# MQA-7: CAS PLANNING

**PREREQUISITES:** MQA-6

**REQUIRED READING:** CDC 1C451 Exportable Training Package Supplement 2-1 (Plan and Perform a Close Air Support Mission); JPUB 3-09.3; AFTTP(I) 3-2.6 (JFIRE); AFTTP(I) 3-2.10 (JAAT); AFFTP 3-1 Vol 26 (ASOC & TACP Operations), Chapter 6; Squadron TACP Handbook

**PURPOSE:** Familiarize new ALO with the CAS mission planning process.

## Introduction - (Slide 2)

A successful TACP cannot employ properly without established CAS Planning. This requires knowledge not only of CAS assets and Army assets, but an established working relationship with the supported Army unit. The following lesson will briefly introduce some of the information required for effective CAS Planning. This is by no means the only way to plan CAS but simply a technique that has worked. The following topics will be discussed:

- Aircraft availability and the ATO
- Commander's Intent
- A2C2/ACA Planning
- TAC Placement
- SEAD Planning
- Communications Planning

## Aircraft availability and the ATO – (Slide 3)

During the mission analysis phase of the MDMP, the Army commander (or XO or G/S-3, depending on the individual unit procedures – more to follow on MDMP in MQA-8) should ask the ALO about the expected number and times of CAS missions. The answer to this question is always a resounding "it depends." There are two primary pieces of data that the ALO needs to answer this question: (1) "What priority does this particular Army unit have in the battle," and (2) "How many and what kinds of aircraft will be dedicated by the JFACC to the CAS mission during our battle."

The answer to question #1 should be spelled out during the order's brief, when each unit will be designated as either a "main" or a "supporting" effort. The corps will designate a division as it's main effort, with all other divisions maintaining a supporting role; each division will designate a BCT main effort, and each BCT will designate a Task Force main effort. A "main effort BCT" in a "main effort division" can expect to get virtually all the CAS it requests (within the limits of what the JFACC will provide), while a "supporting effort BCT" in a "supporting effort division" will have to deal with the "scraps" that the main effort does not need. Once the ALO is briefed on his aligned unit's level of support, he should contact the next higher echelon's ALO (ie division ALO should contact the corps ALO) and get a general gameplan on how CAS will be distributed to the various units.

The answer to #2 is contained in the ATO. Since standard ATO inputs are required to be forwarded 72 hours in advance, there is little chance of brigade and division CAS requests making the published ATO. Additionally, since the ATO is published 12-24 hours prior to the beginning of the fly day, the ALO will generally not have access to the ATO that is applicable to the battle being planned. This situation requires the ALO to earn his flight pay and use some judgment: "If today's ATO has 52 sorties dedicated to XCAS and tomorrow's ATO has 52 sorties dedicated to XCAS, then it's a safe bet that day-after-tomorrow there will be around 50 sorties dedicated to XCAS."

Using the expected number of CAS sorties, their expected on-station times, and the aligned unit's level-of-effort, the ALO should be able to give the Army commander an educated guess as to the times that CAS will be available to the unit and the numbers and types of aircraft that will show up.

In addition to times and numbers, the ALO should also provide the Army commander expertise on what capabilities the expected CAS aircraft will have. The Army tends to think that airplanes-are-airplanes and sorties-are-sorties, and doesn't realize that an allied F-5 carrying two Mk-82's at night cannot expect the same effectiveness as an NVG equipped A-10 loaded for bear. This is one of the primary reasons that the USAF doesn't assign space officers to be ALOs – the ALO has to provide the Army commander with the capability and limitations of the aircraft that will be accomplishing CAS.

## Commander's Intent – (Slide 4)

Once the ALO provides the Army commander with the expected CAS numbers, it's now the Army's turn – the ground commander MUST provide the ALO with a specific, definable, and realistic mission for CAS. Too often, the ground commander will say something like "I want to attrit the AGMB with artillery and CAS." This is simply not enough information – the ALO has to get specifics from the commander – something more like "I want CAS to attrit a minimum of seven armored vehicles from the AGMB prior to reaching phase line Whiskey" gives the ALO something he can plan on accomplishing.

