

# Dedicated Aerial Forward Observers: How a fundamental shift in allocating Unmanned Aerial Systems can increase the sensor to shooter lethality of Corps, Division and Brigade level artillery targeting shaping efforts

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As Large-Scale Combat Operations (LSCO) Decisive Action Training Environment (DATE) scenarios continue to become more complex, the opposing force (OPFOR) continues to become more adaptive to the way they hunt and target blue force command posts and critical assets such as artillery equipment and counter-fire (CF) radars across the battlespace. This is vital to understand because while the U.S military heavily focuses on using unmanned aerial systems (UAS) for information, surveillance, and reconnaissance (ISR) to determine where the enemy could have high payoff targets (HPTs) in time and space, the OPFOR can exploit and achieve success because of one simple fact: they use their red UAS to hunt, and they are good at it. The OPFOR does not need to use red UAS to conduct as much information collection (IC) as the U.S military because the OPFOR understands that blue force artillery and radars does not move as much within a large footprint, and therefore, once they find their HPTs, they can easily use red UAS in tandem with Special Purpose Forces (SPF) to hunt, target, and engage blue force critical assets with long-range precision artillery. What if Division Artillery (DIVARTY), Corps Field Artillery Brigades (FABs), and brigade direct support (DS) battalions had their own targeting UAS detachment? That would shorten the sensor to shooter kill chain, reduce target decay, decrease target prosecution time, reduced the need to dynamically re-task ISR assets that are allocated to the Divisions and Corps intelligence priorities, and increase the effectiveness of actively hunting, targeting, and shaping the enemy

artillery deep, while not interfering with the IC efforts of their respective S2/G2 staffs. Could this revolutionary and fundamental shift in how the U.S Army allocates UAS provide the solution to owning and dominating the hunt against a near-peer OPFOR adversary that believes in owning the fight through artillery and integrated air defense overmatch?

This paper will discuss a theory that by Corps FABs, DIVARTYs and BCT DS Field Artillery (FA) BNs that are given operational control (OPCON) of a targeting detachment consisting of one Grey Eagle (GE) platoon (Shadow UAS/Future Tactical Unmanned Aircraft System (FTUAS) platoon for DS FA BNs) from the Division/Corps respective subordinate Combat Aviation Brigades (CAB), and the necessary personnel to conduct the exploitation allows artillery unit Commanders to own the targeting process for those Division and Corps Commanders. This solution could ensure that field artillery units can strike targets, degrade enemy long-range artillery, disintegrate integrated air defense capabilities, and increase the effectiveness of the kill chain to meet their Commanders operational priorities. The paper will also look at the problem from the Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) model to provide a holistic perspective to the recommendation from a possible training concept to Army wide implementation.

### **Enabling the Counterfire Fight**

Field Artillery headquarters are inherently and deliberately tasked with conducting counterfire and destroying the enemy's long range artillery capability. The artillery has divided counterfire into two categories; proactive and reactive. Reactive counterfire is the form most people are familiar with; enemy artillery shoots, an acquisition radar detects the rounds and we respond by shooting rockets or cannons back at the enemy (FM 3-09; ATP 3-09.12). Artillery units are resourced with radars and can conduct reactive counterfire organically without any outside resources or augmentation.

Proactive counterfire on the initial glance seems contradictory, since most people think of counterfire as only reactive. Proactive counterfire is the result of the targeting process and assigning IC assets the task of identifying the enemy Integrated Fire Command (IFC), composed of supporting sensors, C2 nodes and delivery assets (FM 3-09; ATP 3-09.12). The goal of proactive counterfire is to identify

and engage the enemy's IFC components before they have a chance to engage us. The integration of IC assets to identify the IFC occurs at the Division and Corps G2 sections, which are removed from the DIVARTY and FAB which deliver lethal fires against these targets.

Providing active GEOINT and SIGINT collection assets to the DIVARTY and FAB enables the headquarters that is tasked with defeating the enemy IFC to conduct their own IC operations to detect (or find and fix) the IFC assets and quickly deliver against the targets. This provides the headquarters with the resources to complete this task. Current doctrine and belief provides the task to DIVARTY and FAB, but does not provide the necessary resources.

