
UNITED STATES MARINE CORPS
THE BASIC SCHOOL
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**AVIATION EMPLOYMENT
CONSIDERATIONS
W380000XQ
STUDENT HANDOUT**

Aviation Employment Considerations

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, how to develop a 9 line brief, and introduce how to control aircraft during the CAS attack.

This lesson covers the following topics:

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Aviation Employment Considerations (Continued)

Learning Objectives

Enabling Learning Objectives:

TBS-AVI-1000b Given an scenario, identified air assets, and commanders intent prepare a CAS brief, to accomplish the mission and meet the commanders intent.

TBS-AVI-1000c Given a scenario with identified METT-TC considerations, and identified air assets, incorporate air support into mission planning to accomplish the mission.

TBS-FSPT-1002a Given a tactical scenario, commander's intent, fire support assets, and targets, determine asset to target match to economize force, achieve the commander's intent, and accomplish the mission.

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. 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. 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 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.

CAS follows a 12-step process: (1)Routing/Safety of Flight (2)CAS Aircraft Check-in (3)Situation Update (4)Game Plan (5)CAS Brief (6)Remarks/Restrictions (7)Readbacks (8)Correlation (9)Attack (10)Assess Effectiveness of the Attack (repeat steps 4-9 as necessary) (11)Battle Damage Assessment (BDA) (12)Routing/Safety of Flight.

- **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 the general CAS players.
 - **Aircraft.** 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.

CAS Fundamentals (Continued)

- 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. 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). When referring to aircraft, 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.
 - **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.
 - 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, requesting and controlling CAS, and performing battle damage assessment (BDA).

CAS Fundamentals (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. 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. In other words, the FAC (A) augments and supports the ground terminal controller and ground commander's scheme of maneuver/fire support plan.
JFO (Joint Fires Observer)	A JFO is a certified and qualified service member who can request, adjust, and control surface-to-surface fires, provide targeting information in support of Type 2 and Type 3 CAS terminal attack control, and perform autonomous terminal guidance operations (TGO). JFOs cannot perform terminal attack control of CAS missions and do not replace a trained and certified JTAC.

CAS Aircraft Check In

- **Check-In.** Aircraft are sourced and routed by various agencies and units as part of the 12 step CAS process. As the aircraft assigned to a specific CAS mission arrive on station they will 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. The check-in informs the terminal control of information such as type and number of aircraft, time on station, current position, and ordnance available.

(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).

Game Plan

Every 9-Line CAS request begins with the transmission of a game plan. The game plan is a concise means to inform all players of the flow of the upcoming attack. At a minimum, it will contain the type of control and method of attack. In addition, the following can be part of the game plan or passed in remarks: the ground commander's intent, the ordnance effects desired, or the ordnance and fuze combination required, if known. Aircraft interval can also be specified by the JTAC.

At TBS you will be expected to develop a Game Plan that includes the type of attack, method of attack, and an ordnance request. The following is an example of a game plan at its most basic level:

"This will be a type 1 control, bomb on target, 1x GBU-10, advise when ready for 9-line."

Method of Attack

The method of attack is broken down into two categories, bomb on target (BOT) and bomb on coordinate (BOC). These two categories define how the aircraft will acquire the target or mark. Any type of control can be utilized with either method of attack and no type of control is attached to one particular method of attack.

- A **BOC** attack is used when the JTAC/FAC determines that the desired effects can be created against the target with CAS aircraft employing ordnance on a specified set of coordinates. If the aircraft is never required acquire a visual of the target or mark, it is a BOC attack.
 - This method of attack is generally quicker as no correlation is required. A BOC attack is asking the pilot to release ordnance at a specific point in space, to impact another specific point with no regard for the actual target. Having a grid location for the target doesn't mean the attack will be BOC. BOC attacks are commonly used when:
 - Employing GPS-guided munitions to a known target grid.
 - Employing ordnance through cloud layers to a known target grid.
 - Employing laser-guided munitions when the aircraft is not self-lasing (i.e the weapon is tracking a laser from the ground or another aircraft.)
- A **BOT** attack requires that the JTAC/FAC's intended target or mark is visually acquired by the aircrew. If at any point during the CAS engagement the attack aircrew is required to gain a visual of the target, it is a BOT attack.
 - This method of attack is more time-consuming as it requires correlation with the CAS aircraft. Correlation is the process by which the JTAC/FAC(A) coordinates and confirms that the attacking aircrew, and/or a third-party contributor, have acquired the correct target or mark. This becomes vitally important and can be difficult given the vast differences in distance and FOV. More than a few times, unintended targets have been hit resulting from a lack of proper correlation.

