UNITED STATES MARINE CORPS
THE BASIC SCHOOL
MARINE CORPS TRAINING COMMAND
CAMP BARRETT, VIRGINIA 22134-5019

AVIATION EMPLOYMENT CONSIDERATIONS B2C2777 STUDENT HANDOUT

TERMINAL LEARNING OBJECTIVE(S)

TBS-AVI-1000 Describe the Six Functions of Marine Aviation.

ENABLING LEARNING OBJECTIVE(S)

TBS-AVI-1000a Without the aid of reference, identify the functions of Offensive Air Support (OAS).

TBS-AVI-1000b Without the aid of reference, identify types of ANTIAIR warfare, without omission. ()

TBS-AVI-1000c Given a scenario, identify METT-TC considerations for Marine aviation assault support, to support mission requirements.

TBS-AVI-1000d Without the aid of reference, identify fixed wing 9-line elements without omission.

TBS-AVI-1000e Without the aid of references, identify rotary wing 9 line elements, without omission.

PART 1
SIX FUNCTIONS
OF MARINE CORPS AVIATION

Six Functions of Marine Aviation

Introduction

The purpose of this instruction is to provide you with a basic understanding of the six functions of Marine aviation (Offensive Air Support, Anti-Air Warfare, Assault Support, Air Reconnaissance, Electronic Warfare, Control of Aircraft and Missiles) available to support the Marine Air-Ground Task Force (MAGTF).

Importance

It is important all Officers understand aviation capabilities provided to the MAGTF commander. Additionally, roughly half of all Marine Officers serve in the Wing.

In This Lesson

In this lesson we will discuss the six functions of Marine aviation.

This lesson covers the following topics:

OFFENSIVE AIR SUPPORT

Introduction
Offensive Air Support is defined as, "those air operations conducted against enemy installations, facilities, and personnel to directly assist the attainment of MAGTF objectives by the destruction of enemy resources or the isolation of his military force." This lesson will serve to familiarize you with OAS and the MAGTF's potential application of its capabilities.

OAS Functions
Combined Arms. The MAGTF's combat power is enhanced by the concept of combined arms. Combined arms is the full integration of arms in such a way, that in order to counteract one, the enemy must make himself more vulnerable to another. To accomplish this, a task organized MAGTF will integrate its aviation assets with its organic fire support assets, to effectively support the MAGTF scheme of maneuver. OAS operations apply firepower against our opponents' war making and sustaining capabilities. This firepower may be applied for one of two functions: the neutralization or destruction of the assigned target.

Destruction. Destruction missions destroy enemy forces, equipment, supplies, and installations. Destruction of the target may be difficult to achieve contingent upon the threat, target composition, MAGTF aviation assets and available weapons.

Neutralization. Neutralization missions render areas, weapons, or enemy forces ineffective for a specified time. Neutralization may be applied when we cannot afford to dedicate the assets to destroy our opponent, or when we decide that the most efficient application of force would be to "shut him down" for a set period of time, rendering the requirement for destruction unnecessary.

OAS Categories.
USMC OAS operations are divided into two major categories: CAS (Close Air Support) and DAS (Deep Air Support).

1. Deep Air Support.
Deep air support can be conducted in the form of air interdiction, armed reconnaissance, or strike coordination and reconnaissance (SCAR). The MAGTF commander utilizes DAS to shape the battlefield. DAS is defined as "air action against enemy targets at such a distance from friendly forces that detailed integration of each mission with fire and movement of friendly forces is not required." DAS can be conducted on both sides of the Fire Support Coordination Line (FSCL). When DAS is required short of the FSCL, coordination with the friendly forces is required.

> **a. Air Interdiction.** Air interdiction is defined as, "air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required."

OFFENSIVE AIR SUPPORT (continued)

b. Armed Reconnaissance. Armed reconnaissance is defined as "locating and attacking targets of opportunity, i.e., enemy material, personnel, and facilities, in assigned general areas or along assigned ground communication routes, and not for the purpose of attacking specific/located briefed targets." Armed reconnaissance offers the MAGTF commander a capability to address mobile enemy force structure targets enroute to the battlefield.

c. Strike Coordination and Reconnaissance. SCAR is defined as “a mission flown for the purpose of acquiring and reporting deep air support targets and coordinating armed reconnaissance or air interdiction missions upon those targets.” The breadth of the SCAR mission may range from passing a target location up to providing a mark for the attacking aircraft. The SCAR mission should not be confused with FAC (A) mission. The SCAR mission, as with other DAS missions, does not require the detailed integration with surface forces for the delivery of munitions. Because of this, there is no special qualification required for an aircraft to be tasked with the mission.

2. Close Air Support.

Close air support is defined as, "air action against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces." CAS allows the MAGTF Commander to concentrate firepower at the decisive place and time to achieve local combat superiority. It can be employed in both offensive and defensive operations. There are two types of missions:

a. Preplanned. Preplanned air support is in accordance with a program and planned in advance of operations. Preplanned missions are either scheduled or on-call.

1. **Scheduled.** Preplanned scheduled missions are executed at a specific time against a specific target at a known location. Scheduled missions provide the most economical use of aircraft and ordnance.

2. **On-call.** Preplanned on-call missions involve aircraft that are preloaded for a particular target or array of targets and target area and placed in an appropriate ground/air alert status.

b. Immediate Missions. Immediate missions meet requests that arise during battle, strike unanticipated targets, and are generally urgent in nature. Aviation assets are diverted from other missions via the MACCS to execute immediate requests.

1. **Divert.** Employment of aircraft already in use. Divert missions require that those aircraft be re-tasked in air via radio in order to support a different mission.

2. **On-call.** Employment of aircraft from a standby status (strip alert).

ANTIAIR WARFARE

Introduction

From WWI to the present, anti-air warfare (AAW) has been an integral part of Marine Aviation and an essential ingredient to success. Historically this function has been required with varying degrees of intensity depending upon the extent and nature of the enemy air threat. Marine forces have not had to actively counter a meaningful enemy air threat since WWII. Today, however, the sophistication and magnitude of anti-air weapons systems available to even third world countries pose a serious threat to any mission we may be assigned. With this in mind we must understand the function of AAW so that we can apply it against all potential threats.

Anti-air warfare (AAW) is the action that is required to destroy or reduce to an acceptable level the enemy air and missile threat. There are two general types of AAW: **Offensive AAW (OAAW)** and **air defense**.

1. OAAW constitutes operations conducted against enemy air or air defense systems before they can launch or assume an attacking role. OAAW operations in or near the objective area consist mainly of air attacks to destroy or neutralize hostile aircraft, airfields, radars, air defense systems, and supporting areas.

   OAAW objectives include weakening the enemy's offensive air capability to a manageable level, thereby gaining access to a zone of airspace for a specified timeframe to allow friendly air operations and local air superiority in conjunction with friendly operations. These objectives can be incorporated into three specific areas: preemptive measures, suppression of enemy air defenses (SEAD), and local air superiority measures, each with its corresponding objective:

   a. **Preemptive Measures**. The objective is to weaken the enemy air threat before the enemy can make effective use of his air defense systems (air-to-air elements, ground-to-air elements, and support C3 structure) and prevent attainment of MAGTF objectives. Preemptive measures are required in the early phase of an amphibious operation and in sustained operations ashore.

      Preemptive measures allow subsequent air and ground operations to proceed without prohibitive interference. Preemptive measures can include:
      i. Air strikes on enemy airfields to destroy or damage aircraft, facilities, and logistic support.
      ii. Attacks on command and control facilities and surveillance systems.
      iii. Air strikes on the enemy's aircraft supply and support, such as railroads and convoys.
      iv. Offensive air-to-air sweeps to search out and destroy enemy aircraft.

   b. **Suppression of Enemy Air Defenses (SEAD)**. The objective of SEAD is to gain access to a defined zone of airspace that will allow MAGTF

2. ANTIAIR WARFARE (continued)

operations to proceed. SEAD may become periodic in nature, applied at a critical time that will allow air and ground forces to proceed without prohibitive interference from the enemy's air defense systems. SEAD is an important part of any campaign and the MAGTF must plan a coordinated effort against the enemy air defense threat. Sustainability of a coordinated GCE/ACE SEAD plan is a function of asset availability. In conventional warfare, SEAD will include the following strategy mix:

i. Direct confrontation of the enemy's air defense with ground forces.
ii. Direct confrontation of the enemy's air defense with air forces.
iii. Direct confrontation of the enemy's air defense with naval forces.
iv. Command and Control Warfare (C2W).

b. **Local Air Superiority Measures**. Even with successful application of preemptive measures and SEAD, a residual air threat may still exist. This threat may be of such a nature and magnitude that friendly air operations are still possible and survivable with proper application of local air superiority measures. The objective of local air superiority measures is to prevent the enemy’s residual air threat from affecting the execution of friendly operations to the point of prohibitive interference in a specific zone of action. Local air superiority measures may be used separately or in conjunction with preemptive measures and SEAD. Local air superiority measures can include:

i. The use of offensive combat air patrols.
ii. Escort and self-escort tactics.
iii. The use of aircraft onboard countermeasures and maneuvers.

3. Air defense consists of defensive measures designed to destroy attacking enemy aircraft or missiles or to nullify or reduce the effectiveness of such an attack (Joint Pub 1-02). Air defense can be further broken down into two categories:

a. **Active air defense** is direct defensive action taken to destroy attacking enemy aircraft or missiles or to nullify or reduce the effectiveness of such an attack.
It includes such measures as the use of aircraft, interceptor missiles, air defense artillery, non-air defense weapons in an air defense role, and electronic countermeasures.

b. **Passive air defense** constitutes all measures, other than active air defense, taken to minimize the effects of hostile air action. These measures include the use of cover, concealment, camouflage, deception, dispersion, and protective construction.

The primary purpose of AAW is to gain and maintain AIR SUPERIORITY. Air superiority is "that degree of dominance in the air battle of one force over another which permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force."

ASSAULT SUPPORT

Introduction
Assault support provides the MAGTF commander the ability to concentrate his strength against selected enemy weaknesses using speed and surprise. It provides operational and tactical mobility as well as logistics support to the MAGTF. The MAGTF commander bases his decision about the extent and use of assault support on the following METT-TC considerations:

- MAGTF's mission and concept of operations.
- The enemy's capability to interrupt movement of assault support assets.
- The effect of terrain and weather on assault support missions.
- Aircraft availability and lift capability.
- Time available for planning, rehearsal and briefing.

