Chapter 2:
THE "PACKAGE" AND TYPES OF SEAD

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In This Chapter

- Explanation of the Term "Package"
- Description of standard and non-standard types of Suppression of Enemy Air Defenses (SEAD)
- Explanation of the advantages of non-standard SEAD for combined arms attacks

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Definition
The term "Package" has come into common use in the Combined Arms Exercise (CAX) Program. Since it is a word used frequently by Marines participating in a CAX, it is defined to improve communication between CAX forces and TTECG personnel.

PACKAGE – The term package is a non-doctrinal term that represents the combination of available supporting arms assets – indirect fires and close air support – in support of ground maneuver. The "package" is primarily concerned with providing fire support for a hasty attack. It is similar to a series of fires within a quick fire plan, in that it combines indirect fires and close air support on a timeline, which is constructed to support a scheme of maneuver. The difference is that, due to the hasty nature of the attack it supports, the "package" is not prepared and submitted as scheduled fires. Instead, it uses the framework of the non-standard Suppression of Enemy Air Defense (SEAD) mission for its construction.

Suppression of Enemy Air Defense or SEAD
Suppression of enemy air defenses is that activity which destroys, neutralizes or temporarily degrades enemy air defenses in a specific area. The primary objective of SEAD is to increase air, land and naval operations by reducing enemy surface to air defense capabilities. SEAD is most frequently delivered in support of a specific air strike. This involves the suppression of air defense weapons which can threaten friendly aircraft during an air strike near the target or on ingress and egress routes.

There are two types of SEAD: standard and non-standard. The two types of SEAD are reviewed in this handbook based on their ability to support CAX training objectives.

Standard SEAD
Standard SEAD is suppressive fires scheduled around an established Time on Target (TOT) for aircraft bombs, for a one-drop pass of aircraft. Two formats exist: continuous and interrupted. Continuous SEAD has suppression falling on the air defense asset before, during and after the aircraft TOT. Interrupted SEAD has suppression falling before the TOT, but incorporates a break in suppression just before the aircraft TOT and has no suppression after the TOT.

Standard SEAD can be used to support very hasty air attacks on targets of opportunity with a one-drop pass from the aircraft. However, standard SEAD does not support maneuver well since the suppression is designed to reduce the risk to the aircraft, not support ground maneuver. This forces the commander into dealing with the enemy in a sequential manner. An air attack is run first, followed by the ground attack.

Non-Standard SEAD
Non-Standard SEAD incorporates the elements of a standard SEAD mission with additional fires designed to support ground maneuver. The non-standard SEAD format can support aviation and maneuver simultaneously. It allows for flexibility in the course of an attack and is adaptable to fit the company commander's needs, while allowing for simultaneous actions. Non-standard SEAD has no set format; however, every item in the timeline is based on a single TOT that sets the attack in motion.

The following picture shows a timeline representation of the types of SEAD:
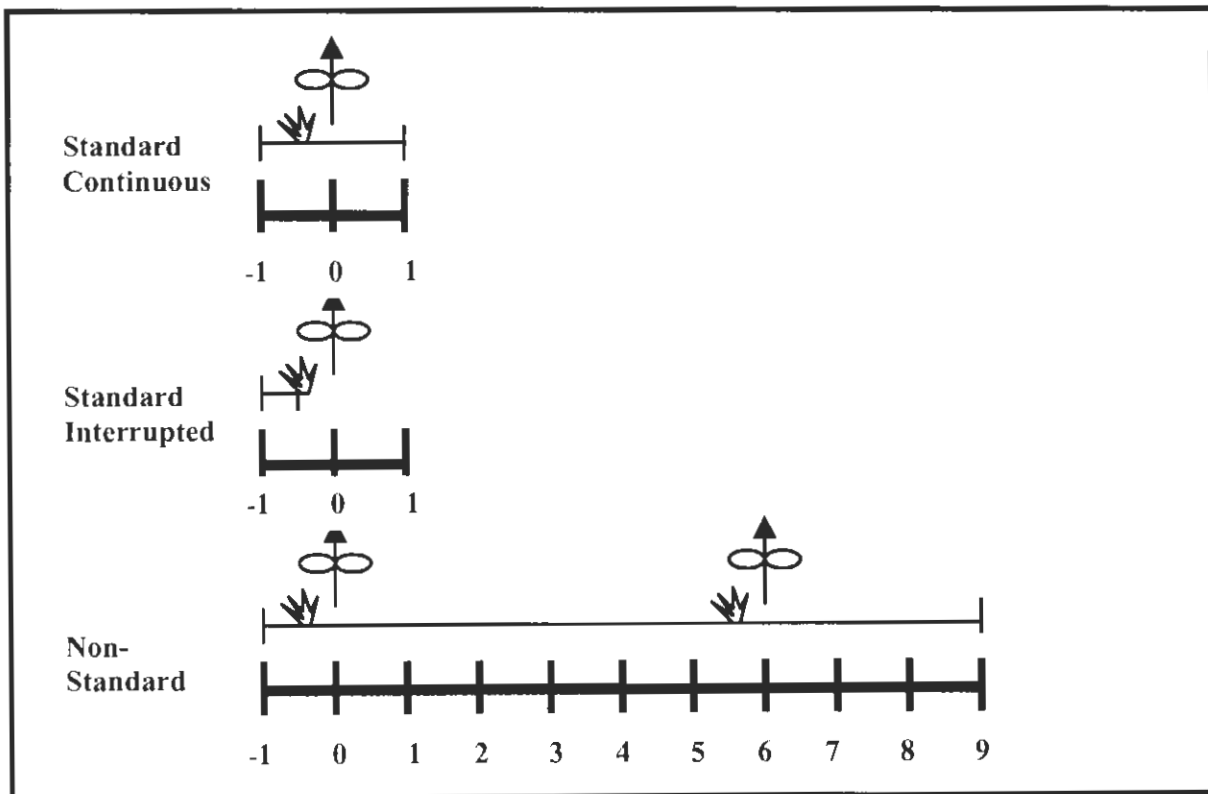
SEAD and Additional Aircraft Attacks
When aircraft with ordnance are at your disposal, take maximum advantage of their capabilities. Therefore, always consider a plan to bring the CAS aircraft back to attack a target in case the first pass is unsuccessful.

When you use the standard SEAD format and the first mission fails, the traditional call is for an "immediate re-attack." An immediate re-attack requires the CAS aircraft to remain in the target area and circle to attack the target a second time immediately following the first TOT. Generally, the second attack does not have a TOT. The problem with this is that the aircraft flightpath is predictable, which increases their exposure to air defense threats.

The non-standard SEAD format plans for additional "follow-on" attacks while still using the initial TOT as a plan to set everything in motion. Thus, the failure of the first attack is not significant because a plan is already in place to continue to use the aircraft.

FOLLOW-ON ATTACK - a non-doctrinal term. It states that the original CAS aircraft will execute a second 9-line from the same or different initial point having a separate TOT and the mission is integrated into the suppression timeline.

This type of attack has the advantage of being more tactical and survivable for aircraft to execute than a immediate re-attack mission.

The Advantage of Non-Standard SEAD

The advantages presented by the non-standard SEAD or "package" concept – the integration of all available supporting arms into a single timeline of fires in support of ground maneuver – are threefold:

- Advancing by fire and maneuver.
- Maintaining momentum through concurrent action.
- Taking maximum advantage of the effects of supporting arms.

First Advantage: Force Protection. Supporting arms provide the fires that enable ground maneuver to move into effective direct fire range of the enemy and to close within the enemy's threat ring. Without these fires, particularly with the increasing range and penetration capabilities of antitank weapons, ground units will suffer unnecessary losses before they are able to destroy the enemy with their weapons.

Second Advantage: Momentum. By integrating and concurrently executing indirect fires, Close Air Support (CAS) and ground maneuver, we achieve the mission simultaneously, vice sequentially. This produces a net reduction in time expended, thereby increasing momentum.

Third Advantage: Disruptive Effects against the Opposing Force. Maneuvering under the effects of supporting arms, we realize not only the benefits of any personnel and equipment destruction caused by air and artillery, but also the effects of the temporary incapacitation and shock inflicted on those remaining forces. Thus, we can take full advantage of the effects of our supporting arms and increase our chances of success, while decreasing the cost in Marines and equipment.

Chapter 3:
FiST Organization and Responsibilities

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In This Chapter

- Organization and Responsibilities of the Fire Support Team

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The Fire Support Team or FiST

The Fire Support Team is the company commanders' means for executing his combined arms attack. The FiST Leader is directly responsible to the company commander for building combined arms "packages" that support the commander's concept of attack. The basic Fire Support Team is made up of the following members, with the following responsibilities:

FiST Leader
- Works for the company commander
- Runs the FiST
- Serves as the Company Fire Support Coordinator
- Approves all indirect missions and CAS 9-lines
- Ensures all team members are oriented on the correct targets
- Maintains the Battle Board
- Plots all information on his map
- Ensures coordination and deconfliction of maneuver and supporting arms

Forward Air Controller
- Controls the employment of all aviation
- Orients the pilots to the enemy situation and disposition of friendly forces
- Provides the company commander and FiST leader with all pertinent information regarding employment of aviation assets

Artillery Forward Observer
- Fires and adjusts artillery on targets
- Provides the company commander and FiST leader with all pertinent information regarding artillery employment

Mortar Forward Observer
- Fires and adjusts mortars on targets
- Provides the company commander and FiST leader with all pertinent information regarding mortar employment

Naval Gun Fire Spotter
- Spots and adjusts naval surface fire support
- Provides the company commander and FiST leader with all pertinent information regarding the employment of naval surface fire support

Variations of the team are based on assets available.

