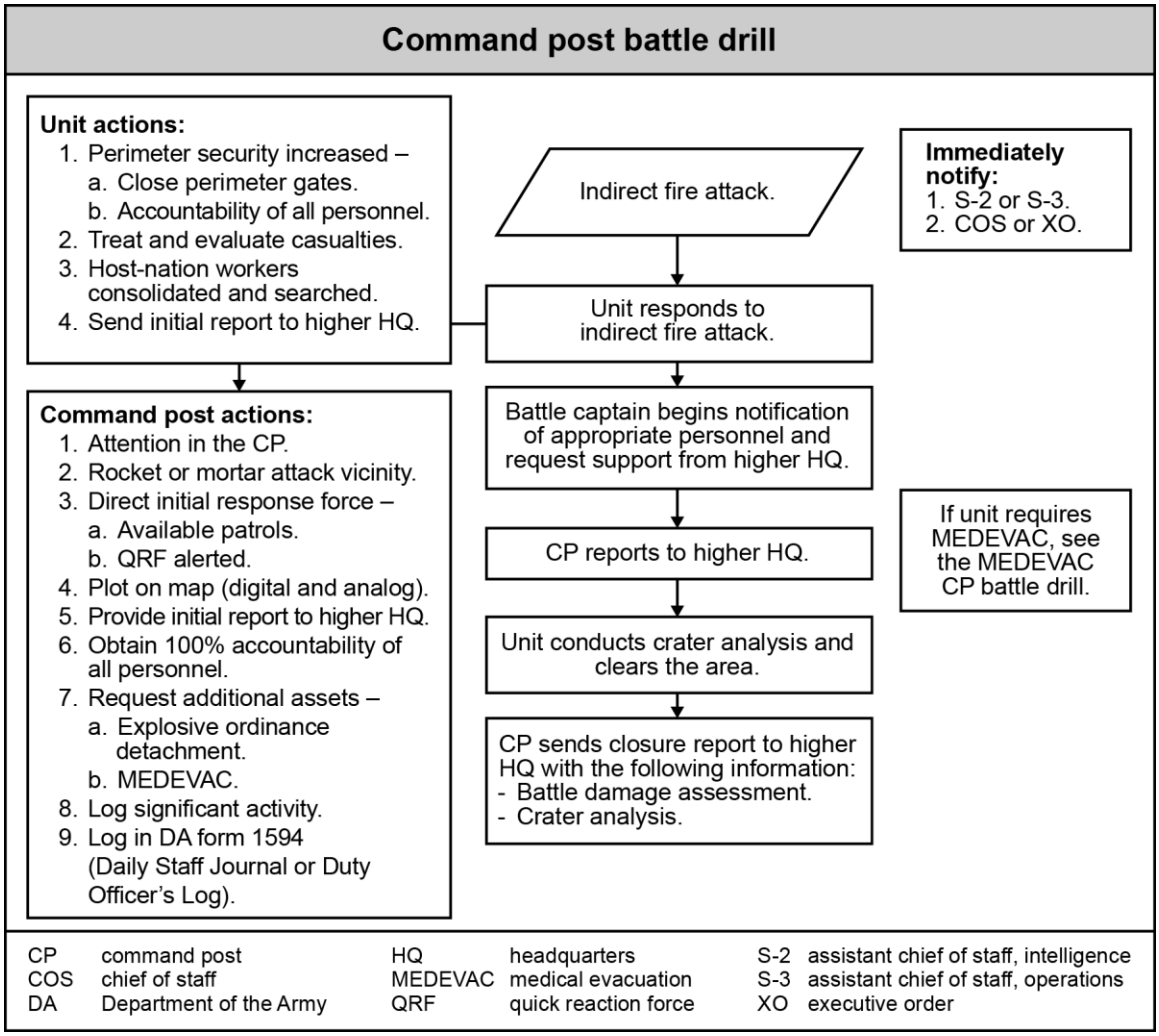


Figure 4-1. Command post battle drill flowchart format

TABLE FORMAT FOR A COMMAND POST BATTLE DRILL

4-28. The table format is a simple but effective technique for documenting battle drills. Rather than a to-do list, it's a focused checklist of steps to execute a specific task. The steps can be listed in sequence or by function. Table 4-5 shows an example table format for a command post battle drill.

Table 4-5. Example table format for a command post battle drill

Entity	*Responsibility*
Current Operations Integrating Cell	Receives and confirms information that a Soldier, U.S. citizen, or contractor is missing or believed to be captured or that a coalition aircraft has executed emergency landing. Obtains the following information: POC unit making the report, type of victim in incident, location, time of abduction, how abduction occurred, units operating in current AO, potential suspects. Activate the PRCC. Directs initial containment measures, contacts adjacent units. Alerts and launches QRF.
Battle Captain or CHOPs	Reviews report against CCIRs and directs necessary notifications. Ensures personal information is protected by all. Ensures initial report is sent to higher headquarters as required. Convenes selected working group as necessary in order to develop a plan for recovery. Secures launch decision of PRCC assets. Develops fragmentary order in support of operations as needed.
Intelligence Cell	Determine available information collection assets (SIGINT, ELINT, EW with higher). Requests re-tasking of assets to assist in locating missing soldier if appropriate Requests increase in SIGINT collection in focus area, be prepared to request UAS coverage and most recent available imagery of area Assess incident local area for likely or potential insurgent or terrorist groups; post air and ground threat assessment
Fires Cell	Assess available assets in range of personnel recovery. Reposition CAS. Establish No Fire Area around crash site and survivors.
Engineer Cell	Conduct mine threat analysis of personnel recovery area, post mine threat assessment, compile mine map, and distribute.
LNOs	Alert units to situation, verify location of elements directly adjacent to focus area.
PMO	Coordinate with unit or host nation law enforcement. Contact CID as required.
ALO or G-3 Air	Determine available assets as required, BPT request support for BCTs, and notify AVN units. Alert MEDEVAC, DART, and airspace control, and establish a restricted operation zone.
CMO or G-9	When applicable, contact local government officials and religious figures for information regarding situation.
IO or MISO	Assess and provide assets available to deliver immediate MISO products to supported BCT for dissemination.
PAO	Contact higher PAO and begin to prepare and staff press release if appropriate.
OSC	Upon arrival at site, OSC clears fires, C2s arrival of units.

ALO	air liaison officer	G-9	assistant chief of staff, civil affairs operations
AVN	aviation	OSC	on-site commander
CHOPs	chief of operations	PAO	public affairs officer
CID	criminal investigation division	POC	point of contact
CMO	civil-military operations	PMO	provost marshal office
DART	downed aircraft recovery team	PRCC	personnel recovery coordination cell
ELINT	electronic intelligence	QRF	quick reaction force
EW	electromagnetic warfare	SIGINT	signals intelligence
		UAS	unmanned aircraft system

THE RAPID DECISION-MAKING AND SYNCHRONIZATION PROCESS

4-29. The material in this section is derived from FM 6-0.

4-30. The rapid decision-making and synchronization process (RDSP) is a technique that commanders and staffs commonly use during execution. While identified here with a specific name and method, the approach is not new; its use in the Army is well established. Commanders and staffs develop this capability through training and practice. When using this technique, the following considerations apply—

- "Rapid" is often more important than "process".
- Much of it may be mental rather than written.
- RDSP should become a battle drill for the current operations integration cells, future operations cells, or both.

4-31. While the military decision-making process (MDMP) seeks the optimal solution, the RDSP seeks a timely and effective solution within the commander's intent, mission, and concept of operations. Operational and mission variables continually change during execution. This often invalidates or weakens courses of action (COAs) and decision criteria before leaders can make a decision. Under the RDSP, leaders combine their experience and intuition to quickly reach situational understanding. Based on this, they develop and refine workable COAs.

4-32. RDSP facilitates continuous integration and synchronization of the warfighting functions to address ever-changing situations. It meets the following criteria for effective decision making during execution:

- Comprehensive—integrates all warfighting functions. It is not limited to any single warfighting function.
- Supportive—ensures all actions support the DO by relating them to the commander's intent and concept of operations.
- Responsive—allows rapid changes to the order or mission.
- Continuous—allows commanders to react immediately to opportunities and threats.

4-33. **The RDSP is based on an existing order and the commander's priorities as expressed in the order.** The most important of these control measures are the commander's intent, concept of operations, and commander's CCIRs. RDSP includes five steps:

- Compare the current situation to the order.
- Determine that a decision, and what type, is required.
- Develop a COA.
- Refine and validate the COA.
- Implement.
- Leaders may perform the first two steps in any order, including concurrently. The last three steps are performed interactively until commanders identify an acceptable COA. Figure 4-2 depicts the RDSP.

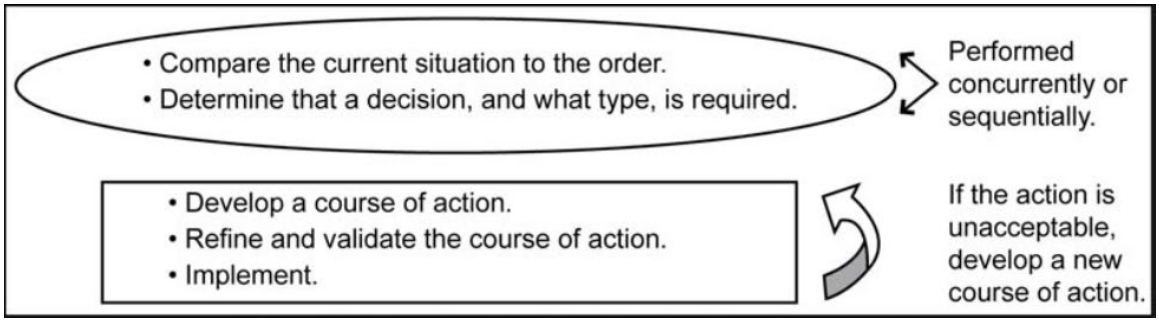


Figure 4-2. The rapid decision-making process

STEP 1. COMPARE THE CURRENT SITUATION TO THE ORDER

4-34. Commanders and staffs identify likely variances during planning, options that will be present, and actions that will be available when each variance occurs. During execution, commanders and staffs monitor the situation to identify changes in conditions. Then they ask if these changes affect the overall conduct of operations or their part in them and if the changes are significant. Finally, they identify if the changed conditions represent variances from the order—especially opportunities and risks. Staff members use running estimates to look for indicators of variances that affect their warfighting function (see table 4-6 on pages 147–148 for examples of indicators of variances).

4-35. Staff members are particularly alert for answers to CCIRs that support anticipated decisions. They also watch for exceptional information. Exceptional information is any piece or group of information that could affect decision making. Exceptional information usually reveals a need for an adjustment decision.

4-36. When performing RDSP, the current operations integration cell first compares the current situation to the one envisioned in the order. It may obtain assistance from the assessment section or the red team section in this analysis. If the situation requires greater analysis, the COS or XO may task the future operations cell (where authorized) or the plans cell to perform this analysis. At echelons with no future operations cell, the plans cell or the current operations integration cell performs this function.

Table 4-6. Example indicators of variances that may require RDSP

Types	*Indicators*
General	Answer to a commander's critical information requirement. Identification of an information requirement. Change in mission. Change in organization of unit. Change in leadership of unit. Signing or implementation of peace treaty or other key political arrangement. Change in capabilities of subordinate unit. Change in role of host nation military force. Climate changes or natural disasters operations.
Intelligence	Identification of enemy main effort. Identification of enemy reserves or counterattack. Indications of unexpected enemy action or preparation. Increase in enemy solicitation of civilians for intelligence operations. Identification of an information requirement. Insertion of manned surveillance teams. Disruption of primary and secondary education system. Unexplained disappearance of key members of intelligence community. Enemy electromagnetic attack use. Indicators of illicit economic activity. Identification of threats from within the population. Identification of high value targets. Unmanned aircraft system launch. Answer to a priority intelligence requirement. Enemy rotary wing or unmanned aircraft system use.
Movement and maneuver	Success or failure in breaching or gap crossing operations. Capture of significant numbers of enemy prisoners of war, enemy CPs, supply points, or artillery units. Establishment of road blocks along major traffic routes. Unexplained displacement of neighborhoods within a given area of operations. Success or failure of a subordinate unit task. Modification of an airspace coordinating measure. Numbers of dislocated civilians sufficient to affect friendly operations. Damages to civilian infrastructure affecting friendly mobility. Loss of one or more critical transportation systems.

Table 4-6. Example indicators of variances that may require RDSP *(continued)*

Types	*Indicators*
Fires	Receipt of an air tasking order. Battle damage assessment results. Unplanned repositioning of firing units. Identification of high payoff targets. Identification of an information requirement. Execution of planned fires. Modification of a fire support coordination measure. Effective enemy counterfire. Negative effects of fires on civilians.
Protection	Chemical, biological, radiological, nuclear report or other indicators of enemy chemical, biological, radiological, or nuclear use. Report or other indicators of enemy improvised explosive device use. Indicators of coordinated enemy actions against civilians or friendly forces. Increased criminal activity in a given area of operations. Increase in organized protests or riots. Identification of threats to communications or computer systems. Reports of enemy targeting critical host-nation infrastructure. Identification of threat to base or sustainment facilities. Escalation of force incidents. Loss of border security.
Sustainment	Significant loss of capability in any class of supply. Identification of significant incidences of disease and non-battle injury casualties. Mass casualties. Receipt of significant resupply. Disruption of one or more essential civil services (such as water or electricity). Contact on a supply route. Answer to a friendly force information requirement. Mass detainees. Degradations to essential civilian infrastructure by threat actions. Civilian mass casualty event beyond capability of host-nation resources. Identification of significant shortage in any class of supply. Outbreak of epidemic or famine within the civilian population. Medical evacuation launch. Dislocated civilian event beyond capability of host-nation resources. Disruption of key logistics LOC. Changes in availability of host nation support.
Command and control	Impending changes in key military leadership. Interference with freedom of the press or news media. Receipt of a fragmentary order or warning order from higher headquarters. Effective threat information efforts on civilians. Loss of civilian communications nodes. Loss of contact with a CP or commander. Jamming or interference.

STEP 2. DETERMINE THE TYPE OF DECISION REQUIRED

4-37. When a variance is identified, the commander directs action while the chief of operations leads chiefs of the current operations integration cell and selected functional cells in quickly comparing the current situation to the expected situation. This assessment accomplishes the following:

- Describes the variance.
- Determines if the variance provides a significant opportunity or threat and examines the potential for either.
- Determines if a decision is needed by identifying if the variance:
  - Indicates an opportunity that can be exploited to accomplish the mission faster or with fewer resources.
  - Directly threatens the decisive operation's (DO's) success.
  - Threatens a shaping operation (SO) such that the variance may threaten the DO directly or in the near future.

- Can be addressed within the commander's intent and concept of operations (if so, determine what execution decision is needed).
- Requires changing the concept of operations substantially (if so, determine what adjustment decision or new approach best suits the circumstances).

4-38. For minor variances, the chief of operations works with other cell chiefs to determine whether changes to control measures are needed. If so, they determine how those changes affect other warfighting functions. They direct changes within their authority (execution decisions) and notify the COS or XO and the affected CP cells and staff elements.

4-39. Commanders intervene directly in cases that affect the overall direction of the unit. They describe the situation, direct their subordinates to provide any additional information they need, and order either implementation of planned responses or development of an order to redirect the force.

STEP 3. DEVELOP A COA

4-40. If a variance requires an adjustment decision, the designated integrating cell and affected CP cell chiefs recommend implementation of a COA or obtain the commander's guidance for developing one. They use the following conditions to screen possible COAs:

- Mission.
- Commander's intent.
- Current dispositions and freedom of action.
- CCIRs.
- Limiting factors, such as supply constraints, boundaries, and combat strength.

COA considerations include, but are not limited to, those shown in table 4-7 on page 150.

4-41. New options must conform to the commander's intent but may alter the concept of operations and CCIRs. If CCIRs change, the commander must approve those changes. Staff leaders identify areas within their fields of expertise that may be affected by proposed changes to the order or mission.

4-42. The commander is as likely as anyone else to detect the need for change and to sketch out options. Whether the commander, COS, XO, or chief of operations does this, the future operations cell is often directed to further develop the concept and draft the order. The chief of operations and the current operations integration cell normally lead this effort, especially if the response is needed promptly or the situation is not complex. The commander, COS, or XO is usually the decision-making authority, depending on the commander's delegation of authority.

4-43. Commanders may delegate authority for execution decisions to their deputies, COSs, XOs, or their operations officers. They retain personal responsibility for all decisions and normally retain the authority for approving adjustment decisions.

4-44. When reallocating resources or priorities, commanders assign only minimum essential assets to SOs. They use all other assets to weight the DO. This applies when allocating resources for the overall operation or within a warfighting function.

4-45. Commanders normally direct the future operations cell or the current operations integration cell to prepare a FRAGORD setting conditions for executing a new COA. When lacking time to perform the MDMP, or quick action is desirable, commanders make an immediate adjustment decision in the form of a focused COA. Developing the focused COA often follows mental war-gaming by commanders until they reach an acceptable COA. If time is available, commanders may direct the plans cell to develop a new COA using the MDMP, and the considerations for planning become operative.

Table 4-7. COA considerations

Types	*Indicators*
Intelligence	Modifying PIRs and other intelligence requirements. Updating named areas of interest and target areas of interest. Updating the intelligence estimate. Updating the enemy SITEMP and enemy COA statements. Modifying the information collection plan. Confirming or denying threat COA. Modifying the deception plan.
Movement and maneuver	Assigning new objectives. Assigning new tasks to subordinate units. Adjusting terrain management. Employing obscurants. Modifying airspace coordinating measures. Making unit boundary changes. Emplacing obstacles. Clearing obstacles. Establishing and enforcing movement priority. Commitment of the reserve criteria.
Fires	Delivering fires against targets or target sets. Modifying the high-payoff target list and the attack guidance matrix. Modifying radar zones. Modifying the priority of fires. Modifying fire support coordination measures. Modifying support relationships.
Protection	Moving air defense weapon systems. Establishing decontamination sites. Conducting chemical, biological, radiological, and nuclear reconnaissance. Establish movement corridors on critical LOCs. Changing air defense weapons control status. Enhancing survivability through engineer support. Revising and updating personnel recovery coordination. Reassigning or repositioning response forces.
Sustainment	Prioritizing medical evacuation assets. Repositioning logistics assets. Positioning and prioritizing detainee and resettlement assets. Repositioning and prioritizing general engineer assets. Modifying priorities. Modifying distribution.
Command and control	Moving communications nodes. Moving CPs. Modifying information priorities for employing information as combat power. Adjusting themes and messages to support the new decision. Adjusting measures for minimizing civilian interference with operations. Revising recommended protected targets. Modifying succession of command.

STEP 4. REFINE AND VALIDATE THE COA

4-46. Once commanders describe the new COA, the current operations integration cell conducts an analysis to validate its feasibility, suitability, and acceptability. If acceptable, the COA is refined to resynchronize the warfighting functions enough to generate and apply the needed combat power. Staffs with a future operations cell may assign that cell responsibility for developing the details of the new COA and drafting a FRAGORD to implement it. The commander, COS, or XO may direct an "on-call" operations synchronization meeting to perform this task and ensure rapid resynchronization.

4-47. Validation and refinement are done quickly. Normally, the commander and staff conduct a mental war game of the new COA. They consider potential enemy reactions, the unit's counteractions, and secondary effects that might affect the force's synchronization. Each staff section considers the following items:

- Is the new COA feasible in terms of my warfighting function?
- How will this action affect my warfighting function?
- Does it require changing my information requirements?

  - Should any of the information requirements be nominated as a CCIR?
  - What actions within my warfighting function does this change require?
  - Will this COA require changing objectives or targets nominated by staff members?
- What other CP cells and elements does this action affect?
- What are potential enemy reactions?
- What are the possible friendly counteractions?
  - Does this counteraction affect my warfighting function?
  - Will it require changing my information requirements?
  - Are any of my information requirements potential CCIRs?
  - What actions within my warfighting function does this counteraction require?
  - Will it require changing objectives or targets nominated by staff members?
  - What other CP cells and elements does this counteraction affect?

4-48. Validation and refinement shows if the COA will solve the problem adequately. If it will not, the COS or chief of operations modifies it through additional analysis or develops a new COA. The COS or XO informs the commander of any changes made to the COA.

STEP 5. IMPLEMENT

4-49. When a COA is acceptable, the COS or XO recommends implementation to the commander or implements it directly, if the commander has delegated that authority. Implementation normally requires a FRAGORD; in exceptional circumstances, it may require a new operation order. That order changes the concept of operations (in adjustment decisions), resynchronizes the warfighting functions, and disseminates changes to control measures. The staff uses warning orders (WARNORDs) to alert subordinates to a pending change. The staff also establishes sufficient time for the unit to implement the change without losing integration or being exposed to unnecessary tactical risk.

4-50. Commanders often issue orders to subordinates verbally in situations requiring quick reactions. At battalion and higher echelons, written FRAGORDs confirm verbal orders to synchronize, integrate, and notify all parts of the force. If time permits, leaders verify that subordinates understand critical tasks. Verification methods include the confirmation brief and backbrief. These are conducted both between commanders and within staff elements to ensure mutual understanding.

4-51. After analysis is complete, the current operations integration cell and CP cell chiefs update decision support templates (DSTs) and synchronization matrices. When time is available, the operations officer or chief of operations continues this analysis and completes combat power integration to the operation's end. Staff members begin the synchronization needed to implement the decision. This synchronization involves collaboration with other CP cells and subordinate staffs. Staff members determine how actions in their areas of expertise affect others. They coordinate those actions to eliminate undesired effects that might cause friction. The cells provide results of this synchronization to the current operations integration cell and the COP.

MEETINGS

4-52. Meetings are gatherings to present and exchange information, solve problems, coordinate action, and/or obtain decisions. Meetings may involve members of the staff; the commander and staff; or the commander, subordinate commanders, staff, and unified action partners. Who attends which meeting depends on the purpose.

4-53. CP cells, staff sections, boards, working groups, and planning teams all conduct meetings. Modern command and control information systems, such as the command post of the future (CPOF), allow virtual participation of meeting members when face-to-face coordination is unnecessary or not practicable. For example, a division headquarters may conduct a protection working group meeting with members of the staff attending face-to-face while subordinate unit participation is via defense collaboration services.

MEETING BASICS

4-54. Efficient meetings help build and maintain shared understanding, facilitate decision-making, and coordinate action. To ensure meetings are organized well and achieve what is intended, staff leads develop instructions for each meeting to include the following:

- Purpose.
- Frequency, duration, and location.
- Medium (face-to-face, video teleconference, and others).
- Expected participants (staff lead, chairperson, and members).
- Required inputs (for example, updated collection plan).
- Expected outputs (for example, approved target nominations).
- Agenda.

4-55. Clearly defining the purpose and desired outputs of each meeting helps determine required inputs, meeting membership, and outputs expected. One technique is for the COS or XO to bring the staff together to discuss, modify, and approve the instruction for each meeting as part of battle rhythm development. Following approval by the COS or XO, meeting instructions become parts of the unit's SOP.

MEETING NOTES

4-56. Recording and sharing the results of each meeting helps maintain shared understanding internal and external to the headquarters. Staff leads capture relevant information at the conclusion of each meeting to include issues, recommendations, decisions, guidance, and tasking. The unit's knowledge management plan should provide a standard format for meeting notes and provide instructions on where to place and how to access meeting notes on the unit's web portal. An example format for meeting minutes includes—

- Meeting title.
- Date and time group.
- Attendees.
- Meeting summary to include—
  - Issues raised.
  - Recommendations determined.
  - Decisions made.
  - Guidance offered.
  - Taskings or due-outs.

BOARDS AND WORKING GROUPS

4-57. The commander establishes boards and working groups to bring together cross-functional expertise to coordinate action, solve problems, and make decisions. The primary difference between boards and working groups is the level of authority granted to boards by the commander. Commanders chair boards or grant decision-making authority to boards within a specific functional area. Working groups coordinate action and develop recommendations for approval by the commander or a board. Boards and working groups conduct meetings that are scheduled on the unit's battle rhythm.

Boards

4-58. Commanders establish boards and assign responsibilities and decision-making authority for each board. The output of a board is a decision. The commander or a senior leader chairs boards with members of the boards consisting of staff elements, subordinate commands, and other organization representatives as required. Typical boards found on the unit's battle rhythm include—

- Operations assessment board.
- Plans synchronization board.
- Sustainment board.
- Targeting board.

- Resource boards.

Working Groups

4-59. A *working group* is a grouping of predetermined staff representatives who meet to provide analysis, coordinate, and provide recommendations for a particular purpose or function (FM 6-0). Working groups address various subjects depending on the situation and echelon. Battalion and brigade headquarters have fewer working groups than higher echelons do. Working groups may convene daily, weekly, monthly, or intermittently depending on the subject, situation, and echelon. Typical working groups at division and corps headquarters scheduled within the unit's battle rhythm include—

- Assessment working group.
- Civil affairs operations working group.
- Cyberspace electromagnetic activities working group.
- Foreign disclosure working group.
- Information collection working group.
- Information operations working group.
- Knowledge management working group.
- Protection working group.
- Sustainment working group.
- Targeting working group.

Note. Joint doctrine uses different terms. Boards, bureaus, cells, centers, and working groups (B2C2WG) are discussed further in JP 3-33.

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Appendix A

Offensive Tactics, Techniques, Procedures, and Considerations

This appendix provides an introduction to offensive operations and describes common offensive tactics, techniques, procedures, and considerations for executing an attack, a gap crossing, a movement to contact, an air assault, and a breakout from encirclement.

INTRODUCTION TO OFFENSIVE OPERATIONS

A-1. This appendix is derived from ADP 3-90, FM 3-90-1, and FM 3-96.

A-2. An o*ffensive operation* is an operation to defeat or destroy enemy forces and gain control of terrain, resources, and population centers (ADP 3-0). The purposes of offensive operations are to defeat, destroy, or neutralize enemy forces. A commander may also conduct offensive actions to—

- Secure decisive terrain.
- Deprive the enemy of resources.
- Gain information.
- Deceive and divert an enemy force.
- Fix an enemy force in position.
- Disrupt an enemy force's attack.
- Set the conditions for future successful operations.

The offense supports friendly operations in the air, maritime, space, and cyberspace domains, and in the information environment. These operations destroy, dislocate, disintegrate, or isolate an enemy force.

A-3. Success in offensive operations depends on the proper application of combat power within the fundamental characteristics of the offense: audacity, concentration, surprise, and tempo.

- Audacity is a willingness to take bold risks.
- Concentration is massing the effects of combat power in time and space at the decisive point to achieve a single purpose.
- Surprise is attacking the enemy at a time or place the enemy does not expect or in a manner that the enemy is unprepared for.
- *Tempo* is the relative speed and rhythm of military operations over time with respect to the enemy (ADP 3-0).

A-4. The commander seizes, retains, and exploits the initiative when conducting offensive actions. Specific operations may orient on a specific enemy force or terrain feature as a means of affecting the enemy. Even when conducting primarily defensive actions, **wresting the initiative from the enemy requires offensive action.**

A-5. There are four types of offensive operations:

- *Movement to contact.* A type of offensive operation designed to develop the situation and to establish or regain contact (ADP 3-90).
- *Attack.* A type of offensive operation that destroys or defeats enemy forces, seizes and secures terrain, or both (ADP 3-90).
- *Exploitation.* A type of offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth (ADP 3-90).

- *Pursuit.* A type of offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it (ADP 3-90).

A-6. This appendix provides common offensive tactics, techniques, procedures, and considerations for executing an attack, gap crossing, movement to contact, air assault, and breakout of encirclement. Figure A-1 provides a graphic of considerations for planning and executing an attack.

Planning Step	7	6	5	4	3	2	1
Execution Step	1	2	3	4	5	6	7
	Tactical Assembly Area	**Recon**	**Movement to LD**	**Manuever**	**Deploy**	**Assault**	**Consolidate & Reorganize**
Considerations	• **Planning** - Patrol - Plan/Prepare - Rehearsals - Time Management - Survivability - Inspect - Recon to LD - Departure - Movement - Land Management • **Security** - Positioning - Posture - Fire Support • **Load Planning** - Sustainment TCP - Contingency • **AA Overlay** • **Recon Planning** - Specific mission (route, area & zone) - # and locations of OP's	• **Assets at BN/BDE /DIV** • **Recon** - Avenues of Approach - Obstacles - Enemy positions • **IPB Drives** - R&S Plan - Priorities - Securities - Fire Support Plan - Sustainment • **Redundancy** • **Sustainment Support** - MEDEVAC/CASEVAC - Resupply of Recon assets	• **Vehicle or Foot?** • **Soldiers' Load?** • **Combat Load?** - Approach - Fighting • **Security Force** • **Route Selection** • **Movement Order** - OOM - Formation - Technique • **Fire Support Plan** • **Passage Lines** • **Reconnaissance Handover/BHL**	• **METT-TC/IPB Driven (MCOO)** - Route Selection - Multiple/Single Routes - Centralized or Decentralized Movement - Who Leads? - Formations - Techniques - Actions on Contact - Security Enroute - Fire Support Plan - Control Measures - Deception Techniques - Navigation • **Soldiers' Load** • **CASEVAC Plan** • **Linkup Plan** • **ORP/ASLT PSN Activities** • **Breech or Bypass?**	• **AP vs. ORP** • **AP/ORP Activities** • **ASLT PSN vs. ORP** • **PLD** - Location/Activity • **OOM**	• **Focus CBT Power @ DP** *(Isolate, Penetrate, Exploit)* • **Mass Effects** - Divide Objective - Direct Fire Distribution - Fire Support - SBF Position - Fire Control/Distribution - Fratricide Prevention - Obscuration • **Concentrate Forces** - Organize for Combat - Weight Main Effort - Reserve Size Purpose/Location • **Synchronization** - Assault Timing - C2	• **Exploit Success** • **Consolidate** - Prepare for Counterattack • **Reorganize** - Restore C2 - Build Combat Potential • **Force Protection** - Sustainment Integration - Position Based upon METT-TC, not SOP - Fire Support Plan • **Culmination Point Achieved** • **Possible Shift of Main Effort** • **C&R Overlay for Simplicity** • **Transitioned**

ASLT PSN	assault position	CBT	combat	EN EA	enemy engagement area	ORP	objective rally point	TRP	target reference point
ATK POS	attack position	DP	decisive point	MVMT	movement	PLD	probable line of deployment		

Figure A-1. Offensive planning and executing considerations

BREACH ACTIVITIES

A-7. This section is derived from ATP 3-90.4/MCWP 3-17.8.

A-8. Breaching allows maneuver despite the presence of enemy obstacles that are covered by fire and used to shape engagement areas. It is one of the most difficult combat tasks to perform and is characterized by thorough reconnaissance, detailed planning, extensive preparation and rehearsal, and a massing of combat power. Breaching begins when friendly forces detect an obstacle and being to apply the breaching fundamentals. Breaching ends when battle handover occurs between follow-on forces and the unit conducting the breach. Breaching includes the reduction of minefields, other explosive hazards, and other obstacles. Most breaches are conducted by either a brigade combat team (BCT) or a battalion task force, both of which require significant augmentation.

A-9. When a force encounters an obstacle, the commander has two decisions. If friendly forces must react immediately to extricate forces from an untenable position within an obstacle and no other breaching assets are available, or a friendly force is in a minefield receiving effective fires, the commander may decide to immediately bull or force through the minefield as a lesser risk to the force rather than withdraw or reduce the obstacle. The other decision, if time allows, is to conduct a breach.

PLANNING FOR BREACH ACTIVITIES

A-10. Planning for breach activities follows the military decision making process, but it is important to take in consideration, the breaching types, tenets of breaching when determining how best to breach an obstacle.

Breaching Types

A-11. There are three general types of breaches: deliberate, hasty, and covert. A deliberate breach is the creation of a lane through a minefield or a clear route through a barrier or fortification, which is systematically planned and carried out. A hasty breach is the creation of lanes through enemy minefields by expedient methods such as blasting with demolitions, pushing rollers or disabled vehicles through the minefields when the time factor does not permit detailed reconnaissance, deliberate breaching, or bypassing the obstacle. A covert breach is the creation of lanes through minefields or other obstacles that is planned and intended to be executed without detection by an adversary.

A-12. An in-stride breach is a type of hasty breach used to describe the situation when a subordinate unit is expected to organize for and conduct a hasty breach with its assets without affecting the higher unit's scheme of maneuver. For example, a BCT conducts an in-stride breach when a subordinate battalion is able to organize for the breach (support, breach, and assault forces) and breach an obstacle without affecting the BCT's scheme of maneuver. In-stride breaching is generally not used below the company level since a platoon is unable to form effective support, breach, and assault forces.

Breaching Tenets

A-13. Successful breaches are characterized by integrating the breaching tenets into the planning process. Table A-1 on pages 159–160 lists the tenets and associated planning actions. Tables A-2 and A-3 on page 160 provide initial planning factors for common threat minefields.

Table A-1. Breaching tenets

ATP 3-90.4/MCWP 3-17.8

Breaching Tenets	*Planning actions*
Intelligence	• Template enemy obstacles on the SITEMP for each enemy COA during IPB based on— ▪ The enemy ability to emplace obstacles based on its capabilities (manpower, equipment, and materials) and time available. ▪ The effects of terrain and weather. ▪ The range of enemy weapon systems covering obstacles and emplacing scatterable mines. ▪ Develop information requirements on enemy engineer units, equipment, activities, and obstacles (location, composition, and mine types). ▪ Integrate information requirements and engineer reconnaissance capabilities into the information collection plan.
Breaching fundamentals (SOSRA)	• Suppress. ▪ Identify enemy forces that can place direct and indirect fires into the breach area. ▪ Identify friendly direct and indirect fire capabilities needed to suppress enemy forces. ▪ Determine locations for support forces. ▪ Establish CFZs for support by fire positions and the reduction area. • Obscure. Identify available friendly assets and determine the placement (wind condition), density, and timing of placing obscurants on enemy positions and placing screening obscuration between the enemy and the reduction area. • Secure. ▪ Identify enemy elements that can reinforce or counterattack into the breach area. ▪ Identify friendly direct and indirect fire capabilities needed to defeat enemy forces. ▪ Allocate maneuver forces based on the SITEMP and the ability to eliminate enemy direct fires on the reduction area. • Reduce. ▪ Allocate breaching assets (plan for redundancy) to the breach force based on the number and width of lanes based on the scheme of movement and maneuver. ▪ Determine reduction methods (explosive, mechanical, or physical). ▪ Establish a lane-marking system. • Assault. ▪ Designate a far side objective ▪ Determine size and composition of the assault force ▪ Complete the breach by destroying the enemy on the far side of the obstacle.

Table A-1. Breaching tenets *(continued)*

Breaching Tenets	*Planning actions*
Breaching organization	• Support force. ▪ Suppress enemy direct fire and observed indirect fires on the reduction area. ▪ Control indirect fires and obscuration within the breach area. ▪ Prevent the enemy from repositioning or counterattacking to place direct fires on breach force. • Breach force. ▪ Create and mark lanes for the breach element. ▪ Secure the obstacle near side and far side for the security element. ▪ Report lane status and location. • Assault force. ▪ Assault through the obstacle and destroy the enemy on the far side.
Mass	• Mass combat power to create enemy weakness at the point of breach. • Prevent enemy from massing combat power at the point of breach.
Synchronization	• Conduct detailed reverse planning. • Communicate clear instructions to subordinate units. • Provide effective command and control. • Perform combined arms rehearsals.
SOSRA suppress, obscure, secure, reduce, and assault	

Table A-2. Enemy standard row minefield dimensions

	Types of minefield			
	Disrupt	***Fix***	***Turn***	***Block***
Frontage (m)	200	200	300	300
Depth (m)	60	60	120	120

Table A-3. Enemy standard minefield resource requirements (number of mines required)

	Types of minefield			
	Disrupt	***Fix***	***Turn***	***Block***
Full width AT mines	60	60	133	133
Pressure-activated mines	110	110	250	250
Note. Calculated by taking the total number of mines per 1 km frontage and dividing by the frontage of minefield (200 m for disrupt/fix, 300 m for turn/block)				

A-14. To determine the size and composition of engineering assets in the support, breach, and assault forces, planners use reverse planning for breaching. The steps for reverse planning for breaching are—

- Step 1. Identify available reduction assets.
- Step 2. Template enemy obstacles.
- Step 3. Understand the scheme of movement and maneuver.
- Step 4. Identify the number of required breach lanes.
- Step 5. Identify the assets required to reduce, proof, and mark lanes.
- Step 6. Task-organize reduction assets within the maneuver forces.

Planning Considerations

A-15. Planning for breaching activities usually follows the military decision making process. Table A-4 on pages 161–162 shows the steps of the MDMP along with breach planning considerations for each step.

Table A-4. Breach planning considerations in the military decision-making process

Steps of the MDMP	*Breach planning considerations*
Receipt of mission	• Gather geospatial information and products (mobility corridors and combined obstacle overlays) for the AO. • Gather intelligence products on threat countermobility capabilities and patterns. • Determine the availability of obstacle information. • Update running estimates (status of breaching assets).
Mission analysis	• Understand the unit mission, commander's intent, and scheme of maneuver (two levels up). • Complete the following as part of the initial IPB— ▪ Develop terrain products (mobility corridor and combined obstacle overlay). ▪ Evaluate the effects of terrain and weather on friendly mobility and enemy countermobility and survivability capabilities. ▪ Assess enemy countermobility capabilities (manpower, equipment, and materials), and template enemy obstacles based on threat patterns, terrain, and time available. • Identify specified and implied breaching tasks and determine any obvious shortfalls in breaching assets, engineer forces, and special equipment and initiate requests for augmentation as early as possible. • Develop information requirements related to breaching (terrain restrictions and mobility restraints, necessary or desired obstacle information, enemy countermobility and survivability capabilities), and recommend draft requirements as possible CCIRs. • Integrate information collection tasks and engineer or other necessary specialized reconnaissance capabilities into the information collection plan.
COA development	• Identify the need to conduct a breach for each COA based on mobility corridors and template enemy obstacles. • Allocate reduction assets (engineer units and breaching equipment) based on the results of reverse planning. • Develop tasks that implement the breaching fundamentals (SOSRA). • Determine breach organization requirements (support, breach, assault force) and ensure that arrayed forces have been adequately resourced.
COA analysis	• Analyze the breach organization— ▪ Force ratios against variances in the enemy disposition. ▪ Array of breach assets based on losses or variances in the composition of obstacles. • Analyze changes in the planned point of breach, locations of SBF positions, and wind effects on obscuration. • Analyze friendly reactions to enemy counterattacks within the breach area and enemy use of scatterable mines to isolate forces and repair breached obstacles. • Analyze the task organization changes that are required for the breach and insure that all units have enough time to safely update their command relationships and locations in preparation for the breach. • Refine the plan based on results of COA analysis.

Table A-4. Breach planning considerations in the military decision-making process (continued)

Steps of the MDMP	*Breach planning considerations*
COA comparison	• Analyze and evaluate the advantages and disadvantages for each COA in relation to the ability to execute the breaching: ▪ Ability (time-distance) to shift breaching assets between units beyond the line of departure. ▪ Ability to reinforce the breaching forces or respond to enemy counterattacks within the breach area (use of a reserve).
COA approval	• Approval for any changes to the essential tasks for mobility. • Approval for recommended priorities of effort and support. • Approval for requests for engineer augmentation to be sent to higher headquarters.
Orders production	• Ensure that the task organization of engineer forces and critical breach equipment is accurate and clear, to include the necessary instructions for effecting linkup. • Ensure the quality and completeness of subunit instructions for performing breaching.
SOSRA suppress, obscure, secure, reduce, and assault	

PREPARING FOR BREACH ACTIVITIES

A-16. During preparation, the commander and staff continues to review IPB products against the current situation and refining the plans based on reporting from information collection assets. For example, this can include adjustments to the breach organization, the scheme of maneuver, or the fire support plan. Subordinate units begin implementing the task organization while performing precombat checks and inspections. Most importantly, the unit conducts a rehearsal as close as possible to the same conditions as the actual breach. At a minimum, it should be a leader and key-personnel walk-through and individual rehearsals by support, breach, and assault forces.

EXECUTING BREACH ACTIVITIES

A-17. Execution involves monitoring the situation, assessing the mission, and making necessary adjustments. The most common adjustments are the allocation of additional assets to the support, breach, or assault force due to attrition, changing the location of the point of breach or penetration, modifying the scheme of maneuver, and changing the order of the units through the created lane.

GAP CROSSING

A-18. This section is derived from ATP 3-90.4/MCWP 3-17.8.

A-19. Gap crossing in support of maneuver is similar to a breach in that the friendly forces are vulnerable while moving through a lane or across a gap. Friendly units are forced to break movement formations, concentrate within lanes or at crossing points, and reform on the far side before continuing to maneuver. While, much of the terminology and planning associated with gap crossing is the same as a breach, a gap crossing and a breach have a series of differences in complexity and task organization. The scale and scope of a gap crossing is vastly great than a breach. Additionally, the amount and type of equipment involved in a wet-gap crossing far outnumbers those required for a breach. Sometimes breaching will include a gap crossing (tank ditch) as a reduction method. The primary focus of planning and preparation is normally focused on the breach, which causes the gap crossing to be discussed as a subordinate part of, rather than a sequential component of the breach.

PLANNING FOR A GAP CROSSING

A-20. Planning for a gap crossing follows the military decision making process, but it is important to take in consideration, the types of gap crossings, gap crossing fundamentals, and understanding the control measures involved when determining how best to breach an obstacle.

Types of Gap Crossings

A-21. Just like a breach, gap crossing can be deliberate, hasty, or covert. Hasty crossing has the further sub-set of in-stride crossing. These categories can then be further defined as either wet-gap or dry-gap crossings. For example in a hasty dry-gap crossing, friendly forces must determine how best to cross an obstacle such as an anti-vehicle ditch, a crater, a dry riverbed, or a partially blown bridge. While in a deliberate wet-gap crossing, friendly forces are determining how to project combat power to the exit bank of a river or other type of significant water obstacle at a faster rate than the enemy can concentrate forces for a counter attack.

Gap Crossing Fundamentals

A-22. Gap crossing fundamentals include—

- Surprise.
- Extensive preparation (less for hasty crossing).
- Flexible planning.
- Traffic management.
- Organization.
- Speed.

Surprise

A-23. The range and lethality of modern weapons can allow a smaller force to defeat a larger force exposed via crossing a gap. Gaps create this possibility by—

- Limiting a force to a small number of crossing sites.
- Splitting the force's combat power on both sides of a gap.
- Exposing the force to fires while crossing a gap.

A-24. Surprise minimizes disadvantages and prevents an enemy from massing forces or fires at a crossing site. To achieve surprise, commanders enforce security measures such as camouflage; noise control; and thermal, electromagnetic, and light discipline. In particular, commanders closely control movement and concealment of gap-crossing equipment and other obvious gap-crossing preparations. Despite modern technologies, skillful use of night obscurants can still be effective. A deception plan and operations security, better known as OPSEC, are key factors that will contribute to achieving surprise.

Extensive Preparation

A-25. Comprehensive intelligence of enemy composition and disposition and crossing area terrain must be accomplished early since planning depends on an accurate and complete intelligence picture. Commanders plan and initiate a deception plan early to mask actual preparations. Deception activities should conceal the time and location of the crossing, beginning before and continuing throughout the preparation period. Work necessary for improving routes to handle the traffic volume of the crossing should occur early to avoid interfering with other uses of the routes. This requires a detailed traffic plan carefully synchronized with the deception plan.

Flexible Planning

A-26. Even successful crossings seldom proceed according to plan. A flexible plan enables the crossing force to adapt rapidly to changes in the situation during execution. It allows the force to salvage the loss of a crossing site or to exploit a sudden opportunity. A flexible plan for a gap crossing is the result of thorough staff planning, not chance. The plan should include—

- Multiple approach routes from assembly areas to crossing sites.
- Lateral routes to redirect units to alternate crossing sites.
- Alternate crossing sites and staging areas that can be activated if enemy action closes the primary routes.
- Alternate gap-crossing means.
- Crossing equipment held in reserve to open alternate sites or replace losses.
- Multiple crossing means or methods.

Traffic Management

A-27. Gap crossings force units to move in column formations along a few routes that come together at the crossing sites. Traffic management is essential to cross units at the proper locations, in the sequence desired, and as quickly and efficiently as possible to maintain momentum. Traffic management prevents massing of targets that are susceptible to destruction by artillery or air strikes. Effective traffic management also contributes to the flexibility of the plan by enabling commanders to change the sequence, timing, or location of the crossing site.

A-28. The crossing area commander at each echelon moves and positions forces within the respective crossing area. The crossing area commander coordinates and synchronizes the staff's collective efforts in managing traffic to ensure the flow of forces to the gap is balanced with the crossing rate across the gap.

A-29. The unit movement officer develops the unit movement plan according to movement priorities set by the operations officer and the sustainment chief and based largely on the estimated crossing rates developed by the unit engineer and other planners. Each unit movement officer provides the unit vehicle information to the planning headquarters. The movement plan normally consists of a traffic circulation overlay and a road movement table found in the sustainment annex to orders and plans.

A-30. The provost marshal section develops the traffic control plan. Military police implement the traffic control plan and play a vital role in supporting gap crossings by assisting the commander in controlling traffic at crossing sites and throughout the crossing area to reduce congestion and promote efficient movement of vehicles. Mission variables influence employing military police for gap crossing. Number and placement of military police units supporting a gap crossing vary with size of the crossing force, direction of the crossing (forward or retrograde), and degree of enemy resistance expected or encountered.

A-31. Military police direct crossing units to their proper locations using staging areas, holding areas, and traffic control posts to control movement within the crossing area according to the traffic control plan. Most gap crossings, traffic control posts, and engineer regulating points are located on both sides of the gap to improve communication and coordination between units.

Organization

A-32. Commanders use the same organic command and control nodes for gap crossings as they do for other missions. These nodes, however, take on additional functions in deliberate gap crossings. For this reason, commanders specify which nodes and staff positions have specific planning and control duties for the crossing. Division and BCT commanders designate a crossing area commander, a crossing area engineer, and a headquarters to specifically focus on efforts needed to cross a gap. Additional engineer or maneuver enhancement brigade headquarters may also provide commanders with additional command and control nodes depending on the size and complexity of the gap crossing. Examples follow of actions by various command and control nodes and commanders during a division wet-gap crossing.

A-33. The division main command post, prepare the gap crossing plan. It also conducts deep operations to isolate the bridgehead from enemy reinforcements and counterattacking formation. It controls movement from its rear boundary up to the near side release line.

A-34. The division tactical command post controls the lead BCT attack across the gap. This command post coordinates and synchronizes movement from the attack position on the far side of the gap. As the battle develops, the division tactical command post may identify the need to reallocate crossing means between units and adjust movements along routes. The division tactical command post coordinates those actions with the division crossing area headquarters.

A-35. The division commander typically designates one of the deputy division commanders as the **division crossing area commander.** The division crossing are commander focuses on getting the division to and across the gap. The crossing area commander is responsible for the movement of forces approaching the gap and within the division crossing area. The crossing area commander ensures the overall traffic management effort is synchronized to flow forces across the gap with the goal of a speedy crossing while preventing congestion and an undesired massing of assets.

A-36. A division conducting a deliberate crossing normally is task-organized with either an engineer brigade or a maneuver enhancement brigade. The commander of the attached brigade normally functions as the division crossing area engineer, and their headquarters typically serves as the division crossing area headquarters.

A-37. The **division crossing area headquarters** controls the crossing means within the crossing area and ensures the execution of the crossing plan. The division crossing area headquarters remains functional until the division has completed the crossing or is relieved by a follow-on force. If a maneuver enhancement brigade is designated the crossing area headquarters, and second maneuver enhancement brigade generally needs to be assigned to the division to focus on the other recurring maneuver enhancement brigade mission in the division area of operations.

A-38. Usually the lead BCT is responsible for the assured mobility force and is augmented by an engineer battalion. This headquarters provides the staff nucleus to control subordinate battalion task forces movement from their rear boundary up to the bridgehead line. The BCT commander designates a brigade crossing area commander, brigade crossing area engineer, and a crossing site commander.

A-39. The **brigade crossing area commander** is normally either the deputy brigade commander or the brigade executive officer and just like the division crossing area commander, the brigade crossing area commander is responsible for the movement and positioning of elements transiting or occupying positions within the brigade crossing area.

A-40. The **brigade crossing area engineer** is normally the task-organized engineer battalion commander, and their headquarters serves as the crossing area headquarters (which is typically collocated with the BCT main command post). The brigade crossing area engineer is responsible to the brigade crossing area commander for moving the brigade forces across the gap. The brigade crossing area engineer only commands those engineers tasked to move the BCT forces across the gap, not the engineers task-organized to the BCT.

A-41. A **crossing site commander** is designated for each crossing site. The crossing site commander is responsible for all crossing means at that site and for crossing the units that are sent there. This officer commands the engineers operating the crossing means and the engineer regulating points at the call forward areas for that site. It is normally an engineer officer and typically the company commander or platoon leader for the bridge unit operating the site. The crossing area commander maintains the crossing site and decides on the immediate action needed to remove broken or damaged vehicles that interfere with activities at the site.

A-42. Commanders conducting a deliberate gap crossing organize their units into assault, assured mobility, bridgehead, and breakout forces.

A-43. **Assault forces** seize far side objectives to eliminate direct fire on the crossing sites and allow bridgehead and breakout forces to secure their objectives. **Assured mobility forces** provide crossing means, traffic control, and obscuration. The main command post controls the assured mobility forces, which typically include an engineer battalion headquarters with bridge companies and other engineer capabilities, military police, and perhaps chemical, biological, radiological, and nuclear units with obscuration capabilities.

A-44. **A *bridgehead force*** is a force that assaults across a gap to secure the enemy side (the bridgehead) to allow the buildup and passage of a breakout force during gap crossing (ATP 3-90.4/MCWP 3-17.8). A *bridgehead* is an area on the enemy side of the linear obstacle that is large enough to accommodate the majority of the crossing force, has adequate terrain to permit defense of the crossing sites, provides security of crossing forces from enemy direct fire, and provides a base for continuing the attack (ATP 3-90.4/MCWP 3-17.8). The bridgehead line is the limit of the objective area in the development of the bridgehead. Breakout forces attack and seize objectives beyond a bridgehead to continue offensive operations.

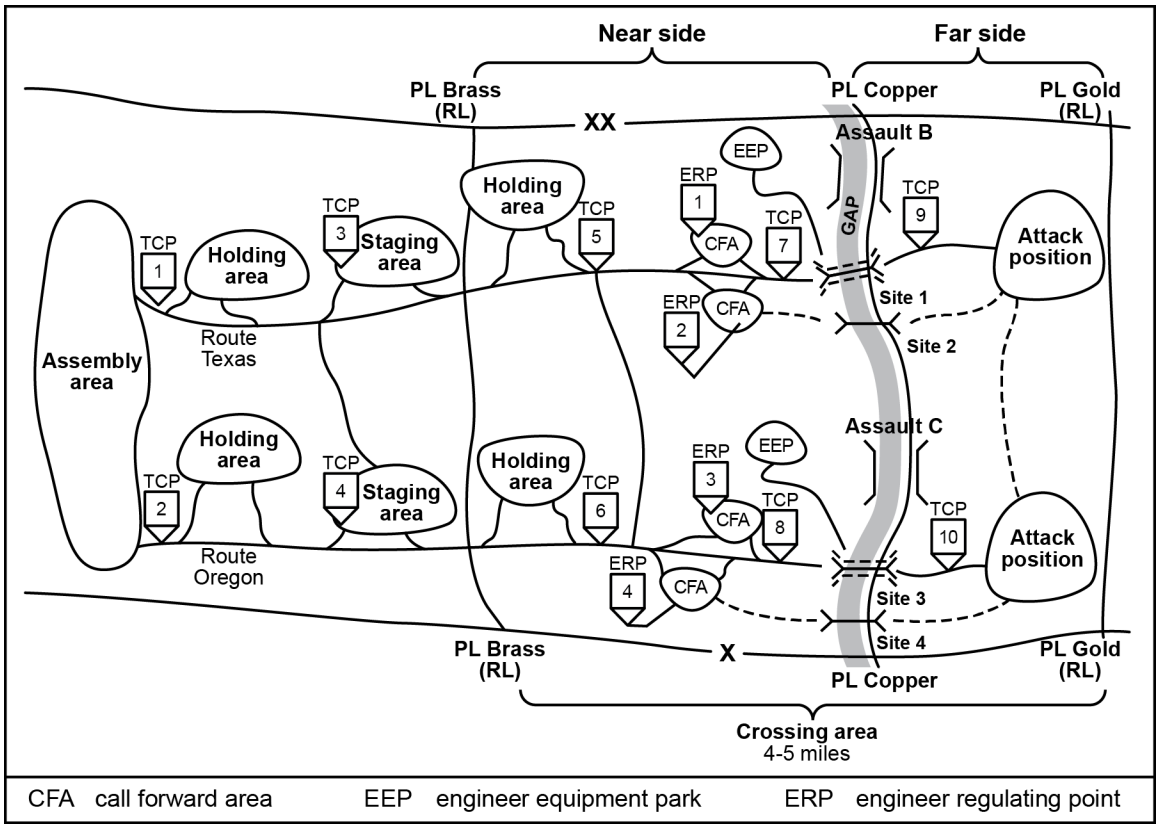
A-45. The communication network that supports a deliberate crossing is critical to the success of the gap crossing. The communications network should be planned, and it should support the five phases of the gap crossing. It requires early planning and redundancy. All sites involved (checkpoints, waiting areas, engineer equipment parks, traffic control posts, and engineer regulating points) should be capable of monitoring and sending information to every other element that has a role in the crossing.

Speed

A-46. A gap crossing in support of maneuver is typically a race between the crossing force and the enemy to mass combat power on the far side. The longer the force takes to cross, the less likely it will succeed—the enemy will defeat the elements split by the gap. Speed is so important to crossing success that extraordinary measures may be justified to maintain it.

Control Measures for a Gap Crossing

A-47. Commanders and staffs use control measures to delineate areas of responsibility for subordinate units and to ease traffic control. Figure A-2 provides a simplistic illustration of the graphic control measures described in paragraphs A-48 through A-50.



ATP 3-90.4/MCWP 3-17.8

Figure A-2. Example gap crossing graphic control measures

A-48. A **release line** is used to delineate the crossing area. Release lines are located on the far side and near side and indicate a change in the headquarters that is controlling movement.

A-49. A **crossing area** is a number of adjacent crossing sites under the control of one commander. It is a controlled access area for a gap crossing used to decrease traffic congestion at the gap. The crossing area is defined on both sides of the gap by a release line. The near side portion of the crossing area must be large enough to stage the optimal number of units to facilitate a speedy crossing while preventing congestion and an undesired massing of assets. The far side must provide enough space for the buildup of sufficient combat power to establish the bridgehead.

A-50. The following areas are known as waiting areas and are used to conceal vehicles, troops, and equipment while waiting to resume movement or to make final crossing preparations:

- Staging area. A waiting area outside the crossing area where forces wait to enter the crossing area.
- Holding area. A waiting area that forces use during traffic interruptions or deployment from an aerial or seaport of embarkation.
- ***Call forward area.*** In gap crossing, the final preparation waiting area within the crossing area (ATP 3-90.4/MCWP 3-17.8)
- ***Attack position.*** The last position an attacking force occupies or passes through before crossing the line of departure (ADP 3-90). Within the bridgehead, the attack position is the last position before leaving the crossing area.
- ***Assault position.*** A covered and concealed position short of the objective from which final preparations are made to assault the objective (ADP 3-90).
- ***Tactical assembly area.*** An area that is generally out of the reach of light artillery and the location where units make final preparations (pre-combat checks and inspections) and rest, prior to moving to the line of departure (JP 3-35).
- Engineer equipment park. An area located a convenient distance from crossing sites for assembling, preparing, and storing bridge and other crossing equipment and materiel. It typically holds spare equipment and empty trucks that are not required at the crossing sites.
- ***Engineer regulating point.*** A checkpoint to ensure that vehicles do not exceed the capacity of the crossing means and to give drivers final instructions on site-specific procedures and information, such as speed and vehicle interval (ATP 3-90.4/MCWP 3-17.8).

Phases of Gap Crossing

A-51. Gap crossing comprises five phases. These phases are for planning purposes only with no intentional pauses between phases during execution. The five phases are—

- Advance to the gap (Phase I). Attack to secure nearside terrain that offers favorable crossing sites and road networks and provides enough area to stage crossing forces while preventing congestion and an undesirable massing of assets.
- Assault across the gap (Phase II). Units assault across the gap to seize the far side objective, eliminating direct fire into the crossing sites.
- Advance from the far side (Phase III). Attack to secure the exit bank and intermediate objectives that eliminate direct and observed indirect fires into the crossing area.
- Secure the bridgehead line (Phase IV). Secure bridgehead objectives, defeating any enemy counterattacks. This provides the necessary time and space for building up forces to attack out of the bridgehead.
- Continue the attack (Phase V). Attack out of the bridgehead to defeat the enemy at a subsequent or final objective. This is considered a phase of gap crossing because the timing and initiation of this phase are typically dependent on the success of the other four phases of gap crossing.

Table A-5 on page 168 shows a division conducting a deliberate wet-gap crossing and the roles of various command posts in each phase of the gap crossing.

Table A-5. Phases of gap crossing in relation to unit echelon headquarters

Phase CPs	*Advance to the gap*	*Assault across the gap*	*Advance from the far side*	*Secure the bridgehead line*	*Continue the attack*
Division main CP	Coordinates operations in-depth to isolate the crossing area and far side objectives. Sustains the fight. Synchronizes the overall traffic management effort.	Continues to coordinate operations in-depth to isolate the crossing area and far side objectives. Sustains the fight. Synchronizes the overall traffic management effort.	Coordinates operations in-depth to isolate the exit bank and intermediate objectives. Sustains the fight. Synchronizes the overall traffic management effort.	Coordinates operations in-depth to isolate the bridgehead. Sustains the fight. Synchronizes the overall traffic management effort.	Coordinates operations in-depth to isolate the enemy attack against corps objectives. Sustains the fight. Synchronizes the overall traffic management effort.
Division tactical CP	Coordinates the division seizure of near side objectives.	Coordinates the division dismounted assault of the gap to attack positions on the far side.	Assists the BCTs in the transition to seize and secure the exit bank and intermediate and bridgehead objectives.	Coordinates the lead BCT seizure and securing of bridgehead objectives.	Directs the attack and integrates follow-on BCTs into the attack.
Division crossing area HQ (engineer brigade, maneuver enhancement brigade or different BCT)	Coordinates marking, control, and improvement of routes from the staging areas to the crossing sites. Lays out staging, holding, and CFAs. Establishes ERPs and TCPs.	Facilitates BCT assault crossings. Coordinates the preparation of far side exit sites. Begins rafting and bridging.	Coordinates marking, control, and improvement of routes and the establishment of holding areas in the far side crossing area. Manages crossing activities.	Manages crossing activity.	Manages crossing.
BCT tactical CP	Coordinates the lead TF seizure and securing of near side objectives.	Coordinates the dismounted assault crossing of the gap to secure the far side objectives.	Coordinates the TF attack to seize and secure exit bank and intermediate objectives.	Coordinates the TF seizure and securing of bridgehead objectives.	Prepares to reorganize and follow the breakout force attack out of the bridgehead toward the division objectives.
BCT crossing area HQ (BCT main CP)	Positions to best control traffic, crossing means, and obscuration.	Coordinates assault crossing means for dismounted TFs and controls obscuration of the crossing sites.	Controls follow-on TFs passing through the crossing area into attack positions.	Controls passage of BCT units through the crossing area and prepares to cross breakout forces.	Passes crossing area control to division crossing area headquarters or the division main CP, as directed.

CP command post
CFA call forward area
ERP engineer regulating point
TCP traffic control post
TF task force

Planning Considerations

A-52. While a gap crossing is similar to a breach, force allocation against enemy units is an added dimension of time that is affected by the crossing site. Friendly forces can only arrive on the battlefield at the rate at which they can be brought across the gap. This rate also affects the number of crossing sites.

Table A-6 on pages 169–170 shows the seven steps of the military decision-making process and additional planning considerations for each step with regard to gap crossing.

Table A-6. Gap crossing planning considerations in the military decision-making process

ATP 3-90.4/MCWP 3-17.8

Steps of the MDMP	*Gap crossing planning considerations*
Receipt of mission	• Gather geospatial information and products (mobility corridors and combined obstacle overlays) for the AO. • Gather intelligence products on the gap.
Mission analysis	• Understand the unit mission, commander's intent, and scheme of maneuver (two levels up). • Complete the following as part of the initial IPB— ▪ Develop terrain products (mobility corridor and combined obstacle overlay). ▪ Evaluate the effects of terrain and weather on friendly mobility and enemy countermobility and survivability capabilities. ▪ Assess enemy countermobility capabilities (manpower, equipment, and materials) and template enemy obstacles based on threat patterns, terrain, and time available. • Determine crossing means (type and amount of crossing assets required based on gap characteristics, capabilities of available crossing assets, and size and type of units conducting the crossing. • Determine the type of crossing (deliberate, hasty, or covert) based on commander's guidance. • Select crossing sites based on the scheme of maneuver, enemy disposition, terrain considerations, and the capabilities of available crossing assets. • Estimate crossing rates (force buildup) on the available crossing means and the number of crossing sites.
COA development	• Each COA has— ▪ Assigned crossing area or crossing site and order of crossing. ▪ Crossing timeline for each COA. ▪ Boundaries (to include bridgehead terrain necessary against to defend against enemy counterattacks. • The engineer staff officers addresses the requirements for either— ▪ Recovering tactical bridging assets after the crossing to enable continuation of movement. ▪ Sustaining crossing equipment. ▪ Replacing tactical bridging assets with support bridging.
COA analysis	• Analyze the breach organization and determine COAs if— ▪ Bridging equipment fails or is lost to enemy action. ▪ Crossing sites take longer than expected to open. ▪ Damage slows progress over entrance and exit route. ▪ Conditions of the gap change (water depth, current velocity). ▪ Enemy actions shut down a crossing site or is forced to be relocated.
COA comparison	• Analyze and evaluate the advantages and disadvantages for each COA in relation to the ability to execute the breaching: ▪ Ability (time-distance) to shift breaching assets between crossing sites ▪ Ability to reinforce the bridgehead forces or respond to enemy counterattacks within the breach area (use of a reserve).

Table A-6. Gap crossing planning considerations in the military decision-making process *(continued)*

ATP 3-90.4/MCWP 3-17.8

Steps of the MDMP	*Gap crossing planning considerations*
COA approval	• Approval for any changes to the essential tasks for mobility. • Approval for recommended priorities of effort and support. • Approval for requests for engineer augmentation to be sent to higher headquarters.
Orders production	• Ensure that the task organization of assault, assured mobility, bridgehead, and breakout forces is accurate and clear, to include the necessary instructions for effecting linkup. • Ensure the quality and completeness of subunit instructions for performing gap crossing.
SOSRA suppress, obscure, secure, reduce, and assault	

PREPARING FOR A GAP CROSSING

A-53. During preparation, just like preparing for a breach, the commander and staff continues to review IPB products against the current situation and refining the plans based on reporting from information collection assets. For example, this can include adjustments to the gap crossing organization, the scheme of maneuver, or the fire support plan. Subordinate units begin task organizing while performing precombat checks and inspections. Most importantly, the unit conducts a rehearsal as close as possible to the same conditions as the actual gap crossing. At a minimum, it should be a leader and key-personnel walk-through.

EXECUTING A GAP CROSSING

A-54. Just like a breach, execution involves monitoring the situation, assessing the mission, and making necessary adjustments. The most common adjustments are the allocation of additional assets to the support, gap crossing, or assault force due to attrition, changing the location of the gap crossing, modifying the scheme of maneuver, and changing the order of the units through the created lane.

MOVEMENT TO CONTACT

A-55. Commanders conduct a movement to contact when the tactical situation is unclear, to create favorable conditions for subsequent tactical tasks, or when the enemy has broken contact. A properly executed movement to contact develops the combat situation and maintains the commander's freedom of action after contact is gained.

A-56. A movement to contact employs purposeful and aggressive movement, decentralized control, and the hasty deployment of combined arms formations from the march to conduct offensive, defensive, or stability operations. The fundamentals of a movement to contact are—

- Focus all efforts on finding the enemy.
- Make initial contact with the smallest force possible, consistent with protecting the force.
- Make initial contact with small, mobile, self-contained forces to avoid decisive engagement of the main body on ground chosen by the enemy (this allows the commander maximum flexibility to develop the situation).
- Task organize the force and use movement formations to deploy and attack rapidly in any direction.
- Keep subordinate forces within supporting distances to facilitate a flexible response.
- Maintain contact regardless of the course of action (COA) adopted once contact is gained.

A-57. A *meeting engagement* is a combat action that occurs when a moving force, incompletely deployed for battle, engages an enemy at an unexpected time and place (ADP 3-90). The enemy force encountered

may be either stationary or moving. For a meeting engagement to occur, both forces do not have to be surprised by their meeting.

PLANNING FOR A MOVEMENT TO CONTACT

A-58. The enemy situation is normally vague or unknown when a unit is given a movement to contact mission. The primary consideration in planning a movement to contact is the determination of action that is anticipated during the movement and the requirement for maneuver when contact is made. A movement to contact is organized (at a minimum) with a security force—which includes a covering force to the front, flank guards, and a rear guard—an advance guard, and a main body.

A-59. The **security force** develops the situation and prevents unnecessary or premature deployment of the main body. Its mission may include destroying enemy reconnaissance, securing key terrain, or containing enemy forces. The security force operates well forward of the main body. The security force performs the mission of a zone reconnaissance across the entire unit's front.

A-60. To maintain flexibility of the maneuver after contact, the commander puts forward the minimum force possible. The mission of screen and guard are the best suited mission. Which mission is used is determined by the enemy situation, terrain, and amount of risk.

A-61. The **flank and rear security** protects the main body from observation, direct fire, and surprise attack. These forces may be strong enough to defeat an enemy attack or to delay it long enough to allow the main body to deploy. Flank and rear security operate under the control of the unit. Flank security travels on routes parallel to the route of the main body. It moves by continuous marching or by successive or alternate bounds to occupy key positions on the flanks of the main body. Flank security also maintains contact with the advance guard and rear security.

A-62. The **advance guard** is normally furnished and controlled by the leading element of the main body. It is organized to fight through enemy forces identified by the covering force or to make sure the main body can deploy uninterrupted into attack formations. Necessary combat support, such as engineers and artillery, are integrated into the advance guard.

A-63. The **main body** contains the bulk of the unit's combat power. It is organized to conduct hasty attack or defense on short notice. March dispositions of the main body must permit maximum flexibility during movement and when contact with the enemy has been established. Elements of the main body may be committed to reduce pockets of resistance contained or bypassed by the covering force or may be left for elimination by following and support units. Elements of a covering force that are assigned containing missions are relieved as rapidly as possible to rejoin the covering force and avoid dissipating their strength. Bypassed enemy forces may be at strong points, garrisoned cities, or reserve locations.

A-64. Three techniques ensure immediate responsive fires:

- Decentralization of calls for fire. Calls for fire are directly sent to designated firing batteries.
- Movement of artillery units. Associated batteries move directly behind the units they support. For choke points, a battery moves in the middle of the movement sequence rather than behind to ensure the lead element does not out-range its artillery support. Batteries might also consider moving by platoon to ensure one element is always in position to provide immediate fires.
- Shifting of priority targets to the lead element. Targets can be plotted on the next probable area of expected enemy contact. If no contact is expected, shift the priority target to the next area of expected enemy contact.

A-65. Engineer assets move with the security force and advance guard to assist with mobility operations. The objective is to maintain the speed of the main body and not become impaired by obstacles. Any engineer assets that move with the main body focus on ensuring route clearance and road mobility so support elements can keep pace with tactical movement.

A-66. A movement to contact is characterized by increased consumption of petroleum, oil, and lubricants, increased vehicular maintenance requirements, and reduced ammunition expenditure. Planning should be geared toward pushing supplies forward. The speed of the operation and high petroleum, oil, and lubricant consumption necessitate careful planning of sustainment operations.

A-67. The unit's main body should displace as far forward as possible before beginning the movement to contact and support the operation with a stable command and control environment. The tactical CP operates forward with the main body to facilitate decision making and transition to other operation missions.

PREPARING FOR A MOVEMENT TO CONTACT

A-68. A primary concern of the command is that subordinate commanders understand their individual missions within the context of the unit commander's intent. Backbriefs and rehearsals assist in mitigating this concern.

A-69. Two major areas require focus in the rehearsal: reporting procedures and actions on contact. Because the enemy situation is unknown or vague, any information regarding the enemy is important. Therefore, when conducting the rehearsal, the commander ensures the reporting procedure is well understood both up and down the chain of command. Each subordinate commander must rehearse what to do when making contact with the enemy, not only for their benefit, but so all commanders and staffs understand their responsibilities when any unit is in contact.

A-70. With no initial established enemy lines, check planned logistical resupply points during the rehearsal. With the possibility of bypassed undetected enemy forces, route security and convoy security are especially important. Echeloning of trains (using combat trains and field trains) is an effective technique for moving sustainment assets without creating overwhelming space control problems.

EXECUTING A MOVEMENT TO CONTACT

A-71. Even though the friendly force's mission is to regain contact with the enemy, the enemy may attempt just the opposite. Bypass criteria help maintain tempo despite enemy actions that attempt to slow friendly movement. As friendly forces advance—enemy stay-behind forces provide a significant threat. Friendly forces fix, bypass, and hand over to a follow-and-support force all bypassed enemy forces. The follow-and-support force is oriented toward engaging the enemy as a function of execution versus a reserve force, which remains uncommitted until the critical point of battle. The covering force clears previously identified areas advantageous to the enemy to avoid ambush or flanking enemy attacks.

A-72. A movement to contact ends with the occupation of an objective without enemy contact or when contact is made and the enemy cannot be defeated or bypassed. This can occur in a series of meeting engagements or hasty attacks. In an encounter with a moving force, immediate actions must occur without hesitation. Subordinate units use fire and maneuver to fix the enemy. The decision to attack, bypass, or defend must be made rapidly at each echelon.

AIR ASSAULT

A-73. This section is derived from JP 3-18, FM 3-90-1, FM 3-96, and FM 3-99.

A-74. An *air assault* is the movement of friendly assault forces by rotary-wing or tiltrotor aircraft to engage and destroy enemy forces or to seize and hold key terrain (JP 3-18). An *air assault operation* is an operation in which assault forces, using the mobility of rotary-wing or tiltrotor aircraft and the total integration of available fires, maneuver under the control of a ground or air maneuver commander to engage enemy forces or to seize and hold key terrain (JP 3-18).

A-75. Army aviation conducts air assaults during offensive, defensive, and stability operations throughout the depth and breadth of the area of operations (AO). Air assaults are combined arms operations conducted to destroy an enemy force or to seize and hold key terrain.

AIR ASSAULT PLANNING TOOLS

A-76. Planning for air assault operations mirrors the military decision-making process. It incorporates parallel and collaborative planning actions necessary to provide the additional time and detailed planning required for successful execution of an air assault mission. Standardizing operations between units conducting an air assault significantly enhances the ability of the unit to accomplish the mission. Table A-7 shows the air assault planning process in relation to the military decision-making process.

Table A-7. Relationship between the air assault planning process and the MDMP

The MDMP steps	*Air assault planning steps*
Receipt of mission	
Mission analysis	
COA analysis	
COA comparison	
COA approval	Air mission coordination meeting (AMCM)
Orders production	
OPORD brief	
	Air mission brief (AMB)
Combined arms rehearsal (CAR)	
	Aircrew brief
	Aviation task force rehearsal

A-77. Air assault planning is based on careful analysis of mission variables and detailed reverse planning. Five basic plans comprise the reverse planning sequence: ground tactical plan, landing plan, air movement plan, loading plan, and staging plan.

- Ground tactical plan. The ground tactical plan is the foundation of a successful air assault operation and serves as the basis for the five basic plans, with the other four plans supporting the ground tactical plan. The ground unit commander (GUC), develops the ground tactical plan, which specifies actions in the objective area to ultimately accomplish the mission and address subsequent operations. Ideally, it is the same as any other unit mission except that it capitalizes on the speed and mobility of the helicopter to achieve surprise and increase the probability of mission success.
- Landing plan. The landing plan is a sequenced movement of elements into an area of operation, ensuring that units arrive at designated locations and times prepared to execute the ground tactical plan.
- Air movement plan. The air movement plan is based on both the ground tactical plan and the landing plan. It is a detailed schedule of events and instructions for the air movement of troops, equipment, and supplies from the pickup zone to the landing zone. It also provides coordinating instructions regarding air routes, air control points, and aircraft speeds, altitudes, and formations.
- Loading plan. The loading plan is based on the air movement plan. It insures that troops, equipment, and supplies are loaded on the correct aircraft and moved from the pickup zone in a controlled manner into the objective area in the order of priorities as designated by the ground unit commander.
- Staging plan. The staging plan is based on the loading plan and prescribes the arrival times of ground units and their equipment at the pickup zone in proper order for movement. Ground units are expected to be in pickup zone posture 15 minutes before aircraft arrive.

A-78. Air assaults are deliberately planned because of their complexity and the commander's need for detailed intelligence concerning the enemy situation. The air assault planning process mirrors the steps in the MDMP and incorporates parallel actions necessary to provide the additional time and detailed planning required for successful mission execution. Table A-8 on page 174 provides planning factors for air assault planning.

Table A-8. Air assault planning considerations

AASLT TF Size	*Aircraft required*	*Personnel and equipment*	*Equipment*	*Total*
1x IN CO, 167 km (90 NM) in 1 LIFT	24x UH-60, 9x CH-47	CO HQ: 11 (2x M998 HMMWV) Scout/Sniper Sec. 11 (dismounted) IN Co: 132 (2x M1151, 2x M998 HMMWV) WPN PLT: 31 (2x M1151, 2x M1167 HMMWV) Fires Sec: 58 (4x M998 HMMWV) Sapper Squad: 11 (dismounted)	2x M119A3 (105 mm), 2x 120mm mortars, 8x trailers, 2x M1167 TOW, 8x M998, 4x M1151 Gun Truck, 8x Trailers, 1x Q36	254x pax, 14x vehicles
1x IN BN, 167 km (90 NM) in 3 LIFTS	24x UH-60, 9x CH-47	BN HQ/HHC: 187 (11x M998 HMMWV) CAV Platoon: 33 (6x M998 HMMWV) IN BN & WPN CO: 383 (13x M998 HMMWV, 4x M1167 TOW) WPN CO: 80 (8x M1151 Gun Trucks, 4x M1167 TOW) Fires Battery: 68 (6x M998 HMMWV) Sapper Squad: 12 (2x M998 HMMWV)	4x M119A3 (105 mm), 8x M1167 TOW, 38x M998, 8x M1151, 1x Q36, 6x Cargo Trailers	763x pax, 54x vehicles, 4x howitzers
2x IN BNs, 167 km (90 NM) in 4 LIFTS	24x UH-60, 9x CH-47	IBCT HQ: 40 (2x, M998, 2 x M1151 Gun Trucks) CAV Troop: 100 (2x M998, 2x M1151 Gun Truck) IN BN: 500 (6x M1151 Gun Trucks) IN BN: 500 (6x M1151 Gun Trucks) FA BN: 130 (9x M998, 4x M1151, 5x Trailer BEB: 130 (2x Sapper PLT, 4x M998, 2x Trailer)	12x M119A3 (105 mm), 3x M777 (155 mm), 1x Q36 Radar, 8x Trailers	1,400x pax, 37x vehicles, 15x howitzers
1x IBCT TF(-) 167 km (90 NM) 6 LIFTS	24x UH-60, 9x CH-47	IBCT HQ: ~32 (3x M998) CAV Squadron: 250 (9x M1151 Gun, 4x M1167 TOW IN BN: 475 (10x M1151 Gun) IN BN: 475 (10x M1151 Gun) IN BN: 475 (10x M1151 Gun) FA BN: 300 (12x M998, 2x M1151, 5x Trailer BEB: 110 (3x Sapper PLT)	12x M119A3 (105 mm), 3x M777 (155 mm), 1x Q36 Radar, 21x M998, 35x M1151, 4x M1167	2,117x pax, 60x vehicles, 15x howitzers
1x IBCT (-) 167 km (90 NM) in 2 LIFTS	60x UH-60, 36x CH-47	IBCT HQ: 59 (3x M998) CAV Squadron 394 (4x M1151 Gun) IN BN: 617 (6x M1151 Gun) IN BN: 600 (6x M1151 Gun) IN BN: 611 (6x M1151 Gun) Fires BN: 297 (12x M998, 2x M1151, 5x Trailer) BEB: 52 (3x Sapper PLT) BSB: 121 (5x M998, 5x Trailer)	12x M119A3 (105 mm), 6x M777 (155 mm), 1x Q36 Radar, 20x M998, 24x M1151	2,751x pax, 44x vehicles, 18x howitzers

BREAKOUT FROM ENCIRCLEMENT

A-79. A unit is encircled when all ground routes of evacuation and reinforcement have been cut by enemy action. A force may become encircled when it is ordered to remain in a strong position on key terrain to deny the enemy passage through a vital choke point following an enemy breakthrough or left to hold the shoulder of a penetration. Additionally, a commander can leave a unit in position behind the enemy by design or give a unit a mission with a high risk of encirclement.

A-80. A *breakout* is an operation conducted by an encircled force to regain freedom of movement or contact with friendly units (ADP 3-90). A breakout is both an offensive and a defensive operation. An encircled force normally attempts to conduct breakout operations when one of the following four conditions exist:

- The senior commander directs the breakout or the breakout falls within the intent of a higher echelon commander.
- The encircled force does not have sufficient relative combat power to defend itself against enemy forces attempting the encirclement.
- The encircled force does not have adequate terrain available to conduct its defense.
- The encircled force cannot sustain itself long enough for relief by forces outside the encirclement.

A-81. The senior commander assumes control of all encircled forces once the force realizes its encirclement. The commander informs higher command of the situation and simultaneously begins to accomplish the following tasks regardless of the subsequent mission:

- **Reestablish a chain of command.** Unity of command is essential. The commander reorganizes fragmented units and troops separated from their parent unit under another unit's supervision. The commander establishes a clear chain of command throughout the forces.
- **Establish a viable defense.** The command quickly establishes all-around defense. It may be necessary to attack and seize ground that favors an all-around defense. The command rapidly and continuously improves fighting positions. Enemy forces may attempt to split an encircled force by penetrating its perimeter with armor-heavy forces. An energetic defense, rapid reaction by reserves, and employment of antitank weapons in depth within the encirclement can defeat such attempts. A reduction in the size of the perimeter may be necessary to maintain coherence of the defense.
- **Establish a reserve.** Use armor-heavy units as a reserve and position them centrally to take advantage of interior lines. If only mechanized infantry forces are present, designate small dismounted local reserves to react to potential penetrations while the infantry fighting vehicles serve in a similar capacity as the tanks. The difference in employment, however, is with respect to the survivability of the vehicle.
- **Establish security elements as far forward as possible to provide early warning.** Initiate vigorous patrolling immediately. Establish local security throughout the force, and strictly enforce passive security measures.
- **Reorganize and centralize control of all artillery.** Distribute artillery and mortars throughout the enclave to limit their vulnerability to counterfires.
- **Maintain morale.** Soldiers in an encirclement must not see their situation as desperate or hopeless. Commanders and leaders at all levels maintain the confidence of Soldiers by resolute action and a positive attitude. They keep Soldiers informed to suppress rumors.
- **Centralize the control of all supplies.** Strict rationing and supply economy is practiced. If friendly forces can maintain local air superiority for the operation, attempt to resupply the encircled forces from the outside by parachute drop or helicopter lift if local air superiority can be maintained for the operation. Establish a centrally-located medical facility and evacuate wounded troops if an air supply line is open.

