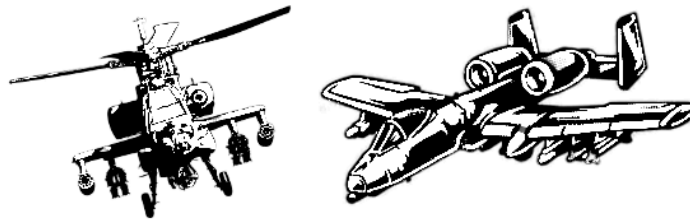


FM 1-75

51st VIRTUAL FIGHTER WING

COMBINED OPERATIONS



JOINT PUBLICATION FOR THE 1st REG AND 75th FS



Section 1: Understanding Limitations and Advantages of Airframe Types

AH-64 Apache (AH-64 and OH-58 Kiowa) Pros:

- **Loiter Time & Terrain Utilization:** Capable of extended loiter time and effective use of terrain to remain concealed and protected.
- **Area-Specific Coverage:** Ideal for covering a defined and specific area with detailed attention.
- **Detailed Situational Awareness (SA):** Provides a highly accurate, close-up picture of the battlespace. Two pilots per airframe facilitate one person focusing more attention on building threat picture, deconflicting with friendlies, and navigation.
- **Payload Capacity:** Can carry a significant amount of air-to-ground ordnance, making them versatile for different mission profiles.
- **Rapid Reaction to Close Threats:** Quick to respond to immediate, close-range threats.
- **Laser Spot Tracker (LST):** Easy use with a fast and wide field of view (FOV), aiding in target acquisition and buddy-lasing.
- **Continuous Target Tracking:** Generally able to follow a target continuously or experience lesser periods of masking in their TGP compared to fixed-wing aircraft.

Apache Cons:

- **Susceptibility to SHORAD:** Highly vulnerable to short-range air defense systems.
 - **Limited Area Coverage:** Slower than fixed-wing aircraft when covering large areas due to lower airspeed.
 - **Laser Range Limitation:** Effective cross-platform laser designation range is limited to approximately 8 nautical miles.
 - **Restricted Operational Picture:** Difficult to build a comprehensive battlespace picture beyond 10 nautical miles from their operating position.
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Hawg (A-10CII) Pros:

- **Versatile Ordnance Loadout:** Capable of carrying a wide variety of air-to-ground ordnance. The GAU-8 gun provides sustained firepower for escort, CAS, and overhead missions.
- **Extended Loiter Time:** Able to remain overhead for long durations to support rotary-wing operations.

- **Broad Situational Awareness:** Can build a comprehensive picture of the area of operations (AO) at a macro level.
- **High-Quality Targeting at Range:** TGP (Targeting Pod) offers excellent visual quality and target identification from 20 to 40 nautical miles. Ability to orbit above AO provides for a clearer “top-down” picture of the battlespace.
- **Defense Against Threats:** More capable of defending against anti-aircraft artillery and climbing above SHORAD weapon engagement zones (WEZ), providing coverage from altitudes inaccessible to Apaches. Airframe is able to take greater damage and remain operational.

Hawg Cons:

- **Slower Reaction to Close Threats:** Less effective at reacting quickly to immediate, close-range threats compared to Apaches.
 - **Limited LSS (LST) Effectiveness:** Laser Spot Search (LSS/T) become challenging when within 15 nautical miles or closer.
 - **Target Engagement Delay:** It can take more time to acquire, track, mark, sort, and engage targets compared to Apaches.
 - **TGP Limitations at Close Range:** Targeting pod becomes less effective at ranges inside 10 nautical miles or when directly overhead. Visual coordination is required in close proximity.
 - **Frequent TGP Masking:** TGP generally experiences equal periods of being masked and losing visual of the target while maneuvering.
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Section 2: Target Acquisition Techniques

Several methods are available for coordinating targets between Hawgs and Apaches. The selection of a method depends on factors such as timing, distance, and posture (overhead or offset).

1. Grid Coordinates (MGRS)

- **Overview:** Providing a 6- or 8-digit MGRS grid is the most universal and effective method, regardless of timing, distance, or position. 6- digit grids provide 100 meter confidence, and generally are easy enough for all aircraft to find their target.

Note: Requests for bomb-on-coordinate always require a 10-digit grid. Bomb-on-coordinate attacks are sight-unseen and assumed to be a pin-point target to attack. However, Apaches and Kiowas are only capable of entering 8-digit grids maximum, necessitating correlation (i.e., Type 1 or 2 control) from another player in the battlespace unless (i) attack is not danger close to friendlies or (ii) collateral damage estimate is sufficiently low.

- **Advantages:** All airframes can quickly enter MGRS coordinates and get their sensors on target within a minute.
- **Disadvantages:** Takes a few minutes to pass the grid, enter it, and slew sensors. In cases where an aircraft is taking direct fire, this time delay should be considered.