Method of Attack (Continued)

- BOT attacks, while more time-consuming, allow the pilot to self-derive targeting information and allow them prosecute the target internally. BOT attacks are commonly used when:
 - Aircraft are self-lasing targets (i.e. when using Hellfire missiles or LGBs.) If aircraft is self-lasing, the aircraft must be able to see the target to be able to guide a missile to it.
 - The terminal controller is not confident in the target grid location.
 - Engaging mobile targets
- **Every CAS engagement conducted is either BOT or BOC regardless of the weapon being employed. This has nothing to do with whether or not the pilot is able to see the target, but whether or not you require them to. Ask yourself, “In order to create the desired effects, does the pilot need to visually acquire the mark/target?”**
 - If the answer is NO, it will be a BOC attack
 - If the answer is YES, it will be a BOT attack

Types of Attack

The three types of attack, or 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 I.** Terminal controllers use Type I control when the risk assessment requires them to visually acquire the attacking aircraft and the target under attack. Type I requires that the JTAC/FAC visually acquires both the aircraft and the target, and that the aircraft visually acquires the target/mark (BOT only). 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.

Types of Attack (Continued)

- The terminal controller will provide a “cleared hot” when:
 - They have visually acquired the target.
 - They have 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 (BOT only).
 - Type I is the most restrictive form of terminal control. In both other types of CAS control, the terminal controller is required to attempt to visually acquire the attacking aircraft and analyze attack geometry for obvious reasons.
When no condition exists that would warrant Type II or III control, default to Type I as it gives you the most control over the attack.
 - **Type II.** Type II control will be used when the terminal controller desires control of individual attacks but assesses that a condition under Type I control is not required. Examples of when a controller would employ a Type II control include:
 - Night missions.
 - Adverse weather operations (i.e. low cloud layers.)
 - Terrain precludes visual acquisition of the aircraft.
 - High threat tactics.
 - High altitude tactics (i.e. JDAMs.)
 - Standoff weapons employment.
 - Use Type II control when either one or a combination of the following conditions exist **given there is observation on the target:**
 - Visual acquisition of the attacking aircraft by the terminal controller at weapons release/launch is not required.
 - Visual acquisition of the target by the terminal controller at weapons release/launch is not required.
 - When it is not necessary for attacking aircraft to be in a position to acquire the mark or target prior to weapons release/launch.
 - **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.
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USMC Common Ordnance

The intent behind the ordnance request is to select the best weapon-to-target match for the prosecution of the target. Weapons, whether by fragmentation, blast, armor piercing, or other characteristics, are designed to destroy targets in different ways. In selecting a proper weapon to destroy the target we ensure that we obtain the desired effects while not wasting assets that could be used elsewhere in the AO. For example, the GBU-38 500lb JDAM is 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 selecting ordnance you are limited to what the aircraft is carrying which you will receive during the check-in. The following are some of the most common ordnance used in the Marine Corps.

- **Rockets and Guns**

- Guns. Carried by most CAS aircraft. Guns generally have high explosive incendiary round with very high rates of fire. A full loaded gun has enough ammo for 2-3 gun runs. Calibers range from the 7.62 GAU-17 on the Huey to the 25mm GAU-12 Equalizer on the AV-8B. Gun runs are effective against lightly armored targets and personnel.
- Rockets. Carried by most CAS aircraft. Rockets are generally unguided, modularly designed munitions that are available with various warheads that are effective against lightly armored targets and personnel.
 - 2.75" Hydra - 35m ECR, available in smoke, illumination, flechette (anti-personnel), and HE variants.
 - 5" ZUNI - 50m ECR, available in smoke and HE variants.

