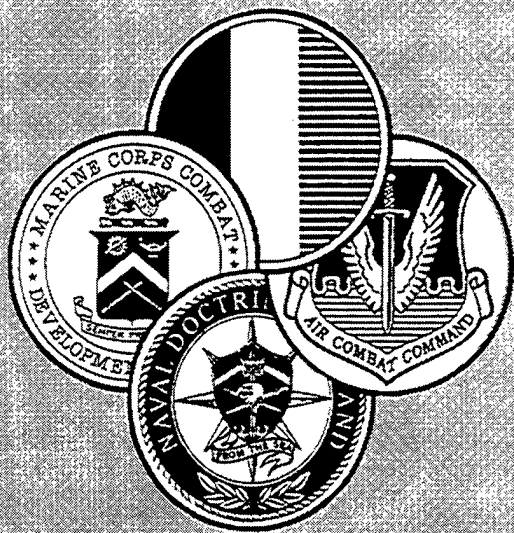


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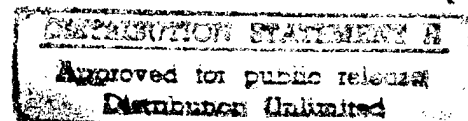
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TARGETING

**THE JOINT TARGETING PROCESS
AND
PROCEDURES FOR TARGETING
TIME-CRITICAL TARGETS**

FM 90-36
MCRP 3-1.6.X
NWP TP 3-60
ACCPAM 10-751
PACAFPM 10-751
USAFEPAM 10-751

MAY 1996



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DECLASSIFIED AND UNCLASSIFIED

MULTISERVICE TACTICS, TECHNIQUES, AND PROCEDURES

FINAL SIGNATURE DRAFT



FOREWORD

This publication has been prepared under our direction for use by our respective commands and other commands as appropriate.

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ACCPAM 10-751 / PACAFPAM 10-751 / USAFEPAM 10-751

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PREFACE

SCOPE

This publication describes the joint targeting process and provides tactics, techniques, and procedures for targeting surface (land or sea) time-critical targets (TCTs). It describes specific procedures for joint force components in the coordination, deconfliction, and synchronization of rapid targeting and attacks in a joint environment. Though not prescriptive, this publication recommends procedures when multiple components have the capability to locate, identify, track, attack, and evaluate targets in overlapping areas of responsibility. The overall objective of this publication is to provide the joint force commander (JFC) and staff tactics, techniques, and procedures (TTP) to destroy surface TCTs and coordinate, deconflict, and synchronize the entire joint effort. By doing so, the JFC can minimize duplication of effort and the potential for fratricide while accomplishing the objective of rapid response.

PURPOSE

This publication has been prepared under the direction of the Commander, US Army Training and Doctrine Command (TRADOC); Commanding General, Marine Corps Combat Development Command (MCCDC); Commander, Naval Doctrine Command (NDC); and Commander, Air Combat Command (ACC). It sets forth multiservice TTP to guide the activities and performance of their commands when conducting joint, multinational, and interagency operations. It provides guidance for geographic combatant commanders, JFCs, and their staffs. It is not the intent of this

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1 publication to restrict the authority of the JFC from organizing the force and executing
2 the mission in a manner the JFC deems most appropriate to ensure unity of effort in the
3 accomplishment of the overall mission. This publication augments and complements
4 existing joint doctrine and joint TTP by providing additional operational warfighting
5 procedures, guidance, and information. However, it is not intended for this publication
6 to supplant any higher joint or combatant command directives.

8 APPLICATION

9 This publication provides JFCs and their operational staff an unclassified, "on the
10 shelf" guidance for the joint targeting process and surface TCT targeting operations.
11 Planners can use this publication to coordinate, deconflict, and synchronize targeting
12 operations among components assigned to a joint force. Accordingly, this document
13 serves as a cornerstone for planners to build and execute coordinated and integrated
14 joint operations. Also, it will assist component training efforts when tasked to support
15 multiple theaters. Finally, this publication provides a perspective on how other
16 components define their service targeting process.

17 This publication is approved for use by the United States Army, Marine Corps,
18 Navy, and Combat Air Forces.

IMPLEMENTATION PLAN

Participating service command offices of primary responsibility (OPRs) will review this publication, validate the information, and reference and incorporate it in service and command manuals, regulations, and curricula as follows:

ARMY

The Army will incorporate the procedures in this publication in US Army doctrinal and training publications as directed by the Commander, US Army Training and Doctrine Command. Distribution is in accordance with DA Form 12-11E.

MARINE CORPS

The Marine Corps will incorporate the procedures in this publication in US Marine Corps doctrinal and training publications as directed by the commanding general, US Marine Corps Combat Development Command. Distribution is in accordance with the Marine Corps Publication Distribution System (MCPDS) and supplementing MCCDC directives.

NAVY

The Navy will incorporate these procedures in US Naval doctrinal and training publications as directed by the Commander, US Naval Doctrine Command. Distribution is in accordance with MILSTRIP Desk Guide and NAVSOP Pub 409.

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8 This publication reflects current joint / service doctrine and TTP, command and
9 control organizations, facilities, and responsibilities. Changes in service protocol,
10 appropriately reflected in joint, multiservice, and service publications, will likewise be
11 incorporated in revisions to this document.
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1		FM 90-36
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31 May 1996

TARGETING

THE JOINT TARGETING PROCESS AND PROCEDURES FOR TARGETING TIME-CRITICAL TARGETS

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EXECUTIVE SUMMARY

COMMANDER'S OVERVIEW

GENERAL

Joint force commanders (JFCs) require common joint targeting procedures to deconflict targeting operations, prevent duplication of effort, and reduce the potential for fratricide throughout the fluid, dynamic battlespace. This is especially true when joint force components have areas of operations that potentially overlap, as well as mutual interests and capabilities to strike targets of common interest. The JFC or component commander may designate these targets as time-critical, priority targets. Each component has the ability to view the battlespace with a multitude of surveillance and reconnaissance assets (organic, joint, and national). However, complicating this problem is the fact that components lack common targeting references for the battlespace. Few common targeting reference systems exist which ensure all targets possess discrete reference numbers universally recognized by all joint force components. One such system is the Basic Encyclopedia (BE) number system. Although this system is normally limited to fixed targets, BE numbers can be modified for mobile targets. Some theaters have used locally produced BE numbers for tracking such targets. However, presently, there is no standardized joint procedure to do this. The National Military Target Intelligence Committee (MTIC) is currently working solutions to standardize such procedures and developing concepts for universal common target numbers (CTN). But until those concepts are approved, the JFC

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1 presently has no common joint system for mobile targets. Instead, individual
2 component numbering systems dominate the environment and are not translatable from
3 one component to another. Further complicating this problem is the fact that although
4 current component systems are robust and continue to grow rapidly, they are
5 considerably "stovepiped" and not interoperable. Currently, the components cannot
6 rapidly share common targeting information between one another. Future systems
7 (such as the Contingency Theater Automated Planning System {CTAPS} linked with the
8 Advanced Field Artillery Tactical Data System {AFATDS}) could correlate individual
9 component target numbers and communicate them simultaneously to all components.
10 Those future systems, combined with joint force targeting procedures, will facilitate
11 effective and efficient use of all attack assets.

12 Joint doctrine addresses the need for target coordination, deconfliction, and
13 synchronization between components. Unfortunately, it does not adequately explain
14 "how" to rapidly conduct this coordination. Likewise, joint TTP does not specifically
15 outline joint targeting procedures. Instead, it defines overall concepts without
16 delineating TTP. As a result, each combatant commander has developed procedures
17 that are theater dependent targeting processes. As an example, the procedures
18 governing joint targeting coordination boards (JTCBs) and guidance, apportionment,
19 and targeting cells (GATs) vary from theater to theater. While this may work for
20 permanently assigned CINC forces, it requires non-assigned units to adapt
21 considerably to theater specific procedures. Augmentees adapting to theater / CINC

1 specific procedures will spend time adapting to theater unique coordination processes
2 prior to executing time-critical missions.

3 Components must understand the joint targeting process to fulfill the JFC's intent
4 and objectives. Effective coordination, deconfliction, and synchronization maximize
5 force against the enemy while reducing the potential for fratricide. Components must
6 have effective joint targeting procedures that ensures:

- 7 • Compliance with JFC guidance and objectives
- 8 • Coordination, synchronization and deconfliction of attacks
- 9 • Rapid response to surface TCTs
- 10 • Prevention of fratricide
- 11 • Minimal duplication of effort
- 12 • Control of taskings for mutually accessible targets
- 13 • Expeditious combat assessment
- 14 • A common perspective of all targeting efforts

15 Each component must understand the perspective and target priorities of other
16 component targeting efforts throughout the campaign. Component targets may not
17 necessarily be joint targets, and therefore coordination requirements may seem
18 minimal. However, there may be situations where component organic weapons may be
19 easily available, yet not the most capable. In such cases, coordination with other
20 components may allow more efficient destruction of the target through the synchronized
21 use of other available assets. In almost every situation, if component attacks affect the
22 operations of another component, coordination, synchronization, and deconfliction must

1 occur. The only exception would be those rare instances identified by the JFC where
2 overriding concerns (such as theater ballistic missiles {TBMs} equipped with weapons
3 of mass destruction) warrant bypassing normal coordination to affect immediate
4 response. The JFC should make such exceptions only after balancing the threat with
5 the potential for fratricide.

6 This publication first explains the fundamentals of the joint targeting process and
7 intelligence support to that process. Then, it addresses the coordination, deconfliction,
8 and synchronization of attacks against surface time-critical targets. The connection is
9 that the joint targeting process and its intelligence support serve as the foundation for
10 the surface TCT targeting procedures described herein.

11 12 **The Joint Targeting Process**

13 Joint targeting fundamentals are the functions, steps, and actions accomplished
14 when conducting joint targeting operations. Joint targeting fundamentals include the
15 definition of a target, the explanation of what joint targeting is as a whole, and the
16 description of the joint targeting process. Joint Publication 1-02 succinctly describes a
17 target as a geographical area, complex, or installation planned for capture or
18 destruction by military forces. However, targets also include the wide array of mobile
19 and stationary forces, equipment, capabilities, and functions that an enemy commander
20 can use to conduct operations. Joint targeting is selecting targets and matching the
21 appropriate response to them to meet a specified objective. The joint targeting process
22 has six basic phases / functions: COMMANDER'S OBJECTIVES AND GUIDANCE,

1 TARGET DEVELOPMENT, WEAPONNEERING ASSESSMENT, FORCE APPLICATION
2 PLANNING, EXECUTION PLANNING/FORCE EXECUTION, and COMBAT
3 ASSESSMENT.¹ Although commonly referred to as a "cycle," the joint targeting
4 process is really a continuous process of overlapping functions independent of a
5 particular sequence. Joint targeting significantly affects the theater campaign as the
6 JFC must synchronize targeting efforts throughout the joint force to ensure the effective
7 accomplishment of theater campaign objectives. Further complicating this is the fact
8 that targeting occurs at all levels within a joint force by all forces capable of attacking
9 targets. It must therefore be deconflicted, coordinated, and prioritized among
10 components to ensure success.

11 Organizing for the joint targeting process is extremely dependent on the situation.
12 JFCs may establish and task an organization within their staffs to accomplish broad
13 targeting oversight functions or may delegate this responsibility to a subordinate
14 commander.² The JFC may assign certain responsibilities associated with targeting to
15 agencies on the staff. In addition, the JFC may appoint a JTCB. The JFC defines the
16 role of the JTCB.³ JTCB responsibilities and authority are defined by JFC directives
17 and should ensure fulfillment of JFC objectives and intent with respect to targeting.
18 Most importantly, the JFC should direct measures to coordinate joint targeting efforts
19 among components. Regardless of how the JFC establishes procedures for joint
20 targeting operations, the procedures must follow the basic principles of the joint

¹ Jt Pub 3-56.1, *Command and Control for Joint Air Operations*, page IV-1

² Jt Pub 3-0, *Doctrine for Joint Operations*, page III-26

³ Ibid

1 targeting process and be flexible enough to respond to rapidly changing situations in
2 the fast tempo of modern warfare.

4 **Surface Time-Critical Targets (TCTs)**

5 A surface TCT is a lucrative, fleeting, land or sea target of such high priority to
6 friendly forces that the JFC or component commander designates it as requiring
7 immediate response. Surface TCTs require such immediate response because they
8 pose, or will pose, a significant threat capable of inflicting casualties on friendly forces
9 and civilians. Surface TCTs, left unserved, could significantly delay achievement of
10 the JFC's theater objectives. Surface TCTs are often characterized as lucrative,
11 fleeting targets. Surface TCTs can either be *planned* or *immediate*, requiring rapid
12 response by the joint force. Targets of opportunity (TOOs) are similar to surface TCTs
13 (that is, lucrative or fleeting) but they may or may not have been designated a high
14 priority by the JFC or component commander. For example, an exposed, moving
15 enemy command vehicle, spotted by a passing friendly aircraft, could be defined as a
16 target of opportunity. Although the opportunity to attack it is fleeting, it is not
17 technically a surface TCT unless the JFC or component commander has designated
18 enemy command vehicles as high priority targets. The distinction is a small, but
19 important one. The key is JFC / component commander designation as a priority.
20 Otherwise, the joint force could not distinguish between TOOs and surface TCTs.

21 Procedures and techniques assist the joint force in the conduct of warfare,
22 especially in regard to surface TCTs. Procedures dealing with surface TCTs include

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1 JFC guidance, joint battlespace control and coordination measures, “grid box” and
2 “bullseye” techniques, and weapon specific procedures. Additionally, the JFC must
3 structure command and control as well as interconnect battle management systems to
4 ensure optimum conditions for successful operations against surface TCTs.

6 **Summary**

7 The primary goal of joint targeting is to provide the most efficient use of joint
8 force assets and capitalize on their synergistic effects. Eliminating duplication of effort
9 and fratricide is an important part of that efficiency. Likewise, eliminating the fog of war
10 is critical to meeting the fratricide challenge while increasing a joint force’s operational
11 tempo. The JFC must ensure effective and efficient attacks against high priority
12 surface TCTs, as well as exercise due caution to avoid fratricide and duplication of
13 effort. Regardless of the threat, a joint force must be able to rapidly execute lethal and
14 non-lethal attacks against surface TCTs using the synergistic power that components
15 contribute; all the while considering that when components work together, they each
16 have responsibilities (functional and / or area) that may intersect. Each must depend
17 on and leverage the capabilities of the others to be decisive in battle. Application of
18 these capabilities is enhanced through clear, concise joint targeting procedures
19 allowing the JFC and components to rapidly coordinate information, deconflict
20 operations, and synchronize attacks. Common target numbers, reference systems, and
21 common pictures of the battlespace are developing technologies that will support joint

targeting procedures in the future. This multiservice TTP offers a procedural fix until those capabilities fully evolve.

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Chapter I

The Joint Targeting Process

"It is not the object of war to annihilate those who have given provocation for it, but to cause them to mend their ways."

- Polybius
Histories (2nd century B.C.)

1. What is a target?

A target is a geographical area, complex, or installation planned for capture or destruction by military forces.¹ Targets include the wide array of mobile and stationary forces, equipment, capabilities, and functions that an enemy commander can use to conduct operations at any level--strategic, operational, or tactical. Targets fall into two general categories, planned and immediate (Fig I-1).

¹ Jt Pub 1-02, *DoD Dictionary of Military and Associated Terms*, page 364

PLANNED TARGETS (KNOWN)		IMMEDIATE TARGETS	
		UNPLANNED TARGETS (KNOWN)	UNANTICIPATED TARGETS (UNKNOWN)
SCHEDULED	ON-CALL		

Fig I-1, General Target Categories and Subcategories

Planned targets are those which are known to exist in an operational area and against which fire or attacks have been scheduled in advance or on-call. Examples range from targets on joint target lists (JTLs) in applicable campaign plans, to targets detected in sufficient time to list in the air tasking order (ATO) or fire support plans. **Immediate targets** are those which fire or attacks have not been scheduled and normally detected to late to be included in the normal targeting cycle. Immediate targets have two subcategories: unplanned or unanticipated. **Unplanned immediate targets** are those which are *known* to exist in an operational area but not detected or located in sufficient time. **Unanticipated immediate targets** are those that are *unknown* or *unexpected* to exist in an operational area. See Chapter II for further discussion of planned and immediate targets in relation to surface time-critical targets (TCTs) and targets of opportunity (TOOs).

2. What is Targeting?

Targeting is the process of selecting targets and matching the appropriate response to them taking into account operational requirements and capabilities.² Targeting occurs at all levels of command within a joint force and is performed at all levels by forces capable of delivering fires, or attacking targets with both lethal and nonlethal disruptive and destructive means.³ Targeting is a function shared by both operations and intelligence. However, the requirement to deconflict duplicative efforts of different echelons within the same force and to synchronize the attack of those targets with other components of the joint force complicates the targeting process. Therefore, an effective and efficient joint targeting process is essential for the JFC and components to plan and execute operations.

3. What is the Joint Targeting Process?

The joint targeting process determines the employment of military force to achieve a desired objective. It integrates capabilities of national assets, geographic combatant commands (that is, unified combatant command), subordinate joint force, multinational, and component commands, all of which possess varying capabilities and requirements. The joint targeting process is described as a "cyclical process"⁴ with sequential *phases*. However, the joint targeting process is really a continuously operating series of closely related, interacting, and interdependent *functions*.

² Jt Pub 3-0, *Doctrine for Joint Operations*, page III-25

³ Jt Pub 3-0, page III-25

⁴ Jt Pub 3-0, page III-26

1 The six functions / phases are:

2 COMMANDER'S OBJECTIVES AND GUIDANCE

3 TARGET DEVELOPMENT

4 WEAPONEERING ASSESSMENT

5 FORCE APPLICATION

6 EXECUTION PLANNING / FORCE EXECUTION

7 COMBAT ASSESSMENT (CA)

8 Joint targeting is not a static, inflexible process, but rather a dynamic process that must
9 be fluidly applied. Each function / phase of the process can directly affect other
10 functions / phases of the process without regard to any specific order. For example,
11 CA directly affects subsequent force application if mission results prove inadequate.
12 Likewise, WEAPONEERING ASSESSMENT directly affects EXECUTION as weapons
13 will drive execution tactics. In addition, specific timelines do not constrain the joint
14 targeting process. Depending on the situation, the entire process can last from a few
15 minutes (as in the case of a theater missile defense {TMD} scenario), to several days
16 (such as in the development of an initial JTL for a CINC's campaign plan for a major
17 operation), to several months (as in the development of the Single Integrated
18 Operations Plan {SIOP}). Figure I-2 depicts the six basic functions of the joint targeting
19 process which applies universally to each component of a joint force.

20

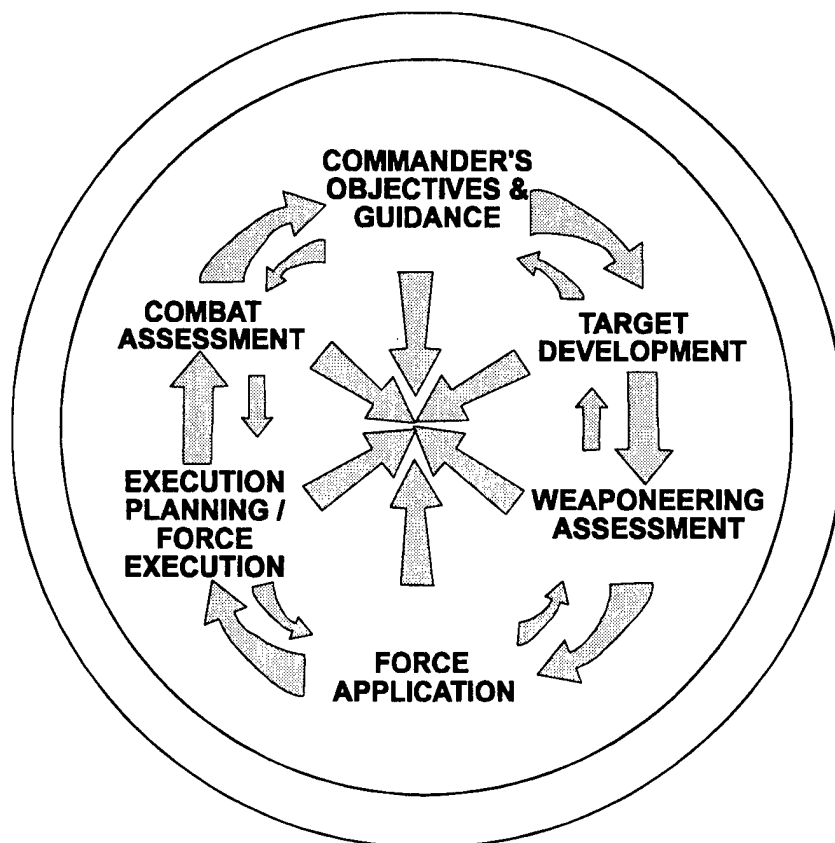


Fig I-2, The Joint Targeting Process

Equally important to understand, however, is that Army and Marine Corps service doctrine traditionally define the targeting process as having four steps:

DECIDE--DETECT--DELIVER--ASSESS (D3A)

At first glance, when compared to the joint targeting process, the Army / Marine Corps service targeting process appears quite different. However, although labeled with different terms, the Army / Marine Corps service targeting process incorporates the same fundamental functions as the joint targeting process (see Fig I-3)

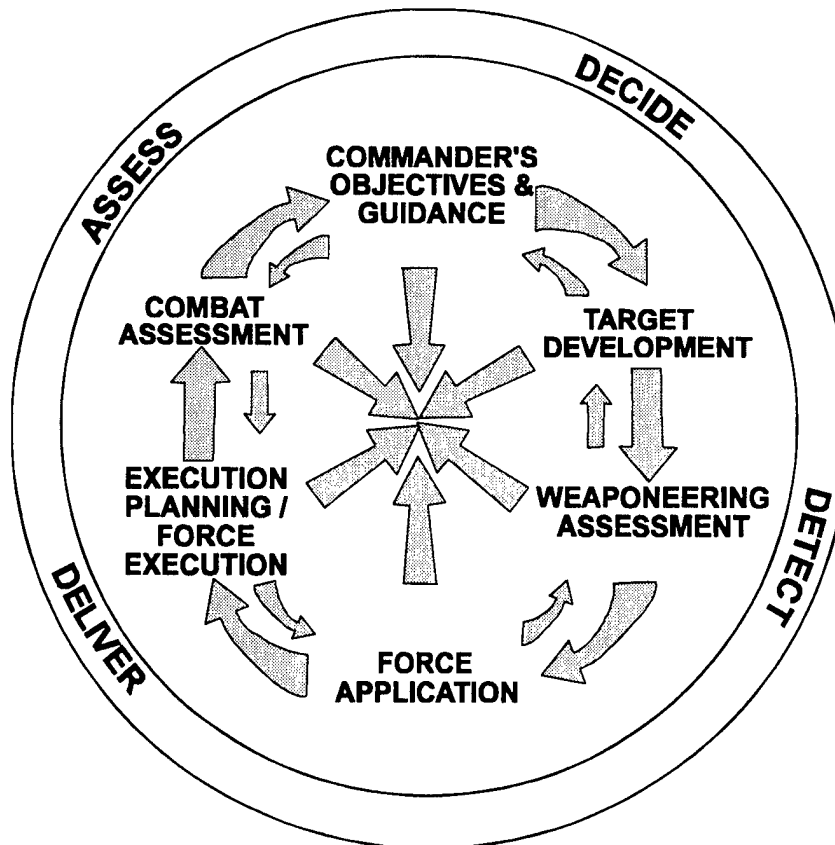


Fig I-3, The Army / Marine Corps Targeting Process
overlaid onto the Joint Targeting Process

The functions of the Army / Marine Corps targeting process can be easily translated to the functions of the joint targeting process. Note that D3A functions flow fluidly across the six functions of the joint targeting process. (NOTE: In some cases, the functions of D3A may also overlap. For further information on D3A, see FM 6-20-10 / MCRP 3-1.6.14, *TTP for The Targeting Process*). Although components may not desire to eliminate or replace service unique doctrinal definitions for their targeting process, there must be a common joint targeting lexicon to eliminate confusion and provide a common perspective. D3A, once translated into the joint targeting process, supports this common lexicon and universally recognized "joint language".

4. Commander's Objectives And Guidance.

Targeting responds to the objectives and guidance that originate at the national level as broad concepts. **Objectives** are the desired position or purpose. Starting at the national level as broadly defined statements, objectives become more specific and dynamic as commanders interpret and translate them into specific plans of action. **Guidance** provides the framework for employing forces to achieve the objectives. Joint force commanders (JFCs) refine national guidance and provide commander's intent, guidance, and clear, measurable, attainable objectives that become specific plans of action. JFCs establish broad planning objectives and guidance for attack of enemy strategic and operational centers of gravity and interdiction of enemy forces as an integral part of joint campaigns and major operations.⁵ Targeting matches objectives with inputs from intelligence, operations, and other functional areas (such as logistics and communications), to identify the forces available and necessary to accomplish the mission.

- a. The National Command Authorities (NCA) communicate national security objectives through the Chairman, Joint Chiefs of Staff (CJCS) to the geographic combatant commander (Unified CINC) as broad campaign objectives. The Unified CINC translates the national guidance and provides clear, measurable, and attainable objectives to established JFCs and component commanders.

⁵ Jt Pub, 3-0, page III-25

(NOTE: In some cases, the Unified CINC and JFC are one in the same. For the purpose of this publication, the term JFC will be used to represent the commander of any joint force.) Part of the objectives includes the articulation of damage levels and states desired for a specific period of operations. The more specific and measurable the objectives, the greater the likelihood that joint force planning staffs and executing component forces will achieve an economy of force that will enable the most effective use of assets against the enemy. The objectives and guidance are shaped by the principles of war, the Laws of Armed Conflict (LOAC), and established rules of engagement (ROE).

b. Intelligence preparation of the battlespace (IPB) provides the JFC a specific context to further specify objectives and guidance. IPB is a systematic, continuous process of analyzing the threat and environment in a specific geographic area. Included in the production of IPB is the detailed analysis of all available operational and intelligence information, to include the enemy situation, capabilities, strengths, composition, disposition, and locations. IPB also addresses possible courses of action, enemy perception of friendly vulnerabilities, and enemy operational sustainment capabilities.

c. With the advice of the component commanders, the JFC sets priorities, provides targeting guidance, and determines the weight of effort for various operations. Subordinate commanders recommend to the JFC how to use their combat power most effectively to achieve the JFC's objectives. Weight of effort

1 for any aspect of joint targeting may be expressed in terms of percentage of total
2 available resources, priorities for resources used with respect to the other
3 aspects of the theater campaign, or as otherwise determined by the JFC.⁶
4

5 d. The JFC consults often with the component commanders to assess the
6 results of the warfighting effort and to discuss the direction and future plans.