2. Smoke or Hit Marker

- **Overview:** Smoke or hit markers can be used to quickly direct attention to a target.
- **Advantages:** Ordnance effects such as gunfire, explosions or black smoke from a destroyed target are easy for aircraft to see, making it effective for acquiring a group of targets. Kiowa colored smoke grenades provide an easy-to-spot reference point for talk-on and correlation.
- **Disadvantages:** Less effective if the airframes are not already operating in the same area. A grid may still be required to confirm target locations.

3. Sparkle (IR Laser with NVGs)

- **Overview:** Sparkle involves using an infrared laser to mark a target, visible through NVGs.
- **Advantages:** Works well at night when the Hawgs are within ~15nm of the Kiowas. Sparkles can quickly illuminate a point of interest, allowing Hawgs and Apaches to fine-tune their sensors.

- **Disadvantages:** Only effective within a limited range and requires night operations. Apaches are not capable of emitting IR Lasers in DCS. The Kiowa can only employ the IR Laser (IZLID - hard mounted to .50 cal gun) by pointing its nose directly at the reference point, which requires pitch-down attitude i.e., forward motion unless the reference point is co-altitude.

4. LSS/LST (Laser Spot Search/Tracker)

- **Overview:** Hawgs can use LSS/LST to acquire targets being lased by Apaches, and vice versa.
- **Advantages:** Useful when the Hawgs are offset from the Apaches and need to find targets quickly. If the Apaches are already oriented toward the target area, a laser designation from a Hawg can be picked up by the Apaches very quickly for target confirmation and sorting.
- **Disadvantages:** LSS/LST is almost ineffective for the hawgs to receive especially when overhead. Hawgs should remain 20nm or further away to use this method effectively. Passing a grid is often more efficient.

5. Talk-on

- **Overview:** Visual talk-ons involve guiding the aircraft to a target using descriptive references.
- **Advantages:** Effective when the Hawgs are directly overhead and able to see the same visual references. If TRPs or other georeferences are pre-briefed and shared between the Hawgs and Apaches prior to flight, can provide quicker target acquisition.
- **Disadvantages:** Hawgs are generally too high or too far to use visual reference points effectively. Descriptions like "The mountain" or "The building with a red roof" may not be visible from altitude. Likewise, Hawgs that are high above the battlefield may struggle to give good close-in reference points for the picture of the Apaches lower to the ground with a shorter view. However, when directly overhead, the Hawgs can visually track a target and follow a talk-on well.

Note: Talk-ons are most effective when the Hawgs and Apaches are in close proximity and share a similar visual perspective. When offset, the visual picture is very different, making this method less reliable.

Section 3: Buddy-Lasing and Lobbing

Hawgs Lasing for Apaches

- **Overview:** Hawgs can stand off significantly further and at higher altitudes while still maintaining an effective laser designation for targets.
- **Advantages:** Apaches can use terrain to get much closer to a target than a Hawg can, allowing them to lob ordnance from behind terrain cover safely while the Hawg lases the weapon in. This combination is highly effective for defeating medium- and long-range SAM threats that either airframe would struggle to engage alone. When executed correctly, this tactic can neutralize high-threat targets with minimal risk to both airframes.
- **Disadvantages:** Hellfire (AGM-114K) seekers on the Apache are optimized for no more than 60 degrees of deflection from LTL to GTL. If lasing occurs at more than a 60 degree offset, vertically or horizontally,, the Hellfire may not track.

Apaches Lasing for Hawgs

- **Overview:** Apaches can provide effective laser designation for Hawgs as well. This is especially true when terrain, altitude, or weather directly affect the Hawg's ability to engage a target.
 - **Advantages:** Apaches lasing for Hawgs can speed up target engagement and increase attack accuracy. This can also allow the Hawgs to employ weapons in otherwise highly unfavorable situations.
 - **Cloud Cover and WEZ Considerations:** In situations where cloud layers or the target's WEZ are factors, Apaches can remain low while the Hawgs climb high over the target area. The Hawgs can drop LGB ordnance on a designated coordinate / reference point, and the Apaches guide the weapon into the target using their laser from a concealed position.
 - **Disadvantages:** Apache laser designators have an effective max range of 10-13km (6-8 miles). Kiowa laser designators have greater range, but may lack the precision beyond 6 miles necessary for an effective attack.
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Section 4: Radios & Communication

Effective radio communication is critical for joint operations between Hawgs and Apaches. The following best practices and guidelines can help improve cross-communication and situational awareness.

Intra-Flight Communication

- **Best Practice:** Hawgs should tune into the Apache inter-flight FM frequency (e.g., 31.5) to maintain real-time situational awareness.
- **Advantages:** This allows both airframes to share updates and coordinate without additional delays. It also improves overall mission effectiveness by reducing the need for redundant or duplicative communication.
- **Alternative:** Utilizing a separate net can work, but it may result in delayed or missing information. When using a separate net, communication updates require more deliberate and timely execution. The complexity of the comms ladder for the particular sortie at hand will dictate if this is required or not.