- **Air to Ground Missiles**

- AGM-65 Maverick: 450-675lb missile with a 130-300lb warhead. It has a range of 25km and can be IR, EO, or laser guided. The Maverick is designed to explode on impact or after a slight delay. It is carried on our jets and is primarily used against large armored targets such as ships or hardened bunkers/facilities.
 - AGM-114 Hellfire: This 100lb missile is the premier anti-armor weapon in the US arsenal. The Hellfire is a rocket-propelled, laser guided, supersonic weapon originally designed as anti-armor but has since been developed to effectively engage other targets such as groups of individuals or structures. There are currently 13 variants carried on the Cobra and KC-130J.
 - AGM-176 Griffin: The Griffin-A is currently in use as part of a roll-on armed kit for the KC-130J. It's dropped out of "gunslinger" tubes and "derringer doors," providing precision weapon drops from the rear ramp and side door. It packs a 13 pound blast-fragmentation warhead, and uses a combination of GPS/INS and a semi-active laser seeker for guidance. The Griffin-A is a precision guided "mini-missile" that attempts to limit collateral damage. It's effective against lightly armored targets and personnel.
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USMC Common Ordnance (Continued)

- **Bombs**

- General Purpose Bombs. Cheap, abundant, and effective. While they have no guidance, modern bombing system are very accurate. Mk-series bombs have limited penetrating power but effective in destroying buildings and moderately armored targets.
 - Mk-82: 500lbs Mk-83: 1000lbs Mk-84: 2000lbs
- Laser-Guided Bombs (LGBs). Laser guided bombs provide better accuracy than the Mk Series bombs and are cheaper the using missiles. Laser guided weapons follow a laser reflected off the target. It is a Mk bomb base with a nose kit that can track a specific laser energy coded to that weapon and send signals to movable tail fins to adjust the flight path. For this weapon to work it must be lased from the aircraft itself, a ground laser, or another aircraft and it must to be released in a position that allows the weapon to pick up the laser energy and then maneuver. Laser guided bombs are effective against moving targets and targets that require a direct hit. They can be negatively affected by weather and atmospherics which degrade the accuracy of the weapon.
 - GBU-12: 500lbs GBU-16: 1000lbs GBU-10: 2000lbs
- GPS-Guided Bombs (JDAMs). Because of the limited performance of LGBs observed during times of adverse weather and atmospherics, the US developed Joint Direct Attack Munitions (JDAMs). JDAMs are a Mk bomb base with tail kit that allows the weapon to be GPS/INS guided. These bombs need to be dropped at high altitude (about 15,000ft to ensure proper tracking) and will impact on a specific set of coordinates. JDAMs are effective against stationary targets with known grid locations in all weather conditions.
 - GBU-38: 500lbs GBU-32: 1000lbs GBU-31: 2000lbs
- Laser-JDAM. The best of both worlds. Laser JDAMs like the GBU-54 use GPS guidance to maneuver to the general area and laser guidance to refine the target. They are able to hit targets moving up to 85mph.

CAS Brief

The CAS brief (see diagram below), also known as the “9-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 followed by the remarks. Use of a standardized briefing sequence improves mission direction and control by allowing terminal controllers to pass information rapidly and succinctly.

CAS Brief (Continued)

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. **At TBS you will be expected to use standard units of measure.**

_____, *this is* _____, *standby for game plan.*"
 (Aircraft call sign) (Terminal controller)

Game Plan:

Type: _____ Method: _____ Ordnance: _____
 (Type I, II, III) (BOT/BOC)

"Advise when ready for 9-line"

9-Line Brief

1. IP/BP: _____
2. Heading: _____ (degrees magnetic)
3. Distance: _____
 (IP/center of BP to target; FW – in nm rounded to the nearest tenth,
 RW– in meters rounded to nearest 100m)

Unkey

4. **Target Elevation:** _____ (in feet MSL)
5. Target Description: _____
6. **Target Location:** _____
 (6-digit grid coordinate is standard)

Unkey

7. Type mark: _____
 (WP / illum on the deck / laser)
8. Location of friendlies: _____
 (Sub-cardinal direction and distance in meters from target)
9. Egress: _____
 (Sub-cardinal direction and destination (specific CP/IP/HA/BP))

"Advise when ready for remarks"

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

Time on Target: TOT _____

CAS Brief (Continued)

