

Research on Joint Operations Target of US Military

Jun Liu^a, Yaxiong Li^b

Rocket Army Engineering University, Xi'an 710025, China

^a547457971@qq.com, ^b13571996716@139.com

Abstract

The joint targeting of the US army is a cross-field and comprehensive work, which is an important basis for the realization of command planning and operation decision. Through a comprehensive analysis of the work cycle of joint targeting, the paper understands the hierarchical transformation of operational intent-operational targets-operational tasks. Describing the management of target list, kill chain process, target work evaluation, joint operational task lists, and else, we can find mature experience of the joint targeting from the support chain into the command chain.

Keywords

Joint Operations; Joint Target Work; Operational Evaluation; Target Management.

1. Introduction

The U.S. military's joint target work process has a comprehensive theoretical system and operational mechanism, deeply integrated into various stages such as operational planning, preparation, execution, and assessment, establishing a complete process for target analysis, selection, confirmation, engagement, and evaluation [1]. The U.S. military has achieved the transformation from theory to practical application, from target theory, target work regulations to the joint target work process. In previous studies, there has been a greater focus on the research of theories and methods, and insufficient exploration of the operational mechanisms of target work. This paper takes the joint target work process as the main line, analyzes the U.S. military's joint target work stage division, main content, and operational mechanism, and explores how target work serves joint operations, assists decision-making, and supports combat missions.

2. Organization of the Text U.S. Military Joint Target Work Process

The U.S. military's joint target work process is divided into six stages, which are the final situation and commander's operational purpose stage, target identification and prioritization stage, combat capability analysis stage, commander's decision-making and force allocation stage, mission planning and force implementation stage, and target work assessment (combat assessment) stage [2][3]. In actual application, the work of each stage is not strictly carried out in order, and may also occur simultaneously, which is a set of iterative processes.

2.1. Final Situation and Commander's Operational Purpose

The main task of this stage is to understand the final situation on the battlefield and the commander's operational intent, to clarify the focus and purpose of the operation, to clarify the effects that operational actions are to achieve, to refine the necessary tasks, and it is the initial stage of the joint target work process. It includes three aspects: first, determining the scope and effects of operational target selection; second, task analysis by command levels; and third, establishing task effectiveness evaluation indicators and execution evaluation indicators.

2.2. Target Identification and Prioritization

This stage is the process for target personnel to compile, analyze, and select targets, to conduct target system analysis of the enemy's combat system, to determine entity-level targets, and to form a target list. In the business work, it always follows the principles of adhering to national strategic guidance, complying with the laws of war and rules of engagement, and being able to effectively support the realization of the commander's operational objectives.

It can be divided into three steps:

- ① Target System Analysis. Conduct a capability analysis of the enemy from the perspective of the target system, including the characterization of the target system's combat capabilities, interrelationships, system composition, and interrelationships between components.
- ② Entity-Level Target Confirmation. According to the degree of understanding and recognition of the target, the confirmation of entity-level targets is divided into three levels: basic, intermediate, and advanced. Basic: Preliminary understanding of target information and ability to identify; Intermediate: Mastering the functional characteristics of the target; Advanced: Fully understanding the detailed information of the target to the extent that it can be applied to actual strike action planning. The standard for confirming entity-level targets is to grasp the target structure, characteristics, and interrelationships to meet the needs of effective strikes[4].
- ③ Target List Management. In the joint target work process, five types of lists are established: the candidate target list, the joint target list, the restricted strike target list, the target nomination list, and the joint unified prioritization target list[4].

Table 1. The Target list management

Name	Content
Candidate Target List	The target list that meets the intermediate determination standard of entity-level target confirmation, which is under review and verification
Joint Target List	The target list that has been reviewed and determined, and can be implemented for strike actions
Restricted Strike Target List	The target list that has been determined, and strike actions are restricted
Target Nomination List	The target list further nominated on the basis of the joint target list and restricted strike target list
Joint Unified Prioritization Target List	The target list formed by sorting the target nomination list according to the importance of targets according to the operational purpose of the joint force commander

2.3. Combat Capability Analysis

The task of the combat capability analysis stage is to assess all the strike forces that can be used to strike targets, and to determine the appropriate target strike plans available to the commander. Achieve the optimal allocation of combat resources, ensuring sufficient combat resources to complete the mission, while minimizing collateral damage and waste of combat resources.

