

C2 Support for Force Fires



MAGTF Staff Training Program
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C2 Support for Force Fires

This pamphlet supports the academic curricula of the Marine Air Ground
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FOREWORD

1. **PURPOSE.** To instruct Marine air-ground task force (MAGTF) commanders and staff officers in the use of current and soon-to-be-fielded command and control (C2) equipment and technology for planning, executing, and assessing fires at the MAGTF level.

2. **SCOPE.** This pamphlet is germane to the Marine expeditionary force (MEF) and Marine expeditionary brigade (MEB) and will use the MEF as a model. This pamphlet will focus on the functions, tasks, and processes associated with MAGTF fires and, in particular, the MEF force fires coordination center (FFCC). It will discuss how the C2 support structure facilitates the management of information in pursuit of understanding and timely decisions and actions by the commander and his staff. It will also address the capabilities, limitations, and products of C2 equipment and technology, and how the MAGTF staff officer can utilize these capabilities and products in the performance of his duties.

While the major subordinate commands (MSCs) are inextricably linked to MAGTF fires, this pamphlet will reference their involvement only to the extent that they either receive or request support through these C2 systems.

3. **SUPERSESSION.** None.

4. **CHANGES.** Recommendations for improvements to this pamphlet are encouraged from commands as well as from individuals. The attached User Suggestion Form can be reproduced and forwarded to:

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5. CERTIFICATION. Reviewed and approved this date.

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Throughout this pamphlet, masculine nouns and pronouns are used for the sake of simplicity. Except where otherwise noted, these nouns and pronouns apply to either sex.

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Part I

Force Fires and C2 Support

1001. Force Fires

The MAGTF commander conducts fires—along with the other warfighting functions—to achieve a decision or to shape the battlespace to set conditions for decisive action. These “force” fires are the MEF and MEB commanders’ primary means of conducting deep operations and influencing the close battle. While doctrine for the conduct of force fires is still emerging, this pamphlet explains how the MAGTF commander uses C2 support organizations, systems, and procedures to command and control force fires. A key element in the command and control of force fires is the FFCC.

1002. Force Fires Coordination Center

The FFCC is responsible to the MAGTF commander for planning, executing, and assessing lethal and nonlethal fires throughout the MAGTF’s battlespace.

The FFCC became a part of the MEF table of organization as a result of Desert Shield/Storm lessons learned and the 1991 Force Structure Planning Group. As yet, there is no doctrine that establishes the functions and tasks associated with the FFCC. Consequently, this pamphlet is based on the experiences of all the MEF FFCCs as reflected in various standing operating procedures (SOPs) and joint and Service doctrine at the corps (Army) and division level.

a. Division of Labor

The FFCC traditionally fights the “deep and rear” and monitors and supports the ground combat element (GCE) in the close battle. Taking this

concept one step further, the FFCC monitors and supports any subordinate command or agency which has been assigned a portion of the MAGTF's battlespace and a corresponding mission, while retaining the responsibility for the conduct of fires in areas outside subordinate areas of operations (AOs).

b. Event-Driven versus Time-Driven Processes

The FFCC is the interface between event and time driven processes. For example, the Marine Corps Planning Process (MCP) is event driven, while air tasking orders (ATOs) are time dominant processes requiring daily inputs with hard deadlines. The FFCC must maintain the proper perspective between the two competitive processes. On one hand, target nominations need to be submitted on time to make the ATO. On the other hand the value of the targets nominated is usually a result of the time invested in detailed planning which may not reflect the ATO production schedule.

c. As a Command and Control System

Per the generic system depicted in Marine Corps Doctrinal Publication (MCDP) 6, *Command and Control*, the FFCC is a complete C2 system. It contains the requisite parts—people, information, and C2 support structure—in an arrangement that interacts to produce effective and harmonious actions. In the case of the FFCC, those actions are geared toward the conduct of fires as an integral element of the MAGTF commander's overall C2 system.

1003. Organization

The FFCC is a part of the G-3 Operations. In addition to the force fires coordinator (FFC) and his assistant, the FFCC has three sections—planning, target information, and current fires. Each section is comprised of a combination of aviation, artillery, and naval surface fire support (NSFS) personnel.

In some cases, the information operations cell works for the FFCC, since they share common interests in lethal and nonlethal attacks of C2 targets. At a minimum, the FFCC and the information operations cell will work closely together to plan the use of MEF capabilities to conduct C2 attack.

a. Plans Section

Fire planners are central to the command's overall planning effort and are an integral part of the operational planning team (OPT). Ideally, representatives knowledgeable of each fire support system available to the MAGTF participate in the OPT. Their major tasks are to—

- Participate in OPT deliberations to ensure fire support planning is linked to the overall planning effort.
- Apply the commander's guidance in the preparation of the concept of fires as an integral part of the concept of operations.
- Determine timing, sequence, and desired effects for targets in each course of action (COA).
- Recommend fire support coordinating measures (FSCMs).
- Ensure desired fire support effects are achievable and measurable to aid the assessment process.
- Work closely with intelligence personnel to prepare the collection plan.

b. Target Information Section

The target information section (TIS) bridges planning and execution. Through detailed targeting, they translate the functional input of the fire planners into executable plans. The TIS major tasks are to:

- Maintain the MEF list of targets (along with the target intelligence officer in the G-2).
- Nominate targets for inclusion on the joint target list.
- Orchestrate the daily MEF targeting board hosted by the FFC and chaired by the deputy MEF commander.
- Recommend target sets and targets to be attacked by the MSCs or request support from higher, adjacent, or supporting commands.
- Monitor and incorporate the results of execution to reflect changes in target dispositions to aid the assessment process.

c. Current Fires Section

Personnel in the current fires section (CFS) are located in or near the MEF combat operations center (COC). While they work for the FFC, they support the senior watch officer (SWO) and the current fight. Based on their understanding of the plan, current fires personnel process fires-related

information to gain and maintain situational awareness (SA). With SA, they adapt to emerging events by making decisions and taking action within the limits of their authority while keeping the SWO informed. When the situation dictates, they forward recommendations to the SWO for subsequent decisions and actions. Current fires major tasks are to—

- Participate in the planning effort to better understand the plan.
- Participate in the transition brief by OPT representatives, especially if the current fight precludes participation in the OPT, to gain an understanding of the plan.
- Utilize the planning and execution tools such as the decision support template (DST), battlespace shaping matrix (BSM), attack guidance matrix (AGM), and target selection standards (TSS) provided by the OPT and targeting board. See Appendix A, Fire Planning and Execution Tools, for examples of the BSM, AGM, and TSS.
- Coordinate support of the deep and rear area fights, monitor and support MSCs and any supported commands in their fights. (See Part III for details.)
- Nominate, implement, and disseminate changes to FSCMs.

1004. What is Command and Control Support?

C2 support, along with people and information, comprise a C2 system, such as the FFCC. Among other things, C2 support entails the equipment, technology, and processes that facilitate system (FFCC) activity. Equipment and technology is any data processing capability or medium used to receive, store, manipulate, display, or convey information. This includes but is not limited to radios, telephones, fiber optics, computers, printers, software applications, web sites, homepages, as well as the electromagnetic spectrum. Processes are systematic, cyclical series of actions, such as the planning, decision, execution, and assessment (PDE&A) cycle.

1005. Command and Control Support Hierarchy

The Department of Defense has established a hierarchy of C2 equipment and technology. At the top of this hierarchy is the Global Command and Control System (GCCS), which is the principal C2 system used by the Joint Chiefs of Staff. Inside GCCS are three distinct types of systems which share

a common trait of having been built around functional requirements, such as Joint Operation Planning and Execution System (JOPES) for planning; contingency theater automated planning system (CTAPS) for aviation; and Advanced Field Artillery Tactical Data System (AFATDS) for fires. The first types of systems are joint programs like JOPES and Joint Deployable Intelligence Support System. The second is Service programs that the Joint Chiefs of Staff have directed to become joint, such as CTAPS. Finally, there are the Service peculiar programs whose compatibility with GCCS vary and, in many cases, are being modified to make them interoperable in the common operating environment used in GCCS systems.

1006. Command and Control Interoperability

In a perfect world, all Department of Defense equipment and technology would work within a common operating environment with systems freely exchanging information vertically and laterally without the aid of translating software. However, lacking top-down, integrating guidance, the Services have, through their own initiative, developed functional programs to meet their requirements. At the joint level, these stovepiped efforts have led to system redundancies in some areas, gaps in others, and numerous systems that won't interoperate without significant workarounds.

In recent years, the Chairman of the Joint Chiefs of Staff has directed the migration of Service peculiar, as well as purely joint systems, such as GCCS, to a common operating environment. Until that migration is complete, the MAGTF must be prepared to work around deficiencies in the systems or, in the case of functional overlap, choose the most appropriate system.