There is more the ALO must drag out from the commander – contingency requests. If the commander's primary areas for CAS are not able to be targeted, or are destroyed and CAS is still available, the commander must establish secondary and tertiary objectives for CAS. For instance "If the AGMB is not located, or past PL Whiskey, you're secondary mission is to attrit six vehicles from the Main Body. The tertiary mission will be to attrit three vehicles from the forward security detachment."

Finally, with a clearly defined intent for the use of CAS, the ALO must again earn his flight pay and conduct a "sanity check" on the ground commander's intent for CAS. This is the primary reason that ALOs are "aligned with," NOT "attached" or "assigned" to Army units; the ALO must be able to (and know when) to tell the Army commander (that outranks him by at least a couple of grades) "No, that's not a valid use for CAS."

Some typical examples of poor commander's intent for CAS are:

- Attacking a Division or Regimental Artillery Group (DAG or RAG) without the ability to provide overwhelming SEAD fire. These enemy units, while high payoff targets, are generally very heavy with SAMs and AAA, and are often located too deep in the battlefield for effective SEAD.
- Targeting a one or two vehicle formation with CAS. Whenever CAS planes cross the FEBA, they're being put at risk – the ALO has to ensure that the potential payoff is worth the potential risk. NOTE – There are times when a small formation may be worth the risk – if that formation constitutes a reserve force that can counter-attack a friendly break though of an enemy defensive belt, then it could well be a valid target.
- Placing unrealistic restrictions of CAS – engaging too close to friendlies or expecting the pilots to specifically target tanks instead of "generic" armored vehicles.

BOTTOM LINE: The ALO should go into his mission planning knowing exactly what the ground commander wants CAS to accomplish, and the ground commander should leave with a realistic assessment of what CAS will be able to accomplish.

## A2C2 / ACA Planning – (Slides 5-10)

A2C2 Planning is probably the most involved portion of the CAS planning process. There are four primary users of airspace over the land battle (CAS, artillery, Army aviation, and UAVs), and each one wants and need his own "piece of the pie."

The easiest airspace deconfliction is generally with Army aviation. The helicopters tend to operate at very low altitude, and the coordination altitude established in the Airspace Control Order (ACO) gives "at-and-below" altitudes for rotary wing and "at-and-above" altitudes for fixed wing, taking care of the majority of the deconfliction problem. The exception to this is during JAATS, where CAS and helicopters are working in close proximity. In this case, the ALO should work with the Aviation Liaison officer and/or Airborne Mission Commander to establish a deconfliction plan based on timing, altitude and lateral deconfliction – just as you would do with any other aircraft working in close proximity. Army aviators are pilots and speak essentially the same language as ALOs, making deconfliction planning significantly easier.

UAV deconfliction is also fairly easy. While once exclusively a division-and-above asset, UAVs are now being fielded at the brigade level, and all ALOs must be prepared to deconflict CAS from UAVs. Since the UAV is an Army intelligence asset, the ALO will have to work closely with the assistant G/S-2 (UAV) to establish a deconfliction plan.

Doctrinally, you can expect the UAVs to operate from 6K-12K AGL, generally preferring to stay 8-10K (these numbers are in feet – remember that the Army uses meters exclusively, so the ALO will have to convert – 1meter = 3.3 feet). These altitudes definitely place the UAV in conflict with low altitude CAS, and may also conflict with high altitude CAS. Luckily, there are usually only one or two UAVs airborne at any given time, and with the "pilots" located in the TOCs and easily accessible to the ALOs, deconfliction is fairly easy. The easiest plan for deconfliction between CAS and UAVs is for the UAV operators to have copies of all of the ACAs that CAS will be using – once the fighters check in at the IP, the UAV operator can then start moving the UAV out of the ACAs that are about to become active and still continue with their mission.