Chapter 4:
Guidelines for the FiST Leader

In This Chapter

- Fire Support Team Leader Responsibilities
- Managing Fire Support
- Fire Support Tasks
- Fire Support Planning
- Fire Support Integration and Execution
- Effective Integration
- Attack Geometry
- Operation of the FiST
- An Effective FiST Leader

The FiST Leader

The FiST leader constructs fire support "packages" that support the company commander's scheme of maneuver and coordinates the activities of the FiST during operations. Thus, the FiST leader has two responsibilities:

1. Manage Fire Support
2. Operate the FiST

Managing Fire Support

In order to integrate fire support into the scheme of maneuver, the FiST leader takes part in fire support planning, conducts fire support integration and executes the fire support plan. As a guide to action, the FiST leader must keep in mind some key **Fire Support Tasks:**

- Locate Targets
- Support the movement to contact
- Plan fires during all phases of an attack
- Integrate all available fire support

Fire Support Planning

Fire support planning is the continual process of analyzing, allocating and scheduling fire support. The goal is to effectively integrate fire support into planning to optimize combat power. Taking part in fire support planning, the FiST leader initially determines the commander's intent for fire support. He keeps the commander informed of the capabilities and limitations of all fire support systems that may be made available to the company. The FiST leader uses the members of the FiST to help provide this information to the commander. The FiST leader should also provide an estimate of fire support to the company commander. In doing so, he assists the commander in estimating

the situation and developing his concept of operation. The FiST leader does not wait for the company commander to complete the scheme of maneuver, but aggressively inputs fire support planning as the scheme of maneuver is being developed to help achieve integration. Additionally, the FiST leader keeps the commander informed of the status, location and availability of fire support. Finally, based on the planned scheme of maneuver the FiST leader determines the task requirements for all available fire support systems and tasks each of the FiST members accordingly.

Fire Support Integration and Execution

Fire support integration is the coordination and separation of the elements of an attack in order to safely and effectively achieve the maximum combat power. Integration and execution of fire support is the most challenging task the FiST leader must accomplish. This task has three components:

1. Construction of a "package" (detailed in Chapter 9)
2. Integration (Coordination and Deconfliction) of a "package" (detailed in Chapter 10)
3. Execution of a "package" (detailed in Chapter 8 and 11)

Construction

Conducting this task is initiated by the receipt or development of a fire support plan based on the company commander's scheme of maneuver. This requires the FiST leader build a package utilizing the best combination of fire support available, that supports that scheme. The FiST leader must have a means to display, in an orderly manner, the elements of an attack, so that the FiST can track the package. A Battle Board is the tool for displaying a package. It will be discussed later in this chapter. (Information on the details of construction of a package is covered in Chapter 9)

Integration

The next step is the integration of a package. This entails the construction of a timeline of events that synchronizes in time, the elements of the package. Additionally, the FiST leader must separate the elements of the attack to ensure the safety of friendly forces. (The details of integration of a package are covered in Chapter 10)

Execution

Then, the FiST leader must execute the package or plan. This process carries out, minute by minute, the completion of each element of the package. The FiST leader's means to execute the package is the FiST Battle Drill. (The FiST Battle Drill is covered in Chapter 8 and the execution of a sample package in detailed in Chapter 11)

Effective Integration

Developing an understanding for the requirements of effective integration starts with understanding the concepts of Battlefield Geometry and Attack Geometry.

Battlefield geometry includes friendly positions, adjacent unit positions, enemy locations and the terrain. Battlefield geometry helps the company commander develop

his scheme of maneuver. The FiST leader must know how the scheme of maneuver takes of advantage of the terrain. This will help planning of fires. Battlefield geometry helps define attack geometry.

Attack geometry is the relationship between enemy positions and how the FiST will attack them with indirect and aviation assets.

Battlefield geometry, schemes of maneuver and attack geometry together form a picture of the battlefield. This picture shows the relationships of unit locations (battlefield geometry), ground maneuver (scheme of maneuver) and supporting arms (attack geometry). With this picture, the FiST leader can begin to see where integration (coordination and deconfliction) is needed. Each of the FiST members aids the FiST leader in integration.

1. The CO with the scheme of maneuver, helps the FiST leader plan the duration of fires based on the appropriate ordnance minimum safe lines of each ordnance active on a target.
2. The FAC with an aircraft separation plan helps the FiST leader deconflict aircraft from active friendly Gun Target Lines (GTL) and over flight of unsuppressed enemy positions.
3. The FO with "Stay Above / Stay Below" calculations helps the FiST leader deconflict aircraft from active indirect fires protecting maneuver and aircraft.

Attack Geometry

Attack geometry references the target or enemy position that is the focus of the supporting arms effort. The terminology used when dealing with attack geometry is "attack" and "suppress." "Attack" refers to the target the aircraft will engage. "Suppress" refers to the position artillery will engage. The distance terms "long" and "short" refer to the position of the targets relative to the artillery battery position. There are three basic attack geometry relationships.

1. **Attack and Suppress same target**. In this association both the artillery and aviation will engage the same target.
2. **Attack long, Suppress short**. With this relationship the aircraft engage a target further away from the artillery unit position in relation to the second target, which the artillery will engage.
3. **Attack short, Suppress long**. This association means the aircraft will engage a target closer to the artillery unit position in relation to the target that the artillery will engage.

ATTACK GEOMETRY
(Attack and Suppress Same Target)

ATTACK GEOMETRY
(Attack Long / Suppress Short)

