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JFS ESC AP MOA 2004-01
Joint Terminal Attack Controller (JTAC) (Ground)
1 Dec 2017

MEMORANDUM OF AGREEMENT (MOA)

Between

Director, Joint Staff

and

U.S. Army Deputy Chief of Staff, G-3/5/7

U.S. Air Force Deputy Chief of Staff for Operations, Plans, and Requirements

U.S. Marine Corps Deputy Commandant for Plans, Policies and Operations

U.S. Navy Deputy Chief of Naval Operations for Operations, Plans, and Strategy

U.S. Special Operations Command Director of Operations

Chief of Air Force, Royal Australian Air Force

Land Component Commander, Belgian Defence

Commander, Canadian Army Doctrine and Training Centre

Commander Air Force, Czech Republic

Deputy Chief of Staff/Chief Capabilities Division Air Command Denmark

Commander Air Force, Republic of Estonia

Chief of Operations, Finnish Defence Forces

Chief, Hungarian Defence Staff Force Planning Directorate

Commander, Royal Jordanian Air Force

Vice Commander, Air Force Operations Command, Republic of Korea Air Force

Commander, Special Warfare Command, Republic of Korea

Assistant Commandant, Marine Corps, Republic of Korea

Chief of Defense, Republic of Latvia

Director General for Capabilities and Armaments, Republic of Lithuania

Minister of Defence, Kingdom of the Netherlands

Chief of Army, New Zealand Army

Commander, Norwegian Army Land Warfare Center

Minister of National Defence of the Republic of Poland

Commander, Royal Saudi Air Force

Ministry of Defence of the Slovak Republic

Commander, Slovenian Armed Forces

Director of Armed Forces Training and Development, Swedish Armed Forces

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Commander, United Arab Emirates Air Force and Air Defence
Director Joint Warfare, United Kingdom Joint Forces Command

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Summary of Changes

- Change 1 – Added ROK Marine Signature
- Change 2 – Added MOD of the Slovak Republic and Air Command Denmark Signatures

**JOINT FIRE SUPPORT EXECUTIVE STEERING COMMITTEE (JFS ESC)
ACTION PLAN MEMORANDUM OF AGREEMENT 2004-01
JOINT TERMINAL ATTACK CONTROLLER (JTAC) (GROUND)**

1. Purpose

Identify minimum training and performance standards for JTAC certification and qualification, address 2003 United States General Accounting Office (GAO) recommendations and 2007 Bi-Strategic Analysis and Lessons Learned (BALL) report to prepare terminal attack controllers to operate in a joint/multinational environment. This Memorandum of Agreement (MOA) also provides for the participation of Partner Nations in order to standardize JTAC certification and qualification requirements with multinational military forces.

2. Background

JTACs are a forward element of the theater air-ground system (TAGS) and must be organized, trained, and equipped to operate within a joint/multinational force construct. A JTAC is defined as, "A qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in close air support and other offensive air operations." (Joint Publication (JP) 1-02, *DOD Dictionary of Military and Associated Terms*). Contents of this MOA – specifically the Joint Mission Task List (JMTL) and training standards are based on JP 3-09.3, CAS. A qualified JTAC will be recognized across DOD and participating nations as capable and authorized to perform terminal attack control (TAC).

2.1. The Joint Fire Support (JFS) Executive Steering Committee (ESC), chartered by the Chairman Joint Chiefs of Staff Instruction (CJCSI) 5127.01 JFS ESC Governance and Management, nominates JFS ESC Action Plan tasks based on combatant command, Service, agency, and participating Partner Nation inputs.

2.2. Joint Close Air Support Issue 1, Joint Terminal Attack Controller (JTAC) of the JFS ESC Action Plan contains actions designed to standardize JTAC training throughout the Services, USSOCOM, and other DOD agencies. Issue 4, Partner Nation JTAC and Forward Air Controllers (Airborne) (FAC[A]) Training and Standardization extends this standardization to Partner Nations. Completion of these actions will improve joint/multinational force interoperability and reduce the potential for mishaps and fratricides. The JFS ESC Joint Close Air Support (JCAS) Working Group developed recommendations for JTAC certification and qualification requirements, procedures and associated JMTL. The JFS ESC endorsed these recommendations to produce the requirements identified in this Memorandum of Agreement.

2.3. Under United States domestic law, training, organizing and equipping personnel to fulfill JTAC duties is a responsibility of each Military Department or Service component within the Department of Defense. In fulfillment of its Title 10 responsibility to train, organize and equip the forces, each Military Department and Service component independently and voluntarily determine whether it is in their Service's best interests to establish, meet or exceed the minimum standards for JTAC training and certification identified in this MOA. This MOA does not create any legally binding obligations for any signatory under international law. US/DOD and participating Partner Nation may unilaterally withdraw from this MOA as specified in paragraphs 6 and 7. Further, this MOA does not restrict in any way a Geographic Combatant Commander (GCC) from determining operational JTAC qualifications unique to the combatant commander's area of responsibility which exceed the standards identified in this MOA. If a

GCC elects to specify JTAC qualifications that exceed the standards specified in this MOA it is incumbent upon the Services to meet the GCC's requirement.

3. Scope

This MOA aims to standardize JTAC training by defining the certification and qualification process. It applies to JTACs conducting close air support (CAS). It does not address FAC(A)s or individuals performing terminal guidance operations (TGO), regardless of the location of the terminal guidance operator. FAC(A) certification and qualification requirements are addressed in a separate MOA. Appendix A, Enclosure 1, lists example CAS controls derived from JMTL Duty Area 03 (CAS Execution) for training; Enclosure 2, is a standard form to be used as the basis for JTAC log sheet; Enclosure 3, is a standard form that may be used to document 18-month evaluations; Enclosure 4/5, are JTAC Instructor waiver examples; and Enclosure 6, is a JTAC Student academic completion letter example. Appendix B, Enclosure 1, outlines the standardization process; Enclosure 2, is the standardization team checklist; Enclosure 3, is JTAC simulation accreditation process; Enclosure 4, is JTAC simulation system accreditation self-assessment checklist; Enclosure 5, is JFS ESC previously accredited JTAC simulation systems; Enclosure 6, is a sample final report format to be used by the JTAC Standardization Team; and Enclosure 7, is unit checklist for JTAC standardization team visits. Appendix C, Enclosure 1, is abbreviations and acronyms, and Enclosure 2, is terms and definitions.

4. Responsibilities

Signatories who train JTACs will ensure formal schools and training organizations comply with the certification requirements set forth in this MOA, that JTAC training programs comply with the qualification process as outlined in this MOA, and are in accordance with applicable national laws, regulations, and policies. Additionally, Signatories will ensure JTAC trainees and JTACs are capable of performing all tasks identified in the JMTL during their certification and maintain identified qualification requirements.

4.1. Being a signatory of the JTAC MOA does not guarantee or obligate access to services, schoolhouse quotas, training assets, ranges, live fire training or the commitment of resources. All activities conducted in furtherance of the JTAC MOA are subject to the availability of funds. Signatories specifically agree that the JTAC MOA is non-binding in law.

4.2. Language Requirements. English is the language to be used; therefore, JTACs require a professional level of proficiency in the English language. Language proficiency must meet standards as defined in NATO STANAG 6001, Language Proficiency Levels. Level 3 is required in the following areas: Listening, Speaking, and Reading; Level 2 is required in Writing (LSRW of 3 3 3 2). It is a national responsibility to ensure JTACs meet this standard.

NOTE: If the English Comprehension Level (ECL) Test is used as part of the assessment, a test score of 85 can be considered equivalent to Language Proficiency Levels 3 for listening and reading. All four areas (LSRW) must be tested.

5. Definitions, Accreditation, Certification, Qualification and JMTL

5.1. JTAC Training Definitions. For purposes of this JTAC MOA, the following JTAC training definitions apply:

accredited simulation system – A live or virtual environment which has been assessed and accredited by the JFS ESC for its capability to facilitate the minimum terminal attack control requirements contained in this MOA. An accredited simulation system can be used to accomplish controls identified in para 5.3.3.1. JTAC Certification Process, 5.3.4. JTAC Qualification Process and the tasks contained in the JTAC JMTL, 5.4.

certified – Individuals who satisfactorily complete the appropriate Service, USSOCOM, or Partner Nation academic, practical, live, dry, and simulated control training requirements per directive or signed regulation and complete an initial JTAC evaluation may be granted JTAC certification. A JTAC trainee who is certified is also initially qualified, unless otherwise specified by national regulations and/or directives. *Certification is a National responsibility.*

condition – Describes the circumstances under which the task will be performed. The condition identifies when, and where the individual performs the task and what materials, personnel, and equipment the individual must have to perform the task.

control – Consists of at least one simulated, dry, or live aircraft (fixed/rotary wing) attacking a surface target. The control should follow the CAS execution template in accordance with (IAW) JP 3-09.3/ATP 3.3.2.1. An actual weapons release is not required. No more than two controls (lead aircraft and wingman) can be counted per CAS briefing per target. *A JTAC Instructor (see para 5.3.1.) instructing a trainee may count the control at the discretion of the signatory. A control which involves both a qualified JTAC and a qualified FAC(A) may be counted by both at the discretion of the signatory.*

dry terminal attack control – Control of an actual aircraft where air-to-ground munitions are not present or release is not intended, also known as “Dry CAS” (referred to as “Dry” throughout this document).

live terminal attack control – Control of an actual aircraft where air-to-ground munitions (live, inert, or training ordnance) are present and release is intended, also known as “Live CAS” (referred to as “Live” throughout this document). *Actual munition release must take place to count towards live control requirements.*

phased program – Certification requirements are accomplished by successful completion of an accredited JTAC schoolhouse academic curriculum, meeting minimum control requirements and receiving an initial JTAC evaluation (see para 5.3.3.1.) under the supervision of a JTAC Evaluator (see para 5.3.2.). The process used must be accredited by the JFS ESC, and be in accordance with Service, SOCOM, or Partner Nation Regulation/manual.

practical exercise – A training event (e.g. sand table, table-top or field exercise) which allows trainees to practice the skills associated with correct use of equipment, tactics, techniques and procedures. These events may include TAC but cannot be used to fulfill certification or qualification requirements, unless accredited to do so (see Accredited Simulation System). Also called **PE**.

proficient – Trainee is able to accomplish all items in the tasks correctly and efficiently without assistance.

qualified – A certified JTAC who completes the established minimum qualification training and evaluation requirements.

remote observer – Any individual who is integral to the success of the CAS attack based on the contributor's ability to provide target location, target marking, terminal guidance or BDA. (When possible this should be a Joint Fires Observer (JFO)).

simulated terminal attack control – Control of a simulated aircraft conducting CAS in a live or virtual environment.

simulation – The use of a live or virtual environment designed to take the place of weapon systems or aircraft in order to train to a specific task(s).

standard – Criteria for how well a task or learning objective must be performed. The standard specifies how well, completely, or accurately a process must be performed or product produced.

task – A clearly defined and measurable activity accomplished by individuals and organizations. It must be specific; usually has a definite beginning and ending; may support or be supported by other tasks; generally is performed in a relatively short time (however, there may be no time limit or there may be a specific time limit); and it must be observable and measurable. The task title must contain an action verb and object and may contain a qualifier.

trainee – Individual identified to attend the appropriate Service, USSOCOM, or Partner Nation JTAC training program with the intent of being certified as a JTAC.

5.2. Accreditation

The JFS ESC will accredit JTAC training programs with a signed regulation/manual which outlines policies and personnel responsibilities for certification and qualification training, and demonstrate compliance with academic, practical, simulated, dry and live terminal attack control training requirements IAW the JTAC MOA. Accreditation/Program review is found in Appendix B, Enclosure 1. For Signatories without a schoolhouse, it is recognized that their certified JTACs have successfully completed an accredited JTAC schoolhouse or an accredited phased program. Signatories must maintain a JTAC management program in compliance with their specified regulation/manual outlining policies and personnel responsibilities for certification and qualification training of JTACs, and the program meets JTAC MOA requirements.

5.2.1. Accredited JTAC Training Programs. The following JTAC training programs are currently recognized by the JFS ESC as being in compliance with JTAC MOA requirements:

- US Marine Corps (USMC)
- US Air Force (USAF)
- US Navy (USN)
- US Special Operations Command (USSOCOM)
- Australian Defense Force (ADF)
- Belgian Armed Forces
- Canadian Armed Forces (CAF)
- Armed Forces of the Czech Republic
- Finnish Defense Forces
- Hungarian Defense Force

- Republic of Korea Air Force (ROKAF)
- Latvian Armed Forces
- Armed Forces of the Netherlands
- New Zealand Defense Force
- Norwegian Armed Forces
- Armed Forces of the Republic of Poland
- Slovenian Armed Forces
- Swedish Armed Forces
- Armed Forces of the United Arab Emirates
- Armed Forces of the United Kingdom (UK)

5.2.2. Accredited JTAC Schoolhouses. The following JTAC training courses are recognized by the JFS ESC as being in compliance with JTAC MOA academic curriculum requirements:

- USMC Expeditionary Warfare Training Group Atlantic TACP Course.
- USMC Expeditionary Warfare Training Group Pacific TACP Course.
- USAF 6th Combat Training Squadron JTAC Qualification Course.
- US Air Forces in Europe (USAFE) Air Ground Operations School JTAC Qualification Course (JTACQC).
- Air National Guard (ANG) JTAC Qualification Course (JTACQC).
- USN Naval Aviation Warfighting Development Center (NAWDC) Joint Terminal Attack Controller Course (JTACC).
- Special Operations Terminal Attack Controller Course (SOTACC).
- Royal Australian Air Force (RAAF) 4th Squadron, Joint Terminal Attack Controller Course (JTACC).
- Canadian Armed Forces (CAF), Royal Canadian Artillery School, Joint Terminal Attack Controller Course (JTACC).
- The Netherlands Air Ground Operations School Joint terminal Attack Controller Qualification Course (JTACQC).
- Norwegian Air Ground Operations Section (NORAGOS) Joint Terminal Attack Control Basic Course.
- Polish Tactical Air Control Party Training Center (TACP TC) Joint Terminal Attack Controller Initial Qualification Course (JTACIQC).
- Republic of Korea Air Force (ROKAF) Air Ground Operations School (AGOS). Joint Terminal Attack Controller Qualification Course (JTACQC).
- Swedish Forward Air Controller Training and Evaluation Cell (FACTEC) Joint Terminal Attack Controller Basic Course.

- Slovenian Armed Forces (SAF) Air Ground Operations School (AGOS) Joint Terminal Attack Controller (JTAC) Certification Course.
- United Arab Emirates (UAE) Presidential Guard Institute Joint Terminal Attack Controller Qualification Course (JTACQC).
- United Kingdom Joint Forward Air Control Training and Standardisation Unit (JFACTSU) Joint Terminal Attack Controller Certification Course.

NOTE: The JFS ESC recognizes NATO-accredited JTAC Programs/Schoolhouses. When utilizing a NATO-accredited Program/Schoolhouse and/or qualified personnel to support JTAC certification/qualification training, it is the responsibility of the certifying nation to ensure training is conducted in accordance with the standards of this MOA.

5.2.3. Partner Nation Accreditation Process. The following conditions must be met prior to starting the accreditation process for Partner Nations:

- Agreement supporting the requirement (NATO/Bilateral).
- An official request for accreditation which is approved by the JFS ESC.
- Partner Nation is a JTAC MOA signatory.
- Partner Nation has a Regulation/manual which outlines policies and personnel responsibilities for certification and qualification training of JTACs.
- One of the following: Partner Nation has an operating JTAC schoolhouse, member of multi-national schoolhouse, or has access to and successfully completes an accredited JTAC Schoolhouse (see para 5.2.2.).

5.3. JTAC Certification and Qualification

This section provides minimum requirements for personnel responsible for training JTACs and the minimum requirements for initial (certification) and recurring (qualification) training to meet combatant commander needs.

5.3.1. JTAC Instructors and Evaluators

5.3.1.1. JTAC Instructors. Qualified JTAC instructors (JTAC-I) must instruct JTAC trainees conducting simulated, dry, or live terminal attack control. Subject matter experts may instruct JTAC trainees on course topics which support CAS operations, but are not directly associated with controlling of aircraft (examples: fire support coordination measures, airspace management, and theater air-ground system). To be designated as a JTAC-I, an individual must:

- Possess a minimum of one year of experience as a qualified JTAC (or one year as a FAC(A) at the discretion of the signatory).
- Maintain JTAC qualification IAW signatory regulation/manual.
- Complete a JTAC instructor training program, IAW signatory regulation. (JTAC-I upgrade programs will train instructors to accurately assess all JTAC Evaluation Criteria, AREAs 1 – 25, on pages 47 – 51).
- Be designated a JTAC-I in writing by approved authority IAW signatory regulation/manual.

5.3.1.1.1. JTAC-Is shall be Active-[or Regular] Component, Guard, Reserve, DOD Civilian, Civilian Contractor or Partner Nation equivalent. During initial JTAC certification or requalification, when instructing JTAC trainees or unqualified JTACs in terminal attack control, a JTAC-I will be physically located with the individual being trained and be able to take control, if necessary.

5.3.1.1.2. JTAC-I Waiver Authority. JTAC instructor waiver authority will be in accordance with Service, USSOCOM, or Partner Nation directives, but should reside no lower than O-6/OF-5 (see examples in Appendix A, Enclosure 4 and 5).

5.3.1.1.3. Contractor JTAC-I. At the discretion of the signatory, contractors may serve as JTAC-Is with the following criteria:

- Previously qualified as JTAC-I or certified and qualified JTAC (IAW the JTAC MOA or NATO ATP 3.3.2.2.) while serving as a member of the Armed Forces. Previously qualified JTACs require upgrade training in accordance with Service, USSOCOM, or Partner Nation directives under the supervision of an Active, Guard, Reserve, or DOD Civilian JTAC-I.
- Meet certification and maintain qualification requirements in accordance with this MOA and their assigned Service/National regulation/directives.
- Restricted to operations in a training environment only.
- Prohibited from performing JTAC duties in support of contingency operations.
- Recurring evaluations will be administrated by a JTAC Evaluator (see para 5.3.2.) designated from Active, Guard, Reserve, or DOD Civilian.

5.3.1.2. JTAC Evaluator. A qualified JTAC Evaluator (JTAC-E) is a JTAC that has been designated to conduct initial and recurring 18-month JTAC evaluations. To be designated as a JTAC-E, an individual must:

- Possess a minimum of one year of experience as a qualified JTAC.
- Maintain JTAC qualification IAW signatory regulation/manual.
- Complete an evaluator upgrade program IAW signatory regulation (Evaluator upgrade programs will train evaluators to accurately assess all JTAC, JTAC-I, and JTAC-E Evaluation Criteria, AREAs 1 – 27.8, on pages 47 – 53).
- Be designated a JTAC-E in writing by approved authority IAW signatory regulation/manual.

5.3.1.3. JTAC-E Waiver Authority. JTAC evaluator waiver authority will be in accordance with Service, USSOCOM, or Partner Nation directives, but should reside no lower than O-6/OF-5 (see examples in Appendix A, Enclosure 4 and 5).

5.3.2. JTAC-I/E Co-designation. JTAC-Is may be co-designated as instructor and evaluator (I/E) by the commander per the signatory regulation. In accordance with paragraph 5.3.1.2, Contractor JTAC instructors may be designated as Evaluators at the discretion of the signatory; however, contractors may NOT conduct evaluations on other contractor JTAC-Is.

5.3.3. JTAC-I/E Evaluations. JTAC I/Es are to be evaluated prior to designation and on a recurring basis, not to exceed 18 months between evaluations.

5.3.3.1. JTAC-I Evaluations at a minimum will assess JTAC and JTAC-I Evaluation Criteria, AREAs 1 – 25 and 26 on pages 52 – 57.

5.3.3.2. JTAC-E Evaluations will assess all JTAC, JTAC-I, and JTAC-E Evaluation Criteria, AREAs 1 – 25, 26, and 27, on pages 52 – 58.

5.3.3.3. JTAC, JTAC-I, and JTAC-E evaluations may be accomplished individually or combined into a single event, however all applicable areas (JTAC, JTAC-I, JTAC-E) Evaluation Criteria AREAs 1 – 27.8, on pages 52 – 58 must be assessed on a recurring basis, not to exceed 18 months between evaluations.

5.3.4. JTAC Certification Training

5.3.4.1. JTAC Certification Process. Prior to commencing JTAC training, it is recommended a trainee complete a pre-screening process to assist in identifying appropriate candidates to enter a JTAC training program. Candidates who have operational or mission ready fire support exposure, or aircrew members with at least one year of operational flying experience have an increased rate of successful course completion. JTAC Trainees will receive authorized training through an accredited JTAC training program listed in paragraph 5.2.2. Services, USSOCOM, and Partner Nations will certify JTACs in accordance with their respective regulations and directives, as aligned with established JTAC guidelines, using the approved JMTL. To be certified as a JTAC, the individual must successfully:

- Complete an accredited JTAC schoolhouse academics
- Demonstrate proficiency conducting the execution tasks under the supervision of a qualified JTAC-I
- Complete an initial JTAC evaluation by a designated evaluator (see examples in Appendix A, Enclosure 1 and 3)
- Complete the following JMTL tasks identified in Table 5.3.4.1. during the conduct of a terminal attack control:

Table 5.3.4.1. Minimum JTAC Certification Controls

Terminal Attack Control	Minimum Required	Condition
Type 1	2	Live or Dry
Type 2	2	Live, Dry or Simulated
Type 3	1	Live, Dry or Simulated
BOT	2	Live or Dry
BOC	2	Live, Dry or Simulated
FW CAS Aircraft	2	Live or Dry
RW CAS Aircraft	1	Live, Dry or Simulated
Laser control ¹	1	Live or Dry
IR Pointer ²	1	Live or Dry
Remote Observer	1	Live, Dry or Simulated
Video Downlink (VDL)	1	Live, Dry or Simulated
Live	2	Live
9-line attack brief ³	2	Live or Dry
SEAD	1	Live, Dry or Simulated
Urban	1	Live, Dry or Simulated
With FAC(A)	1	Live, Dry or Simulated
Day	2	Live or Dry
Night	2	Live or Dry
¹ Ground laser shall be utilized to mark/designate a target for an aircraft (laser spot tracker recommended). Intent is to utilize laser equipment and laser terminology. ² A ground IR pointer shall be utilized to mark a target for a NVG equipped aircrew. Intent is to utilize IR equipment and IR terminology. ³ Must use a complete nine line attack brief - IP to target attack (Lines 1-3 will not be abbreviated, not applicable (N/A) or from the overhead).		

NOTE: Services, USSOCOM, and Partner Nations without NVG equipped aircrew, IR Pointer, Laser Target Designator, FAC(A), or RW CAS Aircraft are exempt until such fielding occurs. This exemption is not intended to be a permanent solution and Services, USSOCOM, and Partner Nations shall procure equipment to support the required capability.

5.3.4.2. JTAC Schoolhouse Documentation. JTAC Schoolhouses will provide course completion documentation. If all required training was not accomplished, the JTAC Schoolhouse will provide a deficiency letter listing the specific training that was not accomplished to include the reason why the training was not accomplished (e.g. no live or dry controls were completed due to weather). See example in Appendix A, Enclosures 6.

5.3.5. JTAC Qualification Training. Qualification training, commonly referred to as continuation training or currency, is training required after certification to maintain proficiency and develop mission specific skills.

5.3.5.1. JTAC Qualification Process. Once certified, a JTAC will remain qualified, provided:

5.3.5.1.1. JMTL knowledge and task proficiency is maintained IAW signatory regulation/manual.

5.3.5.1.2. Evaluation requirements are satisfactorily accomplished.

5.3.5.1.3. Tasks identified in Table 5.3.5.2. are successfully completed during the conduct of a terminal attack control and during an established six-month period unless noted.

5.3.5.2. Minimum JTAC Qualification Controls. Table 5.3.5.2. provides the minimum terminal attack control tasks and conditions that are required to be accomplished every 6 months to maintain JTAC qualification.

Table 5.3.5.2. Minimum JTAC Qualification Controls

Terminal Attack Control	Minimum Required	Condition
Type 1	1	Live or Dry and 1 can be Simulated Annually
Type 2	1	Live, Dry or Simulated
Type 3	1	Live, Dry or Simulated
BOT	1	Live or Dry
BOC	1	Live, Dry or Simulated
FW CAS Aircraft	2	Live or Dry and 1 can be Simulated per 6 Mos
RW CAS Aircraft	1	Live, Dry or Simulated
Laser control ¹	1	Live or Dry and 1 can be Simulated Annually
IR Pointer ²	1	Live or Dry and 1 can be Simulated Annually
Remote Observer	1	Live, Dry or Simulated
Video Downlink (VDL)	1	Live, Dry or Simulated
Live	1	Live
9-line attack brief ³	1	Live or Dry
Day	1	Live or Dry
Night ⁴	1	Live or Dry and 1 can be Simulated Annually
¹ Ground laser shall be utilized to mark/designate a target for an aircraft (laser spot tracker recommended). Intent is to utilize laser equipment and laser terminology. ² A ground IR pointer shall be utilized to mark a target for a NVG equipped aircrew. Intent is to utilize IR equipment and IR terminology. ³ Must use a complete nine line attack brief - IP to target attack (Lines 1-3 should not be abbreviated, N/A or from the overhead). ⁴ Units deployed to or stationed at extreme latitudes (>49 deg) may waive the night control for qualification until night sorties can be executed.		

NOTE: Services, USSOCOM, and Partner Nations without NVG equipped aircrew, IR Pointer, Laser Target Designator or RW CAS Aircraft are exempt until such fielding occurs. This exemption is not intended to be a permanent solution and Services, USSOCOM, and Partner Nations shall procure equipment to support the required capability.

5.3.5.3. JTACs should accomplish qualification requirements with ground maneuver units, integrating JFOs and FAC(A)s whenever possible. Commanders should establish guidance and set goals aimed at achieving joint interoperability.

5.3.5.4. FAC(A) with JTAC Qualification. A FAC(A) who is also a qualified JTAC may count FAC(A) controls towards JTAC currency at the discretion of the signatory. Services, Socom and Partner Nations should identify this capability in their instruction/regulation.

5.3.6. JTAC Training Simulations

A terminal attack control simulation system(s) should be used to enhance procedural training, mission rehearsal and training of certification and qualification JMTs that either cannot be executed, or are very difficult to execute, using existing equipment, weapon systems or aircraft. Upon request from a JTAC MOA signatory, simulation system(s) and operator(s) will be assessed and accredited by the JFS ESC or their designated representative during scheduled schoolhouse or program accreditation for their capability to facilitate the minimum terminal attack control requirements contained in this MOA. To expedite the simulation system(s) accreditation process, a checklist is provided (Appendix B, Enclosure 4) for the signatory to conduct a self-assessment of the simulation system(s) for compliance with criteria established and approved by the JFS ESC. Based on the results of the self-assessment, the JFS ESC will grant an interim accreditation until the JFS ESC JTAC Standardization Team can verify simulation system(s) capabilities during the next regularly scheduled JTAC program review (see accredited simulation devices in Appendix B, Enclosure 5).

NOTE: Personnel trained using JTAC simulation systems which were granted interim accreditation from self-assessment, but do not meet JFS ESC accreditation criteria during the program/triennial review, will lose JTAC qualification status until retraining on those specific tasks is accomplished.

5.3.7. JTAC Evaluations

Evaluations are the primary tool commanders use to assess the effectiveness of training programs and individual readiness.

5.3.7.1. JTAC Evaluation Requirements. Services, USSOCOM, and Partner Nations will determine their own evaluator and recurring evaluation requirements. However, the interval between evaluations will not exceed 18-months.

5.3.7.2. Evaluations will ensure compliance with JTAC MOA qualification standards and Joint Mission Task List (JMTL), and verify that the JTAC Evaluation Folder (Training Jacket) is up to date. A JTAC will lose qualification and recognition under this MOA if they fail a recurring evaluation or if their evaluation period lapses. Appendix A, Enclosure 3, is an example of a form that may be used as a basis for evaluations.

5.3.7.3. At a minimum, JTAC evaluations will assess performance using JTAC Evaluation Criteria, AREAs 1 – 25, on pages 51 – 55.

5.3.8. JTAC Requalification Process

5.3.8.1. Loss of Qualification. JTACs who fail to comply with qualification requirements IAW para 5.3.5. (e.g. JMTL tasks and currency, or Evaluation) are considered Unqualified. JTACs who fail to successfully complete JMTL Tasks/Table 5.3.5.2. requirements must, under the supervision of a qualified JTAC and IAW Service, USSOCOM, or National directives, complete the number and category (e.g., appropriate night, fixed-wing, ordnance, etc.) of controls they failed to accomplish to regain qualification. Supervision is required only for those events which were not accomplished (e.g. if night was not accomplished; only night control requires supervision). A JTAC who is unqualified (JMTL tasks) for more than six months, but less than 24 months, must complete the JMTs requirements IAW para 5.3.5. (JTAC Qualification Process), under the supervision of a qualified JTAC or JTAC-I. A JTAC who fails to satisfactorily complete an evaluation, will only be authorized to control while under the

supervision of a qualified JTAC. This restriction will remain in place until the unqualified JTAC satisfactorily completes a subsequent re-evaluation conducted by a JTAC-E.

5.3.8.2. Unqualified for 24 Months or Longer. A JTAC who is unqualified for 24 consecutive months must regain qualification by completing a Service, USSOCOM, or Partner Nation approved refresher syllabus, to include successful completion of all JMTL tasks and Table 5.3.5.2. (Minimum JTAC Qualification Controls) under the supervision of a qualified JTAC-I.

5.3.9. Deployment Process. JTACs will deploy qualified IAW para 5.3.5.2, JTAC Qualification Process, without caveats. JTACs deployed in support of combat operations are considered qualified for the duration of the deployment and the 18-month evaluation requirement is waived. All deployed JTACs who do fail to maintain qualification requirements are considered unqualified upon completion of the deployment and must re-qualify IAW this MOA.

5.3.10. JTAC Evaluation Folder (Training Jacket). To document compliance with JTAC certification and qualification standards, an individual JTAC Evaluation Folder (Training Jacket) will be created IAW Service, USSOCOM, or Partner Nation directives and maintained by the individual's assigned command. The JTAC Evaluation Folder (Training Jacket) will be used to record and maintain appropriate JTAC training and evaluation records during each duty assignment and deployment. The JTAC Evaluation Folder (Training Jacket) or an up-to-date copy will accompany the individual JTAC to each duty assignment and deployment location to provide commanders a historical record of the individual's JTAC certification and qualification training and their qualification status. JTAC Evaluation Folders shall be organized using the format listed below. However, the arrangement order of the individual parts may be modified at the discretion of the signatory. A JTAC Evaluation Folder (Training Jacket) is mandatory for all JTACs and will contain the six-part format as depicted in Table 5.3.10. JTAC Evaluation Folder Table of Contents.

Table 5.3.10. JTAC Evaluation Folder Table of Contents

PART I: TABLE OF CONTENTS	
PART II: COMMANDER'S DESIGNATION LETTERS	This section contains a copy of the JTAC's current designation letter.
PART III: CAS LOG	This section contains a record of all controls in legible format and must be in compliance with Appendix A of this document. This section should contain records of all controls performed since initial certification.
PART IV: DOCUMENTATION OF TRAINING	All continuation training and refresher training should be documented in Part IV to include academics and testing.
PART V: DOCUMENTATION OF EVALUATIONS	This section contains documentation of all evaluations conducted since initial certification.
PART VI: JTAC FORMAL SCHOOL DOCUMENTATION	This section contains copies of course completion documentation received from attending a formal course of instruction pertaining to close air support or terminal attack control.

5.3.10.1. Electronic Records

Service, USSOCOM, and Partner Nations are authorized to manage JTAC training and evaluation records using an electronic database. However, the systems must be capable of producing a hard copy of individual JTAC records and contain the information in Parts II – VI as listed above. Service, USSOCOM, and Partner Nations are responsible to provide access or a hard copy of individual JTAC training and evaluation records when verification of individual JTAC qualification is required.

5.3.11. Waiver Authority and Staffing. Waivers which reduce JTAC MOA minimum certification or evaluation requirements will be staffed to JFS ESC for concurrence and results will be provided back to the requester. Waiver authority for management of JTAC qualification will be in accordance with Service, USSOCOM, or Partner Nation directives, but should reside no lower than O-6/OF-5. Deploying JTACs will comply with paragraph 5.3.9. of this document.

5.4. JTAC Joint Mission Task List (JMTL)

The following joint mission tasks have been identified as the minimum tasks required for a JTAC to successfully perform terminal attack control. The JMTL will be the basis for developing a schoolhouse academic training syllabus for JTAC certification and qualification training programs. The JMTL will also be used during assessments of JTAC training programs and schoolhouses by the JTAC standardization team. The Joint Mission Tasks are divided into duty areas for academic application and are listed by task and associated sub-tasks.

5.4.1. Duty Area 01 – CAS Planning

This Duty Area focuses on the minimum classroom academics to be instructed. Each Task and Sub-Task will be covered in the schoolhouse/unit lesson plan. Lesson plan learning objectives should also be based on the Task and Sub-task and be a source for test questions. To re-enforce the learning objectives, and to assess student comprehension, practical exercises, quizzes and examinations will be conducted.