Artillery deconfliction and ACA planning is probably the most involved portion of the A2C2 planning process for the ALO. Before the ALO can really get to work establishing ACAs, he needs an answer to the following qeustions:

1) What is the expected weather?
2) What are the ADA threats?
3) Are there any JFACC mandated CAS restrictions?
4) Where are the Army's Position Areas of Artillery (PAAs)?
5) Where is Coordinated Fire Line (CFL)?
6) Will artillery be using high- or low-angle fire?
7) Will MRLS be firing anywhere in the area?
8) What is the MAXORD and MINORD in the primary CAS engagement areas?

What is the expected weather? While weather forecasts are just that – forecasts, the ALO should plan his primary CAS gameplan based on the expected weather. Any ceiling below 3K or visibility below 3 miles will make most CAS impossible. A ceiling below 15K will generally drive CAS into a low war. AF weather reports can be requested from the weather detachment located with the ASOC.

What are the ADA threats? The G/S-2 can give the ALO an idea of the expected ADA threats in the unit's lane. Even if no ADA is briefed, always assume that MANPADS and small caliber ADA is present. The ALO should also check with the AF intel detachment located with the ASOC to determine any longer range or strategic SAMs that could affect CAS aircraft. BOTTOM LINE: If low-altitude battlefield ADA systems are the only threat, the ALO should make a high war the primary plan. If multiple radar-guided tactical or strategic SAMs present the primary threat, the ALO should consider a primary low war.

Are there any JFACC mandated CAS restrictions? Various situations, primarily level-of-risk, may result in the JFACC designating a minimum altitude for CAS employment. While JFACC direction may drive a CAS high war, the ALO should still develop a "hip pocket" low war plan for emergency use.

What are the Army's Position Areas of Artillery (PAAs)? These are the planned firing positions for the Army's artillery. Based on the PAAs and the maximum altitude (MAXORD) of the artillery being fired, the ALO can determine primary ingress and egress routes for CAS that will minimize amount of time that artillery must be shut down. If the PAAs are inconvenient for CAS employment, the ALO can ask the artillery planner if they can be moved, but don't expect it – PAAs are a small piece in a very large puzzle; moving artillery positions can have a significant impact on logistics planning, rear area security, etc. The ALO also needs to ensure that he gets PAAs for artillery at all echelons his aligned unit's AOR – corps, division, and brigade PAAs can all affect CAS is the AOR.

Where is the Coordinated Fire Line (CFL)? The CFL defines the limits of how far artillery "normally" will range. The locations of the CFL and PAAs are major factors in determining the maximum altitudes of artillery.

Will artillery be using high- or low-angle fire? Low angle fire is the preferred method of employment for both the Army and the AF – low angle uses a shorter time-of-flight and is less detectable by the enemy (goods for the Army), and low angle tube artillery tends to stay below about 6K feet AGL, greatly reducing the impact on a CAS high war(good for the AF). There are situations, however, that require high angle fire: intervening terrain may

force the artillery to fire high; and, since high angle artillery fire reduces the frag dispersion pattern, theater ROE may dictate high angle fire. If high angle artillery fire is used, the ALO should expect maximum altitudes as high as 30K AGL (with an obvious impact on high war CAS).

Will MRLS be firing anywhere in the area? Any MRLS fires (usually at the division and corps artillery levels) can generally be treated as high angle tube artillery for altitude purposes (MRLS can fire low angle in some situations, but usually has a maximum altitude in the 30's).

What are the MAXORD and MINORD in the primary CAS engagement areas? Based on the answers to questions 3-7, the artillery planner should be able to provide the ALO with a "worst case" MAXORD and MINORD for the areas where CAS is expected to be employed (ie the highest expected MAXORD and the lowest expected MINORD).

**ACA DESIGN**

Armed with the answers to these questions, the ALO and artillery planner (also called the FSE planner), can go about establishing CAS ACAs. ACA's can generally be divided into two primary types: Ingress/Egress ACAs, and employment ACAs.

*INGRESS/EGRESS ACAs*

Ingress and egress ACAs are exactly as they sound: ACAs used to get the fighters from the IP to the target area without being struck by artillery. The ALO should plan on both high war and low war ACA options, as well as ensuring that ACAs cover the entire width of the maneuver unit's lane (to ensure a variety of ingress and egress options).