PLANNING A BREAKOUT

A-82. Once the commander is aware of force encirclement, the commander turns to the intelligence officer for a quick assessment of the enemy situation. The intelligence officers of all the units within the encircled area furnish this information. In particular, the intelligence officers should attempt to identify the strengths, weaknesses, and vulnerability points of the encircling forces, and determine whether the enemy realizes it has encircled the unit. These two pieces of information drive much of the commander's decision making.

A-83. The success of the operation depends considerably upon the senior commander's understanding of the higher commander's plan and intent. Specifically, if the commander is to contribute to the mission, the unit must attempt to plan operations in concert with the higher commander's operation.

A-84. The forces for a breakout operation are divided into five distinct tactical groups:

- Rupture force.
- Reserve force.
- Main body.
- Rear guard.
- Diversionary force (if sufficient forces are available).

A-85. **Rupture force.** The rupture force attacks, creates a gap in the enemy's weak point (if it has been identified), and holds the shoulders for the remaining forces to pass through. The rupture force must be of sufficient strength to penetrate the enemy line (typically 50% of available combat power). Initially, this

force is the main effort. The commander will probably have additional assets attached to the rupture force commander, such as air defense or engineer assets.

A-86. **Reserve force.** The reserve force (typically 25% of available combat power) follows the rupture force's attack to maintain attack momentum and secure objectives past the rupture. After the rupture force secures the gap, the reserve force normally becomes the lead element. When a unit is given the mission of the reserve force, the commander must coordinate closely with the rupture force commander on the location of the gap, the enemy situation at the rupture point, and the enemy situation (if known) along the direction of attack past the rupture point.

A-87. Initially, the reserve force passes through the gap created by the rupture force. It is essential that the reserve force continue a rapid movement from the encircled area toward the final objective (probably a linkup point). If the reserve force is making secondary attacks, it is important not to become bogged down. Artillery preparation of these objectives may assist the reserve force in maintaining momentum out of the encircled area.

A-88. **Main body.** The main body, which contains the CP elements, casualties, and sustainment elements, moves as a single group. It usually follows the reserve force through the gap created by the rupture force. The commander maintains command and control of this element to ensure orderly movement. Security for the main body is provided by the forces themselves. To lessen the security burden, the main body may travel close to the reserve force, which allows some measure of protection outside of its own capability.

A-89. **Rear guard.** The rear guard consists of the personnel and equipment left on the perimeter to provide protection for the rupture and diversionary attacks (if a diversionary attack force exists). In addition to providing security, the rear guard deceives the enemy as to the encircled force's intentions. The rear guard must be of sufficient strength (typically 15-25% of available combat power) to maintain the integrity of the defense. Once the breakout commences, the rear guard and diversionary force disengage or delay toward the rupture. The rear guard commander must provide a viable defense on the entire perimeter. As other units (rupture force, reserve force, diversionary force) pull off the perimeter, the rear guard commander must spread the forces over an extended area. This requires flexibility and mobility by the rear guard. The perimeter must withstand enemy pressure. If it does not, the enemy force simply follows the breakout forces through the gap and destroys them along the direction of attack.

A-90. **Diversionary force.** The diversionary force diverts enemy attention from the location of the rupture by a feint or show of force elsewhere. The diversionary attack should be as mobile as available vehicles and trafficability allow. Mobile weapon systems and tanks are ideally suited to the diversionary force (typically 10% of available combat power or the rear guard is given this as an additional task). Direct the diversionary attack at a point where the enemy might expect a breakout. Success of the diversionary force is imperative for a successful breakout operation. If the force fails to deceive the enemy as to its intention, the enemy can direct the full combat power at the rupture point. This could lead to a failure of the entire breakout operation. To achieve deception, the unit should—

- Use smoke-producing assets to deceive the enemy as to the size of the diversionary force.
- Increase radio traffic for size deception and as an indicator of an important operation.
- Use any available fire support to indicate a false rupture point.

A-91. The diversionary force may achieve a rupture of enemy lines. If a rupture occurs, the diversionary force commander must know the intent of the unit commander. The commander may exploit this success, or he may disengage to follow the reserve force through the planned rupture point along the direction of attack.

A-92. Reorganize engineer assets and give them missions commensurate with the situation. Task engineers to create obstacles to deny enemy penetration and to improve the survivability of the force by preparing fighting positions. The latter is especially important due to the unit's vulnerability to accurate artillery and missile strikes. Organize remaining engineer equipment into mobility units in preparation for offensive operations.

A-93. It is important to receive instructions and to remain informed about the battle outside the encirclement. Encircled units can be important sources of information on the enemy's support zone and can

perform important roles in defensive counterattacks. Communications are essential when relief and linkup are imminent.

A-94. The commander controls the main effort, while the operations officer probably observes the rear guard. In this way, the operations officer can act as a liaison between the main effort and rear guard commanders. It is critical that each understands the location and situation of the other throughout the operation or the force can become fragmented to the point of decisive engagement.

A-95. Reorganize air defense and chemical, biological, radiological, nuclear, and explosives assets to provide coverage for the encircled area. The static nature of the unit with its known perimeter make it a lucrative air target, especially if it has not had time to prepare adequate defenses.

A-96. The sustainment officer wants to maximize the use of limited recovery and evacuation assets. To achieve this, the sustainment officer must consolidate and control all sustainment assets. The only exception to this rule is the establishment of combat trains for the rear guard, usually an augmentation of existing unit trains. Having the sustainment officer in control of sustainment assets allows them to be used where and when they are needed. The rear guard, on the other hand, continues to operate per sustainment doctrine but with perhaps more confidence due to the additional assets.

PREPARING FOR A BREAKOUT

A-97. The intelligence officer prepares for the breakout by positioning reconnaissance assets so they can provide early warning to the force as it begins the operation. The intelligence officer's primary responsibility to the commander lies in the ability to anticipate possible enemy responses to the breakout (for example, counterattack, reinforcement of enemy positions, or use of chemical munitions). Information concerning enemy strength, intent, and future operations is essential to the commander. Additionally, the intelligence officer attempts to determine if the enemy considers the area significant enough to seize or if it merely fixes and continues to bypass. The latter option may include the enemy's use of chemical weapons.

A-98. Although several options exist for the commander once encircled, this section addresses only the breakout in the direction of a friendly force. The longer a unit waits to conduct a breakout, the more organized enemy forces are likely to become. The difficulty lies in the time required for a unit to organize the force properly to conduct the breakout. Therefore, a commander must weigh the level of preparation against the time available.

A-99. Units should accomplish the following tasks in both planning and preparing for the breakout:

- **Deceive the enemy as to time and place of the breakout.** If impossible to break out immediately, the commander attempts to deceive the enemy by conceding preparations and dispositions. The commander also creates the appearance that the force will make a resolute stand and await relief. Use of dummy radio traffic or landlines that might be tapped are good means of conveying false information to the enemy. The breakout direction should not be the obvious route toward friendly lines unless there is no other alternative.
- **Exploit gaps or weaknesses in the encircling force.** Early in an encirclement, gaps or weaknesses exist in the encircling force. Patrolling or probing actions reveal these weaknesses—an attack should capitalize on them. Although the resulting attack may be along a less direct route or may be over less favorable terrain, this attack is the best COA because it avoids enemy strength and increases the chance of surprise.
- **Exploit darkness and limited visibility.** The cover of darkness, fog, or severe weather conditions favors the breakout because the weapons of the encircling force are less effective in these conditions. In limited visibility, the enemy has difficulty following the movements of the breakout force. However, waiting for darkness or limited visibility conditions may result in consolidation of enemy containment.
- **Coordinate with supporting attacks.** Assist the breakout attack with a supporting attack by a nearby friendly force or by the reserve to divert enemy attention. Time the breakout attempt to occur just after the enemy reacts to the supporting attack.

A-100. Additionally, in preparation for the breakout, the unit engineer ensures that the proper task organization of engineer assets has taken place. The engineers prepare pre-breaches of obstacles that may

block their axis of attack. It is vital not to breach obstacles prematurely; this may alert the enemy to the nature and location of the future operation. Additionally, obstacles in depth are prepared to prevent the rear guard and perimeter defense forces from decisive engagement, particularly once the operation has begun. If possible, the obstacles in depth should allow forces to separate and the breakout force to make a clean break.

A-101. The commander conducts a radio rehearsal, ensuring that the commander of each subordinate element fully understands their role within the commander's intent. To observe and control the main effort, the commander is initially positioned behind the rupture force. Additionally, the operations officer moves to the vicinity of the rear guard and conducts a radio check with the main CP and the commander. **The breakout is an operation based on simplicity of execution, yet made difficult by simultaneous command and control operations.** The commander will designate phase lines for use by the attack forces as well as the rear guard. In this way, through constant coordination with the operations officer, the commander maintains unit integrity without sacrificing the momentum of the operation.

A-102. Finally, sustainment elements should be organized into a single movement formation under control of a senior officer, such as the unit sustainment officer. The sustainment officer establishes a chain of command, issues a frequency to control the formation as it moves, ensures that vehicles with externally mounted weapons are interspersed throughout the formation, posts air guards to ensure security, and augments the trains in support of the rear guard with whatever additional supplies and equipment are required. The trains should be organized to transport as many of the wounded and as much equipment as possible without causing excessive delays.

EXECUTING A BREAKOUT

A-103. As the unit begins the breakout, the intelligence officer monitors the enemy situation from two perspectives. First, the intelligence officer concentrates on the enemy's response to the breakout. Specifically, the intelligence officer attempts to identify possible counterattack forces or probable enemy defensive positions along the direction of attack. As the unit moves, the intelligence officer continually advises the commander of the enemy situation, to include possible courses of action. Second, the intelligence officer monitors the enemy situation faced by the rear guard. In this case, the intelligence officer is particularly interested in the enemy's ability to maintain contact with the force. The primary concern to the unit as a whole is whether the rear guard can keep the enemy from closing with the main body. As a result, if the enemy seems especially strong and tries to press the attack beyond the rear guard's ability to delay, the intelligence officer notifies the commander, who in turn either presses his attack more violently or assists the rear guard.

A-104. The rupture force begins the breakout by attacking a clearly defined objective, usually an identified enemy weakness, but ultimately an objective that allows for a strong defense against enemy counterattack. The rupture force destroys the enemy encountered enroute, consolidates and reorganizes on the objective, establishes hasty defensive positions, and secures the shoulders of the penetration.

A-105. Once a gap has been created, the reserve force passes through the rupture force and maintains the momentum of the maneuver. At this point, the unit is set for a movement to contact with the reserve force leading, followed on either flank by elements of the rupture force. The main body, containing the trains and the CP, is within this protective wedge, while the rear guard completes the all-around security.

A-106. Although the unit moves as in a movement to contact, the execution differs in that the force does not want to establish contact with the enemy; rather it wants to bypass enemy resistance in an effort to linkup with friendly forces. Therefore, enemy elements encountered enroute will be fixed and bypassed or, if possible, avoided altogether. In this operation, speed is essential; the faster the force travels, the less likely the enemy will be able to adequately respond. However, the commander must maintain the integrity of the formation and avoid maneuvering recklessly into an enemy engagement area. As a result, if the unit must move a considerable distance, reconnaissance assets should be given the mission to screen forward of the main body.

A-107. Mobility operations are essential to the success of the operation as the rupture force begins its movement. If engineer assets are limited, they may initially travel with the rupture force, then move in support of the reserve force. The important point is to keep them as far forward as possible without

allowing them to become unnecessarily exposed. Concurrently, conduct countermobility operations by the rear guard to slow the enemy and avoid decisive engagement.

A-108. The commander observes the progress of the rupture force and the movement forward of the reserve while at the same time monitoring activities of the rear guard. The commander determines the tempo of the operation while the operations officer observes the actions of the rear guard. Using phase lines, the commander can control the unit's movement to avoid creating an assailable flank that an enemy counterattack force could exploit. For example, knowing that the reserve force is crossing a particular phase line, the commander should ensure that the rear guard is likewise crossing an appropriate phase line which ensures the unit is maintaining its proper interval. The need to maintain force integrity is often at the expense of speed.

A-109. The fire support officer directs fires initially in support of the diversionary force as part of the deception plan; however, once the rupture force begins to move, the artillery shifts and concentrates on the rupture point. Firing is accomplished on the move through hasty occupation. In this way, the artillery is able to support both the attack and rear guard actions, yet remain protected.

A-110. Sustainment assets move with the main body, destroy non-transportable items, and leave some prestocks for the rear guard along with a detonation device. Control of sustainment assets is difficult due to a lack of radios on supply vehicles. Therefore, each driver must understand the mission and direction of attack. Drivers agree upon visual signals in advance, especially if special signals are required beyond the standard operating procedure. Air guards and flank protection are especially important to the soft-skinned vehicles. If the force must breakout without taking all of its wounded, the commander leaves adequate supplies and medical personnel behind to care for them. Evacuate wounded personnel who can move with the breakout force without hindering its chances for success.

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Appendix B

Defensive Tactics, Techniques, Procedures, and Considerations

This appendix provides common defensive techniques and considerations for executing an area defense, mobile defense, and retrograde (focusing on delay operations) and developing an engagement area and priorities of work.

INTRODUCTION TO DEFENSIVE OPERATIONS

B-1. This appendix is derived from ADP 3-0, ADP 3-90, FM 3-90-1, FM 3-96, and ATP 3-21.20.

B-2. A *defensive operation* is an operation to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations (ADP 3-0). The purpose of defensive operations is to create conditions for a counteroffensive that allows Army forces to regain the initiative. Other reasons for performing defensive operations include—

- Retaining decisive terrain or denying a vital area to an enemy.
- Attriting or fixing an enemy as a prelude to offensive operations.
- Countering enemy action.
- Increasing an enemy's vulnerability by forcing an enemy commander to concentrate subordinate forces.

B-3. This appendix provides common defensive techniques and considerations for executing an area defense, mobile defense, and retrograde (focused on delay operations) and developing an engagement area (EA) and priorities of work.

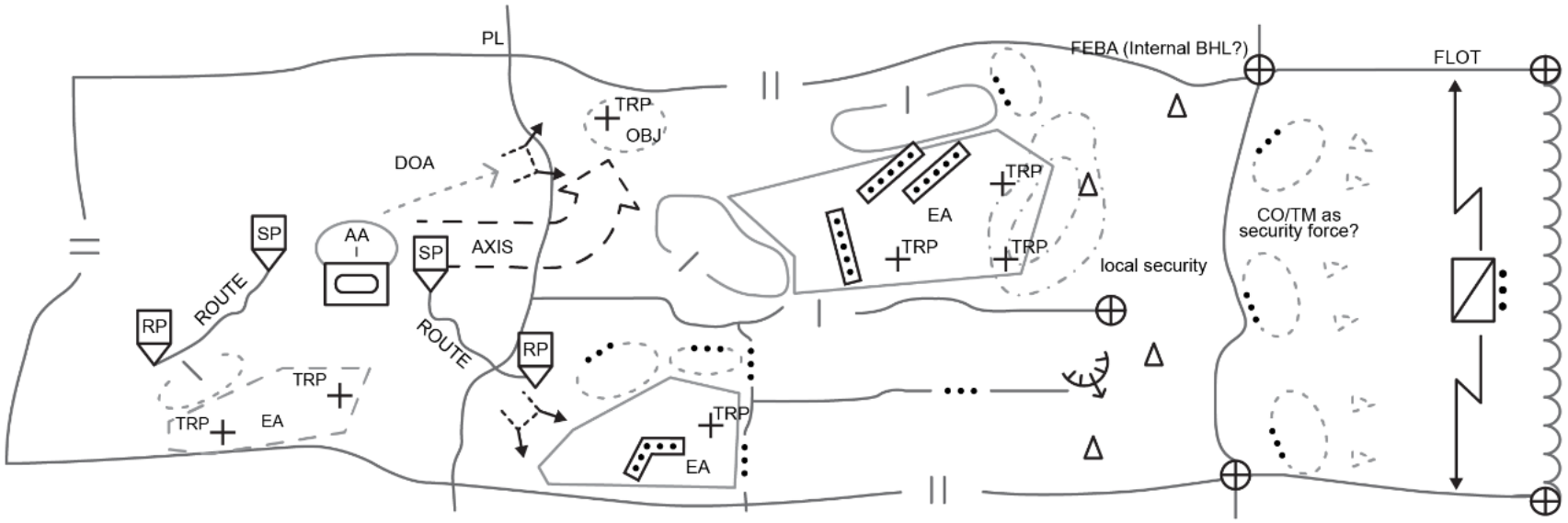
B-4. Successful defenses share the following characteristics: disruption, flexibility, maneuver, massing effects, operations in depth, preparation, and security.

B-5. Defenses are aggressive. Defending commanders use all available means to disrupt enemy forces. Commanders disrupt attackers and isolate them from mutual support to defeat them in detail. Defenders seek to increase their freedom of maneuver while denying it to attackers. Defending commanders use every opportunity to transition to the offense, even if only temporarily. As attackers' losses increase, they falter and the initiative shifts to the defenders. These situations are favorable for counterattacks. Counterattack opportunities rarely last long. Defenders strike swiftly when the attackers reach their decisive point. Surprise and speed enable counterattacking forces to seize the initiative and overwhelm the attackers.

B-6. There are three types of defensive operations:

- *Area defense.* A type of defensive operation that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright (ADP 3-90).
- *Mobile defense.* A type of defensive operation that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force (ADP 3-90).
- *Retrograde.* A type of defensive operation that involves organized movement away from the enemy (ADP 3-90).

B-7. Each defensive operation must be dealt with differently when planning and executing the defense. Although the names of these defensive operations convey the overall aim of a selected operation, each typically contains elements of the other and combines static and mobile elements. Figure B-1 on page 182 provides a graphic of defensive planning and executing considerations when planning and executing a defense.



Planning Step	7	6	5	4	3	2	1
Execution Step	1	2	3	4	5	6	7
	Occupation	**Passage of the Covering Force**	**Defeat of Enemy Recon, Infil, & Prep Fires**	**Approach of Enemy Main ATK**	**Enemy Assault**	**Counter-Attack**	**Consolidate & Reorganize (C&R)**
Considerations	• **R&S Plan** • **OPSEC/Deception Plan** • **Fire Support Plan** • **Control Measures** • **IPB** - EN Recon - EN Air/Arty/CBRN - Maneuver Space - Trafficability • **C2** - Coordination - Recon/QTR Party - Movement Plan - Asset Management • **Operations Process** - Plan - Prepare - Rehearse - Time Management	• **BHL** • **Direct/IndirectFire** • **Obscuration** • **OPSEC/Deception** • **Security Force** - Assist/Counter Fire/Close obstacle - Gain/Maintain Contact - Disengagement • **Passage of Lines** - RPOL/FPOL - Close lanes - C2 of passage points - Near and far side recognition - Fratricide prevention	• **Security throughout the AO** - Passive/Active - Patrols/OPs - OPSEC/Deception • **Security Force** - Task/Purpose (Screen/Guard/Cover?) - Assets - Fires Plan - SUS SPT - C2/Unity of CMD - Disengagement vs Recon continuation • **IPB** - EN Recon - EN Air/Arty/CBRN - Event Template/ R&S Plan • **Engagement Criteria**	• **IPB** - Event Template (NAI) - DST (TAI/DP) • **ID Enemy Main ATK** • **Shape the Battle** - Obstacles - Forces - Fires • **Assets** - Fires - CAS - Aviation - WFF • **Spoiling Attack?** • **Disruption of the EN's main ATK**	• **Sectors vs. Battle Positions (BPs)** - Reverse Slope • **Mass Effects and Concentrate Forces Disruption** • **Act don't React** • **Mass Effects** - Fire Support - Direct fire - Control measures • **Focus CBT Power @ the Decisive Point** • **Method of Resupply** • **CASEVAC/MEDEVAC** • **Commitment of the Reserve?**	• **IPB** - Strike at enemy @ "Culminating Point" • **Who Conducts?** - Reserve at all levels? - Size? - Local C-ATK by forces in contact • **Planned/Prepared** - Priorities (task/purpose for each) - Criteria Decision Point - Rehearsal • **Shift Resources?** • **Contingencies**	• **IPB** - Continuation of enemy fight • **Exploit Successes** • **Consolidate =** - Prep to continue the fight • **Reorganize =** - Restore C2 - Build Combat power • **Force Protection** - SUS integration - SUS prep/rehearsal • **Transition to Pursuit/Exploitation**

AA	assembly area	C-ATK	counter-attack	DOA	direction of attack	PREP	preparation	SPT	support
ARTY	artillery	CBT	combat	EN	enemy	RP	release point	SUS	sustainment
ATK	attack	CMD	command	INFIL	infiltration	SP	starting point	WFF	warfighting function

Figure B-1. Defensive planning and executing considerations

AREA DEFENSE

B-8. An area defense capitalizes on the strength inherent in a closely integrated defensive organization on the ground. The conduct of an area defense facilitates consolidating and reconstituting forces to allow focus on another element of decisive action, such as stability. The commander may assign subordinate units the task of conducting an area defense as part of their mission. Subordinate echelons defend within their area of operations (AOs) as part of the larger echelon's operation.

B-9. Area defense focuses on retaining terrain where the bulk of the defending force positions itself in mutually supportive, prepared positions. Units maintain their positions and control terrain between these positions. The decisive operation (DO) focuses on fires into EAs, possibly supplemented by a counterattack. The commander can use the reserve to reinforce fires, add depth, block, restore a position by counterattack, seize the initiative, or destroy enemy forces. Units at all echelons can conduct an area defense.

PLANNING AN AREA DEFENSE

B-10. An area defense requires detailed planning and extensive coordination. In the defense, synchronizing and integrating the unit's combat and supporting capabilities enables a commander to apply overwhelming combat power against selected advancing enemy forces. A successful defense depends on knowing and understanding the enemy and its capabilities. In planning an area defense, the commander may choose between two forms of defensive maneuver— defense in-depth or forward defense.

B-11. A defense in-depth reduces the risk of a quick penetration by the attacking enemy force. Even if initially successful, the enemy has to continue to attack through the depth of the defense to achieve a penetration. The defense in-depth provides more space and time to defeat the enemy attack. Dependent on the mission variables of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC), defense in-depth may require forces with at least the same mobility as the enemy to maneuver to alternate, supplementary, and subsequent positions. The mobility of the enemy force can determine the disengagement criteria of the defending forces as they seek to maintain depth. The commander considers using a defense in-depth when—

- The mission allows the unit to fight throughout the depth of the AO.
- The terrain does not favor a forward defense and better defensible terrain occurs deeper in the AO.
- Sufficient depth is available in the AO.
- Cover and concealment forward in the AO is limited.
- Chemical, biological, radiological, and nuclear weapons may be used.
- The terrain is restrictive and limits the enemy's maneuver and size of attack.

B-12. A forward defense is used to prevent enemy penetration of the defense. A forward defense is the least preferred form of the area defense due to its lack of depth. A unit commander deploys the majority of the combat power into defensive positions near the forward edge of the battle area. A commander fights to retain the forward position and may conduct spoiling attacks or counterattacks against enemy penetrations, or they may destroy enemy forces in forward EAs. Often, counterattacks are planned forward of the forward edge of the battle area to defeat the enemy. Commanders may use reconnaissance and security forces to find the enemy in vulnerable situations. Commanders can then exploit these opportunities with a spoiling attack that weakens the enemy’s main attacking force and disrupts enemy operations.

B-13. The unit commander uses a forward defense when a higher commander directs the unit commander to retain forward terrain for political, military, economic, and other reasons. A unit commander considers using a forward defense when—

- Terrain forward in the AO favors the defense.
- Strong, existing, natural or manmade obstacles, such as a river or a canal, are located forward in the AO.
- AO lacks depth due to the location of the protected area.
- Natural EAs occur near the forward edge of the battle area.

- Cover and concealment in the rear portion of the AO is limited.
- Unit commander is directed by higher headquarters to retain or initially control forward terrain.

PREPARING AN AREA DEFENSE

B-14. The unit uses time available to build the defense and to refine counterattack plans. The commander and staff assess unit preparations while maintaining situational awareness of developments in the unit's areas of interest. Collection activities begin soon after receipt of mission and continue throughout preparation and execution. Security operations are conducted aggressively while units occupy and prepare positions and rehearse defensive actions. Information collection during preparation helps improve understanding of the enemy, terrain, and civil considerations. Priorities for preparing an area defense are—

- Establish security.
- Occupy positions.
- Conduct rehearsals.

EXECUTING AN AREA DEFENSE

B-15. In an area defense, units are in prepared and protected positions and concentrate combat power against attempted enemy breakthroughs and flanking movements. The commander uses the reserve to cover gaps between defensive positions, reinforce those positions as necessary, and counterattack to seal penetrations or block enemy attempts at flanking movements. Execution of the area defense is divided into a five step sequence:

- **Gain and maintain enemy contact.** In the face of the enemy's determined efforts to destroy friendly reconnaissance and surveillance assets, gaining and maintaining enemy contact is vital to the success of defensive actions.
- **Disrupt the enemy.** The commander executes shaping operations (SOs), including military deception operations, to disrupt the enemy regardless of the enemy's location within the AO.
- **Fix the enemy.** The commander does everything possible to limit the options available to the enemy when conducting an area defense; this includes constraining the enemy to a specific course of action (COA), controlling enemy movements, or fixing the enemy in a given location.
- **Maneuver.** In an area defense, the DOs occur in the main battle area. The commander's goal is for the DO to prevent the enemy's further advance by using a combination of fires from prepared positions, obstacles, and mobile reserves.
- **Follow through.** The purpose of defensive actions is to create conditions for a counteroffensive that regains the initiative. A successful area defense allows the commander to quickly transition to offensive operations.

The steps above might not occur sequentially; they may occur simultaneously. The first three steps are usually SOs. Depending on the circumstances, either of the last two steps may be the echelon’s decisive operation.

MOBILE DEFENSE

B-16. A mobile defense focuses on destroying the enemy by permitting the enemy to advance to a position that exposes them to counterattack and envelopment. Units smaller than a division do not normally conduct a mobile defense because of their limited capabilities to fight multiple engagements throughout the width, depth, and height of the AO. In considering a mobile defense, the commander weighs several factors:

- The defender possesses equal or greater mobility than the enemy.
- The frontage assigned exceeds the defender's capability to establish an effective area or positional defense.
- The depth of the AO allows the attacking enemy force to be drawn into an unfavorable position where it can be attacked.
- Time for preparing defensive positions is limited.
- Sufficient armored, Stryker, aviation, and long-range artillery forces and joint fires are available to allow rapid concentration of combat power.

- The enemy may employ weapons of mass destruction because this type of defense reduces the vulnerability of the force to attack and preserves its freedom of action.
- The mission does not require denying the enemy specific terrain.
- The AO lacks well-defined avenues of approach and consists largely of flat, open terrain.

PLANNING A MOBILE DEFENSE

B-17. In a mobile defense, reconnaissance and security, reserve, and sustaining forces accomplish the same tasks as in an area defense. The commander organizes the main body into two principal groups—the fixing force and the striking force. The commander places the majority (typically one-half to two-thirds) of available combat power in the DO, which is a dedicated counterattack by a striking force. The commander commits the minimum possible combat power to the SO, which uses a fixing force to control the depth and breadth of the enemy's advance. The fixing force also retains the terrain required to conduct the striking force's decisive counterattack.

B-18. The striking force is the key to a successful mobile defense. The striking force must have mobility equal to or greater than that of its targeted enemy unit. The commander's ability to maintain the mobility advantage is an important aspect of the mobile defense. Countermobility assets support the fixing force and mobility assets support the striking force. If the striking force's planned maneuver places it outside the supporting range of the defending commander's fire support systems, the commander must either plan to move fire support assets to locations where they can support the striking force or incorporate them into the striking force. The commander takes precautions to prevent fratricide as the striking force approaches the fixing force's EAs by establishing restrictive fire lines (RFLs).

PREPARING A MOBILE DEFENSE

B-19. The fixing force develops defensive positions and EAs. The commander aggressively uses reconnaissance assets to track enemy units as they approach. The striking force assembles in one or more areas depending on the width of the AO, the terrain, enemy capabilities, and the commander's intent. Before the enemy attack begins, the striking force may deploy some or all of its elements forward in the main battle area to—

- Deceive the enemy regarding the purpose of the force.
- Occupy dummy battle positions.
- Create a false impression of unit boundaries, which is important when operating with a mix of armored, Stryker, and infantry forces or multinational forces.
- Conduct reconnaissance of routes between the striking force's avenues of approach and potential EAs.

EXECUTING A MOBILE DEFENSE

B-20. In a mobile defense, a commander must have flexibility to yield terrain and shape the enemy penetration. The commander may even entice the enemy by appearing to uncover an objective of strategic or operational value to the enemy. The striking force maneuvers to conduct the decisive operation—the counterattack—once the results of the actions of the fixing force shape the situation to meet the commander's intent. Execution of the mobile defense is divided into a five step sequence:

- **Gain and maintain enemy contact.** The commander conducting a mobile defense focuses on discovering the enemy's strength and exact locations to facilitate the effectiveness of the striking force.
- **Disrupt the enemy.** The commander conducts SOs designed to shape the enemy's penetration into the main battle area and disrupt the enemy's introduction of fresh forces, reserves, and follow-on echelons into the fight.
- **Fix the enemy.** Fixing the enemy is the second half of SOs and establishes the conditions necessary for the DO by the striking force.
- **Maneuver.** The actions of the striking force are the echelon's decisive operation on its commitment.

- **Follow through.** A transitional opportunity generally results from the success of the striking force's attack and attempts to establish conditions for a pursuit or future offensive operations.

RETROGRADE

B-21. Three forms of retrograde operations exist:

- *Delay.* When a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on enemy forces without becoming decisively engaged (ADP 3-90).
- *Withdraw.* To disengage from an enemy force and move in a direction away from the enemy (ADP 3-90).
- *Retirement.* When a force out of contact moves away from the enemy (ADP 3-90). Retirement is not discussed in this publication (see FM 3-90-1 for additional information).

B-22. The commander executes retrogrades to:

- Disengage from operations.
- Gain time without fighting a decisive engagement.
- Resist, exhaust, and damage an enemy in situations that do not favor a defense.
- Draw the enemy into an unfavorable situation or extend the enemy's lines of communications.
- Preserve the force or avoid combat under undesirable conditions, such as continuing an operation that no longer promises success.
- Reposition forces to more favorable locations or to conform to movements of other friendly troops.
- Position the force for use elsewhere in other missions.
- Simplify sustainment of the force by shortening lines of communications.
- Position the force where it can safely conduct reconstitution.
- Adjust the defensive scheme to secure more favorable terrain.
- Deceive the enemy.

DELAY

B-23. In delays, units yield ground to gain time while retaining flexibility and freedom of action to inflict the maximum damage on an enemy force. The delay is one of the most demanding of all ground combat operations. A delay wears down the enemy so that friendly forces can regain the initiative through offensive action, buy time to establish an effective defense, or determine enemy intentions as part of a security operation. Normally in a delay, inflicting casualties on the enemy is secondary to gaining time.

B-24. The ability of a force to trade space for time requires depth within the AO assigned to the delaying force. The depth required depends on several factors, including—

- Time to be gained.
- Relative combat power of friendly and enemy forces.
- Relative mobility of forces.
- Nature of the terrain.
- Ability to shape the AO with obstacles and fires.
- Degree of acceptable risk.

B-25. Ordinarily, the greater the available depth, the lower the risk involved to the delaying force and the greater the chance of success. A commander must provide the following guidance for a delay mission:

- Whether to delay within the AO or delay forward of a specified line or terrain feature for a specified time.
- Acceptable risk.
- Whether the delaying force may use the entire AO or will delay from specific battle positions.
- Whether the delaying force will use alternate or subsequent positions.

WITHDRAW

B-26. Withdrawing units, whether all or part of a committed force, voluntarily disengage from an enemy to preserve the force or release it for a new mission. The purpose of a withdrawal is to remove a unit from combat, adjust defensive positions, or relocate forces. A withdrawal may free a unit for a new mission. A unit may execute a withdrawal at any time and during any type of operation.

B-27. Units normally withdraw using a security force, a main body, and a reserve. The two types of withdrawals are assisted and unassisted. In an assisted withdrawal, the next higher headquarters provides security forces that facilitate the move away from the enemy. In an unassisted withdrawal, the unit provides its own security force. Withdrawals are generally conducted under one of two conditions: under enemy pressure and not under enemy pressure. Regardless of the type or condition under which it is conducted, all withdrawals share the following planning considerations:

- Keep enemy pressure off the withdrawing force. Position security elements, emplace obstacles, and cover by direct and indirect fire to delay the enemy.
- Maintain security. Know the enemy's location and possible courses of action. Observe possible enemy avenues of approach.
- Gain a mobility advantage. Gain an advantage by increasing the mobility of the brigade combat team, reducing the mobility of the enemy, or both.
- Reconnoiter and prepare routes. Each unit must know the routes or lanes of withdrawal. Establish priority of movement and traffic control if two or more units move on the same route.
- Withdraw nonessential elements early. Withdrawing nonessential elements early may include some command and control and sustainment elements.
- Move during limited visibility. Movement under limited visibility conceals moving units and reduces the effectiveness of enemy fires.
- Concentrate all available fires on the enemy. Alternate movement between elements so some of the force can always place direct or indirect fires on the enemy.

PLANNING RETROGRADE OPERATIONS

B-28. A retrograde requires detailed planning and extensive coordination. Synchronizing and integrating the unit's combat and supporting capabilities enables a commander to apply overwhelming combat power against selected advancing enemy forces.

B-29. The nature of the delay is to maximize the use of terrain. The intelligence officer, therefore, must prepare a detailed modified combined obstacle overlay. This involves identifying possible areas from which occupying forces may cover enemy avenues of approach. The delaying force must be able to inflict maximum destruction without becoming decisively engaged. The commander must anticipate enemy maneuver and execute plans to counter it. A careful analysis of the enemy's avenues of approach and probable objectives usually yields usable information regarding the location of probable enemy vulnerabilities, which serves as the basis for the delay plan.

B-30. The delay does not include decisive engagement. The delay is considered more difficult than the defense for the following reasons:

- Longer distances are required for triggering disengagement.
- Reconnaissance and counterreconnaissance operations must be highly mobile due to the defender's intent to forfeit terrain, thus preventing use of stay-behind patrols.
- More open terrain requires more effective obstacles to give the delaying force freedom of maneuver.
- Maintaining contact with the enemy makes decisive engagement difficult to avoid.

B-31. Planners should consider the following when planning delay operations:

- Centralizing planning and decentralizing action.
- Coordinating flanks.
- Forcing the enemy to deploy and maneuver.
- Maintaining contact with the enemy.

- Avoiding decisive engagement.

B-32. Commanders must understand both how long to delay and determine the time required for the enemy to maneuver through the AO. The difference between those two times determines how long the unit must create an effect on the enemy. The AO describes the space in which the delay must be accomplished.

B-33. A commander may use three techniques to allocate space and time. The first is called the buffer technique. The commander must delay forward of the rear boundary until a specified time. Therefore the commander creates a line forward of the rear boundary and in turn issues instructions to subordinate units to delay forward of the new line until that same time, this way if the enemy attack is stronger than expected, the commander and subordinate commanders still have maneuver space in which to continue the delay.

B-34. The second technique is called the halves technique. This approach divides the time the unit has to conduct the delay in half and applies it to the terrain. As a result, in areas of generally even terrain, a phase line may be placed in the middle of the AO and subordinate units are given equal time to delay in each portion of their AO. The better defensible terrain requires less space; therefore, the halftime phase line is positioned accordingly.

B-35. The last and most effective technique for allocating space and time is a detailed analysis technique of the unit's AO. In this technique, the commander compares the tentative locations of the delaying elements to the location of the enemy throughout every stage of the battle. In chronological order, planners determine the following:

- Amount of time the enemy needs to travel from the point where it comes within line of sight to the trigger line.
- Amount of time the enemy needs to move through the EA from the trigger line to the break line.
- Amount of time the delaying force needs to evacuate their positions, travel to the next position, and prepare to fight.
- Location of the enemy if it is able to re-form and continue the attack.
- Repeat as necessary.

B-36. The determinations above should be made for each subordinate unit's AO. By visualizing each subordinate unit's fight, the commander gains an appreciation for where each delay line should be drawn and the amount of time each subordinate unit can reasonably be expected to delay at each line. **If a commander establishes a delay line, mission accomplishment outweighs preservation of the force's integrity.**

B-37. Obstacles are usually surface-laid minefields or other easily emplaced obstacles. Maneuver forces rely on indirect fire to help prevent decisive engagement. Air defense assets should remain mobile, yet able to engage at a moment's notice. Bounding assets allow the air defense to always have units in position that are able to keep pace with operations. Support elements should be positioned as far as possible away from the close fight without sacrificing quality of support. Because of the time required to move support assets, every precaution should be taken to streamline sustainment operations.

B-38. The reserve's priorities are to block an enemy penetration, reinforce a weakened AO, assist in disengagement, and counterattacking. Generally, the reserve must avoid missions that extend far forward of the forward line of troops; it should stay focused on maintaining the cohesive nature of the delaying force.

PREPARING RETROGRADE OPERATIONS

B-39. When rehearsing the delay, the intelligence officer should include in the process unexpected enemy action to challenge the chain of command and stimulate thought toward contingency missions. The rehearsal not only confirms the plan but prepares the unit for other eventualities.

B-40. Subordinate commanders backbrief the higher commander on their plans for their operation and how their plans fit into the overall plan. The commander checks subordinate commander's plans to maintain contact while remaining not decisively engaged. The greatest risk to the force is movement from primary to secondary positions (as well as other subsequent moves). To properly execute a delay, the delaying force must have a mobility advantage.

B-41. Pre-stocks of ammunition and fuel should be placed adjacent to subsequent positions. The stocks should not be so large as to prevent the unit from continuing the mission should the stocks be destroyed. The stocks should be kept on transport vehicles to make availability more flexible and to permit their evacuation rather than force destruction in the face of the enemy.

EXECUTING RETROGRADE OPERATIONS

B-42. The intelligence officer uses the event template to confirm the enemy's probable COA and conduct an initial assessment of an enemy's strength. Subordinate units should report the following key characteristics of the enemy—strength, disposition, and probable future operations—and also report in a timely manner coordination point contacts, phase line crossings, checkpoint passings, and occupation of battle positions. Due to wide frontage, aviation assets and the reserve may only be able to influence one area. Therefore, if possible, those assets should remain uncommitted early in the operation; committing them removes the commander's ability to influence the battle. It is possible to commit those assets several times, but only when they can be quickly extracted. Maintenance, medical, and resupply operations continue but with the intent to evacuate rather than return to combat. Commanders should focus on maintaining cohesiveness of the overall operation, coordinating flanks, and assessing the situation to determine the most effective use of the reserve.

ENGAGEMENT AREA DEVELOPMENT

B-43. This section is derived from FM 3-90-1, ATP 3-21.20, and ATP 3-21.11.

B-44. An *engagement area* is an area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems (ADP 3-90). The success of any engagement depends on how effectively the unit integrates the direct fire plan, the indirect fire plan, the obstacle plan, Army aviation fires, close air support, and the terrain within the EA to achieve the unit's tactical purpose.

B-45. Effective use of terrain reduces the effects of enemy fires, increases the effects of friendly fires, and facilitates surprise. By studying the terrain, the commander tries to determine the principal enemy and friendly heavy, light, and air avenues of approach. The commander determines the most advantageous area for the enemy's main attack using the military aspects of terrain: observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment (OAKOC). For more information, refer to ATP 3-34.80, which includes a detailed discussion of OAKOC.

B-46. The following steps describe EA development.

STEP 1. IDENTIFY LIKELY ENEMY AVENUES OF APPROACH

B-47. Commanders and staff members can use the following techniques when identifying the threat's likely avenues of approach:

- Conduct initial reconnaissance of the terrain using OAKOC. If possible, do this from the enemy's perspective along each avenue of approach into the sector of fire or EA.
- Identify key and decisive terrain. This includes locations that afford positions of advantage over the threat and natural obstacles and choke points that restrict forward movement.
- Determine which avenues provide cover and concealment for the threat while allowing the commander to maintain tempo.
- Determine which terrain the enemy is likely to use to support each avenue.
- Evaluate lateral routes adjoining each avenue of approach.

STEP 2. DETERMINE ENEMY SCHEME OF MANEUVER

B-48. Commanders and staff members can consider the following when determining the enemy's likely avenues of approach:

- How will the enemy structure the attack?
- How will the enemy use reconnaissance assets?

- How or whether the threat will attempt to infiltrate friendly positions?
- Where and when will the enemy change formations or establish support by fire positions?
- Where, when, and how will the enemy conduct assault or breaching operations?
- Where and when will the threat commit follow-on forces?
- What are the enemy's expected rates of movement?
- What are the effects of combat multipliers, their anticipated locations, and areas of employment?
- What reactions is the enemy likely to have in response to projected friendly actions?

STEP 3. DETERMINE WHERE TO ENGAGE THE ENEMY

B-49. Apply the following to identify and mark where a unit will engage the enemy:

- Identify target reference points that match the enemy's scheme of maneuver, allowing the unit to identify where it will engage enemy forces through the depth of the sector of fire.
- Identify and record the exact location, composition, and intent of each target reference point. Target reference points within a unit can have varying compositions due to the use of different weapon systems to engage different target types.
- Decide how many weapon systems will engage fires on each target reference point to achieve the desired end state.
- Determine engagement lines for all weapon systems.
- Select which platoons will mass fires on each target reference point.
- Establish EAs around target reference points.
- Develop the direct fire planning measures necessary to fire at each target reference point.

STEP 4. PLAN AND INTEGRATE OBSTACLES

B-50. Apply the following in planning and integrating obstacles into a unit's defense:

- Determine the obstacle group's intent, confirming the target, relative location, and effect. Ensure intent supports the task force scheme of maneuver.
- Identify, site, and mark obstacles within the obstacle group.
- Integrate protective obstacle types and locations within the unit's defense.
- Ensure coverage of all obstacles with direct fires.
- Assign responsibility for guides and lane closure, as required.
- Emplace obstacles based on analysis of mission variables.
- Secure Class IV and V points, mine dumps, and obstacle work sites.

STEP 5. EMPLACE WEAPON SYSTEMS

B-51. Apply the following when selecting and improving a unit's battle position:

- Select tentative battle positions.

Note. When possible, select battle positions while moving in the EA using the enemy's approach. Using the enemy's perspective enables the commander to assess survivability of the positions.

- Ensure subordinates conduct a leader's reconnaissance of the tentative battle positions.
- Drive the EA to confirm that selected positions are tactically advantageous.
- Confirm and mark the selected battle positions.
- Ensure that battle positions do not conflict with those of adjacent units and that they are effectively tied in with adjacent positions.
- Select primary, alternate, and supplementary fighting positions to achieve the desired effect for each EA.
- Ensure that leaders position weapon systems so that each EA is effectively covered by the required number of weapons, vehicles, or platoons.

- Ensure Soldiers in battle positions can observe the EA and engage enemy forces as stated in the mission order.
- Identify and mark, according to the unit standard operating procedure, positions that can be hardened by the construction of fighting or survivability positions.
- Confirm all vehicle or weapon systems positions.

STEP 6. PLAN AND INTEGRATE INDIRECT FIRES

B-52. Apply the following in planning and integrating indirect fires:

- Determine the purpose of fires.
- Decide where that purpose will be best achieved.
- Establish an observation plan with redundancy for each target.
- Include as observers the fire support teams and members of maneuver elements with fire support responsibilities.
- Establish triggers based on enemy movement rates.
- Obtain accurate target locations using survey or navigational equipment.
- Refine target locations to ensure coverage of obstacles.
- Adjust artillery and mortar targets.
- Plan final protective fires.
- Request critical friendly zones for maneuver units and no-fire areas for observation posts and forward positions.

STEP 7. ENGAGEMENT AREA REHEARSAL

B-53. EA rehearsals ensure that leaders and subordinates understand the plan and are prepared to cover their assigned areas with direct and indirect fires. The commander has several rehearsal options (see paragraph 3-39 for rehearsal methods). The rehearsal should cover the following actions:

- Rearward passage of security forces (as required).
- Closure of lanes (as required).
- Movement from the hide position to the battle position.
- Use of fire commands, triggers, or maximum engagement lines to initiate direct and indirect fires. Shifting of fires to concentrate and redistribute fires' effects.
- Preparation and transmission of critical reports using radio and digital systems (as applicable).
- Assessment of enemy weapon systems effects.
- Displacement to alternate, supplementary, or subsequent battle positions.
- Cross-leveling or resupply of Class V.
- Evacuation of casualties.

Figure B-2 on page 192 illustrates an example EA.

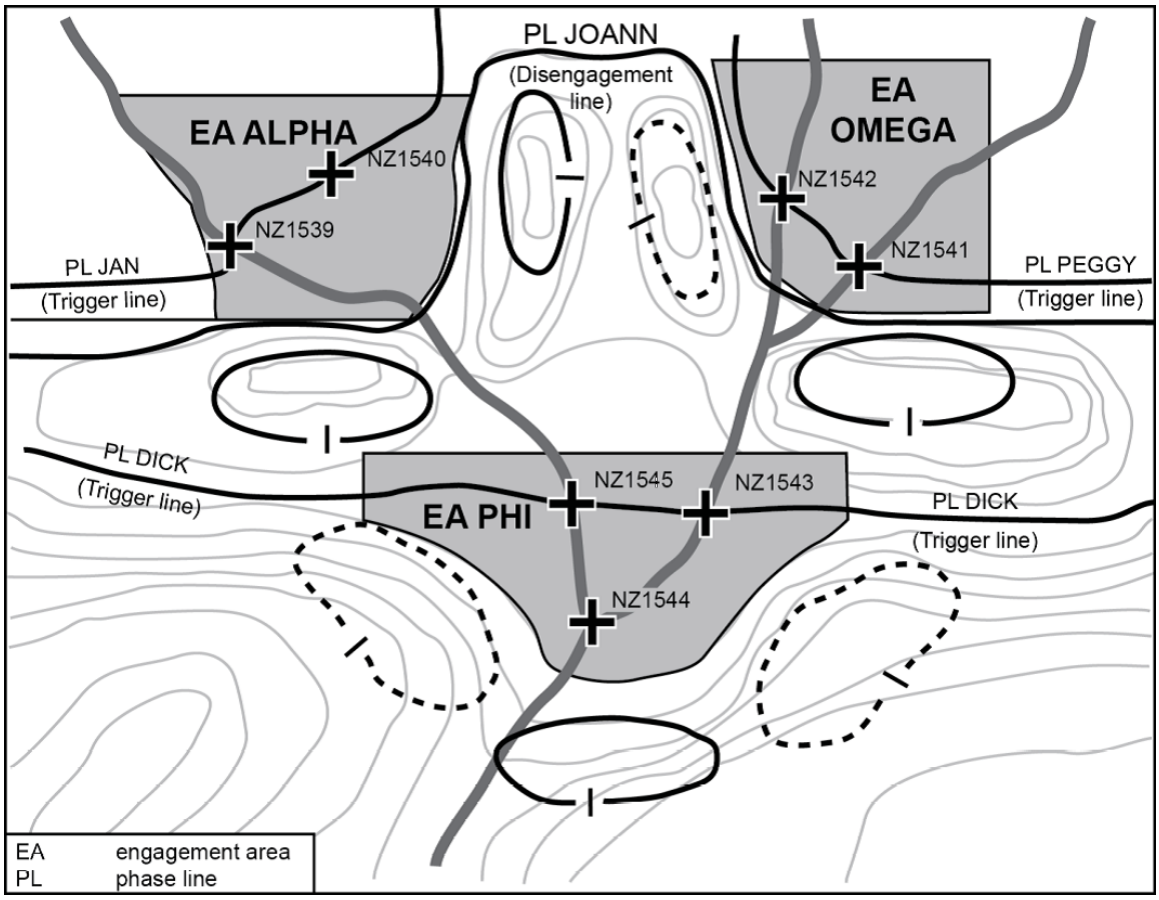


Figure B-2. Example of a battalion engagement area

PRIORITIES OF WORK

B-54. Priorities of work are determined in accordance with METT-TC. In addition to a task name, priorities of work include a given time for performance, a measurable performance standard to guide the accomplishment of each task, and a designation for whether the work will be controlled in a centralized or decentralized manner. Priorities of work may include, but are not limited to, the following tasks:

- Continuous security.
- Withdrawal plan.
- Continuous communication.
- Mission preparation and planning.
- Weapons and equipment maintenance.
- Water resupply.
- Resupply.
- Mess plan.
- Sanitation and personal hygiene.
- Alert plan and "stand to."
- Rest and sleep plan.

Appendix C

Enabling Tactics, Techniques, Procedures, and Considerations

This appendix provides common enabling techniques, tactics, procedures, and considerations for executing the enabling operations of reconnaissance, security, assembly areas, relief in place, battle handover, and linkup.

RECONNAISSANCE AND SECURITY OPERATIONS

C-1. This section is derived from ADP 3-90, FM 3-90-1, FM 3-90-2, FM 3-98, and ATP 3-21.20. Table C-1 shows reconnaissance and security planning factors.

Table C-1. Reconnaissance and security planning factors

	Cavalry squadron echelon	*# OPs short term (<12 hrs)*	*# OPs long term (>12 hrs)*	*Route recons*	*Screen frontage (km)*	*Guard /cover frontage (km)*	*Squadron task organization*
IBCT	Scout PLT	6	3	1	3-5	1-3	2x troops with 3x PLTs each
	Troop	18	9	1-3	7-13	2-7	
	Squadron	36	18	2-6	13-25	3-13	
ABCT	Scout PLT	6	3	1	3-5	1-3	3x troops with 2x PLTs each, 1x AR Co (3x PLTs)
	Troop	12	6	1-2	5-9	1.5-5	
	Squadron	36	18	3-6	13-25	3-13	
SBCT	Scout PLT	6	3	1	3-5	1-3	3x troops with 2x PLTs each, 1x AT Co (6x PLTs)
	Troop	12	6	1-2	5-9	1.5-5	
	Squadron	36	18	3-6	13-25	3-13	

Platoons can conduct route reconnaissance only in permissive environments.
Frontages are a doctrinal planning factor only; terrain will dictate actual frontage.
Cover mission requires additional forces.
Platoons and troops cannot doctrinally guard or cover by themselves; these factors are listed as planning considerations for a squadron effort.
Ground-based OPs under best conditions, identify enemies 6 km out and, if needed, disengage around 3 km out.
SBCT AT CO has 3x Mobile Gun System (MGS) PLTs and 3x ATGM Stryker PLTs.

RECONNAISSANCE AND SECURITY GUIDANCE

C-2. Commanders provide clear reconnaissance and security guidance that offer both freedom of action to develop the situation as well as adequate direction to ensure that their units can accomplish stated reconnaissance objectives within the required timeframe. The commander's reconnaissance and security planning guidance provides a clear understanding of the unit's task, purpose, and objective. Reconnaissance and security guidance explains the focus, levels of detail, completeness, levels of covertness, time requirements, and potential for engagement the commander is willing to accept (by providing guidelines for engagement, disengagement, and displacement of the organization). The commander develops planning guidance based on the unit's mission, timeline, and intent to satisfy information requirements and identify

opportunities to seize, retain, and exploit the initiative. The commander specifies different reconnaissance guidance for each phase of an operation and adjusts components of the guidance when appropriate. Reconnaissance and security guidance elements and purpose are similar with subtle variations. The commander's guidance consists of four elements—

- Focus
  - Reconnaissance. Enemy or terrain and reconnaissance pull or push.
  - Security. What to protect and why.
- Tempo
  - Reconnaissance. Rapid, deliberate, forceful, and or stealthy.
  - Security. Short duration or long duration.
- Engagement and disengagement criteria (if any), both lethal and nonlethal.
- Displacement criteria. Event, time, or threat driven.

Focus

C-3. **Reconnaissance** focus defines the reconnaissance unit's area of emphasis and consists of four categories: enemy, infrastructure, terrain and weather effects, and society. The higher commander's intent as well as the commander's initial assessment of information requirements and information gaps serves as the basis for establishing the focus of reconnaissance tasks. Focus helps the reconnaissance organization narrow the scope of operations to get the information most important to developing the situation for future operations.

C-4. Commanders and staffs can further focus reconnaissance efforts by assigning specific reconnaissance objectives. A *reconnaissance objective* is a terrain feature, geographic area, enemy force, adversary, or other mission or operational variable about which the commander wants to obtain additional information (ADP 3-90). The objective should directly support the end state defined in the commander's intent.

C-5. For example, during offensive operations, a brigade combat team's cavalry squadron may conduct reconnaissance to locate an enemy's security force, to include its composition, disposition, and capabilities. At the same time, the squadron could also address information gaps concerning terrain-collecting information on key terrain features that might affect friendly forces, the enemy's disposition, and various courses of action the brigade combat team's commander might develop during planning. The information developed by terrain- or enemy-focused reconnaissance helps update templated enemy courses of action as part of the continuous assessment of the tactical situation and the operational environment.

C-6. **Security** focus defines what to protect and why. The focus describes the expected results of the security operation. Security tasks are threat, terrain, or friendly unit-oriented. This allows subordinate commanders to narrow their operations to protect the most critical activities and acquire the information most important to a higher headquarters.

Tempo

C-7. Tempo is the relative speed and rhythm of military operations over time with respect to the enemy. Reconnaissance tempo refers to the level of detail and covertness required of the reconnaissance organization. **Reconnaissance tempo is described by four terms: rapid, deliberate, stealthy, and forceful.** Rapid and deliberate are levels of detail and are mutually exclusive in all cases—tempo cannot be rapid and deliberate at the same time. Reconnaissance organizations can oscillate between the two from phase to phase and even within sub-phases of an operation. Stealthy and forceful indicate mutually exclusive levels of covertness.

C-8. Rapid or deliberate operations describe the **level of detail** required by the commander. **Rapid** tempo dictates that the level of detail for the reconnaissance operation and is limited to a certain prescribed list of tasks or priority intelligence requirements (PIR). Rapid tempo is appropriate when time is of the essence and only a limited number of information requirements are necessary to accomplish the mission. **Deliberate** tempo implies all tasks of the mission must be accomplished to ensure mission success. Deliberate tempo allows the organization more time to answer all information requirements. Detailed and

thorough reconnaissance and security tasks require time-intensive, comprehensive, and meticulous mounted and dismounted efforts to observe reconnaissance objectives and develop the situation.

C-9. Forceful or stealthy operations describe the **level of covertness** commanders require. **Forceful** tempo develops the situation through action by employing air and ground reconnaissance, technical means, and both direct and indirect fire systems moving rapidly to develop the situation. Forceful reconnaissance requires firepower, aggressive exploitation of actions on contact, operational security, and unit training to survive and accomplish the mission. Forceful reconnaissance is appropriate when time is limited, detailed reconnaissance is not required, terrain is open, environmental conditions allow for mounted reconnaissance, and dismounted reconnaissance cannot complete the mission within existing time constraints. **Stealthy** tempo emphasizes avoiding detection and engagement dictated by restrictive engagement criteria. Stealthy reconnaissance typically takes more time than forceful reconnaissance. It uses dismounted scouts to take maximum advantage of cover and concealment, reducing signatures that lead to compromise. Stealthy tempo is used when time is available, detailed reconnaissance and stealth is required, enemy forces are likely in a specific area, danger areas are encountered, and restrictive terrain limits effectiveness of mounted reconnaissance.

C-10. For **security** operations, clearly articulating the tempo allows the commander to establish associated time requirements that drive security task planning, such as the method of establishing observation posts (mounted or dismounted), length of unmanned aircraft system (UAS) rotation, and logistical and communications support required to execute the mission. In addition, tempo also relates to depth, especially in screen missions. Throughout an area of operations (AO), time is needed to properly deploy into screen lines to achieve the required depth. When articulating security tempo, commanders consider tasks, the commander's critical information requirements (CCIRs), latest time information of value (LTIOV), tactical risk, movement techniques, and reconnaissance methods and formations. Additionally, tempo affects whether security units employ short- or long-duration observation posts (OPs) in their security tasks.

- **Short duration OPs—**manned for less than 12 hours. Short duration OPs allow commanders to quickly take advantage of available time and mass reconnaissance assets. These are executed by maximizing the number of OPs and associated observing forces on the ground and in the air.
- **Long duration OPs—**manned for greater than 12 hours. The number of OPs decreases as platoons and company-sized units allocate additional forces to each OP to manage a deliberate rotational schedule and rest plan. Units must coordinate adequate resupply of all supply classes to support OPs that operate for extended periods of time.

Engagement and Disengagement Criteria

C-11. *Engagement criteria* are protocols that specify those circumstances for initiating engagement with an enemy force (FM 3-90-1). *Disengage* is a tactical mission task where a commander has the unit break contact with the enemy to allow the conduct of another mission or to avoid decisive engagement (FM 3-90-1). The criteria for engaging or disengaging can be either restrictive or permissive and establish minimum thresholds for engagement or disengagement using all the forms of contact. The commander defines the size or type of enemy force subordinate units should engage or avoid, which drives planning for direct and indirect fires and establishing bypass criteria. Merely defining engagement criteria using terms such as "aggressive" or "discreet" is insufficient. Define engagement criteria using precise doctrinal terms. For example, guidance for units conducting **reconnaissance** includes the following:

- Guidance for actions on contact—
  - What situations constitute a fight?
  - A fight at which echelon?
  - In what situation does the leader defer the fight to a higher element?
- Bypass criteria.
- Reconnaissance handover criteria.
- Priority of fires.
- Rules of engagement or rules for use of force.
- Fire support coordination measures.
- Weapons control status.

C-12. For example, guidance for units conducting **security** includes the following:

- Force or area to secure.
- Location and orientation of the security area.
- Initial location and types of OPs, if applicable.
- Time allocated to establish the security operation.
- Criteria for transitioning from the security operation to the decisive operation (DO).
- Task organization and augmentation of security forces.
- Level of protection and minimum warning time requirements.
- Threat considerations, such as the smallest enemy element allowed to pass without engagement or the threat's capability to influence main body activities.

Displacement Criteria

C-13. Displacement criteria define triggers for planned withdrawal, passage of lines, or reconnaissance handover between units. As with engagement and disengagement criteria, the conditions and parameters established in displacement criteria integrate the commander's intent with tactical feasibility. Conditions are either **event driven** (for example, associated PIRs met, threat contact not expected in the area, and observed NAIs or avenues of approach denied to the enemy); **time driven** (for example, LTIOV time triggers met); or **threat driven** (observation posts compromised). Failure to specifically dictate conditions for displacement within the higher scheme of maneuver likely will result in either: (1) reconnaissance and security assets leaving too early or (2) becoming decisively engaged.

RECONNAISSANCE

C-14. *Reconnaissance* is a mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. Also called RECON (JP 2-0). Reconnaissance is a focused collection effort, not a means to initiate combat, and may involve fighting for information. It is performed before, during, and after other operations to provide information used in the intelligence preparation of the battlefield (IPB) process. The commander uses reconnaissance to formulate, confirm, or modify a course of action (COA).

C-15. Seven fundamentals assist commanders in successful reconnaissance operations:

- Ensure continuous reconnaissance.
- Do not keep reconnaissance assets in reserve.
- Orient on the reconnaissance objective.
- Report information rapidly and accurately.
- Retain freedom of maneuver.
- Gain and maintain enemy contact.
- Develop the situation rapidly.

C-16. The two reconnaissance techniques commanders may employ to answer information requirements are reconnaissance pull or reconnaissance push. Commanders employ these techniques based on their level of understanding of the operational environment combined with the time available to refine their understanding. In selecting one technique over the other, the commander considers the following:

- Degree of the situational understanding of the enemy.
- Time available to collect the information.
- Leadership ability of subordinate commanders.
- Proficiency of subordinate units to plan and rapidly react to uncertain situations.

C-17. **Reconnaissance pull** is used when commanders are uncertain of the composition and disposition of enemy forces in their areas of operations, information concerning terrain is vague, and time is limited. In these cases, reconnaissance assets initially work over a broad area to develop the enemy situation. As they gain an understanding of enemy weaknesses, they then 'pull' the main body to positions of tactical advantage. Reconnaissance pull knowingly emphasizes opportunity at the expense of a detailed,

well-rehearsed plan and unity of effort. Commanders base plans on several viable branches or COAs triggered by DPs that reconnaissance assets operate to answer associated CCIRs. Leaders at all levels must understand and rehearse branches and sequels.

C-18. **Reconnaissance push** is used when commanders have a relatively thorough understanding of the operational environment. In these cases commanders 'push' reconnaissance assets into specific portions of their areas of operation to confirm, deny, and validate planning assumptions impacting operations. Reconnaissance push emphasizes detailed, well-rehearsed planning.

C-19. The five types of reconnaissance follow:

- *Route reconnaissance* is a type of reconnaissance operation to obtain detailed information of a specified route and all terrain from which the enemy could influence movement along that route (ADP 3-90).
- *Area reconnaissance* is a type of reconnaissance operation that focuses on obtaining detailed information about the terrain or enemy activity within a prescribed area (ADP 3-90).
- *Zone reconnaissance* is a type of reconnaissance operation that involves a directed effort to obtain detailed information on all routes, obstacles, terrain, and enemy forces within a zone defined by boundaries (ADP 3-90).
- *Reconnaissance in force* is a type of reconnaissance operation designed to discover or test the enemy's strength, dispositions, and reactions or to obtain other information (ADP 3-90).
- *Special reconnaissance* is reconnaissance and surveillance actions conducted as a special operation in hostile, denied, or diplomatically and/or politically sensitive environments to collect or verify information of strategic or operational significance, employing military capabilities not normally found in conventional forces. Also called SR (JP 3-05).

SECURITY OPERATIONS

C-20. *Security operations* are those operations performed by commanders to provide early and accurate warning of enemy operations, to provide the forces being protected with time and maneuver space within which to react to the enemy, and to develop the situation to allow commanders to effectively use their protected forces (ADP 3-90). Security operations are shaping operations (SOs) that take place during all operations. Other collection assets provide the commander with early warning and information on the strength and disposition of enemy forces. The availability of information collection assets enables greater flexibility in the employment of security forces.

C-21. Security operations provide information about the enemy and terrain and preserve the combat power of friendly forces. Security operations provide information about the size, composition, location, and direction of movement of enemy forces. Reaction time and maneuver space gained by information collected allows the main body commander to prepare for future operations or to deploy to engage the enemy. Security prevents the enemy from surprising the main body that allows the commander to preserve the combat power of maneuver forces and mass effect and combat power at the decisive point in time. Commanders may conduct security operations to the front, flanks, and rear of their force. The primary difference between security operations and reconnaissance is that security operations orient on the force or facility being protected while reconnaissance orients on enemy, populace, or terrain.

C-22. Successful security operations depend on properly applying the following five fundamentals:

- Provide early and accurate warning.
- Provide reaction time and maneuver space.
- Orient on the force or facility to be secured.
- Perform continuous reconnaissance.
- Maintain enemy contact.

C-23. Four forms of security operations exist, each providing varying levels of protection to the main body and requiring different quantities of resources:

- *Screen* is a type of security operation that primarily provides early warning to the protected force (ADP 3-90).

- *Guard* is a type of security operation done to protect the main body by fighting to gain time while preventing enemy ground observation of and direct fire against the main body (ADP 3-90). Units performing a guard task cannot operate independently because they rely upon fires and functional and multifunctional support assets of the main body.
- *Cover* is a type of security operation done independent of the main body to protect them by fighting to gain time while preventing enemy ground observation of and direct fire against the main body (ADP 3-90).
- *Area security* is a type of security operation conducted to protect friendly forces, lines of communications, and activities within a specific area (ADP 3-90).

SURVEILLANCE

C-24. *Surveillance* is the systematic observation of aerospace, cyberspace, surface, or subsurface areas, places, persons, or things by visual, aural, electronic, photographic, or other means (JP 3-0). Surveillance may be a stand-alone mission or part of reconnaissance, security, or other missions (particularly area reconnaissance). In many ways, surveillance is an easier mission to perform than reconnaissance.

C-25. Surveillance is distinct from reconnaissance. Surveillance involves tiered and layered technical assets collecting information. It can be passive and continuous, with an extended period of surveillance used as a tactic or technique. Reconnaissance, on the other hand, is active in collection of information (such as maneuver) and usually involves human participation. It involves many TTP throughout the course of a mission. Commanders complement surveillance with frequent reconnaissance. Surveillance, in turn, increases the efficiency of reconnaissance by focusing those missions while reducing the risk to Soldiers.

C-26. Both reconnaissance and surveillance involve detecting, locating, tracking, and identifying entities in an assigned area and obtaining environmental data. Reconnaissance and surveillance are not executed the same way. During reconnaissance, collection assets find information by systematically checking different locations within the area. During surveillance, collection assets watch the same area, waiting for information to emerge when an entity or its signature appears.

C-27. Reconnaissance and surveillance complement each other by cueing the commitment of collection assets against locations or specially targeted enemy units. An airborne surveillance asset may discover indicators of enemy activity that cues a reconnaissance mission.

ASSEMBLY AREA OPERATIONS

C-28. This section is derived from ADP 3-90 and FM 3-90-1.

C-29. An *assembly area* is an area a unit occupies to prepare for an operation (FM 3-90-1). Units in assembly areas (AAs) execute maintenance, resupply, and personnel actions to maintain the combat power of the force. Units also may conduct reconnaissance, training, and rehearsals and task organization and reorganization of the force; develop and issue orders and plans; and coordinate with other units or higher headquarters. Units occupying AAs employ security measures to deny enemy intelligence any indicators of friendly plans, intentions, force composition, unit identity, and locations consistent with the higher commander's deception plan. Designation and occupation of an AA may be directed by a higher headquarters or by the unit commander, for example, during relief or withdrawal operations or during unit movements.

C-30. Planning for, occupying, and departing an AA is difficult and time consuming. Performed correctly, executing an AA can aid in structuring the unit for timely execution of combat operations. Done incorrectly, executing an AA confuses and disorganizes a unit before the unit ever makes contact with the enemy. AAs are organized and occupied with an emphasis on unit integrity, ease of operations, command and control, and efficient use of facilities. Tactical dispersion and protection from ground or air attack are lesser considerations. Units typically group tightly together and are at an extremely low readiness condition.

C-31. A tactical assembly area is an area that is generally out of the reach of light artillery and the location where units make final preparations (precombat checks and inspections) and rest, prior to moving to the line of departure. Tactical assembly areas (TAAs) are areas where enemy contact is likely and commitment

of the unit directly from the TAA into combat is possible or anticipated. Examples of TAAs include locations occupied by units designated as tactical reserves, by units after completing a rearward passage of lines, temporarily by units during tactical movement, and by units during reconstitution. Units in TAAs are typically preparing to move forward to execute a forward passage of lines followed by offensive operations or have been assigned a reserve mission by their higher commander.

C-32. Both assembly areas and tactical assembly areas have a number of overlapping planning considerations and actions. Unless stated otherwise, the rest of this discussion focuses on planning, establishing, and departing from TAAs. TAAs ideally provide—

- Concealment from air and ground observation.
- Cover from direct fire.
- Terrain masking of electromagnetic signal signatures.
- Sufficient area to disperse units and their vehicles consistent with the tactical situation.
- Suitable entrances, exits, and internal routes. Optimally, at least one all-weather paved surface road transits the TAA and connects to the main supply route in use by the next higher headquarters.
- Terrain that allows the observation of ground and air avenues of approach into the TAA.
- Good drainage and soil conditions that support unit vehicle movement.
- Buildings for maintenance operations, command and control (C2) facilities, and supply storage.
- An area suitable for a helicopter landing zone, if applicable.

Properly locating a TAA contributes significantly to both security and flexibility. The location should facilitate future operations so movement to subsequent positions takes place smoothly and quickly.

TASK ORGANIZATION

C-33. When preparing to occupy an assembly area, a unit usually task-organizes into two components: the quartering party and the main body. A *quartering party* is a group of unit representatives dispatched to a probable new site of operations in advance of the main body to secure, reconnoiter, and organize an area before the main body's arrival and occupation (FM 3-90-2). The quartering party usually guides the main body into position from the route's release point (RP) to their precise locations in the AA.

C-34. A quartering party normally includes an officer in charge (OIC), a noncommissioned officer in charge (NCOIC), representatives from the command post (CP), and all subordinate units. The OIC and NCOIC must be senior enough and empowered to make tactical decisions and settle disputes between the unit's tentative plan and subordinate unit quartering parties' OICs and NCOICs. Unit standard operating procedures (SOPs) should establish the exact composition of the quartering party and its transportation, security, communications equipment, and specific duties.

Note. Some organizations use the term "advance party" interchangeably with the term "quartering party." However, units should primarily use the term "advance party" in the operational and strategic deployment process.

C-35. The *main body* is the principal part of a tactical command or formation. It does not include detached elements of the command, such as advance guards, flank guards, and covering forces (ADP 3-90). In the case of an AA or TAA, the main body is the rest of the organization that is not in the quartering party. Depending on the size of the organization, the main body may be broken down into several sub-organized serials to assist in security, dispersion, and movement control.

ASSEMBLY AREA METHODS

C-36. Three methods exist to organize an AA. Method 1 (single) essentially configures a unit in a perimeter defense, with maneuver units deployed along the entire perimeter and oriented outwards while C2 facilities, the headquarters and headquarters company (HHC), and most sustainment assets are located near the center of the AA (see figure C-1 on page 200 for an example of method 1).

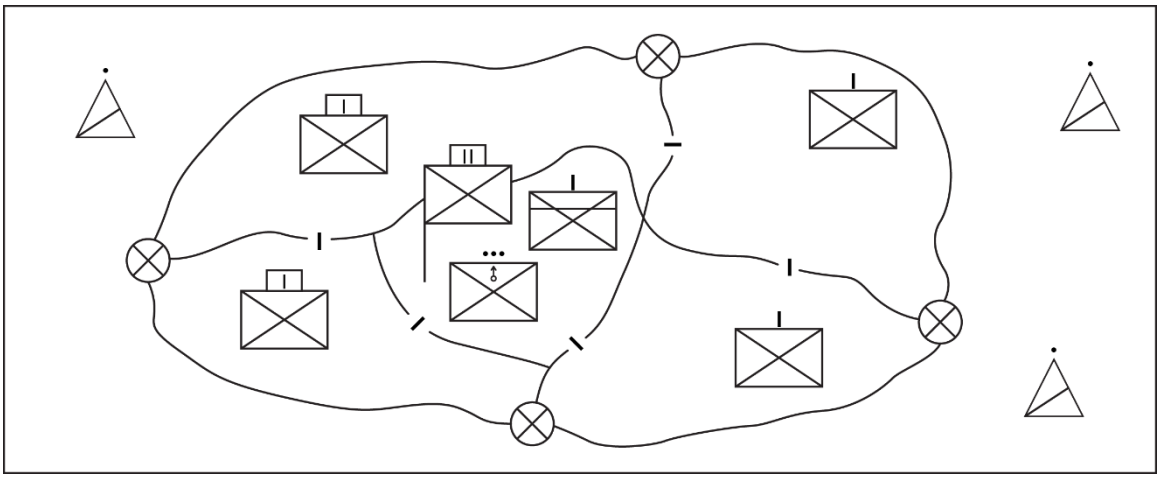


Figure C-1. Example single AA

C-37. In method 2 (as part of a larger AA), the unit may occupy a portion of the perimeter of a higher headquarter's AA. Maneuver units are oriented only on the outward edge of the perimeter and potential avenues of approach. C2 facilities, HHC, and most sustainment assets are located away from the perimeter. Depending on the tactical situation and width of the area assigned, the unit may maintain a reserve (see figure C-2 for an example of method 2).

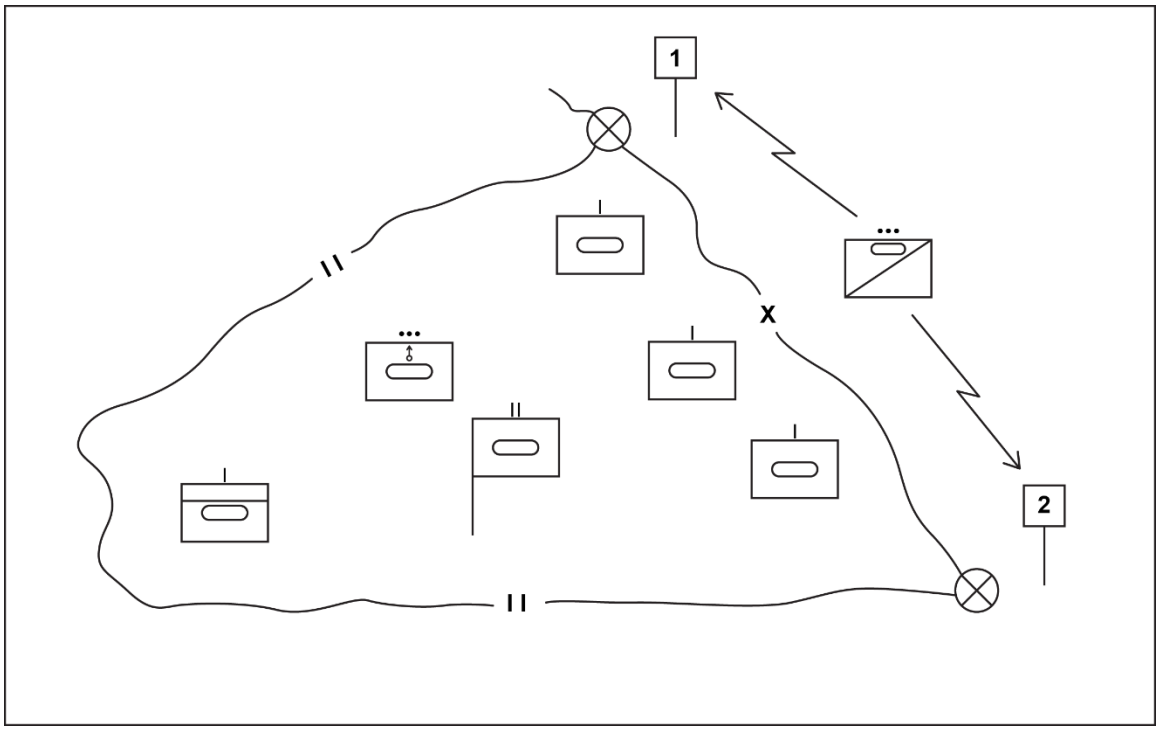


Figure C-2. Example as part of a larger AA

C-38. In method 3 (dispersed), the unit may assign individual AAs to subordinate units. Subordinate units maintain their own 360-degree security. The unit C2 facilities, HHC, and the bulk of sustainment assets occupy positions central to the outlying maneuver units and provide their own security. Subordinate units

secure areas between them through visual and electromagnetic surveillance or patrols (see figure C-3 for an example of method 3).

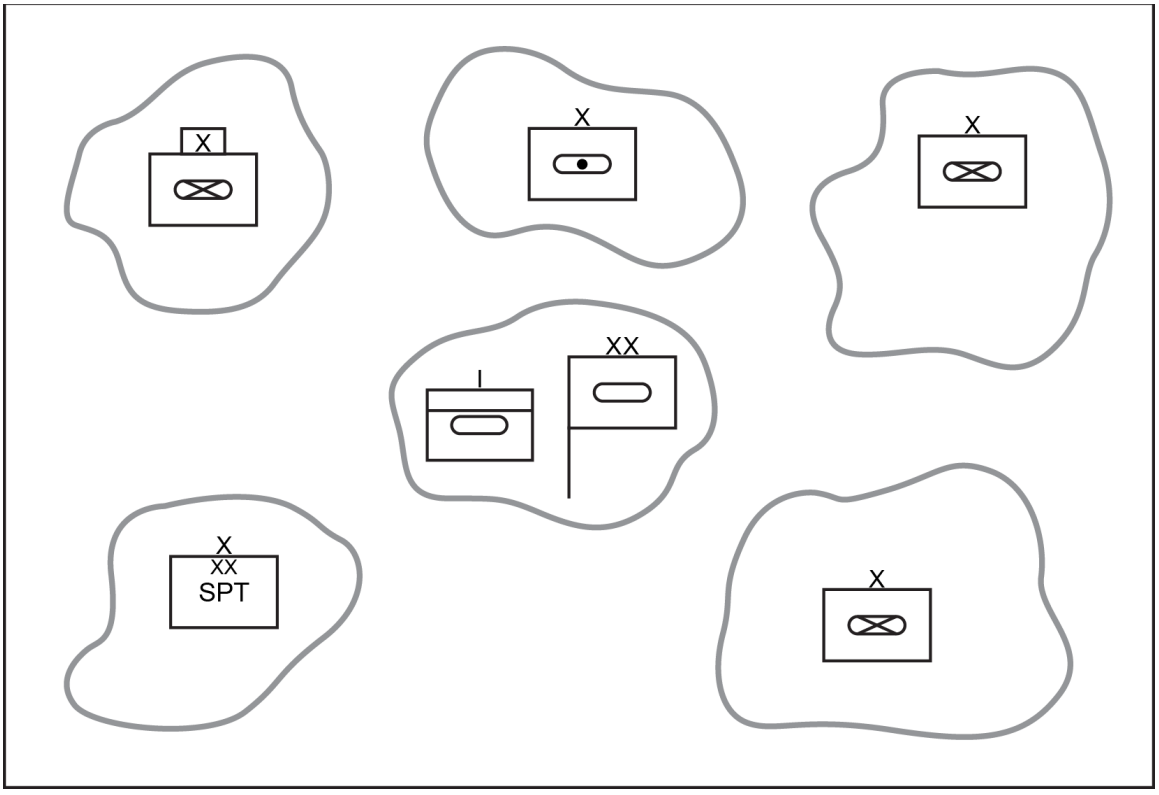


Figure C-3. Example dispersed AA

Note. A brigade support area (BSA) is a special case assembly area. If a brigade support battalion (BSB) incorporates subordinate battalion field trains, then these units together form a BSA. The BSA must be located to the rear of the supported battalions. This positioning prevents the extensive traffic in and out of the BSA from interfering with battalion AA activities. This also allows the battalions to move forward and deploy without having to maneuver through or around the BSA. The location of the BSA in relation to supported battalions depends on the threat, mission of the brigade, proximity to division/corps main supply routes, and the ability of the BSA to support the battalions given the distance between them.

PLANNING AN ASSEMBLY AREA

C-39. A planner or operations officer determines the location, method, and tentative subunit locations based on terrain, enemy situation, and ease of use. Table D-18 on page 227 provides minimum planning factors to assist in allocating assembly areas. Special attention must be paid to the present locations and condition of units, which may influence their order of march to the AA, and to anticipated future unit missions, which influence their placement within the new AA. The ability of a unit to move from the new AA and execute its assigned or anticipated future mission is the overriding consideration in planning. Certain subordinate units may have to meet specific positioning requirements, such as being close to water for decontamination. Once an AA is designated, a planner or operations officer then plan routes from where units are currently located to the AA.

C-40. The planner or operations officer also help develop the ground combat contingency plans for the unit based on the intelligence section's estimate of the likelihood of significant enemy contact in the AA. Contingency plans for subordinate units forced out of the AA typically include fire support and alternate AAs or a rally point. The defense of vital, difficult-to-replace sustainment assets receives special attention.

C-41. Commanders decide if they wish to conduct a personal reconnaissance of the AA prior to the unit's occupation. A personal reconnaissance is clearly superior to map reconnaissance. However, based on an estimate of the situation, the commander may choose to allow the quartering party and the subordinate units' quartering/reconnaissance parties to execute this reconnaissance and unit positioning.

Note. Terrain matters. An AA in a forest has different considerations than an AA in a desert.

C-42. The intelligence section, along with the geospatial engineer team, works with the planner or operations officer to identify places in the AA where mobility may be poor due to drainage, vegetation, or slope and where concealment is very good or poor. The intelligence section also determines the characteristics and likelihood of the air and ground threat to the quartering party and main body during its movement to, and occupation of, the AA.