Task	Defined Task	Condition	Standard
01.1 Advise ground commander on Close Air Support assets in support of ground scheme of maneuver.			
01.1.1 Advise ground commander on Fixed-Wing (FW) / Rotary-Wing (RW) platform capabilities / limitations / employment.	Demonstrate knowledge of the capabilities, limitations, and employment of fixed wing/rotary wing platforms. (e.g. F-15E, F-16, F/A-18, F-35, AV-8B, A-10, B-1, B-52, AC-130. RW: AH-1W/Z, AH-64A/D, UH-1N/Y, MQ-1, MQ-9. Partner Nation: Tornado, Tornado GR4, Mirage 2000, Euro Fighter, Gripen). JTAC will be able to successfully answer questions on capabilities, limitations, and employment of FW/RW CAS platforms. Reference: JP 3-09.3 (Pg I-5-6, I-8, II-27, III-17, III-24 III-89-90, IV-9, V-6, V-22-24, V-68).	Classroom	Score 80% or greater on a written test.
01.1.2 Advise ground commander on FAC (A) capabilities / limitations / employment.	Demonstrate knowledge of the capabilities, limitations, and employment of fixed wing/rotary wing FAC (A) platforms. Clearly define the roles and responsibilities of supporting and supported forces when integrating FAC(A). JTAC will be able to successfully answer questions on the capabilities, limitations, and employment of FW/RW FAC (A). Reference: JP 3-09.3 (Pg II-8, II-13, II-15, II-18, III-38-39, III-42, III-120-121, III-125, IV-8, V-17, V-55, V-57-62).	Classroom	Score 80% or greater on a written test.
01.1.3 Advise ground commander on remote observer capabilities / limitations / employment.	Demonstrate knowledge of the capabilities, limitations, and employment of a remote observer (e.g., scout, FIST, SOF)/ JFO. Clearly define the roles and responsibilities of supporting and supported forces when integrating a remote observer/ JFO. JTAC will be able to successfully answer questions on remote observer/JFO capabilities, limitations, and employment. Reference: JP 3-09.3 (Pg III-50, III-127, V-62-63) applicable Service Publications.	Classroom	Score 80% or greater on a written test.
01.1.4 Advise ground commander on Group 1, 2, 3, 4 Unmanned Aerial Systems (UAS) capabilities/limitations/employment.	Demonstrate knowledge of the capabilities, limitations, and employment of Group 1, 2, 3 UAS platforms. JTAC will be able to successfully answer questions on the capabilities, limitations, video downlink (VDL) and employment of Group 1, 2, 3, 4 UAS IAW JP 3-09.3 Reference: JP 3-09.3 (Pg I-6, III-17, III-100-103,) and applicable Service Publications.	Classroom	Score 80% or greater on a written test.
01.1.5 Advise ground commander on aviation weapon capabilities / limitations / employment.	Demonstrate knowledge of air delivered weapon's capabilities, limitations, and employment methods. (General purpose bombs, laser guided munitions, Inertially aided munitions, aircraft guns, rockets, flares, Air to ground missiles). JTAC will be able to successfully answer questions on weapons capabilities, limitations, and employment IAW JP 3-09.3 (Pg I-8, III-17, III-19-20, III-24, III-51-58 III-61-61, IV-3, V-4), FM 3-09.32, MCRP 3-16.6A, NTTP 3-09.2, AFTTP(I) 3-2.6 <i>JFIRE Multi-Service Tactics, Techniques, and Procedures for the Joint Application of Firepower</i> publication and Joint Munitions Effectiveness Manuals. For additional information, type the following link into your browser: http://www.globalsecurity.org/military/systems/aircraft/index.html .	Classroom	Score 80% or greater on a written test.

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Task	Defined Task	Condition	Standard
01.1.6 Advise ground commander on effects of weather, terrain, and threats on CAS capabilities.	Demonstrate knowledge of weather, terrain and threats when employing CAS assets. JTAC will be able to successfully answer questions on mission impacts of weather, terrain and threats when employing CAS assets IAW JP 3-09.3. Reference: JP 3-09.3 (Pg I-4-5, I-8, II-29, III-4-5, III-15, III-17-21, III-25-26, III-27-29, III-45, III-51-52, III-61, III-81, III-84-86, III-121, IV-5, V-11, V-68).	Classroom	Score 80% or greater on a written test.
01.1.7 Advise ground commander on effects of electronic warfare on CAS capabilities.	Demonstrate knowledge of airborne and ground base electronic warfare (EW) effects. JTAC will be able to successfully answer questions on EW effects, location of electronic warfare planners, the request process and how to submit an EW request (joint tactical air strike requests (JTAR)) when employing CAS assets IAW JP 3-09.3. Reference: JP 3-09.3 (Pg I-5, III-2-3); FM 3-09.32, MCRP 3-16.6A, NTTP 3-09.2, AFTTP(I) 3-2.6 <i>JFIRE</i> (Pg. 75-79).	Classroom	Score 80% or greater on a written test.
01.1.8 Advise ground commander on the use and timely submission of joint tactical air strike requests (JTAR).	Demonstrate knowledge of the Air Tasking Order planning cycle and its effects on JTAR submission. Address what an ATO is, the information listed and how to access the document. The JTAC should also understand the process to get a preplanned mission on the ATO. JTAC trainee will be able to successfully answer questions on the Air Tasking Order planning cycle and its effects on JTAR submission. Reference: JP 3-09.3 (Pg II-25, III-128, III-130-132, V-3).	Classroom	Score 80% or greater on a written test.
01.1.9 Advise ground commander on Battle Damage Assessment (BDA) and Mission Reporting (MISREP) procedures.	Demonstrate knowledge of the information required to successfully complete a BDA (e.g. observed damage (enemy/civilian)), re-attack recommendation, BDA log, and MISREP procedures. JTAC will be able to successfully answer questions on the information required to successfully complete BDA report to CAS aircraft that includes: Size, Activity, and Location. Time, Remarks — Munitions expended, observed damage (number of tanks destroyed, number still active, and recommendation), mission number, and mission accomplishment (SUCCESSFUL, UNSUCCESSFUL or UNKNOWN). Reference JP 3-09.3 (Pg I-4, II-29, III-94, III-100, IV-3, V-29, V-48-50).	Classroom	Score 80% or greater on a written test.
01.2 Advise ground commander on the minimum components of a game plan (types of Terminal Attack Control and Method of Attack).	Demonstrate knowledge of how tactical situation, aircrew, aircraft, and weapons capabilities/limitations determine appropriate type of terminal attack control and method of attack contained in the game plan. JTAC will be able to successfully answer questions on the types of CAS control and the factors that determine the type of control and method of attack to be used in a given situation. Reference: JP 3-09.3 (Pg III-42, III-47, III-50, V-1, V-4, V-20-21, V-25).	Classroom	Score 80% or greater on a written test.
01.3 Advise ground commander on integration of CAS with indirect fires.	Demonstrate knowledge of the integration of indirect fires (surface to surface) with CAS during a written evaluation. Address deconfliction methods which facilitate simultaneous multi-ship/platform CAS and indirect fire operations. Must be well versed in ACA terminology and have knowledge of all applicable ACAs in use. JTAC will be able to successfully answer questions on separation techniques that deconflict airspace to provide a reasonably safe operating space for aircraft to maneuver and attack targets. Reference: JP 3-09.3 (Pg I-7, II-7, II-10, II-12, II-25, II-5, III-10-11).	Classroom	Score 80% or greater on a written test.

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Task	Defined Task	Condition	Standard
01.4 Advise ground commander on the impact of fire support coordination measures (FSCM) on CAS mission planning.	Given a tactical scenario (e.g. operations order) assess the impact of FSCMs on CAS operations in support of the ground commander's concept of operations during a written evaluation. Address, at a minimum, the definition and proper employment of permissive and restrictive FSCMs to expedite the attack of targets. JTAC will be able to successfully answer questions on FSCMs used during CAS operations. <i>Note: Students should be briefed on Kill box terminology, but a kill box will not be established for close air support (CAS) missions. If a CAS mission is required within an established kill box, the portion of the kill box requiring detailed integration should be closed.</i> Reference: JP 3-09.3 (Pg III-6, III-63-66) and JP 3-09.	Classroom	Score 80% or greater on a written test.
01.5 Advise ground commander on airspace command and control (Joint and Component) procedures and their impact on CAS mission planning (supporting documents - Airspace Control Order (ACO), Airspace Control Measures (ACM), Air Tasking Order (ATO), and Special Instructions (Spins).	Demonstrate knowledge of airspace command and control components, the definition and application of ACO, ACM, ATO, and SPINS and their impact on CAS mission planning (e.g. Theater Air Ground System (TAGS), Theater Air Control System (TACS)/Army Air-Ground System (AAGS), Marine Corps Air Command and Control System (MACCS), Navy Tactical Air Control System (NTACS), and Special Operations Air-Ground System (SOAGS)). JTAC will be able to successfully answer questions on the primary command and control agencies and their roles and responsibilities within the associated Command and Control System and the functions of the ACO, ACM, ATO, and SPINS. References: JP 3-09.3 (Ch II (all)), and (Pg I-3-4, III-4, III-6, III-31, III-66, III-125, III-127, IV-15).	Classroom	Score 80% or greater on a written test.
01.6 Apply intelligence products to CAS mission planning.	Given a tactical scenario, operations order, apply intelligence products to support CAS mission planning in support of the ground commander's concept of operations. Describe how intelligence supports air operations, available intelligence products (e.g. order of battle, maps, ISR imagery) and the importance of including Intel early in the planning process. JTAC will be able to successfully answer questions on the intelligence products used to support CAS mission planning. References: JP 3-09.3: (Pg II-9, II-29-30, III-12, III-17, V-50).	Classroom	Score 80% or greater on a written test.
01.7 Apply the products of the targeting process to CAS mission planning.	Demonstrate knowledge of the targeting process. Address the process which the supported commander selects and prioritize targets and match appropriate effects. Lesson should focus on the products the JTAC will use when planning the employment of CAS (tactical level). JTAC trainee will be able to successfully answer questions on the targeting process products. (i.e. Target list) References: JP 3-09.3: (Pg I-4, II-7, II-10, II-29, III-10, III-12, III-32-36, III-45-46, IV-9, V-1).	Classroom	Score 80% or greater on a written test.
01.8 Plan CAS missions with precision and non-precision weapons, in support of the ground scheme of maneuver.	Collective Task	Classroom	
01.8.1 Plan a laser guided weapon delivery and use of a ground and airborne Laser Target Designator (LTD).	Demonstrate knowledge of laser guided weapons employment and use of a ground and airborne LTD (Acft targeting pod and UAS). Address the standard laser brevity terms and procedures for ground and airborne designating, marking, and proper employment of laser guided weapons. JTAC will be able to successfully answer questions on laser guided weapons	Classroom	Score 80% or greater on a written test.

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Task	Defined Task	Condition	Standard
	employment, safety zone, optimal attack zones, hellfire designator exclusion zone and proper laser terminology. References: JP 3-09.3: (Pg I-6, III-53-54, III-58, V-6, V-68).		
01.8.2 Plan inertial aided munitions deliveries.	Demonstrate knowledge of inertial aided munitions employment. Address the unique characteristics and limitations of inertially aided/GPS guided weapons. Lesson will also cover target location error (TLE), Bomb on Coordinate (BOC), and Bomb on Target (BOT). JTAC will be able to successfully answer questions on inertial aided munitions employment. References: JP 3-09.3: (Pg III-28, III-30, III-33-35, III-47-49, III-61-62, III-99, V-5, V-20, V-32, V-34).	Classroom	Score 80% or greater on a written test.
01.8.3 Plan non-precision weapons deliveries.	Demonstrate knowledge of non-precision weapons employment. Address the capabilities, limitations and employment of general-purpose weapons. Consideration must be given to host aircraft navigation/weapons system accuracy. JTAC will be able to successfully answer questions on non-precision weapons employment. References: JP 3-09.3: (Pg I-5, III-58, III-86, III-94, V-5).	Classroom	Score 80% or greater on a written test.
01.9 Plan engagement with appropriate weapon in order to achieve desired effects, proportional response, and minimize collateral damage.	Demonstrate knowledge of aviation ordnance capabilities and effects. Lesson will present scenarios where ordnance is appropriately matched to targets to achieve ground commanders desired results and comply with Rules of Engagement (ROE) and restrictions. Theatre specific ROE, restrictions and lessons learned should be briefed. Reinforcement through practical application is required during simulated, dry, or live controls. JTAC will be able to successfully answer questions on aviation ordnance capabilities and effects. References: JP 3-09.3: (Pg I-5-6, I-8, I-10-11, III-19, III-21, III-29, III-37, III-39-40, III-99, III-107, V-4-6).	Classroom	Score 80% or greater on a written test.
01.10 Plan day CAS missions, in support of the ground scheme of maneuver.	Collective Task	Classroom	
01.10.1 Plan day FW CAS missions.	Demonstrate knowledge of day, FW CAS planning factors. JTAC will be able to successfully answer questions on day, FW CAS planning factors. References: JP 3-09.3: (Pg I-3, III-5, III-18, III-91, III-100, V-9).	Classroom	Score 80% or greater on a written test.
01.10.2 Plan day RW CAS missions.	Demonstrate knowledge of day, RW CAS planning factors. JTAC will be able to successfully answer questions on RW CAS planning factors. References: JP 3-09.3: (Pg I-3, III-5, III-18, III-100, V-9).	Classroom	Score 80% or greater on a written test.
01.11 Plan night CAS missions, in support of the ground scheme of maneuver.	Collective Task	Classroom	
01.11.1 Plan night FW CAS missions.	Demonstrate knowledge of night, FW CAS planning factors. JTAC will be able to successfully answer questions on night, FW CAS planning factors. References: JP 3-09.3: (Pg I-8, III-20, III-25-28, III-31, III-52, III-80, III-91, III-100, V-7-10, V-68).	Classroom	Score 80% or greater on a written test.
01.11.2 Plan night RW CAS missions.	Demonstrate knowledge of night, RW CAS planning factors. JTAC will be able to successfully answer questions on night, RW CAS planning factors. References: JP 3-09.3: (Pg I-8, III-20, III-25-28, III-31, III-52, III-80, III-91, III-100, V-7-10, V-68).	Classroom	Score 80% or greater on a written test.

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Task	Defined Task	Condition	Standard
01.11.3 Plan Illumination in support of night CAS missions.	Collective Task	Classroom	
01.11.3.1 Plan ground-delivered Illumination.	Demonstrate knowledge of ground-delivered illumination, in support of CAS. Address techniques and procedures on how to employ illumination via surface based fire support systems in support of CAS missions (Artillery, Mortars, and Naval Surface Fires). JTAC will be able to successfully answer questions on surface-delivered illumination, in support of CAS. References: JP 3-09.3: (Pg III-19-20, III-26, III-29, V-9), FM 3-09.32, MCRP 3-16.6A, NTTP 3-09.2, AFTTP(I) 3-2.6, JFIRE, Multi-Service TTP for the Joint Application of Firepower).	Classroom	Score 80% or greater on a written test.
01.11.3.2 Plan aviation-delivered Illumination.	Demonstrate knowledge of aviation-delivered illumination, in support of CAS. Address techniques and procedures on how to employ illumination via aviation assets in support of CAS missions (e.g.: Airborne delivered flares, Illumination rockets). JTAC will be able to successfully answer questions on aviation-delivered illumination, in support of CAS. References: JP 3-09.3: (Pg II-8, III-26-27).	Classroom	Score 80% or greater on a written test.
01.12 Incorporate CAS mission planning factors for operations in limited visibility / adverse weather.	Demonstrate knowledge of limited visibility and adverse weather and its effects on CAS. Address techniques and procedures on how to execute a CAS mission during limited visibility and adverse weather conditions. JTAC will be able to successfully answer questions on limited visibility/adverse weather effects on CAS. References: JP 3-09.3: (Pg III-25, III-27, III-31).	Classroom	Score 80% or greater on a written test.
01.13 Incorporate CAS mission planning factors for operations in an urban environment.	Demonstrate knowledge of CAS mission planning factors for operations in an urban environment. Address planning factors, techniques and procedures on how to execute a CAS mission in the urban environment JTAC will be able to successfully answer questions on urban CAS planning factors. References: JP 3-09.3: (Pg III-20-25, III-91, III-98).	Classroom	Score 80% or greater on a written test.
01.14 Plan AC-130 fire missions in support of the ground scheme of maneuver.	Demonstrate knowledge of AC-130 fire missions. Address planning factors, techniques and procedures on how to employ the AC-130. JTAC will be able to successfully answer questions on AC-130 capabilities, Call for Fire procedures and proper employment. References: JP 3-09.3: (Pg III-58, III-94, III-104-108).	Classroom	Score 80% or greater on a written test.
01.15 Plan integrated attack by multiple fire support assets to support CAS.	Collective Task	Classroom	
01.15.1 Plan target marking for CAS assets.	Sub-Task	Classroom	
01.15.1.1 Plan target marking for CAS with indirect fire assets.	Demonstrate knowledge to effectively plan visual target marking for CAS with indirect fire. Address techniques and procedures on how to use indirect fire (e.g. artillery, mortars) to provide visual marks (e.g. smoke, illumination) to execute a CAS mission. JTAC will be able to successfully answer questions on target mark timing, airspace management (deconflicting fires from CAS platforms) and use of smoke, high explosive, illumination or other visual means. References: JP 3-09.3: (Pg I-6-7, III-11, III-19, III-26, III-29, III-69-70, III-77-78, III-81, III-99, V-4-6).	Classroom	Score 80% or greater on a written test.

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Task	Defined Task	Condition	Standard
01.15.1.2 Plan target marking with ground IR pointer for CAS assets.	Demonstrate the ability to effectively plan ground IR pointer target marking for CAS. Address the standard IR pointer brevity terms, procedures for ground IR pointer marking, and the proper employment of IR pointer. JTAC will be able to successfully answer questions on IR Brevity and IR pointer safety. References: JP 3-09.3: (Pg III-30, III-80-81, III-97-99, III-100, V-7-8).	Classroom	Score 80% or greater on a written test.
01.15.2 Plan surface to surface Suppression Enemy Air Defenses (SEAD) for CAS attack.	Demonstrate the ability to effectively plan SEAD for CAS. Address techniques and procedures on how to use indirect fire (e.g. artillery, mortars) to provide SEAD in support of a CAS mission. JTAC will be able to successfully answer questions on definition of SEAD, timing, and airspace management (deconflicting fires from CAS platforms). References: JP 3-09.3: (Pg I-6-7, III-25, III-69, III-77, III-81, IV-6, V-4, V-12-13).	Classroom	Score 80% or greater on a written test.
01.15.3 Plan coordinated attacks by multiple flights of aircraft to support CAS.	Demonstrate knowledge to effectively coordinate attacks by multiple flights of aircraft and deconflict them from each other during simultaneous and sequential attacks to support CAS. Address type of attack (Combined/Sector), timing and procedures on how to deconflict flights. JTAC will be able to successfully answer questions on methods of deconflicting CAS platforms from each other during simultaneous and sequential attacks. References: JP 3-09.3: (Pg III-83, V-21).	Classroom	Score 80% or greater on a written test.
01.16 Plan terminal attack control in support of CAS attack.	Demonstrate knowledge of terminal attack control procedures in support of CAS planning. Address planning factors, techniques and procedures on how to conduct terminal attack control of a CAS mission. JTAC will be able to successfully answer questions on established terminal attack control procedures, Situation update, game plan and CAS Attack Brief. References: JP 3-09.3: (Pg I-2, III-40, III-43-44, III-47).	Classroom	Score 80% or greater on a written test.
01.17 Plan target location procedures with the understanding of target location errors (TLE) in support of attack.	Demonstrate knowledge of target location procedures and target location errors (TLE) in support of CAS planning. Address planning factors, techniques and procedures on how to most efficiently and effectively locate targets; stress the importance of a targets associated TLE. JTAC will be able to successfully answer questions on procedures, equipment used to determine target location, and TLE categories. References: JP 3-09.3: (Pg III-33-35). Reference Service documentation for specific equipment.	Classroom	Score 80% or greater on a written test.
01.18 Request CAS via JTAR.	Demonstrate knowledge of the JTAR. Address the proper routing and processing of pre-planned and immediate request through the command and control system. JTAC will be able to successfully answer questions on the procedures to fill out and route a JTAR. References: JP 3-09.3: (Pg III-132, V-3-4, App A).	Classroom	Score 80% or greater on a written test.
01.19 Plan the use of digitally aided CAS systems in support of weapons deliveries. Note: Signatories without fielded DACAS systems are exempt until such fielding occurs.	Demonstrate knowledge of DACAS/Fires systems to facilitate weapons employment. Address the capabilities, limitations and proper use of Service, SOCOM, Partner Nation-fielded DACAS systems. JTAC will be able to successfully answer questions on the use of DACAS systems to request, CAS brief and BDA. References: JP 3-09.3: (Pg III-109-114, IV-15, App D).	Classroom	See Duty Area 2, CAS Preparation Task 02.1.5.

5.4.2. Duty Area 02 – CAS Preparation

This Duty Area focuses on the minimum practical, dry, or live terminal attack control to be conducted. Trainees should use the same JTAC equipment in training as they are required to operate during combat operations. Appropriate material will be supplied to the trainees to facilitate CAS mission planning. Each Task and Sub-Task will be covered in the exercise.

Performance Level and description:

Proficient – Trainee is able to accomplish all items in the task correctly and efficiently without assistance.

Task	Defined Task	Condition	Standard
02.1 Operate organic JTAC equipment.			
02.1.1 Operate organic JTAC communications equipment.	Demonstrate the ability to operate-all required organic communications equipment necessary for requesting, coordinating and controlling CAS missions. JTAC will demonstrate proficiency in operating communications equipment as designated by their Services/SOCOM/Nation. JTACs will have the skills to operate in the required frequency bands in secure voice, Anti Jam and digital information exchange capabilities. Reference: JP 3-09.3: (Pg I-3, II-13, II-21, II-23-26, II-28, III-15, III-19-20, IV-7, IV-13-14). Service approved checklist/documentation.	Classroom, practical exercise, dry, or live.	Performance level of proficient.
02.1.2 Operate organic JTAC target marking equipment. *Note – services, USSOCOM, and Partner Nations without LTD or IR Pointer are exempt until such fielding occurs.	Demonstrate the ability to operate target-marking equipment in support of CAS. JTAC will demonstrate the ability to operate laser target designators (LTD), IR pointers, radar beacons and other designated target marking equipment designated by their Services/SOCOM/Nation. References: JP 3-09.3: (Pg III-30, III-53-54, III-58, III-80-81, III-100, IV-16i, V-6, V-68). Reference Service equipment checklist, manuals and documentation.	Classroom, practical exercise, dry, or live.	Performance level of proficient.
02.1.3 Operate organic JTAC target location equipment.	Demonstrate the ability to operate target location equipment and knowledge of its accuracy in support of CAS. JTAC will demonstrate the ability to operate Laser Range finders, GPS systems, Targeting Software (i.e. PSS-SOF) and other target location equipment designated by their Services/SOCOM/Nation. References: JP 3-09.3: (Pg III-20-22, III-34, III-69, V-3). Reference Service equipment checklist, manuals and documentation.	Classroom, practical exercise, dry, or live.	Performance level of proficient.
02.1.4 Operate organic JTAC video downlink equipment.	Demonstrate the ability to operate video downlink equipment (e.g. ROVER) in support of CAS. JTAC will demonstrate the ability to operate video downlink equipment designated by their Services/SOCOM/Nation. References: JP 3-09.3: (Pg III-118-120). Reference Service equipment checklist, manuals and documentation.	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.
02.1.5 Operate organic DACAS/Fires systems. Note: Signatories without fielded digital CAS systems are exempt until such fielding occurs.	Demonstrate the ability to operate digitally aided systems in support of CAS and CFF missions using appropriate reference material when required. JTAC will demonstrate the ability to operate digitally aided systems in support of CAS and CFF missions during simulation, dry and/or live training events, using designated equipment and software by their Services/SOCOM/Nation. References: JP 3-09.3: (Pg III-109-116). Reference Service equipment checklist, manuals and documentation.	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.

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Task	Defined Task	Condition	Standard
02.2 Apply the products of Operational planning in support of CAS execution.	Collective Task		
02.2.1 Apply intelligence products in support of CAS execution.	Demonstrate the ability to apply intelligence products (e.g. ISR support, ground order of battle, air order of battle, missile order of battle, maps, charts (1:50, GRG)). JTAC will understand which products of the intelligence/deliberate planning cycle are available to him in order to devise a plan to ensure CAS resources are used against appropriate targets based on the commander's intent. (E.g. Target List). References: JP 3-09.3: (Pg II-9, II-29-30, III-12, III-17, V-50), JP 2-01.3 for more information.	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.
02.2.2 Apply the products of the fire support plan in support of CAS execution.	Demonstrate the ability to apply the products of the fire support plan (e.g., FSCMs). JTAC will understand what role they play in developing a fire support plan, ensuring CAS is fully integrated and be able to use the products that result from fire support planning (e.g. target lists, FSCMs). References: JP 3-09.3: (Pg III-3, III-6, III-10)	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.
02.2.3 Apply the products of the Airspace Control Order in support of CAS execution.	Demonstrate the ability to apply the products of the ACO (e.g. ACMs). JTAC will be able to extract and apply the applicable information contained in the ACO required to safely and effectively conduct a CAS mission. References: JP 3-09.3: (Pg III-4, III-6, III-66, III-73).	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.
02.2.4 Apply the products of communications planning in support of CAS execution.	Demonstrate the ability to apply a communications plan (e.g., Tactical Air Direction (TAD), Air Request Net (ARN), Tactical Air Request (TAR)/Helicopter Request (HR), TACP Local (L), Tactical Chat, IP and URN addressing, OPTASKLINK). JTAC will establish and maintain all applicable communications nets required to plan, coordinate and execute a CAS mission. JTAC will understand communications plans and be able to extract communications network data from applicable sources. References: JP 3-09.3: (Pg II-13, II-23-26, II-28, III-5).	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.
02.2.5 Apply the products of the ATO in support of CAS execution.	Demonstrate the ability to apply the ATO (e.g., aircraft, time on station, SPINS). JTAC will read an ATO and be able to identify and extract the information needed to execute a CAS mission. References: JP 3-09.3: (Pg III-125).	Classroom, practical exercise, simulation, dry, or live.	Performance level of proficient.

5.4.3. Duty Area 03 – CAS Execution

This Duty Area focuses on the minimum practical, dry, or live terminal attack controls to be conducted. Trainees should use the same JTAC equipment in training as they are required to operate during combat operations. Appropriate material will be supplied to the trainees to facilitate CAS mission planning and execution. Each Task and Sub-Task will be covered in the exercise.

Performance Level and description:

Proficient – Trainee is able to accomplish all items in the task correctly and efficiently without assistance.

Task	Defined Task	Condition	Standard
03.1 Targeting			
03.1.1 Target Acquisition	Sub-Task		
03.1.1.1 Execute target acquisition via aided and unaided during daytime conditions.	Demonstrate the ability to acquire targets based on ground commander's CAS target nominations aided (e.g. Binos, LRF, LTD, electro-optical (EO), IR) and unaided eyes. JTAC will visually identify CAS targets based on ground commander's CAS target nominations under day conditions. References: JP 3-09.3: (Pg III-18-20, III-27, III-52, III-54, III-109).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.1.1.2 Execute target acquisition via aided and unaided during nighttime conditions.	Demonstrate the ability to acquire targets aided (e.g., Binos, NVGs, IR, thermal) and unaided eyes during night. JTAC will visually identify CAS targets based on ground commander's CAS target nominations under night conditions. Unaided may involve the use of artificial illumination. References: JP 3-09.3: (Pg III-18-20, III-27, III-52, III-54, III-109, V-39).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.1.1.3 Execute target acquisition via remote observer.	Demonstrate the ability to target via remote observer (e.g., scout, FIST, JFO, SOF). JTAC will demonstrate the ability to work successfully with a remote observer to acquire targeting information (e.g. target location, threats, friendlies) and other critical information needed to build situational awareness in order to successfully conduct a CAS mission. References: JP 3-09.3: (Pg III-50, III-127, V-62-63).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.1.1.4 Execute target acquisition via remote real-time sensor video downlink information.	Demonstrate the ability to acquire targets via remote real-time sensor video downlink (e.g., ROVER, Video Scout, and targeting pod). JTAC will demonstrate the ability to successfully use video downlink to receive full motion video, still photos, imagery or other media to acquire targeting information (e.g. target coordinates, threats, friendlies, etc.) needed to build situational awareness in order to successfully conduct a CAS mission. Reference: JP 3-09.3: (Pg III-118-120).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.1.2 Target Location	Collective Task		
03.1.2.1 Determine target location via map plot.	Demonstrate the ability to determine target location via map plot. JTAC will demonstrate the ability to successfully determine target coordinates within 100 m accuracy in open terrain with identifiable terrain features out to 3500 m using only binoculars map and compass. References: JP 3-09.3: (Pg V-3, V-42).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.1.2.2 Determine target location via coupled GPS/LRF system.	Demonstrate the ability to determine target location via coupled GPS/LRF. JTAC will demonstrate the ability to successfully determine target coordinates using a coupled GPS/LRF with at least the following accuracy: 50-80 m at 1 km. References: JP 3-09.3: (Pg V-3), JFIIT LRF/GPS receiver TLE test report.	Practical exercise, simulation, dry, or live.	Performance level of proficient.

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Task	Defined Task	Condition	Standard
03.1.2.3 Determine target location via tactical targeting system (e.g. Precision Strike Suite – Special Operations Force (PSS-SOF)). Note: Signatories without fielded tactical targeting systems are exempt until such fielding occurs. If service, component, or multinational JTACs employ tactical targeting systems that produce precision coordinates, (PSS-SOF, etc.) proficiency with that equipment must be demonstrated IAW Service regulations.	Demonstrate the ability to determine target location via tactical targeting system. JTAC will demonstrate the ability to successfully determine target location coordinates within 10 m accuracy using a tactical targeting system (e.g. PSS-SOF). References: JP 3-09.3: (Pg IV-16, V-3) CJCSI 3505.01C (28 Oct 2016).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.2 Match target location accuracy / format to desired weapons system.	Demonstrate the ability to determine accuracy of target location (e.g. TLE) and proper coordinate format to desired weapons system. JTAC will determine target location error (TLE) associated with the procedure or equipment used to determine target location coordinates. Match coordinates format and best weapon to target based on accuracy and capability. References: JP 3-09.3: (Pg II-8, II-28, II-33-35, III-61-62).	Practical exercise, simulation, dry, or live.	Performance level of proficient.
03.3 Coordinate CAS missions.	Collective Task		
03.3.1 Integrate CAS missions with ground scheme of maneuver.	Demonstrate the ability to integrate CAS missions with ground scheme of maneuver. JTAC will demonstrate the ability to effectively integrate CAS into the ground scheme of maneuver by meeting the commander's intent for CAS, without limiting the employment of maneuver, aviation or fire support assets. References: JP 3-09.3: (Pg I-1, I-3, I-7, II-7, II-9, II-19, III-5-7, III-10, III-21, III-24, III-31, III-77, IV-4).	Simulation, dry, or live.	Performance level of proficient.
03.3.2 Integrate CAS missions with surface-based fires.	Demonstrate the ability to integrate CAS missions with surface-based fires. JTAC will demonstrate the ability to effectively integrate CAS with supporting or complementary surface fires into the ground scheme of maneuver by meeting the commander's intent for Fire Support. References: JP 3-09.3: (Pg I-4, II-19, III-62, III-67, III-69, III-77, III-122, IV-4).	Simulation, dry, or live.	Performance level of proficient.
03.3.3 Integrate CAS missions with fire support and airspace coordination measures.	Demonstrate the ability to integrate CAS missions with fire support coordination and airspace coordinating measures. JTAC will demonstrate the ability to effectively use fire support coordination and airspace coordinating measures to deconflict CAS with all fire support and aviation assets, to meet the commander's intent for maneuver and fire support. References: JP 3-09.3: (Pg III-63-66).	Simulation, dry, or live.	Performance level of proficient.
03.4 Execute deconfliction of aviation assets.	Collective Task		

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Task	Defined Task	Condition	Standard
03.4.1 Execute procedural control of aircraft to provide safe separation.	Demonstrate the ability to effectively deconflict aircraft. JTAC will demonstrate the ability to use appropriate airspace management procedures IAW JP 3-09.3, to ensure safe operation of aircraft in the Battlespace during CAS operations. References: JP 3-09.3: (Pg III-73, III-82).	Simulation, dry, or live.	Performance level of proficient.
03.4.2 Execute procedural control of aircraft to provide safe separation from fires.	Demonstrate the ability to effectively deconflict aircraft from fires. JTAC trainee will demonstrate the ability to combine appropriate airspace management procedures with active fire support coordination measures to ensure safe operation of aircraft in the Battlespace during CAS operations. Reference: JP 3-09.3 (Pg III-73, III-82).	Simulation, dry, or live.	Performance level of proficient.
03.5 Coordinate CAS Target engagement.	Collective Task		
03.5.1 Receive aircraft check-in and provide situation update to CAS aircraft.	Demonstrate the ability to receive aircraft check-in and provide situation update. JTAC will demonstrate the ability to receive CAS aircraft check-in and provide situation update IAW JP 3-09.3 and apply information to the CAS mission as required. References: JP 3-09.3: (Pg III-115, III-131, V-15-16, V-17-20, V-47).	Simulation, dry, or live.	Performance level of proficient.
03.5.2 Provide Game plan and CAS Attack Brief.	Demonstrate the ability to provide Game plan and CAS attack brief. JTAC will demonstrate the ability to pass a Game plan and CAS attack brief to CAS aircraft IAW JP 3-09.3 in order to attack a surface target. References: JP 3-09.3: (Pg III-49, III-115, V-1, V-4, V-20, V-24-25).	Simulation, dry, or live.	Performance level of proficient.
03.5.3 Provide weapon recommendation to achieve desired effects.	Demonstrate the ability to provide a weapon recommendation, based on ground commander's intent, to achieve desired effects. JTAC will demonstrate the ability to make appropriate weapons recommendations to CAS aircraft to ensure effects achieve the ground commander's desired intent and comply with ROE and restrictions. References: JP 3-09.3: (Pg III-25, III-108); JFIRE pg. 148-154.	Simulation, dry, or live.	Performance level of proficient.
03.6 Execute target marking for CAS assets.	Collective Task		
03.6.1 Execute visual target marking for CAS with indirect fire assets.	Demonstrate the ability to effectively target mark via visual means with indirect fire. JTAC will demonstrate the ability to mark a target using a visual indicator (e.g. smoke (WP, RP), high explosive (HE), illumination) to allow a CAS aircraft to visually acquire the target area. Reference: JP 3-09.3 (Pg III-29, II-78).	Simulation, dry, or live.	Performance level of proficient.
03.6.2 Execute target mark or designation for CAS with a ground laser target designator (LTD). Note: Signatories without LTD are exempt until such fielding occurs.	Demonstrate the ability to effectively target mark or designate with a ground based LTD. JTAC will demonstrate the ability to successfully mark or designate a target using a LTD to allow a CAS aircraft to acquire the target or deliver a laser guided weapon. Laser shall be utilized to designate for a weapon delivery or to mark a target for an aircraft (laser spot tracker recommended). Intent is to utilize laser equipment and proper terminology. Reference: JP 3-09.3 (Pg I-6, III-53-54, III-58, V-6, V-68).	Simulation, dry, or live.	Performance level of proficient.
03.6.3 Execute target mark for CAS with a ground IR pointer. Note: Signatories without IR Pointer are exempt until such fielding occurs.	Demonstrate the ability to effectively target mark with a ground based IR pointer. JTAC will demonstrate the ability to successfully mark a target using an IR pointer to allow a CAS aircraft to acquire the target. IR pointer shall be utilized to mark a target for aircrew with NVG. Intent is to utilize IR pointer equipment and proper terminology. Reference: JP 3-09.3 (Pg III-30, III-80-81, III-97-99, III-100, V-7-8).	Simulation, dry, or live.	Performance level of proficient.