ATTACK GEOMETRY
(Attack Short / Suppress Long)
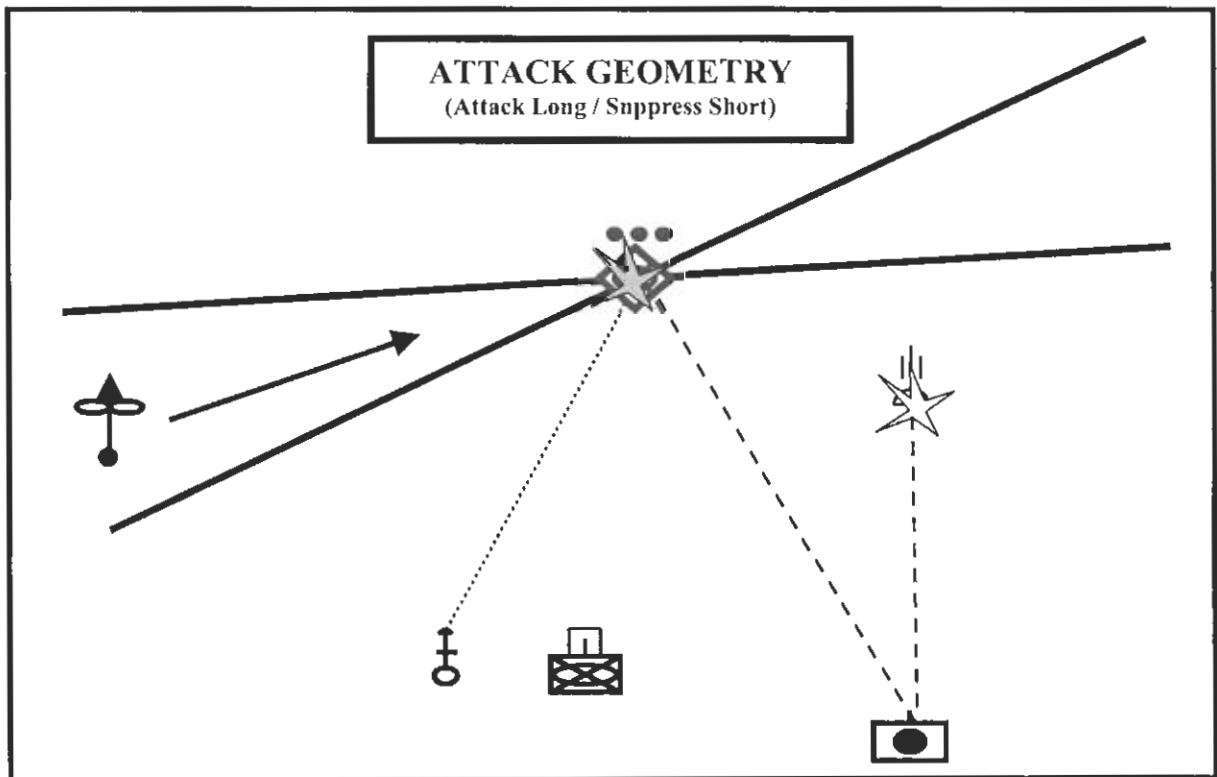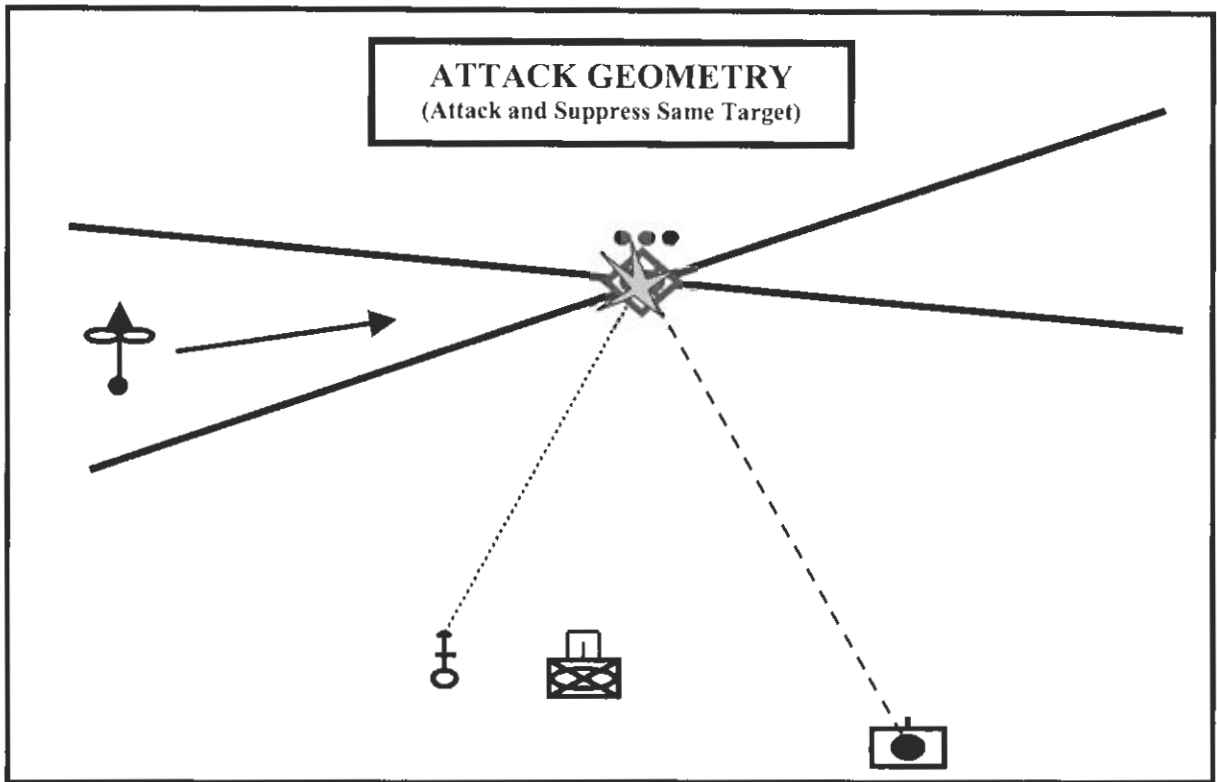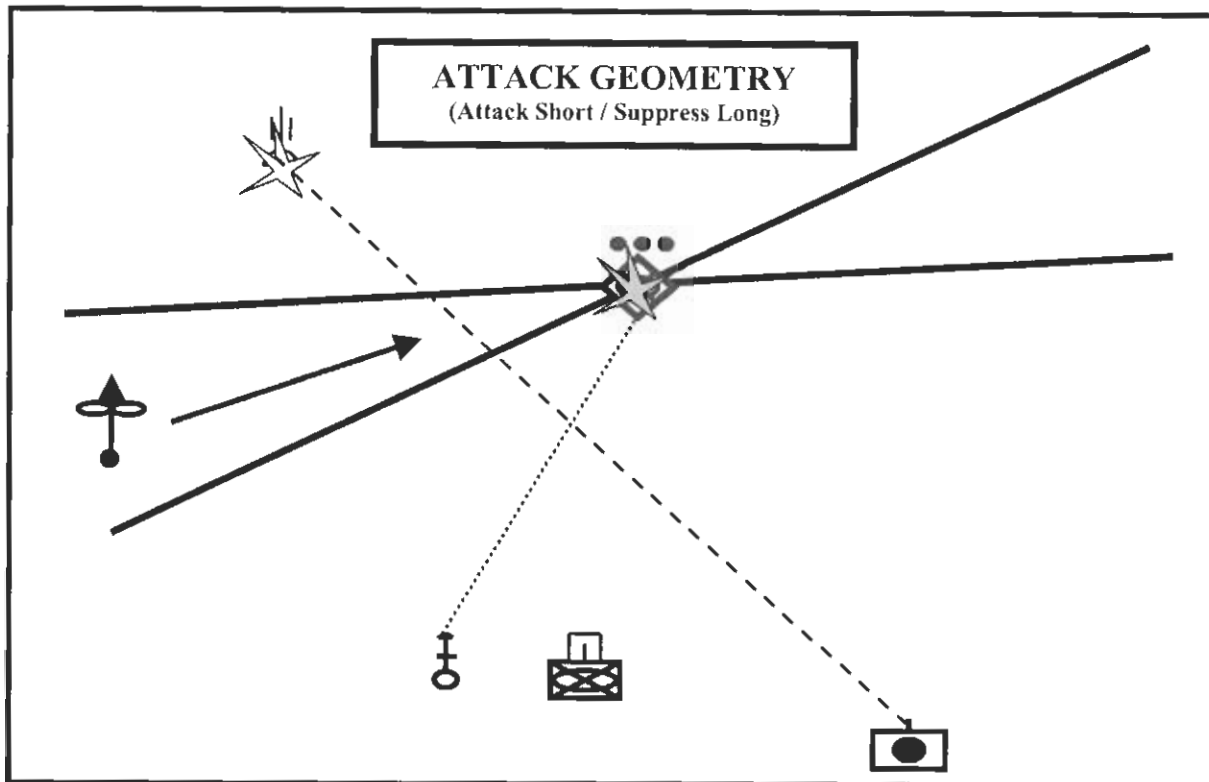
Operating the FiST

In order to effectively operate the FiST, the FiST leader manages and coordinates the efforts of the team to achieve the commander's intent for fire support. Coordination of effort is critical to the successful, timely provision of fire support. It is also important for ensuring calm systematic execution within the FiST. To accomplish this, the FiST leader must provide clear direction to each FiST member and establish effective communication within the FiST. When unsynchronized, the FiST tends to rush. Rushed actions are the quickest way to ensure the failure of a package. Ensure your team attacks a situation with a deliberate and methodical approach. Develop routines and teamwork for FiST actions. This will facilitate control of the FiST for the FiST leader.

Another essential element of managing a FiST is fostering communication within the team. Effective communication supports the flow of information. Information and clear communication come from cooperation and building the team concept on a FiST. All information flows through the FiST leader. He approves all indirect fire missions and CAS 9-lines and is responsible for all integration. Information is critical to building the situational awareness of the FiST leader.

The Effective FiST leader

The key to becoming an effective FiST leader is developing situational awareness. **Situational awareness** is the alertness to the rapidly changing environment that exists on

the battlefield and the ability to perceive how an action effects that environment. In order to develop this trait the FiST leader must gain a clear picture of the situation. He gains a clear picture through information from various sources:

1. The Battlefield (Battlefield and Attack Geometry)
   A. Friendly units
   B. Enemy units
   C. Terrain
2. The FiST Members (Supporting Arms Experts)
3. The Company Commander (Scheme of Maneuver)

This requires that the FiST leader has a thorough working knowledge of each of the FiST members' capabilities and limitations and the information they can provide. Effective operation of the FiST facilitates information flow to the FiST leader. Further, the FiST leader must understand the tasks assigned by the company commander. Finally, the FiST leader must thoroughly understand the enemy situation. To do this, the FiST leader must learn to trust his own observations and those of the team. The next section provides some techniques and procedures to aid the FiST leader in becoming an effective provider of fire support for the commander.

Techniques and Procedures for Effective Operation of the FiST:

✓ **Pass Information to the FiST Leader**
Everyone keeps the FiST leader informed of actions taken.
- This will facilitate control of the team for the FiST leader.

✓ **Positioning the FiST**
Position the FiST where it can see the battlefield.
- Work closely with the company commander to position the FiST.
- The team should be able to see all targets. This will aid the FOs in the adjustment process.
- The team should also be able to see friendly lead trace. This will help the FAC construct his 9-lines and allow him to safely clear the aircraft hot.
- Additionally, the FiST should be in a good position to view the terrain in the target area. This will aid the company commander in building his scheme of maneuver.
- Then orient the FiST member to all targets.

✓ **Use All Available Assets**
Attack targets with all available assets
- This provides insurance against the loss of an agency, allowing the commander to retain flexibility. For example, if a high value target is identified during a battalion attack, artillery support may be unavailable to support the company.
- Additionally, this allows for redundancy in SEAD packages, which can cover a mark round that may dud.

✓ **Avoid getting rushed**

It is faster in the final analysis to check FiST activities and information periodically than to rush an incomplete package with an early TOT.