1007. The Planning, Decision, Execution, and Assessment Cycle

The PDE&A cycle is the process the commander and his staff use to plan operations, make accurate and timely decisions, direct the effective execution of operations, and assess the results of those operations. PDE&A is a complete cycle that starts with the initial receipt of the mission and continues through mission accomplishment. It is both time and event driven. It provides a framework that supports the commander's efforts to assimilate

information in a chaotic environment and to increase tempo through timely and decisive actions. See Figure 1-1.

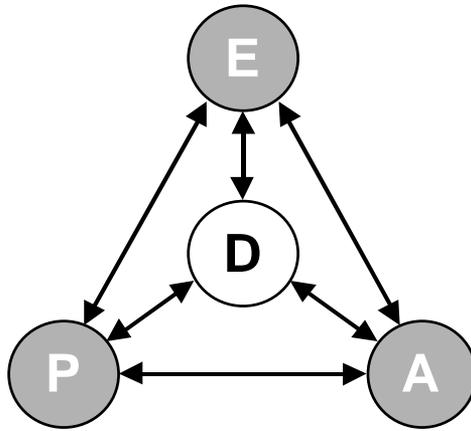


Figure 1-1. The planning, decision, execution, and assessment cycle.

Within the cycle, the “decide” activity is paramount, for decisionmaking is central to the conduct of the other three activities—planning, executing, and assessing. Essentially, planning (**P**) results in a plan that expresses the commander’s decision (**D**) on how to accomplish the mission. Execution (**E**) is the implementation of that plan. Assessment (**A**) enables the commander and staff to evaluate the changing conditions in the battlespace as a result of execution. This enhances the commander’s situational awareness which assists him in making timely and informed decisions (**D**).

The remainder of this pamphlet will address C2 support systems in the MEF FFCC in terms of planning, executing, and assessing fires—all of which support the commander in his bid for success.

Part II

Force Fires Planning

2001. Fire Planning

Fire planning consists of conceptual, functional, and detailed planning. At the highest level is conceptual planning. It establishes aims, objectives, and intentions and involves developing broad concepts for action.

For fire planners, conceptual planning is developing the concept of fires, which is based on the commander's intent, concept of operations, vision of decisive and shaping actions, and targeting guidance and priorities. Functional fire planning designs supporting plans for discrete functional activities like artillery, NSFS, or aviation.

At the lowest level is detailed planning, which translates the conceptual and functional into complete, practical plans. Detailed planning generally corresponds to the science of war and encompasses the specifics of implementation. Detailed planning does not establish objectives; it prescribes the actions or tasks that accomplish the objectives.

Detailed planning for fires includes targeting—the critical, final step where targets are selected and matched with appropriate responses (capabilities) in keeping with operational requirements.

2002. Targeting Processes

The MAGTF uses two complementary targeting processes to perform targeting. The *decide, detect, deliver, and assess* (D3A) process is a methodology used by the Army and the Marine Corps. D3A is a conceptual process that may aid the commander and the OPT in developing a concept of fires and making broad functional decisions.

The joint targeting process builds on conceptual planning resulting from D3A and is used in functional and detailed planning, such as production of the ATO, the principal deliverable of the joint targeting process. This process uses the following six steps:

- Commander's guidance and objectives.
- Target development.
- Weaponing assessment.
- Force application.
- Force planning and execution.
- Effects assessment.

Planning for force fires is part of the *decide* portion of D3A. The following paragraphs will focus on fire planning and target development as an integral part of the MAGTF's OPT planning effort. The *detect*, *deliver*, and *assess* portions of D3A will be addressed later in the pamphlet.

2003. The Operational Planning Team

Normally, the G-3 future operations section provides the nucleus of the OPT, and upon receipt of a mission, the OPT is augmented by representatives from the other staff sections and liaison officers (LnOs) from the MSCs and any supporting agencies. Fire planners from the FFCC will also participate. Whether the fire planners work directly for the future operations officer or the FFC is not as important as their knowledge of each MEF fire support asset (artillery, NSFS, aviation, electronic warfare, etc.) and their full-time participation in the OPT, personnel limitations notwithstanding.

2004. The Marine Corps Planning Process

The MCPP is a six-step problem solving methodology. It is a learning process to promote understanding for success in execution. It aids the commander and staff in—

- Analyzing the mission to determine the scope and essence of the problem.
- Developing solutions to the problem in the form of COAs.

- Wargaming COA(s) against possible threat actions.
- Comparing multiple COAs against each other and selecting the one that best satisfies the requirement.
- Writing the plan.
- Transitioning the plan to subordinate commands and the current operation section for execution.

The scope, complexity, planning horizon (distance in time or event), and time available will determine the level of detail contained in the plan. Planning timelines can vary greatly from the combatant commander's biannual cycle to weeks or even hours. Normally, any planning document produced inside 24 hours, e.g., fragmentary orders, will originate in the current operation section. See MCWP 5-1, *Marine Corps Planning Process*, for more information.

a. Mission Analysis

Mission analysis begins with receipt of the mission, or more commonly, receipt of tasks from which a mission is determined. Fire planners should learn everything they can about the battlespace as it relates to the mission, threat, and the fires warfighting function.

(1) Fire Planners. Fire planners should key on several items during mission analysis:

- Designation of area of interest and area of influence that predict the future MEF AO, as well as adjacent/deep areas for target nominations.
- Existing boundaries, maneuver control measures, and FSCMs that depict the current/future MEF AO.
- Status of higher, adjacent, and supporting units that may require or augment MEF fires capabilities.
- Identification of friendly and enemy centers of gravity to exploit one (friendly strengths) and defeat the other.
- Any threat critical vulnerabilities (CVs) or aspects of the battlespace that can be made vulnerable through shaping actions including fires.
- Any friendly CVs that require protection by fires.
- Determination of specified and implied tasks that could involve fires.
- Intelligence preparation of the battlespace products, particularly doctrinal and situation templates and the modified combined obstacle

overlay to determine potential targets (enemy forces, bridges, choke points, etc.) and possible threats to friendly fire support assets.

- Status of organic fire support systems.
- Target value analysis based on the generation of high value targets (HVTs).

(2) Target Information Section. During mission analysis, the TIS will:

- Review higher headquarters (HHQ) directives and SOPs for battle rhythm timelines (targeting cycles) in order to align the MEF's accordingly.
- Determine HHQ software application, version, and format for timely, acceptable electronic submissions of target nominations and target list updates.
- Maintain the MEF target list and submit updates to the HHQ for additions or deletions to the joint force commander's master target database.

(3) Command and Control Support to Mission Analysis. The demand for information during mission analysis will be intense. Generally, there is not a lack of information, rather the challenge is determining what information is needed, locating it, processing it into useful knowledge, and presenting it in a manner that promotes understanding.

Information can be "pushed" to a site based on established requirements or the originator's belief that the receiver can use the information. Information can also be "pulled" to satisfy a requirement. However, posting (broadcasting) information to a homepage does not guarantee the information is in the hands of the consumer. When posting information to a homepage, such as the activation of an on/order fire support coordination line, additional notification measures are required to ensure its receipt.

(a) SECRET Internet Protocol Router Network. SECRET Internet Protocol Router Network (SIPRNET) can be used to access the HHQ homepage, which is a likely source for pertinent information, such as directives, operations orders, and targeting board results.

(b) Command and Control Personal Computer. Command and Control Personal Computer (C2PC) is an excellent application for creating and displaying battlespace graphics in an electronic medium. It is particularly effective in displaying intelligence preparation of the

battlespace overlays that can be viewed singly or simultaneously at the click of a button. The alternative is a series of bulky, acetate overlays, which must be rolled and unrolled to view the battlespace from different perspectives. Overlays, like the modified combined obstacle overlay, built in C2PC, may be sent as electronic files to other units, ensuring timely delivery and drastically reducing foot traffic in workspaces.

Replicas of C2PC graphics can be built in Microsoft PowerPoint using Encarta maps. While Encarta maps are more pleasing to the eye, replicating C2PC graphics is a time consuming, duplicative effort. The ability to rapidly share adequate C2PC graphics immediately with other units far outweighs the benefits of perfect maps delivered too late.

(c) Advanced Field Artillery Tactical Data System. AFATDS can assist fire planners during mission analysis by—

- Producing candidate HVT lists from its archival library to support target value analysis.
- Monitoring and reporting the status of friendly, ground-based, fire support systems.

(d) Intelligence Analysis System. Intelligence Analysis System (IAS) can aid G-2 personnel and fire planners by—

- Accessing theater and national sources of intelligence regarding the enemy, terrain, and weather. With a Trojan Spirit capability, the G-2 has its own dedicated communication pipe which will expedite the download of large files, such as imagery.
- Displaying current enemy dispositions via Tactical Combat Operations (TCO)/GCCS feeds.

b. Course of Action Development

COA development is the creative step in the planning process where solutions are developed to solve the problems identified in mission analysis. COA development begins with planning guidance from the commander based on the learning that took place in mission analysis. The commander's intent (purpose, method, and end state) is a form of planning guidance as to how he sees operations unfolding.