The MAGTF commander uses assault support to focus combat power at the decisive place and time to achieve local combat superiority. Using assault support, the commander can rapidly concentrate forces or redeploy those forces as necessary. It allows him to apply and sustain combat power and strike the enemy where he is unprepared. This function comprises those actions required for the airlift of personnel, supplies and equipment into or within the battle area by helicopters or fixed wing aircraft. These are the general categories of assault support:

1. Combat assault transport
2. Air Delivery
3. Aerial Refueling
4. Air Evacuation
5. Tactical Recovery of Aircraft and Personnel (TRAP)
6. Air Logistical Support
7. Battlefield Illumination

1. **Combat Assault Transport -** provides mobility for the MAGTF. It is used to rapidly deploy forces, bypass obstacles or redeploy forces to meet the enemy threat. All of these actions provide the MAGTF commander with more diverse options for operational planning. Combat assault transport allows the commander to affect a rapid force build up at a specific time and place of his choosing. Performed by the following platforms:

    - Marine Medium Helicopter Squadron (HMM: 12 CH-46E)
    - Marine Heavy Helicopter Squadron (HMH: 16 CH-53E or 8 CH-53D)
    - Marine Light/Attack Helicopter Squadron (HMLA: 9 UH-1N/Y)
    - Marine Aerial Refueler/Transport Squadron (VMGR: 12 KC-130)
    - Marine Medium Tiltrotor Squadron (VMM: 12 MV-22)

ASSAULT SUPPORT (continued)

2. **Air Delivery -** Provides air delivery of troops, supplies and equipment, performed by the following platforms:

    - Marine Aerial Refueler/Transport Squadron (VMGR: 12 KC-130)
    - Marine Medium Tiltrotor Squadron (VMM: 12 MV-22)

3. **Aerial Refueling –** Provides the aerial refueling to F/A-18, EA-6B, AV-8, CH-53, MV-22. Provided by:

    - Marine Aerial Refueler/Transport Squadron (VMGR: 12 KC-130)

4. **Air Evacuation -** This is the transportation of personnel and equipment from a forward operating base or remote areas. This includes flights from areas of operations to secure areas, CASEVAC, and extraction of forces. Conducted by the following platforms:

    - Marine Medium Helicopter Squadron (HMM: 12 CH-46E)
    - Marine Heavy Helicopter Squadron (HMH: 16 CH-53E or 8 CH-53D)
    - Marine Light/Attack Helicopter Squadron (HMLA: 9 UH-1N/Y)
    - Marine Aerial Refueler/Transport Squadron (VMGR: 12 KC-130)
    - Marine Medium Tiltrotor Squadron (VMM: 12 MV-22)

5. **Tactical Recovery of Aircraft and Personnel (TRAP) –** Involves the recovery of personnel and equipment while avoiding additional loss. Provided by:

    - Marine Medium Helicopter Squadron (HMM: 12 CH-46E)
    - Marine Heavy Helicopter Squadron (HMH: 16 CH-53E or 8 CH-53D)
    - Marine Light/Attack Helicopter Squadron (HMLA: 9 UH-1N/Y)
    - Marine Medium Tiltrotor Squadron (VMM: 12 MV-22)

6. **Air Logistical Support -** is performed by fixed wing aircraft and delivers troops, equipment and supplies to areas beyond helicopter range and lift capability or when surface transportation is slow or unavailable. Provided by:

    - Marine Aerial Refueler/Transport Squadron (VMGR: 12 KC-130)
    - Marine Medium Tiltrotor Squadron (VMM: 12 MV-22)

7. **Battlefield Illumination –** Illumination of the battlefield conducted by:

    - Marine Aerial Refueler/Transport Squadron (VMGR: 12 KC-130)
    - Marine Fighter Attack Squadron (VMFA: 12 F/A-18)
    - Marine Attack Squadron (VMA: 12 AV-8)
    - Marine Light/Attack Helicopter Squadron (HMLA: 18 AH-1W/Z/9 UH-1N/Y)

AIR RECONNAISSANCE

A. Purpose of Air Reconnaissance. Simply stated, when a commander commits his troops to battle, he does so with certain risks. The ultimate purpose of any type of reconnaissance is to reduce the commander's unknown risks. Since we're dealing with air reconnaissance, we'll break reconnaissance down into two categories:

a. **Strategic Reconnaissance**. The gathering of information, which is used to affect policy on the national or international level. This information is used by strategic planners and is conducted mostly by National or Theater assets. Some USMC aircraft are utilized in this role to a limited extent, but not as their primary mission.

b. **Tactical Reconnaissance.** Tactical air reconnaissance is the use of air vehicles to obtain information concerning terrain, weather, and the disposition, composition, movement, installations, lines of communications, electronic and communication emissions of enemy forces. Also included are artillery and naval gunfire adjustment, and systematic and random observation of ground battle areas, targets, and/or sectors of airspace.

B. Types of Air Reconnaissance. The type of air reconnaissance are broken down into three subsections based on the method of collection and distribution:

a. **Visual**. The gathering of information by aircrew by looking through the window of the cockpit or through sensors and verbally passing what is seen to the ground forces. This type of reconnaissance is verbal in nature (only provides a word picture) and does not provide any sort of visible imagery. Visual reconnaissance is a secondary mission assigned to all USMC aircraft.

b. **Multi-Sensor Imagery**. The passing of imagery from aircraft to ground forces. This can be real-time/near real-time through the use of data (rover) feeds from visual sensors to ground forces or can be included as part of a post-mission report where images are attached to a mission report.

c. **Electronic**. The gathering of information on how the enemy is utilizing the electromagnetic spectrum. This can be used for threat warning as well as creating/updating the electronic order of battle.

C. Current Platforms

a. **Unmanned Aircraft Systems (UAS).**

i. **RQ-7 Shadow 200.** As a MAGTF asset, it is dedicated primarily to air reconnaissance. This system has replaced the RQ-2 Pioneer and is now maintained and operated by the Marine UAV squadron (VMU). The mission of the VMU squadron is to conduct day and night unmanned air reconnaissance operations in support of the MAGTF. The Shadow 200 sensor package consists of electro-optical and forward looking infrared (FLIR) cameras with

AIR RECONNAISSANCE (continued)

incorporated IR pointer. The air vehicle is capable of reconnaissance, surveillance, and target acquisition (RSTA) at altitudes of up to 15,000 feet MSL for an advertised endurance of over 6 hours.

b. **Aircraft.**
   i. **EA-6B.**
      1. Electronic Reconnaissance
      2. LITENING II
   ii. **AH-1W/Z**
      1. Night Targeting System (DVR), NTSU
   iii. **AV-8B**
      1. LITENING II
   iv. **FA-18D**
      1. ATARS-Advanced Tactical Airborne Recon System
      2. LITENING II
   v. **UH-1N/Y.**
      1. BRITESTAR II (8mm cassette)

ELECTRONIC WARFARE

Electronic Warfare (EW) Application. Consist of the following subsets:

a. Electronic Attack (EA). Involves the use of electromagnetic energy to determine, reduce, exploit or prevent hostile use of the electromagnetic spectrum and action which retains friendly use of the electromagnetic spectrum. Among them are: Reactive Suppression of Enemy Air Defense (RSEAD), and Air Interdiction/OAAW.

b. Electronic Warfare Support (ES). That division of EW involving actions taken under direct control of an operational commander to search for, intercept, identify, and locate sources of radiated electromagnetic energy for the purpose of immediate threat recognition.

c. EP (Electronic Protection) That division of EW involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of EW that degrade, neutralize, or destroy friendly combat capability.

CONTROL OF AIRCRAFT AND MISSILES

Introduction

Control of aircraft and missiles encompasses the coordinated employment of facilities, equipment, communications, procedures, and personnel in order to enable the ACE commander to plan, direct, and control the efforts of the ACE to support the MAGTF.

CONTROL OF AIRCRAFT AND MISSILES (continued)

The agencies of the MACCS are essential to the conduct of the control of aircraft and missiles. Additionally, although the TACP and other airborne controllers are not part of the administrative chain of the Marine Air Control Group, they are considered to be integral elements of the MACCS.

A. Fundamentals of Control of Aircraft and Missiles

a. Integrating Function

i. The Aviation Combat Element (ACE) Commander's ability to command and control is facilitated through the Marine Air Command and Control System (MACCS). The MACCS provides the ACE Commander with the means to move and process information to effect the decision and execution cycle. The principle objectives of the MACCS are to:

1. Enhance unity of effort.
2. Integrate the elements of the command and control system.
3. Disseminate common situational awareness.

b. The MACCS fulfills these primary objectives through execution of the control of aircraft and missiles function of Marine aviation. The control of aircraft and missiles function ***integrates*** and focuses the other five functions of Marine aviation into a coordinated effort.

B. Methods of Aviation Control

a. Air Direction. Air direction is the authority to regulate the employment of air resources, including both aircraft and surface-to-air weapons, to maintain a balance between their availability and the priorities assigned for their use. The purpose of air direction is to achieve a balance between the MAGTF's finite aviation resources and the accomplishment of the ACE mission. Air direction includes:

i. Developing air tasking orders.
ii. Fulfilling the requirements of air tasking orders (e.g., tasking aircraft to perform specific missions).
iii. Changing or altering prescheduled missions.
iv. Processing air support requests.
v. Collecting information concerning mission status.
vi. Moving ground-based air defense assets to new firing positions.
vii. Adjusting aircraft and surface-to-air weapon unit mission assignments within previously set parameters due to changes in the air or ground situation.

CONTROL OF AIRCRAFT AND MISSILES (continued)

b. Air Control. Air control is the authority to direct the physical maneuver of aircraft in flight or to direct an aircraft or surface-to-air weapon unit to engage a specific target. *Air control includes airspace management and airspace control.*

i. **Airspace Management.** Airspace management is the coordination, integration and regulation of the use of airspace of defined dimensions. Airspace management is used to optimize the use of available airspace to allow maximum freedom, consistent with the degree of operational risk acceptable to the commander. The MACCS provides the ACE Commander with the ability to conduct airspace management.

ii. **Airspace Control.** Airspace control is the authority to direct the maneuver of aircraft so that the best use is made of assigned airspace. Airspace control provides for the coordination, integration, and regulation of the use of a defined airspace. It also provides for the identification of all airspace users. The authority to exercise airspace control is inherent to the commander whose unit is responsible for particular blocks of airspace, types of missions, or types of aircraft. Airspace control does not include measures to approve, disapprove, deny, or delay air operations. ***MACCS agencies accomplish airspace control through the use of positive control, procedural control, or a combination of the two.***

1. **Positive Control**. Positive control is a method of airspace control that relies on positive identification, tracking, and direction of aircraft within a particular airspace. The characteristics of positive control include the required use of radars, other sensors, identification friend or foe (IFF), digital data links for a shared air picture, and reliable and continuous communications with all aviation assets.

2. **Procedural Control.** Procedural control is a method of airspace control that relies on a combination of previously agreed upon and promulgated orders and procedures. The characteristics of procedural control include comprehensive air defense identification procedures and rules of engagement; aircraft identification maneuvers; fire support coordination measures; transit routes; and coordinating altitudes.

CONTROL OF AIRCRAFT AND MISSILES (continued)

C. MACCS Elements.

MACCS elements are organized into several independent squadrons which, when deployed, provide the agencies of the MACCS.

a. Marine Tactical Air Command Squadron (MTACS)
CORRESPONDING AGENCY: **Tactical Air Command Center (TACC)**

i. The role of the TACC is to function as the senior MAGTF Aviation command and control agency and to serve as the operational command post of the ACE commander or his designated representative. Responsible for receiving requests for assault support and offensive air support, and producing the air tasking order (ATO).

b. Marine Wing Communication Squadron (MWCS). The MWCS is the primary communication organization within the Marine Aircraft Wing (MAW).

c. Marine Air Support Squadron (MASS).
CORRESPONDING AGENCY: **Direct Air Support Center (DASC)**

i. DASC is responsible for direction of assault support and offensive air support through procedural control, ideally located with senior FSCC.

d. Fixed Wing Marine Unmanned Squadron (VMU). The VMU provides Air Reconnaissance and OAS in the form of the RQ-7 Shadow 200.

e. Low Altitude Air Defense (LAAD) Battalion. The mission of the LAAD Bn is to provide close-in, low altitude surface-to-air weapons fires in defense of the MAGTF. LAAD Bns defend forward combat areas, maneuver forces, vital areas, installations, and/or units engaged in special or independent operations utilizing the stinger missile system.

f. Marine Air Control Squadron (MACS).
CORRESPONDING AGENCY: **Tactical Air Operations Center (TAOC)**

i. Primary agency for Anti Air Warfare. Along with positive control through air traffic control (ATC) agencies.