- When constructing a timeline, collect necessary information to develop a workable timeline.
- Be very deliberate when obtaining information from FiST members and other agencies.
- A sample of the types of information and actions required to construct and integrate a package is presented in the following table:

Required Information	Required Information
The Enemy (targets / positions)	**Integration of the Package**
• Grid(s) to enemy positions	• Scheme deconflicted from indirect fires
• Direction to enemy positions	• Scheme deconflicted from RW BPs
• Elevation of enemy positions	• RW BPs deconflicted from indirect fires
Information to be Plotted on a Map	• RW BPs deconflicted from FW cones
• Artillery position	• FW deconflicted from indirect fires
• Artillery GTL to enemy positions	• FW deconflicted from Scheme
• Mortar position	**Verify Effects of Fires**
• Mortar GTL to enemy positions	• Artillery has effect on target
• CAS 9-Lines (Final Attack Cones)	• Mortars have effect on target
• RW Battle Positions	**Pass Corrected Grids**
• Company Lead Trace	• Artillery FO passed corrected grid to FAC
• Adjacent unit positions	**Pass the Package to:**
Information Provided by the CO	• The Company Commander
• Scheme of maneuver	• The FiST Members
• Action left or right	• Higher Headquarters (CO)
• SBF position	• Subordinate units (CO)
• Duration of suppression required	**FiST Members Pass Timelines**
Constructing the Timeline	• Arty FO to battery or FDC
• Separation between FW attacks	• Mortar FO to the gun line
• Mark types from FAC	• FAC to FW and RW aircraft
• PGM attack time	**Recheck Package**
• R&G attack time	• Accuracy of timeline
• Duration of RW attacks from FAC	• Deconfliction all assets
• Maneuver time / space estimation	• With the Company Commander
• Duration of suppression on enemy	****************SET TOT***************
• Time when direct fire is active	• Verify with Company Commander

- Only once this information is collected and these actions have been taken is the FiST ready to set a TOT.
- Specific details on timeline construction are covered in **chapter 9.**
- Specific details on integration of a package are covered in **chapter 10.**

✓ **Setting TOTs**

Do not set TOTs that are less than 10 min out from the first artillery action in a timeline

- Many actions have to occur before a package can be executed.
    1. The arty FO, 81s FO and FAC must send the timeline to their respective agencies.
    2. The FSCC has to approve it. This means the AirO, Arty Rep and FSC must each review the package.
    3. Then FDC must process the mission.
    4. The battery will then get the mission and apply the data to the guns.
    5. The mortars must also apply the mission on their gun line.

- Some actions may occur up to five minutes before your TOT (i.e. PGMs fired on the front of the package). The FiST leader must account for this when setting the TOT.

✓ **Develop a routine for FiST Actions**

Use all members of the FiST prior to contact.

- The FiST leader announces when a priority target changes.
- The FO's monitor and pass significant actions of adjacent units.
- The FO's and FAC pass changes in asset availability.
- One FiST member monitors changes in direction of the FiST vehicle.
- One FiST member monitors current FiST position.

Get all members of the FiST working when contact is made

- The arty FO gets grids to and elevation of enemy positions.
- The mortar FO gets direction and distance to enemy positions.
- The FiST leaders makes target assignments.
- FAC requests aviation and constructs 9-lines.
- FOs adjust indirect fires.
- This creates time for the FiST leader to work on construction and integration of a package for the company commander.

✓ **Develop FiST teamwork for CAS attacks**

Acquiring and clearing an aircraft for an attack is very challenging. Use all of the FiST members to aid this process. Assign FiST members tasks:

- One person, usually the arty FO spots and determines corrections from the mark. (the WERM rule applies to CAS corrections)
- The FAC watches for the aircraft.
- One-person watches aircraft egress. (to ensure they follow the FAC's egress instructions)
- Any additional personnel aid in spotting the aircraft.

✓ **Be prepared for a Time Crunch**

With a limited amount of time on station, aircraft can cause the FiST leader to feel a time crunch, which can rush a package.

- When an aircraft checks in with the FAC, get the aircraft's available time on station.

- Determine a "drop dead" TOT for your package based on the aircraft time on station. (a good guideline is having a package TOT that is at least 15 minutes prior to the end of the aircraft's time on station)
- Do not let an aircraft leave with ordnance.
- If necessary run a standard SEAD package. (use this technique if your package is not ready for a TOT)
- Use an adjusting round as a simple mark. Put the adjust round "at my command", fire the round and run the aircraft attack 30 seconds after it hits the target. (use this technique if a standard SEAD cannot be set up in time for the aircraft)
- Anticipate doing a "talk on". (use this technique as a last resort, as the aircraft will be unprotected from enemy fire)

Techniques and Procedures for Maintaining a Map

The FiST leader's map is a very important tool in must be maintained continuously. The map is where the FiST leader deconflicts the elements of the package.

✓ **Plot all information on your map**
  - Indirect fire agencies
  - CAS 9-lines
  - Subordinate and adjacent units
  - Adjacent unit fire missions and 9-lines
  - Fire supports coordination measures
  - Friendly unit positions forward of the FLOT (forward line of troops)
  - Safety restrictions (Ordnance Minimum Safe Lines)
  - This will help you see battlefield and attack geometry.
  - This will also help determine where deconfliction is needed.

✓ **Draw enemy threat rings**
  - This identifies enemy capability to engage friendly forces.
  - This will aid in timing of fires. In order for you to maneuver without cover into a threat ring fires must be planned to support exposed maneuver. (start suppression)
  - Additionally, this will indicate requirements to coordinate maneuver and fires with adjacent units.

✓ **Draw Ordnance Minimum Safe Lines**
  - This will aid in timing of fires. When your maneuver elements reach the edge of the ordnance minimum safe line your indirect fires must stop. (during CAX exercise)(end suppression)
  - Use pre-built templates or a compass to quickly plot minimum safe lines.

Techniques and Procedures for Effective Communication on the FiST:

✓ **Maintain information flow**
Everyone keeps the team informed of actions taken and adjacent unit actions.

- This allows the FiST leader to efficiently track each of the FiST members' actions without always having to question them directly.

✓ **A method for communicating on the FiST**

Everyone "rogers up" to information and "sounds off" when passing information

- This ensures all team members hear the information being passed and if a member does not respond the team leader knows he did not get the information passed.
- An example of this communication might sound like this:

  > The 81s FO has just found the direction to a target
  > He yells out "3 BMPs direction 6120"
  > The rest of the team responds "roger direction 6120"
  > The FiST leader then updates the Battle Board

- This also allows the FiST leader to plot or update information on the map or the Battle Board.
- The following is list of items that require this type of communication:
  1. Grid to target
  2. Distance to target
  3. Mortar "FIRECAP" grid
  4. Target elevation
  5. Aviation "Stay Above"
  6. RW Attack Positions
  7. "Shot" for indirect assets
  8. "Splash" for indirect assets
  9. Corrections from marks for aviation
  10. TOTs

✓ **Everyone stays on the same "sheet of music"**

- FOs should use the same grid and direction to target(s). This aids clearance in the Fire Support Coordination Center (FSCC). If each FO uses a separate grid to a target then the Fire Support Coordinator (FSC) sees multiple targets where only one actually exists. Resulting in an incorrect enemy situation in the FSCC. This can also cause the mission being planned by the FiST to be denied.

✓ **The Battle Board**

Use a Battle Board to display critical information

- The board belongs to the FiST leader and serves to focus the efforts of the team.
- It is a communication tool.
- In order to be an effective tool for the FiST the Battle Board must be updated continuously to ensure only current, accurate information is being referenced by the FiST.
- Written information eliminates misunderstandings that can occur with verbal communication or trying to remember what information was passed 5 minutes ago.
- Additionally a Battle Board provides an accurate and detailed reference for the FiST members and company commander with respect to time lines, deconfliction of fires from maneuver and aviation.
- This is where construction and coordination of a package will occur.
- An example Battle Board follows on the next page.

FRIENDLY LOCATION	ENEMY GRID	DESCRIPTION	DIR	DIST/OT	TGT # / ADJ GRID
	(1)				
MORTAR POSITION	(2)				
	(3)				

BATTERY LOCATIONS
(1)
(2)
(3)

RWCAS:
PGM BP ___ | R&G BP ___
DIR ___ | DIR ___

FWCAS: #1
IP ___
DIR ___
OFFSET ___
FAC/H ___
SA ___

FWCAS: #2
IP ___
DIR ___
OFFSET ___
FAC/H ___
SA ___

TOT ___

RW
FW

TGT # / DESC ___

ARTY ___
ARTY ___
81s ___

MANEUVER SBF ___ ASLT

✓ **Everyone keeps records of their missions**
  - This allows the FiST leader to track the progress of the team. (i.e. the FiST leader knows that once an FO establishes the 100m bracket on a target, he is almost adjusted on the target)
  - This also allows for a review of FiST actions during a debrief after a package has been executed.

✓ **Priority of communicatious**

Priority of fires requires priority of communications on supporting arms nets
  - If you have priority of fire then clear others off the net. If you do not have priority of fires and another FO, who does have priority, starts to call a mission get off the net so he can get his mission called. Remember the commander has a reason for assigning priority of fires.
  - If the indirect nets are crowded by all FOs then all missions will be delivered slower than if FOs cooperate on the nets.

✓ **Communication Problems**

Make use of alternate communications nets
  - There are numerous ways to work around communication problems.
  - Many nets are monitored in the battalion COC. If a primary net is down, use an alternate net as a means of communication.

✓ **Other sources of information for the FiST**

Make use of artillery nets as an alternate source of information
  - Adjacent unit fire missions and CAS 9-lines provide enemy locations and descriptions.
  - Track these missions to find out where the enemy is in adjacent sectors. Plot their threat and verify if they can affect your unit.
  - This gives you an alternate source of information that is near real-time versus waiting for battalion to pass an intelligence update.
  - FiST members should monitor their nets and pass information as they get it.

Chapter 5:
Guidelines for the Forward Air Controllers and Aviation Employment

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In This Chapter

- Goals of Employing CAS
- Guiding Aircraft So Ordnance Hits the Target
- Ensuring Aircraft Safety during an Attack
- Understanding Separation Plans
- Controlling Aircraft Using a 9-Line Brief
- Techniques and Procedures for Employing CAS for the FiST Leader
- Aviation Weapon Considerations for the FiST Leader

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CAS Employment
When employing CAS the FiST leader and FAC should focus on two goals.

- Ensuring the aircraft's bombs have an effect on the target.
- Ensuring that the aircraft are reasonably safe from enemy and friendly surface fires.