- **Line 1: IP/BP**

- **Initial Point (IP):** For fixed-winged aircraft, this is the starting point for the run-in to the target. The IP is located 5-15nm from the target area (8-12nm optimal).
 - An IP is a type of control point (CP). Control points route aircrews (both FW and RW) to the target area 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. By convention, CPs are named after states, i.e., "UTAH".
 - Terminal controllers and aircrews use IPs to help position aircraft delivering ordnance. By convention, IPs are named after car makes, i.e., "CHEVY."
- **Battle Position (BP):** For rotary-wing aircraft, the BP is where attacks on the target are commenced, normally 1-5km from target area.
 - The BP is an airspace coordination area that contains firing points (FP) for attack helicopters. Once the terminal controller authorizes aircraft into a BP, flight outside of the BP is not permitted unless authorized by the terminal controller. BPs are often 2X2 grid squares in dimension (a box containing four grid squares), but they are not required to conform to these dimensions. By convention, BPs are named after snakes, i.e. "COPPERHEAD." 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.
 - Holding area. The HA is occupied while awaiting targets or missions. While in the HA, aircrews receive the CAS briefing and perform final coordination. After receiving the brief, aircrews move to BPs to commence the attack. The HA should be well forward yet provide cover and concealment from enemy observation and fires. Often, HAs will be 2x2 Grid squares in dimension. (a box containing four grid squares). HAs, by convention, are named after female names, i.e., "SALLY."

Use the control measures described above (CP, IP, HA, BP) when controlling aircraft in the terminal environment. Do not attempt to send an aircraft to, for example, the intersection of tank trail and MCB-3 for egress.

CAS Brief (Continued)

• Line 2: Heading

- Given in degrees magnetic from the IP to the target (FW) or from the center of the BP to the target (RW). Passed as 3-digits i.e. 010 is read “zero-one-zero.”
- Offset: Terminal controllers can 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, i.e. “Offset Right” would prohibit the aircraft from maneuvering in the airspace to the left of the IP-to-target line. Offset is not taught at TBS.

• Line 3: Distance

- Distance is measured from the IP to the target (FW) or from the center of the BP to the target (RW).
 - FW: The distance is given in nautical miles (NM) and should be accurate to a tenth of an NM (found using the scale.)
 - RW: the distance is given in meters from the center of the BP and is accurate to the nearest 100m.

• Line 4: Target Elevation*

- Elevation is given in feet above mean sea level (MSL).
- Found by utilizing the contour interval on your map. Your maps give contour interval in meter. Convert meters to feet by multiplying feet by 3.3.

$$1\text{m} = 3.3\text{ft}$$

This line is read back by the aircrew.

• Line 5: Target Description

- Should be specific enough for the aircrew to recognize the target. A good description of the target assists the aircrew with correct weapon-to-target match.
- Target should be described using the acronym STD:
 - S = Size (how many? i.e. , 4)
 - T = Type (what is it? i.e., Tank, Troops, APC)
 - D = Disposition (where is it? what is it doing? i.e., In the open, on a road)

CAS Brief (Continued)

- **Line 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 (i.e. TH 804677) and should know the grid zone designator. A 6-digit grid is standard though a more accurate grid is desirable for GPS-guided weapons.
 - Latitude and longitude.
 - Visual description from a conspicuous reference point.

*This line is read back by the aircrew and **is the only grid location transmitted.***

- **Line 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. The mark assists in CAS accuracy, enhances situational awareness, and 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 which allows the illumination round to bloom.
 - The laser that is used to guide a weapon is NOT the mark. A mark is used to identify a target area prior to designating the target.
- Talk-on: The terminal controller may “talk the aircrew onto the target” by verbally describing the target to be attacked. This is not a preferred method as it can take a significant amount of time and increases the risk of attacking the wrong target.
- For Bomb on Coordinate (BOC) attacks, state “No Mark”

- **Line 8: Friendlies**

- The cardinal/semi-cardinal direction and distance of the closest friendlies from the target. (North, North East, North West, etc.) 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.
- This is the location of the closest friendly unit; it may not be your position but there will always be a closest friendly unit.

CAS Brief (Continued)

- **Line 9: Egress**

- Instructions the aircrews use to exit the target area. This should include a cardinal/semi-cardinal direction and a destination (CP, IP, HA, BP.)
- The word, “Egress” is used before delivering the egress instructions.
- Should only be as complicated as the situation requires.