**The Hunt: Where the U.S Army is effective and where we struggle versus an OPFOR that effectively exploits and achieves success.**

Within the LSCO training scenarios conducted during Warfighter exercises, a FAB's primary task is to conduct corps-level strike operations and augment Division level shaping operations, while DIVARTYs are tasked with controlling the Divisions' organic and attached FA units, coordinating closely with the Division fires support element (FSE), and indirect fire support (FS) operations for continuous operations to support the Division schemes of maneuver (HQDA, 2020). While U.S Army Division and Corps level staffs are highly effective at leveraging numerous highly advanced technical effects from multi-intelligence disciplines, joint air, cyber and electro-magnetic activities (CEMA), and aerial ISR, the blue force still continues to struggle because the OPFOR realizes that it can conduct aggressive hunting techniques across the battlespace. The OPFOR, as an independent and autonomous near-peer adversary, continuously refines its hunting and targeting process because they understand that in war you must have an "apex predator and hunt aggressively" mindset.

During the warfighters the OPFOR is not invincible or indestructible, but the OPFOR staff does understand that to seize the initiative and dominate the fight, you have to dominate the hunt by destroying blue force critical assets such as long-range artillery equipment and CF radars before the blue force can destroy their own critical assets. The OPFOR is able to aggressively achieve this through the use of their Harpy unmanned combat aerial vehicle (UCAV) and Tipchak artillery target acquisition (TA) UAV.

While U.S Army training audiences have a common knowledge of OPFOR UAS tactics and can request Worldwide Equipment Guide (WEG)-focused Counter-UAS elements, EW/SIGINT, and GPS-Hardening Capabilities as well, the OPFOR can still achieve decisive advantages across the battlespace through aggressive hunting and targeting techniques that allows them to identify, target, and shape blue force faster than the blue force can do the same to them. Although this can become highly confusing and complex for intelligence and fires staffs, it is a simple aspect of winning a chess game. While some consider the objective of chess as checkmating the king, it is not. Although the checkmate is the overall means to win the game, the overall strategic objective of chess is to control the board, remove as much of the opposing player's materiel as possible, maneuver unimpeded, and dominate the fight with long-range pieces such as the Rook, Bishop, and Queen to achieve the strategic checkmate.

John Antal concurs with this sentiment in his literature on the second Nagorno-Karabakh War as he alluded to the fact that in the three-dimensional game of chess that is modern war, Azerbaijan maintained the advantage because they moved first, struck first, maintained the initiative, and integrated and synchronized fires and maneuver to force Armenia to react to their moves and never recover (Antal, 2021). Another vital aspect noted in the literature is that this was the first modern war primarily decided by the use of unmanned weapons. Azerbaijan dominated the war by consistently striking and destroying Armenian artillery, radars, and air defense positions deep with BAYRAKTAR TB2 unmanned air combat vehicles (UCAVs), HAROP loitering munitions (LM), and precision long-range artillery to enable their maneuver, and occupy key terrain and critical objectives (Antal, 2021). In the aspects of offensive realism, because the OPFOR needs to actively maintain security for survival, they constantly seek to diminish the overwhelming technological capability and competitor power of the training audience (TA) by using red UAS for targeting priorities to shape deep instead of IC to enhance their own dominance of the battlespace. Their target prosecution and sensor to shooter kill chain is shorter, faster, and more effective in targeting the TA's critical assets through the distribution of UAS directly down to the lowest echelon for reconnaissance and target acquisition.

Within the respective Combat Aviation Brigade that supports each Division and Corps-level echelon, there is normally one Shadow UAS/FTUAS platoon with four Shadow UAS UAS/FTUAS. While these Shadow UAS/FTUAS are traditionally unarmed and fitted with multiple sensors (Full Motion Video, Ground Moving Target Indicator, Electro-Optical, and Synthetic Aperture Radar) for the Divisions or Corps scheme of IC priorities, they can also be used for direct targeting efforts. The Army Field Artillery Tactical Data System (AFATDS) is doctrinally the standard fire coordination system for incorporating UAS into Target Prosecution Process via push-button Call-for-Fires (CfF) and/or immediate Close Air Support (CAS) requests via the Joint Attack Request Network (JARN) by Joint Terminal Attack Controllers (JTAC)/Tactical Air Control Party (TACP)/Air Support Operation Center (ASOC) elements to the Air Operations Center (AOC) for immediate approval instead of the Army's slow/deliberate CAS request process that is likely to get disapproved by the AOC. However, the challenge is the process of routing fire missions from the Division or Corps fires and targeting cells/Joint Air Ground Integration Cells (JAGICs) down to the respective subordinate DIVARTY or FAB that must be routed down to the gun line. While this is the doctrinal process to decide, detect, deliver, assess (D3A), and have the necessary command authorities for clearance of air, ground, and ammunition release authority, it significantly increases the possible target decay time and kill chain time. To maximize the sensor to shooter targeting effects, Shadow UAS/FTUASs that are directly OPCON to the DIVARTY or Corps FAB can service the DIVARTY Commander's or FAB Commander's targeting priorities for their Commanders without pulling away Shadow UAS/FTUASs from the G2's and their own respective IC priorities to the commander. This allows G2's to actively scan their named areas of interests (NAIs) to answer the commander's priority intelligence requests (PIRs), while DIVARTYs and Corps FABs can more effectively own and manage the entire targeting effort for their Division and Corps commanders.