Goal 1: Getting Bombs on Target
To get an aircraft's ordnance onto a target you must accomplish three tasks:

- Acquire the aircraft
- Accurately mark the target for the aircraft
- Make a good correction from the mark for the pilot

Task 1: Acquire the Target
The first step in getting a plane's bombs on target is having the FAC clear the aircraft "HOT." In order to clear an aircraft to release its ordnance the FAC must visually acquire it. There are several techniques to accomplish this task. They include flares, fuel dump (also know as a "squirt") and wing flash (or wing tip). Keep in mind that these methods also make the aircraft visible to the enemy so always use caution when employing these methods to acquire aircraft.

Additional methods you can use to acquire aircraft include drawing the final attack cone on a map and having the FAC explain the aircraft tactics (i.e.. Roll in altitude). By drawing out the final attack cone you can narrow down the sector of sky to search for the aircraft. Aircraft tactics will further narrow the search for aircraft.

Task 2: Mark the Target
The second step in getting a plane's bombs on target is to orient the pilot to the target by marking the target. Obviously, accurate marking is critical to success. Use both artillery (WP or Illumination) and mortar rounds (RP and Illum) to mark the target. The accuracy with these marks will depend on your adjust fire procedures.

Consider using laser designators. This type of mark will increase first round hit probability. However, consider the possibility of the laser spot tracker (LST) picking up backscatter at the designator, which may cause the aircraft to release, toward the designator. Proper construction of a final attack cone with respect to the designator position can eliminate this problem.

The key to marking a target is redundancy in marks. Always, plan for a second, backup mark. This provides insurance against an abort of the mission due to the loss of the mark.

Task 3: Making Accurate Corrections
The third and final step in the process is to make an accurate correction from the mark for the aircraft. The basic correction contains three elements; the reference point (usually the mark), a cardinal direction, and distance in meters (from the mark to the target).

Goal 2: Protecting Aircraft from Enemy and Friendly Fires
By using a SEAD package that suppresses enemy targets, that can endanger the aircraft, you protect the aircraft from potential enemy fires. In order to protect aircraft from friendly fires active during your SEAD package, you can create safety measures or fratricide avoidance measures for the aircraft. The purpose of these measures is to separate the aircraft from the affects of your fires. These measures will help determine the construction of your timelines and affect the FACs' 9 lines. By building safety measures for aircraft into your timeline and 9 lines you will allow other supporting arms to continue to fire in support of ground maneuver and aircraft protection (the fires of your package). Additionally, you achieve the overall goal of combining all assets for maximum effect on the enemy. A separation plan is the technique you will use as your safety measure.

Separation Plans
A Separation Plan is an informal Airspace Coordination Area (ACA). It is established by the maneuver commander to deconflict aviation from other supporting arms in order to protect them from the unintended effects of those fires. The separation plan allows supporting fires to continue which aid the protect aircraft from enemy surface fires. Suppression of a target or enemy position during an aircraft's attack will affect the type of separation plan that can be use to protect the aircraft. Ideally, the FiST leader should use the separation technique that requires the least coordination without adversely affecting the pilot's ability to complete the mission safely.

There are four types of separation plans.
1. Lateral separation
2. Altitude separation

3. Time separation
4. Altitude and lateral separation

The following pages provide examples of the various types of separation plans.
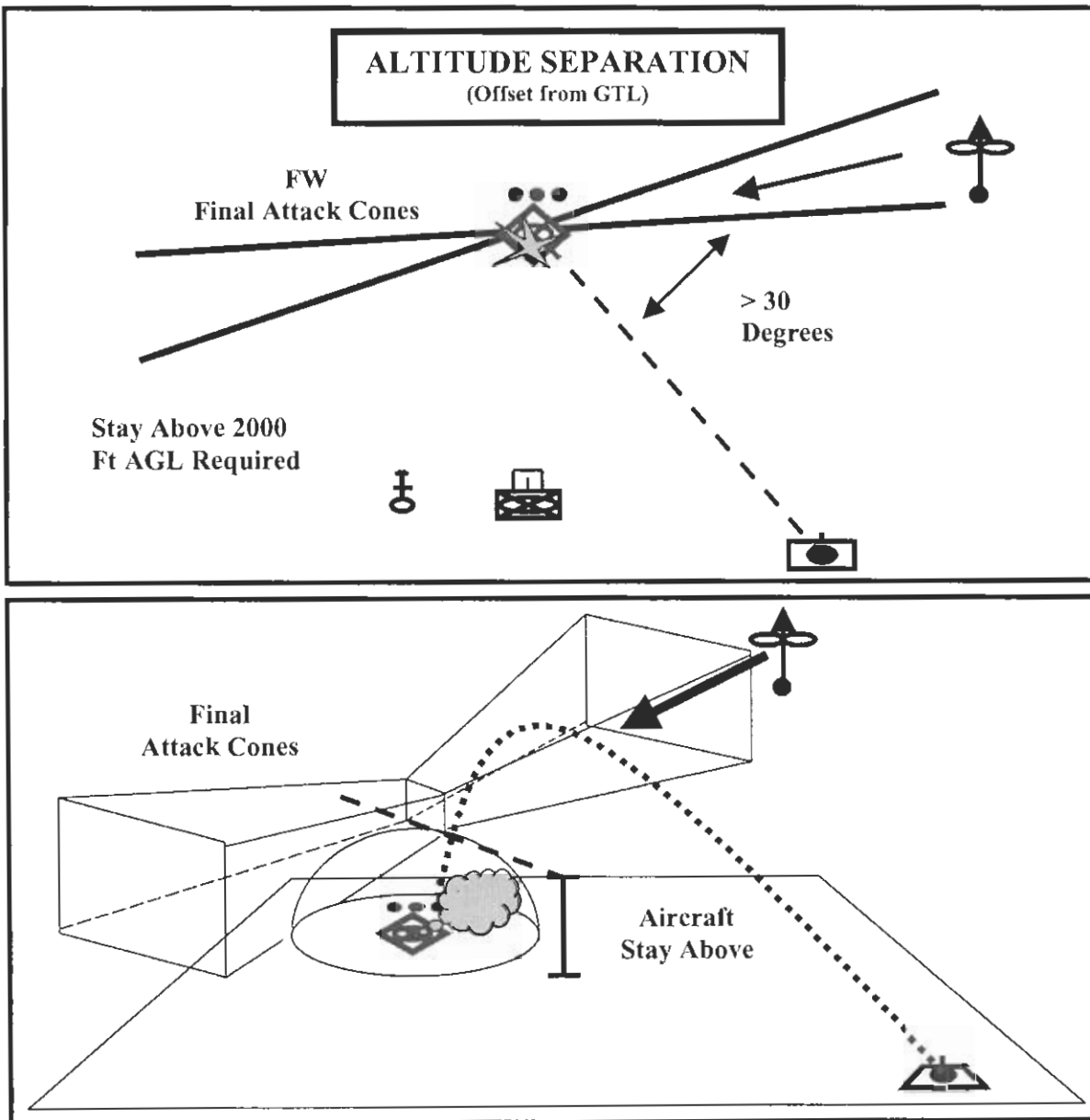
Lateral Separation
Lateral separation can be used for attacks against two adjacent targets. The technique involves indirect fires attacking one target while the CAS attacks the other target. In order to achieve this technique the aircraft flightpath must be restricted to deconflict it with active gun target lines (both artillery and mortars). Aircraft flight restrictions are stated in lines 1 (IP selection), 2 (offset direction and final attack heading / cone) and 9 (egress instructions) of the CAS 9 Line Brief. Additionally, RW are normally separated with this technique by the construction of offset battle positions.
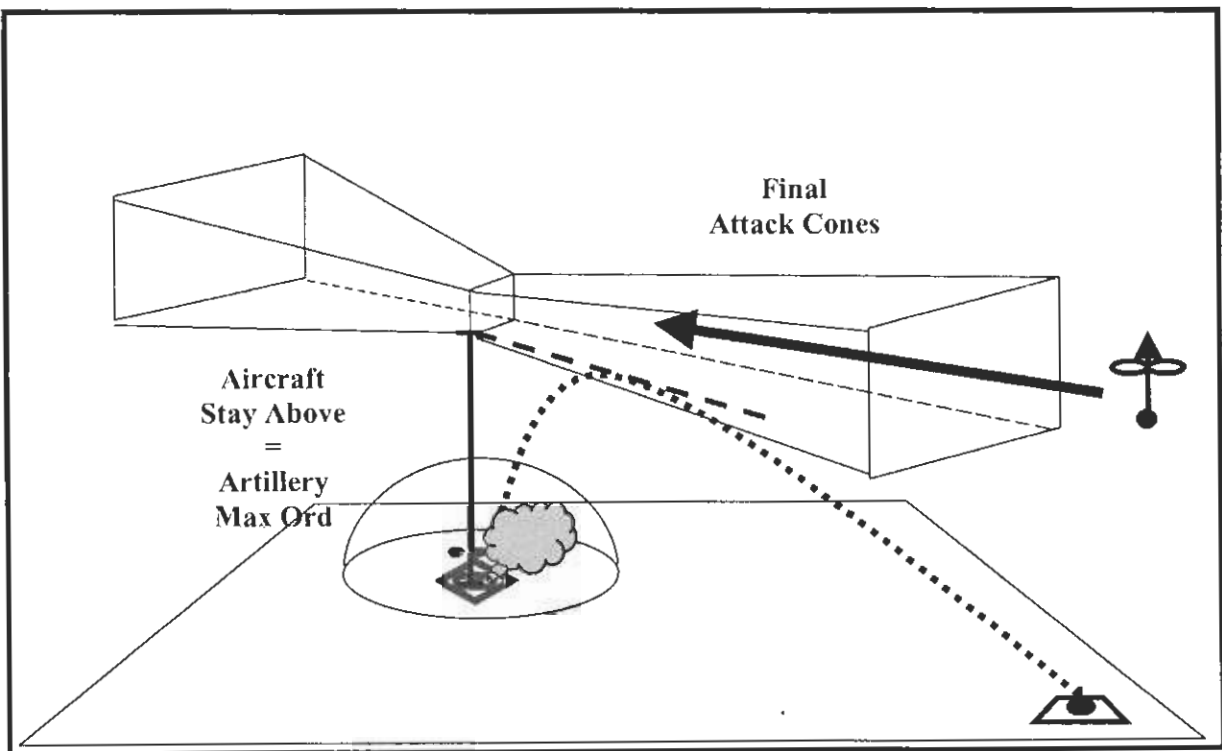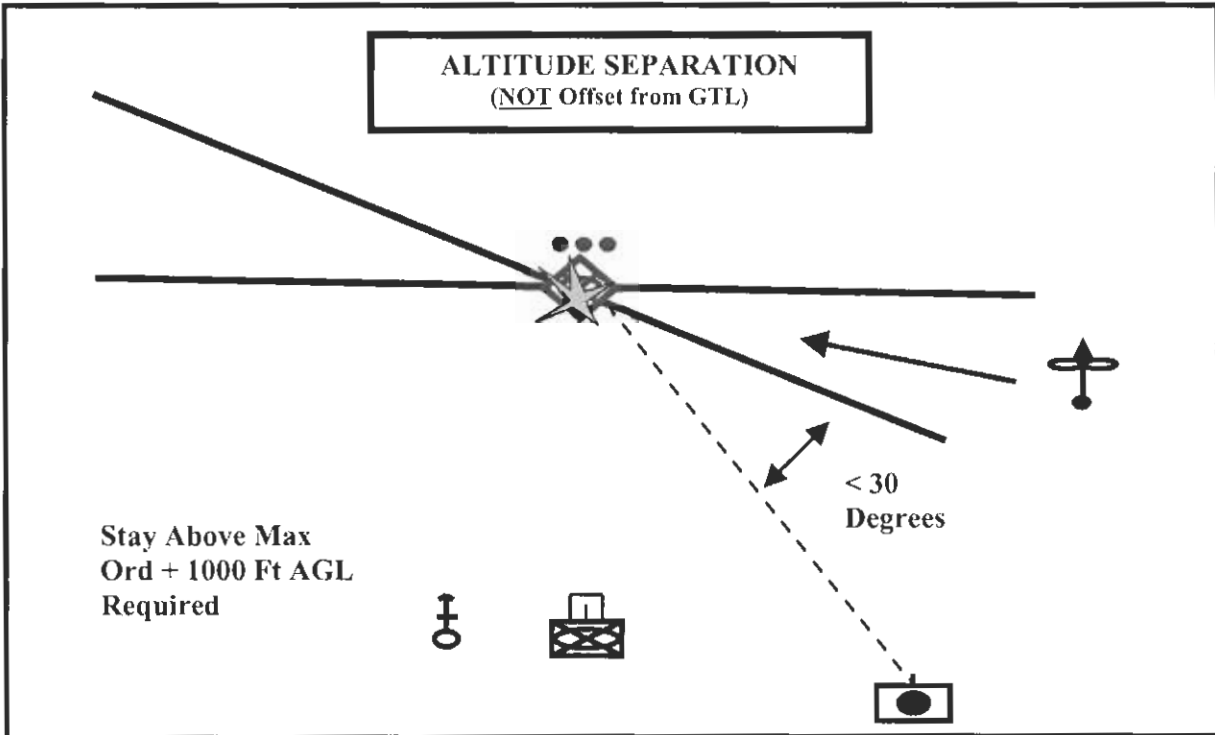