It is divided into four steps:

- ① Target Vulnerability Analysis. Based on the target system or key elements analysis in the II stage, further confirm the internal and external connections and weaknesses of the target.
- ② Combat Resource Allocation. Allocate combat resources according to target vulnerabilities, forming a combat resource-target pairing table (i.e., weapon allocation table ATI), and clarify all strike styles for the commander's reference.
- ③ Feasibility Assessment. Conduct a feasibility assessment of the weapon allocation table to identify feasible strike plans.

④ **Strike Effect Estimation.** Evaluate the expected effects of each combat target in the strike plan, and the strike effects are divided into primary, secondary, and advanced levels. Table 2 The Strike Effect Evaluation Grade Division.

Table 2. The Strike effect evaluation grade division

Level	Standard
Primary	The effect of suppression and destruction of the target itself
Secondary	The potential collateral damage effects brought by the target
Advanced	The diplomatic and public relations impact that the strike action may cause

2.4. Commander's Decision-Making and Force Allocation

In this stage, integrate the results of the previous stages, comprehensively consider combat capability analysis and available forces, intelligence resources, and weapon systems to form a feasible target strike plan.

Mainly includes five basic steps:

- (1) Merge target data and combat capability analysis results.
- (2) Organize data related to the status of friendly forces.
- (3) Assign combat forces for specific targets and support tasks.
- (4) Submit joint target work recommendations to the joint force commander.
- (5) The joint force commander issues mission orders to the troops.

2.5. Mission Planning and Force Implementation

After the troops receive the mission, they formulate a detailed combat action plan. Joint target personnel provide detailed information related to combat targets to the mission planners. The implementation process of combat actions is highly dynamic, and the joint target work process needs to monitor the changes in targets in real-time, enabling commanders to flexibly use the joint force to seize and maintain the initiative after the combat action unfolds.

Throughout the target work process, meticulous target work and dynamic target work will be differentiated in Phase V. In the first four stages, the two types of target work are implemented under the guidance of the joint force commander's target work, and produce corresponding target work results and target strike tasks. In this stage, the joint force command institution formulates dynamic target work guidance. The content includes: target priority sorting, including time-sensitive target determination standards, processes; subordinate unit target requirements; target detection search guidance and strike actions against targets[4].

Dynamic target selection and engagement are referred to as the F2T2EA process: Find, Fix, Track, Target, Engage, and Assess, also known as the "kill chain"[4].

Planned targets in this stage only need to be checked, verified, and confirmed, and do not need to complete the entire F2T2EA process.

In dynamic target work, impromptu targets and time-sensitive targets are the focus of attention. In specific practice, some steps may be carried out simultaneously, or may need to be iterated repeatedly.

"Assessment" is a preliminary evaluation of the execution of the engagement action, and the implementation of the "assessment" step is based on the completion of the previous "engagement" process. The main purpose is to determine the changes in the entity and function of the target to confirm whether the "engagement" action was successful.

2.6. Target Work Assessment (Combat Assessment)

Assessment is an activity that analyzes changes and points to the future. Combat assessment is divided from high to low into strategic, operational, and tactical levels. Tactical combat level

combat assessment, also known as combat assessment, is a direct assessment of combat actions [5]. Combat assessment is also an important part of the U.S. military's joint target work assessment, evaluating combat effectiveness, and then adjusting and planning subsequent combat actions, including three aspects: combat damage assessment, ammunition effectiveness assessment, and recommendations for re-attack[4].

2.6.1. Combat Damage Assessment

Combat damage assessment refers to a comprehensive and systematic comparison of the actual strike effects on the target with the expected strike effects, mainly implemented in three steps: entity damage assessment, functional damage assessment, and target system assessment[2][4]. Entity damage assessment is the content of "assessment" in the target work process stage V, which is a quantitative assessment of the physical damage effects after the target is attacked; functional damage assessment is a quantitative and qualitative analysis and comprehensive judgment based on the conclusions of the entity damage assessment; the functional assessment of the target system is a rough assessment of the overall impact of the combat action on the enemy's target system (system) by integrating the previous two reports.

2.6.2. Ammunition Effectiveness Assessment

Ammunition effectiveness assessment refers to the evaluation of the combat application of weapons and ammunition, which is carried out simultaneously with the aforementioned combat damage assessment. The main purpose is to compare the combat effects produced with the predicted effects. Through overall analysis, the selection of weapon systems, the use of ammunition, and the deficiencies in coordination are systematically evaluated to provide reference information for future combat. Assess the effectiveness of weapon systems and ammunition, improve the efficiency of ammunition application, and propose adjustment suggestions. From the results, it includes recommendations for re-attack.