Example: “Egress South to IP Ford”

- **Remarks.** Following the numbered sequence (1-9) of the CAS briefing the controller will say, “Advise when ready for remarks.” 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. The remarks section is broken down into remarks and restrictions. Remarks in their entirety will not be read back by the pilot – only the restrictions.
 - Remarks are amplifying information that is important for the aircrew but that won’t restrict their operation. Examples of these are: Gun Target Line, Laser Target Line, Suppression, Flight Hazards, and Threats.
 - **Restrictions*** are the aspects of the remarks section that include flight parameters with which pilots are required to comply. Examples of these are: Final Attack Heading, Altitude (stay above, stay below), Time on Target, and Danger Close. 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.
 - **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 expressed as the minutes only, the hour is understood. TOT is the timing standard for CAS missions.
 - 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.
 - **Danger Close.** Due to the inherent differences in the size, type, and killing effects of different types of aviation ordnance, CAS has no single danger close distance as artillery and mortars do. Danger close distances for aviation ordnance are listed by type in Joint Publication 3-09.3. The supported commander must accept responsibility for the risk to friendly forces when targets are inside danger close distance.

CAS Brief (Continued)

- **Final Attack Heading.** Final attack headings (FAH) 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 075 - 105 degrees (this FAH cone will have the aircraft attacking from the west to the east) and should allow the greatest latitude possible to the pilot while facilitating the FAC's requirement to ensure the safe execution of the support. You will always be expected to give a FAH. Some considerations for developing a FAH cone are:
 - To ensure the aircraft will not fly over or toward friendly troops during the bomb run. Do not allow aircraft to fly within +/- 10 degrees over or toward friendly troops.
 - To aid in the visual acquisition of the aircraft by the terminal controller.
 - To deconflict the aircraft with the Gun Target Line (GTL).
 - When using a third-party laser to designate the target. (The aircraft must fly a particular heading to for the weapon to detect and track the laser energy.)
 - To provide further safeguarding to the aircraft from surface threats.

Terminal Control

The terminal controller can expect the following standard calls from the aircrew during execution of the CAS run:

- "IP inbound" – The aircraft is passing through the IP and beginning their attack run. You will hear some of the following communications:

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; i.e. the mark
Tally	Visual acquisition of the TARGET.

- "In"
 - Attack aircrew will provide "In" call, indicating entering terminal phase of air-to-ground attack prior to weapons release. The terminal controller may require the CAS aircraft to "Call 'In' with direction" during the remarks/restriction portion of the CAS brief.

(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 below:

Terminal Control

Terminology

Call	Meaning
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.)

- **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. A positive clearance by the terminal controller (“Cleared Hot” or “Cleared to Engage”) is *mandatory* before any release of ordnance by the aircrew.
 - “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.

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: (1) Cardinal Direction from a visible reference point and (2) Distance in meters.
 - From the Mark. To pass corrections from a visual mark use cardinal/semi-cardinal points of the compass and a common distance reference. Specify the type of mark if multiple types are used.

“Viper 44, this is Sasha, from the mark, northeast—two hundred.”
 - From Ordnance Impact. Corrections can be made from the last ordnance to impact the target:

“Combat 51, this is Furpants, from lead’s hit, southeast – one hundred”
 - Visual marks must land within 300 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.

“Spade 31, this is Queezy, disregard the mark, from the road intersection, north three hundred.”
 - **Re-attacks.** The aircrew’s goal is to complete a successful attack on the first pass. Reattacks may be required for the following reasons: multiple targets remaining in the target area, desired effects not created on first attack, and aircraft reconnaissance/BDA.
 - 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.
 - **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 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.”
-

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 3-2	Aviation Operations
MCWP 3-23.1	Close Air Support
JP 3-09.3	Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)
MAWTS-1	TACP TACSOP

Glossary of Terms and Acronyms

Term or Acronym	Definition or Identification
ACE	Air combat element
AR	Attack routes
BDA	Battle damage assessment
BP	Battle position
CAS	Close air support
CP	Control 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
IP	Initial point
IR	Infrared
JTAC	Joint terminal attack controller
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)

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

Appendix A: CAS Scenarios (Continued)

CAS Scenario Example (Continued)**Special Instructions****Control 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

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.

