



Senior leaders observe a joint combined arms rehearsal on 5 June 2024 on the eve of Ivy Mass 24 at Fort Carson, Colorado. (Photo courtesy of the 4th Infantry Division Public Affairs Office)

Becoming Multidomain Practitioners

Tactical Training for Multidomain Operations at Echelon

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Editor's note: This article first appeared as a Military Review online exclusive on 5 February 2025.

In 2020, the XVIII Airborne Corps initiated a series of joint exercises named Scarlet Dragon. The commanding general at the time, Lt. Gen. Erik Kurilla, recognized that despite the near-constant discussion of the need for artificial intelligence and machine learning to aid decision-making and full integration of joint and multidomain effects in the next war, there was almost no practical integration of these tools into tactical exercises. Project Maven, the Department of Defense's initial effort to use machine learning algorithms to assist intelligence analysts, had existed for several years and even seen some success in joint special operations targeting efforts in Afghanistan. However, the units that would be decisive in large-scale combat operations (LSCO)—corps, divisions, and brigades—had little to show for the early efforts. The implementation of these critical technologies and the practice of layering multidomain effects was long overdue, and thus, XVIII Airborne Corps created Scarlet Dragon.

With multidomain operations (MDO) moving beyond future concepts and into our doctrine with the update to Field Manual 3-0, *Operations*, we must determine what the practice of MDO means for units at echelon and for our tactical headquarters. We must find cost-effective, high-payoff methods to develop best practices iteratively, inform refinements to nascent doctrine, and identify gaps in capability development efforts.¹ It is time to become multidomain practitioners. Corps, division, and brigade commanders are ideally positioned in experience, resources, and staff proficiency to take

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on echelon-appropriate components of this task. To be clear, there is no shortage of talent and initiative across the force. Fort Bragg is not the only installation where leaders are striving to push beyond the status quo.

At Fort Carson, in June 2024, the 4th Infantry Division completed its second iteration of "Ivy Mass," a biennial joint, multidomain fire support coordination exercise. This article uses the observations and lessons from Ivy Mass 2024 to propose clearly defined roles for each tactical echelon as they train for MDO; propose enterprise-level opportunities for investing in innovation at the corps, division, and brigade levels; and share the challenges experienced in building and executing a division exercise of this scope and scale.

Clarity of Purpose at Echelon

As we engage our junior and midlevel leaders, there is still a lack of clarity as to what *exactly* they do as part of MDO. Even among senior leaders, this is a frequent topic of discussion. Perhaps, in our effort to solidify MDO's acceptance among the joint force and our allies, the constant drum beat of "big changes needed now" left many young leaders in our ranks uncertain of their role in that change.² Furthermore, the ongoing evolution of the concept into doctrine is generating healthy dialogue that is keeping pace with the speed at which forces are transforming or experimenting with new technologies.³ We cannot afford to have our formations listless in either confusion or cynicism. If we are going to make real headway in developing leaders and headquarters as expert MDO practitioners, we need to capture the attention of our people and orient their creativity and innovation on echelon-appropriate problems.

"What do we do in MDO?" is the wrong question.

Each formation exists for a tactical purpose well-defined by their mission essential tasks. The "what" does not change in MDO. The correct question is, "How does the multidomain battlefield change how we do what we do?" The answer is a simple one: *Warfighting remains all about combined arms maneuver.* The Army

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Forward observers from Q Battery, 5th Battalion, 14th Marine Regiment, spot targets on 9 June 2024 during a live-fire portion of Ivy Mass 24. (Photo courtesy of the 4th Infantry Division Public Affairs Office)

has been clear on this point from the start. The centrality of combined arms maneuver as the “how” by which the U.S. Army will fight in future conflicts was clear in the unveiling of the MDO concept.⁴ The umbrella of MDO was inherently a joint, multinational vision of a future battlefield that would “demand that the Joint Force apply the proven principles of combined arms maneuver and massing of effects at decisive spaces.”⁵ The doctrinal definition of MDO is “combined arms employment of joint and Army capabilities to create and exploit relative advantages.”⁶

Fortunately, we assess that there is a simple way of visualizing the unique roles and responsibilities of each echelon in LSCO on the MDO battlefield. At Fort Carson, these are known as “The Ivy Way of MDO.” However, the authors do not claim the core ideas in this proposal as their own. Many of these thoughts emerged through group dialogue in multiple venues, and special credit must go to Maj. Gen. James Isenhower, former commanding general of 1st Armored Division, who was a notable voice in most of these discussions.

The corps, synchronizer of convergence. Absent a scale of conflict that resurrects the field army, the corps is the senior tactical headquarters that executes combined arms maneuver. The corps synchronizes convergence through the joint task force and has two clear responsibilities in battle: to prioritize and allocate tools and effects to divisions, and to shape the deep area.