7 This provides component commanders an opportunity to introduce
8 recommendations, state support requirements, and provide their ability to
9 support other components.
10

11 e. The JFC's objectives and guidance identifies targeting priorities, planning
12 guidance, and procedures. For example, the JFC states guidance in the air
13 apportionment decision. See Jt Pub 3-56.1, *Command and Control for Joint Air*
14 *Operations*, for more information on air apportionment.
15

16 **5. Target Development.**

17 This part of the process is the systematic evaluation of potential target systems,
18 individual targets, and the elements of each target. Targets are systematically
19 evaluated for military, economic and political importance. Target development closely
20 examines enemy doctrine and order of battle as well as takes into account operational
21 concerns such as friendly schemes of maneuver, assets available, and battlespace

⁶ Jt Pub 3-0, page III-26

1 geometry/management. Identification of centers of gravity (COGs), such as key target
2 systems and their critical nodes, is an essential part of this process. Personnel tasked
3 to perform target development must identify and analyze key target systems relevant to
4 the JFC's changing objectives and guidance. Target validation, collection, and target
5 list prioritization also occur during this phase. Target development is an objective
6 analysis conducted independently of munitions or platform availability.

7
8 a. Target development has several steps:

9
10 (1). Establish information requirements

11
12 (2). Identify of potential target systems

13
14 (3). Identify of critical nodes and their activities and functions

15
16 (4). Develop target system models & utility measures

17
18 (5). Validate of targets and "No-Hit" lists.

19
20 (6). Define production requirements

21
22 b. Target development inputs are:

1
2 (1). Operation Plan Joint Target List Annex (OPLAN JTL). For a given
3 operational area, the OPLAN JTL Annex constitutes a target baseline.
4 OPLAN JTLs are subsets of the military national intelligence integrated
5 data base / integrated data base (MIIDS/IDB) modified to meet joint force
6 requirements in various regions throughout the world. The OPLAN JTL is
7 a "dynamic" database. During peacetime, the unified command J2
8 modifies this database via inputs from both national agencies as well as
9 assigned component forces.

10
11 (2). Battlespace Geometry Management. Assessment of battlespace
12 geometry allows intelligence planners to accurately develop targets based
13 on regional and geographic characteristics.

14
15 (3). All source national agency support

16
17 (4). Enemy Orders of Battle (EOB)

18
19 (5). Enemy military capability studies

20
21 (6). Current intelligence assessments

22 (7). Component target nominations

1
2 (8). JTCB inputs (if established)
3

4 (9). Existing basic encyclopedia (BE) numbered targets
5

6 c. Target development outputs are:
7

8 (1). **JTL.** In wartime, the OPLAN JTL annex is updated and serves as an
9 initial list of campaign targets. The JTL is the master target list that
10 supports the JFC's objectives, guidance, intent, and courses of action.
11 Also, it normally lists high-value targets (HVTs), which are later
12 incorporated as high-payoff target (HPT) nominations during component
13 wargaming.
14

15 (a). The JTL is normally constructed by the unified command with
16 support from components and with inputs from the Joint Staff and
17 other national agencies.⁷ Component commanders will identify
18 and select fixed and mobile targets that meet the JFC's
19 objectives/guidance and submit them for inclusion in the JTL.
20 Each component develops such targets to support its own
21 assigned mission.

⁷ Jt Pub 3-56.1, *Command and Control for Joint Air Operations*, page IV-8

1
2 (b). The JTL is not a prioritized list of targets, but contains
3 prioritized target categories (command and control, airfields, lines
4 of communications, and others as appropriate) listing specific
5 targets.⁸ The JFC should prioritize the JTL target categories
6 according to the campaign plan and focus the intelligence / target
7 material production effort. Upon direction of the JFC, the JTL is
8 updated daily or as required via target information reports
9 (TGTINFOREP) messages from components. Maintenance of the
10 JTL may be conducted by the JFC's staff or as directed by the JFC
11 (e.g. JTCCB).⁹
12

13 (2). **Joint Integrated Prioritized Target List (JIPTL).** Joint doctrine
14 allows for the use of a JIPTL for prioritizing specific targets. (Note: In
15 Combined Forces Command, ROK, this list is designated the single
16 prioritized integrated target list {SPITL}). The JIPTL is a JFC level product
17 usually produced by the joint force air component commander (JFACC).
18 Prioritization refers to a target's relative importance and significance
19 within a specific target system and to other targets. Prioritization does not
20 necessarily denote operational sequencing. See Jt Pub 2-01.1, *JTTP for*

⁸ Jt Pub 3-56.1, page IV-8

⁹ Ibid

1 *Intelligence Support to Targeting*, and Jt Pub 3-56.1, *Command and*
2 *Control for Joint Air Operations*, for additional information on the JIPTL.

3
4 (3). Inputs to Intelligence collection plan

5
6 (4). Restricted targets lists (targets not to be struck due to ROE, LOAC,
7 or exploitation requirements)

8
9 (5). IPB event template

10
11 (6). Established Target Selection Standards (TSS). TSS are criteria,
12 applied to enemy activity (acquisitions and battlefield information), used in
13 deciding whether the activity is a target. TSS break nominations into two
14 categories: targets and suspected targets. Targets meet accuracy and
15 timeliness requirements for attack. Suspected targets must be confirmed
16 before any attack.

17
18 (7). Target information. Generally, target information consists of:

19
20 (a). General location (area)

1

2

(b). Target type (category)

3

4

(c). Common target number (CTN), if available

5

6

(d). Specific location

7

8

(e). Disposition

9

10

(f). Disposition size

11

12

(g). Target velocity and direction

13

14

(h). Surveyed target data

15

16

(i). Target identification specifics

17

18

(j). Unit identification

19

20

d. The J2 supports target development with resources of the theater Joint

21

Intelligence Center (JIC) at the geographic combatant command level, or the

22

Joint Intelligence Support Element (JISE), at the subordinate joint task force

23

(JTF) level. Component intelligence assets and intelligence organizations,

1 along with augmentation from national intelligence agencies, also contribute.

2 The theater JIC provides the coordination of intelligence resources, reporting,
3 and services to support the tactical commanders.

4 5 **6. Waponeering Assessment**

6 The purpose of the waponeering assessment phase is to provide various force
7 application options for each target based upon desired results. The process depends
8 on detailed intelligence analysis of target construction and vulnerabilities combined
9 with operational assessments of weapons effects and delivery parameters.

10 Waponeering assessment determines the quantity, type, and mix of lethal and
11 nonlethal weapons required to produce a desired effect. It is an analysis of the best
12 weapon combination for economy of force (that is, the best "bang for the buck").

13 Timeliness is also a critical factor in waponeering decisions. The short dwell nature of
14 TCTs requires the timely availability of an attack asset be an important factor in
15 weapons selection.

16
17 a. Using the JTL from the target development phase, intelligence planners
18 conduct detailed analysis of target construction, system analysis, and
19 interconnectivity with other systems to reveal key vulnerabilities. Intelligence
20 planners also provide an analysis of threat systems associated with each target
21 to identify significant risks. Operational planners fuse the target and threat
22 analysis with joint munitions effectiveness data manual (JMEM) data and other

1 non-lethal effects in order to assess expected results. If desired destruction
2 criteria will be met, and other factors are favorable (such as weapons and
3 delivery system availability), a variety of options with weapons recommendations
4 are assigned to targets on the JTL. Recommendations will prescribe the
5 amount and type of ordnance as well as the number and type of delivery
6 parameters to achieve desired effects.

7
8 (1). Lethal force weaponeering parameters include target vulnerability,
9 weapons effects, aimpoint selection, delivery errors, weather, damage
10 criteria, and weapon reliability.

11
12 (2). Nonlethal force weaponeering assessment is the assessment of the
13 ability of friendly systems to observe activity, deceive, jam, affect (as in
14 psychological operations {PSYOP}), disrupt, or deny access to critical
15 friendly targets. Nonlethal weaponeering is a significant part of command
16 and control (C2) attack analysis conducted by the joint force command
17 and control warfare (C2W) cell. The C2W cell performs non-lethal
18 targeting and weaponeering (effects and means) analysis to identify and
19 match adversary C2 targets to friendly C2W and operational objectives.

20 b. Weaponeering assessment is not a prediction of results, but a statistical
21 probability of weapons effects. It includes the detailed study and refinement of

1 aimpoints, fuze delays, impact angles and velocities, weapons trajectories,
2 number and type of weapons for employment (both air-to-surface and surface-to-
3 surface), and recommended damage criteria. Depending on the assets of the
4 component attacking the target, the nature of the target, and the time available
5 to engage the target, weapons / munitions selection procedures can vary. In
6 some cases very deliberate procedures can be used to weaponeer attack
7 assets. In other cases, quick (often computer assisted) decisions must be made
8 as to what attack assets will be employed. However, requisite assumptions in
9 the prediction process may or may not match actual operational conditions, as
10 variations in actual force employment may cause the results to vary greatly.
11 This depends on the type of target, type of weapon, delivery system, weather,
12 threat, and range to the target. The result in weaponeering assessment is a
13 probability of damage against the designated target and the recommended
14 weapons or weapons systems required to achieve the required level of damage.

16 **7. Force Application**

17 Force application is the selection of lethal or nonlethal forces for the mission. It
18 integrates previous phases in the cycle and fuses weaponeering assessment with
19 available forces. Force application is primarily an operations function, but it requires
20 considerable intelligence support. Intelligence and operations staffs work closely to
21 optimize the force necessary to achieve the objective considering operational realities
22 and data (available assets). With guidance from the JFC, component commanders

1 conduct force application planning to fuse target, weapon system, munitions, and
2 nonlethal force options. This phase results in the jointly coordinated selection of forces
3 and associated weapon systems or platforms.

4
5 a. The primary objectives of force application are to sequence target attacks
6 and synchronize the application of lethal or non-lethal force.

7
8 b. During force application, the components identify primary resources to
9 execute missions and supporting requirements. To accomplish force packaging
10 and task organization, the planners must have a concise list of assets to include
11 various component resources available for JTL targets. During this process,
12 force packaging and task organization may group various targets based on
13 geographic location to facilitate economy of force and unity of effort. Likewise, a
14 relatively high priority target may go unserved because of situational factors
15 that renders the target too force intensive to execute.

16
17 c. Intelligence provides planners updated threat analysis for intended targets.
18 This includes both air and ground threats en route to targets. Intelligence
19 estimates of the threat must reveal situational factors indicating whether or not
20 the threat is too high for successful mission accomplishment. If so, the target
21 may require reevaluation for either a different weapons system to attack it, a
22 different target in the target system, or postponement of the attack until the

1 threat is diminished. In either case, an accurate intelligence assessment of the
2 current threat is a critical aspect of the force application process.

3
4 d. The key products from the force application phase are the master air attack
5 plan/ ATO shell for the air effort or an attack guidance matrix (AGM) for the
6 ground effort.

7 8 **8. Execution Planning / Force Execution**

9 The JFC will issue mission type orders directing component commanders to
10 execute the operation.

11
12 a. **Execution Planning.** Component commanders and their staffs, upon receipt
13 of the execution order from the JFC, conduct mission planning and preparation
14 for engagement. The ATO and AGM guide respective components in the
15 preparation of schedules, missions, route planning, and tactics to execute
16 attacks. Due to inevitable changes in the enemy situation (and thereby the
17 assumptions used in the force application phase), intelligence and operations
18 personnel need to analyze the ATO and AGM to validate whether or not they
19 accurately address the current enemy situation. This analysis and validation are
20 an ongoing function throughout execution planning, as IPB is a continuous
21 process. IPB can significantly enhance the targeting process for surface TCTs
22 by identifying the probable locations or operating areas where surface TCTs
23 may emerge. Depending on the seriousness of the threat, resources available,

1 and level of confidence in the IPB, component commanders may elect to position
2 or posture target acquisition and strike assets to rapidly respond to the
3 forecasted areas. During execution planning, intelligence also closely monitors
4 target status in order to update final planning prior to execution. It must identify
5 both changes required to current taskings, as well as provide changes to follow-
6 on target development phases and weaponeering phases. Inputs from
7 intelligence planners update enemy threat assessments and directly impact a
8 broad area, such as tasking orders, operations orders (OPORDS) and
9 associated annexes, deconfliction plans, decision support templates (DSTs),
10 schedules of fires, and support OPORDs. Intelligence planners also play a
11 major role in mission planning support. This includes threat locations, target
12 materials, graphics, maps, charts, geodesy products, and surveyed data points.

13
14 **b. Force Execution.** As directed, components and their assigned forces
15 execute their operations while monitoring other components. Components
16 report laterally to each other and vertically to the JFC. Component commanders
17 monitor the execution phase and provide real-time recommendations for
18 redirection of forces, re-attack, and other taskings as the situation warrants.
19 Intelligence must also monitor the execution of the plan and be prepared to
20 provide immediate threat and target updates should a change in the plan occur.
21 Mission execution requires the flexibility to impact unforeseen surface TCTs.
22 The intelligence architecture and collection plan must rapidly address these
23 types of threats.

9. Combat Assessment (CA)

CA directly affects all other phases of the joint targeting cycle. CA is the determination of the overall effectiveness of force employment during military operations.¹⁰ At the JFC level, the CA effort should be a joint program, supported at all levels, designed to determine if the required effects on the adversary envisioned in the campaign plan are being achieved by the joint force components to meet the JFC's overall concept.¹¹

a. Combat Assessment seeks to determine if the JFC's objectives for an operation are being or have been met, and provides information that helps determine if they need to be modified. Three questions make this determination: Were the strategic operational, and tactical objectives met by force employment? Did the forces employed perform as expected? If the above answers are no, what will fix the problem? CA provides the JFC information on past performance so operations can decide how to apply future planning.

b. CA is done at all levels in the joint force. JFCs should establish a dynamic system to support CA for all components. Normally, the joint force J3 will be responsible for coordinating CA, assisted by the joint force J2.¹²

¹⁰ Jt Pub 3-0, page IV-16

¹¹ Ibid

¹² Jt Pub 3-0, page IV-16

1 Also, the JTCB (if established) should receive CA information in order to fulfill
2 their assigned responsibilities.

3
4 c. Intelligence supports CA by providing objective assessments on the overall
5 impact of military operations against adversary forces, possible enemy courses
6 of action (COAs), and predictions of enemy intent. These assessments come
7 from a variety of sources, to include mission reports (MISREPs), aircraft inflight
8 reports (INFLTREPs), reconnaissance reports, intelligence summaries
9 (INTSUMs), national systems, and reports from joint reconnaissance,
10 surveillance and target acquisition (RSTA) systems.

11
12 d. CA includes battle damage assessment (BDA), munitions effectiveness
13 assessments (MEAs), and reattack recommendation (RR). (NOTE: Some
14 services also include the evolving concept of *mission assessment (MA)* as part
15 of the CA phase).

16
17 (1). **Battle Damage Assessment (BDA).** BDA is a principle subordinate
18 element of CA. BDA attempts to determine the impact of operations
19 against individual targets and target systems. BDA is the estimate of
20 physical, functional, and target system damage resulting from the
21 application of military force, either lethal or nonlethal, against a
22 predetermined objective. Although primarily an intelligence responsibility,
23 accurate BDA depends on the coordination and integration between

1 operations and intelligence. BDA uses all source intelligence to assess
2 target damage and response. During each phase of the BDA process,
3 determinations are made on what adjustments, if any, are required in
4 other phases of the joint targeting process.

5
6 (a). **Phase I BDA - Initial.** Phase I BDA is an initial analysis,
7 based primarily on visual observation of the target and usually
8 derived from a single source. Inputs come from aircrew MISREPs
9 and debriefs, weapon system video, manned and unmanned
10 imagery reconnaissance, and other sources. The unit controlling
11 the weapon system develops Phase I BDA. Reports should state
12 whether a target was hit or missed and include an initial estimate of
13 damage. Phase I is usually the first indicator of problems with
14 weapons systems or tactics assessed during MEA.

15
16 (b). **Phase II BDA - Supplemental.** Phase II BDA reviews all
17 phase I damage assessments and amplifies the initial analysis.
18 Phase II draws on all source intelligence and operational data to
19 determine functional damage to a target and an estimate of impact
20 on the target system. This phase requires the integration of theater
21 and national source information. The theater JIC has access to
22 these sources and provides significant support. Signals
23 intelligence (SIGINT), imagery intelligence (IMINT), and

1 measurement and signature intelligence (MASINT) sources are
2 useful during this phase.

3
4 (c). **Phase III BDA - Target System Assessment.** Primarily
5 performed in large-scale operations, phase III BDA produces a
6 target system assessment by fusing all supplemental BDA with the
7 experience of subject matter experts. It provides the JFC with an
8 estimate of the remaining capabilities of the targeted system. Its
9 fundamental use is an input for determining if objectives are being
10 met. The fundamental determination made during phase III BDA is
11 how successful efforts have been to degrade or deprive the
12 enemy's warfighting capability. The bottom line question is "How
13 successful have our efforts been to degrade or deprive the
14 enemy's warfighting capabilities?"

15
16 (2). **Munitions Effectiveness Assessment (MEA).** MEA provides
17 feedback on how well ordnance, tactics, weapons systems, and platforms
18 performed in combat. MEA is primarily an operations responsibility
19 requiring inputs from the intelligence community. MEA is conducted
20 concurrently and interactively with BDA to evaluate ordnance, weapon
21 system, and tactics performance and continues over an extended period
22 of time beyond the BDA process. MEA evaluates weapons parameters
23 such as delivery accuracy, fusing, and damage mechanisms (blast,

1 fragmentation and penetration). In the MEA process, analysts identify
2 weapons and tactics/munitions deficiencies. Once a deficiency is
3 identified, the analysts make recommendations either for procedural
4 changes, different tactics or system modifications.

5
6 (3). **Reattack Recommendation (RR).** RR is a combined operations
7 and intelligence function. It provides the JFC specific advice on reattack
8 of targets and further target selection to achieve objectives. RR develops
9 recommendations on which targets may require re-attack, based upon the
10 enemy's remaining capability, capacity, and potential for recuperation. In
11 doing so, it also attempts to solve deficiencies identified during the BDA
12 and MEA processes. Reassessment of objectives, target selection,
13 vulnerabilities, timing, tactics, weapons, and munitions factors into the
14 new recommendations. Reattack recommendations are passed back into
15 the joint targeting cycle at the target development, force application, and
16 execution planning/force execution phases. In addition, RR provides
17 significant indications for the further exploitation of the on-going
18 operations, thus "restarting" the targeting process with the development
19 and definitions of new objectives.

20
21 (4). **Mission Assessment (MA).** Though not a formally recognized part
22 of CA, some services are beginning to use the evolving concept of MA to
23 address the effectiveness of the overall operation in light of commander's

objectives and guidance. MA gives the JFC a broad perspective of the comprehensive impact of operations against the enemy and evaluates mission accomplishment on the enemy's warfighting and war sustaining capabilities.

10. Organizing for the Joint Targeting Process

The JFC conducts the joint targeting process within an established organizational framework optimized for targeting operations. A primary consideration in organizing this framework is the joint force's ability to coordinate, deconflict, and synchronize joint targeting operations. The structure established by the JFC must be able to facilitate the joint targeting process throughout the entire spectrum of anticipated targeting timelines. It must be able to conduct effective joint targeting for long-term, daily, and rapidly changing time-critical situations. The JFC defines this structure based upon assigned, attached, supporting forces, threat, mission, and operational area. The structure must focus on enemy COGs to expedite campaign success. It must also be able to identify those critical vulnerabilities that directly or indirectly lead to the degradation of enemy COGs. Also, it must be responsive enough to react to rapidly changing events. A targeting structure able to quickly coordinate and synchronize joint targeting operations will be able to effectively counter high priority, time-critical threats. Likewise it should be able to execute all phases of the joint targeting process efficiently and continuously.

1 **a. Intelligence Division (J2).** The J2 oversees the intelligence operations of
2 the joint force and provides intelligence to all levels of the command for
3 planning, directing, and conducting operations. The J2 is the staff agency with
4 the primary responsibility for prioritization of intelligence collection efforts, target
5 detection, validation, and BDA for all operations. Also, the J2 is a major
6 participant in the detection of targets and the target prioritization process.

7
8 **b. Theater JIC.** The theater JIC is located at combatant command level and
9 integrates all national and DOD supporting capabilities to develop a current
10 intelligence picture. The National Military Joint Intelligence Center (NMJIC)
11 supports their efforts. The theater JIC is the center of intelligence activities
12 supporting the JFC, J2, and components, and provides the all-source analysis
13 and target materials needed to support the targeting and BDA process. At the
14 subunified command and JTF level, a JISE assists in coordinating JIC
15 operations.

16
17 **c. Operations Division (J3).** The operations division assists the commander in
18 the discharge of assigned responsibility of the direction and control of
19 operations, beginning with the planning and follow-through until specific
20 operations are completed. In this capacity, the division plans, coordinates, and
21 integrates operations. The flexibility and range of modern forces require close
22 coordination and integration for effective unity of effort. When the joint staff

1 includes a Plans Division (J-5), it also performs the long range or future planning
2 responsibilities.¹³

3
4 **d. Joint Targeting Coordination Board (JTCB).** JFCs may establish and task
5 an organization within their staffs to accomplish broad targeting oversight
6 functions or may delegate the responsibility to a subordinate commander.
7 Typically, JFCs organize JTCBs. If the JFC designates, a JTCB may be an
8 integrating center for this effort or a JFC-level review mechanism. In either
9 case, it needs to be a joint activity composed of representatives from the staff, all
10 components, and, if required, their subordinate units. JFCs task commanders
11 or staff officers with the JTCB function based on the JFC's concept of operations
12 and the individual's experience, expertise, and situational awareness
13 appropriate to the situation. The JFC defines the role of the JTCB. Typically,
14 the JTCB reviews targeting information, develops targeting guidance and
15 priorities, and may prepare and refine JTLs. The JTCB should also maintain a
16 complete list of restricted targets and areas where special operations forces
17 (SOF) are operating to avoid endangering current or future operations.¹⁴

18
19 (1). The JTCB maintains a macro-level view of the area of responsibility

¹³ UNAAF, page IV-20

¹⁴ Jt Pub 3-0, , page III-26.

1 (AOR)/joint operations area (JOA) and ensures targeting nominations are
2 consistent with the JFC's campaign plan.¹⁵ This view encompasses *all*
3 component operations and *all* joint force targeting (not solely air
4 targeting). Its principal focus is on the strategic and operational level of
5 war.

6
7 (2). The JTCCB must maintain a campaign-level perspective and should
8 not involve itself at levels of detail best left to the component
9 commanders, such as selecting specific targets and aimpoints, or
10 development of attack packages.¹⁶ They do not write master air attack
11 plans, develop ATOs, develop AGMs, or make apportionment decisions.
12 Components are responsible for planning and execution.

13
14 (3). The JTCCB generally focuses on operations beyond a 24-hour cycle.
15 It may have difficulty monitoring operations short of a 24-hour period and
16 may have little, or no ability to affect real-time targeting operations. Other
17 solutions, such as component to component direct coordination, must
18 occur to fulfill the role of rapid deconfliction, synchronization, and
19 coordination.

20

¹⁵ Jt Pub 3-56.1, p IV-2.

¹⁶ CSAF / CSA Article, *The Army-Air Force Team: Leveraging Our Strengths*, page 5

1 (4). The JTCB as a planning support function helps components follow
2 the JFC's intent in the execution of operations by preparing targeting
3 guidance, refining joint target lists, and reviewing target information.¹⁷
4

5 (5). The JFC may direct the JTCB to maintain the JTL.¹⁸
6

7 (6). The JTCB may serve as a focal point to coordinate joint
8 force/component targeting operations with other operations, such as
9 logistics and space/national asset support.
10

11 (7). In multinational operations, the JTCB may be subordinate to a
12 Multinational Targeting Coordination Board, with JFCs or their agents
13 representing the joint force on the multinational board.¹⁹

14 e. **Component Commanders.** Component commanders are instrumental in the
15 execution of targets resulting from the joint targeting process and identifying
16 targets critical to their operations. They are instrumental in assisting the JFC in
17 formulating guidance, controlling many of the collection assets, executing
18 operations against targets, and providing feedback as part of combat
19 assessment. These functions remain constant regardless of joint force
20 organization (functional or service). Coordination and communication between

¹⁷ CSAF / CSA Article, *The Army-Air Force Team: Leveraging Our Strengths*, page 5

¹⁸ Jt Pub 3-56.1, page IV-8.

¹⁹ Jt Pub 3-0, page III-26.

1 components are especially critical in regard to time-critical targets. JFCs
2 establish common procedures, communications, and target reference systems to
3 enable them to quickly react when a time-critical target presents itself. Joint
4 Publication 3-0, *Doctrine for Joint Operations*, provides further information on
5 component commander targeting responsibilities. Joint Publication 3-56.1,
6 *Command and Control for Joint Air Operations*, explains JFACC targeting
7 responsibilities. *Jt Pub 3-05.5, Special Operations Targeting / Mission Planning*
8 *Responsibilities*, explains joint special operations task force (JSOTF) targeting
9 responsibilities.

10
11 **f. Delegation Of Targeting.** JFCs will normally delegate the authority to
12 conduct execution planning, coordination, and deconfliction associated with
13 targeting and will ensure that this process is also a joint effort involving
14 applicable subordinate commands. Whoever is designated this responsibility
15 must possess or have access to a sufficient C2 infrastructure, adequate
16 facilities, and ready availability of joint planning expertise. Should such an
17 agency be charged with joint functional command responsibilities, a joint
18 targeting mechanism is also needed to facilitate this process at this level.
19 All components are normally involved in targeting and should establish
20 procedures and mechanisms to manage the targeting function.²⁰

21

²⁰ Jt Pub 3-0, page III-26 and III-27

Chapter II

Surface Time-Critical Targets

"When you see a rattlesnake poised to strike, you do not wait until he has struck before you crush him"

- Franklin D. Roosevelt

11 Sep 1941

1. Surface Time-Critical Targets

A TCT is a lucrative, fleeting, air, land or sea target of such high priority to friendly forces that the JFC / component commander (CC) designates it as requiring immediate response. TCTs pose, or will pose, an imminent threat to friendly forces or present an exceptional operational or tactical opportunity. Other adjectives commonly used to describe a TCT are "emerging", "perishable", "high payoff", "short dwell", or "time-sensitive" (as defined in Jt Pub 1-02, *DoD Dictionary of Military and Associated Terms*). This chapter deals exclusively with surface (land or sea) TCTs. Most surface TCTs typically have the ability to move rapidly and hide throughout the battlefield, limiting their exposure time. In terms of the joint targeting process, the JFC / CC set surface TCTs as priorities during the commander's

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1 guidance and objectives phase. Target development dedicates sensors for
2 detection and identification and weaponeering assessment provides the JFC
3 options for attack. Force application assigns attack assets, after which the
4 execution planning / force execution phase employs force. CA follows through with
5 feedback for subsequent engagements.