LATERAL SEPARATION

FW
Final Attack Cones
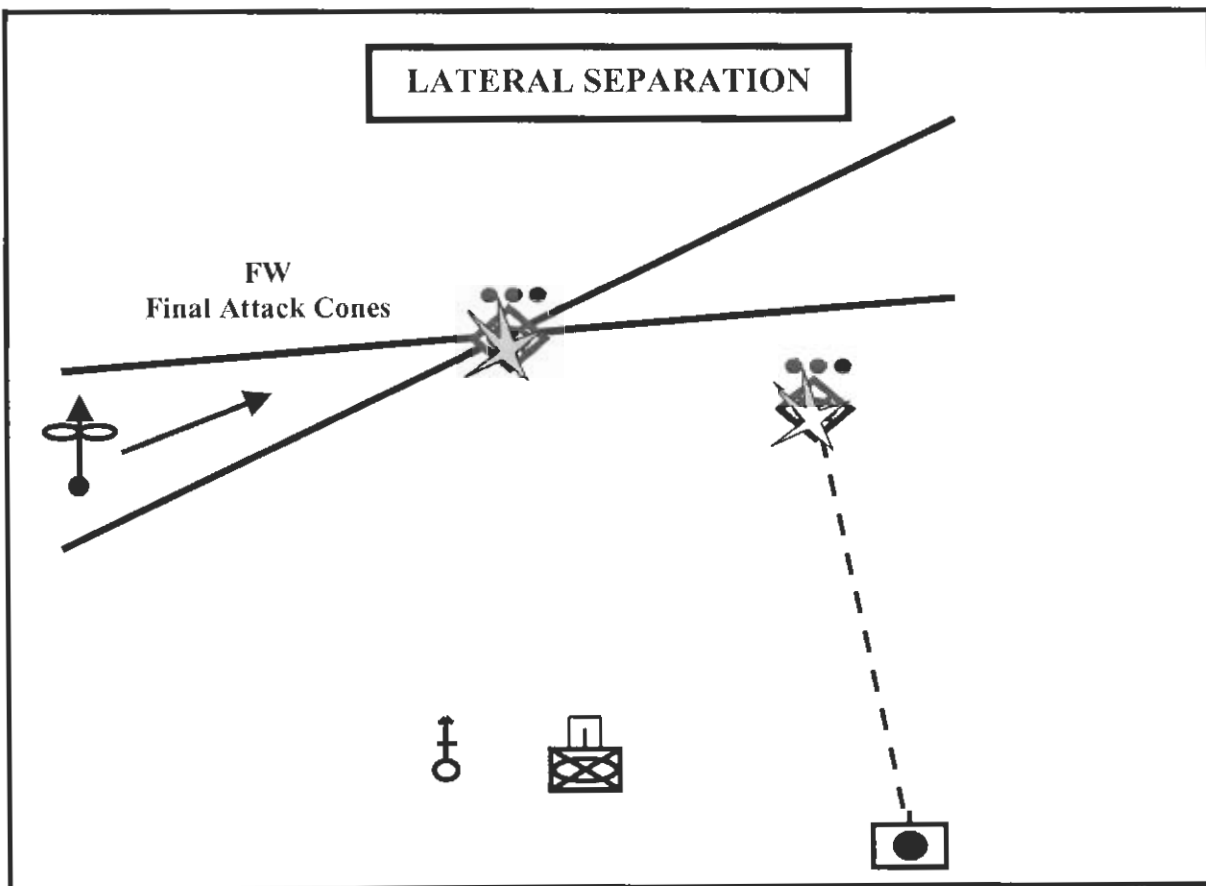
Altitude Separation

Altitude separation is used for simultaneous attacks by CAS and indirect fire weapons against the same target. To do this, the aircraft are given altitude restrictions during portions of thier flight profile. This restriction is stated in the amplifying remarks section of the CAS 9 Line Brief. There are two techniques for altitude separation.

First, the aircraft must be laterally offset from active artillery gun-target-lines and mortars must be interrupted. In order for the aircraft to be considered laterally offset from a gun target line the final attack cone must be a minimum of 30 degrees off of the gun target line. If these conditions are met then the aircraft are given altitude restrictions to deconflict it from the artillery fragmentation pattern.

ALTITUDE SEPARATION
(Offset from GTL)

FW
Final Attack Cones

> 30
Degrees

Stay Above 2000
Ft AGL Required

Final
Attack Cones

Aircraft
Stay Above

Second, when the aircraft are not laterally offset from the artillery gun target line or mortars are being fired continuous then the aircraft are required to remain above the maximum ordinate of the indirect projectile plus a 1000 ft AGL buffer.


ALTITUDE SEPARATION
(**NOT** Offset from GTL)

< 30
Degrees

Stay Above Max
Ord + 1000 Ft AGL
Required

Final
Attack Cones

Aircraft
Stay Above
=
Artillery
Max Ord

Time Separation

Time separation is in effect when indirect weapons are not active during the CAS attack. Interrupted SEAD is an example of time separation. This is the least preferred separation plan because it does not protect the aircraft from ADA threats. It may be required when mortars are used or when ordnance type requires a low delivery and you are suppressing a deep ADA threat (attack short, suppressing long).

