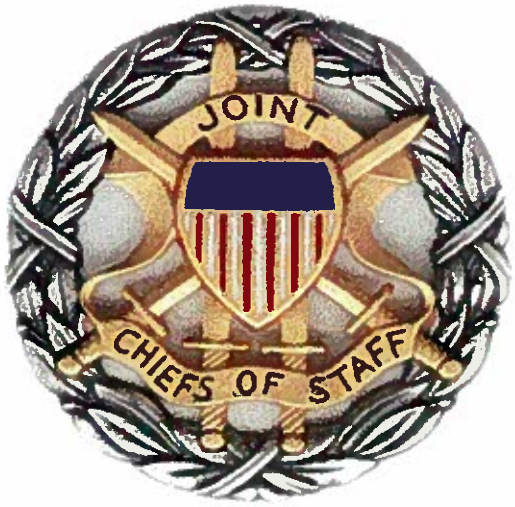
JCS J8 DDC4
Architecture & Integration Division

Joint Fire Support
Tier I Joint Mission Thread

AV-2 Integrated Dictionary



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A. INTRODUCTION

The AV-2 is an Integrated Dictionary that contains definitions of terms used in the given architecture. It consists of textual definitions in the form of a glossary, a repository of architecture data along with their taxonomies and metadata (i.e., data about architecture data), including metadata for tailored products associated with the architecture products developed. Metadata are the architecture data types, possibly expressed in the form of a physical schema. In this document, architecture data types are referred to as architecture data elements.

The AV-2 provides a central repository for a given architecture's data and metadata. The AV-2 enables the set of architecture products to stand alone, allowing them to be read and understood with minimal reference to outside resources. The AV-2 is an accompanying reference to other products and its value lies in unambiguous definitions. The key to long-term interoperability can reside in the accuracy and clarity of these definitions.

This document is the AV-2 for the Joint Fire Support (JFS) Tier I Joint Mission Thread (JMT). Reference the AV-1 for the JFS Tier I JMT for a description of the Tier I Joint Mission Thread.

B. PERFORMERS

B.1 Air Support Control Agency

A generic term used in the JCAS Joint Capabilities Document (JCD) to describe functions similar to those of the Air Support Operations Center (ASOC)/Direct Air Support Center (DASC). See also Air Support Operations Center. [JCAS JCD]

B.2 Air Support Operations Center (ASOC)

The ASOC is the principal Air Force C2 node for integrating air power into Army land operations. As a direct subordinate element of the JAOC, the ASOC is responsible for the direction and control of air operations directly supporting the Army land operation. It processes and coordinates air missions requiring integration with other supporting arms and ground forces. The ASOC is usually collocated with the senior Army tactical echelon, and coordinates operations with the permanently aligned TACP and the JAOC. The ASOC has five primary functions. It manages CAS assets within the supported ground commander's AO; processes CAS requests and controls the flow of CAS aircraft; deconflicts airspace coordination measures and fire support coordinating measures with aircraft; assigns and directs attack aircraft, when authorized, to the joint terminal attack controllers (JTACs); and manages the Air Force air request net and its specific tactical air direction net frequencies. Additionally, the ASOC may also coordinate in other mission areas, to include AI, air defense, ISR, joint suppression of enemy air defenses (J-SEAD), and joint personnel recovery. [JP 3-09, II-12]

B.3 Commander (Senior/Intermediate/Supported)

A general term applied to a combatant commander, subunified commander, or joint task force commander authorized to exercise combatant command (command authority) or operational control over a joint force. [JP 1-02]

B.4 Fires and Effects Cell (Senior/Intermediate/Supported)

The Fires Cell is the special staff that plans, coordinates, integrates, and synchronizes all fires and effects activities to support BCT operations. Primary Fires Cell functions include the following: Planning, coordinating, synchronizing, and executing fires and effects in support of BCT operations; Collaborating in the intelligence preparation of the battlefield (IPB); Coordinating the tasking of sensors during development of the collection plan with the BCT S2, the military intelligence company (MICO) commander (as needed), and the reconnaissance squadron (RS) to acquire targets; Participating in the BCT military decision-making process (MDMP); Participating in the BCT targeting process; Being responsible for coordinating, integrating, and synchronizing information operations into combined arms operations; Managing the establishment of and changes to fire support coordinating measures (FSCMs); Coordinating maneuver space for the positioning of field artillery assets; Coordinating clearance of lethal and nonlethal attack against targets (clearance of fires); Performing combat assessments as a result of employing lethal and nonlethal effects; Coordinating requests for additional fires and effects, both lethal and nonlethal; Coordinating for joint fires through the higher headquarters; Coordinating requests for additional nonlethal effects/operations assets through the higher headquarters (i.e., information operations (IO), civil affairs (CA), to include psychological operations (PSYOP); Providing input to the BCT's common operational picture (COP) to enhance situational understanding. [FMI 3-09.42, 6-4]

B.5 Command Post (Senior/Intermediate/Supported/Division/MEF/Battalion/Company)

The operations directorate (J-3) assists the commander in the discharge of assigned responsibility for the direction and control of operations, beginning with planning and through completion of specific operations. In this capacity, the J-3 plans, coordinates, and integrates operations. The flexibility and range of modern forces require close coordination and integration for effective unified action. [JP 3-33,xvii]

B.6 Sensor Elements

An organization formed around a specific function within a designated directorate of a joint force commander's headquarters. The subordinate components of an element usually are functional cells. [JP 1-02]

B.7 Supporting Forces

Forces stationed in or to be deployed to an operational area to provide support for the execution of an operation order. Combatant command (command authority) of supporting forces is not passed to the supported commander. [JP 1-02 Supporting Forces]

B.8 Maneuver Headquarters (Senior/Intermediate/Supported)

The leadership element responsible for the employment of forces in the operational area through movement in combination with fires to achieve a position of advantage in respect to the enemy in order to accomplish the mission. [Derived from JP 1-02]