C-43. The quartering party OIC coordinates with the planner or operations officer to determine—

- The mission of the quartering party.
- Whether or not the quartering party remains in the AA to await the remainder of the units or returns to lead the unit into position.
- The route the quartering party will use.

C-44. The quartering party NCOIC coordinates to ensure that all personnel moving in the quartering party—

- Are identified and alerted.
- Begin preparations for movement.
- Focus on actions of the quartering party and not current operations.
- Have the necessary supplies.

C-45. Depending on the likelihood of enemy attack, the quartering party, for security, may move with a subunit quartering party, a higher headquarter’s quartering party, or reconnaissance units. Ideally, the quartering party executes a route reconnaissance and a time-distance check and move along the main body's designated routes.

C-46. For the main body, unit leaders—

- Plan for all non-quartering party elements in their movement.
- Determine serial composition and leadership.
- Coordinate with the quartering party to obtain updates to the route and AA.

C-47. The fire support officer/fire support element (FSO/FSE) coordinates with units whose areas the element will move through or whose areas encompass the new AA to obtain their existing artillery target lists.

C-48. The logistics officer coordinates with the planner or operations officer and recommends locations for the sustainment units. Once planners identify the main CP location, the HHC commander plans the occupation of the HHC support elements after the main CP location.

C-49. The quartering party NCOIC determines the support required for the quartering party. The NCOIC's estimation of necessary supplies and equipment covers the entire quartering party, including accompanying staff section representatives and sustainment assets required. Movements during limited visibility may require the NCOIC to obtain additional night-vision devices or chemical light sticks. If the quartering party will travel over extended distances or if sustainment support is difficult to obtain through nearby units, other sustainment assets such as fuel, maintenance, or medical support may accompany the quartering party.

C-50. Unit leadership ensures the main body has the required sustainment assets for their movement. The sustainment assets needed are the same as the quartering party.

C-51. Engineer support for the quartering party or main body is not normally required since the quartering party and main body generally move through a known and secure area, and other units usually need these scarce engineer support assets. Air defense units may move with the quartering party enroute to the new AA, or already in place air defense units provide air defense coverage.

PREPARING AN ASSEMBLY AREA

C-52. The quartering party assembles at a time and place directed by the OIC. The OIC posts graphics concerning the route, location and identity of friendly units, and the tentative occupation plan for the AA.

C-53. The main body prepares to occupy the AA by ensuring that each subordinate unit understands where to position itself in the AA, what security tasks the unit is responsible for in the AA, and how it is to move to the AA.

C-54. After the quartering party OIC has completed planning, the OIC assembles the quartering party to brief the plan. This briefing should follow the standard five-paragraph order format. The briefing should emphasize—

- Actions of the quartering party in the assembly area.
- Actions on contact.
- Actions to take if separated from the quartering party.
- Actions at halts.
- Medical evacuation procedures.
- Actions at critical areas.
- Contingency plans.
- Methods to request and receive sustainment.

C-55. The OIC may require backbriefs from quartering party element leaders and may execute rehearsals of key actions before starting movement. Rehearsals are vitally important when the threat level is high and elements in the quartering party have no habitual association or functioning SOP. The OIC may conduct brief, informal precombat inspections (PCI) of the quartering party. PCI checks should emphasize vehicle and radio preventive maintenance and services, weapons and ammunition status, communications ability, graphics, understanding of the plan, and signals information.

C-56. When briefing the main body, unit leadership follows the same briefing format the quartering party used along with the additional topic of updates from the quartering party.

C-57. Having determined the support requirements of the quartering party during the planning phase, the NCOIC takes all actions necessary to obtain the support needed to accomplish the mission. Most quartering party personnel come with a supporting vehicle. If too many members arrive without transportation, the NCOIC needs to coordinate for additional vehicles. The NCOIC ensures that all vehicles are prepared for movement including full fuel tanks, maps, radios (if so equipped), ammunition, and water. One or more quartering party vehicles should carry vehicle tow bars. If different types of vehicles are in the convoy, a means of recovery for each vehicle type is needed. For sustainment obtained through other sustainment units on an area support basis, the NCOIC coordinates estimated fuel and resupply requirements with the logistics officer. This coordination includes where and when support is required. Usually, the quartering party carries both needed and extra fuel and supplies which they can then use to establish refuel on the move (ROM) locations that both the quartering party and the main body use.

C-58. Unit leadership for the main body ensures that a means of recovery for each type of vehicle and the appropriate amount of sustainment are available for the duration of the movement. Leaders should not leave anything behind when they move the main body; therefore, they must accomplish proper manning of all vehicles and equipment and an accounting of all equipment and personnel.

Note. If the BSB incorporates the subordinate unit field trains to form the BSA, the BSB commander may coordinate a rehearsal with sustainment representatives to review this portion of the operation.

EXECUTING AN ASSEMBLY AREA

C-59. Units occupy AAs via the occupation actions of their subordinate units and the positioning of headquarters, sustainment, and C2 assets. Units position themselves in AAs in accordance with their parent unit's tentative plan and any coordinated changes. The quartering parties typically guide their units into position. Units must accomplish occupation procedures smoothly, without halting or bunching of units at the RP.

C-60. The quartering party moves to the AA, generally along one route. If the quartering party moves along the same route that the main body will use, the quartering party executes a route reconnaissance during movement. If the results reveal that the route is impassable, the quartering party reports this immediately, and then seeks a bypass. Once a bypass is located, the quartering party reports the bypass, and the marking method for the bypass, to the main body. If required, the quartering party also executes a simultaneous time-distance check.

C-61. After arriving at the AA, the quartering party moves to the general location selected for it during the map reconnaissance, clears and secures the location, and seeks covered and concealed positions. Reconnaissance of proposed locations by the OICs or other quartering party subunits may reveal that the area is unsuitable for occupation. In that case, the quartering party OIC and NCOIC attempt to adjust unit locations within the area assigned by higher headquarters. If such adjustments do not correct the problem, the OIC immediately notifies the unit commander. Pending the commander's decision regarding occupation of the present AA or coordinating for a new one, the quartering party's actions continue. If the quartering party stays in the AA awaiting the main body, guides move on order to a preselected checkpoint or RP to await main body serials. Otherwise, the quartering party moves back to rejoin the main body and lead them back to the new AA.

C-62. Once enough time has elapsed for the quartering party to ensure the route and AA are feasible, the main body begins movement to the AA following any bypasses or updates the quartering party provided. Once the main body arrives at the AA, guides meet their respective elements at or near the RP and take them to their positions. Vehicles move into the best cover and concealment in the area if their positions are not individually marked. Once their vehicles are in position, crewmembers conduct appropriate maintenance checks, establish local security, and camouflage vehicles, as necessary. Simultaneously, the CPs provide command and control for the conclusion of the unit's movement to, and occupation of, the AA.

C-63. During movement to the AA, the quartering party OIC is positioned to best control the quartering party and maintain communications with all subordinate elements. The NCOIC is usually in the last vehicle to ensure all disabled vehicles are recovered with none left behind. Once in the AA, the OIC and NCOIC establish themselves at a central location that all other members of the quartering party can easily identify until the main body arrives.

C-64. The portion of the quartering party responsible for the CP determines its exact locations. Ideally, this reconnaissance would include a communications check to fix the site precisely. Establishment of the main CP in the new AA should occur early in the occupation so subunit CPs can establish themselves and communicate with the main CP. Early establishment of the main CP also allows for timely initiation and continuation of tactical planning.

C-65. Attached sustainment assets generally conduct resupply and maintenance operations for the quartering party or main body at scheduled halts or in the new AA. The plan may have the quartering party resupplied when the main body arrives. In this case, the quartering party takes no action, and individual quartering party elements coordinate their own resupply through their regular supply channels after closure of the main body. Maintenance recovery of quartering party vehicles is usually through recovery by like vehicles using tow bars. The quartering party may include dedicated recovery assets.

C-66. Because subordinate units in an AA concentrate on maintenance and replenishment tasks that are too difficult or time-consuming to perform during combat operations, the initial demand for sustainment will be quite high. Sustainment elements must anticipate this and balance priorities of work for establishing security and wire communications, installing camouflage netting (or similar actions), and resupplying units at the AA.

ACTIONS IN THE ASSEMBLY AREA

C-67. Preparing the unit for future operations is the focus of all actions in the AA. Actions most commonly associated with AA activities include—

- Establish and maintain security.
- Conduct resupply, refueling, and rearming operations.
- Conduct dismounted security patrols to clear dead space and restrictive terrain.
- Conduct precombat checks and a precombat inspection.
- Conduct rehearsals and other training for upcoming operations.
- Adjust task organization as necessary.
- Develop a defensive fire plan.
- Perform maintenance on vehicles and communications equipment.
- Account for personnel, including attachments.
- Conduct personal care and hygiene activities.

C-68. Maintenance activities concentrate on deadline faults and faults that degrade the equipment's ability to shoot, move, and communicate. Maintenance personnel, when short on time, employ critical repair and battle damage assessment and repair techniques. Sustainers conduct resupply actions to replenish items used in previous operations, assemble stocks for future operations, and replace damaged or contaminated supplies as required.

C-69. Planning and preparing for future operations occurs simultaneously with maintenance and administrative activities. Planning includes developing and issuing combat orders and coordinating with higher, lower, and adjacent units. Preparing includes backbriefs and rehearsals. Preparing in a non-tactical AA may also include individual or small unit training, weapons zeroing, and calibration. Training is required if the unit is issued new or modified equipment while in the AA. If the unit is introducing large numbers of replacement personnel, small unit training will be necessary. This is especially true when replacing significant numbers of key leaders. Such training will probably center on mastering drills and SOPs used by the unit. If the unit has recently left combat, after action reviews (AARs) are conducted to verify or refine unit SOPs. AARs may also capture, record, and disseminate hard-learned combat lessons in an effort to institutionalize successful techniques throughout the command.

DEPARTURE FROM THE ASSEMBLY AREA

C-70. Anticipated future unit missions provide the basis of planning considerations for occupying the assembly area. Planners position units in the AA so they can depart the AA enroute to their tactical missions without countermarching or moving through another unit. Sometimes, the future employment of subunits is unknown when planning the occupation of the AA. In this case, units may be poorly positioned to lead the parent unit to the start point (SP). Rather than sending this unit through other formations or allowing it to maneuver at its own discretion to the SP, the higher headquarters assigns the unit a separate route to the SP that takes it away from and around other units.

C-71. Units departing the AA must hit the SP at the correct interval and speed. To achieve this, planners should place the SP sufficiently far from the AA to allow units to maneuver out of their positions and configure themselves for the movement prior to reaching the SP. Leaders establish correct march order, interval, and speed enroute to the SP because units that line up in preparation for movement often block the maneuver of other units. The SP for a battalion movement should be 2 to 3 kilometers (km) from the AA to permit companies to attain proper speed and interval before crossing it. Ideally, the lead march unit can visually identify the SP from the AA. Moreover, with only one unit moving at a time, the chance of units intermingling and becoming lost and confused is near zero.

RELIEF IN PLACE

C-72. A *relief in place* is an operation in which, by direction of higher authority, all or part of a unit is replaced in an area by the incoming unit and the responsibilities of the replaced elements for the mission and the assigned zone of operations are transferred to the incoming unit (JP 3-07.3). Commanders conduct a relief in place (RIP) as part of a larger operation, primarily to maintain the combat effectiveness of committed units. The higher echelon headquarters directs when and where to conduct a RIP and it establishes the appropriate control measures. Normally, during the conduct of large-scale combat operations, the unit being relieved (the outgoing unit) is defending. However, a relief may set the stage for resuming offensive operations, introducing a new unit into combat, or freeing the relieved unit for other tasks, such as decontamination, reconstitution, routine rest, resupply, maintenance, specialized training, or redeployment. Units normally are relieved at night or during periods of limited visibility.

C-73. Three techniques for conducting a RIP are sequentially, staggered, or simultaneously:

- A **sequential** relief occurs when each element in the relieved unit is relieved in succession, from one flank to the other, front to rear, rear to front, or center outwards.
- A **staggered** relief occurs when the commander relieves each element in a sequence determined by the tactical situation, not its geographical orientation. The enemy situation and the proximity of each battle position to the enemy determine the procedure. Generally, if the enemy is likely to attack, those areas unlikely to receive the majority of contact will be relieved first. In this way, the main defensive positions remain strong, crewed by Soldiers who know the terrain and the defensive plan.
- A **simultaneous** relief occurs when all elements are relieved at the same time. It takes the least time to execute, but is more easily detected by the enemy.

PLANNING A RELIEF IN PLACE

C-74. Upon receipt of the order to conduct a RIP, the following events should occur:

- The incoming unit commander and staff coordinate in person with the outgoing unit commander and staff at their CP.
- If required, the incoming unit moves to an assembly area to the rear of the outgoing unit.
- The incoming unit's commander and staff, after coordinating with the outgoing unit, complete their command and staff actions at the CP of the outgoing unit. If time is available and the situation permits, incoming unit leaders can conduct a reconnaissance at this time. The incoming unit commander then issues orders.
- Upon completion of the order, the incoming unit command group collocates their CP with the outgoing CP. The incoming unit moves subordinate units from assembly areas to positions, as prescribed in the order.

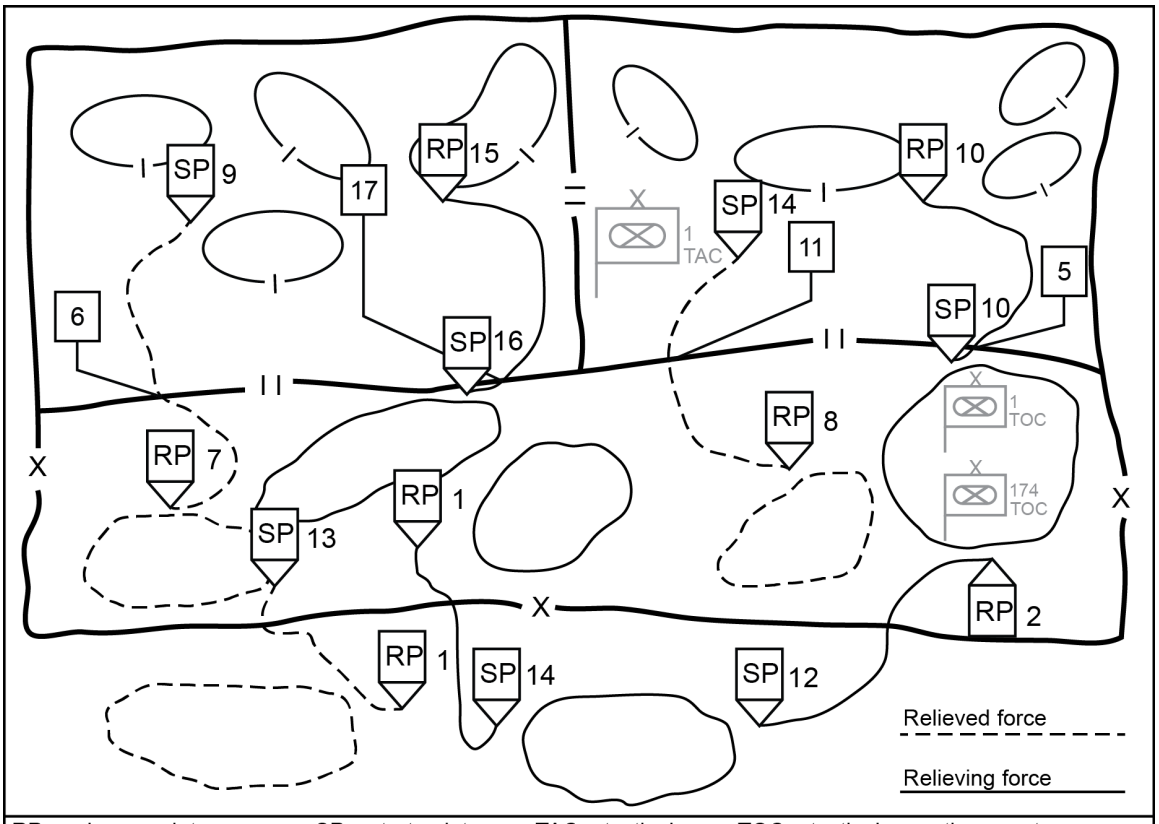
C-75. The two units conducting RIP must agree on procedures for accomplishing the following items:

- Sequence and technique of relief (if not specified by the headquarters ordering the relief). Both commanders should consider the following when picking a sequence and technique:
  - Subsequent mission of the unit conducting the relief.
  - Strength and combat efficiency of the unit presently in the defensive area.
  - Capability of the enemy to detect and react against the relief.
  - Characteristics of the AO.
  - Need to vary the pattern of relief.
  - Size and type of elements involved in the relief.
- When to pass responsibility for the fight to the incoming unit.
- Reconnaissance.
- Security.
- Routes to use.
- Location of AAs.
- Integrated deception plan.

C-76. The outgoing unit transfers to the incoming unit all information and intelligence concerning the enemy and the AO. Close cooperation and coordination of plans are necessary between the commanders and subordinates of both the incoming and outgoing units. This normally requires their CPs to be collocated. The incoming unit must fit into and accept the general defense plan of the outgoing unit until RIP is complete. Non-maneuver units normally should not be relieved at the same time as the units they support and, ideally, are complete before maneuver units conduct their RIP. This provides an opportunity to establish operations in preparation for the outgoing unit's recovery.

C-77. In the simplest RIP, the incoming unit has the same equipment and organizational structure as the relieved unit. When possible, separate routes are planned for the incoming and outgoing units to avoid two-way traffic. The higher headquarter's order should designate the contact point where the two commanders meet (usually the outgoing commander's CP). If a contact point is not provided, the incoming commander should request a location from the outgoing commander. The higher headquarter's order, at a minimum, includes the time for commencing and completing the relief and priorities for use of the routes.

C-78. Control measures for relief in place are generally restrictive to prevent fratricide. At a minimum, these control measures include the AO with its associated boundaries, battle positions, contact points, start points, routes, release points, AAs, fire support coordination measures, and defensive direct fire control measures, such as target reference points and engagement areas (see figure C-4 for an example of control measures).



FM 3-90-2

Figure C-4. Example control measures for a relief in place

PREPARING A RELIEF IN PLACE

C-79. Normally, when minimum forces are employed on the forward line of troops (FLOT), the relief is conducted from rear to front. When maximum forces are employed on the FLOT, the relief is conducted from front to rear. In determining the sequence of relief, commanders should consider—

- Time available to accomplish the RIP.
- Enemy situation and the capability of the enemy to detect and react against the relief.
- Subsequent missions of outgoing and incoming units.
- Strength and condition of elements in the relief.
- Characteristics of the AO.
- Acceptable amount of concentrated forces.

C-80. Generally, simultaneous relief of all elements is the fastest option; however, it is also the least secure and most difficult to control. Sequential and staggered reliefs involve only one element at a time; therefore, they are the slowest, most secure, and easiest to control.

FORWARD PASSAGE OF LINES

C-81. A *forward passage of lines* occurs when a unit passes through another unit's positions while moving toward the enemy (ADP 3-90). Ideally, a passage of lines does not interfere with the stationary unit's operations. A commander conducts a forward passage of lines to sustain the tempo of an offensive operation or to free a unit, another mission, or task.

Planning a Forward Passage of Lines

C-82. One of the most critical aspects of a passage of lines is terrain management. Unoccupied areas by the stationary unit may represent possible locations to stage the passing unit. Passage lanes must take into account existing obstacles and, if the tactical plan requires the movement of forces in formation, some obstacles may have to be moved or prepared for demolition prior to the movement of the passing unit. Sustainment is an essential part and must occur as quickly as possible and, if possible, without incident. Sustainment assets should be positioned to support the passage where they can best keep the lane open and vehicles moving. The passing commander should collocate with the stationary unit commander to facilitate information exchange. The three options for collocating are the—

- Main CP for both units collocates together, which is best for information exchange but presents a lucrative target for indirect fires.
- Tactical CP or mobile CP for the passing unit collocates with the stationary unit's main CP. This option provides more flexibility to the passing unit with regard to C2 and presents a smaller target for the enemy.
- Passing unit sends a liaison officer to the stationary unit's main CP. This technique is least desirable and used only when the situation does not permit the first two options. This generally occurs because the terrain does not support the collocation of the passing unit's headquarters.

C-83. Just like a relief in place, control measures for a forward passage of lines are generally restrictive to prevent fratricide. Close coordination between the passing and stationary units is crucial to successfully executing the forward passage and subsequent transfer of responsibility. The moving unit's operations officer will prepare a tentative plan within the parameters established by the commander. The operations officer will also examine the location of the contact points to determine whether or not they are compatible with the scheme of maneuver. Once the contact points have been finalized, the moving unit's operations officer coordinates with the stationary force's operations officer to negotiate the location of the passage lanes. Operations officers must remember that the physical characteristics and number of the passage lanes will determine the speed and disposition of the passing force as it crosses the line of departure (LD). Therefore, when conducting a forward passage in preparation for a deliberate attack, it may be important to create passage lanes with sufficient width to allow the passing force to move in a tactical formation appropriate to the operation, such as company columns or a platoon wedge. Figure C-5 shows example graphic control measures used in a forward passage of lines.

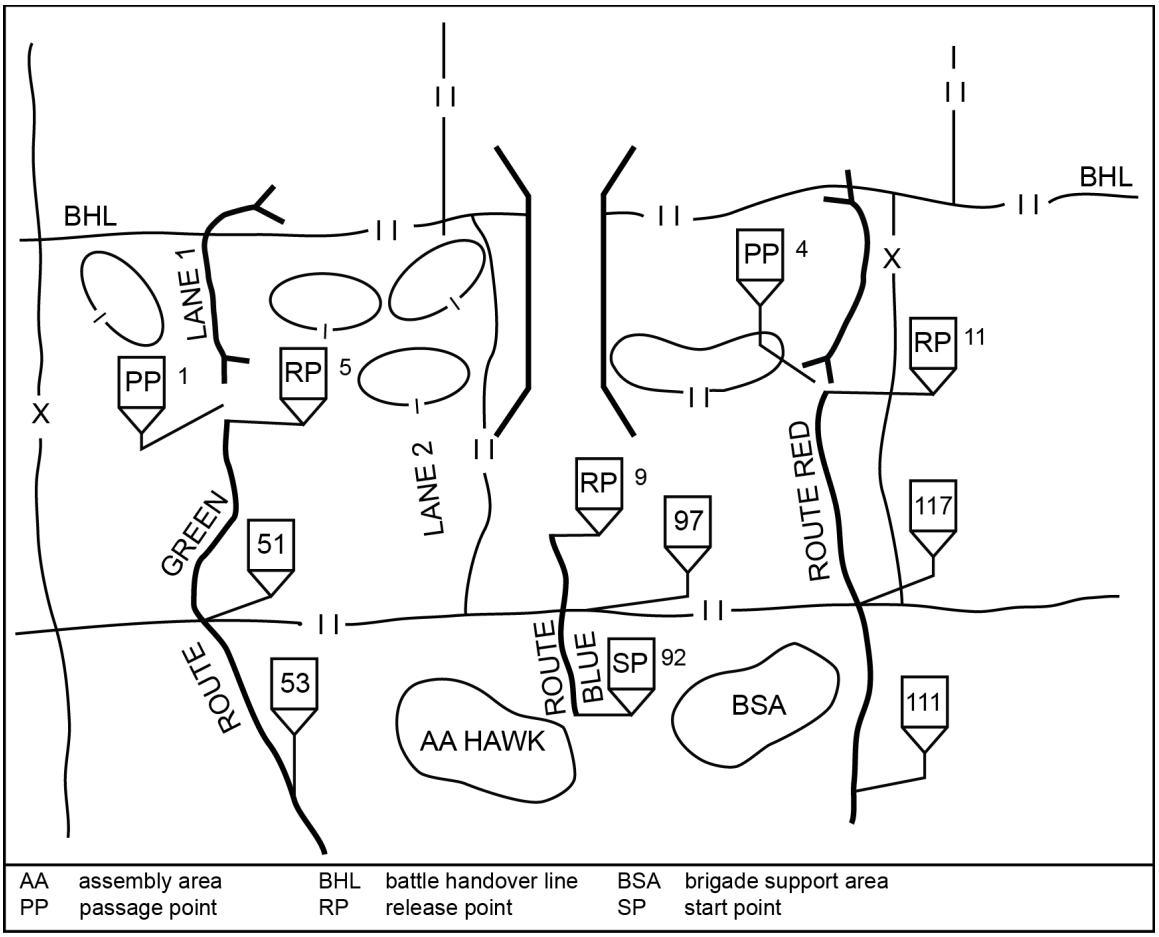


Figure C-5. Example control measures for a forward passage of lines

Preparing a Forward Passage of Lines

C-84. If time allows, the passing unit conducts reconnaissance from its current location to its designated AAs, which are generally located to the rear of the stationary unit. After completing reconnaissance, the passing unit occupies these AAs. The commander organizes the passing force for its subsequent mission before initiating the forward passage of lines. The passing force avoids regrouping in forward AAs or attack positions.

C-85. If time permits, the unit conducts a rehearsal. Generally, a forward passage of lines is incorporated into the combined arms rehearsal. If time does not allow for a rehearsal, subordinate commanders can backbrief their concept of the passage of lines as a mitigation measure.

C-86. The moving unit establishes their CPs where they can best control the operation and share information with the passing unit.

Executing a Forward Passage of Lines

C-87. When the passing force moves forward, it moves without a halt through the stationary unit while deployed in a combat formation. This minimizes the time the two forces are concentrated, making them less vulnerable to enemy attack. If the passage occurs slower than planned, the higher headquarters issues fragmentary orders to the units waiting to pass, pushing back their time of execution and keeping them in the AA until it is their time to move, rather than having them move to a contact point and wait in line.

C-88. Key events during the forward passage of lines are—

- Stationary support ends when the combat element of the passing unit—including the reserve—moves beyond direct fire range.
- Passing unit's reconnaissance assets screen forward of release points.
- Stationary unit provides security operations along passage lines.
- Passing unit moves from AA to attack positions.
- Stationary unit clears obstacles from contact point to passage points.
- Higher headquarters ideally controls the passage as two parallel chains of command are operating simultaneously in one AO and increased risk of friction exists.
- Passing unit assumes responsibility for conducting operations beyond the battle handover line (BHL) once the attack begins.
- Passing unit assumes full responsibility for sustainment forward of the BHL.

C-89. The stationary unit furnishes the passing unit with any previously coordinated or emergency logistics assistance within its capabilities. These typically include—

- Evacuating casualties and enemy prisoners of war.
- Controlling dislocated civilians.
- Using areas and facilities such as water points and medical facilities.
- Controlling routes and traffic management.
- Recovering disabled vehicles and equipment.

REARWARD PASSAGE OF LINES

C-90. A *rearward passage of lines* occurs when a unit passes through another unit's positions while moving away from the enemy (ADP 3-90). A rearward passage of lines is similar in concept to a forward passage of lines. It continues the defense or retrograde operation while allowing for recovery of security or other forward forces. This operation may or may not be conducted under enemy pressure.

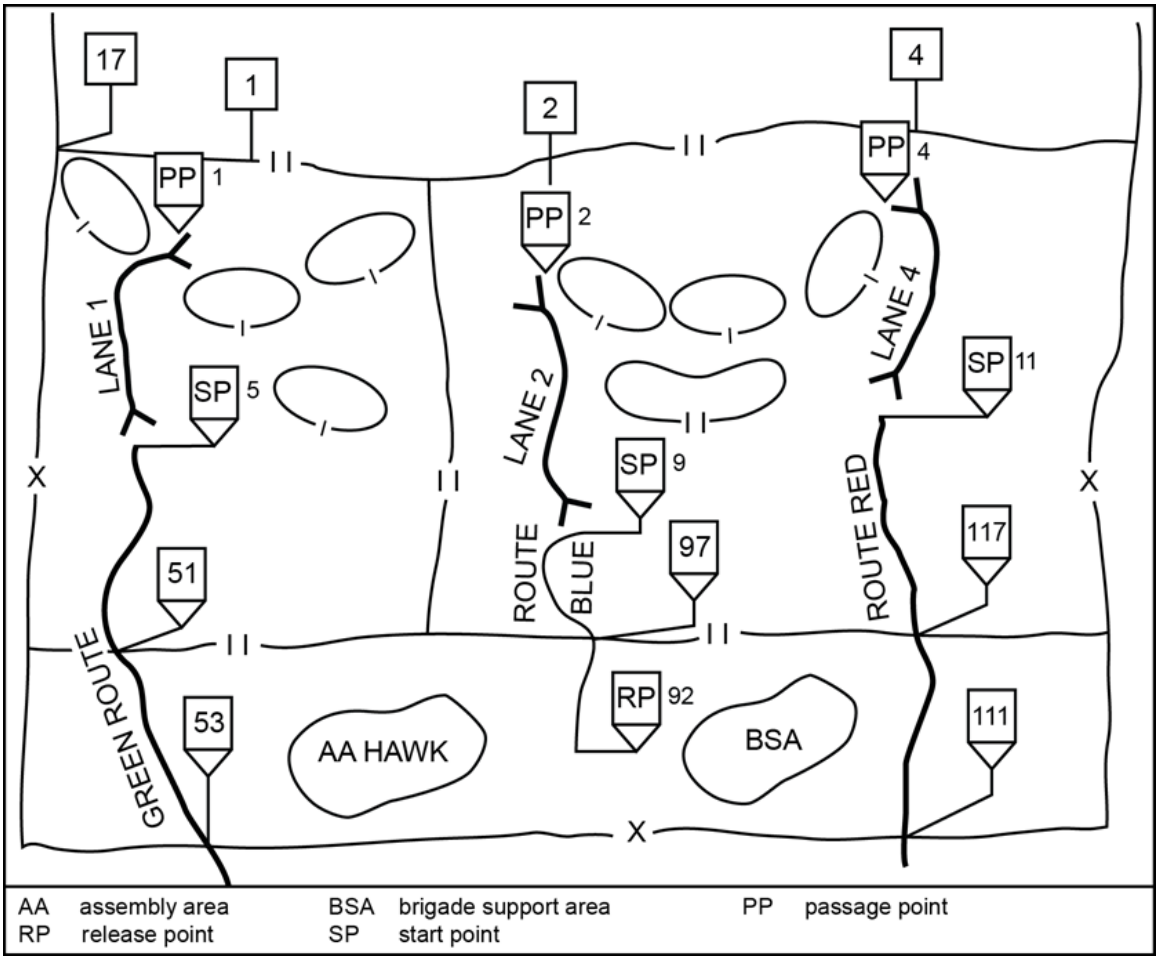
C-91. A rearward passage of lines is likely to be more difficult than a forward passage because of the following:

- The enemy probably has the initiative, which tends to reduce the time available to conduct liaison and reconnaissance and make detailed plans.
- If the rearward moving force has been in action, its Soldiers are tired and possibly disorganized.
- The enemy may be applying pressure on the passing force.
- Friendly forces may be more difficult to recognize because enemy forces may be intermixed with them.

Planning a Rearward Passage of Lines

C-92. The required support agencies and a tentative location for the unit's trains should be established as quickly as possible. The sustainment assets of the stationary unit should be used to free up some of the passing force's support operations in depth.

C-93. Close coordination between the passing and stationary units is crucial to successfully executing the rearward passage and subsequent transfer of responsibility. This is even more critical when the tactical situation results in a staggered or incremental rearward passage across an AO. The passing commander relinquishes control of subordinate elements remaining in contact at the time of the transfer of responsibility to the stationary commander. Generally, the stationary unit assumes control of the AO forward of the BHL after two-thirds of the passing force's combat elements move through the passage points. Figure C-6 shows example graphic control measures used in a rearward passage of lines.



FM 3-90-2

Figure C-6. Example graphic control measures for a rearward passage of lines

Preparing a Rearward Passage of Lines

C-94. As discussed with a forward passage of lines, the passing unit uses one of three options to collocate as part of the preparations for the rearward passage.

C-95. Due to enemy contact, the passing unit may not have time to conduct a rehearsal of a rearward passage of lines. Commanders can mitigate a lack of rehearsal by having subordinate commanders brief their concept of the passage of lines during the order backbrief.

Executing a Rearward Passage of Lines

C-96. The passing unit maintains command of its subordinate elements throughout the retrograde and rearward passage. The normal order of march in a rearward passage of lines is sustainment elements, main CP, enablers, tactical CP, and maneuver units. The passing unit's CP passes through the lines as soon as possible after the lead elements complete their passage. When responsibility transfers, the stationary unit assumes defense of the AO. Key events during the rearward passage are—

- Stationary unit provides to the passing unit as much assistance as possible, such as indirect fire support, sustainment, and direct fire support. Indirect fire assets answer the passing unit's call for fires until battle handoff is complete.
- Stationary unit ensures passage lanes are through obstacles and around stationary unit's defensive positions.

- Stationary units close passage lanes once the passing unit and stationary unit's security element disengage and withdraw through the security area and obstacles.
- Stationary unit moves sustainment assets as far forward as possible, focusing on medical, recovery, and fuel to enable the passing unit to rapidly move through the stationary unit's defensive positions.

LINKUP OPERATIONS

C-97. This section is derived from ADP 3-90 and FM 3-90-2.

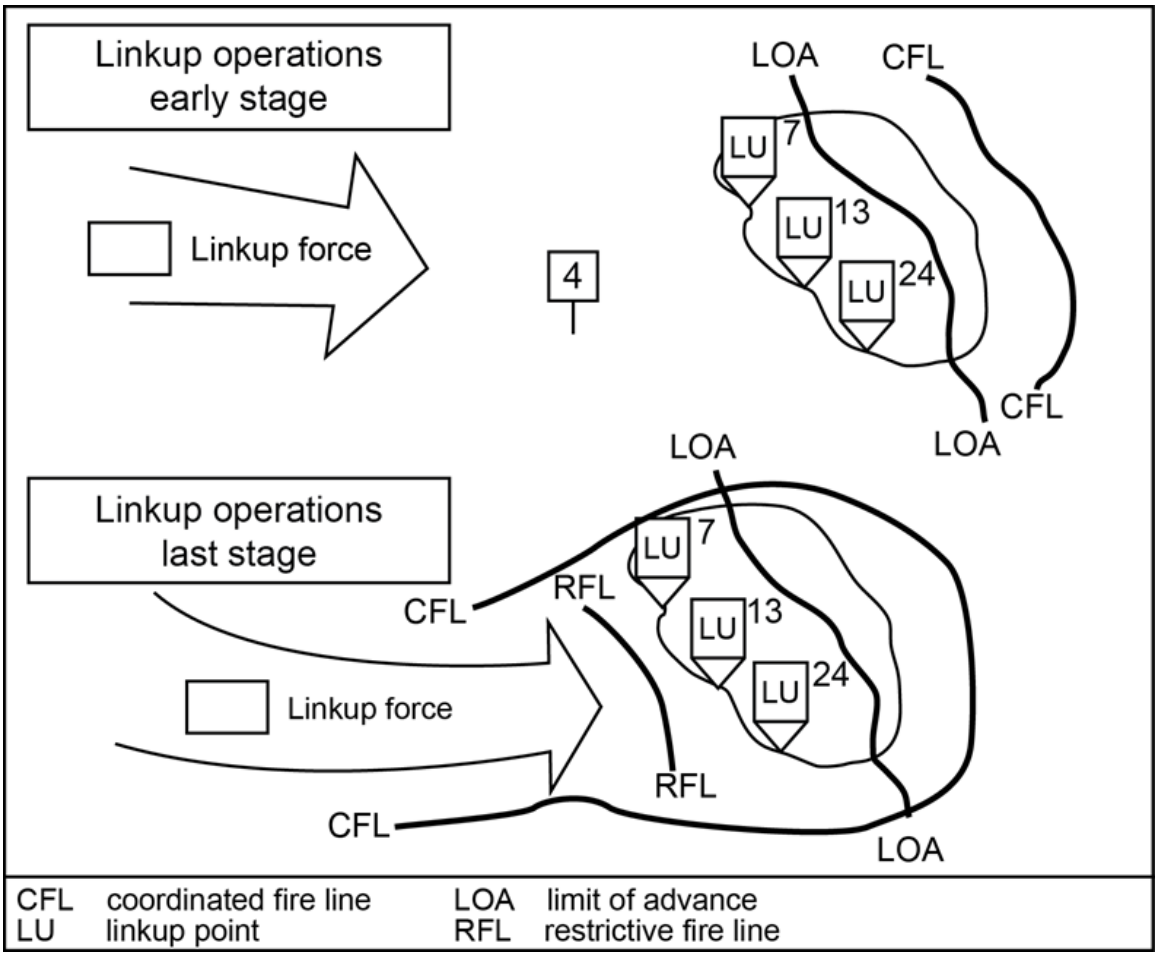
C-98. A *linkup* is a meeting of friendly ground forces, which occurs in a variety of circumstances (ADP 3-90). Examples are an advancing force reaching an objective area previously seized by an airborne or air assault, an encircled element breaking out to rejoin friendly forces, a force coming to the relief of an encircled force, and a meeting of converging maneuver forces. Whenever possible, joining forces exchange as much information as possible before starting a linkup operation.

C-99. The linkup is a complex operation requiring detailed planning and coordinating as far in advance as possible. The two forces carefully define and coordinate their schemes of maneuver with attention given to graphic control measures, communications, and each force's subsequent mission after linkup operations are complete. Alternate linkup points are planned and lend flexibility to the overall operation.

C-100. The first of two existing linkup methods is the **linkup of a moving force with a stationary force.** Under these circumstances, the moving force usually has linkup points near a restrictive firing line (RFL) or limit of advance (LOA), which is near the stationary forces security elements. The second linkup method occurs when **both forces are moving.** This is usually an indicator of a fluid operation, which requires detailed coordination and effective communication to avoid fratricide.

C-101. To ensure friendly forces join without engaging one another, the commander of the linkup force designates linkup points. These linkup points are at locations where the axis of advance of the linkup force intersects the security elements of the stationary force. These points must be readily recognizable to both forces and should be posted on both digital overlays and conventional maps in case of digital communications loss. Alternate points are chosen so the units are prepared in case enemy activities cause linkups at places other than those planned. The number of linkup points selected depends on the terrain and number of routes used by the linkup force.

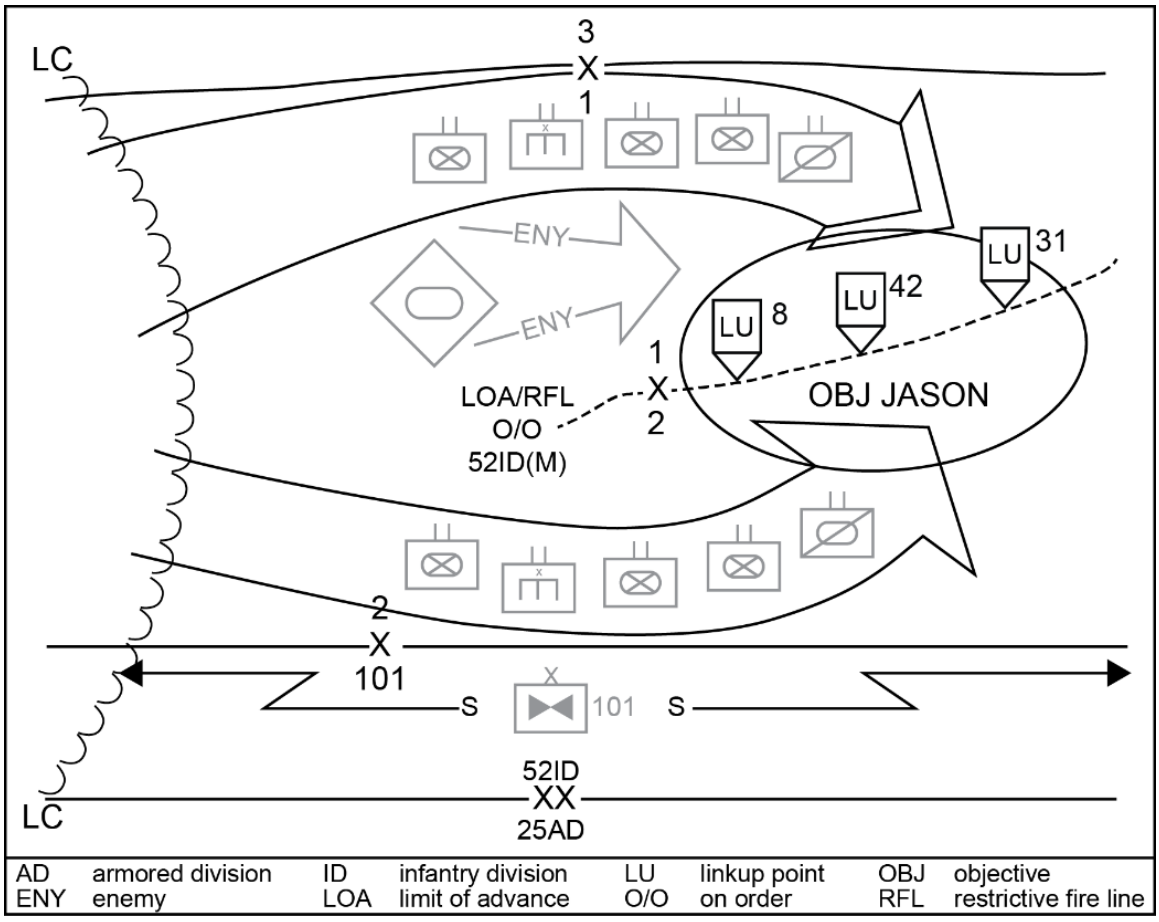
C-102. To facilitate a rapid passage of lines and to avoid inadvertent engagement of friendly forces, personnel in the linkup force must be thoroughly familiar with recognition signals and plans. As required, stationary forces assist in the linkup by opening lanes in minefields, breaching or removing selected obstacles, furnishing guides, providing routes with checkpoints, and designating assembly areas. Figure C-7 shows graphic control measures for a moving linkup force with a stationary force.



FM 3-90-2

Figure C-7. Example graphic control measures for a moving linkup force with a stationary force

C-103. Linkup between two moving units is one of the most difficult operations. It is usually conducted to complete the encirclement of an enemy force. Primary and alternate linkup points for two moving forces are established on boundaries where the two forces are expected to converge. As the linking units move closer, positive control is coordinated to avoid fratricide and ensure the enemy does not escape between the two forces. Lead elements of each unit should monitor a common radio net. Figure C-8 on page 214 shows example graphic control measures of a linkup with both units moving.



FM 3-90-2

Figure C-8. Example graphic control measures for a linkup with both units moving

PLANNING A LINKUP

C-104. The headquarters ordering the linkup establishes—

- A common operational picture (COP) using available command and control systems.
- The command and support relationship and responsibilities of each unit before, during, and after the linkup.
- Fire support coordination measures.
- Recognition signals and communication procedures.
- Operations to conduct following the linkup.

C-105. Both the linkup force and the stationary force should remain under the control of the directing headquarters. Operational plans must prescribe the primary and alternate day and night identification and recognition procedures, vehicle systems, and manmade materials used to identify friend from enemy.

C-106. The fire support coordination line (FSCL) is adjusted as one force moves toward the other. An RFL is established between the two units, usually at the point where the two units plan to establish contact.

C-107. In conducting a linkup with airborne or air assault units, priority for sustainment by air is given to units assaulting the objective area. Supplies for the linkup forces normally move by land. If the objective area is to be defended jointly by the linkup and airborne or air assault unit, supplies for the linkup force may be flown into the objective area and stockpiled.

PREPARING A LINKUP

C-108. Time may be limited to conduct rehearsals for a linkup. Ideally, in the combined arms rehearsal (CAR), the commander highlights the coordination required to affect the linkup without confusion. The commander also should remind subordinate commanders that the linkup is an enabling activity enroute to a further objective. If unable to conduct a rehearsal, the commander conducts a backbrief with his subordinate commanders and attempts to walk them through the operation.

EXECUTING A LINKUP

C-109. The initial conduct of a linkup is identical to a movement to contact or deliberate attack, depending on the enemy situation. When both units are moving, each monitors the progress of the other and makes adjustments to the plan as necessary. For example if unit A is unable to travel at the speed described in the plan, and unit B is moving faster, the location of the linkup point my move closer to unit A. The same reasoning should be applied to other control measures, such as the FSCL and RFL.

C-110. The linkup unit must not only be prepared to fight for the immediate goal but also be prepared to sustain operations for the subsequent mission. When the linkup is made, the linkup force may join the stationary force or the linkup force may pass through or around to continue the attack. If the linkup force is to continue operations in conjunction with the stationary force, a single commander for the overall force should be designated. Plans for these operations must be made in advance. The linkup force may immediately pass through the perimeter of the stationary forces, be assigned objectives within the perimeter, or be assigned objectives outside the perimeter, depending on its mission.

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Appendix D

Movement and Maneuver Planning Factors

This appendix provides a variety of planning factors for the movement and maneuver warfighting function. It includes topics such as movement rates under a variety of conditions, aircraft planning factors, and assembly area planning factors.

MOVEMENT

D-1. Tables D-1 through D-10 on pages 217–222 show planning factors for movement and maneuver forces. Figure D-1 on page 223 shows friendly vehicle movement planning factors.

Table D-1. Unopposed movement planning speeds for U.S. forces

ATP 2-01.3

Maximum road speeds (day):	
M1/M2/M3 = 40 km/hr M113/M901 = 40 km/hr Wheeled vehicle on road = 35 km/hr	Wheeled vehicle off road = 10 km/hr Cross-country movement speed = 30 km/hr
Maximum road speeds (night):	
M1/M2/M3 = 30 km/hr M113/M901 = 30 km/hr Wheeled vehicle on road = 10 km/hr	Wheeled vehicle off road = 6 km/hr Cross-country movement speed = 18-20km/hr
Dismounted rate = 3 km/hr	

Table D-2. Unopposed movement rates

DTAC milSuite

Model	*Name*	*Cruising speed (mph)*	*Maximum speed (mph)*	*With load (mph)*
M1A2 SEP	Abrams	35	42	
M2A2/M3A2	Bradley IFV/CFV	40	45	
M88A2	Hercules	25	35	17
M1135	Stryker NCBRV	40	60	60
M109A6	Paladin How	35	40	
M113A2	APC	30	40	
M270	MLRS/ATACMS	35	40	
M977	HEMTT Cargo	50	62	50
M978	HEMTT Fuel	45	62	45
M998	HMMWV	50	65	
M1070	HET	40	45	25
M1078	LMTV	55	58	58
M1087	MTV	55	58	55
M1126	Stryker	40	60	60
MRAP III	Buffalo	45	55	
TBD	M-ATV	75		

Note. Use cruising speeds for on-road at zero to 10% slope, half of the cruising speed after 30%, and 2-5 mph at 60%.

Table D-3. Terrain types for mechanized or armored forces

ATP 2-01.3

Terrain type	Slope (%)	Streams			Vegetation			Typical speeds (unopposed) (km/hour)
		Depth (feet)	Current (feet/sec)	Width (feet)	Spacing (feet)	Trunk diameter (inches)	Roads/trails (per km)	
Unrestricted	<30	<2	-----	<5	>20	<2	24	24
Restricted	30 to 45	2 to 4	<5	<AVLB length	<20	2 to 6	12	16 (8 at night)
Severely restricted	>45	>4	>5	>AVLB length	<20	>6	0<2	1 (.4 at night)

AVLB armored vehicle-launched bridge

Table D-4. Factors of foot marches for typical dismounted units

ATP 2-01.3

Basic data table, foot marches				
Terrain	Visibility	Rate of march* (km/hr)	Normal march (8 hours) (km)	Forced march (12 hours)(km)
Roads	Day	4	32	48
	Night	3	24	36
Cross-country	Day	2	16	24
	Night	1	8	12

*Computed on a 50-minute hour, allowing for a 10-minute halt each hour.

Length of column*, factor table, foot marches		
Formation**	2 meters person distance	5 meter/person distance
Single file	2.4	5.4
Column of twos	1.2	2.7

*To determine the length of a column occupied by a dismounted unit, multiply the estimated or known number of personnel by the applicable factor.
**Foot marches vary with the tactical situation; normal formation is a column of twos with a file on either side of the road and staggered, much like U.S. forces. However, columns of threes and fours may be employed where conditions permit.

Pass time factors*, foot marches	
Rate (km/hr)	Factor
4	0.015
3	0.018
2	0.020
1	0.023

*To determine the pass time in minutes for a dismounted unit, multiply the length of the column by the appropriate factor for the estimated or known rate of march.

Table D-5. Brigade and below opposed rates of advance (km/hr)

Degree of resistance	***Prepared defense[2]***						***Hasty defense or delay[3]***					
Attacker:defender ratio[1]	Unrestricted terrain		Restricted terrain		Severely restricted		Unrestricted terrain		Restricted terrain		Severely restricted	
	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted
Intense Resistance 1:1[4]	.6	.5	.5	.3	.15	.1	1.0	.8	.8	.5	.4	.2
Very heavy 2:1[4]	.9	.6	.6	.4	.3	.2	1.5	1.0	1.0	.7	.6	.3
Heavy 3:1[5]	1.2	.7	.75	.5	.5	.3	2.0	1.2	1.3	.9	.8	.5
Medium 4:1	1.4	.8	1.0	.6	.5	.5	2.4	1.4	1.75	1.1	.9	.8
Light 5:1	1.5	.9	1.1	.7	.6	.5	2.6	1.6	2.0	1.2	1.0	.9
Negligible 6:1[6]	1.7+	1.0+	1.3+	.8+	.6+	.6+	3.0+	1.7+	2.3+	1.3+	1.1+	1.0

[1] The Relative Combat Power ratio must be computed for the unit under consideration. Rates are reduced by 12 at night.
[2] Prepared Defense is based on defender in positions prepared for a minimum of 24 hours.
[3] Hasty Defense is based on defender in positions prepared for less than 24 hours.
[4] Units cannot sustain these rates for 24 hours.
[5] Sustained rates of advance are not possible without a ratio of 3:1, except in very rare instances usually involving complete surprise.
[6] Rates of advance greater than 6:1 ratio are between this row and unopposed rates.
The following are the factors for tactical surprise:
–Complete Surprise rate from table above x5 (example: 1989 OPN Just Cause, 1973 Yom Kippur).
–Substantial Surprise rate from table above x3 (example: 1991 OPN Desert Storm, 1967 Israeli attack in Sinai).
–Minor Surprise rate from table above x1.3 (example: 1944 OPN Overlord).
–Effects of surprise reduce by 13 on day 2, by 23 on day 3 and do not apply on day 4.

Table D-6. Division opposed rates of advance (km/day)

Numbers, Predictions & War, Dupuy, T.N., 1979

Degree of resistance	***Prepared defense[2]***						***Hasty defense or delay[3]***					
	Unrestricted terrain		Restricted terrain		Severely restricted		Unrestricted terrain		Restricted terrain		Severely restricted	
Attacker : defender ratio[1]	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted	Mounted	Dismounted
Intense Resistance 1:1[4]	2	2	1	1	.6	.6	4	4	2	2	1.2	1.2
Very heavy 2:1[4]	5-6	4	2-3	2	1.5-1.8	1.2	10-12	8	5-6	4	31-3.6	2.4
Heavy 3:1[5]	7-8	5	3-4	2.5	1.2-2.3	1.5	13-16	10	8	5	3.9-14.8	3
Medium 4:1	8-10	6	4-5	2.3-3	2.7	1.8	16-20	12	10	6	4.8-6	3.6
Light 5:1	16-20	10	8-10	4.8-6	5.4	3	30-40	18	20	9	9-12	5.4
Negligible 6:1[6]	24-30	12	12-15	7.2-9	8.1	3.6	48-60	24	30	12	14.4-18	7.2

Notes.
[1]Rates are reduced by 12 at night.
[2]The relative combat power ratio must be computed for the unit under consideration.
[3]Prepared defense is based on defender prepared positions for a minimum of 24 hours.
[4]Hasty defense is based on defender preparing positions for less than 24 hours. Two numbers indicate hasty defense/delay factors
[5]Sustained rates of advance are not possible without a ratio of 3:1, except in very rare instances usually involving complete surprise.
[6]Rates of advance greater than 6:1 ratio are between this row and unopposed rates.
The following are the factors for tactical surprise:
–Complete surprise rate from table above x5 (example: 1989 OPN Just Cause, 1973 Yom Kippur).
–Substantial surprise rate from table above x3 (example: 1991 OPN Desert Storm, 1967 Israeli attack in Sinai).
–Minor surprise rate from table above x1.3 (example: 1944 OPN Overlord).
–Effects of surprise reduce by 13 on day 2, by 23 on day 3 and do not apply on day 4.

D-2. Tables D-7 and D-8 are useful in determining the amount of time required for a given march unit to pass a given point. For example, if a convoy has 20 vehicles traveling at 24 km/hr with an interval of 50 meters, the time needed is 3 minutes, 20 seconds. If a convoy has 26 vehicles, using the same parameters (24 km/hr and 50 meter interval), simply add the time needed for 6 vehicles (1 minute) to the required time for 20 vehicles (3 minutes, 20 seconds) for a total time of 4 minutes, 20 seconds.

Table D-7. Pass time table (single march unit)

# of vehicles in march unit	Pass Time (minutes and seconds)												# of vehicles in march unit
	16 kmh / 10 mph				24 kmh / 15 mph				32 kmh / 20 mph				
	Interval—meters				Interval—meters				Interval—meters				
	25	50	75	100	25	50	75	100	25	50	75	100	
	30 VPK	15 VPK	12 VPK	10 VPK	30 VPK	15 VPK	12 VPK	10 VPK	30 VPK	15 VPK	12 VPK	10 VPK	
1	:08	:15	:19	:23	:05	:11	:13	:15	:04	:08	:10	:12	1
2	:15	:30	:38	:45	:11	:20	:26	:30	:08	:15	:19	:23	2
3	:23	:45	:57	1:08	:15	:30	:38	:45	:12	:23	:29	:34	3
4	:30	1:00	1:15	1:30	:20	:41	:50	1:00	:15	:30	:38	:45	4
5	:38	1:15	1:34	1:53	:26	:50	1:03	1:15	:19	:38	:47	:57	5
6	:45	1:30	1:53	2:15	:30	1:00	1:15	1:30	:23	:45	:57	1:08	6
7	:53	1:45	2:12	2:38	:35	1:11	1:28	1:45	:26	:53	1:06	1:19	7
8	1:00	2:00	2:30	3:00	:41	1:20	1:41	2:00	:30	1:00	1:15	1:30	8
9	1:08	2:15	2:49	3:23	:45	1:30	1:53	2:15	:34	1:08	1:25	1:42	9
10	1:15	2:30	3:08	3:45	:50	1:41	2:05	2:30	:38	1:15	1:35	1:53	10
15	1:53	3:45	4:41	5:38	1:15	2:30	3:08	3:45	:57	1:53	2:21	2:49	15
20	2:30	5:00	6:15	7:30	1:41	3:20	4:11	5:00	1:15	2:30	3:08	3:45	20
25	3:08	6:15	7:49	9:23	2:05	4:11	5:13	6:15	1:34	3:06	3:55	4:42	25
30	3:45	7:30	9:23	11:15	2:30	5:00	6:15	7:30	1:53	3:45	4:42	5:38	30
40	5:00	10:00	12:30	15:00	3:20	6:41	8:20	10:00	2:30	5:00	6:15	7:30	40
50	6:15	12:30	15:38	18:45	4:11	8:20	10:26	12:30	3:08	6:15	7:49	9:23	50

# of vehicles in march unit	Pass time (minutes and seconds)												# of vehicles in march unit
	40 kmh / 25 mph				48 kmh / 30 mph				56 kmh / 35 mph				
	Interval—meters				Interval—meters				Interval—meters				
	25	50	75	100	25	50	75	100	25	50	75	100	
	30 VPK	15 VPK	12 VPK	10 VPK	30 VPK	15 VPK	12 VPK	10 VPK	30 VPK	15 VPK	12 VPK	10 VPK	
1	:04	:08	:08	:09	:03	:05	:06	:08	:03	:05	:06	:06	1
2	:08	:15	:15	:18	:05	:11	:13	:15	:05	:09	:11	:13	2
3	:11	:22	:23	:27	:08	:15	:19	:23	:07	:13	:17	:20	3
4	:15	:29	:30	:36	:11	:20	:26	:30	:09	:18	:22	:26	4
5	:18	:36	:38	:45	:13	:26	:32	:38	:11	:22	:27	:33	5
6	:22	:44	:45	:54	:15	:30	:38	:45	:13	:26	:33	:39	6
7	:26	:51	:53	1:03	:18	:35	:44	:53	:15	:30	:38	:45	7
8	:29	:58	1:00	1:12	:20	:41	:50	1:00	:18	:35	:41	:52	8
9	:33	1:05	1:08	1:21	:23	:45	:57	1:08	:20	:39	:48	:58	9
10	:36	1:12	1:15	1:30	:26	:50	1:03	1:15	:22	:43	:54	1:05	10
15	:54	1:48	1:53	2:15	:38	1:15	1:34	1:53	:33	1:05	1:21	1:36	15
20	1:12	2:24	2:30	3:00	:50	1:41	2:05	2:30	:43	1:26	1:48	2:09	20
25	1:30	3:00	3:08	3:45	1:03	2:05	2:36	3:08	:54	1:48	2:14	2:41	25
30	1:48	3:36	3:45	4:30	1:15	2:30	3:08	3:45	1:05	2:09	2:41	3:13	30
40	2:24	4:48	5:00	6:00	1:41	3:20	4:11	5:00	1:26	2:52	3:35	4:18	40
50	3:00	6:00	6:15	7:30	2:05	4:11	5:13	6:15	1:48	3:35	4:28	5:22	50

Extra time allowance (EXTAL) Table (single march unit)

# of vehicles in march unit	0 – 12	13-37	38-62	63-87	88-112	113-137	138-162	163-187	188-212	213-237	238-262
EXTAL in minutes	0	1	2	3	4	5	6	7	8	9	10

* VPK vehicles per kilometer

Table D-8. Time required for a march unit to pass a single point

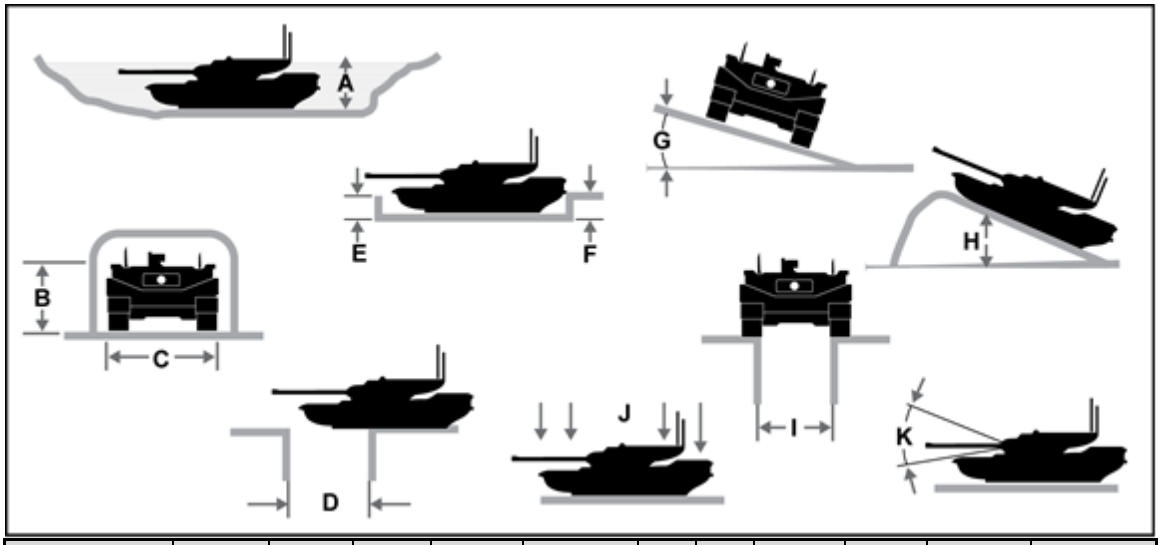
VPK	*Interval*	*4 vehicles*	*1 MU 25 vehicles*	*5 MU 125 vehicles*	*6 MU 150 Vehicles*	*7 MU 175 vehicles*	*8 MU 200 Vehicles*
40	15 m	85 m	925 m	4.6 km	5.6 km	6.5 km	7.4 km
20	40 m	160 m	1.6 km	7.8 km	9.3 km	10.6 km	12.4 km
18	50 m	190 m	1.8 km	9.0 km	10.8 km	12.6 km	14.4 km
10	100 m	340 m	3.0 km	15.3 km	18.3 km	21.6 km	24.4 km
5	200 m	640 m	5.6 km	27.8 km	33.3 km	38.9 km	44.4 km
Assumes one route, 10 m length per vehicle, one 200 m gap per movement unit (MU) and 25 vehicles per MU VPK vehicles per kilometer							

Table D-9. Movement rates

Distance / Rate of March	***1 km***	***2 km***	***3 km***	***4 km***	***5 km***	***10 km***	***20 km***	***30 km***	***40 km***	***50 km***	***60 km***
60 km/hr	1	2	3	4	5	10	20	30	40	50	60
50 km/hr	1.2	2.4	3.6	4.8	6	12	24	36	48	60	72
40 km/hr	1.5	3	4.5	6	7.5	15	30	45	60	75	90
30 km/hr	2	4	6	8	10	20	40	60	80	100	120
25 km/hr	2.4	4.8	7.2	9.6	12	24	48	72	96	120	144
20 km/hr	3	6	9	12	15	30	60	90	120	150	180
15 km/hr	4	8	12	16	20	40	80	120	160	200	240
10 km/hr	6	12	18	24	30	60	120	180	240	300	360
5 km/hr	12	24	36	48	60	120	240	360	480	600	720
Movement rate is in minutes.											

Table D-10. Movement conversion rates

Kilometers per hour	*Meters per minute*	*Miles per hour*	*Knots*	*Feet per second*
60	1,000	38	33	55
50	830	31	27	46
40	666	25	21	36
30	500	19	16	28
25	416	16	13	23
20	333	13	11	18
15	250	9	8	14
10	164	6	5	9
5	83	3	3	5
1	16	0.6	0.5	1



Obstacle	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*
Country and vehicle	Water Fording (m)	Height to Clear (m)	Width to clear (m)	Max Gap to Traverse (m)	Ground Clearance (m)	Max Step (m)	Max Tile (m)	Max Gradient (%)	Max Strattle (%)	Ground Pressure (pbi)	Depression and Elevation (degrees)
U.S. M1	1.22	2.89	3.6	2.74	0.48	1.24	40	60	2.14	13.4	-10+20
U.S. M2/M3		2.92	3.04	2.54	0.45	0.91	40	60	1.87	11.8	+30-20 (TOW) +60-10 (25mm)
U.S. Stryker	1.35	3.2	2.87	1.98	0.53	0.60	30	60	2.94	63 psi (soil)	-20+60 RWS
U.S. Paladin	1.07	3.63	3.3	1.83	0.45	0.60	0.53	60	2.38	13.6	-11.45 +76.37
U.K. Centurion	1.2	2.96	3.4	3.35	0.51	0.9	30	60	2.19	13.3	-10+20
U.K. Chieftain	1.07	2.9	3.66	3.15	0.51	0.91	30	60	2.44	11	-10+20
GER Leopard 2	2.25	2.93	3.71	3	0.48	1.15	30	60	2.15	12.2	-9+20
FRA AMX-30	2	2.86	3.1	2.9	0.45	0.93	30	60	1.96	10.9	-8+20

Figure D-1. Friendly vehicle movement planning factors

AIRCRAFT

D-3. Material in this section is derived from ATP 3-01.81, FM 3-04, and GTA 55-07-003. Tables D-11 through D-16 on pages 224–226 show selected aircraft characteristics, fuel consumption, loads, and airspeed conversions. Table D-17 on page 226 describes types of unmanned aerial systems. Table D-18 on page 227 shows planning factors for assembly areas.

Table D-11. Helicopter characteristics

FM 3-04

Type	Speed (KIAS)	Armament	Range (R) Endurance (E)	Remarks (Note 1)
UH-60 L/M	156 (max) 120 max with sling-load	UH-60: 2x M240H VOLCANO scatterable mine delivery system (no guns can be carried with Volcano)	(internal fuel only) R: 225 km E: 2 hours (w/ aux tanks: 4 hours) Fuel: 362-gal (internal); two aux. tanks (200 gal ea) burns 178-gal/hr	22k lbs max up to 9k lbs external cargo or 11x combat equipped troops (16x if seats are removed) or VOLCANO system (takes 8 hours to install, limits crew to two pilots and one operator and limits speed to 80 kts when scattering mines). MC Node provides 6x FM, 1x HF, 2x VHF, 2x UHF radios Crew = 2-4 (2 pilots, crew chief, gunner)
HH-60 L (MEDEVAC)	120-145 (Cruise)	HH-60: unarmed air ambulance		22k lbs max up to 9k lbs external cargo; 600 lbs rescue hoist; can carry up to 6 litter or ambulatory patients; crew = 2 pilots, crew chief & 3 medics
CH-47 D/F	170 (max) 120 max with sling-load 145 (cruise)	3x M240H 7.62-mm MG – 2x door guns, 1x rear ramp gun	(internal fuel only) R: 90 km (50 nm) w/ 16k lbs, or 180 km (120 nm) w/ 33 troops. E: 2 hours (514-gal per hour); carries 1,030-gal total	50k lbs max, 33 combat equipped troops; for CASEVAC may carry 24 litter + 1 ambulatory, or 31 ambulatory patients; max sling load: 26k lbs Crew = 3-6 (two pilots, flight engineer, crew chief, two gunners) With auxiliary tanks can ferry up to 1,056 nm
AH-64 D/E	140 (max) 110 (cruise)	1x 30-mm M230E1 chain gun; max eff. range = 1.5 to 1.7km standard ammo load is 1,200 rounds. If the 100-gal auxiliary internal tank is used it falls to 300 rds (or to 100 rds if the 130-gal auxiliary tank is used) 4x universal pylons (two per wing); each can carry 4x AGM-114 “Hellfire” missiles (range = 8km) or one LAU-6168 “Hydra” rocket launchers or a 230-gal fuel tank (ferry missions only); also has wingtip pylons for FIM-32 “Stinger” air-to-air missiles (range; 200m to 4.5km) or AIM-9 “Sidewinder” AAM	R: 120 km (normal fuel only) E: 2 hours (standard); Burns 175-gal/hour; standard fuel load = 370 gal; may carry an internal auxiliary fuel tank with either 100 or 130-gal capacity	Laser designates tank size target up to 6,000 meters. Fire control radar can detect, classify, and prioritize targets w/o line of sight or in limited visibility for Hellfire engagements. Identifies and prioritizes radar emitters. Keeping these systems operational requires a very high maintenance effort. Ordnance carried will not normally exceed 2,500lbs; Crew = 2 (pilot, co-pilot/ gunner)

KIAS: Knots-Indicated Air Speed

Note 1. Combat range endurance varies with temperature, humidity, wind, aircraft configuration, and mission requirements. See environmental considerations. Specific performance must be calculated for every mission.

Table D-12. Rotary wing fuel consumption

Aircraft	Fuel capacity	Fuel consumption	LOG planning rate	Endurance
UH/HH-60 L/M w/ ERFS	760 gal	1206 lbs/hr	180 gph	4+00 hrs
UH/HH-60M	360 gal	1086 lbs/hr	162 gph	2+00 hrs
CH-47F	1028 gal	2560 lbs/hr	382 gph	2+20 hrs
AH-64E	475 gal	1072 lbs/hr	160 gph	2+40 hrs

ERFS extended external range fuel system

Table D-13. Aircraft configuration load

Aircraft	*UH-60L*		*UH-60M*		*CH-47F*	
	Seats out	Seats In	Seats out	Seats In	Seats out	Seats In
With rucksacks (360 lbs)	16	11	16	11	45*	30
W/o rucksacks (360 lbs)	20	11	20	11	60	30
* CH-47 ACL *45 “Seats Out” reflects equipment being loaded on the back ramp						

Table D-14. Airspeed conversion chart

Knots	*Km/hour*	*Km/min*	*Knots*	*Km/hour*	*Km/min*	*Knots*	*Km/hour*	*Km/min*
1	1.85	0.03	9	16.57	0.28	80	148.16	2.47
2	3.70	0.06	10	18.52	0.31	90	166.68	2.78
3	5.56	0.09	20	37.04	0.62	100	185.20	3.09
4	7.41	0.12	30	55.56	0.93	110	203.72	3.40
5	9.26	0.15	40	74.08	1.24	120	222.24	3.70
6	11.10	0.19	50	92.60	1.54	130	240.76	4.02
7	12.96	0.22	60	111.12	1.85	140	259.28	4.32
8	14.82	0.25	70	129.64	2.16	150	277.80	4.63

Table D-15. Common load weights

Equipment	*GVW (kg)*
TOW HMMWV	9,000
M1114 (Up-armored HMMWV)	12,100
M1151 (Up-armored gun truck)	11,500
M1165 (Up-armored C2 HMMWV)	12,100
M1167 (TOW HMMWV)	13,100
M998 Unarmored HMMWV	7,535
A22 Cargo bag	3,500
500-gallon fuel blivet of JP8	3,750
200-gallon water blivet	2,125
M119A3 Howitzer w/3 personnel	4,900
M777 Howitzer	9,300
Water buffalo (400 gallons)	6,320
120-mm M998	9,000

Table D-16. Aircraft characteristics

Aircraft	*Allowable cabin load* [1]	*Maximum troop seats over water*	*Cargo compartment dimensions by length width*	*Overall height*
C-130	25,000 lbs	74	624" / 123"	108"
C-5A/B	130,000 lbs	73	1,733"/ 228"	162"
C-17	135,000 lbs	102	1,075"/ 216"	148"[2]
KC-10	80,000 lbs	69	1508" / 218"	162" [3] / 108"

[1] Peace time/ contingency planning factors
[2] Foreword/under wing box
[3] Aft wing box

Table D-17. Unmanned aerial systems types and descriptions

ATP 3-01.81

Category	*Description*	*Notes*	*Examples*
Group 1: micro/mini UAS	Weighs 20 lbs or less and normally operates below 1,200 ft above ground level (AGL) at speeds less than 100 knots	These systems are generally hand launched including hobby type UAS. They offer real time video and control, and have small payload capabilities. Operated within line of sight of the user	RQ-11 Raven
Group 2: small tactical	Weighs 21-55 lbs and normally operates below 3,500 ft AGL at speeds less than 250 knots	Small airframes and low radar cross sections provide medium range and endurance. Requires line of sight to the ground control station.	Scan Eagle
Group 3: tactical	Weighs more than 55 lbs, but less than 1,320 lbs, and normally operates below 18,000 ft mean sea level (MSL) at speeds less than 250 knots	Range and endurance varies significantly among platforms. Requires a larger logistics footprint than Groups 1 and 2	RQ-7B Shadow
Group 4: persistent	Weighs more than 1,320 lbs and normally operates below 18,000 ft MSL at any speed	Relatively large systems operated at medium to high altitudes. This group has extended range and endurance capabilities (may require runway for launch and recovery)	MQ-1C Gray Eagle MQ-1A/B Predator
Group 5: penetrating	Weighs more than 1,320 lbs and normally operates higher than 18,000 ft MSL at any speed	Operates at medium to high altitudes having the greatest range, endurance, and airspeed. Requires large logistical footprint similar to that of manned aircraft	RQ-4 Global Hawk MQ-9 Reaper

Table D-18. Planning factors for assembly areas

Unit	*Unrestricted (km^2)*	*Restricted (km^2)*	*Severely restricted (km^2)*
ABCT	17	34	67.5
CAB	2.5	5.25	10.25
CAV SQDN	1.75	3.5	7.75
Fires Battalion	2.25	4	8.25
BSB	3.25	6.5	12.75
BEB	2.25	4.25	8
IBCT	12	24.5	49
IN Battalion	1.5	3.25	6.5
CAV SQDN	1.5	3	6.25
Fires Battalion	1.5	3.25	6.5
BSB	3	5.5	10.75
BEB	1.5	3	6
SBCT	11.75	22.5	45.25
Stryker IN BN	2.5	5.25	10.25
Stryker CAV SQDN	1.75	3.5	7.75
Fires Battalion	2.25	4	8.25
BSB	4.75	9.25	18.5
Stryker BEB	1.75	3	6
Combat AVN BDE	14	23.75	51
Fires Brigade	6.75	12.5	24.75
DIV HQ	1	2.75	5
Corps HQ	1.25	2.25	4.5

Notes.
Assumes standard 100-m interval between most vehicles.
Small to no interval for CP vehicles.
Less than 100-m interval for dismounted forces.
More than 100-m interval for logistic and aviation units.

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Appendix E

Intelligence Planning Factors

This appendix presents data, civil considerations, and other factors to assist in conducting intelligence preparation of the battlefield.

INTELLIGENCE DATA AND FACTORS

E-1. Tables E-1 through E-6 on pages 229–231 present various data and factors for intelligence planning.

Table E-1. Maximum distance between and typical widths of mobility corridors

ATP 2-01.3

Maximum distance between mobility corridors		
Avenue of approach	***Cross-country mobility corridor classification***	***Approximate distance between terrain features***
Division	Brigade/Regiment	10 kilometers
Brigade/Regiment	Battalion	6 kilometers
Battalion	Company	2 kilometers
Typical widths of mobility corridors		
Unit	***Width***	
Division	6 kilometers	
Brigade/Regiment	3 kilometers	
Battalion	1.5 kilometers	
Company	500 meters	

Table E-2. Unopposed movement planning speeds for opposition forces

ATP 2-01.3

Day:	
Maximum speed = 30 km/hr	Average speed off road = 20 km/hr
Night:	
Maximum speed = 20 km/hr	Average speed off road = 10 km/hr
Aircraft movement speeds:	
Rotary-wing flight speed = 150 km/hr	Fixed-wing = 500 knots
Dismounted movement speeds:	
Dismounted rate = 3 km/hr	

Table E-3. Threat reaction and march times

ATP 2-01.3

Reaction times to mounting an attack			*March column assembly times*	
Unit	***Reaction time***	***Planning time***	***Unit***	***Minutes***
Division	2 to 4 hours	1 to 3 hours	Motorized rifle company	5
			Motorized rifle battalion	10 to 15
Regiment	1 to 3 hours	30 minutes to 2.5 hours	Artillery battalion	15 to 20
			Artillery regiment	40 to 50
Battalion	25 to 60 minutes	20 to 45 minutes	Motorized rifle regiment (reinforced)	60 to 120

Technique: Units should study the specific capabilities and history of the enemy they are fighting to estimate frontages and depths. The Soviet planning factors are based on historical doctrine and are provided as a starting point. Individual frontages can be calculated if the effective direct fire ranges of weapon systems and the tendencies the threat follows when they employ them is understood.

Table E-4. Typical Soviet style frontages and depths for units (defense)

ATP 2-01.3

	Frontage (km)	***Depth (km)***	***Gaps between units (km)***
Company/Team	0.5 to 1	0.5	0.5 to 1.5
Battalion	3 to 5	2 to 5	0.5 to 2
Brigade/Regiment	10 to 15	7 to 10	
Division	20 to 30	15 to 20	
Note. Tanks may deploy 200 to 300 meters apart and armored personnel carriers up to 200 meters apart. Antitank obstacles are placed so they are covered by direct fire.			

Table E-5. Typical Soviet style frontages and depths for units (offense)

ATP 2-01.3

	Zone of attack (km)	***Main attack axis (km)***	***Immediate objective depth (km)***	***Subsequent objective depth (km)***
Battalion	2 to 3	1 to 2	2 to 4	8 to 15
Brigade/Regiment	8 to 15	3 to 5	8 to 15	20 to 30
Division	15 to 25	6 to 10	20 to 30	50 to 70
Army	60 to 100	35 to 45	100 to 150	250 to 350
Note. These figures vary with the terrain and the tactical situation.				

Table E-6. Tactical deployment norms for Soviet style artillery

Distances	*Mortars*	*Guns and howitzers*	*Multiple rocket launchers*
Between weapons	16–60 m	20–40 m	15–50 m
Between batteries	N / A	500 to 1,500 m (normally about 1,000 m)	1–2 km
From the FEBA	500–1,000 m	5–8 km (AAG) 3–6 km (DAG) 1–4 km (RAG)	5–8 km 3–8 km
AAG Army artillery group DAG division artillery group RAG regimental artillery group			

THREAT EQUIPMENT

E-2. Tables E-7 through E-22 on pages 231–235 describe common adversary equipment capabilities. Variants of the equipment in these tables exist, but the equipment found in these tables is widely proliferated and still in use.