PART 2

CLOSE AIR SUPPORT

Close Air Support

Introduction

Close air support (CAS) is a Marine Corps innovation. Since the first dive-bombing attempts in World War I and subsequent operations, Marines have realized the value of closely integrating aviation with ground combat efforts. World War II and the Korean War galvanized the importance of CAS. During those conflicts, the fundamental tactics, techniques, and procedures (TTP) for conducting CAS today were forged in places such as Guadalcanal and the Pusan Perimeter. Today, CAS continues to be Marine aviation's unique contribution to the combat power available to a Marine air-ground task force (MAGTF) commander.

Importance

The MAGTF commander uses CAS to concentrate firepower on the enemy. CAS provides fire support with the speed and violence that is essential in maneuver warfare. The speed, range, and maneuverability of aircraft allow them to attack targets that other supporting arms may not be able to effectively engage. The ground commander at the lowest level is responsible for employment of CAS assets unless specifically retained by a higher-level commander in the ground force chain of command.

In This Lesson

We will discuss close air support fundamentals, the key personnel, how to develop a 9 line brief, and how to control aircraft from the check in brief until the Battle Damage Assessment is reported back to the supporting aircraft.

This lesson covers the following topics:

CAS Fundamentals

CAS is an “Air action by fixed- and rotary-wing aircraft against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces.” -- Joint Publication (Joint Pub) 1-02, *DOD Dictionary of Military and Associated Terms*

CAS is an offensive air support (OAS) mission that is planned and coordinated to deliver firepower against selected enemy capabilities at a designated place and time. By using the speed and mobility of aircraft, CAS provides the commander with the means to strike the enemy swiftly and unexpectedly. Applying the fundamentals of combined arms, the commander integrates CAS with other forms of fire support and the fire and movement of ground forces. CAS is a mission conducted at the tactical level that may affect operational-level objectives.

CAS is conducted when and where friendly combat forces are in close proximity to enemy forces. The word, “close,” does not imply a specific distance; rather, it is situational. The requirement for detailed integration based on proximity, fires, or movement is the determining factor. CAS provides firepower to neutralize or destroy enemy forces in offensive and defensive operations.

Although the concept is simple, CAS requires detailed planning, coordination, and training for effective and safe execution.

Types of Terminal Control

The three types of terminal control each follow a set of procedures with associated risk. The commander considers the situation and issues guidance to the FAC based on recommendations from his staff and associated risks identified in the tactical risk assessment. The intent is to offer the lowest level supported commander, within the constraints established during risk assessment, the latitude to determine which type of terminal attack control best accomplishes the mission. The three types of control are not ordnance specific.

- **Type 1**. Terminal controllers use Type 1 control when the risk assessment requires them to visually acquire the attacking aircraft and the target under attack. It may have been determined, during the tactical risk assessment process, that analysis of attacking aircraft nose position and geometry is the best method of ensuring first pass success and fratricide mitigation under the existing conditions. Examples where visual means of terminal attack control is the method of choice are:
  - Language barriers when controlling coalition aircraft.
  - Lack of confidence in a particular platform.
  - Ability to operate in adverse weather.
  - Aircrew capability.
  - Troops in contact situations.

  The terminal controller will provide a “cleared hot” when:

  - He has visually acquired the target.
  - He has ensured the attack will not affect friendlies by visual acquisition and analysis of attack geometry/nose position to determine weapon impact point.
  - The attack aircraft has visually acquired the target or mark.

  Type 1 is the most restrictive form CAS of terminal control.

- **Type 2**. Type 2 control will be used when the terminal controller desires control of individual attacks but assesses that either one or a combination of any two or three of the following conditions exist:
  - Visual acquisition of the attacking aircraft by the terminal controller at weapons release/launch is not possible

- Visual acquisition of the target by the terminal controller at weapons release/launch is not possible
- When attacking aircraft are not in a position to acquire the mark or target prior to weapons release/launch.

Examples of when a controller would employ a Type 2 control include:

- Night missions.
- Adverse weather operations.
- High threat tactics.
- High altitude tactics.
- Standoff weapons employment.

Types of Terminal Control (Continued)

o **Type 2 (Continued).**

Successful CAS attacks under these conditions depend on timely and accurate targeting data. When delivering GPS/INS or unguided weapons on GPS coordinates, attack aircraft will confirm targeting location with the terminal controller or FAC (A). When employing unguided munitions using Type 2 control, consideration must be given to host aircraft navigation/weapons system accuracy. Inaccurate navigation/weapon systems can result in extensive miss distances. Weapon time of flight will be a factor relative to movement of enemy targets and friendly forces when employing standoff weapons incapable of receiving targeting updates throughout the duration of flight. Detailed planning and preparation by both the terminal controller and the aircrew are required to identify the situations and locations conducive to standoff weapons attacks and to address flight profile and deconfliction (aircraft/weaponry/terrain) considerations.

Digital or data link systems capable of displaying aircraft track, sensor point of interest, etc., significantly enhance situational awareness that better enable the terminal controller to authorize weapons release when the terminal controller is unable to visually acquire the attacking aircraft. The terminal controller will provide a "cleared hot" when he or an observer sees the target either visually or through electronic means and ensures the attacking aircraft will not affect friendlies by analysis of attack geometry/nose position through other means. The attack aircraft will verify target coordinates correlate with expected target area and the terminal controller is confident that the attack aircraft has visually or electronically acquired the correct target. Attack aircraft do not have to visually acquire the target area or mark.

o **Type 3**. Type 3 control is used when the terminal controller requires the ability to provide clearance for multiple attacks within a single engagement subject to specific attack restrictions. Type 3 control does not require the terminal controller to visually acquire the aircraft or the target. When commanders authorize Type 3 control, terminal controllers grant a "blanket" weapons release clearance to an aircraft or multiple aircraft attacking a target or targets that meet the prescribed restrictions set by the terminal controller. Attack aircraft flight leaders may then initiate attacks within

the parameters imposed by the terminal controller. Observers may be equipped and in a position to provide terminal guidance to attack aircraft. The terminal controller will monitor radio transmissions and other available digital information to maintain control of the attacks. The terminal controller maintains abort authority throughout the attack. The terminal controller will provide a "cleared to engage" once a tactical risk assessment has determined that there is a low risk of fratricide. Type 3 is the least restrictive form of CAS terminal control.

Conditions for Effective CAS

For CAS to be delivered effectively, some basic conditions that optimize CAS employment must be considered. These conditions include:

- Effective training and proficiency.
- Planning and integration.
- Command, control, and communications (C^3).
- Air superiority.
- Target marking and acquisition.
- Streamlined and flexible procedures.
- Appropriate ordnance.
- Favorable weather.

- **Effective Training and Proficiency**. This training should integrate all maneuver and fire support elements involved in executing CAS. Maintaining proficiency allows aircrew and Joint Terminal Attack Controllers (JTACs) to adapt to rapidly changing operational environment conditions.

- **Planning and Integration**. Effective CAS relies on thorough, coherent planning and detailed integration of air support into ground operations. The ability to mass joint fire support at a decisive point and to provide the supporting fires needed to achieve the commander's objectives is made possible through detailed integration with ground forces. From a planner's perspective, the preferred use of a CAS asset is to have it pre-planned and pre-briefed. Rehearsals provide participants an opportunity to walk through the operation; to achieve familiarity with terrain, airspace restrictions, and procedures; and to identify shortfalls.

- **Command, Control, and Communications (C^3)**. CAS requires an integrated, flexible C^3 structure to identify requirements, request support, prioritize competing requirements, task units, move CAS forces to the target area, provide threat warning updates, etc. Accordingly, C^3 requires dependable and interoperable communications between aircrews, air control agencies, JTACs, ground forces, requesting commanders, and fire support agencies. Any airspace control

measures and fire support coordinating measures should allow for timely employment of CAS without adversely affecting other fire support assets.

- **Air Superiority.** Air superiority permits CAS to function without prohibitive interference by enemy aircraft or surface to air weapons. Air superiority may range from local or temporary air superiority to control of the air over the entire operational area. Suppression of Enemy Air Defenses (SEAD) is an integral part of achieving air superiority and may be required during CAS attacks.

Conditions for Effective CAS (Continued)

- **Target Marking and Acquisition.** The commander employing CAS can improve its effectiveness by providing timely and accurate target marks. Target marking builds situational awareness, identifies specific targets in an array, reduces the possibility of fratricide, and facilitates terminal attack control. When the commander employing CAS foresees a shortfall in ability to mark for CAS, the commander should request that capability during the planning phase.

- **Streamlined and Flexible Procedures.** Responsive fire support allows a commander to exploit fleeting battlefield opportunities. Because the modern battlefield can be extremely dynamic, the CAS system must also be flexible enough to rapidly change targets, tactics, or weapons. The requestor is usually in the best position to determine fire support requirements, and like all fire support, CAS must be responsive to be effective. Techniques for improving responsiveness include:
    - Using forward operating bases (FOBs) or forward operating locations near the area of operations.
    - Placing aircrews in a designated ground or airborne alert status.
    - Delegating launch and divert authority to subordinate units.
    - Placing JTACs and other air personnel to facilitate continuous coordination with ground units, communication with aircraft, and observation of enemy locations.

- **Appropriate Ordnance.** To achieve the commander's intent for CAS, planners, JTACs, and aircrews must tailor the weapons and fuse settings for the target being attacked. For example, precision guided munitions (PGM) guided by the Global Positioning System (GPS), such as the GBU-38 500 lb JDAM, are highly effective against fixed targets such as a building, but can be ineffective against mobile targets such as tanks on the move as their guidance coordinates cannot be updated after weapons release. In all cases, the supported commander needs to know the type of ordnance expended and its possible impact on the unit's current or subsequent mission.

- **Favorable Weather.** Favorable weather improves aircrew effectiveness regardless of aircraft or weapon capability. Inclement weather can affect target acquisition, aircraft sensor performance, laser attenuation, and terminal control. Before CAS missions are executed, weather conditions must be considered. If the visibility or cloud ceiling are too low, aircraft support may not be feasible depending on the mission. Additionally, targets located solely by radar or geographic coordinates may not offer the aircrew or JTAC precise enough information to ensure positive target identification and assure avoidance of fratricide.

CAS Key Personnel

CAS Players. Numerous agencies and units are involved in the planning, execution, and assessment of each CAS mission. The depth and breadth of this lesson does not allow us to explore every nuance of the CAS process and all participants. However, you should be familiar with three general categories of personnel when it comes to a baseline knowledge of CAS.

- **Aircraft**. During *B2C2437*, *Principles of Fire Support,* you learned about the different Marine Corps aircraft that conduct CAS and the ordnance that they are capable of bringing to the fight. Although fixed- and rotary-wing aircraft can both provide CAS, employment considerations differ. Some planning and employment methods for CAS with fixed-wing aircraft are not the same as for rotary-wing aircraft.

  Although attack helicopters and fixed-wing aircraft capabilities are complementary, neither capability can fully replace the air support provided by the other. The range, speed, and ordnance load of fixed-wing aircraft and the helicopter's excellent responsiveness, long on-station times, and ability to operate in diverse conditions represent distinct advantages that are unique to each.