B.9 Joint Forces Air Component Command [JFACC]

The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of assigned, attached, and/or made available for tasking air forces; planning and coordinating air operations; or accomplishing such operational missions as may be assigned. The joint force air component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. (JP 1-02) Also called **JFACC.** See also **joint force commander.** (JP 3-0)

B.10 Joint Air Operations Center [JAOC]

A jointly staffed facility established for planning, directing, and executing joint air operations in support of the joint force commander's operation or campaign objectives. (JP 1-02) Also called **JAOC.** See also **joint air operations.** (JP 3-30)

B.11 Tactical Air Command Center [TACC]

The principal US Marine Corps air command and control agency from which air operations and air defense warning functions are directed. It is the senior agency of the US Marine air command and control system that serves as the operational command post of the aviation combat element commander. It provides the facility from which the aviation combat element commander and his battle staff plan, supervise, coordinate, and execute all current and future air operations in support of the Marine air-ground task force. The tactical air command center can provide integration, coordination, and direction of joint and combined air operations. (JP 1-02) Also called **Marine TACC.** (JP 3-09.3)

B.12 Joint Force Land Component Command [JFLCC]

The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of assigned, attached, and/or made available for tasking land forces; planning and coordinating land operations; or accomplishing such operational missions as may be assigned. The joint force land component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. (JP 3-0)

B.13 Joint Force Special Operations Component Commander [JFSOCC]

The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of assigned, attached, and/or made available for tasking special operations forces and assets; planning and coordinating special operations; or accomplishing such operational missions as may be assigned. The joint force special operations component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. (JP1-02) Also called JFSOCC. See also joint force commander. (JP 3-0)

B.14 Direct Air Support Center [DASC]

The principal air control agency of the US Marine air command and control system responsible for the direction and control of air operations directly supporting the ground combat element. It processes and coordinates requests for immediate air support and coordinates air missions requiring integration with ground forces and other supporting arms. It normally collocates with the senior fire support coordination center within the ground combat element and is subordinate to the tactical air command center. (JP 1-02) Also called **DASC.** See also **Marine air command and control system; tactical air operations center.** (JP 3-09.3)

B.15 Joint Air Coordination Element (JACE)

The JACCE is a component level liaison that serves as the direct representative of the JFACC. A JACCE is normally made up of the liaison element(s) of the Service designated to provide the JFACC. The JACCE does not perform any C2 functions and the JACCE director does not have command authority over any air forces. The JACCE facilitates the integration of joint air power by exchanging current intelligence, operational data, support requirements, and by coordinating the integration of JFACC requirements for ACMs, FSCMs, personnel recovery, and CAS. JACCE expertise should include plans, operations, ISR, space, airspace management, air mobility, and administrative and communications support. (JP 3-09)

B.16 Corps

An intermediate headquarters between divisions and the theater army. A corps may consist of two or more divisions together with supporting brigades. Corps headquarters are capable of serving as either a joint task force or joint force land component command headquarters. (JP 3-31)

B.17 Special Operations Task Force (SOTF)

A force composed of special operations units from more than one Service, formed to carry out a specific special operation or prosecute special operations in support of a theater campaign or other operations. The special operations task force may have conventional non-special operations units assigned or attached to support the conduct of specific missions. (Derived from JP 1-02) Also called **JSOTF.** (JP 3-05)

B.18 Brigade Combat Team (BCT)

The principal tactical unit of the modular Army will be the BCTs, which will be made up of battalion-sized and company-sized subunits. Brigade-based, modular units are rapidly deployable, lethal, responsive, agile, tailorable, and discrete packages of land force combat power. (FM 3–90.61)

B.19 Regt

The primary mission of a regiment is to locate, close with, and destroy the enemy by fire and maneuver or to repel his assault by fire and close combat. The regiment, with appropriate attachments, is capable of independent, sustained operations. (Derived from MCRP 5-12D)

B.20 Indirect Fires

Fire delivered on a target that is not itself used as a point of aim for the weapons or the director. (JP 3-09.3)

B.21 Unmanned Aircraft System (UAS)

That system whose components include the necessary equipment, network, and personnel to control an unmanned aircraft. (JP 1-02) Also called **UAS.** (JP 3-52)

B.22 Fixed Wing Aircraft

An aircraft capable of flight using forward motion that generates lift as the wing moves through the air. Fixed-wing aircraft offer the versatility and capability to deliver combat power against the enemy when and where needed to attain objectives across the range of military operations. The ability of aircraft to employ precision-guided munitions offers a distinct advantage over other weapon systems in many cases. Guided weapons can correct for ballistic, release, and targeting errors in flight. Manned aircraft can offer the advantage of providing immediate attack assessment. (Derived from JP 3-09)

B.23 Rotary Wing Aircraft

An aircraft which is partly or wholly sustained in the air by lifting surfaces (*rotors*) revolving around a vertical axis. Serves as an attack rotary-wing aviation primarily as a CAS platform. They are also capable of operating during periods of limited visibility. (Derived from JP 3-09)

B.24 Naval Surface Fire Support

Fire provided by Navy surface gun and missile systems in support of a unit or units. (JP 1-02) Also called **NSFS.** See also **fire support.** (JP 3-09.3)

B.25 Supporting Arms Coordination Center (SACC)

A single location on board an amphibious command ship in which all communication facilities incident to the coordination of fire support of the artillery, air, and naval gunfire are centralized. This is the naval counterpart to the fire support coordination center utilized by the landing force. (JP 1-02) Also called **SACC.** See also **fire support coordination center.** (JP 3-09.3)

C. MESSAGES

In order to represent the category of message being used, each message defined below is a generalization of a set of messages. In each case there are several different message formats currently being used. To learn more information about interoperability of specific messages review the associated desk top analysis.