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Task	Defined Task	Condition	Standard
03.7 Integrate SEAD during the execution of CAS missions in a medium to high threat environment.	Demonstrate the ability to effectively integrate SEAD with CAS in a medium to high threat environment. JTAC will demonstrate the ability to successfully integrate SEAD during a CAS mission. Reference: JP 3-09.3 (Pg. I-6-7, III-25, III-69, III-77, III-81, IV-6, V-4, V-12-13) and Service/National publications.	Simulation, dry, or live.	Performance level of proficient.
03.8 Execute appropriate terminal attack control procedures and method of attack.	Collective Task		
03.8.1 Execute Type 1 terminal attack control procedures.	Perform Type 1 terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a Type 1 CAS control. Reference: JP 3-09.3 (Pg III-40, III-43, III-47).	Simulation, dry, or live.	Performance level of proficient.
03.8.2 Execute Type 2 terminal attack control procedures.	Perform Type 2 terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a Type 2 CAS control. Reference: JP 3-09.3 (Pg III-40, III-44-45, III-47).	Simulation, dry, or live.	Performance level of proficient.
03.8.3 Execute Type 3 terminal attack control procedures.	Perform Type 3 terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a Type 3 CAS control. Reference: JP 3-09.3 (Pg III-40, III-45-47).	Simulation, dry, or live.	Performance level of proficient.
03.8.4 Execute BOT method of attack during a terminal attack control.	Perform BOT method of attack during terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a BOT method of attack. Reference: JP 3-09.3 (Pg III-47-49).	Simulation, dry, or live.	Performance level of proficient.
03.8.5 Execute BOC method of attack during a terminal attack control.	Perform BOC method of attack during terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a BOC method of attack. Reference: JP 3-09.3 (Pg III-47-49).	Simulation, dry, or live.	Performance level of proficient.
03.9 Control day and night CAS missions, in support of the ground scheme of maneuver.	Collective Task		
03.9.1 Control day FW CAS missions.	Perform a day fixed-wing control. JTAC will demonstrate the ability to successfully perform a day fixed-wing control. References: JP 3-09.3: (Pg V-2, V-14, V-20-31).	Simulation, dry, or live.	Performance level of proficient.
03.9.2 Control night FW CAS missions.	Perform a night fixed-wing control. JTAC will demonstrate the ability to successfully perform a night fixed-wing control. References: JP 3-09.3: (Pg III-80V-2, V-14, V-20-31, V-68, App C).	Simulation, dry, or live.	Performance level of proficient.
03.9.3 Control RW CAS missions.	Perform a rotary-wing control. JTAC will demonstrate the ability to successfully perform a day or night rotary-wing control IAW JP 3-09.3 and appropriate service references. References: JP 3-09.3: (Pg III-89-91, III-95).	Simulation, dry, or live.	Performance level of proficient.
03.9.4 Control CAS missions with the support of a remote observer.	Perform a Type 2 or 3 control with the support of a remote observer (e.g. scout, FIST, JFO, SOF). JTAC will demonstrate the ability to successfully perform a day or night Type 2 or 3 control with the support of a remote observer. Reference: JP 3-09.3 (Pg III-50, III-127, V-62-63).	Simulation, dry, or live.	Performance level of proficient.

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Task	Defined Task	Condition	Standard
<p>03.9.5 Control CAS missions with the support of a FAC(A).</p> <p>Note: Signatories without FAC(A)s and a JTAC simulation system are exempt until such fielding occurs.</p>	Perform a control with the support of a FAC(A). JTAC will demonstrate the ability to successfully perform a day or night control with the support of a FAC(A). Reference: JP 3-09.3 (Pg III-125, IV-8, V-17, V-55, V-57-62).	Simulation, dry, or live.	Performance level of proficient.
03.10 Control a CAS mission in an urban environment in support of the ground scheme of maneuver.	Perform a CAS control in an urban environment. JTAC will demonstrate the ability to successfully perform a CAS control in an Urban environment. Reference: JP 3-09.3 (Pg III-20-25).	Simulation, dry, or live.	Performance level of proficient.
<p>03.11 Employ service DACAS/Fires systems.</p> <p>Note: Services, USSOCOM/Partner Nations without fielded DACAS systems are exempt until such fielding occurs.</p>	Demonstrate the ability to control CAS missions (e.g. Friendly deconfliction, A/C check in, ON STATION REPORT, CAS 9-Line brief, and BDA) using DACAS systems. JTAC will demonstrate the ability to successfully perform a digital aided CAS control. Reference: JP 3-09.3 (Pg III-110, III-114, App D).	Simulation, dry, or live.	Performance level of proficient.
03.12 Conduct Battle Damage Assessment (BDA).	Demonstrate the ability to provide accurate BDA (e.g. observed damage (enemy/civilian)), re-attack recommendation and maintain a log of all BDA collected, using appropriate reference material when required. JTAC will demonstrate the ability to provide BDA report to CAS aircraft that includes: Size, Activity, Location, Time, and Remarks — Munitions expended, observed damage (number of tanks destroyed, number still active, and recommendation), mission number, and mission accomplishment (SUCCESSFUL, UNSUCCESSFUL or UNKNOWN). Reference JP 3-09.3 (Pg IV-3, V-48-49).	Simulation, dry, or live.	Performance level of proficient.

6. Participating U.S. Signature Page

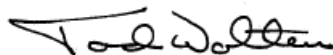
Effective Date, Review, and Withdrawal. This JTAC MOA and all Appendices attached hereto are effective as of 1 Dec 2017. The MOA will be reviewed biennially and updated as required. Updates that change MOA intent or add issues not previously addressed will be coordinated through the JFS ESC, then the Joint Staff process, and will be signed by the Director of the Joint Staff, Service Operations Deputies, USSOCOM Deputy Commander, and equivalent participating Partner Nations. Updates that do not change the intent of the MOA will be reviewed and approved by the JFS ESC. US/DOD Signatories may withdraw from the JTAC MOA by providing 90-day advance written notice to the JFS ESC.



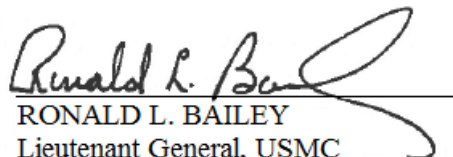
DAVID L. GOLDFEIN, Lt Gen, USAF
Director, Joint Staff



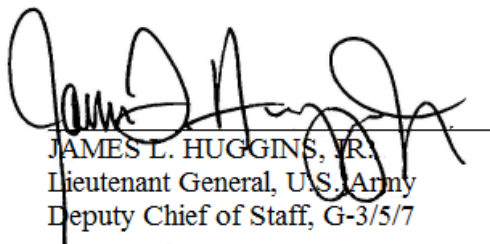
TIMOTHY J. LEAHY
Major General, USAF
USSOCOM Director of Operations



TOD D. WOLTERS
Lieutenant General, USAF
Deputy Chief of Staff, Operations



RONALD L. BAILEY
Lieutenant General, USMC
HQ USMC Deputy Commandant
Plans, Policies and Operations



JAMES L. HUGGINS, JR.
Lieutenant General, U.S. Army
Deputy Chief of Staff, G-3/5/7

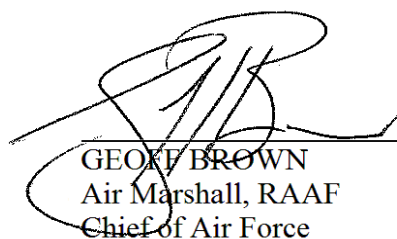
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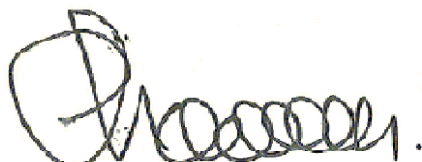
KEVIN M. DONEGAN
Rear Admiral, USN
Acting Deputy Chief of Naval Operations
for Operations, Plans and Strategy

7. Participating Partner Nation Signature Page


Effective Date, Review, and Withdrawal. This JTAC MOA and all Appendices attached here to are effective as of 1 Dec 2017. The MOA will be reviewed biennially and updated as required. Updates that change MOA intent or add issues not previously addressed will be coordinated through the JFS ESC, then the Joint Staff process, and will be signed by the Director of the Joint Staff, Service Operations Deputies, USSOCOM Deputy Commander, and equivalent participating Partner Nations. Updates that do not change the intent of the MOA will be reviewed and approved by the JFS ESC. Partner Nation Signatories may withdraw from the JTAC MOA by providing 90-day advance written notice to the JFS ESC.



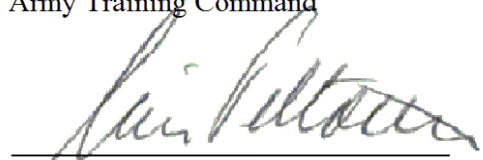
GEORGE BROWN
Air Marshall, RAAF
Chief of Air Force



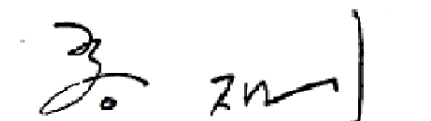
J.C. LAWRENCE, CBE
Major General, Director Joint Warfare
UK Joint Forces Command



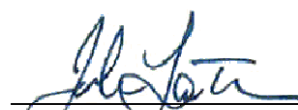
N. GEERTS
Brigadier General
Commander, Royal Netherlands
Army Training Command



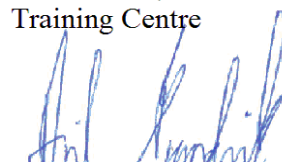
MIKA PELTONEN
Lieutenant General
Chief of Operations, Finnish Defence Forces
for The Ministry of Defence of Finland



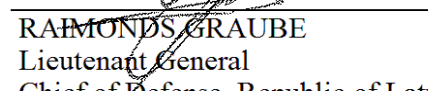
Hong, Jae Ki
Major General
Vice Commander, Air Force Operations Command
Republic of Korea Air Force



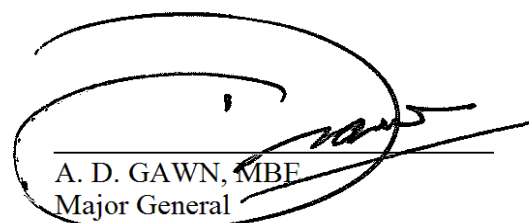
J.M. LANTHIER
Major General, Canadian Armed Forces
Commander, Canadian Army Doctrine and
Training Centre




ARIL BRANDVIK
Brigadier General
Commander NOR Army Land Warfare Cen



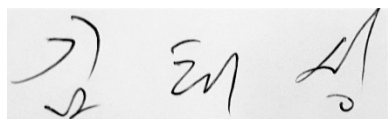
RAMONDS GRAUBE
Lieutenant General
Chief of Defense, Republic of Latvia



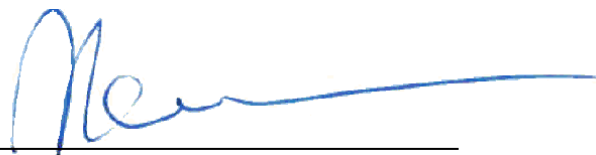
A. D. GAWN, MBE
Major General
Chief of Army, New Zealand



Nam Young-Sin
Lieutenant General
Commanding General, Republic of
Korea Special Warfare Command



KIM, TAE SUNG
Brigadier General
Assistant Commandant
Republic of Korea Marine Corps



JAAK TARIEN
Colonel
Commander, Estonian Air Force



JOZSEF SZPISJAK
Brigadier General
Commander, Hungarian Defense Forces
Training and Doctrine Center



ANDERS SILWER
Lieutenant General
Director, Training and Procurement
Swedish Armed Forces



JEAN-PAUL DECONINCK
Major General
Land Component Commander, Belgium



JAN ŚLIWKA
Major General
Inspector of the POL Air Force
(on behalf of POL MoND)



M.S. HINDMARSH
Major General, UAE
Commander, Presidential Guard



DARIUS UŽKURAITIS
Colonel, Director General for Capabilities
and Armaments
Ministry of National Defence of
The Republic of Lithuania



LIBOR ŠTEFÁNEK
Brigadier General
Commander Air Force
Czech Republic



MANSOUR S. AL JOBOUR
Major General
Commander, Royal Jordanian Air Force

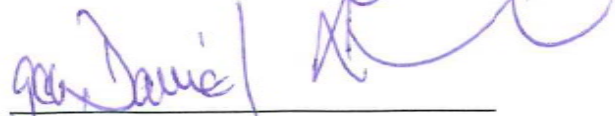


Mohammed Ahmed Al Shalan
Lieutenant General
Commander, Royal Saudi Air Force



HENRIK HEGNER NIELSEN
Colonel
Deputy Chief of Staff/Chief Capabilities
Division Air Command Denmark

DAVID HUMAR
Brigadier General
Deputy Chief of General Staff, Slovenian
Armed Forces



Daniel ZMEKO
General
Chief of the General Staff
of the Armed Forces of the Slovak Republic

Statement of the Slovak Signatory:

The Ministry of Defence of the Slovak Republic understands the JTAC MOA does not create rights and obligations under international law per Sections 2.3 and 4. However, in order to effectively apply and recognize procedures and provisions contained in the JTAC MOA, the Ministry of Defence of the Slovak Republic will implement the JTAC MOA in accordance with its national legislation.

Appendix A

A.1. Appendix A covers the following items:

- A.1.1. Example Close Air Support Controls for Training
- A.1.2. JTAC CAS Log
- A.1.3. JTAC Evaluation Form and Criteria
- A.1.4. Example JTAC Instructor/Evaluator Waiver (Experience)
- A.1.5. Example JTAC Instructor Waiver (FAC(A) Experience)
- A.1.6. Example JTAC Student Academic Completion Letter

APPENDIX A

Enclosure 1: Example Close Air Support Controls for Training

A.1. JMTL Duty area 03 – CAS Execution, lists the required tasks that a JTAC trainee must successfully complete to be certified and maintain qualification as a JTAC. It further defines the sub-tasks to be demonstrated and performed during execution task demonstration. A trainee must successfully demonstrate each execution task for initial JTAC certification. Listed below are examples of CAS Controls which support JMTL requirements and utilize a building block approach to training. This is not intended to specify national training programs, but to provide example control descriptions and standards that support the JMTL. The control examples can be conducted in simulation, dry, or live environment in accordance with JMTL. This is not intended to restrict training programs from completing controls in a different sequence or to higher performance standards. The examples can also be used for qualification training.

(See examples on next pages)

A. Type 1 BOT, FW aircraft, marked or unmarked, Day CAS Control

Goal: Conduct Type 1 BOT terminal attack control with FW aircraft in a low threat environment on a marked or unmarked target.

Criteria: Given a tactical scenario, control a FW aircraft in a low threat environment. Indirect fire marking rounds should be used. Two successful Type 1 BOT terminal attack controls recommended for completion.

Performance Standards: Using doctrinal control procedures and the CAS execution template successfully coordinate and control a FW aircraft on a marked or unmarked target. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line / remarks / restrictions).
- Receive aircraft readbacks.
- Conduct correlation (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute procedural control of aircraft to provide safe separation of aircraft and fires.
- Execute target talk-on or mark for CAS assets.
- Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

Prerequisite: Class room academics and simulation (if available).

Ordinance: Free fall bombs or gun (High Explosive (HE) or inert preferred). Two indirect fire marking rounds (White Phosphorous (WP), Red Phosphorus (RP), or Illumination).

External Syllabus Support: One firing unit of artillery or mortars (may be notional). One (two preferred) FW aircraft.

B. Type 2 BOT or BOC, FW aircraft, Laser mark or designation, Day or Night CAS Control

Goal: Conduct Type 2 terminal attack control with FW aircraft in a low threat environment on a Laser marked (BOT) or designated (BOC) target.

Criteria: Given a simple tactical scenario, control a FW aircraft in a low threat environment. Laser mark or designation shall be utilized. One successful Type 2 BOT or BOC terminal attack control recommended for completion.

Performance Standards: Using doctrinal control procedures, CAS execution template and Laser CAS brevity terms, successfully coordinate FW aircraft control on a Laser marked or designated target. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line / remarks / restrictions).
- Receive aircraft readbacks.
- Conduct correlation – BOT only (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute procedural control of aircraft to provide safe separation of aircraft.
- Execute Laser target mark and or weapon terminal guidance for CAS assets.*
- Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

* Intent is to utilize laser equipment and laser terminology during a simulated, dry, or live terminal attack control.

Prerequisite: Class room academics and simulation (if available). CAS Control A.

Ordnance: One laser guided training round or laser guided bomb desired.

External Syllabus Support: Laser and operator. One (two preferred) laser spot tracker capable equipped FW aircraft desired.

C. Type 2 BOT, FW or RW Aircraft, IR Pointer Mark, Night CAS Control

Goal: Conduct Type 2 BOT terminal attack control with FW or RW aircraft in a low threat environment at night utilizing IR pointer and night vision devices (NVDs).

Criteria: Given a tactical scenario, control a FW or RW aircraft in a low threat environment at night while utilizing IR pointer to mark the target and NVDs. One successful Type 2 BOT terminal attack control recommended for completion.

Performance Standards: Using doctrinal control procedures, CAS execution template and Night IR CAS brevity terms, successfully coordinate and control attacks from CAS platforms on a target marked by an infrared pointer at night. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line or 5-line / remarks / restrictions).
- Receive aircraft readbacks.
- Conduct correlation (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute procedural control of aircraft at night to provide safe separation of aircraft and fires.
- Execute IR pointer target mark for CAS assets.
- Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

Prerequisite: Class room academics and simulation (if available). CAS Control A and B.

Ordinance: Free fall bombs, gun, or rockets (HE or inert preferred).

External Syllabus Support: One IR pointer. One (two preferred) NVD capable FW or RW aircraft.

D. Type 2 BOT or BOC, FW or RW Aircraft, Remote Observer, Day CAS Control

Goal: Conduct Type 2 BOT or BOC terminal attack control in a low threat environment on a marked target utilizing a remote observer support.

Criteria: Given a tactical scenario, control a FW or RW aircraft in a low threat environment on a surface target. Remote observer should be used to provide an indirect fire or LTD mark. The remote observer/LTD could also be used for weapons guidance. One successful Type 2 BOT or BOC terminal attack control recommended for completion.

Performance Standards: Using doctrinal control procedures and CAS execution template, successfully coordinate and control a FW or RW aircraft on a marked target. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line or 5-line / remarks / restrictions).
- Receive aircraft readbacks.
- Provide target description/talk-on and conduct (BOT only) correlation via the Remote Observer.
- Execute procedural control of aircraft to provide safe separation of aircraft and fires.
- Execute the attack utilizing the remote observer to provide a target description, talk-on, mark, or weapon guidance as appropriate. Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

Prerequisite: Class room academics and simulation (if available). CAS Control C.

Ordinance: Free fall bombs or laser guided training round or laser guided bomb desired.

(HE or inert preferred). Two indirect fire marking rounds (WP, RP, or Illumination).

External Syllabus Support: One firing unit of artillery and/or mortars (may be notional). Remote Observer with a LTD. One (two preferred) FW aircraft.

E. Type 1 BOT, FW Aircraft, Day CAS Control

Goal: Conduct Type 1 BOT terminal attack control in a medium to high threat environment while employing SEAD fires.

Criteria: Given a scenario, control a FW aircraft in a medium to high threat environment on a marked target. Coordinate SEAD and mark with a surface indirect fire asset. One Type 1 BOT terminal attack control recommended for completion.

Performance Standards: Using doctrinal control procedures and CAS execution template, successfully coordinate and control a FW aircraft on an IDF marked target while employing SEAD. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line / remarks / restrictions)*.
- Receive aircraft readbacks.
- Conduct correlation (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute procedural control of aircraft to provide safe separation of aircraft and fires.
- Provide SEAD assessment.
- Execute target talk-on or mark for CAS assets.
- Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

*Control must use entire 9-line (e.g. IP to TGT).

Prerequisite: Class room academics and simulation (if available). CAS Control A, and B.

Ordinance: Free fall bombs (HE or inert preferred). Two indirect fire marking rounds (WP, RP, or Illum) and 5 HE suppression rounds.

External Syllabus Support: One firing unit of artillery and/or mortars (may be notional). One (Two preferred) FW aircraft.

F. Type 3 BOT, FW and RW Aircraft, Coordinated Attack, Day CAS Controls

Goal: Conduct a Type 3 BOT coordinated attack terminal attack control with FW and RW (or additional FW) aircraft in a low threat environment on a marked or unmarked target.

Criteria: Given a tactical scenario, control a FW and RW (or additional FW) aircraft in a low threat environment. Indirect fire marking rounds should be used. Two successful Type 3 BOT terminal attack controls required for completion.

Performance Standards: Using doctrinal control procedures and CAS execution template, successfully coordinate and control a FW and RW (or additional FW) aircraft on an IDF marked or unmarked target as required by the scenario. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line or 5-line / remarks / restrictions).
- Receive aircraft readbacks.
- Conduct correlation (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute coordinated types of attack (Combined and Sectored (Simultaneous/Sequential))
- Execute procedural control of aircraft to provide safe separation of aircraft and fires.
- Execute target talk-on or mark for CAS assets.
- Provide “CLEARED TO ENGAGE, or “TYPE 3, CONTINUE DRY” or “ABORT” to both sets of aircraft.
- Receive “COMMENCING ENGAGEMENT” from both sets of aircraft.
- Receive “ENGAGEMENT COMPLETE” from both sets of aircraft.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

Prerequisite: Class room academics and simulation (if available). CAS Control A, and B.

Ordinance: Free fall bombs, gun, or precision guided munitions. (HE or inert preferred). Two indirect fire marking rounds (WP, RP, or Illumination).

External Syllabus Support: One firing unit of artillery or mortars and ground maneuver unit (may be notional). One FW and one RW aircraft (two FW and RW aircraft preferred).

G. Type 1 BOT, FW or RW Aircraft with FAC(A) support, Day CAS Control

Goal: Conduct a Type 1 BOT terminal attack control with FW or RW aircraft in a low threat environment with FAC(A) support on a marked or unmarked target.

Criteria: Given a tactical scenario (Airborne, Heliborne, Mechanize or Amphibious Assault), control a FW or RW aircraft in a low threat environment with FAC(A) support. Indirect fire or FAC(A) mark should be used. One successful Type 1 BOT terminal attack control recommended for completion.

Performance Standards: Using doctrinal control procedures and CAS execution template, successfully coordinate and control a FW or RW aircraft with FAC(A) support on a marked or unmarked target as required by the scenario. Procedures must include:

- Provide Routing / Safety of flight.
- Receive FAC(A) check-in brief.
- Provide situation update to FAC(A).
- Provide game plan (Type of control and method of attack) to FAC(A) to include Brief, Stack, Mark, and Control.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line or 5-line / remarks / restrictions).
- Receive aircraft readbacks.
- Conduct correlation (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute procedural control of aircraft with support of a FAC(A) to provide safe separation of aircraft and fires.
- Provide target talk-on or mark for CAS assets with support of a FAC(A).
- Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

Prerequisite: Class room academics and simulation (if available). CAS Control 01.

Ordinance: Free fall bombs or Gun (HE or inert preferred). Two indirect fire marking rounds (WP, RP, or Illumination) or two 2.75 in. rocket marking rounds (WP or RP).

External Syllabus Support: One firing unit of artillery or mortars (may be notional) and ground maneuver unit. One FW and one FAC(A) aircraft (two FW preferred, ground maneuver unit and FAC(A) may be notional).

H. Type 2 BOT, FW or RW Aircraft, Urban Terrain, Day CAS Control

Goal: Conduct a Type 2 BOT terminal attack control in urban terrain with FW or RW aircraft in a low threat environment on a marked or unmarked target.

Criteria: Given a scenario, control a FW or RW aircraft in a low threat urban terrain. Gridded Reference Graphic (GRG) and or indirect fire marking rounds can be used. One Type 2 BOT terminal attack control required for completion.

Performance Standards: Using doctrinal control procedures and CAS execution template, successfully coordinate and control a FW or RW aircraft in urban terrain on a marked or unmarked target as required by the tactical scenario. Procedures must include:

- Provide Routing / Safety of flight.
- Receive aircraft check-in brief.
- Provide situation update to CAS aircraft.
- Provide game plan (Type of control and method of attack).
- Provide CAS Brief (9-line or 5-line / remarks / restrictions).
- Receive aircraft readbacks.
- Conduct correlation (Confirmation the attacking aircraft has acquired the correct target or mark).
- Execute procedural control of aircraft to provide safe separation of aircraft and fires.
- Execute target talk-on or mark for CAS assets.
- Provide “CLEARED HOT”, “CONTINUE DRY” or “ABORT”.
- Assess effects.
- Conduct BDA.
- Provide Routing / Safety of flight.

Prerequisite: Class room academics and simulation (if available). CAS Control A

Ordinance: Free fall bombs, Gun or rockets (HE or inert preferred). Two indirect fire marking rounds (WP, RP, or Illumination).

External Syllabus Support: One firing unit of artillery or mortars and ground maneuver unit (may be notional). One FW or RW aircraft (two preferred).

APPENDIX A
Enclosure 2: Joint Terminal Attack Controller (JTAC) CAS Log

JOINT TERMINAL ATTACK CONTROL (JTAC) MISSION LOG FOR JOHN Q. PUBLIC								
DATE	RANGE / SIM NAME & LOCATION	NUMBER & A/C TYPE	TYPE OF ORDNANCE	NUMBER OF CONTROLS	*9-LINE/TYPE OF CONTROL/MOA/T HREAT/MARK/DA Y/NIGHT/SIM/OTH ER (Specify)	CONTROLLER SIGNATURE	SUPERVISOR INITIALS	REMARKS
02 Feb 2017	Coleman, Ft Bragg, NC	2xA-10	30mm, Mk82	2	9L/1/T/L/IR/N			
28 Feb 2017	Manchester Ft Bragg NC	2xF-16	Dry	4	2/C/L/NA/TO/D			Talk-on from the overhead
10 Mar 2017	Shoal Creek, Ft Hood TX	2xA-10	BDU-33	2	1/T/L/VDL/D			From the overhead
22 Mar 2017	Coleman, Ft Bragg, NC	1xA-10	AGM-65B	1	9L/2/C/MH/LD/N			
28 Mar 2017	Noble Pass, 29 Palms, CA	2xAH-1	20mm, 2.75 inch rkt	2	9L/3/T/L/WP, IF/D/RO			

*Column 6 should be completed in the following order:

9-Line = 9L

Type of Control: Type 1 = 1, Type 2 = 2, Type 3 = 3

Method of Attack: BOT = T, BOC = C

Threat: Low = L, Med to High = MH

Mark: Laser Designation (laser mark or terminal guidance) = LD, IR = IR, White Phosphorous = WP, Red Phosphorous = RP, Illume = IL, Indirect Fire or Artillery = IF, No Mark = NA, Direct Fire = DF, Video Downlink = VDL, Talk On = TO

Day: = D and **Night**: = N

Supporting Element: Digitally Aided = DA, Forward Air Controller (Airborne) = FAC(A), Remote Observer = RO

Simulated Terminal Attack Control = SIM (Sim name (type) will be annotated in column 2, RANGE/SIM NAME & LOCATION); Other = O (Specify Service, USSOCOM, or Partner Nation training requirement).