The commander may also choose to give specific planning guidance on the operation. This could include guidance on each of the warfighting functions, initial guidance on the effects of fires, and an initial concept of fires to achieve those effects. Adding to this any restraints and constraints and the commander's vision of decisive and subsequent shaping actions, the OPT has, figuratively speaking, a box (start point, end state, left and right lateral limits) within which to determine how the MEF will be successful in accomplishing the end state and achieving the purpose.

(1) Fire Planners. Fire planners in the OPT will suggest ways to employ fires as part of any potential COA. Fire planners' major tasks are to—

- Array friendly fire support assets to achieve asymmetric advantage.
- Assess enemy fire capabilities for lethality, range, and ability to range friendly CVs.
- Plan the employment of fires to support the main effort.
- Integrate fires with schemes of maneuver (combined arms) to pose dilemmas for the enemy.
- Plan shaping activities which render enemy strengths vulnerable to attack in order to set conditions for decisive action.
- Exploit critical vulnerabilities to allow friendly forces to disrupt or defeat a center of gravity resulting in an action larger than itself (decisive action).
- Integrate with collection plans to ensure targets can be detected and tracked prior to execution and assessed afterwards.

At this point in the planning, the relative importance of individual targets emerges. This relative importance is known as target relevancy. However, relevancy is strictly dependent on a particular COA. For each proposed COA, fire planners develop a rough concept of fires depicting the role that fires will play.

(2) Command and Control Support to COA Development

- **Command and Control Personal Computer.** C2PC is an excellent tool for COA development. COA briefs to the commander should include a COA graphic and a narrative. If C2PC is used to graphically display unit movements, the completed file can be used for the brief itself and is electronically transferable to the MSCs for their planning.

- **Microsoft Office Applications.** These include Word for word processing, PowerPoint for graphics, Excel for spreadsheets, Access for databases, and Outlook for group ware. The TIS may want to set up a targeting database and spreadsheets in Microsoft applications to track target progress. Word can be used by planners to publish the narrative of the concept of fires. PowerPoint can be used to augment C2PC for producing COA graphics.
- **Advanced Field Artillery Tactical Data System.** Fire planners can use AFATDS to refine the control measures for each COA. With input from IAS and coordination with the OPT, fire planners can build friendly and enemy forces in AFATDS, adjusting each element of a programmed template or creating units specifically for the situation. AFATDS can incorporate HVTs, high-payoff targets (HPTs), named areas of interest (NAIs), and targeted areas of interest (TAIs) to provide the basis for an initial concept of fires. AFATDS can assist in determining positioning requirements based on range and movement rates, and develop ammunition estimates for each COA, as well as recommended task organization and support relationships. All this information can be passed electronically to the MSCs for their use in integrated planning. The result is a computer aided, comprehensive fire support estimate for each COA. This will allow the fires planners to array and move fire support units, call for resupply, and engage relevant targets at the right time during the ensuing COA war games.

c. **Course of Action War Game**

The COA war game is a step-by-step process of action, reaction, and counteraction for visualizing each friendly COA in relation to enemy COAs. COA wargaming can lead to—

- A better understanding of the battlespace and all its elements.
- Advantages and disadvantages of each friendly COA.
- Validation of the commander's decisive action.
- Validation of friendly and enemy centers of gravity.
- Branches and sequels.

(1) Fire Planners. Fire planner participation in COA wargaming is critical to fires and targeting. COA wargaming is the most productive event in the planning process for generating relevant targets. At this point HPTs are

selected from potential targets (HVTs), and the timing, sequence, and effects of the target's attack are chosen. The initial concept of fires and fires estimate developed during COA development is tested and refined as necessary. Through observation and participation in an interactive war game against a free-thinking, willful enemy, fire planners can visualize the attack of which bridge, chokepoint, enemy force, etc., is key to friendly success. Fire planners' major tasks are—

- Determine which enemy units and elements of the infrastructure should be attacked in each COA.
- Help develop the DST by identifying NAIs and TAIs associated with decision points (DPs). The DST will become a key tool in execution for current operations.
- Formulate a counterfire plan, if required, that states which agency or MSC will have responsibility for coordinating strikes against enemy artillery, including strikes by the aviation combat element (ACE) beyond the range of the GCE's organic capabilities.

(2) Command and Control Support to COA Wargaming

- **Command and Control Personal Computer.** C2PC is ideal for wargaming. By projecting the map, graphics, and unit positions, commanders and staffs can see the progress of the operation. Units can be moved for each COA, range capabilities assessed, and spatial relationships between enemy and friendly units observed as both sides war game the COA. Turns can be depicted for the war game brief by either saving an overlay for each turn, or by pasting each "snapshot" of the war games progress to a PowerPoint slide. C2PC map scales can be adjusted for greater granularity. NAIs, TAIs, and DP modifications can be saved to help create the DST.
- **Advanced Field Artillery Tactical Data System.** AFATDS can record adjustments to the fire support concept as it evolves during the war game. Attrition of firing units and ammunition usage can be recorded, which generates new estimates for later phases. The result is a refined fire support estimate for each COA, forming the basis for functional and detailed planning.

d. Course of Action Comparison and Decision

During this step friendly COAs are evaluated against each other and the commander's evaluation criteria. The commander then selects the COA

which best accomplishes the mission. The commander will establish the criteria (risk, simplicity, supportability, etc) to weigh the merits of each COA. This step requires the involvement of the commander, his subordinate commanders, and their staffs. With a decision by the commander, detailed planning can accelerate now that all planning is focused on one COA.

(1) Fire Planners. Fire planners can assist by—

- Providing an estimate of supportability for artillery, aviation, NSFS, and electronic warfare.
- Planning the fires portion of any emerging branch plans.
- Completing the fires portion—lethal and nonlethal—of the concept of operations.
- Completing the synchronization matrix to ensure fire support assets are integrated with the other warfighting functions in time, space, and purpose.

(2) Target Information Section. With completion of the concept of operations (including the concept of fires), the TIS can—

- Schedule the MEF targeting board.
- Develop a proposed MEF prioritized target list for consideration at the targeting board based on targeting objectives, targeting priorities (by category), MSC target nominations, and any HPTs identified during the war game.
- Continue to work with G-2 Collections to schedule reconnaissance, surveillance, and target acquisition assets to detect, identify and validate desired targets in concert with NAIs and TAIs.

(3) Command and Control Support to COA Comparison and Decision

- **Command and Control Personal Computer.** This application continues to be useful in providing snapshots in time at various stages in a COA. These can be transferred to PowerPoint or presented on screen “live” for the commander during the decision brief. Operators can adjust an “approved with modification” COA at the presentation so that unit positions, boundaries, or mission graphics portray exactly what the commander desires before development of the order.

- **Microsoft Office Applications.** PowerPoint graphics and Excel spreadsheets are excellent media for displaying information, such as matrices and IAS sourced imagery that show details of key terrain or objectives.
- **Advanced Field Artillery Tactical Data System.** The concept of fire support captured and adjusted in AFATDS is the foundation for the fire support appendix in the order. The narrative text, control measures, FSCMs, task organization, and guidance for target engagement is largely complete by this time. Comparisons among COAs are possible by viewing computer-generated reports to aid the fire planner's assessment. Last minute changes by the commander that lead to an approved COA can be electronically transmitted to the MSCs to aid their integrated planning.

e. Orders Development

The orders development step allows planners to communicate the commander's intent, guidance, and decisions in a clear, useful form that is easily understood by those who must execute the order. The order directs actions and focuses subordinate activities toward accomplishing the mission.

(1) Fire Planners. Fire planners' major tasks include—

- Writing the concept of fires for the basic order.
- Drafting tasks for subordinate units and agencies that appear in paragraph 3 of the basic order.
- Writing the fire support appendix to Annex C.
- Completing all fires-related planning and execution tools, such as the DST, decision support matrix (DSM), BSM, AGM, and TSS for use by the current fires section in execution. The size of these products may preclude placement in the order itself, but all should be delivered or available electronically for local reproduction.
- Ensuring taskings to subordinates reflect a balance between the best system to achieve asymmetrical advantage and MSC workload.
- Ensuring words used in drafting taskers or establishing goals, conditions, phases, targeting effects, etc., are understandable, achievable, and measurable to assist the assessment process. See Part IV for more on assessment.
- Conducting an orders crosswalk with the staff using the basic order and the annexes to ensure the concept of fires is an integral part of

the MEF commander's single battle. An orders crosswalk serves to reduce the impact of uncoordinated, stovepiped planning and helps to integrate detailed planning conducted by functional planners and subordinate commands and agencies.

(2) Target Information Section. The activity level in the TIS will pick up noticeably during orders development as execution approaches. The TIS major tasks in this step are to—

- Support the fire planners in writing their portion of the order.
- Assist the fire planners in developing execution tools, specifically the BSM.
- Translate targeting guidance, objectives, and target sets into specific target nominations for upcoming targeting boards.
- Receive target nominations from the MSCs.