C.1 Course of Action (COA)

Possible plans open to an individual or commander that would accomplish, or is related to the accomplishment of the mission. (The message is applied in many states. E.g. Approved, Proposed, Recommended, etc.)[JP 1-02]

C.2 Commander's Estimate

In the context of the Joint Operation Planning and Execution System level 1 planning detail for contingency planning, a developed course of action. The product for this level can be a course of action briefing, command directive, commander's estimate, or a memorandum. The commander's estimate provides the Secretary of Defense with military courses of action to meet a potential contingency. [JP 1-02]

C.3 Engagement Decision

In an estimate of the situation, a clear and concise statement of the line of action intended to be followed by the commander as the one most favorable to the successful accomplishment of the assigned mission. A tactical conflict, usually between opposing lower echelons maneuver forces. [JP 1-02]

C.4 Fire Support Estimate

An analysis of a foreign situation, development, or trend that identifies its major elements, interprets the significance, and appraises the future possibilities and the prospective results of the various actions that might be taken. Fires that directly support land, maritime, amphibious, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives. [JP 1-02]

C.5 Fire Support Plan

Fires that directly support land, maritime, amphibious, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives. [JP 1-02]

C.6 Fragmentary Order (FRAGO)

An abbreviated form of an operation order issued as needed after an operation order to change or modify that order or to execute a branch or sequel to that order. Also called FRAGO. [JP 1-02] GuidanceTo effectively plan joint fire support, planners must understand the objective, purpose of the operation, and the commander's intent. Subordinate JFCs will translate the combatant commander's guidance and strategy into clearly defined and attainable operational level objectives. They then write supporting operational plans and orders to attain those objectives. These plans and orders will contain a CONOPS that describes joint force employment. Joint fire support priorities and goals are typically listed as part of the overall priorities and goals within

the CONOPS. The commander's estimate and the CONOPS assist in focusing the employment of all assets, to include those providing joint fire support. [JP 3-09, II-4]

C.7 Intelligence Data

The product resulting from the collection, processing, integration, evaluation, analysis, and interpretation of available information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations. [JP 2-0]

C.8 Target Solutions

An examination of potential targets to determine military importance, priority of attack, and weapons required to obtain a desired level of damage or casualties. Also called Target Analysis. (The message is applied in many states. E.g. Approved, Proposed, Recommended, etc.) [derived from JP 1-02]

C.9 Tactical Coordination & Liaison

This is he information required for coordination prior to each type of fires engagement. It includes battle tracking, target nomination, airspace deconfliction and coordination, synchronization; weapons release authority, and tactical risk assessment. [Derived from JP 3-09.3, pg V-2]

C.10 Target Information

Target information provides for the detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons. [JP 3-60]

C.11 Target Nomination

A target-consolidated list of targets made up of the multiple candidate target lists. A prioritized list of targets drawn from the joint target list and nominated by component commanders, appropriate agencies, or the joint force commander's staff for inclusion on the joint integrated prioritized target list. [JP 1-02]

C.12 Target Solution

The detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons. Also called Target Acquisition. [derived from JP 1-02]

C.13 Tasking Order

A method used to task and to disseminate to components, subordinate units, and command and control agencies projected targets and specific missions. In addition, the tasking order provides specific instructions concerning the mission planning agent, targets, and other control agencies, as well as general instructions for accomplishment of the mission. [JP 3-05.1]

D. ACTIVITY DEFINITIONS

D.1 Plan

D.1.1 Receipt of Mission

Upon receipt of a mission, joint fire support personnel assist the commander in mission analysis. Joint fire support personnel must understand the commander's guidance on the following: (a) Specific COAs, (b) Objectives and end state, (c) ISR, (d) TSTs, HVTs, and HPTs, (e) Use of weapons effects and special munitions such as blast, fragmentation, cluster, nuclear, mines, and lasers, (f) Acceptable risks, (g) C2, (h) Commitment of the reserve force, (i) Critical events to be considered, (j) Commander's assumptions, (k) ROE, (l) Assessment, (m) Host nation concerns. [JP 3-09, III-9]

D.1.2 Conduct Target Analysis

The commander establishes targeting guidance that must be incorporated into the joint fire support planning process. The commander establishes the priorities and describes the importance of a target set and/or category in relation to a given situation or phase of operation. [JP 3-09, III-10]

D.1.3 Prepare the Joint Fire Support Estimate

This estimate influences how available joint fire support resources are employed to support the possible COAs and helps joint fire support planners and/or coordinators integrate and synchronize the employment of joint fire support resources. The estimate is a realistic appraisal of the effort required to support the operation. It serves as a basis for identifying joint fire support priority requirements that support the commander's intent. Factors that could affect the mission and may be considered in the joint fire support estimate include the following: The task organization of subordinate forces and their missions; The availability of joint fire support resources, including FA, CAS, NSFS, SOF, EW, and ISR assets; The probable enemy fires plan; Enemy fires capability; The identification of TSTs, HVTs, and HPTs; Consumption factors (type and quantity), positioning requirements, and priority of logistic support; Joint fires-related decision points. [JP 3-09, III-9-10]

D.1.4 Issue the Commander's Estimate

Based on information provided in the staff estimates, the commander issues an estimate. It should provide joint fire support planners and/or coordinators with guidance regarding prioritization of targets, desired effects, and reattack. [JP 3-09, III-11]

D.1.5 Submit Support Requests

Joint fire support planners and/or coordinators must determine what is needed. If assets are inadequate, they must request additional joint fire support from the appropriate echelon or component. The requester is usually in the best position to determine joint fire support requirements. However, joint fire support planners and/or coordinators are in a position to weigh the request against the commander's guidance on priority targets and the current and future needs

for joint fire support. Requests for joint fire support are transmitted to the force capable of delivering the most effective joint fires within the required time. [JP-3-09, III-13]

D.1.6 **Publish Asset Tasking Order**

Once the plan developed by the force assignment team is approved, tasking orders to the assigned combat and support forces are prepared and issued. Intelligence assets and organizations, which support mission planning and assessment, are also tasked during this phase. [JP 3-60, F-4]

D.1.7 **Initiate Planning Actions**

Once the commander decides on a COA, joint staff and fire support planners: (a) Refine named areas of interest, decision points, and HVTs/HPTs, (b) Integrate and refine the collection, TA, and assessment plan. All collection assets are tasked and integrated to ensure there are no gaps in the coverage of the AO, (c) Develop joint fire support tasks, responsibilities, and requirements, (d) Develop the joint fires employment concept and joint fire support plan.