2.6.3. Recommendations for Re-engagement

Recommendations for re-engagement refer to the submission of suggestions to the joint operations commander for the need to conduct another systematic strike based on the degree of damage to the target, following the two previous assessments. Additionally, it includes a re-evaluation of the operational objectives, target selection, timing of strikes, tactical choices, and weaponry and ammunition[5].

3. U.S. Military Joint Target Management Mechanism

Each of the six stages of the U.S. military's joint target work process has corresponding output results, which support and constrain the subsequent stages. At the same time, the content of the subsequent work will also feedback to the previous stages and exert influence, continuously updating the target results documents in the cyclical iterative process to achieve joint target management.

3.1. Output Documents of Each Stage

3.1.1. Final Situation and Commander's Operational Purpose

The output documents of this stage include three levels and six aspects.

Joint Force Commander and Command Organization: Final situation on the battlefield and operational intent;

Target Personnel: Target scope and target intelligence requirements;

Troop Commander and Command Organization: Task analysis, task effectiveness evaluation indicators, and execution evaluation indicators.

3.1.2. Target Identification and Prioritization

The output documents of this stage also include three levels.

Target system analysis;

Determination of entity-level targets;

Target list management.

3.1.3. Combat Capability Analysis

This stage mainly forms two types of results.

Conduct vulnerability analysis of targets and matching of ordnance to targets, forming a weapon allocation table to support the formulation of operational plans;

Conduct damage plan estimation, evaluate operational plans, and form a collateral damage estimation report.

3.1.4. Commander's Decision-Making and Force Allocation

The actors in this stage are the joint force commander and their command organization, who need to integrate the results of the first three stages and allocate tasks and issue orders. In this stage, the joint force commander organizes personnel to study the joint unified prioritization target list and feasible combat resources generated by the target work process, integrates target data and combat capability analysis results, determines targets, tasks, and forces, and the outcome is a task allocation plan and a series of operational orders.

3.1.5. Mission Planning and Force Implementation

The actors in this stage are at the task force level. After receiving the mission, the task force, based on the detailed target information provided by the target work process, formulates a meticulous mission plan to ensure that actions focus on achieving the operational objectives of the joint force commander. The target work results of this stage include the collection of target information intelligence and detailed mission reports. The target work in combat operations follows the "F2T2EA" process, which is highly dynamic at this stage. The combat environment will change at any time due to the interaction and influence of friendly, enemy, or other reasons. The implementation of the target work process is to monitor these changes and feedback to the joint force commander and troops, so that after the combat operations are launched, the capabilities of the joint force can be quickly and accurately used to seize and maintain the initiative, and to continuously advance the combat operations towards the realization of operational objectives.

3.1.6. Target Work Assessment (Combat Assessment)

Target work assessment is an evaluation of the effectiveness of all activities in the first five stages and is a continuous process that can be carried out at the strategic, operational, and tactical levels. The tactical level assessment (i.e., combat assessment) is fundamental and provides a basis for operational and strategic level assessments, laying the foundation for the iteration of the joint target work process. The effective implementation of the assessment work requires detailed and continuous information input from the first five stages, which is the output of the results of each stage. This stage produces four outcomes: combat damage assessment, ammunition damage assessment, collateral damage assessment, and recommendations for re-attack^[5].

In the U.S. military's joint target work process, the interaction among different stages is crucial for the progressive and iterative nature of the workflow.

3.2. Interrelationships among Stages

The preceding stage in the joint target work process provides support for subsequent stages, while the following stages verify the effectiveness of the previous ones. There is a cross-influence among the stages, with each building upon the last.

3.2.1. Support Relationships

Phase I : The final situation on the battlefield, operational objectives, tasks, and expected outcomes provide guidance and standards for the target work of the subsequent five phases. Effectiveness assessment indicators and execution assessment indicators offer a fundamental basis for the evaluation work in each phase.

Phases I , II, III, IV: These phases advance progressively, with each preceding phase supporting the unfolding of the following one, collectively constituting the joint target work during the operational planning phase.

All work from the first four phases serves Phase V , as the operational process transitions into the execution phase. In Phase V , the F2T2EA (Find, Fix, Track, Target, Engage, Assess) process of target work has six steps, where each preceding step supports the subsequent one. The output from the first five phases supports the commencement of the assessment work in Phase VI.