Establishing altitudes blocks for ingress/egress ACAs is a fairly straightforward process: high-war ACAs should be floored at 10K AGL or 1K above the MAXORD of low-angle artillery (whichever is higher). Low war ACAs are blocked from the surface to 2K AGL (and generally allow high-angle artillery fire over them).

ACA widths are very dependent upon the war type (high or low). If the primary plan is for a high war, and there is no planned artillery with a MAXORD above 10K AGL, then the ACA can be designed to cover the entire width of the Army unit's lane. If MRLS or high-angle tube artillery will be firing, however, the ALO must limit ACA widths similarly to those in a CAS low war.

Low altitude CAS ingress requires ACAs with limited width in order to avoid unduly restricting artillery fires. The ALO should plan on using a primary ingress ACA that maximizes the use of terrain masking, avoids expected ADA and enemy troop concentrations, and minimizes the impact on artillery fires. Given standard tactical spacing of 1-1.5nm in a formation and the fact that a typical SAM defense will require 2-2.5nm of lateral spacing, the MINIMUM width of an ingress/egress ACA should be 3.5 nm (or 7km in Army-speak). If the low altitude SAM threat is significant, this minimum width should be increased to 10km, to allow defensive reactions to both sides of the formation. Any narrower ACAs will virtually assure spillouts, and place CAS aircraft at undue risk.

In order to maximize flexibility, ingress/egress ACAs should be built to cover the entire unit lane. Realize that ACAs do not need to be mutually exclusive: if a brigade has a 12km-wide lane, it can support two 7km ACAs that overlap in the center.

Another factor in ACA development is the length of ingress/egress ACAs. If CAS is planned for various depths in the battlefield, then the ACA plan should avoid unnecessarily shutting down deep artillery when CAS will be employed closer to the FLOT. One technique for accomplishing this is to divide ingress/egress ACAs at 5-10 km intervals and number them (for example – ACA Eagle along the northern lane border would be Eagle 1 from the IP to 10km deep, Eagle 2 from 10-15km, Eagle 3 15-20km, etc,etc,etc). This will allow the ALO and FSO to only activate ACAs required for transit.

Finally, in the planning phase, the ALO should ensure that the FSO understands that, in a high threat situation, one ACA may be used for ingress while a separate ACA is used for egress (in order to avoid overflight of recently alerted ADA).

*EMPLOYMENT ACAs*

Employment ACAs are also exactly as they sound: areas where the fighters will be accomplishing their trade. Because of the dynamic nature of maneuvering, target acquisition, and weapons employment, employment ACAs are necessarily larger than ingress/egress ACAs.

Laterally, fighters need a minimum of 5nm to properly execute CAS in the target area. 7nm is preferred, but it is always aircraft dependant. A-10's have a tighter turn radius than an F-16 so an A-10 might be able to use a 5 – 7 km ACA while an F-16 might need 7 – 10 km . Therefore, employment ACAs should be a minimum of 9km wide, preferably 13km. The actual shape of the ACA can take several forms – one technique is to simply make the ACA a 9km circle based on a set of coordinates (this technique has the advantage of telling the fighters to remain within 5nm of point XYZ). Another technique is to make the ACA square or rectangular based on particular grid lines (very useful in a north/south or east/west fight). Finally, the ALO should modify the shape of the ACA based on the expected situation: if the targets are expected to be in column formation along a road, the length of the ACA should cover the road, whereas if the targets are expected to be bottled up along an obstacle belt, then the width of the ACA should cover the belt.

The altitudes of employment ACAs will also be larger and allow for all anticipated aircraft and weapons types. For a low war, this means that an employment ACA should extend from the surface to 10K AGL to allow for a pop maneuver. When the fighters check in, the ALO can query them real-time and determine the actual altitude block needed. It is much easier to give unneeded airspace back to the Army than it is to quickly acquire new airspace in the heat of the battle.

For high altitude employment ACAs, a general rule of thumb is 10K AGL and above. If the MAXORD of artillery through that ACA is lower, however, the ALO should place the floor of the ACA 1000' above the MAXORD. This technique will not restrict artillery fires and allows fighters or a FAC-A to quickly "dip down" to acquire or identify targets. Again, it's easier to give back airspace than to get it.