TIME SEPARATION

No Cone

Suppression
Interrupted
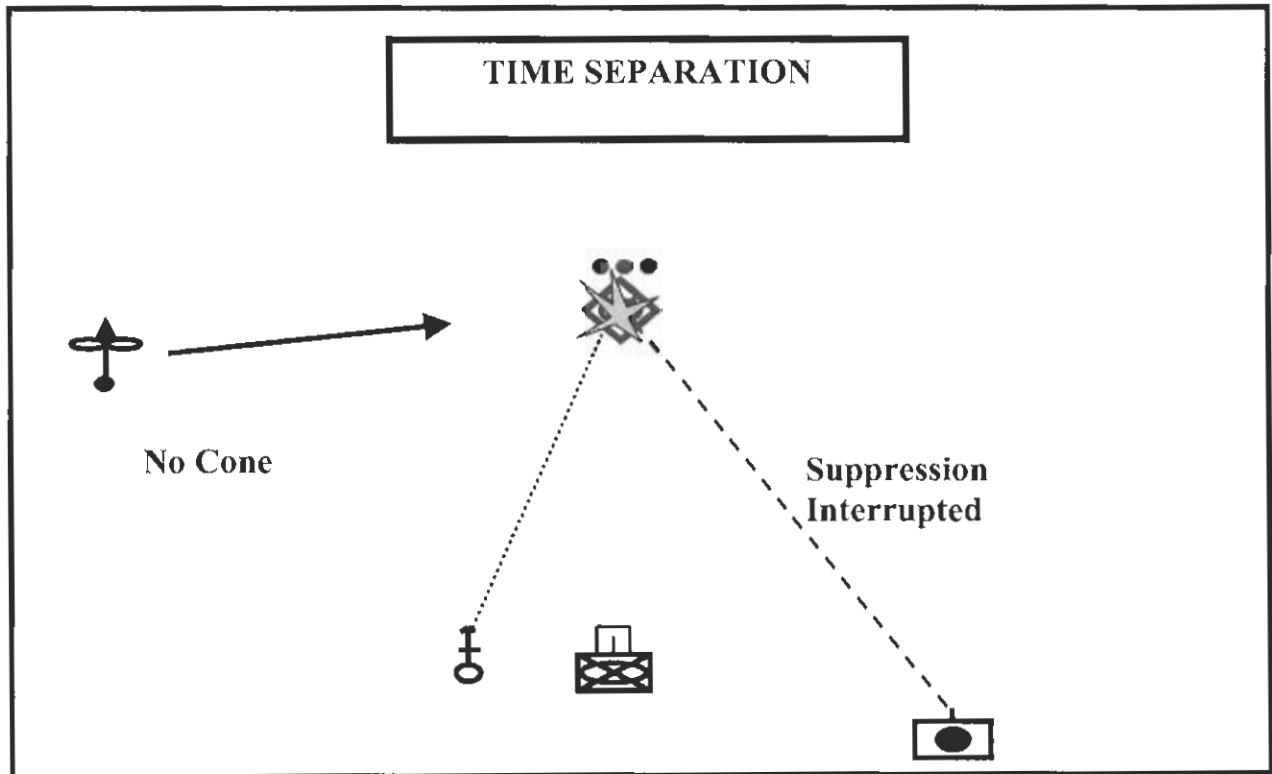
Altitude and Lateral Separation

Altitude and lateral separation is used when multiple indirect gun target lines and direct fires are active during an aircraft's attack. Both altitude and flightpath restrictions are placed on the aircraft. Aircraft and indirect fire weapons that are attacking the same target are deconflicted in space by a stay above altitude restriction. IP selection, offset, final attack cones and egress instructions restrict aircraft overflight of active gun target lines. Additionally, aircraft may be given a stay above or stay below to deconflict it from deep artillery fires.

ALTITUDE AND LATERAL SEPARATION

Stay Above or Stay Below Required

SUPPRESSION CONTINUOUS

Aircraft Stay Below

Final Attack Cones

32
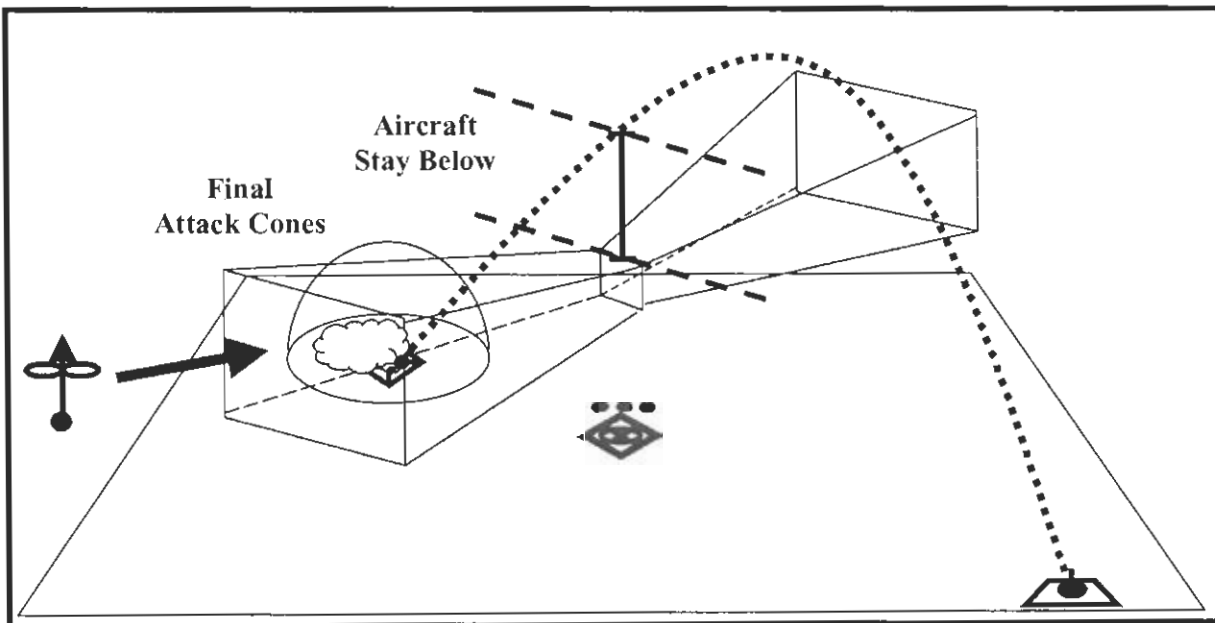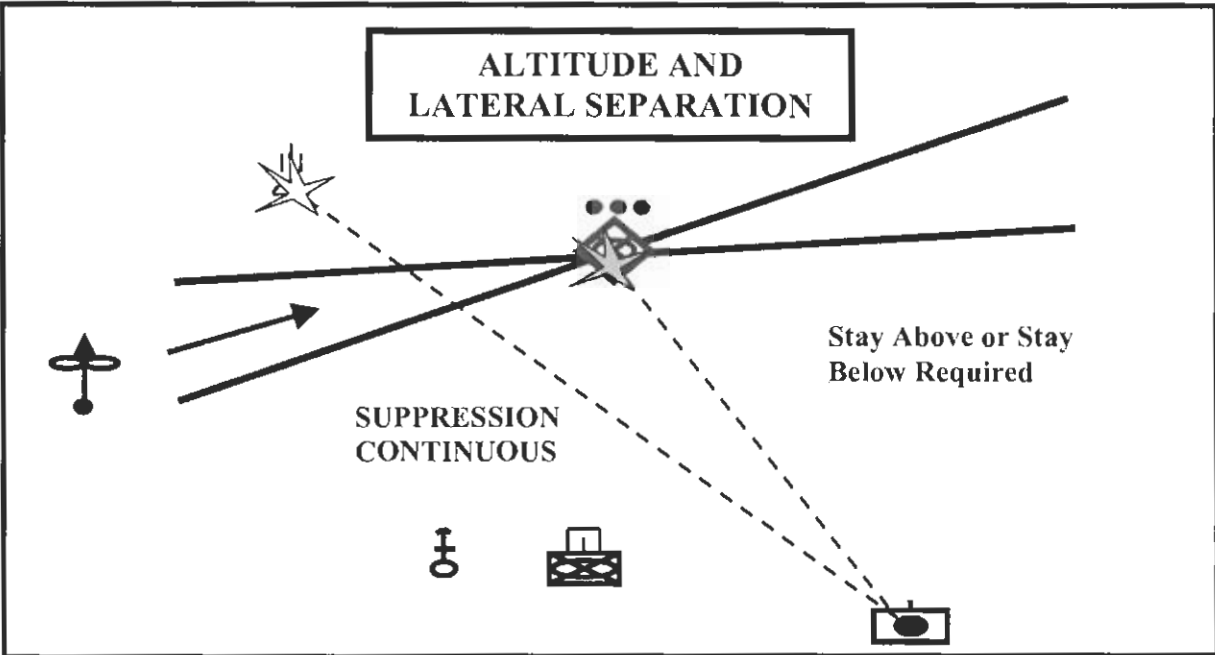
Selection of a Separation Plan

The choice of a separation plan is based on several factors:
1. Ground scheme of maneuver
2. Suppression requirements to support maneuver
3. Indirect fire weapons available
4. Air defense threats
5. Weather conditions
6. Aircraft ordnance (high or low drag)
7. Adjacent unit boundaries

Once these factors are determined you can decide how to deliver aviation ordnance for maximum affect on an enemy while protecting the aircraft.

Aircraft Control and 9-Lines

In order to realize these separation techniques the FAC will use CAS 9 Line Briefs to pass information to the pilots of the aircraft. These briefs are used to control the aircraft and ensure pilots have specific instructions to achieve the results required by the FiST and company commander.