This estimate influences how available joint fire support resources are employed to support possible COAs and helps joint fire support planners and/or coordinators integrate and synchronize the employment of joint fire support resources. This estimate is a realistic appraisal of the effort required to support the operations. It serves as a abasis for identifying joint fire support priority requirements that support the commander's intent. Factors that could affect the mission and may be considered in the joint fire support estimate include the following: The task organization of subordinate forces and their missions; the availability of joint fire support resources, including FA, CAS NSFS, SOF, EW, and ISR assets; the probable enemy fires plan; enemy fires capability; the identification of TST's HVTs, and HPT's; consumption factors (type and quantity), positioning requirements, and priority of logistic support; and joint fires-related decision points. [JP 3-09, III-10-12]

D.2 **Prepare**

D.2.1 **Receive the Joint Fire Support Plan**

Upon receipt of a mission, joint fire support personnel assist the commander in mission analysis. Joint fire support personnel must understand the commander's guidance on the following: Specific COAs; Objectives and end state; ISR; TSTs, HVTs, and HPTs; Use of weapons effects and special munitions such as blast, fragmentation, cluster, nuclear, mines, and lasers; Acceptable risks; C2; Commitment of the reserve force; Critical events to be considered; Commander's assumptions; ROE; Assessment and Host nation concerns. [JP 3-09, III-9]

D.2.2 **Conduct Rehearsals**

Walks through the approved plan in either a reduced force or full dress mode. Reduced force uses key leaders to explain their actions on small scale replicas of the actual terrain. A full dress rehearsal allows all units to practice on the actual terrain in both good light and limited visibility conditions. It also allows synchronization of supporting elements with the maneuver force. Staff identifies risks, shortfalls and improvements to the plan. [FM 5-0, p 4-15]

D.2.3 Conduct Movement In Accordance with Fire Support Plan

Maneuver positions forces at decisive points to achieve surprise, psychological shock, physical momentum, and massed effects. The focus of maneuver is to render opponents incapable of resisting by shattering their morale and physical cohesion (their ability to fight as an effective, coordinated whole) rather than by destroying them physically through attrition. [JP 3-09, I-4]

D.3 Execute

D.3.1 Conduct Reconnaissance/ Surveillance of Target

Reconnaissance is a focused intelligence collection effort, performed before and during other combat operations to provide information and intelligence that is used by the commander and his staff to develop, confirm or modify the operational plan. In contrast, Surveillance is the systematic observation of airspace or surface areas by visual, aerial, electronic, photographic, or other means. [FMI 3-09.42, 7-39]

D.3.2 Receive Target Information

Target Information is intelligence that portrays and locates the components of a target or target complex and indicates its vulnerability and relative importance. [JP 1-02]

D.3.3 Evaluate Target Information

The process of determining the quantity of a specific type of lethal or nonlethal weapons required to achieve a specific level of damage to a given target, considering target vulnerability, weapons characteristics and effects, and delivery parameters. Also called Weaponeering. [JP 1-02]

D.3.4 Determine Engagement

The process of determining the quantity of a specific type of lethal or nonlethal weapons required to achieve a specific level of damage to a given target, considering target vulnerability, weapons characteristics and effects, and delivery parameters. Also called weaponeering. [JP 1-02]

D.3.5 Use Non-Lethal Attack

Examples of nonlethal fires are electronic attack (EA), certain psychological operations (PSYOP), smoke operations, and some computer network operations (CNO) which deceive the enemy, disable the enemy's C2 systems, and disrupt operations. The employment of nonlethal fires is especially important in stability operations when restraint and limitations on the use of deadly force are necessary. Nonlethal weapons include but are not limited to non-penetrating blunt impact munitions, acoustic systems, entangling devices, and sticky and slick foams. [Joint Fires and Targeting Handbook, I-1] A non lethal weapon is a weapon that is explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment. [JP 1-02]

D.3.6 Conduct IO Non-Lethal Operations

The integrated employment, during military operations, of information-related capabilities in concert with other lines of operation to influence, disrupt, corrupt, or usurp the decision-making

of adversaries and potential adversaries while protecting our own. [JP 1-02] EA is the division of EW involving the use of electromagnetic (EM) energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of non lethal fires. EA includes: actions taken to prevent or reduce an enemy's effective use of the EM spectrum, such as jamming and EM deception, and employment of weapons that use either EM or directed energy as their primary destructive mechanism (e.g., lasers, radio frequency weapons, particle beams); Computer Network Attack (CAN) is the division of computer network operations that uses computer networks to disrupt, deny, degrade, or destroy information resident in computers and computer networks, or the computers and networks themselves. [JP 3-09, III-20]

D.3.7 **Conduct Other Non-Lethal Operations**

Other non-lethal joint fire support includes obscurant fires to mask friendly positions and illumination fires when required for night operations. [JP 3-09, III-20]

D.3.8 **Use Lethal Attack**

Weapon systems deliver fires that are capable of producing both lethal and nonlethal effects on a target. Lethal effects are produced through some combination of blast, fragmentation, and kinetic penetration of the selected target. Though highly effective for their intended purpose, lethal effects may not always be suitable across the range of military operations. [Joint Fires and Targeting Handbook, I-23]