3.2.2. Feedback Relationships

Looking at the large cycle of the target work process, after the target work assessment, it transitions back to Phase I to form a closed-loop work cycle, achieving cyclical iteration. Phase VI forms a feedback relationship with the preceding phases.

In terms of the individual stages of the target work process, subsequent work is a continuation and verification of the previous work, with the results directly assessing the effectiveness of the previous stage's work, establishing a feedback relationship.

When looking at the work within a single phase, it contains small loops within the larger cycle, especially the F2T2EA process in Phase V , which forms a closed loop with the kill chain, creating a feedback relationship.

3.2.3. Command and Coordination Relationships

From the perspective of the actors in each stage of the target work process, command and coordination are frequent, with close linkage between higher and lower levels. Target staff remain continuously involved, receiving command from the joint force commander and following the guidance for joint target work. The first four phases (operational planning phase) complete target confirmation and form a target list. Phase V (operational execution phase) works with the mission planning team to finalize mission planning. Phase VI (operational termination phase) collaborates with the combat assessment team to conduct combat assessments.

The joint target work process is an integral part of the U.S. military's joint operational command planning and organization implementation. It is not a "solo act" by target staff but is nested within the joint operational planning and actions. The joint target work process transforms situations and intentions into concrete operational objectives and proposes methods and means to achieve them, linking operational intentions-operational objectives-operational tasks from the perspective of target work.

4. Joint Task List from a Target Perspective

The U.S. military's joint operation task list presents strategic, operational, tactical, and service-specific levels of military activities in a standardized format, including task descriptions, metrics for measurement, conditions for execution, and executing entities[9]. The joint operation task list provides a common language for joint operation force commanders, command organizations, and combat units to plan operations, direct actions, and communicate task requirements, covering foundational combat tasks in a series of activities such as

operational planning, intelligence reconnaissance, communication transmission, command and control, maneuver employment, fire engagement, and combat assessment [9][12].

4.1. From Operational Intent to Target Selection

During the operational planning phase, the joint target work process integrates battlefield intelligence resources and understands the final situation, where the joint force commander clarifies the intent of the operation. The joint target work process further conducts target confirmation, target system analysis, and develops a unified joint prioritization target list. It transforms the realization of operational intent into actions against a series of operational objectives. The sequence and standards for targeting operational objectives are established, implicitly including the allocation of targets, the matching of targets with means, and the alignment of targets with tasks.

4.2. From Target Selection to the Operation Task List

After the target list is prepared, the joint target work process transitions to capability analysis and task formulation. Task planners integrate existing friendly resources, conduct capability analysis on task forces, and when commanders make decisions on the target list, they determine the means and extent of the strike for each target and correspond them with task forces to complete the assignment of operational target strike tasks. Task forces focus on operational target strike missions (suppression, interference) and further form operational plans that include tasks such as operational preparation, maneuver transition, deployment, fire engagement, and combat assessment. In this process, the support of standardized documents such as the "Joint Operation Common Task List" and service-specific task lists is required, using operational objectives as the guide and task lists as the language to customize force operational plans, enabling rapid preparation of task plans with a coherent system of indicators.

4.3. Transformation of Target Work Process and Task List

The content, methods, steps, standards, and requirements in the joint target work process can also be regarded as a task list for target work. Intelligence requirements for targets generate tasks for intelligence resource support; the preparation of target lists generates tasks for target compilation, target analysis, and target selection. The joint target work process is how the U.S. military links the organization and implementation of joint operations from a target perspective, and the joint task list provides a standardized language for the organization and implementation process, achieving the transformation of operational objectives into operational tasks.

The joint target work process breaks down and refines operational intent into specific operational objectives, and the joint task list transforms operational objectives into a series of action tasks. From the study of the joint target work process, it is evident that the U.S. military's target work has been deeply integrated into the joint operation command chain, with targets driving decision-making and focusing on the implementation of combat actions.

5. Conclusion

The joint target work process represents a significant advancement for the U.S. military in the domain of target operations, following on the heels of the "Five Rings" target theory. This process has successfully bridged the gap from conceptual theory to tangible operational practices. It offers invaluable insights for the planning of joint operations, the mechanisms for target support, and the organization of military actions. Delving into the operational principles, target management systems, and the interplay between organization and execution within the joint target work process is essential for enhancing the efficacy of joint operational planning, ensuring robust target support mechanisms, and effectively organizing military actions.

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