  Fixed-wing aircraft are typically tasked and employed to conduct CAS in terms of aircraft sorties. A sortie is "*an operational flight by one aircraft*." (Joint Pub 1-02) Fixed-wing CAS sorties are normally flown in sections (two aircraft) or divisions (four aircraft). Rotary-wing aircraft providing CAS are typically tasked and employed in sections, divisions, or flights (two or more divisions). Both fixed- and rotary-wing aircraft are normally assigned as part of the air combat element (ACE) of a MAGTF. When referring to aircraft flights, the lead aircraft is referred to as "lead" or "dash-one." The second and subsequent aircraft are referred to as "dash-two," "dash-three," etc.

- **Marine Air Command and Control System (MACCS).**

  - **The Tactical Air Command Center (TACC**) is the senior MAGTF air command and control agency, and the only one to exercise command.

The TACC is the operational command center of the ACE Commander. The TACC plans, supervises, coordinates, and executes all current and future MAGTF air operations. The TACC is the only agency with authority to **launch** aircraft.

- **The Direct Air Support Center (DASC)** integrates aviation operations with the ground commanders' scheme of maneuver, and is usually collocated with the senior FSCC. The DASC requests, directs, and routes aircraft to where they are needed on the battle field. The DASC executes procedural control, and has **divert** authority of airborne aircraft.

CAS Key Personnel (Continued)

- **Ground Personnel.** Tactical air control parties (TACPs) exist at the MAGTF through battalion level and are primarily used to integrate and coordinate air support in the fire support process. At the battalion level, the TACP is also used to provide terminal control for CAS aircraft.

  The battalion TACP consists of 3 Forward Air Controllers (FAC) and 12 radio operators. The senior FAC is the air officer (AO), who acts in a dual capacity as special staff officer to the battalion commander for all aviation matters and as the officer in charge of the TACP. Each of the other two FACs are the leaders of a forward air control party. All AOs and FACs at the battalion level are naval aviators who have attended the Tactical Air Control Party Course and have the secondary MOS of 7502. Each forward air control party has four communicators. Regimental, division, and MAGTF TACPs do not have FACs, only AOs.

  The TACP participates in fire support coordination. The AO advises the ground unit commander on CAS employment and works in the Fire Support Coordination Center (FSCC) as the battalion's air representative. The forward air control parties prepare the majority of the requests for CAS and provide the battalion with its CAS terminal control capability.

  The FAC provides terminal control for CAS aircraft and maintains radio communications with assigned CAS aircrews from a forward ground position. The FAC aids in target identification and greatly reduces the potential for fratricide. The duties of the FAC include:

  - Knowing the enemy situation, selected targets, and location of friendly units.
  - Knowing the supported unit's plans, position, and needs.
  - Locating targets of opportunity.
  - Advising the supported company commander on proper air employment.
  - Requesting CAS.
  - Controlling CAS.
  - Performing battle damage assessment (BDA).

CAS Key Personnel (Continued)

Throughout this handout and during your study of CAS, you may see the following terms:

Term	Definition
FAC (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 (JP 1-02). A Marine aviator with the additional MOS of 7502. FAC is a Marine Corps specific moniker and qualification.
JTAC (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. A qualified and current joint terminal attack controller will be recognized across the Department of Defense as capable and authorized to perform terminal attack control. In the Marine Corps, qualified ground combat arms officers and staff non-commissioned officers who have completed the Tactical Air Control Party Course and have received the additional MOS 8002 are JTACs. All FACs are also JTACs, but only winged aviators can be FACs. The JTAC moniker is recognized throughout the Department of Defense and NATO countries.
Terminal Controller	Personnel with the authority to control the maneuver of and grant weapons release clearance to attacking aircraft. A terminal controller is not necessarily a FAC or JTAC but simply whoever is controlling the aircraft and has been granted weapons release authority by the ground commander.
FAC(A) Forward Air Controller (Airborne)	A specifically trained and qualified aviation officer who exercises terminal control of aircraft engaged in close air support of ground troops from an air platform in flight. The forward air controller (airborne) is an airborne extension of the tactical air control party and executes the ground commander's intent. (JP 1-02) In other words, the FAC (A) augments and supports the ground terminal controller and ground commander's scheme of

	maneuver/fire support plan.

Control and Coordination Measures

Commanders can employ a variety of measures to control and coordinate airspace and airspace users. The senior air control agency is responsible for deconflicting air operations by establishing control procedures to ensure the efficient and safe use of airspace.

In joint operations, the airspace control authority deconflicts the airspace by publishing the airspace control plan and the subsequent airspace control orders.

The air and ground commanders coordinate the use of control procedures to strike a balance between the ground force use of airspace and protection of aircraft using that airspace. One method to accomplish this is the use of airspace control measures.

Airspace Control Measures. Airspace control measures increase operational effectiveness. They also increase CAS effectiveness by ensuring the safe, efficient, and flexible use of airspace. Airspace control measures speed the handling of air traffic within the objective area. Air C^2 systems use airspace control measures to help control the movement of CAS aircraft over the battlefield. Airspace control measures are not mandatory or necessary for all missions. Airspace control measures include:

- Control Points
- Contact point (CP)
- Initial point (IP)
- Holding area (HA)
- Battle position (BP)

- **Control points** route aircrews to their targets and provide a ready means of conducting fire support coordination. Control points should be easily identified from the air and should support the MAGTF's scheme of maneuver. The senior FSCC and the ACE select control points based on MAGTF requirements.

    - **Control Point Selection**. Use terrain features. Advanced navigational equipment available on many CAS-capable aircraft, such as the GPS, can make the navigation process less difficult. Regardless, CAS planners should still select control points at or near significant terrain features; if possible, allowing the pilot to easily identify the control features location visually.

- **Fixed Wing Control Points**

    - **Contact Point.** A CP is "the position at which a mission leader makes radio contact with an air control agency" (Joint Pub 1-02). Normally, a CP is outside the range of enemy surface to air weapon systems and is 15-30 nautical miles (NM) from the target area. During ingress, the aircrew contacts the terminal controller at the CP. A CP allows coordination of final plans before entering heavily defended airspace. By convention, CPs are named after states, i.e., "TEXAS."

Control and Coordination Measures (Continued)

- **Initial Point.** The IP is "used as the starting point for the bomb run to the target." (Joint Pub 1-02) An IP is:

  - Easily identified (visually or electronically).
  - Located 5-15 NM from the target area (optimally 8-12 NM, as at this distance the pilot has roughly a minute to acquire the target between passing through the IP and executing weapons release).
  - A reference point for the pilot to gain target acquisition.
  - Terminal controllers and aircrews use IPs to help position aircraft delivering ordnance. By convention, IPs are named after car makes, i.e., "CHEVY."

- **Rotary-Wing Control Points**

  - **Holding area.** The HA is occupied while awaiting targets or missions. While in the HA, aircrews receive the CAS briefing and perform final coordination. Aircrews can receive updated target or mission information in a face-to-face brief or over the radio. After receiving the brief, aircrews move along attack routes (ARs) to BPs. HAs, by convention, are named after female names, i.e., "Sally." HAs can be located near regimental or battalion headquarters to take advantage of their communications connectivity. Terminal controllers can also locate HAs at their position. The HA should be well forward yet provide cover and concealment from enemy observation and fires. The HA should be large enough for adequate dispersion and meet all landing zone selection criteria. Often, HAs will be 2x2 Grid squares in dimension. (a box containing four grid squares).

  - **Battle position.** The BP is an airspace coordination area that contains firing points (FP) for attack helicopters. A BP should:

    - Allow good cover and concealment.
    - Provide necessary maneuvering space.
    - Allow for appropriate weapons engagement zones (WEZs).
    - Be reasonably easy to identify.
    - Be a reference point for the pilot to gain target acquisition.
    - BP selection begins during pre-mission planning. A coordinated effort between air and ground units in the selection of BPs is optimal. **Once the terminal controller authorizes aircraft into a BP, flight outside of the BP is not permitted unless authorized by the terminal controller.** Uncoordinated egress from the BP may interrupt other supporting fires and endanger CAS aircrews. BPs, by convention, are named after snakes, i.e., "ASP." To avoid enemy counter fire, the CAS aircraft may need to displace and resume the attack from a different BP. Therefore, alternate BPs should be established. Like HAs, BPs are often 2X2 grid squares in dimension (a box containing four grid squares), but they are not required to conform to these dimensions. BP selection is based on the criteria described in the following table:

Control and Coordination Measures (Continued).

BP Selection Criteria

Selection Criteria	Considerations
METT-T/ Supporting arms deconfliction	The BP must: • Support the mission requirements. • Be integrated into the scheme of maneuver. • Provide deconfliction with gun-target lines and fixed-wing attack profiles. • Also ensure that potential BPs are examined for communications limitations.
Adequate maneuver area	The BP: • Must be large enough to contain the CAS aircraft. • Must provide safe and flexible maneuver between various FPs. • Must provide flexible delivery profiles to ensure accurate weaponeering by the CAS flight. • Is often depicted as a 2x2 grid square but can also be a distance around a known point or conform to the contour of the terrain.
Prevailing wind	To maintain the element of surprise and to minimize acoustic signature detection, locate the BP downwind from the target.
Visibility and sensor performance	Target area visibility and its associated effect on sensor performance will influence the BP range to target. Fog, smoke, smog, low-lying clouds, and haze can degrade laser/IR sensors and weapons systems such that BP-to-target ranges may have to be significantly decreased for effective employment.
Target altitude	BP should be at an elevation equal to or higher than the target area to allow for unobstructed weapon-to-target lines.
Terrain relief	Hilly and mountainous terrain enables the CAS aircrew to mask/unmask easily and aids in navigation.
Range	BPs should be: • Located so that the target area is within the effective range of the aircraft's weapons systems (1-5 km). • Outside the threat's weapons engagement zone, unless terrain masking is available.
Field of fire	BPs should permit unobstructed sighting of targets throughout the target area.
Sun/moon	If possible, the sun or moon should be behind or to the side (night time) of the attacking aircraft to: • Allow the CAS aircrew to view the kill zone. • Prevent the enemy from seeing and targeting the aircraft.
Rotor wash	The BP location should reduce the effects of rotor wash on surrounding terrain (debris, leaves, snow, sand, and dirt).
Back blast	The BP location should reduce the effects of weapon's back blast on surrounding terrain.

Control and Coordination Measures (Continued)

- **CAS Briefing Form.** The CAS brief (see following diagram), also known as the "nine-line brief," is the standard brief used for all aircraft conducting CAS. The brief is used for all threat conditions and does not dictate the CAS aircrew's tactics. The mission brief follows the numbered sequence (1-9) of the CAS briefing form. Use of a standardized briefing sequence improves mission direction and control by allowing terminal controllers to pass information rapidly and succinctly.

    - The CAS briefing helps aircrews determine the information required to perform the mission. Due to the emergence of long range precision munitions and mishaps involving terminal controllers, the Joint CAS Community has determined that lines 4, 6, and restrictions will be read back by the CAS aircrew after the 9-line has been transmitted.

        - Restrictions are the aspects of the remarks section including flight parameters with which pilots are required to comply. Examples of these are: Final Attack Heading, Altitude (stay above, stay below), and Time on Target. These items must be read back to ensure pilot understanding and compliance with the controller's requirements for organizing the attack as well as the battlespace geometry.

        - Remarks are similar to Coordinating Instructions. Remarks can include any information the controller wishes to pass to the aircraft, specifically: threats, hazards, weather, ordnance requests, danger close, final attack heading, altitude requirements, etc. Remarks in their entirety will not be read back by the pilot – only the restrictions.