D.3.9 **Conduct Fixed Wing Aircraft Execution Activities**

The flexibility, range, speed, lethality, precision, and ability to mass at a desired time and place contributes significantly to the overall joint fire support available to a JFC. Fixed-wing aircraft offer the versatility and capability to deliver combat power against the enemy when and where needed to attain objectives across the range of military operations. The ability of aircraft to employ precision-guided munitions offers a distinct advantage over other weapon systems in many cases. Guided weapons can correct for ballistic, release, and targeting errors in flight. Manned aircraft can offer the advantage of providing immediate attack assessment. Also, stealth technology and the ability to employ air launched conventional standoff weaponry offer unique advantages and, in effect, may achieve their own local air superiority due to their reduced detectability. [JP 3-09, III-17]

D.3.10 **Conduct Attack Helo Execution Activities**

The US Army normally employs attack helicopters as maneuver units capable of conducting two basic types of attack missions, close combat attack and interdiction attack. US Army attack helicopters can also perform CAS functions when operating in support of another component. The USMC employs its attack rotary-wing aviation primarily as a CAS platform. As an integral part of the MAGTF, the ACE deploys as a supporting element to the GCE to execute CAS missions in support of ground maneuver elements. Attack helicopters are capable of employing precision guided weapons and providing terminal guidance for other weapon platforms. They are also capable of operating during periods of limited visibility. [JP 3-09, III-17]

D.3.11 **Conduct UAV / UAS Execution Activities**

The long endurance capability of UASs has demonstrated that UASs can be critical to the support of TST, HVT, and HPT missions. Situations may require UASs to support CAS, strike coordination and reconnaissance, AI, and other joint fires missions. Specific tasks for the UASs may include: target acquisition/marking, terminal guidance of ordnance, providing precision coordinates for GPS-aided munitions, delivery of onboard precision-guided ordnance, battle damage assessment, and retargeting (i.e., shoot-look-shoot). In the TST role, UASs are routed, controlled, and deconflicted in the same manner as fixed- and rotary-winged manned aircraft, as outlined in joint doctrine. Current weapons employed by unmanned aircraft are in the 500-pound class or less and are usually GPS or laser guided. [JP 3-09, III-17]

D.3.12 **Conduct Missile Execution Activities**

ATACMS provides long-range, surface-to-surface fires against high value, well-defended targets, day or night, and in near-all weather conditions. The ATACMS missiles fired from the Multiple Launch Rocket System (MLRS) and the High Mobility Artillery Rocket System (HIMARS) launchers deliver warheads that include antipersonnel/anti-materiel bomblets, unitary high-explosive charges, or guided sub-munitions. ATACMS can support a full range of operations including TSTs, JSEAD, counter fires, and in strikes requiring high levels of accuracy. Their inherent low risk, accuracy, and range make these missiles a very viable option against stationary, non-hardened targets; US Navy TLAMs can be effective in engaging well-defended targets at long distances and provide a potent precision employment option to the joint force. Their inherent low risk, accuracy, and range make these missiles a very viable option against stationary, non-hardened targets. The TLAM weapon system may require coordination with the strike and mission planners in theater at the maritime component commander's HQ. Planning is an ongoing process, independent of the decision to use the weapon and can run in parallel to the decision process. With proper planning, TLAMs are capable of conducting short-notice employment, day or night, with few weather restrictions. TLAM strikes may be conducted without air support and/or when manned aircraft loss is considered to be likely. TLAMs are also capable of neutralizing enemy air defenses to facilitate a much larger attack by land- and maritime-based airpower. In theater, the associated afloat planning systems suites provide the joint force maritime component commander with the capability to plan new missions or modify selected missions in the operational area; The US Air Force conventional air-launched cruise missile (CALCM) is a near-precision, GPS-aided standoff weapon launched from a B-52. Mission planning for the CALCM is accomplished by reach back, and close coordination is required between missile planners, B-52 aircraft planners, and AOC planning staffs; The joint air-to-surface standoff missile (JASSM) is a US Air Force air launched, low observable (LO), subsonic cruise missile specifically designed to penetrate air defense systems. The missile incorporates GPS guidance with an infrared seeker in the terminal phase of flight. Optimizing JASSM's full precision and LO capabilities require prior coordination with both strike units and target intelligence agencies. [JP 3-09, III-18]

D.3.13 **Conduct Rocket Execution Activities**

The MLRS and the HIMARS launchers provide the joint force with effective counter fire and attack of enemy defenses, light materiel, and personnel targets. These weapon systems supplement cannon artillery fires by delivering large volumes of firepower against selected

targets. The MLRS and HIMARS typically fire free-flight rockets against area targets and guided munitions against point targets. The guided MLRS rocket provides another precision attack capability to support maneuver forces and provide interdiction of HPTs and HVTs. [JP 3-09, III-18]

D.3.14 **Conduct Cannon, Artillery, Mortar Execution Activities**

Although cannon artillery and mortars primarily provide close supporting fires to maneuver forces, they can also perform other roles such as interdiction to support maneuver, or J-SEAD to facilitate air operations. New precision artillery rounds, such as the Excalibur, provide all weather precision strike capability for point targets in close proximity to friendly forces. [JP 3-09, III-19]

D.3.15 **Conduct Naval Surface Fire Execution Activities**

The general mission of NSFS ship units in an amphibious operation is to support the assault by destroying or neutralizing shore installations that oppose the approach of ships and aircraft, defenses that may oppose the LF, and defenses that may oppose the post-landing advance of the LF. [JP 3-09, III-19]

D.3.16 **Integrate and Synchronize Engagement**

Joint fire support coordination is a flexible process that must be kept as simple as possible to produce the desired results. The JFC and component commanders synchronize joint fire support operations to place the right attack means on the correct target at the precise time. To achieve synchronization, commanders and staffs must have a thorough knowledge of each Service's doctrine, major systems, significant capabilities and limitations, and often their tactics, techniques, and procedures. [JP 3-09, III-12]