6
7 a. Examples of surface TCTs include mobile rocket launchers (MRLs),
8 mobile high threat surface-to-air missiles (SAMs), theater ballistic missiles
9 (TBMs), supporting launchers, mobile weapons of mass destruction (WMD),
10 or mobile C2 vehicles and facilities.

11
12 b. Surface TCTs may also be fixed targets, such as operational-level
13 command centers which, once their location is determined, must be
14 destroyed quickly to allow further friendly force actions. Other fixed surface
15 TCTs may be nuclear or chemical weapons depots, (when transportation of
16 the stored weapons is imminent --or if hidden, once they are detected), or
17 fixed surface-to-surface missile (SSM) sites (when detected and threatening
18 to launch). Under certain circumstances, ordinary fixed surface targets may
19 be classified as time-critical if they present a lucrative opportunity that the
20 JFC / CC determines is a priority. For example, an enemy airfield may
21 become a surface TCT if it is determined (through intelligence sources) that it

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will soon support aircraft equipped with WMD. Likewise, a bridge, previously left standing to channel enemy movement, may become a surface TCT once the commander determines it time to destroy it and seal off an avenue of escape.

c. Surface TCTs are classified as either **planned** or **immediate** (Fig II-1).

PLANNED TARGETS (KNOWN)		IMMEDIATE TARGETS	
SCHEDULED	ON-CALL	UNPLANNED TARGETS (KNOWN)	UNANTICIPATED TARGETS (UNKNOWN)
		SURFACE TCTs	

Fig II-1

Surface TCT Relationship to Planned and Immediate Targets

(1). **Planned** surface TCTs are ordinarily fixed targets, known to exist in an operational area, which have been upgraded to time-critical status due to JFC / CC priority. This is normally due to a newly

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1 acquired "short dwell" status which presents an exceptional
2 operational or tactical opportunity. Fires and attacks are placed on-
3 call against planned surface TCTs. Generally, surface TCTs (as
4 planned targets) are limited in number.

5
6 (2). **Immediate** surface TCTs are mobile TCTs against which fire or
7 attacks have not been scheduled. Some fixed TCTs may also be
8 immediate. Immediate surface TCTs have two subcategories:
9 unplanned and unanticipated.

10
11 (a). **Unplanned immediate surface TCTs** are those *known* to
12 exist in operational area, but have no fire or attacks scheduled.
13 They are generally the largest category of surface TCTs. They
14 require established procedures for proactive, timely acquisition
15 by sensors and immediate response once acquired. The JFC
16 directs component commanders to assign adequate attack
17 assets to respond to all unplanned immediate surface TCTs in
18 an operational area. In situations where a JFC or component
19 commander does not have sufficient attack assets, prioritization
20 must occur.

1 (b). **Unanticipated immediate surface TCTs** are those
2 surface TCTs not expected or *unknown* to exist in an
3 operational area. This category of surface TCT is the most
4 dangerous as response is extremely reactive due to the
5 element of surprise. Established procedures for proactive,
6 timely acquisition and immediate response is still required. JFC
7 / CCs can minimize this element of surprise by ensuring
8 procedures are flexible enough to handle response against
9 these type of targets, regardless of target location or type.
10

11 **2. Target of Opportunity (TOO)**

12 A TOO is a target visible to a surface, airborne, or space based sensor or
13 observer, within range of available weapons, and against which fire or attacks have
14 not been scheduled or requested.¹ It is either an **unplanned** or **unanticipated**
15 target that may not be a danger to friendly forces. Also, it may present a narrow
16 window of opportunity for attack due to limited time of exposure. A TOO may have
17 the same lucrative, fleeting characteristics as a surface TCT. However, the key
18 discriminator between a TOO and a surface TCT is JFC / CC priority and dwell time.
19 For example, if a sensor acquires a "short dwell" command vehicle against which no
20 fires or attacks have been scheduled or requested (that is "on-call"), the command

¹ Jt Pub 1-02, page 366

1 vehicle is a TOO. If the JFC / CC has *not* designated such command vehicles as
 2 high priorities requiring immediate response, it is *not* considered a surface TCT.
 3 However, if the sensor acquires such a command vehicle under the same conditions
 4 (no scheduled or requested / "on-call" fires or attacks), and these targets have
 5 been designated high priorities requiring immediate response, then the command
 6 vehicle is both a TOO *and* a surface TCT. TOOs are classified as **immediate**
 7 **targets**, either **unplanned** or **unanticipated**. Most TOOs are unanticipated. See
 8 Fig II-2 below.

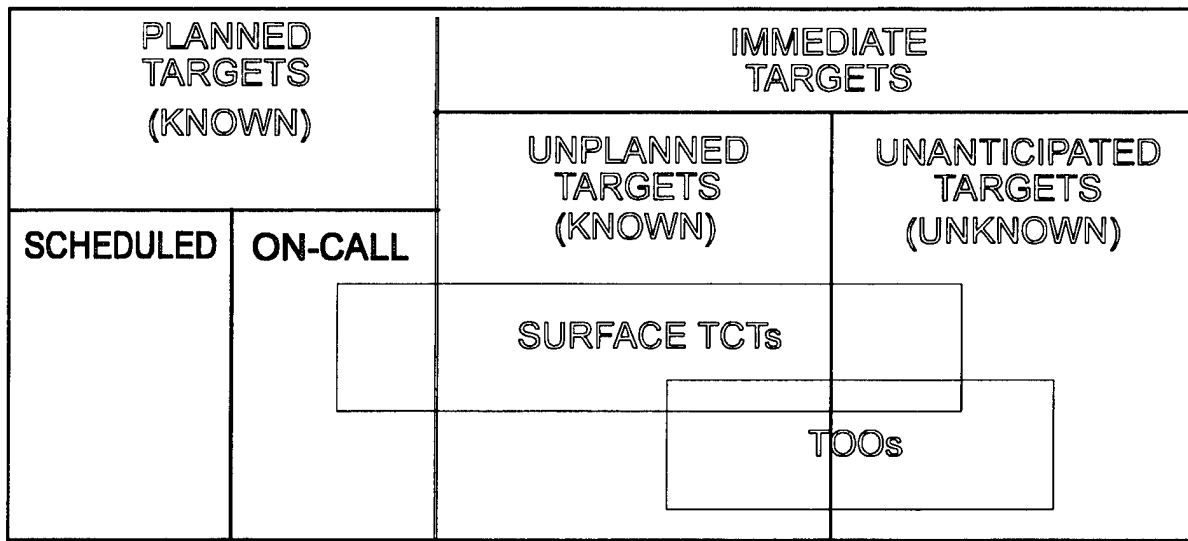


Fig II-2

TOO Relationship to Surface TCTs and Immediate Targets

3. Attacks Against Surface TCTs --The Challenge

Attacks against surface TCTs are characterized by preemptive or reactive offensive actions intended to destroy land or sea TCTs as part of counterair, strategic attack, interdiction, fire support, maneuver, antisurface warfare, strike warfare, amphibious operations, or special operations. Attacks against surface TCTs are similar to attack operations as defined in Jt Pub 3-01.5, *Doctrine for TMD*, but not limited solely to enemy operational area ballistic missile (TBM) capabilities. Each component has the capability to locate and attack surface TCTs in mutually accessible areas of interest. Given the state of current and future sensor systems, a surface TCT could be identified by more than one component simultaneously. As such, the JFC must establish means to effectively eliminate the threat without causing fratricide or duplication of effort among components. All the while, this must be accomplished across several levels of command within and across component / service lines.

- a. Joint force planning and execution of surface TCT targeting operations requires a delicate balance of flexibility and control that must be maintained over large operational areas and over numerous complex weapon systems. Synergy, momentum, and unity of effort must be maintained in order to achieve the JFC's intent.

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1 b. Ideally, a common "picture" of the battlefield shared by all components
2 focuses the targeting effort, especially if near-real-time (NRT) information (such
3 as that available from Joint STARS) is available. National and operational area
4 sensors, data links, and command and control (C2) systems provide the
5 information on which the joint force and component commanders are able to
6 make decisions and exercise control over their forces. However, current JTF
7 command and control systems do not allow unified, real-time coordination and
8 deconfliction of all forces. Likewise, national and in-theater sensors do not
9 necessarily provide all components with a "common picture" of the battlefield.

10
11 (1). For example, the Joint STARS platform, considered to be a critical
12 JFC tool for real-time surface surveillance, provides two separate data
13 links to different components. The Surveillance Control Data Link (SCDL)
14 sends "pre-processed" data to land and amphibious (ground element)
15 component operations center ground station modules (GSMs) while Joint
16 Tactical Information Distribution System (JTIDS) "filtered" data is
17 transmitted to the air component and amphibious (air element) operations
18 centers. Essentially, the ground elements have a different picture of the
19 battlespace than the air elements.

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(2). Similarly, the All Source Analysis System (ASAS) cannot transmit the land / amphibious component's view of the battlespace to the air component's Theater Integrated Situation Display (TISD). As a result, each component views the battlespace from their unique perspective.

c. This deficit in structure and systems may make it difficult to efficiently apply joint force assets against potential targets on a real-time or NRT basis with complete situational awareness, economy of force and synchronization of effort. Until command and control structures and sensor systems are improved, JFC's must establish procedural fixes to effectively deal with surface TCTs.

4. JFC's Objectives and Guidance for Surface TCTs.

During the commander's objectives and guidance phase, the JFC / CC designates specific surface TCTs as priority requiring immediate response. Also, the JFC establishes specific guidance on how coordination, deconfliction, and synchronization will occur among components assigned in the operational area. Once this guidance is set forth, planned and reactive procedures for attacking surface TCTs are established. JFC guidance sets the basic procedural framework for the components to comply with the commander's intent and expedite targeting of surface TCTs. JFC objectives and guidance to component commanders enable and support different phases of the joint targeting process. Examples are:

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- 1 a. Identification and assignment of primary sensors and weapon systems
2 specifically assigned to support attacks on surface TCTs (TARGET
3 DEVELOPMENT).
- 4
- 5 b. Establishment of planned, deconflicted fire areas (with definable trigger
6 events) against specific surface TCTs (TARGET DEVELOPMENT).
- 7
- 8 c. Directives to component commanders to task assets for standby or secondary
9 missions as backup to primary sensors and weapons systems. An example
10 would be the JFACC designating aircraft most likely to be diverted to assist
11 attack operations (WEAPONNEERING and FORCE APPLICATION).
- 12
- 13 d. Determination of surface TCT engagement authority based on either
14 component commander area of operations (such as an area of operations {AO}),
15 component commander assigned mission, or combination thereof (FORCE
16 APPLICATION).
- 17
- 18 e. If necessary, specification of those few, exceptional circumstances when
19 component commanders who first acquire specific surface TCTs have authority
20 for immediate engagement responsibility regardless of assigned AO or mission.
21 In other words, the JFC should determine those situations, if any, where

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1 immediate destruction of the imminent surface TCT threat outweighs the
2 potential for fratricide or duplication of effort. Inherently, this determination, to
3 whatever degree, may allow a component to bypass the requirement for
4 informing, coordinating, deconflicting, and synchronizing. However, if time
5 allows, these efforts should be accomplished prior to engagement. The JFC
6 must carefully balance the risk between the surface TCT threat and the potential
7 for fratricide. (FORCE APPLICATION and EXECUTION PLANNING / FORCE
8 EXECUTION).

9
10 f. Identification of specific communication/data links between component
11 command and control (C2) elements to conduct rapid coordination. This
12 includes authorizing direct liaison and coordination authority. (EXECUTION
13 PLANNING / FORCE EXECUTION)

14
15 g. Establishment of priority "quickfire" sensor to shooter communication links
16 with defined conditions for circumventing/bypassing normal
17 command/coordination channels (to improve timeliness of response).
18 (EXECUTION PLANNING / FORCE EXECUTION)

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5. Availability of Surface TCT Capable Attack Assets.

Generally, the primary weapon systems suitable for surface TCT attacks in an operational area are fixed wing fighter/attack aircraft, attack helicopters, the Army Tactical Missile System (ATACMS), multiple launch rocket system (MLRS), conventional artillery, conventional air launched cruise missiles (CALCMs), Navy Tomahawk Land Attack Missiles (TLAMs), naval surface fire support (NSFS), and special operations forces (SOF). If the numerical availability of surface TCT capable attack assets within the operational area is weighted significantly in favor of one weapon system, it will greatly affect JFC guidance in regard to the weaponeering assessment phase for surface TCT attacks. As such, the JFC may be required to adapt guidance based upon available weapon systems.

a. If fixed wing aircraft provide the numerical preponderance of attack assets, the JFC may orient guidance toward execution by these forces and assign the JFACC responsibility to coordinate attacks.

b. If ATACMS are in preponderance, the JFC may orient guidance toward ATACMS execution and assign the land or amphibious component commander responsibility to coordinate attacks.

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1 c. If the political situation prevents significant land forces in an operational area,
2 the JFC may orient guidance toward naval asset execution (such as fixed wing,
3 TLAM, and NSFS) and assign the joint force maritime component commander
4 (JFMCC) responsibility to coordinate attacks.

5
6 d. If forces within the operational area are not significantly weighted towards
7 one weapon system or the other, the JFC should consider procedures that allow
8 maximum flexibility in the attack of surface TCTs after considering all weapon
9 system options. If one component cannot strike a surface TCT (due to re-
10 loading, weather, limited range capability, etc.), procedures must allow for rapid
11 handover to another component for mission execution.

12
13 **6. Determination of "Best Capable" Surface TCT Asset.**

14 Determination of "best capable" surface TCT asset (such as fixed wing,
15 ATACMS, TLAM, etc.) begins during the weaponeering assessment phase and
16 continues through the force application phase. Individual component commanders
17 provide recommendations to the JFC highlighting the pros and cons of their available
18 weapon systems based upon the current situation. The JFC also provides guidance to
19 component commanders to allow them the flexibility to make the proper decision
20 regarding rapid selection of "best capable" attack asset. (NOTE: the land and
21 amphibious component commanders use the AGM for this purpose, as it offers primary

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1 and alternate weapon selection options, thereby expediting execution decisions).

2 Determination of "best capable" requires the assessment of five subjective factors:

3
4 a. **Effectiveness.** Depending on the desired effects, appropriate weapons must
5 be selected. Some surface TCT attack assets may be highly effective in
6 destroying *unhardened* surface TCTs (such as TLAM or current version
7 ATACMS). Destruction of *hardened* surface TCTs (that is, sheltered), may
8 require other attack assets such as aircraft delivered precision guided munitions
9 (PGMs), laser guided bombs (LGBs), or SOF infiltration and sabotage.

10
11 b. **Responsiveness.** Once surface TCTs are detected, weapon
12 responsiveness is critical to ensure the attack opportunities are not lost.
13 Responsiveness can be measured in the elapsed time required from receipt of
14 an execution order to weapons impact / effects, including the time required for
15 weapons deconfliction, if applicable. Responsiveness is also measured by
16 whether or not the chosen weapon system can operate under the current
17 weather / illumination conditions (such as all-weather, day-night systems versus
18 day only, fair weather systems).

19
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1 c. **Range.** Selected weapon systems must have the range capability to enable
2 them to attack. (NOTE: Range may not be a factor for in-country SOF team
3 operations).

4
5 d. **Accuracy.** The weapon system must be able to accurately acquire the
6 target. Moving targets, with large target location errors (TLEs), require accurate
7 predicted locations. End game accuracy is accomplished by weapons systems
8 able to refine the search for moving targets once overhead (such as fixed wing
9 aircraft), or weapons systems with area coverage submunitions that compensate
10 for anticipated target movement (such as ATACMS).

11
12 e. **Threat.** Potential TCTs may emerge in heavily defended areas.

13
14 (1). The existence of a significant air defense threat may obviate the use
15 of manned non-stealthy fixed wing aircraft, rotary wing aircraft, and cruise
16 missiles as strike assets. The employment of guns, rockets, missile
17 artillery, or stealth aircraft may be required to achieve an acceptable
18 probability of damage. If air-delivered precision munitions must be
19 employed against such heavily defended TCTs to ensure adequate
20 destruction, suppression of enemy air defenses (SEAD) fires or electronic
21 combat (EC) support may be required.

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(2). The existence of a significant ground threat may preclude the insertion or operations of SOF teams.

f. Overall, the JFC has several surface TCT capable attack assets with varying degrees of effectiveness, responsiveness, range, accuracy, and threat.

However, no one weapon system encompasses the best of all of these characteristics under all conditions. No one weapon system is always “best capable” to deal with the surface TCT threat.

7. Planned Procedures for Attacking Surface TCTs

The extent of planned procedures for attacking surface TCTs determines the probability of joint force success in carrying out the mission. The more planning accomplished, the higher the probability of mission success. The transient or fleeting nature of surface TCTs requires shorter execution cycles for attacks to be successful. The majority of surface TCTs, as immediate targets, are difficult to insert into traditional targeting mechanisms for planned targets. However, the JTF can compensate for this through the use of various fixes, such as on-call ATACMs fire missions, airborne surface TCT combat air patrols (CAPS), and airborne attack aircraft divert procedures. During these immediate taskings, the joint targeting process described in Chapter I still applies, yet occurs on a very accelerated timeline. Timely execution of the joint targeting process may require pre-established, streamlined C2 arrangements tailored

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to expedite the flow of targeting information and execution decisions. Timely execution of attacks against immediate surface TCTs requires the JFC to establish, in advance, procedures for components to effectively carry out attacks. Planned Procedures include, but are not limited to, the following:

- Control and Coordinating Measures
- FSCL Procedures and Associated Attack Options
- Airspace Coordination Area Options
- Common Reference Systems
- Weapon System Procedures

a. **Control and Coordinating Measures.** JFCs employ various maneuver and movement control and fire support coordinating measures to facilitate effective joint operations.² These measures may be used to expedite attacks against surface TCTs. Joint control and coordination measures apply to all JTF components, and as such, the JFC has final approval authority. The JFC is responsible for ensuring coordination measures are appropriate, function as designed, and are well understood. These measures include use of boundaries,

² Jt Pub 3-0, page III-33

1 fire support coordination measures (FSCMs), and airspace control measures
2 (ACMs).

3
4 (1). **Boundaries.** Boundaries are maneuver control measures that
5 define surface areas to facilitate coordination and deconfliction of
6 operations. JFCs use lateral, rear, and forward boundaries to define AOs
7 for land and naval forces.³ Boundaries give the JFC the ability to clearly
8 define areas requiring coordination and deconfliction of surface TCT
9 attacks between components and units. The JFC will normally establish
10 the land or amphibious force commander's forward boundary, and adjust
11 as necessary, to balance the land force commander's need to rapidly
12 maneuver with the JFACC's need to rapidly mass and employ airpower
13 with minimal constraints.

14
15 (a). Theater air sorties are not constrained by land boundaries, per
16 se. However, because the airspace above surface areas is used
17 by all components of the joint force, JFCs promulgate ACMs to
18 deconflict the multiple uses required of this space.⁴ Airspace is
19 not constrained by boundaries in terms of movement of aircraft,

³ Jt Pub 3-0, page III-33

⁴ Ibid

1 however, attacks by aircraft that occur within a surface force's
2 boundary require an appropriate degree of coordination.

3
4 (b). A naval boundary may be designated for seas adjacent to the
5 area of land conflict to enhance coordination and execution of
6 naval operations.⁵

7
8 (c). Boundaries may require relatively frequent adjustment based
9 on the actual and projected rate of maneuver and the operational
10 environment.⁶ The frequency of change will have direct impact on
11 the deconfliction of firepower employment within the joint force.
12 Change of these boundaries by the JFC must be communicated to
13 all affected components of the joint force.

14
15 (d). Though not formalized in joint or service doctrine, the term
16 deep battle synchronization line (DBSL) is an example of a theater
17 specific maneuver control measure used by Combined Forces
18 Command (CFC). CFC uses the DBSL in a specific operations

⁵ Jt Pub 3-0, page III-33

⁶ Ibid

1 area (much like a forward boundary) to rapidly coordinate between
2 components for deconfliction of fires and attacks.

3
4 (2). **FSCMs.** FSCMs and associated procedures assist in the C2 of joint
5 forces. Within their AOs, land and amphibious commanders employ
6 permissive and restrictive FSCMs to enhance the expeditious attack of
7 targets; protect forces, populations, critical infrastructure, and sites of
8 religious or cultural significance; and set the stage for future operations.
9 Commanders position and adjust FSCMs consistent with the operational
10 situation and in consultation with superior, subordinate, supporting, and
11 affected commanders.⁷ FSCMs are identified by location and date/time
12 effective (as well as termination date/time, if applicable). FSCMs, when
13 used properly, aid in the rapid engagement of surface TCTs. FSCMs
14 should not be used to constrain operational flexibility but rather enhance
15 the operational scheme. At the JTF level their use must be carefully
16 considered and closely coordinated because of the impacts on
17 component efforts to support JFC objectives.

⁷ Jt Pub 3-0, page III-33

1 (a). **Permissive Measures.** These measures are normally used to
2 authorize the attack of targets without coordination from the
3 establishing commander (within the commander's applicable
4 boundaries) if certain circumstances are met. While the
5 circumstances are situationally dependent, it is imperative they be
6 closely coordinated with the other components of the joint force.
7 Permissive measures provide the JFC the ability to rapidly
8 *coordinate and synchronize* fires and attacks between components
9 and units. Permissive measures include Free Fire Areas (FFAs),
10 Coordinated Fire Lines (CFLs), and the Fire Support Coordination
11 Line (FSCL).

- 12
- 13 • **FFAs** are specifically designated areas into which any weapons
14 system may be fired without any additional coordination. FFAs
15 do not adequately deconflict between air and surface attacks on
16 surface TCTs unless they are combined with adequate ACMs.
17 FFAs are established by the appropriate ground commander.
- 18
- 19 • **CFLs** are lines beyond which conventional surface fire support
20 means (such as ATACMS, TLAM, or NSFS) may fire at any time

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1 within the zone of the establishing headquarters without
2 additional coordination.⁸ Typically, CFLs are used by land and
3 amphibious forces. CFLs *expedite* surface TCTs attacks as
4 long as indirect fire (surface to surface) means are used.
5 (NOTE: A CFL is sometimes referred to as a *no-fire line* by
6 other nations). CFLs do not adequately *deconflict* surface TCT
7 attacks by fixed wing aircraft. CFLs are established by the
8 appropriate ground commander and should be placed as close
9 as practical to the FLOT.

- 10
11 • An **FSCL** is a permissive FSCM. See paras b.,c.,and d. for
12 further information on the FSCL.

13
14 (b). **Restrictive Measures.** Restrictive measures are used to
15 restrict the use of fire support assets in particular areas. They may
16 be established by any component commander and are normally
17 applicable to all subordinate elements. Restrictive measures also
18 provide the JFC the ability to *deconflict* fires and attacks between
19 components and units. Commanders employ restrictive measures

⁸ FM 101-5-1, page I-19

1 to enhance the protection of friendly forces operating beyond an
2 FSCL.⁹ This applies to measures both inside and outside AO /
3 AOA boundaries. Examples of restrictive measures are No Fire
4 Areas (NFAs), Restrictive Fire Lines (RFLs), Restrictive Fire Areas
5 (RFAs), and Airspace Coordination Areas (ACAs).

- 6
- 7 • **NFAs** are areas into which no fires or effects can enter. The
8 purpose of a NFA is to protect forces operating forward of the
9 forward line of own troops (FLOT) or to protect areas, friendly
10 or enemy, which may serve a purpose in future operations.
11 SOF NFAs are of particular importance. An NFA will be
12 identified by a central grid coordinate and a radius in nautical
13 miles from that point. Fire or attacks into an NFA are
14 authorized under two exceptions:
15 -- the establishing headquarters approves on a mission-by-
16 mission basis or
17 -- immediate force protection is necessary and the response
18 used is the minimum force required.

⁹ Jt Pub 3-0, page III-34

1 As such, component attacks against surface TCTs located in
2 NFA's require either approval or disregard for coordination.
3 Therefore, to expedite attacks, NFA use should be minimized in
4 areas of expected surface TCT locations. NFAs are established
5 by the appropriate ground commander.

- 6
- 7 • **RFLs** are lines established between converging forces that
8 prohibit fires or the effects of fires across the lines without
9 coordination from the establishing headquarters. RFLs
10 *deconflict* component surface TCT attacks "by default." RFLs
11 aid in deconfliction but limit the JFC's flexibility and
12 responsiveness by increasing the amount of coordination
13 required. RFLs assist in the prevention of fratricide among
14 conventional forces. RFLs are established by the appropriate
15 ground commander.

- 16
- 17 • **RFAs** regulate and control fire and attacks into an area
18 according to stated restrictions. Surface TCTs acquired within
19 an RFA may only be attacked in accordance with the firing
20 restrictions, unless the establishing authority approves

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otherwise. As with RFLs, RFAs similarly aid in deconfliction but limit the JFC's flexibility and responsiveness in coordinating other component attacks into the area. RFAs are established by the appropriate ground commander.

- **ACAs** are three-dimensional blocks of airspace with defined dimensions that significantly enhance deconfliction of surface TCT attacks among components. Friendly aircraft are reasonably free from friendly surface fires, with artillery, helicopters, and fixed-wing aircraft given specific lateral or vertical airspace within which to operate. Timely implementation of the area is dependent on the ground situation. Burden of deconfliction rests with the ground commander. An ACA is established by the Airspace Control Authority at the request of the appropriate ground commander.¹⁰ (Note: Both an airspace control area and the Airspace Control Authority are defined by the acronym "ACA") See para d. *Airspace Coordination Area Options*, for more information on ACAs.