Examples:

2 Feb 2017 – 9-line, Type 1, BOT, Low Threat, IR pointer, Night.

28 Feb 2017 – Type 2, BOC, Low Threat, No Mark, Talk On, Day from the overhead.

10 Mar 2017 – Type 1, BOT, Low Threat, Video Downlink, Day from the overhead.

22 Mar 2017 – 9-line, Type 2, BOC, Medium to High Threat, Laser Designation, Day.

28 Mar 2017 – 9-line, Type 3, BOT, Low Threat, White Phosphorous Arty, Day, Remote Observer.

APPENDIX A

Enclosure 3: JTAC Evaluation Form, And Evaluation Criteria

TERMINAL ATTACK CONTROL EVALUATION									
Part I – Personal Data									
Name (Last, First, MI)			Unit		Overall Qualification				
					<input type="checkbox"/> JTAC <input type="checkbox"/> JTAC-I <input type="checkbox"/> JTAC-E				
Part II – Evaluation Data									
Evaluation Location			Evaluation Date		Evaluation Type				
					<input type="checkbox"/> JTAC <input type="checkbox"/> JTAC-I <input type="checkbox"/> JTAC-E				
Qualification Date		Type	Category			Notification			
		<input type="checkbox"/> Initial <input type="checkbox"/> Recurring	<input type="checkbox"/> Regular <input type="checkbox"/> Spot <input type="checkbox"/> Concurrent			<input type="checkbox"/> Prior Notice <input type="checkbox"/> No Notice			
Part III – Evaluation									
A. Event Description:									
B. Evaluation Tasks and Grades:									
Task		Grade			Task		Grade		
		Q	Q-	U			Q	Q-	U
1.	Mission Planning				23.	Inertially Aided Munitions Operations			
2.	Equipment Preparation				24.	Night CAS Operations			
3.	Comm Equipment Ops				25.	Safety			
4.	GPS Operations				26.	JTAC-I Eval Criteria			
5.	Transmit/Receive Procedures				26.1	Equipment Preparation			
5.1.	Authentication Procedures				26.2	Lesson Overview Objectives			
6.	CAS Request Submission				26.3	Instruction Effectiveness			
7.	Target Analysis				26.4	Procedures – Technique			
8.	Threat Analysis				26.5	Training Aids			
9.	Ground Force Staff Coord				26.6	Knowledge of Subject			
10.	Ground Commander Coord				26.7	Communication			
11.	Fires/Airspace Mngt				26.8	Time Management			
12.	Airspace Management				26.9	Live CAS Instruction			
13.	Use of Signaling Devices				26.10	Admin Grade/Document			
14.	JTAC to CAS aircraft brief				26.11	Safety			
14.1	Digitally aided CAS systems				27.	JTAC-E Eval Criteria			
15.	Weapons Utilization				27.1	Compliance w Manuals			
16.	CAS Aircraft Control				27.2	Evaluation Briefing			
17.	Ordnance Adjustment				27.3	Discrepancies and Grades			
18.	Post Attack Assessment				27.4	Performance Assessment			
19.	Area Procedures				27.5	Assignment of Add Trng			
20.	FAC(A)/JFO/RO Interface				27.6	Mission Debrief			
21.	Laser Operations				27.7	Supervisor Debrief			
22.	IR Pointer				27.8	Completed Eval Documentation			
C. Items Requiring Additional Training:									
Training Due Date:					Training Completion Date:				

Part IV – Remarks					
JTAC-E Name and Rank		JTAC-E Signature		Evaluation Grade	
				Q Q- U	
Part V – Certification					
Billet	Name and Rank	Concur	Do Not Concur	Signature	Date
Program Manager					
Commanding Officer					

JTAC, JTAC-I, and JTAC-E Evaluation Criteria

	Q	Q-	U
AREA 1. Mission Planning.	Checked all factors applicable to mission (i.e. ATO, weather, timing, frequencies, map datum, range procedures, call signs, airspace and special requirements). Aware of alternatives if mission cannot be completed as planned.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Major error of omission/commission precluded mission accomplishment or unnecessarily endangered personnel or equipment.
AREA 2. Equipment Preparation.	All equipment needed for mission accomplishment properly prepared and inspected. Unsatisfactory items identified and appropriate corrective actions taken.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Major error of omission or commission precluded mission accomplishment or unnecessarily endangered personnel or equipment.
AREA 3. Communications Equipment Operations.	Able to operate all required communications equipment secure and non-secure necessary for requesting, coordinating and controlling CAS missions.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Major errors that precluded mission accomplishment or unnecessarily endangered personnel or equipment.
AREA 4. Global Positioning System Operations.	Successfully turned on, initialized and performed operator checks. Able to determine individual location using MGRS and Latitude/longitude in seconds and decimal minutes. Able to determine distant location using slant range calculations from a known point to an unknown point. Properly loaded waypoints. Able to properly load encryption fill. Able to configure GPS to proper map datum/ ellipsoid and	Minor errors of omission/commission that did not detract from mission effectiveness or safety. Need for study in some areas is indicated.	Unsuccessfully turned on, initialized and/or operated GPS. Unable to determine individual location using MGRS and Latitude/ longitude in seconds and decimal minutes. Unable to determine distant location using slant range calculations from known point to an unknown point. Unable to properly load waypoints. Unable to properly load encryption fill. Unable to configure GPS to proper map

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	Q	Q-	U
	convert coordinates between map datums. Demonstrates complete knowledge of battery fault conditions/ procedures.		datum/ ellipsoid or unable to convert coordinates between map datums. Unable to explain battery fault conditions or procedures.
AREA 5. Transmit / Receive Procedures.	Communications clear, concise, and understandable. Promoted mission effectiveness.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Deviation from acceptable communications procedures impaired mission effectiveness.
AREA 5.1 Authentication Procedures	Successfully authenticated CAS aircraft IAW pre-coordinated methods.	Successfully authenticated CAS aircraft, with minor errors, timely fixed by JTAC	JTAC failed, or was unable to authenticate CAS aircraft due to insufficient pre-mission coordination.
AREA 6. CAS Request Submission.	Demonstrated in-depth knowledge of CAS request procedures. Submitted the request in a timely, thorough, and effective manner.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Unfamiliar with CAS request procedures. Unable to properly or effectively compile, prepare, and transmit CAS requests.
AREA 7. Target Analysis.	Analyzed target for CAS employment procedures (i.e. ID, description, location, suitability, and collateral damage,).	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Could not recommend appropriate CAS employment procedures for the target. Errors that precluded mission accomplishment or unnecessarily endangered personnel or equipment.
AREA 8. Threat Analysis.	Recognized ground to air threats capable of engaging CAS aircraft. Plan mitigated threat to the survivability of the aircraft.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Failed to recognize ground to air threats capable of engaging CAS aircraft. Plan did not mitigate threat to the survivability of the aircraft.

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AREA 9. Ground Force Staff Coordination.	Demonstrated timely coordination procedures with appropriate ground force staff agencies (i.e. S-2, S-3, FSE, NSFS, ADA, Aviation LNOs, etc.).	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Coordination with appropriate agencies not completed before attack commenced. Delays caused by untimely coordination degraded or prevented successful mission accomplishment.
AREA 10. Ground Commander Coordination.	Demonstrated timely coordination with ground commander or designated representative. Accurately explained to the ground commander CAS mission data and dangers to friendly forces. Understood ground commander's scheme of maneuver. Requested timely ground commander attack clearance.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Did not adequately coordinate with ground commander/designated representative. Provided inaccurate data regarding CAS mission data/dangers to friendly forces. The information provided or not provided impacted mission effectiveness or exposed friendly forces to hazards. Did not request or receive ground commander attack clearance prior to weapons release.
AREA 11. Fire Support and Airspace Management.	Demonstrated timely coordination for fire support (i.e. SEAD). Recognized and deconflicted attack aircraft with formal or informal airspace coordination measures.	Slow to coordinate fire support. Recognized but Did not deconflict attack aircraft with formal or informal airspace control measures. Did not impact mission or aircraft survivability.	Did not coordinate fire support. Did not recognize or deconflict attack aircraft with formal and informal airspace control measures.
AREA 12. Airspace Management.	Integrate attack aircraft with formal or informal airspace coordination measures.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Did not recognize or integrate attack aircraft with formal and informal airspace control measures.

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AREA 13. Use of Signaling Devices.	Thorough working knowledge of signaling devices day/night. Selected most appropriate device for tactical situation. Enhanced mission effectiveness.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Not familiar with signaling devices. Use of signaling device inappropriate to tactical situation.
AREA 14. JTAC to CAS Aircraft Briefing.	Provided the attack aircraft, via voice or data transmission, with a complete, concise, and effective briefing with enhanced mission effectiveness i.e., CAS 9-line or theater specific briefing, and mission check-in.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Briefing compromised safety or mission effectiveness due to erroneous information or errors of omission/commission. Tactics briefed inappropriate to situation and precluded effective mission completion and jeopardized survivability.
AREA 14.1 Digitally aided CAS systems. *Note – Services, USSOCOM/Partner Nations without fielded digital CAS systems are exempt until such fielding occurs.	Thoroughly understood and utilized digital systems to aid the Fires delivery process. Able to generate target coordinates, receive on station report, send 9-line, track A/C, send BDA, conduct CFF and integrate applicable FSCMs, ACMs and closest friendly position on equipment display.	Minor deficiencies observed, did not preclude mission success. Equipment was utilized to some level.	Failed to understand and/or utilize Digitally Aided CAS/Fires equipment in any capacity.

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	Q	Q-	U
AREA 15. Attack Weapons Utilization.	<p>Demonstrated thorough knowledge of weapons characteristics, capabilities, and effects. Used weapons most suitable to target. Employed weapons in the correct manner.</p> <p>Considered aircraft and ground forces survivability. Delivery sequence of ordnance enhanced mission effectiveness. Understood risk-estimate distances.</p>	<p>Minor errors of omission/commission that did not detract from mission effectiveness.</p> <p>Need for study in some areas is indicated.</p>	<p>Discrepancies in knowledge and/or employment with impact on mission effectiveness. Did not understand risk-estimate distances, and exposed friendly forces to unacceptable risk. Failed to achieve desired results (due to JTAC's action/inaction).</p> <p>Mission resulted in unwanted collateral damage.</p>
AREA 16. CAS Aircraft Control.	<p>Exercised thorough situational awareness and control of assigned aircraft throughout mission. Clearance or aborts issued in a positive and timely manner. Reestablished abort code after aborting an attack.</p>	<p>Minor errors of omission/commission that did not detract from mission effectiveness.</p> <p>Need for study in some areas is indicated.</p>	<p>Control instructions were not timely, clear, and accurate or were unsafe. Loss of situational awareness or actions resulted in either degraded or ineffective mission.</p>
AREA 17. Ordnance Adjustment.	<p>Ordnance adjust instructions were clear, concise, and timely. All attack restrictions placed on attack aircraft were appropriate and necessary.</p>	<p>Minor errors of omission/commission that did not detract from mission effectiveness.</p> <p>Need for study in some areas is indicated.</p>	<p>Adjustment instructions were not timely, clear, and accurate or were unsafe. Actions resulted in either degraded or ineffective mission.</p>
AREA 18. Post Attack Assessment.	<p>Battle damage assessment was realistic, accurate, and timely. Attack flight and appropriate agencies were provided a concise report in accordance with governing directives.</p>	<p>Minor errors of omission/commission that did not detract from mission effectiveness.</p> <p>Need for study in some areas is indicated.</p>	<p>Unrealistic. Reports contained major errors or omissions. Reports were not timely.</p>

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AREA 19. Area Procedures.	Complied with all area procedures, range/MOA safety requirements and restrictions. Knowledgeable of emergency procedures (i.e. hung bombs, off range release, fire on range, MEDEVAC, etc.). Ensured aircraft briefed on applicable restrictions.	Minor errors of omission/commission that did not detract from mission effectiveness. Need for study in some areas is indicated.	Violated range procedures. Was not knowledgeable of range requirements. Incomplete knowledge of emergency procedures. Gave incomplete restrictions to fighters.
AREA 20. FAC(A)/JFO/ RO Interface.	Successfully functioned as an air-ground interface to achieve mission effectiveness.	Minor errors of omission/commission that did not detract from mission effectiveness. Requires additional training as indicated.	Failed to provide effective interface between FAC(A)/JFO/RO required to achieve mission effectiveness.
AREA 21. Laser Operations.	Readily understood laser procedures (target distance, safety zone, etc.) from an effective location, using proper LTD code, terminology and timely coordination.	Minor errors of omission/commission that did not detract from mission effectiveness or safety. Need for study in some areas is indicated.	Actions caused unsafe terminal environment or deficiencies noted precluded mission success.
AREA 22. IR Pointer Operations.	Readily understood and utilized IR Pointer procedures from an effective location, using proper IR Pointer terminology and timely coordination.	Minor errors of omission/commission that did not detract from mission effectiveness or safety. Need for study in some areas is indicated.	Actions caused unsafe terminal environment or deficiencies noted precluded mission success.
AREA 23. Inertial Aided Munitions Operations.	Readily understood inertial aided munitions procedures (coordinate format, coordinate reliability, target elevation, final attack clearance, and final attack headings/angle).	Minor errors of omission/commission that did not detract from mission effectiveness or safety. Need for study in some areas is indicated.	Actions caused unsafe terminal environment or deficiencies noted precluded mission success.
AREA 24. Night CAS Operations.	Readily understood night CAS procedures and tactics that enhanced mission effectiveness.	Minor errors of omission/commission that did not detract from mission effectiveness or	Actions caused unsafe terminal environment or deficiencies noted precluded mission success.

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		safety. Need for study in some areas is indicated.	
AREA 25. Safety. (CRITICAL)	Employed all available methods to ensure safety of flight and ground personnel. Analyzed emergency situations and implemented emergency procedures. Used equipment, to include signaling devices, laser target designators and IR marking devices, in a safe manner.		Any dangerous act. Disregarded safety procedures. Did not use equipment in a safe manner. Did not comply with safety requirements.

JTAC-Instructor Evaluation Criteria

AREA 26. Use the following grading area to conduct the recurring JTAC-I Evaluations.			
AREA 26.1. Equipment Preparation.	All equipment needed for mission accomplishment properly prepared and inspected. Unsatisfactory items identified and corrective actions taken.	Minor errors did not detract from mission / training effectiveness.	Major error precluded mission accomplishment or unnecessarily endangered personnel or equipment.
AREA 26.2. Lesson Overview with Statement of Objectives	Thoroughly briefed the lesson overview and clearly stated the objective.	Minor errors did not detract from mission / training effectiveness.	Major omissions precluded mission / training success.
AREA 26.3. Instruction Effectiveness	Assured student understood material and relationship to job performance	Minor errors did not detract from mission / training effectiveness.	Instruction was ineffective, precluded mission / training success.
AREA 26.4 Identified Procedures vs. Technique.	Thoroughly explained instructions as procedures and technical methods as techniques.	Minor errors did not detract from mission / training effectiveness.	Confused procedures with techniques, precluded mission / training success.
AREA 26.5 Training Aids	Training aids were used in a manner that enhanced the training outcome.	Minor errors did not detract from mission / training effectiveness.	Training aids were omitted, precluded mission / training success.
AREA 26.6 Knowledge of Subject Matter	Demonstrated thorough knowledge of the subject matter and used examples to clarify / enhance subject areas.	Minor errors did not detract from mission / training effectiveness.	Lack of knowledge or could not provide examples, precluded mission / training success
AREA 26.7 Communication	Communications clear, concise, and understandable. Promoted effective training.	Minor errors did not detract from mission / training effectiveness.	Unacceptable communications impaired mission / training effectiveness.
AREA 26.8 Time Management.	Effectively managed time to ensure all objectives were covered.	Minor errors did not detract from mission / training effectiveness.	Did not cover all objectives or manage time wisely.
AREA 26.9 Live or Dry CAS Control Instruction.	Provided proper instruction and feedback throughout the live-fly CAS mission.	Minor errors did not detract from mission / training effectiveness.	Improper CAS instruction and incorrect feedback precluded mission effectiveness.
AREA 26.10 Administered Student Grade & Documentation	Assigned proper grade and completed training documentation correctly.	Minor errors did not detract from mission / training effectiveness.	Failed to assign proper grade when appropriate. Unable to complete training documentation correctly.
AREA 26.11. Safety. (CRITICAL)	Employed all available methods to ensure safety of flight and ground personnel. Used equipment, to include signaling devices, laser target designators and IR marking devices, in a safe manner.		Any dangerous act. Disregarded safety procedures. Did not use equipment in a safe manner. Did not comply with safety requirements.

JTAC-Evaluator Evaluation Criteria

AREA 27. Use the following grading criteria when conducting both the initial and the recurring JTAC-E Evaluations.			
AREA 27.1. Compliance with Pertinent Manuals.	Complies with all manuals pertaining to the administration of a JTAC evaluation.	Complied with most manuals. Deviations did not jeopardize the effectiveness of the evaluation or safety.	Failed to comply with manuals or allowed safety to be jeopardized.
AREA 27.2. Evaluation Briefing.	Thoroughly briefed the examinee on the conduct of the evaluation.	Omitted items during the briefing causing minor confusion. Did not fully brief the examinee as to the conduct and purpose of the evaluation.	Failed to adequately brief the examinee.
AREA 27.3. Identification of Discrepancies and Assignment of Area Grades.	Identified all discrepancies and assigned proper area grade.	Most discrepancies were identified. Failed to assign Q- grade when appropriate. Assigned discrepancies for performance that was within standards.	Failed to identify discrepancies related to discipline or deviations that merited an unqualified grade. Assigned Q- grades that should have been U or assigned U grades for performance within standards.
AREA 27.4. Assessment of Overall Performance.	Awarded the appropriate overall grade based on the examinee's performance.	Awarded an overall grade without consideration of cumulative deviations in the examinee's performance.	Did not award a grade commensurate with overall performance.
AREA 27.5. Appropriate Assignment of Additional Training.	Assigned proper additional training if warranted.	Additional training assigned was insufficient to ensure the examinee would achieve proper level of qualification.	Failed to assign additional training when warranted.
AREA 27.6. Mission Debrief.	Thoroughly debriefed the examinee on all aspects of the evaluation.	Failed to discuss all deviations and assigned grades. Did not advise the examinee of additional training, if required.	Did not discuss any assigned area grades or overall rating. Changed grades without briefing the examinee.
AREA 27.7. Briefing the Supervisor on the Evaluation.	Thoroughly debriefed the examinee's supervisor.	Debriefed supervisor, but failed to discuss all discrepancies, grades, or additional training.	Failed to debrief the examinee's supervisor on an unsatisfactory evaluation.
AREA 27.8. Completed Evaluation Documentation	Correctly completed all documentation required in accordance with manuals	Completed documentation with minor errors.	Failed to properly document evaluation in accordance with manuals.

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APPENDIX A

Enclosure 4: Example JTAC Instructor/Evaluator Waiver (Experience)

Date

From: Commanding Officer (O-6/OF-5), (Organization)
To: Commander, (Schoolhouse)
Info: Chairman, Joint Fire Support Executive Steering Committee

Subj: WAIVER OF JFS ESC AP MOA 2004-001 JTAC INSTRUCTOR/EVALUATOR
PREREQUISITE MINIMUM OF ONE YEAR OF EXPERIENCE AS A QUALIFIED JTAC
(Name of instructor)

1. Waiver of the JFS ESC JFS ESC AP MOA 2004-01 JTAC Instructor/Evaluator prerequisite of one year of experience as a qualified JTAC per paragraph 5.3.1.1. for (Name of candidate) based on this individual satisfying the intent of the prerequisite through the following criteria:
 - a. Combat experience (months): XXX
 - b. Operational exposure (months): XXX
 - c. Mission ready fire support exposure (months): XXX
2. (Name of candidate) aptitude, combat experience, and thorough knowledge of CAS procedures satisfy the intent of one year of experience as a qualified JTAC per the JFS ESC AP MOA 2004-01.
3. Specific questions regarding this waiver can be addressed directly to (Name and contact information).

(Signature)

APPENDIX A
Enclosure 5: Example JTAC Instructor Waiver (FAC(A) Experience)

Date

From: Commanding Officer (O-6/OF-5), (Organization)
To: Commander, (Schoolhouse)
Info: Chairman, Joint Fire Support Executive Steering Committee

Subj: WAIVER OF JFS ESC AP MOA 2004-001 JTAC INSTRUCTOR/EVALUATOR
PREREQUISITE MINIMUM OF ONE YEAR OF EXPERIENCE AS A QUALIFIED FAC(A)
(Name of instructor)

1. Waiver of the JFS ESC AP MOA 2004-01 JTAC Instructor prerequisite of one year of experience as a qualified FAC(A) per paragraph 5.3.1.1. for (Name of candidate) based on this individual satisfying the intent of the FAC(A) prerequisite through the following criteria:
 - a. Aircraft type flight hours: XXX
 - b. Combat flight hours: XX.X
 - c. Combat sorties: XX
 - d. CAS training sorties: XX
2. XX month combat deployment
3. (Name of candidate) quality flight time, combat experience, and thorough knowledge of CAS procedures satisfy the intent of the one year of operational experience as a qualified FAC(A) per the JFS ESC AP MOA 2004-01.
4. Specific questions regarding this waiver can be addressed directly to (Name and contact information).

(Signature)

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APPENDIX A

Enclosure 6: Example JTAC Student Academic Completion Letter

Date

MEMORANDUM FOR RECORD

From: Commander, (Schoolhouse)
To: Student Name, (Organization)

Subj: JTAC ACADEMIC COMPLETION/DEFICIENCY LETTER

Ref: (a) JFS ESC AP MOA 2004-01 JTAC (1 Dec 2017)
(b) National JTAC/FAC Regulation

Encl: (1) JTAC Course Academic Completion List

1. Student Name successfully completed the Academic phase of Joint Terminal Attack Controller Course (number) in accordance with refs (a) and (b). During this training he completed JTAC academics with an average of XX%. Student Name did or did not complete all required certification training. Student Name did not complete the following certification training tasks per paragraph 5.3.4.1.
2. Any questions can be addressed to (Schoolhouse) staff at (Phone Number).

(Signature)

Appendix B: JTAC Training Standardization

B.1. Purpose. This appendix addresses issues related to JTAC training standardization. In particular, it provides definitions associated with the standardization process and describes JTAC Schoolhouse/Program Accreditation, the JTAC Standardization Process, and JTAC Standardization Team Guidance. It also provides a Standardization Team Checklist (Appendix B, Enclosure 2), Sample Final Report (Appendix B, Enclosure 6), and a Joint Terminal Attack Control (JTAC) Operational Unit Checklist (Appendix B, Enclosure 7).

B.2. Background. The JFS ESC Action Plan established a requirement to institutionalize methods and metrics to standardize JTAC certification and qualification training programs, provide a vehicle for monitoring and evaluating the state of signatory JTAC training programs, and provide periodic updates and feedback to the JFS ESC.

B.3. Approach. This appendix describes JTAC training program accreditation review procedures and establishes a methodology for maintaining standardization through the JTAC Standardization Team. The curricula of JTAC accredited schoolhouses are expected to incorporate the JTAC Joint Mission Task List (JMTL) outlined in this MOA. To ensure the JMTL is being properly incorporated into the schoolhouse curriculum, JTAC MOA Signatories agree that a JS DDC5I, Joint Fires Division (JFD)-led standardization team will conduct an initial accreditation and triennial course review of each JTAC schoolhouse/program utilizing the JTAC Standardization Team Checklist (Appendix B, Enclosure 2). In addition to the triennial course review, JS DD C5I JFD will conduct a review of the entire certification process of a multi-phase program in conjunction with the schoolhouse accreditation review. Services, USSOCOM, and Partner Nations will continuously monitor and evaluate units with JTACs IAW regulations and directives. In order to support that effort at the operational unit, a Joint Terminal Attack Control (JTAC) Operational Unit Checklist is included (Appendix B, Enclosure 7).

B.4. JTAC Standardization Process

The intent of the standardization process is to:

- Ensure that JTAC mission tasks are being adhered to.
- Expose instructors from each schoolhouse to other schoolhouses.
- Provide continuity in the JTAC training process.
- Enhance Joint/Multinational collaboration and standardization as CAS doctrine, tactics, techniques, and procedures evolve.

Ultimately, the JTAC standardization process will ensure JTACs are trained to a common standard throughout the Department of Defense and participating Partner Nations.

B.4.1. JTAC Standardization Team. A team of individuals, led by JS DD C5I JFD and formed at the direction of the JFS ESC, responsible for conducting initial accreditation and triennial reviews of schoolhouses/programs and implementing the standardization process outlined in this MOA.

B.4.1.1. Standardization Team Composition. The team may consist of the following individuals for initial accreditation and triennial reviews:

- JS DD C5I JFD CAS SME (Active Duty or DOD Civilian) (Team Lead)

- USMC
- USAF
- USN
- USA
- USSOCOM
- Partner Nation Representative*

Standardization Team size for reviews can be a minimum of three members, but Services, USSOCOM, and Partner Nations reserve the right to send a member to each review.

NOTE: *Visit requests for Partner Nation personnel participating in JTAC Standardization Team reviews at U.S./DOD JTAC schoolhouses will be processed in accordance with DOD Directive 5230.20, CJCS Instruction 2212.01C, and applicable Service directives governing foreign visits

B.4.1.2. JS DD C5I JFD, each Service, USSOCOM, and Partner Nations may provide one additional non-voting advisory member to the team. JTAC MOA Signatories agree that the team shall perform a course review and assessment of each accredited JTAC schoolhouse, initial accreditation of new JTAC schoolhouses, and will remain formed for the duration of the assessment. Accreditation recommendation will be determined by simple majority. JS DD C5I JFD lead will release the team once all associated tasks are complete, and will ensure duration of team assignment has minimal impact.

B.4.2. JTAC Course Standardization Checklist (Appendix B, Enclosure 2): Form used by the JTAC Standardization Team to assess compliance with JTAC joint mission task list when visiting a schoolhouse.

B.4.3. JTAC Schoolhouse Accreditation: Should a Service, USSOCOM, or Partner Nation determine a requirement for creating an additional JTAC schoolhouse or receive accreditation of an established schoolhouse, JFS ESC will form and direct a JTAC standardization team to conduct a full course review. For accreditation, the JTAC standardization team will:

B.4.3.1. Attend the course and evaluate the curriculum, course of instruction, simulation and practical exercises to include dry and live range events. Organizations which have a multi-phase program will have their entire certification process reviewed in conjunction with the schoolhouse.

B.4.3.2. Ensure JTAC MOA compliance.

B.4.3.3. Verify that the curriculum addresses identified MOA-defined JTAC Joint Mission Tasks (Duty Areas).

B.4.3.4. Upon completion of this review, the team will forward recommendation to JFS ESC for either accreditation or non-accreditation.

B.4.3.4.1 Accreditation with discrepancies will contain recommended actions to correct discrepancies and a projected timeline to provide documentation clearing all discrepancies. Course may continue to operate and train JTAC students, but if discrepancies are not cleared within timeline the accreditation will be removed along with all JTAC certifications issued in the preceding period.

B.4.3.4.2 Non-accreditation will contain recommended actions to correct discrepancies and a projected timeline to reschedule a follow-on review and/or assessment.

B.4.4. JTAC Program Accreditation: Signatories without a JTAC schoolhouse or being a member of a multi-national schoolhouse will receive accreditation after a thorough review of their JTAC Program. JTAC MOA Signatories agree that in such cases, JFS ESC will form and direct a JTAC standardization team to conduct a full program review. For accreditation, the JTAC standardization team will:

B.4.4.1. Verify JTACs successful attendance at an accredited schoolhouse IAW para 5.3.4.1.

B.4.4.2. Verify JTAC Management Program addresses MOA-defined qualification (currency) requirements. (Approx. 3-5 days).

B.4.4.3. Attend enough of the practical exercises to include range events.

B.4.4.4. JTACs which have attended a multi-phase program will have their entire certification process reviewed. (Approx. 3-5 days).

B.4.4.5. Ensure JTAC MOA compliance and verify the program addresses identified MOA-defined JTAC Joint Mission Tasks (Duty Areas).

B.4.4.6. Upon completion of this review, the team will forward recommendation to JFS ESC for either accreditation or non-accreditation.

B.4.4.6.1 Accreditation with discrepancies will contain recommended actions to correct discrepancies and a projected timeline to provide documentation correcting all discrepancies. Signatory may continue to operate and train JTAC students, but if discrepancies are not corrected within the timeline the accreditation will be removed along with all JTAC certifications issued in the preceding period.

B.4.4.6.2 Non-accreditation will contain recommended actions to correct Discrepancies and a projected timeline to reschedule a follow-on review and/or assessment.

B.4.5. “Grandfather Clause”. Newly accredited schoolhouses or JTAC programs may recommend previous graduates for designation as JTACs under the “grandfathering” concept. The request to grandfather these individuals will be submitted to the JTAC Standardization Team as part of the accreditation process. The JTAC Standardization Team will include any recommendation for grandfathering in their accreditation visit final report.

B.4.6. JTAC Course/Program Review. JTAC MOA Signatories agree that this review will take place, at a minimum, once every three years and be conducted by a designated JTAC standardization team. A schoolhouse/program may have accreditation suspended if their JTAC course/program is found not to be in accordance with guidelines as specified in this MOA. Accreditation may be reinstated through follow-on review and assessment, at the discretion of the JFS ESC, based on a recommendation from the JTAC standardization team. In the case of a newly accredited schoolhouse/program, the initial course review will be scheduled 18 to 24 months after initial accreditation. After successful review, the new schoolhouse/program will be placed in the Triennial review cycle. For triennial course/program review, the JTAC standardization team will:

B.4.6.1. (Triennial Review) Attend enough of the course to evaluate curriculum, course of instruction, and practical exercises to include range events (Approx 10 -12 days).

B.4.6.2. (Program Review) Verify JTACs successful attendance at an accredited schoolhouse IAW para 5.3.4.1.

B.4.6.3. (Program Review) Verify JTAC Management Program addresses MOA-defined qualification requirements. (Approx 3-5 days).

B.4.6.4. (Program Review) Attend enough of the practical exercises to include range events. JTACs which have attended a multi-phase program will have their entire certification process reviewed. (Approx 3-5 days).

B.4.6.5. (Triennial/Program Review) Ensure JTAC MOA compliance and verify the program addresses identified MOA-defined JTAC Joint Mission Tasks (Duty Areas).

B.4.6.6. (Triennial/Program Review) Upon completion of this review and assessment, the team will forward recommendation to JFS ESC for either continued accreditation or suspension of accreditation.

B.4.6.6.1 Accreditation with discrepancies will contain recommended actions to correct discrepancies and a projected timeline to provide documentation clearing all discrepancies. Program may continue to operate and train JTAC students, but if discrepancies are not cleared within the timeline the accreditation will be removed along with all JTAC certifications issued since the last review (initial/triennial).

B.4.6.6.2 Suspension of accreditation will contain recommended actions to correct discrepancies and a projected timeline to reschedule a follow-on review and/or assessment.

B.4.7. Annual Curriculum Review. A JS DD C5I JFD hosted forum for military-to-military exchanges of views in which JTAC schoolhouses will compare curricula, ensure joint standardization, share “best practices”/ lessons learned, and discuss potential improvements/adjustments to the JTAC curriculum, certification and qualification processes. This review will take place, at a minimum, once a year.

B.5. Responsibilities

B.5.1. JS DD C5I JFD will:

- Provide team lead and a representative to head logistics and administrative details of assessment visit.
- Coordinate with schoolhouse representatives and develop a schedule of visits for the standardization team.
- Conduct a review of the segments of a multi-phase program that are not seen by the standardization team in conjunction with the schoolhouse accreditation/triennial review.
- Provide assessment checklists (Enclosure (1)) to the school houses/standardization team no later than 60 days prior to review.
- Coordinate team membership, fund travel and per diem for the U.S. standardization team members (subject to availability of funds). Partner Nations are responsible for funding all costs of participation by their personnel in JTAC standardization team activities.

- Provide verbal in/out-brief to the unit’s commanding officer.
- Provide the reviewed schoolhouse, parent command, and JFS ESC with a written report of the findings and recommendations no later than 30 days (45 days for a combined JFS ESC/NATO Team) following the assessment.
- Maintain records of assessment results for two years, archived as appropriate.
- Capture “best practices” and highlight within the report and post on JCAS Section web site.
- Collect and submit JTAC standardization team recommendations to Joint CAS publication office of primary responsibility (OPR).

B.5.2. Standardization Team Members will:

- Have successfully completed a JTAC course.
- Have a working knowledge of the JTAC MOA.
- Evaluate schoolhouse on adherence to joint mission tasks.
- Provide Team lead with any comments/recommendations for standardization.
- Be available for assistance in developing final report.
- Debrief own schoolhouse on results.
- Provide feedback on issues that would make the JTAC standardization team more efficient.

B.5.3. JTAC Standardization Team Guidance. The following is a list of items that could cause a schoolhouse or program to be recommended for suspension of accreditation by a JTAC standardization team. This list is not all-inclusive and the recommendation for suspension of JTAC accreditation will be forwarded to the JFS ESC for resolution and action.

- JTAC trainees being supervised by non-qualified instructors. Non-JTAC qualified instructors may conduct briefings and other formal classes in an area in which they have expertise. Only qualified JTAC instructors shall be used to supervise JTAC trainees while performing terminal attack control with a live aircraft.
- JTAC trainees being taught TTPs other than current JP3-09.3 as standard TTPs. TTPs not found in JP 3-09.3 may be instructed, however, the course must teach the recognized JTTPs as the primary method of conducting CAS.
- JTAC trainees being certified as a JTAC by the schoolhouse and not being trained to the minimum certification requirements as outlined in this MOA.
- Safety violations where JTAC trainees or JTAC instructors are at an increased risk of fratricide or possibility of bodily harm.
- Course not performing scheduled lectures/events. This does not preclude the schoolhouse from changing/omitting certain events due to unforeseen circumstances. The standardization team shall respect the commanding officer’s authority and judgment in the case of unforeseen circumstances. However, in all circumstances the schoolhouse is responsible for instruction to fulfill the joint mission tasks requirements of the JTAC.

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– JP 3-09.3 information and procedures being taught incorrectly or completely omitted.

B.5.3.1. If any of the above are noted by a JTAC standardization team member, the standardization team shall record the date and time of the infraction. In addition, all circumstances surrounding the infraction which were observed by the standardization team or one of its members will be documented and briefed to the course manager for immediate correction and the commanding officer of the respective schoolhouse during the scheduled out brief.

B.5.3.2. The checklist in Appendix B, Enclosure 2, shall be used by the JTAC Standardization Team.

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Appendix B**Enclosure 1: JTAC Standardization Team Checklists**

	Date Due	Date Complete	Task	Comments
90 days prior			JFS ESC recommends schoolhouse review or accreditation assessment.	
			JS DD C5I JFD assigns JTAC standardization team lead.	
			Each signatory (when requested) provides a qualified representative for TAD/TDY with JTAC standardization team.	
			JS DD C5I JFD coordinates visit time/date with schoolhouse or program to be reviewed and assessed.	
60 days prior			JS DD C5I JFD provides agenda, names of team members, and assessment checklist to schoolhouse.	
			Schoolhouse provides current curriculum to JS DD C5I JFD for distribution to all team members.	
			Schoolhouse or program provides a host POC to handle assessment admin/logistics. (Host POC may be member of standardization team).	
			JTAC standardization team collaborates and determines lectures/events to be assessed.	
			JS DD C5I JFD notifies schoolhouse which lectures/events to be assessed.	
21 days prior			JS DD C5I JFD provides standardization team members with an itinerary and, subject to the availability of funds, provides US/DOD standardization team members with funding data.	
Day 1			JTAC standardization team provides an in brief to school's commanding officer or director.	
			Team receives schoolhouse space familiarization.	