D.3.17 **Engage Target**

In this activity, identification of the target as hostile is confirmed and engagement is ordered and transmitted to the pilot, aircrew, or operator of the selected weapon system. The engagement orders must be sent to, received by, and understood by the "shooter." The engagement should be monitored and managed by the engaging component. The desired result of this step is successful action against the target. [Joint Fires and Targeting Handbook, III-1.06]

D.3.18 **Conduct Post Strike Surveillance**

The systematic observation of aerospace, surface, or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means. [JP 1-02]

D.4 Assess

D.4.1 **Provide Physical Damage Assessment**

A physical damage assessment is an estimate of the quantitative extent of physical damage (through munitions blast, fragmentation, or fire damage) to a target element based on observed or interpreted damage. This post-attack target analysis should be a coordinated effort among combat units, component commands, the subordinate joint force, the combatant command,

national agencies, supporting commands, the JIOC, and the primary theater BDA cell. Some representative sources for data necessary to make a physical damage assessment include the ATO or MAAP, MISREPs, ACV, WSV, visual/verbal reports from ground spotters or combat troops, controllers or observers, artillery target surveillance reports, SIGINT, HUMINT, IMINT, MASINT, or OSINT. [Joint Fires and Targeting Handbook, III-118]

D.4.2 **Provide Functional Damage Assessment**

Functional damage assessment is an estimate of the degradation or destruction of the functional/operational capability of a target to perform its intended mission. Functional assessments are inferred from the assessed physical damage and all source intelligence information. This assessment must include an estimation of the time required for recuperation or replacement of the target's function. BDA analysts need to compare the desired targeting effect or objective for the attack with the current status of the target to determine if the targeting objective was met. [Joint Fires and Targeting Handbook, III-120]

E. SYSTEMS

E.1 Air Defense System Integrator (ADSI)

Air Defense Systems Integrator (ADSI) provides the Tactical Data Link (TDL) picture to locations aboard CV/CVN/LCC/LHA/LHD class ships (e.g. TFCC, Flag Plot, Warfare Cell) for a fused situational awareness capability to the strike group staff. ADSI also provides TDL information to GCCS-M for generation of the Common Operational Picture (COP)/Situational Awareness which can be disseminated among COP network participants. [https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.2 Advanced Field Artillery Tactical Data System (AFATDS)

The Advanced Field Artillery Tactical Data System (AFATDS) performs Command and Control, increases Situational Awareness and automates fire support coordination for the Army, Navy, and Marine Corps. AFATDS automates the planning, coordinating and controlling of all fire support assets in the Joint battlespace (field artillery, mortars, close air support, naval gunfire, attack helicopters, and offensive electronic warfare) from Echelons Above Corps to Battery or Platoon in support of all levels of conflict. AFATDS will interoperate with the other Army Battle Command Systems, current and future Army, Navy and Air Force Command and Control weapon systems, and the German, French, British, and Italian fire support systems. The system is composed of common hardware/software employed in varying configurations at different operational facilities (or nodes) and unique system software interconnected by tactical communications in the form of a software-driven, automated network. The system uses non-developmental, rugged common hardware/software, including the Windows Laptop Computer, Unix Laptop Computer (ULC), Compact Computer Unit (CCU), Notebook Computer Unit (NCU) as well as vehicle installation kits (IKs). The total force will be fielded a Windows based platform by fiscal year 2013. [https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.3 Battlefield Air Operations Kit (BAO Kit)

The BAO Kit comprises a communications device capable of net-centric operation; human input/output devices that allow hands-free, heads-up operation while human sensory organs remain protected and situational capability is retained; a computing device that uses an off-the-shelf operating system which is loaded with Special Tactics applications that allow Integrated Targeting Device (ITD) and Battlefield Air Targeting Camera Autonomous Micro Air Vehicle (BATMAV) sensor output to be received, the sensors' field of view to be controlled, sensor data to be analyzed, and messages to be prepared in proper format; along with a power generation and management system. The applications within the BAO Kit software suite focus on transmitting, receiving, and processing Cursor on Target (CoT) messages. The CoT leverages Extensible Markup Language (XML) technology and defines a common, terse yet extensible message format that communicates 'What, When, Where' information. The CoT comprises a base Event schema, referred to as the CoT 'core' schema, and provides a place for subschema extension. The BAO Kit implements the Event core schema, 9 of the 10 operational sub schemas registered on the Department of Defense (DOD) Metadata Registry (MDR), and 10 additional sub schemas that support system-unique mission requirements.
[https://c2c.jtae.jfcom.mil/Pages/Articles.aspx?ArticleID=97]

E.4 Command Post of the Future (CPOF)

Command Post of the Future is a planning and mapping tool intended for collaboration between multiple echelons in a tactical environment. The CPOF is a commander-centric software environment and an intuitive and easy-to-learn system that supports 2D and 3D visualization. It was specifically developed to enable distributed, collaborative, command and control. CPOF supports deep collaboration at the thought process level that literally allows commanders, subordinates, and key battle staff to see what the commander is thinking. It also supports parallel, synchronous and asynchronous, cross-functional planning and execution; and provides for bi-directional interoperability with Army Battle Command System (ABCS) and other Department of Defense (DoD) systems. [DAU, Command Post of the Future, January 2010, www.dau.mil]

E.5 Distributed Common Ground System-Army (DCGS-A)

The Distributed Common Ground System-Army (DCGS-A) family of systems is an integral component of the Army's net-centric Intelligence, Surveillance, and Reconnaissance (ISR) for the commander, analyst, and shooter. DCGS-A will migrate capabilities of disparate ISR systems into a joint common and interoperable, multi-intelligence architecture to improve the ground commander's ability to react within the enemy's decision cycle. DCGS-A software/hardware will be used throughout the Army and joint environment, and will task, process, exploit, and disseminate army, joint, national, and coalition ISR sensor data and information in support of Future Force and Joint Task Force operations.
[https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.6 Distributed Common Ground System (DCGS-AF)