(3) Command and Control Support to Orders Development

- **Command and Control Personal Computer.** C2PC is an excellent means for transmitting operational graphics to higher, adjacent and subordinate units assuming they have compatible hardware and software to receive and display that information. Once applied to TCO, these products form the operations map from which the operation is conducted. If necessary, C2PC graphics can be printed to acetate on a Hewlett-Packard Plotter printer. Depending on the model, these can be as much as three feet wide.
- **Microsoft Office Applications.** Word, PowerPoint, and Excel serve well in documenting the order using standard word processing and imagery production. When building large orders and posting them onto the unit homepage, Microsoft Outlook (group ware) is an excellent tool for organizing the various annexes, appendices, tabs, etc., into folders and binders for ease of handling.
- **Advanced Field Artillery Tactical Data System.** The fire support concept, guidance, target lists, fire support organization for combat and battlespace geometry associated with the approved COA built in AFATDS are now available for “pasting” into the unit order. Concurrent with this administrative function, the FFCC can transmit the approved portions of the fires section of the order to all subordinate and adjacent fire support coordination centers (FSCCs)

for their use in concurrent planning. AFATDS can also send target nominations to the CTAPS terminal at the supporting arms coordination center or tactical air control center via the tactical air support module. This program, which runs on top of the AFATDS program, allows transmission of air target nominations and associated air mission request from subordinate FSCCs to the FFCC for consolidation, deconfliction and forwarding to higher headquarters. Presently, these nominations must be reentered manually into CTAPS for inclusion into the ATO.

f. Transition

Transition ensures a successful shift from planning to execution. It enhances the situational awareness of those who will execute the plan, maintains the intent of the concept of operations, promotes unity of effort, and generates tempo through timely, informed decisions. At the MEF level, the scope and complexity of operations usually requires separate planners and executors. Thus, the transition step is critical to conveying the understanding that the planners have gained to the executors, since tempo is so critical to success.

(1) Fire Planners. Fire planners' major tasks are to—

- Transition fire planning to the personnel in the current fires section.
- Provide any fires-related planning and execution tools developed in planning, such as the DST, DSM, AGM, and BSM.
- Participate in the targeting boards.
- Provide a detailed brief to Marine Corps component representatives to the joint targeting board so they can convey the rationale behind MEF targets and their linkage to the MEF's concept of operations.

(2) Target Information Section. Transition is a very busy period for the TIS, as execution is imminent. The TIS major task during this step is the conduct of the daily MEF targeting board. As such, the TIS will—

- Ensure targeting board timelines are synchronized with HHQ battle rhythms.
- Receive apportionment recommendations from the ACE and any other MSCs who desire to comment.
- Monitor the GCE's requests for preplanned close air support since validated requests affect the apportionment decision.

- Conduct a daily target working group meeting with action officers from the MSCs and MEF staff sections.
- Order, or “rack and stack” target nominations based on targeting priorities and designation of main effort.
- Establish an initial list—known as the “cut line”—of targets to attack.
- Notify all required members of the targeting board of their briefing requirements and sequence to include intelligence, weather, future operations, future plans, engineer, information operations cell, and legal.
- Prepare briefing slides and map graphics.
- Review published ATOs to verify sorties and targets match MEF and joint targeting board deliberations.

(3) Current Fires Section. During the transition step, the CFS will receive the transition brief from the OPT. In preparation for execution their major tasks are to—

- Participate in the transition brief and become intimately familiar with the execution tools provided by the OPT. If current operations is manned and operating, this brief will have to go twice to cover both shifts.
- Conduct execution drills using the commander’s critical information requirements and planning and execution tools (e.g., DST, DSM, AGM, and BSM).
- Set up appropriate maps, screens, monitors, electronic journal, and verify voice and data net connectivity.
- Verify digital switching voice transmitter (DSVT) phone numbers and e-mail addresses for key personnel.
- Conduct communication checks with all appropriate fire support agencies, to include the MEF representatives on the airborne battlefield command and control center.
- Verify availability of C2 support equipment such AFATDS, TCO, etc.

(4) Command and Control Support to Transition

- **Advanced Field Artillery Tactical Data System.** Digital rehearsals comprise the main activity for AFATDS operational

facilities during this step. After transmission of the plan, the FFCC should verify receipt for each subordinate facility. Depending on the situation, various levels of digital rehearsal can occur. To conduct a rehearsal, the plan must be implemented in AFATDS, thus making it the *virtual* current situation. Level III, the most extensive digital rehearsal, is done in conjunction with a full-scale maneuver rehearsal. Fire support units and observers move on the ground, reporting their new status to update AFATDS and TCO. FSCMs come into effect, phase lines are crossed, and each fire mission or air mission is executed, as it would be in combat. This level of rehearsal is rarely possible above battalion level. Level II rehearsals also involve the processing of missions, except as the tactical situation prevents adjustment of unit locations in the computer. In this situation, only those actions, which can occur from the current locations, are rehearsed digitally, while the others are verbalized. Level I rehearsals are possible when the units involved are in an assembly area or other situation where the movement of units in AFATDS will not impact on actual mission processing. In these rehearsals, the units once again move and shoot, although in “CPX mode” in the computer only.

The goal of rehearsals is verifying unit capability to engage the targets at the right time, clearance of fires connectivity, and verifying the guidance set in the computer to generate an engagement solution which conforms with the commander’s guidance. Participation in these rehearsals can be as inclusive as the unit desires. AFATDS is also capable of tracking ammunition, major end items, and fuel expenditures automatically. Thus, the force service support group (FSSG) can use AFATDS as a near real time window for the status of fire units in the MEF, thus validating the combat service support concept with regard to fire support.

- **Tactical Combat Operations.** While the G-3 is able to prepare a transition briefing using C2PC, TCO also provides the G-3 a capability for a comprehensive rehearsal using the MEF’s organic C4I systems. Not only will this verify communications connectivity, it will reinforce the information management plan and internalize the scheme of maneuver in all MSCs. As with AFATDS, the level of rehearsal depends on the situation. Most useful and flexible would be a Level I style rehearsal. Transmission and verification of graphics and starting unit status would be a necessary precursor to such a

rehearsal. Orchestrated by the G3, each MSC executes its portion of the plan “virtually”, moving its tracks in TCO, expending supplies, reporting attainment of maneuver or target engagement objectives. The Red Cell does the same for notional enemy forces, providing information, which would be available assuming execution of the collection plan and proper reporting by units in contact. Each side incurs notional losses based on input from the OPT members who participated in COA wargaming, reporting the same per SOP to exercise the FSSG in executing and reporting its preplanned and routine processes.

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Part III

Force Fires Execution

The term *execute* means to produce in accordance with a plan. At lower levels of command, execution means activities like firing artillery or flying an aircraft, maneuvering across terrain, or delivering critical supplies. At the MEF level, execution is more mental than physical as the staff concentrates on gathering and managing information to aid the commander in decisionmaking.

Unlike planning cell timelines that are frequently measured in months and weeks, the current operations staff has only hours, minutes, and even seconds to decide and act during execution. This is especially true in the CFS where the time to engage fleeting targets of opportunity is often measured in mere minutes. The commander and his staff cannot wait until they have a “complete” picture to react to emerging events. They must process information expeditiously to generate actions faster than the enemy can respond. The resulting tempo provides an antidote to the uncertainty inherent in war.

In its simplest form, the use of information in execution can be described as an *input, process, output* cycle. The staff first gathers or receives information (input) and then evaluates the information to determine its usefulness (process). If relevant, the information updates the commander’s understanding of the battlespace and determines what action, if any, is required (output).

3001. Input

With connectivity to higher, adjacent, and subordinate units, the CFS is provided with information from all directions and in varying formats and degrees of maturity.

a. Higher Headquarters

The HHQ will pass down guidance and direction, as well as assessments of ongoing operations from the broader perspective of superior commands. This type of information updates the context within which MEF fires take place, providing changes in mission, intent, and tasks. It could also include shifts in the main effort which have direct implications for the level of fire support the MEF can expect from external sources (joint air sorties, NSFS, Army Tactical Missile System (ATACMS), etc.).

b. Adjacent Units

Adjacent units can be a great source of information on enemy units, either directly by routine reporting or indirectly through requests for fire support. During combined operations, it is not unusual for adjacent allied units to request the MEF attack targets of common interest, since many of these units lack the sensors and range of weapon systems available within the MEF. Normally, information between adjacent units at the MEF level is exchanged by LnOs. At a minimum, LnOs will pass information verbally over single-channel radio at regular intervals or as required for significant events.

c. MEF Staff Sections

Within the MEF staff, there are several agencies that feed information to the CFS.