## TAC Placement (Slide 11)

One the commander's intent for CAS and ACAs are built, the ALO should determine the type of terminal control and who will be executing. In high war situations, the plan should allow for a FAC-A to be on station for final control, but should not depend upon it. In cases where friendly troops are not a factor, the ALO should primarily consider indirect control from the appropriate TOC or TAC. In general, if the nearest friendly will be 5km or more from the enemy unit being engaged, then indirect control is sufficient (this range is very situation dependent – if there is a clearly defined demarcation line – such as a river – then this range can be compressed to as little as 2km; if, on the other hand, the expected fight involved two high-speed armored columns racing towards each other on a desert floor, then 10km may be more appropriate). The controlling TACP should be based upon which TACP is expected to have the highest situational awareness on that portion of the battle.

If the proximity of friendlies does not allow for indirect control, the ALO must establish a plan for direct control (this usually only occurs at the brigade and battalion level – there is virtually no corps or division TACP direct control). If the friendlies consist of a maneuver force (task force or company-team), then the ALO should ensure that the corresponding BALO and ETAC coordinate with their appropriate battalion for proper positioning to control the CAS.

If the situation does not allow a battalion ETAC team to control the CAS (possibly due to several friendly units quickly moving around the area where CAS will be employed), then the ALO should position a brigade ETAC team to control the CAS (NOTE: This "brigade ETAC team" does not have to be comprised of brigade TACP personnel – if the situation dictates, the brigade ALO can designate ANY personnel under his command for brigade duty). Whether positioned with a task force or by the brigade TACP, the ALO should ensure that the controlling TACs are adequately protected and have a safe egress route if the situation gets too hot.

In either case, the ALO should strongly consider positioning his TAC teams in the vicinity of an Army FIST. These are artillery forward observer units that also must have a clear field of view, adequate security, and a safe egress route. This is not to say that the TAC team must be collocated with the FIST – large groups tend to draw enemy scout attention and hostile artillery fire. Detached mutual support (500 meters, line-of-sight and radio contact) is usually the best technique.

## SEAD Planning

Once the objectives are established, ACAs developed, and TAC positions planned, the ALO and FSO planner must establish a workable SEAD plan that will maximize the potential for fighter survival, and, hence, mission accomplishment.

The first step in effective SEAD planning is establishing hostile ADA as a high priority target. This is generally not a problem, since the current practice is for the Army to place ADA on the "high payoff targets" list, resulting in any identified hostile ADA system within range getting the full attention of friendly artillery.

Since most ADA systems will not be identified and destroyed prior to CAS arriving, the Army uses the concept of "templating" where the enemy ADA will be. This simply means that the G/S-2 gives their "best guess" to the ALO and FSO as to where they think the ADA will be. The FSO will then preplan fire missions against the templated ADA. If the actual location of the ADA can be determined by forward observers during the battle, then those actual positions will be fired upon, otherwise, the templated positions will take fire. While the result of fires on templated positions rarely, if ever, results in target destruction, it isfairly good at forcing the ADA to "keep their heads down," resulting in effective suppression (the "S" in SEAD).

During the SEAD planning step, the ALO must ensure that the G/S-2 and FSO do not forget about templating SEAD and planning missions in the ingress/egress ACAs as well as the engagement ACAs; additionally, since virtually all enemy troop concentrations can carry MANPADS, the ALO should ensure that the FSO plans SEAD fire missions that the fighters will overfly.

In addition to establishing targets, the ALO and FSO need to plan how ACAs will be activated SEAD will be deconflicted from the aircraft. In a high war, this is fairly easy – SEAD against ADA in the ingress ACAs should begin 3-5 minutes prior to the fighters departing the IP and can terminate once the fighters have pushed. SEAD in the target area should begin at the time the fighters push and continue as long as there are jets in the target area. Once the fighters call outbound, SEA D should again shift to the egress ACA. This technique results in SEAD being continuously fired in the area directly under the fighters, and only works if the fighters are able to remain above the artillery's MAXORD.