¹⁰ Jt Pub 3-52, page B-3

1 **(3). Airspace Control Measures (ACMs).** The airspace in a combat
2 zone is a crucial dimension of the battlespace used by all components of
3 the joint and allied forces to conduct assigned missions. A high
4 concentration of friendly surface, subsurface, and air-launched weapon
5 systems must share this airspace without unnecessarily hindering combat
6 power that is being applied in accordance with the JFC's campaign or
7 operational plan. The goal of combat zone airspace control is to enhance
8 air, land, maritime, and SOF effectiveness in accomplishing the JFC's
9 objectives.¹¹ The JFC designates the Airspace Control Authority (ACA,
10 normally the JFACC) who is responsible for developing, coordinating, and
11 publishing airspace control procedures and for operation of the airspace
12 control system in the AOR/JOA. The ACA establishes an airspace control
13 plan (ACP), which includes procedural ACMs. Specific ACMs useful for
14 surface TCT attacks are Restricted Operation Areas (ROAs), High
15 Density Airspace Control Zones (HIDACZ), Minimum Risk Routes
16 (MRRs), and Special Use Airspace. Airspace coordination areas (as
17 restrictive FSCMs) are also published in the ACP.

¹¹ Jt Pub 3-52, page v

1 (a). A **ROA** is airspace of defined dimensions created in response
2 to specific operational situations or requirements within which the
3 operation of one or more airspace users is restricted. It is also
4 known as a Restricted Operations Zone (ROZ).¹² ROAs / ROZs
5 significantly aid in the deconfliction of surface TCT attacks and
6 prevent duplication of effort and potential fratricide by closely
7 restricting airspace access over a designated surface area. ROAs
8 / ROZs are established by the Airspace Control Authority.

- 9
- 10 • During surface TCT attacks, ROAs / ROZs can be used to
11 restrict air operations over ATACMs battery launch areas, also
12 referred to as a platoon airspace hazard areas (PAHs).

13 Similarly, they can be used over predicted ATACMS munitions
14 impact points, also referred to as target airspace hazard areas
15 (TAHs).

- 16
- 17 • ROAs / ROZs can be used to sanitize and limit airspace to only
18 aviation operations (similar to an ACA).
- 19

¹² Jt Pub 3-52, page B-7

- ROAs / ROZs are effective in protecting SOF operations areas.

(b). A **HIDACZ** is an area in which there is a concentrated employment of numerous and varied weapons or airspace users. A HIDACZ has defined dimensions that usually coincide with geographical features or navigational aids. A HIDACZ restricts use of the airspace because of the large volume and density of fires supporting the ground operations within the described geographic area.¹³ A HIDACZ is nominated by the ground commander and approved by the Airspace Control Authority.¹⁴ HIDACZ may be used similar to ROAs / ROZs and ACAs.

(c). **MRRs**. An MRR is a temporary corridor for defined dimensions recommended for use by high-speed, fixed-wing aircraft that presents the minimum known hazards to low-flying aircraft transiting the combat zone. MRRs are established considering the threat, friendly operations, known restrictions, known fire support locations, and terrain.¹⁵ MRRs may also be

¹³ Jt Pub 3-52, page B-5

¹⁴ Ibid, page B-6

¹⁵ Ibid

1 used by rotary-wing aircraft. MRRs are established by the
2 Airspace Control Authority.

3
4 (d). **Special Use Airspace** is a term used to define airspace for a
5 specific purpose. It may also designate airspace in which no flight
6 activity is authorized.¹⁶ Special use airspace is typically applied to
7 CAP / orbit areas. CAP / orbit areas provide the JFC with flexibility
8 for responsive aircraft attacks against surface TCTs. CAP / orbit
9 areas are defined by location, orientation, altitude, and
10 vulnerability time, and allow the JFACC and other component
11 commanders to preposition air assets for surveillance,
12 reconnaissance, air defense, battle management, and anticipated
13 airstrikes. Special Use Airspace is established by the Airspace
14 Control Authority.

15
16 (e). Normally, ROAs / ROZs and CAP / orbit areas are under the
17 control of an airborne element of the theater air control system
18 (AETACS). AETACS include platforms such as the Airborne

¹⁶ Jt Pub 3-52, page B-6

1 Warning and Control System (AWACS), and Airborne Battlefield
2 Command and Control Center (ABCCC). Additionally, E2-C
3 surveillance aircraft and Direct Air Support Center-Airborne
4 (DASC-A) aircraft may control ROAs / ROZs and CAPs / orbit
5 areas as assigned by the Airspace Control Authority.

6
7 (f). Further information on ACMs may be found in Jt Pub 3-52,
8 *Doctrine for Joint Airspace Control in the Combat Zone*,
9 Jt Pub 3-56.1 *Command and Control for Joint Air Operations*, and
10 FM 100-103-1 / FMFRP 5-61 / NDC TACNOTE 3-52.1 / ACCP 50-
11 38 / PACAFP 50-38 / USAFEP 50-38 *ICAC2-- Integrated Combat*
12 *Airspace Command and Control*.

13
14 **b. FSCL Procedures.** FSCLs are permissive FSCMs. They are established
15 and adjusted by appropriate land or amphibious force commanders within their
16 boundaries in consultation with superior, subordinate, supporting, and affected
17 commanders. Forces attacking targets beyond an FSCL must inform all affected
18 commanders in sufficient time to allow necessary reaction to avoid fratricide,
19 both in the air and on the ground.¹⁷

¹⁷ Jt Pub 3-0, page III-34

1 (1). The FSCL is not a boundary--the synchronization of operations on
2 either side of the FSCL is the responsibility of the establishing
3 commander out to the limits of the land or amphibious force boundary.¹⁸
4 The FSCL does not divide AOs. In particular, it is not a boundary between
5 the land or amphibious commander and the JFACC.

6
7 (2). Use of an FSCL is not mandatory. However, the land or amphibious
8 commander must realize that not using a FSCL will require other
9 components to extensively coordinate all attacks into the AO. As a result,
10 the land or amphibious commander may have to rely extensively on
11 organic attack assets for immediate support due to possible delays in the
12 coordination required for other components to attack desired targets.

13
14 (3). Situations may arise where two or more components establish
15 separate FSCLs. For example, the land component commander
16 establishes an FSCL in the AO and the amphibious commander
17 establishes an FSCL in the amphibious operations area (AOA). In cases
18 such as these, if the components share a mutual boundary, the JFC may
19 choose to establish a mutual FSCL applicable to the joint force as a
20 whole.

¹⁸ Jt Pub 3-0, page III-34

1 (4). By establishing an FSCL at sufficient depth so as to not limit high-
2 tempo maneuver, land or amphibious force commanders ease the
3 coordination requirements for attack operations within their AOs by forces
4 not under their control, such as naval gunfire or air interdiction.¹⁹
5

6 (a). Placement of the FSCL is based on the type of mission, threat,
7 terrain, and concept of the operation, as well as organic weapons
8 capabilities, location of friendly and enemy forces, anticipated
9 rates of movement, and tempo of the operation. Careful
10 consideration and judicious placement should be exercised as
11 there are significant tradeoffs between close and deep FSCLs.
12

- 13 • Close placement of the FSCL may be used in defensive
14 operations, and when rapid movement of land component
15 forces is not expected. The benefit of a close FSCL would be
16 the greater ability for supporting components to execute attacks
17 without the requirement of extensive coordination.
18
- 19 • Deep placement of the FSCL facilitates high-tempo maneuver
20 and may be used in rapidly advancing, offensive situations.

¹⁹ Jt Pub 3-0, page III-34

1 However, it will limit operational freedom for supporting
2 component operations behind the FSCL, due to the
3 requirement for increased coordination and tighter, positive and
4 procedural controls (for example, close air support {CAS} or air
5 interdiction {AI} behind the FSCL).

6
7 (b). It is up to the land or amphibious force commander to place
8 the FSCL so as not to inhibit operational tempo and maximize the
9 use of all organic and supporting component assets.

10 Fundamentally, FSCL placement is situational, and may be
11 changed as required to maximize success of the campaign. It is
12 incumbent upon each component commander to provide key inputs
13 to aid in placing the FSCL in the best location to support the JFC's
14 objectives.

15
16 (5). The land or amphibious force commander adjusts the location of the
17 FSCL as required to keep pace with operations. In high-tempo maneuver
18 operations, the FSCL may change frequently, such as every several
19 hours. The establishing commander quickly transmits the change to
20 higher, lower, adjacent, and supporting headquarters to ensure attack
21 operations are appropriately coordinated by controlling agencies.

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1 Anticipated adjustments to the location of the FSCL are normally
2 transmitted to other elements of the joint force sufficiently early to reduce
3 potential disruptions in their current and near-term operations.²⁰
4 Component commanders must receive notification of pending FSCL
5 change as soon as possible. Timely notification (normally 6-8 hours) of a
6 change in the FSCL status or location will allow effective coordination with
7 other components. However, some tactical situations could results in less
8 advance notice.

9
10 (6). "On-Order" FSCLs. The land or amphibious force commander may
11 choose to plan "on-order" FSCLs throughout the AO / AOA which can be
12 rapidly established and adjusted. These "on-order" FSCLs are similar to
13 movement phase lines established at designated distances across the AO
14 / AOA. The advantage of "on-order" FSCLs is that they allow the land or
15 amphibious force commander the flexibility to rapidly coordinate the
16 change of the currently established FSCL to another planned FSCL as
17 the tempo of land operations / movement increases. This is equally
18 advantageous in offensive operations as it is in defensive, retrograde
19 operations. Coordination among other component C2 agencies is
20 simplified if the locations of these "on-order" FSCLs have been previously

²⁰ Jt Pub 3-0, page III-35

transmitted to the joint force in advance. Use caution not to overly clutter operational graphics/maps with too many "on-order" FSCLs, as this may lead to confusion and outweigh the benefits of the planned measure.

(7). The FSCL should follow well-defined terrain features. It should also be defined by a series of latitude and longitude points for ease of transmission via component C2 agencies. However, FSCLs do not have to follow traditional "straight-line" paths. Curved and enclosed, "circular" FSCLs have applications in nonlinear joint operations.

c. **Attack Options with an FSCL.** With an established FSCL, there are two geographic areas requiring deconflicted surface TCT attacks:

(1). **Attacks short of the FSCL.** Short of an FSCL, all air-to-surface and surface-to-surface attack operations are controlled by the appropriate land or amphibious force commander.²¹ This area also has the highest potential for fratricide. Surface TCT attack operations conducted in this area may require similar coordination and deconfliction procedures as those required for CAS if detailed integration and friendly forces are factor. To ensure sufficient control and safety of friendly forces, a

²¹ Jt Pub 3-0, page III-34

1 component desiring to attack a surface TCT short of the FSCL must
2 receive permission from the AO / AOA component commander and
3 operate under positive control measures when necessary. See Jt Pub 3-
4 09.3 *JTTP for CAS*, for additional information.

5
6 (a). Positive control is normally coordinated through the Corps Fire
7 Support Element (FSE) or the Marine Air Ground Task Force
8 (MAGTF) Fire Support Coordination Center (FSCC).

9
10 (b). Fighter/attack assets attacking surface TCTs short of the FSCL
11 first coordinate with a designated C2 platform or center, such as an
12 ABCCC, a DASC-A, an Air Support Operations Center (ASOC), or
13 Direct Air Support Center (DASC). These elements will then
14 coordinate with the FSE/FSCC.

15
16 (c). Approved missions will then normally be handed off for
17 positive terminal control by a forward air controller -airborne (FAC-
18 A), tactical air control party (TACP), or Air Naval Gunfire Liaison
19 Company (ANGLICO), if required. Missions not handed off to a
20 FAC-A, TACP, or ANGLICO will only be those surface TCT attack

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missions (such as AI) where close integration with ground forces is not required and friendlies are not a factor in the intended target area. Although rare, this may sometimes occur between the FLOT and FSCL.

(2). Attacks between the FSCL and the forward boundary.

Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and special operations forces. Their forces may now be operating beyond an FSCL or may plan to maneuver on that territory in the future. Such coordination is also important when attacking forces are employing wide-area munitions or munitions with delayed effects. Finally, this coordination assists in avoiding conflicting or redundant attack operations. In exceptional circumstances, the inability to conduct this coordination will not preclude the attack of targets beyond the FSCL. However, failure to do so may increase the risk of fratricide and could waste limited resources.²²

(a). Normally, when the land or amphibious force commander establishes an FSCL, it facilitates the JFACC's ability to rapidly conduct attacks between the FSCL and forward boundary as the

²² Jt Pub 3-0, page III-34

1 JFC assigned supported commander for overall air interdiction,
2 counterair, and strategic attack missions. The land or amphibious
3 force commander may conduct attacks *within the same area*.
4 Consequently, there exists the potential for conflict between air and
5 land forces conducting attacks. It is crucial the appropriate degree
6 of coordination, deconfliction, and synchronization takes place
7 between respective C2 centers to prevent fratricide, duplication of
8 effort, manage risks, and maximize results during attacks between
9 the FSCL and the forward boundary. To assist in this coordination,
10 the land / amphibious component commander should relay target
11 priority, affects, and timing of interdiction operations within their AO
12 / AOA to the JFACC and other component commanders.

13
14 (b). Attacks on surface TCTs between the FSCL and the forward
15 boundary should not violate established FSCMs, ACMs, directives,
16 or protected target lists. Such measure may be sufficient
17 coordination for surface TCT attacks. However, rapid deconfliction
18 of attacks sometimes requires further information be passed
19 among components in order to keep the affected component
20 commander informed of activities within the AO / AOA and their
21 potential impact on planned future operations.

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- Component commanders may establish rapid coordination and deconfliction via direct voice and datalinks between any combination of airborne and surface C2 agencies. Typical links may include (but are not limited to) ABCCC to FSE, DASC-A to FSCC, and Joint STARS to the force projection tactical operations center (FPTOC) and combat operations division (COD) of the joint air operations center (JAOC).

- Minimum elements of information to be transmitted are:

- Target description
- Target coordinates (LAT/LONG and/or UTM)
- Target number or identifier (as assigned)
- Common Reference System (Grid Box / Bullseye)
- Weapon type/effects desired
- Weapon firing position/ attack origination
- Time of attack/weapon time of flight
- CA of attack once complete (BDA)

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1 d. **Attack Options without an FSCL.** If an FSCL is not established, component
2 commanders must develop procedures for coordination and deconfliction of
3 surface TCT attacks. These procedures will be approved by the JFC. In those
4 cases without an established FSCL, there are two geographic areas requiring
5 deconflicted surface TCT attacks:
6

7 (1). **Attacks inside the AO / AOA.** Normally, an AO / AOA without a
8 FSCL severely restricts rapid attacks against surface TCTs. Since an AO
9 / AOA with no FSCL is restrictive in nature, component commanders may
10 make use of permissive and restrictive FSCMs (such as ACAS, FFAs, and
11 RFAs) and airspace control measures (such as MRRs and ROZs) to
12 coordinate and deconflict attacks. (Note: CAS missions will be
13 conducted as per Jt Pub 3-09.3, *JTTP for CAS*).
14

15 (2). **Attacks outside the AO / AOA.** FSCLs are not normally established
16 outside of an AO / AOA. Coordination of attacks on surface TCTs outside
17 component AOs / AOAs will be as directed by the JFC and in accordance
18 with the supported and supporting component commander relationships
19 established in Jt Pub 3-0, *Doctrine for Joint Operations* and Jt Pub 3-56.1
20 *Command and Control of Joint Air Operations*.

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e. **Airspace Coordination Area Options.** ACAs allow simultaneous component attack of surface TCTs in close proximity to each other by multiple attack means, one of which is normally air. ACAs are designed with a minimum altitude, maximum altitude, specified width / length, and defined off of a line between two coordinate points. Friendly fires are not permitted through established ACAs. Fires above, below, and outside the boundaries of an established ACA are authorized. The FSE/FSCC must advise the applicable Army Airspace Command and Control (A2C2) / Marine airspace control element of fires in close proximity to ACA entry and exit points. The A2C2 / Marine element will coordinate with the ASOC/DASC, ABCCC/DASC-A, AWACS/E2-C,

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1 or the airspace managers in the JAOC to ensure aircraft using the ACA are
2 aware of the close proximity of fires. Formal and informal ACAs exist, with
3 several techniques for deconfliction.

4
5 (1). **Formal ACA.** The Airspace Control Authority establishes formal
6 ACAs at the request of the appropriate ground commander. Formal ACAs
7 require detailed planning. Though not always necessary, formal ACAs
8 should be considered. The vertical and lateral limits of the ACA are
9 designed to allow freedom of action for air and surface fire support for the
10 greatest number of foreseeable targets. Since only the fire direction
11 center (FDC) can determine the trajectory for a specific battery firing at a
12 specific target, each target must be evaluated in the FDC to ensure the
13 trajectories of the artillery rounds do not penetrate the ACA. The fire
14 support coordinator (FSCOORD {US Army} or FSC {USMC}) should
15 consult the FDC when deciding the altitude of an ACA to determine if that
16 altitude would allow the majority of targets to be attacked without
17 interference or problems. ²⁴

²⁴ Jt Pub 3-09.3, page IV-11

1 (2). **Informal ACA.** Informal ACAs can be established using separation
2 plans and may be established by any maneuver commander. Aircraft and
3 surface fires may be separated by distance (lateral, altitude, and
4 combination of lateral and altitude) or by time. Distance separation
5 requires less detailed coordination between aircraft and firing units, but
6 can be the most restrictive for aircraft routing. Fire support personnel
7 should select the separation technique that requires the least
8 coordination without adversely affecting the aircrew's ability to safely
9 complete the mission.²⁵

10
11 (a). **Lateral Separation.** Lateral separation is effective for
12 coordinating fires against targets that are adequately separated
13 from flight routes to ensure aircraft protection from the effects of
14 friendly fires. This is an appropriate technique when aircrews and
15 firing units engage separate targets (at least 500 meters apart) and
16 aircraft will not cross gun-target lines.²⁶ Safe lateral separation
17 between ATACMS and aircraft engaging separate surface TCTs
18 may require more than 500 meters distance.
19

²⁵ Jt Pub 3-09.3, page IV-11

²⁶ Jt Pub 3-09.3, page IV-11

1 (b). **Altitude Separation.** Altitude separation is effective for
2 coordinating fires when aircrews will remain above indirect fire
3 trajectories and their effects. This technique is effective when
4 aircrews and firing units engage the same or nearby targets.²⁷
5 This technique works exceptionally well when simultaneous
6 indirect fire and air attacks are executed on surface TCTs.

7
8 (c). **Altitude and Lateral Separation.** Altitude and lateral
9 separation is the most restrictive technique for aircrews and may
10 be required when aircraft must cross the firing unit's gun-target
11 line.²⁸ This technique is especially effective for deconflicting
12 aircraft attacking surface TCTs underneath the flight path of a
13 overflying ATACMS trajectory.

14
15 (d). **Time Separation.** Time separation requires the most detailed
16 coordination and may be required when aircrews must fly near
17 indirect fire trajectories or ordnance effects. The timing of surface
18 fires must be coordinated with aircraft routing. This ensures that
19 even though aircraft and surface fires may occupy the same space,

²⁷ Ibid, page IV-12

²⁸ Ibid, page IV-13

1 they do not do so at the same time. All timing for surface fires will
2 be based on the specific aircraft event time (time on target {TOT} /
3 time to target {TTT}). This technique is appropriate when aircrews
4 and firing units engage the same or nearby targets. Consider
5 weapons fragmentation envelope and the likelihood of secondary
6 explosions when deconflicting sorties. ²⁹ Though normally used in
7 a CAS scenario with a terminal controller, this technique may be
8 used in coordinated attacks against surface TCTs. However, its
9 usefulness in deconfliction is excessively complicated by the need
10 for detailed timing. In deep attack scenarios, a terminal controller
11 may not be available to coordinate the time separation. Attack
12 aircraft may require a radio relay platform (such as an AETACS) to
13 communicate with the FDC. The inherent delays of radio relay may
14 result in a loss of a timely opportunity to attack the surface TCT.

15
16 **f. Common Reference Systems.** Common reference systems provide a
17 universal, joint perspective with which to define specific areas of the battlespace,
18 enabling the JFC and component commanders to efficiently coordinate,
19 deconflict, and synchronize surface TCT attacks. These reference systems are

²⁹ Jt Pub 3-09.3, page IV-13

1 especially useful when used to describe mutually accessible areas of attack and
2 rapidly deconflict assigned attack operations. Once identified, these areas may
3 be protected by control and coordinating measures (in particular FSCMs and
4 ACMs), thereby enabling unhampered precision attack and flexibility of weapon
5 system employment. Common reference systems result in rapid, deconflicted
6 surface TCT attacks, enhanced probability of mission success, and reduced
7 potential for duplication of effort and fratricide. Also, they allow for rapid
8 coordination of joint engagement and the employment of combined arms.
9 Additionally, they are flexible enough to be used for a variety of other purposes,
10 such as geographically identifying search and surveillance areas, identification
11 of restricted zones, and designation of high threat areas (such as enemy
12 surface-to-air missile {SAM} battery locations). The primary purpose of these
13 stems is to provide a common frame of reference for joint force situational
14 awareness.

15
16 (1). **“Grid Box” Reference System.** The “Grid Box” reference system is
17 an administrative measure highly useful in facilitating rapid attacks on
18 surface TCTs. This reference system may be used to rapidly and clearly
19 define geographical location for attack coordination, deconfliction, and
20 synchronization. Components may use the grid box system to identify the
21 area of intended attack to other components. After a target is acquired

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1 and areas of intended attack are designated by alphanumeric grid, the
2 identifying component establishes appropriate control and coordinating
3 measures, (such as FSCMs and / or ACMs), to expedite and deconflict
4 attacks with other components. Grid boxes themselves are not FSCMs or
5 ACMs, but simply a common reference system that compliments
6 established fire support / airspace control systems and measures.
7 Normally, FSCMs and / or ACMs established in grid box areas should be
8 of a temporary nature, protecting singular component attack operations
9 only for as long as operationally necessary. The purpose is rapid, and
10 usually short duration, deconfliction. As such, grid box identification is
11 only temporary. Some situations warrant simultaneous joint engagements
12 within a single grid box area. Appropriately constructed FSCMs and / or
13 ACMs (such as informal ACAs with altitude separation) allow for massed
14 attacks against surface TCTs. Unlike the "Kill Box" concept used solely
15 by the JFACC during Desert Storm, each component commander, as well
16 as the JFC, can use a joint "Grid Box" reference system to facilitate
17 deconfliction and execution of attacks against surface TCTs throughout
18 the operational area. This reference system allows the JFC and
19 component commanders to clearly communicate information, establish a
20 common frame of reference, and enable joint force prosecution of surface
21 TCTs with multiple weapon systems. The grid box reference system is

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1 extremely useful in the area between the FSCL and the forward boundary,
2 where it is highly possible more than one component may be conducting
3 attacks. This system, when properly employed by the joint force,
4 facilitates component commander requirements to inform all other
5 affected commanders when attacking targets both inside and beyond an
6 FSCL (as directed in Jt Pub 3-0, *Doctrine for Joint Operations*, page III-
7 34.)

8
9 (a). **Basic Considerations.** Grid boxes designate specific
10 horizontal surface areas and their associated volumes of airspace.
11 Design is situationally dependent on METT-T (Mission, Enemy,
12 Terrain / Weather, Troops Available, and Time Available) and IPB.
13 Basic considerations when designing grid boxes are planned
14 weapons effects and planned weapon system employment tactics.

- 15
16 • **Planned Weapons Effects.** Weapons effects, attack profiles,
17 and attack system maneuverability determine the size of a grid
18 box.

1 – For indirect fires, this size is dependent on the munition
2 and associated submunition; number of rounds; single
3 tube (or launcher) vs. massed fires (platoon / battery /
4 battalion); accuracy / precision of fires; and safety /
5 buffer zones incorporating fragmentation patterns.

6
7 – For air delivered munitions from fixed and rotary wing
8 aircraft, grid box size is dependent on maneuver
9 requirements, aircraft per flight; accuracy / precision
10 capability of the aircraft and / or weapon; munition;
11 quantity of weapons delivered per aircraft; and maximum
12 fragment travel distances.

- 13
14 • **Planned Weapon System Employment Tactics.** Weapon
15 system employment tactics also determine the size of a grid
16 box.
17

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1 – For indirect fire weapons, this size is dependent on the
2 number of systems in effect; associated gun-target
3 line(s), projectile trajectory(ies), and missile flight path(s).

4
5 – Aircraft considerations are dependent on the airspace
6 required to safely and effectively maneuver the aircraft
7 (or flight of aircraft) during weapons delivery, based on
8 delivery tactics and parameters. Dimensions should
9 allow for freedom of aircraft movement within the grid box
10 without inhibiting precision targeting and delivery.

11
12 (b). **Dimensions.** Basic considerations of planned weapons
13 effects and weapon system employment tactics determine the
14 appropriate size of a grid box based on the employment of a *single*
15 weapon system. However, since the grid box system should be a
16 common reference for all joint force components, it must be simple
17 and flexible enough to adapt to the requirements of *any* available
18 weapon systems. As such, the JFC may determine the *optimum*
19 dimensions of a grid box and use it as a *standard baseline*
20 applicable to the majority of joint force operations where rapid

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1 deconfliction is required. Dimensions should be based on the
2 largest order of magnitude expected, and allow for further
3 adjustment and downsizing as necessary. Optimum grid box sizes
4 should accommodate the most restrictive weapon system
5 employment tactic, yet allow flexibility (through further subdivision)
6 so as to not overly restrict other weapon system employment. In
7 order for the grid box system to be simple and easy to use, the grid
8 boxes should be based on lines of latitude and longitude that are
9 printed on the maps in use in the theater.

- 10
- 11 • **Horizontal Dimensions.** The optimum horizontal dimensions
12 of a standard baseline grid box are 15 minutes of latitude (LAT)
13 by 15 minutes of longitude (LONG). This is the surface area
14 required to accommodate *most* fixed wing employment tactics
15 (normally, the largest order of magnitude for weapon system
16 employment tactics). Such a grid box will measure
17 approximately 15 nautical miles (nm) x 15 nm. Exact size may
18 vary depending on latitude (see Fig II-3, Standard Baseline
19 Grid Box). LAT / LONG references easily define grid boxes
20 since they are common and exist on most military operational
21 graphics and charts.

