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FROM BOMBS TO BITS: AIR-TO-GROUND OPERATIONS AS A MODEL FOR THE TACTICAL INFORMATION ENVIRONMENT

TERRY TRAYLOR AND DAVID NASS
COMMENTARY

MARCH 25, 2022



The lethality of American air power lies not only in aviation technology but in strategies developed for deploying it. Over the last century, aviation has evolved from its initial role as strategic reconnaissance in World War I to modern stealth bombers, attack helicopters, and hand-launched killer drones. As part of this transformation, personnel roles have evolved as well. Pilots are assigned to ground units to advise mid-level commanders, while specific ground operators are trained as tactical air controllers to advise the lowest-level commanders. These ground air controllers are also equipped with radios, tablets, lasers, and drones to spot and identify the enemy.

Amidst a wide-ranging debate over how America can achieve superiority in the cyber, information, and space realms, the development of air-to-ground operations can offer a model. Today's armed forces should take a similar approach to doctrine, organization, and training in these new environments. Pairing information experts at mid-level commands with a ground "multi-domain terminal effects controller" specialist at the edge of the battlefield will help enable commanders at every level to maintain an information advantage.

Bombs

Innovative aviation approaches in World War I and World War II paved the way for modern aviation support to ground operations. In assessing this period, historians Richard Hallion and Richard Mason have argued that up to World War I, aviation was focused on transforming reconnaissance by providing intelligence on enemy locations and movements. This changed in

1916, when the British military began employing armed reconnaissance aircraft to strafe German trenches. A further transformation occurred during the *blitzkrieg* of World War II. German Gen. Heinz Guderian pioneered the use of simultaneous armored attacks and airstrikes, helping to propel the Nazis to quick victories in Europe and North Africa. World War II also saw the British use the first air controller teams, pairing air liaison officers with communications specialists near the front lines to help direct strike aircraft.

Air-to-ground integration further advanced in Vietnam, when the United States Marine Corps introduced the first armed helicopter, the UH-1E Huey, in 1964. By 1975, the modern AH-1 Cobra and AH-64 Apache attack helicopters were providing armed escort to other helicopters and close air support to troops on the ground. The United States Air Force and Marine Corps continued to use pilots as air controllers. Some of these controllers were attached to ground units and some were trained to control air attacks while flying. The assignment of pilots to ground units was effective, but also costly, taking highly trained pilots out of the cockpit. This led the Air Force to begin training enlisted servicemembers as tactical air controllers in the 1980s, continuing the trend of pushing tactical airpower toward smaller units at lower echelons.

Contemporary air-to-ground support has continued to devolve to enhance operations at the lowest tactical level. In 1995, the Joint Staff formalized the air-to-ground process and defined close air support as air attacks in close proximity to friendly forces, requiring a higher level of coordination. To enable this coordination, pilots are still assigned to mid-level commands.

These pilots assist with planning, execution, and liaison with aviation units. They also bring aviation expertise, a vast knowledge of aviation procedures, and the perspective of having flown close air support missions in the past. Joint doctrine also formalized the tactical air controller concept previously used by the Air Force. These joint terminal attack controllers are tactical ground operators, serving at the forward edge of the battlefield, who direct aircraft engaged in close air support and control joint-fires delivery. Joint terminal attack controllers provide expertise to ground commanders on when and how to properly employ aviation assets. They also communicate with aviation assets, as well as ground and surface fires agencies, passing on targeting information and controlling air-delivered ground attacks. While the organizational construct differs in each service, pilots often reside at the battalion or company level while attack controllers are pushed even lower, to a platoon or team level. In all cases, the goal has been to ensure the tactical utility of air power by pairing experts with ground personnel trained in the employment of aviation capabilities.

Today, drones have enabled leaders at the lowest level to survey the environment in both an offensive and defensive setting in order to drive a bottom-up targeting process. Even the smallest ground units now possess a stack of drones capable of intelligence, surveillance, and reconnaissance. These tools are a critical element in creating the military force of the future, facilitating the identification of friendly and enemy targets for strategic strike assets including the F-35, B-52, or cruise missiles. Special operations units have gone a step further, employing killer drones. The pilots and air controllers advising ground commanders frequently fly these drones. Their

expertise on aviation also ensures tactical drones work in concert with helicopters, fighter jets, or larger remotely piloted drones. Combining the organizational expertise of these pilots and joint terminal attack controllers with tactical-level aviation capabilities has positioned the U.S. military to employ airpower to its fullest potential.

Bits

While the military has developed the doctrine, skills, and training to employ aviation at every level, the same cannot be said about the information environment. Currently, the most established organizations, capabilities, and authorities reside at the strategic level. Since 2017, the Navy has been experimenting with the assignment and employment of information warfare officers at the strike group level. The Army and the Marine Corps have created new units to provide information capabilities at the corps and Marine expeditionary force levels. The Marine Corps has also established a new career field for information maneuver. Since 2019, Special Operations Command, the lead entity for psychological operations, has stood up both the Joint Military Information Support Operations Web Center and the 1st Special Forces Group Information Warfare Center. While all of these entities are important evolutionary steps in conducting successful information and cyber operations, they do not address the need for information tools and training at the lowest tactical level.