Control and Coordination Measures (Continued)

CAS Briefing Form (9-Line)

Note: Omit data not required; do not transmit line numbers. Units of measure are standard unless otherwise specified. Denotes minimum essential information required in a limited-communication environment. Bold denotes pilot's required read back items.

Terminal controller: _____, this is _____
(Aircraft call sign) (Terminal controller)

1. IP/BP: _____

2. Heading: _____ Offset: L or R (FW ONLY)

3. Distance: _____

4. Target Elevation: _____ (in feet MSL)

5. Target Description: _____

6. Target Location: _____
(latitude/longitude, grid coordinates, offsets or visual)

7. Type mark: _____ Code: _____
(WP/laser/IR/beacon) (actual code)
Laser-to-target line: _____ degrees

8. Location of friendlies: _____
Position marked by: _____

9. Egress _____

Remarks (as appropriate):_____
(**Final attack heading/cone**, threats, hazards, weather, **altitudes**, requested ordnance, danger close)

Time on Target: **TOT** _____

- or -

Time to Target: standby _____ plus _____… Hack

Control and Coordination Measures (Continued)

The table below details the line-by-line elements of the CAS brief.

Line #	Heading	Description
1	IP/BP	• IP is the starting point for the run-in to the target 5-15nm from the target area (8-12nm optimal). • For rotary-wing aircraft, the BP is where attacks on the target are commenced, normally 1-5km from target area. • This is the first reference point of the nine-line brief.
2	Heading	• Given in degrees magnetic from the IP to the target or from the center of the BP to the target • Terminal controllers give an offset (offset left/right) if a restriction exists (Fixed-wing only); the offset is the side of the IP-to-target line on which aircrews can maneuver for the attack
3	Distance	• Given from the IP/BP to the target • For fixed-wing aircraft, The distance is given in NM and should be accurate to a tenth of an NM • For attack helicopters, the distance is given in meters from the center of the BP and is accurate to the nearest 100m
4	Target elevation	Given in feet above mean sea level (MSL). Found by utilizing the contour interval on your map • 1m = 3.3ft
5	Target description	• Should be specific enough for the aircrew to recognize the target. • Target should be described using the acronym STD: o S = Size (how many? i.e. , 4) o T = Type (what is it? i.e., Tank, Troops, APC) o D = Description (where is it? what is it doing? i.e., In the open, on a road) • Describe a single target and adjust to other targets after the desired effects are met. • A good description of the target assists the aircrew with correct weaponeering.
6	Target location	The terminal controller can give the target location in: • Grid coordinates (most commonly accepted method). If using grid coordinates, terminal controllers must include the 100,000-square meter grid identification (Example: TH 804677). • Latitude and longitude. • Visual description from a conspicuous reference point. • Because of the multiple coordinate systems available for use, the datum that will be used must always be specified (i.e., WGS-84).

Control and Coordination Measures (Continued)

The table below details the line-by-line elements of the CAS brief (Continued).

Line #	Heading	Description
7	Mark	• The type of mark the terminal controller will use [White phosphorous (WP), Illumination (Illum) on deck, laser, Infrared (IR) pointer, etc.]. • The mark must be distinguishable in the operational environment. • Assists in CAS accuracy. • Enhances situational awareness. • Reduces the possibility of fratricide. • An effective mark is within 300 meters of the target. • WP and other indirect marks should be on the deck 30 seconds prior to TOT. • Illumination on deck should land 45 seconds prior to TOT. • A backup mark should be used whenever possible, preferably a different type from the primary (i.e. primary mark – WP, backup mark – Illum on deck). • The terminal controller may "talk the aircrew onto the target" by verbally describing the target to be attacked.
8	Friendlies	• The direction and distance of friendlies from the target. • A cardinal/semi-cardinal direction from the target (North, North East, North West, South, South East, South West, East, or West). • Distance given in meters. • If the friendly position is marked, identify the type of mark. • Do not pass friendly grid locations during the 9-line.
9	Egress	The instructions the aircrews use to exit the target area. Can be given: • As a cardinal/semi-cardinal direction • By using control points The word, "Egress," is used before delivering the egress instructions

Control and Coordination Measures (Continued)

The table below details the line-by-line elements of the CAS brief (Continued).

Line #	Heading	Description
	Remarks	Included if applicable: • Threat and location • Hazards to aviation • Laser-to-target line (in degrees magnetic) • Ordnance delivery • Airspace control areas (ACAs) • Weather • Restrictions • Additional target information • Laser, illumination, and night vision capability • Danger close • Final attack heading (final attack cone headings) **Note**: Final attack headings are a restricted run-in and the aircraft must fly within it during the bomb run. It should be expressed as a cone, i.e., "FAH 060 - 090 degrees" and should allow the greatest latitude possible to the pilot while facilitating the FAC's requirement to ensure the safe execution of the support. Some examples of when a final attack cone might be required are: • To aid in the visual acquisition of the aircraft by the terminal controller. • To deconflict the aircraft with the Gun Target Line (GTL). • To ensure the aircraft will not fly over or toward friendly troops during the bomb run. • When using a laser to mark the target. (The aircraft must fly a particular heading to detect the laser energy.) • To provide further safeguarding to the aircraft from surface threats.
	Timing	TOT/TTT: The terminal controller gives aircrew a TOT or TTT. • TOT is the synchronized clock time when ordnance is expected to hit the target: o Is the timing standard for CAS missions. o When using TOT, there is no time "Hack" statement. • TTT (Rarely used with the advent of GPS). Is the time in minutes and seconds, after the time "Hack" statement is delivered, when ordnance is expected to hit the target. • The time "Hack" statement indicates the moment when all participants start the timing countdown.

Control and Coordination Measures (Continued)

- **Danger Close.** Due to the inherent differences in the size, type, and killing effects of different types of aviation ordnance, CAS has no one danger close distance as artillery and mortars do. Danger close distances for aviation ordnance are listed by type in Joint Publication 3-09.3 with Change 1 (2005), Joint Tactics, Techniques, and Procedures for Close Air Support, Appendix D. The supported commander must accept responsibility for the risk to friendly forces when targets are inside danger close distance. Risk acceptance is confirmed when the supported commander passes his initials to the attacking CAS aircraft, signifying that he accepts the risk inherent in ordnance delivery inside the danger close distance.

- **Check–In.** Check-in procedures are essential for establishing the required flow of information between CAS aircrews and terminal controllers. Use the CAS check-in briefing format (see diagram below) on check-in with terminal controllers.

(Aircraft transmits to Controller)

Aircraft: _____, this is _____
(Controller call sign) (Aircraft call sign)

1. Identification/Mission Number: _____

NOTE: Authentication and an appropriate response are suggested here. The brief may be abbreviated for brevity or security ("as fragged" or "with exception")

2. Number and Type of Aircraft: _____

3. Position and Altitude: _____

4. Ordnance: _____

5. Time on Station: _____

6. Abort Code: _____
(if applicable)

Close Air Support Check-In Brief

After CAS aircrew checks in, the JTAC will provide a current situation update. This update should include:

- Unit mission.
- Enemy disposition.
- Threat activity in target area.
- Weather (if required).
- Friendly positions.
- Current Fire Support Coordination Measures (FSCMs).

Terminal Control

After the aircraft depart the CP or HA, the terminal controller provides target and threat updates to the aircrews. The terminal controller may direct the aircrews to report departing the IP or arrival in the BP. This information may be used to coordinate the CAS attack with SEAD, marking, or the maneuver of the supported unit. The terminal controller attempts to acquire the CAS aircraft visually and give final corrections to assist the aircrew in target acquisition.

The terminal controller can expect the following standard calls from the aircrew during execution of the CAS run (calls in bold are required):

- **"IP inbound"**
- "In"

This will facilitate positive control and aid the terminal controller in successfully conducting the CAS mission. Aircrew call "In" (commencing an attack run) using the format below:

- (Call sign), in from (cardinal heading). (i.e., "Knight 31, in from the West)

Following the "In" call, all other CAS aircrews should maintain radio silence, except to make threat calls, and allow the terminal controller to transmit the appropriate control and clearance communications listed in the table below.

Terminology

Call	**Meaning**
Continue	Continue as briefed. You are not yet cleared to release any ordnance.
Visual	Visual acquisition of FRIENDLIES.
Contact	Visual acquisition of something on the GROUND.
Tally	Visual acquisition of the TARGET.
Abort (Abort code)	Abort the pass. Do not release any ordnance.
Cleared Hot	You are cleared to release ordnance on this pass. (Types 1 and 2 controls.)
Cleared to Engage	You are cleared for multiple engagements within the parameters I have established. (Type 3 controls only.)
Continue Dry	You are cleared to proceed with the attack run, but you may not release any ordnance. (Normally used during training when live ordnance is not available.)

Terminal Control (Continued)

Clearance to Drop/Fire. The authority and responsibility for expenditure of any ordnance on the battlefield rests with the supported ground commander. The supported ground commander will delegate weapons release clearance authority to his terminal controllers to facilitate CAS attacks. Battlefield conditions, aircrew training, ordnance capabilities, and terminal controller experience are factors in the decision to authorize weapons release. Weapons release authority grants terminal controllers the authority to provide the following to attacking aircraft:

- **"Cleared Hot"** – Term used by a terminal controller granting weapons release clearance to an aircraft attacking a specific target. Clearance should be given as soon as possible in the delivery sequence after the terminal controller is convinced the attacking aircraft will engage the correct target and will not release on friendly positions. This allows the aircrew to concentrate on the weapons solution and improves delivery accuracy, further reducing the possibility of fratricide. Used during Types 1 and 2 controls only.
- **"Cleared to Engage"** – Term used by a terminal controller granting a "blanket" weapons release clearance to an aircraft or multiple aircraft attacking a target or multiple targets which meet the prescribed restrictions set by the terminal controller. Used during Type 3 controls only.

A positive clearance by the terminal controller ("Cleared Hot" or "Cleared to Engage") is *mandatory* before any release of ordnance by the aircrew. The "Cleared Hot" call can be made only after the terminal controller analyzes the attacking aircraft's geometry to ensure ordnance effects will not affect friendly forces.

WARNING: The word "Cleared" will be used only when ordnance is actually to be delivered. This will minimize the chances of dropping ordnance on dry passes and further reduce the risk of fratricide.

Abort Procedures. The terminal controller must direct CAS aircrews to abort if:

- Any portion of the CAS brief is not understood.
- Any unsafe situation develops.
- Clearance criteria not met.
- The tactical situation changes, requiring a reset of the attack run in order to facilitate effective engagement of the target.
- **Abort Code.** If no abort code was briefed, then the CAS attack is aborted by simply transmitting, "Abort. Abort. Abort."

Terminal Control (Continued)

Corrections. Corrections are given in two parts with respect to an identified reference**:**

- Cardinal Direction from a visible reference point.
- Distance (in meters).
  - o From the Mark. To pass corrections from a visual mark use the eight cardinal points of the compass and a common distance reference. Specify the type of mark if multiple types are used.
    "Viper 44, this is Nomo, from the mark, northeast—two hundred."

  - o From Ordnance Impact. Corrections can be made from the last ordnance to impact the target:
    "Combat 51, this is Rabbit, from lead's hit, southeast – one hundred"

- Visual marks (smoke, illum on the deck) must land within three hundred meters of the target to be considered effective. If a mark lands more than 300 meters from the target, the controller should tell the aircraft to disregard the mark and then conduct a brief visual talk-on.

  - o "Spade 31, this is Talent, disregard the mark, from the road intersection, north three hundred."