Appendix B**Enclosure 2: JTAC Schoolhouse Checklist**

Review and assess curriculum to ensure it instructs the following Joint Mission Tasks:

Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
A. Administration				
			Instructor staffing is sufficient to support student throughput?	
			Is there a formal instructor training program?	
			Is the Evaluation Folder (Training jacket) in accordance with JTAC MOA? (Instructors and Students)	
			Is there established Graduation Criteria? (Graded exams and practical application exercises)	
			Schoolhouse has developed a refresher course for JTACs at operational units for re-qualification?	
			Is there sufficient billeting and messing?	
			Verify JTAC Management Program addresses MOA-defined qualification requirements.	
B. Academics				
			Does the course schedule allow for sufficient classroom time to cover required materials under the current syllabus?	
			Field training schedules provide for weather back-up periods?	
01 - CAS Planning				
01.1 Advise ground commander on Close Air Support assets in support of ground scheme of maneuver.				
			01.1.1 Advise ground commander on Fixed-Wing (FW) / Rotary-Wing (RW) platform capabilities / limitations / employment. - Demonstrate knowledge of the capabilities, limitations, and employment of fixed wing/rotary wing platforms. (e.g. F-15E, F-16, F/A-18, F-35, AV-8B, A-10, B-1, B-52, AC-130. RW: AH-1W/Z, AH-64A/D, UH-1N/Y, MQ-1, MQ-9. Partner Nation: Tornado, Tornado GR4, Mirage 2000, Euro Fighter, Gripen). JTAC will be able to successfully answer questions on capabilities, limitations, and employment of FW/RW CAS platforms.	
			01.1.2 Advise ground commander on FAC (A) capabilities/limitations/employment. - Demonstrate knowledge of the capabilities, limitations, and employment of fixed wing/rotary wing FAC (A) platforms. Clearly define the roles and responsibilities of supporting and supported forces when integrating FAC(A). JTAC will be able to successfully answer questions on the capabilities, limitations, and employment of FW/RW FAC (A).	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
			01.1.3. Advise ground commander on remote observer capabilities / limitations / employment. – Demonstrate knowledge of the capabilities, limitations, and employment of a remote observer (e.g., scout, FIST, SOF)/ JFO. Clearly define the roles and responsibilities of supporting and supported forces when integrating a remote observer/ JFO. JTAC will be able to successfully answer questions on remote observer/JFO capabilities, limitations, and employment.	
			01.1.4. Advise ground commander on Group 1, 2, 3 and 4 Unmanned Aerial Systems (UAS) capabilities/limitations/employment. – Demonstrate knowledge of the capabilities, limitations, and employment of Group 1,2,3,4 UAS platforms during a written evaluation. JTAC will be able to successfully answer questions on the capabilities, limitations, video downlink (VDL) and employment of Group 1, 2, 3 UAS.	
			01.1.5. Advise ground commander on aviation weapon capabilities / limitations / employment. - Demonstrate knowledge of air delivered weapon's capabilities, limitations, and employment methods. (General purpose bombs, laser guided munitions, Inertially aided munitions, aircraft guns, rockets, flares, Air to ground missiles). JTAC will be able to successfully answer questions on weapons capabilities, limitations, and employment.	
			01.1.6. Advise ground commander on effects of weather, terrain, and threats on CAS capabilities. – Demonstrate knowledge of weather, terrain and threats when employing CAS assets. JTAC will be able to successfully answer questions on mission impacts of weather, terrain and threats when employing CAS assets.	
			01.1.7. Advise ground commander on effects of electronic warfare on CAS capabilities. - Demonstrate knowledge of airborne and ground base electronic warfare (EW) effects. JTAC will be able to successfully answer questions on EW effects, location of electronic warfare planners, the request process and how to submit an EW request (joint tactical air strike requests (JTAR)) when employing CAS assets.	
			01.1.8. Advise ground commander on the use and timely submission of joint tactical air strike requests (JTAR). – Demonstrate knowledge of the Air Tasking Order planning cycle and its effects on JTAR submission. Address what an ATO is, the information listed and how to access the document. The JTAC should also understand the process to get a preplanned mission on the ATO. JTAC trainee will be able to successfully answer questions on the Air Tasking Order planning cycle and its effects on JTAR submission.	
			01.1.9. Advise ground commander on Battle Damage Assessment (BDA) and Mission Reporting (MISREP) procedures. - Demonstrate knowledge of the information required to successfully complete a BDA (e.g. observed damage (enemy/civilian)), re-attack recommendation, BDA log, and MISREP procedures*. JTAC will be able to successfully answer questions on the information required to successfully complete BDA report to CAS aircraft that includes: Size, Activity, Location, Time, and Remarks — Munitions expended, observed damage (number of tanks destroyed, number still active, and recommendation), mission number, and mission accomplishment (Successful, Unsuccessful or Unknown).	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
			01.2. Advise ground commander on the minimum components of a game plan (types of Terminal Attack Control and Method of Attack). – Demonstrate knowledge of how tactical situation, aircrew, aircraft, and weapons capabilities/limitations determine appropriate type of terminal attack control and method of attack contained in the game plan. JTAC will be able to successfully answer questions on the types of CAS control and the factors that determine the type of control and method of attack to be used in a given situation.	
			01.3. Advise ground commander on integration of CAS with indirect fires. – Demonstrate knowledge of the integration of indirect fires (surface to surface) with CAS during a written evaluation. Address deconfliction methods which facilitate simultaneous multi-ship/platform CAS and indirect fire operations. Must be well versed in ACA terminology and have knowledge of all applicable ACAs in use. JTAC will be able to successfully answer questions on separation techniques that deconflict airspace to provide a reasonably safe operating space for aircraft to maneuver and attack targets.	
			01.4. Advise ground commander on the impact of fire support coordination measures (FSCM) on CAS mission planning. – Given a tactical scenario (e.g. operations order) assess the impact of FSCMs on CAS operations in support of the ground commander's concept of operations during a written evaluation. Address, at a minimum, the definition and proper employment of permissive and restrictive FSCMs to expedite the attack of targets. JTAC will be able to successfully answer questions on FSCMs used during CAS operations. <i>Note: Students should be briefed on Kill box terminology, but a kill box will not be established for close air support (CAS) missions. If a CAS mission is required within an established kill box, the portion of the kill box requiring detailed integration should be closed.</i>	
			01.5. Advise ground commander on airspace command and control (Joint and Component), and their impact on CAS mission planning. – Demonstrate knowledge of airspace command and control components, the definition and application of ACO, ACM, ATO, and SPINS and their impact on CAS mission planning (e.g. Theater Air Ground System (TAGS), Theater Air Control System (TACS)/Army Air-Ground System (AAGS), Marine Corps Air Command and Control System (MACCS), Navy Tactical Air Control System (NTACS), and Special Operations Air-Ground System (SOAGS)). JTAC will be able to successfully answer questions on the primary command and control agencies and their roles and responsibilities within the associated Command and Control System and the functions of the ACO, ACM, ATO, and SPINS.	
			01.6. Apply intelligence products to CAS mission planning. – Given a tactical scenario, operations order, apply intelligence products to support CAS mission planning in support of the ground commander's concept of operations. Describe how intelligence supports air operations, available intelligence products (e.g. order of battle, maps, ISR imagery) and the importance of including Intel early in the planning process. JTAC will be able to successfully answer questions on the intelligence products used to support CAS mission planning.	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
			01.7. Apply the products of the targeting process to CAS mission planning. – Demonstrate knowledge of the targeting process. Address the process which the supported commander selects and prioritize targets and match appropriate effects. Lesson should focus on the products the JTAC will use when planning the employment of CAS (tactical level). JTAC trainee will be able to successfully answer questions on the targeting process products. (i.e. Target list).	
01.8. Plan CAS missions with precision and non-precision weapons, in support of the ground scheme of maneuver.				
			01.8.1. Plan a laser guided weapon delivery and use of a ground and airborne Laser Target Designator (LTD). – Demonstrate knowledge of laser guided weapons employment and use of a ground and airborne LTD (Acft targeting pod and UAS). Address the standard laser brevity terms and procedures for ground and airborne designating, marking and the proper employment of laser-guided weapons. JTAC will be able to successfully answer questions on laser guided weapons employment, safety zone, optimal attack zones, hellfire designator exclusion zone and proper laser terminology.	
			01.8.2. Plan inertial aided munitions deliveries. – Demonstrate knowledge of inertial aided munitions employment. Address the unique characteristics and limitations of inertially aided/GPS guided weapons. Lesson will also cover target location error (TLE), Bomb on Coordinate (BOC), and Bomb on Target (BOT). JTAC will be able to successfully answer questions on inertial aided munitions employment.	
			01.8.3. Plan non-precision weapons deliveries. – Demonstrate knowledge of non-precision weapons employment. Address the capabilities, limitations and employment of general-purpose weapons. Consideration must be given to host aircraft navigation/weapons system accuracy. JTAC will be able to successfully answer questions on non-precision weapons employment.	
			01.9. Plan engagement with appropriate weapon in order to achieve desired effects, proportional response, and minimize collateral damage. – Demonstrate knowledge of aviation ordnance capabilities and effects. Lesson will present scenarios where ordnance is appropriately matched to targets to achieve ground commanders desired results and comply with Rules of Engagement (ROE) and restrictions. Theatre specific ROE, restrictions and lessons learned should be briefed. Reinforcement through practical application is required during simulation, dry and/or live controls. JTAC will be able to successfully answer questions on aviation ordnance capabilities and effects.	
01.10. Plan day CAS missions, in support of the ground scheme of maneuver.				
			01.10.1. Plan day FW CAS missions. – Demonstrate knowledge of day, FW CAS planning factors. JTAC will be able to successfully answer questions on day, FW CAS planning factors.	
			01.10.2. Plan day RW CAS missions. – Demonstrate knowledge of day, RW CAS planning factors. JTAC will be able to successfully answer questions on RW CAS planning factors.	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
01.11. Plan night CAS missions, in support of the ground scheme of maneuver.				
			01.11.1. Plan night FW CAS missions. – Demonstrate knowledge of night, FW CAS planning factors. JTAC will be able to successfully answer questions on night, FW CAS planning factors.	
			01.11.2. Plan night RW CAS missions. – Demonstrate knowledge of night, RW CAS planning factors. JTAC will be able to successfully answer questions on night, RW CAS planning factors.	
01.11.3. Plan Illumination in support of night CAS missions.				
			01.11.3.1. Plan ground-delivered Illumination. – Demonstrate knowledge of ground-delivered illumination, in support of CAS. Address techniques and procedures on how to employ illumination via surface based fire support systems in support of CAS missions (Artillery, Mortars, and Naval Surface Fires). JTAC will be able to successfully answer questions on surface-delivered illumination, in support of CAS.	
			01.11.3.2. Plan aviation-delivered Illumination. – Demonstrate knowledge of aviation-delivered illumination, in support of CAS. Address techniques and procedures on how to employ illumination via aviation assets in support of CAS missions (e.g., Airborne delivered flares, Illumination rockets). JTAC will be able to successfully answer questions on aviation-delivered illumination, in support of CAS.	
			01.12. Incorporate CAS mission planning factors for operations in limited visibility/adverse weather. – Demonstrate knowledge of limited visibility and adverse weather and its effects on CAS. Address techniques and procedures on how to execute a CAS mission during limited visibility and adverse weather conditions. JTAC will be able to successfully answer questions on limited visibility/adverse weather effects on CAS.	
			01.13. Incorporate CAS mission planning factors for operations in an urban environment. – Demonstrate knowledge of CAS mission planning factors for operations in an urban environment. Address planning factors, techniques and procedures on how to execute a CAS mission in the urban environment JTAC can successfully answer questions on urban CAS planning factors.	
			01.14. Plan AC-130 fire missions in support of ground scheme of maneuver. – Demonstrate knowledge of AC-130 fire missions. Address planning factors, techniques and procedures on how to employ the AC-130. JTAC will be able to successfully answer questions on AC-130 capabilities, Call for Fire procedures and proper employment.	
01.15 Plan integrated attack by multiple fire support assets to support CAS.				
			01.15.1 Plan target marking for CAS assets.	
			01.15.1.1. Plan target marking for CAS with indirect fire assets.– Demonstrate knowledge to effectively plan visual target marking for CAS with indirect fire. Address techniques and procedures on how to use indirect fire (e.g. artillery, mortars) to provide visual marks (e.g. smoke, illumination) to execute a CAS mission. JTAC will be able to successfully answer questions on target mark timing, airspace management (deconflicting fires from CAS platforms) and use of smoke, high explosive, illumination or other visual means.	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
			01.15.1.2 Plan target marking with ground IR pointer for CAS assets. – Demonstrate the ability to effectively plan ground IR pointer target marking for CAS. Address the standard IR pointer brevity terms, procedures for ground IR pointer marking, and the proper employment of IR pointer. JTAC will be able to successfully answer questions on IR Brevity and IR pointer safety.	
			01.15.2. Plan Suppression of Enemy Air Defenses (SEAD) for CAS attack. –Demonstrate the ability to effectively plan SEAD for CAS. Address techniques and procedures on how to use indirect fire (e.g. artillery, mortars) to provide SEAD in support of a CAS mission. JTAC will be able to successfully answer questions on definition of SEAD, timing, and airspace management (deconflicting fires from CAS platforms). 01.15.3 Plan coordinated attacks by multiple flights of aircraft to support CAS. -Demonstrate knowledge to effectively coordinate attacks by multiple flights of aircraft and deconflict them from each other during simultaneous and sequential attacks to support CAS. Address type of attack (Combined/Sectored), timing and procedures on how to deconflict flights. JTAC will be able to successfully answer questions on methods of deconflicting CAS platforms from each other during simultaneous and sequential attacks.	
			01.16. Plan terminal attack control in support of CAS attack. –Demonstrate knowledge of terminal attack control procedures in support of CAS planning. Address planning factors, techniques and procedures on how to conduct terminal attack control of a CAS mission. JTAC will be able to successfully answer questions on established terminal attack control procedures, Situation update, game plan and CAS Attack Brief.	
			01.17. Plan target location procedures with the understanding of target location errors (TLE) in support of attack. – Demonstrate knowledge of target location procedures and target location errors (TLE) in support of CAS planning. Address planning factors, techniques and procedures on how to most efficiently and effectively locate targets; stress the importance of a targets associated TLE. JTAC will be able to successfully answer questions on procedures, equipment used to determine target location, and TLE categories.	
			01.18. Request CAS via JTAR. –Demonstrate knowledge of the JTAR. Address the proper routing and processing of pre-planned and immediate request through the command and control system. JTAC will be able to successfully answer questions on the procedures to fill out and route a JTAR.	
			01.19 Plan the use of digitally aided CAS systems in support of weapons deliveries. - Demonstrate knowledge of digitally aided CAS/Fires systems to facilitate weapons employment. Address the capabilities, limitations and proper use of Service, SOCOM, Partner Nation-fielded DACAS systems. JTAC will be able to successfully answer questions on the use of DACAS systems to request, CAS brief and BDA. *Note - Services, USSOCOM/Partner Nations without fielded digital CAS systems are exempt until such fielding occurs.	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
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02 - CAS Preparation				
02.1 Operate organic JTAC equipment.				
			02.1.1 Operate organic JTAC communications equipment. – Demonstrate the ability to operate all required organic communications equipment necessary for requesting, coordinating and controlling CAS missions. JTAC will demonstrate proficiency in operating communications equipment as designated by their Services/SOCOM/Nation. JTACs will have the skills to operate in the required frequency bands in secure voice, Anti Jam and digital information exchange capabilities.	
			02.1.2. Operate organic JTAC target marking equipment. – Demonstrate the ability to operate target-marking equipment in support of CAS. JTAC will demonstrate the ability to operate laser target designators (LTD), IR pointers, radar beacons and other designated target marking equipment designated by their Services/SOCOM/Nation.	
			02.1.3. Operate organic JTAC target location equipment. – Demonstrate the ability to operate target location equipment and knowledge of its accuracy in support of CAS. JTAC will demonstrate the ability to operate Laser Range finders, GPS systems, Targeting Software (i.e. PSS-SOF) and other target location equipment designated by their Services/SOCOM/Nation.	
			02.1.4. Operate organic JTAC video downlink equipment. - Demonstrate the ability to operate video downlink equipment (e.g. ROVER) in support of CAS. JTAC will demonstrate the ability to operate video downlink equipment designated by their Services/SOCOM/Nation.	
			02.1.5. Operate organic digital aided CAS/Fires systems. - Demonstrate the ability to operate digitally aided systems in support of CAS and CFF missions using appropriate reference material when required. JTAC will demonstrate the ability to operate digitally aided systems in support of CAS and CFF missions during simulation, dry and/or live training events, using designated equipment and software by their Services/SOCOM/Nation. *Note – Services/SOCOM/Partner Nations without fielded digital CAS systems are exempt until such fielding occurs.	
02.2. Apply the products of Operational planning in support of CAS execution.				
			02.2.1. Apply intelligence products in support of CAS execution. – Demonstrate the ability to apply intelligence products (e.g. ISR support, ground order of battle, air order of battle, missile order of battle, maps, charts (1:50, GRG)). JTAC will understand which products of the intelligence/deliberate planning cycle are available to him in order to devise a plan to ensure CAS resources are used against appropriate targets based on the commander's intent. (E.g. Target List).	
			02.2.2. Apply the products of the fire support plan in support of CAS execution. – Demonstrate the ability to apply the products of the fire support plan (e.g., FSCMs). JTAC will understand what role they play in developing a fire support plan, ensuring CAS is fully integrated and be able to use the products that result from fire support planning (e.g. target lists, FSCMs).	
			02.2.3. Apply the products of the Airspace Control Order in support of CAS execution. – Demonstrate the ability to apply the products of the ACO (e.g. ACMs). JTAC will be able to extract and apply the applicable information contained in the ACO required to safely and effectively conduct a CAS mission.	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
			02.2.4. Apply the products of communications planning in support of CAS execution. – Demonstrate the ability to apply a communications plan (e.g., Tactical Air Direction (TAD), Air Request Net (ARN), Tactical Air Request (TAR)/Helicopter Request (HR), TACP Local (L), Tactical Chat, IP and URN addressing, OPTASKLINK). JTAC will establish and maintain all applicable communications nets required to plan, coordinate and execute a CAS mission. JTAC will understand communications plans and be able to extract communications network data from applicable sources.	
			02.2.5. Apply the products of the ATO in support of CAS execution. Demonstrate the ability to apply the ATO (e.g., aircraft, time on station, SPINS). JTAC will read an ATO and be able to identify and extract the information needed to execute a CAS mission.	
03 - CAS Execution				
3.1. Targeting.				
03.1.1. Target Acquisition				
			03.1.1.1. Execute target acquisition via aided and unaided during daytime conditions. – Demonstrate the ability to acquire targets based on ground commander's CAS target nominations aided (e.g. Binos, LRF, LTD, electro-optical (EO), IR) and unaided eyes. JTAC will visually identify CAS targets based on ground commander's CAS target nominations under day conditions.	
			03.1.1.2. Execute target acquisition via aided and unaided during nighttime conditions. – Demonstrate the ability to acquire targets aided (e.g., Binos, NVGs, IR, thermal) and unaided eyes during night. JTAC will visually identify CAS targets based on ground commander's CAS target nominations under night conditions. Unaided may involve the use of artificial illumination.	
			03.1.1.3 Execute target acquisition via remote observer. – Demonstrate the ability to target via remote observer (e.g., scout, FIST, JFO, SOF). JTAC will demonstrate the ability to work successfully with a remote observer to acquire targeting information (e.g. target location, threats, friendlies) and other critical information needed to build situational awareness in order to successfully conduct a CAS mission. 03.1.1.4 Execute target acquisition via remote real-time sensor video downlink information. – Demonstrate the ability to acquire targets via remote real-time sensor video downlink (e.g., ROVER, Video Scout, and targeting pod). JTAC will demonstrate the ability to successfully use video downlink to receive full motion video, still photos, imagery or other media to acquire targeting information (e.g. target coordinates, threats, friendlies, etc.) needed to build situational awareness in order to successfully conduct a CAS mission. 03.1.2 Target Location 03.1.2.1 Determine target location via map plot. – Demonstrate the ability to determine target location via map plot. JTAC will demonstrate the ability to successfully determine target coordinates within 100 m accuracy in open terrain with identifiable terrain features out to 3500 m using only binoculars map and compass. 03.1.2.2 Determine target location via coupled GPS/LRF system. – Demonstrate the ability to determine target location via coupled GPS/LRF. JTAC will demonstrate the ability to successfully determine target coordinates using a coupled GPS/LRF with at least the following accuracy: 50-80 m at 1 km.	

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			<p>03.1.2.3 Determine target location via tactical targeting system (e.g. Precision Strike Suite – Special Operations Force (PSS-SOF)).</p> <p>- Demonstrate the ability to determine target location via tactical targeting system. JTAC will demonstrate the ability to successfully determine target location coordinates within 10 m accuracy using a tactical targeting system (e.g. PSS-SOF).</p> <p>Note - Service/component or Partner Nation JTACs without fielded tactical targeting systems are exempt until such fielding occurs. If service/component or partner nation JTACs employ tactical targeting systems that produce accurate coordinates, (PSS-SOF, etc.) proficiency with that equipment must be demonstrated IAW Service regulations.</p>	
			<p>03.2 Match target location accuracy / format to desired weapons system.</p> <p>- Demonstrate the ability to determine accuracy of target location (e.g. TLE) and proper coordinate format to desired weapons system. JTAC will determine target location error (TLE) associated with the procedure or equipment used to determine target location coordinates. Match coordinates format and best weapon to target based on accuracy and capability.</p>	
03.3 Coordinate CAS missions.				
			<p>03.3.1. Integrate CAS missions with ground scheme of maneuver.</p> <p>- Demonstrate the ability to integrate CAS missions with ground scheme of maneuver. JTAC will demonstrate the ability to effectively integrate CAS into the ground scheme of maneuver by meeting the commander's intent for CAS, without limiting the employment of maneuver, aviation or fire support assets.</p>	
			<p>03.3.2. Integrate CAS missions with surface-based fires.</p> <p>- Demonstrate the ability to integrate CAS missions with surface-based fires. JTAC will demonstrate the ability to effectively integrate CAS with supporting or complementary surface fires into the ground scheme of maneuver by meeting the commander's intent for Fire Support.</p>	
			<p>03.3.3. Integrate CAS missions with fire support and airspace coordination measures.</p> <p>- Demonstrate the ability to integrate CAS missions with fire support coordination and airspace coordinating measures. JTAC will demonstrate the ability to effectively use fire support coordination and airspace coordinating measures to deconflict CAS with all fire support and aviation assets, to meet the commander's intent for maneuver and fire support.</p>	
03.4 Execute deconfliction of aviation assets.				
			<p>03.4.1 Execute procedural control of aircraft to provide safe separation.</p> <p>- Demonstrate the ability to effectively deconflict aircraft. JTAC will demonstrate the ability to use appropriate airspace management procedures IAW JP 3-09.3, to ensure safe operation of aircraft in the Battlespace during CAS operations.</p>	
			<p>03.4.2. Execute procedural control of aircraft to provide safe separation from fires.</p> <p>- Demonstrate the ability to effectively deconflict aircraft from fires. JTAC trainee will demonstrate the ability to use appropriate fire support coordination measures IAW JP 3-09.3, to ensure safe operation of aircraft in the Battlespace during CAS operations.</p>	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
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03.5. Coordinate CAS Target engagement.				
			03.5.1. Receive aircraft check-in and provide situation update to CAS aircraft. – Demonstrate the ability to receive aircraft check-in and provide situation update. JTAC will demonstrate the ability to receive CAS aircraft check-in and provide situation update IAW JP 3-09.3 and apply information to the CAS mission as required.	
			03.5.2. Provide Game plan and CAS Attack Brief. – Demonstrate the ability to provide Game plan and CAS attack brief. JTAC will demonstrate the ability to pass a Game plan and CAS attack brief to CAS aircraft IAW JP 3-09.3 in order to attack a surface target.	
			03.5.3. Provide weaponeering recommendation to achieve desired effects. – Demonstrate the ability to provide a weapon recommendation, based on ground commander's intent, to achieve desired effects. JTAC will demonstrate the ability to make appropriate weapons recommendations to CAS aircraft to ensure effects achieve the ground commander's desired intent and comply with ROE and restrictions.	
03.6. Execute target marking for CAS assets.				
			03.6.1. Execute visual target marking for CAS with indirect fire assets. – Demonstrate the ability to effectively target mark via visual means with indirect fire. JTAC will demonstrate the ability to mark a target using a visual indicator (e.g. smoke (WP, RP), high explosive (HE), illumination) to allow a CAS aircraft to visually acquire the target area.	
			03.6.2. Execute target mark or designation for CAS with a ground laser target designator (LTD). – Demonstrate the ability to effectively target mark or designate with a ground based LTD. JTAC will demonstrate the ability to successfully mark or designate a target using a LTD to allow a CAS aircraft to acquire the target or deliver a laser guided weapon. Laser shall be utilized to designate for a weapon delivery or to mark a target for an aircraft (laser spot tracker recommended). Intent is to utilize laser equipment and proper terminology.	
			03.6.3. Execute target marking for CAS with a ground IR pointer. – Demonstrate the ability to effectively target mark with a ground based IR pointer. JTAC will demonstrate the ability to successfully mark a target using an IR pointer to allow a CAS aircraft to acquire the target. IR pointer shall be utilized to mark a target for aircrew with NVG. Intent is to utilize IR pointer equipment and proper terminology.	
			03.7. Integrate SEAD during the execution of CAS missions in a medium to high threat environment. – Demonstrate the ability to effectively integrate SEAD with CAS in a medium to high threat environment. JTAC will demonstrate the ability to successfully integrate SEAD during a CAS mission.	
03.8 Execute appropriate terminal attack control procedures and methods of attack.				
			03.8.1. Execute Type 1 terminal attack control procedures. – Perform Type 1 terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a Type 1 CAS control.	
			03.8.2. Execute Type 2 terminal attack control procedures. – Perform Type 2 terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a Type 2 CAS control.	
			03.8.3. Execute Type 3 terminal attack control procedures.	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
			– Perform Type 3 terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a Type 3 CAS control.	
			03.8.4. Execute BOT method of attack during a terminal attack control. – Perform BOT method of attack during terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a BOT method of attack.	
			03.8.5. Execute BOC method of attack during a terminal attack control. – Perform BOC method of attack during terminal attack control of CAS aircraft. JTAC will demonstrate the ability to successfully perform a BOC method of attack.	
03.9. Control day and night CAS missions, in support of the ground scheme of maneuver.				
			03.9.1. Control day FW CAS missions. – Perform a day fixed-wing control. JTAC will demonstrate the ability to successfully perform a day fixed-wing control.	
			03.9.2. Control night FW CAS missions. – Perform a night fixed-wing control. JTAC will demonstrate the ability to successfully perform a night fixed-wing control.	
			03.9.3. Control RW CAS missions. – Perform a rotary-wing control. JTAC will demonstrate the ability to successfully perform a day or night rotary-wing control IAW JP 3-09.3 and appropriate service references.	
			03.9.4. Control CAS missions with the support of a remote observer. – Perform a Type 2 or 3 control with the support of a remote observer (e.g. scout, FIST, JFO, SOF). JTAC will demonstrate the ability to successfully perform a day or night Type 2 control with the support of a remote observer.	
			03.9.5. Control CAS missions with the support of a FAC(A). – Perform a control with the support of a FAC(A). JTAC will demonstrate the ability to successfully perform a day or night control with the support of a FAC(A).	
			03.10. Control a CAS mission in an urban environment in support of the ground scheme of maneuver. – Perform a CAS control in an urban environment. JTAC will demonstrate the ability to successfully perform a CAS control in an Urban environment.	
			03.11. Employ service digital aided CAS/Fires systems. – Demonstrate the ability to control CAS missions (e.g. Friendly deconfliction/attack geometry, target acquisition/location/accuracy determination/passage, CFF, A/C check in/ON STATION REPORT, CAS 9-Line brief and BDA passage.) using digital aided CAS systems. JTAC will demonstrate the ability to successfully perform a digital aided CAS control. *Note - Services, USSOCOM/Partner Nations without fielded digital CAS systems are exempt until such fielding occurs.	
			03.12 Conduct Battle Damage Assessment (BDA). – Demonstrate the ability to provide accurate BDA (e.g. observed damage (enemy/civilian)), re-attack recommendation and maintain a log of all BDA collected, using appropriate reference material when required. JTAC will demonstrate the ability to provide BDA report to CAS aircraft that includes: Size, Activity, Location. Time, and Remarks — Munitions expended, observed damage (number of tanks destroyed, number still active, and recommendation), mission number, and mission accomplishment (SUCCESSFUL, UNSUCCESSFUL or UNKNOWN).	

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Review and Assessment	YES	NO	Items to be reviewed and assessed by JTAC standardization Team	Discrepancies / Comments
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C. Simulations				
			Are simulation devices incorporated into the course?	
D. Live Events				
			Does the range complex support JTAC training?	
			Does the course have sufficient Day sorties?	
			Does the course have sufficient Night sorties?	
			Does the course have sufficient indirect fires?	
E. Equipment				
			Does the JTAC equipment match the equipment used by the students gaining command?	
			Is the JTAC equipment in sufficient quantity to support student training?	
F. Safety				
			Does the course maintain a safe student to instructor ratio?	
			Does the course conduct a range safety brief prior to conducting Live Fire training?	
			Does the course conduct a LASER safety brief prior to conducting Live Fire training?	
			Are students supervised by qualified JTAC instructors during Live terminal attack control?	
Final Day			JTAC standardization team produces a "quick look report" of the assessment and provides a copy along with a verbal out-brief to the school's Commanding Officer or Director	

Assessment Timeline	Date Due	Date Complete	Task	Comments
NLT 30 days after review			JS DDC5I JFD takes the teams' "quick look", notes, comments, and data from the assessment visit and produces a consolidated and "vetted" JTAC standardization team report. This report will be staffed with all team members for concurrence and sent to the assessed unit.	
Next JFS ESC			JS DDC5I JFD provides JFS ESC a summary of recent reviews.	
Ongoing			JS DDC5I JFD JCAS Section POC maintains record of schoolhouse review and assessment reports.	

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Phased JTAC Program Checklist**Items to be reviewed and assessed by JTAC standardization Team:**

Line Number	JTAC MOA References	Requirements	Yes	No	Remarks
1	4.	Do candidates successfully pass the NATO STANAG 6001 test with a score of (LSRW of 3 3 3 2) or the English Comprehension Level (ECL) Test - a minimum average test score of 85%?			N/A for native English speaking nations
2	4.	Do candidates possess the operational English skills necessary to successfully communicate with attack aircraft?			
3	4. and 5.2.	Does the Service/Partner Nation/Component have a signed regulation/manual which outlines policies and responsibilities for JTAC certification and qualification training?			
4	5.2.	Does the JTAC training program comply with the established JTAC Training regulation/manual?			
5	5.3.4.*	Does the regulation/manual clearly define each phase of the certification process?			
6	5.2.*	Has an organization/individual been designated to provide oversight of the JTAC training program?			
7	5.2.*	Are support agreements established to ensure the process remains consistent and enduring?			If external support is required to accomplish training.
8	5.3.1.	Are JTAC Students supervised by qualified JTAC instructors during certification training?			Name of the accredited schoolhouse/Program:
9	5.2.2	Do JTAC Students complete CAS planning academic training at an accredited schoolhouse?			Name of accredited schoolhouses used:
10	5.3.4.1.	Do JTAC Students complete the minimum successful controls prior to certification?			