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: *“Beetle, this is Blade 61, holding Kentucky (a predetermined control 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”*
(A/C)

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”

“Egress South to Jaguar, angels 12, advise when ready to copy remarks”

Note: 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 not 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:	<i>"Blade 61 pushing"</i> (leaving the CP for the IP)
FAC:	<i>"Continue"</i> (Acknowledgment to ensure communication is still up. <i>"Roger"</i> would also be an appropriate call.)
A/C:	<i>"IP inbound"</i> (passing over the IP, inbound to the target)
FAC:	<i>"Continue"</i>
FAC:	<i>"Mark's on the deck"</i> (The pre-coordinated mark is on the deck and should be visible to the pilot.)
FAC:	<i>"Visual"</i> (The FAC sees the aircraft.)
A/C 1:	<i>"Contact the mark"</i> (The pilot sees the mark, is waiting for a correction to the target.)
FAC:	<i>"From the mark, east 100"</i> (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:	<i>"Tally Target, In from the West"</i> (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"*

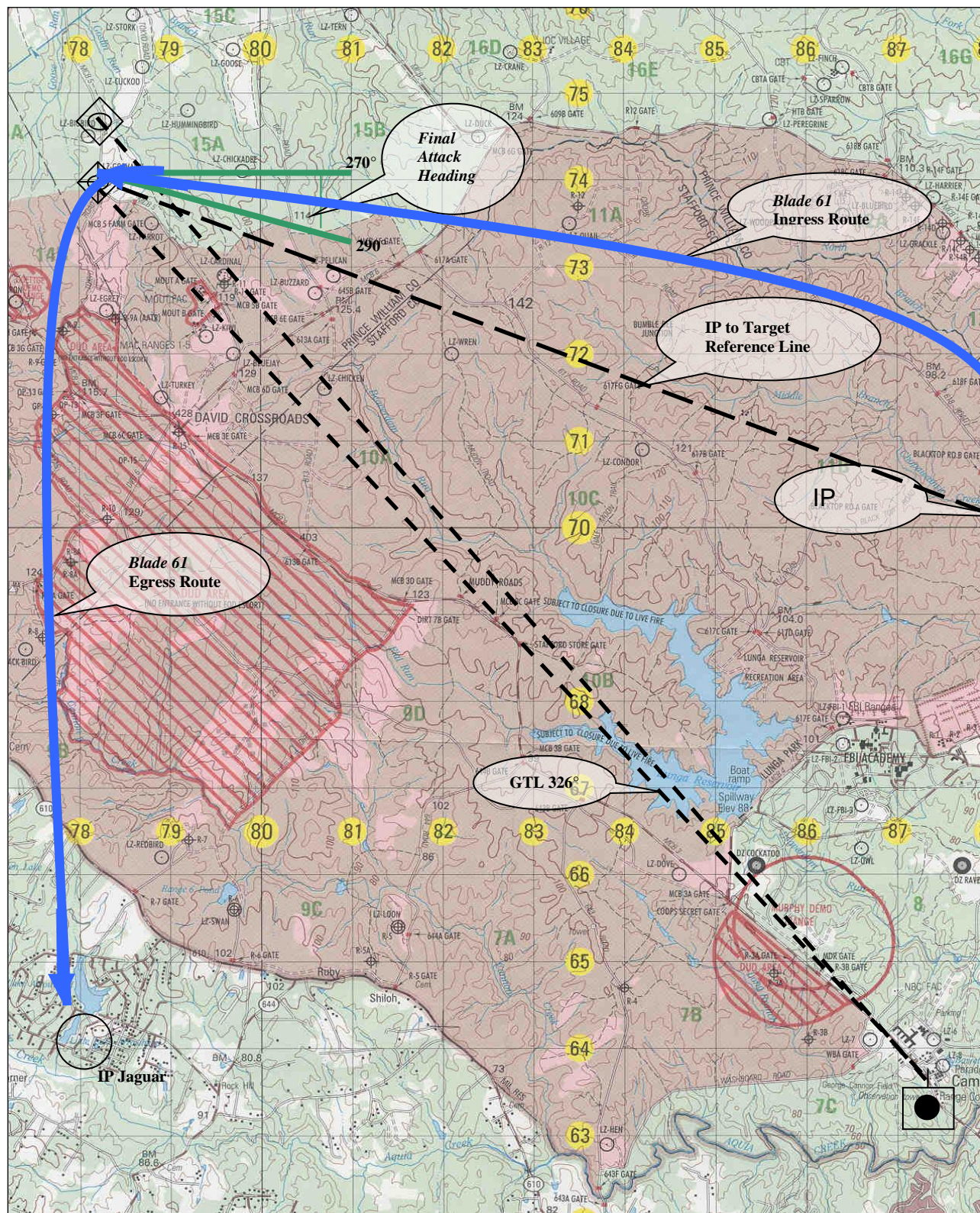
FAC: *"Blade 62 Cleared hot"*

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)
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)