The basic CAS 9 Line Briefs contain the following information:

Fixed Wing	Rotary Wing
1. Initial Point (IP) – the position the aircraft starts his run into the attack.	1. Battle Position – the maneuver area that contains the RW CAS firing point.
2. Heading / Offset	2. Heading
3. Distance (nautical miles)	3. Distance (meters)
4. Target elevation	4. Target elevation
5. Target description	5. Target description
6. Target location	6. Target location
7. Mark type (laser code if applicable)	7. Mark Type (laser code)
8. Friendly position	8. Friendly positions
9. Egress instruction	9. Egress instructions
Amplifying remarks	Amplifying remarks
TOT	TOT

Techniques and Procedures for Effective Employment of CAS for the FiST leader

One of the most difficult functions performed by the FiST Leader is integrating air support with surface fires. This section presents techniques and procedures, which can be used in situations which require integration of aviation with other supporting arms.

✓ **Plotting Guidelines**

The FAC should plot indirect fire agencies and friendly unit positions on his map and understand the ground scheme of maneuver

- This will aid in choosing a separation plan, deconfliction of aircraft routing, placement of RW attack positions and positioning of FW attack cones.

✓ **Maintain Flexibility in the Package**

Always plan for employing both RW and FW CAS in the package

- Planning for only one asset, when both may show up will cause time delays in order for you make changes to your plan to accommodate both RW and FW.
- It is easier to plan for both RW and FW in your SEAD package, because even if only one asset shows your package can accommodate it without changes. Thus, saving time and allowing you maintain flexibility.

✓ **Managing the "Time Crunch"**

Aviation assets, because of their limited time on station, will often put pressure on the FiST to work quickly. Be prepared for this "time crunch."

- When an aircraft checks in with the FAC get its time on station and write it down with the current time. This will help in determining a drop-dead time when you must use the ordnance that the aircraft has available.
- Know the aircraft's time on station.
- Plan "drop dead" times for a TOT, Talk On or sending the aircraft to the Tanker.
- Generally, plan on using an aircraft at least 15 minutes prior to their need to return to base. This means you should have a TOT 15 minutes prior to the drop-dead time.
- Don't let aircraft go home with ordnance.
- If time is running short and only one agency is adjusted on target set a TOT for a standard SEAD (interrupted or continuous) to deliver the ordnance.
- Any mark is better than no mark (use suppression as a mark if necessary).
- Use an adjust round "at my command" as a mark. Request time of flight for the round from the artillery FO. Then trigger the "at my command" round so it land 30 seconds prior to the aircraft TOT.
- The FAC should mentally rehearse talk-ons.
- Have the FAC do a talk-on for the aircraft. (this technique should only be used as a last resort as it offers no protection for the aircraft from enemy fires)
- Do not talk on with an adjustment from your position or a lead trace position.

✓ **Build and Maintain the Pilots Situational Awareness**

The FAC should always be building the pilot's situational awareness

- Use adjust rounds as a reference for building a pilots situational awareness.
- Use terrain features that are highly identifiable from the air to build situational awareness (i.e. roads, intersections, large hilltops, etc...).
- Use descriptive and directive terminology when talking to the pilot (i.e. "follow the main road running down the middle of the corridor north to the road junction by the large hilltop").

✓ **Visual Acquisition of Aircraft**

FiST members must aid the FAC in visual acquisition of the aircraft

- A clear sky can make acquisition a very difficult task.

- Anticipate the need for a flare, wing tip or a "squirt" (the AV-8B is not allowed to give a "squirt").
- The FAC should lay out very specific sectors of the sky for the team members to scan for aircraft based on the final attack cone.
- The FAC should reference terrain features to help orient the team to the appropriate sector of the sky.
- The FAC should state the aircraft's roll in altitude and tactics (high, medium or low) to further narrow the search for team members.

✓ **Decisive Corrections from Marks**

Corrections from marks must be clear, concise and quick

- Differentiate between marks, when there is more than one mark.
- Reference the specific mark (i.e. "from the RP", "from the illum on the deck").
- Make corrections in cardinal directions only. (Drop or add does not make sense to the pilots).
- Give a direction correction first, then a distance correction.
- Make corrections using cardinal directions.
- Make distance corrections in meters.
- Generally make distance corrections in increments of 50 meters. (i.e. "from the illum mark southeast 250")
- Make Dash 2's correction from leads hits if his hit was close to the target, otherwise tell Dash 2 to disregard leads hits and reference the mark for a correction. (i.e. "from LEADS hits west 100")

✓ **Choosing a Mark**

The mark is your means for controlling where the aircraft places its ordnance. Consider the type of mark you use for the aircraft

- For RP or WP consider the effect of the wind on the smoke.
- If using precision guided missiles consider a marks obscuration effects.
- For illumination on the deck, consider micro terrain in the vicinity of the target. The aircraft may see the mark but the FAC can not. If you can not see the mark then you will not be able to get the bombs on target.

✓ **LASER Markers**

Use a LASER marker when available

- Laser pointers can include the MULE, the Night Target System (NTS) on the cobra and the handheld ISLT and LPL-30.
- Laser marking can increase the probability of first round hit.
- The maximum effective range for most Laser designators is 3 to 5 km. At ranges beyond this the beam becomes too diffuse to for the Laser Spot Tracker (LST) to pick up the energy.
- Consider environmental factors when employing a laser mark as conditions can affect designators and seeker performance.
- Remember, not all aircraft are (LST) equipped.
- The LST should not be used as the sole source for target verification. An additional mark (i.e. illum on the deck during the day or RP during night attacks) should also be used because of the possibility of the LST picking up backscatter at the designator, which may cause the aircraft to release toward the designator.

- When using a laser spot for a mark build the FWCAS final attack cone or RWCAS BPs around the laser designator to target line.
- In order to construct final attack cones for the FWCAS the FAC must build a "basket" around the designator. The final attack cone must be 10 degrees off of either side of the designator to target line and no further than 60 degrees from the designator to target line. Thus creating a 50 degree "basket" on either side to the designator to target line for the aircraft final attack cone.
- Standard Laser Brevity Terms:
  1. "Ten Seconds" – prepare to start Laser designation in 10 seconds.
  2. "Laser On" – turn the Laser designator on.
  3. "SPOT" – Aircraft has acquired Laser energy.
  4. "SHIFT" – Shift Laser energy from offset position to the target"
  5. "TERMINATE" – Turn the Laser designator off.

✓ **Aviation Ordnance and Maneuver**

Evaluate the effects of ordnance on maneuver

- Ordnance minimum safe separation may affect when maneuver can begin and may affect the length of indirect suppression required to support maneuver.
- The company commander must deconflict ground maneuver from the effects of air delivered ordnance.
- This will ensure that ground forces are as safe as practically possible. This is your means of reducing the fratricide risk to friendly forces.

✓ **Aircraft Reconnaissance**

Use aircraft to look down range

- Aircraft can report enemy positions.
- Aircraft may be able to adjust fire and record as target in advance of maneuver.
- Do not let aircraft work on any targets the FiST can see.
- Once the FiST can see the target be sure to take the mission over from the pilot if they have not recorded as a target. (You will have better Situational Awareness of the situation and your fight than the pilot)

Aviation Weapon Considerations for the FiST Leader:

Aviation weapons present the FiST with some specific considerations that can affect the construction of Packages (timelines), 9 Lines and the selection of Separation Plans

✓ **Hellfire** (rotary wing LASER guided munition)
- Because the Hellfire is a laser guided munition it requires a clean battlefield in order for it to be employed.
- Hellfires do not have to be employed as part of a package. However if you decide to tie it into a package consider employing it up front before suppression starts.
- Hellfire allows up to 8 km standoff from a target, which is outside of the range of most ADA threats. Thus suppression to protect the aircraft is not necessary.

- Always account for the time of flight of the missile and provide a TOT firing window in the package timeline. The missile should impact at TOT, not be fired at TOT.
- A mark for a Hellfire is often helpful for quickly orienting the pilot to the target. If a mark is used plan for it to occur at least 45 seconds prior to the start of the attack in the package timeline.
- The preferred mark type for Hellfire is an illumination round placed on the deck. This will keep the battlefield relatively clean and not affect the laser.
- Always consider the position of friendlies relative to the Hellfire Surface Danger Zone as it is very large.

✓ **TOW** (rotary wing wire guided munition)
  - Because the TOW is a wire guided munition it does not require a clean battlefield in order for it to be employed.
  - The TOW offers a 3 to 5 km standoff from a target so suppression of ADA threats may or may not be required in order to protect aircraft.
  - Always account for the time of flight of the missile and provide a TOT firing window in the package timeline. The missile should impact at TOT, not be fired at TOT.
  - The TOW can be employed during a package with suppression on a target as long as the pilot can see the target.

✓ **RW direct fire ordnance** (2.75 and 5 in. rockets and 20 mm)
  - RW direct fire ordnance cannot be delivered toward friendly unit positions as this presents a fratricide risk.
  - To use direct fire ordnance to its maximum effectiveness the aircraft will have to get close to the intended target. In this situation the aircraft will be exposed to ADA threats and direct fire from the enemy position and the effects of friendly fire engaging the enemy position. In order to protect the aircraft you should provide suppression on the target and ADA threats.

✓ **High drag aviation ordnance and FW direct fire ordnance**
  - Plan gaps in suppression timelines for high drag or direct fire ordnance. This enables the aircraft to fly optimal delivery parameters (below 2000 ft AGL) required for better hits.

✓ **Napalm**
  - To use Napalm to its maximum effectiveness the aircraft will need to get close to the intended target.
  - Plan gaps in suppression timelines for Napalm. This enables the aircraft to fly optimal delivery parameters around 500 ft AGL required for the best hits.
  - This also improves the effectiveness of the hit of the canister and account for its lack of aerodynamics.