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Minimum successful controls per Table 5.3.3.1.					
Terminal Attack Control	Minimum Required	Condition	Yes	No	Remarks
Type 1	2	Live or Dry			
Type 2	2	Live, Dry, or Simulated			
Type 3	1	Live, Dry, or Simulated			
BOT	2	Live or Dry			
BOC	2	Live, Dry, or Simulated			
FW CAS Aircraft	2	Live or Dry			
RW CAS Aircraft	1	Live, Dry, or Simulated			
Laser Control	1	Live or Dry			
IR Pointer	1	Live or Dry			
Remote Observer	1	Live, Dry, or Simulated			
Video Downlink	1	Live, Dry, or Simulated			
Live	2	Live			
9-Line Attack Brief	2	Live or Dry			
SEAD	1	Live, Dry, or Simulated			
Urban	1	Live, Dry, or Simulated			
With FAC(A)	1	Live, Dry, or Simulated			
Day	2	Live or Dry			
Night	2	Live or Dry			

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Line Number	JTAC MOA References	Requirements	Yes	No	Remarks
11.	5.3.4.1.	Do candidates complete a pre-screening process (if applicable)?			
12.	5.3.4.2.	Is student progress documented and maintained throughout the JTAC certification process?			
13.	5.3.5.	Does the regulation/manual clearly define how JTACs will maintain qualification?			
14.	5.3.6.	Does the regulation/manual provide guidance on how to conduct JTAC evaluations?			
15.	5.3.7.	Are JTAC evaluations conducted and documented IAW the JTAC MOA?			(min 18 months)
16.	5.3.1.2.	Are JTAC-Es designated and do they comply with requirements of the JTAC MOA?			JTAC-E requirements: min of one year operational experience as a qualified JTAC; complete a JTAC-E upgrade program; designated by the unit commander. If no resident JTAC-Es, identify program supplying evaluators.
17.	5.3.10.	Do certified/qualified JTACs maintain a six part JTAC Evaluation Folder/Training Jacket?			
18.	5.3.8.	Does the regulation/manual provide guidance for JTAC requalification?			
19.	02.1.1.	Are JTAC Students trained to operate organic communications equipment?			
20.	02.1.2.	Are JTAC Students trained to operate organic target marking and location equipment?			
21.	02.1.3.	Are JTAC Students trained to operate organic target location equipment?			
22.	5.3.5.	Are sufficient numbers of aircraft and ordnance available to maintain JTAC qualification?			
23.	02.1.1. 02.1.2. 02.1.3. 02.1.4.	Do JTACs have the appropriate type and sufficient numbers of equipment required to perform JTAC duties?			<div>TYPE</div> <div>QUANTITY</div> <div>Radio:</div> <div>LTD:</div> <div>IR pointer:</div> <div>NVG:</div> <div>LRF:</div> <div>GPS:</div> <div>Binoculars:</div> <div>ROVER:</div>

Appendix B

Enclosure 3: JTAC Simulation System Accreditation

B.3.1. Purpose. This appendix addresses JTAC Simulation System Accreditation. As the availability of live aircraft and weapons is reduced across the force, simulation is fast becoming the primary resource used to facilitate JTAC certification and qualification training. The purpose of the Joint Fire Support Executive Steering Committee's (JFS ESC) JTAC Simulation System Accreditation Initiative is to ensure standardization of the simulation systems used to achieve mastery of JTAC Joint Mission Tasks. These tasks have traditionally been accomplished using live aircraft and weapons. This initiative also serves as an instrument to assist signatories in developing a robust simulation capability to ensure JTACs are sufficiently trained to meet combatant commander needs with fewer live resources.

B.3.2. Background. Simulation has been part of JTAC training since the mid-1990s. Training organizations have used simulation systems for many years to develop the knowledge, skills and abilities required to control live aircraft in training, demonstrating that effective use of simulation can reduce the number of live control events required to meet training objectives. In 2007, the JFS ESC instituted the JTAC Simulator Accreditation Initiative to recognize the capability of fielded systems to replace a small number of the live controls required by the JTAC MOA; to expose signatory members to simulation systems and emerging technologies through the assessment process; and to raise overall awareness of simulation and encourage investment for the advancement of simulation for JTAC training. As simulation development program offices became aware of this initiative, the JTAC Simulator Accreditation Standard quickly became the build-to-standard, which was never intended. This resulted in a short term increase in capability as programs had joint justification for funding to make improvements, however as time passed little effort was given to go beyond the JFS ESC standard. This has resulted in the stagnation of JTAC simulation capability.

B.3.3. Approach. The JFS ESC intent is to recognize all simulation systems which are capable of facilitating high quality JTAC training. In the past, the JFS ESC JTAC Simulator Accreditation Initiative only viewed JTAC simulation as a self-contained, virtual, computer-based environment which replicates a static ground position. Within this environment, the JTAC reacts to scenario driven missions, interacting with natural and manmade entities to perform close air support missions. This view of simulation is very narrow and needs to be expanded to recognize other simulation devices which are effective for JTAC training, but do not fit the original accreditation criteria. The JTAC Simulation System Accreditation Initiative should be applicable to any live, virtual and constructive training environments which assist Services, USSOCOM, and partner nations in building capability. In order to expand the JFS ESC accreditation scope, the accreditation criteria will focus on the JTAC MOA Joint Mission Execution Tasks and control requirements. An accreditation criterion recognizes the capability of simulation systems based on their capability to facilitate mastery of groups of those tasks required to achieve performance objectives. Services, USSOCOM and Partner Nations are responsible for designing and fielding simulation systems to meet their own training objectives in accordance with the requirements of this MOA.

B.3.4. Definitions. For purposes of this JTAC MOA, the following JTAC simulation system accreditation definitions apply:

Emulate – To imitate the function of (another system), as by modifications to hardware or software that allow the imitating system to accept the same data, execute the same programs or functions, and achieve the same results as the imitated system. [Does not require form fit and function devices, but requires the same steps and produces the same result as the emulated system]

Simulate – To assume or have the appearance or characteristics of an actual system or device that will accept the same data, execute the same programs or functions, and achieve the same results as the imitated system.

Stimulate – The ability to use actual equipment in the simulation system as it would in the real world in order to provide the same results for use in the simulation.

B.3.5. Simulation System Accreditation Criterion Fidelity Scale. The following rating scale was adapted from an existing U.S. Navy /NAVAIR grading scheme that was developed for a similar purpose and was used in the original development of the JFS ESC JTAC Simulation System Accreditation Criteria. Minimum fidelity scale ratings are assigned to each criterion task contained in Table B.3.5, and are applied during the assessment process.

Table B.3.5 Fidelity Scale

Rating	Short Description	Detailed Description
0	Information Not Presented	The information is not presented in any form.
1	Provided by System but Insufficient Detail (Unusable)	Although the information is presented, it is not presented with enough detail to be useful to the student. For example, if students are required to perform the terminal control of an aircraft and the aircraft is visually presented but the detail is too low to determine which direction the aircraft is pointed or whether it is still maneuvering.
2	Provided by System but Incorrect Scale (Unusable)	Although the information is presented, it is not presented in a scale that matches the real-world. For example, target scaling is incorrect and leads to students overestimating or underestimating distances.
3	Information is Provided to Students in a Different Form (presented by instructor)	Although the information is presented with sufficient detail to perform the task, it is not in the form that it is presented in the real world. For example, the <i>instructor</i> could tell students that their target has started moving east at 40 km/h instead of requiring students to detect that the target is moving and estimate the speed.
4	Information is Provided to Students in a Different Form (presented by system)	Although the information is presented with sufficient detail to perform the task, it is not in the form that it is presented in the real world. For example, the <i>system</i> could present a text description of a target instead of requiring students to look at the target and determine what the target type is.

B.3.6. Simulation System Accreditation Criteria. The following criteria was designed to identify the minimum capabilities a virtual JTAC training system should possess to facilitate high quality terminal attack control training and supporting tasks. Although this criterion focuses on a JTAC virtual training device, it may be applicable to other live, virtual and constructive environments. Signatories can request JFS ESC accreditation for training systems, other than virtual JTAC training systems, which are capable of facilitating the specified Joint Mission Tasks. The intent of this criterion is to ensure standardization of training and to assist signatories in developing effective simulation systems.

Table B.3.6. JTAC Simulation System Accreditation Criteria

JTAC Simulation system Accreditation Criteria		Minimum Fidelity Rating	Desired Fidelity Rating
1. Environment			
1.1.	Terrain with natural and manmade features must be consistent with military maps.	5	6
1.2.	Terrain must be of sufficient detail, scaled appropriately, to facilitate military scenarios to generate trainee reactions during detection, identification, targeting and engagement of entities.	5	6
1.3.	Terrain must correlate to military mapping datum database and map products used in the training environment.	6	6
1.4.	Terrain must be capable of providing natural obscuration, hindering observation of targets, aircraft, weapons effects, and other entities when appropriate (depressions, terrain masking, etc.).	5	6
1.5.	Man-made features (buildings, bridges, roads, etc.) and entity models (military and civilian vehicles, weapons systems, people, etc.) must be consistent with real world representations and behavior (to the greatest extent as possible), and scaled appropriately, to facilitate detection, identification, location and engagement of targets.	5	6
1.5.1.	Entities must be sufficient in number/type to facilitate the full scope of military scenarios (major combat operations (MCO) to counter insurgency).	5	6
1.5.2.	Targetable models must have a minimum of 3 damage states. <ul style="list-style-type: none"> • Intact (no visible damage). • Damaged (overall structure intact with visible damage to wheels/tracks, turret, guns/missiles, etc.). • Destroyed (model structure severely damaged, smoking hulk). • Weapons effects on moving vehicles must cease motion when attacked to indicate a mobility kill. 	5	6

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JTAC Simulation system Accreditation Criteria	Minimum Fidelity Rating	Desired Fidelity Rating
1.5.3. Model locations correlate to WGS-84 or newer military mapping datum database and map products used in the training Simulation.	5	6
1.5.4. Ground models have sufficient detail (size, shape) to facilitate detection, recognition and identification.	5	6
<ul style="list-style-type: none"> Day Visual Unaided (3 meter high target). <ul style="list-style-type: none"> Detectable @ 3000 meters. Recognizable @ 1500 meters. Identifiable @ 1000 meters. 	5	6
<ul style="list-style-type: none"> Day Visual Aided (magnifying device) (3 meter high target). <ul style="list-style-type: none"> Detectable @ 6000m. Recognizable @ 4000 m. Identifiable @ 2000m. 	5	6
<ul style="list-style-type: none"> Night Aided (NVG or thermal). <ul style="list-style-type: none"> Detectable @ 1000 m. Recognizable @ 500 m. 	5	6
1.5.5. Aircraft models have sufficient detail (size, shape, scale) to facilitate detection and identification while in flight.	5	6
<ul style="list-style-type: none"> Day Visual Unaided. <ul style="list-style-type: none"> Detectable @ 6 nautical miles. Determine direction of aircraft flight @ 6 nautical miles. Identifiable aircraft @ 4 nautical miles. 	5	6
1.5.6. Aircraft entities must be able to comply with trainee directions (stay west of the river, proceed to IP C).	5	6
1.6. System should be capable of importing available terrain and map datum file formats to permit users to build custom terrain and scenarios (desired future capability).	-	6
1.7. System must replicate environmental conditions which impact CAS /operations (should be operator selectable).		
1.7.1. System must replicate realistic time of day and shadowing consistent with sun angles, location and moon phase, and star representation.	5	6
1.7.2. System must replicate varying cloud heights (in 500 feet increments), scattered clouds selectable in percent of entire sky.	5	6
1.7.3. System must replicate a full range of visibility (200 feet to unrestricted, fog).	5	6
1.7.4. System must replicate wind and effects (direction and velocity) on scenario features (grass, trees, flares, etc.), on air-burst illumination rounds (ground- and air-delivered) and weapon effects (smoke).	5	6
1.7.5. System must replicate precipitation (rain, sleet, snow).	5	6

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JTAC Simulation system Accreditation Criteria	Minimum Fidelity Rating	Desired Fidelity Rating
1.7.6. System should replicate seasonal effects (defoliated trees, snow/ice/leaves ground cover, etc.).	3	6
1.8. System must provide sufficient terrain and manmade feature detail to facilitate a CAS target-talk-on.		
1.8.1. System must provide sufficient terrain and manmade feature detail to conduct effective target correlation (between JTAC and pilot perspectives).	5	6
1.9. Sounds must be consistent with the natural and manmade Simulation (accurate representative Doppler shift).		
1.9.1. Explosion sounds must be consistent with size of weapon (minimum distinction small, medium, large weapons).	5	6
1.9.2. Delays/intensity of sounds must be consistent with range/size of explosion (flash bang).	5	6
1.9.3. Machine entity sounds must be representative of actual military and civilian equipment.	5	6
1.9.4. Cultural sounds must be consistent with normal sounds produced by the environment.	5	6
2. Model Behavior		
2.1. Ground model behavior must be consistent with actual objects.		
2.1.1. Ground model movements must be natural and consistent with those normally associated with the actual object.	5	6
2.1.2. Ground model reactions are consistent with actual objects (attack, break contact, etc.).	5	6
2.2. Fixed wing aircraft, rotary wing aircraft and unmanned aerial systems (UAS) performance during CAS missions in the simulation environment must be consistent with current CAS aircraft tactics, techniques and procedures (TTPs).		
2.2.1. Aircraft flight-paths must be realistic and resemble actual performance characteristics (physics-based).	6	6
2.2.2. Aircraft speed during ingress/egress/orbit must be consistent with actual aircraft type.	5	6
2.2.3. Aircraft turning ability must be consistent with actual aircraft performance.	5	6
2.2.4. Aircraft flight-paths and flight performance must be realistic to each aircraft type represented and resemble actual performance characteristics (physics-based models)” during very low, low, medium and high altitude attack profiles.	5	6
2.3. Aviation weapons deliveries must be consistent with current aircraft TTPs.		
2.3.1. Aircraft models must be capable of realistic weapons configurations (SCLs).	5	6
2.3.2. System must replicate aircraft dropping bombs consistent with current TTP.	5	6

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JTAC Simulation system Accreditation Criteria	Minimum Fidelity Rating	Desired Fidelity Rating
2.3.3. Bomb flight paths must be physics based.	5	6
2.3.4. System must replicate aircraft employing forward firing weapons (rockets, guns, missiles) consistent with current TTP.	5	6
2.3.5. Rotary wing aircraft must be capable of off axis engagements (as appropriate)	5	5
2.3.6. System operator must be able to abort attacks, based on an abort call from the JTAC, or failure to provide proper clearance in a timely manner	6	6
2.4. Weapons effects must be proportional in size and visual effect inflicting damage consistent with current weapons.		
2.4.1. Weapons effects must include: <ul style="list-style-type: none"> • Blast (visible explosions, fire proportional to weapon size). • Damage (structural damage, casualties' proportional to weapon size and effects). • Collateral effects (structural damage, casualty's proportional to weapon size and effects). • Smoke and fire from weapons impacts will be persistent with accurately modeled dissipation and wind speed/direction modeling. 	5	6
2.5. The following are the minimum Air to Ground weapons: <ul style="list-style-type: none"> • Bombs (500lbs, 1000lbs, 2000lbs): <ul style="list-style-type: none"> – General purpose (dumb bombs). – Laser guided. – Inertially aided. • Strafe (20-30 mm). • Rockets (2.75''): – Laser guided. • Missiles: <ul style="list-style-type: none"> – AGM-65. – AGM 114. • Illumination: <ul style="list-style-type: none"> – Aerial Flares (parachuting). – Target marking flares (ground). 	5	6
2.6. The following are the minimum surface to surface weapons <ul style="list-style-type: none"> • Artillery (High Explosive (HE), Smoke, Illumination (Illum)). • Mortars (HE, Smoke, Illum). • Naval Surface Fire Support (HE, Smoke, Illum). 	5	6
2.6.1. System must be able to provide realistic firing response and sustained rate of fire.	5	6

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JTAC Simulation system Accreditation Criteria	Minimum Fidelity Rating	Desired Fidelity Rating
2.6.2. System should enable the selection of number of guns, multi-target capability (min of 2 x targets – e.g. SEAD mark and suppress), number of rounds, and time on target (TOT) for each target.	5	6
2.6.3. System must provide message to observer (MTO) information to include time of flight (TOF) / maximum ordinate / Angle-T, when appropriate.	5	6
2.6.4. System should be able replicate entities operating using degrees magnetic (aircraft), milliradians (IDF), and be present the difference between magnetic north and grid north as appropriate (requires consideration of GM angle).	5	6
2.7. System must facilitate realistic time and spatial relationships required for airspace deconfliction and integration of air and surface fires during the conduct of a CAS mission.		
2.7.1. System must facilitate time-on-target missions.	5	6
2.7.2. System must facilitate time-to-target missions	5	6
2.7.3. System must produce negative feedback when control measures are not employed correctly (midair collisions, A/C damage from indirect fire, etc.)	5	6
2.8. System must facilitate the visual marking of CAS targets with air and indirect delivered fire systems.	5	6
2.8.1. Volume and duration of smoke must closely replicate fielded weapons (IAW appropriate weapons manuals).	5	6
2.8.2. Marking effects (i.e. smoke, dust) must behave appropriately when influenced by the environmental factors. (i.e. drift based on wind direction and speed).	5	6
2.8.3. Trainee must be able to determine range and bearing from a mark to the target to facilitate aircrew target acquisition.	6	6
2.9. System must facilitate combined arms scenarios where multiple fire support systems and aircraft simultaneously engage targets in the same target area.	5	6
2.10. System must replicate realistic surface to air threat systems.		
2.10.1. Threat system models must be of sufficient detail to invoke a decision on the need to coordinate suppression of enemy air defenses (SEAD).	5	6
2.10.2. Threat models must exhibit realistic behaviors to invoke a decision on the capability of the threat system (i.e. turret/vehicle movement, tracking radar, troops in vicinity, missile launch, gun fire (muzzle flash).	5	6
2.10.3. The following air defense system weapons and effects are the minimum to be available in the system (derived from unclassified sources).	5	6

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JTAC Simulation system Accreditation Criteria	Minimum Fidelity Rating	Desired Fidelity Rating
<ul style="list-style-type: none"> • Surface to Air Missile Systems (radar and IR guided). (3 types minimum) <ul style="list-style-type: none"> – Launch blasts. – Smoke trails (contrails, plumes). – Detonation explosions. • Air defense artillery systems (3 types minimum). <ul style="list-style-type: none"> – Muzzle flashes. – Tracer rounds. – Impact effects. 		
2.10.4. Damage to threat systems when engaged by SEAD must provide visual effects to the threat system to illicit a successful / not successful determination (visible model damage, SEAD impacts on target, cease in activity, etc.)	5	6
3. Equipment		
3.1. System must provide an emulated or stimulated replica global positioning system (GPS) which corresponds to a WGS-84 or newer military mapping datum database, and map products used in the training simulation.	5	6
3.2. System must provide an emulated or stimulated replica magnetic compass for JTAC spatial awareness.	5	6
3.2.1. Compass bearing must be consistent with terrain database and accompanying map products.	5	6
3.3. System must facilitate the use of laser range finder (LRF) and laser target designator (LTD) for target location, marking and designation.		
3.3.1. Laser target designators must be emulated or simulated likenesses of actual equipment required in CAS operations.	5	6
3.3.2. Selection of appropriate laser code and system feedback for noncompliance is required for lasing and marking targets.	5	6
3.3.3. Laser devices must be capable of providing accurate range and bearing consistent with WGS-84 or newer military mapping datum database, and map products used in the training simulation.	5	6
3.3.4. System operator must be able to verify laser mark and laser spot during target designation.	5	6
3.3.5. Laser guided weapon must terminally guide to the point of laser designation (on or off target).	5	6
3.4. System must facilitate radio communications for command and control agencies in the air - ground system.		
3.4.1. Radio communications equipment used by the JTAC to communicate with aircraft must be an emulated or simulated likeness of actual equipment.	5	6
3.4.2. Communications radio equipment used by the JTAC to communicate with command and control and supporting	5	6

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JTAC Simulation system Accreditation Criteria		Minimum Fidelity Rating	Desired Fidelity Rating
agencies must be similar in likeness and functionality of fielded equipment.			
3.5. System must facilitate the use of Video Downlink (VDL) equipment for reconnaissance, targeting, and CAS execution.			
3.5.1. VDL equipment must have the ability to emulate, simulate or stimulate current VDL equipment.		5	6
3.5.2. Airborne sensor must be able to provide grid coordinates consistent with real world sensor capabilities.		5	6
4. Night			
4.1. System must be capable of varying light levels during night time based on moon phase, star lighting, and cultural lighting to determine the need, suitability of air and/or ground delivered illumination in support of night CAS.		5	6
4.2. Man-made models must display lighting as appropriate (building lights, vehicle headlights, etc.).		5	6
4.3. System must simulate or stimulate current night vision equipment.			
4.3.1. Individual simulated NVGs or night vision devices must be worn by trainee similar to actual NVGs.		5	6
4.3.2. Night capable devices must emulate, simulate or stimulate current LRFs, scopes, and LTDs.		5	6
4.3.3. Night vision devices must display images consistent with actual night vision devices (resolution, clarity, color).		5	6
4.4. System must facilitate the use of infra-red target marking systems from the ground (IR Pointer).			
4.4.1. IR markers at a minimum must be simulated or stimulated.		5	6
4.4.2. IR markers must be capable of producing NVG visible "sparkle," "snake," and "rope" to mark targets.		5	6
4.4.3. "Sparkle," "snake," and "rope" must be visible in the pilot field of view (operator).		5	6
4.4.4. Weapons effects (when appropriate) must be visible through NVDs to assess mission effectiveness.		5	6
4.4.5. System aircraft must be able to match sparkle. Both beams must be visible to the JTAC and pilot (system operator).		5	6
4.5. System must replicate friendly night time position markers (overt and covert strobe lights).		5	6
4.6. System must replicate aircraft marker lights during night time (overt and covert beacon /position lights / formation lights); (desired future capability).		-	6
4.7. System must replicate air and surface delivered illumination to facilitate CAS during night time.			
4.7.1. Aerial Illumination (flares) must be consistent with height of burst, ground lighting patterns, burn times, descent rates,		5	6

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JTAC Simulation system Accreditation Criteria		Minimum Fidelity Rating	Desired Fidelity Rating
wind drift, and ground shadowing associated with actual weapons.			
4.7.2. Ground Illumination must be consistent with ground lighting patterns, burn times, descent rates, wind drift, and ground shadowing associated with actual weapons.		5	6
5. Type 1 terminal attack control			
5.1. During type 1 control, the trainee must be able to visually acquire the attacking aircraft's attack geometry in relation to the target to predict the weapon trajectory from release to impact, to ensure friendly positions and collateral damage concerns are safe from undesired weapons effects.		5	6

B.3.7. JTAC Live Simulation Accreditation. Simulation (notional assets) is commonly used to increase the realism in the live training environment. Threat systems, friendly and enemy ground forces, and indirect fires are routinely simulated during live CAS training. As access to live assets for training continues to be a challenge, the JFS ESC must recognize that quality training can be accomplished by using simulated assets in the live training environment. The following minimum tasks standards are required to facilitate the minimum terminal attack control requirements for certification and qualification training IAW Table 5.3.4.1. and Table 5.3.5. The following paragraphs define the minimum criteria for each type of terminal attack control event to be accredited for use in the live simulation environment. The specified tasks are derived using the CAS execution template and procedures in JP 3-09.3. Note: The default classification for terminal attack control is in the daytime environment. Only criteria for Night terminal attack control is included.

B.3.7.1. Type 1 Terminal Attack Control. The following are the minimum tasks required to facilitate Type 1 Terminal Attack Control:

Type 1 Control Accreditation Tasks	
1.	Provides the means to identify CAS target.
2.	Provides the means to determine CAS target location.
3.	Provides the means to determine friendly locations in relation to the CAS target.
4.	Provides the means to generate a CAS briefing.
5.	Provides the means to receive final attack approval from Ground Commander.
6.	Provides the means to establish communications contact with aircraft.
7.	Provides the means to facilitate the direction and compliance with aircraft to CP/IP instructions (routing safety of flight).
8.	Provides the means to receive fighter check-in.
9.	Provides the means to provide situation update to aircraft.
10.	Provides the means to provide a game plan.
11.	Provides the means to pass a CAS brief to aircraft.
12.	Provides the means to provide the aircraft with relevant remarks/restrictions.
13.	Provides the means to receive CAS brief read-backs.
14.	Provides the means to conduct target correlation.
15.	Provides the means to direct aircraft to depart IP/commence attack.
16.	Provides the required visual cues to permit the trainee to locate the aircraft on ingress and be able to assess attack geometry.
17.	Provides the visual cues required for a trainee to assess attack geometry during the terminal phase of the attack.
18.	Provides the means to determine if the pending attack poses a risk to friendly forces.
19.	Provides the means to issue attack clearance or abort.
20.	Provide required visual cues and sounds to permit assessment of weapons effects on target.
21.	Provide visual cues required for trainee to provide weapons corrections to inbound aircraft.
22.	Provides visual cues required to observe anti-aircraft fire/missile launch on egressing aircraft.
23.	Provides the required visual cues and sounds to facilitate bomb damage assessment.
24.	Provides the means to facilitate the direction of and compliance with aircraft egress instructions (routing safety of flight).

B.3.7.2. Type 2 Terminal Attack Control. The following are the minimum tasks required to facilitate Type 2 Terminal Attack Control:

Type 2 Control Accreditation Tasks	
1.	Provides the means to identify CAS target.
2.	Provides the means to determine CAS target location.
3.	Provides the means to determine friendly locations in relation to the CAS target.
4.	Provides the means to generate a CAS briefing.
5.	Provides the means to receive final attack approval from Ground Commander.
6.	Provides the means to establish communications contact with aircraft.
7.	Provides the means to facilitate the direction of and compliance with aircraft to contact point / initial point (CP/IP) instructions (routing safety of flight).
8.	Provides the means to receive fighter check-in.
9.	Provides the means to provide situation update to aircraft.
10.	Provides the means to provide a game plan.
11.	Provides the means to pass a CAS brief to aircraft.
12.	Provides the means to provide the aircraft with relevant remarks/restrictions.
13.	Provides the means to receive CAS brief read-backs
14.	Provides the means to conduct target correlation
15.	Provides the means to direct aircraft to depart IP/commence attack
16.	Provides the means to determine if the pending attack poses a risk to friendly forces
17.	Provides the means to issue attack clearance or abort for individual attacks
18.	Provides the means to assess weapons effects on target
19.	Provides the means to provide weapons corrections to inbound aircraft
20.	Provides the means to identify and report anti-aircraft fires/missile launch on egressing aircraft
21.	Provides the means to facilitate bomb damage assessment as appropriate
22.	Provides the means to facilitate the direction of and compliance with aircraft egress instructions (routing safety of flight)

B.3.7.3. Type 3 Terminal Attack Control. The tasks required to facilitate Type 3 Terminal Attack Control are the same as B.3.7.2. Type 2 Terminal Attack Control, the only difference being Type 3 control permits multiple attacks within a single engagement, subject to specific attack restrictions.

B.3.7.4. Bomb on Coordinate (BOC) Terminal Attack Control. The tasks required to facilitate BOC Terminal Attack Control are the same as B.3.7.2 (or B.3.7.3 for type 3) except bomb on coordinate procedures must be executed IAW JP 3.09.3.

B.3.7.5. Fixed Wing Terminal Attack Control. The tasks required to facilitate Terminal Attack Control with a fixed wing aircraft are the same as B.3.7.2 (or B.3.7.3 for type 3) except fixed wing procedures must be executed IAW JP 3.09.3. Personnel role-playing fixed wing aircrew must have a working knowledgeable of fixed wing aircraft systems, TTPs, radio procedures, and brevity terms.

B.3.7.6. Rotary Wing Terminal Attack Control. The tasks required to facilitate Terminal Attack Control with a rotary wing aircraft are the same as B.3.7.2 (or B.3.7.3 for type

3) except rotary wing procedures must be executed IAW JP 3.09.3. Personnel role-playing rotary wing aircrew must have a working knowledgeable of rotary wing aircraft systems, TTPs, radio procedures, and brevity terms.

B.3.7.7. Ground Laser Target Designation and Marking. The following are the minimum tasks required to facilitate laser target designation and marking tasks required to support a laser terminal attack control. Personnel role-playing aircrew must have a working knowledgeable of aircraft systems, TTPs, radio procedures, and brevity terms.

Ground Laser Target Designation	
1.	Provides the means to identify CAS target
2.	Provides the means to determine CAS target location using a laser target designator/range finder (range and bearing) when coupled with GPS
3.	Provides the means to determine friendly locations in relation to the CAS target
4.	Provides the means to generate a CAS briefing
5.	Provides the means to receive final attack approval from Ground Commander
6.	Provides the means to establish communications contact with aircraft
7.	Provides the means to facilitate the direction of and compliance with aircraft to CP/IP instructions (routing safety of flight)
8.	Provides the means to receive fighter check-in
9.	Provides the means to provide situation update to aircraft
10.	Provides the means to provide a game plan
11.	Provides the means to pass a CAS brief to aircraft
12.	Provides the means to provide the aircraft with relevant remarks/restrictions
13.	Provides the means to receive CAS brief read-backs
14.	Provides the means to provide a laser designation for weapon terminal guidance or laser marking spot to facilitate target engagement
15.	Provides the means to direct aircraft to depart IP/commence attack
16.	Provides the means to determine if the pending attack poses a risk to friendly forces
17.	Provides the means to issue attack clearance or abort for individual attacks
18.	Provides the means to assess of weapons effects on target
19.	Provides the means to be able to provide weapons corrections to inbound aircraft
20.	Provide means to identify and report AA fires/missile launch on egressing aircraft
21.	Provides the means to facilitate bomb damage assessment as appropriate
22.	Provides the means to facilitate the direction of and compliance with aircraft egress instructions (routing safety of flight)

B.3.7.8. Terminal Attack Control Employing IR Pointer for Target Marking. The following are the minimum tasks required to facilitate IR laser marking tasks required to support an IR pointer terminal attack control. Personnel role-playing aircrew must have a working knowledgeable of aircraft systems, TTPs, radio procedures, and brevity terms.

IR Pointer (Laser Target Marking)	
1.	Provides the means to identify CAS target
2.	Provides the means to determine friendly locations in relation to the CAS target
3.	Provides the means to generate a CAS briefing
4.	Provides the means to receive final attack approval from Ground Commander
5.	Provides the means to establish communications contact with aircraft
6.	Provides the means to facilitate the direction of and compliance with aircraft to CP/IP instructions (routing safety of flight)
7.	Provides the means to receive fighter check-in
8.	Provides the means to provide situation update to aircraft
9.	Provides the means to provide a game plan
10.	Provides the means to pass a CAS brief to aircraft
11.	Provides the means to provide the aircraft with relevant remarks/restrictions
12.	Provides the means to receive CAS brief read-backs
13.	Provides the means to provide a laser “Sparkle” to facilitate target correlation
14.	Provides the means to direct aircraft to depart IP/commence attack
15.	Provides the means to determine if the pending attack poses a risk to friendly forces
16.	Provides the means to issue attack clearance or abort for individual attacks
17.	Provides the means to assess of weapons effects on target
18.	Provides the means to be able to provide weapons corrections to inbound aircraft
19.	Provides the means to identify and report AA fires/missile launch on egressing aircraft
20.	Provides the means to facilitate bomb damage assessment as appropriate
21.	Provides the means to facilitate the direction of and compliance with aircraft egress instructions (routing safety of flight)

B.3.7.9. Terminal Attack Control with a Remote Observer. The tasks required to facilitate terminal attack control with a remote observer are the same as B.3.7.2 (or B.3.7.3 for type 3) except targeting information is provided to the JTAC by a remote observer. The JTAC and remote observe should be participants in the training scenario. Personnel role-playing aircrew must have a working knowledgeable of aircraft systems, TTPs, radio procedures, and brevity terms.

B.3.7.10. Terminal Attack Control using Video Downlink (Full motion Video). The following are the minimum tasks required to facilitate terminal attack control using sensor video broadcast from aircraft. Personnel role-playing aircrew must have a working knowledgeable of aircraft systems, TTPs, radio procedures, and brevity terms.

Terminal Attack Control Using Video Down-Link	
1.	Provides the means to identify CAS target using a broadcast video received from an aircraft sensor
2.	Provides the means to determine CAS target location using a broadcast video received from an aircraft sensor
3.	Provides the means to determine friendly locations in relation to the CAS target
4.	Provides the means to generate a CAS briefing
5.	Provides the means to receive final attack approval from Ground Commander
6.	Provides the means to establish communications contact with aircraft
7.	Provides the means to facilitate the direction of and compliance with aircraft to CP/IP instructions (routing safety of flight)
8.	Provides the means to receive fighter check-in
9.	Provides the means to provide situation update to aircraft
10.	Provides the means to provide a game plan
11.	Provides the means to pass a CAS brief to aircraft
12.	Provides the means to provide the aircraft with relevant remarks/restrictions
13.	Provides the means to receive CAS brief read-backs
14.	Provides the means to direct aircraft to depart IP/commence attack
15.	Provides the means to determine if the pending attack poses a risk to friendly forces
16.	Provides the means to issue attack clearance or abort for individual attacks
17.	Provides the means to assess weapons effects on target
18.	Provides the means to be able to provide weapons corrections to inbound aircraft using VDL info
19.	Provides the means to facilitate bomb damage assessment using VDL
20.	Provides the means to facilitate the direction of and compliance with aircraft on egress instructions (routing safety of flight)

B.3.7.11. Suppression of Enemy Air Defenses (SEAD). The tasks required to facilitate SEAD in support of terminal attack control are the same as B.3.7.2 (or B.3.7.3 for type 3) with the addition of the following tasks. Personnel role playing aircrew and indirect fire systems must have a working knowledgeable of the employed systems, TTPs, radio procedures, and brevity terms.