- **Surveillance and Reconnaissance Center.** The surveillance and reconnaissance center is the MEF collection point for organic, attached, and supporting sensor reports, which are then forwarded concurrently to G-2 Intelligence for analysis and fusion, and to the MEF COC for potential prosecution of perishable, fleeting targets by the CFS. The surveillance and reconnaissance center has three primary collection units that report to it: the sensor control and management platoon (SCAMP); the Marine unmanned aerial vehicle squadron; and force reconnaissance.
- **Operations and Control Center.** The operations and control center is the main node for the C2 of radio battalion signals intelligence operations. It plays a key role in the attack of C2 nodes and provides indications and warning for pending enemy operations.
- **Force Artillery Headquarters.** The force artillery headquarters is a MEF-level, task organized, artillery unit designed to command and

control additional M-198 battalions and U.S. Army Multiple Launched Rocket System (MLRS) units, if assigned. These units can reinforce the GCE, provide fires to the rear area, or support the MEF's deep fight. The force artillery headquarters can be tasked to coordinate the MEF's counterfire fight. MLRS units supporting Marines normally include a field artillery detachment with the Q-37 counterbattery radar. This radar can detect targets beyond the range of the GCE artillery that can be attacked by other MEF assets (aviation, MLRS). The force artillery headquarters provides Q-37 target acquisitions to the CFS for engagement per the AGM and analysis by the G-2.

d. Subordinate Units

The primary source of situation awareness for the CFS is feedback from the MSCs, whether an update of current status or requests for additional fire support. As the principal executor of the MEF's deep fight, the ACE deep battle cell will be in constant contact with the CFS to discuss—

- Strike results.
- Intelligence from pilot reports (PIREPs).
- New target assignments.
- Changing FSCMs.
- Execution day changes to the apportionment decision driven by emerging events in the battlespace.

The division, FSSG, and rear area operations center, if established, also provide information to the CFS on a regular basis as they request supporting fires, update the friendly and enemy situation, and nominate additional FSCMs.

e. Command and Control Support to Input

Equipment and technology facilitate the transfer of information from higher, adjacent, and supporting units. While an effective information management system should help improve the flow and value of information, it is not simply a matter of increasing volume. The real value of such a system is its' contribution to the quality, timing, location and form of information. The action officer's e-mail account, his DSVT telephone, and the exchange of information inside the MEF COC will be the principal means for receiving information.

- **Navy Units.** Since the Navy and Marine Corps both use Joint Maritime Command Information System (JMCIS) as the foundation for their fused operational battlespace picture, the MEF shares information electronically with U.S. Navy ships occupying adjacent waters. Navy and Marine air control agencies can also share a real-time air picture through data links between the ACE's tactical air operations center and Aegis cruisers.
- **Army Units.** With special interface equipment, protocols, and the use of DSVTs, the Army's mobile subscriber equipment is compatible with the Marine telephone system. Otherwise, LnOs will need to use single channel radios or some other data network, such as AFATDS to pass information.
- **Radio Nets.** Monitoring subordinate tactical nets can be an effective "directed telescope" by which the MEF "pulls" information to maintain its SA. Due to range and line-of-sight limitations, GCE frequency modulated radio nets may not be suitable for monitoring. However, forward air controller (airborne) ultra high frequency nets can be an excellent, passive source for ground and air progress reports.

3002. Processing Information

Regardless of its source, inbound information must be assessed for value. If it is raw data, it must be must be plotted and correlated with other known facts to determine its value. Even the most innocuous appearing data can have a major impact on friendly operations.

a. Decision Support Tools

CFS personnel will use decision support tools to help process information. Some of these tools serve as filters to determine which information is relevant. Other tools help to fuse and prioritize information to make the information more useful, gain a better understanding of a situation, and ensure timely, informed decisions and proper dissemination. These tools are developed during planning and help the commander and staff in the "decide" portion of the D3A targeting model.

- **Decision Support Template and Matrix.** The DST and DSM are developed by planners in the OPT. The DST contains NAIs, TAIs and DPs. Collection assets are placed against the NAIs to confirm

templated enemy targets. When detected and validated as a target, the DP linked to that NAI assists the CFS in determining what action to take, such as scheduling fires on the target as it enters the TAI. NAIs can also confirm or deny an enemy COA based, for example, on the enemy's presence and choice of a particular avenue of approach. DPs associated with this type of NAI will personally involve the commander in the event a branch plan is executed or a shift in main effort is required.

- **High-Payoff Target List.** The high-payoff target list (HPTL) is derived from the DST. It lists those targets that are key to friendly success. An example might be selected air defense units which are protecting an enemy's armor, which must be defeated to ensure mission accomplishment. If the air defense assets are destroyed or neutralized, then the enemy's armor becomes vulnerable to asymmetric attacks by aviation.
- **Target Selection Standards.** TSS are the criteria used by the CFS to determine if an enemy activity is a target or a suspected target. TSS are based on the reliability and capability of the sensor, the accuracy of the attacking system, and timeliness of the report. For instance, SCAMP sensors can identify suspected targets, but further validation is required to identify the type of unit and classify it as a target. On the other hand, countermortar radar (Q-46/37) acquisitions are targets as they identify the type of enemy fire support system and can provide a very accurate target location. The target can then be attacked without further validation if it meets the targeting priorities and is still relevant to the concept of maneuver.
- **Attack Guidance Matrix.** The AGM aids the CFS in determining how to attack targets that meet the TSS. It includes HPTs, when to attack, how to attack, and the desired effects of the attack. *When* could be any time from the next planning cycle (ATO) to immediately at the expense of other ongoing operations. *How* should identify the best attack system to use and include a backup, if available/capable. The *desired effects* are what the commander wants done to the target in quantifiable terms and might include such effects as suppress, neutralize, or destroy.
- **Battlespace Shaping Matrix.** The BSM has been used by some MEF FFCCs to consolidate the HPTL, TSS, and AGM into one document. The BSM identifies the targeting objectives and target priorities across all categories, and the desired effects for each target.

b. Situational Awareness

SA is the knowledge and understanding of the current situation which promotes timely, relevant, and accurate assessment of friendly, enemy, and other operations within the battlespace in order to facilitate decisionmaking. It results from processing incoming information to put it into a useful form, then relating it to what is already known to give this new information meaning. This newly acquired knowledge updates the commander's perceptions of the battlespace. The resulting SA enables comparisons between the current status and the desired end state per the plan. The difference between the two is the catalyst for decisions and subsequent actions in a continuous effort to accomplish the desired end state.

3003. Output—Decisions and Actions

The output of the cycle is the commander's decision, which sets into motion the actions needed to execute the plan. During this portion of the cycle, information supports the informed and timely decisionmaking of the commander. The commander decides, based on his situational awareness, what action to take. The CFS supports the commander in execution by taking the following actions to provide information.

a. Information Search

Sometimes inbound information generates more questions than it answers. The CFS may invest time in seeking additional information through telephone calls to sources, database research, etc. Due to the compressed timelines inherent in current operations, more extensive research usually will be conducted by the planners or the TIS.

b. Archival Data

Some information may not require immediate action within the CFS, but it could have use in the long term in trend analysis. The CFS should forward this type of information to the all-source fusion center for their consideration.

c. Briefs

The CFS will typically provide two types of briefs—information briefs to maintain situational awareness and decision briefs for issues requiring

decisions beyond the authority of the CFS. Information briefs can be verbal announcements to the entire COC, informal discussions over a map during a morning “boardwalk,” or formal presentations with PowerPoint color graphics to address complex topics. For decision briefs, the CFS action officers will meet with the appropriate decisionmaker, cover the salient points, make recommendations, and seek a decision.

d. Taskers to Subordinates

Beyond the taskers that are found in paragraph 3 of an order, action officers in current operations invariably find themselves in a position to pass on taskers as emerging events dictate changes from the plan. Commanding officers may grant action officers “by direction” authority—as long as the action officer is making decisions within his authority, he speaks for the commander in dialogue with higher, adjacent and subordinate forces. However, when events occur in the battlespace that requires a change in policy, e.g., executing a branch plan or shifting deep sorties to close targets, thus changing the apportionment decision, the action officer refers to his superiors for guidance. Similarly, action officers don’t say “no” to an MSC without checking with their superiors first.

e. Broadcasting

Posting information to a homepage or a shared drive is an often used means of broadcasting, but information passed is no guarantee of information received and understood. Within the CFS, timely activation and notification of FSCM changes are critical to combined arms and force protection. Consequently, confirmation procedures should be established that alert potential users of the presence, location (frequency, web site) and current version of posted information.

f. Feedback to Higher Headquarters

Adaptation is the ability to respond to emerging events in the battlespace. It does not happen, or at least not well, without feedback from subordinates. Feedback comes in many forms—routine situation reports, telephone conversations, e-mails, visits to subordinates, updates to common tactical picture tracks, aircraft IFF (identification friend or foe) squawks or analysis of subordinate requests for fires support, logistics or personnel replacements, to name a few. The CFS at the MEF level keeps the Marine Corps component commander, as well as the component LnOs at the joint

air operations center, abreast of the current situation. If the MEF is under the operational or tactical control of the joint force maritime component commander or the joint force land component commander, the CFS will provide feedback to counterpart agencies (deep operations coordination cell, supporting arms coordination center, etc.) to help maintain the HHQs' SA.