RUSSIA

Table E-7. Russian tanks

System	*Main gun (mm)*	*Rounds of ammo*	*Eff range of main gun (m)*	*Range (km)*	*Speed (km)*	*Remarks*	*Types of rounds*
T-55	100	43	1500	500	50	wide export; limited NBC protection; reactive armor retrofitted; ATGM firing; active NV; laser warning systems on some models	AP, APDS, HE, HE-FRAG, HEAT
T-62	115	40	1600	450	50	wide export and use; NBC protection; auto loader; laser range finders; armor in some countries; smoke dischargers	APFSDS, HE-FRAG, HEAT
T-72	125	40	2100	400	60	wide export; fire ATGM's; auto loader; reactive armor; smoke dischargers; laser range finders; self-entrenching kit, weapons upgrade package available	APFSDS, HE-FRAG, HEAT, ATGM
T-80	125	40	2400	385	85	reactive armor; NBC protection; self-entrenching kit; smoke dischargers, CIS service	APFSDS, HE-FRAG, HEAT, ATGM
T-90	125	?	2400+	550	60	Laser warning package, T72BM hull and turret, 125mm AT-11 laser guided weapon thermal sight; ATGM jammer system; being offered for export	APFSDS, HE-FRAG, HEAT, ATGM

Table E-8. Russian armored personnel carriers and infantry fighting vehicles

System	Main gun (mm)	Troops	Eff range of main gun (m)	Range (km)	Speed (km)	Remarks	Other weapons
BMP-2	30	7	1000	550+	65	tracked; Two roof hatches; co-produced outside CIS	AT-5 (4000 m)
BRDM-2	14.5	2	2000	750	100	wheeled; BTR-60 turret; crew compartment moved forward	AT-4/5 (2500/4000 m)
BTR-70	14.5	9	2000	600	80	wheeled	
BTR-80	14.5	9	2000	600	80	wheeled	
BTR-90	30	6	1000	~500+	~80+	wheeled; BMP-2 turret on improved BTR-70/80 style hull; improved jet propulsion for water movement	AT-4/5 (2500/4000 m)

Table E-9. Russian anti-tank guided missiles

System	Nickname	Guidance	Command	Max range (m)	Min range (m)	Remarks
AT-3	SAGGER	Wire	SACLOS	3000	300	BMP, BMD, BRDM, HELO, Manpack models; very wide use and export; Chinese copy is Red Arrow
AT-4	SPIGOT	Wire	SACLOS	2500	70	BMP, BMD, BRDM, Manpack models; can be fired from AT-5 launchers
AT-5	SPANDREL	Wire	SACLOS	4000	100	BMP, BMD, BRDM, Manpack models; can be fired from AT-4 launchers
AT-9	ATAKA-V	Radio	SACLOS	6000+		HAVOC, HOKUM, HIND launchers
AT-X-14	KORNET	Laser	SACLOS	5500	100	Tripod or vehicle-mounted; thermal viewer effective to 3500 m
SACLOS Semi-automatic command to line of sight						

Table E-10. Russian artillery

System	Main gun (mm)	Type	Range (m)	ERBB or RAP range (m)	Remarks	Types of rounds
2S3	152	Howitzer	17230	20500	Self-propelled; May have 12.7 mm anti-aircraft MG	AP, HE, HE-FRAG, smoke, illumination, incendiary, flechette, concrete piercing, chemical, mine, ICM, laser guided, nuclear, jammer
2S7	203	Gun	37500	50000	Self-propelled; NBC overpressure	HE, HE-FRAG, concrete piercing, chemical, ICM, nuclear
D30	122	Howitzer	15300	21900	Wide use	HE, HE-FRAG, HEAT, smoke, illumination, incendiary, flechette
G6	155	Gun	30800	39000	Wheeled carrier; exported	
BM-21	122	MRL	20380	30000	40 rounds; wide export and use	

Table E-11. Russian surface to air missiles

System	Guidance	Max range (km)	Min alt (km)	Max alt (km)	Associated radars	Remarks
SA-6	semi-active	24	0.05	12	long track, thin skin, straight flush	Wide export, tracked
SA-7	IR	5.5	0.01	4.5	none	MANPAD, Wide export, naval adaptation, 2 Soldier team, helicopter and land mine versions
SA-8	command	12	0	12.2	Land roll, pop group	Limited export, naval adaptation
SA-9	IR	9	0.02	5.2	Hat box, dog ear	On BRDM chassis; widely used; being replaced by SA-13; range only radar (hat box); early warning only (dog ear)
SA-18	laser	7	0.01	6	none	MANPAD; Replacing SA-7/14/16

Table E-12. Russian antiaircraft guns

System	Caliber (mm)/Type	Max range (km)	ADA range (km)	Max alt (km)	Associated radars	Remarks
2S6	30/SAM	8	4.3	6.2	Hot shot, dog ear, UI Surveillance	SA-19; electro-optic fire control plus radar
M1939	85/gun	15.65	8.4	10.5	Fire can	AP ammo; indirect role
S-60	57/gun	12	6	8.8	Fire can, WHIFF, flap wheel, long track; flat face	1 & 2 gun mountings
Type 63	14.5/HMG	9.5	1.4	5	None	1,2 & 4 gun mountings
ZSU-23-4	23/quad	2.5	2.5	5	Gun dish, dog ear	SP quad 23 mm mount; optical and radar tracking fire control; computerized engagement; amphibious

Table E-13. Russian helicopters

System	Name	Max speed (kph)	Max troops	Combat radius (km)	Ceiling (km)	Remarks
KA-50	HOKUM	310	0	250	4	May carry AT-9
MI-17	HIP-H	250	24	200	3.6	Exported; may carry rockets, gun pods, ATGMS, bombs, mines and lay smoke or chemicals
MI-24/25	HIND-D	335	8	300	4.48	Normally armed with AT-2 or AT-3; 57 mm rockets; can carry extra fuel or complete weapons reload internally
MI-26	HALO	295	80+	400	4.5	Can lift BNP, 2S1 and many other vehicles, can carry more than one of some vehicles
MI-4	HOUND	210	14	250	4.5	FASCAM capability; 12.7-mm MG; 57-mm rocket pods

NORTH KOREA (SEE ALSO RUSSIA AND CHINA)

Table E-14. North Korean tanks

System	Main gun	Rounds of ammo	Eff range of main gun (m)	Range (km)	Speed (km)	Remarks	Types of rounds
M1985	85 mm		1150	260	44	light amphibious tank; AT-3 SAGGER	AT-3 (3000 m)
PT 85	85 mm		1150	370	64	Variant of Chinese type 63 amphibious light tank	AP, HE, HE-FRAG

Table E-15. North Korean armored personnel carriers and infantry fighting vehicles

System	Main gun (mm)	Troops	Eff range of main gun (m)	Range (km)	Speed (km)	Remarks	Other weapons
M1973	2x 14.5	8	2000	500	65		AT 4 (4000 m)
UI APC	2x 14.5	12	1200		80	Amphibious tracked transport used in place of the BTR-60 or BRDM	AT 3 (3000 m) SA 7 (5500 m)

Table E-16. North Korean artillery

System	Main gun (mm)	Type	Range (km)	ERBB or RAP range (km)	Remarks	Types of rounds
M1974	152	Howitzer		20.5	ATS-59 artillery tractor, day and night direct fire sights	
M1985	122	Gun	20.5		30 tubes with an onboard reload	HE, smoke, chemical
M1977	122	Howitzer	15.3	21.9	Self-propelled D-30	
M1978	170	Gun	40	53	T-55 chassis, support required by secondary vehicle to transport crew and ammunition	
TAEPO DONG-1		Missile	2,000		Transported on a modified SCUD transporter	HE, chemical

CHINA

Table E-17. Chinese tanks

System	Main gun (mm)	Rounds of ammo	Eff range of main gun (m)	Range (km)	Speed (km)	Remarks	Types of rounds
Type 62	85	47	1150	500	60	light tank; scaled down type 59	AP, HE, HEAT, smoke
Type 63	85	47	1150	370	64	amphibious light tank	AP, HE, HEAT, smoke
Type 69	100	34	1300	440	50	Improved type 59, wide export	APFSDS, HE, HEAT, flechette
Type 79	105	44	~1600	440	50	Type 69 refitted with NATO M68 cannon; improved fire control and sights	APDS, APFSDS, HEP/HESH, HEAT, smoke, flechette
Type 80	125	44	~1600	550	60	Computerized fire control and laser ranging system; individual NBC system; some may have collective NBC protection	APFSDS, HEPHESH, HEAT

Table E-18. Chinese armored personnel carriers and infantry fighting vehicles

System	Main gun (mm)	Troops	Eff range of main gun (m)	Range (km)	Speed (km)	Remarks
Type 77	12.7	16		370	60	
WZ503	73	13	800	460+	65	Chinese BMP-1; upgraded turret
WZ531	12.7	13		500	65	Formerly called K-63; mortar and SP gun versions; widely exported
YW307	25	7	1500+	500	65	YW534 with bushmaster turret
YW534	none	13		500	65	resembles AMX-10 APC

Table E-19. Chinese anti-tank guided missile

System	Nickname	Guidance	Command	Max range	Min range	Remarks
Red Arrow 8		Wire	SACLOS	3000 m	100 m	Export models; Chinese transfer of TOW technology
SACLOS Semi-automatic command to line of sight						

Table E-20. Chinese artillery

System	Main gun (mm)	Type	Range (km)	ERBB or RAP range (km)	Remarks	Types of rounds
Type 56	85	Field gun	15.65		Chinese and others	AP, APDS, HE, HE-FRAG, HEAT
Type 60	122	Field gun	24		Chinese copy of D74	
Type 54-1	122	Howitzer	11.8		Chinese and others; copy of M30	HE, smoke, illumination, incendiary, leaflet, ICM
Type 81	107	MRL	10		Jammer rockets available	HE, HE-FRAG, incendiary, jammer
Type 83	152	Howitzer	17.23	39		HE, smoke, illumination, ICM

Table E-21. Chinese surface-to-air missile systems

System	Guidance	Max range (km)	Min alt (km)	Max alt (km)	Associated radars	Remarks
HN-5	IR	4.4	0.05	2.3	none	Chinese improvement of SA-7; available in MANPACK, vehicle and pedestal mounts; exported
HQ-7	IRTV command	12	0.02	5.5	none	Chinese used in shelter and towed versions
QW-1	IR	5	0.03	4	none	Resembles SA-18

Table E-22. Chinese antiaircraft guns

System	Caliber (mm)/Type	Max range (km)	ADA range (km)	Max alt (km)	Associated radars	Remarks
Type 56	85/HMG	15.65	8.4	10.5	Fire can	AP ammo; indirect role
Type 74	Twin 37/gun	9.5	3.5	6.7	none	Chinese copy of M1939
Type 75	14.5/HMG	9.5	1.4	5	none	Chinese copy of ZPU
Type 80	Twin 23	7	2.5	5.1	none	Chinese variant of ZSU-23-2
Type 85	Twin 23 mm	5		3.2	none	Chinese variant of ZU-23

IRAN (SEE ALSO RUSSIAN EQUIPMENT)

E-3. Iran uses primarily Russian equipment.

CIVIL CONSIDERATIONS

E-4. Civil considerations (areas, structures, capabilities, organization, people, and events—ASCOPE) encompass the constructed infrastructure, civilian institutions, and the attitudes and activities of civilian leaders, populations, and organizations within an area of operations (AO) and how these elements influence military operations. Civil considerations assist commanders in understanding the social, political, and cultural variables within an AO and their effects on the mission. Tactical Army staffs use ASCOPE to analyze civil considerations that are essential to developing of effective plans for operations. Table E-23 on pages 236–238 presents one method of cross-walking civil considerations (including examples for each

ASCOPE characteristic) with the operational variables (political, military, economic, social, information, infrastructure, physical environment, and time—PMESII-PT).

Table E-23. Crosswalk of ASCOPE with PMESII-PT example

ATP 2-01.3

	Areas	*Structures*	*Capabilities*	*Organizations*	*People*	*Events*
Political	Enclaves Municipalities Provinces Districts Political districts Voting Party affiliation areas Shadow government influence areas	Courts (court house, mobile courts) Government centers Provincial/ district centers Meeting halls Polling sites	Public administration: Civil authority, practices, and rights Political system, stability, traditions Standards and effectiveness Executive and Legislative: Administration Policies Powers Organization Judicial/legal: Administration Capacity Policies Civil and criminal codes Powers Organization Law enforcement Dispute resolution, grievances Local leadership Degrees of legitimacy	Banks Business organizations Cooperatives Economic nongovernment organizations Guilds Labor unions Major illicit industries Large landholders Volunteer groups	United Nations representatives Political leaders Governors Councils Elders Community leaders Paramilitary members Judges Prosecutors	Elections Council meetings Speeches (significant) Security and military training sessions Significant trials Political Motivation Treaties Will
Military	Areas of influence Areas of interest Areas of operations Safe havens or sanctuaries Multinational/ local nation bases Historic data on operations by the opposition	Bases Headquarters (police) Known leader houses/ businesses	Doctrine Organization Training Materiel Leadership Personnel manpower Facilities History Nature of civil-military relationships Resource constraints Local security forces Quick-reaction forces Insurgent strength Enemy recruiting	Host-nation forces present Insurgent groups present and networks Multinational forces present Paramilitary organizations Fraternal organizations Civic organizations	Key leaders Multinational, insurgent, military	Combat Historical Noncombat Kinetic events Unit reliefs Loss of leadership

Table E-23. Crosswalk of ASCOPE with PMESII-PT example *(continued)*

ATP 2-01.3

	Areas	*Structures*	*Capabilities*	*Organizations*	*People*	*Events*
Economic	Commercial Fishery Forestry Industrial Livestock dealers Markets Mining Movement of goods services Smuggling routes Trade routes Black market areas	Banking Fuel: distribution, refining, source Industrial plants Manufacturing Mining Warehousing Markets Silos, granaries, warehouses Farms/Ranches Auto repair shops	Fiscal: access to banks, currency, monetary policy Can tolerate drought Black market Energy Imports/Exports External support/aid Food: distributing, marketing, production, processing, rationing, security, storing, transporting Inflation Market prices Raw materials Tariffs	Banks Business organizations Cooperatives Economic nongovernment organizations Guilds Labor unions Major illicit industries Large landholders Volunteer groups	Bankers Employers Employees Labor occupations Consumption patterns Unemployment rate (if this exists) Job lines Landholders Merchants Money lenders Black marketers Gang members Smuggling chain	Drought, harvest, yield, domestic animals, livestock (cattle, sheep), market cycles Labor migration events Market days Payday Business openings Loss of business
Social	Refugee camps Enclaves: ethnic, religious, social, tribal, families or clans Neighborhoods Boundaries of influence School districts Parks Traditional picnic areas Markets Outdoor religious sites	Clubs Jails Historical buildings/houses Libraries Religious buildings Schools Universities Stadiums Cemeteries Bars and tea shops Social gathering places (meeting places) Restaurants	Medical: traditional, modern Social networks Academic Strength of tribal village traditional structures Judicial	Clan Community councils and organizations School councils Familial Patriotic/service organizations Religious groups Tribes	Community leaders, councils, and members Education Ethnicity/racial: biases, dominant group, percentages, role in conflict Key figures: criminals, entertainment, religious leaders, chiefs/elders Languages Dialects Vulnerable populations Displaced persons Sports Influential families Migration patterns Culture: artifacts, behaviors, customs, shared beliefs/values	Celebrations Civil disturbance National holidays Religious holidays and observance days Food lines Weddings Birthdays Funerals Sports events Market days Family gatherings History: major wars and conflicts

Table E-23. Crosswalk of ASCOPE with PMESII-PT example *(continued)*

ATP 2-01.3

	Areas	*Structures*	*Capabilities*	*Organizations*	*People*	*Events*
Information	Broadcast coverage area (newspaper, radio, television) Information Word of mouth Gathering points Graffiti Posters	Communications: lines, towers (cell, radio, television) Internet service: satellite, hard wire, cafes Cellular phone Postal service Print shops Telephone Television stations Radio stations	Availability of electronic media Local communications networks Internet access Intelligence services Printed material: flyers, journals, newspapers Propaganda Radio Television Social media Literacy rate Word of mouth	Media groups, news organizations Religious groups Insurgent inform and influence activity groups Government groups Public relations and advertising groups	Decision makers Media personalities Media groups, news organizations Community leaders Elders Heads of families	Disruption of services Censorship Religious observance days Publishing dates Inform and influence activity campaigns Project openings
Infrastructure	Commercial Industrial Residential Rural Urban Road systems Power grids Irrigation networks Water tables	Emergency shelters Energy: distribution system, electrical lines, natural gas, power plants Medical: hospitals, veterinary Public buildings Transportation: airfields, bridges, bus stations, ports and harbors, railroads, roadways, subways Waste distribution, storage, and treatment: dams and sewage Construction sites	Construction Clean water Communications systems Law enforcement Fire fighting Medical: basic, intensive, urgent Sanitation Maintenance of roads, dams, irrigation, sewage systems Environmental management	Construction companies: government and contract	Builders Road contractors Local development councils	Scheduled maintenance (road/bridge construction) Natural/ made disasters Well digging Community center construction School construction

OTHER PLANNING TOOLS

E-5. Table E-24 presents height of eye versus horizon range. This assists planners in determining line of sight for various weapon systems.

Table E-24. Height of eye versus horizon range

ATP 2-01.3

Height (feet)	Nautical miles	Statute miles	Height (feet)	Nautical miles	Statute miles	Height (feet)	Nautical miles	Statute miles
1	1.1	1.3	95	11.2	12.8	740	31.1	35.8
2	1.6	1.9	100	11.4	13.2	760	31.5	36.3
3	2.0	2.3	105	11.7	13.5	780	31.9	36.8
4	2.0	2.6	110	12.0	13.8	800	32.4	37.3
5	2.6	2.9	115	12.3	14.1	820	32.8	37.7
6	2.8	3.2	120	12.5	14.4	840	33.2	38.2
7	3.0	3.5	125	12.8	14.7	860	33.5	38.6
8	3.2	3.4	130	13.0	15.0	880	33.9	39.1
9	3.4	4.0	135	13.3	15.3	900	34.3	39.5
10	3.6	4.2	140	13.6	15.6	920	34.7	39.9
11	3.8	4.4	145	13.8	15.9	940	35.1	40.4
12	4.0	4.6	150	14.0	16.1	960	35.4	40.8
13	4.1	4.7	160	14.5	16.7	980	35.8	41.8
14	4.9	4.9	170	14.9	17.2	1000	36.2	42.8
15	5.1	5.1	180	15.3	17.7	1100	37.9	43.7
16	4.6	5.3	190	15.8	18.2	1200	39.6	45.6
17	4.7	5.4	200	16.2	18.6	1300	41.2	47.8
18	4.9	5.6	210	16.6	19.1	1400	43.8	49.8
19	5.0	5.7	220	17.0	19.5	1500	44.8	52.0
20	5.1	5.9	230	17.3	20.0	1600	45.8	52.8
21	5.2	6.0	240	17.7	20.4	1700	47.2	54.8
22	5.4	6.2	250	18.1	20.8	1800	48.5	55.9
23	5.5	6.3	260	18.4	21.2	1900	49.9	57.8
24	5.6	6.5	270	18.8	21.6	2000	51.2	58.9
25	5.7	6.6	280	19.1	22.0	2100	52.4	60.4
26	5.8	6.7	290	19.5	22.4	2200	53.7	61.8
27	5.9	6.8	300	19.8	22.8	2300	54.9	63.2
28	6.1	7.0	310	20.1	23.2	2400	56.0	64.8
29	6.2	7.1	320	20.5	23.6	2500	57.2	65.8
30	6.3	7.2	330	20.8	23.9	2600	58.3	67.2
31	6.4	7.3	340	21.1	24.3	2700	59.4	68.4
32	6.5	7.5	350	21.4	24.6	2800	60.5	69.7
33	6.6	7.6	360	21.7	25.0	2900	61.6	70.9
34	6.7	7.7	370	22.0	25.3	3000	62.7	72.1
35	6.8	7.8	380	22.3	25.7	3100	63.7	73.3
36	6.9	7.9	390	22.6	26.0	3200	64.7	74.5
37	7.0	8.0	400	22.9	26.3	3300	65.7	75.7
38	7.1	8.1	410	23.2	26.7	3400	66.7	76.8
39	7.1	8.2	420	23.4	27.0	3500	67.7	77.8
40	7.2	8.3	430	23.7	27.3	3600	68.6	79.0
41	7.3	8.4	440	24.0	27.6	3700	69.6	80.1
42	7.4	8.5	450	24.3	27.9	3800	70.5	81.3
43	7.5	8.6	460	24.5	28.2	3900	71.4	82.3
44	7.6	8.7	470	24.8	28.6	4000	72.4	83.3
45	7.7	8.8	480	25.1	28.9	4100	73.3	84.3
46	7.8	8.9	490	25.3	29.2	4200	74.1	85.4
47	7.8	9.0	500	25.6	29.4	4300	75.0	86.4
48	7.9	9.1	520	26.1	30.0	4400	75.9	87.4
49	8.0	9.2	540	26.6	30.6	4500	76.7	88.4
50	8.1	9.3	560	27.1	31.2	4600	77.6	89.3
55	8.5	9.8	580	27.6	31.7	4700	78.4	90.3
60	8.9	10.2	600	28.0	32.3	4800	49.3	91.2
65	9.2	10.6	620	28.5	32.8	4900	80.1	92.2
70	9.6	11.0	640	28.9	33.3	5000	80.9	93.1
75	9.9	11.4	660	29.4	33.8	6000	88.6	102.0
80	10.2	11.8	680	29.8	34.3	7000	95.7	110.9
85	10.5	12.1	700	30.1	34.8	8000	102.3	117.8
90	10.9	12.5	720	30.7	35.3	9000	108.5	124.8

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Appendix F

Fires Planning Factors

Appendix F provides tabular data for fires planning. This includes data on selected artillery and munitions capabilities, smoke planning, illuminating factors, howitzer distribution, radar planning, and planning times.

FIRES PLANNING DATA

F-1. Tables F-1 and F-2 on pages 241–242 provide data on the capabilities of cannon field artillery and MLRS/HIMARS munitions. Tables F-3, F-5, and F-7 on pages 243–245 provide data on artillery smoke planning, howitzer distribution, and radar planning. Table F-4 on page 244 and Table F-6 on page 245 provide data on artillery, mortar, and rocket illuminating factors, and artillery and mortar planning times.

Table F-1. Cannon field artillery capabilities

FM 3-09

Artillery	*Ammunition*		*Range (meters)*		*Rates of fire (rounds per minute)*		
	Projectile	*Fuse*	*Maximum*	*DPICM*	*RAP*	*Sustained*	*Maximum*
105-mm M119 series	HE, HC, WP, ILLUM, APICM, DPICM	PD, VT, MT, ET, MTSQ, delay	11,500 with charge 7 14,000 with charge 8	12,100	19,500	3 for 30 minutes	8 every 3 minutes
155-mm M109A5[1]	HE, HC, WP, ILLUM, APICM, DPICM, M825 smoke, SCATMINE		18,000 or 22,000 with M795 HE; M825 smoke	18,000 or 28,200 with M864 base bleed	30,100	2	4 every 3 minutes
155-mm M109 A5/A6			18,000 or 21,700 with M795 HE; M825 smoke; *M982 Excalibur: Block Ia-1 – 24,000 Block Ia-2 – 37,000+ Block Ib – 40,000+	17,900 or 28,100 with M864 base bleed	30,000	Zones 3-7: 1 round per minute; Zone 8: 1 round per minute until limited by tube temperature sensor	
155-mm M777-series			22,200 w/M201A1 modular charge 8S or 22,500 with M232, modular charge zone 5; 24,500 with M982 Excalibur Block 1-1a	N/A		2 in accordance with thermal warning device	4 every 2 minutes

Note. Excalibur not authorized for M109A5.
See appendix I, ATP 3-09.32/MCRP 3-16.6A/NTTP 3-09.2/AFTTP 3-2.6 for discussion of "danger close"

APICM	antipersonnel improved conventional munitions	MTSQ	mechanical time superquick
DPICM	dual-purpose improved conventional munitions	PD	point detonating
ET	electronic time	RAP	rocket-assisted projectile
HC	hexachloroethane smoke	SCATMINE	scatterable mines
HE	high explosive	VT	variable time
ILLUM	illumination	WP	white phosphorus
MT	mechanical time		

Table F-2. MLRS/HIMARS munitions capabilities

FM 3-09

Munition	*Variant*	*Payload*	*Accuracy*	*Range (km)*	*Target type*
Rockets	M26	644x M77 DPICM	Unguided 10+mils	10-32	Personnel, light armor, soft vehicles, area targets
	M26A2 ER-MLRS	518x PI M77 DPICM		13-45	Personnel, light armor, soft vehicles, area targets, point targets (M31 only)
Guided rockets	M30	404x PI M77 DPICM	GPS circular error probable 5 meters; inertial 0.6 mils	15-84+	Personnel, light armor, soft vehicles (stationary)
	M31	51.5 lbs of PBXN-109; VT, PD, or delay fuse; nominal or vertical angle of fall			
ATACMS	Block 1 M39	950x M74 APAM bomblets	Classified	25-165+*	Personnel, light armor, soft vehicles (stationary)
	Block 1A M39A1	300x M74 APAM bomblets		70-300+*	
	Quick reaction unitary M48/M57	215x lbs of DESTEX; PD fuse; vertical angle of fall		70-270+*	Block 1-1A targets when duds / collateral damage are precluded, fixed infrastructure sites (buildings for example)
	ATACMS Unitary	Single unitary warhead with multi-function fuse-proximity, PD or delay		70-300+*	

Notes. Default rates of fire are 5 seconds between rockets and 15 seconds between missiles. All munitions may be fired from both the M142 HIMARS and the M20A1 MLRS.
*GMLRS and ATACMS minimum and maximum ranges are dependent on local conditions, specifically firing unit elevation. Both munitions reliably achieve the above listed ranges which can be used as planning factors.

APAM	antipersonnel, anti-materiel	HE	high explosive
ATACMS	Army tactical missile system	MLRS	multiple launch rocket system
DESTEX	high explosive (type)	PBXN-109	explosive, plastic-bonded, cast 109
DPICM	dual-purpose improved conventional munitions	PD	point detonating
ER-MLRS	extended-range multiple launch rocket system	PI	product improved
GMLRS	guided multiple launch rocket system	VT	variable time
HIMARS	high mobility artillery rocket system		

Table F-3. Artillery smoke planning data

ATP 3-09.42

Delivery system	*Round type*	*Time to build effective smoke (minutes)*	*Average burning time (minutes)*	*Average obscuration length (meters per round)*	
				Wind direction	
				Cross	*Head or Tail*
155 mm	WP	0.5	1 – 1.5	150	50
	HC	1 – 1.5	4	350	75
	WP(M825)	0.5	5 – 10	350	100 - 200
105 mm	WP	0.5	1 – 1.5	75	50
	HC	1 – 1.5	3	250	50
120 mm	WP	0.5	2.5	100	60
81 mm	WP	0.5	1	100	40
	RP	0.5	2.5	100	40
60 mm	WP	0.5	1	75	40

Note. All rounds are fired as standard missions with parallel sheafs under favorable conditions
HC: hexachloroethane smoke RP: Red Phosphorous WP: White phosphorous

Quick smoke data—155-mm shell smoke

	Weather conditions	Wind speed (knots)	Rate of fire	Duration requested by forward observer (minutes)													
						4	5	6	7	8	9	10	11	12	13	14	15
				Rounds per tube													
Hexachloroethane (HC)	IDEAL	5	1 rd per 2 min			2	2	3	3	4	4	5	5	6	6	7	7
	FAVORABLE	5	1 rd per 2 min			2	2	3	3	4	4	5	5	6	6	7	7
		10	1 rd per 1 min			2	3	4	5	6	7	8	9	10	11	12	13
		15	1 rd per 40 sec			3	4	6	7	9	10	12	13	15	16	18	19
	MARGINAL	5	1 rd per 40 sec			3	4	6	7	9	10	12	13	15	16	18	19

	Weather conditions	Wind speed (knots)	Rate of fire	Duration requested by forward observer (minutes)													
				2	3	4	5	6	7	8	9	10	11	12	13	14	15
				Rounds per tube													
White phosphorous (WP)	IDEAL	5	1 rd per 2 min	2	3	3	4	4	5	5	6	6	7	7	8	8	9
	FAVORABLE	5	1 rd per 2 min	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		10	1 rd per 1 min	4	6	8	10	12	14	16	18	20	22	24	26	28	30
		15	1 rd per 40 sec	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	MARGINAL	5	Exceeds rate of fire														

Table F-3. Artillery smoke planning data *(continued)*

ATP 3-09.42

Quick smoke data—105-mm shell smoke															
Hexachloroethane (HC)	Weather conditions	Wind speed (knots)	Rate of fire	Duration requested by forward observer (minutes)											
				3	4	5	6	7	8	9	10	11	12	13	14	15
				Rounds per tube												
	IDEAL	5	1 rd per 1 min	2	3	4	5	6	7	8	9	10	11	12	13	14
	FAVORABLE	5	1 rd per 1 min	2	3	4	5	6	7	8	9	10	11	12	13	14
		10	1 rd per 30 sec	3	5	7	9	11	13	15	17	19	21	23	25	27
		15	1 rd per 24 sec	4	6	9	11	14	16	19	21	24	26	29	31	34
	MARGINAL	5	1 rd per 20 sec	4	7	10	13	16	19	22	25	28	31	34	37	40
White phosphorous (WP)	Weather conditions	Wind speed (knots)	Rate of fire	Duration requested by forward observer (minutes)											
				3	4	5	6	7	8	9	10	11	12	13	14	15
				Rounds per tube												
	IDEAL	5	1 rd per 40 sec	5	7	8	10	11	13	14	16	17	19	20	22	23
	FAVORABLE	5	1 rd per 30 sec	6	8	10	12	14	16	18	20	22	24	26	28	30
		10	1 rd per 15 sec	11	15	19	23	27	31	35	39	43	47	51	55	59
		15	1 rd per 10 sec	16	22	28	34	40	46	52	58	64	70	76	82	88
	MARGINAL	5	Exceeds rate of fire													

Table F-4. Artillery, mortar, and rocket illuminating factors

Weapon	*Type*	*Height of burst (meters)*	*Burn time (seconds)*	*Rate of fall (m/sec)*
60 mm	M83A1 M83A2/A3	160	25 32	6
70 mm (2.75”)	M-257	550	120	4.5
70 mm (2.75”)	M-278 (IR)	800	180	4.5
81 mm	M301A3	600	60	6
105 mm	M314A2 M314A3	750	60-65	12
120 mm	M930	500	50	5
155 mm	M118 M485-series	750 600	60 120	10 5

Table F-5. Artillery howitzer distribution

ATP 3-09.42

Brigade combat team	*Indirect fire weapons*	*Quantities*	*Unit distribution*
ABCT	155-mm howitzers (M109)	18	3x batteries of 6x Cannons
SBCT	155-mm howitzers (M777)	18	3x batteries of 6x Cannons
IBCT	105-mm howitzers (M119) and 155-mm howitzers (M777)	6, 12, 18	3x batteries of 6x Cannons Select airborne units are 2x6 (1x 105mm battery, 1x 155-mm battery) or 1x battery of 105-mm howitzers

Table F-6. Artillery and mortar planning time factors

Activities (in min:sec)	*60-mm mortar*	*81-mm mortar*	*120-mm mortar*	*105-mm howitzer*	*155-mm howitzer*
Occupation	1:30	4:30		6:00	8:00
Hipshoot	2:00	2:00		11:00	11:00
BN/PLT FFE	1:00	1:00		1:35	1:35
Primary Target	:30	:30		:25	:25
Immediate Suppression	:30	:30		:40	:40
Immediate Smoke	:30	:30		:40	:40
Quick Smoke	NA	:30		5:25	5:25
Low adjust	NA	NA		4:35	4:35
High adjust	3:00	3:00		5:45	5:45
Copperhead	NA	NA		NA	2:30
FASCAM	NA	NA		NA	15+
FPF	:30	:30		:25	:25

Table F-7. Artillery radar planning data

ATP 3-09.12

Asset	*Search Sector (degrees)*	*Planning range detection mortar (km)*	*Planning range detection Artillery (km)*	*Planning range detection Rocket (km)*	*Min range (m)*
Q-36	90	18	14.5	24	750
Q-37	90	30	30	50	3000
Q-50 (LCMR)	360	10	10	10	500
Q-53	90/360	20 (90°) / 15 (360°)	34 (90°) / 25 (360°)	50 (90°) / 20 (360°)	500 (90°) / 3000 [mortars] 5000 [artillery & rockets] (360°)

Notes. 1. If multiple Q-50s are operating in the same area, each system is minimum of 1000 m apart and on a different frequency
2. 2x Q-53 operating in one of the 360 degree mode must be separated by 20 km
3. 2x Q-53 operating in one of the 90 degree modes must be separate by 5 km and facing the same general direction with a max angle of 50 degrees
LCMR lightweight countermortar radar

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Appendix G

Sustainment Planning Factors

This appendix describes the principles of sustainment and sustainment planning, execution, and logistics. It also describes associated personnel services and health service support.

PRINCIPLES OF SUSTAINMENT

G-1. This section is derived from ADP 4-0.

G-2. The sustainment principles are essential to maintaining combat power, enabling strategic and operational reach, and providing Army forces with endurance.

- *Integration* is combining all of the sustainment elements within operations assuring unity of command and effort (ADP 4-0). Army forces integrate sustainment with joint forces and multinational operations to maximize the complementary and reinforcing effects from each Service and national resources.
- *Anticipation* is the ability to foresee events and requirements and initiate necessary actions that most appropriately satisfy a response without waiting for operations orders or fragmentary orders (ADP 4-0). Sustainment commanders and staffs visualize future operations, identify required support, and start the process of acquiring the sustainment that best supports an operation.
- *Responsiveness* is the ability to react to changing requirements and respond to meet the needs to maintain support (ADP 4-0). Through responsive sustainment, commanders maintain operational focus and pressure, set the tempo of friendly operations to prevent exhaustion, replace ineffective units, and extend operational reach.
- *Simplicity* relates to processes and procedures to minimize the complexity of sustainment (ADP 4-0). Clarity of tasks, standardized and interoperable procedures, and clearly defined command relationships contribute to simplicity.
- *Economy* is providing sustainment resources in an efficient manner that enables the commander to employ all assets to the greatest effect possible (ADP 4-0).
- *Survivability* is all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy (JP 3-34). Survivability is a quality or capability of military forces that permits them to avoid or withstand hostile actions or environmental conditions while retaining the ability to fulfill their primary mission.
- *Continuity* is the uninterrupted provision of sustainment across all levels of war (ADP 4-0). Continuity is achieved through joint interdependence, linked sustainment organizations, a strategic to tactical level distribution system, and integrated information systems.
- *Improvisation* is the ability to adapt sustainment operations to unexpected situations or circumstances affecting a mission (ADP 4-0). It includes creating, arranging, or fabricating resources to meet requirements. It may also involve changing or creating methods that adapt to changing operational environments.

G-3. Army sustainment comprises 4 components with 16 elements, as depicted in table G-1 on page 248.

Table G-1. Army sustainment elements

ADP 4-0

Logistics. ***ADP 4-0; FM 4-0***		***Financial management support FM 1-06 (not covered)***	***Personnel services.*** ***ATP 1-0.1; ATP 1-0.2***	***Health service support*** ***FM 4-02***
Distribution. ATP 4-0.1	Field services. JP 3-09; ATP 4-44; ATP 4-42	Financial operations	Human resources support. FM 1-0	Casualty care
Transportation. FM 4-01		Resource management	Legal support. FM 1-04	Medical evacuation
Maintenance.	Operational contract support. ATP 4-10/MCRP 4-11H/NTTP 4-09.1/AFMAN 10-409-O (not covered)		Religious support. FM 1-05 (not covered)	Medical logistics
Supply FM 4-40; FM 4-30			Band support. ATP 1-19 (not covered)	
General engineering support FM 3-34 (not covered)				

SUSTAINMENT PLANNING

G-4. Sustainment planning focuses on sustaining friendly forces to the degree that supported units accomplish the desired end state. The primary product of sustainment planning is the concept of support, which is produced in briefing and written formats. Annexes and appendices to plan orders (PLANORDs) and operation orders (OPORDs) detail the sustainment plan.

G-5. Some of the factors considered in initial sustainment planning include—

- Information on climate, terrain, and endemic diseases in the area of operations (AO) to determine when and what types of equipment are needed.
- Information on the availability of supplies and services. Supplies such as water and fresh food, subsistence items, bulk petroleum, and general construction materials are the most common.
- Information on the availability of warehousing, cold storage, production and manufacturing plants, reservoirs, administrative facilities, hospitals, housing, and sanitation capabilities.
- Information on road and rail networks, inland waterways, airfields, truck availability, bridges, ports, cargo handlers, petroleum pipelines, materials handling equipment, traffic flow, choke points, and control problems.
- Availability of host-nation maintenance capabilities.
- Information on available general skills such as translators and skilled and unskilled laborers.
- Agreements and contracts of host nation and partner nation available to the sustainment unit. These often determine the levels or types of requests for forces required.
- Level of threat. This determines what protection units and measures are required. Selected initial forces, follow on forces, and other requirements are impacted by the level of threat.

G-6. *Sustainment preparation of the operational environment* is the analysis to determine infrastructure, physical environment, and resources in the operational environment that will optimize or adversely impact friendly forces means for supporting and sustaining the commander's operations plan (ADP 4-0). In planning and preparation phases of operations, the command and staff consider various factors to prevent the premature culmination of operations and reduce unexpected lag or loss of sustainment capabilities due to environmental, infrastructure, on-ground conditions, and mission variables (mission, enemy, terrain and weather, troops and support available, time available, and civil considerations—METT-TC). Table G-2 lists some sources of information for sustainment preparation of the operational environment.

Table G-2. Sources for research for sustainment preparation of the operating environment

Operational logistics (OPLOG) planner	Logistics cluster (LOG Cluster)	Air Mobility Command maps	SkyVector aeronautical charts
Logistics Support Activity (LOGSA)	Logistics estimation worksheet (LEW)	Acquisition cross-service agreements (ACSA)	Quick logistics estimation tool (QLET)
The U.S. Transportation Command's single mobility system	Electronic transportation acquisition	The transportation infrastructure archive from the Transportation Engineering Agency	The World Port Source website
The Central Intelligence Agency's World Factbook	Army Geospatial Center products	Country handbooks from the Marine Corps Intelligence Activity	CultureGrams from ProQuest
Country information resources from the Combined Arms Research Library (CARL) at Ft. Leavenworth	National Geospatial-Intelligence Agency maps	U.S. bilateral relations fact sheets from the Department of State	Intellipedia-U from Intelligence Community Enterprise Services

SUSTAINMENT EXECUTION

G-7. Information in this section is derived from ATP 4-93; FM 3-96; and ATP 4-90.

G-8. Strategic and operational sustainment organizations are an integral part of delivery and reachback for materiel, transportation services, contracting, personnel services, force flow, armament, contracting, and other services vital to the warfighter. These organizations are found on the battlefield as low as the battalion level coordinating and managing the delivery of sustainment services, personnel and equipment. Table G-3 lists many of the organizations sustainment staffs rely on.

Table G-3. Sustainment enterprise partners

FM 4-0

Defense Logistics Agency (DLA)	U.S. Transportation Command (USTRANSCOM)	U.S. Army Materiel Command (USAMC)
Defense Contract Management Agency (DCMA)	Air Mobility Command (AMC)	U.S. Army Contracting Command
Defense Finance and Accounting Service (DFAS)	Military Surface Deployment and Distribution Command (SDDC)	Joint Munitions Command (JMC)
Army Sustainment Command (ASC)	Military Sealift Command (MSC)	U.S. Army Finance Command (USAFINCOM)
Human Resources Command (HRC)		

ARMY SUSTAINMENT UNITS AT THEATER AND BELOW

G-9. Sustainment operations below the national level are conducted organically and through the attachment, detachment, and coordination of sustainment providers. Some units that provide command and control (C2), acquisition services, coordination up and down the echelons, and assets to the BCT and below are—

- Theater sustainment command (TSC)
- Expeditionary sustainment command (ESC)
- Army field support brigade (AFSB)
- Sustainment brigade (SB)
- Division sustainment brigade (DSB)
- Army field support battalion (AFSBN)
- Combat sustainment support battalion (CSSB)
- Division sustainment support battalion (DSSB)
- Brigade support battalion (BSB)
- Forward support company (FSC)

G-10. The **TSC** and its subordinate units are assigned to a theater army or Army Service component command supporting a geographical combatant commander.

G-11. The **ESC** is the corps theater level sustainment command. The ESC deploys to an AO or joint AO and provides command and control capabilities to multiple SBs or when the TSC determines that a forward command is required.

G-12. The **AFSB** synchronizes and integrates U.S. Army materiel command capabilities in support of Army service component commands and corps. The AFSB provides command and control capabilities to multiple AFSBNs.

G-13. The **SB** is a multifunctional headquarters integrating and employing all assigned and attached units while planning and synchronizing sustainment operations. The SB is the focal point for delivery of supplies and services from the operational to the tactical level. It also provides support to brigade combat teams (BCTs); multifunctional and functional support brigades; deployable, self-contained division and corps headquarters; and other units operating in its assigned support area.

G-14. The **DSB** is assigned to a division. The DSB employs sustainment capabilities to create desired effects in support of the division command's objectives. The DSB and its subordinate units assigned to a division provides direct support to all assigned and attached units in an operational area, as directed by the division commander. The DSB provides GS logistics, personal services, and financial management to non-divisional forces operating in the division AO.

G-15. The **AFSBN** synchronizes and integrates U.S. Army Materiel Command capabilities in support of divisions.

G-16. The **CSSB** is the building block upon which SB capabilities are developed. The CSSB controls execution and synchronizes logistics support in a designated AO. The CSSB is task-organized with functional companies, teams, and detachments that execute transportation (mode, terminal, and movement control) operations, maintenance operations, ammunition operations, supply support activity operations, water operations, petroleum operations, aerial delivery operations, and mortuary affairs. It employs and controls up to six company-sized units conducting logistics operations. The CSSB is task-organized with units required to support logistics requirements. A task-organized CSSB is dependent on the SB for administrative support; the support maintenance company for field maintenance and recovery support; the area support medical company for Role 2 medical support; and an expeditionary signal battalion or the SB for communications support.

G-17. The **DSSB** is organic to a DSB assigned to a division. The DSSB and its subordinate units must be able to move and displace at the pace of large-scale combat operations (LSCO). The DSSB synchronizes and executes logistics support to BCTs, multifunctional support brigades attached to the division, and non-divisional units operating in the division AO.

G-18. The **BSB** is an organic component of a BCT and some support brigades. When resourced, the BSB provides supply, maintenance, motor transportation, and Roles 1 and 2 medical support (see FM 4-02) to the BCT or supported brigade. The BSB provides distribution capability with its distribution company truck squads operating 24-hour delivery of all supply classes. The distribution company general supply section receives, stores, issues, and transloads approximately 29 short tons of class (CL) I, II, III (P), IV, and CL VII supplies daily (see figure G-4 on page 263 and paragraphs G-49 through G-75 for CL descriptions). The CL IX section handles approximately 2 short tons of CL IX daily and manages up to 1,500 lines of an authorized stockage list (ASL). The ammunition transfer holding point (ATHP) section can handle approximately 52 short tons of CL V daily. Fuel capacity of the BSB varies by type between 25,000 (infantry brigade combat team)–90,000 (armored brigade combat team) gallons. These assets can be centralized but are more commonly distributed to provide support as far forward as possible (see table G-4 and FM 4-0 for the structure and operation of the BSB).

Table G-4. Brigade support battalion components

ATP 4-90

BSB distribution company components	***Capability***
HHC company	Command and control, administrative, and logistics support for all organic, assigned, operational control (OPCON), and attached units to the BSB.
Distribution company	The BSB distribution company executes daily receipt, storage, and issue of CL I, II, III, IV, V, and IX supplies and transports cargo in general support of its brigade combat team in decisive action operations.
Transportation platoon	Transportation support. Distribution to FSC.
Supply platoon	SSA receives, stores, and issues CL I, II, III(P), IV, V, VII, IX, packaged water, and retrograde materiel.
Fuel and water platoon	Water storage and issue point for the BCT. CL III(B) distribution for the BCT. No CL III storage capacity.
Field Maintenance Company	Field-level maintenance support to the BSB and the BCT.
Maintenance control platoon	Directs, controls, and supervises the unit's field-level maintenance mission and activities; maintains shop stock and bench stock for shop operations; performs maintenance management and production control functions for units operating within the BSA.
Maintenance platoon	Provides shop and onsite contact field-level maintenance support for the companies of the BSB, additional field-level maintenance support to the FSCs, and when able, general support to units traversing through the BSA and its AO.
Brigade Support Medical Company (BSMC)	Army Health System (AHS) support to a brigade combat team; Role 1 and Role 2 in support of a brigade combat team and AHS support on an area basis to all BCT units without organic medical assets.
Treatment platoon	Receives, triages, treats, and determines the disposition of patients in the brigade AO; provides for advanced trauma management, tactical combat casualty care, general medicine, general dentistry, and physical therapy. In addition, the medical treatment platoon has limited radiology, medical laboratory, and patient holding capabilities.
Evacuation platoon	Performs ground evacuation and enroute patient care for supported units; employs ten evacuation teams, utilizing wheeled or tracked ambulances; provides organic and area evacuation capability.
Behavioral health section	Supports commanders in the prevention and control of combat and operational stress reaction through the brigade's behavioral health activities.
Preventative medicine section	Provides preventative medical support to the BCT and area support when required.
Brigade medical supply office (BMSO)	Provides brigade level, Role 2, class VIII coordination, synchronization, and execution of medical logistics support for the BSMC and supported BCT.
Forward Support Company X6	Provides direct support to maneuver, engineer, cavalry, fires, aviation, and maneuver enhancement battalions and special forces groups; provides field feeding, bulk fuel, general supply, ammunition, and field-level maintenance to its maneuver battalion.
Field feeding section	Conducts field feeding operations.
Distribution platoon	Consists of a platoon headquarters and four squads that can be task-organized to distribute CL II, III, IV, V, and VII supplies.
Maintenance platoon	Performs field-level maintenance, maintenance management, dispatching, and scheduled maintenance operations for their supported maneuver battalion and FSC vehicles and equipment.

Note. A *short ton* is the equivalent of 2,000 pounds (0.907 metric ton) of weight (ATP 4-35).

G-19. The **FSC** is organic to the BSB for regular BCTs and other select units. The FSC is the critical supply delivery and distribution manager for the BCT battalion. Each FSC is manned and equipped to transport, store, and distribute all classes of supply to supported units. The FSC receives, stores, issues, and distributes between 5,000–30,000 gallons of CL III (B) daily using the modular fuel system's (MFS's) tank rack module (TRM). It can distribute over 176 short tons of general cargo (CL I, II, IV, and IX) and Class V supplies daily.

G-20. An FSC may be attached to or placed under operational control of its supported battalion for a limited duration. The fires brigade FSCs are separate companies (numbered not lettered). They are normally assigned to the BSB and attached to, or under operational control of, an artillery battalion for the duration of an operation or as determined by the brigade commander.

G-21. Combat aviation brigades have an organic aviation support battalion (ASB) and FSCs. Aviation FSCs and aviation maintenance companies are organic to aviation brigade battalions, not the aviation support battalion. Within the maneuver enhancement brigade and engineer brigade, engineer battalions have FSCs, but military police and chemical, biological, radiological, and nuclear battalions do not. SBs have neither BSBs nor FSCs.

LOGISTICS

G-22. *Logistics* is planning and executing the movement and support of forces. It includes those aspects of military operations that deal with: design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; acquisition or construction, maintenance, operation, and disposition of facilities; and acquisition or furnishing of services (ADP 4-0). Logistics consists of the following areas: distribution, transportation, supply, maintenance, field services, general engineering (not covered in this publication), and operational contract support (not covered in this publication).

DISTRIBUTION MANAGEMENT PROCESS

G-23. Information in this section is derived from ADP 4-0, AR 56-4, ATP 4-0.1, JP 4-0, JP 4-09, ATP 4-16, ATP 4-13, FM 3-96, ATP 4-93, and ATP 4-42.

G-24. *Distribution* is the operational process of synchronizing all elements of the logistic system to deliver the "right things" to the "right place" at the "right time" to support the geographic combatant commander (JP 4-0). Operational forces use the distribution management process to move material within a theater. Distribution management synchronizes and optimizes transportation, its networks, and material management to move personnel and material from point of origin to point of need in accordance with the supported commander's priorities. The process includes integration of material management and transportation operations to ensure timely distribution.

G-25. Sustainment headquarters (TSC, ESC, sustainment brigade, division sustainment brigade, CSSB, DSSB, and BSB) distribution management centers or support operations sections execute the distribution management process. The Army Service component command (ASCC), field Army, corps, and division staffs support the process by determining, validating, and communicating support requirements to the sustainment headquarters. A clear understanding of support requirements ensures that commanders executing close operations receive needed supplies. Operational and sustainment commanders and staffs should synchronize requirements to ensure responsive support. This coordination is conducted via command, staff, and technical channels.

G-26. The distribution management process consists of three components: material management, distribution integration, and transportation. However, components are not intended to stand alone or be compartmentalized. Personnel executing all components should constantly coordinate and collaborate for successful operations.

G-27. The material management component involves the continuous situational understanding, planning, and execution of supply and maintenance capabilities. Effective material management requires anticipation, synchronization, and resourcing of all classes of supply to maximize combat power and enable freedom of action in accordance with the supported commander's priorities. Material management ultimately determines availability of the material from on-hand or higher source-of-supply stocks, obtains the material, and coordinates its distribution with the distribution integration personnel according to command priorities. The TSC, ESC, and distribution management center (DMC) execute material management. The CSSB, DSSB, and BSB support operations staff also execute material management. Material management personnel provide the distribution integration branch with the commodity to be moved, quantity to be moved, and priority of distribution by commodity and unit.

G-28. The distribution integration branch (DIB) within the TSC and ESC distribution management center executes distribution integration. The support operations staff within the sustainment brigade, DSB, DSSB, CSSB, and BSB also execute distribution integration. The DIB receives input from the material management sections and develops the plan for execution. The plan includes the commodity to be moved, quantity to be moved, and priority of movement. The plan also recommends a mode of transportation based on the community and priority. Once the distribution integration personnel complete the plan, the distribution management center (TSC and ESC) or support operations staff (CSSB, DSSB, and BSB) passes the plan to the G3/S3 to be included in the orders process.

G-29. The transportation component receives input from the distribution integration or support operations staff and allocates adequate transportation modes for specific commodities to ensure timely distribution of material. The transportation managers coordinate with movement control elements for timing and routing of transportation to meet command priorities. The TSC, ESC, and DMC transportation operations branch and the CSSB, DSSB, and BSB support operations transportation personnel execute these functions.

Distribution Planning

G-30. Distribution planning includes considering terminal types, methods of distribution, mode operations, the supply chain and supply trains, and retrograde of material. These topics are discussed in paragraphs G-31 through G-35.

Terminals

G-31. Distribution of material into, within, and out of theater depends on terminal operations. Terminals are operated either by military personnel or commercially. Three types of terminals exist:

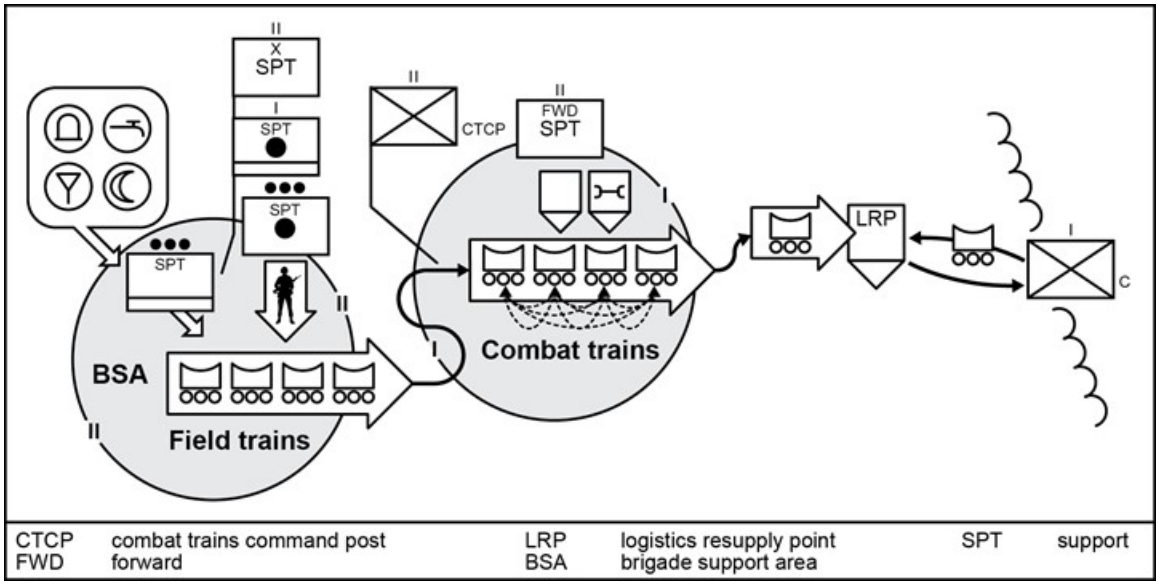
- **Land terminals** include centralized receiving and shipping points, trailer transfer points, and rail, petroleum, and inland water terminals. Land terminals are established at points along air, rail, river, canal, pipeline, and motor transportation lines of communication to provide for the transshipment of cargo and personnel carried by these modes. Inland terminals are key enablers or links between modes when terrain and operational requirements cause a change in type of conveyance.
- **Sea terminals**, such as seaports, are nodes at the start or end of a shipment route by sea.
- **Air terminals**, such as airports or austere runways, are nodes at the start or end of a shipment route by air.

Methods of Distribution

G-32. Operational variables and theater conditions generally dictate the method of distribution each echelon selects. The three methods are throughput distribution, supply point distribution, and unit distribution:

- ***Throughput distribution*** is a method of distribution which bypasses one or more intermediate supply echelons in the supply system to avoid multiple handling (ATP 4-11). This method is often used to get critical CL III, V, and VII supplies to a BSB as they arrive in theater, to prolong an operation, or to extend operational reach and avoid culmination. Throughput distribution can be extended to FSCs and users in extenuating circumstances. Such support relies on an operational unit communicating requirements and a sustaining unit responding. Aerial delivery is a common method. Throughput distribution is used for speed and efficiency, to address shortages as assets become available, and for surge situations.
- **Supply point distribution** is a routine distribution method by which a unit moves to a supply point to receive supplies and returns to its original location using organic transportation. The supply unit distributing supplies is responsible for breaking down supplies received from higher echelons for distribution to subordinate units. For example, an FSC assembles a convoy to pick up supplies from the BSB, and then returns to its original location. The BSB will load supplies at the supply point, but has no other responsibility in this method.
- **Unit distribution** is a method of distributing supplies where the receiving unit is issued supplies in its own area with transportation furnished by the issuing agency. The distributor is responsible for filling supply requests and transporting items to a location predetermined by the receiving

unit. The receiving unit is responsible for the download and storage of the supplies in their area of responsibility. For example, the BSB will load and deliver supplies to the FSC then return to the original location. The FSC is responsible for downloading the supplies from the BSB and storing and distributing the supplies as necessary. Figure G-1 shows a notional battalion concept of distribution.



ATP 4-90

Figure G-1. Notional battalion concept of distribution

Mode Operations

G-33. Mode operations describe the methods by which sustainment and cargo are delivered. Two modes of operation, surface and air, are available to logisticians performing the theater distribution function. Surface modes include motor, water, and rail operations, and air modes consist of fixed-wing and rotary-wing aircraft. Distribution modes follow:

- *Motor transportation* is a ground support transportation function that includes moving and transferring units, personnel, equipment and supplies by vehicle to support the operations (ATP 4-11). Motor transportation provides essential distribution capabilities for organizations and is the predominant mode of transportation for the reception, onward movement, and sustainment of forces. Motor transport units provide the ability to perform line haul movements operated for extended distances over main supply routes that can serve the entire theater. There are many factors to consider when planning motor transport operations including convoy organization, control measures, and the security and integration of host nation, contract, or allied vehicles.
- *Logistics over-the-shore operations* are the loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas dependent on threat force capabilities (JP 4-01.6). Logistics over-the-shore operations include all processes from in-stream discharge through the off-loading, and arrival of equipment, cargo, and supplies at the inland staging and marshalling areas. Logistics over-the-shore operations provide a critical capability for bringing equipment, cargo, and supplies into theater in areas with degraded or austere port facilities, or they can be used to bypass enemy anti-axis or area denial efforts. Logistics over-the-shore operations can also supplement existing port facilities. They can provide the combatant commander with the option to choose which off-load locations to use, such as bare beach, austere port, or a damaged fixed port. Using a variety of Army watercraft systems, the Army can conduct its own logistics over-the-shore

operation, or it can operate in conjunction with the Navy in a joint logistics over-the-shore operation.

- *Joint logistics over-the-shore operations* are operations in which Navy and Army logistics over-the-shore forces conduct logistics over-the-shore operations together under a joint force commander (JP 4-01.6).
- Railway operations are the incorporation of rail operations into theater distribution planning. This requires assessing existing rail infrastructure and planning, advising, and assisting host-nation rail personnel when required to support assigned missions (see ATP 4-14 for more information about railway operations).
- Aerial delivery provides an efficient and effective means of conducting distribution operations. Aerial delivery includes airland, airdrop, and sling-load operations. Aerial delivery is increasingly employed as a routine distribution method, primarily for areas that are unreachable due to terrain, enemy situation, or for urgent resupply operations. When applied together with surface distribution operations, aerial delivery enables maneuver forces to engage in a battle rhythm that is not as restricted by geography, supply routes, tactical situations, or operational pauses for logistics support. The type used for a specific mission depends on what is to be dropped, how much accuracy is required, the threat situation, and airdrop equipment available (for more information on aerial delivery operations, see ATP 4-48).

Supply Chain and Supply Trains

G-34. Supply chains followed by supply field trains or combat field train delivery takes supplies from acquisition to user, using commercial then military modes of transportation. The final tactical mile is completed using echeloned storage and delivery systems organic to, or attached to, the SB and the BCT.

Retrograde of Materiel

G-35. *Retrograde of materiel* is an Army logistics function of returning materiel from the owning or using unit back through the distribution system to the source of supply, directed ship-to location, or point of disposal (ATP 4-0.1). Retrograde includes turn-in, classification, preparation, packing, transporting, and shipping. To maximize retrograde and delivery of material, units and sustainment providers seek to maximize the amount of materiel on each conveyance. **Never let a truck leave empty** (see ATP 4-0.1; DODM 4160.21, Vol 1; and ATP 3-37.10).

TRANSPORTATION OPERATIONS

G-36. The information in this section is derived from ATP 4-93; ATP 4-11; FM 4-01. *Transportation* is a logistics function that includes movement control and associated activities to incorporate military, commercial, and multinational motor, rail, air, and water mode assets in the movement of units, personnel, equipment, and supplies in support the concept of operations (ADP 1-02).

G-37. During large-scale combat operations (LSCO), a large number of movements occur within an AO. Transportation managers must de-conflict and maximize platforms to reduce the number targets on any given route. Transportation planners rely on information collected during intelligence preparation of the battlefield, sustainment preparation of the operational environment, and distribution planning to develop a transportation scheme.

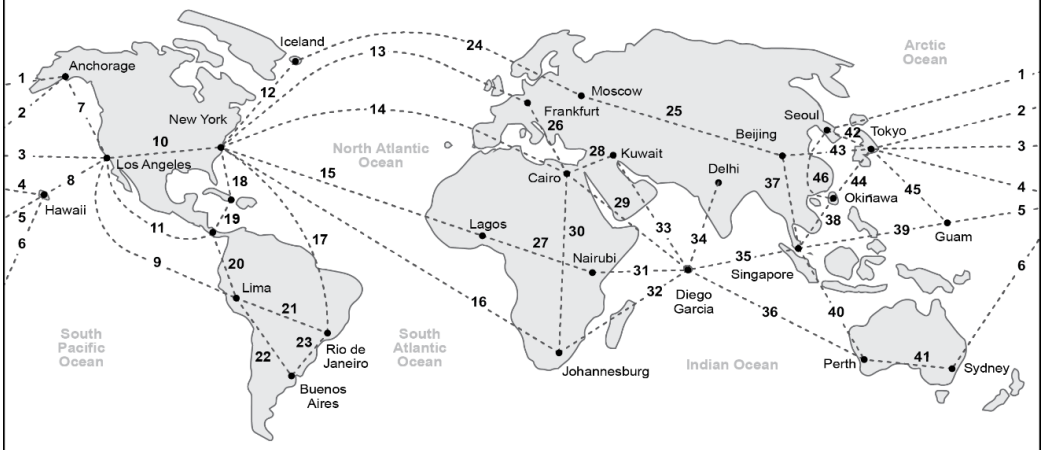
Deployment and Redeployment

G-38. The joint system uses 463L palletized loads, International Organization for Standardization (ISO) containers, and ISU® containers to move the majority of equipment and supplies into a theater. Utilization and tracking of distribution platforms is covered in AR 56-4.

G-39. The transportation provider determines the mode of shipment based on the urgency of the request. Figures G-2 and G-3 on page 256 depict general shipment times for air and surface shipments worldwide.

Air Route Times (Hours)

Route	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
NM	3303	3024	4802	3997	3385	4413	2060	2211	3612	2160	2589	2283	3339	4868	4559	6895	4153	1260	761	1223	2038	1690	1069
460 Kts[1]	7.2	6.6	10.4	8.7	7.4	9.6	4.5	4.8	7.9	4.7	5.6	5.0	7.3	10.6	9.9	15.0	9.0	2.7	1.7	2.7	4.4	3.7	2.3
425 Kts[2]	7.8	7.1	11.3	9.4	8.0	10.4	4.8	5.2	8.5	5.1	6.1	5.4	7.9	11.5	10.7	16.2	9.8	3.0	1.8	2.9	4.8	4.0	2.5
290 Kts[3]	11.4	10.4	16.6	13.8	11.7	15.2	7.1	7.6	12.5	7.4	8.9	7.9	11.5	16.8	15.7	23.8	14.3	4.3	2.6	4.2	7.0	5.8	3.7



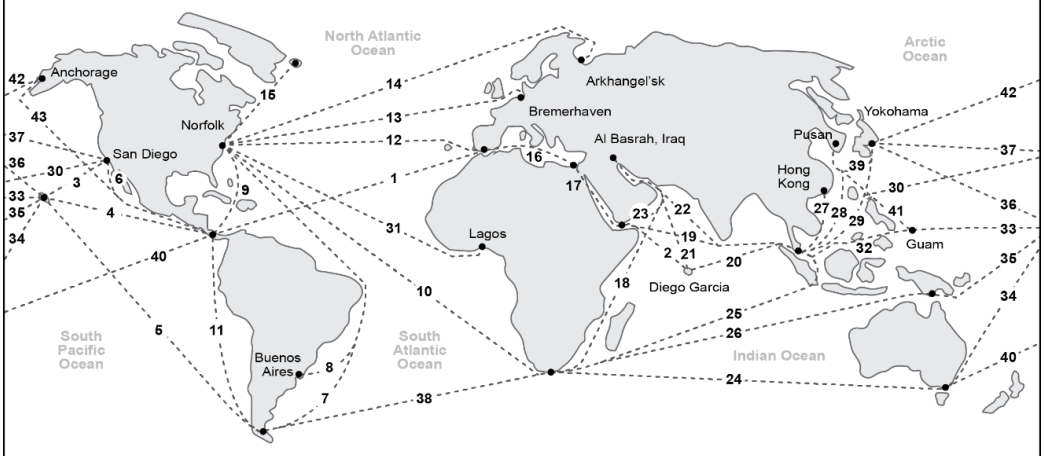
Route	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
NM	1781	3161	1583	2052	856	3356	3342	2169	2755	2607	2153	1938	2833	2407	2046	2547	2089	1796	638	1135	829	1357	670
460 Kts[1]	3.9	6.9	3.4	4.5	1.9	7.3	7.3	4.7	6.0	5.7	4.7	4.2	6.2	5.2	4.4	5.5	4.5	3.9	1.4	2.5	1.8	3.0	1.5
425 Kts[2]	4.2	7.4	3.7	4.8	2.0	7.9	7.9	5.1	6.5	6.1	5.1	4.6	6.7	5.7	4.8	6.0	4.9	4.2	1.5	2.7	2.0	3.2	1.6
290 Kts[3]	6.1	10.9	5.5	7.1	3.0	11.6	11.5	7.5	9.5	9.0	7.4	6.7	9.8	8.3	7.1	8.8	7.2	6.2	2.2	3.9	2.9	4.7	2.3

[1] Heavy Bomber [2] Heavy Airlift, Tanker, Ferrying Fighter [3] Intra-Theater Airlift

Figure G-2. Air route times for cargo and personnel transport

Sea Route Times (Days)

Route	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
NM	4351	2090	2278	4685	6370	2843	6900	5786	1825	6802	3932	3335	3758	4399	2677	1943	1400	5232	3627	2710	2656	3916
18 KTS [1]	10.1	4.8	5.3	10.8	14.7	6.6	16.0	13.4	4.2	15.7	9.1	7.7	8.7	10.2	6.2	4.5	3.2	12.1	8.4	6.3	6.1	9.1
25 KTS [1]	7.3	3.5	3.8	7.8	10.6	4.7	11.5	9.6	3.0	11.3	6.6	5.6	6.3	7.3	4.5	3.2	2.3	8.7	6.0	4.5	4.4	6.5



Route	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41*	42	43
NM	1967	5530	5696	6854	1454	2502	2889	7736	4941	2585	3318	4792	4191	3397	4932	4362	665	7770	1740	2696	5840
18 KTS [1]	4.6	12.8	13.2	15.9	3.4	5.8	6.7	17.9	11.4	6.0	7.7	11.1	9.7	7.9	11.4	10.1	1.5	18.0	4.0	6.2	13.5
25 KTS [1]	3.3	9.2	9.5	11.4	2.4	4.2	4.8	12.9	8.2	4.3	5.5	8.0	7.0	5.7	8.2	7.3	1.1	13.0	2.9	4.5	9.7

[1] Sealift Convoy [2] Carrier Battle Group Reference: "Distance Between Ports" DMA Pub. 151 1995 * Estimated

Figure G-3. Estimated surface transit times from port to port

Transportation in Theater

G-40. Transportation providers execute transport from the port of embarkation (POE) to the port of debarkation (POD) and, if required (by contract), from the POD to a marshaling area for pick-up in support of reception, staging, onward movement, and integration.

G-41. Some factors used in transportation planning to compute vehicle and truck company requirements are—

- Delivery requirements in gallons, short tons, pallets, containers, and platform availability.
- Driver availability.
- Mission variables (METT-TC).
- Vehicle availability
  - Short Range Planning: 87 percent (Use only for an all-out effort less than 30 days).
  - Long Range Planning: 75 percent (This is the standard transportation planning factor).
- Daily Round Trips (average)
  - Line Haul: one trip/day (one/shift) @ one way per operating shift, about 144 km (90 miles)
  - Local Haul: two trips/day (two/shift) @) one way per operating shift, about 32 km (20 miles)
- Average km or miles in an hour
  - Unimproved roads: 16 km (10 miles)/hour
  - Improved roads: 32 km (20 miles)/hour

Table G-5 on page 258 details conveyance load capabilities. Tables G-6 through G-8 on pages 258–259 show standardized categories of Soldier weights, planning data for the 463L cargo system, and aircraft planning data, respectively.

Table G-5. Conveyance load capabilities

JP 4-02; GTA 55-07-003; FM 3-04; AFTTP 3-3

Asset	*Warehouse pallets*	*463L pallets*	*Minutes up/down load*	*Max personnel*	*Max litter*	*Max ambulatory*
20’ container	16		10			
40’ container	32		10			
M872 Trailer	18		10	30		
M871 Trailer	12	4	8	50		
Supply van	12	3	8			
463L Pallet	4					
PLS Flatrack	10	2	2			
LMTV	6		4	12		
M3/M3A1 CROP	8	2	2			
MTV	8		6	22		
HEMTT	8		6	9		
UH-60/HH-60 Black-hawk				11	6	6
CH-47 Chinook	12	3		31	24	31
UH-72 Lakota				8	2	8
CH-46 Sea Knight	7	2		15	6	15
CH-53 Sea Stallion	4	2		19	8	19
V-22 Osprey				24	12	24
Sherpa	4			30	24	30
C-21				3	1	3
C-130 H/J-30		6/8		64/92	74/96	74/96
C-17 Globemaster		18		102	36	54
C-5 A/B Galaxy		36		73		70

CROP Container roll-in/roll-out platform PLS Palletized load system

Table G-6. Standard Soldier weights

Category	*Weight*	*Details*
Category 1	210 lbs per Soldier	Includes assault pack weapon and helmet
Category 2	300 lbs per Soldier	Includes Category 1, plus rucksack and organizational equipment
Category 3	400 lbs per Soldier	Includes Category 1, 2, and duffel bag (100 lbs)

Soldier planning weight for KC-10 is 180 lbs per Soldier. All Soldier baggage and hand-carried equipment will be palletized.

Table G-7. 463L Cargo system

GTA 55-07-003

	Length	*Width*	*Height*
Pallet dimensions	88 in	108 in	2¼ in
Usable space	84 in	104 in	96 in
Empty weight	290 lbs	***Weight of nets***	65 lbs
Maximum cargo weight	10,000 lbs	***Maximum gross weight***	10,355 lbs

Table G-8. Aircraft pallet data

TEA PAMPHLET 700-2, AFTTP 3-3

	C-130 H	*C-130 J CW*	*C-130 J-30*	*C-5 A/B*	*C-17*	*KC-10*	*KC-135*
Maximum 463L pallets	6	6	8	36	11 Center 18 Double row	23	6
Maximum height (inches)	1-5: 102(1) Ramp #6: 76	1-5: 103(2) Ramp #6: 77	1-7: 103(2) Ramp #8: 77	96 Aft Ramp # 35 and #36: 70	96		
Gross weight per pallet space (lbs)	1-4: 10,355(3) #5: 8,500 #6: 4,664(4)	1-4: 10,355(3) #5: 8,500 #6: 5,000(4)	1-4: 10,355(3) #5: 8,500 #6: 5,000(4)	10,355 Ramps #1,#2, #35, #36: 7,500	10,355 Max weight on ramp: 40,000		

Notes.
1. Pallet position 1 may be restricted if overhead equipment racks are installed that protrude into the cargo area. This restriction will be 76 inches and will begin at the inboard side of the dual rails and extend inboard for 12 inches.
2. Cargo height forward of LS 640 may be restricted if overhead equipment racks protrude into the cargo area. This restriction will be 76 inches and will begin at the inboard side of the cargo handling system rails and extend inboard 12 inches.
3. Value represents maximum single pallet weight, under 96 inches, when restrained with cargo nets only. Greater pallet weights may be achieved, dependent upon aircraft restrictions and method of restraint.
4. With air deflector shields installed, the maximum weight on the ramp is 4,527 pounds (MC-130 and AC-130W aircraft).

Units Providing Convoy Transportation in Theater

G-42. In addition to organic assets, motor transportation units provide additional lift and delivery options in theater to support convoy resupply of units down range. Motor transportation units may be allocated to the SB, ESC, or division in support of BCT operations. Table G-9 shows the estimated lift capabilities of palletized load system (PLS) truck companies and medium truck companies.

Table G-9. Projected lift capability

ATP 4-11

Type	*Palletized load system truck company*	*Medium truck company cargo (34T)*
Break/bulk general cargo	421 short tons	447 short tons
Break/bulk ammunition	757 short tons	803 short tons
Pallets	960	1080
463L pallets	240	240
Containers, twenty foot (TEU)	120	120
Containers, forty foot (FEU)	0	60
Bulk water	240,000 gallon	285,000 gallon
Bulk fuel	300,000 gallon	240,000 gallon
Assumes 100% total vehicle availability rate		

Convoy Planning

G-43. The material in this section is derived from JP 3-02.1 (Obsolete), ADP 3-90, ATP 4-11, ATP 4-16, ATP 3-90.97, FM 3-96, and Center for Army Lessons Learned (CALL) Newsletter No. 18-10. Not referenced, but applicable, is ATP 4-01.45/MCRP 3-40F.7 [MCRP 4-11.3H]/AFTTP 3-2.58 (Distribution D).

G-44. Convoy routes are categorized by color (green, amber, red, or black) based on criteria limiting route transit. Leaders take precautions or measures to ensure the security of convoys and troop maneuvers per

standard operating procedure, policy, or judgement (see table G-10 on pages 260–261 and ATP 4-16 for more details).

Table G-10. Sample route status

ATP 4-16

Criteria		Green	Amber	Red	Black
Enemy	Security	Security is established along routes.	Additional security is needed along routes and bypasses.	Security is not established along routes.	
	Threats	Low occurrences of enemy activities.	Two enemy attacks between the same phase lines within the last twelve hours with damage of equipment or injuries.	Enemy attacks > 3 between the same phase lines within the last 12 hours with damage of equipment or injuries.	Enemy concentration at or above level 2 attack; enemy contact imminent along route.
Command and control	Commu-nications	Communications established.	Communications established, but there are dead spots in certain areas.	No communications established.	
Terrain	Bridges	Bridges MLC > 100. No damages. No overhead restrictions.	Bridges with MLC > 25 and < 99. Damages with bypass available overhead > 4.3 and < 5m.	Bridges with MLC > 4 and < 24. Overhead < 4.3m Damaged bridges awaiting engineer damage assessment.	Non-passable; bridge completely destroyed. Bridges designated unsafe by division engineers for military traffic. No bypass available.
	Roads	Double flow roads supports wheeled vehicles with width over 7.3 m and tracked and combination with width over 8 m. All weather roads (weather proof roads).	Single lane roads (restricted to support vehicles, tracked and combination with width > 3.5 and < 6.0m). Single flow roads (restricted to support vehicles, tracked and combination with width > 6.0 and < 8.0 m. Limited all-weather routes affected by rain, frost, thaw, or heat. Road conditions delay convoy movements for < 2hrs.	Limited access roads (permits passage of isolated vehicles with width < 3.5 m and vehicles tracked combination with width < 4.0 m). Adverse weather conditions seriously affect the fair-weather route, which remains closed for long periods.	Construction: Non-trafficable routes or bridges due to severe damage due to enemy interdiction, blockages, or floods. Road remains closed for an indefinite period.
		No Obstructions: No overhead restrictions. Slopes < 7%. Curves with a radius > 45 meters. No blockages.	Obstructions: Curves with a radius of 25.1 to 45 m. Slopes > 7%. Overhead restrictions > 4.3 < 5.0 m over the route.	Obstructions: Curves with a radius > 25 m. Road blockages passable with bypass but delays traffic considerably.	Obstructions that block the entire traveled way of road. No bypass available.

Table G-10. Sample route status *(continued)*

ATP 4-16

Criteria		Green	Amber	Red	Black
Weather	Impact on personnel or maneuver	Favorable impact (wind chill or heat index temperature - 6C (21F) to 29C (85F). No light precipitation, ground dry or frozen to 12", < 6" snow depth.	Marginal Impact: Wind chill or heat index temperature 30C to 35C or -7C to -26C, moderate precipitation, lightning within 5 mi, wind > 35 knots, hail > ½ inch diameter, puddles on improved surfaces, 1"– 2" rain per 12 hours or 0.1–0.4" rain per hour, 1–2" snow per 12 hours, 6–12" snow depth, visibility 160– 800 m.	Unfavorable impact: Wind chill or heat index temperature > 35C (95F) or < -26C (-15F). Heavy precipitation, with > 49 knots, hail > ¾" diameter, sand storms that reduce visibility to < 25 m.	Unfavorable impact that causes a cease of military operations for more than two days. Visibility < 10 m for sustainment convoys. No MEDEVAC coverage available due to extreme weather. MEDEVAC will not fly during the following conditions – Day: < 500 ceiling and or 1 mile visibility, Night: < 700 ceiling or 2 mile visibility. Thunder storm warning or gusts > 45 knots.
Multi-national operations		No occurrences or scheduled friendly operations.	Scheduled or ongoing friendly operations without access restrictions.	Limited friendly operations with access restrictions.	Heavy enemy concentration; multinational forces engaged in ongoing offensive operations.
Unit/friendly action		Absolute verification of no threat.	Threats are possible even if no immediate perceivable threat is present.	Observed and reported an unconfirmed threat or interrogated, has limited use by multinational forces within last 7 days or security assets are not available in the specific area.	No traffic can travel on it due to washout, damage, or a unit route clearance, or EOD observes and reports a confirmed threat.
Note. Route status is established in intelligence preparation and sustainment preparation of the battlefield and is updated throughout the course of operations. During LSCO, the determination of restriction such as Green, Amber, Red, or Black is a commander's decision.					

Management of Containers and Flatracks

G-45. Use and tracking of distribution platforms is covered in AR 56-4. Table G-11 on page 262 details the various types of conveyance platforms.

Table G-11. Conveyance platforms

TEA PAMPHLET 700-2

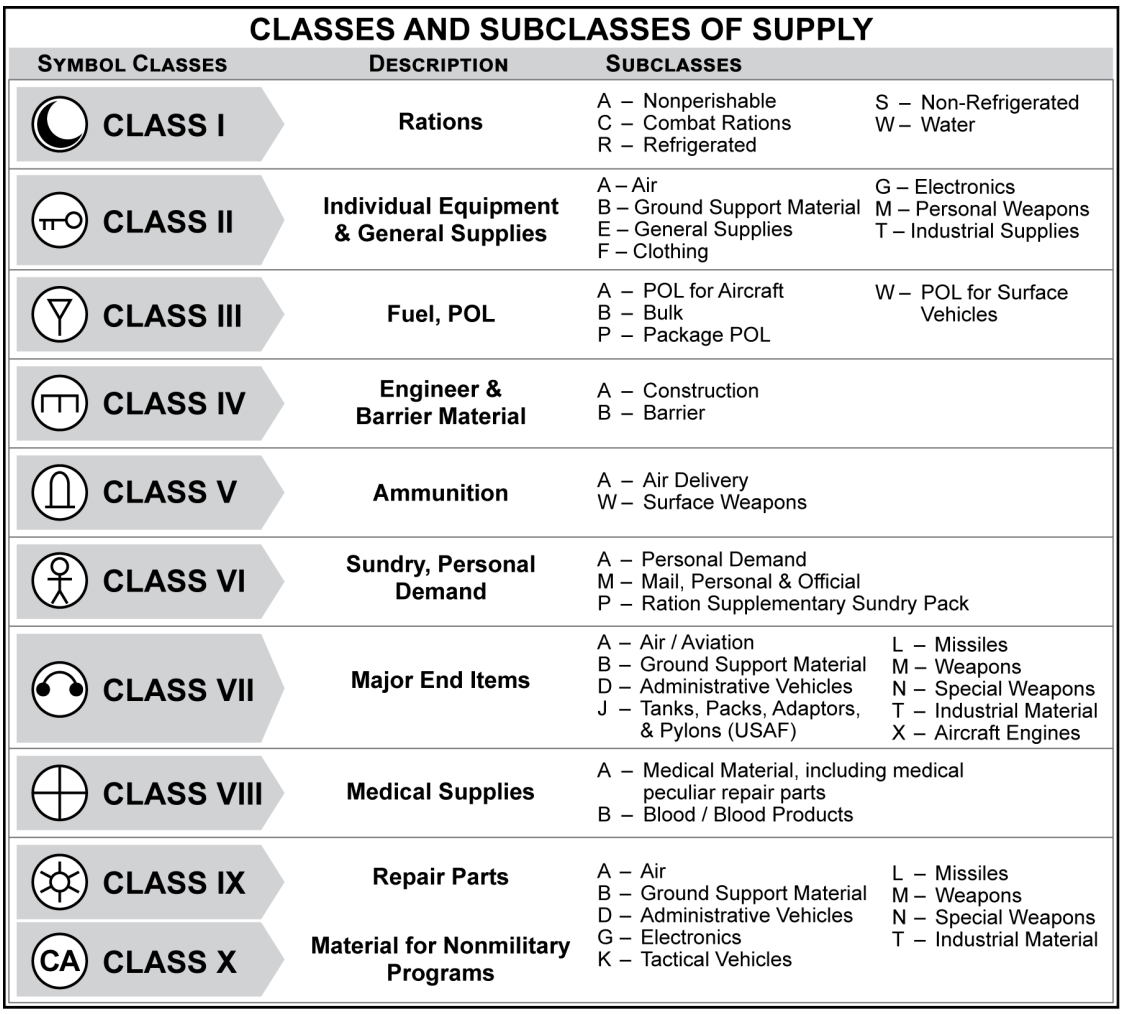
Platform	*Size*	*Details*
M1 Flatrack	20 ft	Compatible BCD flatrack with inward folding end walls designed to support intermodal transport by allowing stacking in a ship's container cells.
M1077 Flatrack	20 ft	A-frame BCD flatrack is the original flatrack fielded from 1994 to 1996. It has one fixed end wall and is designed to distribute payloads, to include containers, forward of the corps rear boundary.
M3/M3A1 CROP	20 ft	The CROP (container roll-in/roll-out platform) is a PLS and/or HEMTT–LHS BCD flatrack, which serves as the internal blocking and bracing system for a 20-foot end-opening container and can be quickly extracted or inserted by a LHS for movement
ISU 90	108"x 88"x 91.35"	One pallet position on platform. Load capacity 10,000 lbs
20-ft Container	20 ft	Open space for cargo. Requires blocking and bracing
40-ft Container	40 ft	Open space for cargo. Requires blocking and bracing
463L Pallet	108"x 88"	104'x84' usable space. One pallet position on platform.

SUPPLY AND RESUPPLY

G-46. The material in this section is derived from ADP 4-0, AR 710-1, AR 710-2, AR 740-1, ATP 4-42, ATP 4-42.2, ATP 4-43, TC 8-270, JP 4-09, AR 30-22, ATP 4-48, ATP 3-34.22, FM 4-0, and FM 4-30.

Supply and Resupply Planning

G-47. During sustainment preparation of the operational environment planners develop supplies and services estimates, gather information on the availability of supplies and services readily available in the AO, and begin the flow of materiel into theater. Subsistence items, bulk petroleum, ammunition, and barrier materials are the most commonly needed supplies for deployed forces. Acquisition of materials and movement of materiel in theater begins as soon as planning estimates are validated. Figure G-4 depicts classes and subclasses of supply.