Suppression of Enemy Air Defense (SEAD) Tasks	
1.	Provides the means to identify threat system.
2.	Provides the means to determine threat location.
3.	Provides the means to determine friendly locations in relation to threat system.
4.	Provides the means to determine all elements of the appropriate call for fire
5.	Provides the means to establish communications contact with fire direction center / surface fires coordination unit.
6.	Provides the means to determine observer to target range and bearing.
7.	Provides the means to determine if suppressing fires poses a risk to friendly forces
8.	Provides the means to transmit the call for fire and receive required Message to Observer or other required read-backs elements
9.	Provides the means to assess weapons effects on threat system
10.	Provides the means to provide round adjustments
11.	Provides the means to assess effectiveness of suppression fires and provide BDA to fire direction center / surface fires coordination unit at end of mission

B.3.7.12. Terminal Attack Control in an Urban Environment. The tasks required to facilitate Terminal Attack Control with in an urban environment are the same as B.3.7.2 (or B.3.7.3 for type 3) except the JTAC is located in an urban environment. Urban training scenarios should present unique challenges such as operations in urban canyons, deconfliction in confined airspace, restrictive ROE, difficulty in threat analysis, the presence of noncombatants, the potential for collateral damage, and the increased risk of friendly fire. Personnel role playing aircrew must have a working knowledgeable of aircraft systems, TTPs, radio procedures, and brevity terms.

B.3.7.13. Terminal Attack Control using a FAC(A). The tasks required to facilitate Terminal Attack Control with a FAC(A) are the same as B.3.7.2 (or B.3.7.3 for type 3) except the JTAC is employing FAC(A) to assist with detecting and destroying enemy targets, coordinating target marking, providing TAC of CAS missions, conducting air reconnaissance, providing artillery and naval gunfire air spotting, providing radio relay for the TACP or JTAC, and passing BDA. Personnel role playing the FAC(A) must have a working knowledgeable of aircraft systems, FAC(A) TTPs, radio procedures, and brevity terms.

B.3.7.14. Night Terminal Attack Control. The following are the minimum tasks required to facilitate Night Terminal Attack Control. Conducting CAS at night requires employment of special equipment and TTPs to facilitate target engagement.

Night Terminal Attack Control Accreditation Tasks	
1.	Provides the means to identify CAS target at night using night vision devices (illumination)
2.	Provides the means to determine CAS target location at night
3.	Provides the means to determine friendly locations in relation to the CAS target at night
4.	Provides the means to generate a CAS briefing
5.	Provides the means to receive final attack approval from Ground Commander
6.	Provides the means to establish communications contact with aircraft
7.	Provides the means to facilitate the direction and compliance with aircraft to CP/IP instructions (routing safety of flight)
8.	Provides the means to receive fighter check-in
9.	Provides the means to provide situation update to aircraft
10.	Provides the means to provide a game plan
11.	Provides the means to pass a CAS brief to aircraft
12.	Provides the means to provide the aircraft with relevant remarks/restrictions
13.	Provides the means to receive CAS brief read-backs
14.	Provides the means to conduct target correlation using night marking devices
15.	Provides the means to direct aircraft to depart IP/commence attack
16.	Provides the means to determine if the pending attack poses a risk to friendly forces
17.	Provides the means to issue attack clearance or abort for individual attacks
18.	Provides the means to assess weapons effects on target at night
19.	Provides the means required to provide weapons corrections to inbound aircraft
20.	Provides the means to identify and report anti-aircraft fires/missile launch on egressing aircraft at night
21.	Provides the means to facilitate bomb damage assessment as appropriate at night
22.	Provides the means to facilitate the direction of and compliance with aircraft egress instructions (routing safety of flight)

B.3.8. JTAC Simulation System Accreditation Assessment Process. At the request of the signatory, simulation systems will be assessed and accredited by the JFS ESC or their designated representative during scheduled schoolhouse or program accreditation for their capability to facilitate the minimum terminal attack control requirements for certification and qualification training. The following paragraph explains the process by which the JFS ESC implements the JTAC Simulation Accreditation process.

B.3.8.1. Self-Assessment. Signatories are responsible for training and equipping JTACs and will ensure simulation systems are capable of facilitating the specified Joint Mission Execution Tasks and control requirements prior to requesting JFS ESC assessment. Signatories should ensure simulation systems are assessed by experienced JTAC instructors and evaluators who were not involved with the acquisition of the system. A JTAC Simulation System Accreditation Self-Assessment Checklist (Appendix B, Enclosure 4) is provided as a guideline for self-assessments.

B.3.8.2. Requests for JFS ESC Accreditation Assessment. All requests for JFS ESC accreditation assessments will be forwarded to the JFS ESC Working Group Chairman for consideration and action. The request will include the following information:

- A detailed description of system to be accredited (Information paper or briefing format).
- Completed JFS ESC Accreditation Self-Assessment Checklist with name and contact info of certifying official.
- Other documents which validate the system meet user requirements (Examples: Acceptance testing documents, manufacturer test documents, performance specifications, etc.).

B.3.8.2.1 Upon receipt of the signatory request, the JFS ESC Working Group Chairman will review the request and supporting document and make a determination if an interim accreditation is feasible based upon the information provided and schedule a formal assessment during the next scheduled standardization visit, or direct an assessment team be formed to conduct the assessment as soon as reasonably possible.

B.3.8.3. Accreditation Assessment. Formal Accreditation Assessments will be conducted to ensure the training system is capable of facilitating the Joint Mission Execution Tasks and control requirements. Assessment teams will consist of JTAC MOA signatory JTAC/CAS subject matter experts to ensure objectivity of the process. The assessments will be conducted using pre-coordinated mission profiles to demonstrate system capability and operations. Although not specifically addressed in the accreditation criteria, effective operation of the training system by the instructors and/or designated simulation operators, and the design of training, are critical to the effectiveness of simulation and will be considered during the accreditation determination.

B.3.8.3.1 Assessments will be conducted in a constructive manner and discrepancies should be resolved on the spot if possible. Upon completion of the assessment, the team leader will capture the assessment results in a report and forward to the JFS ESC with an accreditation recommendation to the JFS ESC (Working Group) for review and endorsement.

B.3.8.4. Accreditation Duration. Once granted by the JFS ESC, accreditations will remain effective until the accreditation criterion is significantly changed, or if during regular standardization visits, systems fail to demonstrate their ability to meet the current criteria. Capability upgrades will be recognized during regularly scheduled standardization visits, and documented in Standardization Team Reports.

Appendix B

Enclosure 4: JTAC Simulation System Accreditation Self-Assessment Checklist

Item #	Task Question	Yes	No	Classification
1.	Do terrain features in the simulation (natural and manmade) accurately reflect those depicted on corresponding military maps?			
2.	- Does the system realistically display mountains, hills, plains, depressions, valleys, woodlands, lakes, and rivers and correlate to associated military maps?			All
3.	- Does the system realistically display cities, towns, buildings, roads, bridges, railroads, and utility lines and correlate to associated military maps?			All
4.	Is terrain sufficient in detail and scaled appropriately to facilitate military scenarios capable of eliciting trainee reactions during detection, identification, targeting and engagement of system generated entities?			
5.	- Does the system enable terrain association and range estimation to facilitate target detection, identification and location?			All
6.	- Does the system provide visual cues of motion to capture trainee's attention to approaching distant entities?			All
7.	Does the terrain correlate to a military mapping datum and map products used in the training environment?			
8.	- Are military maps used during training in the simulation?			All
9.	- Are the actual military maps used in the simulation printed using standard military mapping system / datum?			All
10.	Is the terrain capable of providing natural obscuration, hindering observation of targets, aircraft, weapons effects, and other entities when appropriate (depressions, terrain masking, etc.)? Entities can be masked by:			
11.	- Manmade Structures (buildings, vehicles)			All
12.	- Elevated terrain features (mountains, hills)			All
13.	- Low terrain features (valleys, reverse slope, depressions)			All
14.	- Vegetation (trees, brush)			All
15.	- Are man-made features (buildings, bridges, roads, etc.) and entity models (military and civilian vehicles, weapons systems, people, etc.) consistent with real world representations, behavior, and scaled appropriately, to facilitate detection, identification, location and engagement of targets?			

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Item #	Task Question	Yes	No	Classification
16.	- Do buildings, bridges and roads facilitate normal activity (vehicles travel on roads, across bridges, and not through buildings)?			All
17.	- Are military/civilian vehicles, weapons systems, and people, accurately represented and do they behave realistically enough to accomplish the training task(s) in the sim?			All
18.	- Are military/civilian vehicles, weapons systems, and people, accurately represented and do they behave realistically enough to accomplish the training task(s) in the sim?			All
19.	- Are entities sufficient in number/type to facilitate the full scope of military scenarios (major combat operations (MCO) to counter insurgency)?			
20.	- Can the simulation build and run a scenario with a minimum of 200 externally generated simultaneous entities?			All
21.	- Do targetable models have a minimum of 3 damage states?			
22.	- Intact, no damage			All
23.	- Damaged (overall structure intact with visible damage to wheels/tracks, turret, guns/missiles, etc.)			
24.	- Destroyed (model structure severely damaged, smoking)			All
25.	- When engaged by lethal weapons, do moving vehicles cease motion to indicate a mobility kill?			
26.	Do model locations correlate to a military mapping datum database and map products?			
27.	- Do entity locations in the sim correlate to the location on the associated map?			All
28.	- Capable of generating an accurate entity location coordinate (+/- 100m) using map, compass and terrain association?			All
29.	- Are ground models constructed with sufficient detail (size, shape) to reasonably facilitate target detection, recognition and identification?			All
30.	- Does the size and detail of ground models change appropriately as they get closer and further away (daytime)? - Ground model requirements for day visual unaided acquisition (3 meter high target)			All
31.	1. Detectable @ 3000 meters (I see something)			
32.	2. Recognizable @ 1500 meters (I see a tank, APC, truck)			
33.	3. Identifiable @ 1000 meters (I see a T-55, BMP, Ford pickup)			

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Item #	Task Question	Yes	No	Classification
34.	Are aircraft models constructed with sufficient detail (size, shape, scale) to facilitate detection and identification while in flight (daytime)? 4. Aircraft model requirements for day visual unaided acquisition			Fixed /Rotary Wing
35.	Detectable @ 6 nautical miles (I see something in the air)			
36.	Determine direction of aircraft flight @ 6 nautical miles (I see an aircraft flying north to south)			
37.	Able to identifiable aircraft @ 4 nautical miles (I see an F-18 flying east to west at 4-6000 ft.)			
38.	Are aircraft entities able to comply with trainee directions (i.e. stay west of the river, proceed to IP C)?			Fixed /Rotary Wing
39.	Is the system capable of importing available terrain and map datum file formats to permit users to build custom terrain and scenarios?			
40.	Does the system adequately replicate the daytime environment needed to accomplish JTAC training tasks?			All
41.	Does the system replicate realistic time of day?			
42.	Does the day environment present challenges of sun angle?			
43.	Are shadows consistent with sun angles which can hinder target identification?			
44.	Does the system adequately replicate the night time environment required to accomplish Night JTAC training tasks?			Night
45.	Does the system replicate Moon Phase (min 4 moon phases: new, 1/4, 1/2, 3/4, and full)			
46.	Does the system replicate star lighting with moon illum (4 varying degrees, 10-70 %)			
47.	Does the system replicate cultural lighting (realistic washout and halo)?			
48.	Does the system adequately replicate varying cloud heights?			All
49.	Min cloud decks: clear, scattered, broken, overcast			
50.	Varying cloud height intervals 500 to1000 feet AGL			
51.	Cloud heights in 500 foot increments up to 3000 AGL & 1000 foot increments from 3k to 40k			

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Item #	Task Question	Yes	No	Classification
52.	Does the system replicate an adequate range of visibility (200 feet to unrestricted, fog)?			All
53.	Min selectable levels of visibility: clear, 5 miles, 3 miles, one mile, ¼ mile			
54.	Does the system replicate wind and effects (direction and velocity) on air-burst illumination rounds (ground- and air-delivered) and weapon effects (smoke)?			All
55.	Does the system replicate precipitation (rain, sleet, snow)?			
56.	Does the system replicate seasonal effects (defoliated trees, snow /ice/ leaves ground cover, etc.)?			
57.	Does the system provide sufficient terrain and manmade feature detail to facilitate a CAS target-talk-on? (Enhanced target description)			Type 1,2,3
58.	<p>- Does the system provide the appropriate visual cues in the ground perspective to facilitate the successful identification of a target?</p> <p>Components which enable an enhanced target description:</p> <p>Consider: Terrain features: Roads, buildings, other manmade structures; Distance and direction reference points; Entity movement (direction and speed)</p>			Type 1, 2, 3
59.	1. Does the system provide the appropriate visual cues in the aerial perspective (operator/pilot view) to facilitate the successful target ID?			Type 1,2,3
60.	2. Does the system provide sufficient terrain /manmade feature detail to conduct target correlation (between JTAC and pilot perspectives)?			Type 1,2,3
61.	<p>Are sounds produced by the system reasonably consistent with actual sounds produced in the live environment, to enable JTAC training tasks?</p> <p>3. (Sound should add to realism, not detract from it)</p>			All
62.	<p>- Are weapons impact sounds proportional to associated weapons and range?</p> <p>Rule of Thumb:</p> <ul style="list-style-type: none"> • MK 84/MRLS/HIMARS = large boom • MK 82/Artillery/NGS = medium boom • A-G Missiles/rockets /mortars = small boom <p>Strafe = loud noise</p>			
63.	<p>Is the delay/intensity of sounds reasonably consistent with range/size of explosion?</p> <p>1. Flash to bang rule: 500m = 1.5 sec./1000m = 3 sec./4000m = 12 sec./6000m = 18 sec.</p>			All
64.	Are machine entity sounds reasonably consistent with actual military and civilian equipment?			
65.	Are cultural sounds reasonably consistent with normal sounds produced by the environment?			

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Item #	Task Question	Yes	No	Classification
66.	Are <u>ground model movements</u> natural and consistent with those normally associated with the actual object?			All
67.	Are <u>ground model reactions</u> reasonably consistent with actual objects (attack, break contact, etc.) to accomplish JTAC training tasks?			All
68.	Is <u>Fixed wing</u> aircraft performance reasonably consistent with current CAS aircraft tactics, techniques and procedures (TTPs)?			Fixed Wing
69.	Is <u>Rotary wing</u> aircraft performance reasonably consistent with current CAS aircraft tactics, techniques and procedures (TTPs)?			Rotary Wing
70.	Are aircraft (FW&RW) flight-paths reasonably realistic and resemble actual performance characteristics? (physics based)			Fixed / Rotary Wing
71.	Is aircraft (FW&RW) speed on ingress/egress/orbit reasonably consistent with actual aircraft type?			Fixed / Rotary Wing
72.	Is aircraft (FW&RW) turning performance reasonably consistent with actual aircraft performance?			Fixed / Rotary Wing
73.	Are aircraft tactics/attack profiles low (very), medium and high altitudes consistent with actual aircraft performance?			Fixed / Rotary Wing
74.	Are aircraft weapons deliveries reasonably consistent with current CAS aircraft TTPs? (JP 3-09.3)			Fixed / Rotary Wing
75.	Are aircraft models capable of carrying realistic weapons loads (SCL)?			Fixed / Rotary Wing
76.	Does the system reasonably replicate FW aircraft dropping bombs consistent with current TTP?			Fixed Wing
77.	Low level Pop Attack			
78.	Dive attack			
79.	Level Delivery			
80.	Does the system reasonably replicate RW aircraft expending ordnance consistent with current TTP?			Rotary Wing
81.	Hover fire			
82.	Running fire			
83.	Diving fire			

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Item #	Task Question	Yes	No	Classification
84.	Do FW & RW air delivered weapons generally follow realistic flight paths? (follows ballistic paths; physics based)			Fixed/Rotary Wing
85.	Does the system reasonably replicate FW & RW aircraft employing forward firing weapons (rockets, guns, missiles) consistent with current TTP?			Fixed/Rotary Wing
86.	Are rotary wing aircraft capable of off-axis engagements (as appropriate)?			
87.	Is the System/operator able to abort attacks, based on an abort call from the JTAC or failure to provide proper clearance in a timely manner?			Fixed/Rotary Wing
88.	Are the visual effects of weapons impacts reasonably consistent with weapons employed? (consider fire, blast, damage)			All
89.	Are weapons effects proportional to associated weapons and range? - MK 84/MLRS/HIMARS = large explosion (blast, damage, smoke, CE) - MK 82/Artillery/NSFS = medium explosion, (blast, damage, smoke, CE) - A-G Missiles/rockets /mortars = small explosion, (blast, damage, smoke, CE) Strafe = loud noise, many impacts, (damage, CE)			Fixed Wing
90.	Minimum Air to Ground weapons:			
91.	General purpose bombs (500lbs, 1000lbs, 2000lbs)			Fixed Wing
92.	Laser guided bombs			Fixed/Rotary Wing
93.	Inertially aided bombs (500lbs, 1000lbs, 2000lbs)			Fixed Wing
94.	Strafe (20-30 mm)			Fixed/Rotary Wing
95.	- Rockets (2.75") Laser guided			Fixed/Rotary Wing
96.	2. Missiles (AGM-65 & AGM 114)			Fixed/Rotary Wing
97.	- Aerial Delivered Illumination • Aerial Flares (parachuting) 3. Target marking flares (ground)			Fixed/Rotary Wing Night
98.	4. The following are the minimum surface to surface weapons:			

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Item #	Task Question	Yes	No	Classification
99.	5. Artillery (High Explosive (HE), Smoke, Illumination(Illum))			Surface to Surface
100.	6. Mortars (HE, Smoke, Illum)			Surface to Surface
101.	7. Naval Surface Fire Support (HE, Smoke, Illum)			Surface to Surface
102.	8. Does the system must provide realistic firing response and sustained rate of fire?			Surface to Surface
103.	9. Is the system capable of engaging multiple targets with indirect fire to facilitate simultaneous suppression/marketing during a CAS mission? (min of 2 x targets – e.g. SEAD mark and suppress using time on target (TOT)).			Surface to Surface
104.	10. Is the system able to provide message to observer (MTO) information?			Surface to Surface
105.	11. Is the system able to provide and replicate accurate time of flight (TOF)?			Surface to Surface
106.	12. Is the system able to provide and replicate accurate maximum ordinate?			Surface to Surface
107.	13. Is the system able to accept degrees magnetic and milliradians and able to convert between magnetic north and grid north?			All
108.	Does the system replicate the difference between true and magnetic north? - Map coordinates given in grid north require trainee to convert using GM Angle (GM angle varies depending on location)? 14. Do aircraft in the simulation fly using magnetic north?			All
109.	Is the system capable of facilitating time-on-target missions			
110.	Are indirect fires systems capable of conducting time-on-target missions? (automated or operator facilitated)			Surface to Surface
111.	Are aircraft entities within the system capable of conducting time-on-target missions? (automated or operator facilitated)			Fixed/Rotary Wing
112.	Is the system capable of facilitating time-to-target missions?			Fixed/Rotary Wing
113.	Are aircraft entities within the system capable of conducting time-to-target missions? (automated or operator facilitated)			Fixed/Rotary Wing

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Item #	Task Question	Yes	No	Classification
114.	Does the system produce negative feedback when airspace/fires support control measures are not employed correctly (midair's, A/C damage from indirect fire)?			Surface to Surface
115.	Does the system facilitate the visual marking of CAS targets with air and indirect delivered fire systems?			
116.	Does the system adequately replicate <u>indirect fired</u> marking rounds (smoke; HE)?			Surface to Surface
117.	Does the system adequately replicate <u>aircraft delivered</u> marking rockets (smoke)?			Fixed/Rotary Wing
118.	Does the volume of smoke and bloom duration adequately replicate fielded weapons (aircraft and indirect systems)?			FW/RW Surface to surface
119.	Do marking effects generally behave appropriately when influenced by the environmental factors? (drift with wind direction and speed)			
120.	Does smoke generally dissipate and drift in the direction of the wind line?			All
121.	Does the speed of the drifting smoke generally correlate to the wind speed?			All
122.	Can a trainee determine range and bearing from the mark to the target in the system?			All
123.	Can the system facilitate combined arms scenarios where multiple fire support systems and aircraft simultaneously engage targets in the same target area?			All
124.	Are surface to air threat system models of sufficient detail to invoke a decision on the need to coordinate suppression of enemy air defenses (SEAD)? Considerations - Armament: gun /missile / combination Guidance system / optical / IR / radar / combination			Surface to surface (SEAD)
125.	Do threat models exhibit adequate behaviors to invoke a decision on the capability of the threat system? Considerations: - Do threat models exhibit realistic Turret/vehicle movement? - Do threat models exhibit realistic target tracking (radar/turrets)? - Do threat models exhibit Missile launch effects (smoke plume/trail)? Do threat models exhibit Gunfire (muzzle flash)?			Surface to surface (SEAD)
126.	At a minimum, are the following air defense systems and weapons effects available in the system:			

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Item #	Task Question	Yes	No	Classification
127.	- Surface to air Missile Systems <ul style="list-style-type: none"> • Launch flash • Smoke trail Detonation; explosion			Surface to surface (SEAD)
128.	- Air Defense Artillery Systems <ul style="list-style-type: none"> • Muzzle flash • Tracer rounds Impact effects			Surface to surface (SEAD)
129.	When engaged by SEAD, is the weapons effect to the threat system visible to illicit a SEAD successful / not successful determination? (Visible model damage, impacts on target, cease in activity, etc.)			Surface to surface (SEAD)
130.	Does the system provide an emulated, simulated or stimulated global positioning system (GPS) which corresponds to a military mapping datum database and map products?			All
131.	Does the system provide an emulated, simulated or stimulated magnetic compass for JTAC spatial awareness?			All
132.	Does the compass bearing correlate to simulation and accompanying map products?			All
133.	Does the system provide an emulated, simulated or stimulated laser range finder (LRF) for ranging and target location?			All
134.	Does the system provide an emulated, simulated or stimulated laser target designator (LTD) to perform target marking and designation in CAS operations?			Laser
135.	Does the system require selection of the appropriate laser code and provide system feedback for noncompliance when lasing and marking targets?			Laser
136.	Are laser targeting devices capable of providing range and bearing consistent with WGS 84 or newer military mapping datum and map products?			Laser
137.	Is the system or operator able to verify the laser mark/spot during target designation?			Laser
138.	Do laser guided weapons terminally guide to the point of the laser designation (on or off target)?			Laser
139.	Does the system provide emulated, simulated or stimulated communications equipment to enable the JTAC to communicate with aircraft?			All
140.	Communications radio equipment used by the JTAC to communicate with command and control and supporting agencies?			All
141.	Does the system realistically emulate, simulate or stimulate fielded VDL equipment? (Provides a video aerial view of target and surrounding features)			VDL

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Item #	Task Question	Yes	No	Classification
142.	VDL equipment must be able to provide grid coordinates consistent with real world sensor capabilities (+/- 500M)			VDL
143.	Does VDL equipment display provide sensor point of interest (cross-hair / aim point)?			VDL
144.	Does VDL equipment display provide sensor point of view azimuth (magnetic)?			VDL
145.	Does VDL equipment display Cardinal direction indication (north arrow)?			VDL
146.	Is system capable of varying light levels during night time based on moon phase, star lighting, and cultural lighting to determine the need, suitability of air and/or ground delivered illumination in support of night CAS?			Night
147.	Do man-made models display lighting as appropriate (building lights, vehicle headlights, etc.)			
148.	Do emulated, simulated or stimulated NVGs function similarly to actual NVGs? (<u>device must be worn by the trainee like NVGs</u>)			Night
149.	Do emulated, simulated, or stimulated night capable LRFs, scopes, and LTDs function similarly to actual equipment?			Night
150.	Do night vision devices display images reasonably consistent with actual night vision devices (resolution, clarity, color)?			Night
151.	Does the system facilitate the marking of targets from the ground using emulated, simulated or stimulated infra-red target marking systems (IR Pointer)?			IR Pointer
152.	Are IR markers hand held, point and shoot simulated, or stimulated functional likeness of fielded equipment?			IR Pointer
153.	Are IR markers capable of producing NVG visible “sparkle,” “snake,” and “rope” to mark targets (ground view)?			IR Pointer
154.	In the simulation, is the “Sparkle,” “snake,” and “rope” visible in the pilot field of view? (target correlation by system or operator)			IR Pointer
155.	Are weapons effects visible through NVDs to assess mission effectiveness?			Night
156.	Is the system aircraft able to “match sparkle”? (both beams must be visible to the JTAC and aircrew/operator)			
157.	Does the system replicate friendly night time position marking? (covert or overt)			Night
158.	Does the system replicate aircraft marker lights during night time (overt or covert beacon /position lights / formation lights)			

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Item #	Task Question	Yes	No	Classification
159.	Does the system replicate air and surface delivered illumination to facilitate CAS during night time?			Night
160.	Is aerial delivered illumination reasonably consistent with height of burst, ground lighting patterns, burn times, descent rates, wind drift, and ground shadowing associated with actual weapons?			Night
161.	Is ground illumination reasonably consistent with ground lighting patterns, burn times, descent rates, wind drift, and ground shadowing associated with actual weapons?			Night
162.	During type 1 control, is the trainee able to visually acquire the attacking aircraft, assess attack geometry in relation to the target to predict weapon trajectory from release to impact, and ensure friendly positions and collateral damage concerns are safe from undesired weapons effects?			
163.	JTAC must be able to visually acquire the target			Type 1
164.	JTAC is able to visually acquires attacking aircraft during the terminal phase of the attack until weapon release (at or near (+/- 1nm) 4nm, JTAC to aircraft slant range).			Type 1
165.	JTAC is able to assess attack geometry in relation to the target to predict weapon trajectory from release to impact			Type 1
166.	JTAC is able to assess weapon impact			Type 1

Appendix B**JFS ESC JTAC Simulation Self- Assessment Certification Page**

Date self-assessment conducted:_____

Sponsor Nation/Service/Command:_____

Simulation System Name:_____

Simulation System Manufactures:_____

Simulation system description (see JTAC MOA page 104-106 for description examples):

Accreditation Requested (see Tables 3.4.)

Type 1 TAC	IR Pointer
Type 2 TAC	Remote Observer
Type 3 TAC	VDL
BOC	SEAD
RW	FAC(A)
Laser control	Night

Self-Assessment POC and contact info:_____

Certifying Official

Name: _____

Rank: _____

Title: _____

Phone Number: _____

Email Address: _____

Date Accomplished: _____

Appendix B

Enclosure 5: JFS ESC Accredited JTAC Simulation Systems (Virtual).

B.5. JFS ESC Accredited JTAC Simulation Systems (Virtual).

The following is a list of JFS ESC accredited virtual JTAC simulation systems, at the time of publication, which are approved to facilitate the JTAC MOA control requirements and JMTL training tasks. Leased systems are not included in this list. Accreditation status of leased systems is the responsibility of the lease, through the JFS ESC secretary.

1. SYSTEM: Advanced JTAC Training Simulator (AJTS)

- a. **OWNER:** Latvia; Hungary **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); and SEAD.
- b. **Caveats:** Form fit and functional IR Pointer capability required to meet IR Pointer requirement.
- c. **Description:** Fixed site, 3 to 5 meter, partial dome projection display; 240°H X 100° V (+70/-30) FOV; Integrated JTAC equipment (emulated or GLTD, LRF, GPS, VDL receiver, binos, M-4), Integrated push-to-talk (PTT) communication system.
- d. **DATE:** 16 Jan 2016
- e. **Source:** QuantaDyn <http://www.quantadyn.com/ajts.html>

2. SYSTEM: ANG JTAC Qualification Course Instructional Simulator (AJITS)

- a. **OWNER:** USAF
- b. **CLASSIFICATION:** Type 2 and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, remote observer; video down-link (VDL); Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** None
- d. **Description:** Fixed site, Multiple LCD Flat Screen TV Display; Integrated JTAC equipment (emulated GLTD, LRF, and GPS; simulated IR pointer, VDL receiver, binoculars), and Integrated PTT communication system.
- e. **DATE:** 13 Jun 2017
- f. **Source:** QuantaDyn <http://www.quantadyn.com/ajts.html>

3. SYSTEM: ANG Advanced JTAC Simulator (AAJTS)

- a. **OWNER:** USAF Air National Guard (ANG)
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote

observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); and SEAD.

- c. **Caveats:** None
 - d. **Description:** Fixed site, 5 meter, partial dome projection display; 270° H X 100° V (+70/-30) FOV; Integrated JTAC equipment (emulated GLTD, LRF, and GPS; simulated IR pointer, VDL receiver, binoculars, M-4), Integrated PTT communication system. Employs IR projection to generate a true night environment, facilitating use of actual NVGs.
 - e. **DATE:** 28 Oct 2016
 - f. **Source:** QuantaDyn <http://www.quantadyn.com/ajts.html>
4. **SYSTEM:** Call for Fire Trainer II (CFFT), Software Version 1.1.2.0 or higher
- a. **OWNER:** US Army
 - b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); and SEAD.
 - c. **Caveats:** Only CFFT II systems equipped with a head-mounted-display (HMD) having a field of view of 270° H X 70° V or greater may be used to conduct type 1 controls. Only CFFT II systems equipped with a form-fit and functional IR pointer be used to conduct IR pointer controls.
 - d. **Description:** Portable system, flat dual-screen display, forward projected system, integrated HMD. Combination of integrated and simulated JTAC equipment (GLTD, LRF, GPS, IZLID, NVG, binoculars)
 - e. **DATE:** 2 Feb 2016
 - f. **Source:** Fidelity Technologies Corporation <http://www.fidelitytech.com/>
5. **SYSTEM:** Dismounted Close Combat Trainer (DCCT)
- a. **OWNER:** United Kingdom
 - b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC; Urban TAC; control using a FAC(A); and SEAD.
 - c. **Caveats:** None
 - d. **Description:** Fixed site, flat screen projected display, head mounted display, pilot station, and form fit laser target designator. The DCCT is effectively used as a procedural trainer facilitating indirect fires and CAS targeting, visual representations operational areas (terrain, targets, infra- structure, aircraft, maneuver units and threats).
 - e. **DATE:** 16 Jul 2017
 - f. **Source:** Meggit Training Systems

6. SYSTEM: Deployable Tactical Trainer (DTT)

- a. **OWNER:** Finland
- b. **CLASSIFICATION:** Type 2 and 3 Terminal Attack Control (TAC); BOC; FW; Ground laser target designator (marking only) TAC; remote observer; video down-link (VDL); Night TAC; control using a FAC(A).
- c. **Caveats:** None
- d. **Description:** Fixed site, head mounted display (HMD), display; 360° FOV; network connection to FinAF F-18 distributed mission training system. Integrated DACAS system.
- e. **DATE:** 5 Dec 2015
- f. **Source:** Boeing

7. SYSTEM: Distributed Synthetic Air Land Trainer (DSALT) 2 **Software:** QinetiQ DSALT2 v1.3; XPI Simulation Tempest v6.0.12.

- a. **OWNER:** United Kingdom
- b. **CLASSIFICATION:** Type 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** None
- d. **Description:** System is arranged as a dismounted, static fire support team / TACP position viewing a single, flat projection screen (4.5m wide x 3.0m high). Additionally a HMD is available at the JTAC position to provide him with a 360° view of the virtual environment. JTAC role equipment includes: binoculars/LRF, radio, compass, GPS position, clock and full motion video (FMV) display, which are emulated on computer screens / interactive tablets and controlled via joysticks.
- e. **DATE:** 16 Jul 2017
- f. **Source:** QinetiQ, Boeing

8. SYSTEM: Forward Air Control Simulator (FACSIM)

- a. **OWNER:** NLD
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; remote observer; video down-link (VDL); Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** The head mounted display (HMD) will be used during terminal phase of type 1 control. The system may not be used to replace a live ground laser designation training event.
- d. **Description:** Fixed site and portable versions, flat screen display with integrated HMD. Simulated JTAC equipment through HMD.
- e. **DATE:** 7 Apr 2017

- f. **Source:** TNO
https://www.tno.nl/downloads/def_algemeen_facsim_S050113_FACSIM.pdf
- 9. SYSTEM:** Immersive Close Air Support Simulator (iCASS)
- a. **OWNER:** United Kingdom
 - b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); and SEAD.
 - c. **Caveats:** None
 - d. **Description:** Fixed site, partial dome projection display: 240° x 120° FOV. Integrated form/function JTAC role equipment (LRF, GLTD, IR pointer/marker, video downlink receiver, and basic DACAS functionality) and emulated kit (GPS, radio, magnetic compass, clock).
 - e. **DATE:** 16 Jul 2017
 - f. **Source:** Close Air Solutions <http://www.closeairsolutions.com/modularicass/>
- 10. SYSTEM:** Indirect Fires and Forward Air Controller (FAC) Training System (IFFS)
- a. **OWNER:** Canadian Army
 - b. **CLASSIFICATION:** Type 2 and 3 Terminal Attack Control (TAC); BOC; FW TAC; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); control using a FAC(A); and SEAD.
 - c. **Caveats:** The head mounted (HMD) display will be used during the terminal phase of type 1 control. The HMD or the limited view workstation display will be used at night to limit the field of view.
 - d. **Description:** Fixed site, flat dual-screen display, forward projected system, integrated HMD. Combination of integrated and simulated JTAC equipment (LTD, LRF, GPS, IZLID)
 - e. **DATE:** 31 Jun 2017
 - f. **Source:** Fidelity Technologies Corporation <http://www.fidelitytech.com/>
- 11. SYSTEM:** Indirect Fires-Forward Air Control Trainer (IFACT) Software, Version 9.3.2 or higher
- a. **OWNER:** NZL Army
 - b. **CLASSIFICATION:** Type 2 and 3 Terminal Attack Control (TAC); BOC; FW TAC; remote observer; control using a FAC(A); and SEAD.
 - c. **Caveats:** None
 - d. **Description:** Semi-portable, flat single screen, front projected system, integrated HMD. Simulated/emulated JTAC equipment (LTD, LRF, GPS, binoculars)
 - e. **DATE:** 29 Mar 2016

- f. **Source:** Meggitt Training Systems <http://www.meggitttrainingsystems.com>

12. SYSTEM: Joint Fires Product Line (JFPL) Joint Terminal Attack Control (JTAC) system, Software Version 2.9.2.2662 or higher

- a. **OWNER:** USSOCOM/MARSOC and NAVSOC **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); and SEAD.
- b. **Caveats:** The head mounted display (HMD) will be used during terminal phase of type 1 control unless equipped with a domed display.
- c. **Description:** Semi-Immersive Dome: 120° x 40° FOV visualization display, Mark VII Handheld Eye safe Laser Rangefinder, SOF Laser Marker (SOFLAM), Laser Marking Night Vision System (LMNVS), Infrared Zoom Laser Illuminator Designator (IZLID), M-22 Binoculars, DAGR GPS, Compass, Clock/Stopwatch.
- d. **DATE:** 26 Apr 2016
- e. **Source:** USSOCOM /PEO STRI
<http://www.peostri.army.mil/PRODUCTS/JFPL/>

13. SYSTEM: JTAC Training and Rehearsal System (JTAC-TRS) **Software:** MetaVR VRSG5.1+/ BSI MACE R1 2015 or higher.

- a. **OWNER:** USAF/AFRL
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** None.
- d. **Description:** Fixed site, partial Dome Projection display; 220° x 160° FOV, integrated JTAC equipment: Simulated GLTD II, MK-VII LRF, compass, GPS, binoculars, VDL receiver, integrated communications headsets.
- e. **DATE:** 17 Sep 2015
- f. **Source:** Air Force Research Laboratory (AFRL)

14. SYSTEM: Joint Terminal Control Training and Rehearsal System (JTC TRS) Software Version: MetaVR VRSG 6.0; BSI MACE 2016 R2; QuantaDyn Discovery 3.0.0; or higher.