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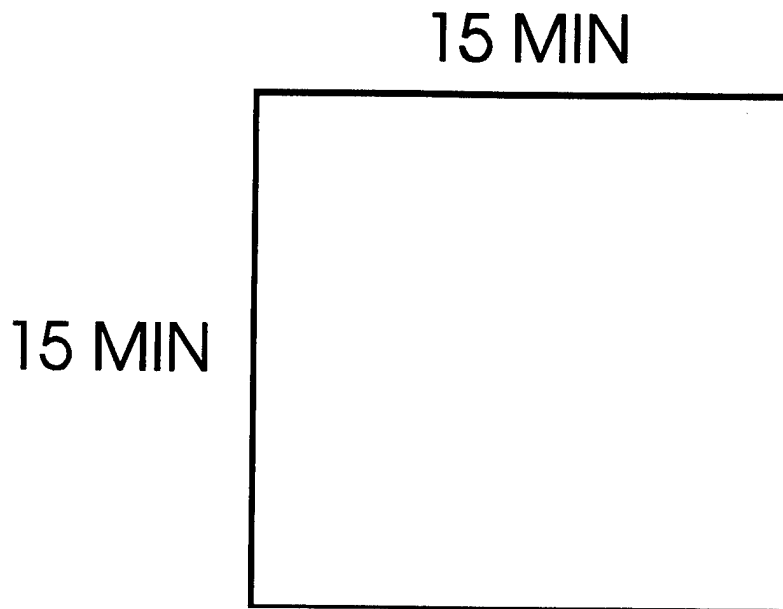


Fig II-3

Standard Baseline Grid Box

- Of particular use are 1:250,000 scale Joint Operational Graphic -Air (JOG-Air) charts, which display both LAT / LONG and universal transverse mercator (UTM) scales.
- 15 x 15 minute LAT / LONG grid box dimensions are particularly advantageous because they also encompass a single 1:50,000 UTM topographical line chart.

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- In the absence of charts with both LAT / LONG and UTM coordinates, handheld precision locating ground reference (PLGR) devices can be used to convert LAT / LONG coordinates into UTM coordinates and vice versa.

- All grid box dimensions should be defined using world grid system (WGS)-84 Datum Plane charts unless operational requirements dictate otherwise. In cases where only WGS-76 Datum Plane charts exist, use caution in the conversion of WGS-76 data to WGS-84 data.

- **Horizontal Subdivision.** If desired, and as necessary, the standard baseline grid box may be further subdivided so as to not overly restrict other weapon system employment. Two such methods are:

- Four subdivisions, 7.5 x 7.5 minute LAT / LONG
- Nine subdivisions, 5 x 5 minute LAT / LONG

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For example, attack helicopter operations may only require a 7.5 x 7.5 minute LAT / LONG subdivided grid box. (Fig II-4A).

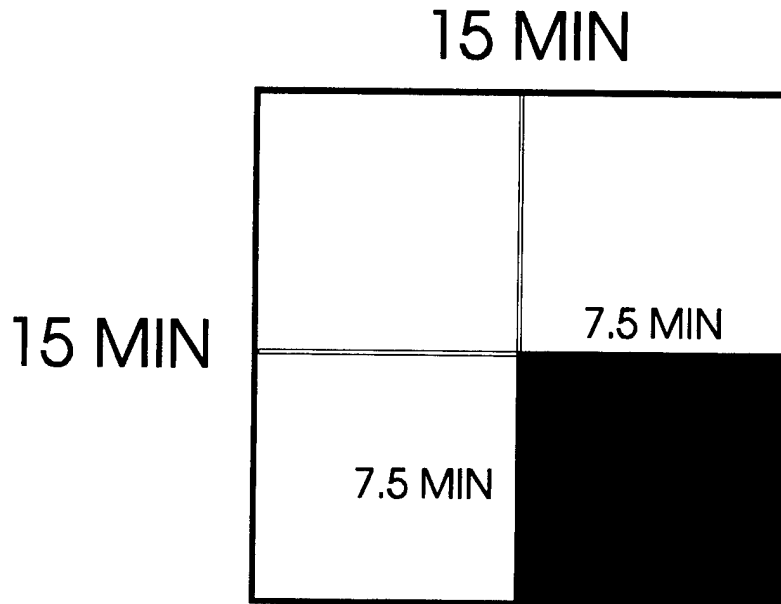


Fig II-4A

Four Quadrant Subdivision Option

Similarly, ATACMS do not require an ACM (PAH/TAH ROZ) the size of a standard baseline grid box. Most ATACMS PAH/TAH ROZ will fit within the size of a 5 x 5 minute subdivided grid box. SOF operations ROZs, like ATACMS, also may only require a 5 x 5 minute surface area (Fig II-4B).

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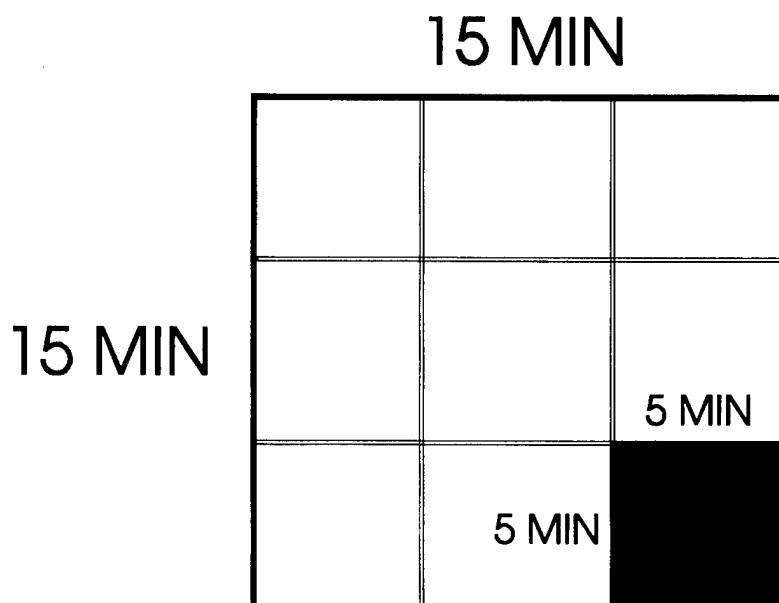


Fig II-4B

Nine Sector Subdivision Option

The advantage of subdividing a grid box reference area (and establishing FSCMs and / or ACMs in these smaller areas) is that unused space is made available for other adjacent operations. It allows components to use one or more subdivisions of a standard grid box, in any combination, as necessary. Subdivision also allows for the employment of several different weapons systems on multiple targets within a standard grid box without overly restricting any one weapon system to the use of only a standard 15 x 15 minute standard baseline. However, subdivision should be used as necessary,

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1 and care should be exercised not to overly complicate the grid
2 box system, as simplicity is key to its success.

- 3
- 4 • **Vertical dimensions.** As with horizontal dimensions, the
5 vertical dimensions of a grid box are dependent on planned
6 weapon system employment tactics. However, they are also
7 very dependent on the control and coordinating measures used
8 during the attack. Consequently, the optimum *vertical*
9 dimensions of a baseline grid box are difficult to standardize.
10 Vertical dimensions are much more situationally dependent on
11 than horizontal dimensions. Generally, FSCMs (in this case,
12 ACAs) and / or ACMs are used to facilitate the planned weapon
13 system employment tactic. Typical measures include
14 establishing ACAs (formal and informal), RFAs, HIDACZ,
15 MRRs, and ROAs / ROZs. In doing so, the JFC and
16 component commanders should give careful consideration to
17 the maximum vertical dimensions of the measure established in
18 the grid box so as not to unnecessarily restrict or inhibit other
19 affected component operations.
- 20

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1 – Indirect fire weapon systems require vertical dimensions to
2 accommodate maximum ordnance altitudes along the gun-
3 target line or route of flight of the missile. In the case of
4 ATACMS, the altitude along the missile's flight path must be
5 deconflicted. Appropriately subdivided grid box sectors may
6 be used to identify established PAHs and TAHs (normally as
7 ROAs / ROZs) for ATACMS launch positions and target
8 areas.

9
10 – Aircraft require grid box vertical dimensions to accommodate
11 planned minimum and maximum altitudes for effective
12 employment (normally an ACA).

13
14 – The vertical dimensions of any measure established in a
15 grid box should be carefully planned so as to not inhibit
16 overflight of weapons systems enroute to other targets in
17 other grid boxes. Occasionally, adjacent grid boxes may be
18 identified for attacks by different components. In such
19 cases, FSCMs and / or ACMs must be properly established
20 to adequately deconflict neighboring operations. These

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1 situations require the establishment of appropriate
2 measures to deconflict weapon system flight paths (aircraft,
3 missile, or projectile) enroute to geographically separated
4 grid boxes.

- 5
- 6 – Aircraft have the flexibility to move around most vertical
7 restrictions (such as an ATACMS TAH or ROZ) enroute to a
8 target area or grid box. MRRs protect such aircraft
9 movements. Likewise, some TLAM and CALCM can be
10 planned to maneuver within MRR restrictions.

- 11
- 12 – ATACMS engagements generally do not have the flexibility
13 to maneuver around ACAs. Therefore, careful consideration
14 should be exercised before establishing vertical restrictions
15 in the path of expected ATACMS routes of flight.

16

17 (c). **Theater Layout.** The grid box reference systems may be
18 used anywhere in the operational area. Placement of the grid
19 system is situationally dependent on IPB and the location of known

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1 (planned and unplanned immediate) surface TCTs. In other words,
2 grid boxes should be established in potential surface TCT areas
3 where rapid component to component coordination and
4 deconfliction will be required. The grid systems may be small and
5 limited in size, covering separate areas, or the JFC may elect to
6 group grid boxes together to form a "patchwork quilt" or "lattice"
7 covering the entire AOR/JOA. The second option allows maximum
8 flexibility to rapidly coordinate and deconflict attacks/airborne
9 surveillance operations against both known *and* unknown
10 (immediate unanticipated) surface TCTs anywhere they are
11 located. If the JFC so desires, grid boxes may be used to extend
12 from the rear areas of the AO, across the forward line of own
13 troops (FLOT), through the area between the FLOT and FSCL, and
14 beyond the FSCL (to include areas past the AO boundary - see Fig
15 II-5, Example Theater Layout)

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Fig II-5

(d). **Labeling and Identification.** Grid boxes should be labeled with a simple, common, universal identifier recognizable by each component and their associated C2 and attack assets.

Coordination and deconfliction of attacks is simplified by procedurally communicating grid boxes labeled by alphanumeric identifiers rather than complicated and detailed series of LAT / LONG coordinates. A simple alphanumeric system allows for a common “language” and perspective when components

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communicate in time-critical situations. Example: "Grid Box D-8"
(Fig II-6).

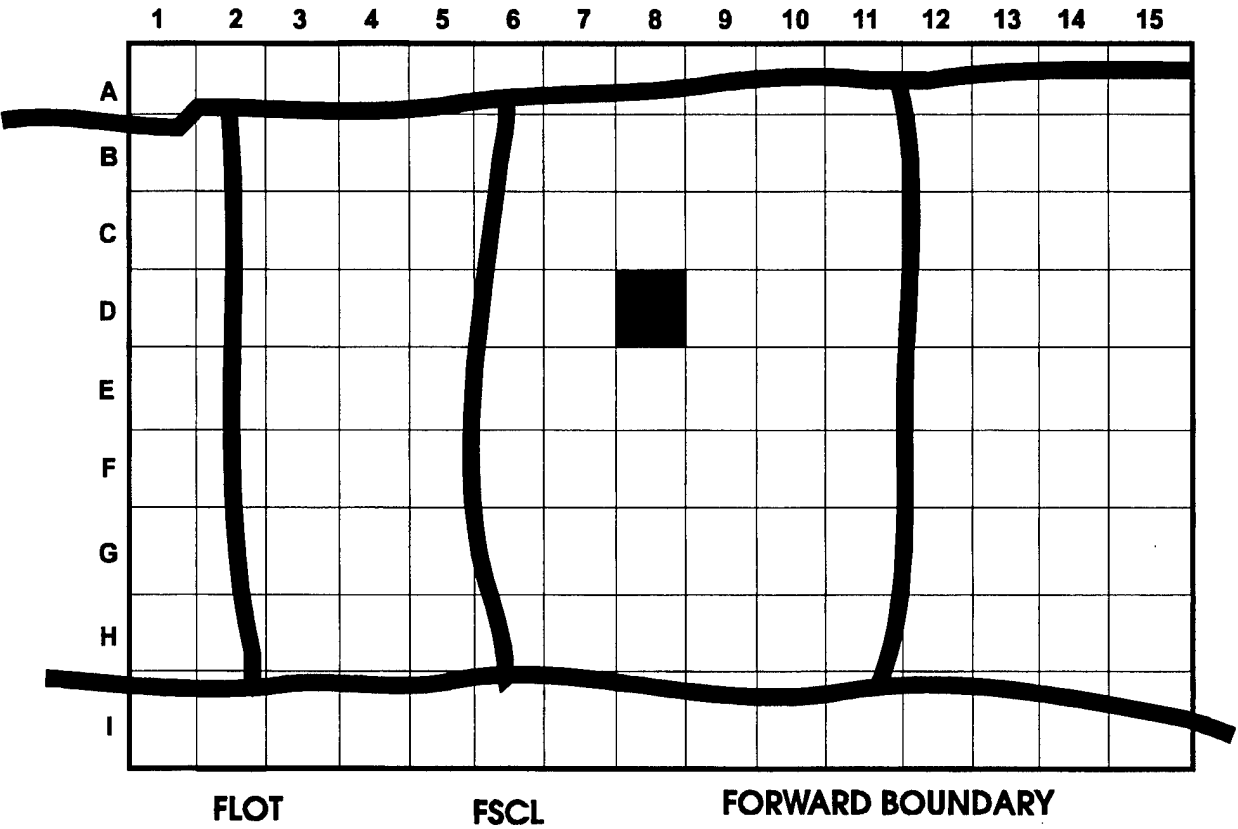
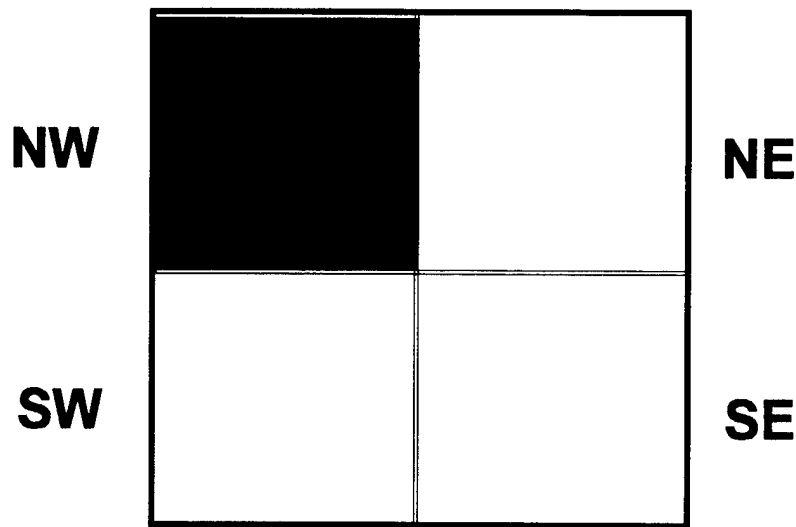


Fig II-6

Grid Box Labeling and Identification

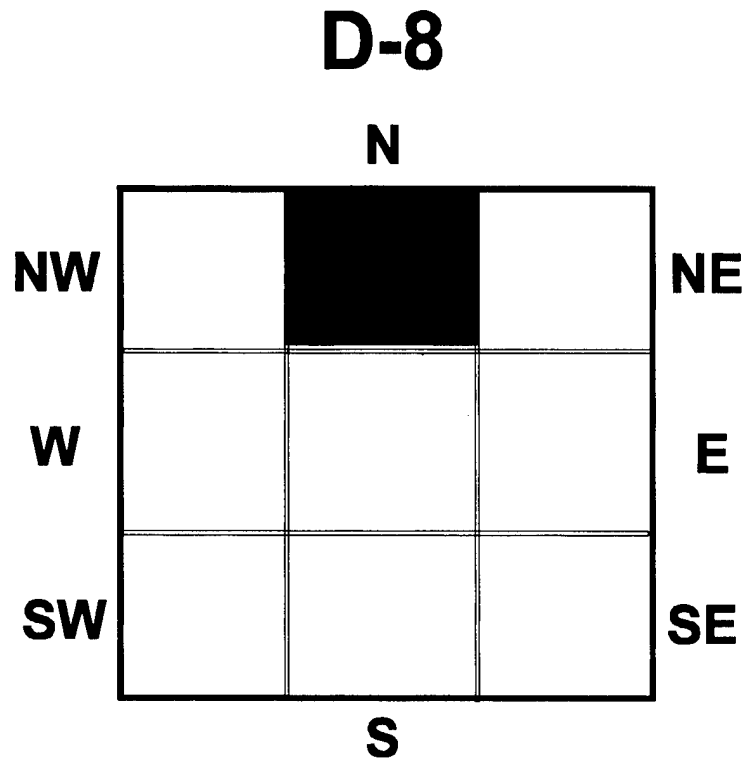
D-8



"Grid Box D-8, northwest quadrant"

Fig II-7

- Grid boxes subdivided into four quadrants may be identified by their respective cardinal position--Northwest, Northeast, Southeast, and Southwest. Example: *"Grid Box D-8, northwest quadrant"* or *"D-8, northwest"* (Fig II-7).



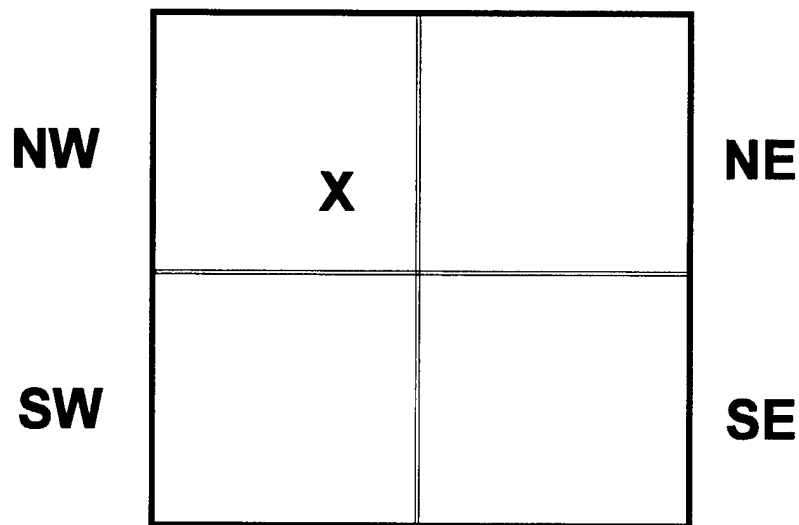
"Grid Box D-8, north sector"

Fig II-8

- Grid boxes subdivided into nine sectors may be identified by respective cardinal positions as well. Example: *"Grid Box D-8, north sector"* or *"D-8, north"* (Fig II-8).

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D-8



"Grid Box D-8, northwest 40 x 20"

Fig II-9

- Refinement of a specific target location within a grid box quadrant may be accomplished by adding the actual minutes of latitude and longitude. Example: *"Grid Box D-8, northwest quadrant, 40 min x 20 min"*, or for brevity: *"D-8, northwest, 40 x 20"* (Fig II-9). Other techniques for refinement transmitting detailed target coordinates. Example: *"Grid Box D-8, North xxxx.xx East xxxx.xx."* (NOTE: Transmitting LAT / LONG coordinates over unsecured nets may compromise the location of planned attacks.)

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- Grid boxes may be assigned TADIL-J / A / B numbers in addition to their alphanumeric designation for ease of dissemination across specific operational area data links.
- Grid box reference systems have a communication security (COMSEC) advantage. Unlike stand alone LAT / LONG or UTM coordinates, grid box alphanumerics may be communicated over unsecured channels (voice or data) without risk of compromise as long as the actual coordinates of the areas are not associated. (Initial grid reference systems and their associated geographic coordinates should be published in classified orders and instructions, to include the ACP). Also, grid box alphanumeric coding should be regularly changed to ensure enemy forces have not deduced and correlated unsecure grid box identification transmissions with executed attacks (that is, the ability of the enemy to correlate areas recently attacked by friendly forces with intercepted grid box transmissions).

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1 (e). **Grid Box Reference System Development.** The JFC should
2 appoint a component commander (normally the JFACC, as the
3 Airspace Control Authority) to develop the grid box reference
4 system for the entire AOR / JOA. Similar to land / amphibious
5 force commander establishment of the FSCL, the Airspace Control
6 Authority should develop the grid box reference system (although it
7 is not a FSCM in and of itself) in consultation with superior,
8 subordinate, supporting, and affected commanders. Guidance
9 from the JFC and inputs from other component commanders are
10 critical to ensuring the reference system fits the needs of the joint
11 force, and more importantly, accepted as a mutual tool. Once
12 developed, the JFC should evaluate the system for its potential to
13 expedite coordination, deconfliction, and synchronization within the
14 applicable operational area. Once approved, the reference system
15 is passed to each component and their associated C2 and attack
16 assets.

- 17
- 18 • Grid box reference systems should be incorporated into
19 operational graphics and overlays of component C2 systems.
20 With the Advanced Field Artillery Tactical Data System
21 (AFATDS), the land or amphibious component can enter the

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1 reference system as an operational graphic in the same manner
2 boundaries or phase lines are entered. Most importantly,
3 AFATDS accepts input of FSCMs and ACMs. With the joint
4 approved Contingency Theater Automated Planning System
5 (CTAPS), the JFACC can similarly enter the reference system
6 in the Theater Integrated Situation Display (TISD). Also, the
7 JFACC should ensure the information is entered into AETACS
8 databases, as well as published in the ACP.

9
10 (f). **No Assigned Establishing Authority.** It is important to
11 recognize that grid boxes are a *reference system*, and not control
12 and coordinating measures. As such, there is no "Establishing
13 Authority" for any specific grid box, as they are not "established" or
14 "activated" as control and coordinating measures. (NOTE: As
15 stated in para (e), the JFC appoints a single component
16 commander only to *develop* the grid box reference system for the
17 AOR / JOA.) The usefulness of this system is that it allows
18 components to establish appropriate control and coordination
19 measures, as authorized, that can be mutually coordinated,

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1 deconflicted, and synchronized via a simple, common, mutually
2 understood, and agreed upon reference system.

3
4 (g). **Grid Box Reference System Management.** Once developed
5 and approved, each component uses the common grid box
6 reference system to rapidly coordinate, deconflict, and synchronize
7 attack operations with other components. In a time-critical
8 situations, components use grid boxes to reference where they
9 plan to establish FSCMs and / or ACMs and execute attack
10 operations. Unilateral activation of FSCMs and / or ACMS within
11 grid box areas without coordinating and deconflicting with other
12 components severely risks the potential for duplication of effort and
13 fratricide.

14
15 (h). **Separate Grid Box Systems.** In some cases, the JFC may
16 elect to establish separate grid box systems.

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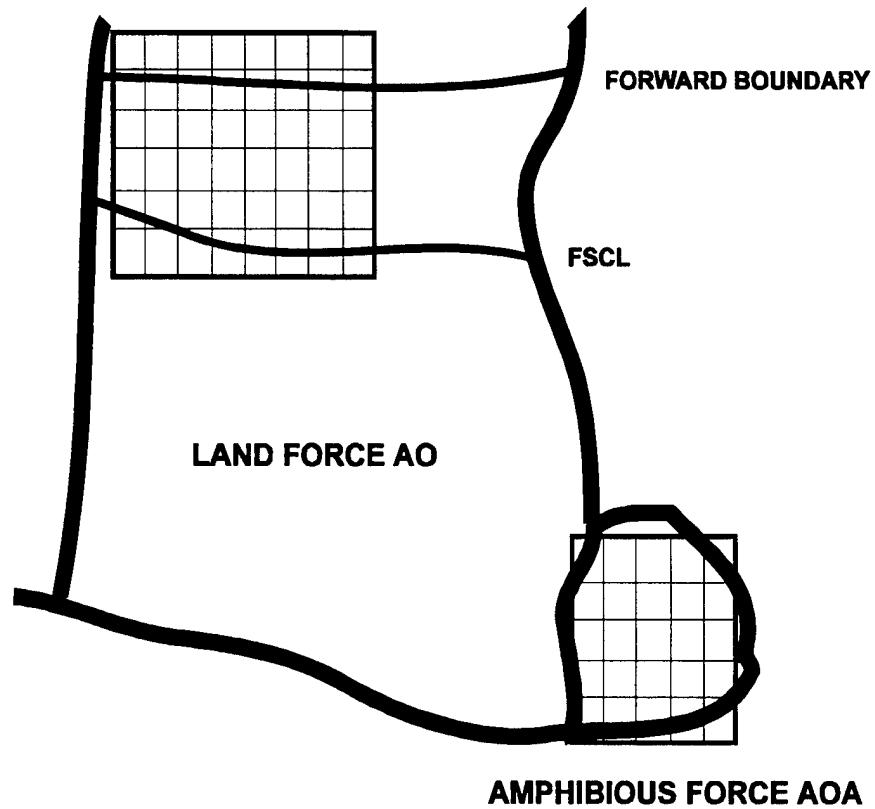


Fig II-10

Separate Grid Box systems

Reasons for doing this rely heavily on geographic separation of the battlespace (that is, two distinct, geographically separate AOs / AOA) where two distinct grid box reference systems are in place (Fig II-10).

(i). **Grid Box Status.** Grid boxes identify ongoing attack operations and established FSCMs and / or ACMs. Under normal

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1 circumstances, the airspace and / or surface areas identified by a
2 grid box are under prior established control and coordinating
3 measures and applicable supported / supporting commander
4 relationships apply. However, once a grid box is used to identify
5 appropriate airspace and/or surface areas, operations within the
6 grid box are temporarily restricted in accordance with the
7 established FSCMs and / or ACMs within the area.

8
9 (j). **Grid Box Execution.** Once a component acquires a surface
10 TCT, they identify the grid box (along with the specified grid box
11 quadrant). Next, the component transmits their intent to fire on or
12 attack the surface TCT, along with their intent to establish an
13 appropriate FSCM and / or ACM, to the other components. After
14 detailed coordination component liaison/coordination elements, the
15 component established the desired control measure. Coordination
16 will require verification there are no other airspace/surface area
17 conflicts in the intended grid box. Depending on the level of
18 situational awareness and access to sensors (such as AWACS,
19 control and reporting center {CRC}, or Joint STARS), this
20 coordination could take several minutes. Components are
21 responsible for transmitting grid box areas with FSCMS / ACMs to

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1 affected units via C2 agencies and systems. Required information
2 includes grid box identification, type of attack, and established
3 FSCMs and / or ACMs (to include appropriate applicable times).

4 Once the attack is complete, the originating component informs the
5 other components that the FSCMS and / or ACMs in the grid box
6 are deactivated.