### **Recommendation and Solution**

**Design and designate a "strike cell" target acquisition UAS detachment that can be OPCON to DIVARTYs and Corps FABs:** This recommendation is feasible, suitable, and does not require a significant change in manning or resources. To achieve the recommendation, one platoon of four Shadow

UAS/FTUAS platforms, with two ground control stations (GCS), two Shadow UAS/FTUAS launchers, and four to six 15W series Shadow UAS/FTUAS operators are allocated from the respective Division CAB and the CAB supporting the Corps to the DIVARTY and Corps FAB to target, hunt, and shape DIVARTY and Corps HPTs deep. To facilitate and manage the targeting process and necessary authorizations, the Joint Air Ground Integration Centers (JAGICs) at the Division and Corps will be responsible for UAS mission control management and target prosecution through the 131A and 150U located at the DIVARTY and Corps FAB command posts. This will ensure that while the equipment and personnel are allocated to the DIVARTY and Corp FABs, the targeting priorities and process are achieved to meet the commander's requirements. To support the targeting and exploitation of the Shadow UAS/FTUAS sensor feeds, one tactical ground station (TGS), one geospatial workstation (GWS), and two to four 35Gs (imagery intelligence analysts) from the Corps expeditionary-military intelligence brigade (E-MIB) should be allocated to the DIVARTY and FAB. Maintenance and logistics for the airframes and associated equipment can still be managed by the Shadow UAS/FTUAS company personnel within the Division Support Areas (DSAs) and Corps Support Areas (CSAs).

#### **DOTMLPF-P Analysis**

**Doctrine:** According to ATP 3-09.24, the intelligence and targeting cell, led by the S2 and the intelligence warfighting function, is charged with providing the commander and staff with intelligence information essential to operations and targeting through direct observation, electronic warfare sources, human intelligence, weapon-locating radars, unmanned aircraft systems, higher HQ and joint HQ intelligence (G2) elements, and maneuver formations (HQDA, 2012). While the doctrine does provide guidance on how UAS should support DIVARTY and FAB operations, there is no current policy that does or does not prevent those staffs from requesting an OPCON targeting detachment consisting of UAS directly to them for targeting purposes. According to para. 3-4 of ATP 3-09.24, The FAB can plan for and employ its organic fire support assets and those it receives as attached, under its operational control (OPCON), or tactical control (TACON). The FAB may provide these units mission, tasks, and support relationships as part of field artillery organization for combat and tasks to subordinate units in FIB plans

and orders. These may include additional surveillance, reconnaissance, TA, and/or other fire support assets. It also includes ground reconnaissance and surveillance, manned aviation, and additional unmanned aerial assets from Division or higher echelons. These assets augment the FIB based on the higher HQ or supported command's mission analysis or the requirements of a particular mission.