The Air Force Distributed Common Ground System, or AF DCGS, weapon system is the service's premier globally networked intelligence, surveillance and reconnaissance weapon system. The DCGS produces intelligence information collected by the U-2, RQ-4 Global Hawk, MQ-9 Reaper and MQ-1 Predator. The AF DCGS is currently composed of 45 geographically separated, networked sites. The distributed ground and mission sites are a mixture of active-duty, Air National Guard and Air Force Reserve units working as an integrated combat capability. [http://www.af.mil/information/factsheets/factsheet.asp?id=15433]

E.7 Global Command and Control System-Joint (GCCS-J)

GCCS-J is a Command, Control, Communications, Computer, and Intelligence (C4I) system, consisting of hardware, software, procedures, standards, and interfaces to provide worldwide connectivity. The system uses the Defense Information Systems Network (DISN) and must work over tactical communication systems to ensure connectivity with deployed forces in the tactical environment. GCCS-J employs an open system client/server architecture that allows a diverse group of commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) software packages to operate at any GCCS-J location. [http://www.disa.mil/gccs-j/]

E.8 Internet Relay Chat (IRC)

Internet Relay Chat (IRC) is a set of open protocols that enables near-real-time communication in chat room forums, also called channels. Built on a client/server model, IRC consists of various separate networks (or "nets") of IRC servers (machines that share the same user

database, status information, and channels). The networked servers establish a server-to-server link, which enables users to log in to multiple IRC servers and rooms (channels) with the same account information. [https://c2c.jtae.jfcom.mil/Pages/Articles.aspx?ArticleID=231]

E.9 Joint Automated Deep Operations Coordination System (JADOCS)

JADOCS is a mission management tool providing horizontal and vertical integration across battlefield functional areas. JADOCS is a distributed system supporting any number of workstations that are typically located at multiple command and control and fire support operation facilities. This enables JADOCS to provide horizontal coordination of tactical and functional information within each echelon, as well as vertical coordination with higher and subordinate headquarters. [https://us.jfcom.mil/sites/JSIC/JSIC Reports/FY 2005/JADOCS.doc]

E.10 Joint Targeting Toolbox (JTT)

JTT-B is a stand-alone system that consists of a JTT receive-only radio terminal and a laptop computer. It displays the data received from the Integrated Broadcast system received by the JTT terminal. [https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.11 Maneuver Control System (MCS)

Maneuver Control System (MCS) 6.4 serves as a mission critical C2 system that allows Commanders and staffs to visualize the battle space and synchronize the elements of combat power for successful execution of combat operations. MCS includes battle staff tools and maneuver functional capabilities including Chemical, Biological, Radiological, and Nuclear (CBRN) tools and Engineering Tools for Combat and Construction Engineers. MCS 6.4 is a component of capability developed and fielded by Product Manager (Pym) Tactical Battle Command (TBC) in support of the overall program mission to provide the tactical core environment and common services baseline for executive decision making capabilities, maneuver functional and battle staff tools, and enterprise services. Maneuver Control System (MCS) is designed to interoperate with nations participating in the Multilateral Interoperability Program (MIP) which consists of North Atlantic Treaty Organization (NATO), American, British, Canadian, and Australian (ABCA) and Partners for Peace nations. [https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.12 Radio (HF)

High frequency (HF) radio frequencies are between 3 and 30 MHz; also known as the decameter band or decameter wave as the wavelengths range from one to ten decameters. Frequencies immediately below HF are denoted medium frequency (MF), and the next higher frequencies are known as Very high frequency (VHF). [http://en.wikipedia.org/wiki/High_frequency]

E.13 Radio (link 16)

Link 16 is a military tactical data exchange network created and used by the United States and adopted by some of its Allies and by NATO. Its specification is part of the family of Tactical Data Links. With Link 16, military aircraft as well as ships and ground forces may exchange their tactical picture in near-real time. Link 16 also supports the exchange of text messages, imagery data and provides two channels of digital voice (2.4 Kbit/s and/or 16 Kbit/s in any combination). Link 16 is a TDMA-based secure, jam-resistant high-speed digital data link which

operates in the radio frequency band 960–1,215 MHz, allocated in line with the ITU Radio Regulations to the *aeronautical radio navigation* service and to the *radio navigation satellite* service. This frequency range limits the exchange of information to users within line-of-sight of one another, although emerging technologies provide the means to pass Link 16 data over long-haul protocols such as TCP/IP and UHF SATCOM. **[http://en.wikipedia.org/wiki/Link_16]**

E.14 Radio (UHF)

Ultra High Frequency (UHF) designates the ITU Radio frequency range of electromagnetic waves between 300 MHz and 3,000 MHz, also known as the decimeter band or decimeter wave as the wavelengths range from one to ten decimeters (10 cm to 1 meter). Radio waves with frequencies above the UHF band fall into the SHF (super high frequency) and EHF (extremely high frequency) bands, all of which fall into the microwave frequency range. Lower frequency signals fall into the VHF (very high frequency) or lower bands. The main advantage of UHF transmission is the physically short wave that is produced by the high frequency. The size of transmission and reception antennas is related to the size of the radio wave. The UHF antenna is stubby and short. Smaller and less conspicuous antennas can be used with higher frequency bands. [http://en.wikipedia.org/wiki/Ultra_high_frequency]

E.15 Radio (VHF)

VHF radio refers to several communications services in the VHF frequency range, (30MHz – 300MHx) including: Air band aircraft radio, Amateur radio in the 6, 2 and 1-1/4 meter bands, FM radio broadcasts and Marine VHF radio. [http://en.wikipedia.org/wiki/VHF_radio]