3004. Command and Control Support to Fires Execution

a. Advanced Field Artillery Tactical Data System

With master unit list, guidance, distribution lists, geometry, current friendly situation, and FSCMs established in the AFATDS tactical database, fire mission processing occurs as rapidly as the comfort level of the commander allows. Given digital communication connectivity, it is possible for counterfire missions and digitally initiated fire requests to be processed with little human intervention other than to load and fire the delivery systems. Clearance of fires for special munitions such as ATACMS, initiating fires on targets nominated from the other sections of the COC meeting the AGM, and shifting the focus of fires based on emerging requirements constitute the primary activities of the CFS. Once a mission gets loaded into AFATDS, clearance and engagement can occur with minimal operator action. FSCM nominations and approved changes move through AFATDS with backup message traffic, e-mail, or telephone conversations to verify receipt of vital information. Unit status reports route through AFATDS either automatically as firing units update their status, or periodically as part of SOP reporting.

b. Tactical Combat Operations System and Intelligence Analysis System

TCO and IAS can display friendly and enemy situations; tactical control measures, and interface with local and wide area networks for receiving feedback such as PIREPs from the ACE, which is critical to gaining and maintaining SA. Since the core software for TCO and IAS is JMCIS based, the MEF COC can also share battlespace information with the Navy.

c. Contingency Theater Automated Planning System/ Theater Battlefield Management Core System

With CTAPS/ Theater Battlefield Management Core System, the CFS can receive, sort and track sorties in the ATO to verify target sourcing and

allocated joint sorties, and track FSCMs listed in the SPINS (special instructions). CTAPS may provide more information than is needed at the MAGTF headquarters. Commanders must guard against over centralization of control of air operations at the MAGTF headquarters.

d. SECRET Internet Protocol Router Network

SIPRNET is a tremendous capability for sharing large volumes of information. However, improving information is not simply a matter of increasing volume; it is a matter of improving quality, timing, location, and form. One of the biggest challenges for the CFS is sorting through all the incoming information to find the information most critical to current operations. Establishing and publishing routing and priority protocols in SOPs and information management plans can help qualify inbound traffic. Also, action officers must exercise discipline when broadcasting information to “all hands” making sure everyone needs it. Otherwise, point-to-point e-mails are more appropriate.

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Part IV

Force Fires Assessment

4001. What is Assessment?

Assessment is the continuous appraisal of military operations to determine progress toward established goals. It answers the commander's questions, "How are we doing?" and "When will we be done?" Assessment can be divided into two parts: goals and SA. Goals are those things the commander seeks to accomplish; while SA is the commander's understanding of his progress towards those goals. The "delta" or difference between the two is often the catalyst for the commander to make a decision that will alter his planned operations to better achieve his objectives. This is the ultimate "goal" of assessment.

a. Goals

Goals might include the purpose, end state, objectives, and desired effects of the operation. They are the milestones by which progress is measured. For goals to be effective, they must be understandable, achievable, and observable in order to assess. If not observable, then some objective, tangible measures of effectiveness (MOE) should be used to help define the goals to aid assessment.

b. Situational Awareness

SA is knowledge and understanding of the situation which promotes timely, relevant, and accurate assessment of friendly, enemy, and other operations within the battlespace. It facilitates decisionmaking. SA is an informational perspective that fosters the ability to determine quickly the context and relevance of events as they unfold.

SA is the product of filtered, fused, and prioritized information flow, particularly in the form of feedback from subordinates. It is combined with the commander's intuition and judgment, based on his experience and recognitional skills, to assist him in making timely and informed decisions.

4002. Fires and Assessment

Fires and assessment have always been closely linked. The last step of D3A is “assess”. There are numerous doctrinal publications that describe assessment, particularly the combat assessment process. Combat assessment includes battle damage assessment (BDA), munitions effectiveness, and reattack recommendations. Within the framework of fires and targeting, combat assessment is a major contributor to the commander’s assessment. But combat assessment alone is not sufficient; commanders and their staffs must also look beyond physical, functional, and target system damage to the linkages with the concept of operations and commander’s intent to assess how well fires is contributing to the overall effort.

4003. Planning for Fires Assessment

The key to planning for assessment is recognizing the need to assess before planning begins. This allows taskers, conditions, end states, and targeting effects to be written with assessment in mind, and planners can ensure they are understandable, achievable, and observable. Such standards should be objective based when possible. When subjective standards are necessary or appropriate, MOE will be used to help define them. Other keys to assessment planning are—

- Determining information requirements (BDA, PIREPs, Q-37 acquisitions, unmanned aerial vehicle sightings, etc.)
- Establishing an information management system that filters, fuses, and prioritizes information.
- Prioritizing collection requirements because there are never enough assets to collect on everything (NAIs/TAIs, detection, location, identification, validation, and post-strike BDA).
- Developing taskers and desired targeting effects that are achievable and assessable.
- Developing objective MOE, that will aid the assessment process, if initial goals are not assessable in their own right.
- Using planning and execution tools (DST, DSM, AGM, etc.).

a. Terminology

When writing orders and planning for assessment, words matter. Tactical tasks have definitions that describe precisely what is to be accomplished.

Some tactical tasks seek to achieve effects whose difficulty is directly proportional to the resources required. Planners need to appreciate the cost in terms of time, resources, and risk to friendly forces inherent in the desired effects. One of the most costly in terms of time, resources, and danger to friendly forces is the tactical task *destroy*. Too often fire planners want to destroy targets without regard to the desired effects or the level of effort required. Before committing scarce resources—aviation sorties and artillery battalions—needed to “destroy 50% of all artillery in zone,” planners should seek alternative solutions, such as electronic attack or psychological operations, to deal with the enemy’s counterfire threat.

During the early stages of Desert Storm, MARCENT planners realized that there was not sufficient time, sorties, ordnance, and collection assets to achieve and verify CENTCOM’s objective of 50% destruction of armor and artillery prior to ground operations. One of MARCENT’s major concerns was the Iraqi artillery that could range the obstacle belts during the assault. The solution was to “alter the behavior” of the enemy artillery units through a series of artillery raids supported by 3rd MAW aircraft. Initial Iraqi counterfire was heavy, but over time the Iraqi’s learned that returning fire came at great personal risk as 3rd MAW aircraft delivered immediate and effective air strikes on the Iraqi batteries. Since “altering behavior” is a subjective goal, MARCENT planners used the volume of Iraqi counterfire as an MOE to determine the success of their efforts.

b. Ends versus Means

Knowing target vulnerabilities and the desired effect an attack is meant to have on enemy operations allows a staff to propose the most efficient available attack option. Key guidance is whether the commander wishes to disrupt, delay, limit damage, or destroy the enemy. In planning, the FFCC uses the commander’s concept of operations and any specific fires guidance to recommend the effects of an attack on a target (disrupt, delay, or limit). To accomplish these *ends*, the FFCC determines the *means*—desired effects of fires (harass, suppress, neutralize, or destroy)—and the attack option (artillery, aviation, NSFS, nonlethal, or direct action).

In execution, a fire support system (the attack option) strikes the target to achieve the desired effect (harass, suppress, neutralize, or destroy). In turn,

the FFCC must assess the attack to determine what effect the attack has had on the enemy (disrupt, delay, or limit). If the attack fails to achieve the commander's desired effects, then the commander must determine whether to reattack the target.

c. Disrupt versus Destroy

MCDP 1 *Warfighting* characterizes war as an interaction of physical, moral, and mental forces. The physical aspects of war are easily seen and measured: equipment, supplies, objectives seized, or prisoners captured. The mental and moral forces are less tangible and more difficult, but not impossible, to assess.

Although material factors are more easily quantified, the moral and mental forces exert a greater influence on the nature and outcome of conflicts. Consequently, the greatest effect of fires is not the amount of physical destruction they cause, but the *mental disruption* as a result of the physical destruction.

Whether fires have destroyed 28% or 32% of the enemy's tanks is not as important as the disruptive effects the fires have had on the integrity of the enemy force as a whole. Though planners cannot expect to accurately assess the psychological impact of their fires, they need to recognize that the disruptive effects will occur, and be prepared to exploit opportunities as they occur.

4004. Assessing Fires During Execution

Assessment is continuous during execution. Information is filtered and fused to form an updated picture of the battlespace, from which the commander makes decisions and directs action. The commander's ability to effectively assess fires during execution is largely determined by—

- How well goals are developed during planning to ensure they are achievable and observable.
- How effective the plan is in generating a common understanding among the staff and MSCs of what is to be accomplished.
- The staff's ability to ensure useful information reaches the right person or location in the proper format.

Meeting these requirements will enhance the CFS' ability to adapt to emerging events in current operations, and proactively respond in a chaotic, uncertain environment.