If the situation call for a low war, then timing must be used to deconflict the SEAD, and timing with the FSO becomes critical. In general, ingress ACA suppression should begin 3-5 minutes prior to fighters departing the IP – as soon as the fighters cross the IP inbound, fires should immediately shift to suppression in the target area. Once the fighters are two minutes from the target, SEAD should then shift to the egress ACA and continue until the fighters call outbound.

Obviously, for this technique to work, it is essential that the fighters give accurate "Five minutes," "IP inbound", and "outbound" calls. In the event that communications with aircraft in the target area may not reliable (as is often the case with deep CAS, indirect control and a low war), then only ingress and target area SEAD should be fired, with no SEAD during egress.

## Communications Planning – (Slide 11)

Communications are the real "tools of the trade" for the TACP, and the GRC-206 communications pallet has considerable capability. Those 5 or 6 radios on the pallet are useless, however, unless there is a concise communications plan to fully utilize them. The following are the most common uses for communications.

Air Force Air Request Net(AFARN). The AFARN is controlled by the ASOC and is used to communicate air requests. It can be used for other communications, but only in emergencies and with the permission of the ASOC. All TACPs should monitor the AFARN. The preferred radio for the AFARN is SATCOM, with HF as the backup. In the event other communications are lost, brigade and division TACPs can also pass air requests via the DNVT (Army field telephones).

Tactical Admin. Each echelon should have discrete communications capability with the echelon both above and below (ie. Both division and brigade TACPs should have two tactical admin nets – one going up and echelon and the other down an echelon). These nets are used for coordination, status reports, etc. The type of radios used will depend upon the ranges between the various echelons.

VHF-FM is a preferred radio for tactical admin – the amplified FM on the GRC-206 has an advertised range of 30km, although this is greatly affected by weather and terrain. These radios are also secure and use frequency agility, greatly reducing the probability of intercept and direction-finding. It is also possible to forward

position a GRC-206 system configured as a repeater if range if is problem. The disadvantage of this system is that it takes on GRC-206 "out of the fight." If VHF-FM is planned for tactical admin, frequencies should be requested through the appropriate Army G/S-6.

VHF-AM is also a good choice for tactical admin. While still a line-of-sight system, it tends to have greater range capability than VHF-FM. Disadvantages are that it is not frequency agile, and also that some theater communications plans may require that VHF-AM be used for aircraft communication. If VHF-AM is planned for tactical admin, then frequencies should be requested through the ASOC and AOC for theater deconfliction.

The final common choice for tactical admin is the HF. While is has severe communications quality limitations, wide geographical separation may require its use. From practical experience, lower HF frequencies tend to work better during night hours, while the higher frequencies are better during the day. Any use of HF for tactical admin should be coordinated through the ASOC and AOC for frequency assignment.

An alternate option for tactical admin between brigade and higher TACPs are the DVNT field phone.

Check-in. This net is defined in the communications section of the SPINS and is usually UHF (possibly with a VHF alternate). This frequency is used for initial fighter check-in and situation briefs, and is exclusively used by the fighters and ASOC. Lower echelon TACPs may want to monitor this frequency to build situational awareness.

CAS Control. This is usually a UHF frequency (can also be UHF – HAVE QUICK) that is used for TACP final control with fighters. The ASOC is usually given several control frequencies is the SPINS, and designates primary control frequencies for each division (or brigade) TACP.

Army Admin. The is any Army assigned VHF-FM net that is used within each individual unit. While brigade-and-above TACPs are usually co-located with their Army counterparts, battalion TACPs may need to conduct a significant portion of their coordination in this net.

## Conclusion – (Slide 51)

As the cliché says, "Prior planning prevents poor performance." As with everything involving combat flying, this adage applies to the ALO as well. While every situation the ALO can expect in the field cannot possibly be covered, this paper has striven to provide a "tool kit" of techniques to use during CAS planning. And, like all other aspects of flying, if the ALO puts some effort into the plan, "chair flies" it a couple of times, and "what if's" it to death, it will probably result in successful CAS accomplishment.