Re-attacks. The aircrew and terminal controller's goal is to complete a successful attack on the first pass. Once acquired by the enemy in the target area, an aircraft that remains for re-attacks may be more vulnerable. In low- and medium threat environments, immediate re-attacks may be a practical option, although single-pass attacks require less time in enemy air defense envelopes.

A re-attack can help assure the desired effect on the target, aid visual orientation for the aircrew, and increase responsiveness to the supported commander. Terminal controllers authorize re-attacks. If a re-attack is necessary and possible, the terminal controller may give the aircrew a pull-off direction and may assign different attack headings. The terminal controller may provide additional target marks for the re-attack.

The terminal controller can describe re-attack target locations by using the last mark, last hit, terrain features, or friendly positions. The re-attack may engage other targets within a specific target area. Re-attacks allow CAS aircraft to expeditiously maneuver, at the aircrew's discretion while in compliance with any restrictions in force to an attack position subsequent to a CAS attack.

Each re-attack is a separate evolution from any previous attack, and positive clearance to release is required each time. Clearance for a re-attack does not alleviate the requirement for subsequent "Cleared hot" calls. Clearance for re-attack *is not* an indefinite clearance to drop/fire. To emphasize this point, the phrase "continue for a re-attack" should be used rather than "cleared for a re-attack." This technique should help reduce confusion. Have a plan for re-attacks.

Terminal Control (Continued)

BDA. Whenever possible, the terminal controller provides attack flights with the BDA of their attack as they egress. The terminal controller gives BDA for the flight, not for individual aircraft in the flight. At times, it may not be possible to pass all BDA information. At a minimum, the terminal controller should pass an assessment of mission accomplishment and enemy assets remaining.

- "Mission successful. Two tanks destroyed, one tank mobility kill, one tank remains. Estimate 10 casualties."

Note: Refer to Appendix A for an example of a complete 9-line scenario and brief.

Study Questions

1. In line 2 of the 9-line brief, with what unit of measurement is heading given to the aircraft?

2. In line 3 of the 9-line brief, with what unit of measurement is distance given for a fixed wing aircraft? For a rotary wing aircraft?

3. What differences occur in the 9-line brief when handling fixed wing aircraft versus rotary wing aircraft?

4. What are the three conditions that must be met for the "Cleared Hot" call during a Type 1 Control?

Study Questions Answers

1. In line 2 of the 9-line brief, what unit of measurement is heading given to the aircraft?

- Degrees magnetic

2. In line 3 of the 9-line brief, what unit of measurement is distance given for a fixed wing aircraft? For a rotary wing aircraft?

- For fixed wing, nautical miles to the nearest tenth; for rotary wing, meters to the nearest 100m.

3. What differences occur in the 9-line brief when handling fixed wing aircraft versus rotary wing aircraft?

- Line 1, fixed wing uses an IP and rotary wing uses a BP.
- Line 2, no Offset for rotary wing.
- Line 3, fixed wing is in nautical miles to the nearest 0.1nm and rotary wing is meters to the nearest 100 meters.

4. What are the three conditions that must be met for the “Cleared Hot” call during a Type 1 Control?

- Attacking aircraft is “tally” the target or the mark.
- Terminal controller is “tally” the target.
- Terminal controller is “visual” the attacking aircraft.

Summary

The fire support provided by fixed and rotary wing aircraft can mean the difference between maintaining the offensive advantage and languishing in a stalled attack. Knowing how to quickly and effectively call in fires from CAS aircraft is an essential skill for the small unit leader.

References

Reference Number	Reference Title
MCWP 3-16.6A	Supporting Arms Observer, Spotter, and Controller
MCWP 3-23.1	Close Air Support
JP 3-09.3	Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)
MCRP 3-16.6A	JFIRE: Multi-Service Tactics, Techniques, and Procedures for the Joint Application of Firepower
MCRP 3-16A	TTPs for the Targeting Process
FMFM 6-18.1	TTPs for the Marine Corps Fire Support System
FMFM 2-7	Fire Support in MAGTF Operations
MCRP 3-16.2	Techniques and Procedures for Fire Support Coordination

Glossary of Terms and Acronyms

Term or Acronym	Definition or Identification
ACA	Airspace control area
ACE	Air combat element
AO	Air officer
AR	Attack routes
BDA	Battle damage assessment
BP	Battle position
C^3	Command, control, and communications
CAS	Close air support
CP	Contact point
DASC	Direct air support center
FAC	Forward air controller
FAC(A)	Forward air controller (Airborne)
FOB	Forward operating base
FP	Firing point
FSCC	Fire support coordination center
FSCM	Fire support coordination measures
GPS	Global positioning system
GTL	Gun target line
HA	Holding area
Illum	Illumination
IP	Initial point
IR	Infrared

Glossary of Terms and Acronyms (Continued)

Term or Acronym	Definition or Identification
JTAC	Joint terminal attack controller
MACCS	Marine Air Command and Control System
MAGTF	Marine air-ground task force
MBT	Main battle tank
METT-TC	Mission; enemy; terrain and weather; troops and fire support available; time, space, and logistics; civilian considerations
NM	Nautical miles
OAS	Offensive air support
PGM	Precision guided munitions
SEAD	Suppression of enemy air defenses
TACC	Tactical air command center
TACD	Tactical air direction center
TACPs	Tactical air control parties
TTT	Time to Target
TOT	Time on Target
TTP	Tactics, techniques, and procedures
UAS	Unmanned aerial systems
WEZ	Weapon engagement zone
WP	White phosphorous

Notes

Appendix A: CAS Scenarios

CAS Scenario Example

Purpose. The purpose of this CAS scenario exercise is to demonstrate the proper employment of close air support from preparation of the CAS mission brief (9-Line) through terminal control of the aircraft. Emphasis will be placed on the following items:

- CAS mission brief considerations.
- Procedures for passing the brief to aircraft.
- Communications procedures throughout the mission.
- Correcting the aircraft from the mark to the target.
- Determination of "Cleared Hot" or "Abort" criteria.

Refer to your Quantico 1:50,000 map for this scenario

Background Information. I MEF is currently conducting full-scale operations in the country of Prince William, in order to restore democratic rule. The government was overthrown three months ago by a military coup. Under the command of a fanatical, paranoid general, the army has embarked on a systematic campaign to "eliminate" all dissidents. Currently it has established a siege on the capital city of Manassas and has taken control of the primary supply route, MCB 5. 8th Marines has been tasked with clearing the enemy presence along MCB 5 in order to free up much needed supply shipments into the city.

General Situation. You are the FAC with Lima Company 3/8 located at TH 780 720. The battalion's mission is to secure the Tokyo Road/MCB 5 junction located at TH 783 739. Lima Company is the lead element in the battalion's movement. The company security element spots an enemy T-72 tank platoon in the vicinity of the objective. The company commander is concerned about exposing the company to the enemy's direct-fire weapons as he moves North from his current location. He intends to use CAS or indirect fire to destroy the enemy armor. He assembles the fire support team (FST) consisting of you, the FAC, the artillery FO, 81 mm mortar FO, and the weapons platoon commander in order to determine his best course of action for engaging the targets. You contact the battalion air officer and learn that F/A-18 Hornets are available to support the company. After weighing his options and realizing the limitations of artillery to engage mobile targets, the company commander decides to use CAS. You are given control of the mission and any indirect fire assets available. To get better observation of the targets, the fire support team moves to establish an OP at TH 785 724.

From the OP, you enjoy an unobstructed view of the target area. You spot a dust cloud North of the road junction, and a closer look reveals a ZSU 23-4 North of the road junction. You coordinate with the artillery FO to provide suppression on the ZSU and a mark for the target.

Mission. Plan and control a CAS mission in order to destroy the enemy mechanized forces in the vicinity of the road junction.

Appendix A: CAS Scenarios (Continued)

CAS Scenario Example (Continued)

The following additional information is provided:

1. Call signs:

CO	BIZ
FAC	Beetle
F/A-18	Blade 61, 62

2. MAGTF fixed-wing CPs are designated state names and IPs are designated car makes.

3. A 1/10 is in GS. They are located at TH 875 638. They can provide suppression and marking for the A/C.

Considerations. To complete an appropriate 9-line brief for the "Blade" flight, the following items must be considered:

IP selection. The appropriate IP will be selected from an existing list approved for use by the MAGTF commander. For our scenario, the IPs available are listed on the next page. You are responsible for choosing from the list the IP that is best suited to the mission. You must consider the following items:

Distance. IP should be located between 5 and 15 NM from the target (8-12NM is ideal).

Threat. IP should not be located near known enemy air defense systems.

Gun target line. IP should be selected that will keep aircraft clear of the artillery gun target line (GTL), if applicable

Enemy air defenses. The presence of enemy air defenses within the target area will greatly affect the ability of CAS aircraft to successfully complete the mission. Should enemy air defenses be located near the target, these systems will have to be suppressed during the mission

Offset. Determine the requirement for an offset direction (left or right) to be given to the aircraft. This gives the pilot the freedom to maneuver the aircraft on that side of the centerline from the IP to the TGT.

Appendix A: CAS Scenarios (Continued)

CAS Scenario Example (Continued)

Special Instructions

Contact Points:

Kentucky	Off the map to the southeast of Mathias Point

Initial Points:

Chevy	UH 034 704	Cockpit Point
Buick	UH 016 617	Sandy Point Light
Chrysler	TH 916 681	Breckenridge Reservoir Dam
Lexus	TH 889 723	Belfair Crossroads
Jaguar	TH 781 645	Lake Arrowhead

Fire Support Agencies:

A 1/10	TH 875 638

Call Signs:

FAC	Beetle
Aircraft	as assigned

Appendix A: CAS Scenarios (Continued)

CAS Scenario Solution

Because of the ZSU-23-4 threat, a low-altitude air defense platform which uses a radar tracked anti-artillery (AAA) system located near the target, suppression of that threat will be required to ensure the CAS aircraft are not engaged. Artillery will provide this suppression. The resulting GTL will be approximately 326 degrees°. The "Blade" flight will have to be deconflicted from the GTL through selection of an appropriate IP.

Given the above considerations, the following elements of the 9-line brief would be appropriate for the "Blade" flight:

1. IP: Chrysler

   Chevy and Buick are not acceptable because of the distance away from the target area. Jaguar and Lexus could be used, but are not as good as Chrysler (Chrysler is 7.9nm from the target, putting the aircraft one minute from IP to target)

2. Heading: 303 degrees/offset: R

   Derived from your map by measuring from the IP and the target. Remember to convert from grid to magnetic azimuth based on the G-M angle in the area you are working (*Refer to the declination diagram*). On ingress the pilot is referencing his magnetic compass.

   Right offset will ensure the aircraft does not maneuver to the left of the IP to Target line during the “ingress” and inadvertently cross the GTL. It will also keep the aircraft from flying over the friendly position south of the target.

3. Distance: 7.9 nautical miles

   The mission computer in the aircraft displays nautical miles for fixed-wing aircraft to the nearest 0.1 NM.

4. Target Elevation: 365 feet MSL

   Converted to feet mean sea level. The aircraft is referencing altitude with the altimeter in feet above sea level. The conversion is 3.3 feet per 1 meter.

5. Target Description: 4 T-72 Tanks on an N/S road

   Used for weaponeering (selecting the appropriate weapon system for the desired effect). STD: Size (number), Type (type of target), Description (degree of protection).

Appendix A: CAS Scenarios (Continued)

CAS Scenario Solution (Continued)

6. Target Location: TH 783 739

   The target location of the specific target you intend to engage, not the center of the objective area, etc. Remember to use the 100,000 map sheet identifier. It is located in the legend information.