4005. Command and Control Support to Assessment

Using AFATDS, the FFCC or the MSC's FSCCs can rapidly determine the friendly force situation by calling for and receiving unit status updates. AFATDS can generate fire unit status displays showing unit description and summary information with color-coded assessment of capability in multiple categories. It also allows the operator to adjust pre-set conditions or thresholds that indicate when the unit has reached a pre-determined level of degradation. Reaching these thresholds prompt the commander's decisions to withdraw, re-supply, reinforce, or reorganize. The FFCC can also receive GCE or force artillery headquarters' assessment of the enemy fire support system via AFATDS. The FFCC can then pass this to the all-source fusion center for use in their overall enemy situation assessment. AFATDS can update unit location for display and list printing, with strength, activity, and projected activity being the subject of accompanying free text messages. Version control is critical. Unit SOPs or plans should include procedures for tracking and reporting such information.

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Appendix A

Fire Planning and Execution Tools

The commander and the FFCC may use the following tools to assist in fire planning and execution. These tools are examples and may be modified to meet different situations.

A-1. Battlespace Shaping Matrix

The BSM is a planning tool to guide target selection. It provides a systematic method to shape the enemy by prioritizing target objectives by category and systems within those categories. The matrix also includes the desired effect on the targets. It is normally developed by the FFCC and is presented for approval at the targeting board or conformation brief. This form is based on the I MEF Fire Support Standing Operating Procedures.

ATO N (D+110)

	TGT Obj "A"		TGT Obj "B"		TGT Obj "C"		TGT Obj "D"	
PRI	PREVENT enemy forces from disrupting planned I MEF river crossing of the Blue River in the vicinity of Smallville.		PROTECT III Corps' eastern flank.		PREVENT 6 th ARM Division escape to the north or entering Capitol City.		ISOLATE enemy in the vicinity of Haven in preparation for next phase.	
	7 th Armor, 1 st ID, 11 th Mech, 2 nd ID, 3 rd ID and 9 th Armor		5 th ID		12 th Armor Brigade			
Time	H-6 to H+4		After PL A Crossed		After PL B Crossed		Continuous	
1	FS	MRL (N) FROG (D) Div Arty (N)	FS	MRL (N) FROG (D) Div Arty (N)	MN	HETS (N) Trucks (D) Mech (N) Armor (N)	MN	Mech (N) Armor (N) Mobility (N)
2	MN	Mech (N) Armor (N) Mobility (N)	MN	Mech (N) Armor (N) Mobility (N)	C3I	Corps/Div HQs (N) CSS (N)	FS	MRL (N) FROG (D) Div Arty (N)
3	C3I	Corps/Div HQs (N) RSTA (N) CSS (N) FS (N)	C3I	Corps/Div HQs (N) RSTA (N) CSS (N) FS (N)	CS	POL (N) LOCs (N) Supply Depot (N)	CS	FS (N) Armor (N) LOCs (N)
4	AD	SAM (N) AAA (N)	AD	SAM (N) AAA (N)	FS	MRL (N) FROG (D) Div Arty (N)	AD	SAM (N) AAA (N)
5	CS	FS (N) Armor (N) LOCs (N)	CS	FS (N) Armor (N) LOCs (N)	AD	SAM (N) AAA (N)	C3I	Corps/Div HQs (N) RSTA (N) CSS (N) FS (N)

DESIRED EFFECT: (N) NEUTRALIZE
(D) DESTROY

Table A-1. Example battlespace shaping matrix.

A-2. Attack Guidance Matrix

The AGM provides guidance on what HPTs should be attacked and when and how they should be attacked. The AGM consists of the following elements:

- **HPTL.** The HPTL is a prioritized list of HPTs by phase of the operation.
- **WHEN.** This column indicates the time the target should be engaged.
- **HOW.** This column indicates the fire support system that will engage the target.
- **EFFECT.** This column indicates the desired effects on the target.
- **REMARKS.** This column may include commander's intent for the target. It may also include accuracy or time constrains, required coordination, limitations or amount or type of ammunition, and requirements for BDA.

PHASE/EVENT: Protect III Corps eastern flank				
HPTL	WHEN	HOW	EFFECT	REMARKS
Fire Support	P	GS Artillery	N	Plan in initial prep
Maneuver	I	Aviation	N	
C3I	P	Aviation GS Artillery	D	Plan in initial prep
Air Defense	A	GS Artillery	S	SEAD
Combat Support	A	MLRS	N	

WHEN: (I) IMMEDIATE
(A) AS ACQUIRED
(P) PLANNED

EFFECT: (S) SUPPRESS
(N) NEUTRALIZE
(D) DESTROY
(EW) ELECTRONIC WARFARE

Table A-2. Example attack guidance matrix.

This format is contained in MCRP 3-16A, *Tactics, Techniques, and Procedures for the Targeting Process* (FM 6-20-10).

A-3. Target Selection Standards

TSS are used to determine whether enemy activity is a target or a suspected targets. TSS are developed by the FFCC in conjunction with the G-2. The G-2 use TSS to evaluate enemy activity and pass resulting targets to the FFCC. Fire support personnel use TSS to rapidly identify targets for attack. Commander can develop standard TSS based on anticipated enemy order of battle that can be modified as the situation dictates.

Targets must meet accuracy and timeliness requirements to be considered for attack. Suspected targets must be confirmed before any attack. TSS are based on specific enemy activity and available attack systems. Specific considerations include—

- Attack system target location accuracy requirements (target location error).
- Size of the enemy activity (point or area).
- Status of the activity (moving or stationary).
- Timeliness of the information.

Considering these factors, different TSS may exist for a given enemy activity, based on the fire support system used to attack that activity. TSS address the accuracy of target acquisition systems, associated target location error, and expect dwell time of enemy targets.

The TSS consists of the following elements:

- **HPTL.** This refers to the designated HPTs which the collection manager is tasked to acquire.
- **ATTACK SYSTEM.** The friendly fire support systems available to the commander.
- **TARGET LOCATION ERROR/TIME.** Targets are reported to the FFCC that meet the required target location error and the designated timeliness criteria. Timeliness criteria includes dwell time, target acquisition time, and response time of the attack system.

HPTL	ATTACK SYSTEM	TARGET LOCATION ERROR/TIME
Div Arty	Aviation	500 m/30 min
FROG	MLRS	500 m/ 30 min
RSTA	Artillery	150 m/30 min
SAM/AAA	Artillery	500 m/15 min
Corps/Div HQ	EA	1000 m/3 hrs
CSS/Supply Depots	MLRS	1 km/6 hrs
Mech/Armor	Aviation	300 m/30 min

Table A-3. Example target selection standards.

This format is contained in MCRP 3-16A, *Tactics, Techniques, and Procedures for the Targeting Process* (FM 6-20-10).

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Appendix B

Glossary

Section I Acronyms

Note: Acronyms change over time in response to new operational concepts, capabilities, doctrinal changes, and other similar developments. The following publications are the sole authoritative sources for official military acronyms:

1. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*.
 2. MCRP 5-12C, *Marine Corps Supplement to the Department of Defense Dictionary of Military and Associated Terms*.
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ACE	aviation combat element
AFATDS	Advanced Field Artillery Tactical Data System
AGM	attack guidance matrix
AO	area of operations
ATACMS	Army Tactical Missile System
ATO	air tasking order
BDA	battle damage assessment
BSM	battlespace shaping matrix
C2	command and control
C2PC	Command and Control Personal Computer
CFS	current fires section
COA	course of action
COC	combat operations center
CTAPS	Contingency Theater Automated Planning System
CV	critical vulnerability

D3A	decide, detect, deliver, and assess
DP	decision point
DSM	decision support matrix
DST	decision support template
DSVT	digital subscriber voice terminal
FFC	force fires coordinator
FFCC	force fires coordination center
FSCC	fire support coordination center
FSCM	fire support coordinating measure
FSSG	force service support group
GCCS	Global Command and Control System
GCE	ground combat element
HHQ	higher headquarters
HPT	high-payoff target
HPTL	high-payoff target list
HVT	high-value target
IAS	Intelligence Analysis System
JMCIS	Joint Maritime Command Information System
JOPES	Joint Operation Planning and Execution System
LnO	liaison officer
MAGTF	Marine air-ground task force
MCDP	Marine Corps doctrinal publication
MCPP	Marine Corps Planning System
MEB	Marine expeditionary brigade
MEF	Marine expeditionary force
MLRS	Multiple Launch Rocket System
MOE	measures of effectiveness
MSC	major subordinate command
NAI	named area of interest
NSFS	naval surface fire support
OPT	operational planning team

PDE&A	planning, decision, execution, and assessment
PIREP	pilot report
SA	situational awareness
SCAMP	sensor control and management platoon
SIPRNET	SECRET Internet Protocol Router Network
SOP	standing operating procedures
SPINS	special instructions
SWO	senior watch officer
TAI	targeted area of interest
TCO	Tactical Combat Operations System
TIS	target information section
TSS	target selection standards

Section II Definitions

Note: Definitions of military terms change over time in response to new operational concepts, capabilities, doctrinal changes, and other similar developments. The following publications are the sole authoritative sources for official military definitions of military terms:

1. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*.