The division, unit of action. The division delivers land power at the time and place of convergence and has two unique responsibilities: to plan, synchronize, and request multidomain effects; and to shape the close area. It is important to note that while the division is capable of visualizing and employing multidomain assets, they do not own them. This is unlikely to change much in the foreseeable future.

The brigade, agility at the edge. The brigade is the primary executor of their respective element of combat power—fires, maneuver, sustainment, etc. They receive assets, employ them for specified durations, and coordinate laterally. The brigade also has two distinct responsibilities: to plan and synchronize all forms of support for subordinate units, and to manage terrain by sequencing action in time and space.

The battalion, focused fighters. The battalion is the lowest echelon capable of synchronizing combined arms effects. They must do two things well on the

multidomain battlefield: organize the battalion task force for directed tactical tasks and fight the combined arms fight.

The company and platoon, tip of the bayonet. The company and platoon are ultimately the formations that will seize terrain or defeat an adversary at the decisive point of battle. They should be experts at their craft, but they are extremely vulnerable without the protection of higher-echelon shaping. On the multidomain battlefield, the company and platoon have two critical responsibilities: to *stay alive* by staying out of contact until directed otherwise, and to stay ready to move and arrive to the assigned objective *on time*.

Isenhower explained that corps and divisions can be “multidomain headquarters” while brigade and below headquarters are often “multiple domain” headquarters.⁷ Thinking of roles and responsibilities in terms of the implications imposed by the friendly and enemy effects on the multidomain battlefield provide clarity for the problems that each echelon must solve through iterative capability integration and practice. Each echelon can shape their unit-level training around the core challenges facing their formations. This does not mean that each echelon is alone in the effort. As we have observed in both Ukraine and Nagorno-Karabakh, evolving drone technology will make staying out of contact a challenging task for our lowest echelons.⁸ In fact, the problems facing lower echelons are perhaps the most difficult to solve as smaller formations will require coordinated assistance from higher echelons and enterprise-wide materiel solutions. However, the best answers in emerging tactics will come from the echelons in the field that must fight that fight, not from a simulation in a battle lab.

Building and Growing a Division Exercise

In 2021, then-Maj. Gen. David Hodne, the previous commanding general of the 4th Infantry Division, conceived of Ivy Mass as a means of tackling two initiatives. The first requirement was to build an iterative framework to practice with the multidomain tools that the division would use in battle. The second requirement was to find a way to keep the division staff sharp on warfighting tasks in the years between Warfighter exercises. In this way, the division staff, despite the very high annual turnover rate among field

grade officers and senior noncommissioned officers, experiences a reliable tactical training progression every year while in garrison.

The inaugural Ivy Mass in 2022 took the form of a fire support coordination exercise employing the division’s organic cannon artillery with supporting fixed wing close air support. Intentionally, Ivy Mass focused on synchronizing targeting and kinetic fires in the close area—the basic building blocks of the division’s fight in LSCO. At its core, the exercise prioritizes lethality, but the design was intended to be scalable and train additional Army and joint capabilities that may support the division’s maneuver in future battles. The second iteration retained the original focus on lethality while taking the division a step forward into truly multidomain operations.

In the autumn of 2023, the 4th Infantry Division staff began detailed planning for Ivy Mass 24. The division used the same planning model that the XVIII Airborne Corps employed in building Scarlet Dragon. The model is a slightly modified joint exercise life cycle framework often employed by the 75th Ranger Regiment and other joint special operations forces elements that plan and execute multilateral and task force training events.⁹ These units need live joint capability integration to meet their training objectives but typically lack the time to officially resource support through the various service tasking channels like the Army Synchronization and Resourcing Conference.¹⁰ Simply put, find friends who will bring their toys and come play with you.

The two primary adjustments to the doctrinal joint exercise life cycle are (1) limiting early concept development to goal-setting for types of units to recruit to meet the planning headquarters’ training objectives by aligning with a participating unit’s desired learning objectives, and in this case, Marine Corps tasks; and (2) shifting the burden of exercise design later in the planning process until the planning headquarters establishes a sufficiently complete list of participants. In part, the initial planning conference becomes a sales pitch where the planning headquarters says, “We want you to participate; the scenario is flexible; tell us what you need to train, and we can make it happen.” This slower approach to concept development affords greater opportunity to build a robust team of players, but it places increased stress on the planning staff by truncating



Maj. Gen. David S. Doyle, commanding general of the 4th Infantry Division and Fort Carson, Colorado, answers a service member's question about innovation during the 4th Infantry Division's inaugural Multi-Domain Operations Symposium on 23 January 2025 at McMahon Auditorium on Fort Carson. Doyle highlighted the need for forward-thinking strategies, cutting-edge solutions, and seamless integration across all domains to maintain the division's operational edge, enhance interoperability with allied forces, and ensure mission success in modern warfare's increasingly complex and evolving landscape. (Photo by Spc. Doniel Kennedy, U.S. Army)

available time for detailed planning and constructing scenario depth.