To fill this gap, the force should adopt information, cyber, and space capabilities that mirror the advances in air-to-ground integration. First, placing subject matter experts at the battalion or company level will ensure

operations in the information environment are executed effectively. The biggest obstacle to this right now is manpower. Cyber operators, information warfare officers, and space planners are in short supply and require extensive training. If the military relies solely on experts, it will never fill all the positions needed to truly master the information realm in the future. To bridge this gap, individuals with ground combat arms and information warfare backgrounds should be trained in information, cyber, and space much like joint terminal attack controllers are trained to control aviation and joint-fires assets. These multi-domain terminal effects controllers would serve at the lowest tactical level to advise ground commanders on how to employ information, cyber, and space capabilities.

So, what exactly would a multi-domain terminal effects controller do? Mimicking the main tasks for an air controller, a multi-domain controller would focus effort in three areas: advising ground commanders, assisting with mission planning, and controlling actions. Multi-domain controllers would be able to provide an answer to questions about how deception operations, cyber attacks, or space capabilities could support the ground force's maneuver plans.

Analyzing the current Russo-Ukraine war remains difficult, but it could help to think about how Russian front-line troops are trying to use information, cyber, and space effects in their campaign. In the decade leading up to the conflict, Russia had been lauded for its ability to use electronic warfare and cyber-attacks in conjunction with ground-based fires. Now it appears that Russia may be struggling to synchronize its ground maneuver with national-level capabilities, including aviation,

cyber, and space. Missions like these are where a cyber-joint terminal attack controller or multi-domain terminal effects controller could be effective. They would be able to bridge the gap from tactical to strategic, identifying local targets of opportunity where multi-domain effects could support tactical mission accomplishment. They could also help the ground force manage its electromagnetic signature or request support to leverage United States Cyber or Space Command capabilities to influence targets or change how targets function.

The role of a multi-domain terminal effects controller would not be limited to the planning phase. After a mission has begun, the effects controller could identify virtual or physical information targets and recommend how to employ information, cyber, or space capabilities to support the ground unit's maneuver or plan of attack. For example, as a tank platoon advances, an organic multi-domain controller could coordinate a cyber or electronic operation that degrades the enemy's communication network just prior to the main attack. After the attack is over, the multi-domain controller could also coordinate with regional psychological warfare specialists to use social-media messaging to influence local target audiences. Without someone on the ground with the training to understand how to leverage these unique effects to support ground maneuver, it is difficult to see how a national-level cyber capability will rapidly identify and synchronize effects in a complex and fast-moving combat operation. Much like the air controller who identifies targets, relays their position to supporting aircraft, and coordinates the timing of their attack, a multi-domain terminal effects controller would identify local physical or virtual targets,

relay their positions to information, cyber, or space experts at a higher command, and synchronize the timing of their effects with the ground force's maneuver.

The multi-domain terminal effects controller would also have the capabilities to manage information, cyber, and space activities, much like modern ground units employ and control large drones or aviation assets. These capabilities would first and foremost allow the ground force to build awareness through assessment of the information environment. This stack of multi-domain intelligence, surveillance, and reconnaissance technologies could include AI-powered social media analytics and sentiment analysis programs, real-time natural-language processing of local open-source information and enemy material exploitation, electromagnetic spectrum analysis, near real-time space imagery and meteorological data, and crowd-sourced ground photography or imaging. In addition to battlefield awareness tools, action or engagement tools are also needed, such as limited intelligence-collection capabilities, communications jamming, and social- or rich-media analysis tools. This next-generation stack of information, cyber, and space capabilities controlled by a trained and certified multi-domain terminal effects controller would in turn enable a bottom-up refined targeting process, allowing more specialized units to focus on hard or sensitive targets.

Of course, there are limits to the parallel between air-to-ground coordination and cyber activities. For one, aviation supporting a ground force can easily be allocated for a specific time and area through the air tasking order. The same cannot be done with cyber and space assets.

Secondly, information, cyber, and space planning and effects often span all arenas, where aviation effects do not. Also, because an advantage in the information environment is fleeting at best, multi-domain terminal effects controllers would not always be able to plan for long-term permanent effects like joint terminal attack controllers do. Finally, the current authorities to use cyber and space capabilities still reside at very high approval levels. In order for a tactical model to evolve, target engagement authority and target control authority will have to be addressed alongside this concept.

Conclusion

Every ground officer is familiar with the concept of air-to-ground coordination. As such, it remains a unique model to think about the emerging and much less familiar multi-domain space. United States general officers, NATO field grade officers, and academic civilians all understand the role of the joint terminal attack controller. The same cannot be said about the lexicon and tactical capabilities in the information environment.

Current efforts fall short of empowering the lowest tactical level with the tools, training, and organization necessary to be effective in the information, cyber, and space environments. A solution to this problem is to learn from the evolution of military aviation. Pairing information experts at mid-level commands with ground multi-domain terminal effects controllers at the edge of the battlefield is an effective technique. These multi-domain terminal effects controllers can help bridge the gap between

ground maneuver and national-level information, cyber, and space capability. In doing so, they can help equip every level of command with the right personnel and equipment to gain and maintain an information advantage. Rather than wait another century, the United States can employ the lessons of aviation history today.

BECOME A MEMBER

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David Nass is a Marine staff non-commissioned officer with operational experience in both conventional and special operations units. He has served as a joint terminal attack controller for over 10 years with operational deployments in support of Operation Enduring Freedom and Operation Inherent Resolve. He is currently a graduate student in the Defense Analysis Department at Naval Postgraduate School.

These views expressed in this article are those of the authors and do not reflect the official policy or position of the United States Marine Corps or the Department of Defense.

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COMMENTARY

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