JP 4-0

Figure G-4. Classes and subclasses of supply

G-48. Early estimation of critical classes of supply required to sustain operations is necessary for any planning effort. Maintenance of the running estimate for the sustainment section covers estimated consumption of all classes of supplies. However, with limited time available, planners focus on CL I, III, and V because shortages of these supply classes may result in culmination. Table G-12 on page 264 provides estimated bulk consumption rates of CL III, CL V, CL I, and CL I Water for brigade combat teams and their respective battalions and companies, based on historical data. This estimate serves as a starting point for planning only and will need to be updated by logistics planners for each planning effort.

Table G-12. Brigade combat team CL I, III, and V estimated daily consumption rates

Quick Logistics Estimation Tool

	CL III	*CL V*		*CL I*		*CL I Water*		
	(gallons)	(short tons)	(pallets)	(short tons)	(pallets)	Bulk (gallons)	Bottled (short tons)	Bottled (pallets)
SBCT	39,224	32.7	43	18.55	45	14,752.6	61.52	154
Infantry battalion	2571	0.54	1	2.72	7	2165.8	9.03	23
Reconnaissance squadron	5162	0.3	1	2.04	5	1625.2	6.78	17
Field artillery battalion	3901	30.73	37	1.52	4	1207	5.03	13
Brigade engineer battalion	6067	0.06	1	1.84	5	1465.4	6.11	16
Brigade support battalion	13,122	0.03	1	4.28	10	3400	14.18	36
ABCT	117,708	31	42	18.4	43	14,633.6	61.02	153
AR heavy combined arms battalion	20,673	0.31	1	1.88	5	1492.6	6.22	16
IN heavy combined arms battalion	15,671	0.41	1	2.19	5	1744.2	7.27	19
Reconnaissance squadron	15,883	0.42	1	1.95	5	1553.8	6.48	17
Field artillery battalion	8111	29.54	36	2.16	5	1720.4	7.17	18
Brigade engineer battalion	11,179	0.13	1	1.96	5	1560.6	6.51	17
Brigade support battalion	24,827	0.04	1	5.81	13	4620.6	19.27	49
IBCT	29,452	13	20	17.92	43	14,249.4	59.42	149
Infantry battalion	1869	0.33	1	2.76	7	2196.4	9.16	23
Reconnaissance squadron	2949	0.14	1	1.53	4	1220.6	5.09	13
Field artillery battalion	3740	11.28	14	1.76	4	1400.8	5.84	15
Brigade engineer battalion	5595	0.06	1	1.87	5	1489.2	6.21	16
Brigade support battalion	10,983	0.03	1	3.91	9	3107.6	12.96	33

CL I Food

G-49. The approved feeding standard is three quality meals per day achieved by using a combination of unitized group rations (UGRs) and individual operational rations (primarily meals ready to eat (MREs) or first strike rations (FSRs)). During initial deployment to an undeveloped area, ration support is on a push system. Operational rations are used for all meals. MREs can be used as the sole ration for up to 21 days, but after 3 days require supplements (see DA Pam 30-22 for additional guidance). Planners include religious and dietary requirements in their Class I estimates. Chaplains provide assistance in validating requirements but are not the means for ration distribution. Make requests in sufficient time to allow for delivery (see table G-22 on page 280 for operational rations planning factors).

G-50. Units can request, contract, or requisition from higher echelons, fresh fruits and vegetables. These food products are generally delivered as part of a theater contract to units below the theater level. Fresh fruits and vegetables and other food stuffs can be obtained locally when approved by veterinary services and prepared by unit cooks or contracted personnel.

CL I Water

G-51. Storage and distribution of potable water are supply functions. Water purification is a field service. Water is required for drinking, cooking, hydration, sanitation, medical treatment, mortuary affairs, construction, decontamination, and maintenance. The amount of water needed depends upon the regional climate and the type and scope of operations.

Ice and Bottled Water

G-52. Procedures for ordering and issuing ice are contained in DA Pam 30-22. Potable ice required for installation needs, regardless of source, are made, stored, and conveyed per TB MED 530.

CL I : Bulk Water

G-53. Bulk water planning follows the military decision-making process in terms of identifying capabilities, requirements, and shortfalls.

G-54. Calculate bulk water needs on a per-person, per-day cycle. Adjust water consumption requirements with historical data as an operation progresses. Common requirements for water in theater are listed in table G-23 on page 280 and tables G-24 and G-25 on page 281. Table G-26 on page 281 details bulk water storage and transport capacity.

CL II

G-55. CL II includes clothing, individual equipment, tentage; tool sets and kits, hand tools, administrative and housekeeping supplies, and equipment. Equipment includes maps, automation, and other equipment items (except major end items prescribed in allowance tables) and items of supply (not including repair parts). Supply of CL II is resourced and filled by requisition and conducted through regular supply chains from provider to user. Some CL II items are stocked in the supply support activity.

CL III (P)

G-56. Packaged petroleum and lubricant items such as grease and hydraulic fluid fall under CL III (P). Some fuels found only in small quantities are also supplied under CL III (P). These items are supplied as part of a unit's authorized stock, shop stock, and maintenance authorizations. Most units deploy with 15-30 days of packaged lubricants on hand as part of their stockage listing. They are replaced by re-supply through automated stockage requests, based on recorded use, or by individual request. Estimates for petroleum, oils, and lubricants (POL) are maintained by the maintenance officer section of the requesting unit and typically consolidated by the next sustainment unit (FSC, BSB, DSB, or ESC) and re-supplied through the same chain.

CL III (B)

G-57. Bulk fuel operations are equally complex and necessary to sustain forces in offensive and defensive operations. The most common way to conduct bulk fuel operations is to maintain bulk storage as near to an operation as possible. Defense Logistics Agency-Energy provides theater-wide bulk fuel to the joint force. The TSC requisitions fuel from Defense Logistics Agency-Energy based on theater requirements. Bulk fuel is distributed by a combination of military and contracted capabilities using the theater distribution network. The typical delivery method is ground, but aerial resupply is a viable means for small quantities (see refueling operations beginning at paragraph G-76 for more details and estimate tables).

CL IV

G-58. CL IV comprises construction materials, to include installed equipment and all fortification and barrier materials. CL IV supplies are requisitioned to support specified projects. Engineers at all echelons anticipate and frequently require large quantities of CL IV for the conduct of operations. Estimates for CL IV supplies are based on the operations plan or order. Procurement of CL IV begins as soon as the plan and estimate are validated. Lead times for delivery are reduced by forecasting, using standard operating procedures (SOPs), and developing requests as early as possible. Local procurement, whenever feasible, is another way to expedite delivery.

CLASS V

G-59. Weapon density, number of personnel, and specific mission requirements determine the forecast. UBL varies with each operation. Note that there is no "one size fits all" UBL for an entire operation. Each combat phase may require unique ammunition.

G-60. Use ammunition management and reporting references—AR 700-19, DA PAM 700-16, DA PAM 710-2-1, AR 735-5, AR 710-2, and AR 190-11—and automated systems such as the Worldwide Ammunition Reporting System-New Technology (WARS-NT), Global Command and Control System-Army (GCCS-A), and General Fund Enterprise Business System (GFEBS), whenever possible. If necessary, use manual forms.

Ammunition Transfer Holding Point

G-61. Ammunition at the tactical level is supplied to the BCT through its organic ATHP. The ATHP is established and operated by the distribution company that is organic to the BSB or aviation support battalion. The ATHP is an operation established to facilitate the receipt and transfer of all types of ammunition from echelons above brigade ammunition storage activities to units within a brigade. Under most circumstances, the ATHP is a temporary operation located in the brigade support area to facilitate rapid receipt and issuance of ammunition to users. At the ATHP, ammunition is transloaded to supported units with minimal reconfiguration or holding.

G-62. Ammunition replenishment occurs in two ways:

- Pushed to the supported units using the BSB distribution company (preferred).
- Drawn from the ATHP by the FSC supporting the unit.

G-63. Below the BCT, units establish temporary ammunition holding areas pending issuance to subordinate units. Ammunition holding areas guard, manage, maintain custody, and provide physical security of conventional and unconventional ammunition and munitions.

CL VI

G-64. Soldiers deploy with a 30-day supply of health and comfort items or the commander requests a 30-day supply of health and comfort packs (HCPs) to include in the UBL. After the first 30 days, HCPs are centrally funded and provided at 30-day intervals through CL I channels at the request of the unit commander and until Army Air Force Exchange Service (AAFES) support can be established (see ATP 4-41).

Health and Comfort Packs

G-65. Theater commanders may authorize HCPs for outside the continental U.S. (OCONUS) contingency operational deployments in excess of 15 days. HCPs are only authorized for use at austere or remote camp or base environments where AAFES support is unavailable or cannot be readily established. HCPs provide deploying and forward area troops with routine necessities required for their health and comfort. Three types of HCPs exist: type I, II, and III. Table G-13 details some environmental considerations for planning CL VI.

Table G-13. CL VI Environmental Considerations

Calculation Formula: multiply the population by lbs per Soldier per day; this equals lbs required per day. Include type of health and comfort pack required for each line of request.	***Climate***	***Lbs/Soldier/Day***
	Temperate	1.10
	Arctic	1.30
	Tropic	1.62
	Arid	1.30

G-66. Type I HCP contains articles used to supply 10 individuals for approximately 30 days. Each shipping container includes 10 prepackaged polyethylene bags with a drawstring closure containing a designated quantity of items for issuance to 10 individuals. The type I container also includes other items intended as general supply for replacement or issuance as needed, which are not stored in the bags.

G-67. Type I HCP includes a toothbrush, toothpaste, soap bar, foot powder, tissues, deodorant, lip balm, sunscreen, toilet paper, eye drops, shampoo, shaving razor, shaving cream, personal hygiene body wipe, and a plastic bag.

G-68. Type II HCP is for female Soldiers and contains articles for feminine hygiene. It supplies 10 females for approximately 30 days.

G-69. Type III HCP consists of a personal body wipe packet, bulk packed with 40 packets per box. Each packet contains 10 washcloth-sized body wipes. The contents of each box are intended for 10 individuals.

CL VII

G-70. Major end items such as rolling stock, aircraft, large generators, oversized items, and weapons are delivered into theater using strategic lift. Use of Army prepositioned stocks (APS), reallocation of materiel, theater provided equipment (TPE), and other pre-positioned stocks of materiel can significantly reduce the time required to make a force combat ready. Planners use these avenues of materiel supply to the greatest extent possible for initial deployment and resupply. Resupply of major end items is conducted in the same manner as for other stocks.

CL VIII

G-71. The Army's medical logistics (MEDLOG) system is an integral part of the Army health system (AHS). It provides intensive management of medical products and services that are used almost exclusively by the AHS and are critical to its success (see ATP 4-02.1 for more details). The brigade medical supply office is an integral member of the Army medical logistics enterprise. The brigade medical supply officer in charge oversees, manages, and coordinates MEDLOG activities with the assistance of the support operations (SPO) MEDLOG officer. The brigade medical supply officer in charge advises the SPO and the brigade support medical company on all MEDLOG or MEDLOG-related issues.

G-72. The BSB medical operations section, in concert with the brigade surgeon section and medical company commander, plans for all brigade Army health system support operations. The medical operations section takes into account the placement of brigade AHS support assets and their logistical footprint. They also coordinate the ordering, receipt, and distribution of Class VIII within the BCT.

G-73. Storage of medical supplies is often controlled and requires specialized warehouse variants such as climate controlled spaces, access control features, and hazardous material considerations. The brigade medical supply officer plans for these requirements (see TC 8-270 for details on requirements and capabilities).

G-74. TC 8-270 also details support requirements for blood management, medical gas storage and distribution, medical waste, optical requirements, controlled substance requirements, and other health service support topics (see health service support beginning at paragraph G-167 for additional details).

CL IX

G-75. CL IX repair parts are managed under the Army Maintenance System (for more information, see the Army Maintenance System beginning at paragraph G-95 of this guide).

Refueling Operations

G-76. The material in this section is derived from JP 4-03, ATP 4-43, and *Army Sustainment,* January–February 2016.

G-77. Assuming a medium truck company has a total vehicle availability rate of 100% (60 vehicle platforms) and uses their 5,000 gallon trailers to maximum capacity, the unit can provide a one-time lift capability for bulk fuel of 300,000 gallons of fuel.

G-78. Fuel in theater and the ability to distribute that fuel from national levels to the user can be the determining factor in culmination or effective unit operations. In LSCO, fuel can be the ultimate "show stopper" if not delivered on time or in sufficient quantities.

G-79. Storage capacity and vehicle consumption rates are considerable concerns to the planning and execution of refueling operations. Tables G-14 through G-17 on page 268 show planning factors for fuel storage, transport, and consumption (source: Combined Arms Support Command's (CASCOM's) Planning

Data Branch). For more up-to-date CL III (bulk) planning factors, consider the operational logistics (OPLOG) planner and unit historical data.

Table G-14. Bulk fuel storage capability planning factors

Storage type	*M106 7.5K*	*M969 5K*	*M978 HEMTT*	*500 gallon blivet*	*TPU PODS*	*TRM*
Usable capacity	7,500	5,000	2,500	500	500/600	2,500
Bulk fill rate (gpm)	300	600	600	125	125	
Self-load rate (gpm)	300	300	300			
Retail flow per nozzle			60		25	
Number of nozzles			02	01	02	

TPU tank pump unit TRM tank rack module

Table G-15. Vehicle consumption (gals/hr)

Vehicle	*Idle*	*Cross-country*	*Road*
M1	17.3	56.6	44.6
Stryker	0.75	18.0	10.1
M2/3	1.4	18.0	8.6
M113	1.0	10.5	8.9
M88	2.0	42.0	31.0
M9 ACE	1.4	12.6	9.3
M109A7	1.2	20.0	17.0
MLRS	1.3	15.0	8.6

Table G-16. Rotary wing fuel consumption

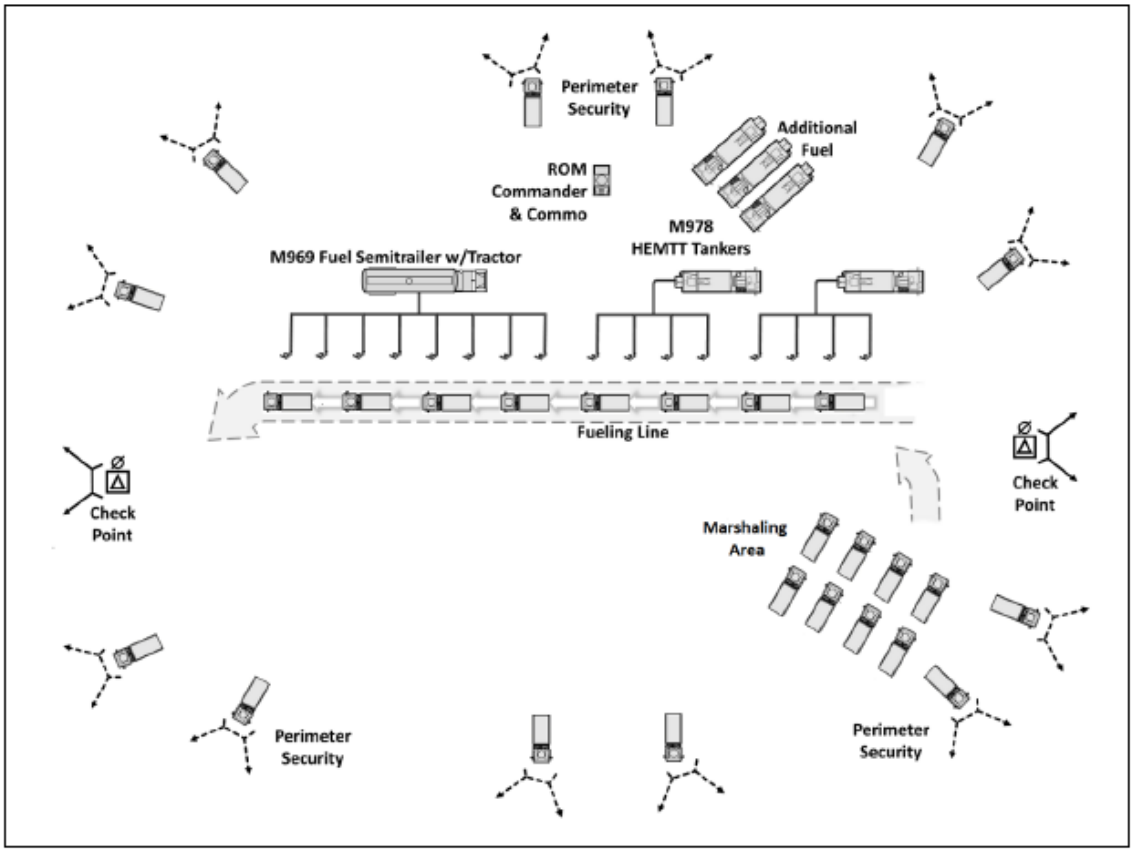
Aircraft	*Fuel capacity (gal)*	*Fuel consumption (lbs/hr)*	*LOG planning rate (gph)*	*Endurance (hrs)*
AH-64E	475	1072	175	2+40
CH-47F	1030	2560	382	2+20
UH/HH-60M	362	1086	175	2+00
UH/HH-60 l/M w/ERFS	760	1206	180	4+00

Table G-17. Modular fuel system capabilities

Item or activity	*Detail*
Set up–tear down	1 hour with limited engineer support
2,500 gallon tanks (14x)	7x primary tanks for 17,500 gallon capacity, 7x spare tanks
Pump racks (2x)	600 gallon per minute pumps. 3 stage filter/separator. Spill control kits. Fuel test kits.
Transportability	Can be transported by any of the following: C-130; CH-47; 10,000 pound MHE lift; PLS; LHS; Air droppable tank rack.
Components	3,300 ft hose and a variety of nozzles, fittings, and adapters.

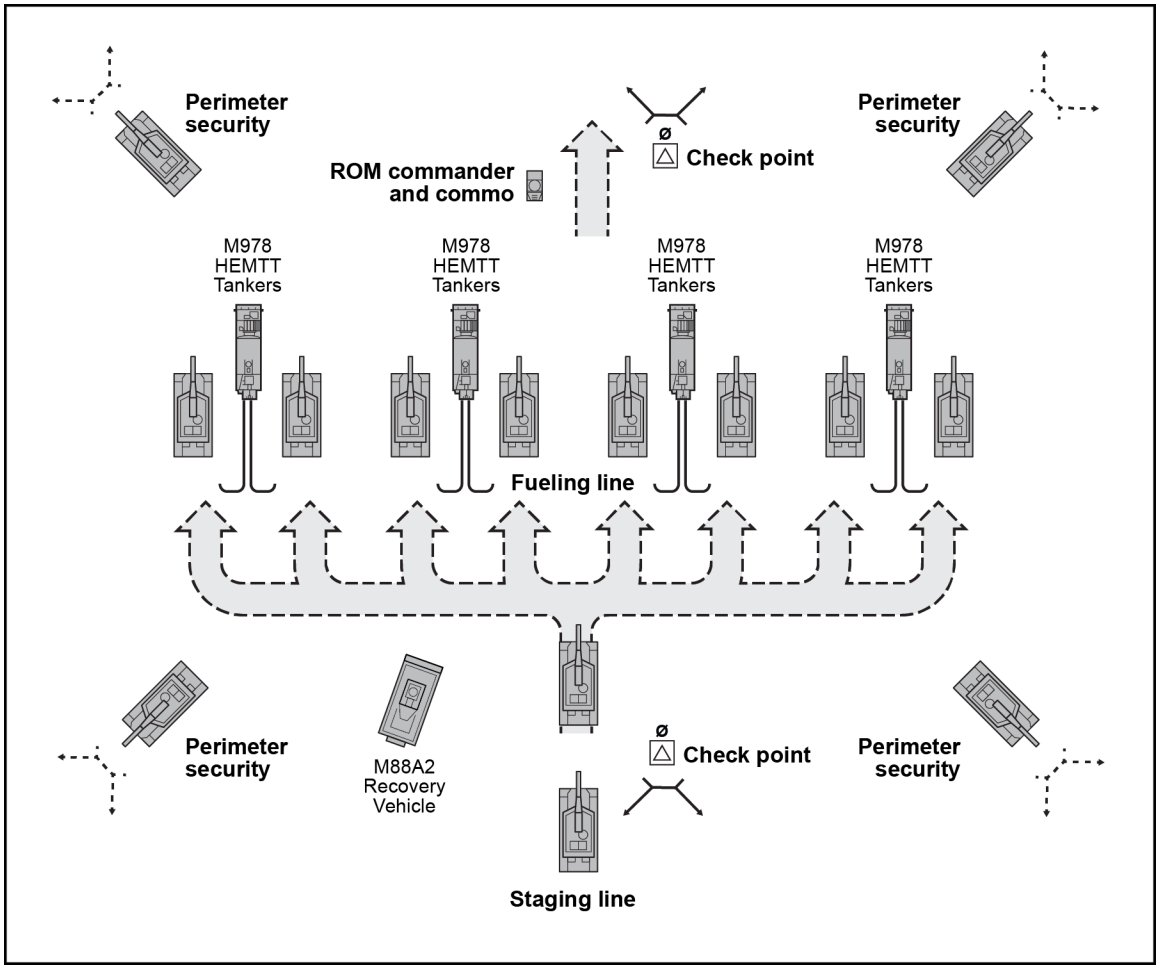
Refuel on the Move

G-80. If the length of a unit movement requires refueling, this can be done efficiently by refueling on the move. Each refueling adds 20–30 minutes to the movement route time and increases the column length by approximately 10 km. There are two primary purposes of refueling on the move: (1) to provide a "splash" of fuel to extend movement length of time/distance or (2) to enable a convoy or combat movements to keep momentum to a destination or remain on an objective. Vehicles at a refuel on the move site enter, receive a predetermined amount of fuel (usually determined by time at the pump), and depart. The complexity of the operation depends on the situation, time to prepare, assets available, and planned duration of an operation. The site must allow the minimum spacing between vehicles and equipment. Other site selection criteria are detailed in ATP 4-43. Figure G-5 and figure G-6 on pages 269–270 show possible layouts for a refuel on the move site.



ATP 4-43

Figure G-5. Example refuel on the move layout



ATP 4-43

Figure G-6. ROM alternate configuration layout

Forward Arming and Refueling Point Considerations

G-81. A *forward arming and refueling point* is a temporary facility, organized, equipped, and deployed to provide fuel and ammunition necessary for the employment of aviation maneuver units in combat. Also called FARP (JP 3-09.3). FSCs and distribution companies in the aviation support battalion have the capability of establishing FARPs. The FARP mission is to provide fuel and ordnance necessary for highly mobile and flexible helicopter operations. The size of the FARP varies with the mission and the number of aircraft to be serviced. Normally, FARPs are temporary, transitory facilities established for a specific duration and mission. The scope of flight operations in a FARP area includes, but is not limited to, individual aircraft, sections, or divisions of aircraft requiring ordnance and refueling.

G-82. FARPs are normally established by aviation battalions, which are manned and equipped to refuel and rearm aircraft under combat conditions using various FARP types and setups. Heavy expanded mobility tactical truck (HEMTT) FARPs are most effective behind a forward line of troops (FLOT) or where a secure ground line of communication exists. Forward of the FLOT, jump FARPs (JFARPs), comprising sling-loaded 500-gallon fuel drums, pumps, hoses, and pre-configured ammunition loads, refuel and rearm attack aircraft.

G-83. While operating behind the FLOT in the tactical assembly area, fuel is provided to the division by the SB assets that have the division area support mission or that have been designated to support the operation under the TSC. This allows the division to stage its equipment for deep operations. Resupply of

consolidated rapid refueling points behind the FLOT is normally by ground via theater sustainment (either Army or host nation support).

G-84. Rapid refueling points are established to rapidly refuel large numbers of aircraft during surge periods, such as air assaults. They are generally long-duration fueling operations that are time-consuming to establish and difficult to move, especially when they are established with 10,000-, 20,000-, or 50,000-gallon fuel bags. HEMTT systems and 5,000-gallon tankers may also be used to store fuel at a rapid refueling point, increasing its mobility.

Aerial Supply and Resupply

G-85. Airdrop operations and aerial resupply is commonly conducted when resupply using ground vehicles is impossible due to threat, impassable lines of communication, or other adverse conditions. Air-centric operations are unique in that they are routinely conducted deep across the FLOT. Aerial supply and resupply allows for the timely distribution of supplies while maximizing both aircraft and unit support capabilities. The SB is the coordinating headquarters for air resupply.

G-86. Methods for aerial resupply range from doctrinal to non-doctrinal. The method used depends on the assets available from higher levels of sustainment. Units develop a "menu" of supply that is developed by maneuver units and built by the FSC. Table G-18 on page 272 details planning data for some common equipment delivered by airdrop.

Air Delivery Methods

G-87. Sling-load equipment are assets organic to a brigade. Units can rig and sling-load cargo with nets, bags or sling legs for air delivery or retrograde. Additional sling-load requirements are established at the SB. Sling load operations, and most technical manuals and training circulars, have some information on how to sling specific equipment.

G-88. Speedballs and kicker boxes are the most common and efficient method to deliver supplies to troops forward. A speedball is a small amount of supplies put in a bag such as a human remains pouch, duffle bag, aviator's kit bag, or any reinforced container. Menus are developed by units and filled by the FSCs.

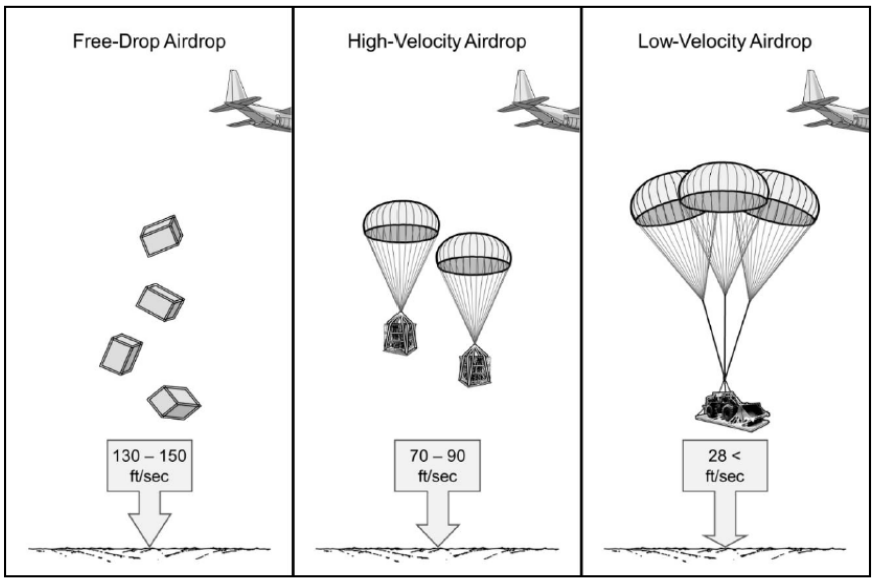
G-89. The container delivery system (CDS) is a commonly used method for aerial insertion of supplies quickly for air assault operations. CDS bundles are used as a means of delivering additional equipment or for emergency resupply. CDS loads are heavy and ideal for commodities such as water and larger munitions. Units request CDS bundles built in 500–1200 pound configurations.

G-90. Low cost low altitude incorporates low cost containers and disposable parachutes. Units can request bundles from 50-200 pounds. The bundles are flown at 150–500 feet above ground level in order to improve the accuracy of the point of impact. If trained, units can conduct low cost low altitude operations from CH 47s.

G-91. The joint precision airdrop system (JPADS) is an American military airdrop system that uses global positioning system (GPS), steerable parachutes, and an onboard computer to steer loads to a designated point of impact on a drop zone.

G-92. The low-cost aerial delivery system loads is a simplified, low cost alternative to the A-22 cargo bag assembly that is used for high volume delivery of supply items when recovery of airdrop equipment is impractical or disruptive to retrograde operations. The weight range for the resupply load is 501–2200 lbs.

G-93. Figure G-7 on page 272 depicts three types of airdrop. Table G-18, also on page 272, details some common equipment load weights for sling loading.



ATP 4-43

Figure G-7. Types of airdrop

Table G-18. Common equipment load weight

TB 55-46-1

Equipment	*GVW**
TOW HMMWV	9,000
M1114 (up-armored HMMWV)	12,100
M1151 (up-armored gun truck)	11,500
M1165 (up-armored C2 HMMWV)	12,100
M1167 (tow HMMWV)	13,100
M998 unarmored HMMWV	7,535
A22 cargo bag	3,500
500-gallon fuel blivet of JP8	3,750
200-gallon water blivet	2,125
M119A3 howitzer w/3 personnel	4,900
M777 howitzer	9,300
Water buffalo (400 gallons)	6,320
120-mm wM998	9,000
*GVW= gross vehicle weight in lbs	

G-94. Airdropped loads are derigged as dictated by the enemy threat on the drop zone and as soon as possible after landing. Derigging must be done rapidly to prevent loss or pilferage of supplies by enemy forces and to minimize damage to aerial delivery equipment. Upon recovery of aerial delivery equipment, units must synchronize retrograde support operations and establish return of priority items such as JPADS, parachutes, aerial delivery platforms, and other airdrop-related equipment in accordance with theater guidance.

THE ARMY MAINTENANCE SYSTEM

G-95. The material in this section is derived from ATP 4-33, ATP 3-04.7, AR 750-1, and TC 8-270.

G-96. The Army Maintenance System consists of two types: field maintenance and sustainment maintenance. *Field maintenance* is on system maintenance, repair and return to the user including maintenance actions performed by operators (FM 4-30). It is maintenance performed by the equipment operator, equipment crews, and ordnance corps-trained maintainers. The owning unit or a supporting maintenance unit performs field maintenance using its own tools and test equipment. The unit should retain and repair the item until it is ready to return to service. Maintainers perform field maintenance on all types of unserviceable items of equipment and weapon systems. Repairs include the replacement of an unserviceable line, component, module, or part. However, field maintenance is not limited to remove-and-replace actions. If the operator, crew, or ordnance corps-trained maintainers are authorized and possess the required skills, tools, repair parts, references, and time, then the item should remain onsite and not be evacuated for sustainment maintenance. This is especially relevant to BCTs. The expertise to fix major weapon systems—Abrams, Bradley, Paladin, and Stryker vehicles—resides only in the FSC. No maintenance units are equipped or staffed to perform field-level maintenance repairs to the weapon systems outside the BCT. The BSB in a Stryker brigade combat team (SBCT) is one exception, because the FMC includes mechanics that maintain the medical company's Stryker medical vehicles.

G-97. *Sustainment maintenance* is off-system component repair and/or end item repair and return to the supply system or by exception to the owning unit, performed by national level maintenance providers (FM 4-30). Sustainment maintenance consists of two subcategories: (1) below-depot-level sustainment maintenance and (2) depot-level sustainment maintenance. Units use sustainment maintenance when crew, operators, operators-maintainer, or ordnance corps-trained maintainers lack the required skills and tools or cannot perform proper repairs using field maintenance. Based on the extent of damage to an item and operations and mission variables, leaders decide the best course of action (COA). No absolute checklist exists. Field maintenance is the preferred method of repair. The intent of sustainment-level maintenance is to perform commodity-oriented repairs to return items to a national standard, providing a consistent and measureable level of reliability. The Army sustainment command, its subordinate Army field support brigades, and Army field support battalions execute sustainment maintenance missions. Sustainment maintenance supports both operational forces and the Army supply system.

Maintenance Operations

G-98. Planners ensure maintenance for offensive operations supports momentum and massing at critical points. Operators, crews, and maintenance personnel maximize momentum by fixing inoperable equipment at the point of malfunction or damage. They enhance momentum by keeping the maximum number of weapon systems operational. Therefore, maintenance and recovery personnel perform their mission as far forward as possible.

G-99. Planners ensure maintenance operations include planning to replace lost maintenance capability, using maintenance teams well forward at maintenance collection points, planning to displace often, and emphasizing recovery and retrograde of equipment that requires extended repair time. The FSC's field maintenance platoon takes all required steps to place as many weapon systems as possible in serviceable condition. Operators, crews, and field maintenance teams perform any necessary repairs authorized at their level of repair. Once defensive operations begin, the principles are the same as for offensive operations.

Vehicle Recovery

G-100. The material in this section is derived from ATP 4-31, ATP 4-33, GTA 01-14-001, and GTA 09-14-002.

G-101. *Recovery* are actions taken to extricate damaged or disabled equipment for return to friendly control or repair at another location (JP 3-34). LSCO increases the need for vehicle recovery commensurate with estimated loss rates. The more prepared a unit is to accomplish recovery, the greater their survivability rates.

Types of Recovery Operations

G-102. **Self recovery** indicates that the equipment is capable of clearing the battlefield under its own power, but it may not be fully mission capable. It may also be used to recover other inoperable or damaged equipment not able to self recover.

G-103. **Like-vehicle recovery** occurs if a vehicle cannot self recover, but can be moved to a safer location using the same class or a heavier class vehicle. Depending on the weight classification, dedicated recovery assets may be required to move it to a maintenance facility or the nearest unit maintenance collection point (UMCP).

G-104. **Dedicated recovery** is accomplished with specialized recovery equipment and trained recovery personnel. Commanders evaluate the risk of losing recovery assets before sending dedicated teams into combat areas.

Planning Recovery Operations

G-105. Planning considerations for maintenance support in offensive operations include rapid repair and return of non-mission capable equipment to support the operation and establishment of command maintenance priorities. Other planning tasks include—

- Identify UMCPs.
- Establish criteria for requesting additional recovery assets.
- Consider the feasibility of splitting recovery assets to provide broader coverage for attacking companies.
- Identify critical combat spares and have them ready to move forward on short notice.
- Ensure rapid repair and return of non-mission capable equipment to support the operation.
- Anticipate increased consumption of CL III (B) and CL IX due to maneuver requirements.

G-106. Recovery operations are coordinated with maintenance efforts and commander's priorities. Tips include—

- Use maintenance time guidelines established by the commander to make repair-or-recovery decisions.
- Use the right recovery equipment for the recovery mission. In general, wheeled recovery systems recover wheeled vehicles and tracked recovery systems recover tracked vehicles.
- Keep recovery vehicles as far forward as the tactical situation permits.
- Establish recovery priorities when recovery assets are limited.

Units Involved in Recovery Operations

G-107. **Owning unit (user).** Each unit plans for self recovery and like-vehicle recovery when feasible. Such plans provide for SOPs; TTP; equipment required; and communications plans for protection and assistance during recovery operations.

G-108. **Higher headquarters.** Brigades and higher headquarters provide for dedicated recovery whenever self and like-vehicle recovery is either infeasible or considered to be of higher risk than the commander is willing to accept. Higher headquarters (such as corps) and sustainment commands (such as the TSC) provide command and control, requests for forces, and authorities for dedicated recovery operations in theater. The BSB typically plans and distributes field maintenance and recovery in support of BCT operations.

G-109. **Field maintenance company.** Field maintenance companies are responsible for recovering their own equipment and providing limited backup support with wreckers or tracked recovery vehicles when requirements exceed a supported unit's capability. They may also be tasked to provide recovery support on an area basis to units without a recovery capability. The field maintenance company executes dedicated recovery operations for the BSB and supports the FSCs when required.

G-110. **Forward support company.** The FSC has recovery assets located in the recovery section and field maintenance teams within the field maintenance platoon. The FSC commander along with the maintenance

technician and the battalion logistics officer track and manage recovery operations. The FSC commander assigns the repair or recovery mission to the field maintenance platoon.

Recovery Process

G-111. Dedicated and like-vehicle recovery begins with a request for support from the affected unit. The tactical request and solution addresses—

- Movement restrictions.
- Primary and alternate routes of march.
- Individual clothing and equipment and chemical, biological, radiological, nuclear, and high-yield explosive defense items.
- Equipment and supplies to decontaminate the disabled vehicles.
- Communication equipment availability (including applicable call signs, primary and alternate frequencies, and required reports).
- Security and safety requirements.
- Special instructions regarding the disposition of contaminated equipment.
- Contingency plans.
- Any special tactical considerations.

G-112. Operator, crew, and field maintenance personnel use organic repair and recovery capabilities including—

- Battle damage assessment and repair (BDAR) techniques.
- Self or like-vehicle recovery.
- Assistance from other units onsite.

G-113. Units request assistance from the FSC. Requests must provide—

- Unit identification.
- Equipment identification.
- Location (map coordinates, when possible).
- Equipment fault.
- Evaluation of on-site repair capability.
- Repair parts required.
- Organic recovery capability.
- Tactical situation and security requirements.
- Recommended route of approach.

G-114. The operator or crew must remain with the equipment and follow unit SOPs.

Recovery Equipment

G-115. Planners at all levels prepare their units for self, dedicated, and like-vehicle recovery. To do so they evaluate on-hand and needed equipment. LSCO increases the need for self, dedicated, and like-vehicle recovery (see tables G-19 through G-21 on pages 276–277 for details of common dedicated vehicles and equipment).

Table G-19. Common recovery vehicles

GTA 09-14-002

Vehicle	*Type Dimensions*	*Lift Capacity*	*Range speed*	*Notes*
M88 A1	Full track medium Width (overall): 11.25 ft Height (overall): 10.25 ft Length (overall): 27.125 ft GVW: 56 tons	Tow: 56 tons Winch x4: 90 tons Boom winch: 25 tons	Range: 300 mi Max speed: 29 mph Towing speed: 26 mph	TM 9-2350-256-10
M88 A2 Hercules	Full track heavy Width (overall): 12 ft Height (overall): 9.75 ft Length (overall): 28.33 ft GVW: 69.8 tons	Tow: 70 tons Winch: 70 tons Boom winch: 35 tons Auxiliary winch: 3 tons	Range: 314 mi Max speed: 25 mph Towing speed: 17 mph	TM 9-2350-292-10
M984A1 HEMTT	8x8 wheeled truck wrecker Width (overall): 96 in Height (overall): 112 in Length (overall): 392 in GVW 47.5 tons	Tow: 31.5–52 tons, depending on terrain. Recovery winch: 30 tons Crane: 7.1 tons	Range: 300 mi Max speed: 57 mph	TM 9-2320-279-10-1 and -2 (Obsolete)
M984A2 /M984A2R1 HEMTT	8x8 wheeled truck wrecker Width (overall): 96 in Height (overall): 119 in Length (overall): 402 in GVW: 49.5 tons	Tow: 50 tons Crane: 7.1 tons Recovery winch: 30 tons Self-recovery winch: 10 tons Lift point capacity: 6.3 tons	Range: 300 mi Max speed: 63 mph	TM 9-2320-279-10-1 and -2 (Obsolete)
M984A4	8x8 wheeled truck wrecker Width (overall): 96 in Height (overall): 119 in Length (overall): 402 in GVW: 49.5 tons	Max load 50 tons Recovery winch: 30 tons Self-recovery winch: 10 tons Crane: 7.1 tons Lift point capacity: 7.6 tons	Range: 300 mi Max speed: 62 mph	TM 9-2320-342-10-1 and -2
M1089 FMTV	6x6 wheeled truck wrecker Width (overall): 96 in Height (overall): 112 in Length (overall): 363 in GVW: 20.3 tons	Max load flat tow: 10.5 tons Max load lift tow: 18.3 tons Winch x2: 15 tons Crane: 5.5 tons Lift point capacity: 4.4 tons	Range: 300 mi Max speed: 55 mph	TM 9-2320-366-10-1 and -2
M1089A1P2 FMTV	6x6 wheeled medium truck wrecker Width (overall): 96 in Height (overall): 114 in Length (overall): 376–382 in GVWR: 22.1 tons	Max load flat tow: 32.5 tons Max load B kit lift tow: 27.5 tons Max load A cab lift tow: 25 tons Winch x2: 15 tons Crane: 7.1 tons Lift point capacity: up to 50 tons	Range: 300 mi Max speed: 55 mph	TM 9-2320-334-10-1 and 2

GVW gross vehicle weight
GVWR gross vehicle weight rating (with attached equipment, load, and fluids)
Notes. Maximum tow speed for wreckers is 35 mph on unimproved roads and 15 mph cross-country.
Ton refers to the U.S. unit short ton, equal to 0.907 metric tons or 2000 lbs.

Table G-20. Typical truck and trailer combinations used for recovery

GTA 09-14-002

Modular catastrophic recovery system (MCRS) includes: • M983A4 LET • FWTRD with 17.5 ton winch kit • TDRT	Winches: • 22.5 tons (on truck) • 17.5 tons (on FWTRD) • 9 tons (on FWTRD)
Fifth wheel towing recovery device (FWTRD) (XM20)	Lift capacity: 16 tons
Tilt deck recovery trailer (TDRT) (XM1250)	Capacity: 35 tons

Table G-21. Common Army vehicles with recovery data

GTA 09-14-002

Model/Nomenclature	GVW short tons	GVWR short tons	Winch type	Max Load tons	Cable length
M1235A4 MRAP Dash ISS w/ OGBK	23.25	23.25	Electric	9	75 ft
M1235A5 MRAP Dash ISS w/CROWS	23.25	23.25	Electric	9	75 ft
M1266A1 MRAP MAXXPRO	24.4.	27.21	Electric	9	75 ft
M1240/M124A1 MATV	16.12	18.5	Electric	9	75 ft
M983A2 LET/ Truck tractor	18.7	67.5	Hydraulic	22.5	150 ft
M983A4 LET/ Truck tractor	18.7	75.5	Hydraulic	10	200 ft
M978A4 Truck tanker	21.07	54.5	Hydraulic	10	200 ft
M1120A4 LHS Load handling system	19.62	54.5	Hydraulic	10	200 ft
M977A4 CBT/Common bridge transport	19.62	54.5	Hydraulic	10	200 ft
M985A4 GMT/ Ground missile transport	21.31	54.5	Hydraulic	10	200 ft
M985A4 Truck cargo	21.31	54.5	Hydraulic	10	200 ft
M977A4 Truck cargo	21.38	54.5	Hydraulic	10	200 ft
M1151 Truck expanded capacity armament carrier	5.75	7.75	Hydraulic	5.25	50 ft
M1151A1 Truck expanded capacity armament carrier IAP armor	6.25	8.23	Hydraulic	5.25	50 ft
M1152 Truck expanded capacity	6.05	8.6	Hydraulic	5.25	50 ft
M1152A1 Truck expanded capacity IAP armor	6.05	8.55	Hydraulic	5.25	50 ft
M1165A1 Truck command and control G/P IAP armor	6.05	8.98	Hydraulic	5.25	50 ft
M1165A1 Truck command and control G/P IAP armor	6.05	8.98	Hydraulic	5.25	50 ft
M1167 Truck expanded capacity TOW/ITAS	6.55	7.7	Hydraulic	5.25	50 ft
M997A3 Truck ambulance 4-liter	6.05	7.56	Hydraulic	5.25	50 ft
M1070 Truck tractor (HETT)	22.75	48.09	Hydraulic	27.5	300 ft
M916A1/A2 Tractor light equipment transport (LET)	15.77	34.00	Hydraulic	22.5	150 ft
M1257 Engineer squad vehicle double V hull Stryker	23.08	28.03	Hydraulic	13.37	187 ft
M1251 Fire support vehicle double V hull Stryker	23.52	25.12	Hydraulic	13.37	187 ft
M1256 Infantry carrier vehicle double V hull Stryker	22.36	28.30	Hydraulic	13.37	187 ft
M1252 Mortar carrier vehicle double V hull Stryker	24.30	29.20	Hydraulic	13.37	187 ft
M1255 Commanders vehicle double V hull Stryker	22.36	25.12	Hydraulic	13.37	187 ft
M1126 Infantry carrier vehicle Stryker	17.56	20.17	Hydraulic	13.37	187 ft
M1127 Reconnaissance/scout vehicle Stryker	17.79	19.79	Hydraulic	13.37	187 ft
M1128 Mobile gun system Stryker	22.56	23.85	Hydraulic	13.37	187 ft
M1129A1 Motor carrier vehicle Stryker	19.19	20.17	Hydraulic	13.37	187 ft
M1132 Engineer squad vehicle Stryker	17.90	21.10	Hydraulic	13.37	187 ft

Battle Damage Assessment and Repair

G-116. The material in this section is derived from ATP 4-31 and GTA 01-14-001.

G-117. *Battle damage assessment* is the estimate of damage composed of physical and functional damage assessment, as well as target system assessment, resulting from the application of lethal or nonlethal military force. Also called BDA (JP 3-0).

G-118. BDAR is a nonstandard assessment and repair procedure to bring a damaged piece of equipment to some level of operational capability. The assessment and repair may bring the piece of equipment anywhere from being capable of recovery to fully mission capable. These expedient measures are conducted under combat conditions to prevent the total loss of equipment and increase the combat power available to the commander both in the present and the future. Leaders ensure that formations, operators, and maintenance personnel have BDAR kits on hand—and have experience using the kits—before committing the repair teams to combat.

G-119. After identifying which systems or subsystems are not operational, maintenance personnel determine the risk level for each repair. Repairs are classified in either of two risk level categories:

- High risk repair may result in injury to personnel or cause further damage to the equipment. Example: Using a fuse or circuit breaker of higher amperage rating can cause circuit overloads and fires.
- Low risk repairs may result in minor equipment failures but poses little or no threat to equipment or personnel. Example: Using a fuse or circuit breaker of lower amperage rating can cause equipment systems to frequently shut down.

BDAR Techniques

G-120. Forward positioned repair teams and equipment operators can expediently get a piece of equipment moving using nonstandard techniques such as wiring parts together, duct taping external components, and temporarily removing nonessential parts. Decisions concerning BDAR are typically made on the spot without a lot of coordination. Maintenance personnel focus on getting the equipment out of the area or into the fight.

G-121. Shortcuts are inherent to BDAR. When the removal, installation, and repair of components are not performed in sequence or to standard as outlined in technical manuals, they are considered shortcuts.

- **Bypassing** consists of eliminating a device or component from the system in which it plays a role. For example, a damaged fuel filter can be bypassed allowing the fuel system to function in a degraded mode. Before attempting to bypass any component, an assessment of the repair must be conducted to determine risks associated with the procedure.
- **Expedient repairs** are temporary in nature and more reliable repairs are performed as soon as possible. Examples of expedient repairs include using safety wire to temporarily replace a broken exhaust hanger and using duct tape or bungee cords to secure a partially detached fender or section of slat armor.
- **Fabrication** involves using readily available materials and fashioning them by bending, cutting, or welding them in the place of a damaged component. An example is fabricating a radiator overflow reservoir using a suitable plastic container to temporarily replace the damaged overflow tank.
- **Substitution** involves replacing damaged components that serve a critical function on the equipment with repair parts that serve a non-critical function on the same equipment. As an example, a bad circuit breaker for the engine starter can be replaced with a good breaker controlling internal lighting.
- **Controlled exchange** is the removal of serviceable components, with the commander's authorization and in accordance with AR 750-1, from unserviceable but economically reparable equipment for immediate reuse in another like item of equipment, restoring it to combat serviceable condition.
- **Cannibalization** is the authorized removal of components from materiel designated for disposal. Refer to AR 750-1 and AR 710-2 for more information on cannibalization.

Aircraft Recovery

G-122. Aircraft recovery types follow the same scheme as vehicle recovery with some additions. Aircraft recovery comprises four types:

- **Self recovery** is defined as actions required for an aircraft to fly out under its own power to either rejoin the mission or undergo additional repairs or inspections at a maintenance area.
- **Immediate recovery** is performed by assets within a flight mission that assumes the tactical situation permits a recovery with the forces at hand without detailed planning or coordination.
- **Delayed recovery** is a planned or coordinated aircraft recovery mission performed by the Downed Aircraft Recovery Team (DART) with the intent to repair or replace damaged components to return the aircraft to flying status.
- **Dedicated recovery** are actions required to extract an aircraft by means of an aerial or surface recovery vehicle to a maintenance area for repairs or inspections. Dedicated recovery is most often associated with delayed recovery.

Additional information concerning aircraft recovery responsibilities and procedures can be found in ATP 3-04.13.

FIELD SERVICES

G-123. The material in this section is derived from JP 4-03, ATP 4-41, ATP 4-42, and ATP 4-44.

G-124. Field services include shower and laundry, field feeding, water production and distribution, clothing and light textile repair, aerial delivery, and mortuary affairs. Many of these services are provided by operational contract support and are integrated into the theater plan. The TSC or ESC provides contracts for and provision of services and requests for forces for services unavailable by contract, such as water production, distribution, aerial delivery, and mortuary affairs. The SB and the maneuver enhancement brigade provide contracting officer representatives, command and control, and distribution management of field services in the AO.

G-125. In LSCO, services to all members of the force will likely be reduced. Water production, purification, and distribution will retain priority over shower, laundry, and textile repair. Additionally, field feeding may be reduced to minimal events. These services will be reduced to rotational provisions in much the same way as personnel services. Services will be reduced to rotational events forward or static locations where units are rotated through in conjunction with force rotations. LSCO will likely overwhelm the mortuary affairs system. Planners at all echelons must anticipate the expected and potential need for increased mortuary affairs services due to the intensity of the conflict, mission, tempo, and lethality of the enemy.

Field Feeding

G-126. Food preparation is a basic unit function and one of the most important factors in Soldiers' health, morale, and welfare (see AR 30-22 for more information). Proper refuse and waste disposal is important to avoid unit signature trails and maintain field sanitation standards (see table G-22 on page 280 and supply and resupply beginning at paragraph G-46 for details on meal types).

Table G-22. Planning delivery numbers for rations

ATP 4-41

Ration/item	*Servings per UI*	*UI per pallet*	*Servings per pallet*	*Case cube*	*Case weight*	*Pallet weight*
MRE	12	48	576	1.02	22.7	1089
FSR	09	48	432	0.99		10
MCWLRP	12	48	576	1.02		
HDR	10	48	480	1.02		
TOTM	12	48	576	0.95		
MARC	10	56	560	0.63		
MORE	24	48	1152	0.98		
Religious meal, halal	12	48	576	0.98		
Religious meal, kosher	12	28	336	1.75		
UGR-E (AVG)	18	18	324	1.9		
UGR-H&S	50	08	400	5.0	128	1020

FSR	first strike ration	MORE	modular operational rations enhancement
HDR	humanitarian daily ration	TOTM	tailored operational training meal
MARC	meal, alternative regionally customized	UGR	unitized group rations
MCWLRP	meal, cold weather food packet, long range patrol	UGR-E	UGR express
MRE	meal, ready to eat	UGR H&S	UGR heat and serve

Water Production, Purification, and Distribution

G-127. The water support company and the composite support company through their water support platoons have the capability to produce, store, and distribute potable water to supported units. A water support platoon can produce potable water at a maximum of 150,000 gallons per day from fresh water sources and 100,000 gallons per day from a brackish or contaminated source. They can also store and distribute potable water (maximum of 40,000 gallons daily with two 20,000 gallon bags or 100,000 gallons with two 50,000 gallon bags). Tables G-23 and G-24 on pages 280-281 detail some capabilities and planning factors for water production and purification. Tables G-25 through G-27 on pages 281-282 show water usage requirements, water storage and transport capacities, and water consumption factors, respectively. Tables G-24 through G-27 originate in ATP 4-44.

Table G-23. Army water purification capabilities

JP 4-03

Equipment type	*Maximum production from salt water (gph)*	*Maximum production from fresh water (gph)*
Lightweight water purifier	75	125
Lightweight water purification system	75	125
1500-gph TWPS	1200	1500
3000-gph ROWPU	2000	3000

Note. The gph next to each piece of equipment is the maximum production in ideal conditions.

ROWPU reverse osmosis water purification unit TWPS tactical water purification system

Table G-24. Standard water planning factors related to personnel in force (gal/person/day), conventional theater

Function	*Hot*				*Temperate*		*Cold*	
	Tropical		*Arid*					
	Sus	*Min*	*Sus*	*Min*	*Sus*	*Min*	*Sus*	*Min*
Universal unit level consumption[1]	6.91	4.87	7.27	5.23	5.26	3.22	5.81	3.77
Role 1 and 2 medical treatment	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Role 3 and 4 medical treatment	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Central hygiene—showers	2.07	1.87	2.07	1.87	2.07	1.87	2.07	1.87
Mortuary affairs operations	0.03	0.03	0.22	0.22	0.03	0.03	0.03	0.03
Potable total	9.92	7.68	10.47	8.23	8.27	6.03	8.82	6.58
Centralized hygiene—laundry[2]	0.26	0.12	0.26	0.12	0.26	0.12	0.26	0.12
Mortuary affairs operations	0.19	0.19	N/A	N/A	0.14	0.14	0.14	0.14
Engineer construction	1.98	0.00	1.98	0.00	1.98	0.00	1.98	0.00
Aircraft maintenance	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Vehicle Maintenance (Non-potable)	0.36	0.36	N/A	N/A	0.19	0.19	0.19	0.19
Non-potable total[3]	2.93	0.81	N/A	N/A	2.72	0.60	2.72	0.60
Theater total	12.86	8.49	12.86	8.49	10.99	6.63	11.54	7.18

Sus sustaining Min minimum
[1] Includes gal/person/day requirements for drinking, personal hygiene, field feeding, heat injury treatment, and vehicle maintenance.
[2] Based on a central hygiene goal of two showers and 15 pounds of laundry per Soldier (or Marine) per week.
[3] All potable in arid environment.

Table G-25. Water usage requirements

Drinking*	Heat treatment	CBRNE decontamination
Hospital care and subsistence*	Food preparation*	Personal hygiene*
Vehicle maintenance	Mortuary affairs	Firefighting
Centralized hygiene	Engineer construction	Equipment washing (aircraft)
Laundry	Tactical ice plant*	Refugee, detainee, civilian internee, and POW camps*

Note. *must be potable water

Table G-26. Water storage and transport capacities

Bulk fixed storage	*Capacity (gals)*
3K SMFT	3,000
5K SMFT	5,000
Onion Skin (Airdrop)	500
20 K Tanker	20,000
50 K Tanker	50,000
Buffalo	400
Blivets	500
HIPPO	2,000
Camel	900

SMFT Semi-trailer mounted fabric tank
HIPPO LHS-compatible water tank rack

Table G-27. Water consumption factors in gal/person/day

Use	*Temperate*	*Tropical*	*Arid*	*Arctic*
Drinking water	1.5	3.0	3.0	2.0
Personal hygiene	1.7	1.7	1.7	1.7
Field feeding	2.8	2.8	2.8	2.8
Heat injury treatment	.1	.2	.2	.1
Vehicle maintenance	--	--	.2	--
Standard planning factor	6.1	7.7	7.9	6.6

G-128. Bottled potable water can be manufactured by military or commercial means. The Army has a small quantity of expeditionary water packaging systems in operational project stocks to meet initial combatant command requirements. Additional systems can be procured. These systems are normally maintained and operated by contractors of the Army Materiel Command.

G-129. Clothing and light textile repair is essential for hygiene, discipline, and morale purposes. Clean, serviceable clothing is provided as far forward as the brigade area. This function is typically tied to the laundry contract, if one has been established.

Mortuary Affairs

G-130. Information in this section is derived from ATP 4-46, AR 638-8, AR 638-2, and DA PAM 638-2.

G-131. The Army mortuary affairs program includes current return operations, concurrent return operations, and temporary interment operations. Remains of personnel for which the Army is responsible are cared for with utmost respect in keeping with the highest traditions of military service. Deployed unit commanders and logisticians are responsible for understanding mortuary affairs policies and unit SOPs. Mortuary affairs support begins at the unit level. Commanders are responsible for the recovery and evacuation of human remains of assigned and attached personnel (military, DOD civilian, and contractor) to the nearest mortuary affairs facility (usually located at the nearest support area). This facility is the Mortuary Affairs Collection Point (MACP). Units use the casualty evacuation (CASEVAC) process to remove remains.

G-132. Human remains are evacuated as quickly as possible-using air transport, when available, or retrograde convoys-to the theater mortuary evacuation point. This point is usually located in a secure area on or near an aerial port of embarkation. Movement of human remains is situational and theater specific and is accomplished in the most expedient manner possible (for more information, see the CASEVAC discussion beginning at paragraph G-196).

G-133. The disposition of personal effects is a complex issue closely related to, but separate from, the disposition of remains. Disposition policy is found in AR 638-2. The Soldier's unit collects, inventories, safeguards, packages, and evacuates all personal effects for the unit member. The unit uses SOP and Army property transfer processes to accomplish this task. Personal effects travel with the human remains during evacuation.

Facilities for Processing Remains

G-134. As stated in the field services introduction, the most likely effect of LSCO will be to overwhelm the mortuary affairs system. When multiple remains are present, facilities must allow for simultaneous processing as near to the site of the incident as possible. In most cases, this requires improvising. Garages, warehouses, large tents, screened areas, and similar enclosures may be used. Arrangements must be made for refrigeration equipment to inhibit decomposition of remains.

Mortuary Affairs Company

G-135. The mortuary affairs company has the capability to process up to 400 personnel remains per day for up to 20 mortuary affairs collection points in a theater. This unit is typically operational control

(OPCON) or tactical control (TACON) to either the combat sustainment support battalion or the BCT on an area basis. Services include limited search, recovery, and evacuation by the collection team on an area basis and coordination of mortuary affairs processing.

Shower and Laundry

G-136. Shower, laundry, and clothing repair (SLCR) teams are assigned to outposts and sometimes operate on a rotating basis. A quartermaster field service company can provide shower and laundry services for up to 21,000 troops on an area basis.

G-137. Shower and laundry teams are the key elements of the theater field services function and they may be separately deployed as far forward as BSBs. Each shower and laundry team comprises one bath unit and one laundry advanced system. The laundry unit operates 20 hours per day. The shower unit operates 10 hours per day. The remaining operating time is for equipment maintenance.

G-138. Laundered clothing consists of 15 pounds per Soldier per week. The shower and laundry function does not include laundry decontamination support. Water capacities required are measured in gallons per person per day (see ATP 4-42 for more information).

PERSONNEL SERVICES

G-139. Personnel services are sustainment functions that fill and fund the force, maintain Soldier and Family readiness, promote the moral and ethical values of the nation, and enable the fighting qualities of the Army. Personnel services complement logistics by planning for and coordinating efforts that provide and sustain personnel. Personnel services include human resources (HR), legal, religious, and band support.

G-140. During LSCO, some personnel services may be limited in capability to support forward deployed units. For example, HR support such as morale, welfare, and recreation (MWR) or postal operations may be limited to support areas or entirely unavailable. Commanders, in consultation with G-1/S-1 personnel officers determine what services are necessary to maintain accountability and morale.

HUMAN RESOURCES SUPPORT

G-141. The functions of HR support are described below under their respective HR core competency. Human resources core competencies are man the force, provide HR services, coordinate personnel support, and conduct HR planning and operations. All of these functions and tasks affect the personnel aspects of building combat power within an organization (see FM 1-0 for more detailed information).

Man the Force

G-142. Man the force is any action or function that impacts on strength or readiness of an organization. This includes personnel readiness management, personnel accountability, strength reporting, retention operations, and personnel information management. The challenge is getting the right Soldier with the right qualifications to the right place at the right time.

G-143. Personnel readiness management involves analyzing personnel strength data to determine current combat capabilities, projecting future requirements, and assessing conditions of individual and unit readiness. Personnel readiness management is directly interrelated and interdependent upon the other functions of man the force. Changing the priority of replacement fills should only be made based on operational input from the commander or the G-3/S-3.

G-144. Personnel accountability is the by-name management of the location and duty status of every person assigned or attached to a unit. It includes tracking the movement of personnel as they arrive to, and depart from, a unit. This includes maintaining visibility of individuals as they enter, transit, and depart theater. Additional accountability requirements may be assigned by the commander, such as accounting for detainees, prisoners of war, host-nation or partner-nation forces, and delegations. Higher casualty rates also increase the emphasis on personnel accountability, casualty reports, and replacement operations. Personnel officers plan for accurate tracking of casualties and replacements through coordination with casualty liaison teams and the human resources sustainment center.

G-145. Strength reporting is turning by-name data into a numerical end product and is conducted at all levels of command. The personnel strength reporting process starts with by-name strength data submitted to battalion or a separate unit-level and ends with personnel systems updates. Strength reports reflect the combat power of a unit and are used to monitor unit strength, prioritize replacements, monitor deployable and non-deployable personnel, execute strength distribution, and make tactical and HR support decisions.

G-146. The retention operations objective is to improve readiness, enhance force alignment, and maintain Army end strength through the development and retention of Soldiers. While unit commanders and unit leaders are ultimately responsible for retaining Soldiers at their level, career counselors located at battalion and above are technical experts charged with advising commanders on all aspects of the Army Retention Program. They also determine retention eligibility, evaluate retention options, and assist with eligibility for special commissioning programs consistent with published regulations and DA directives.

G-147. Personnel information management encompasses the collecting, processing, storing, displaying, reconciling, and disseminating of relevant HR information about units and personnel. Commanders, HR professionals, and planners rely on personnel information systems when performing their mission.

Provide Human Resources Services

G-148. HR services are those functions conducted by HR professionals that specifically affect Soldiers and organizations and include essential personnel services, postal operations, and casualty operations.

G-149. Essential personnel services provide timely and accurate HR functions affecting Soldier status, readiness, and quality of life and allow Army leadership to manage the force. Essential personnel services include awards and decorations, evaluation reports, promotions and reductions, transfers and discharges, identification documents, leaves and passes, line of duty investigations, Soldier applications, and processing of military pay and entitlements.

G-150. Postal operations provide mail and postal finance services within the deployed area of operations. Processing mail involves receiving, separating, sorting, dispatching, transporting, and redirecting ordinary, official, insured, certified, return receipt, and registered mail; conducting multinational and international mail exchange; and handling official casualty, contaminated, suspicious, and enemy prisoner of war mail. Postal finance services include selling postage stamps; cashing and selling money orders; mailing packages; providing insured mail, certified mail services, registered services, and special services (including classified up to SECRET level); and processing postal claims and inquiries.

G-151. Casualty operations management is the collecting, recording, reporting, verifying, and processing of casualty information from unit level to Headquarters, Department of the Army. The recorded information facilitates next of kin notification, aids casualty assistance, eases casualty tracking and status updates, and provides the basis for historical and statistical reports. This information is also shared with other DOD and Army agencies to initiate required actions. Accuracy and timeliness are critical components of casualty management, and depend on assured communications and reliable access to personnel information.

Coordinate Personnel Support

G-152. Coordinating personnel support functions generally falls under the responsibility of the G-1 and S-1. These functions include command interest programs; Army band operations; and morale, welfare, and recreation operations.

G-153. Command interest programs are of general interest to organizations and Soldiers. These include, but are not limited to, such programs as the equal opportunity program, Army voting assistance program, Army substance abuse program, Army body composition program, Army continuing education system, sexual harassment and assault response and prevention program, Army sponsorship program, family readiness, and other programs. All command interest programs have regulatory guidance or statutory requirements that S-1s must follow to ensure successful completion of the program.

G-154. Army band operations provide support to the deployed force by tailoring music support throughout military operations. Army bands promote the Army and our national interests, enable commanders to shape the environment to accomplish their mission, and set the conditions that lead to trust and confidence in

America's Army and its readiness to conduct operations in peacetime, conflict, and war (see ATP 1-19 for detailed information on Army band operations).

G-155. MWR operations includes unit recreation, sports programs, and rest areas for military and deployed DOD civilian personnel. MWR personnel provide these services and facilities in coordination with unit points of contact. G-1s and S-1s coordinate and plan for MWR operations. MWR support includes coordinated AAFES and American Red Cross support.

G-156. The American Red Cross delivers essential Red Cross services to all Army components, civilians, and their families worldwide in order to assist them in preventing, preparing for, and coping with emergency situations. The American Red Cross provides services such as emergency communication (for example, death of a family member, emergency financial assistance, counseling, and comfort kits in the deployed environment).

Conduct Human Resources Planning and Operations

G-157. Human resources leaders envision a desired HR end state in support of an operational commander's mission requirements through HR planning and operations. Human resources leaders communicate to subordinate HR providers and HR unit leaders the intent, expected requirements, and desired outcomes via an operation plan and operation order. Human resources planning and operations in support of the commander—

- Assesses the current situation and forecasts HR requirements based on the progress of the operation.
- Executes and adjusts decisions, as necessary, to exploit opportunities or unforecasted requirements.
- Applies human resources and support at decisive points in time.
- Estimates and stratifies casualties.

Casualty Estimates

G-158. The material in this section is derived from FM 1-0, AR 638-8, and ATP 4-02.5.

G-159. The Army assistant chief of staff (COS), personnel is the functional proponent for Army total mission casualty estimation (killed in action, captured, missing in action, and wounded in action). The Army Surgeon General is the functional proponent for Army disease and non-battle injury (DNBI) casualty estimation. The Army assistant COS, personnel is the functional proponent for overall casualty estimation, which includes both total mission casualties and DNBI casualties, to determine projected manning requirements.

G-160. **Currently, no approved casualty estimation tool exists.** Casualty estimation is based on the operations plan against the threat with all of the assumptions and mission variables (METT-TC). Essentially, planners answer the question "How costly, in terms of casualties, is the commander's plan going to be?" Planners develop further plans to treat casualties, evacuate casualties, and conduct other services such as mortuary affairs, and request replacements based on casualty estimates. Casualty estimates across the deployed force also affect the proposed needs for transportation assets, evacuation platforms, replacement needs by time (accelerated mobilizations), medical supplies, and water estimates.

G-161. Ensuring reasonable casualty estimates requires more than a numeric estimating procedure or set of rates. A frame of reference is critical to show how rates relate to variables. The currently approved and mandated methodology for deriving casualty rates for operational planning is the benchmark rate structure (see FM 1-0 for additional information on the benchmark rate structure).

G-162. These tools are based on a modified version of Dupuy's model published in 1995 (see Dupuy, 1995). Automated worksheets take into account various factors—

- Relative advantage or disadvantage.
- Unit types involved.
- Type of operation.
- Terrain.

- Weather.
- Posture.
- Strength of friendly and enemy forces.
- Opposition factor.
- Surprise factor.
- Sophistication factor.

The output of the medical COA tool and Army casualty estimate tool are worksheets of estimated casualties, required evacuation, and hospitalization estimates.

LEGAL CONSIDERATIONS

G-163. Commanders at all levels consult their legal advisor before and during the conduct of operations (for additional information, see Department of Defense Law of War, FM 6-27/MCTP 11-10C, AR 27-1, ADP 4-0, ADP 1-01, AR 600-8, and the Uniform Code of Military Justice [Sections 801–946, Title 10, United States Code]).

G-164. *Rules of engagement* are directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered. Also called ROE (JP 3-84). ROE are commanders' tools for regulating the use of force. The legal sources that provide the foundation for ROE are complex and include customary and treaty law principles from the laws of war. As a result, judge advocates participate significantly in the preparation, dissemination, and training of ROE.

G-165. ROE serve three purposes: (1) provide guidance to deployed units on the use of force, (2) act as a control mechanism for the transition from peacetime to combat operations, and (3) provide a mechanism to facilitate planning. ROE provide a framework that encompasses national policy goals, mission requirements, and the law. ROE provide parameters within which commanders must operate to accomplish their assigned mission:

- ROE provide a limit on operations and ensure that U.S. actions do not trigger undesired escalation, for example, by forcing a potential opponent into a "self-defense" response.
- ROE may regulate a commander's capability to influence a military action by granting or withholding the authority to use particular weapon systems or tactics.
- ROE may also reemphasize the scope of a mission. Units deployed overseas for training exercises may be limited to use of force only in self defense, reinforcing the training rather than combat nature of the mission.

G-166. Unit commanders always retain the inherent right and obligation to exercise unit self defense in response to a hostile act or demonstrated hostile intent. Unless otherwise directed by a unit commander as detailed below, military members may exercise individual self defense in response to a hostile act or demonstrated hostile intent. When individuals are assigned and acting as part of a unit, individual self defense is considered a subset of unit self defense. As such, unit commanders may limit individual self defense by members of their unit. Both unit and individual self defense include defense of other U.S. military forces in the vicinity.

HEALTH SERVICE SUPPORT

G-167. Material in this section is derived from ADP 4-0, FM 4-0, FM 4-02, ATP 4-02.1, ATP 4-02.2, ATP 4-02.3, ATP 4-02.5, ATP 4-02.7/MCRP 4-11.1F/NTTP 4-02.7/AFTTP 3-42.3, ATP 4-02.10, ATP 4-02.55, ATP 4-02.83/MCRP 4-11.1B/NTRP 4-02.21/AFMAN 44-161(l), ATP 4-25.12, and TC 4-02.1.

G-168. Health service support (HSS) encompasses all support and services performed, provided, and arranged by the AHS to promote, improve, conserve, or restore the behavioral and physical well-being of Army personnel and, as directed, other Services, agencies, and organizations. This includes—

- Medical evacuation (MEDEVAC) (including medical regulating).
- Medical treatment (organic and area support), including—
  - Dental care (treatment aspects).

  - Behavioral health and neuropsychiatric treatment.
  - Treatment of chemical, biological, radiological, and nuclear patients.
- Hospitalization.
- Medical logistics (including blood management).

G-169. The concept of medical care in theater is developed and adhered to by medical commanders and their staffs in conjunction with the command surgeon at each echelon. The medical plan in each operation order includes care by echelon, MEDEVAC procedures, and CASEVAC procedures.

ARMY HEALTH SYSTEM PRINCIPLES

G-170. Enduring principles underpin the AHS' delivery of health care in a field environment. These principles guide medical planners in developing operation plans that are effective, efficient, flexible, and executable. AHS plans are designed to support the operational commander's scheme of maneuver while retaining a focus on the delivery of health care. The AHS principles are—

- Conformity. Conformity with the operation order provides the most basic element of effective AHS support.
- Proximity. Proximity provides AHS support to sick, injured, and wounded Soldiers at the right time and the right place and keeps morbidity and mortality to a minimum.
- Flexibility. Flexibility is health care personnel prepared and empowered to shift AHS resources as requirements change.
- Mobility. Mobility ensures that AHS assets remain in proximity to support maneuvering forces.
- Continuity. Continuity in care and treatment moves the patient through progressive, phased roles of care, extending from the point of injury or wounding to the CONUS-support base. *Continuity of care* is an attempt to maintain the role of care during movement between roles at least equal to the role of care at the originating role (FM 4-02).
- Control. Control ensures that scarce AHS resources are efficiently employed and support the operational and strategic plan.

ROLES OF MEDICAL CARE

G-171. A basic characteristic of organizing modern AHS support is the distribution of medical resources and capabilities to facilities at various levels of command, diverse locations, and progressive capabilities—these are referred to as roles of care. As a general rule, no role will be bypassed except in instances of medical urgency, efficiency, or expediency. The rational for this rule is to ensure the stabilization/survivability of the patient through tactical combat casualty care (TCCC), advanced trauma management, and far forward resuscitative surgery. The four roles of medical care are—

- Role 1—First medical care a Soldier receives.
- Role 2—Advanced trauma management and TCCC.
- Role 3—Resuscitative surgical intervention.
- Role 4—Medical care at CONUS-based hospitals and other safe havens.

G-172. Role 1 care is performed expediently by self and battle buddies (first aid), nearby combat lifesavers (enhanced first aid), and combat medics. These personnel are referred to as first responders and their capabilities as TCCC. Tactical combat casualty care occurs during a combat mission and is the military counterpart to prehospital emergency medical treatment. Tactical combat casualty care uses a strictly limited range of interventions and focuses on the most likely and serious threats, injuries, and conditions encountered in combat.

G-173. Tactical combat casualty care consists of three phases:

- Care under fire. Only lifesaving interventions that must be performed immediately are undertaken during this phase.
- Tactical field care. Interventions directed at other life-threatening conditions, resuscitation, and other measures to increase the comfort of the patient may be performed. Physicians and physician assistants at battalion aid stations or during tailgate medical support also provide

TCCC. *Tailgate medical support* is an economy of force device employed primarily to retain maximum mobility during movement halts or to avoid the time and effort required to set up a formal, operational treatment facility (for example, during rapid advance and retrograde operations) (FM 4-02).

- Tactical evaluation. Casualties are transported to a medical treatment facility (MTF) by aircraft or vehicles augmented, if possible, with dedicated medical personnel who can perform limited medical care and response.
- Combat medics, the physician, the physician assistant, or the health care specialist provide Role 1 medical treatment in the battalion aid station.

G-174. Role 2 care is rendered at the role 2 MTF, which is operated by medical companies' area support squad medical treatment platoon. The area support squad examines patients and evaluates wounds and general medical conditions to determine treatment and evacuation precedence. The area support squad continues advanced trauma management, including resuscitation, and, if necessary, institutes additional emergency measures. Treatments do not extend beyond measures dictated by immediate necessity.

G-175. The role 2 MTF provides greater capability to resuscitate trauma patients than is available at role 1 locations. Patients who can return to duty within 72 hours are held for treatment. Role 2 care can evacuate patients from role 1 locations and provide role 1 medical treatment on an area support basis for units without organic role 1 resources. The role 2 MTF has the capability to provide packed red blood cells (liquid), limited x-ray, clinical laboratory, operational dental support, combat and operational stress control, preventive medicine, and when augmented, physical therapy and optometry services.

G-176. Role 3 MTFs are staffed and equipped to provide care—including resuscitation, initial wound surgery, damage control surgery, and postoperative treatment—to all categories of patients. Role 3 care expands support provided at role 2. Patients unable to tolerate and survive movement over long distances receive surgical care in a hospital as close to the supported unit as the tactical situation allows. Role 3 includes provisions for—

- Coordinating patient evacuation.
- Providing care with proper staff and equipment for all categories of patients in an MTF.
- Providing support on an area basis to units without organic medical assets.

G-177. Role 4 medical care is found in CONUS-based hospitals and other safe havens (to include robust overseas MTFs). If mobilization requires expansion of military hospital capacities, then the Department of Veterans Affairs and civilian hospital beds in the National Disaster Medical System are added to meet the increased demand created by evacuation of patients from the AO. Support-based hospitals represent the most definitive medical care available within the AHS.

PERSONNEL ACTIVE IN INITIAL CARE OF CASUALTIES

G-178. **Combat Lifesavers.** A combat lifesaver is a nonmedical Soldier of a unit trained to provide enhanced first aid as a secondary mission.

G-179. **Combat Medics.** Combat medics are organic to medical platoons or sections. They are normally placed under the operational control of platoons or companies of maneuver battalions. Combat medics provide TCCC to wounded Soldiers.

G-180. **Ambulance Squads.** An ambulance squad consists of two ambulance teams that each have one ambulance and two ambulance aides (for a total of two ambulances and four ambulance aides). Ambulance squads are organic to medical platoons, brigade support medical companies assigned to brigade combat teams, medical companies (ground ambulance), and medical companies (area support) assigned to medical battalions (multifunctional). Ambulance squads provide direct support for ground MEDEVAC or they provide ground MEDEVAC on an area support basis throughout an AO. The ambulance teams of a battalion's medical platoon are in direct support of a company or team or collocated with the treatment squad at a battalion aid station. When collocated, ambulance teams are dispatched from the battalion aid station to reinforce a team in direct support or to evacuate patients from units in area support.

G-181. **Treatment squad (medical platoon).** The treatment squad consists of the field surgeon, a physician assistant, three health care sergeants, and three health care specialists. The squad establishes the battalion aid station as far forward as possible, performs triage, and provides care to the casualty.

G-182. **Treatment Squad (brigade support medical company).** The treatment squad consists of an emergency physician, a physician assistant, three health care sergeants, and three health care specialists. The squad provides augmentation to the battalion medical platoons, sick call operations, emergency medical treatment, and advanced trauma management.

G-183. **Area support squad (brigade support medical company).** The area support squad comprises one Dental Corps officer, a dental specialist, a radiology sergeant, a radiology specialist, a medical laboratory sergeant, and a medical laboratory specialist. The squad is organic to the medical companies of BCTs and medical company (area support) in echelons above brigade. The medical companies of the BCT have two additional personnel in their area support squads: a physical therapist and a physical therapy sergeant. The dental officer is trained in advanced trauma management and provides additional treatment capabilities to the role 2 MTF during mass casualty situations. The squad also provides limited clinical laboratory and radiology services commensurate with role 2 capabilities.

G-184. **Medical treatment squad (area) (brigade support medical company).** The area support squad comprises one field surgeon, one senior physician assistant, three health care sergeants, and three health care specialists. This squad is the base medical treatment element that provides troop clinic-type services and advanced trauma management within the brigade support area (BSA).

G-185. **Patient holding squad (brigade support medical company).** The patient holding squad consists of a medical-surgical nurse, two health care sergeants, and two health care specialists. It is capable of holding and providing minimal care for up to 40 return-to-duty patients in the medical company (area support) and 20 return-to-duty patients in the medical companies of the BCT. This squad is organic to the medical companies of BCTs and the medical company (area support) (MCAS).

G-186. **Forward resuscitative surgical detachment.** The forward resuscitative surgical detachment is attached to the field hospital when not operationally employed forward. The resuscitative forward surgical detachment may be further attached to BCT medical companies or MCAS. Its mission is to provide forward damage control resuscitation and damage control surgery, enabling patients to withstand further evacuation.

G-187. **Medical company (area support).** The MCAS provides role 1 and role 2 AHS support to units located in its AO. It provides area medical support for designated non-brigade combat team units including—

- Treatment of patients with disease and minor injuries, triage of mass casualties, initial resuscitation or stabilization, advanced trauma management, and preparation for further evacuation of ill, injured, and wounded patients who are incapable of returning to duty within 72 hours.
- Treatment squads which are capable of operating independently of the MCAS for limited periods of time.
- Evacuation of patients from units within the MCAS AO.
- Emergency medical supply and resupply to units operating within the MCAS AO.
- Behavioral health consultation and education support, to include coordinating operations of attached combat and operational stress control elements operating within the MCAS AO.
- Pharmacy services, laboratory, and radiological services commensurate with role 2 medical treatment.
- Operational dental care services to include emergency dental, stabilization of maxillofacial injuries, essential care to prevent and manage potential dental emergencies, and limited preventive dentistry.
- Patient holding for up to 40 patients.
- Outpatient consultation services for patients referred from units with only role 1 capabilities.

G-188. **Combat support hospital or hospital center.** When treatment is insufficient at the AHS, a patient may be transferred to a hospital. A hospital provides essential care to either return the patient to duty or stabilize the patient for evacuation to a definitive care facility outside the AO. The capacity of a combat

support hospital is 248 beds and 240 beds for a hospital center. Table G-28 shows an example of the number of beds and operating tables each type of hospital unit can hold and the number of surgical hours each unit can produce in 24 hours.

Table G-28. Example hospital center configuration (maximum 240 beds)

ATP 4-02.55

Hospital units	*Intensive care beds*	*Intermediate care beds*	*Minimal care beds*	*Surgical tables*	*Surgical hours per 24 hours*
Field hospital (32 bed)	12	20	0	2	36
Field hospital (32 bed)	12	20	0	2	36
Hospital augmentation detachment (surgical 24 bed)	24	0	0	2	36
Hospital augmentation detachment (medical 32 bed)	12	20	0	0	0
Hospital augmentation detachment (intermediate care ward 60 bed)	0	60	0	0	0
Hospital augmentation detachment (intermediate care ward 60 bed)	0	60	0	0	0
Totals	60	180	0	6	108

G-189. Figure G-8 depicts an example of the relative placement of roles 1–3 medical units by echelon on the battlefield in the patient care framework (see ATP 4-02.10).