2. MCRP 5-12C, *Marine Corps Supplement to the Department of Defense Dictionary of Military and Associated Terms*.

A

advanced field artillery tactical data system—AFATDS is a multi-Service (Army and Marine Corps) fire support software system that runs on the Army's common hardware for the Army battle command system. AFATDS provides the land or amphibious force commander with a robust ability to conduct automatic digital coordination on all land/amphibious fire support requests including ATACMS missions, close air support missions, attack helicopter operations, naval gunfire missions, and mortar/cannon/rocket missions. This coordination allows the commander to automatically prioritize and engage targets in the fastest time possible with positive coordination across the battlespace and have flexibility in using available resources. It also can deconflict fires from other airspace operations. AFATDS prioritizes multiple missions to ensure the most important missions are processed first. It also checks incoming fire missions against FSCMs, airspace coordination measures, and unit boundaries/zones of responsibility. AFATDS notifies the operator and automatically, electronically requests clearance from the unit that established the control measure. That unit must approve or deny the mission before processing continues. (MCRP 3-16B)

air tasking order—A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties/capabilities/forces to targets and specific missions. Normally provides specific instructions to include call signs, targets, controlling agencies, etc., as well as general instructions. Also called **ATO**. (JP 1-02)

B

battle damage assessment—The timely and accurate estimate of damage resulting from the application of military force, either lethal or non-lethal, against a predetermined objective. Battle damage assessment can be applied to the employment of all types of weapon systems (air, ground, naval, and special forces weapon systems) throughout the range of military operations. Battle damage assessment is primarily an intelligence responsibility with required inputs and coordination from the operators. Battle damage assessment is composed of physical damage assessment, functional damage assessment, and target system assessment. Also called **BDA**. (JP 1-02)

C

centers of gravity—Those characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight. (JP 1-02)

combat operations center—The primary operational agency required to control the tactical operations of a command that employs ground and aviation combat, combat support, and combat service support elements or portions thereof. The combat operations center continually monitors, records, and supervises operations in the name of the commander and includes the necessary personnel and communications to do the same. Also called **COC**. (MCRP 5-12C)

command and control—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called **C2**. (JP 1-02)

Command and Control Personal Computer (C2PC)—C2PC is a Windows-based software application designed to facilitate military command and control functions. Used as a stand-alone tool, trained C2PC operators can produce digital overlays and operational graphics for a unit's internal use. When connected to a C4I computer network, complete with a Tactical Database Manager (TDBM), C2PC has the capability of visually

depicting the locations of friendly and enemy units, as well as to transmit doctrinal overlays. (MSTP Pamphlet 6-5)

common operating environment—The common operating environment provides a familiar look, touch, sound, and feel to the commander, no matter where the commander is deployed. Information presentation and command, control, communications, computers, and intelligence system interfaces are maintained consistently from platform to platform, enabling the commander to focus attention on the crisis at hand. Also called **COE**. (JP 1-02)

common operational picture—The common operational picture is the integrated capability to receive, correlate, and display a common tactical picture (CTP), including planning applications and theater-generated overlays/projections (i.e., Meteorological and Oceanographic (METOC), battle plans, force position projections). Overlays and projections may include location of friendly, hostile, and neutral units, assets, and reference points. The COP may include information relevant to the tactical and strategic level of command. This includes, but is not limited to, any geographically oriented data, planning data from JOPEs, readiness data from SORTS, intelligence (including imagery overlays), reconnaissance data from the Global Reconnaissance Information System (GRIS), weather from METOC, predictions of nuclear, biological, and chemical (NBC) fallout, and air tasking order (ATO) data. (CJCSI 3151.01)

common tactical picture—The common tactical picture (CTP) is derived from the CTD and other sources and refers to the current depiction of the battlespace for a single operation within a CINC's AOR including current, anticipated or projected, and planned disposition of hostile, neutral, and friendly forces as they pertain to US and multinational operations ranging from peacetime through crisis and war. The CTP includes force location, real time and non-real-time sensor information, and amplifying information such as METOC, SORTS, and JOPEs. (CJCSI 3151.01)

Contingency Theater Automated Planning System—CTAPS is a joint force level computerized command and control backbone system currently implemented by the USAF, USN, and USMC. It consists of common, modular, deployable communications-computer equipment and software applications. CTAPS is designed to interface the joint air operations center, air support operations centers, and control and reporting centers, and connect functional areas within these centers using a local area network.

CTAPS provides automated data exchange; processing and display capabilities for friendly and enemy combat information; support to ATO planning, generation and dissemination; mission execution monitoring; and, mission reporting/assessment. (MCRP 3-16B)

course of action—1. A plan that would accomplish, or is related to, the accomplishment of a mission. 2. The scheme adopted to accomplish a task or mission. It is a product of the Joint Operation Planning and Execution System concept development phase. The supported commander will include a recommended course of action in the commander's estimate. The recommended course of action will include the concept of operations, evaluation of supportability estimates of supporting organizations, and an integrated time-phased data base of combat, combat support, and combat service support forces and sustainment. Refinement of this data base will be contingent on the time available for course of action development. When approved, the course of action becomes the basis for the development of an operation plan or operation order. Also called **COA**. (JP 1-02)

critical vulnerability—An aspect of a center of gravity that if exploited will do the most significant damage to an adversary's ability to resist. A vulnerability cannot be critical unless it undermines a key strength. Also called **CV**. (MCRP 5-12C)

G

Global Command and Control System—Highly mobile, deployable command and control system supporting forces for joint and multinational operations across the range of military operations, any time and anywhere in the world with compatible, interoperable, and integrated command, control, communications, computers, and intelligence systems. Also called **GCCS**. (JP 1-02)

H

high-payoff target—A target whose loss to the enemy will significantly contribute to the success of the friendly course of action. High-payoff targets are those high-value targets, identified through wargaming, which must be acquired and successfully attacked for the success of the friendly commander's mission. Also called **HPT**. (JP 1-02)

high-value target—A target the enemy commander requires for the successful completion of the mission. The loss of high-value targets would be expected to seriously degrade important enemy functions throughout the friendly commander's area of interest. Also called **HVT**. (JP 1-02)

I

Intelligence Analysis System—The intelligence analysis system automates the intelligence activities of direction, collection, processing, production and dissemination of critical tactical intelligence from embedded databases and multiple sources. IAS is interoperable with other intelligence systems such as the Navy Tactical Command System-Afloat, Joint Deployable Intelligence Support System, and all MAGTF intelligence systems to ensure a common intelligence picture of the battlefield during planning and direction. The IAS configuration also provides administrative support through the use of commercial off-the-shelf word processing, graphics, spreadsheet, and data base management programs. These software applications provide the required automated support for planning and direction. (MSTP Pamphlet 6-7)

J

Joint Maritime Command Information System—The foundation for the GCCS fused operational battlespace picture. Using a core service known as Unified Build, JMCIS provides geographic display, contact correlation, and track database management, displaying near real time ground, sea, and air tracks. This served as the basis for the original GCCS COE, which has evolved into the DII COE. (MCWP 6-22)

Joint Operation Planning and Execution System—A continuously evolving system that is being developed through the integration and enhancement of earlier planning and execution systems: Joint Operation Planning System and Joint Deployment System. It provides the foundation for conventional command and control by national- and theater-level commanders and their staffs. It is designed to satisfy their information needs in the conduct of joint planning and operations. JOPES includes joint operation planning policies, procedures, and reporting structures supported by communications and automated data processing systems. JOPES is used to monitor, plan, and execute mobilization, deployment, employment, and sustainment activities associated with joint operations. Also called **JOPES**. (JP 1-02)

O

operational planning team—A group built around the future operations section which integrates the staff representatives and resources. The operational planning team may have representatives or augmentation from each of the standard staff sections, the six warfighting functions, staff liaisons, and/or subject matter experts. Also called **OPT**. (MCRP 5-12C)

S

SECRET Internet Protocol Router Network—Worldwide SECRET level packet switch network that uses high-speed internet protocol routers and high-capacity Defense Information Systems Network circuitry. Also called **SIPRNET**. (JP 1-02)

T

Tactical Combat Operations System—TCO consists of computer workstations operating at the secret level on multiple LANs interconnected on the SIPRNET through MAGTF communications networks. TCO components include the MCHS terminals, the tactical communications interface module (TCIM) for radio interface, and LAN equipment. Using the C2PC application, TCO provides an automated capability to process battlefield information. It provides timely information to help commanders and their staffs conduct operations planning and make decisions. TCO supports the operations sections of all FMF units of battalion/squadron size and larger as well as planning sections at higher echelons. (MCWP 6-22)

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Appendix C

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