E.16 Secret Internet Protocol Router (SIPR)

The worldwide SECRET-level packet switch network that uses high-speed internet protocol routers and high-capacity Defense Information Systems Network circuitry. See also Defense Information Systems Network. [http://www.dtic.mil/doctrine/dod_dictionary]

E.17 Secure Voice

Secure voice (alternatively secure speech) is a term in cryptography for the encryption of voice communication over a range of communication types such as radio, telephone or IP. [http://en.wikipedia.org/wiki/Secure_voice]

E.18 Tactical Air Control Party- Close Air Support System (TACP-CASS)

1. The TACP CAS system provides machine-to-machine digital communications (position reports, text and targeting messages) distributed to all TACP members across the battlespace. The TACP CAS system is digitally tied to Battle Management systems such as FBCB2, AFATDS and ADOCS, and actively interacts with the Air Support Operations Center (ASOC) and the Combined Air Operations Center (CAOC). This digital integration of the TACP CAS system offers the edge user the same level of situational awareness available in the CAOC, such as Link 16, Army Tactical Internet and Joint Blue Force Situational Awareness (JBFSA) back to the dismounted warfighter.
[www.rockwellcollins.com/.../Rosetta%20Joint%20Fires%20data%20sheet.aspx]

E.19 Tactical Airspace Integration System (TAIS)

Tactical command and control system that will provide automated Army Airspace Command and Control (A2C2), improved air traffic services, airspace management services during military operations other than war, effective battlespace synchronization and intel.
[https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.20 Tactical Data Link (TADL)

Tactical data links involve transmissions of bit-oriented digital information which are exchanged via data links known as Tactical Digital Information Links (TADIL). The TADIL Program applies to all bit oriented message formats used in support of joint and combined operations for Joint Interoperability of Tactical Command and Control Systems (JINTACCS). The TADIL Program facilitates information exchange between the United States and Allied commands.
[http://www.fas.org/irp/program/disseminate/tadil.htm]

E.21 Theater Battle Management Core System (TBMCS)

TBMCS provides target nomination via United States Message Text Format (USMTF) messages from Global Command and Control-Joint (GCCS-J) to TBMCS. The Air Tasking Order (ATO) and Airspace Coordination Order (ACO) are provided, via USMTF messages, from TBMCS to Global Command and Control System-Joint (GCCS-J). The interface can also provide Common Operational Picture (COP) data. GCCS-J interfaces with TBMCS at the Force level. The interface is via an Institute of Electrical and Electronic Engineers (IEEE) 802.3 Local Area Network (LAN) connection between the collocated ACO and the GCCS-J System. [Source: JITC http://jitc.fhu.disa.mil.gccsiop]

E.22 Virtual Distributed Laboratory (VDL)

The Virtual Distributed Laboratory (VDL) is a collection of tools and services to facilitate information sharing and collaboration across the entire DOD Automatic Target Recognition (ATR), Sensor Fusion and C4ISR RDT&E communities. The goal is to provide a secure, shared virtual workspace for this entire community. Primarily a web based portal, the system includes web servers, file services, compute servers, electronic mail and instant messaging. The VDL system embodies an open architecture designed to accommodate the rapid introduction into the system of advanced information processing resources.
[https://ditpr.dod.mil/dodcio/DITPR/MenuDITPR.cfm]

E.23 Pocket Sized forward Entry Device (PFED)

PFED/LFED FOS - Pocket-sized Forward Entry Device (PFED) is the forward entry device used by forward observers and fire support teams to transmit and receive fire support messages over standard military line of sight, HF and SATCOM radios. Combined with the integrated Precision Fire Imagery application, PFED can generate a coordinate sufficient to target precision munitions. PFED also incorporates the latest changes to support the Digitally Aided Close Air Support effort. (PFED PEO; http://peoc3t.army.mil/mc/docs/FSC_Brochure.pdf)

E.24 Lightweight Forward Entry Device (LFED)

Lightweight Forward Entry Device (LFED) hardware hosts the Forward Observer System (FOS) software which enables forward observers and fire support teams to plan, control and execute fire support operations at maneuver platoon, company, battalion and brigade levels. With its integration of applications from the Digital Prescision Strike Suite, LFED supports targeting the latest precision munitions. LFED supports the latest changes in Digitally Aided Close Air Support. (PFED PEO; http://peoc3t.army.mil/mc/docs/FSC_Brochure.pdf)

E.25 Forward Observer Device (FOS)

A U.S. Army automated fire support system used by Commanders, Fire Support Coordinators, Fire Support Officers, Fire Support Team Chiefs, and Forward Observers located at or employed remotely from fire support agencies at all echelons. FOS provides Fires and Effects integrators with an automated decision-making, planning, and execution capability which ensure seamless integration of synchronized and highly accurate fires into the maneuver commander's scheme of maneuver. (USJFCOM JBMC2 JCAS JMT DTA Final Report – 13 February 2008)

E.26 Target Location, Designation, and Hand-Off System (TLDHS)

TLDHS is a modular, man-portable equipment suite that provides the ability to quickly acquire targets in day, night, and near-all-weather visibility conditions.
(www.mctssa.usmc.mil/.../TLDHS%20Fact%20Sheet%20Aug%2008.pdf)

E.27 Air and Missile Defense Workstation (AMDWS)

AMDWS supports the Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM) air defense system by providing an automated defense planning capability for deployed units. The Galaxy program (AMDWS derivative) has demonstrated the ability to support Homeland Defense Initiatives through the integration and coordination of civilian and military air traffic control data. The AMDPCS provides the Army Battle Command System (ABCS) architecture and the Army AMD Task Force (AMDTF) with Joint BM/C4I capability and the Army component of interoperable Joint Theater Air and Missile Defense (JTAMD) BM/C4I. (SME Provided Definition)