7. Mark Type: White phosphorus (WP), by convention “Willy Pete.”

   The mark has to be distinguishable on the battlefield and within 300 meters to be effective.

8. Friendlies: South 1400

   Expressed in meters from the target. The closest friendlies to the target, expressed as cardinal direction first, then distance from the target to the friendly location.

9. Egress: Egress South to Jaguar

REMARKS:

Suppression on ZSU-23-4 located 800m NE of your target

Arty GTL 326°

FAH 270-290°

Your target is the 2nd tank (Command variant) in the column on the North-South road (MCB-5).

TOT/TTT:

TOT is the preferred method but requires that both the FAC and the pilot to be on the exact same time. TTT is rarely used since the advent of universal GPS time hacks.

Appendix A: CAS Scenarios (Continued)

CAS Scenario Solution (Continued)

Once you have completed the 9-line brief and coordinated with the artillery FO for the suppression and mark, you will wait for the aircraft to check in with you. The communication from aircraft check-in to the end of mission would sound as follows:

AIRCRAFT: (A/C) "*Beetle, this is Blade 61, holding Kentucky* (a predetermined contact point to which the aircraft would be directed by the DASC), angels 12 (12,000 feet), *two F/A-18s, each with (4) MK-83s (1,000lb "dumb" or freefall bombs), 0+20 time on station (20 minutes until they need to leave because of gas), up for your control"*

FAC: "*Blade 61 this is Beetle, advise when ready to copy 9-LINE*"

A/C: " *Blade 61, ready to copy*"

FAC: "Chrysler"
"303 Right"
"7.9"

(Unkey the handset to break the transmission)

"365"
"4 T-72s on a North-South road"
"*TH 783 739"* Spoken "Tango Hotel…. 783…. 739"

(Unkey the handset to break the transmission)

"WP" Spoken "Willy Pete"
"*South 1400*"
"*<u>Egress</u> South to Jaguar, angels 12, advise when ready to copy remarks"*

<u>Note</u>: Only the content of the 9-line brief is read to the pilot. All line numbers/titles, mileage, altitudes, and degrees are understood and are <u>not</u> read. Line 9 is an exception. The word "*Egress"* is always stated.

A/C: Blade 61 ready for remarks

FAC: "REMARKS: *Artillery will provide suppression on a ZSU-23-4 800m Northeast of your target. GTL is 326°. FAH 270-290°. Your target is the 2nd tank (Command variant) in the column on the North South road (MCB-5)."*

"TOT 15" (15 minutes after the hour. The hour is understood and not expressed.)

A/C: "*Roger 15"* (The pilot copies all the information and can meet the TOT.) Always use appropriate call signs throughout, especially in a multi-section environment.

Appendix A: CAS Scenarios (Continued)

CAS Scenario Solution (Continued)

Once the mission is briefed, both the pilot and the FAC have tasks to accomplish:

Pilot

- Enter the pertinent data from the 9-line brief into the aircraft mission computer.
- Determine at what time he needs to leave the CP (push) to meet the TOT (based on CP-IP-TGT routing and distance, groundspeed, time required for the ingress maneuver, and the time of fall of the bomb).
- Do a map study of the target location.

Terminal controller

- Make final coordination with the arty FO to ensure that the suppression and mark for the target will take place on time. (For the mark to be effective, it should be on the deck 30 seconds prior to TOT.)
- Determine where in the sky the aircraft will first be visible. (The - FAC must observe the aircraft during the bomb run in order to give the pilot clearance to drop.)

The pilot then maintains an orbit at the CP until he reaches his predetermined *'push'* time.

A/C: "*Blade 61 pushing"* (leaving the CP for the IP)
FAC: "*Continue"* (Acknowledgment to ensure communication is still up. "*Roger*" would also be an appropriate call.)
A/C: "*IP inbound*" (passing over the IP, inbound to the target)
FAC: "*Continue*"
FAC: "*Mark's on the deck"* (The pre-coordinated mark is on the deck and should be visible to the pilot.)
FAC: "*Visual"* (The FAC sees the aircraft.)
A/C 1: "*Contact the mark"* (The pilot sees the mark, is waiting for a correction to the target.)
FAC: "*From the mark, east 100"* (The mark landed to the west of the target by 100m. The corrections are always given as the cardinal direction first, then the distance in meters from the mark to the target.)
A/C 1: "*Tally Target, In from the West"*" (The aircraft is on the final dive path to the target and the pilot is waiting for clearance from the FAC to release his ordnance.

Appendix A: CAS Scenarios (Continued)

CAS Scenario Solution (Continued)

FAC: "*Blade 61, Cleared hot*"

(The FAC has determined that the aircraft's geometries are correct and that it will engage the correct target. The FAC is also confident that the aircraft has a clear picture of the tactical situation on the ground):

Note: If the aircraft was not pointing at the target or was possibly endangering friendlies, the FAC would give the pilot an "*Abort"* call.

A/C 1: "*Lead's off, 4 away"* (The lead aircraft has come off target after dropping 4 bombs.)

FAC: "*Visual. From lead's hits, north 50"* (Lead's bombs serve as a mark for the second aircraft which is generally 30 seconds behind lead. Corrections are given as previously discussed.)

A/C 2: "Tally"

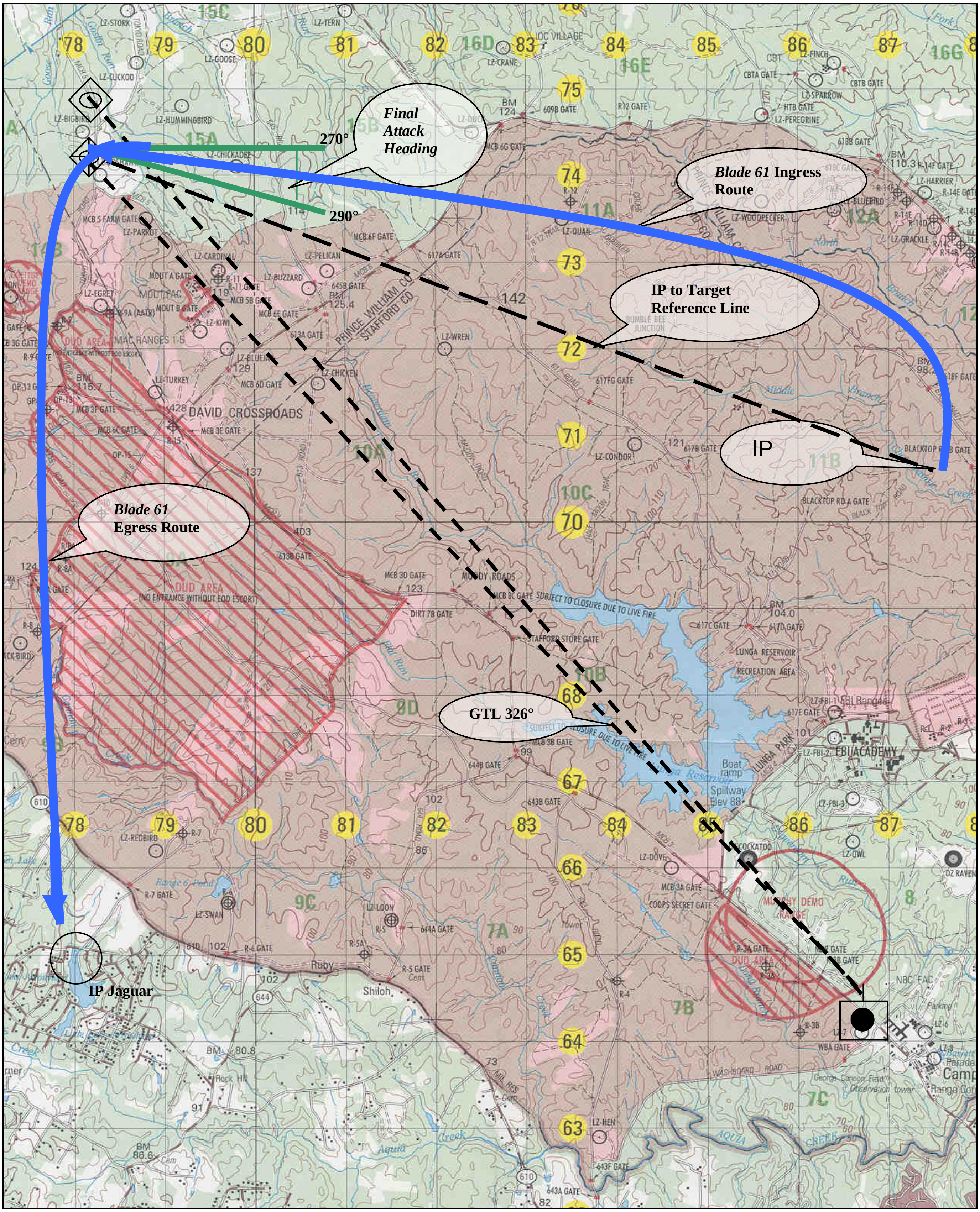
FAC: "*Blade 62 Cleared hot*"

A/C 2: "Dash *2's off, 4 away*"

FAC: "*Blade 61, 4 tanks destroyed, estimate 12 KIA, no enemy remaining"* (The surveillance of target destruction -- BDA. Report secondary explosions and enemy remaining. The aircraft will pass this back to the DASC for intelligence purposes.)

From this point, the FAC passes the aircraft back to the DASC and the mission is complete.

Appendix A: CAS Scenarios (Continued)



Appendix A: CAS Practical Application Scenario 1

General Situation. You are the platoon commander of A Co 2d LAR located at TH 792 709. Your company's mission is to secure MCB-6 to the junction of MCB-1 (TH 827 746). Forward elements identify an enemy tank platoon just North of the MCB 6E gate. The company commander desires to engage the tanks with air. You move to an OP at TH 798 720 for a closer view of the target. You see 4 T-72 tanks at TH 807 727. You send a request to the air officer. He informs you to expect a section of 2 F/A-18s in 10 minutes.

Mission. Plan and control a close air support mission to destroy the enemy tanks located at TH 807 727 in order to clear MCB 6 for follow on missions.