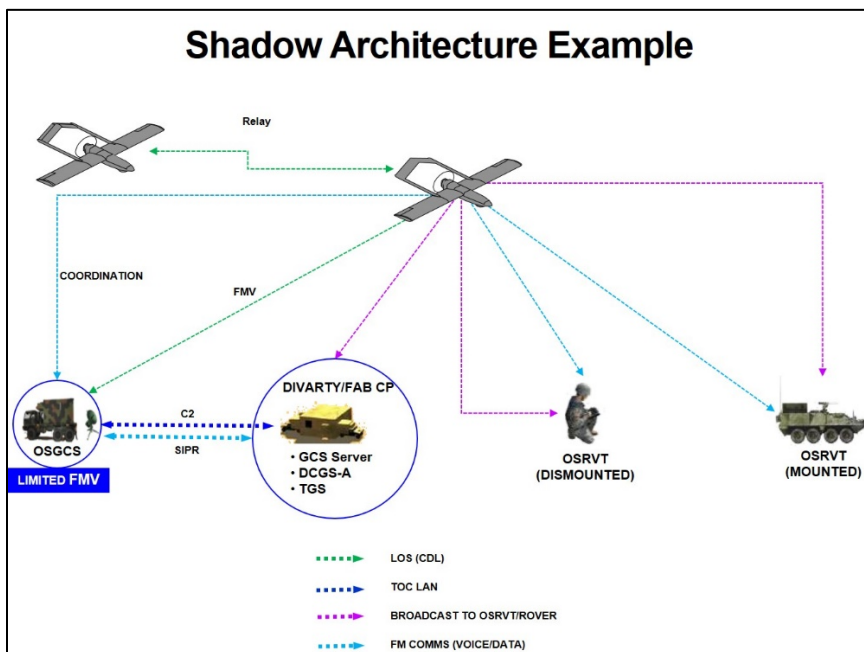


Figure 1. Shadow Architecture Example

**Organization:** Currently, Divisions already organized with a subordinate DIVARTY HQ element to manage the subordinate FA battalions, and FABs have their organic FA battalions. The current problem is that DIVARTYs and Corps FABs do not have organic UAS assigned to them, and therefore, the process of requesting UAS capabilities for targeting significantly increases the target prosecution and kill chain time. This in turn increases target decay as well, allowing enemy OPFOR to maintain the capability to use long-range precision artillery and their red UAS against blue force TA's at the time and space of their choosing. To solve the capability gap of having a faster sensor to shooter kill chain, Division and Corps commanders allocating a UAS targeting detachment OPCON to the DIVARTY and Corps FAB is a feasible and suitable recommendation. This solution could be a better organizational structure during collective training events such as warfighters and combat training center (CTC) rotations

to test and validate the theory before the proof of concept is used in a real-time combat deployment situation.

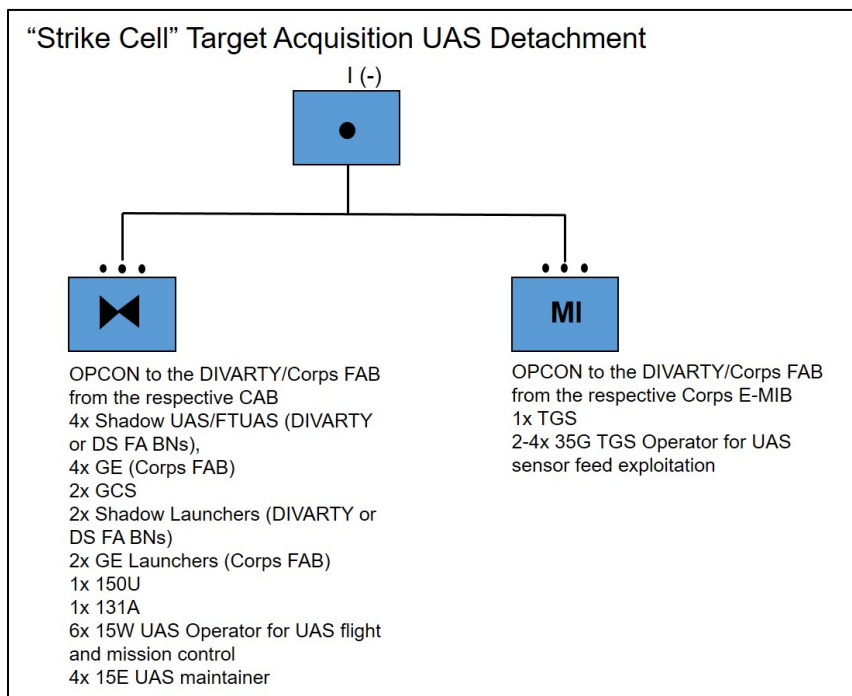


Figure 2. Proposed layout for targeting UAS detachment

**Training:** The Target Acquisition UAS detachment solution is not caused by a lack of or inadequate training. This solution would require an increase in integrated training between the DIVARTY targeting cells, Corps targeting cells, Shadow UAS/FTUAS detachments, and supporting personnel for the E-MIB before collective training events to mitigate the effects of possible capability gaps.