- 7
- 8 • Depending on the intensity of the active surface TCT threat and
9 the level of component attack execution, it is possible to have
10 multiple component attacks occurring throughout the grid box
11 reference area at the same time. Carefully managed, numerous
12 grid boxes can be used simultaneously with various FSCMs and
13 / or ACMs in effect. The complexity of coordinating,
14 deconflicting, and synchronizing multiple component operations
15 against a significant surface TCT threat is simplified through the
16 use of this flexible reference system which can provide
17 immediate situational awareness to all players. The reference
18 system further enhances a common joint force perspective
19 when it is translated onto real-time command and control data
20 systems, such as CTAPS, AFATDS, and ADOCS. (Fig II-11)

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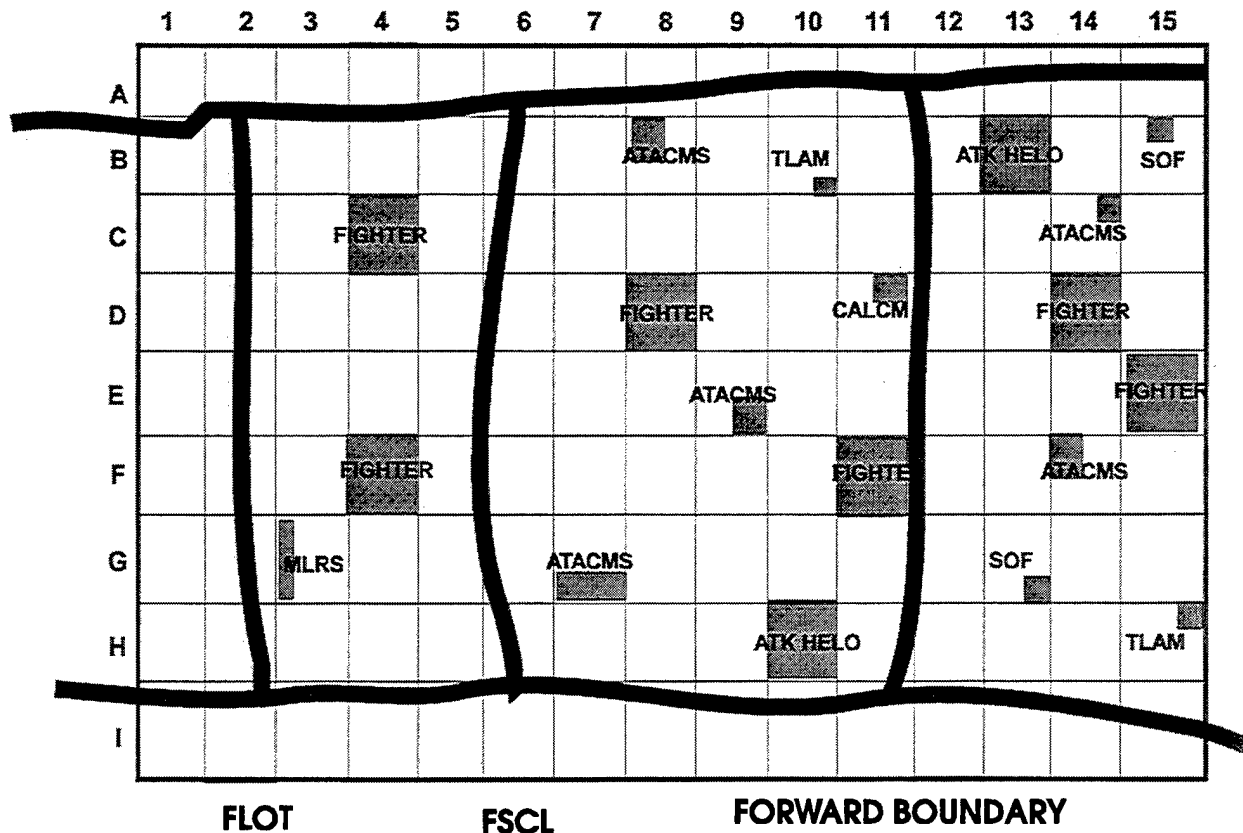


Fig II-11

Multiple Component Attack Operations Using a Single Grid Box Reference System

- The JFACC can transmit grid box information to fighters, sectors, and wing operations centers (WOCs) via AETACs platforms (such as AWACS, ABCCC, Joint STARS, or DASC-A) or ground coordination agencies (such as the ASOC, DASC, CRC, and control and reporting element {CRE}). CTAPS may also be used to communicate this information via the TISD.

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- The land and amphibious force commander can transmit similar information via the FSE, FSCC, Force Fires Coordination Center (FFCC), Deep Operations Coordination Cell (DOCC), or FPTOC. The Advanced Field Artillery Tactical Data System (AFATDS) and Army Deep Operation Coordination System (ADOCS) serve as rapid means to communicate this information via established tactical fire direction system nets and local area network (LAN) systems.

- The naval component commander, or joint force maritime component commander (JFMCC, if designated), can transmit this information via the supporting arms coordination center (SACC), tactical air command (or control) center (TACC), E-2 and DASC-A platforms, and AEGIS cruisers.

(k). **Blanket Grid Box Use.** There may be instances where it is prudent to use grid boxes to identify blanket FSCMs and / or ACMs in advance of surface TCT acquisition. Grid boxes can be assigned to specific weapons systems for immediate attack once the surface TCT is acquired within the grid box. For example, a

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1 series of grid boxes may be assigned directly to fighter aircraft for
2 interdiction purposes. Similarly, grid boxes may be assigned to a
3 forward air controller-airborne (FAC-A). Likewise, grid boxes may
4 also be assigned to an ATACMS battery for pre-planned fire
5 missions. Once the target is acquired, coordination is minimized
6 and the mission can be executed on a NRT basis.

7
8 **(I). Grid Box Examples:**

- 9
- 10 • **Example #1.** Joint STARS acquires a surface TCT and
11 transmits its location to the FSE / FSCC GSM, BCD GSM, and
12 JAOC. The BCD and JAOC mutually decide to assign fighter
13 assets (holding on CAP stations) to attack the TCT.
14
 - 15 – The BCD requests the FSE to terminate all indirect surface
16 to surface fires (if any) into the intended grid box.
17
 - 18 – The JAOC, acting as the agent for the Airspace Control
19 Authority, and as requested by the BCD (if appropriate),

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1 establishes an ACA in the intended grid box. The JAOC also
2 determines which MRRs (if necessary) should be used
3 enroute, as well as determines if any other conflicting grid
4 boxes are active.

5
6 – The BCD transmits the ACA and MRR information via
7 AFATDS to the FSE for deconfliction.

8
9 – The JAOC directs the fighter controlling agency (normally
10 AWACS, ABCCC, or the DASC-A) to execute the fighters,
11 transmitting all appropriate targeting and deconfliction
12 information using the grid box system as a common
13 reference. Specific targeting information (such as detailed
14 coordinates) is passed once the grid box references focuses
15 the area of intended attack (that is, the “big to small”
16 concept).

17
18 – The fighters depart the CAP and follow MRRs (if any)
19 enroute to the assigned grid box, maintaining situational

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1 awareness and not entering any other FSCM / ACM in any
2 other grid box. Upon arrival at the assigned grid box and
3 established ACA, the attack begins.

4
5 – Once the fighters have completed their attack and the target
6 is destroyed, the AWACS/ABCCC/DASC-A advises the
7 JAOC it is ready to deactivate the ACA in the grid box and
8 associated MRRs.

9
10 – Once fighters are clear, the JAOC, in coordination with the
11 BCD, deactivates the ACA in the grid box and transmits the
12 information to all components. The BCD transmits this
13 information via AFATDS.

- 14
15 • **Example #2.** The land component has acquired a target
16 through national assets. The FSE identifies which grid box the
17 surface TCT is located in and plans for an ATACMS attack.

- 1 – The FSE transmits grid box information to its BCD, advising
2 them which grid box they intend to attack.
3
- 4 – The BCD coordinates this information with the JAOC, and
5 they mutually identify the intended grid box.
6
- 7 – The BCD, in coordination with the land component
8 commander, establishes an RFA over the TAH. The JAOC,
9 as agent for the Airspace Control Authority and in
10 coordination with the BCD, similarly establishes a ROZ over
11 the ATACMS launcher (PAH), and ROZ over the surface
12 TCT (TAH) in the intended grid box.
13
- 14 – The JAOC and the BCD determine if any other FSCMs /
15 ACMS are active that might conflict with the ATACMS flight
16 path enroute from the PAH (ROZ) to the TAH (ROZ).
17
- 18 – The JAOC advises all affected aircraft of the pending
19 ATACMS fire mission via AWACS, ABCCC, or DASC-A (as

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1 appropriate). The grid box reference system is used to
2 rapidly identify the PAH (ROZ) and TAH (ROZ) location.
3 The grid box system is particularly useful for passing these
4 locations to aircrews of fixed and rotary wing aircraft, since
5 they do not need to plot coordinates to determine if they are
6 in potential conflict. (During mission planning, the aircrew
7 can plot the grid boxes/quadrants of their planned flight
8 route, and when a warning is transmitted, they will
9 immediately be able to determine whether their route of
10 flight is in potential conflict. Likewise, for immediate,
11 unplanned airborne divers, the grid box system is a useful
12 tool for quick reference, coordination, and deconfliction of
13 flight paths from other operations).

- 14
- 15 – The ATACMS mission fires.
- 16
- 17 – Once the mission is complete, the FSE advises the BCD it is
- 18 ready to deactivate the FSCM in the grid box. The JAOC
- 19 and BCD deactivate the ROZs and RFA (respectively).
- 20

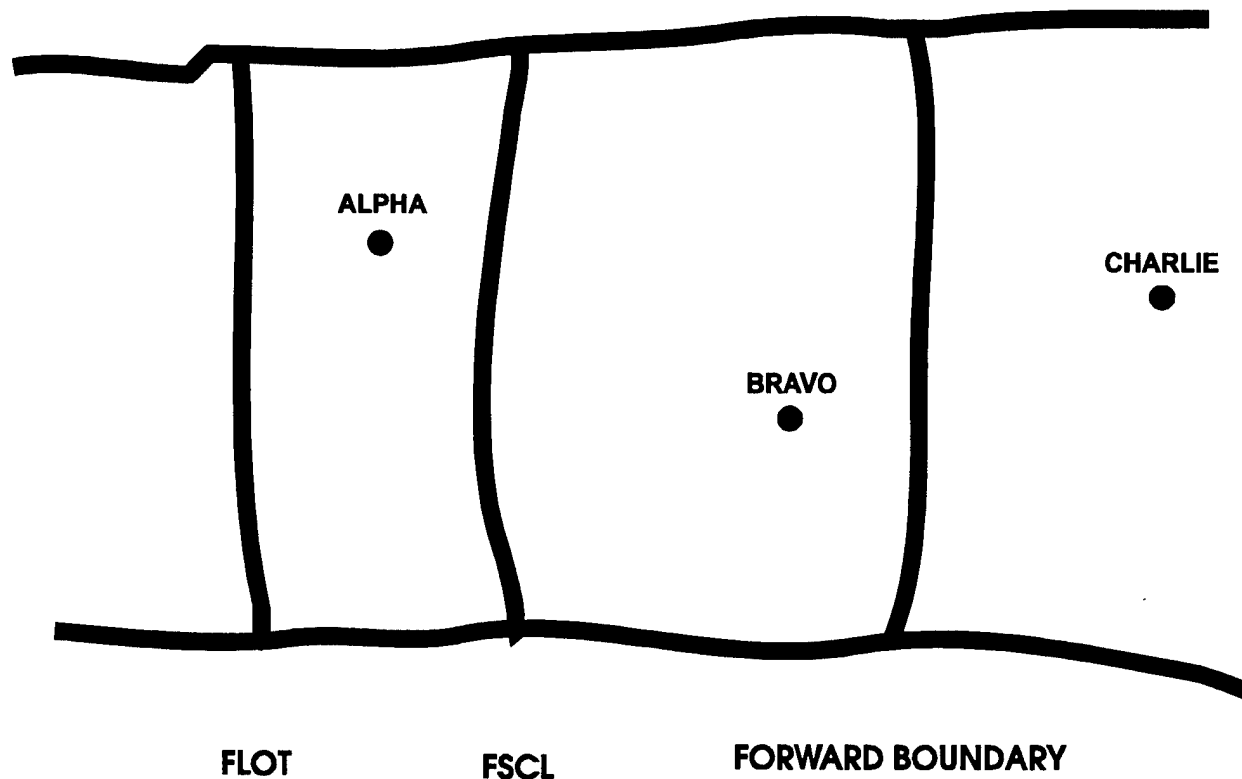
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1 (2). **"Bullseye" Reference System.** The bullseye reference system is
2 similar to the grid box reference system in that it can be used to provide
3 components with a common perspective of the battlespace and allow for
4 common identification of mutually accessible attack areas. In addition, it
5 can be used to identify the center point for the establishment of an
6 appropriate FSCM / ACM. The bullseye reference system is normally
7 used during counterair engagements for situational awareness on
8 targeted and untargeted airborne threats. However, it has application in
9 attacks against surface TCTs. The bullseye concept is similar to the US
10 Army Terrain Index Reference System (TIRS) as well as the Target
11 Reference Point (TRP) concept, which are used to quickly identify a target
12 off of a known geographic point.

13
14 (a). **Bullseye Design.** Bullseyes may be established throughout
15 the AO / AOA by selecting geographic points of reference and
16 encoding them with code words, or alphanumerics. If multiple
17 bullseyes are required, each bullseye can be labeled with a
18 specific codeword. For example, three bullseyes can be
19 designated as Bullseye *"Alpha"*, *"Bravo"*, and *"Charlie"* (Fig II-12)
20 These geographic points should be incorporated into operational

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1 graphics and overlays of component C2 systems, such as
2 AFATDS, CTAPS, AETACS databases, and the ACP.



3
4 Fig II-12
5 Bullseye Reference System
6

7 (b). **Bullseye Development.** Any component can develop
8 bullseyes. To be effective during cross-component coordination
9 and deconfliction, these bullseyes must be communicated to other
10 components, preferably in advance of combat operations.
11

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1 (c). **Bullseye Execution.** Any surface TCT or attack can be
2 referenced by its bearing and distance from a selected bullseye.
3 Bearings should be described reference magnetic north and
4 distance in nautical miles. Selected targets or attacks can then be
5 rapidly coordinated and deconflicted using the bullseye as a
6 common reference.

7
8 (d). **Bullseye Errors.** The utility of a bullseye system is greatly
9 hampered when targets are identified a significant distance from
10 the specified bullseye point. As distance from the point increases,
11 the larger the surface area per degree occurs, and consequently,
12 the higher probability of error. The formula for error is as follows:

13 *One degree of azimuth error = one nm of horizontal distance error*
14 *at a range of 60 nm ("60 to 1" Rule)*

15 Therefore, a one degree of azimuth error at a range of 12 nm from
16 a selected bullseye is equivalent to a **0.2 nm** location error.

17 However, a one degree of azimuth error at a range of 120 nm from
18 a selected bullseye results in a significantly greater location error.

19 In this case, it equates to **2 nm**. Essentially, the potential for error
20 increases in direct proportion to any increase in range. If the range

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1 increases by a factor of 10, any degree of azimuth error will
2 likewise increase the location error by a factor of 10. Therefore, it
3 is best to use the bullseye technique in smaller areas / AOs /
4 AOA's.

5
6 (e). **Bullseye Examples.** The following are examples of
7 component descriptions of surface TCT targets while using a
8 bullseye reference system. Provided the each component
9 understands the common bullseye reference points, coordination
10 and deconfliction can occur. However, this process is much more
11 fluid and inexact than the grid box procedure.

- 12
- 13 • **Example #1.** A surface TCT located 20 nm south of bullseye
14 alpha should be referred to as "*Target, Bullseye Alpha, 180*
15 *degrees for 20 nm*" (Fig II-13) Fighter aircraft are then assigned
16 to search for and attack the surface TCT. Appropriate FSCMs
17 and / or ACMs can be established as in the grid box procedure.
- 18

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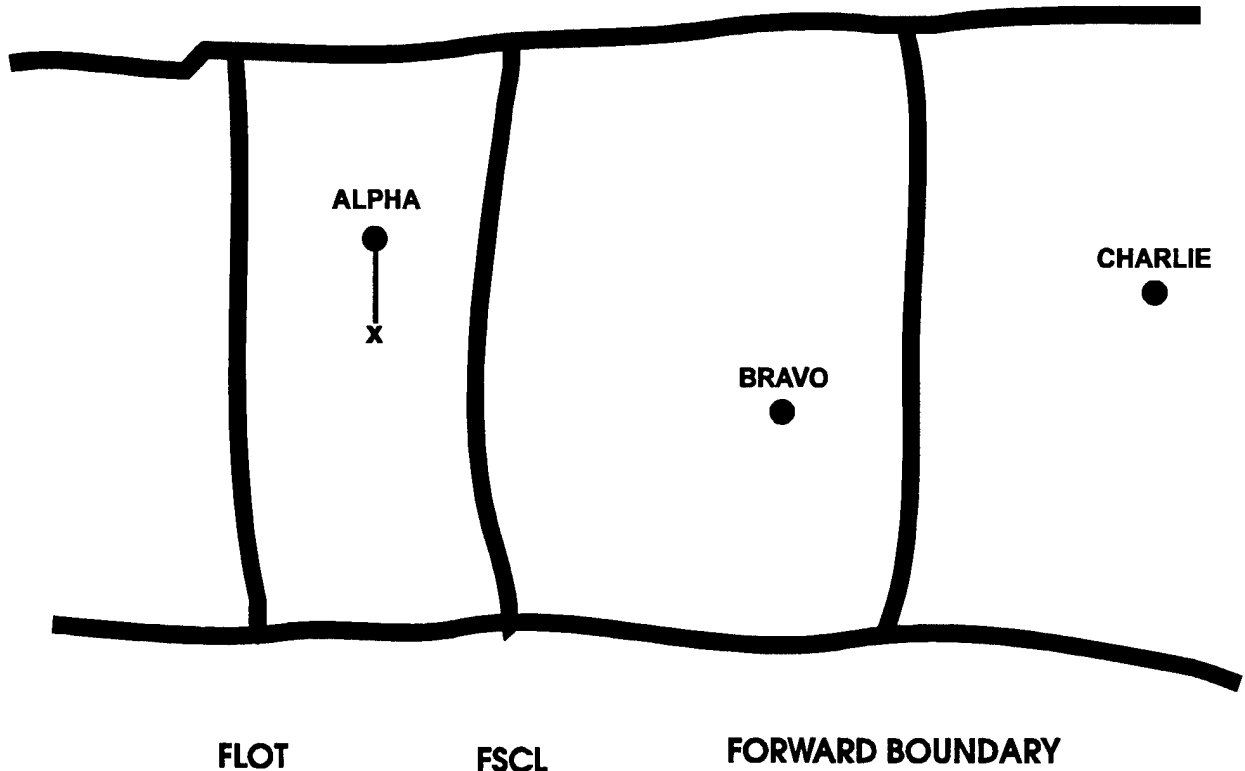


Fig II-13

Bullseye Example #1

- **Example #2.** ATACMS attacks intended for a target northwest of bullseye "Charlie" should be coordinated and deconflicted with other components by communicating *"ATACMS attack, Bullseye Charlie, 335 degrees for 55 nm."* (Fig II-14)

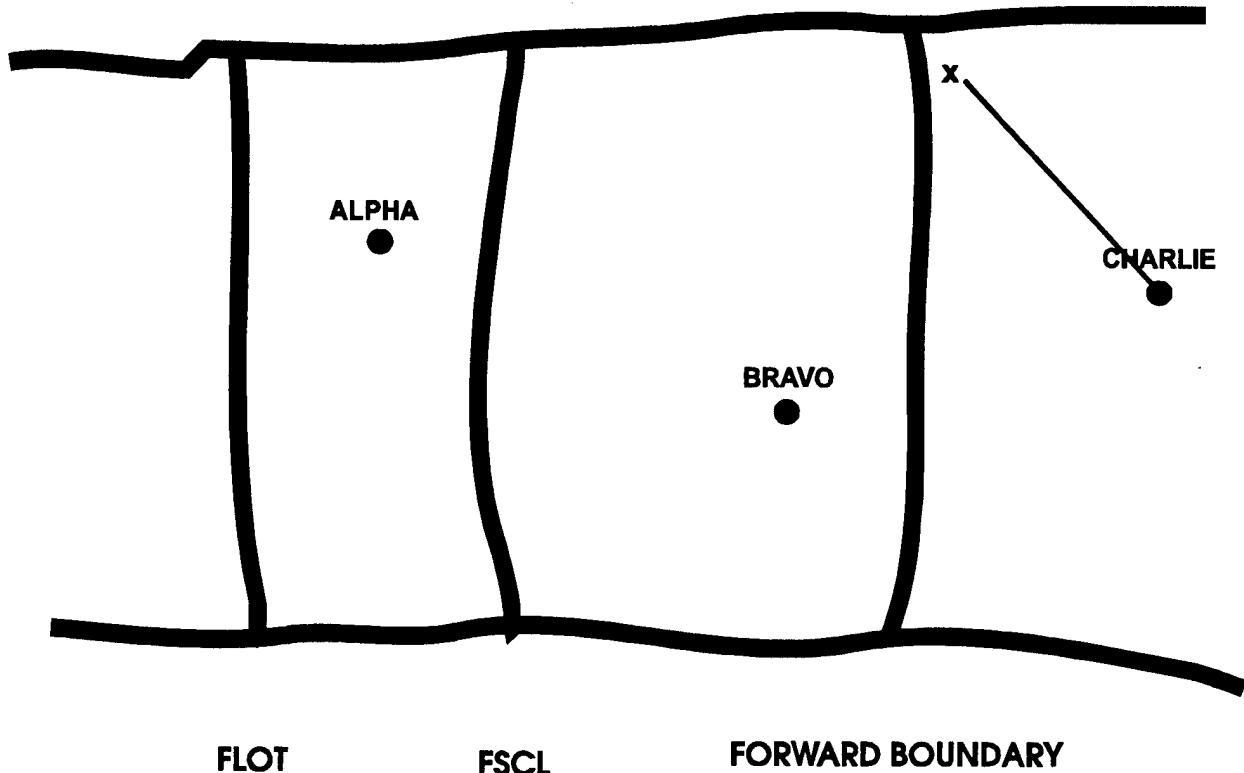


Fig II-14

Bullseye Example #2

(NOTE: Actual targeting data {that is, specific target coordinates} is much more detailed. This information does not have to be transmitted for area deconfliction.) Similarly, ATACMS PAH, route of flight, and TAH can be cleared via the BCD and the JAOC. Appropriate FSCMs and / or ACMs can be established as before (RFAs and ROZs).

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- **Example #3** . In extreme cases, bullseye calls can be transmitted on GUARD frequencies (UHF 243.0 and VHF 122.5) to warn aircraft of impending ATACMS, CALCM, or TLAM attacks in their area. This should only be used as a last resort when prior coordination and deconfliction could not have been accomplished.

g. Weapon System Procedures. Various weapon systems carry out attacks against surface TCTs. Specific procedures oriented towards this mission enhance overall success. This section describes some of the primary weapon systems procedures that may be used against surface TCTs: ATACMS, Fighter / Attack Aircraft, AC-130s, and Attack Helicopters.

(1). ATACMS Procedures. The land or amphibious force commander may choose to use ATACMS when assigned the responsibility to engage surface TCTs as a specific target set.

(a). Tasking. Using the AGM, the land or amphibious force commander directs the desired number of ATACMS launchers

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1 (battery, battalion, or brigade) to maintain a "hot" (ready to fire)
2 posture. Some ATACMS will normally be controlled by CORPS
3 Artillery in support of the deep battle.
4

5 (b). **Identification of Anticipated Engagement Areas.** The AGM
6 sets forth a priority matrix listing HPTs, normally surface TCTs.
7 Anticipated engagement areas are defined as named areas of
8 interest (NAIs) which focus surveillance efforts for collection
9 assets. These areas are also defined as target areas of interest
10 (TAIs), and assigned to ATACMS with specific trigger events.
11 NAIs, TAIs, and trigger events are all listed in the decision support
12 template (DST). TAIs should be forwarded to other component
13 commanders, particularly the JFACC, for advance deconfliction
14 planning.
15

16 (c). **Specified Engagement Windows.** The land or amphibious
17 force commander may be able to set forth planned engagement
18 windows for these potential engagement areas tied to the AGM,
19 commander's intent, IPB, and availability of intelligence sensors.
20 These windows would not preclude aircraft from operating in the

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1 area, but it would alert them to the possibility that the zone could go
2 "hot" with very little advance notice. AETACS platforms, as well as
3 Joint STARS and CRC / CRE / ASOC / DASC agencies should also
4 be advised of the time windows.

5
6 (d). **Firing Positions.** For responsiveness, PAHs may be
7 computed and precoordinated using anticipated target locations
8 and engagement areas. PAHs for planned ATACMS missions
9 should be published, whenever possible, in the airspace control
10 order (ACO). Additional PAHs (ROZs) may be computed and
11 designated on the ACO for activation on an "as needed" basis for
12 "on-call" and immediate fire missions. This will facilitate ATACMS
13 battery flexibility to employ "shoot and scoot" tactics. However,
14 restricting all ATACMS PAHs (ROZs) to be published on the ACO
15 for on-call and immediate fire missions may not always be feasible,
16 as restricting an ATACMS firing unit to a position designated by the
17 ACO will increase their vulnerability and reduce their
18 responsiveness to the flow of the battle. With fire missions that
19 cannot be anticipated, immediate PAHs (ROZs) should be

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1 coordinated and deconflicted via the grid box technique described
2 earlier.