Attack Calls (e.g., "RIFLE")

- **Best Practice:** Attack calls, such as "RIFLE," should always be made over the agency net being used in the area of operations (AO). Calls over intra- or inter-flight nets could be missed or walked over easier.
- **Timing:** The attack call should **always** be made within a reasonable time (ideally immediately) before or concurrent with weapon release. Pilots should strive to avoid RIFLEs when it is known that enemy SAMs are launching within the same time window, **unless** expediency requires a shot to neutralize an imminent threat.
- **Reason: Any** delay in the attack call can cause panic among nearby aircraft, who may interpret a late call as a hostile SAM launch when their RWR goes off. This is particularly critical when multiple airframes are operating in tight airspace. Mavericks, Hellfires, and rockets will often sound the RWR missile launch warning on all airframes.

Section 5: Inter-agency Coordination

Standardized inter-agency communication is essential for expedient and accurate coordination between rotary, fixed wing, and ground assets. The objective of this coordination is to maximize engagement of all observed hostile units, leaving no assets unused. We can achieve this by utilizing standard CAS check-in, 5-line, 9-line, and FRAGORD communication procedures to build a unified situational awareness picture and ensure safe weapon employment that optimizes stand-off and volume of fires on a target.

Close Air Support Check-in

- CAS check in consists of 5 lines of information outlining the composition and status of a flight (lines detailed below).
- When a flight performs a CAS Check-in, the flight enters a “contract” with the unit that receives the check-in, building the available asset picture for the observing unit. Without this, the CAS flight is not required to work with the observer and the observer disregards that asset as unavailable for calls for fire, assuming it fragged for a different mission.
- This contract requires that if the observer finds a target deemed appropriate for engagement within the constraints of the commander’s intent, to enact a call for fire with either a 5-line or 9-line. The checked-in aircraft must remain on station and available to the observer and any deviation or change in availability reported to the observer.

Aircraft: " _____, this is _____." (ground unit) (aircraft call sign)
Aircraft Team: " _____." (composition and location)
Munitions Available: " _____." (rockets/guns/missiles)
Night Vision (if applicable): " _____." (capability and type)
Station Time: " _____." (minutes)

5-Line Call for Fire

The 5-Line call for fire is the standard for rotary wing calls for fire. It consists of 5-lines of information and is meant to be abbreviated for use in high tempo engagements that require

less stringent control measures, such as well established front lines with clearly discerned friendly units.

- Often, rotary assets are the observers, given they have a higher SA of the ground and operate in more fixed positions which makes it easier for the supporting aircraft to maintain situational awareness on the location of the observer and the FLOT.
- When employing a 5-line call for fire especially from a designating A-10, the range limitation of the AH-64's AGM-114K needs to be kept in mind. If an observed target is farther than 10km from the FLOT and the supporting aircraft has to cross into hostile territory, it may be beneficial to use a longer range weapon from an A-10 such as the AGM-65.
- A highly effective capability of the AH-64 is its ability to engage from a concealed position using the AGM-114K's ability to lock onto a laser designator after launch (LOAL). This means an observing aircraft can be at the maximum range of their laser designator (8nm) and designate threats without risking either airframe. When using this engagement method, it's critical to understand the deflection between the designating aircraft and the shooter. If the deflection is higher than 60 degrees, there's a high likelihood of the laser not being tracked. Be sure to remark on the required final attack heading for the shooter.

Rotary-Wing CAS 5-Line Brief		
1. Observer / Warning Order / Game Plan		
" _____, 5-line, (aircraft call sign) (JTAC call sign)		
Type (1, 2, or 3) control, MOA (BOC or BOT), (ordnance requested)."		
2. Friendly location / mark		
"My position _____, marked by _____" (TRP, grid, etc.) (VS-17, beacon, IR strobe, etc.)		
3. Target location		
"Target location, _____" (magnetic bearing and range in meters, target reference point, grid, etc.)		
4. Target description / mark		
" _____, marked by _____." (target description) (IR marker, tracer, etc.)		
5. Remarks / *Restrictions:		
*Final attack headings		
*LTL or PTL Surface-to-air threat, location, and type of SEAD		
*ACAs		
*Danger close and initials Additional calls requested		
Additional remarks GTL, weather, hazards, friendly mark		
*TOT / TTT		
*Post launch abort coordination and considerations		
Note: The rotary-wing CAS 5-Line should be passed as one transmission. If the restrictions portion is lengthy, it may be a separate transmission.		
Legend:		
ACAs- airspace coordination areas	IR—infrared	PTL- pointer target line
BOC—bomb on coordinate	JTAC- joint terminal attack controller	TOT-time on target
BOT—bomb on target	LTL- laser target line	TTT- time to target
GTL- gun target line	MOA—method of attack	SEAD—suppression of enemy air defense