The following additional information is provided:

- The F-18s are holding at CP Kentucky 27nm SE of your position. Their call sign is Smoke 11. They are loaded with 8 Mk 83 GP bombs per aircraft.
- A 1/10 is in GS located at TH 875 638. They can provide you with a suitable target mark.
- IP Chevy TH 788 627; IP Dodge TH 828 747

Aircraft call sign: _____ Your call sign: _____

"Advise when ready to copy 9 Line"

1. IP: _____
2. Heading: _____
3. Distance: _____
4. Elevation: _____
5. Description: _____
6. Location: _____
7. Mark: _____
8. Friendlies: _____
9. Egress: _____

Additional Remarks:

Appendix A: CAS Practical Application Scenario 1 (Continued)

Line

1. Use IPs for FW; use BPs for RW.

2. Heading in degrees magnetic from IP/BP to target. (Aircraft flies a heading to the target) R/L Offset for FW.

3. Distance in NM for FW, meters for RW.

4. Feet MSL

5. STD: Size (number), Target (type of target), Description (degree of protection)

6. Six-digit grid coordinate with two letter 100,000-grid identifier.

7. Mark type: WP, illumination on deck (has to stand out on the battlefield).

8. Nearest friendlies

9. Include “Egress” in your instructions. (This signifies the end of the nine line) Example: “Egress North, then South to Chrysler.” Requires a cardinal direction and destination (CP/IP/HA/BP)

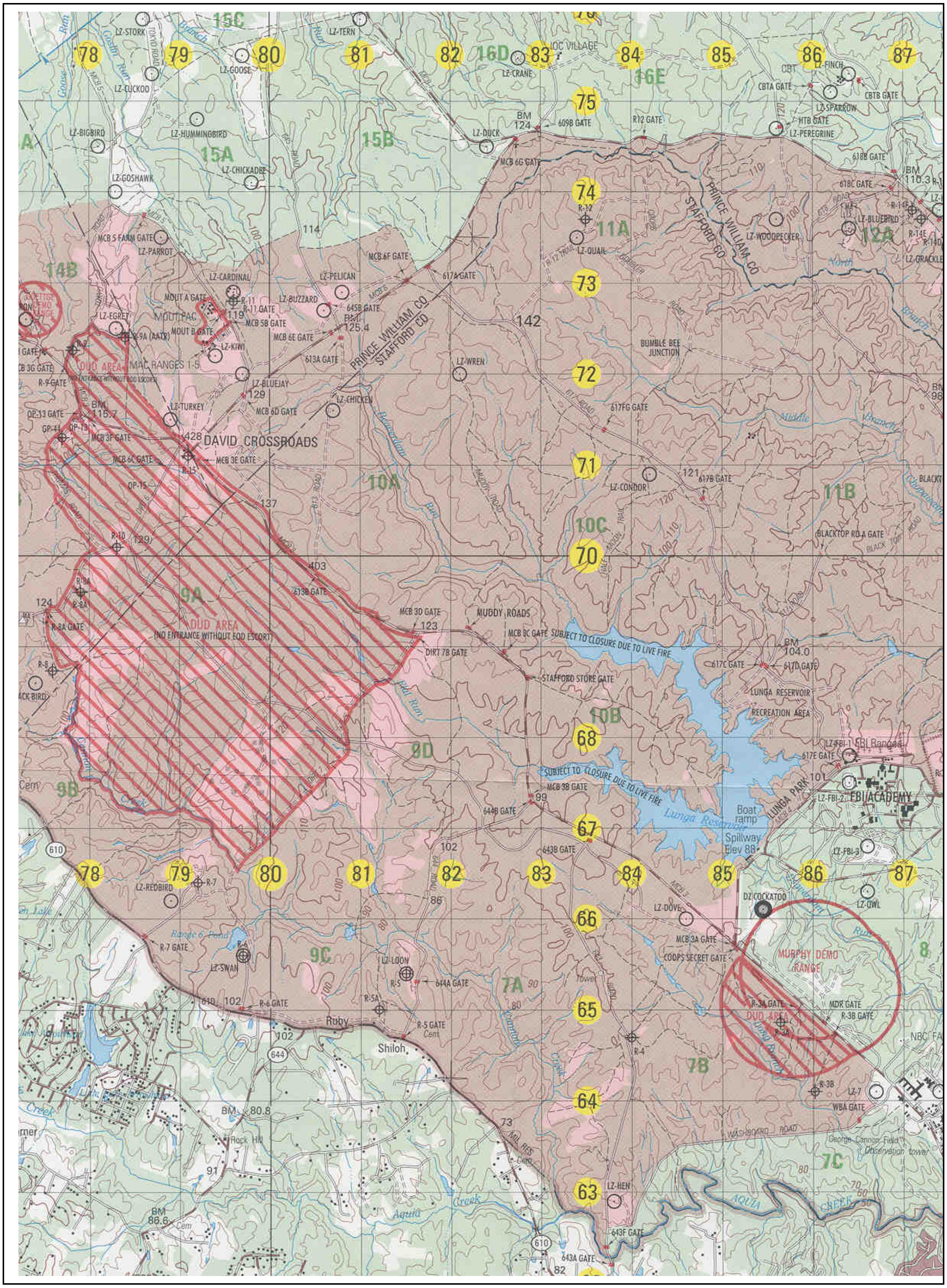
Additional Remarks:

Additional air defense threats in area.

Final attack cones/headings (FAC/FAH)

TOT: Ensure aircrew is hacked in on your (universal/GPS) clock upon check in. Example: “TOT 45.”

Appendix A: CAS Practical Application Scenario 1 (Continued)



Appendix A: CAS Practical Application Scenario 2

General Situation. You are the weapons platoon commander with Hotel Company 2/8. The battalion mission is to seize the Route 611 Bridge over Cedar Run (TH 777 772) in order to deny the enemy the ability to move their mechanized forces across Cedar Run. Delta Company, the lead element, begins moving toward the road; dust is observed along MCB 8 to the Northeast. You immediately occupy an observation position (TH 797 764) in the tree line to the East of the battalion's position in the vicinity of TH 78 76. You can clearly make out at least 4 BTR-60 reconnaissance vehicles and 3 T-72 main battle tanks (MBTs). The battalion air officer informs you that he has requested air and to expect a section of AH-1 Cobra's in 10 minutes.

Mission. Prepare and control a CAS mission in order to destroy the enemy threat located at TH 803 767.

The following information is provided:

- The surface to air threat is small arms.
- The cobras are holding at HA Sally (TH 77 73, center grid for a 2x2 grid square); call sign is Viper 32. Each aircraft is loaded with (4) TOW anti-armor missiles, (4) 5.0" HE rockets, and 20mm HEI. Maximum range for the TOW is 3750 meters.
- 81mm mortars are able to provide a mark for the targets with RP or illumination located at TH 779 758.
- BP Asp TH 81 75; BP Boa TH 81 78 (center grid for 2x2 grid square)

Aircraft Call Sign: _____ Your Call Sign: _____

"Advise when ready to copy 9 Line"

1. BP: _____
2. Heading: _____
3. Distance: _____
4. Elevation: _____
5. Description: _____
6. Location: _____
7. Mark: _____
8. Friendlies: _____
9. Egress: _____

Appendix A: CAS Practical Application Scenario 2 (Continued)

Additional Remarks:

Mortar's PDF is _____

Your target is the lead tank in the formation of BTR 60s and T-72s. The formation is moving from Northeast to Southwest on MCB 8 at the intersection of MCB 1.

TOT _____

Line

1. Use IPs for FW; use BPs for RW.

2. Heading in degrees magnetic from IP/BP to target. (Aircraft flies a heading to the target) R/L Offset for FW.

3. Distance in NM for FW, meters for RW.

4. Feet MSL

5. STD: Size (number), Target (type of target), Description (degree of protection)

6. Six-digit grid coordinate with two letter 100,000-grid identifier.

7. Mark type: WP, illumination on deck (has to stand out on the battlefield).

8. Nearest friendlies

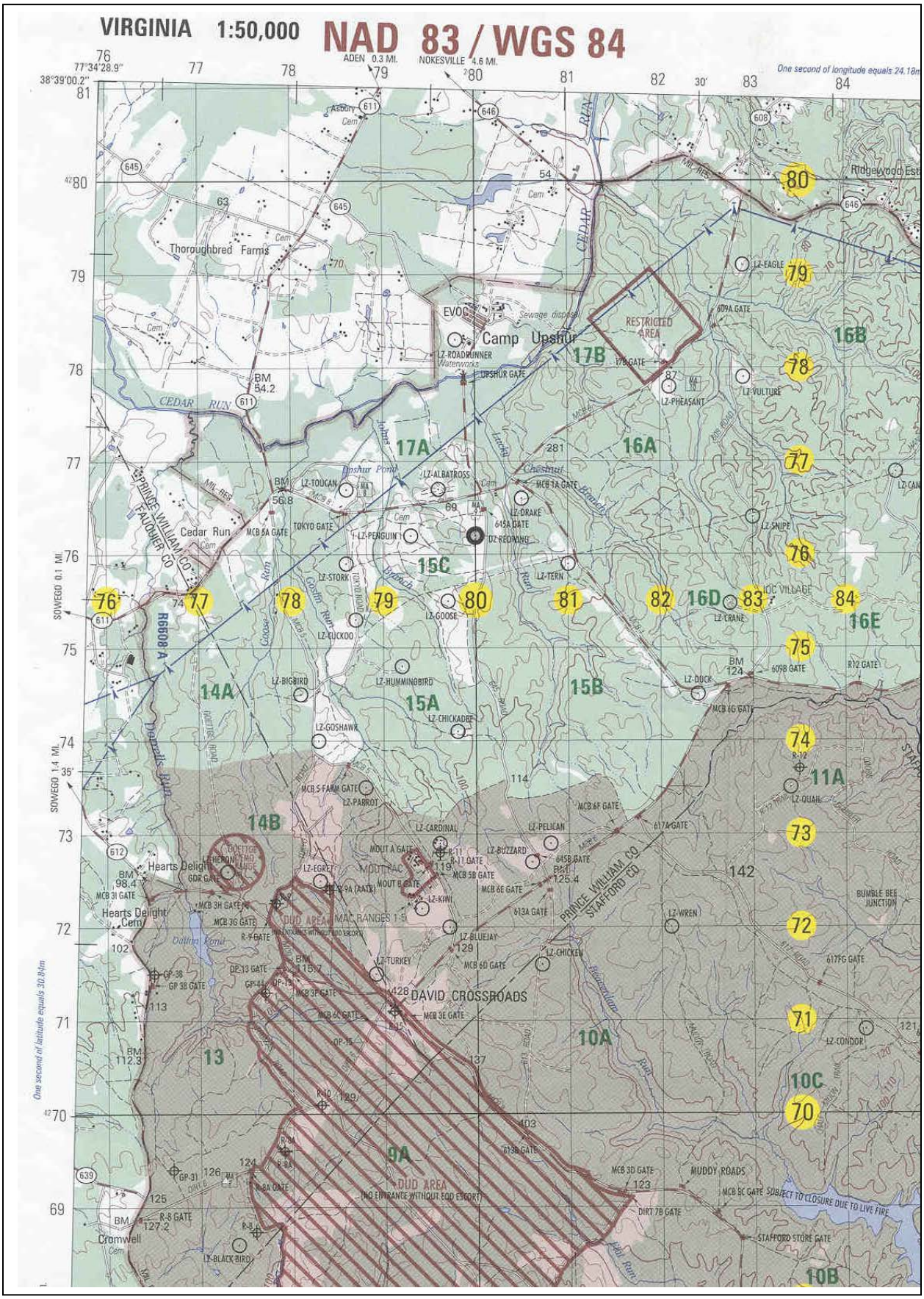
9. Include "Egress" in your instructions. (This signifies the end of the nine line) Example: "Egress East, then South to Sally." Requires a cardinal direction and destination (CP/IP/HA/BP)

Additional Remarks:

Additional air defense threats in area.

TOT: Ensure aircrew is hacked in on your (universal/GPS) clock upon check in. Example: "TOT 45."

Appendix A: CAS Practical Application Scenario 2 (Continued)



Appendix A: CAS Practical Application Scenarios Possible Solutions

Possible solution to Practical Application Scenario Number 1:

1. IP:	Chevy
2. Heading:	017 L
3. Distance:	5.6
4. Elevation:	410
5. Description:	4 T-72 in open
6. Location:	TH 807 727
7. Mark:	WP
8. Friendlies:	South West 1200
9. Egress:	East then South to Chevy

Possible solution to Practical Application Scenario Number 2:

1. BP:	Asp
2. Heading:	351
3. Distance:	1900
4. Elevation:	180
5. Description:	3 T-72 & 4 BTR-60 in open
6. Location:	TH 803 767
7. Mark:	WP
8. Friendlies:	South West 800
9. Egress:	Southwest to Sally