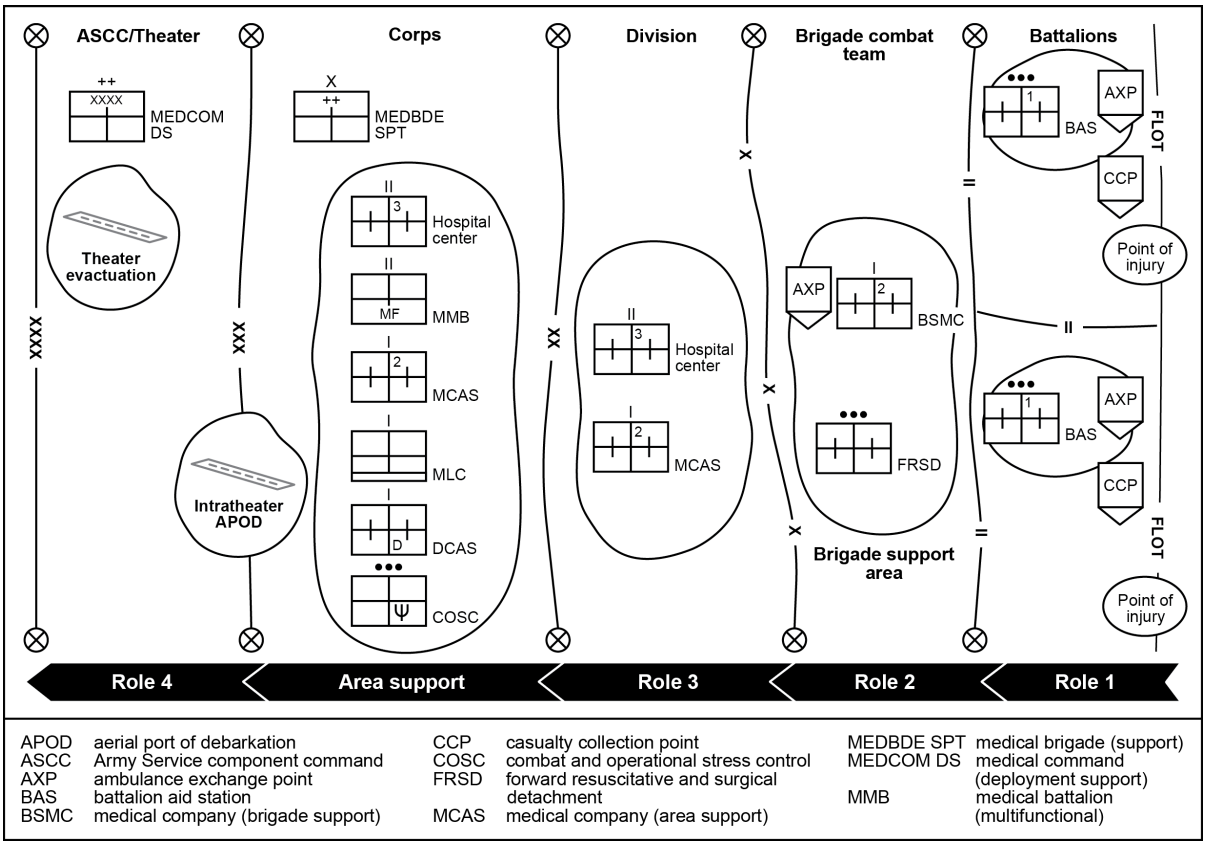


Figure G-8. Health service support Roles 1–3 patient care framework

CASUALTY REPORTING

G-190. For purposes of casualty reporting, a casualty is defined as any person lost to an organization that has been declared deceased, duty status-whereabouts unknown, excused absence-whereabouts unknown, missing, injured, or ill. Commanders at all echelons are responsible for timely reporting of casualties to superiors and casualty assistance centers in their AOs. The casualty assistance center is usually associated with mortuary affairs for deceased personnel but also manages reporting of evacuated injured and ill personnel. Release of information for casualties of any disposition is governed by AR 360-1 (see AR 638-8 for more details). Categories of casualties are detailed in table G-29.

Table G-29. Types of casualties

Type	*Description*
Not seriously ill/injured (NSI)	Injuries or illness not threatening life, limb, or eyesight. May or may not require hospitalization. Medical authority classifies as less severe than SI.
Seriously ill/injured (SI)	Injuries or illness threatening life, limb or eyesight. Requires medical attention, and medical authority declares that death is possible, but not likely, within 72 hours or the severity of the injury is such that it is permanent and life altering.
Very seriously ill/injured (VSI)	Injuries or illness causing loss of limb or eyesight or likely to cause loss of life. Medical authority declares it more likely than not that death will occur within 72 hours.
Duty status-whereabouts unknown (DUSTWUN)	Unknown whereabouts of personnel while on duty. Is a transitory or temporary casualty status.
Excused absence-whereabouts unknown (EAWUN)	Unknown whereabouts of personnel while on leave or excused absence.
Missing	Unknown whereabouts of personnel after initial search conducted (following DUSTWUN or EAWUN report unless situation compels a missing status on the initial casualty report (such as kidnapping or loss of accountability during kinetic operations (missing in action))
Deceased	A casualty status applicable to a person who is either known to have died, determined to have died on the basis of conclusive evidence, or declared dead on the basis of a presumptive finding of death. The recovery of remains is not a prerequisite to determining or declaring a person deceased.

MEDICAL AND CASUALTY EVACUATION PROCESS

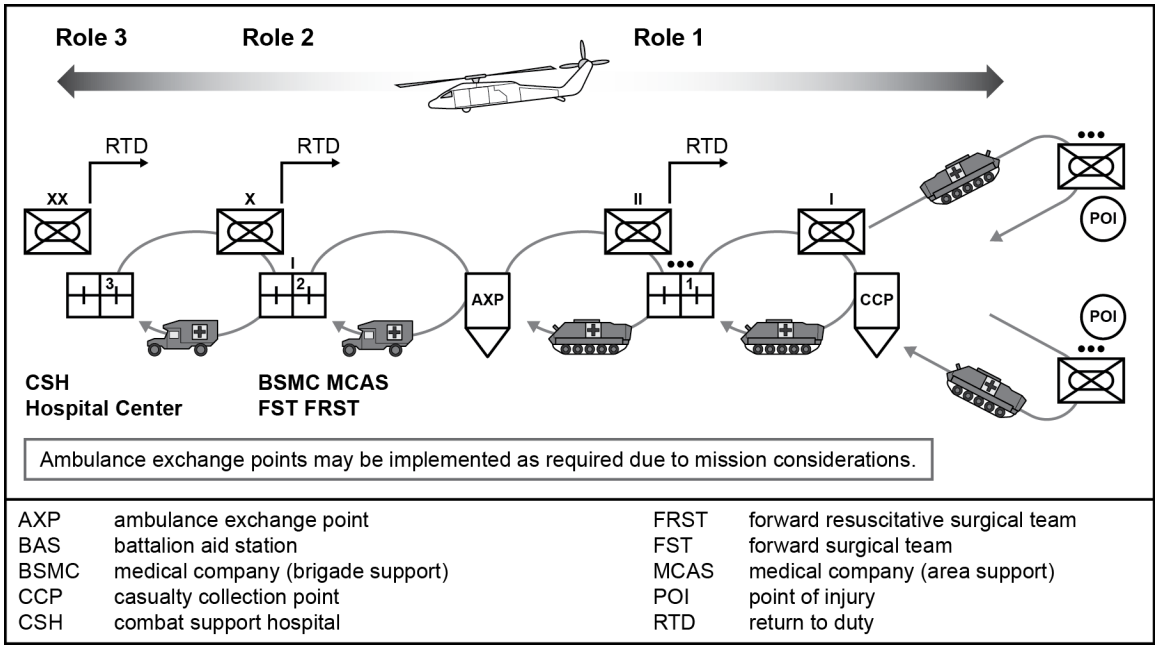
G-191. The first person to see a Soldier is their buddy. Buddy care stabilizes a casualty until a combat lifesaver can attend. When combat lifesaver care is exhausted, the combat medic provides tactical casualty care in the field. When a casualty needs to be evacuated, the combat medic requests evacuation using the 9-line MEDEVAC request.

G-192. Evacuation occurs based on the category (priority) of the casualty, availability of assets, and other factors such as terrain or enemy. The first unit in the evacuation chain is normally the ambulance squad. The ambulance squad evacuates to the nearest MTF or casualty collection point. The patient is further evacuated, as necessary and by priority, by either ground or air evacuation. The scheme of evacuation generally follows the same path as medical care capability. Figure G-9 on page 292 depicts a notional patient flow during MEDEVAC and CASEVAC. Table G-30 on page 292 details evacuation priorities.

G-193. Some considerations for evacuation planning are—

- Proximity of medical assets.
- Role 1 treatment area support.
- Route reconnaissance and rehearsals.
- Aid station and ambulance exchange point (AXP) layout and markings.

- Situational awareness graphics.
- Planning, resourcing, and use of nonstandard evacuation assets.
- Communication plan.
- Casualty estimates.
- Plan for reconstitution of role 1 treatment and evacuation assets.



ATP 4-02.2

Figure G-9. Patient flow from point of injury to role 3

Table G-30. Categories of evacuation precedence

ATP 4-02.2; ATP 4-25.13

Priority	***Description***
Priority I—Urgent	Is assigned to emergency cases that should be evacuated as soon as possible, and within a maximum of 1 hour, to save life, limb, or eyesight; to prevent complications of serious illness; and to avoid permanent disability.
Priority IA—Urgent surgical	Is assigned to patients who should be evacuated as soon as possible, and within a maximum of one hour, who must receive far forward surgical intervention to save life, limb, or eyesight and to stabilize them for further evacuation.
Priority II—Priority	Is assigned to sick and wounded personnel requiring prompt medical care. This precedence is used when the individual should be evacuated within 4 hours, if the medical condition could deteriorate to such a degree that they will become an URGENT precedence, if their requirements for special treatment are not available locally, or if they will suffer unnecessary pain or disability.
Priority III—Routine	Is assigned to sick and wounded personnel requiring evacuation but whose condition is not expected to deteriorate significantly. The sick and wounded in this category should be evacuated within 24 hours.
Priority IV—Convenience	Is assigned to patients for whom evacuation by medical vehicle is a matter of medical convenience rather than necessity.
Note. NATO STANAG 3204 has deleted the category of Priority IV—Convenience, but this category is still included in the U.S. Army evacuation priorities because the need for it exists in an operational environment.	

Medical Evacuation

G-194. MEDEVAC is the routine evacuation of injured personnel from lower echelon medical care to higher echelon medical care. MEDEVAC is conducted using dedicated lift, with medical care available, and by priority. MEDEVAC planning is conducted within all sustainment planning (see ATP 4-02.2 for more information).

G-195. Air MEDEVAC capabilities include the 15x HH-60M aircraft MEDEVAC company, which breaks down into four forward support MEDEVAC platoons and one area support platoon. Typically, a forward support MEDEVAC platoon consisting of three HH-60M air ambulance helicopters in support of an aviation task force. The area support platoon also operates three HH-60M aircraft and performs both point of injury missions as well as area support patient transfer missions. The forward support MEDEVAC platoon leader or designated representative briefs the air MEDEVAC plan at the air mission coordination meeting, the air mission briefing, and the health service support rehearsal. Table G-31 on pages 293–294 details the litter and ambulatory capacities for dedicated ground and air platforms. Table G-32 on page 294 details United States Air Force evacuation platforms. Table G-33 on page 295 details vessel and rail car MEDEVAC capabilities.

Table G-31. Ground and air evacuation

ATP 4-02.55 and NTTP 4-02.M/MCRP 4-11.1G

Type	*Litter*	*Ambulatory*	*Combination*
MEDEVAC (ground)			
M997 HMMWV	4	6	2 Litter/3 ambulatory
MEV, STRYKER	4	6	2 Litter/2-4 ambulatory
M113 ambulance	4	6-8	2 Litter/3-4 ambulatory
M1266A1 LWB MRAP ambulance	2	4	1 Litter/2 ambulatory
AMPV medical evacuation	4	6	2 Litter/3 ambulatory
MEDEVAC (rotary wing)			
HH-60M without hoist	6	7	4 Litter/1 ambulatory
HH-60M with hoist	4	4	4 Litter/1 ambulatory
CASEVAC (ground)			
HMMWV M998 series	3	5	Varies with configuration
M1081 LMTV	7	12	
M1093 MTV	8	14	
M977A4 HEMTT	9		
M871 22 1/2 ton cargo trailer	16		
CASEVAC (rotary wing)			
CH-47 Chinook (multiple evacuation configurations with litter support kit installed)	0	31	Varies with configuration
	4	25	
	8	19	
	12	16	
	16	9	
	20	4	
	24	1	
CASEVAC (fixed wing)			
C-12 Huron	0/2	8/4	Varies with configuration
C-23 Sherpa	0	20	

Table G-31. Ground and air evacuation *(continued)*

ATP 4-02.55 and NTTP 4-02.M/MCRP 4-11.1G

U.S. Navy/Marine Corps CASEVAC (ground)			
MRAP CAT II ISS	2	4	
LAV 25	0	4	
LAV-L	4	7	
7-ton truck	10	20	
U.S. Navy/Marine Corps CASEVAC (rotary wing)			
UH-1Y Huey	6	10	
CH-46 Sea Knight	15	22	
CH-53 Sea Stallion	24	37	
V-22 Osprey	13	24	

Table G-32. United States Air Force evacuation platforms

ATP 4-02.55

USAF floor loading capacities (fixed wing)						
Type	***Litter***					
C-130	15					
C-17	48 (12 litter patients can be loaded on the ramp)					
KC-135	8					
USAF MEDEVAC (fixed wing)						
C-130 H / J-30	***AE configuration***	***AE-1***	***AE-2***	***AE-3***	***AE-4***	***AE-5***
	Litter spaces	30	72/92	20	50/60	10
	Total seats*	46/62	6/10	44/62	30/62	31/45
C-17	***AE configuration***	***AE-1***	***AE-2***	***AE-3***	***AE-4***	
	Litter spaces	9	36	9	6	
	Total seats*	54	54	90	49	
KC-135	***AE configuration***	***AE-1***	***AE-2***	***AE-3***		
	Litter spaces	6	9	15		
	Total seats*	31	28	20		
C-12J	***AE configuration***	***AE-1***				
	Litter spaces	1				
	Total seats*	10				
C-21	Litter spaces	1				
	Total seats*	5				

* Actual seats may decrease based on crew complement, mission requirements, and patient load.

AE aeromedical evacuation

Table G-33. Vessel and rail car evacuation

JP 4-02 and ATP 4-02.55

MEDEVAC vessels			
Type	***Litter***	***Ambulatory***	***Comments***
USNS Mercy USNS Comfort	1,000	1,000	12 operating rooms, 88 intensive care beds, maximum patient flow is 300 patients per 24 hours. Limited capability to receive patients by boat. Primary means is by helicopter.
Wasp class amphibious assault ship (LHD) (multipurpose)	604	604	Six main ORs, four dental ORs, bed capacity that can be expanded to 600, and it carries 1,500 pints of frozen blood. This ship can receive casualties from helicopters or landing craft.
Tarawa class amphibious assault ship (LHA) (general purpose)	367	367	Three main ORs, two dental ORs, an overflow bed capacity of 300, and carries 1,500 pints of frozen blood. The ship can receive casualties from helicopters or landing craft.
Iwo Jima class amphibious assault ship (LPH)	222	222	2x ORs and overflow bed capacity of 200.
Amphibious transport dock (LPD)	14	14	Designate as a secondary casualty receiving ship due to limited medical capabilities.
Dock landing ship (LSD)	50	108	
Amphibious cargo ship (LKA)	12	12	
Amphibious command ship (LCC)	24	24	
MEDEVAC Rail Cars			
Ambulance, railway car (NATOHN)	24	30	
Ambulance, railway car, personnel	21	21	

Casualty Evacuation

G-196. Information from this section is derived from ATP 4-25.13, ATP 4-02.5, AR 638-8, AR 360-1, and TC 4-02.1.

G-197. *Casualty evacuation* is used by nonmedical units to refer to the movement of casualties aboard nonmedical vehicles or aircraft without enroute medical care (FM 4-02). If a combat medic is unavailable to provide care enroute, a combat lifesaver may accompany the casualties to monitor their conditions.

G-198. Evacuate casualties from their current location when their injuries cannot be treated at the organic level and their continued presence in the area presents a risk to life, limb, or eyesight. Staffs and commanders at all echelons plan for standardization and provision of equipment, transportation, and SOPs to facilitate evacuation of expected numbers of casualties.

CASEVAC Planning

G-199. Allocate litter-configured platforms for CASEVAC, if available. The number of platforms depends on the mission and the casualty estimate. CASEVAC with standard UH-60 assets are considered if aircraft are available for support.

G-200. Consider all available ground vehicles for augmenting MEDEVAC assets in an emergency. The key to success is identifying the vehicles, drivers, and medical personnel or combat lifesavers who can accompany casualties. Equip each of the planned vehicles with a warrior aid and litter kit (WALK®). The WALK® provides users with enough medical supplies and a stable evacuation platform for two critically injured casualties. Coordinating for the release of these assets upon demand, rather than waiting for a mass casualty situation, is crucial to the success of the operation.

MEDICAL CAPABILITY PLANNING

G-201. Tables G-34 through G-37 on pages 296–297 and figure G-10 on page 298 detail various planning factors for medical support.

Table G-34. Estimated combat support hospital operational space requirements

ATP 4-02.5

Hospital unit	*Required square meters*
Early entry element (44 bed)	14,600
Hospital element (40 bed)	8,500
Company A (84 bed)	23,100
Company B (164 bed)	23,100
Combat support hospital (248 bed)	37,700

Table G-35. Estimated hospital center operational space requirements

ATP 4-02.10

Hospital unit	*Required square meters*
Headquarters and headquarters detachment	4,600
Field hospital (32 bed)	27,500
Hospital augmentation detachment (surgical 24 bed)	4,500
Hospital augmentation detachment (medical 32 bed)	950
Hospital augmentation detachment (intermediate care ward 60 bed)	1,300
Hospital center (240 bed) with 1 or 2 field hospitals	39,900 or 67,400

Table G-36. Estimated medical water planning factors

ATP 4-02.10

Patient care	*Gallons required per day*	*84-bed hospital company*	*164-bed hospital company*	*248-bed combat support hospital*
Clean up	1.00 per bed	84	164	248
Bed bath	5 per bed patient	420	820	1,120
Bed pan wash	1.50 per bed	126	246	372
Laboratory test	0.20 per bed	16.8	32.8	49.6
Sterilizer	45.00 per sterilizer	3,780	7,380	11,160
X-ray processor	5.00 per X-ray	420	820	1,120
Hand washing	2.00 per bed	168	328	496
Showers	3.40 per ambulatory patient	0	0	0
	Total	5,014.8	9,790.8	14,656.6
SURGICAL				
Scrub	8.00 per case	672	1,312	1,984
Instrument rinse	2.00 per case	168	328	496
Instrument cleaning	7.00 per unit	588	1,148	1,736
Operating room cleanup	3.00 per case	48	96	144
	Total	1,476	2,884	4,360

Table G-36. Estimated medical water planning factors *(continued)*

ATP 4-02.10

Patient care	*Gallons required per day*	*84-bed hospital company*	*164-bed hospital company*	*248-bed combat support hospital*
HOSPITAL LAUNDRY				
Hospital linen	3.00 per pound	898.98	1,558.77	2,457.75
	Total	898.98	1,558.77	2,457.75
STAFF/PATIENT				
Direct care worker	3.20 per direct care worker	448	720	1,168
Food preparation	1.00 per meal	260	432	692
Showers	3.40 per direct care worker	476	765	1,241
	Total	1,184	1,917	3,101
	Grand total	8,573.78	16,150.57	24,575.35

Table G-37. Class VIII pounds per hospital admission type

ATP 4-02.10

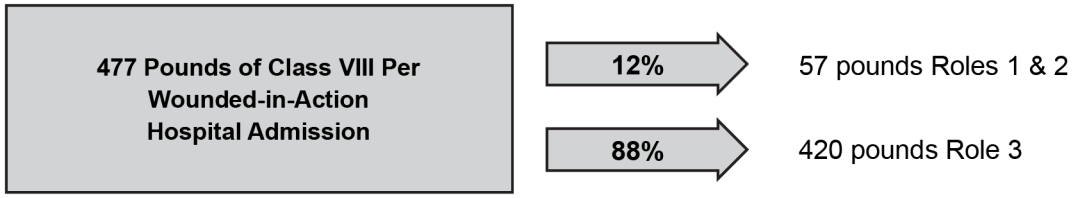
Class VIII planning factors				
Roles of care	*Wounded-in-action planning factor as pounds/wounded-in-action hospital admission*	*Disease and nonbattle injuries planning factor as pounds/disease and nonbattle injury hospital admission*	*Blister planning factor as pounds/ blister hospital admission*	*Nerve planning factor as pounds/nerve hospital admission*
Roles 1 and 2	57 pounds	27 pounds	3 pounds	7 pounds
Role 3	320 pounds	84 pounds	19 pounds	89 pounds
Note. Population supported items planning factor = 0.19 pounds per Soldier per day				

Class VIII planning factor percentages by role of care

Role of care	*Wounded-in-action planning factor = 477 pounds/ hospital admission*	*Disease-and-nonbatttle-injuries planning factor = 112 pounds/ hospital admission*	*Blister planning factor = 36 pounds/ hospital admission*	*Nerve planning factor = 110 pounds/ hospital admission*
Roles 1 & 2	12%	22%	7%	6%
Roles 3	88%	78%	93%	94%

NOTE: Population Supported Items Planning Factor = 0.19 pounds per Soldier per day (such as sunscreen, foot powder, and other items as provided under Common Table of Allowance 8-100).

Illustration



ATP 4-02.1

Figure G-10. CL VIII planning factors

Appendix H

Protection Planning Factors

Appendix H provides a variety of planning factors for the protection warfighting function. It includes topics such as air defense planning factors, CBRN decontamination requirements, and Army personnel recovery and requirements.

AIR DEFENSE PLANNING FACTORS

H-1. This section presents air defense planning factors. Table H-1 is derived from MSTP 5-0.3 and ATP 3-01.8.

Table H-1. Air defense planning factors

Type	*Targets*	*Planning range*	*# of launchers per organization*	*# of missiles per launcher*	*Coverage angle of supporting radar*	*Engagement range (planning)*
Patriot (MIM-104)	Airplanes, Helicopters, UAV, TBM, TASM, Cruise missiles	100 km (ANMPQ-53)	4x batteries per Patriot or AMD BN; 6x launchers per battery	16x PAC-3	Track = 120 degrees Search = 90 degrees	70 km (PAC-3)
Avenger Stinger	Airplanes, Helicopters, UAV	40 km ANMPQ-4 Sentinel radar; Avenger has on board visual or FLIR systems	24 fire units per AMD battalion	8x Stinger per Avenger fire unit	360 degrees out to 75 km	4 km (Stinger) 2 km (.50-cal)

DECONTAMINATION REQUIREMENTS

H-2. Tables H-2 through H-4 on pages 300–301 provide planning factors from ATP 3-11.32/MCWP 10-10E.8/NTTP 3-11.37/AFTTP 3-2.46. These planning factors assist with chemical, biological, radiological, and nuclear (CBRN) decontamination.

Table H-2. Decontamination levels and techniques

Level	*Purpose*	*Technique*	*Best start time**	*Done by*
Immediate	Saves lives Stops agent from penetrating Limits agent spread	Skin decontamination	Before 1 minute	Individual
		Personnel wipe down	Within 15 minutes	Individual or buddy
		Operator spray down		Individual or crew
		Spot decontamination		Individual or crew
Operational	Continues operations in a contaminated environment Limits agent spread	MOPP gear exchange	Within 6 hours**	Contaminated unit
		Vehicle wash down***	Within 6 hours	Battalion/squadron crew/team or decontamination unit
Thorough	Provides probability of long-term MOPP reduction	Detailed aircraft decontamination (DAD), detailed equipment decontamination (DED) and/or detailed troop decontamination (DTD)	When mission allows reconstitution	Decon PLT or contaminated unit, as applicable
Clearance	Allows unrestricted transportation, maintenance, employment, and disposal	Dispose of and replace the contaminated item, equipment, or material	When mission allows restoration	Supporting strategic resources (military commanders, subject matter experts, and other stakeholders)
		Contaminated surface, component, repair, replacement		

*The techniques become increasingly less effective the longer they are delayed.
**Consider performance degradation, equipment limitation, and health risk assessment when exceeding six hours.
***Vehicle washdown is most effective within 1 hour but often has to be delayed for logistical reasons.

Table H-3. Operational decontamination checklist

Decon assessment	If the task force has no decon assets, request assistance from the next higher headquarters for needed support.
Coordination	Task force chemical section conducts coordination with contaminated unit of where decon linkup point is located. The decontamination should be conducted between 1 and 6 hours after becoming contaminated.
Site selection	Consider the following when selecting a site: Off main route, but easy access Large enough area to decon element Good overhead concealment (when possible) Water source (when available) Good drainage
Rendezvous	Ensure TF decon crew knows where decon site and decontamination linkup points are located
Site setup	Ensure the power-driven decontamination equipment (PDDE) are positioned properly and ready to dispense hot, soapy water Ensure the contaminated unit operates the MOPP gear exchange at the same time as the vehicle wash down (provide battalion chemical NCO to supervise, if needed)

Table H-3. Operational decontamination checklist *(continued)*

Site control and security	Ensure the drivers of the contaminated vehicles on the movement control plan of the vehicle wash down line. Ensure the contaminated unit has security of the site.
Processing	Decon NCOIC ensures rate of flow of vehicles
Cleanup	Decon NCOIC ensures the MOPP gear exchange area is cleaned up Decon NCOIC ensures the vehicle wash down lane is cleaned up.
Marking and reporting	Decon NCOIC has the team properly mark the decon site and send NBC 5 report up.

Table H-4. Decontamination area planning

Operational decontamination	*Thorough decontamination*
120 m^2 per squad or armored vehicle	5x different 500m^2 sites over a distance of 1.5kms that is oriented with the wind
*Ideally, decontamination locations are 15 km from populated areas and provides adequate space, multiple access routes, sufficient water and utility support, and a degree of personnel protection from elements and threats	

ARMY PERSONNEL RECOVERY

H-3. Material for this section is derived from FM 3-50. For additional information, see AR 525-28, ATP 3-18.72, and ATP 3-50.10/MCRP 3-05.3/NTTP 3-57.6/AFTTP 3-2.90.

H-4. *Army personnel recovery* is the military efforts taken to prepare for and execute the recovery and reintegration of isolated personnel (FM 3-50). In most cases, a unit conducts a recovery making full use of the in-place Army personnel recovery (PR) capabilities and the designated recovery forces. Army commanders consider four general approaches (sometimes referred to as methods) to conduct PR: unassisted, immediate, deliberate, or external supported.

- Unassisted PR is the unaided return of isolated personnel to their unit or organization. Isolated persons use evasion and survival techniques to establish contact and return to secure areas.
- Immediate recovery involves the immediate efforts of the company to locate and bring isolated personnel back to secure areas and reintegrate them.
- Deliberate recovery efforts involve dedicated assets and personnel conducting recovery operations. These efforts are pre-planned events triggered by an isolating event. They can involve detachments, specified assets, or whole units.
- External-supported recovery involves recovery efforts by dedicated support from external organizations (such as host nation, partner nation, or interagency organizations). These operations can be conducted in support of, or in coordination with, U.S. forces.

H-5. Commanders must be aware of PR plans from theater level through their own echelon prior to conducting operations. Staff activities in planning and conduct of PR are contained in FM 3-50.

H-6. PR starts at the home station with training and the creation of an individual isolated personnel report (ISOPREP). Each Soldier submits an ISOPREP prior to deployment and updates the ISOPREP information annually or per standard operating procedure (SOP). Requirements for ISOPREP information input, storage, and management are detailed in AR 525-28 Chapter 6.

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Appendix I

Command and Control Planning Factors

This appendix provides a variety of planning factors for the command and control warfighting function. It includes topics such as command and support relationships, tactical mission tasks, and electromagnetic warfare.

COMMAND AND SUPPORT RELATIONSHIPS

I-1. This section covers various command and support relationships and associated responsibilities. At different times, U.S. forces can find themselves in these varied relationships with regard to their higher headquarters.

U.S. ARMY COMMAND RELATIONSHIPS

I-2. Table I-1 on pages 303–304 shows U.S. Army command relationships.

Table I-1. U.S. Army command relationships

FM 6-0

If relationship is—	*Then inherent responsibilities are—*							
	Have command relationship with—	*May be task-organized by—[1]*	*Unless modified, ADCON responsibility goes through—*	*Are assigned position or AO by—*	*Provide liaison to—*	*Establish/maintain communications with—*	*Have priorities established by—*	*Can impose on gained unit further command or support relationship of—*
Organic	All organic forces organized with the HQ	Organic HQ	Army HQ specified in organizing document	Organic HQ	N/A	N/A	Organic HQ	Attached; OPCON; TACON; GS; GSR; R; DS
Assigned	Gaining unit	Gaining HQ	Gaining Army HQ	OPCON Chain of command	As required by OPCON	As required by OPCON	ASCC or Service-assigned HQ	As required by OPCON HQ
Attached	Gaining unit	Gaining unit	Gaining Army HQ	Gaining unit	As required by gaining unit	Unit to which attached	Gaining unit	Attached; OPCON; TACON; GS; GSR; R; DS

Table I-1. U.S. Army command relationships *(continued)*

FM 6-0

If relationship is—	*Then inherent responsibilities are—*							
	Have command relationship with—	*May be task-organized by—*[1]	*Unless modified, ADCON responsibility goes through—*	*Are assigned position or AO by—*	*Provide liaison to—*	*Establish/maintain communications with—*	*Have priorities established by—*	*Can impose on gained unit further command or support relationship of—*
OPCON[2]	Gaining unit	Parent and gaining units	Parent unit	Gaining unit	As required by gaining unit	As required by gaining unit and parent unit	Gaining unit	OPCON; TACON; GS; GSR; R; DS
TACON	Gaining unit	Parent unit	Parent unit	Gaining unit	As required by gaining unit	As required by gaining unit and parent unit	Gaining unit	TACON;GS GSR; R; DS

Note. 1. In NATO, the gaining unit may not task-organize a multinational force (see TACON)
2. Gaining unit may pass OPCON to lower HQ

ADCON	administrative control headquarters	GSR	general support-reinforcing
ASCC	Army Service component command	NATO	North Atlantic Treaty Organization
DS	direct support	OPCON	operational control
GS	general support	TACON	tactical control

U.S. ARMY SUPPORT RELATIONSHIPS

I-3. Tables I-2 and I-3 on pages 304–305 show U.S. Army support relationships.

Table I-2. U.S. Army support relationships

FM 6-0

If relationship is—	**Then inherent responsibilities are—**							
	Have command relationship with—	**May be task-organized by—**	**Receive sustainment from—**	**Are assigned a position or an area of operations by—**	**Provide liaison to—**	**Establish/maintain communications with—**	**Have priorities established by—**	**Can impose on gained unit further support relationship of—**
Direct support[1]	Parent unit	Parent unit	Parent unit	Supported unit	Supported unit	Parent unit; supported unit	Supported unit	See note[1]
Reinforcing	Parent unit	Parent unit	Parent unit	Reinforced unit	Reinforced unit	Parent unit; reinforced unit	Reinforced unit; then parent unit	Not applicable
General support-reinforcing	Parent unit	Parent unit	Parent unit	Parent unit	Reinforced unit and as required by parent unit	Reinforced unit and as required by parent unit	Parent unit; then reinforced unit	Not applicable
General support	Parent unit	Parent unit	Parent unit	Parent unit	As required by parent unit	As required by parent unit	Parent unit	Not applicable

Commanders of units in direct support may further assign support relationships between their subordinate units and elements of the supported unit after coordination with the supported commander.

Table I-3. U.S. Artillery supporting roles

Artillery unit mission	Answers calls for fire in priority from	Establish liaison with	Establish comms with	Has as its zone of fire	Furnishes forward observers	Is positioned by	Has fires planned by
Direct support (DS)	Supported units own observers higher artillery HQ	Supported unit (down to BN Level)	Supported unit	Zone of action of supported unit	To each maneuver company of supported unit	Unit CDR as needed or ordered by higher arty HQ	Develop own fire plan in coordination with supported unit
Reinforcing (R)	Reinforced unit own observers higher artillery HQ	Reinforced unit	Reinforced unit	Zone of action of supports unit	Upon request of reinforce units	Reinforced unit or as ordered by higher arty HQ	Reinforced unit
General support (GS)	Higher artillery HQ own observers	No inherent requirement	No inherent requirement	Zone of action of supports unit	No inherent requirement	Higher artillery HQ	Higher artillery HQ
General support reinforcing (GSR)	Higher artillery HQ reinforced unit own observers	Reinforced unit	Reinforced unit	Zone of action of supports unit to include that of reinforced unit	Request of reinforced unit subject to the approval of higher artillery HQ	Higher artillery HQ or reinforce unit (with higher artillery HQ)	Higher artillery HQ

NATO LEVELS OF AUTHORITY

I-4. NATO has 5 levels of authority (defined in AAP-06):

- **NATO full command.** The military authority and responsibility of a commander to issue orders to subordinates. It covers every aspect of military operations and administration and exists only within national services.

Note. The term "command" as used internationally, implies a lesser degree of authority than in a purely national sense. No NATO or coalition commander has full command over the forces assigned because, in assigning forces to NATO, nations delegate only operational command or operational control.

- **NATO operational command (OPCOM).** The authority granted to a commander to assign missions or tasks to subordinate commanders, to deploy units, to reassign forces, and to retain or delegate operational and/or tactical control as the commander deems necessary. It does not include responsibility for administration.
- **NATO operational control (OPCON).** The authority delegated to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time, or location; to deploy units concerned; and to retain or assign tactical control of those units. It does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administrative or logistic control.
- **NATO tactical command (TACOM).** The authority delegated to a commander to assign tasks to forces under their command for the accomplishment of the mission assigned by higher authority.
- **NATO tactical control (TACON).** The detailed and usually local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned.

See table I-4 on page 306 for additional details on NATO levels of authority.

Table I-4. NATO levels of authority

FM 3-16

Authority	*FULLCOM*	*OPCOM*	*OPCON*	*TACOM*	*TACON*
Direct authority to deal with nations, diplomatic missions, and agencies	X				
Granted to a command	X	X			
Delegated to a command			X	X	X
Set chain of a command to forces	X				
Assign mission/designate objective	X	X			
Assign tasks	X	X		X	
Direct/employ forces	X	X	X	X	
Establish maneuver control measures	X	X	X	X	X
Reassign forces	X	X			
Retain operational control	X	X			
Delegate operational control	X	X	X		
Assign tactical command	X	X			
Delegate tactical command	X	X	X		
Retain tactical control	X	X	X		
Deploy force (information/within theater)	X	X	X		
Local direction/control designated forces	X			X	X
Assign separate employment of unit components	X	X			
Directive authority for logistics	X				
Direct joint training	X				
Assign/reassign subordinate commanders/officers	X				
Conduct internal discipline/training	X				

The national authority always retains FULL COMMAND by Allied doctrine.

X Has this authority

Denied authority or not specifically granted

TACTICAL MISSION TASKS DEFINITIONS AND GRAPHICS

I-5. A *tactical mission task* is the specific activity performed by a unit while executing a form of tactical operation or form of maneuver. It may be expressed in terms of either actions by a friendly force or effects on an enemy force (FM 3-90-1).

I-6. Tactical mission tasks address actions by friendly forces. They are the actions, the "what," the commander wants the friendly force to perform. These actions are normally measurable. Tasks involving only actions by friendly forces rarely provide sufficient clarity for a mission statement, thus the addition of a solid purpose coupled with a task aids clarity and understanding. As shown in table I-5 on pages 307–311, most of these actions have associated tactical mission graphics that are used in course of action (COA) development and sketches as part of the military decision-making process.

Table I-5. Common tactical mission tasks

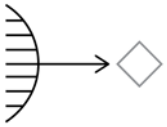
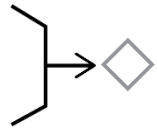
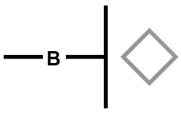
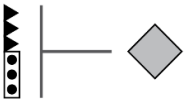
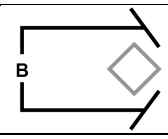
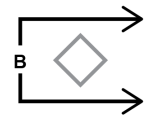
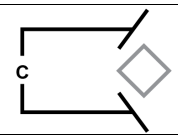
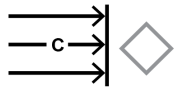
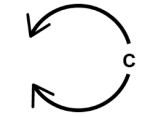
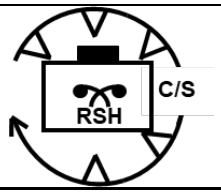
Tactical task	*Graphic*	*Definition*
AMBUSH		*Ambush* is an attack by fire or other destructive means from concealed positions on a moving or temporarily halted enemy (FM 3-90-1).
ATTACK BY FIRE		*Attack by fire* is a tactical mission task in which a commander uses direct fires, supported by indirect fires, to engage an enemy force without closing with the enemy to destroy, suppress, fix, or deceive that enemy (FM 3-90-1).
BLOCK		*Block* is a tactical mission task that denies the enemy access to an area or prevents the enemy's advance in a direction or along an avenue of approach (FM 3-90-1).
BLOCK		*Block* is also an obstacle effect that integrates fire planning and obstacle efforts to stop an attacker along a specific avenue of approach or prevent the attacking force from passing through an engagement area (FM 3-90-1).
BREACH		*Breach* is a tactical mission task in which the unit employs all available means to break through or establish a passage through an enemy defense, obstacle, minefield, or fortification (FM 3-90-1).
BYPASS		*Bypass* is a tactical mission task in which the commander directs the unit to maneuver around an obstacle, position, or enemy force to maintain the momentum of the operation while deliberately avoiding combat with an enemy force (FM 3-90-1).
CANALIZE		*Canalize* is a tactical mission task in which the commander restricts enemy movement to a narrow zone by exploiting terrain coupled with the use of obstacles, fires, or friendly maneuver (FM 3-90-1).
CLEAR		*Clear* is a tactical mission task that requires the commander to remove all enemy forces and eliminate organized resistance within an assigned area (FM 3-90-1).
CONTAIN		*Contain* is a tactical mission task that requires the commander to stop, hold, or surround enemy forces or to cause them to center their activity on a given front and prevent them from withdrawing any part of their forces for use elsewhere (FM 3-90-1).
CONTROL		*Control* is a tactical mission task that requires the commander to maintain physical influence over a specified area to prevent its use by an enemy or to create conditions necessary for successful friendly operations (FM 3-90-1).
CORDON AND SEARCH		*Cordon and search* is a technique of conducting a movement to contact that involves isolating a target area and searching suspected locations within that target area to capture or destroy possible enemy forces and contraband (FM 3-90-1).

Table I-5. Common tactical mission tasks *(continued)*

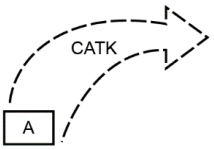
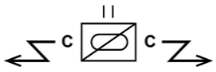
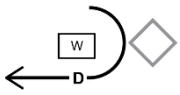
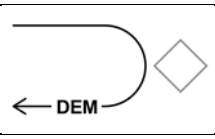
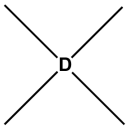
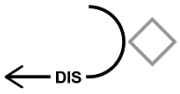
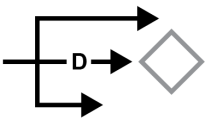
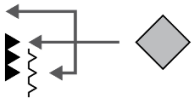
Tactical Task	*Graphic*	*Definition*
COUNTERATTACK		*Counterattack* is an attack by part or all of a defending force against an enemy attacking force, for such specific purposes as regaining ground lost, or cutting off or destroying enemy advance units, and with the general objective of denying to the enemy the attainment of the enemy's purpose in attacking. In sustained defensive operations, it is undertaken to restore the battle position and is directed at limited objectives (ADP 1-02).
COUNTER-RECONNAISSANCE	No graphic	*Counterreconnaissance* is a tactical mission task that encompasses all measures taken by a commander to counter enemy reconnaissance and surveillance efforts. Counterreconnaissance is not a distinct mission, but a component of all forms of security operations (FM 3-90-1).
COVER		*Cover* is a type of security operation done independent of the main body to protect them by fighting to gain time while preventing enemy ground observation of and direct fire against the main body (ADP 3-90). Units performing the cover task can operate independently of the main body.
DEFEAT	No graphic	*Defeat* is to render a force incapable of achieving its objectives (ADP 3-0).
DELAY		*Delay* is when a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on enemy forces without becoming decisively engaged (ADP 3-90).
DEMONSTRATION		In military deception, a *demonstration* is a show of force similar to a feint without actual contact with the adversary, in an area where a decision is not sought that is made to deceive an adversary (JP 3-13.4).
DESTROY		*Destroy* is a tactical mission task that physically renders an enemy force combat-ineffective until it is reconstituted. Alternatively, to destroy a combat system is to damage it so badly that it cannot perform any function or be restored to a usable condition without being entirely rebuilt (FM 3-90-1).
DISENGAGE		*Disengage* is a tactical mission task where a commander has the unit break contact with the enemy to allow the conduct of another mission or to avoid decisive engagement (FM 3-90-1).
DISRUPT		*Disrupt* is a tactical mission task in which a commander integrates direct and indirect fires, terrain, and obstacles to upset an enemy's formation or tempo, interrupt the enemy's timetable, or cause enemy forces to commit prematurely or attack in a piecemeal fashion (FM 3-90-1).
DISRUPT		*Disrupt* is also an obstacle effect that focuses fire planning and obstacle effort to cause the enemy force to break up its formation and tempo, interrupt its timetable, commit breaching assets prematurely, and attack in a piecemeal effort (FM 3-90-1).

Table I-5. Common tactical mission tasks *(continued)*

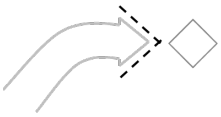
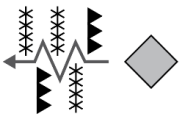
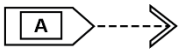
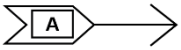
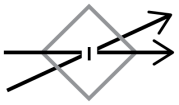
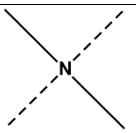
Tactical Task	*Graphic*	*Definition*
EXFILTRATE		*Exfiltrate* is a tactical mission task where a commander removes Soldiers or units from areas under enemy control by stealth, deception, surprise, or clandestine means (FM 3-90-1).
FEINT		In military deception, a *feint* is an offensive action involving contact with the adversary conducted for the purpose of deceiving the adversary as to the location and/or time of the actual main offensive action (JP 3-13.4).
FIX		*Fix* is a tactical mission task where a commander prevents the enemy force from moving any part of that force from a specific location for a specific period (FM 3-90-1).
FIX		*Fix* is also an obstacle effect that focuses fire planning and obstacle effort to slow an attacker's movement within a specified area, normally an engagement area (FM 3-90-1).
FOLLOW AND ASSUME		*Follow and assume* is a tactical mission task in which a second committed force follows a force conducting an offensive task and is prepared to continue the mission if the lead force is fixed, attrited, or unable to continue (FM 3-90-1).
FOLLOW AND SUPPORT		*Follow and support* is a tactical mission task in which a committed force follows and supports a lead force conducting an offensive task (FM 3-90-1).
GUARD		*Guard* is a type of security operation done to protect the main body by fighting to gain time while preventing enemy ground observation of and direct fire against the main body (ADP 3-90). Units conducting a guard task cannot operate independently because they rely upon fires and functional and multifunctional support assets of the main body.
INFILTRATION		An *infiltration* is a form of maneuver in which an attacking force conducts undetected movement through or into an area occupied by enemy forces to occupy a position of advantage behind those enemy positions while exposing only small elements to enemy defensive fires (FM 3-90-1).
INTERDICT		*Interdict* is a tactical mission task where the commander prevents, disrupts, or delays the enemy's use of an area or route (FM 3-90-1).
ISOLATE		*Isolate* is a tactical mission task that requires a unit to seal off—both physically and psychologically—an enemy from sources of support, deny the enemy freedom of movement, and prevent the isolated enemy force from having contact with other enemy forces (FM 3-90-1).
NEUTRALIZE		*Neutralize* is a tactical mission task that results in rendering enemy personnel or materiel incapable of interfering with a particular operation (FM 3-90-1).

Table I-5. Common tactical mission tasks *(continued)*

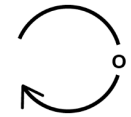
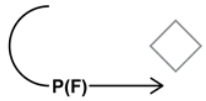
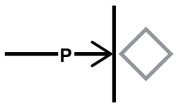
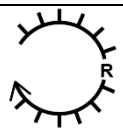
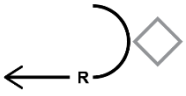
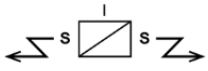
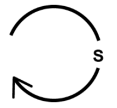
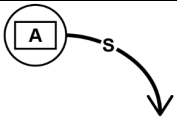
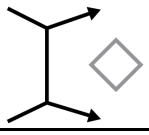
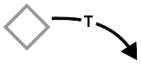
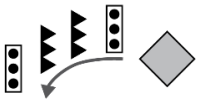
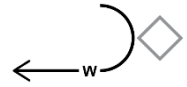
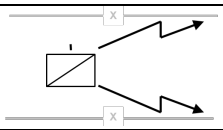
Tactical Task	*Graphic*	*Definition*
OCCUPY		*Occupy* is a tactical mission task that involves moving a friendly force into an area so that it can control that area. Both the force's movement to and occupation of the area occur without enemy opposition (FM 3-90-1).
PASSAGE OF LINES (FORWARD)		A *forward passage of lines* occurs when a unit passes through another unit's positions while moving toward the enemy (ADP 3-90). The purpose of a forward passage of lines is to move forces forward to conduct operations.
PASSAGE OF LINES (REARWARD)		A *rearward passage of lines* occurs when a unit passes through another unit's positions while moving away from the enemy (ADP 3-90). The rearward passage of lines continues the defense or retrograde operation, maintaining enemy contact while allowing for recovery of security or other forward forces.
PENETRATION		*Penetration* is a form of maneuver in which an attacking force seeks to rupture enemy defenses on a narrow front to disrupt the defensive system (FM 3-90-1).
REDUCE	No Graphic	*Reduce* is a tactical mission task that involves the destruction of an encircled or bypassed enemy force (FM 3-90-1).
RELIEF IN PLACE		*Relief in place* is an operation in which, by direction of higher authority, all or part of a unit is replaced in an area by the incoming unit and the responsibilities of the replaced elements for the mission and the assigned zone of operations are transferred to the incoming unit (JP 3-07.3).
RETAIN		*Retain* is a tactical mission task in which the commander ensures that a terrain feature controlled by a friendly force remains free of enemy occupation or use (FM 3-90-1).
RETIREMENT		*Retirement* is when a force out of contact moves away from the enemy (ADP 3-90).
SCREEN		*Screen* is a type of security operation that primarily provides early warning to the protected force (ADP 3-90).
SECURE		*Secure* is a tactical mission task that involves preventing a unit, facility, or geographical location from being damaged or destroyed as a result of enemy action (FM 3-90-1).
SEIZE		*Seize* is a tactical mission task that involves taking possession of a designated area by using overwhelming force (FM 3-90-1).
SUPPORT BY FIRE		*Support by fire* is a tactical mission task in which a maneuver force moves to a position where it can engage the enemy by direct fire in support of another maneuvering force (FM 3-90-1).

Table I-5. Common tactical mission tasks *(continued)*

Tactical Tasks	*Graphic*	*Definition*
SUPPRESS		*Suppress* is a tactical mission task that results in the temporary degradation of the performance of a force or weapon system below the level needed to accomplish its mission (FM 3-90-1).
TURN		*Turn* is 1. a tactical mission task that involves forcing an enemy element from one avenue of approach or mobility corridor to another (FM 3-90-1).
TURN		*Turn* is 2. a tactical obstacle effect that integrates fire planning and obstacle effort to divert an enemy formation from one avenue of approach to an adjacent avenue of approach or into an engagement area (FM 3-90-1).
WITHDRAW		*Withdraw* is to disengage from an enemy force and move in a direction away from the enemy (ADP 3-90).
ZONE RECONNAISSANCE		A *zone reconnaissance* is a type of reconnaissance operation that involves a directed effort to obtain detailed information on all routes, obstacles, terrain, and enemy forces within a zone defined by boundaries (ADP 3-90).

Technique. Table I-6 shows common purposes used in a mission statement. This list should not be constraining but used as a quick reference to assist in developing a mission's purpose.

Table I-6. Common purposes

Allow	Cause	Create	Deceive	Deny
Divert	Enable	Influence	Open	Prevent
Protect	Support	Surprise		

ELECTROMAGNETIC WARFARE

I-7. Material in this section is derived from ATP 3-12.3.

I-8. *Electromagnetic warfare* is military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Also called EW (JP 3-85). EW capabilities enable Army forces to create conditions and effects in the electromagnetic spectrum (EMS) to support the commander's intent and concept of operations. EW includes electromagnetic attack, electromagnetic protection, and electromagnetic warfare support and includes activities such as electromagnetic jamming, electromagnetic hardening, and signal detection, respectively. EW affects, supports, enables, protects, and collects on capabilities operating within the EMS, including cyberspace capabilities. With proper integration and deconfliction, EW can create reinforcing and complementary effects by affecting devices that operate in and through wired and wireless networks. The term EW operations refers to planning, preparing, execution, and continuous assessment of the electromagnetic warfare activities of an operation. The term EMS operations indicates the addition of those operationally related spectrum management operations activities. Figure I-1 on page 312 provides an EW overview.

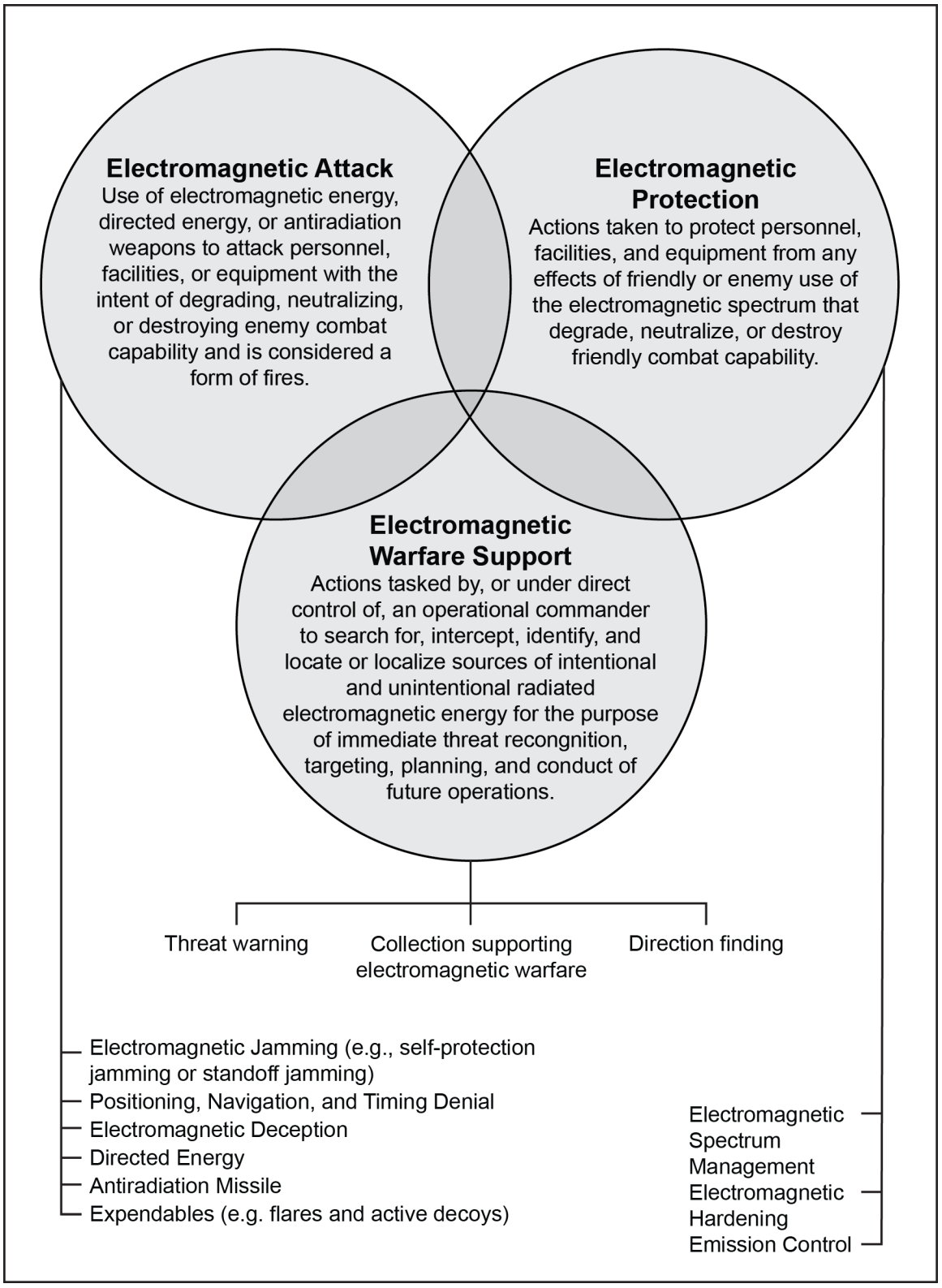


Figure I-1. Electromagnetic warfare overview

ELECTROMAGNETIC ATTACK

I-9. *Electromagnetic attack* is a division of electromagnetic warfare involving the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of fires (JP 3-85). Electromagnetic attack includes—

- Actions taken to prevent or reduce an enemy's effective use of the EMS.
- Employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism.
- Offensive and defensive activities, including countermeasures.

I-10. Electromagnetic attack includes using weapons that primarily use electromagnetic or directed energy for destruction. These can include lasers, radio frequency weapons, and particle beams. *Directed energy* is an umbrella term covering technologies that relate to the production of a beam of concentrated electromagnetic energy or atomic or subatomic particles. Also called DE (JP 3-85). In EW, most directed energy applications fit into the category of electromagnetic attack. A directed energy weapon uses electromagnetic energy to damage or destroy an enemy's equipment, facilities, or personnel. In addition to destructive effects, directed energy weapon systems support area denial and crowd control. Figure I-1 on page 312 depicts the relationships between electromagnetic attack, electromagnetic protection, and electromagnetic warfare support.

I-11. Actions related to electromagnetic attack are either offensive or defensive. Although offensive and defensive actions and capabilities are similar, their purposes differ. Defensive electromagnetic attack protects friendly personnel and equipment or platforms. Offensive electromagnetic attack denies, disrupts, or destroys enemy capability. Electromagnetic attack actions include—

- Countermeasures.
- Electromagnetic deception.
- Electromagnetic intrusion.
- Electromagnetic jamming.
- Electromagnetic probing.
- Electromagnetic pulse.
- Positions, navigation, timing denial, and deception.

ELECTROMAGNETIC PROTECTION

I-12. *Electromagnetic protection* is a division of electromagnetic warfare involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy use of the electromagnetic spectrum that degrade, neutralize, or destroy friendly combat capability. Also called EP (JP 3-85). For example, EP includes actions taken to ensure friendly use of the EMS, such as frequency agility in a radio or variable pulse repetition frequency in radar. Commanders should avoid confusing EP with self protection. Both defensive electromagnetic attack and EP protect personnel, facilities, capabilities, and equipment. However, EP protects from the effects of electromagnetic attack (friendly and enemy) and electromagnetic interference, while defensive electromagnetic attack primarily protects against lethal attacks by denying enemy use of the EMS to guide or trigger weapons.

I-13. During operations, EP includes, but is not limited to, the application of training and procedures for countering enemy electromagnetic attack. Army commanders and forces understand the threat and vulnerability of friendly electronic equipment to enemy electromagnetic attack and take appropriate actions to safeguard friendly combat capability from an exploitation and attack. EP measures minimize the enemy's ability to conduct electromagnetic warfare support and electromagnetic attack operations successfully against friendly forces. To protect friendly combat capabilities, units—

- Regularly brief friendly force personnel on the EW threat.
- Safeguard electromagnetic system capabilities during exercises and pre-deployment training.
- Coordinate and deconflict EMS usage.
- Limit the EMS signatures to reduce the threat's ability to locate nodes.

- Provide training during routine home station planning and training activities on appropriate EP active and passive measures under normal conditions, conditions of threat electromagnetic attack, or otherwise degraded networks and systems.
- Take appropriate actions to minimize the vulnerability of friendly receivers to enemy jamming (such as reduced power, brevity of transmissions, and directional antennas).
- Ensure redundancy in systems is maintained and ensure that personnel are well versed in switching between systems.

I-14. Electromagnetic protection includes electromagnetic protection actions. Electromagnetic protection actions include—

- Electromagnetic compatibility.
- Electromagnetic hardening.
- Electromagnetic masking.
- EMS management.
- Emission control.
- Wartime reserve modes.

ELECTROMAGNETIC WARFARE SUPPORT

I-15. Electromagnetic warfare support (ES) is a division of electromagnetic warfare involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning and conduct of future operations. ES enables U.S. forces to identify the electromagnetic vulnerability of an enemy's electronic equipment and systems. Friendly forces take advantage of these vulnerabilities through EW operations.

I-16. ES systems are a source of information for immediate decisions involving electromagnetic attack, EP, avoidance, targeting, and other tactical employment of forces. ES systems collect data and produce information to—

- Corroborate other sources of information or intelligence.
- Conduct or direct electromagnetic attack operations.
- Create or update EW databases.
- Initiate self-protection measures.
- Support EP efforts.
- Support information-related capabilities.
- Target enemy systems.

I-17. Several actions relate to ES:

- *Electronic intelligence* is technical and geolocation intelligence derived from foreign noncommunications electromagnetic radiations emanating from other than nuclear detonations or radioactive sources. Also called ELINT (JP 3-85).
- *Electromagnetic reconnaissance* is the detection, location, identification, and evaluation of foreign electromagnetic radiations (JP 3-85).
- *Electromagnetic security* is the protection resulting from all measures designed to deny unauthorized persons information of value that might be derived from their interception and study of noncommunications electromagnetic radiations (e.g., radar) (JP 3-85).

COMMANDER'S GUIDANCE WORKSHEET EXAMPLES

I-18. Commanders can use a commander's initial guidance worksheet to provide guidance to the staff on how to plan and focus the mission analysis effort. This can also include identifying items the commander already understands; therefore, staff analysis is unnecessary. For example, the commander may state, "Describe the capabilities and limitations of the attached anti-armor company" or alternatively, "I am already familiar with the objective, so don't waste time describing it to me" (see figure I-2 for an example commander's initial guidance worksheet for use after the receipt of mission step of the military

decision-making process (MDMP)). Figures I-3 and I-4 on page 316 show pages 1 and 2 of an example commander's guidance worksheet for use after the mission analysis step of the MDMP.

Commander's initial guidance worksheet

Although brief, the commander's initial guidance includes—

Planning methodology guidance (choose 1):

- Conduct ADM and then the MDMP
- Conduct ADM and the MDMP in parallel
- Conduct the MDMP, skip ADM

RDSP (if applicable)

Initial time allocations

Desired execution time:

Desired OPORD brief time:

XO, COS, or lead planner will provide the rest of the times

How to abbreviate the MDMP, if required

Number of COAs to do:

Or directed COA of:

Events in the MDMP where I will be involved:

How to use LNOs

How to increase collaborative planning

Known specified and implied tasks

Movements, reconnaissance, or surveillance to initiate

Coordination to perform, including LNOs to exchange

Collaborative planning times and locations (if applicable)

Initial information requirements (needed to plan or make decisions)

Mission analysis focus areas

Things not to waste time on

Additional staff tasks (for example, protection—I want to see the threat range rings)

EXAMPLE

Figure I-2. Example commander's initial guidance worksheet

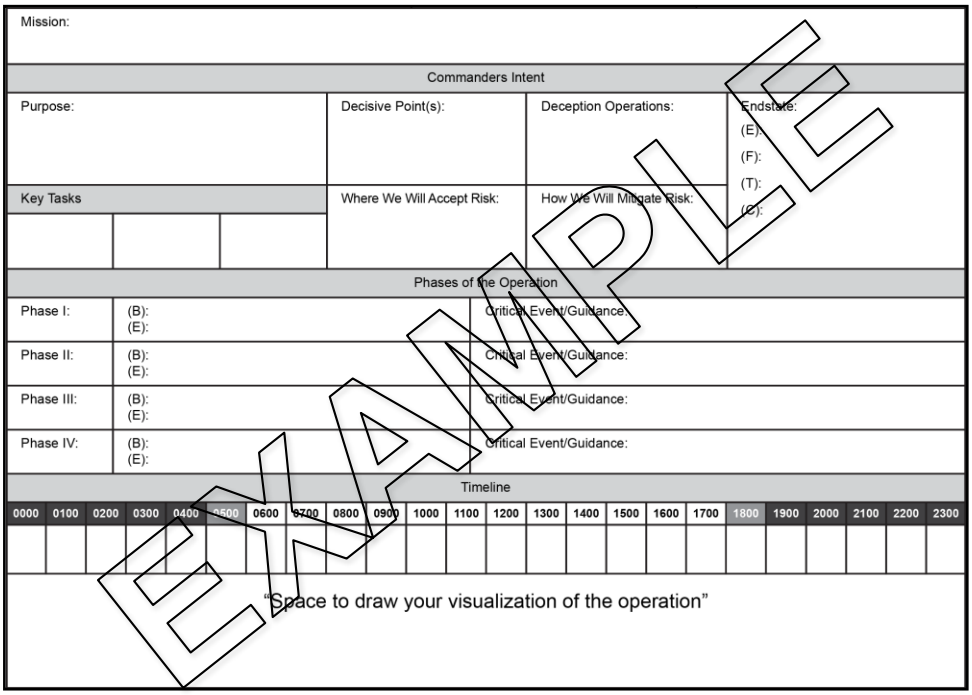


Figure I-3. Example commander's guidance worksheet, page 1

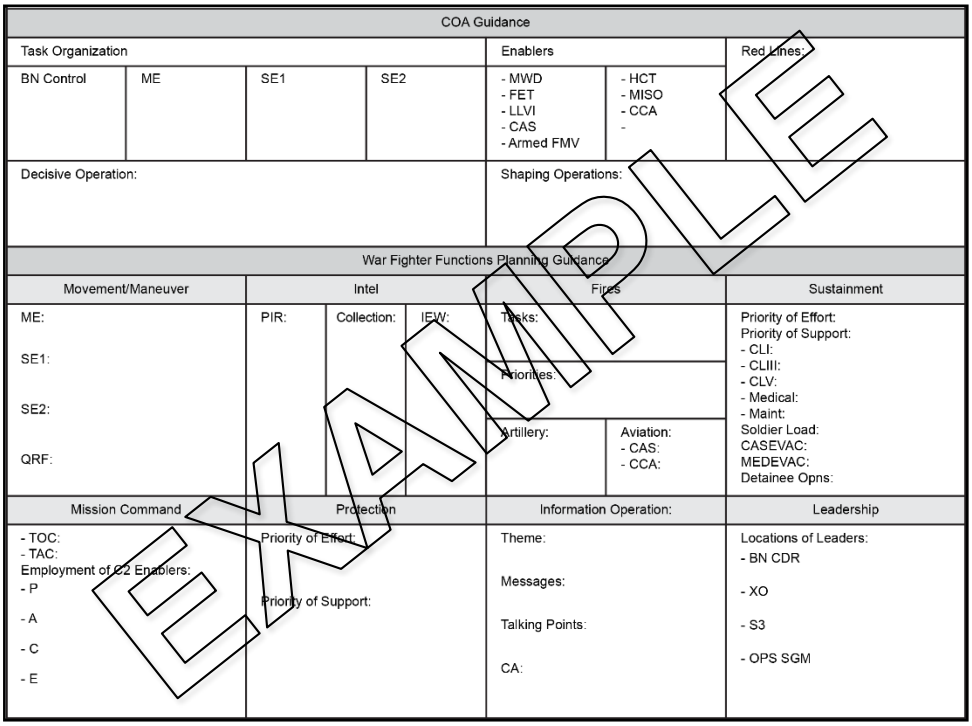


Figure I-4. Example commander's guidance worksheet, page 2

EXAMPLE

EXPRESSING UNNAMED DATES AND HOURS

I-19. Table I-7 details the operational day and hour concept.

Table I-7. Designated letters for dates and times

FM 6-0

Term	*Definition*
C-day	The unnamed day on which a deployment operation commences or is to commence (JP 5-0). The deployment may be movement of troops, cargo, weapon systems, or a combination of these elements, using any or all types of transport. The letter "C" is the only letter used to denote the activities described above. The highest command or headquarters responsible for coordinating planning specifies the exact meaning of C-day within the aforementioned definition. The command or headquarters directly responsible for the execution of the operation, if other than the one coordinating the planning, will do so in light of the meaning specified by the highest command or headquarters coordinating the planning. Ends at 2400Z.
D-day	The unnamed day on which a particular operation commences or is to commence (JP 3-02).
E-day	The day on which a NATO exercise commences or is due to commence (AAP-06).
E-day (amphibious operations)	The day landing force personnel, supplies, and equipment begin to embark aboard amphibious warfare or commercial ships (JP 3-02).
G-day	The day on which an order is or is due to be given to deploy a unit (AAP-06).
H-hour	The specific hour on D-day at which a particular operation commences (JP 5-0).
H-hour (amphibious operations)	In amphibious operations, the time the first landing craft or amphibious vehicle of the waterborne wave lands or is scheduled to land on the beach and, in some cases, the commencement of countermine breaching operations (JP 3-02).
L-hour	The specific hour on C-day at which a deployment operation commences or is to commence (JP 5-0). Normally established to allow C-day to be a 24-hour day.
L-hour (amphibious operations)	In amphibious operations, the time at which the first helicopter or tiltrotor aircraft of the airborne ship-to-shore movement wave touches down or is scheduled to touch down in a landing zone (JP 3-02).
P-hour (airborne operations)	An airborne operation begins at parachute-hour (P-hour), which is when the first paratrooper exits the first aircraft.

Notes.

• C- and D-days end at 2400 hours, Universal Time (ZULU time). For planning purposes, these days are 24-hours long. Refer to days preceding or following C- or D-day by using a plus or minus sign and an Arabic number after the letter. For example, D-3 is three days before D-day; D+7 is seven days after D-day. When using a time element other than days, spell it out: for example, D+3 months.

• Refer to hours preceding or following H- or L-hour by a plus or minus sign and an Arabic number after the letter. For example, H-3 is three hours before H-hour; H+7 is seven hours after H-hour. When using a time element other than hours, spell it out: for example, H+30 minutes.

• Where it is necessary to identify a particular operation or exercise, place a nickname or code words before the letter, such as BALD EAGLE (D-day) or ANVIL EXPRESS (C-day).

EXECUTION MATRIX AND EXECUTION CHECKLIST

I-20. Figure I-5 and Table I-8 are examples of an execution matrix (EXMAT) and execution checklist (EXCHECK), respectively.

As of: 13 1200 JUN 18		Day	14 JUN 18 (C+3)				15 JUN 18 (C+4)		
		Hour	2000-2059	2100-2159	2200-2259	2300-2359	0000-0059	0100-0159	0200-0259
		Phase	Phase 1				Phase 2		
Area of influence	Weather and light		MR: 2059, Illum: 75%						
	Division fires								
	USAF								
	Adjacent units								
Decision points									
M2	1-16 IN (DO)								
	2-34 AR (SO1)								
	3-66 AR (SO2)								
	1-4 CAV (SO3)								
	A/1-6 CAB								
	C/3-66 AR (Reserve)								
Intel	UAV								
	ISR								
	HUMINT								
	SIGINT								
Fires	1-5 FA								
	CAS								
	360 POG								
	A/407 CA								
Protection	1 EN BN								
	62 EN Co								
	287 MP Co								
	63 CM								
	704 EOD Tm								
	A/1-188 AD								
Sustain	101 BSB								
	FLE								
	Brigade support area (BSA)								
C2	MAIN								
	TAC								
	RETRANS #1								

EXAMPLE

Figure I-5. Example execution matrix

Techniques. A way to quickly show light data is, in the time block, to use white font on a black cell for periods of darkness, and, for periods of light, have black font on a white cell.

Table I-8. Example execution checklist

Line	*H-hour*	*Time*	*Event*	*Code word*
10	H-8	12 2000 JUN 18	B Co occupies AA BLACKFOOT	Akron
15	H-4	13 0001 JUN 18	A Co SPs from AA APACHE	Albany
20	H-1	0300	C Co SPs from AA COMANCHE	Allentown
25	H-hour	0400	A Co crosses LD	Arlington
30	H+2.5	0630	C Co crosses LD	Ashville
35	H+3.25	0715	B Co SPs from AA BLACKFOOT	Atlanta
40	H+4	0800	A Co establishes SBF 1	Augusta

OPORD FORMAT AND RESPONSIBILITIES

I-21. Table I-9 on pages 319–324 shows the entire OPORD format and an example way to assign responsibilities for portions of an OPORD and its associated annexes at echelon. Blocks in black show items that typically do not apply at that echelon. This list serves as a starting point for leaders to decide during receipt of mission what needs to be produced and who is responsible for each portion.

Table I-9. OPORD format and responsibilities

FM 6-0

	Division	*Brigade*	*Battalion*
OPORD			
References	G5	S3	S3
Task Organization			S3
1. Situation	G2	S2	S2
a. Area of Interest	G2	S2	S2
b. Area of Operations	EN	EN	S2
i. Terrain	EN	EN	S2
ii. Weather	USAF Staff Weather Office	S2	S2
c. Enemy Forces	G2	S2	S2
d. Friendly Forces	G5	S3	S3
i. Higher Headquarters Mission and Intent	G5	S3	S3
1. Higher Headquarters Two Levels Up	G5	S3	S3
a. Mission	G5	S3	S3
b. CDR's Intent	G5	S3	S3
2. Higher Headquarters	G5	S3	S3
a. Mission	G5	S3	S3
b. CDR Intent	G5	S3	S3
ii. Missions of Adjacent Units	G5	S3	S3
e. Interagency, Intergovernmental, and Non-Governmental Organizations	G5	S3	S3
f. Civil Considerations	Civil Affairs	S3	S3
g. Attachments and Detachments	G5	S3	S3
h. Assumptions	G5	S3	S3
2. Mission	G5	S3	S3

Table I-9. OPORD format and responsibilities *(continued)*

FM 6-0

	Division	*Brigade*	*Battalion*
OPORD			
3. Execution	G5	S3	S3
a. Commander's Intent	CDR/G5	CDR/S3	CDR/S3
b. Concept of Operations	G5	S3	S3
c. Scheme of Movement and Maneuver	G5	S3	S3
i. Scheme of Mobility/Countermobility	EN	EN	S3/EN
ii. Scheme of Battlefield Obscuration	CHEMO	CHEMO	CHEMO
iii. Scheme of Information Collection	G3 & G2	S3 & S2	S3 & S2
d. Scheme of Intelligence	G2	S2	S2
e. Scheme of Fires	DFSCORD	FSO	FSO
f. Scheme of Protection	PMO / CHEMO / ADA	MP / CHEMO / ADA	CHEMO/ S3
g. Cyber Electromagnetic Activities	EW Officer	EW Officer	S3
h. Stability Tasks	G5	S3	S3
i. Assessments	G5	S3	S3
j. Tasks to Subordinate Units	G5	S3	S3
k. Coordinating Instructions	G5	S3	S3
i. Timeline	G5	S3	S3
ii. Commander's Critical Information Requirements	CDR/G3/G2	CDR/S3/S2	CDR/S3/S2
iii. Essential Elements of Friendly Information	CDR/ OPSEC Officer	CDR/S3	CDR/S3
iv. Fire Support Coordination Measures	DFSCORD	FSO	FSO
v. Airspace Coordinating Measures	ADAM	ADAM	S3/FSO
vi. Rules of Engagement	DIV SJA/G3	BDE SJA/S3	S3
vii. Risk Reduction Control Measures	PMO / CHEMO / ADAM	MP / CHEMO / ADAM	CHEMO / S3
viii. Personnel Recovery Coordination Measures	G3 PRO	S3 PRO	S3 PRO
ix. Environmental Considerations	EN	EN	S3
x. Soldier and Leader Engagement	G5	S3	S3
xi. Other Coordinating Instructions	All/G5	All/S3	All/S3
4. Sustainment	G4	S4	S4
a. Logistics	G4	S4	S4
b. Personnel	G1	S1	S1
c. Health Service Support	SURG	SURG	MEDO
5. Command and Signal	G5	S3	S3
a. Command	G5	S3	S3
i. Location of Commander and Key Leaders	G5	S3	S3
ii. Succession of Command	G5	S3	S3
iii. Liaison Requirements	G5	S3	S3
b. Control	G5	S3	S3
i. Command Posts	G5	S3	S3
ii. Reports	KMO	S3	S3

Table I-9. OPORD format and responsibilities *(continued)*

FM 6-0

	Division	***Brigade***	***Battalion***
c. Signal	G6	S6	S6
Annexes			
Annex A: Task organization	G5	S3	S3
Annex B: Intelligence	G2	S2	S2
Appendix 1: Intelligence Estimate	G2	S2	S2
Tab A: Terrain	GEO EN TM	GEO EN TM	S2
Tab B: Weather	USAF Staff Weather Office	S2	S2
Tab C: Civil Considerations	G2	S2	S2
Tab D: Intelligence Preparation of the Battlefield Products	G2	S2	S2
Appendix 2: Counterintelligence	G2	S2	
Appendix 3: Signals Intelligence	G2	S2	
Appendix 4: Human Intelligence	G2	S2	
Appendix 5: Geospatial Intelligence	G2	S2	
Appendix 6: Measurements and Signature Intelligence	G2	S2	
Appendix 7: Open-Source Intelligence	G2	S2	
Annex C: Operations	G5/G3	S3	S3
Appendix 1: Army Design Methodology Products	G5/G3	S3	S3
Appendix 2: Operation Overlay	G5/G3	S3	S3
Appendix 3: Decision Support Products	G5/G3	S3	S3
Tab A: Execution Matrix	G5/G3	S3	S3
Tab B: Decision Support Template and Matrix	G5/G3	S3	S3
Appendix 4: Gap Crossing Operations	G5/G3	S3	S3
Tab A: Traffic Control Overlay	G5/G3	S3	S3
Appendix 5: Air Assault Operations	G5/G3	S3	S3
Tab A: Pick-up Zone Diagram	G5/G3	S3	S3
Tab B: Air Movement Table	G5/G3	S3	S3
Tab C: Landing Zone Diagram	G5/G3	S3	S3
Appendix 6: Airborne Operations	G5/G3	S3	S3
Tab A: Marshalling Plan	G5/G3	S3	S3
Tab B: Air Movement Plan	G5/G3	S3	S3
Tab C: Drop Zone/Extraction Zone Diagram	G5/G3	S3	S3
Appendix 7: Amphibious Operations	G5/G3	S3	
Tab A: Advance Force Operations	G5/G3	S3	
Tab B: Embarkation Plan	G5/G3	S3	
Tab C: Landing Plan	G5/G3	S3	
Tab D: Rehearsal Plan	G5/G3	S3	
Appendix 8: Special Operations	G5/G3	S3	
Appendix 9: Battlefield Obscuration	CHEMO	CHEMO	CHEMO
Appendix 10: Airspace Control	G3/ACO	BAE	
Tab A: Air Traffic Services	G3/ACO	BAE	

Table I-9. OPORD format and responsibilities *(continued)*

FM 6-0

	Division	*Brigade*	*Battalion*
Annexes			
Appendix 11: Rules of Engagement	SJA	SJA	S3
Tab A: No Strike List	G3	S3	S3
Tab B: Restricted Target List	DIV SJA/G3	BDE SJA/S3	FSO/S3
Appendix 12: Cyber Electromagnetic Activities	EWO	EWO	
Tab A: Offensive Cyberspace Operations	EWO	EWO	
Tab B: Defensive Cyberspace Operations – Response Actions	EWO	EWO	
Tab C: Electromagnetic Attack	EWO	EWO	
Tab D: Electromagnetic Protection	EWO	EWO	
Tab E: Electromagnetic Warfare Support	EWO	EWO	
Appendix 13: Military Information Support Operations	G3/IO	S3	S3
Appendix 14: Military Deception	MDO	S3	S3
Appendix 15: Information Operations	IO	S3	S3
Annex D: Fires	DFSCORD	FSO	FSO
Appendix 1: Fire Support Overlay	DFSCORD	FSO	FSO
Appendix 2: Fire Support Execution Matrix	DFSCORD	FSO	FSO
Appendix 3: Targeting	DFSCORD	FSO	FSO
Tab A: Target Selection Standards	DFSCORD	FSO	FSO
Tab B: Target Synchronization Matrix	DFSCORD	FSO	FSO
Tab C: Attack Guidance Matrix	DFSCORD	FSO	FSO
Tab D: Target List Work Sheets	DFSCORD	FSO	FSO
Tab E: Battle Damage Assessment	G2	S2	S2/FSO
Appendix 4: Field Artillery Support	DFSCORD	FSO	FSO
Appendix 5: Air Support	USAF	USAF	FSO
Appendix 6: Naval Fire Support	DFSCORD	FSO	FSO
Appendix 7: Air and Missile Defense	AMDO	BAE	
Tab A: Enemy Air Avenues of Approach	AMDO	BAE	S2
Tab B: Enemy Air Order of Battle	AMDO	BAE	S2
Tab C: Enemy Theater Ballistic Missile Overlay	AMDO	BAE	
Tab D: Air and Missile Defense Protection Overlay	AMDO	BAE	
Annex E: Protection	Chief of Protection	EN	S3
Appendix 1: Operational Area Security	Chief of Protection	EN	S3
Appendix 2: Safety	SAFETY	SAFETY	S3
Appendix 3: Operations Security	IO	S2	S2
Appendix 4: Intelligence Support to Protection	G2	S2	S2/S3
Appendix 5: Physical Security	G2	S2	S2
Appendix 6: Antiterrorism	G2	S2	S2
Appendix 7: Police Operations	PMO	PMO	
Appendix 8: Survivability Operations	Chief of Protection	EN	S3

Table I-9. OPORD format and responsibilities *(continued)*

FM 6-0

	Division	*Brigade*	*Battalion*
Annexes			
Appendix 9: Force Health Protection	SURG	SURG	MEDO
Appendix 10: Chemical, Biological, Radiological, and Nuclear Defense	CHEMO	CHEMO	CHEMO
Appendix 11: Explosive Ordnance Disposal	EOD	EN	
Appendix 12: Coordinate Air and Missile Defense	ADA	BAE	
Appendix 13: Personnel Recovery	PRO	S3	S3
Appendix 14: Detainee and Resettlement	PMO	PMO	
Annex F: Sustainment	G4	S4	S4
Appendix 1: Logistics	G4	S4	S4
Tab A: Sustainment Overlay	G4	S4	S4
Tab B: Maintenance	G4/DMO	Maint	S4/BMO
Tab C: Transportation	G4	S4	S4
Exhibit 1: Traffic Circulation and Control	PMO	PMO	
Exhibit 2: Traffic Circulation Overlay	PMO	PMO	
Exhibit 3: Road Movement Table	PMO	PMO	
Exhibit 4: Highway Regulation	PMO	PMO	
Tab D: Supply	G4	S4	S4
Tab E: Field Services	G4	S4	S4
Tab F: Distribution	G4	S4	S4
Tab G: Contract Support Integration	G4/G8	S4/S8	S4
Tab H: Mortuary Affairs	G1	S1	
Appendix 2: Personnel Services Support	G1	S1	S1
Tab A: Human Resources Support	G1	S1	S1
Tab B: Financial Management	G8	S8/SPO	
Tab C: Legal Support	SJA	SJA	
Tab D: Religious Support	CHAP	CHAP	CHAP
Tab E: Band Operations	G1		
Appendix 3: Health Service Support	SURG	SURG	MEDO
Annex G: Engineer	EN	EN	EN/S3
Appendix 1: Mobility/Countermobility	EN	EN	EN/S3
Tab A: Obstacle Overlay	EN	EN	EN
Appendix 2: Survivability	EN	EN	EN/S3
Appendix 3: General Engineering	EN	EN	EN/S3
Appendix 4: Geospatial Engineering	GEO EN TM	GEO EN TM	
Appendix 5: Environmental Considerations	EN	EN	
Tab A: Environmental Assessments	EN	EN	
Tab B: Environmental Assessments Exemptions	EN	EN	
Tab C: Environmental Baseline Survey	EN	EN	
Annex H: Signal	G6	S6	S6
Appendix 1: Defensive Cyberspace Operations	G6	S6	S6
Appendix 2: Information Network Operations	G6	S6	S6
Appendix 3: Voice, Video, and Data Network Diagrams	G6	S6	S6

Table I-9. OPORD format and responsibilities *(continued)*

FM 6-0

	Division	*Brigade*	*Battalion*
Annexes			
Appendix 4: Satellite Communications	G6	S6	
Appendix 5: Foreign Data Exchanges	G6	S6	
Appendix 6: Spectrum Management Operations	G6	S6	
Appendix 7: Information Services	G6	S6	
Annex J: Public Affairs	PAO	PAO	
Appendix 1: Public Affairs Running Estimates	PAO	PAO	
Appendix 2: Public Affairs Guidance	PAO	PAO	
Annex K: Civil Affairs Operations	G9	CA	S3
Appendix 1: Execution Matrix	G9	CA	
Appendix 2: Populace and Resources Control Plan	G9	CA	
Appendix 3: Civil Information Management Plan	G9	CA	
Annex L: Information Collection	G5/G3	S3	S3
Appendix 1: Information Collection Plan	G5/G3	S3	S3
Appendix 2: Information Collection Overlay	G5/G3	S3	S3
Annex M: Assessment	G5/G3	S3	
Appendix 1: Nesting of Assessment Efforts	G5/G3	S3	
Appendix 2: Assessment Framework	G5/G3	S3	
Appendix 3: Assessment Working Group	G5/G3	S3	
Annex N: Space Operations	Space	S3/S2	
Annex O: Not Used			
Annex P: Host-Nation Support	G4	S4	
Annex Q: Knowledge Management	KMO	S3	
Appendix 1: Knowledge Management Decision Support Matrix	KMO		
Appendix 2: Common Operational Picture Configuration Matrix	KMO		
Appendix 3: Command and Control Information Systems Integration Matrix	KMO		
Appendix 4: Content Management	KMO		
Appendix 5: Battle Rhythm	COS	BDE XO	BN XO
Annex R: Reports	G5/G3	S3	S3
Annex S: Special Technical Operations	STO	S2	S2
Appendix 1: Special Technical Operations Capabilities Integration Matrix	STO	S2	
Appendix 2: Functional Area I Program and Objectives	STO	S2	
Appendix 3: Functional Area II Program and Objectives	STO	S2	
Annex T: Spare			
Annex U: Inspector General	IG		
Annex V: Interagency Coordination	G3/G9	S3/S9	S3
Annex W: Operational Contract Support	G4	S4	S4
Annex X: Spare			
Annex Y: Spare			
Annex Z: Distribution	G3		

I-22. Table I-10 shows how much time can be devoted to each MDMP step, based on the time between receipt of mission and execution. This sample timeline is based on the one-third/two-thirds rule and uses the following percentages to determine the amount of time to allocate to each step:

- Mission analysis—30%
- COA development—20%
- COA analysis, comparison, and approval—30%
- Orders production, dissemination, and transition—20%

I-23. The "R" in table I-10 represents the time at mission receipt. All "R+" times represent the time that the action should be complete. For example, given 48 hours to plan and prepare for a mission, COA development should last no more than 3 hours and 12 minutes and should be complete by 8 hours after mission receipt. Generic timelines serve as guides and are adjusted based on mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC).