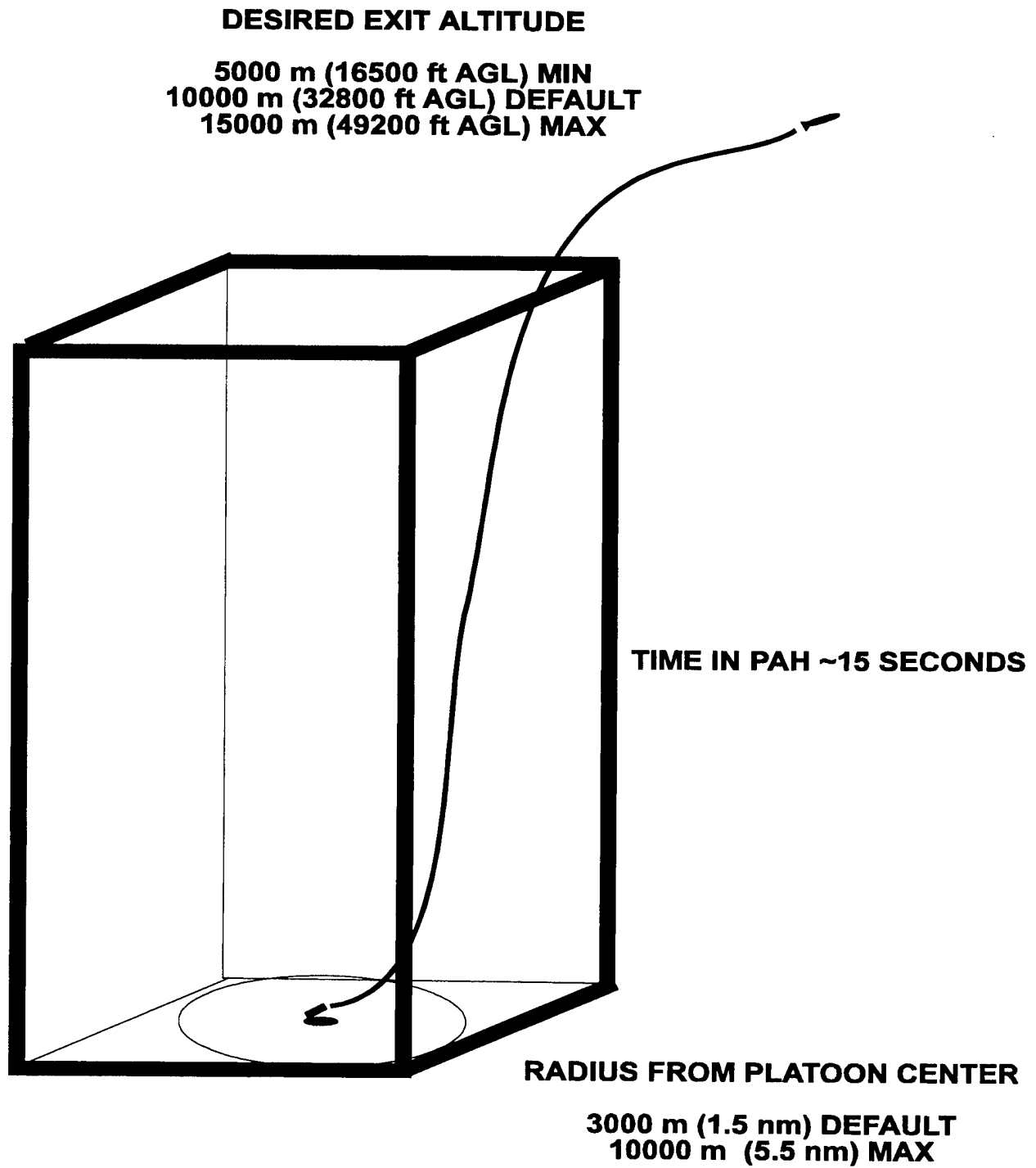
- 3
- 4 • The ATACMS fire direction system computes the PAH (ROZ)
5 based on the size and deployment of the ATACMS platoon,
6 desired exit altitude, and missile trajectory. This information is
7 transmitted to appropriate agencies (such as the FSE and BCD)
8 via AFATDS.
- 9

- 10 • Dimensions vary from 3 km (1.5 nm) to 10 km (5.5 nm) radius
11 from platoon center. Typical altitude of the PAH (ROZ) can be
12 as low as 5000 meters (16,500 feet above ground level {AGL})
13 to 15,000 meters (49,200 feet AGL).³⁰ Fire direction system
14 defaults are 3000 meters radius (1.5 nm) and 10,000 meters
15 (32,800 feet AGL). Coordination for these PAHs (ROZs) occurs
16 through the BCD and the A2C2 element to the JAOC.
- 17

³⁰ ST 6-60-36, *ATACMS TTP*, page 17.

- Although the PAH (ROZ) is measured horizontally by a radius from platoon center, the fire direction computer defines the PAH (ROZ) , using trajectory information for the mission, as four corner coordinates and an altitude. The PAH (ROZ) contains the missile trajectory from launch point to the desired altitude. The sides of the PAH (ROZ) correspond to the location of the missile, projected on the ground, when it achieves the desired altitude. (Fig II-15)

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1
2

3

4

Fig II-15
ATACMS PAH (ROZ)

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- The total time an ATACMS missile transits the PAH (ROZ), from launch to desired altitude, is approximately 15 seconds.

(e). **ATACMS Enroute Altitudes.** The ATACMS missile is above the PAH (ROZ) altitude enroute to the TAH (ROZ). Desired exit altitude and missile trajectory (key elements for computing the PAH {ROZ}) are determined by the FDC based on a number of factors, primarily range to the specific surface TCT. However, the FDC must evaluate the desired exit altitude and missile trajectory to ensure they result in a computed flight path that will not conflict with any established FSCMs and / or ACMs, specifically those established for fighter and attack helicopter operations.

- The FDC should consult the FSE /FSCC (in contact with the BCD) to determine the requirement (if any) for flight path deconfliction.

- There should be no requirement to clear the flight path of the missile unless airspace above the PAH / TAH (ROZ) altitudes

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1 will be used. The high altitude flightpath characteristics of an
2 ATACMS missile place it in a different category than classic
3 indirect fire projectiles. By comparison, the missile's flightpath
4 is similar to that of a high-altitude, fixed-wing aircraft, with a
5 maximum altitude of greater than 30 km (approximately 98000
6 feet AGL). Total ATACMS missile time of flight between the
7 PAH (ROZ) and TAH (ROZ) is 3-6 minutes.

- 8
- 9 • If necessary, this flight path may be deconflicted by establishing
10 temporary coordinating altitudes for any given profile or series
11 of profiles. Grid box references and coordinated high altitude
12 ACAs along the route of flight are one such method to
13 accomplish deconfliction. Typically, the only reason this would
14 be necessary would be to deconflict the missile's flight path
15 from high-altitude surveillance aircraft, such as a U-2.
- 16

17 (f). **Target Area Deconfliction.** For responsiveness, TAHs
18 (ROZs), like PAHs (ROZs) should be computed and
19 precoordinated using anticipated target locations and engagement
20 areas. However, since surface TCT location is not precisely known

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1 until shortly before launch, most ATACMS TAHs (ROZs) may not
2 be able to be published in the ACO. Consequently, deconfliction of
3 the impact area occurs on very short notice. Use of grid box or
4 bullseye reference system procedures are valid techniques to
5 deconflict attacks in such situations. Dimensions of ATACMS
6 TAHs (ROZs) are computed similarly to PAHs (ROZs)

- 7
- 8 • The ATACMS fire direction system computes the TAH (ROZ)
9 based on the size and deployment of the ATACMS platoon,
10 desired reentry altitude, and missile trajectory. As with the PAH
11 (ROZ), this information is transmitted via AFATDS.

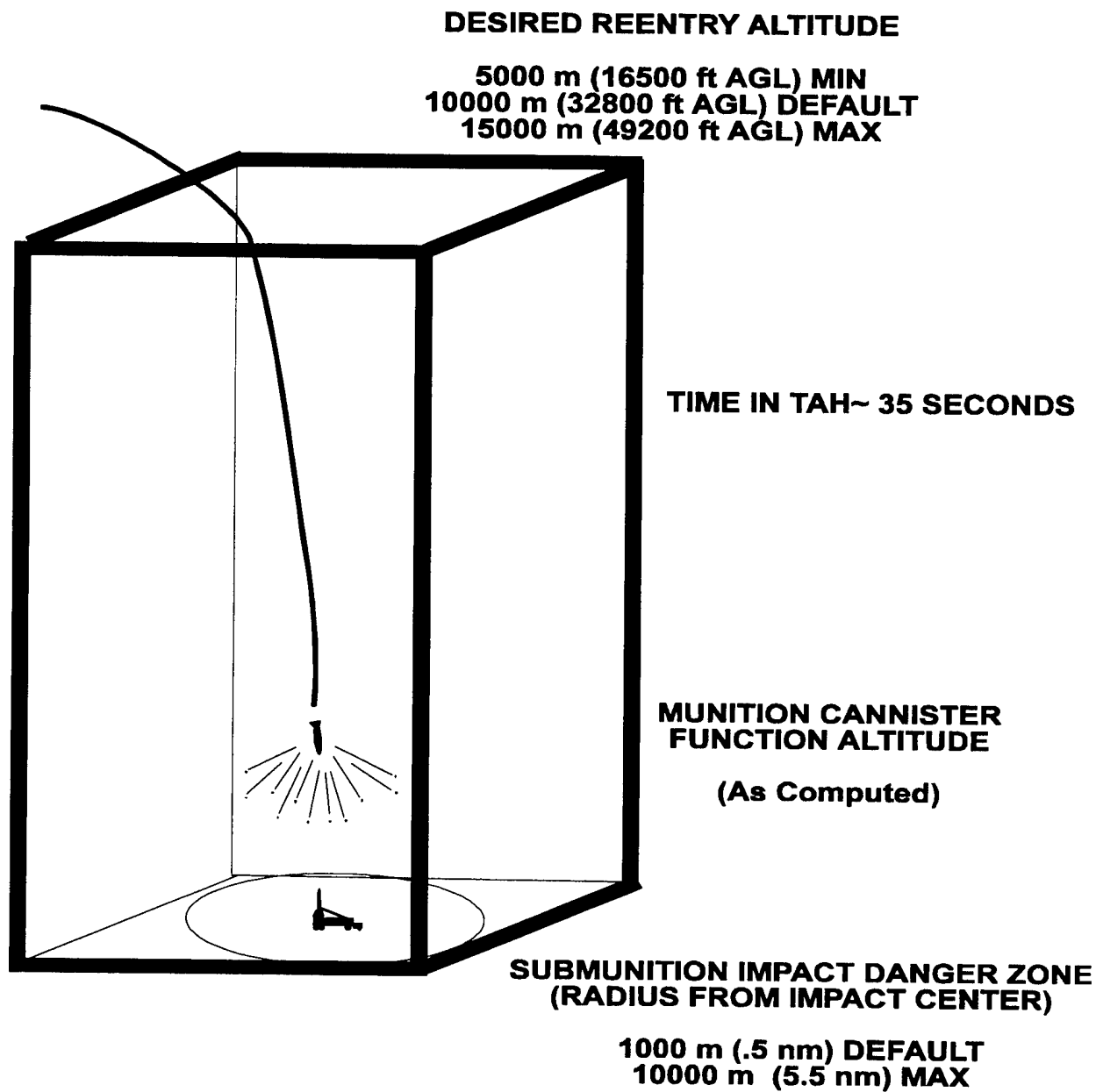
- 12
- 13 • Dimensions vary from 1,000 meters (.5 nm) to 10,000 meters
14 (5.5 nm) radius from missile canister function / impact center.
15 Typical altitude of the TAH (ROZ) can be as low as 5000
16 meters (16,500 feet above ground level {AGL}) to 15,000
17 meters (49,000 feet AGL).³¹ Fire direction system defaults are
18 1000 meters radius (.5 nm) and 10,000 meters (32,800 feet

³¹ ST 6-60-36, page 17.

1 AGL). As with PAH (ROZs), coordination for TAHs (ROZs)
2 occurs through the BCD and the A2C2 element to the JAOC.

- 3
- 4 • The TAH (ROZ) contains the missile trajectory from reentry
5 point to missile canister function altitude / impact center. It is
6 measured horizontally by a radius from missile canister function
7 / impact center. However, the fire direction computer defines
8 the TAH (ROZ) --using trajectory information for the mission--,
9 as four corner coordinates and an altitude. The sides of the
10 TAH (ROZ) correspond to the location of the missile, projected
11 on the ground, when it enters the TAH (ROZ) (Fig II-16)
- 12

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1
2

3
4
5
6

Fig II-16
ATACMS TAHO (ROZ)

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- The total time an ATACMS missile transits the TAH (ROZ), from entry to function / impact time, is approximately 35 seconds.

(g). Joint STARS Support. Joint STARS supports ATACMS through direct targeting information via deployed GSMs. See *MTTP for Joint STARS* for more information.

(2). **Fighter / Attack Aircraft Procedures.** Fighter / Attack aircraft can rapidly respond to surface TCTs provided they are airborne and in communication with the C2 platform and / or agencies that receive NRT targeting information. This targeting information can be received directly (via voice or datalink) from airborne surveillance platforms (such as a direct strike direction net with Joint STARS) or C2 platforms (such as a indirect strike direction net with an AWACS / ABCCC / DASC-A receiving off-board targeting information).

(a). **Surface TCT Combat Air Patrol (CAP) Procedures.** Surface TCT CAP points are Special Use Airspace ACMs that define orbit / holding areas for fighter / attack aircraft assigned to surface TCT

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1 attack missions. Fighter / attack aircraft are most responsive when
2 airborne and holding in these pre-established areas. This
3 technique should normally be used in specific conditions and times
4 when surface TCTs are known to exist and air employment is a
5 critical factor for accomplishment of JFC objectives. These surface
6 TCT CAP points should be located close to expected surface TCT
7 engagement areas so as to minimize en route time (Note: surface
8 TCT CAP points should not expose holding fighters to surface
9 threats, nor should they be located in areas requiring possible
10 deconfliction with other weapon systems). surface TCT CAP points
11 should not be over Grid Boxes or planned ATACMS PAH {ROZ}).
12 Fighter / attack aircraft should be placed on ground alert to backfill
13 surface TCT CAPs once the original aircraft have been committed
14 against surface TCTs. Aircraft on ground alert may be used for
15 direct surface TCT tasking, yet their response time will be longer.

16
17 (b). **General Fighter / Attack Aircraft Capabilities.** As directed by
18 the JFC, the JFACC should assign fighters with optimum
19 capabilities for surface TCT attack. Consideration should be the
20 availability of the following:

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- 1 • Day - Night Sensors, such as night vision devices (NVDs) and
2 forward looking infrared radar (FLIR)
3
- 4 • Precision Navigation And Fire Control Systems, such as global
5 positioning systems (GPS), inertial navigation systems (INS), fire
6 control computers (FCC), high resolution maps (HRM), and
7 synthetic aperture radars (SAR)
8
- 9 • Precision Guided Munitions, such as laser guided bombs,
10 (LGBs) and MAVERICK Missiles.
11

12 (c). **Airborne Divert.** Fighter / attack aircraft enroute to planned
13 targets may be diverted to attack surface TCTs by battle
14 management directors aboard AETACS (AWACS, ABCCC, E-2C, or
15 DASC-A). Primary considerations for divert tasking is priority of the
16 surface TCT versus that of the original planned target, distance
17 from divert aircraft to the surface TCT, time enroute from divert
18 location, aircraft fuel state, weapons load, precision targeting
19 capability, and enroute threats. Airborne divert is a valid option for

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1 surface TCT attack provided conditions are such that rapid
2 response can occur and the probability of mission success is high.
3 However, airborne divert should only be exercised when no other
4 option is available.

5
6 (d). **Deconfliction from Other Operations.** Once fighter / attack
7 aircraft have been directed to attack a specific TCT, the JAOC
8 (through AETACS) must ensure safe passage from surface TCT
9 CAP location or divert points to the assigned target area. Using the
10 grid box reference system, AETACS can quickly advise aircraft
11 which areas are currently active with other attacks (aircraft ,
12 ATACMS etc) and which areas have established FSCMs and / or
13 ACMs that would affect route of flight.

- 14
- 15 • Aircraft should use established MRRs, if appropriate, enroute to
16 the assigned target.
 - 17
 - 18 • There may be many cases where established MRRs do not exist
19 between the aircraft's present location (surface TCT CAP or

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divert point) and the assigned target. In such cases, aircraft should determine, with the assistance of AETAC battle management directors, the safest route of flight to the target. Using the grid box reference system, aircrews can plot and fly a route with the characteristics of an informal, temporary MRR.

(e). **Air Refueling Support.** Fighter / attack aircraft assigned to surface TCT CAPs in support of surface TCT attack missions require dedicated airborne tanker support. Air refueling support extends the sortie duration of assigned fighters and increases their ability to remain on station for longer periods of time. Tanker tracks should be close enough to established CAP points to allow fighters to refuel quickly and resume CAP responsibilities. Also, such tanker tracks allow fighters to terminate air refueling operations on short notice and be relatively close to ingress points, allowing them to quickly initiate attack operations.

(f). **Joint STARS Support.** If designated by the JFC, Joint STARS platforms may direct fighter / attack aircraft missions against surface TCTs. However, targets designated by Joint

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1 STARS should be verified and positively identified by other cross-
2 cued sensors, such as unmanned aerial vehicles (UAVs).

- 3
4 • Fighter / attack aircraft can be assigned directly to the Joint
5 STARS platform for targeting information. The Joint STARS
6 mission crew is informed, via the ATO or voice communications
7 from the JAOC, of attack aircraft available, weapons loads, and
8 on-station times. Weapons directors onboard the Joint STARS
9 direct the attack aircraft against available targets. Weapons
10 directors onboard the aircraft can predict and display the
11 surface TCT's time of arrival at a specific geographic point, or
12 can predict the future position of a surface TCT at a specified
13 time. This ability enables weapons directors to provide
14 accurate surface TCT information to the attack aircraft.
15 Additionally, if AWACS or CRC/CRE ground radar is tracking
16 the attack aircraft, and transmits that track over JTIDS /
17 TADIL J, the weapon directors onboard the Joint STARS know
18 the approximate position of the attack aircraft for easier
19 coordination.

20
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- The following list is an example of advisory and directive information the Joint STARS should provide to fighter attack aircraft:

- Target Coordinates/Elevation in LAT / LONG (hundredths of a minute), UTM, or geographic reference points. Elevation is estimated in feet (AGL and / or mean sea level {MSL})
- Target Description (quantity, formation, and classification)
- Target Direction (cardinal) and Speed (nmph or kph)
- Choke point assessments
- Location of friendlies
- Location of threats

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- Time-over target coordination and deconfliction (grid box identification and establishment of FSCMs and / or ACMs).

- Clearance to drop, if confirmed hostile through outside sources

(3). **AC-130H / AC-130 U Gunship Procedures.** The AC-130H and AC-130U gunships are highly adaptable to a variety of special missions and offer the JFC unique capabilities in attacks against surface TCTs. Through the use of surgical firepower capabilities and precision night surveillance sensors, the AC-130, with its air refueling capability can conduct extended autonomous operations within threat permissive environments.

(a). As directed by the JFC, the JSOTF Commander (in coordination with the JFACC) may assign AC-130 gunships to specific surface TCT attack responsibilities. The primary limiting factor to such an operation is the intensity of area threats.

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1 (b). The AC-130 has the advantage of being able to loiter over
2 known areas of surface TCTs with the ability to provide near-real-
3 time response. AC-130 aircraft work best in planned engagement
4 areas during anticipated engagement times.

5
6 (c). The Airspace Control Authority should deconflict AC-130
7 orbits through the use of ACMs such as ROAs / ROZs and / or
8 Special Use Airspace. Normally, these orbits should be published
9 in the ACO.

10
11 (d). Due to the slower speed of the AC-130 (as compared to
12 fighter/attack aircraft), responsiveness may suffer if tasked to
13 traverse considerable distance prior to engaging an acquired
14 surface TCT.

15
16 (4). **Attack Helicopter Procedures.** Attack helicopters can launch
17 rapidly to attack surface TCTs; however, slower enroute times and range
18 limitations must be considered when the decision to employ them is
19 contemplated. To compensate, these assets should be placed on strip

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1 alert at either a lagger site or at a more forward holding area in closer
2 proximity to TCTs. Once alerted, the aircraft can be airborne in minutes.

3
4 (a). Most attack helicopters are capable of night operations with
5 NVDs and FLIR in clear weather conditions. When low clouds and
6 overcast conditions are present, helicopters may operate under
7 lower ceilings than fighters or attack aircraft. Due to their slower
8 speed, rotary wing aircraft can often operate safely in poorer
9 visibility than fixed wing aircraft.

10
11 (b). Attack helicopter assets are controlled by the land or
12 amphibious force commander. They may also be directly
13 controlled by the JFC in support of specific joint force missions.

14
15 (c). Attack helicopter missions to and from surface TCTs should be
16 deconflicted via MRRs. Coordination and deconfliction occur in the
17 A2C2 element in the BCD, which in turn coordinates and
18 deconflicts with the JAOC.

19
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8. Command and Control Structuring

Command and control response to TCTs must be streamlined to meet time constraints. Though the overall responsibility for the mission will remain with the various supported commanders, the authority to engage should be delegated to the C2 node that has the best information or situational awareness to perform the mission and direct communications to weapons. Placing the appropriate level of battlespace awareness at subordinate C2 nodes can streamline the C2 cycle and allow timely engagement of these targets. The decentralized C2 nodes can exchange sensor, status, and target information with a fidelity that permits them to operate as a single, integrated C2 entity. Tied together by wide area networks and common interactive displays, they can effectively perform decentralized, coordinated execution of time critical attacks. The JFC has several options with which to structure command and control operations for attacks against surface TCTs. Normally, the JFC directs component commanders to establish interoperable and collocated (if possible) C2 centers. Additionally, the JFC must ensure the JSOTF commander effectively integrates SOF C2 operations with other components.

a. Interoperable Air / Ground Operations. The Theater Air Ground System (TAGS) is the functional architecture through which interoperable air / ground operations occur. Joint air operations are normally directed from a JAOC.

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1 Depending on the appointed JFACC, the JAOC may either be an Air Force
2 Forces (AFFOR) Air Operations Center (AOC), Marine Forces Air Control
3 Element (MARFOR ACE) TACC, or Naval Forces (NAVFOR) TACC. Ground
4 operations are normally directed through an operations center, such as the Army
5 Forces (ARFOR) Tactical Operations Center (TOC) or MARFOR Combat
6 Operations Center (COC). Other key ARFOR agencies for ground operations
7 are the FSE, Army Theater Missile Defense Element (ATMDE), DOCC, and
8 FPTOC. Key MARFOR agencies include the Ground Control Element (GCE)
9 FFCC, FSCC, and FDC. The NAVFOR supports ground operations with the
10 SACC. Interoperable air / ground operations ensure:

- 11 • Deconfliction of the battlespace
- 12 • Coordination and synchronization of attack assets
- 13 • Expeditious joint target coordination
- 14 • Transmission of joint battlespace control and coordination
15 measures
- 16 • Conversion of target coordinates between latitude/longitude
17 and UTM's
- 18 • Exchange of component commander target lists
- 19 • Employment of common grid references (grid boxes)

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- Enhancement of mutual air/ground situational awareness

(1). **Liaison Agencies.** Between the JFACC and the land or amphibious component commander, liaison agencies exist to conduct coordination, deconfliction, synchronization, and integration of operations. At an established JAOC, the ARFOR operates a BCD. The MARFOR and NAVFOR are represented by liaison officers, as appropriate. At the ARFOR TOC, the AFFOR operates an ASOC. Similarly, the MARFOR operates a DASC to coordinate air operations with land operations, either with the MARFOR COC or ARFOR TOC, as appropriate.

(2). **Unique Air / Ground C2 Capabilities.** The ARFOR and AFFOR employ unique capabilities which enhance surface TCT attacks.

(a). **Deep Operations Coordination Cell (DOCC).** The ARFOR may deploy a DOCC into the AO. The DOCC is a C2 node that plans, coordinates, and manages deep operations, to include surface TCT attacks, within the land force commander's AO. The DOCC develops deep attack plans based on identified HPTs. The

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1 DOCC selects attack assets based on several factors including the
2 location of attack assets with respect to targets, the operational
3 status of attack assets, target ranges, the number and type of
4 missions in progress, munitions available, the enemy air defense
5 threat, and the accuracy of the targeting acquisition data. This
6 target-weapon pairing process is automatic. Targets that can be
7 better serviced by joint or other component assets will be
8 nominated to joint headquarters for prosecution (such as a JAOC).
9 DOCCs may recommend direct sensor-to-shooter dissemination of
10 targeting information to meet critical timelines associated with
11 surface TCTs. The DOCC may employ an FPTOC to decentralize
12 execution of surface TCT attacks. Future connectivity to the
13 AFFOR / JFACC combat integration capability (CIC) will provide
14 the means to coordinate and deconflict surface TCT attack
15 operations.

16
17 (b). **Combat Integration Capability (CIC).** CIC is an AFFOR
18 capability undergoing development. When fielded, the CIC will
19 consolidate relevant sensor, intelligence, and air tasking
20 information at the CRC and AOC (or JAOC, if the AFFOR is the
21 JFACC). The CIC will provide battlespace awareness at the node

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1 at which the JFACC wishes to place execution authority for the
2 attack of surface TCTs. The CIC is normally located at the AOC /
3 JAOC COD. If placed at the CRC, it becomes an execution level
4 extension of the COD. The CIC contributes to battlespace
5 awareness through installation of a Combat Intelligence System
6 (CIS) gateway that will provide enemy order of battle, active threat,
7 surface TCT data, airspace deconfliction, and weather information.
8 The CIC identifies attack assets for tasking against surface TCTs,
9 much like AFATDS. Connectivity to the Army BCD, DOCC, and
10 FPTOC provides the means to coordinate and deconflict surface
11 TCT attacks. See *ACC CONOPS for C2 of the Attack Operations*
12 *and Active Defense Phases of Theater Air Defense and CAF*
13 *CONOPS for the CIC* for more information.

14
15 (2). **Interconnectivity.** Current technology limits electronic
16 interconnectivity and automated data planning between the JAOC
17 (whether it be AOC or either TACC) and the BCD. Presently, only verbal
18 coordination and deconfliction occurs. Similar limitations exist between
19 the ARFOR TOC / MARFOR COC and ASOC / DASC. The level of
20 interoperability is solely dependent on the ability of officers in both

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1 organizations to work with each other. However, component unique
2 command and control system exist:
3

4 (a). **AFATDS.** AFATDS is the primary command and control fire
5 support system for the ARFOR / MARFOR. AFATDS digitally links
6 the land / amphibious force commander with their respective
7 operations centers, FSE / FSCC, and firing units (to include
8 ATACMS). AFATDS enables timely and automated C2
9 connectivity, sharing of situational awareness, and coordination
10 and deconfliction of surface TCT attacks. See Appendix B, and
11 *TTP for AFATDS ST 6-3+*, for more information.
12

13 (b). **CTAPS.** CTAPS is the accepted joint standard air planning
14 and command and control system which provides connectivity and
15 overall situational awareness for the JFACC. It serves as a
16 significant link between the JAOC and the ASOC / DASC. With
17 CTAPS and other associated communications capability, the JAOC
18 and ASOC / DASC have direct links with AETACS for rapid
19 coordination and deconfliction of surface TCT attacks. See
20 Appendix A for more information.

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1 (c). **AFATDS - CTAPS Interface.** Currently, AFATDS and CTAPS
2 are under undergoing modification to enable each system to share
3 key elements of information. Initially, AFATDS and CTAPS will be
4 able to share preplanned air information, (such as the ATO and
5 ACP) and real-time indirect fire trajectories (to include ATACMS
6 PAH / TAH ROZs) for coordination and deconfliction of surface
7 TCT attacks. This preplanned information will enhance component
8 capabilities to develop preplanned FSCMs and ACMs. Eventually,
9 AFATDS and CTAPS (and the follow-on Theater Battle
10 Management Control System- {TBMCS}) will be able to share real-
11 time air information (such as the air situation picture) and enable
12 rapid development and coordination of near real-time FSCMS and
13 ACMs. Such a system will rapidly and efficiently deconflict flight
14 operations and indirect fires during surface TCT attacks.