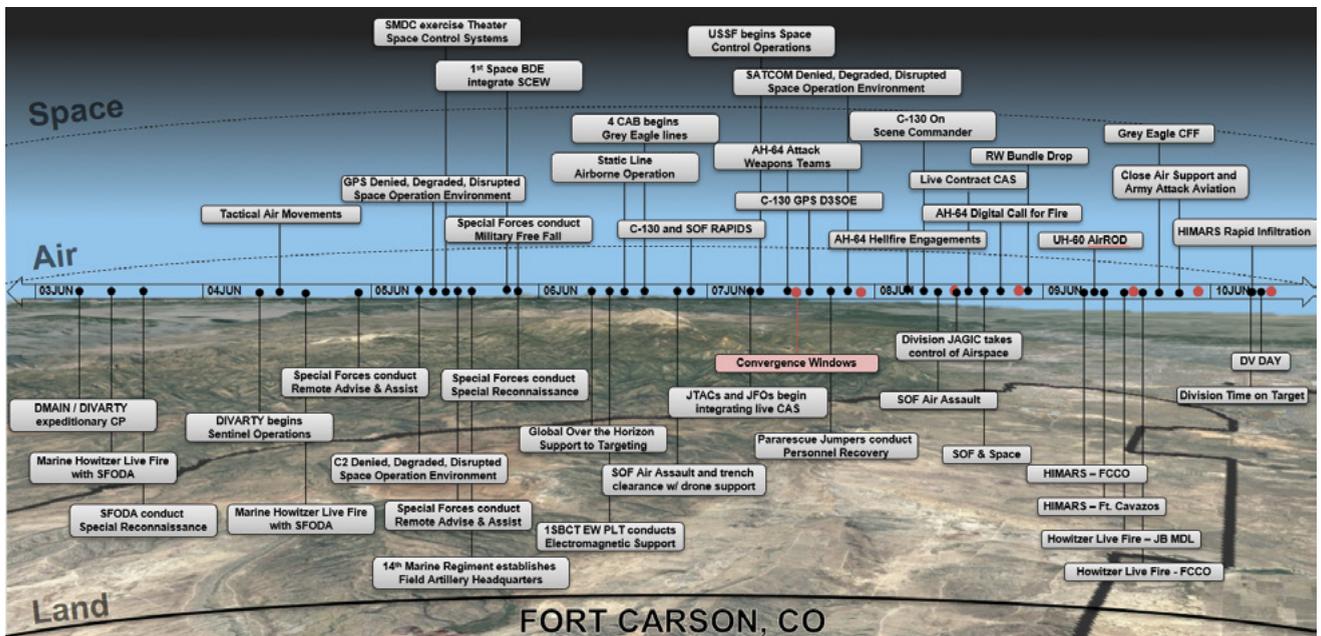
In the end, just like Scarlet Dragon, the process worked. With roughly nine months of planning and preparation, Ivy Mass 24 brought together forty-five units with representatives from every service, including all three components, to conduct a fully synchronized live-virtual-constructive exercise across eleven installations (see figure). The division replicated seven "convergence windows" with live land, air, space, and cyber effects to conduct forty-one separate tactical tasks involving live Army and joint fires. All of this

was synchronized with live special operations forces direct-action activities and virtual maneuver from a Stryker brigade combat team and a division sustainment brigade conducting full command post exercises. We walked away from the experience with a far greater understanding of the frictions we will encounter under a similar task organization in combat. Additionally, we walked away with three groups of observations: opportunities for acceleration at the Army enterprise level, lessons for division-level staffs, and unit-level education to best train for MDO.

Observations: Army Enterprise-Level Investment

Two clear observations from Ivy Mass suggest that increased Army investment may accelerate MDO proficiency. The first concerns a known problem: modernizing the Army and joint Mission Command Network. The second is an opportunity to apportion resources to corps- and division-level exercises like Ivy Mass.

Network modernization and mission command. In most formations, the current division-level mission



(Figure by 4th Infantry Division Artillery)

Figure. Joint, Multidomain “Players” and Activity Synchronization during Ivy Mass 24

command networks do not enable the speed demanded within LSCO and MDO. At one point in Ivy Mass, we recorded nineteen steps to execute a single integrated joint surface artillery space mission. The wide range of communications equipment and tactics used across Army National Guard, Marine Corps, Space Command, and even our organic Army aviation assets were enough to challenge any tactical headquarters in maintaining a disciplined communications plan. Additionally, the digital call-for-fire integration with our AH-64 fleets continues to be fraught with technical issues that make executing without external field service support highly impractical. The Army is aggressively addressing this issue, and further detailed discussion lies beyond the scope of this article. The chief of staff of the Army is answering this demand from the field as he makes this effort the top priority for transformation.¹¹