Table I-10. Generic timelines

	Time available before execution									
	8 hrs		***24 hrs***		***48 hrs***		***72 hrs***		***96 hrs***	
	Time for	R +	Time for	R +	Time for	R +	Time for	R +	Time for	R +
Mission analysis	0:45	0:45	2:24	2:24	4:48	4:48	7:12	7:12	9:36	9:36
COA development	0:30	1:15	1:36	4:00	3:12	8:00	4:48	12:00	6:24	16:00
COA analysis, comparison, and approval	0:45	2:00	2:24	6:24	4:48	12:48	7:12	19:12	9:36	25:36
Orders production	0:30	2:30	1:36	8:00	3:12	16:00	4:48	24:00	6:24	32:00
Total time used	2:30		8:00		16:00		24:00		32:00	

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Appendix J

Other Resources

This appendix provides a variety of information that applies to all warfighting functions. This includes conversion factors, the Command and General Staff College, Department of Tactic's doctrine matrix, and some planning considerations for deploying and redeploying.

CONVERSION FACTORS

J-1. Tables J-1 through J-3 on pages 327–328 show a variety of conversion factors; table J-3 includes commonly used prefixes. Figure J-1 on page 328 shows the Julian calendar and figure J-2 on page 329 illustrates standard time zones.

Table J-1. Common conversion factors

ATP 3-90.4/MCWP 3-17.8 and TEA PAMPHLET 700-2

To Convert	*Into*	*Multiply By*	*To Convert*	*Into*	*Multiply By*
Ounces (fluid)	Liters	0.02957	Inches	Millimeters	25.4
Ounces (weight)	Grains	437.5		Centimeters	2.54
	Drams	16.0		Meters	0.0254
	Pounds	0.0625		Kilometers	0.0000254
	Grams	28.3495270	Feet	Miles	5,280.0
	Kilograms	0.0283		Centimeter	30.48
Grains	Ounces	0.002286		Meters	0.3048
Drams	Ounces	0.0625		Kilometers	0.0003048
Pounds	Grams	453.5924	Yards	Meters	0.9144
	Kilograms	0.4536	Miles	Meters	1,609.0
Grams	Ounces (weight)	0.03527		Kilometers	1.609
	Pounds	0.002205	Centimeters	Inches	0.3937
Kilograms	Ounces (weight)	35.274		Feet	0.003281
	Pounds	2.205		Meters	0.01
Ton	Metric ton	0.907	Milliliters	Inches	0.03937
Quarts	Milliliters	946.4	Meters	Inches	39.37
	Liters	0.9464		Feet	3.281
Milliliters	Ounces (fluid)	0.0338		Yards	1.094
	Quarts	0.001057		Miles	0.0006214
Liters	Ounces (fluid)	33.814		Kilometers	0.001
	Quarts	1.057	Kilometers	Meters	1,000.0
	Gallons (US)	0.2642		Feet	3,281.0
	Cubic feet	0.03531		Miles	0.6214
Gallon (US)	Gallon (UK)	0.83267		Nautical mile	0.54
Gallon (UK)	Gallon (US)	1.20095	Miles	Kilometer	1.609
Cubic feet	Cubic meters	0.02832		Nautical mile	0.869
	Liters	28.32	Nautical Mile	Miles	1.51
Square yards	Square meters	0.836		Kilometer	1.852
Square meters	Square yards	1.196	Celsius	Fahrenheit	(F-32)1.8
Square meters	Square feet	10.764			
Acres	Square feet	43,560.00	Fahrenheit	Celsius	(C x 1.8) + 32
Acres	Square meters	4,047.00			

Notes.
1. The avoirdupois system of weights is used for pounds, ounces, and drams except when specified. The avoirdupois system is the everyday system of weights commonly used in the U.S. where 16 ounces = 1 pound and 16 drams = 1 ounce. It is considered more modern and standardized than the alternative troy or apothecary system.
2. The U.S. gallon is a different size than the UK gallon, so no liquid measures of the same name are the same size in the U.S. and UK systems.

Table J-2. Gallon to weight conversion

1 gallon JP8 = 6.75 lbs
1 gallon water = 8.345 lbs

Table J-3. Commonly used prefixes

Prefix	*Symbol*	*Factor*
Mega	M	1,000,000
Kilo	k	1,000
Hecto	h	100
Deka	da	10
Deci	d	0.1
Centi	c	0.01
Milli	m	0.001
Micro	μ	0.000001
Nano	n	0.000000001
Pico	p	0.000000000001

Julian Date Calendar (Perpetual)													Julian Date Calendar (Leap Year)												
Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	001	032	060	091	121	152	182	213	244	274	305	335	001	032	061	092	122	153	183	214	245	275	306	336	1
2	002	033	061	092	122	153	183	214	245	275	306	336	002	033	062	093	123	154	184	215	246	276	307	337	2
3	003	034	062	093	123	154	184	215	246	276	307	337	003	034	063	094	124	155	185	216	247	277	308	338	3
4	004	035	063	094	124	155	185	216	247	277	308	338	004	035	064	095	125	156	186	217	248	278	309	339	4
5	005	036	064	095	125	156	186	217	248	278	309	339	005	036	065	096	126	157	187	218	249	279	310	340	5
6	006	037	065	096	126	157	187	218	249	279	310	340	006	037	066	097	127	158	188	219	250	280	311	341	6
7	007	038	066	097	127	158	188	219	250	280	311	341	007	038	067	098	128	159	189	220	251	281	312	342	7
8	008	039	067	098	128	159	189	220	251	281	312	342	008	039	068	099	129	160	190	221	252	282	313	343	8
9	009	040	068	099	129	160	190	221	252	282	313	343	009	040	069	100	130	161	191	222	253	283	314	344	9
10	010	041	069	100	130	161	191	222	253	283	314	344	010	041	070	101	131	162	192	223	254	284	315	345	10
11	011	042	070	101	131	162	192	223	254	284	315	345	011	042	071	102	132	163	193	224	255	285	316	346	11
12	012	043	071	102	132	163	193	224	255	285	316	346	012	043	072	103	133	164	194	225	256	286	317	347	12
13	013	044	072	103	133	164	194	225	256	286	317	347	013	044	073	104	134	165	195	226	257	287	318	348	13
14	014	045	073	104	134	165	195	226	257	287	318	348	014	045	074	105	135	166	196	227	258	288	319	349	14
15	015	046	074	105	135	166	196	227	258	288	319	349	015	046	075	106	136	167	197	228	259	289	320	350	15
16	016	047	075	106	136	167	197	228	259	289	320	350	016	047	076	107	137	168	198	229	260	290	321	351	16
17	017	048	076	107	137	168	198	229	260	290	321	351	017	048	077	108	138	169	199	230	261	291	322	352	17
18	018	049	077	108	138	169	199	230	261	291	322	352	018	049	078	109	139	170	200	231	262	292	323	353	18
19	019	050	078	109	139	170	200	231	262	292	323	353	019	050	079	110	140	171	201	232	263	293	324	354	19
20	020	051	079	110	140	171	201	232	263	293	324	354	020	051	080	111	141	172	202	233	264	294	325	355	20
21	021	052	080	111	141	172	202	233	264	294	325	355	021	052	081	112	142	173	203	234	265	295	326	356	21
22	022	053	081	112	142	173	203	234	265	295	326	356	022	053	082	113	143	174	204	235	266	296	327	357	22
23	023	054	082	113	143	174	204	235	266	296	327	357	023	054	083	114	144	175	205	236	267	297	328	358	23
24	024	055	083	114	144	175	205	236	267	297	328	358	024	055	084	115	145	176	206	237	268	298	329	359	24
25	025	056	084	115	145	176	206	237	268	298	329	359	025	056	085	116	146	177	207	238	269	299	330	360	25
26	026	057	085	116	146	177	207	238	269	299	330	360	026	057	086	117	147	178	208	239	270	300	331	361	26
27	027	058	086	117	147	178	208	239	270	300	331	361	027	058	087	118	148	179	209	240	271	301	332	362	27
28	028	059	087	118	148	179	209	240	271	301	332	362	028	059	088	119	149	180	210	241	272	302	333	363	28
29	029		088	119	149	180	210	241	272	302	333	363	029	060	089	120	150	181	211	242	273	303	334	364	29
30	030		089	120	150	181	211	242	273	303	334	364	030		090	121	151	182	212	243	274	304	335	365	30
31	031		090		151		212	243		304		365	031		091		152		213	244		305		366	31

Figure J-1. Julian calendar

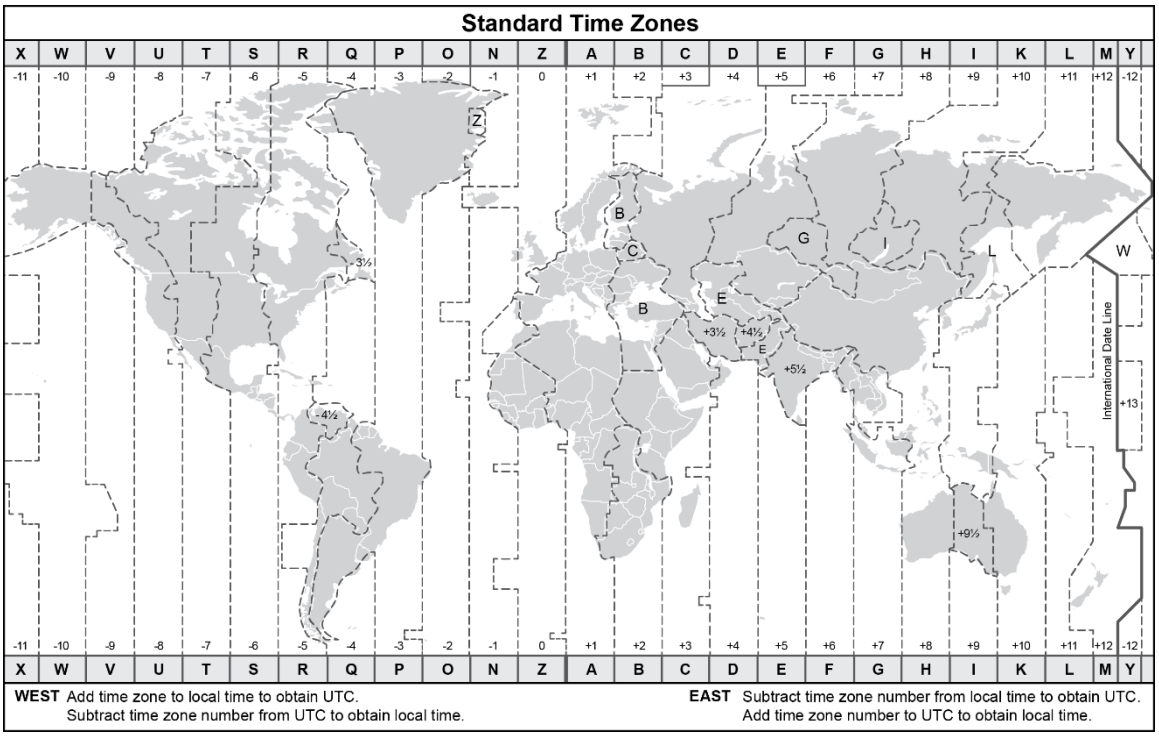


Figure J-2. Standard time zones

DOCTRINE MATRIX

J-2. Figures J-3 through J-8 on pages 330–335 contain parts of the Command and General Staff College (CGSC), Department of Tactic's (DTAC's) doctrine matrix (DOCMAT).

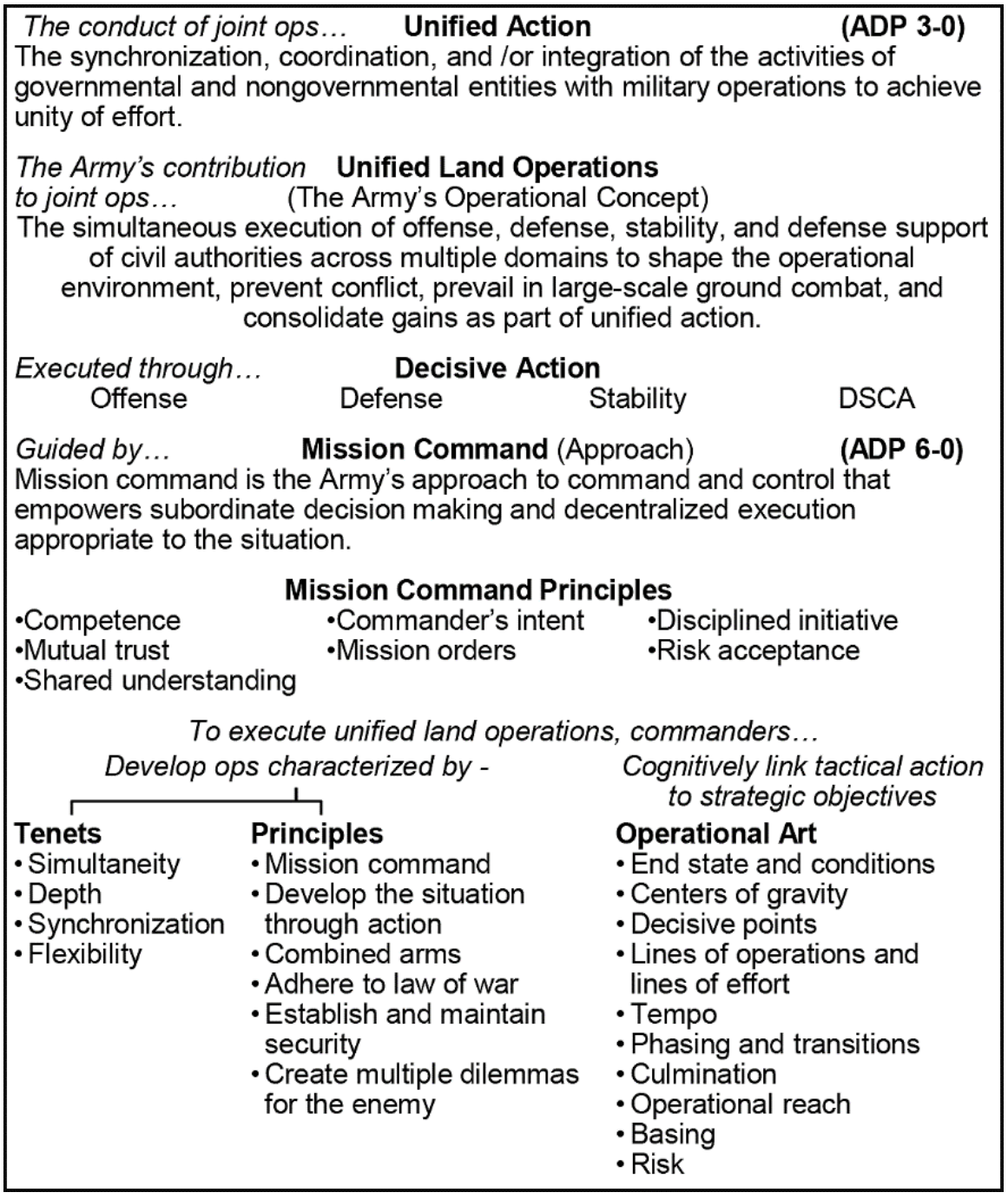


Figure J-3. DTAC DOCMAT—unified land operations

Operations Structure **(ADP 3-0)**

Provide a broad process for conducting operations	*Provide basic options for visualizing and describing operations*	*Provide intellectual organization for common critical tasks*
Operations Process •Plan - Army Design Methodology - MDMP -TLPs •Prepare •Execute •Assess	**Operational Framework** •Area of operations •Deep, close, consolidation, and support areas •Decisive, shaping, and sustaining ops •Main and supporting efforts	**Combat Power** •Warfighting functions – Command and control – Movement and maneuver – Intelligence – Fires – Sustainment – Protection •Information •Leadership

Commander's Role in the Operations Process (UVDDLA)
• Understand • Visualize • Describe • Direct • Lead • Assess

Decisive Action (Offense) **(ADP 3-0 and ADP 3-90)**

Purposes*	Types of Offensive Ops	Characteristics	Forms of Maneuver
• Dislocate, isolate, disrupt, and destroy enemy forces. • Seize key terrain. • Deprive the enemy of resources. • Refine intelligence. • Deceive and divert the enemy. • Provide a secure environment for stability tasks.	• Movement to contact • Attack – Ambush – Counterattack – Demonstration – Feint – Raid – Spoiling attack • Exploitation • Pursuit	• Audacity • Concentration • Surprise • Tempo	• Envelopment • Frontal assault • Infiltration • Penetration • Turning movement

***Note.** Some purposes in ADP 3-0 (shown) differ slightly in wording from those in ADP 3-90. ADP 3-90 also lists two additional purposes: *fix an enemy force in position*, and *set the conditions for successful future operations.*

Decisive Action (Stability) **(ADP 3-0 and ADP 3-07)**

Purposes	Stability Ops Tasks	Fundamentals	Stabilization Framework
• Provide a secure environment • Secure land areas • Meet the critical needs of the population • Gain support for HN gov't • Shape the environment for interagency and HN success • Promote security, build partner capacity, and provide access • Refine intelligence	• Establish civil security • Establish civil control • Restore essential services • Support to governance • Support to economic and infrastructure development • Conduct security cooperation	• Conflict transformation • Unity of effort • Building host-nation capacity and capabilities • Host-nation ownership and legitimacy	• Initial response *(stabilize OE in a crisis state)* • Transformation *(post-conflict reconstruction, stabilization, and capacity-building)* • Fostering sustainability *(establish stable conditions so forces can transition control)*

Figure J-4. DTAC DOCMAT—operational structure, offense, and stability

Army Planning Processes

Army Design Methodology (ATP 5-0.1)

1. Frame OE (current state and desired end state)
2. Frame the problem
3. Develop an operational approach
4. Document results
5. Reframe as required

Military Decision-Making Process (FM 6-0)

1. Receipt of mission
2. Mission analysis
3. COA development
4. COA analysis (War-game)
5. COA comparison
6. COA approval
7. Orders production, dissemination, and transition

Troop Leading Procedures

1. Receive the mission
2. Issue a warning order
3. Make a tentative plan
4. Initiate movement
5. Conduct reconnaissance
6. Complete the plan
7. Issue the order
8. Supervise and refine

Types of Orders (FM 6-0)

- Warning order (WARNORD)
- Operation order (OPORD)
- Fragmentary order (FRAGORD)

Decisive Action (Defense) (ADP 3-0, ADP 3-90 and FM 3-90-1)

Purposes*

- Deter or defeat enemy offense.
- Gain time.
- Achieve economy of force.
- Retain key terrain.
- Protect the population, critical assets, and infrastructure.
- Refine intelligence.

Types of Defensive Ops

- Area defense
  - Defense in Depth
  - Forward Defense
- Mobile defense
- Retrograde
  - Delay
  - Withdrawal
  - Retirement

Characteristics

- Disruption
- Flexibility
- Maneuver
- Mass and concentration
- Operations in depth
- Preparation
- Security

Forms of the Defense

- Defense of a linear obstacle
- Perimeter defense
- Reverse slope defense

Battle Positions

- Primary
- Alternate
- Supplementary
- Subsequent
- Strong point

***Note:** Some purposes in ADP 3-0 (shown) differ from those in ADP 3-90. See ADP 3-90 for differences.

Decisive Action (DSCA) (ADP 3-0 and ADP 3-28)

Purposes

- Save lives
- Restore essential services
- Maintain or restore law and order
- Protect infrastructure and property
- Support maintenance or restoration of local government
- Shape the environment for intergovernmental success

DSCA Tasks

- Provide support for domestic disasters
- Provide support for domestic CBRN incidents
- Provide support for domestic civilian law enforcement agencies
- Provide other designated support

Characteristics

- State and federal laws define how military forces support civil authorities
- Civil authorities are in charge, and military forces support them
- Military forces depart when civil authorities are able to continue without military support
- Military forces must document costs of all direct and indirect support provided

Figure J-5. DTAC DOCMAT—planning processes, defense, and DSCA

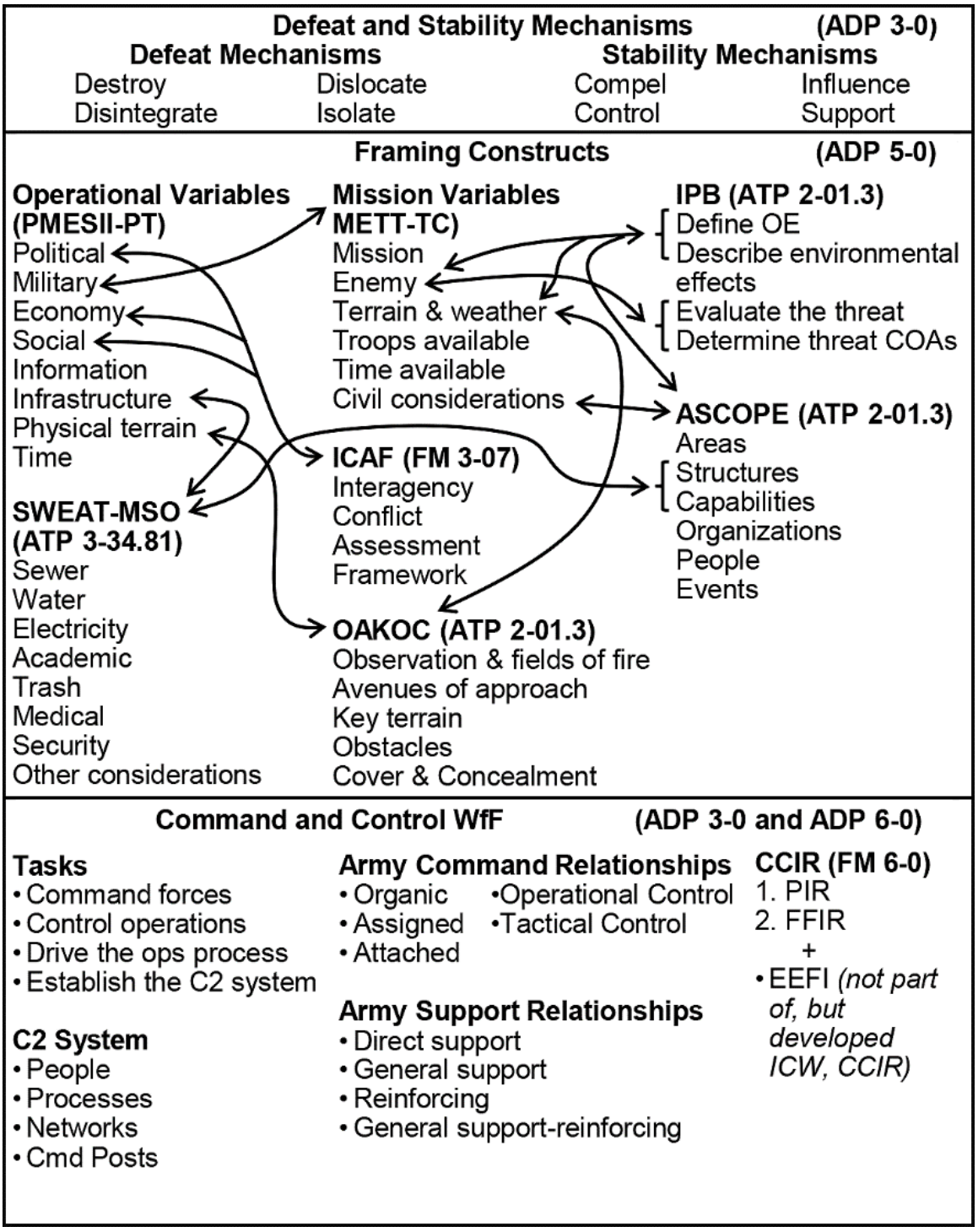


Figure J-6. DTAC DOCMAT—defeat and stability mechanisms, framing constructs, and command and control

Enabling Operations (ADP 3-90)

Reconnaissance
- Route recon
- Zone recon
- Area recon
- Recon in force
- Special recon

Recon Fundamentals
- Ensure continuous recon
- Do not keep recon assets in reserve
- Orient on the recon objective
- Report information rapidly and accurately
- Retain freedom of maneuver
- Gain and maintain enemy contact
- Develop the situation rapidly

Troop Movement
- Administrative
- Approach March
- Tactical Road March

Relief in Place
- Sequential
- Simultaneous
- Staggered

Security
- Screen
- Guard
- Cover
- Area security

Security Fundamentals
- Provide early and accurate warning
- Provide reaction time and maneuver space
- Orient on the force or facility to be secured
- Perform continuous recon
- Maintain enemy contact

Passage of Lines (POL)
- Forward POL
- Rearward POL

Intelligence WfF (ADP 2-0)

Intel WfF Tasks
- Provide intel spt to force generation
- Provide spt to situational understanding
- Conduct info collection
- Provide intel spt to targeting and info ops

Intel Core Competencies
- Intel synchronization
- Intel operations
- Intel processing, exploitation, and dissemination (PED)
- Intel analysis

Intel Disciplines
•CI •HUMINT •OSINT •TECHINT
•GEOINT •MASINT •SIGINT

Intel Operations Guidelines (FM 2-0)
- Ensure continuous intel ops
- Orient on requirements
- Provide mixed / overlapping coverage
- Gain and maintain sensor contact
- Report info rapidly and accurately
- Provide early warning
- Retain freedom of maneuver

IPB (See framing constructs)

Sustainment WfF (ADP 3-0 and ADP 4-0)

Principles
- Integration
- Anticipation
- Responsiveness
- Simplicity
- Economy
- Survivability
- Continuity
- Improvisation

Classes of Supply
I Rations
II Individual equip / General supplies
III Fuel, POL
IV Engineer & barrier material
V Ammunition
VI Personal demand
VII Major end items
VIII Medical supplies
IX Repair parts
X Material for non-military programs

Elements of Sustainment
1. Logistics
   - Maintenance
   - Transportation
   - Supply
   - Field services
   - Distribution
   - Operational contract support
   - General engineering
2. Financial management ops
   - Finance ops
   - Resource management
3. Personnel services
   - HR support
   - Legal support
   - Religious support
   - Band support
4. Health service support
   - Casualty care
   - Medical evacuation
   - Medical logistics

Figure J-7. DTAC DOCMAT—tactical enabling tasks, intelligence, and sustainment

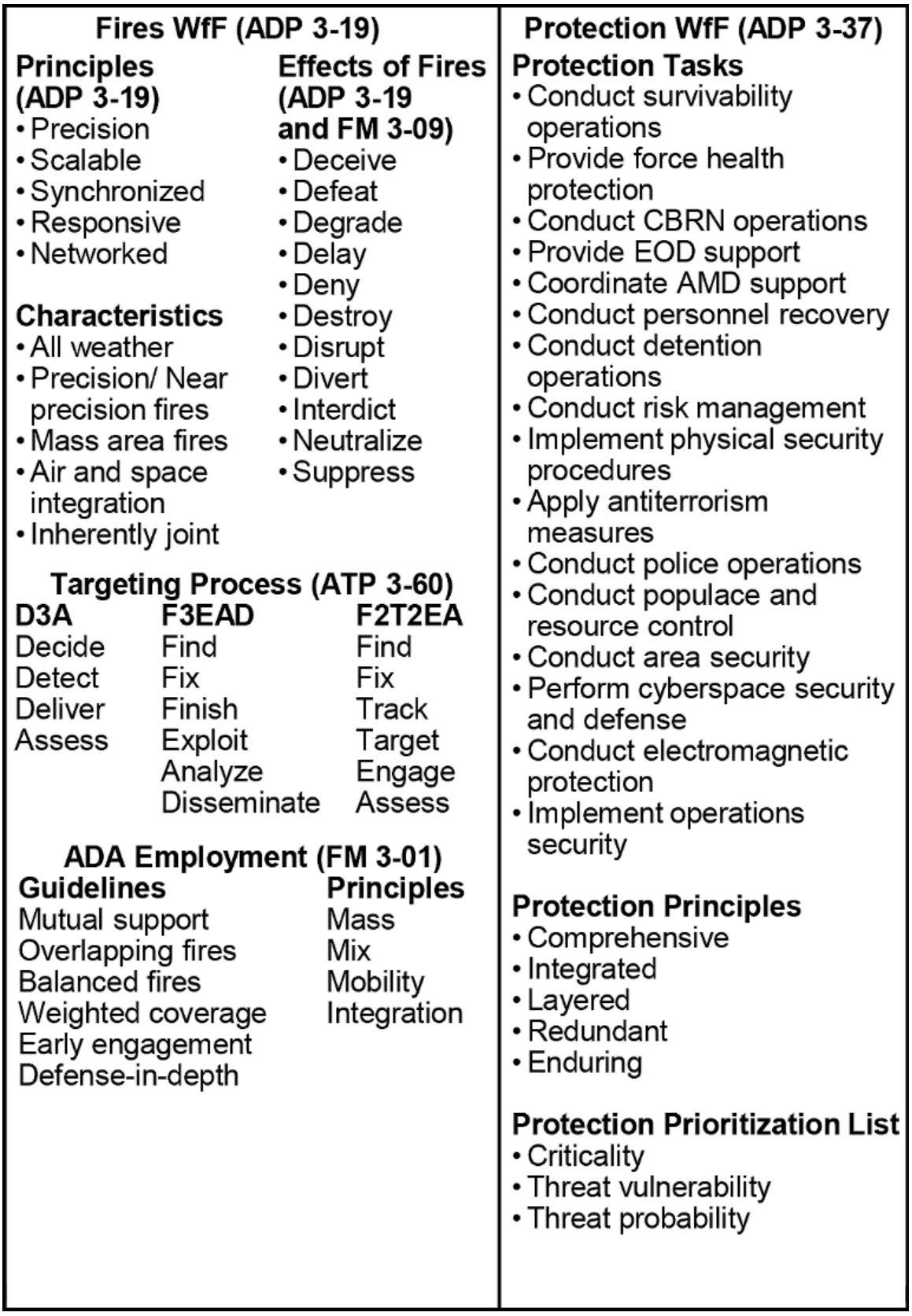


Figure J-8. DTAC DOCMAT—fires and protection

DEPLOYMENT AND REDEPLOYMENT

J-3. *Deployment* is the movement of forces into and out of an operational area (JP 3-35). Deployment consists of four phases: deployment planning, pre-deployment activities, movement, and reception, staging, onward movement, and integration.

DEPLOYMENT PLANNING

J-4. Deployment planning is a logical process that focuses on methods and information required to deploy and track Soldiers, deployable Army Civilians, supplies, and equipment. In particular, deployment plans require detailed information. Deployment planning consists of five steps:

- Analyze the mission.
- Structure forces.
- Refine deployment data or time-phased force and deployment data (TPFDD).
- Prepare the force.
- Schedule movement.

UNIT MOVEMENT OFFICER AND UNIT MOBILITY OFFICER

J-5. The unit movement officer (battalion and below) and unit mobility officer (brigade, echelons above brigade, and rapid deploying units) plan—and are responsible for—unit movements. Deployment and redeployment of large forces require the use of automated systems and expertise. Table J-4 lists references for unit movement officers and others to use in planning and executing unit movements.

Table J-4. Functional reference list

Function	*Reference*
Duties of UMO	DTR Part III, AR 525-93
Unit movement data	DTR Part III
Unit movement plans	TEA Pamphlet (PAM) 700-2
Transportability of unit equipment	TEA Pam 700-5; TB 55-46-1/NAVFAC P-1055
Motor transportation operations	ATP 4-11; TEA Pam 700-2; TEA Pam 55-20
Convoy plan	ATP 4-11
Rail operations	ATP 4-14; Technical Manual (TM) 55-2220-058-14; TEA Pam 55-19; TEA Pam 700-2
Port operations	ATP 4-13
Airlift operations	DTR; TM 38-250; TEA Pam 55-24; TEA Pam 700-2
Sealift operations	DTR; TEA Pam 700-2; TEA Pam 700-4
Vehicle load plans	TEA Pam 55-20
Aircraft load plans	TEA Pam 55-24
Tiedown of equipment in aircraft	TEA Pam 55-24
Containerization	DTR Part IV; ATP 4-12; TEA Pam 55-23; TEA Pam 700-2
HAZMAT	Title 49 code of federal regulation (CFR); TM 38-250
AIT and RF tags	DTR; AR 700-80
AIT automatic identification technology DTR defense transportation regulation RF radio frequency	TEA Transportation Engineering Agency UMO unit movement officer

PRE-DEPLOYMENT ACTIVITIES

J-6. Unit pre-deployment activities include final Soldier readiness processing (SRP), configuring and staging equipment, inspections, preparing and validating movement manifests, timelines, and coordinating activities after arrival.

MOVEMENT

J-7. To prepare for movement, chalk and align personnel and equipment into the movement sequence. For instance, days of supply fuel and fuelers should precede equipment. Maintenance personnel and operators should move with their equipment so the equipment can be downloaded and put into use off of the platform.

J-8. Movement of personnel is usually by air and of short duration. Move personnel with required equipment such as tentage, communications equipment, personal weapons, basic load of ammunition, minimal required vehicles, days of supply fuel, material handling equipment, and rations. Movement with required equipment expedites the initial setup and conduct of initial operations.

J-9. Movement of follow-on equipment is conducted by sealift and can be fort to port or port to port. Theater provided equipment (TPE) can be issued at the port of debarkation or at the first station in theater. Units falling in on equipment, front load accountability personnel, maintenance personnel, and operators to ensure the equipment is combat ready when the main body arrives.

J-10. Units must account for equipment and personnel during movement. *In-transit visibility* is the ability to track the identity, status, and location of Department of Defense units, and non-unit cargo (excluding bulk petroleum, oils, and lubricants) and passengers; patients; and personal property from origin to consignee or destination across the range of military operations. Also called ITV (JP 4-01.2). Commanders, whose employment planning depends on the closure of forces, base their decisions on accurate and reliable ITV. ATP 3-35 annex K describes proper utilization of automatic identification technology along with placement of automatic identification technology interrogators and other readers, military shipping labels, and radio frequency identification tags to enable movement managers to maintain ITV and the ITV common operational picture (COP).

JOINT RECEPTION, STAGING, ONWARD MOVEMENT, AND INTEGRATION

J-11. Joint reception, staging, onward movement, and integration (JRSOI) is the process that delivers combat power to the joint force commander in the operational theater. If pre-deployment tasks and movement are conducted properly, the flow of JRSOI can be streamlined, delivering personnel and equipment expeditiously to the fight. The sustainment command plans and enables theater opening and JRSOI (see ATP 3-35 for more information). JRSOI is simply reception, staging, onward movement, and integration conducted jointly, as described below:

- Reception—unloading personnel and equipment from strategic transportation assets; managing port marshalling areas; transporting personnel, equipment, and materiel to staging areas; and providing logistics support services to units transiting the ports of debarkation.
- Staging—organizing personnel, equipment, and basic loads into movement units; preparing the units for onward movement; and providing logistics support for units transiting the staging area.
- Onward movement—moving units from reception facilities and staging areas to the tactical assembly area or other theater destinations; moving non-unit personnel to gaining commands; and moving sustainment supplies to distribution sites.
- Integration—during integration, combat-ready units transfer to the operational commander and merge into the tactical plan. The time required for integration may vary, depending upon the size of the total force, contingency conditions, and amount of pre-deployment and ongoing planning and coordination. Rapid integration, however, is critical to the success of combat operations, and adequate planning and coordination can reduce integration time. **Integration is the gaining unit's function.**

J-12. JRSOI can be conducted geographically either directly into an operational area (for example in the rear or as part of an insertion) but is most often conducted in intermediate stages using intermediate staging bases to facilitate the convergence of units, personnel, equipment, and materiel securely and effectively. Units must be fully prepared to fall into the sequence of movement developed through the TPFDD to an intermediate staging base; support arming, fueling, and fixing of equipment; and finally, conduct movement to the operational area.

REDEPLOYMENT

J-13. *Redeployment* is the transfer of forces and materiel to home and/or demobilization stations for reintegration and/or out-processing (ATP 3-35). Redeployment is considered an operational movement critical to reestablishing force readiness.

J-14. Units nest their redeploying unit's plan within plans of their higher headquarters. The redeployment plan conveys the commander's intent and includes responsibilities, priorities, and guidance for movement of forces, individuals, and materiel. Issues that must be addressed in the plan are—

- Scheduling of redeployment activities.
- Personnel accountability.
- Cleaning of equipment.
- Transfer of equipment.
- Ammunition turn-in.
- Army preposition stock procedures.
- Security of the force.
- Availability of theater transportation assets.
- Availability of strategic lift.

J-15. Tasks associated with redeployment are readying the force; clearing the area of operations (AO); securing, protecting, and moving equipment; moving personnel; and conducting redeployment administrative responsibilities. Units prepare for redeployment by preparing equipment and personnel, dispositioning equipment and real property, performing accounting activities, and scheduling movements. Specific requirements for redeployment vary with each situation but the basic principles of accountability, safety, security, and efficiency do not change. Commanders are responsible for the conduct of redeployment by their units. Redeployment considerations include—

- Developing a command and control plan for split forces.
- Conducting medical screening prior to redeploying.
- Ensuring family readiness activities are coordinated for each element.
- Planning early for relief in place.

Appendix K

Liaison Considerations

Appendix K provides an introduction to liaison and describes the functions of liaison officers. It also describes liaison elements, including the digital element, and liaison practices and responsibilities, including those of the sending and receiving unit.

INTRODUCTION TO LIAISON

K-1. Liaison is that contact or intercommunication maintained between elements of military forces or other agencies to ensure mutual understanding and unity of purpose and action. Most commonly used for establishing and maintaining close communications, liaison continuously enables direct, physical communications between commands and with unified action partners. Commanders use liaison during operations and normal daily activities to facilitate a shared understanding and purpose among organizations, preserve freedom of action, and maintain flexibility. Liaison provides commanders with relevant information and answers to operational questions, thus enhancing the commander's situational understanding.

K-2. Liaison activities augment a commander's ability to synchronize and focus combat power. These activities include establishing and maintaining physical contact and communications between elements of military forces and nonmilitary agencies during unified action. Liaison activities ensure—

- Cooperation and understanding among commanders and staffs of different headquarters.
- Coordination on tactical matters to achieve unity of effort.
- Synchronization of lethal and nonlethal effects.
- Understanding of implied or inferred coordination measures to achieve synchronized results.

LIAISON OFFICER

K-3. A liaison officer (LNO) represents a commander or staff officer to the receiving unit. LNOs transmit information directly, bypassing headquarters and staff layers. A trained, competent, trusted, and informed LNO (either a commissioned or noncommissioned officer) is the key to effective liaison. LNOs must have the commander's full confidence and experience for the mission. At higher echelons, the complexity of operations often requires an increase in the rank required for LNOs (see table K-1 for recommended liaison rank equivalents).

Table K-1. Recommended liaison officer rank by echelon

Echelon	*Recommended senior liaison rank*
Multinational or joint force commander[1]	Colonel
Corps	Lieutenant Colonel
Division	Major
Brigade, regiment, or group	Captain/Master Sergeant
Battalion	Lieutenant/Sergeant First Class
Note. [1]These include joint force commanders and functional component commanders and may also include major interagency and international organizations.	

K-4. As a representative, the LNO has access to the commander consistent with the duties involved. However, for routine matters, LNOs work for, and receive direction from, the chief of staff (COS) or executive officer (XO). Using one officer to perform a liaison mission conserves manpower while

guaranteeing a consistent, accurate flow of information; **however, continuous operations may require a liaison team or liaison detachment.**

K-5. The professional capabilities and personal characteristics of an effective LNO encourage confidence and cooperation with the commander and staff of the receiving unit. Effective LNOs—

- Know the sending unit's mission; current and future operations; logistics status; organization; disposition; capabilities; and TTP.
- Appreciate and understand the receiving unit's TTP; organization; capabilities; mission; doctrine; staff procedures; and customs.
- Are familiar with the—
  - Requirements for and purpose of liaison.
  - Liaison system and its reports, documents, and records.
  - Liaison team training.
- Observe the established channels of command and staff functions.
- Are tactful.
- Possess familiarity with local culture and language and, if possible, have advanced regional expertise.

LIAISON ELEMENTS

K-6. Commanders organize liaison elements based on mission variables and echelon of command. Division, corps, and theater army headquarters are authorized two command liaison teams. Common ways to organize liaison elements include, but are not limited to-

- A single LNO.
- A liaison team consisting of one or two LNOs, or an LNO and a liaison non-commissioned officer in charge, clerical personnel, and communications personnel along with their equipment.
- Couriers (messengers) responsible for the secure physical transmission and delivery of documents and other materials.
- A digital liaison detachment comprising several teams with expertise and equipment in specialized areas, such as intelligence, operations, fire support, air defense, and sustainment.

DIGITAL LIAISON DETACHMENTS

K-7. Digital liaison detachments provide Army commanders with units to liaison with major subordinate or parallel headquarters. Digital liaison detachments consist of staff officers with a broad range of expertise who are capable of analyzing a situation, facilitating coordination between multinational forces, and assisting in cross-boundary information flow and operational support. These 30-Soldier teams are essential not only for routine liaison, but also for advising and assisting multinational partners in planning and operations at intermediate tactical levels. These detachments can operate as a single entity for liaison with a major multinational headquarters or provide two smaller teams for digital connectivity and liaison with smaller multinational headquarters. Commanders can also tailor digital liaison detachments to match a given mission. The digital liaison detachment allocation is five per committed theater Army and one per corps and division serving as a joint task force headquarters or as approved by the Department of the Army.

LIAISON PRACTICES

K-8. When possible, liaison is reciprocal among higher, lower, supporting, supported, and adjacent organizations. Each organization sends a liaison element to the other. When U.S. forces are placed under control of a different nation's headquarters and vice versa or when brigade-sized and larger formations from different nations are adjacent, liaison activities should be reciprocal. When not reciprocal, the following practices apply to liaison (where applicable):

- Higher-echelon units establish liaison with lower echelons.
- In contiguous operations, units on the left establish liaison with units on their right.
- In contiguous operations, units of the same echelon establish liaison with those to their front.

- In noncontiguous operations, units establish liaison with units within closest proximity.
- Supporting units establish liaison with units they support.
- Units not in contact with the enemy establish liaison with units in contact with the enemy.
- During a passage of lines, the passing unit establishes liaison with the stationary unit.
- During a relief in place, the relieving unit establishes liaison with the unit being relieved.

K-9. If liaison is broken, both units act to reestablish it. However, the primary responsibility rests with the unit originally establishing liaison.

LIAISON RESPONSIBILITIES

SENDING UNIT

K-10. The sending unit's most important tasks include selecting and training the best qualified Soldiers for liaison duties. Liaison personnel should have the characteristics and qualifications discussed previously.

K-11. The sending unit describes the liaison team to the receiving unit providing number and types of vehicles and personnel, equipment, call signs, and frequencies. The LNO or liaison team also requires-

- Point-to-point transportation, as required.
- Identification and appropriate credentials for the receiving unit.
- Appropriate security clearances, courier orders, and information systems accredited for use on the receiving unit's network.
- The standard operating procedures (SOPs) outlining the missions, functions, procedures, and duties of the sending unit's liaison section.
- If the receiving unit is multinational, it may provide communications equipment and personnel.

The movement from the sending unit to the receiving unit requires careful planning and coordination.

RECEIVING UNIT

K-12. The receiving unit—

- Provides the sending unit with the LNO's reporting time, place, point of contact, recognition signal, and password.
- Provides details of any tactical movement and logistics information relevant to the LNO's mission, especially while the LNO is in transit.
- Ensures that the LNO has access to the commander, the COS or XO, and other staff members, as required.
- Gives the LNO an initial briefing of the unit battle rhythm and allows the LNO access necessary to remain informed of current operations.
- Protects the LNO while at the receiving unit.
- Publishes a standard operating procedure outlining the missions, functions, procedures to request information, information release restrictions, clearance procedures, and duties of the LNO or team at the receiving unit.
- If possible, provides access to communications equipment (and operating instructions, as needed) when the LNO needs to communicate using the receiving unit's equipment.
- Provides adequate workspace for the LNO.
- Provides administrative and logistics support or agreed to host-nation support.

DURING THE TOUR

K-13. During the tour, LNOs have specific duties. LNOs inform the receiving unit's commander or staff of the sending unit's needs or requirements. Due to the numbers of LNOs at headquarters, sending units guard against inundating the receiving unit with formal requests for information. By virtue of their location in the headquarters and knowledge of the situation, LNOs can rapidly answer questions from the sending unit and

keep the receiving unit from wasting planning time answering requests for information. During the liaison tour, LNOs—

- Arrive at the designated location on time.
- Promote cooperation between the sending and receiving units.
- Accomplish their mission without becoming overly involved in the receiving unit's staff procedures or actions; however, they may assist higher echelon staffs in course of action (COA) development and analysis.
- Follow the receiving unit's communications procedures.
- Actively obtain information without interfering with the receiving unit's operations.
- Facilitate understanding of the sending unit's commander's intent.
- Help the sending unit's commander assess current and future operations.
- Remain informed of the sending unit's current situation and provide that information to the receiving unit's commander and staff.
- Quickly inform the sending unit of the receiving unit's upcoming missions, tasks, and orders.
- Ensure the sending unit has a copy of the receiving unit's standard operating procedure.
- Inform the receiving unit's commander, COS, or XO of the content of reports transmitted to the sending unit.
- Keep a record of their reports, listing everyone met (including each person's name, rank, duty position, and telephone number) as well as key staff members and their telephone numbers.
- Attempt to resolve issues within the receiving unit before involving the sending unit.
- Notify the sending unit promptly if unable to accomplish the liaison mission.
- Report their departure to the receiving unit's commander at the end of their mission.

K-14. Once a deploying liaison team or detachment arrives and sets up communications at the receiving unit, it submits a liaison establishment report to the sending unit. This report informs the sending unit's command that the detachment is ready to conduct liaison, and it establishes exactly what systems are available. A redeploying team or detachment submits a liaison disestablishment report to the sending unit as its last action prior to disconnecting its digital devices. This report informs the command that the element is leaving the network and is no longer capable of conducting liaison at any level beyond unsecure voice (see unit standard operating procedures for the liaison establishment report and the liaison disestablishment report formats).

K-15. LNOs promptly transmit the receiving unit's requests for information to the sending unit's commander or staff, as appropriate. Accuracy is important. Effective LNOs provide clear, concise, and complete information. If the accuracy of information is in doubt, they quote the source and include the source in the report. LNOs limit their remarks to mission-related observations.

Appendix L

Stability and DSCA Considerations

The rest of this publication is focused on how to asses-plan-prepare-execute in large-scale combat operations. This appendix focuses on considerations and how to modify the existing process for the remaining two activities of decisive action.

STABILITY OPERATIONS CONSIDERATIONS

L-1. This section is derived from FM 3-07, FM 6-0, and FM 3-0.

L-2. Stability tasks are part of every operation. A s*tability operation* is an operation conducted outside the United States in coordination with other instruments of national power to establish or maintain a secure environment and provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief (ADP 3-0).However, the proportion of stability operations, in relation to offensive and defensive operations, may change. For example, in a peace operation, forces may still perform offensive operations such as a raid to capture war criminals. Conversely, in large-scale combat operations, forces perform stability operations to control captured areas or provide emergency essential services.

L-3. Units conducting stability operations have specified and recognizable end state goals. Stability operations seek to maintain, improve, or re-establish legitimate governance to an otherwise contingent or combat environment. Planning for stability operations seeks deliberate interaction and inclusion of local authorities. Stability operations establish a security environment while seeking to stabilize local governmental authority. The six primary stability operations are—

- Establish civil security.
- Establish civil control.
- Restore essential services.
- Support governance.
- Support economic and infrastructure development.
- Conduct security cooperation.

L-4. Stability operations rely on military forces quickly seizing the initiative to improve the civil situation while preventing conditions from deteriorating further. Commanders must be flexible and exercise mission command principals to allow subordinate commanders to react and assist host-nation partners. The military decision-making process and the rapid decision-making and synchronization process may be required regularly. Planning these tasks requires increased consideration of—

- Protection assets.
- Public affairs considerations.
- Engineer (horizontal and vertical construction assets and expertise).
- Civil affairs operations.
- Military information support operations.
- Medical support and administration.
- Logistics assistance.
- Prevention of civilian casualties (often at the expense of offensive operations).
- Political and cultural considerations.
- Host-nation control and decision-making abilities (often in disagreement).
- Training of host-nation personnel (professionalism).
- Balancing security forces with assistance elements.

- Authorities.

L-5. When joint and host-nation security forces can realistically maintain a reduced level of violence, the transition to stability occurs. At this time, the commander begins the transition to stability operations to increase the capability of host-nation forces and local governance to operate without assistance.

L-6. Unlike combat operations, stability operations most likely bring Soldiers and Department of the Army Civilians into direct contact with host-nation forces and the populace. In planning for these interactions, public affairs and legal advisors train forces extensively. Increased interaction brings increased need for additional services such as translators, contracting, and finance. End state goals of stability operations are—

- Safe and secure environment.
- Established rule of law.
- Social well-being.
- Stable governance.
- Sustainable economy.

L-7. With stability operations, protection forces are needed to process detainees and to reduce the resurgence of large-scale violence. Combined arms units will likely be required to conduct stability operations. Flexibility in the plan to account for setbacks, unanticipated advances, and contingencies is essential. Units must also be able to conduct non-standard roles when conducting stability operations. Artillery units may be required to conduct infantry training and tasks in support of stability operations. Protection forces may be required to accompany contracted host-nation convoys and perform primarily contracting officer representative tasks. Logistics units may be required to conduct training to units that do not speak English. Financial and engineer assets may be required to conduct assessments in support of State Department personnel.

L-8. A *stability mechanism* is the primary method through which friendly forces affect civilians in order to attain conditions that support establishing a lasting, stable peace (ADP 3-0). They are used when developing an operational approach. They are—

- Compel—using, or threatening to use, lethal force to establish control and dominance, effect behavioral change, or enforce compliance with mandates, agreements, or civil authority.
- Control—imposing civil order.
- Influence—altering the opinions, attitudes, and ultimately the behavior of foreign, friendly, neutral, adversary, and enemy targets and audiences through messages, presence, and actions.
- Support—establishing, reinforcing, or setting the conditions necessary for the instruments of national power to function effectively.

L-9. A plan for stability operations is built on lines of effort (LOEs) with end states rather than on specified objectives. LOEs account for a reliance on host-nation advances rather than that of U.S. forces. Host-nation forces (during stability operations) are typically less capable of unilateral offensive operations and take varying periods of time to conduct unilateral operations in their own defense. U.S. forces are reliant on host nation progress for transition to local authorities. Commanders generally resist committing forces or resources that do not contribute to the LOE. Planners must clearly explain the need for committing forces or resources to a task in support of an LOE. Figure L-1 depicts an LOE development model.

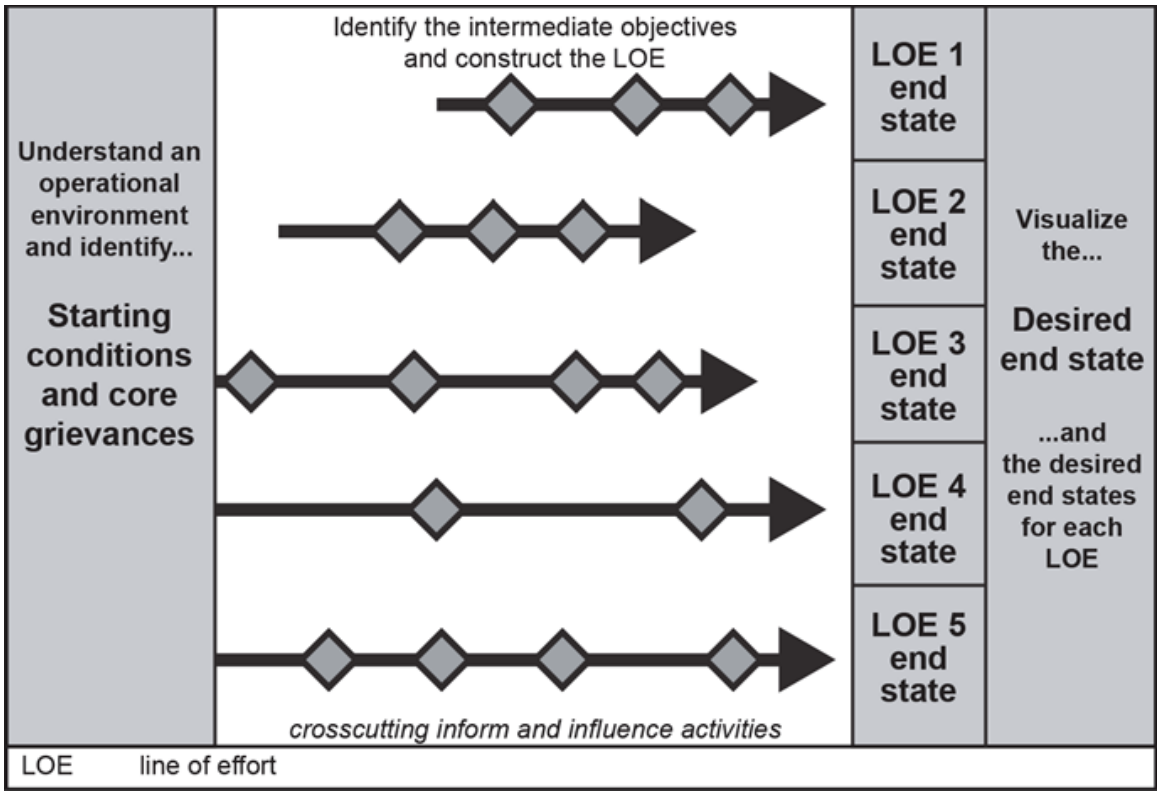


Figure L-1. Developing lines of effort

L-10. During course of action (COA) development, planners use troop-to-task analysis to determine relative combat power by comparing available resources to specified or implied stability operations. In stability operations, sustainment, movement and maneuver, nonlethal effects, and information tasks may dominate.

L-11. The COA analysis method (belt, avenue in depth, and box) selected for stability operations may differ from that selected for large-scale combat operations because the analysis focuses on LOE intermediate objectives and end-states (progression and DPs) rather than geographic or enemy conditions. Analysis of conditions for stability operations also can be more subjective than for combat conditions. A way to help with the subjective analysis is to use external analysts, such as subject matter experts in economics or local governance.

L-12. Unit areas of control will likely be larger for stability operations than other operations. Units will likely be assigned areas, as for offensive or defensive operations, but their "fronts" are undefined.

OTHER CONSIDERATIONS

L-13. Support to governance. As Army units develop host-nation institutional capability and capacity, they continue to foster good governance by advising, assisting, supporting, and monitoring other actors.

L-14. Support to economic and infrastructure development. U.S. Army units may support local and national economies and infrastructure by contracting for labor and services and improving infrastructure. The State Department usually directs these projects, but they are approved by military authorities during transition. Planners seek to bolster the local economy and infrastructure whenever possible.

L-15. Taking prudent risks to allow host-nation forces, police, and authorities to exercise their own control. Commanders must balance their own responsibilities to keep the peace with the responsibility to foster host nation independence. Commanders may take risks to reduce the number of U.S. forces accompanying

trained but untested host-nation forces in operations of many kinds. These actions must be perceived by host nations as legitimate efforts toward fostering trust and reaching LOE end states rather than cutting ties.

L-16. Efforts to reduce collateral damage and civilian risks. Although protection of civilians applies across the range of military operations, it is vital to stability operations. Commanders and planners must take extra efforts to reduce civilian casualties and collateral damage during stability operations. Protection of the civilian populace is the primary means to legitimize governmental authorities in most stability operations and may be the primary purpose of multiple LOEs.

L-17. Stability operations rely on multiple partners and organizations. Army commanders are rarely the sole authority for stability operations and as such, must plan to include multiple partners and organizations. Since the establishment or re-establishment of peace is of greatest concern to the host nation, commanders develop plans in concert with (or in consideration of) the stated ends of the host-nation authorities (military and civilian) they are supporting. Additionally, during planning, commanders consult with partner-nation military commanders, the State Department, and supporting organizations.

L-18. Authorities form the basis for conducting operations. Commanders must understand the complexities of the authorities likely to be present when planning and conducting stability operations. Some examples of authorities include—

- U.S. Law/U.S. Code
- Host-nation laws.
- Status of forces agreements (SOFA).
- International treaties.
- Combatant command directives.
- Army directives and orders.

L-19. Planners and commanders must take into consideration all agreements in place for every operation. Violating agreements and laws may impact future operations and erode trust and cooperation. As a situation develops, commanders and planners must remain informed of changes to agreements, laws, and directives.

L-20. Rules of engagement decisions emphasize the inherent right of self defense and outwardly communicate a desire to protect the populace. Coordinating with public affairs, legal officers, and intelligence officers assists a planner and commander in developing effective and appropriate rules of engagement.

DEFENSE SUPPORT OF CIVIL AUTHORITIES CONSIDERATIONS

L-21. Material in this appendix is derived from ADP 3-28, ATP 3-28.1/MCWP 3-36.2/NTTP 3-57.2/AFTTP 3-2.67, and ATP 2-91.7.

L-22. Army forces support civil authorities by performing defense support of civil authorities (DSCA) tasks. *Defense support of civil authorities* is support provided by U.S. Federal military forces, Department of Defense civilians, Department of Defense contract personnel, Department of Defense component assets, and National Guard forces (when the Secretary of Defense, in coordination with the Governors of the affected States, elects and requests to use those forces per National Guard [Title 32, United States Code], status) in response to requests for assistance from civil authorities for domestic emergencies, law enforcement support, and other domestic activities, or from qualifying entities for special events (DODD 3025.18). DSCA is also known as civil support.

L-23. DSCA operations focus on saving lives, protecting civilian populations, alleviating suffering, and protecting property. Proficiency in command and control, sustainment, and protection are the contributing warfighting functions.

L-24. For Army forces, four primary tasks are associated with DSCA:

- Provide support for domestic disasters.
- Provide support for domestic chemical, biological, radiological, or nuclear incidents.
- Provide support for domestic civilian law enforcement agencies.

- Provide other designated support.

L-25. The U.S. Army's DSCA responsibilities in relation to emergency support functions are detailed in table L-1.

Table L-1. Emergency support function annexes and coordinators

ESF #1: Transportation. Coordinator: Department of Transportation
Manages and regulates transportation systems, infrastructure, and the Nation's airspace. Ensures the safety and security of the national transportation system.
ESF #2: Communications. Coordinator: Department of Homeland Security
Reestablishes critical communications infrastructure and coordinates communications support to response efforts. Facilitates stabilization of systems and applications from cyberspace attacks.
ESF #3: Public Works and Engineering. Coordinator: DOD (U.S. Army Corps of Engineers)
Facilitates the delivery of services, technical assistance, engineering expertise, construction management, and other support to prepare for, respond to, or recover from a disaster or an incident.
ESF #4: Firefighting. Coordinator: Department of Agriculture (U.S. Forest Service) and Department of Homeland Security (Federal Emergency Management Agency and U.S. Fire Administration)
Coordinates support for the detection and suppression of fires.
ESF #5: Information and Planning. Coordinator: Department of Homeland Security (Federal Emergency Management Agency)
Supports and facilitates multiagency planning and coordination for incidents requiring federal coordination.
ESF #6: Mass Care, Emergency Assistance, Temporary Housing, and Human Services. Coordinator: Department of Homeland Security (Federal Emergency Management Agency)
Coordinates the delivery of mass care and emergency assistance.
ESF #7: Logistics. Coordinator: General Services Administration and Department of Homeland Security (Federal Emergency Management Agency)
Coordinates comprehensive incident resource planning, management, and sustainment capability to meet the needs of disaster survivors and responders.
ESF #8: Public Health and Medical Services. Coordinator: Department of Health and Human Services
Coordinates assistance in response to an actual or potential public health and medical disaster or incident.
ESF #9: Search and Rescue. Coordinator: Department of Homeland Security (Federal Emergency Management Agency)
Coordinates rapid deployment of search and rescue resources to provide specialized lifesaving assistance.
ESF #10: Oil and Hazardous Materials Response. Coordinator: Environmental Protection Agency
Coordinates support in response to an actual or potential discharge or release of oil or hazardous materials.
ESF #11: Agriculture and Natural Resources. Coordinator: Department of Agriculture
Coordinates a variety of functions to protect the Nation's food supply, respond to plant and animal pest and disease outbreaks, and protect natural and cultural resources.
ESF #12: Energy. Coordinator: Department of Energy
Helps to reestablish damaged energy systems and components and provides technical expertise during incidents involving radiological and nuclear materials.
ESF #13: Public Safety and Security. Coordinator: Department of Justice (Bureau of Alcohol, Tobacco, Firearms and Explosives
Integrates public safety and security capabilities and resources to support the full range of incident management activities.
ESF #14: [Formerly named Long-Term Community Recovery]
Superseded in 2013 by the National Disaster Recovery Framework.
ESF #15: External Affairs. Coordinator: Department of Homeland Security
Releases accurate, coordinated, timely, and accessible public information to affected audiences, including the government, media, nongovernmental organizations, and the private sector. Works closely with state and local officials to ensure outreach to the whole community.
ESF emergency support function

L-26. Planners focus their efforts on responding to local emergencies and operating within their authorities while under the direction of civil authorities (such as the Department of Homeland Security) rather than using their own judgement. Exercising restraint when responding is critical.

L-27. Planners and units also prepare for deliberate transition to civilian support-even when it seems contrary to common judgement-whenever their authority to operate is rescinded (and for whatever reason). **The structure of command and control relationships is of considerable importance for DSCA operations and must be adjudicated before an operation starts.** Planners must determine the command relationship they fall under and exercise operating under such authority to minimize friction and mission delay.

L-28. Explicitly state rules for the use of force, law enforcement support, and authorities for protection and operations in mission orders. Units may or may not deploy with weapons (see ADP 3-28 for more information).

L-29. Chemical, biological, radiological, nuclear, and high-yield explosive and pandemic responses present unique considerations with respect to the initiation of the response and the size and type of force. ATP 3-28.1/MCWP 3-36.2/NTTP 3-57.2/AFTTP 3-2.67 provides a detailed planning consideration description for multi-service response to a DSCA request.

Appendix M

Command and Staff Roles

This appendix provides a brief overview of staff responsibilities and available resources. This is not an all-inclusive list, but it can serve as a starting point for someone unfamiliar with certain roles.

INTRODUCTION TO COMMAND AND STAFF ROLES

M-1. *Command* is the authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment (JP 1). The legal and ethical responsibilities of a commander exceed those of any other leader of similar position and authority. The commander alone is responsible for what the command does or fails to do. Commanders constantly use their judgement for such things as delegating authority, making decisions, determining the appropriate degree of control, and allocating resources. A commander's experience and training also influence that commander's decision making. Proficiency in the art of command stems from years of schooling, self-development, introspection, and operational and training experiences. It also requires a deep understanding of the science of war.

M-2. Commanders, aided by staffs, use control to regulate forces and the functions of subordinate and supporting units. Staffs give commanders their greatest support in providing control. However, **for control to be effective, commanders must actively participate in exercising it.**

COMMON STAFF DUTIES AND RESPONSIBILITIES

M-3. Each staff element has specific duties and responsibilities by area of expertise. However, all staff sections share a set of common duties and responsibilities:

- Advising and informing the commander.
- Building and maintaining running estimates.
- Preparing plans, orders, and other staff writing.
- Assessing operations and providing recommendations.
- Exercising staff supervision and managing information within their area of expertise.
- Identifying and analyzing problems.
- Performing risk management.
- Performing intelligence preparation of the battlefield.
- Conducting staff inspections.
- Conducting staff research.
- Performing staff administrative procedures.

COMMANDER RESPONSIBILITIES

M-4. The commander must decide what the unit has to accomplish and then lead their unit through mission accomplishment. As such, the commander-

- Trains the staff on combining the "art" of command with the "science" of control.
- Sets the standards for training the staff.
- Drives the operations process.
- Determines if there is a need for design prior to conducting the military decision-making process.
- Provides guidance for each step of the military decision-making process.

Staff Expectations of the Commander

M-5. The staff generally needs to know basic information from the commander, which includes—

- Mission.
- Commander's intent.
- Commander's visualization of the operation
- Time available.
- Chain of command.
- How and where the commander can be located.
- Priorities for planning.

CHIEF OF STAFF OR EXECUTIVE OFFICER DUTIES AND RESPONSIBILITIES

M-6. The chief of staff (COS), at division or higher, or executive officer (XO), brigade and battalion, is normally the commander's assistant in coordinating and synchronizing the staff. Commanders normally delegate executive management authority to the COS or XO. As the key staff integrator, the COS or XO frees the commander from routine details of staff operations and management of the headquarters. Division and higher units have a COS, while brigades and below have an XO. The COS or XO duties include, but are not limited to—

- Coordinating, directing, and supervising the work of the staff.
- Establishing and monitoring the headquarters battle rhythm and nesting with higher and subordinate headquarters battle rhythms for effective planning support, decision making, and other critical functions.
- Representing the commander when authorized.
- Monitoring combat readiness.
- Formulating and disseminating staff policies.
- Ensuring effective liaison exchanges with higher, lower, and adjacent units and other organizations as required.
- Supervising the sustainment of the headquarters and activities of the headquarters and headquarters battalion or company.

M-7. The commander generally needs to know the following from the COS or XO:

- Operating policies and procedures.
- Staff recommendations.
- Status of warfighting functions within the command.
- The military decision-making process timeline and when the COS or XO expects input from the commander.

COMMAND SERGEANT MAJOR DUTIES AND RESPONSIBILITIES

M-8. The command sergeant major serves as the senior non-commissioned officer in the unit. A command sergeant major has no conflicts of interest. They are dedicated to assisting the commander in directing the unit towards the successful accomplishment of the mission. They keep the commander advised of potential situations, procedures, and practices affecting the welfare, morale, job satisfaction, and employment of the units' enlisted Soldiers. With regard to staff planning, the command sergeant major recommends the best non-commissioned officers and Soldiers to the commander to augment staff officers and provides valuable expertise and experience to help develop or analyze a course of action (COA).

M-9. The commander generally needs to know the following from the command sergeant major:

- Training status of unit Soldiers and leaders.
- Welfare, morale, and satisfaction of Soldiers within the unit.
- Administrative recommendations regarding assignments, discipline, training, awards and decorations, and uniform regulation relevant to enlisted Soldiers of the command.
- Potential combat technical and tactical deficiencies in the unit and suggestions for improvement.

COORDINATING STAFF OFFICERS

M-10. Coordinating staff officers are the commander's principal assistants who advise, plan, and coordinate actions within their area of expertise or a warfighting function. Commanders may designate coordinating staff officers as assistant chiefs of staff, chiefs of a warfighting function, or staff officers. Coordinating staff officers may also exercise planning and supervisory authority over designated special staff officers.

M-11. Coordinating staff officers comprise the following positions:

- G-1 (S-1) (personnel).
- G-2 (S-2) (intelligence).
- G-3 (S-3) (operations).
- G-4 (S-4) (logistics).
- Support Operations Officer.
- G-5 (plans).
- G-6 (S-6) (signal).
- G-8 (financial management).
- G-9 (S-9) (civil affairs operations).
- Chief of fires or fire support officer.
- Air missile defense officer.
- Aviation officer
- Engineer officer.
- Chemical, biological, radiological, nuclear, and high-yield explosives officer.
- Provost marshal.
- Chaplain.
- Staff judge advocate.
- Command surgeon.

M-12. The chief of fires is at division and corps levels. This staff officer coordinates their respective warfighting function for the commander through functional cells within the main command post (CP).

M-13. An initial (but not all inclusive) list of doctrinal resources available to the staff for large-scale combat operations includes—

- ADP 1-02, *Terms and Military Symbols,* August 2018.
- ADP 3-0, *Operations,* July 2019.
- ADP 3-90, *Offense and Defense,* July 2019.
- ADP 5-0, *The Operations Process,* July 2019.
- ADP 6-0, *Mission Command: Command and Control of Army Forces,* July 2019.
- ADP 6-22. *Army Leadership and the Profession,* July 2019.
- FM 3-0, *Operations,* October 2017.
- FM 3-07, *Stability,* June 2014.
- FM 3-13, *Information Operations,* December 2016.
- FM 3-50, *Army Personnel Recovery,* September 2014.
- FM 3-55, *Information Collection,* May 2013.
- FM 6-0, *Commander and Staff Organization and Operations,* May 2014.
- ATP 2-01.3, *Intelligence Preparation of the Battlefield,* March 2019.
- ATP 5-19, *Risk Management*, April 2014.
- ATP 6-0.5, *Command Post Organization and Operations,* March 2017.
- ATP 6-22.5, *A Leader's Guide to Soldier Health and Fitness,* February 2016.
- Appropriate organization- and echelon-level doctrine includes:
  - FM 3-94, *Theater Army, Corps, and Division Operations,* April 2014.
- At the brigade level, this doctrine includes—

- FM 3-81, *Maneuver Enhancement Brigade,* April 2014.
- FM 3-96, *Brigade Combat Team,* October 2015.
- ATP 3-01.7, *Air Defense Artillery Brigade Techniques,* March 2016.
- ATP 3-09.24, *Techniques for the Fire Brigade,* November 2016.
- ATP 3-96.1, *Security Force Assistance Brigade,* May 2018.
- ATP 4-91, *Army Field Support Brigade,* December 2011.
- ATP 4-93, *Sustainment Brigade,* April 2016.

At the battalion level, this doctrine includes—

- ATP 3-01.64, *Avenger Battalion and Battery Techniques,* March 2016.
- ATP 3-01.85, *Patriot Battalion Techniques,* January 2019.
- ATP 3-09.23, *Field Artillery Cannon Battalion,* September 2015.
- ATP 3-20.96, *Cavalry Squadron,* May 2016.
- ATP 3-21.20, *Infantry Battalion,* December 2017.
- ATP 3-21.21, *SBCT Infantry Battalion,* March 2016.
- ATP 3-90.5, *Combined Arms Battalion,* February 2016.
- ATP 4-90, *Brigade Support Battalion,* June 2020.
- ATP 4-93.1, *Combat Sustainment Support Battalion,* June 2017.

G-1/S-1 Personnel Officer Duties and Responsibilities

M-14. The G-1/S-1 is the principal staff officer for all matters concerning human resources support (military and civilian). The G-1/S-1 also serves as the senior adjutant general officer in the command. Overall responsibilities of the G-1/S-1 include manning the force, providing human resource services, conducting human resource planning and operations, and coordinating personnel support.

M-15. The commander generally needs to know the following from the G-1/S-1:

- Personnel status (PERSTAT).
- Casualties estimate by unit at expected enemy contact locations.
- Status on the delivery of replacements and return-to-duty Soldiers.
- Unit combat power.
- Ability to execute future operations based on present combat strength.
- Duty status of Soldiers.
- Casualty reports.
- Location of the Personnel and Administration Center (PAC).
- Reconstitution plan.
- Deployment status.

M-16. A basic list of doctrinal resources available to the G-1/S-1 includes—

- FM 1-0, *Human Resources Support,* April 2014.
- ATP 1-0.1, *G-1, AG, and S-1 Operations,* March 2015.

G-2/S-2 Intelligence Officer Duties and Responsibilities

M-17. The G-2/S-2 provides the intelligence and counter-intelligence functions for the unit. Success for an intelligence officer depends, in large measure, on the relationship cultivated between them, the commander, and the operations officer.

M-18. The commander generally needs to know the following from the G-2/S-2:

- Assessment of threat forces, capabilities, intentions, and courses of action two levels down and other key capabilities.

- Weather, enemy, terrain, and their effects on operations (***Note.*** While listed as a G-2/S-2 task, this is a staff task accomplished by each section as it applies to them).
- Location of known and templated barriers, obstacles, and minefields.
- Intelligence analysis applied to SPOT reports and other pieces of information discovered.
- Enemy avenues of approach.
- Recommended priority intelligence requirements.
- Command's reconnaissance and surveillance target acquisition assets.
- Information collection plan (in conjunction with the S-3).
- Counterintelligence measures.

M-19. A basic list of doctrinal resources available to the G-2/S-2 includes—

- ATP 2-19.4, *Brigade Combat Team Intelligence Techniques,* February 2015.
- ATP 2-22.4, *Technical Intelligence,* November 2013.
- ATP 2-22.9, *Open-Source Intelligence,* August 2019.
- ATP 2-33.4, *Intelligence Analysis,* January 2020.
- TC 7-100, *Hybrid Threat,* November 2010.

G-3/S-3 Operations Officer Duties and Responsibilities

M-20. The G-3/S-3 operations officer's responsibilities are unique within the coordinating staff. The G-3 (S 3) is the chief of the movement and maneuver warfighting function, primary staff officer for integrating and synchronizing the operation as a whole for the commander, and the principal staff officer for all matters concerning operations and plans. While the COS or XO directs efforts of the entire staff, the operations officer ensures warfighting functions integrate and synchronize across the planning horizons in current operations integration, future operations, and plans integrating cells. Additionally, the operations officer authenticates all plans and orders for the commander to synchronize the warfighting functions in time, space, and purpose in accordance with the commander's intent and planning guidance.

M-21. The commander generally needs to know the following from the G-3/S-3:

- Command resource allocation priorities including time, personnel, supplies, and equipment.
- Proposed task organization and mission responsibilities of subordinate units.
- Proposed tactical maneuver, dispositions, and fire schemes.
- Locations of friendly forces.
- Overview of electromagnetic warfare, military information support operations, operational security, deception activities, civil affairs operations, support area protection measures, and inform and influence activities regarding rules of engagement.
- Overview of airspace considerations.
- Status of unit readiness and combat effectiveness.
- Rehearsal schedules.
- Information collection plan (in conjunction with the G-2/S-2).

M-22. A basic list of doctrinal resources available to the G-3/S-3 includes—

- FM 3-04, *Army Aviation,* April 2020.
- FM 3-90-1. *Offense and Defense, Volume 1,* March 2013.
- FM 3-90-2, *Reconnaissance, Security, and Tactical Enabling Tasks, Volume 2,* March 2013.
- ATP 3-06, *Urban Operations,* December 2017.
- ATP 3-07.5, *Stability Techniques,* August 2012.
- ATP 3-11.50, *Battlefield Obscuration,* May 2014.
- ATP 3-37.2, *Antiterrorism,* June 2014.
- ATP 3-90.8, *Combined Arms Countermobility Operations,* September 2014.
- ATP 3-90.4/MCWP 3-17.8, *Combined Arms Mobility,* March 2016.

G-4/S-4 Logistics Officer Duties and Responsibilities

M-23. The G-4/S-4 is the principal staff officer for sustainment plans and operations, supply, maintenance, transportation, services, and operational contract support. The G-4/S-4 helps the support unit commander maintain logistics visibility with the commander and the rest of the staff. The G-4 has coordinating staff responsibility for the G-1, G-8, transportation officer, and the surgeon.

M-24. The commander generally needs to know the following from the G-4/S-4:

- Key sustainment constraints and limitations.
- Determining expenditure of all classes of supply except class VIII.
- Positioning of assets and units to support operations.
- Organization of trains (echelon versus unit).
- Commodity requirements versus those on hand and available.
- Class VII weapon system loss estimate.
- Equipment recovery and evacuation operations.
- Transportation requirements and routes capabilities.
- Adequacy of command and control facilities for directing sustainment activities.
- Status of slice elements and other elements supported.
- Resupply method of distribution.

Support Operations Officer Duties and Responsibilities

M-25. A support operations officer (SPO), authorized in support commands and battalions, is the principal staff officer for coordinating logistics. The SPO provides technical supervision for the sustainment mission of the support command and is the key interface between the support command and the supported unit.

M-26. The commander generally needs to know the following from the SPO—

- Support requirements versus support assets available.
- Coordination efforts on external support requirements for supported units.
- Support requirements of current and future operations.
- Support operations plans and adjustments needed to meet support requirements.
- Emergent requirements.

M-27. A basic list of doctrinal resources available to the G-4/S-4 and SPO includes—

- ADP 4-0, *Sustainment,* July 2019.
- FM 4-0, *Sustainment Operations,* July 2019.
- FM 4-01, *Army Transportation Operations,* April 2014.
- FM 4-30, *Ordnance Operations,* April 2014.
- ATP 4-02.2, *Medical Evacuation,* July 2019.
- ATP 4-10/MCRP 4-11H/NTTP 4-09.1/AFMAN 10-409-O, *Multi-Service Tactics, Techniques and Procedures for Operational Contract Support,* February 2016.
- ATP 4-11, *Army Motor Transport Operations,* August 2020.
- ATP 4-16, *Movement Control,* April 2013.
- ATP 4-32, *Explosive Ordnance Disposal (EOD) Operations,* September 2013.
- ATP 4-42, *General Supply and Field Services Operations,* July 2014.
- ATP 4-43, *Petroleum Supply Operations,* August 2015.
- ATP 4-44, *Water Support Operations,* October 2015.
- ATP 4-92, *Contracting Support to Unified Land Operations,* October 2014.