15
16 (3). **Information Requirements:** Interoperable air / ground operations in
17 the pursuit of surface TCT attacks require specific information passed
18 between air and ground C2 agencies. The following is a notional list of
19 key information requirements:
20

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(a). From an air C2 agency:

- The Air Tasking Order (ATO)
- The Airspace Control Order (ACO) and Airspace Control Plan (ACP)
- Actionable targets
- Airborne / ground threats
- Combined friendly /enemy air picture
- Fighter surface TCT CAP points
- Fighter taskings to surface TCT targets
- Surface TCT engagement areas
- Grid box activation intentions
- Target lists and nominations
- Enemy order of battle

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(b). From a ground / surface C2 agency:

- Rotary wing aviation routes (if applicable)
- Attack helicopter lagger / staging areas
- SEAD plans
- Artillery locations and readiness status
- Actionable targets
- ATACMS locations and ready states
- ATACMS fires on surface TCT targets
- ACPs
- Airspace control requests
- Engagement areas
- NFAs, FSCL, phase lines, and other control measures
- Maneuver unit locations
- Surface TCT engagement areas
- Target lists and nominations

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- Friendly force locations

b. **Coordinating SOF Operations.** SOF operations must be coordinated and deconflicted with surface TCT attacks. The primary method to accomplish this is via liaison with established conventional C2 agencies. The Special Operations Liaison Element (SOLE) is linked with the JAOC for interface with regard to air operations. The Special Operations Coordinator (SOCOORD) or Special Operations Command and Control Element (SOCCE, if established) is linked with surface C2 agencies (DOCC/FSE/FSCC/SACC) for ground operations. The SOLE, SOCOORD, and SOCCE have situation awareness on the locations and activities of SOF forces in and outside of the AO / AOA. Most SOF operations areas can be protected by RFAs, NFAs, or in some instances, ROAs / ROZs. Clandestine SOF operations, where published control and coordinating measures may not be permitted, will require direct coordination and deconfliction with friendly forces by the SOLE, SOCOORD, or SOCCE. Should conventional force operations put SOF operations at risk (for example, an ATACMS attack), the SOLE, SOCOORD, or SOCCE is responsible for deconfliction and / or recommending disapproval due to the potential for fratricide.

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9. Battle Management System Interconnectivity

Battle management systems should allow the JFC and component commanders to pass targeting information on surface TCTs on a NRT basis. Effective targeting of TCTs requires common targeting terminology and notation as well as lateral and vertical connectivity between all component C2 agencies. Secure, jam resistant, automated data systems are critical for the NRT exchange of surface TCT information. Current service unique data link standards and targeting notations inhibit true joint interoperability. Presently, the JFC's options are limited. The JFC can locate common data terminals at each component's C2 agencies (as available) or attempt to establish a network of dissimilar system data terminals. Battle management systems should allow the JFC and component commanders to pass targeting information on surface TCTs on an NRT basis. Currently, however, these systems are limited to internal component operations only. Effective targeting of surface TCTs requires lateral and vertical connectivity between all component C2 agencies. Secure, jam resistant, automated data systems are critical to support this connectivity. Presently, the only options a JFC has to connect component battle management systems is to provide common terminals at each component C2 agency or connect dissimilar component terminals together.

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1 a. **Common Terminal Connectivity.** Locating common data terminals at each
2 component C2 agency allows immediate and simplified direct connectivity. The
3 JFC should decide which terminal should be fielded based upon capabilities in
4 the operational area.

5
6 (1). **Locations.** Common terminals may be located at the following
7 component C2 agencies:

8
9 (a). JAOC / TACC / ASOC / DASC / SACC

10 (b). AETACS Platforms (AWACS / ABCCC / DASC-A / E-2C)

11 (c). CRC/ CRE / AEGIS / Tactical Air Operations Center (TAOC)

12 (d). BCD / FSE / FSCC / DOCC / FPTOC

13
14 (2). **Terminals.** Common terminals that may be assigned to each location
15 are situationally dependent on availability in the operational area and
16 mission requirements. However, the JFC should consider:

17
18
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1 (a). CTAPS

2 (b). Joint tactical information data systems (JTIDS)

3 (c). GSMs

4 (d). ADOCS

5 (e). AFATDS

6

7 **b. Dissimilar Terminal Connectivity.** Connecting dissimilar battle

8 management systems generally requires the development of data translation

9 programs to bridge one system's language with another. Expected results

10 would be the ability of dissimilar systems to be able to "talk" to one another, and

11 thereby rapidly share information. Battle management systems fall into two

12 general categories: air tactical digital information systems and ground digital

13 information systems. JTIDS and CTAPS are air tactical information systems that

14 have been designated as joint systems for use by all services. However, JTIDS

15 and CTAPS have limited use applications for the land or amphibious force

16 commander and associated maneuver forces. Instead, they predominantly use

17 ground digital tactical information systems supported by fire support data

18 systems such as the AFATDS or the experimental ADOCS. Connecting JTIDS

19 and CTAPS workstations to AFATDS/ADOCS terminals is a viable technique

20 provided data buffers can adequately transfer information. Once the connection

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1 is made, acquired surface TCTs can be communicated real-time between
2 components via JTIDS/CTAPS and AFATDS/ADOCS. Dissimilar terminals
3 require either common target numbers, common target identification information,
4 or correlated target numbers.

5
6 **c. Common Target Number (CTN).** Common target numbers allow each
7 component to precisely identify targets and communicate with other components
8 via a common frame of reference. However, common target numbers only exist
9 for two categories of targets:

- 10 • Fixed installations (as basic encyclopedia numbers {BE#})
- 11 • Enemy order of battle (as individual unit identification codes {UIC}).

12 BE#s and UICs are unfeasible for surface TCTs. Components normally assign
13 their own arbitrary, unique target numbers to surface TCTs. However, this leads
14 to several problems. First, these target numbers differ from other target
15 numbers assigned *to the same target* by other components. Second,
16 components use these unique target numbers solely within their individual
17 component battle management systems-- which are presently *incompatible* with
18 other component systems. Thus, confusion and duplication often occurs. True
19 universal common target numbers, beyond BE#s and UICs, have not been
20 established.

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1 **(1). Basic Encyclopedia Number (BE#).** A BE# is a ten character
2 number unique to each fixed installation (Example- BE# 0000XX0000).
3 The first four characters identify the world area code (WAC) where the
4 installation is located. The next six spaces uniquely label the identifying
5 source of the installation with the fifth and sixth spaces serving as
6 identifying agency codes. For example, if USCENTCOM adds an
7 installation to the military intelligence data base, it uses the two alpha
8 characters assigned to it for this purpose.

9
10 **(2). Unit Identification Code (UIC).** UICs are ten character codes that
11 are used to track enemy order of battle (Example UIC- XXXXX00000).
12 The first two characters identify the responsible producer. The third and
13 fourth space identify the country code for the unit. The fifth character is
14 used to identify the type of unit (that is air, ground, naval). The remaining
15 five characters are sequentially assigned.

- 16 • Field initiated “soft UICs” have been used to track
17 unidentifiable enemy units. Soft UICs include a character which
18 identifies the component which first located the enemy unit.

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1 **(3). Temporary CTN Solutions.** Some geographic combatant
2 commanders (Unified CINCs) have had success in establishing temporary
3 CTN solutions in simple joint operations with limited target sets. Such
4 CTNs were simple, alphanumeric characters, tracked manually:

5
6 **EXAMPLE: JM 003**

7 J = Joint Target

8 M = Mobile Target

9 003 = Sequential number
10

11 **(4). Long Term CTN Solutions.** Long Term CTN solutions must be able
12 to withstand a more dynamic and complex operation with large target
13 sets, supported by data processing and multiple reconnaissance and
14 surveillance inputs. One such CTN format being experimented with is the
15 integrated data base (IDB) Unit Identification Numbering method. This
16 method works well in identifying mobile targets. Since major units
17 assigned to garrison locations receive a unique 7-10 digit IDB identifier,
18 mobile subordinate elements of these units could be assigned the parent

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unit identifier coupled with an alphanumeric character representing
function and element:

EXAMPLE #1 : ICACU03892-L1

IC = responsible producer

A = air

CU = country code

03892 = number assigned in IDB tied to garrison BE#

L = launcher

1 = first detached

EXAMPLE #2 : ICACU03892-003A

IC = responsible producer

A = air

CU = country code

03892 = number assigned in IDB tied to garrison BE#

003 = IDB code for the mobile rocket Bn with equipment code

A = alpha character to delineate individual launchers

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1 **d. Correlated Target Numbers.** Correlated target numbers offer a partial
2 solution to the CTN problem. Methods to correlate individual component target
3 numbers are relatively simple. Essentially, one component's target number is
4 "tagged" with another component's number and input into each battle
5 management system. The correlated pair of numbers is transmitted across data
6 nets to all component users of each system. Once received, the user can
7 identify the target by recognizing the component target number that operates
8 within the operating data system, and then reference the other component's
9 number as necessary via accompanying data or remarks. This allows for
10 common situational awareness and provides the avenue for coordination and
11 deconfliction. Responsibility for correlating target numbers does not have to be
12 assigned to a centralized agency. Each component can accomplish this function
13 independently without redundant or duplicated numbers. Each component can
14 be allocated blocks of other component numbers to tag with their primary
15 component target number. Once the tagged numbers are transmitted across
16 data links, other components can easily recognize the source of the target by its
17 correlated number.

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APPENDIX A

CONTINGENCY THEATER AUTOMATED PLANNING SYSTEM (CTAPS)

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 comms-computer equipment and software applications. The software applications described below run on the CTAPS standard workstation (Sun Sparc). CTAPS is designed to interface the Joint Air Operations Center (JAOC), Air Support Operations Centers (ASOC), and Control and Reporting Centers (CRC), and connect functional areas within these centers using a local area network (LAN).

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. System implementation will be incremental, with various functions and capabilities being added to the core system in modular fashion.

Inputs to CTAPS include messages and CINC/JFACC tasking and directives, information provided by the various force level functional areas, and user support requests from other command centers. Outputs include the combat information and data provided by linked functional centers/areas and their associated support systems;

the ATO/ACO; and various direction and coordination action messages/reports.

Planned enhancements include a battlefield situation display capability for situation awareness, full interconnectivity between command centers and functional areas, and additional automated functions.

CTAPS APPLICATIONS AND CAPABILITIES

ADS: Airspace Deconfliction System	- Plans requested airspace. - Identifies airspace by time, altitude, and position. - Builds an Airspace Control Order (ACO).
TISD: Theater Integrated Situation Display	- Provides a NRT radar-sourced air picture for the AOC planning and execution functions. - Air picture capability will eventually be incorporated into the Battlefield Situation Display (BSD). - Includes JTIDS AOC Interface TISD (TISD/JMI).
CIS: Combat Intelligence System	- Supports data correlation/fusion, situation assessment/display, order-of-battle (OB) database maintenance, imagery, and collection management. - Identifies and assesses targets from intelligence database. - Analyzes effects of various targeting combinations. - Accesses JMEM to perform weaponeering, and create a target nomination list for input to APS for ATO planning.
APS: Advanced Planning System	- Provides an automated capability to develop air battle plans, and create combat and support mission taskings. - Provides graphic displays of the developing ATO. - Loads the CTAPS master database, enabling execution applications access to the completed ATO.
JPT: Joint Planning Tool and APT: Air Campaign Planning Tool [In development]	- Enables rapid development, visualization, and evaluation of air campaign options; provides results and assessments. - Provides access to maps, imagery, country studies, target analyses, and OB information. - Graphically displays information allowing JFACC to visualize large amounts of data and analyze updates. - Primary outputs are overall Air Campaign Plan and daily Master Attack Plan.
JDSS: JFACC Decision Support System [In development]	- Provides graphically oriented presentation of JCC4I data in user-selectable and combinable on-screen displays. - Has access to local JCC4I database directories and generates query scripts for other databases.

FLEX: Force-Level Execution (Combat Operations Automation) [In development]	• Central module serving AOC's combat operations staff. • Provides capability to respond to the tactical situation by replanning the ATO and disseminating changes. • Provides tailorable mission and status alarm capabilities to monitor progress of ongoing air campaign activities.
BSD: Battlefield Situation Display [In development]	• Displays tailorable view of air and ground (land) situation. • Provides common identification of targets and other objects, and <i>access through the view</i> to underlying data.

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APPENDIX B

ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM (AFATDS)

AFATDS is a multiservice (Army and Marine Corps) fire support software system that runs on the Army's common hardware for the Army Battle Command System (ABCS). 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, CAS 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 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, ACMs, 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.

AFATDS is equipped with a situational awareness screen. The screen is able to display range fans, FSCMs, ACMs, target overlays, battlefield geometry, and

1 common reference systems. The graphics can be tailored using up to seven separate
2 overlays. By clicking on a target, a commander can review all mission and target
3 information and digitally track the status of each mission.

4
5 **Version 1** of AFATDS allows for automated digital coordination and replaces
6 the initial fire support automation system (IFSAS) and tactical fire direction system
7 (TACFIRE). Version 1 digitally automates the following:

8
9 All on-line Army Battle Command Systems

10 Shared fire support situation awareness distributed databases

11 Fire planning

12 Weapon target pairing in accordance with command guidance

13 Execution of fires on surface targets
14

15 **Version 2** (in development) will feature a tactical air support module
16 (TASM) to assist in the joint targeting process and provide joint interoperability.

17 Eventually, AFATDS will provide an automated, comprehensive tactical fire support
18 decision support system. AFATDS TASM will ease daily coordination and planning by
19 providing automated access to the JFACC's ATO. The operator will be able to use
20 ATO information to keep missions from conflicting, including those involving ATACMS.
21 AFATDS will also be able to provide future input to ATO's, as well as incorporate ATO
22 sortie information to prevent target conflicts. TASM processes target nominations from

1 the DOCC/FSE/FSCC to the BCD for coordination with the JAOC. TASM can also
2 process target nominations and send them directly into CTAPS for rapid coordination.
3 TASM has the capability to enable AFATDS to pass digital requests for CAS and AI
4 support directly to the BCD and directly to the JAOC via CTAPS. This does away with
5 the requirement to pass requests for air support via voice.

6
7 **AFATDS and surface TCTs.** AFATDS can rapidly coordinate attacks on
8 surface TCTs. Intelligence data on the surface TCT is passed via ASAS to AFATDS at
9 the DOCC/FSE/FSCC or directly to AFATDS from Joint STARS. AFATDS
10 automatically verifies the surface TCT with the high payoff target list and conducts
11 weapon-target pairing. AFATDS displays to the DOCC/FSE/FSCC operator if the
12 target violates any fire support coordination measures or airspace control measures.
13 (NOTE: Such established measures, once identified and deconflicted by the grid box
14 reference system, may be inserted into AFATDS.) If the target violates established
15 FSCMs and ACMs, then the operator receives an amber warning light on his
16 intervention window, meaning that coordination must take place. The operator would
17 OK the mission request, sending an automatic message to the BCD for coordination.
18 The BCD coordinates with the JAOC, and then the BCD approves or denies the
19 request. Similar coordination and deconfliction can occur between the FPTOC and the
20 COD (equipped with CIC), or other component fire support centers (such as the USMC
21 FFCC). Once deconflicted and approved, the mission is sent digitally to the firing unit
22 for processing. Firing units who acquire the identical target and send identical requests

1 will be sorted by the system, and disapproved automatically via a red light in the
2 intervention window.

3

APPENDIX C

AUTOMATED DEEP OPERATIONS COORDINATION SYSTEM (ADOCS)

ADOCS is a LAN system developed by the Advanced Research Projects Agency (ARPA) and in field testing / use by the US Army. The functions of ADOCS are:

- a. Coordination, planning, and execution databases (to include targeting, aviation routes, air control points, ACPs, and deep battle synchronization)
- b. Interface with US Army systems such as TACFIRE, FDS, FDDM, ASAS-W, MCS, and the Target Acquisition Fire Support Model
- c. Display of situational graphics such as order of battle and threats, friendly maneuver and artillery units, phase lines, engagement areas, RFAs, and TAIs
- d. Display of mission coordination and execution status
- e. Interface with AFATDs
- f. Conduct targeting operations

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- g. Exercise control and alerting procedures
- h. Coordinate aviation planning and airspace control measures
- i. Collect data on selected targets
- j. Provide mission reports, to include ATACMS missions fired and target lists

Glossary

1		
2		
3	A2C2	army airspace command and control
4	ABCCC	Airborne Battlefield Command And Control Center
5	ABCS	army battle command system
6	ACA	airspace control area
7	ACA	Airspace Control Authority
8	ACC	Air Combat Command
9	ACCPAM	Air Combat Command pamphlet
10	ACM	airspace control measures
11	ACO	airspace control order
12	ACP	airspace control plan
13	ACPT	Air Campaign Planning Tool
14	ADM	air defense measure
15	ADOCS	automated deep operations coordination system
16	ADP	automated data processing
17	ADS	Airspace Deconfliction System
18	AETACS	airborne elements of the theater air control system
19	AFATDS	Advanced Field Artillery Tactical Data System
20	AFFOR	air force forces
21	AGM	attack guidance matrix
22	AI	air interdiction
23	ALSA	Air Land Sea Application Center
24	ANGLICO	air naval gunfire liaison company
25	AO	area of operations
26	AOA	amphibious operations area
27	AOC	air operations center
28	AOR	area of responsibility
29	APS	Advanced Planning System
30	ARFOR	army forces
31	ARNG	Army National Guard
32	ARPA	Advanced Projects Research Agency
33	ASAS	all source analysis system
34	ASAS-W	all source analysis system-warrior
35	ASOC	air support operations center
36	ATACMS	Army Tactical Missile System
37	ATDO-J	Joint Doctrine Division, TRADOC
38	ATO	air tasking order
39	ATTN	attention
40	AWACS	Airborne Warning And Control System
41	B.C.	before Christ
42	BCD	battlefield coordination detachment
43	BDA	battle damage assessment
44	BE	basic encyclopedia
45	BSD	Battlefield Situation Display

1	C2	command and control
2	C2W	command and control warfare
3	C3	command, control, and communications
4	C42	Joint Doctrine Division, MCCDC
5	CA	combat assessment
6	CALCM	conventional air launched cruise missile
7	CAP	combat air patrol
8	CAS	close air support
9	CCT	combat control teams
10	CFL	coordinated fire line
11	CIC	combat integration center
12	CINC	commander in chief (combatant commander)
13	CIS	combat intelligence system
14	CIS	Combat Intelligence System
15	CJCS	Chairman, Joint Chiefs of Staff
16	COA	course of action
17	COC	combat operations center
18	COD	combat operations division
19	COG	center of gravity
20	COMM	commercial
21	COMSEC	communications security
22	CONOPS	concept of operations
23	CONPLAN	contingency plan
24	CRC	control and reporting center
25	CRE	control and reporting element
26	CTAPS	Contingency Theater Automated Planning System
27	CTN	common target number
28	D3A	decide-detect-deliver-assess
29	DA	Department of the Army
30	DASC	direct air support center
31	DASC-A	direct air support center-airborne
32	DOCC	deep operations coordination cell
33	DoD	Department of Defense
34	DSN	Defense Switched Network
35	DST	decision support template
36	DZ	drop zone
37	E-MAIL	electronic mail
38	EC	electronic combat
39	EOB	enemy order of battle
40	EW	electronic warfare
41	FA	field artillery
42	FAC	forward air controller
43	FAC-A	forward air controller (airborne)
44	FCC	fire control computer
45	FFA	free fire areas

1	FFCC	force fires coordination center
2	FLEX	Force-Level Execution
3	FLIR	forward looking infrared radar
4	FLOT	forward line of own troops
5	FM	field manual
6	FMFM	Fleet Marine Force Manual
7	FMFRP	Fleet Marine Force Reference Publication
8	FPTOC	force projection tactical operations center
9	FSC	Fire Support Coordinator (USMC)
10	FSCC	fire support coordination center
11	FSCL	fire support coordination line
12	FSCM	fire support coordination measure
13	FSCoord	Fire Support Coordinator (US Army)
14	FSE	fire support element
15	GAT	guidance, apportionment, and targeting
16	GPS	global positioning system
17	GSM	ground system module
18	HIDACZ	high density airspace control zone
19	HPT	high-payoff target
20	HPTL	high-payoff target list
21	HRM	high resolution map
22	HVT	high-value target
23	HVTL	high-value target list
24	ICAC2	Integrated Combat Airspace Command and Control
25	IDB	integrated data base
26	IFSAS	initial fire support automated system
27	IM	information management
28	IMINT	imagery intelligence
29	INFLTREPS	inflight reports
30	INS	inertial navigation system
31	INTSUMS	intelligence summaries
32	IPB	intelligence preparation of the battlespace
33	ITO	integrated tasking order
34	J2	Intelligence Directorate of a Joint Staff
35	J3	Operations Directorate of a Joint Staff
36	J4	Logistics Directorate of a Joint Staff
37	J5	Strategic Plans and Policy Directorate of a Joint Staff
38	J6	Command, Control, Communications, and Computer
39	JAG	judge advocate general
40	JAOC	joint air operations center
41	JDSS	JFACC Decision Support System
42	JFACC	joint force air component commander
43	JFC	joint force commander
44	JFMCC	joint force maritime component commander
45	JIC	joint intelligence center

1	JIPTL	joint integrated prioritized target list
2	JISE	joint intelligence support element
3	JMEM	joint munitions effectiveness manual
4	JOA	joint operations area
5	JOG	joint operation graphic
6	JOINT STARS	Joint Surveillance Target Attack Radar System
7	JPOTF	joint political operations task force
8	JPT	joint planning tool
9	JSOTF	joint special operations task force
10	JT	joint
11	JTCB	joint targeting coordination board
12	JTF	joint task force
13	JTIDS	Joint Tactical Information Distribution System
14	JTL	joint target list
15	JTTP	joint tactics, techniques, and procedures
16	KM	kilometer
17	KPH	kilometers per hour
18	LAN	local area network
19	LANTIRN	low altitude navigation and targeting for night
20	LAT	latitude
21	LCC	land component commander
22	LGB	laser guided bomb
23	LOAC	law of armed conflict
24	LONG	longitude
25	MA	mission assessment
26	MAGTF	Marine air ground task force
27	MARFOR	marine forces
28	MARLO	Marine liaison officer
29	MASINT	measurement and signature intelligence
30	MCCDC	Marine Corps Combat Development Command
31	MCPDS	Marine Corps Publication Distribution System
32	MCRP	Marine Corps Reference Publication
33	MCS	maneuver control system
34	MEA	munitions effectiveness assessments
35	METT-T	Mission, Enemy, Terrain / Weather, Troops Available, and Time Available
36		
37	MIIDS/IDB	military intelligence integrated database/integrated database
38	MIN	minute
39	MISREPS	mission reports
40	MLP	missile launch point
41	MRL	mobile rocket launcher
42	MSL	mean sea level
43	MTIC	Military Targeting Intelligence Committee
44	MTTP	multiservice tactics, techniques, and procedures
45	N5	Joint Doctrine Directorate, NDC

1	NAVFOR	navy forces
2	NAVSOP	Navy Standard Operations Procedures
3	NCA	National Command Authorities
4	NDC	Naval Doctrine Command
5	NFA	no-fire area
6	NGFS	naval gunfire support
7	NM	nautical mile
8	NMJIC	National Military Joint Intelligence Center
9	NMPH	nautical miles per hour
10	NRT	near-real-time
11	NSFS	naval surface fire support
12	NVD	night vision device
13	OB	order of battle
14	OPLAN	operation plan
15	OPORD	operations order
16	OPR	office of primary responsibility
17	PACAF	Pacific Air Forces
18	PACAFFPAM	Pacific Air Forces pamphlet
19	PAH	platoon airspace hazard area
20	PCN	publication control number
21	PGM	precision guided munition
22	PIN	publication inventory number
23	PLGR	precision location ground reference
24	POLAD	political advisor
25	PUB	publication
26	QTY	quantity
27	RFL	restricted fire line
28	ROE	rules of engagement
29	ROZ	restricted operations zone
30	RR	reattack recommendation
31	RSTA	reconnaissance, surveillance, and target acquisition
32	SACC	supporting arms coordination center
33	SADO	Senior Air Defence Officer
34	SAM	surface-to-air missile
35	SAR	synthetic aperture radar
36	SCDL	surveillance control data link
37	SIGINT	signals intelligence
38	SIOP	Single Integrated Operations Plan
39	SIPTL	Single Integrated Prioritized Target List
40	SOCCE	special operations command and control element
41	SOCOORD	special operations coordinator
42	SOF	special operations forces
43	SOJ	standoff jamming
44	SOLE	special operations liaison element
45	SPIN	special instruction

1	SSM	surface-to-surface missile
2	TACC	tactical air command center (USMC)
3	TACC	tactical air control center (USN)
4	TACFIRE	tactical fire direction system
5	TACMEMO	tactical memorandum
6	TACP	tactical air control party
7	TADIL-J	tactical data link - joint
8	TAGS	theater air-ground system
9	TAH	target airspace hazard area
10	TASM	tactical air support module
11	TBM	theater ballistic missile
12	TBMCS	theater battle management control system
13	TCT	time-critical target
14	TIRS	terrain index reference system
15	TISD	Theater Integrated Situation Display
16	TLAM	Tomahawk Land Attack Missile
17	TLE	target location error
18	TMD	theater missile defense
19	TOC	tactical operations center
20	TOO	target of opportunity
21	TOT	time-on-target
22	TRADOC	United States Army Training and Doctrine Command
23	TRP	terrain reference point
24	TSS	target selection standards
25	TTP	tactics, techniques, and procedures
26	TTT	time-to-target
27	UAV	unmanned aerial vehicle
28	UHF	ultra high frequency
29	US	United States
30	USA	United States Army
31	USAF	United States Air Force
32	USAFE	United States Air Forces Europe
33	USAFEPAM	United States Air Forces Europe pamphlet
34	USAR	United States Army Reserve
35	USMC	United States Marine Corps
36	USN	United States Navy
37	UTM	universal transverse mercator
38	VA	Virginia
39	VHF	very-high frequency
40	WAC	world area code
41	WGS	world grid system
42	WMD	weapons of mass destruction
43	WOC	wing operations centers
44	XPJ	Joint Matters and Arms Control Division, ACC

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