- a. **OWNER:** US Air Force
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC; IR pointer; remote observer; video down-link (VDL); Night TAC; Urban TAC; control using a FAC(A); Surface to surface (indirect fires); and SEAD.
- c. **Caveats:** None

- d. **Description:** Fixed site, 5 meter, partial dome projection display; 270° H X 100° V (+70/-30) FOV; Integrated JTAC equipment (LTD, LRF, GPS, IR marker, VDL receiver, binoculars, M-4), Integrated PTT Communications
- e. **DATE:** 08 Jul 2016
- f. **Source:** QuantaDyn <http://www.quantadyn.com/ajts.html>

15. SYSTEM: JTAC-TACP/Operational Simulation Suite (J-T/OSS), Software Version 1.0 and 2.0/ JFIRES

- a. **OWNER:** USAF
- b. **CLASSIFICATION:** Type 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; video down-link (VDL); Day only TAC; Urban TAC; control using a FAC(A); Surface to surface (indirect fires); and SEAD.
- c. **Caveats:** Type 1 control trainees are required to use a display with 220°FOV or greater or an HMD during the terminal phase of control. Laser accreditation is contingent on the employment of a system integrated form-fit and functioning laser target designator.
- d. **Description:** Semi-portable, multi-display configuration depending on location; Integrated software based Distributed Interactive Simulation (DIS) radio, handheld laser range finder/laser designator (compatible with AFSOC's form fit and functioning SOFLAM and MK-VII), head-mounted display.
- e. **DATE:** 12 Jun 2015
- f. **Source:** Meta-VR-BSI <http://www.metavr.com/casestudies/jtac-hurlburt.html>

16. SYSTEM: Mobile Forward Air Control Trainer (MFAC-T)

- a. **OWNER:** United Kingdom
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; Ground laser target designator (GLTD) TAC.
- c. **Caveats:** The head mounted display (HMD) will be used during terminal phase of type 1 control.
- d. **Description:** Laptop based, flat single screen, front projected system, integrated HMD. Simulated JTAC equipment (GLTD, LRF, GPS, binoculars)
- e. **DATE:** 16 Jun 2017
- f. **Source:** Meggitt Training Systems <http://www.meggitttrainingsystems.com>

17. SYSTEM: Combined Arms Virtual Environment (CAVE) Simulation System

- a. **OWNER:** USN
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; Video Down-Link TAC; Day and Night TAC; Urban TAC; control using a FAC(A); Surface to surface (indirect fires); and SEAD.

- c. **Caveats:** None
- d. **Description:** Fixed site, partial Dome Projection display; 240° x 60° FOV, integrated JTAC equipment: Simulated: GLTD, LRF, IZLID, binoculars. Emulated: GPS, communications equipment. Stimulated: NVGs
- e. **DATE:** 29 Jul 2016
- f. **Source:** Battlespace Simulation Inc. (BSI), <https://www.bssim.com/>

18. SYSTEM: Real-Fires JTAC Part Task Trainer (PTT) Simulation System

- a. **OWNER:** RAAF
- b. **CLASSIFICATION:** Type 2 and 3 terminal attack control (TAC); BOC; FW and RW; IR pointer; remote observer; Video Down-Link TAC; Night TAC; Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** None
- d. **Description:** Fixed site, partial Dome Projection display; 270° X 100° FOV; Integrated JTAC equipment (LRF, GPS, IR marker, VDL receiver, binoculars, M-4), Integrated PTT Communications
- e. **DATE:** 30 Nov 2015
- f. **Source:** Rockwell Collins

19. SYSTEM: Republic of Korea Air Force (ROKAF) Air to Ground Operations Training Support System for Joint Terminal Attack Controller (JTAC) Training

- a. **OWNER:** ROKAF
- b. **CLASSIFICATION:** Type 2 and 3 terminal attack control (TAC); BOC; FW and RW; IR pointer; remote observer; Video Down-Link TAC; Night TAC; Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** None
- d. **Description:** Fixed site, curved screen display; 180° H X 90°V FOV and Head mounted display (HMD), integrated JTAC equipment: Simulated PAX-07 IR Pointer, NVGs, binoculars, LRF. Emulated GLTD, thermal imager, GPS, VDL receiver.
- e. **DATE:** 2 Dec 2016
- f. **Source:** DoDAMM Systems LTD. <http://www.dodaam.com/eng/main/index.php>

20. SYSTEM: Supporting Arms Virtual Trainer (SAVT)

- a. **OWNER:** USMC
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, IR pointer; remote observer; Video Down-Link TAC; Night TAC; Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** None

- d. **Description:** Fixed site, partial Dome Projection display; 240°H x 60°V FOV, integrated JTAC equipment: Simulated: GLTD, LRF, IZLID, and binoculars. Emulated: GPS, communications equipment. Stimulated: NVGs
- e. **DATE:** 24 Aug 2016
- f. **Source:** TJ Inc. <http://tjinc-eng.com/news.asp?id=25>

21. SYSTEM: UAE Joint Fires Company Fidelity Fires Simulation System

- a. **OWNER:** UAE Air Warfare Center **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC, remote observer; video down-link (VDL); Urban TAC; control using a FAC(A); and SEAD.
- b. **Caveats:** None
- c. **Description:** Fixed site, partial Dome Projection display; 270° X 100° FOV; Integrated JTAC equipment (GLTD, LRF, GPS, IR marker, VDL receiver, binoculars, M-4), Integrated PTT Communications
- d. **DATE:** 24 Jun 2016
- e. **Source:** Fidelity Technologies Corporation

22. SYSTEM: UAE STRAFE Collective Unit Training System (CUTS)

- a. **OWNER:** UAE Presidential Guard
- b. **CLASSIFICATION:** Type 1, 2, and 3 Terminal Attack Control (TAC); BOC; FW and RW; Ground laser target designator (GLTD) TAC; remote observer; video down-link (VDL); Urban TAC; control using a FAC(A); and SEAD.
- c. **Caveats:** When conducting Type 1 controls in the CUTS 300 Series Trainer (120° x 45° display), the simulation instructor/operator must limit attacking aircraft to a maximum run-in altitude of 9000 feet AGL and target placement at ranges of 1 km or greater from the JTAC position to permit visual acquisition of the aircraft by the JTAC in time to assess attack geometry and issue weapons release clearance.
- d. **Description:** Fixed site, partial Dome Projection displays; three 120° x 45° curved screens; two 400 series, 220° x 45° curved screens; and one 600 series, 270° x 100° field of view, 5-meter semi-domed display; Integrated JTAC equipment (GLTD, LRF, GPS, IR marker, VDL receiver, binoculars), Integrated PTT Communications
- e. **DATE:** 10 Jun 2016
- f. **Source:** Immersive Display Systems (Strategic Alliance for Excellence)

23. SYSTEM: Belgium Virtual Battlespace 3 (VBS 3) Desktop Tactical Trainer (DTT)

- a. **OWNER:** Belgium Army

- b. **CLASSIFICATION:** Type 2 and 3 Terminal Attack Control (TAC); BOC; FW and RW; remote observer; video down-link (VDL); Urban TAC; control using a FAC(A); Surface to surface (indirect fires); and SEAD.
- c. **DESCRIPTION:** Fixed site, desktop-based, multi-station set-up (50 gaming stations per SIM location) flat screen. Simulated/emulated JTAC equipment available in the sim (Compass, GLTD, LRF, GPS, VDL receiver, IZLID).
- d. **DATE:** 7 Apr 2017
- e. **Source:** Bohemia Interactive

24. SYSTEM: Polish TACP Training Center (TC) Joint Fire Support Simulator Deployable.

- a. **OWNER:** POL Air Force
- b. **CLASSIFICATION:** Type 2 and 3 Terminal Attack Control (TAC); BOC; RW; remote observer; video down-link (VDL); SEAD; FAC(A); Urban TAC.
- c. **Caveats:** None.
- d. **Description:** The TACP TC Joint Fire Support Simulator-deployable (Virtual Battlespace (VBS) 2) system enables virtual JTAC equipment (binoculars, laser target designator, laser range finder, GPS), controlled by a keyboard or game controller. Radio communications is facilitated using a combination of commercially available small push to talk handheld radios and/or low power tactical radios (PRC-152). The system is capable of producing a realistic video downlink (VDL) / full motion video (FMV) feed picture which correlates to the system database and associated maps. All activities conducted in the system are recorded to facilitate mission debriefs.
- e. **DATE:** 31 May 2017
- f. **Source:** www.produs.com.pl/oferta/vbs/vbs.htm

Appendix B
Enclosure 6: Sample Final Report

Date: XX Apr XX

MEMORANDUM FOR CHAIRMAN, JOINT FIRE SUPPORT EXECUTIVE STEERING COMMITTEE (JFS ESC)

SUBJECT: JTAC Schoolhouse Course to be Reviewed or Accredited

REFERENCES:

- A. JFS ESC Action Plan (AP) Memorandum of Agreement (MOA) 2004-01 JTAC, *[Appendix B, dated XX MMM 2017]*
- B. Joint Publication (JP) 3-09 Joint Fire Support *[09 December 2014]*
- C. JP 3-09.3 Close Air Support, *[25 November 2014]*
- D. NATIONAL/SERVICE JTAC INSTRUCTION

1. PURPOSE: At the direction of JFS ESC, an initial evaluation of XXXX Terminal Attack Controller Course (TACC) was conducted IAW JFS ESC Action Plan (AP) Memorandum of Agreement (MOA) 2004-01 Joint Terminal Attack Controller (JTAC) (Ground), Appendix B. The JTAC Standardization Team reviewed the XXXX, and recommends official accreditation. This report is based on criteria established in the JTAC MOA.

2. JTAC STANDARDIZATION TEAM MEMBERS:

3. ITINERARY: Inclusive dates of the visit were XXXX, location.

4. DISCUSSION: The JTAC Standardization Team examined the XXXX Terminal Attack Control (TAC) Program of Instruction (POI), lesson plans, courseware, reference materials, and practical exercises (PE). The following simulation system(s) and live training methods were used: XXXX The following observations are submitted:

A. Administration:

- 1) JTAC Program Regulation: JTAC Program Regulation was examined and complied with requirement of the MOA.
- 2) Instructor Training Program: The XXXX has an instructor training program which ensures all faculty members are knowledgeable and proficient in all responsible areas.
- 3) Instructor Training Jackets: Instructor log books were examined and complied with the Training Jacket requirement of the MOA.
- 4) Manning: XXXX staffing is sufficient to support X students per class. XXXX schedules X JTAC courses annually with an expected production of XX JTACs per year. (See recommendations and observations below)

5) JTAC Production: XX conducts X courses annually with an expected production of X graduates per year.

6) Student Training Jackets: Student log books were examined and complied with the Training Jacket requirement of the MOA.

7) Graduation Criteria: XX question exam with XX% pass criteria and a performance assessment conducted in each phase of practical application.

8) Facilities.

a. Classrooms: Centrally located, sufficient to accommodate class size.

b. Audiovisual equipment is adequate to support the multimedia learning environment.

c. Billeting: Students are billeted on base.

d. Messing: Base meals are available.

B. Academics: POI and courseware were reviewed by the standardization team. All syllabus materials for classroom instruction met JTAC MOA Joint Mission Task List (JMTL) requirements. The course schedule allows for sufficient classroom time to cover required materials with standard break times between classes. Field training schedules provide sufficient time periods with coordinated training aids to accomplish requirements. The course was X weeks long and gave ample opportunity to reinforce knowledge objectives with repetitive practical application.

C. Simulation/Training Aids: The following simulation training aids are incorporated into the course:

D. Live Events:

1) Range Facility: XXXX has XX range areas where CAS training is conducted.

2) Sorties (Day/Night): Students receive a minimum of XX controls; X controls minimum, per night. For the class observed, there were XX sorties scheduled (XX day, XX night). Controls include the use of artillery, laser and IR marking.

a. Fixed Wing: Day Sorties, Night Sorties

b. Rotary Wing: Day Sorties, Night Sorties

3) Indirect Fires: XX Howitzers are used for target marking and SEAD (Day and night events)

E. Equipment:

1) Communication:

2) Laser Target Designator (LTD):

3) Infra-Red (IR) Pointer:

4) Night Vision Devices (NVD):

5) Thermal Imager:

6) Laser Range Finder (LRF):

UNCLASSIFIED

7) Global Positioning System (GPS):

8) Remote Video Receiver:

9) Misc:

F. Safety: Range and LASER safety briefs were conducted prior to each range period. Qualified JTAC instructors supervised all trainees during live terminal attack control. A Range Safety Officer was present at the OP during all events.

5. DISCREPANCIES:

A. ISSUE:

FOLLOW-ON ACTION:

B. ISSUE:

RECOMMENDATION:

6. OBSERVATIONS:

7. BEST PRACTICES:

8. SUMMARY: The XXXX JTAC Course met the requirements for the instruction of Joint Terminal Attack Controllers. Any questions or comments may be directed to XXXX (JS DD C5I JFD, DSN XXX-XXX

JTAC Standardization Team Lead

Enclosures

Appendix B

Enclosure 7: Joint Terminal Attack Control (JTAC) Operational Unit Checklist

Review and Assessment	Yes	No	Items to be reviewed and assessed.	Discrepancies / Comments																																																									
			JTAC has successfully completed an accredited Joint Terminal Attack Controller (JTAC) course (Completion documentation).																																																										
			<p>JTAC has successfully completed a formal JTAC certification process that included the following:</p> <ul style="list-style-type: none"> - Completed an accredited JTAC schoolhouse academics - Demonstrated proficiency conducting the execution tasks under the supervision of a qualified JTAC-I - Completed an initial JTAC evaluation by a designated evaluator (see recommendations in Appendix A, Enclosure 1 and 3). - Completed the following JMTL task during the conduct of a terminal attack control: <table border="1"> <thead> <tr> <th>Terminal Attack Control</th> <th>Minimum Required</th> <th>Condition</th> </tr> </thead> <tbody> <tr><td>Type 1</td><td>2</td><td>Live or Dry</td></tr> <tr><td>Type 2</td><td>2</td><td>Live, Dry or Simulated</td></tr> <tr><td>Type 3</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>BOT</td><td>2</td><td>Live or Dry</td></tr> <tr><td>BOC</td><td>2</td><td>Live, Dry or Simulated</td></tr> <tr><td>FW CAS Aircraft</td><td>2</td><td>Live or Dry</td></tr> <tr><td>RW CAS Aircraft</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>Laser control ¹</td><td>1</td><td>Live or Dry</td></tr> <tr><td>IR Pointer ²</td><td>1</td><td>Live or Dry</td></tr> <tr><td>Remote Observer</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>Video Downlink (VDL)</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>Live</td><td>2</td><td>Live</td></tr> <tr><td>9-line attack brief ³</td><td>2</td><td>Live or Dry</td></tr> <tr><td>SEAD</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>Urban</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>With FAC(A)</td><td>1</td><td>Live, Dry or Simulated</td></tr> <tr><td>Day</td><td>2</td><td>Live or Dry</td></tr> <tr><td>Night</td><td>2</td><td>Live or Dry</td></tr> </tbody> </table> <p>¹Ground laser shall be utilized to mark/designate a target for an aircraft (laser spot tracker recommended). Intent is to utilize laser equipment and laser terminology.</p> <p>²Ground IR pointer shall be utilized to mark a target for a NVG equipped aircrew. Intent is to utilize IR equipment and IR terminology.</p> <p>³Must use a complete nine line attack brief - IP to target area (Lines 1-3 should not be abbreviated, not applicable (N/A) or from the overhead). (JTAC control log).</p> <p>Note – Services, USSOCOM, and Partner Nations without NVG equipped aircrew, IR Pointer, Laser Target Designator, FAC(A) or RW CAS Aircraft are exempt until such fielding occurs.</p>	Terminal Attack Control	Minimum Required	Condition	Type 1	2	Live or Dry	Type 2	2	Live, Dry or Simulated	Type 3	1	Live, Dry or Simulated	BOT	2	Live or Dry	BOC	2	Live, Dry or Simulated	FW CAS Aircraft	2	Live or Dry	RW CAS Aircraft	1	Live, Dry or Simulated	Laser control ¹	1	Live or Dry	IR Pointer ²	1	Live or Dry	Remote Observer	1	Live, Dry or Simulated	Video Downlink (VDL)	1	Live, Dry or Simulated	Live	2	Live	9-line attack brief ³	2	Live or Dry	SEAD	1	Live, Dry or Simulated	Urban	1	Live, Dry or Simulated	With FAC(A)	1	Live, Dry or Simulated	Day	2	Live or Dry	Night	2	Live or Dry	
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			<p>Once certified, a JTAC will remain qualified, provided:</p> <ul style="list-style-type: none">– JMTL knowledge is maintained– Evaluation requirements are satisfactorily accomplished– Following JMTL task or tasks identified below are successfully completed during the conduct of a terminal attack control and during an established six month period unless noted: <table><tr><th>Terminal Attack Control</th><th>Minimum Required</th><th>Condition</th></tr><tr><td>Type 1</td><td>1</td><td>Live or Dry and 1 can be Simulated Annually</td></tr><tr><td>Type 2</td><td>1</td><td>Live, Dry or Simulated</td></tr><tr><td>Type 3</td><td>1</td><td>Live, Dry or Simulated</td></tr><tr><td>BOT</td><td>1</td><td>Live or Dry</td></tr><tr><td>BOC</td><td>1</td><td>Live, Dry or Simulated</td></tr><tr><td>FW CAS Aircraft</td><td>2</td><td>Live or Dry and 1 can be Simulated per 6 months</td></tr><tr><td>RW CAS Aircraft</td><td>1</td><td>Live, Dry or Simulated</td></tr><tr><td>Laser control ¹</td><td>1</td><td>Live or Dry and 1 can be Simulated Annually</td></tr><tr><td>IR Pointer ²</td><td>1</td><td>Live or Dry and 1 can be Simulated Annually</td></tr><tr><td>Remote Observer</td><td>1</td><td>Live, Dry or Simulated</td></tr><tr><td>Video Downlink (VDL)</td><td>1</td><td>Live, Dry or Simulated</td></tr><tr><td>Live</td><td>1</td><td>Live</td></tr><tr><td>9-line attack brief ₃</td><td>1</td><td>Live or Dry</td></tr><tr><td>Day</td><td>1</td><td>Live or Dry</td></tr><tr><td>Night ⁴</td><td>1</td><td>Live or Dry and 1 can be Simulated Annually</td></tr></table> <p>¹ Ground laser shall be utilized to mark/designate a target for an aircraft (laser spot tracker recommended). Intent is to utilize laser equipment and laser terminology.</p> <p>² Ground IR pointer shall be utilized to mark a target for a NVG equipped aircrew.</p> <p>³ Must use a complete nine line attack (Lines 1-3 should not be abbreviated - N/A or from the overhead; IP to target area). (JTAC control log).</p> <p>⁴ Units deployed to or stationed at extreme latitudes (>49 deg) may waive the night control for qualification until night sorties can be executed.</p> <p>Note – Services, USSOCOM, and Partner Nations without NVG equipped aircrew, IR Pointer, Laser Target Designator or RW CAS Aircraft are exempt until such fielding occurs.</p>	Terminal Attack Control	Minimum Required	Condition	Type 1	1	Live or Dry and 1 can be Simulated Annually	Type 2	1	Live, Dry or Simulated	Type 3	1	Live, Dry or Simulated	BOT	1	Live or Dry	BOC	1	Live, Dry or Simulated	FW CAS Aircraft	2	Live or Dry and 1 can be Simulated per 6 months	RW CAS Aircraft	1	Live, Dry or Simulated	Laser control ¹	1	Live or Dry and 1 can be Simulated Annually	IR Pointer ²	1	Live or Dry and 1 can be Simulated Annually	Remote Observer	1	Live, Dry or Simulated	Video Downlink (VDL)	1	Live, Dry or Simulated	Live	1	Live	9-line attack brief ₃	1	Live or Dry	Day	1	Live or Dry	Night ⁴	1	Live or Dry and 1 can be Simulated Annually	
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			JTAC successfully completed 18-month evaluation if past the last day of the 17 th month following initial certification or last evaluation. (Part V, JTAC evaluation folder).																																																	

Glossary

Section I – Acronyms and Abbreviations

AAGS	Army air-ground system
ACA	airspace control authority; airspace coordination area
ACM	airspace coordinating measure (Joint) / airspace control means (NATO)
ACO	airspace control order
ACP	airspace control plan
AFDD	Air Force doctrine document
AJP	Allied joint publication
ALO	air liaison officer
AO	air officer
APP	allied procedural publication
ATO	air tasking order
ATP	allied tactical publication
AWACS	Airborne Warning and Control System
BCD	battlefield coordination detachment
BDA	battle damage assessment
C2	command and control
CAS	close air support
CID	combat identification
COA	course of action
COC	combat operations center
CONOPS	concept of operations
DACAS	digitally aided close air support
EO	electro-optical
EW	electronic warfare
FAC	forward air controller
FAC(A)	forward air controller (airborne)
FIST	fire support team
FLIR	forward-looking infrared
FSCC	fire support coordination center
FSCM	fire support coordination measure
FSE	fire support element
GBU	guided bomb unit
GCP	ground commander's pointer
GLINT	gated laser intensifier
GLTD	ground laser target designator
GPS	global positioning system
HF	high frequency
INFLTREP	in-flight report
INS	inertial navigation system
IR	infrared
ISR	intelligence, surveillance, and reconnaissance
JAOC	joint air operations center
JARN	joint air request net
JDAM	joint direct attack munition

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JOA	joint operations area
JP	joint publication
JSTARS	Joint Surveillance Target Attack Radar System
JTAC	joint terminal attack controller
JTAC(I)	joint terminal attack controller instructor
JTACQC	joint terminal attack controller qualification course
JTAR	joint tactical air strike request
JTTP	joint tactics, techniques, and procedures
LGB	laser-guided bomb
LGM	laser-guided missile
LGW	laser-guided weapon
LRF	laser range finder
LST	laser spot tracker
LTD	laser target designator
MACCS	Marine air command and control system
MISREP	mission report
MOA	memorandum of agreement; method of attack; military operations area
NATO	North Atlantic Treaty Organization
NSFS	naval surface fire support
NTACS	Navy tactical air control system
NVD	night vision device
NVG	night vision goggle
OPLAN	operation plan
OPORD	operation order
PSS-SOF	precision strike suite-special operations force
ROE	rules of engagement
SA	situational awareness
SATCOM	satellite communications
SCL	standard conventional load
SEAD	suppression of enemy air defenses
SINCGARS	single-channel ground and airborne radio system
SOCCE	special operations command and control element
SOF	special operations forces
SOFLAM	special operations forces laser marker
SOLE	special operations liaison element
SOP	standard operating procedure
SPINS	special instructions
STANAG	standardization agreement (NATO)
TAC	terminal attack control
TACC	tactical air control center (USN)
TACC	tactical air command center (USMC)
TACP	tactical air control party
TACS	theater air control system
TAD	tactical air direction
TADC	tactical air direction center
TAGS	theater air ground system

TGO	terminal guidance operations
TLE	target location error
TOC	tactical operations center
TTP	tactics, techniques, and procedures
UAS	unmanned aircraft system

Section II – Terms and Definitions

air liaison officer – The senior tactical air control party member attached to a ground unit who functions as the primary advisor to the ground commander on air power. Also called **ALO**. (JP 3-09.3)

airspace control authority — The commander designated to assume overall responsibility for the operation of the airspace control system in the airspace control area. Also called **ACA**. (JP 3-52)

airspace control order – An order implementing the airspace control plan that provides the details of the approved requests for airspace coordinating measures. Also called **ACO**. (JP 3-52)

airspace control plan — The document approved by the joint force commander that provides specific planning guidance and procedures for the airspace control system for the joint force operational area. Also called **ACP**. (JP 3-52)

airspace coordinating measures — Measures employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces. Also called **ACMs**. (JP 3-52)

airspace coordination area – A three-dimensional block of airspace in a target area, established by the appropriate commander, in which friendly aircraft are reasonably safe from friendly surface fires. Also called **ACA**. (JP 3-09.3)

air tasking order – A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities and/or forces to targets and specific missions. Also called **ATO**. (JP 3-30)

Army air-ground system – The Army system which provides for interface between Army and tactical air support agencies of other Services in the planning, evaluating, processing, and coordinating of air support requirements and operations. Also called **AAGS**. (JP 3-09.3)

attack heading – The assigned magnetic compass heading to be flown by aircraft during the delivery phase of an air strike. (JP 3-09.3)

battle damage assessment – The estimate of damage composed of physical and functional damage assessment, as well as target system assessment, resulting from the application of lethal or nonlethal military force. Also called **BDA**. (JP 3-0)

bomb on coordinate – An attack when the JTAC/FAC(A) determines that the desired effects can be created against the target with CAS aircraft employing ordnance on a specified set of coordinates; the aircraft is not required to be TALLY/CAPTURED the target or CONTACT the mark. Also called **BOC**. (JP 3-09.3)

bomb on target – Aircraft/aircrew will acquire the target or intended aim point using the best method available; an attack requiring that the JTAC/FAC(A)'s intended target or mark is TALLY/CONTACT/CAPTURED by the aircrew. Also called **BOT**. (JP 3-09.3)

boundary – A line that delineates surface areas for the purpose of facilitating coordination and deconfliction of operations between adjacent units, formations, or areas. (JP 3-0)

close air support – Air action by manned or unmanned fixed-wing and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces. Also called **CAS**. (JP 3-0)

command and control – The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Also called **C2**. (JP 1)

concept of operations – A verbal or graphic statement that clearly and concisely expresses what the commander intends to accomplish and how it will be done using available resources. Also called **CONOPS**. (JP 5-0)

continue – Continue present maneuver; does not imply a change in clearance to engage or expend ordnance. (JP 3-09.3)

digitally aided CAS – The machine-to-machine exchange of required CAS mission data (e.g. aircraft check-in, attack brief, BDA) between a terminal attack controller, C2 node and CAS platform for the purpose of attacking a surface target. Also called **DACAS**.

fire support – 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 3-09)

fire support coordination – The planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons. (JP 3-09)

fire support coordination center – A single location in which are centralized communications facilities and personnel incident to the coordination of all forms of fire support for Marine forces. Also called **FSCC**. (JP 3-09)

fire support coordination measure – A measure employed by commanders to facilitate the rapid engagement of targets and simultaneously provide safeguards for friendly forces. Also called **FSCM**. (JP 3-0)

fire support team – A field artillery team provided for each maneuver company/troop and selected units to plan and coordinate all supporting fires available to the unit, including mortars, field artillery, naval surface fire support, and close air support integration. Also called **FIST**. (JP 3-09.3)

forward air controller – An officer (aviator/pilot) member of the tactical air control party who, from a forward ground or airborne position, controls aircraft in close air support of ground troops. Also called **FAC**. (JP 3-09.3)

forward air controller (airborne) – A specifically trained and qualified aviation officer, normally an airborne extension of the tactical air control party, who exercises control from the air of aircraft engaged in close air support of ground troops. Also called **FAC(A)**. (JP 3-09.3)

forward-looking infrared – An airborne, electro-optical thermal imaging device that detects far-infrared energy, converts the energy into an electronic signal, and provides a visible image for day or night viewing. Also called **FLIR**. (JP 3-09.3)

game plan – A concise and situational awareness enhancing tool to inform all players of the flow of the following attack. At a minimum, the game plan will contain the type of control and method of attack. In addition, the following can be part of or passed in remarks: the ground commander's intent, the ordnance effects desired, or the ordnance and fuze combination required, if known. Aircraft interval can also be requested from the aircrew or proposed by the JTAC. (JP 3-09.3)

immediate air support – Air support to meet specific requests which arise during the course of a battle and which by their nature cannot be planned in advance. (JP 3-09.3)

infrared pointer – A low power laser device operating in the near infrared light spectrum that is visible with light amplifying night vision devices. Also called **IR pointer**. (JP 3-09.3)

joint terminal attack controller – A qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in close air support and other offensive air operations. Also called **JTAC**. (JP 3-09.3)

JTAC Evaluator – A qualified JTAC Evaluator is a JTAC that has been designated to conduct initial and recurring 18-month JTAC evaluations. Also called **JTAC-E**.

JTAC Instructor – A highly qualified JTAC who is designated as a course instructor. A JTAC instructor is authorized to instruct JTAC trainees. Also called **JTAC-I**.

JTAC Qualification – A service member who meets certification and qualification requirements for a JTAC delineated in the JTAC MOA.

Marine air command and control system – A system that provides the aviation combat element commander with the means to command, coordinate, and control all air operations within an assigned sector and to coordinate air operations with other Services. Also called **MACCS**. (JP 3-09.3)

method of attack – Agreement between the supported commander, the JTAC/FAC(A), and the aircraft, regarding the aircrew's correlation requirement, and is completely independent of the type of control. The method of attack is broken down into two categories, BOT and BOC. These two categories define how the aircraft will acquire the target or mark. (JP 3-09.3)

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

night vision device – Any electro-optical device that is used to detect visible and infrared energy and provide a visible image. Also called **NVD**. (JP 3-09.3)

night vision goggle – An electro-optical image intensifying device that detects visible and near-infrared energy, intensifies the energy, and provides a visible image for night viewing. Also called **NVG**. (JP 3-09.3)

preplanned air support – Air support in accordance with a program, planned in advance of operations. (JP 3-09.3)

rules of engagement – Directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered. Also called **ROE**. (JP 1-04)

suppression of enemy air defenses – Activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means. Also called **SEAD**. (JP 3-01)

tactical air command center – The principal U.S. Marine Corps air command and control agency from which air operations and air defense warning functions are directed. Also called **Marine TACC**. (JP 3-09.3)

tactical air control center – The principal air operations installation (ship-based) from which all aircraft and air warning functions of tactical air operations are controlled. Also called **Navy TACC**. (JP 3-09.3)

tactical air control party – A subordinate operational component of a tactical air control system designed to provide air liaison to land forces and for the control of aircraft. (JP 3-09.3)

targeting – The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (JP 3-09.3)

terminal attack control – The authority to control the maneuver of and grant weapons release clearance to attacking aircraft. (JP 3-09.3)

terminal control – 1. A type of air control with the authority to direct aircraft to maneuver into a position to deliver ordnance, passengers, or cargo to a specific location or target. 2. Any electronic, mechanical, or visual control given to aircraft to facilitate target acquisition and resolution. (JP 3-09.3)

terminal guidance – The guidance applied to a guided missile between midcourse guidance and arrival in the vicinity of the target. (JP 3-09)

type of control – There are three Types: 1, 2, and 3. (JP 3-09)

unmanned aircraft – An aircraft that does not carry a human operator and is capable of flight with or without human remote control. Also called **UA**. (JP 3-30)

unmanned aircraft system – That system whose components include the necessary equipment, network, and personnel to control an unmanned aircraft. Also called **UAS**. (JP 3-30)

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JFO MOA
15 July 2019

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