G-5/S-5 Plans Officer Duties and Responsibilities

M-28. The G-5/S-5 is the principal staff officer for planning operations for the mid- to long-range planning horizons at the division echelon and higher. In the absence of a G-5 or S-5, the operations officer becomes responsible for the planning effort.

M-29. The commander generally needs to know the following from the G-5/S-5:

- Status of planning.
- Status of current planning efforts.
- Status on plans, orders, branches, and sequels.

M-30. A basic list of doctrinal resources available to the G-5/S-5 includes—

- FM 3-04, *Army Aviation,* April 2020.
- FM 3-90-1, *Offense and Defense, Volume 1,* March 2013.
- FM 3-90-2, *Reconnaissance, Security, and Tactical Enabling Tasks, Volume 2,* March 2013.
- ATP 3-06, *Urban Operations,* December 2017.
- ATP 3-07.5, *Stability Techniques,* August 2012.
- ATP 3-11.50, *Battlefield Obscuration,* May 2014.
- ATP 3-37.2, *Antiterrorism,* June 2014.
- ATP 3-90.4/MCWP 3-17.8, *Combined Arms Mobility,* March 2016.
- ATP 3-90.8, *Combined Arms Countermobility Operations,* September 2014.
- ATP 5-0.1, *Army Design Methodology,* July 2015.

G-6/S-6 Signal Officer Duties and Responsibilities

M-31. The G-6/S-6 is the principal staff officer for all matters concerning network operations (jointly comprising DOD information network operations and applicable portions of defensive cyberspace operations), network transport, information services, and spectrum management operations within a unit's area of operations (AO). When planning a communications system, the commander should be guided by the types and amounts of equipment available. Consider all communications-electronic assets available throughout the command. This includes equipment in signal units in addition to communications-electronic equipment and personnel assigned to the command.

M-32. The commander generally needs to know the following from the G-6/S-6:

- Communications-electronic status.
- Communication resources available.
- Communication support available (mobile subscriber equipment coverage).
- Special additional training requirements.
- Modifications in signal operation instructions.
- Frequency changes and alternate means of communications.
- Anti-jamming plan.
- Retransmission capability.
- Operational communications-electronic dead space and the plan to mitigate it.

M-33. A basic list of doctrinal resources available to the G-6/S-6 includes—

- FM 3-12, *Cyberspace and Electronic Warfare Operations,* April 2017.
- FM 6-02, *Signal Support to Operations,* September 2019.
- ATP 6-02.71, *Techniques for Department of Defense Information Network Operations,* April 2019.
- ATP 6-02.72/MCRP 3-30B.3 [MCRP 3-40.3A]/NTTP 6-02.2/AFTTP 3-2.18, *Multi-Service Tactics, Techniques, and Procedures for Tactical Radios,* May 2017.

G-8/S-8 Financial Management Officer Duties and Responsibilities

M-34. The G-8/S-8 is the principal staff officer for all financial management (resource management and finance operations). In coordination with the financial management center and through the theater sustainment command, the G-8 establishes and implements command finance operations policy. G-8/S-8 are typically found at brigade and higher. In the absence of a G-8 or S-8, the S-4 or XO usually provides financial management to the unit.

M-35. The commander generally needs to know the following from the G-8/S-8:

- Funds available.
- Cost associated with each COA or operation.
- Status of operational financial management tasks.

M-36. A basic list of doctrinal resources available to the G-8/S-8 includes—

- FM 1-06, *Financial Management Operations,* April 2014.
- ATP 1-06.1, *Field Ordering Officer (FOO) and Pay Agent (PA) Operations,* May 2013.
- ATP 1-06.3, *Banking Operations,* January 2015.
- ATP 1-06.4, *Internal Controls,* May 2016.
- ATP 4-92, *Contracting Support to Unified Land Operations,* October 2014.

G-9/S-9 Civil Affairs Officer Duties and Responsibilities

M-37. The G-9/S-9 is the principal staff officer for all matters concerning civil affairs. The G 9/S 9 evaluates civil considerations and prepares the groundwork for transitioning the AO from military to civilian control.

M-38. The commander generally needs to know the following from the G-9/S-9:

- Status, including locations, capabilities, and effects, of other U.S. government agencies, host-nation civil and military authorities, and nongovernmental and international organizations in the AO.
- Status of staff coordination with—
  - G2/S-2 on information gained for civilians in the area of operations.
  - Chief of fires or fire support officer on the restricted target and no-strike list.
  - G-4/S-4 to coordinate facilities, supplies, and other material from the civil sector to support operations.
  - G-6/S-6 on military use of local information systems.
  - Information operations officer to ensure disseminated information is not contradictory.
  - Surgeon on the military use of civilian medical treatment facilities, materials, and supplies.
  - Provost marshal to coordinate and manage support to host-nation personnel recovery center efforts in the AO.
  - Civil-military operations center personnel to maintain liaison with unified action partners, indigenous populations and institutions (IPI), other U.S. government agencies, host-nation civil and military authorities, and non-governmental and international organizations in the AO.
- Status of community relations programs to gain and maintain public understanding and goodwill and to support military operations.
- Civil affairs assets available to include capabilities and limitations.
- Displaced civilian's movement, routes, and assembly areas that support the current COA.
- Status of the IPI ability of care of civilians and provide resources to support military operations.
- Efforts that units, officials (friendly, host-nation civil, or host-nation military), and the population are taking to identify, plan, and implement programs to support civilian populations and strengthen host-nation internal defense and development.

M-39. A basic list of doctrinal resources available to the G-9/S-9 includes—

- FM 3-05, *Special Operations,* January 2014.
- FM 3-57, *Civil Affairs Operations,* April 2019.
- ATP 3-07.5, *Stability Techniques,* August 2012.
- ATP 3-07.6, *Protection of Civilians,* October 2015.
- ATP 3-07.31/MCTP 3-03B/AFTTP 3-2.40, *Multi-Service Tactics, Techniques, and Procedures for Peace Operations,* May 2019.
- ATP 3-57.10, *Civil Affairs Support to Populace and Resources Control,* August 2013.
- ATP 3-57.20/MCRP 3-33.1C, *Multi-Service Techniques for Civil Affairs Support to Foreign Humanitarian Assistance,* February 2013.
- ATP 3-57.30, *Civil Affairs Support to Nation Assistance,* May 2014.
- ATP 3-57.50, *Civil Affairs Civil Information Management,* September 2013.
- ATP 3-57.60, *Civil Affairs Planning,* April 2014.
- ATP 3-57.70, *Civil-Military Operations Center,* May 2014.
- ATP 3-57.80, *Civil-Military Engagement,* October 2013.

Chief of Fires and Fire Support Officer Duties and Responsibilities

M-40. The chief of fires is the principal staff officer for the fires warfighting function at division through theater army. At brigade and below, the fire support officer serves as the staff officer for fires. The chief of fires or fire support officer may have coordinating responsibilities for the air and missile defense officer and the aviation officer.

M-41. The commander generally needs to know the following from the fire support officer:

- Fire support officer targeting capabilities.
- Recommended fire support tasks for mortars and cannons.
- All fire support assets available.
- Ammunition status of fire assets.
- Location and direction of azimuth for radars.
- Weather impacts on fire assets.
- Ability of fire support assets to meet defeat criteria as stated in the commander's attack guidance.
- Nomination and evaluation of high-payoff targets.
- Ammunition pre-stocks availability.

M-42. A basic list of doctrinal resources available to the chief of fire and the fire support officer includes—

- ADP 3-19, *Fires,* July 2019.
- FM 3-09, *Field Artillery Operations and Fire Support,* April 2020.
- ATP 3-01.60, *Counter-rocket, Artillery, and Mortar Operations,* May 2013.
- ATP 3-09.02, *Field Artillery Survey,* February 2016.
- ATP 3-09.12, *Field Artillery Target Acquisition,* July 2015.
- ATP 3-09.13, *The Battlefield Coordination Detachment,* July 2015.
- ATP 3-09.30, *Techniques for Observed Fire,* August 2013.
- ATP 3-09.32/MCRP 3-16.6A/NTTP 3-09.2/AFTTP 3-2.6, *JFIRE Multi-Service TTPs for the Joint Application of Firepower,* October 2019.
- ATP 3-09.42, *Fire Support for the Brigade Combat Team,* March 2016.
- ATP 3-11.50, *Battlefield Obscuration,* May 2014.

Air and Missile Defense Officer Duties and Responsibilities

M-43. The air and missile defense officer coordinates air and missile defense activities and, when necessary, plans with the area air and missile defense commander, joint force air component commander, and airspace control authority. The air and missile defense officer coordinates the planning and use of all joint air and missile defense systems, assets, and operations. A key role of the air and missile defense officer is to assist the commander in developing a critical asset list (CAL) and a defended asset list (DAL)—assets defendable by air and missile defense forces.

M-44. The commander generally needs to know the following from the air and missile defense officer:

- Recommended air defense priorities.
- Number, type, and positioning of air defense artillery weapons defending key assets.
- Air defense artillery task organization.
- Terrain and weather factors and limitations impacting the air defense plan.
- Threat characteristics and tactics impacting the air defense plan.
- Number and types of air defense artillery weapons available to each defense.
- Weapon system requirements, limitations, and characteristics, impacting the air defense plan.
- An effective early warning plan.
- Weapons control status and air defense warning status.
- Operational security plan for air defense artillery assets.

M-45. A basic list of doctrinal resources available to the air and missile defense officer includes—

- FM 3-01.13, *Air Defense Artillery Operational Planning Data (S/NF),* May 2019.
- ATP 3-01.7, *Air Defense Artillery Brigade Techniques,* March 2016.
- ATP 3-01.8, *Techniques for Combined Arms for Air Defense,* July 2016.
- ATP 3-01.15/MCTP 10-10B/NTTP 3-01.8/AFTTP 3-2.31, *Tactics, Techniques, and Procedures for an Integrated Air Defense System,* March 2019.
- ATP 3-01.16, *Air and Missile Defense Intelligence Preparation for the Battlefield (AMD IPB),* March 2016.
- ATP 3-01.50, *Air Defense and Airspace Management (ADAM) Cell Operation,* April 2013.
- ATP 3-01.64, *Avenger Battalion and Battery Techniques,* 3-01.64, March 2016.
- ATP 3-01.85, *Patriot Battalion Techniques,* January 2019.
- ATP 3-01.91, *Terminal High Altitude Defense (THAAD) Techniques,* August 2018.

Aviation Officer Duties And Responsibilities

M-46. The aviation officer is in charge of the aviation cell and plans, coordinates, and incorporates aviation into the ground maneuver commander's scheme of maneuver. The aviation officer focuses on providing employment advice and initial planning for aviation missions, unmanned aerial systems, and airspace planning. The aviation officer also assists in coordination and synchronization with the tactical air control party and the fires cell.

M-47. The commander generally needs to know the following from the aviation officer:

- Employment planning advice for the employment of all manned and unmanned Army Aviation units.
- Status of aviation assets in support of the unit.

M-48. A basic list of doctrinal resources available to the aviation officer includes—

- FM 1-564, *Shipboard Operations,* June 1997 (Obsolete).
- FM 3-04, *Army Aviation,* April 2020.
- FM 3-52, *Airspace Control,* October 2016.
- FM 3-98, *Reconnaissance, Security, and Tactical Enabling Tasks,* July 2015.
- AR 95-1, *Flight Regulations,* March 2018.
- AR 95-2, *Air Traffic Control, Airfield/Heliport and Airspace Operations,* March 2016.

Engineer Duties and Responsibilities.

M-49. The unit engineer officer provides the commander with the technical skills and equipment needed to execute the mobility, counter-mobility, and survivability requirements of the command.

M-50. The commander generally needs to know the following from the engineer officer:

- Engineer priorities of work.
- Obstacle emplacement status.
- Barrier material status.
- Countermobility capabilities.
- Blade hours available.
- Plan for use of assets (such as equipment, class IV items, and platoons).
- Plan for tracking engineer work (such as obstacle emplacement and survivability positions).

M-51. A basic list of doctrinal resources available to the engineer officer includes—

- FM 3-34, *Engineer Operations,* April 2014.
- ATP 3-34.22, *Engineer Operations—Brigade Combat Team and Below,* December 2014.
- ATP 3-34.23, *Engineer Operations—Echelons Above Brigade Combat Team,* June 2015.
- ATP 3-34.40, *General Engineering,* February 2015.
- ATP 3-34.81, *Engineer Reconnaissance,* March 2016.
- ATP 3-37.34, *Survivability Operations,* April 2018.
- ATP 3-90.4/MCWP 3-17.8, *Combined Arms Mobility,* March 2016.
- ATP 3-90.8, *Combined Arms Countermobility Operations,* September 2014.

Chemical, Biological, Radiological, and Nuclear Officer Duties and Responsibilities

M-52. The chemical, biological, radiological, and nuclear (CBRN) officer is responsible for CBRN operations, obscuration operations, and CBRN asset use.

M-53. The commander generally needs to know the following from the CBRN officer:

- Threat's plan for CBRN activities.
- Monitoring teams' readiness.
- Potential downwind vapor hazards.
- Recommendations on employment missions of attached CBRNE assets, if applicable.
- Decontamination (to include priorities) and smoke operations plans.
- Templated chemical strikes location.
- The use and impact of threat smoke operations.

M-54. A basic list of doctrinal resources available to the chemical officer includes—

- FM 3-11, *Chemical, Biological, Radiological, and Nuclear Operations,* May 2019.
- ATP 3-11.32/MCWP 10-10E.8/NTTP 3-11.37/AFTTP 3-2.46, *Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Passive Defense,* May 2016.
- ATP 3-11.36/MCRP 10-10E.1/NTTP 3-11.34/AFTTP 3-2.70, *Tactics, Techniques, and Procedure*s for Chemical, Biological, Radiological, and Nuclear Planning, September 2018.
- ATP 3-11.37/MCWP 3-37.4/NTTP 3-11.29/AFTTP 3-2.44, *Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Reconnaissance and Surveillance,* March 2013.
- ATP 3-11.41/MCRP 3-37.2C/NTTP 3-11.24/AFTTP 3-2.37, *Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Consequence Management Operations,* July 2015.
- ATP 3-11.50, *Battlefield Obscuration,* May 2014.

Provost Marshal Duties and Responsibilities

M-55. The provost marshal plans, coordinates, and employs all organic, assigned, or attached military police assets.

M-56. The commander generally needs to know the following from the Provost Marshal:

- Priorities for limited assets and recommendations to mitigate risks.
- Detainee estimates and status
- Police intelligence assessments.
- Analysis of criminal and hybrid threats.
- Plan for the protection of high-risk personnel and facilities.
- Preparation for the employment of lethal and nonlethal military police capabilities.
- Anticipated requirements and capabilities.
- Products and services developed on force protection and the rule of law.

M-57. A basic list of doctrinal resources available to the engineer and chemical officer includes—

- ADP 3-37, *Protection,* July 2019.
- FM 3-39, *Military Police Operations,* April 2019.
- ATP 3-07.6, *Protection of Civilians,* October 2015.
- ATP 3-37.2, *Antiterrorism,* June 2014.

Chaplain Duties and Responsibilities

M-58. The chaplain serves as a personal staff officer and provides religious support to all assigned and attached service members, family members, and authorized civilians. Provides religious, moral, and ethical advisement to the command as it impacts both individuals and organizational missions. Coordinates with higher, subordinate, and adjacent chaplain sections and unit ministry teams for denominational coverage requirements.

M-59. The commander generally needs to know the following from the chaplain:

- Religious support plan.
- Issues dealing with ethics, morals, and morale as affected by religion.
- Impact of local religious groups and sites on planned military operations.
- Location of the unit ministry teams and chaplain sections.
- Any special religious accommodation requests from Soldiers.
- Any humanitarian issues arising from indigenous groups.
- How to access additional religious support assets, as required.

M-60. A basic list of doctrinal resources available to the chaplain includes—

- ADP 4-0, *Sustainment,* July 2019.
- FM 1-05, *Religious Support,* January 2019.
- ATP 1-05.01, *Religious Support and the Operations Process*, July 2018.
- ATP 1-05.02, *Religious Support to Funerals and Memorial Events,* November 2018.
- ATP 1-05.03, *Religious Support and External Advisement,* January 2019.
- ATP 1-05.04, *Religious Support and Internal Advisement,* March 2017.
- ATP 1-05.5, *Religious Support and Casualty Care,* August 2019.

Staff Judge Advocate General Duties and Responsibilities

M-61. The staff judge advocate is the senior legal advisor in the command and the primary legal advisor to the commander. The staff judge advocate provides complete legal support encompassing the six core legal disciplines-military justice, international and operational law, administrative and civil law, contract and fiscal law, claims, and legal assistance.

M-62. The commander generally needs to know the following from the staff judge advocate:

- Legal advice and support across the core legal disciplines.
- Legal advice and support in decisive action.
- Legal advice and support in military justice, administrative separations, command policies, and other issues related to the good order and discipline within the command.
- Administration of military justice for the command for the general court-martial convening authority.
- Legal assistance services (including Soldier readiness processing) for the command consistent with all applicable laws, regulations, rules of professional responsibility, and requirements of the command's mission.
- Ethics counseling for the commander.

M-63. A basic list of doctrinal resources available to the staff judge advocate includes—

- AR 27-1, *Judge Advocate Legal Services,* January 2017.
- FM 1-04, *Legal Support to Operations,* June 2020.
- FM 6-27/MCTP 11-10C, *The Commander's Handbook on the Law of Land Warfare,* August 2019.
- *Manual for Courts-Martial United States,* 2019 edition.

Command Surgeon Duties and Responsibilities

M-64. The surgeon coordinates health assets and operations within the command. This officer provides and oversees medical care to Soldiers, civilians, and enemy prisoners of war. Battalion and higher echelon units are authorized a surgeon.

M-65. The commander generally needs to know the following from the command surgeon:

- Assessment of the health of the command.
- Medical workload requirements (patient estimates).
- Status of casualties in the Army health system.
- Eligibility for medical care in a U.S. Army military treatment facility has been determined, in conjunction with the staff judge advocate and the chain of command.
- Recommended medical evacuation (MEDEVAC) policies and procedures.
- Monitored medical regulating and patient tracking operations.
- Recommended disposition instructions for captured enemy medical supplies and equipment.
- Emergency medical and preventive medicine measures.
- Location and capabilities of unit and higher medical services.

M-66. A basic list of doctrinal resources available to the command surgeon includes—

- FM 4-02, *Army Health System,* August 2013.
- ATP 4-02.1, *Army Medical Logistics,* October 2015.
- ATP 4-02.2, *Medical Evacuation,* July 2019.
- ATP 4-02.3, *Army Health System Support to Maneuver Forces,* June 2014.
- ATP 4-02.5, *Casualty Care,* May 2013.
- ATP 4-02.8, *Force Health Protection,* March 2016.

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Appendix N

Environmental Considerations

This appendix covers three unique environments—desert, mountain, and cold weather. Base chapters of this publication assume a temperate climate. By modifying base planning factors with the following considerations, units can be successful in these three unique environments.

DESERT OPERATIONS

N-1. Information in this section is derived from ATP 3-90.97, ATP 3-34.5, FM 90-3, and DODI 4715.05.

N-2. Desert climate characteristics include dusty, rugged landscapes with temperatures varying from extreme highs to freezing (with potential swings of 70 degrees Fahrenheit between day and night) and visibility between 30 miles to 30 feet at any given location. These climates are also characteristically arid, with little or no viable sources of water. Winds, flash flooding, a higher probability of detection due to dust from moving vehicles, and a lack of available concealment (for light and acoustic signatures), and other environmental concerns present risks to Soldiers, equipment, and operations.

N-3. Moreover, most desert terrain presents challenges, and commanders must adapt their operations to accommodate these variables. Protection of lines of communication and water supply are vital. Common desert terrain includes sand dunes, escarpments, wadis, and depressions. Aerial reconnaissance is a valuable tool in identifying these and other desert geographic features in order to plan operations.

N-4. Drivers must be well trained in judging desert terrain so they can select the best method of overcoming the varying conditions they encounter. Desert terrain varies from nearly flat, with high trafficability, to lava beds and salt marshes with little or no trafficability. Techniques for driving and operating equipment in desert conditions are contained in Appendix C of FM 90-3.

N-5. Soldiers in the desert must be trained to navigate in extreme conditions with few landmarks, with loss of communications, and in isolation. Map reading and land navigation are vital skills that Soldiers should refresh often. The lack of identifiable terrain features and other landmarks increases the risk of fratricide, so commanders must synchronize tactical movements. Targeting is also more complex without discernable target reference points.

N-6. Employing obstacles, both natural and artificial, can reduce avenues of approach. Some desert areas contain wadis or other natural terrain features that serve as obstacles. Other areas require artificial obstacles such as minefields. A minefield, to be of any tactical value in the desert, must usually cover a relatively large area. This requires mechanical means and engineer support. Because too many avenues of approach often exist to cover with mines, they are usually best employed—especially at night—to cover gaps between units.

N-7. Air operations can be adversely affected by heat and dust present in desert environments. The effects of the environment on both flight and weapon systems increases the need for maintenance and replacement systems. However, visibility and the capability of massing fires from a distance when targets are established is generally enhanced in desert conditions, making air attacks a valuable asset to the force.

N-8. The desert offers excellent fields of fire; therefore, leaders should site tanks and heavy antitank weapons to take advantage of their long range and accuracy. Firing first and accurately are the most important considerations in desert operations.

N-9. Refraction due to extreme heat can cause weapon systems and manual targeting errors. When a crew is missing targets under these conditions, the cause is refraction and not crew error or loss of boresight due to improper procedures. Units and crews must be trained to adjust for refraction.

N-10. Health risks to personnel in the desert environment include dehydration, accumulated heat exhaustion leading to heat stroke, and hypothermia from extreme temperature variations between day and night. Leaders must plan ways, including increased water consumption, to bring body temperatures down during daytime rest periods. Table G-24 on page 281 shows standard water planning factors related to personnel (gal/person/day) for a variety of theaters. Air flow and proper cooling during rest periods requires elevation (such as cots), ventilation, and air conditioning (when available). Adjusting work-rest cycles in coordination with expected temperatures and avoiding sunburn and windburn reduces heat stress. Monitoring Soldiers and ensuring they are afforded opportunities to stay warm and dry as the mission allows helps reduce the occurrence of hypothermia.

N-11. Other health risks to individuals and units include wildlife, plants, and poorly maintained water supplies. Personnel attract wildlife that may breed in equipment; these can reach swarm numbers when left unchecked. Diseases common to the desert and related to these risks include plague, typhus, malaria, dengue fever, dysentery, cholera, and typhoid. Medical and veterinary services plan how to manage wildlife risks.

N-12. General maintenance tips for desert operations follow:

- Check track tension daily.
- Check drive belt adjustment frequently.
- Lubricate suspension items daily, and clean grease fittings.
- Reduce sand ingestion by stretching nylon stockings over air cleaners.
- Emphasize proper engine cooldown and shutdown procedures, especially diesel engines.
- Prepare all vehicles for desert operations in accordance with the appropriate TMs.
- Adjust battery specific gravity to the environment (refer to TMs).
- Set voltage regulators at the lower end of specifications.
- Start vehicles regularly to prevent battery discharge.
- Increase stocks of oils and lubricants.
- Use high-grade 20W-50 oil, which performs well under desert conditions.
- Compensate for increased pressure due to severe heat in closed pressurized systems.
- Check lubrication orders and technical manuals for the correct viscosity of lubricants at higher temperatures.
- Keep lubrication to the absolute minimum on exposed or semi-exposed moving parts, including working weapons parts.
- Erect screens against blowing sand in maintenance areas.
- Cover the gap between the fuel nozzle and the fuel tank filler neck opening during refueling operations.
- Protect exposed electrical cables and wires with electrical tape.
- Issue small paintbrushes to all personnel for weapons cleaning and other equipment maintenance.
- Keep optics covered. Clean them with a soft paintbrush or a low-pressure air system (this works well for weapons also).
- Clean sand and dirt from hulls of armored vehicles.
- Check tire pressures and fuel levels at the midpoint of the temperature range for the day.
- Ground all refueling equipment to prevent static discharge
- Replenish radiators with potable water whenever possible.
- Determine battery shortages early and requisition early.
- Drain fuel lines at night and in the morning due to condensation collecting in the lines.
- Increase prescribed load lists (PLL) for the following parts due to high failure rates in desert environments:
  - Tires.
  - All track components.
  - All suspension components for both wheel and track vehicles.

  - Brake shoes.
  - Bearings and bushings.
  - Plastic and rubber parts, including seals.
  - All filters.
  - Generator components.
- Deploy with extra plastic bags to cover weapons and protect other equipment during maintenance or when not in use.
- Bring muzzle plugs.

MOUNTAIN OPERATIONS

N-13. Information in this section is derived from ATP 3-90.97, TC 3-97.61, and AR 70-38.

N-14. Regardless of their appearance, rugged terrain is common among all types of mountains. Mountains may have isolated peaks, rounded crests, eroded ridges, gorges, high plains cut by valleys, and deep ravines. High rocky crags with glaciated peaks and year-round snow cover exist in mountain ranges at most latitudes in the western portion of the Americas and in Asia. Different types of rock and varied slopes present varied hazards (see TC 3-97.61 for a discussion on rock types and hazards, route classifications, and climbing condition estimates).

N-15. Mountain weather can be extremely erratic. It varies from stormy winds to calm, and from extreme cold to warmth within a short time or with a minor shift in locality. The severity and variance of the weather causes it to have a major impact on military operations.

N-16. Mountains are commonly classified according to elevation, which is the height of the immediate terrain in reference to sea level. Descriptors from the conditions for joint tasks follow:

- Very high—greater than 3,048 meters (10,000 feet).
- High—1,829 to 3,048 meters (6,000 to 10,000 feet).
- Moderately high—914 to 1,829 meters (3,000 to 6,000 feet).
- Moderately low—305 to 914 meters (1,000 to 3,000 feet).
- Low—152 to 305 meters (500 to 1000 feet).
- Very low—less than 152 meters (500 feet).

MANEUVERING IN MOUNTAINOUS REGIONS

N-17. Mountainous regions can severely degrade maneuverability due to snow, ice, terrain features, grades, and damage caused by frequent snowfall and weather. During weather events, fog, and cloudy conditions may limit visibility—up to white out conditions—posing threats and presenting opportunities for concealed movement. The area that stationary forces may be able to cover effectively may decrease due to obstructed fields of fire. Cover and concealment for dismounted and mounted forces are typically prevalent in mountainous regions below the timberline and unexpected above the timberline. Tables N-1 through N-3 on pages 365–366 detail some planning factors for maneuverability in mountainous regions.

Table N-1. Mountainous terrain levels

ATP 3-90.97

Level	*Description*
I	Bottoms of valleys and main LOC
II	Ridges, slopes, and passes that overlook valleys
III	Dominant terrain of the summit region

Table N-2. Mountainous terrain maneuverability

ATP 3-90.97

Class	*Terrain*	*Mobility requirements*	*Skill level required*
1	Gentler slopes/trails	Walking techniques	Unskilled (with some assistance) and basic mountaineers
2	Steep/rugged terrain	Some use of hands	
3	Easy climbing	Fixed ropes where exposed	Basic mountaineers (with assistance from assault climbers)
4	Steep/exposed climbing	Fixed ropes required	
5	Near vertical	Technical climbing required	Assault climbers

Table N-3. Altitude effects

ATP 3-90.97

Altitude	*Approximate elevation*	*Effects of acute altitude exposure*
Low	Sea Level–1,200 m (4,000 ft)	None
Moderate	1,200–2,400 m (4,000–7,870 ft)	Mild altitude illness and decreased performance may occur
High	2,400–4,000 m (7,870–13,125 ft)	Altitude illness and performance decrements are more common and greater
Very High	4,000–5,500 m (13,125–18,000 ft)	Altitude illness and decreased performance is the rule
Extreme	5,500 m (18,000 ft) and higher	With acclimatization, humans can function for short periods of time

N-18. Impacts and risks of mountainous regions include—

- Concealment of movements due to fog, clouds, foliage, ravines, and rock.
- Obstacles to movement.
- Severely hindered sustainment resupply by vehicle.
- Avalanches.
- Temperature swings can fatigue Soldiers and pose risks to their health.
- Wind damage and wind chill.
- Equipment damage due to rugged terrain, rock slides, heavy snow, wind, and falls.
- Personnel injury and death due to falls, rockslides, avalanches, exposure, and prolonged injury.
- Altitude sickness.
- Difficulty in evacuation.
- The need for extended planning time, reconnaissance, and preparation before conducting operations.
- Multiple avenues of approach and cover/concealment present advantages to an attacker.
- Difficult terrain presents an advantage to the defense.
- Retrograde and recovery operations are difficult in mountainous terrain.
- Increased risk of vehicle rollovers.

CASUALTY EVACUATION IN MOUNTAINOUS REGIONS

N-19. Casualty evacuation (CASEVAC) in the mountains is resource-intensive in manpower, equipment, and time. If possible, planned routes should identify casualty collection points accessible to multiple transportation assets. Units consider how they will move casualties when vehicles or aircraft are not available due to terrain and weather restrictions. Personnel should be trained in rough terrain evacuation techniques prior to deployment, to include raising, lowering, and using nonstandard platforms. Leaders plan

and rehearse contingencies for mounted, dismounted, and aviation evacuations. Realistic time/distance analysis is conducted to ensure proper allocation of assets and to maximize casualty survivability. Units consider pushing medical assets to lower echelons to reduce CASEVAC requirements.

COLD WEATHER OPERATIONS

N-20. Information in this section is derived from ATP 3-90.97, TC 3-97.61, and AR 70-38.

N-21. For military purposes, cold regions are any region where cold temperatures, unique terrain, and snowfall have a significant effect on military operations for one month or more each year. About one quarter of the earth's land mass may be designated as severely cold. These areas vary in topography from mountain caps, boreal forests, tundra, icecaps, muskeg or bog, permafrost, glaciers, and freezing rivers.

N-22. In the arctic region, conditions resemble a desert environment with respect to observation and fields of fire. Generally, the terrain is open with little high vegetation and allows for unrestricted visibility, although complex terrain still exists. Boreal forests of the subarctic are the exception with dense growth and cover dominating the landscape.

N-23. Operational considerations follow:

- Operational delays due to storms or extreme cold.
- Changes to mobility corridors, avenues of approach, and trafficability due to freezes or thaws.
- Antenna icing can reduce range, increase noise, alter frequency, or simply collapse the antenna.
- Radar signal scattering due to ice, fog, and airborne snow.
- Thickened oil and lubricants, which can cause mechanical problems in generators and vehicles.
- Decreased battery life and performance.
- Significantly degraded visibility due to snow and fog.
- Avalanches, due to instability of the snowpack, threaten troops and hinder mobility.
- Wind chill factors and potential human problems due to frostbite and trench foot (also known as immersion foot).

N-24. Risks of operating in extreme cold environments include frostbite, fatigue, concomitant injury, malnutrition, hypothermia, trench foot, respiratory illnesses, and degraded maneuvering. Table N-4 details wind chill effects on relative temperature.

Table N-4. Wind chill effects

	Actual thermometer reading in degrees Fahrenheit											
Estimated wind speed (mph)	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent temperature in degrees Fahrenheit											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-21	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-89	-100	-116	-132	-148
Winds greater than 40 mph have little additional effect on wind chill but pose additional risks to equipment and personnel.	Little danger to properly clothed personnel.			Increased danger for freezing of exposed flesh. Increased danger of windburn, breathing difficulty, and lung damage. Increased fatigue and difficulty performing tasks.				Maximum danger of freezing and death. Maximum danger of exhaustion, dehydration, frostbite, respiratory illness, and inability to perform rudimentary and basic functions.				

SUPPLY CONTROL IN EXTREME ENVIRONMENTS

N-25. Tables N-5 and N-6 are derived from FM 90-3 and ATP 3-90.97. Table N-5 on pages 368–371 describes supply considerations in extreme environments, and table N-6 on page 371 lists common items requiring additional stock levels in extreme environments.

Table N-5. Supply considerations in extreme environments

Class	*Environment*	*Requirements*
CL I	***Desert and arid environments***	Class (CL) I rations are typically perishable and need to be rotated more frequently during operations in hot weather arid environments. Plan and contract for refrigerated containers or other refrigeration capability. This provision increases the short ton requirements per day for all kinds of operations. Bottled water needs rotation and protection from outside environments in both hot and cold environments. Bottled water consumption and purification requirements increase in arid and hot environments. Water treatment and inspection is required in greater quantities in environments where diseases and bacteria flourish
	Mountain	Mountainous operations increase consumption of CL I because the caloric requirements of operating in these environments is high. The cold weather ration contains menu bags that contain 1,540 calories each. At high altitudes with extreme cold, an individual consumes three menu bags per day. Water requirements for production, resupply, storage, and consumption are often the most significant logistical challenge to extended mountain operations. Leaders should enforce an increase in water consumption for two days prior to an operation. When operating at altitude, it may be difficult to carry enough water to sustain a unit for more than a day.
	Cold weather-specific	Units must be cognizant of thawing requirements for food stuffs in cold environments. Transportation of some commodities such as bottled and bulk water may require some additional care, insulation packing (weight), and damage control during cold weather operations. Temperature variations between extreme cold and hot liquids can also pose a risk to Soldiers during preparation and consumption.
CL II	***Desert and arid environments***	Desert environments require additional protective gear such as balaclavas, goggles and replacements, replacement boots, and inserts damaged by sand.
	Mountain	Operations in rugged mountainous terrain require the frequent replacement of clothing and other materials such as tentage. Complete planning to issue and replace mountain boots well before deployment.
	Cold weather-specific	Cold weather environments require additional clothing and tentage requirements to include heating capabilities. All requirements increase the need for resupply of damaged equipment. Plan for additional cold weather-specific clothing issue and resupply to prevent cold weather injuries. Some cold weather environments require specialized equipment detailed in ATP 3-90.97.
CL III (P) and CL III (B)	***Desert and arid environments***	Air and all fluids expand and contract according to temperature. Fuel tanks filled to the brim at night, overflow by mid-day. Use filters when refueling any type of vehicle and cover the gap between the nozzle and the fuel tank filler pipe. It takes comparatively little dirt to block a fuel line. Fuel filters require more frequent cleaning. Check and replace fuel filters often. Condensation can affect such items as optics, fuel lines, and air tanks. Drain fuel lines both at night and in the morning (whenever necessary). Establish a ground (metal circuit) between fuel tankers and vehicles before and during refueling. The great distances a unit must travel to outflank enemy positions require significant amounts of fuel and complicate resupply.

Table N-5. Supply considerations in extreme environments *(continued)*

Class	*Environment*	*Considerations*
CL III (P) and CL III (B)	***Mountain***	Mountain operations challenge the use, storage, and distribution of fuel. Ground operations increase fuel consumption rates of individual vehicles by 30–40 percent due to elevation climb, requiring more fuel filtering and distribution. Terrain factors such as unimproved roads, mud, snow, and slush can add to fuel consumption. As vehicles ascend, the amount of oxygen available is reduced and the engine efficiency drops. On average, vehicles lose 20–25 percent of their rated carrying capacity; however, overall fuel consumption for the unit decreases because of lower vehicle movement. Heavy reliance on aviation assets for resupply and movement increases aviation fuel requirements.
	Cold weather-specific	Cold weather operations require increased testing, recirculation, equipment maintenance, and fuel usage due to extended equipment operation requirements. In the extreme cold weather environment, fuel is the single point of failure in the whole operation. Depending on temperature, adding icing inhibitors to fuel may be necessary. When operating in the cold, anticipate increased petroleum-oil-lubricant needs. Fuel consumption can rise as much as 25 percent for vehicles operating in deep snow, slush or mud. This is in addition to increased fuel usage from elevation increases. Expect increased consumption due to longer warm-up times. Diesel fuel reaches its freezing point and begins to gel at around 15° Fahrenheit, whereas, jet fuel has a much lower freezing point of around -51° Fahrenheit. Fuel additives are available to decrease the possibility of fuel gelling. Although fuels do not completely freeze, they keep the same temperature as the air. To prevent frostbite, fuel handlers must always wear gloves designed for handling petroleum products when working with fuels.
CL IV	***Desert and arid environments***	Barriers and other construction in desert environments almost exclusively need to be fabricated. There is little natural, permanent barrier material. Engineer assets should precede other forces whenever possible. Soldiers often improvise construction in the absence of engineer assets or materials (see FM 90-3, chapter 3, for some techniques).
	Mountain	Depending on the nature of the environment (soft or hard ground) and the engagement level, the need for CL IV is highly variable. CL IV likely needs to be delivered by air and planning should include unit pre-packaged deliveries.
	Cold weather-specific	Cold weather conditions affect the ability to construct fighting positions due to hardness of the ground and permafrost. Units should carry additional CL IV to construct above-ground fighting positions to compensate.
CL V	***Desert and arid environments***	Ammunition must be out of direct heat and sunlight. Units use containers in the early stages of operations to store and distribute ammunition. Follow-on forces establish more permanent structures to protect ammunition. Ammunition safe enough to be held by bare hands is safe to fire. White phosphorous ammunition filler tends to liquefy at temperatures over 111 degrees Fahrenheit, which causes unstable flight unless projectiles are stored in an upright position.
	Mountain	Ammunition resupply is difficult and increases the need to enforce strict fire control and discipline. Field artillery emplaced by helicopter normally requires continued airlift for subsequent displacement and ammunition resupply. Ammunition consumption for direct fire weapons may be low; however, consumption of indirect fire munitions, such as grenades, mortars, and artillery, may be high because of dead space.

Table N-5. Supply considerations in extreme environments *(continued)*

Class	*Environment*	*Considerations*
CL V	***Cold weather-specific***	Expect an increase in requirements for aerial rockets and tactical air support due to the limited mobility of ground artillery. Consider multiple cache or resupply via helicopter for forward units. Mines often fail to explode when stepped on or when driven over by heavy equipment. The slower burning rates for propellants may reduce the maximum effective ranges for artillery by as much as a kilometer. Initial rounds fired from cold tubes also have reduced range. Due to the dampening effect of deep snow or mud, impact bursts of artillery and mortars are less effective (by as much as 80 percent). Use of a variable time fuse can help overcome this; however, a potential increase in fuse failure exists at 0 degrees Fahrenheit, in heavy rain, and in snow. Phosphorus shells produce obscurant; however, they can contaminate the area of impact with particles. Extreme cold decreases muzzle velocity and hence the accuracy of tank ammunition.
CL VI	***Desert and arid environments***	The demand for Class VI supplies, especially beverages, is high. They are not, however, essential, and, if transportation is limited, they are given a low priority—especially if refrigeration space is in short supply. Sundries packs can also be used.
	Mountain	See cold weather.
	Cold weather-specific	An increased need for health and comfort packages may be present during mountainous operations. Plan in advance for specific items needed for the environment.
CL VII	***Desert and arid environments***	The demand for Class VII supplies depends greatly on maneuver and the intensity of the operation. The only variation that can be forecast is for refrigeration equipment, which depends on casualty estimates.
	Mountain	Resupply of battle-damaged major end items is a significant challenge in mountain operations. Movement of deadline equipment clogs narrow supply routes. Forward-based units that stay lean may not be able to stock many spare end items. When equipment is destroyed or damaged beyond repair, the only course of action (COA) is redistribution.
	Cold weather-specific	Cold weather increases demand for power generators, heaters, and rough terrain loaders with snow removal capability. The demand for other clearing vehicles and attachments for snow removal also increases.
CL VIII	***Desert and arid environments***	Heat can damage some CL VIII supplies and cause reduction in the shelf life of others. Care should be taken when transporting CL VIII supplies into theater to maintain temperature variables.
	Mountain	See cold weather.
	Cold weather-specific	High consumption rates for medical supplies should be anticipated. Move CL VIII supplies by air whenever possible. Normally medical items require heated transportation since they are particularly susceptible to damage from freezing. Some items that are particularly vulnerable to cold are— • Oxygen or compressed air tanks. • Surgical sinks. • X-ray machines. • Combat lifesaver bag contents. • Medications, intravenous solutions, and, especially, whole blood.

Table N-5. Supply considerations in extreme environments *(continued)*

Class	*Environment*	*Considerations*
CL IX	***Any extreme climate***	Extreme climates increase the likelihood of damage to parts, vehicles, and equipment. Overuse of air conditioning, idling, and operating in rugged, dusty, and arid terrain increases the malfunction rates of certain types of parts. Table N-6 lists common CL IX items needing additional stockage when in extreme environments.

Table N-6. Common items needing additional stock levels in extreme environments

Tires	Tracks	Clothing replacements
Fan belts	Sprockets	Tentage repair parts or kits
Bushings	Track pins	Weapons parts
Fender replacements	Radiator and cooling systems	Air, oil, and fuel filters
Suspension parts	Batteries	Fuel lines
Transmission parts	Exposed radio parts	Bearings
Antenna systems	Lubrication fittings	

MAINTENANCE AND RECOVERY IN EXTREME ENVIRONMENTS

N-26. Leaders increase maintenance cycles during operations in extreme climates and consider increasing the numbers of maintenance personnel attached to operational units to counter environmental impacts. Planners must use local and most recent estimates to plan for additional prescribed load list and authorized stockage list items to accommodate maintenance requirements. Table N-7 details some effects of environmental factors on maintenance operations.

Table N-7. Environmental effects on maintenance operations

Desert operations	Severe terrain can greatly affect suspension and transmission systems, especially those of wheeled vehicles. Heat. Vehicle cooling and lubrication systems are interdependent. A malfunction by one rapidly places the other under severe strain. All types of engines may overheat to some degree, leading to excessive wear and, ultimately, to leaking oil seals in the power packs.
Cold weather operations	Maintenance personnel operating within enclosed spaces need to ensure they have adequate ventilation from CO_2 gases. At temperatures below -20°F, expect task requirements to increase by 5 times. Warming requirements for some lubricants increase the footprint and time for completion of some tasks.
Mountain operations	Terrain may disperse support units over a wide area. Increased distances lead to increased evacuation response times. Fix as far forward as possible. Rugged terrain causes repair parts consumption to increase. Typical high-consumption repair parts include tires, tie rods, transmissions, brake shoes, tracks and pads, final drives and winch parts. Use helicopters or fixed wing aircraft to deliver critical repair parts and technical experts.

ENVIRONMENTAL IMPACTS

N-27. Military operations can negatively affect the environment. Environmental risks (sometimes unavoidable) of military operations include risks to health or future land use; introduction of hazardous materials; and depletion of, or pollution of, resources such as water or water delivery systems. Commanders are obligated to consider the risks of their actions on the environment against the threat posed by enemy forces and actors. They are further obligated to avoid large-scale, permanent, or long-term damage to the environment whenever possible. Various legal frameworks such as status of forces agreements, DODI 4715.05, final governing standards, federal policies, and service regulations guide commanders when planning activities and operations.

N-28. Some environmental impact considerations follow:

- Release of poisons, oils, lubricants, or other wastes onto the land or into the water may make an area unusable, nonarable, or unlivable.
- Burning of materials may cause short- and long-term sickness in the local population and in Soldiers.
- Placement of mines and potential for future removal.
- Excessive urban destruction may prolong suffering of residents.
- Destruction of farmland, livestock, or other resources may impact future livelihood of host-nation residents.
- Retrograde operations often release or leave behind hazardous materials such as metal, oil, lubricants, debris, plastic, and other hazardous waste.
- Destruction of religious and culturally significant sites may cause long-term political problems within the host nation and towards the U.S. and its Allies.
- Hospital and medical sites must consider medical and infectious waste removal.
- Areas particularly vulnerable for long term damage degradation are—
  - Areas in direct combat.
  - Areas of consolidated operations: bases, base camps, support areas, static command posts (CPs), water treatment sites, forward arming and refueling points, retrograde processing sites, medical treatment sites, urban areas, and farmlands.

N-29. The following laws and regulations are source documents that provide guidelines for properly handling and disposing of hazardous waste: AR 200-1, 29 CFR 1910, 40 CFR 260–273, 49 CFR 100–199, DODM 4160.21 Vol. 4, MCO P5090.2A, TB MED 593, TM 3-34.56, COCOM regulations and policies, and local laws and policies.

N-30. Medical considerations for terrain and environmental conditions is covered in ATP 4-02.3 and ATP 4-02.5.

Appendix O

Distribution D Resources

Appendix O provides Distribution D figures and factors for brigade organization; engineer; fires; military; and chemical, biological, radiological, and nuclear planning (see page 421 of ATP 5-0.2, Volume II: Appendix O [ATP 5-0.2-2] for these resources).

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Glossary

The glossary lists acronyms and terms with Army or joint definitions. Where Army and joint definitions differ, (Army) precedes the definition.

SECTION I – ACRONYMS AND ABBREVIATIONS

AA	assembly area
AAFES	Army Air Force Exchange Service
AAP	allied administrative publication
AAR	after action review
ADA	air defense artillery
ADM	Army design methodology
ADP	Army doctrine publication
AFMAN	Air Force manual
AFTTP	Air Force tactics, techniques, and procedures
AGM	attack guidance matrix
AI	area of influence
AO	area of operations
AOI	area of interest
APS	Army prepositioned stocks
AR	Army regulation
ASB	aviation support battalion
ASCOPE	areas, structures, capabilities, organizations, people, and events
ASL	authorized stockage list
ATHP	ammunition transfer holding point
ATP	Army techniques publication
AXP	ambulance exchange point
BAO	brigade ammunition officer
BCT	brigade combat team
BDA	battle damage assessment
BDAR	battle damage assessment and repair
BHL	battle handover line
BSA	brigade support area
BSB	brigade support battalion
C2	command and control
CAL	critical asset list
CAR	combined arms rehearsal
CASCOM	Combined Arms Support Command

CASEVAC	casualty evacuation
CBRN	chemical, biological, radiological, and nuclear
CCIR	commander's critical information requirement
CDS	container delivery system
CFL	coordinated fire line
CGSC	Command and General Staff College
CL	class
COA	course of action
COFM	correlation of forces and means
COP	common operational picture
COS	chief of staff
CP	command post
CPOF	command post of the future
CSSB	combat sustainment support battalion
D3A	decide, detect, deliver, and assess
DA	Department of the Army
DAL	defended asset list
DART	Downed Aircraft Recovery Team
DNBI	disease and non-battle injury
DO	decisive operation
DOCMAT	doctrine matrix
DP	decision point
DSCA	defense support of civil authorities
DSM	decision support matrix
DST	decision support template
DTAC	Department of Tactics
EA	engagement area
EEFI	essential element of friendly information
ESC	expeditionary sustainment command
EXCHECK	execution checklist
EXMAT	execution matrix
EXORD	execute order
FARP	forward arming and refueling point
FFIR	friendly force information requirement
FLOT	forward line of troops
FM	field manual
FRAGORD	fragmentary order
FSC	forward support company
FSCL	fire support coordination line
FSO/FSE	fire support officer/fire support element
FSR	first strike ration

FULLCOM	NATO full command
GTA	graphic training aid
GUC	ground unit commander
HEMTT	heavy expanded mobility tactical truck
HHC	headquarters and headquarters company
HPT	high-payoff target
HPTL	high-payoff target list
HVT	high-value target
IC	information collection
IPB	intelligence preparation of the battlefield
IR	information requirement
ISOPREP	isolated personnel report
JFARP	jump forward arming and refueling point
JP	joint publication
JPADS	joint precision airdrop system
JRSOI	joint reception, staging, onward movement, and integration
km	kilometer
LNO	liaison
LOA	limit of advance
LOC	line of communication
LOE	line of effort
LOGPAC	logistics package
LSCO	large-scale combat operations
LTIOV	latest time information is of value
MACP	mortuary affairs collection point
MAGTF	Marine air-ground task force
MCAS	medical company (area support)
MCO	Marine Corps order
MCOO	modified combined obstacle overlay
MCRP	Marine Corps reference publication
MCTP	Marine Corps tactical publication
MCWP	Marine Corps warfighting publication
MDMP	military decision-making process
MEDCOE	Army Medical Center of Excellence
MEDEVAC	medical evacuation
MEDLOG	medical logistics
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, and civil considerations [mission variables]
MOE	measure of effectiveness
MOP	measure of performance
MRE	meal ready to eat
MSTP	Marine Air-Ground Task Force Staff Training Program

MTF	medical treatment facility
MTOE	modified table of organization and equipment
MWR	morale, welfare, and recreation
NAI	named area of interest
NATO	North Atlantic Treaty Organization
NCOIC	noncommissioned officer in charge
NTTP	Navy tactics, techniques, and procedures
OAKOC	observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment [military aspects of terrain]
OCONUS	outside the continental United States
OE	operational environment
OIC	officer in charge
ONS	operational needs statement
OP	observation post
OPCOM	NATO operational command
OPCON	NATO operational control
OPLAN	operation plan
OPLOG	operational logistics
OPORD	operation order
OPSEC	operations security
ORSA	operations research and systems analysis
PAC	Personnel and Adminstration Center
PCC	precombat check
PCI	precombat inspection
PERSTAT	personnel status
PIR	priority intelligence requirement
PLL	prescribed load list
PLS	palletized load system
PMESII-PT	political, military, economic, social, information, infrastructure, physical environment, and time
POD	port of debarkation
POL	petroleum, oils, and lubricants
PR	personnel recovery
RDSP	rapid decision-making and synchronization process
RFL	restrictive fire line
RIP	relief in place
ROC	rehearsal of concept
ROE	rules of engagement
ROM	refuel on the move
RP	release point
SB	sustainment brigade
SITEMP	situation template

SLCR	shower, laundry, and clothing repair
SO	shaping operation
SOFA	status of forces agreement
SOP	standard operating procedure
SP	start point
SPO	support operations officer
SRP	Soldier readiness processing
SSA	supply support activity
TACOM	NATO tactical command
TACON	NATO tactical control
TAMIS	total ammunition information system
TAI	target area of interest
TC	training circular
TCCC	tactical combat casualty care
TPE	theater provided equipment
TPFDD	timed-phase force and deployment data
TRM	tank rack module
TSC	theater sustainment command
TTP	tactics, techniques, and procedures
UAS	unmanned aircraft system
UBL	unit basic load
UGR	unitized group ration
UMCP	unit maintenance collection point
WALK	warrior aid and litter kit
WARNORD	warning order
XO	executive officer

SECTION II – TERMS

air assault

The movement of friendly assault forces by rotary-wing or tiltrotor aircraft to engage and destroy enemy forces or to seize and hold key terrain. (JP 3-18)

air assault operations

An operation in which assault forces, using the mobility of rotary-wing or tiltrotor aircraft and the total integration of available fires, maneuver under the control of a ground or air maneuver commander to engage enemy forces or to seize and hold key terrain. (JP 3-18)

ambush

An attack by fire or other destructive means from concealed positions on a moving or temporarily halted enemy. (FM 3-90-1)

anticipation

The ability to foresee events and requirements and initiate necessary actions that most appropriately satisfy a response without waiting for operations orders or fragmentary orders. (ADP 4-0)

area defense

A type of defensive operation that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright. (ADP 3-90)

area of influence

A geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control. (JP 3-0)

area of interest

An area of concern to the commander, including the area of influence, areas adjacent thereto, and extending into enemy territory. (JP 3-0)

area of operations

An operational area defined by a commander for land and maritime forces that should be large enough to accomplish their missions and protect their forces. Also called AO. (JP 3-0)

area reconnaissance

A type of reconnaissance operation that focuses on obtaining detailed information about the terrain or enemy activity within a prescribed area. (ADP 3-90)

area security

A type of security operation conducted to protect friendly forces, lines of communications, and activities within a specific area. (ADP 3-90)

Army design methodology

A methodology for applying critical and creative thinking to understand, visualize, and describe problems and approaches to solving them. (ADP 5-0)

Army personnel recovery

The military efforts taken to prepare for and execute the recovery and reintegration of isolated personnel. (FM 3-50)

assault position

A covered and concealed position short of the objective from which final preparations are made to assault the objective. (ADP 3-90)

assembly area

An area a unit occupies to prepare for an operation. (FM 3-90-1)

assessment

The determination of the progress toward accomplishing a task, creating a condition, or achieving an objective. (JP 3-0)

assumption

A specific supposition of the operational environment that is assumed to be true, in the absence of positive proof, essential for the continuation of planning. (JP 5-0)

attack

A type of offensive operation that destroys or defeats enemy forces, seizes and secures terrain, or both. (ADP 3-90)

attack by fire

A tactical mission task in which a commander uses direct fires, supported by indirect fires, to engage an enemy force without closing with the enemy to destroy, suppress, fix, or deceive that enemy. (FM 3-90-1)

attack position

The last position an attacking force occupies or passes through before crossing the line of departure. (ADP 3-90)

backbrief

A briefing by subordinates to the commander to review how subordinates intend to accomplish their mission. (FM 6-0)

battle damage assessment

The estimate of damage composed of physical and functional damage assessment, as well as target system assessment, resulting from the application of lethal or nonlethal military force. (JP 3-0)

battle rhythm

A deliberate daily cycle of command, staff, and unit activities intended to synchronize current and future operations. (FM 6-0)

be-prepared mission

A mission assigned to a unit that might be executed. (FM 6-0)

begin morning nautical twilight

The start of that period where, in good conditions and in the absence of other illumination, the sun is 12 degrees below the eastern horizon and enough light is available to identify the general outlines of ground objects and conduct limited military operations. Also called BMNT. (JP 3-09.3)

block

A tactical mission task that denies the enemy access to an area or prevents the enemy's advance in a direction or along an avenue of approach. Block is also an obstacle effect that integrates fire planning and obstacle efforts to stop an attacker along a specific avenue of approach or prevent the attacking force from passing through an engagement area. (FM 3-90-1)

breach

A tactical mission task in which the unit employs all available means to break through or establish a passage through an enemy defense, obstacle, minefield, or fortification. (FM 3-90-1)

breakout

An operation conducted by an encircled force to regain freedom of movement or contact with friendly units. (ADP 3-90)

bridgehead

An area on the enemy side of the linear obstacle that is large enough to accommodate the majority of the crossing force, has adequate terrain to permit defense of the crossing sites, provides security of crossing forces from enemy direct fire, and provides a base for continuing the attack. (ATP 3-90.4)

bridgehead force

A force that assaults across a gap to secure the enemy side (the bridgehead) to allow the buildup and passage of a breakout force during gap crossing. (ATP 3-90.4)

bypass

A tactical mission task in which the commander directs the unit to maneuver around an obstacle, position, or enemy force to maintain the momentum of the operation while deliberately avoiding combat with an enemy force. (FM 3-90-1)

call forward area

In gap crossing, the final preparation waiting area within the crossing area. (ATP 3-90.4)

canalize

A tactical mission task in which the commander restricts enemy movement to a narrow zone by exploiting terrain coupled with the use of obstacles, fires, or friendly maneuver. (FM 3-90-1)

casualty evacuation

Nonmedical units use this to refer to the movement of casualties aboard nonmedical vehicles or aircraft without en route medical care. (FM 4-02)

C-day

The unnamed day on which a deployment operation commences or is to commence. (JP 5-0)

clear

A tactical mission task that requires the commander to remove all enemy forces and eliminate organized resistance within an assigned area. (FM 3-90-1)

close area

The portion of the commander's area of operations Where the majority of subordinate maneuver forces conduct close combat. (ADP 3-0)

collaborative planning

Two or more echlons planning together in real time, sharing information, perceptions, and ideas to develop their respective plans simultaneously. (ADP 5-0)

combat power

The total means of destructive, constructive, and information capabilities that a military unit or formation can apply at a given time. (ADP 3-0)

command

The authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment. (JP 1)

commander's intent

A clear and concise expression of the purpose of the operation and the desired military end state that supports mission command, provides focus to the staff, and helps subordinate and supporting commanders act to achieve the commander's desired results without further orders, even when the operation does not unfold as planned. (JP 3-0)

commander's visualization

The mental process of developing situational understanding , determining desired end state, and envisioning an operational approach by which the force will achieve that end state. (ADP 5-0)

commander's critical information requirement

An information requirement identified by the commander as being critical to facilitating timely decision making. (JP 3-0)

common operational picture

A display of relevant information within a commander's area of interest tailored to the user's requirements and based on common data and information shared by more than one command. (ADP 6-0)

confirmation brief

A brief subordinate leaders give to the higher commander immediately after the operation order is given to confirm understanding. (ADP 5-0)

continuity of care

Attempt to maintain the role of care during movement between roles at least equal to the role of care at the originating role.

consolidation area

The portion of the land commander's area of operations that may be designated to facilitate freedom of action, consolidate gains through decisive action, and set conditions to transition the area of operations to follow on forces or other legitimate authorities. (ADP 3-0)

constraint

A restriction placed on the command by a higher command. A constraint dictates an action or inaction, thus restricting the freedom of action of a subordinate commander. (FM 6-0)

contain

A tactical mission task that requires the commander to stop, hold, or surround enemy forces or to cause them to center their activity on a given front and prevent them from withdrawing any part of their forces for use elsewhere. (FM 3-90-1)

continuity

The uninterrupted provision of sustainment across all levels of war.

control

A tactical mission task that requires the commander to maintain physical influence over a specified area to prevent its use by an enemy or to create conditions necessary for successful friendly operations. (FM 3-90-1)

cordon and search

A technique of conducting a movement to contact that involves isolating a target area and searching suspected locations within that target area to capture or destroy possible enemy forces and contraband (FM 3-90-1)

counterattack

Attack by part or all of a defending force against an enemy attacking force, for such specific purposes as regaining ground lost, or cutting off or destroying enemy advance units, and with the general objective of denying to the enemy the attainment of the enemy's purpose in attacking. In sustained defensive operations, it is undertaken to restore the battle position and is directed at limited objectives. (ADP 1-02)

counterreconnaissance

A tactical mission task that encompasses all measures taken by a commander to counter enemy reconnaissance and surveillance efforts. Counterreconnaissance is not a distinct mission, but a component of all forms of security operations. (FM 3-90-1)

cover

A type of security operation done independent of the main body to protect them by fighting to gain time while preventing enemy ground observation of and direct fire against the main body. (ADP 3-90)

covert crossing

A planned crossing of an inland water obstacle or other gap that is intended to be undetected. (ATP 3-90.4)

cueing

The integration of one or more types of reconnaissance or surveillance systems to provide information that directs follow-on collection of more detailed information by another system. (FM 3-90-2)

D-day

The unnamed day on which a particular operation commences or is to commence. (JP 3-02)

decision point

A point in space and time when the commander or staff anticipates making a key decision concerning a specific course of action. (JP 5-0)

decision support matrix

A written record of a war-gamed course of action that describes decision points and associated actions at those decision points. (ADP 5-0)

decision support template

A combined intelligence and operations graphic based on the results of wargaming that depicts decision points, timelines associated with movement of forces and the flow of the operation, and other key items of information required to execute a specific friendly course of action. (JP 2-01.3)

decisive operation

The operation that directly accomplishes the mission. (ADP 3-0)

deep area

Where the commander sets conditions for future success in close combat. (ADP 3-0)

defeat

To render a force incapable of achieving its objectives. (FM 3-90-1)

defense support of civil authorities

Support provided by U.S. Federal military forces, Department of Defense civilians, Department of Defense contract personnel, Department of Defense component assets, and National Guard forces (when the Secretary of Defense, in coordination with the Governors of the affected States, elects and requests to use those forces in title 32, U.S.C., status) in response to requests for assistance from civil authorities for domestic emergencies, law enforcement support, and other domestic activities, or from qualifying entities for special events. (DODD 3025.18)

defensive operation

An operation to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations. (ADP 3-0)

delay

When a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on enemy forces without becoming decisively engaged. (ADP 3-90)

deliberate crossing

The crossing of an inland water obstacle or other gap that requires extensive planning and detailed preparations. (ATP 3-90.4)

demonstration

In military deception, a show of force similar to a feint without actual contact with the adversary, in an area where a decision is not sought that is made to deceive an adversary. (JP 3-13.4)

deployment

The movement of forces into and out of an operational area. (JP 3-35)

destroy

A tactical mission task that physically renders an enemy force combat-ineffective until it is reconstituted. Alternatively, to destroy a combat system is to damage it so badly that it cannot perform any function or be restored to a usable condition without being entirely rebuilt. (FM 3-90-1)

direct support

A support relationship requiring a force to support another specific force and authorizing it to answer directly to the supported force's request for assistance. (FM 3-0)

directed energy

An umbrella term covering technologies that relate to the production of a beam of concentrated electromagnetic energy or atomic or subatomic particles. Also called DE. (JP 3-85)

disengage

A tactical mission task where a commander has the unit break contact with the enemy to allow the conduct of another mission or to avoid decisive engagement. (FM 3-90-1)

disrupt

1. A tactical mission task in which a commander integrates direct and indirect fires, terrain, and obstacles to upset an enemy's formation or tempo, interrupt the enemy's timetable, or cause enemy forces to commit prematurely or attack in a piecemeal fashion. 2. An obstacle effect that focuses fire planning and obstacle effort to cause the enemy force to break up its formation and tempo, interrupt its timetable, commit breaching assets prematurely, and attack in a piecemeal effort. (FM 3-90-1)

distribution

The operational process of synchronizing all elements of the logistic system to deliver the "right things" to the "right place" at the "right time" to support the geographic combatant commander. (JP 4-0)

distribution system

That complex of facilities, installations, methods, and procedures designed to receive, store, maintain, distribute, and control the flow of military materiel between the point of receipt into the military system and the point of issue to using activities and units. (JP 4-09)

economy

Providing sustainment resources in an efficient manner that enables the commander to employ all assets to the greatest effect possible. (ADP 4-0)

E-day

The day landing force personnel, supplies, and equipment begin to embark aboard amphibious warfare or commercial ships. (JP 3-02)

effect

1. The physical or behavioral state of a system that results from an action, a set of actions, or another effect. 2. The result, outcome, or consequence of an action. 3. A change to a condition, behavior, or degree of freedom. (JP 3-0)

electromagnetic attack

Division of electromagnetic warfare involving the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of fires. (JP 3-85)

electronic intelligence

Technical and geolocation intelligence derived from foreign noncommunications electromagnetic radiations emanating from other than nuclear detonations or radioactive sources. Also called ELINT. (JP 3-85)

electromagnetic protection

Division of electromagnetic warfare involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy use of the electromagnetic spectrum that degrade, neutralize, or destroy friendly combat capability. Also called EP. (JP 3-85)

electromagnetic reconnaissance

The detection, location, identification, and evaluation of foreign electromagnetic radiations. (JP 3-85)

electromagnetic warfare

Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Also called EW. (JP 3-85)

electromagnetic security

The protection resulting from all measures designed to deny unauthorized persons information of value that might be derived from their interception and study of non-communications electromagnetic radiations (e.g., radar). (JP 3-85)

end of evening nautical twilight

The point in time when the sun has dropped 12 degrees below the western horizon, and is the instant of last available daylight for the visual control of limited military operations. Also called EENT. (JP 2-01.3)

engagement area

An area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems. (ADP 3-90)

engagement criteria

Protocols that specify those circumstances for initiating engagement with an enemy force. (FM 3-90-1)

engineer regulating point

Checkpoint to ensure that vehicles do not exceed the capacity of the crossing means and to give drivers final instructions on site-specific procedures and information, such as speed and vehicle interval. (ATP 3-90.4)

essential element of friendly information

A critical aspect of a friendly operation that, if known by a threat would subsequently compromise, lead to failure, or limit the success of the operation and therefore should be protected from enemy detection. (ADP 6-0)

essential task

A specified or implied task that must be executed to accomplish the mission. (FM 6-0)

event template

A guide for collection planning that depicts the named areas of interest where activity, or its lack of activity, will indicate which course of action the adversary has adopted. (JP 2-01.3)

execution

The act of putting a plan into action by applying combat power to accomplish the mission and adjusting operations based on changes in the situation. (ADP 5-0)

execution matrix

A visual representation of subordinate tasks in relationship to each other over time. (ADP 5-0)

exfiltrate

A tactical mission task where a commander removes Soldiers or units from areas under enemy control by stealth, deception, surprise, or clandestine means. (FM 3-90-1)

exploitation

A type of offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth. (ADP 3-90)

feint

In military deception, an offensive action involving contact with the adversary conducted for the purpose of deceiving the adversary as to the location and/or time of the actual main offensive action. (JP 3-13.4)

field maintenance

On system maintenance, repair and return to the user including maintenance actions performed by operators. (FM 4-30)

fix

A tactical mission task where a commander prevents the enemy force from moving any part of that force from a specific location for a specific period. Fix is also an obstacle effect that focuses fire planning and obstacle effort to slow an attacker's movement within a specified area, normally an engagement area. (FM 3-90-1)

follow and assume

A tactical mission task in which a second committed force follows a force conducting an offensive task and is prepared to continue the mission if the lead force is fixed, attrited, or unable to continue. (FM 3-90-1)

follow and support

A tactical mission task in which a committed force follows and supports a lead force conducting an offensive task. (FM 3-90-1)

forward arming and refueling point

A temporary facility, organized, equipped, and deployed to provide fuel and ammunition necessary for the employment of aviation maneuver units in combat. Also called FARP. (JP 3-09.3)

forward passage of lines

Occurs when a unit passes through another unit's positions while moving toward the enemy. (ADP 3-90)

friendly force information requirement

Information the commander and staff need to understand the status of friendly force and supporting capabilities. Also called FFIR. (JP 3-0)

G-day

The day on which an order is or is due to be given to deploy a unit. (AAP-06)

guard

A type of security operation done to protect the main body by fighting to gain time while preventing enemy ground observation of and direct fire against the main body. (ADP 3-90)

hasty crossing

The crossing of an inland water obstacle or other gap using the crossing means at hand or those readily available, and made without pausing for elaborate preparations. (ATP 3-90.4)

H-hour

1. The specific hour on D-day at which a particular operation commences. (JP 5-0) 2. In amphibious operations, the time the first landing craft or amphibious vehicle of the waterborne wave lands or is scheduled to land on the beach and, in some cases, the commencement of countermine breaching operations. (JP 3-02)

high-payoff target list

A prioritized list of high-payoff targets by phase of the operation. (FM 3-09)

high-value target

A target the enemy commander requires for the successful completion of the mission. Also called HVT. (JP 3-60)

implied task

A task that must be performed to accomplish a specified task or mission but is not stated in the higher headquarters' order. (FM 6-0)

improvisation

The ability to adapt sustainment operations to unexpected situations or circumstances affecting a mission. (ADP 4-0)

indicator

In the context of assessment, a specific piece of information that infers the condition, state, or existence of something, and provides a reliable means to ascertain performance or effectiveness. (JP 5-0)

infiltration

A form of maneuver in which an attacking force conducts undetected movement through or into an area occupied by enemy forces to occupy a position of advantage behind those enemy positions while exposing only small elements to enemy defensive fires. (FM 3-90-1)

information collection

An activity that synchronizes and integrates the planning and employment of sensors and assets as well as the processing, exploitation, and dissemination systems in direct support of current and future operations. (FM 3-55)

information requirements

In intelligence usage, those items of information regarding the adversary and other relevant aspects of the operational environment that need to be collected and processed in order to meet the intelligence requirements of a commander. Also called IR. (JP 2-0)

integration

Combining all of the sustainment elements within operations assuring unity of command and effort. (ADP 4-0)

intelligence

1. The product resulting from the collection, processing, integration, evaluation, analysis, and interpretation of available information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations. 2. The activities that result in the product. 3. The organizations engaged in such activities. (JP 2-0)

intelligence preparation of the battlefield

The systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. (ATP 2-01.3)

interdict

A tactical mission task where the commander prevents, disrupts, or delays the enemy's use of an area or route. (FM 3-90-1)

in-transit visibility

The ability to track the identity, status, and location of Department of Defense units, and non-unit cargo (excluding bulk petroleum, oils, and lubricants) and passengers; patients; and personal property from origin to consignee or destination across the range of military operations. Also called ITV. (JP 4-01.2)

isolate

To separate a force from its sources of support in order to reduce its effectiveness and increase its vulnerability to defeat. (ADP 3-0)

joint logistics over-the-shore operations

Operations in which Navy and Army logistics over-the-shore forces conduct logistics over-the-shore operations together under a joint force commander. (JP 4-01.6)

L-hour

1. The specific hour on C-day at which a deployment operation commences or is to commence. (JP 5-0) 2. In amphibious operations, the time at which the first helicopter or tiltrotor aircraft of the airborne ship-to-shore movement wave touches down or is scheduled to touch down in a landing zone. (JP 3-02)

linkup

A meeting of friendly ground forces, which occurs in a variety of circumstances. (ADP 3-90)

local security

The low-level security activities conducted near a unit to prevent surprise by the enemy. (ADP 3-90)

logistics

Planning and executing the movement and support of forces. It includes those aspects of military operations that deal with: design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; acquisition or construction, maintenance, operation, and disposition of facilities; and acquisition or furnishing of services. (ADP 4-0)

logistics over-the-shore operations

The loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas dependent on threat force capabilities. Also called LOTS operations. (JP 4-01.6)

logistics package

A grouping of multiple classes of supply and supply vehicles under the control of a single convoy commander. (FM 3-90-1)

main body

The principal part of a tactical command or formation. It does not include detached elements of the command, such as advance guards, flank guards, and covering forces. (ADP 3-90)

measure of effectiveness

An indicator used to measure a current system state, with change indicated by comparing multiple observations over time. Also called MOE. (JP 5-0)

measure of performance

An indicator used to measure a friendly action that is tied to measuring task accomplishment. Also called MOP. (JP 5-0)

meeting engagement

A combat action that occurs when a moving force, incompletely deployed for battle, engages an enemy at an unexpected time and place. (ADP 3-90)

military decision-making process

An iterative planning methodology to understand the situation and mission, develop a course of action, and produce an operation plan or order. (ADP 5-0)

mission statement

A short sentence or paragraph that describes the organization's essential task(s), purpose, and action containing the elements of who, what, when, where, and why. (JP 5-0)

mixing

Using two or more different assets to collect against the same intelligence requirement. (FM 3-90-2)

mobile defense

A type of defensive operation that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force. (ADP 3-90)

modified combined obstacle overlay

A joint intelligence preparation of the operational environment product used to portray the militarily significant aspects of the operational environment, such as obstacles restricting military movement, key geography, and military objectives. (JP 2-01.3)

motor transportation

A ground support transportation function that includes moving and transferring units, personnel, equipment and supplies by vehicle to support the operations. (ATP 4-11)

movement to contact

A type of offensive operation designed to develop the situation and to establish or regain contact. (ADP 3-90)

named area of interest

A geospatial area or systems node or link against which information that will satisfy a specific information requirement can be collected, usually to capture indications of adversary courses of action. Also called NAI. (JP 2-01.3)

neutralize

A tactical mission task that results in rendering enemy personnel or materiel incapable of interfering with a particular operation. (FM 3-90-1)

occupy

A tactical mission task that involves moving a friendly force into an area so that it can control that area. Both the force's movement to and occupation of the area occur without enemy opposition. (FM 3-90-1)

offensive operation

An operation to defeat or destroy enemy forces and gain control of terrain, resources, and population centers. (ADP 3-0)

on-order mission

A mission to be executed at an unspecified time. (FM 6-0)

parallel planning

Two or more echelons planning for the same operations nearly simultaneously facilitated by the use of warning orders by the higher headquarters. (ADP 5-0)

penetration

A form of maneuver in which an attacking force seeks to rupture enemy defenses on a narrow front to disrupt the defensive system. (FM 3-90-1)

phase

A planning and execution tool used to divide an operation in duration or activity. (ADP 3-0)

planning

The art and science of understanding a situation, envisioning a desired future, and determining effective ways to bring that future about. (ADP 5-0)

preparation

Those activities performed by units and Soldiers to improve their ability to execute an operation. (ADP 5-0)

priority intelligence requirement

An intelligence requirement that the commander and staff need to understand the threat and other aspects of the operational environment. Also called PIR. (JP 2-01)

pursuit

A type of offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it. (ADP 3-90)

quartering party

A group of unit representatives dispatched to a probable new site of operations in advance of the main body to secure, reconnoiter, and organize an area before th' main body's arrival and occupation. (FM 3-90-2)

rearward passage of lines

Occurs when a unit passes through another unit's positions while moving away from the enemy. (ADP 3-90)

recovery

Actions taken to extricate damaged or disabled equipment for return to friendly control or repair at another location. (JP 3-34)

reconnaissance

A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. Also called RECON. (JP 2-0)

reconnaissance in force

A type of reconnaissance operation designed to discover or tes' the enemy's strength, dispositions, and reactions or to obtain other information. (ADP 3-90)

reconnaissance objective

A terrain feature, geographic area, enemy force, adversary, or other mission or operational variable about which the commander wants to obtain additional information. (ADP 3-90)

redeployment

The transfer of forces and materiel to home and/or demobilization stations for reintegration and/or out-processing. (ATP 3-35)

reduce

A tactical mission task that involves the destruction of an encircled or bypassed enemy force. (FM 3-90-1)

redundancy

Using two or more like assets to collect against the same intelligence requirement. (FM 3-90-2)

rehearsal

A session in which the commander and staff or unit practices expected actions to improve performance during execution. (ADP 5-0)

relief in place

An operation in which, by direction of higher authority, all or part of a unit is replaced in an area by the incoming unit and the responsibilities of the replaced elements for the mission and the assigned zone of operations are transferred to the incoming unit. (JP 3-07.3)

responsiveness

The ability to react to changing requirements and respond to meet the needs to maintain support. (ADP 4-0)

retain

A tactical mission task in which the commander ensures that a terrain feature controlled by a friendly force remains free of enemy occupation or use. (FM 3-90-1)

retirement

When a force out of contact moves away from the enemy. (ADP 3-90)

retrograde

A type of defensive operation that involves organized movement away from the enemy. (ADP 3-90)

retrograde of materiel

An Army logistics function of returning materiel from the owning or using unit back through the distribution system to the source of supply, directed ship-to location, or point of disposal. (ATP 4-0.1)

risk management

The process to identify, assess, and control risks and make decisions that balance risk cost with mission benefits. (JP 3-0)

route reconnaissance

A type of reconnaissance operation to obtain detailed information of a specified route and all terrain from which the enemy could influence movement along that route. (ADP 3-90)

rules of engagement

Directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered. (JP 3-84)

screen

A type of security operation that primarily provides early warning to the protected force. (ADP 3-90)

sea state

A scale that categorizes the force of progressively higher seas by wave height. (JP 4-01.6)

secure

A tactical mission task that involves preventing a unit, facility, or geographical location from being damaged or destroyed as a result of enemy action. (FM 3-90-1)

security operations

Those operations performed by commanders to provide early and accurate warning of enemy operations, to provide the forces being protected with time and maneuver space within which to react to the enemy, and to develop the situation to allow commanders to effectively use their protected forces. (ADP 3-90)

seize

A tactical mission task that involves taking possession of a designated area by using overwhelming force. (FM 3-90-1)

shaping operation

An operation at any echelon that creates and preserves conditions for success of the decisive operation through effects on the enemy, other actors, and the terrain. (ADP 3-0)

short ton

Equivalent of 2,000 pounds (0.907 metric ton) of weight. (ATP 4-35)

simplicity

Relates to processes and procedures to minimize the complexity of sustainment. (ADP 4-0)

situation template

A depiction of assumed adversary dispositions, based on that adversary's preferred method of operations and the impact of the operational environment if the adversary should adopt a particular course of action. (JP 2-01.3)

situational understanding

The product of applying analysis and judgment to relevant information to determine the relationships among the operational and mission variables (ADP 5-0).

special reconnaissance

Reconnaissance and surveillance actions conducted as a special operation in hostile, denied, or diplomatically and/or politically sensitive environments to collect or verify information of strategic or operational significance, employing military capabilities not normally found in conventional forces. Also called SR. (JP 3-05)

specified task

A task specifically assigned to a unit by its higher headquarters. (FM 6-0)

stability operation

An operation conducted outside the United States in coordination with other instruments of national power to establish or maintain a secure environment and provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief. (ADP 3-0)

stability mechanism

The primary method through which friendly forces affect civilians in order to attain conditions that support establishing a lasting, stable peace. (ADP 3-0)

support area

The portion of the commander's area of operations that is designated to facilitate the positioning, employment, and protection of base sustainment assets required to sustain, enable, and control operations. (ADP 3-0)

support by fire

A tactical mission task in which a maneuver force moves to a position where it can engage the enemy by direct fire in support of another maneuvering force. (FM 3-90-1)

suppress

A tactical mission task that results in the temporary degradation of the performance of a force or weapon system below the level needed to accomplish its mission. (FM 3-90-1)

surveillance

The systematic observation of aerospace, cyberspace, surface, or subsurface areas, places, persons, or things by visual, aural, electronic, photographic, or other means. (JP 3-0)

survivability

All aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. (JP 3-34)

sustainment maintenance

Off-system component repair and/or end item repair and return to the supply system or by exception to the owning unit, performed by national level maintenance providers. (FM 4-30)

sustainment preparation of the operational environment

The analysis to determine infrastructure, physical environment, and resources in the operational environment that will optimize or adversely impact friendly forces means for supporting and sustaining the commander's operations plan. (ADP 4-0)

tactical assembly area

An area that is generally out of the reach of light artillery and the location where units make final preparations (pre-combat checks and inspections) and rest, prior to moving to the line of departure. (JP 3-35)

tactical mission task

The specific activity performed by a unit while executing a form of tactical operation or form of maneuver. It may be expressed in terms of either actions by a friendly force or effects on an enemy force. (FM 3-90-1)

tailgate medical support

An economy of force device employed primarily to retain maximum mobility during movement halts or to avoid the time and effort required to set up a formal, operational treatment facility (for example, during rapid advance and retrograde operations). (FM 4-02)

task

A clearly defined action or activity specifically assigned to an individual or organization that must be done as it is imposed by an appropriate authority. (JP 1)

tempo

The relative speed and rhythm of military operations over time with respect to the enemy. (ADP 3-0)

target

An entity or object that performs a function for the threat considered for possible engagement or other action. (JP 3-60)

targeting

The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (JP 3-0)

task

A clearly defined action or activity specifically assigned to an individual or organization that must be done as it is imposed by an appropriate authority. (JP 1)

tempo

The relative speed and rhythm of military operations over time with respect to the enemy. (ADP 3-0)

terrain management

The process of allocating terrain by establishing areas of operations, designating assembly areas, and specifying locations for units and activities to deconflict activities that might interfere with each other. (ADP 3-90)

thermal crossover

The natural phenomenon that normally occurs twice daily when temperature conditions are such that there is a loss of contrast between two adjacent objects on infrared imagery. (JP 3-09.3)

throughput distribution

A method of distribution which bypasses one or more intermediate supply echelons in the supply system to avoid multiple handling. (ATP 4-11)

transportation

A logistics function that includes movement control and associated activities to incorporate military, commercial, and multinational motor, rail, air, and water mode assets in the movement of units, personnel, equipment, and supplies in support the concept of operations. (ADP 1-02)

turn

1. A tactical mission task that involves forcing an enemy element from one avenue of approach or mobility corridor to another. 2. A tactical obstacle effect that integrates fire planning and obstacle effort to divert an enemy formation from one avenue of approach to an adjacent avenue of approach or into an engagement area. (FM 3-90-1)

withdraw

To disengage from an enemy force and move in a direction away from the enemy (ADP 3-90).

working group

A grouping of predetermined staff representatives who meet to provide analysis, coordinate, and provide recommendations for a particular purpose or function. (FM 6-0)

zone reconnaissance

A type of reconnaissance operation that involves a directed effort to obtain detailed information on all routes, obstacles, terrain, and enemy forces within a zone defined by boundaries. (ADP 3-90)

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