**Materiel:** The recommended necessary equipment to achieve this solution would be one platoon of four Shadow UAS/FTUAS platforms, two GCS, two Shadow UAS/FTUAS launchers, one TGS, and one GWS to conduct targeting and GE sensor exploitation operations. The Shadow UAS/FTUAS platforms, launchers, and GCS must operate from an established airfield. A satellite ground data terminal (SGDT) as well as beyond line of sight (BLOS) operations are required depending on how far removed the Shadow UAS/FTUAS platoon is from the long-range surveillance (LRS) and where the identified target is.



**Leader and Education:** To enhance leadership proficiency for the proposed solution, the UAS/Warfighter Training, the Air Cavalry Leaders Course (ACLC) at Ft Rucker, AL, the Joint Fire Power Course (JFC) at Nellis AFB, Las Vegas, and the Air Operations Center Course (AOCC) at Nellis AFB, Las Vegas are recommended. These courses will help to fill knowledge gaps on UAS and UAS integration to targeting support and create shared understanding for UAS operators and targeting personnel.

**Personnel:** The recommended necessary personnel to achieve this solution would be one 150U Tactical Unmanned Aerial System Operations Technician, one 131A Field Artillery Targeting Technician, six 15W Shadow UAS/FTUAS operators, four 15E maintainers, and two to four 35Gs. An alternate personnel recommendation is to push the required vulnerability window (VUL) times per day as this will dictate the required crews to support, capabilities, mission requirements, and allows the personnel to plan for meeting the requirement.

**Facilities:** The recommended solution is not caused by a lack of operations, maintenance, or inadequate infrastructure. The recommended solution also does not likely require a significant change in maintenance or logistical support. A Shadow UAS/FTUAS forward site with a SGDT – BLOS AV Control is recommended.

**Policy:** There is current no DOD, interagency, or international policy that prevents Division or Corps commanders from implementing targeting UAS detachment OPCON order from their respective supporting CAB to the subordinate DIVARTY and FAB commanders.

### **Conclusion**

In conclusion, to increase the sensor to shooter lethality and decrease the kill chain for faster target prosecution, it is recommended that DIVARTYs and Corps FABs be allocated an OPCON UAS “strike cell” targeting detachment. To begin a training and proof-of-concept cycle, the recommended step is to request to simulate the effects via an Operation Jaded NITE (Network Integrated Training Exercise) at the Air Force Research Laboratory in Ohio as a proof-of-concept before requesting real-world implementation. The recommended step in the proposed solution would consist of TEA authority, all

players, and TACP element with JARN capabilities, Interagency Training Center (ITC), Judge Advocate General (JAG), and Chief Data Officers (CDO) over multiple scenarios with immediate hot-washes to discuss and refine TTPs on the spot. The end state is that this will allow DIVARTY and Corps FAB targeting cells to aggressively hunt, target, and shape their respective HPTs deep to meet their Commander's priorities.

This shift in UAS allocation allows DIVARTY and FAB Commanders to directly own and more effectively manage the targeting process for their commanders within their respective area of operations across the battlespace, while still ensuring that Division and Corps G2's are able to use the remaining Shadow UAS/FTUAS and other multi-intelligence discipline capabilities for ISR and IC. This recommended solution should be analyzed and implemented during a collective training event such as a scheduled unit warfighter, before being implemented into CTC rotation and deployment. Post After-Action Review (AAR) and recommended observation reports should look at the Fires Integration Plan, JAAT operations, post-SEAD operations, and Gridded Area Reference System (GARS) Kill Box utilization. Targeting processes such as open/closed/hot/cold time, multi-tiered targeting, munition trajectory, blast effect radius at the point of impact (POI), maximum ordnance (MAX ORD) recommendations, gun-target lines (GTL), effectiveness of fires de-confliction, and the cueing, mixing, and redundancy of the UAS assets via Link-16 to increase the effectiveness of the sensor to shooter process. As UAS assets such as the FTUAS and vertical take-off and landing (VTOL) UAS are introduced into the U.S Army and joint force inventory in the future, these advanced and more capable assets and capabilities should be considered for additions into operational and strategic level targeting detachments. These assets will ensure the U.S Army, joint forces, and partner nations are prepared to fight in a multi-domain environment and win in a complex world.

## References

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## Author Bios.

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