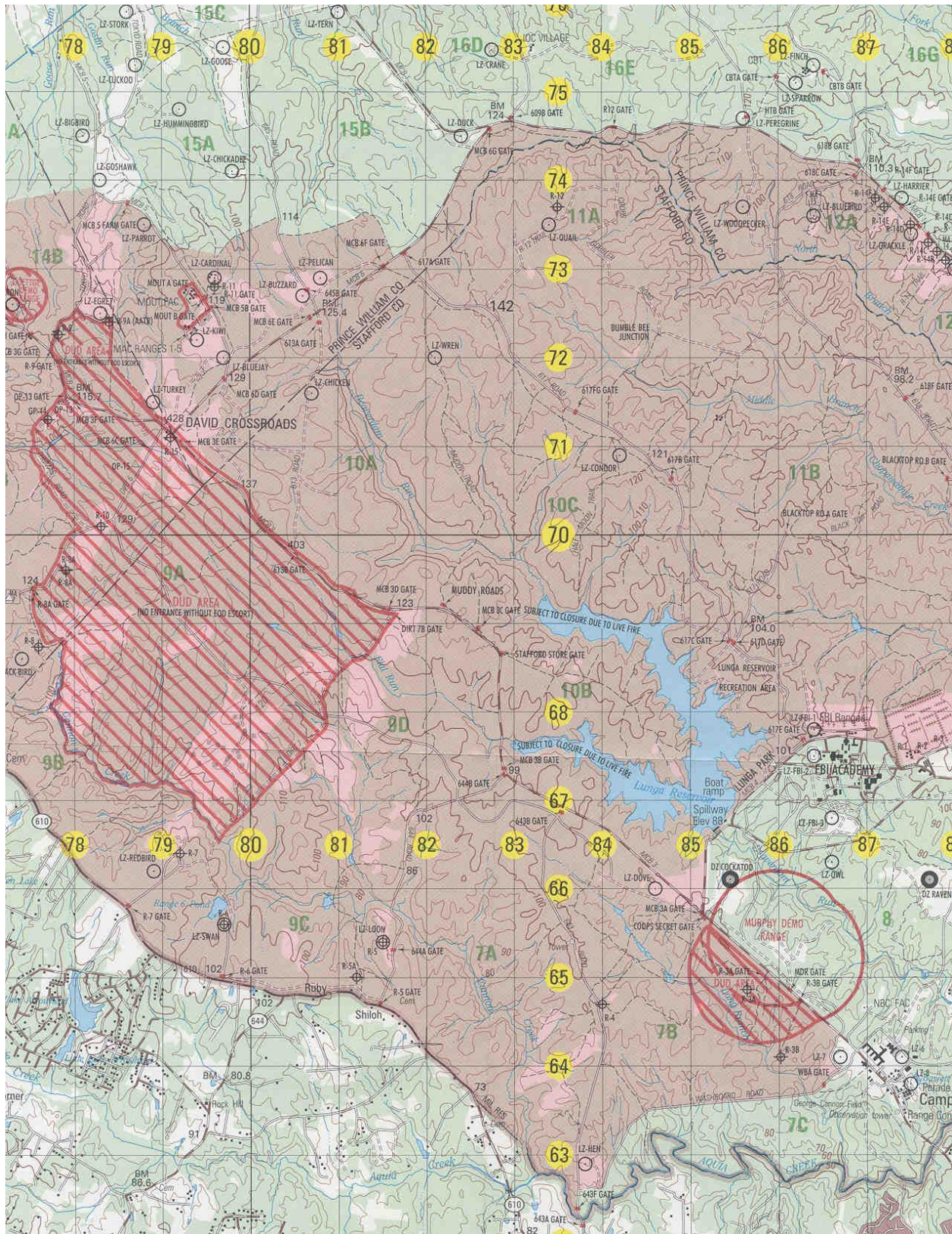
Additional Remarks:

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)
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."

[illegible]

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