Formal investment in exercises designed by tactical headquarters. The Army has an opportunity to accelerate the practical application of MDO by assigning a “thought leader”—or more accurately, a “lead practitioner”—responsible to corps, division, and brigade commanders and providing dedicated fiscal resources

for these organizations to design and execute training beyond standard training pathways. The Strategic Studies Institute’s integrated research project on lessons from Ukraine concluded that the U.S. Army must “re-assess the roles and responsibilities of headquarters at echelon to account for MDO” and develop “innovative options for executing multi-echelon training on how to synchronize the concept of convergence and combined arms.”¹² It is unrealistic to think that our combat training centers and the focused experimentation under Project Convergence can meet this goal alone.

At the corps level, this is already happening through the initiative of commanders, but it would be an easy step for the Army to formalize the existing lines of effort. The I Corps is deeply involved in overcoming the challenges of distributed mission command and sustainment under U.S. Army Pacific’s Pacific Pathways exercise series.¹³ The III Armored Corps is working on convergence and penetration tactics through their Remagen Ready gap crossing exercise.¹⁴ The V Corps is routinely invested in multinational interoperability across the range of NATO and U.S. European Command training events.¹⁵ The XVIII Airborne Corps has already taken on the decision dominance



A C-130 aircraft from the 731st Airlift Squadron departs a field landing strip on 10 June 2024 at Fort Carson, Colorado, after conducting a HIRAIN (High Mobility Artillery Rocket System Rapid Infiltration) rehearsal. The squadron also supported special operations forces airborne infiltration, forward resupply, and intratheater medical evacuation training objectives. (Photo courtesy of the 4th Infantry Division Public Affairs Office)

problem set through Scarlet Dragon and supported innovation efforts.¹⁶

For divisions, the Army can select and assign discrete problems for that headquarters to solve through division-led exercise design. The transformation-in-contact initiative is doing this with tactical communications with the 101st Airborne and 25th Infantry Divisions in exercises like Lethal Eagle at Fort Campbell and the multidomain task force integration at the Joint Pacific Multinational Readiness Center.¹⁷ At the 4th Infantry Division, multidomain synchronization at the division level is the obvious task for our focus.

With neighbors like U.S. Space Operations Command and multiple space deltas at Peterson and Schiever Space Forces Bases, the U.S. Air Force Academy, the U.S. Army Space and Missile Defense Command, the Army's 1st Space Brigade collocated in the Colorado Springs basing cluster, in addition to the 10th Special Forces Group on Fort Carson,

the proximity to and natural relationships with theater-level capability providers make joint, multidomain integration relatively easy for the 4th Infantry Division. More importantly, the coordination and integration are relatively inexpensive. With so many local participants and all others traveling "pay to play," Ivy Mass 24 cost only \$1.3 million above the already funded training plans for 4th Infantry Division units. Aligning tasks to divisions based on their proximity to relevant academic, industry, or joint military partners, these division-led initiatives can become very cost effective for the resulting readiness and innovation gains. Even allowing for a \$3 million biennial allocation per division, the Army would spend less than \$40 million every two years across the Regular Army. To frame perspective, that is roughly the cost of one light infantry brigade rotation at the Joint Readiness Training Center. Division headquarters need this training opportunity between the U.S. Forces Command scheduled "division in the dirt" exercises at combat training centers.

Observations: Division Lessons Learned

For division staffs integrating multidomain capabilities in training or combat, our experience in Ivy Mass 24 provided recommendations for planning horizons and integrating joint enablers. We learned specific

lessons that apply to the LSCO battlefield through the planning and development of Ivy Mass 24.

Expanded battlefields require expanded planning horizons. In future LSCO fights, nearly all combined arms maneuver will require joint theater-controlled capabilities to ensure success. As the echelon of control rises to the joint task force or beyond, the division must think further out. In combat, it is critical for division G-2s (intelligence officers) to identify high-value and high-priority targets out to a ninety-six-hour horizon. Requesting assets against specific enemy communications networks, electronic warfare capabilities, or signals of interest will increase both the odds of getting asset priority and eventual success in shaping. The feedback we received from Army and joint space assets during Ivy Mass 24 was that vague support requests are all too often the norm, and they are also only “vaguely effective.” Training to think and plan further out in our G-2 and G-5 (plans) sections can reverse this trend.

Additionally, the same rule applies as divisions seek to secure space asset support for their home-station training. Appropriate lead time is key. The 4th Infantry Division secured robust support for Ivy Mass 24 in nine months only because our proximity allowed us to “cheat.” After working closely with Space and Missile Defense Command on this topic, we recommend a minimum of fifteen months of planning time for live space integration. Consider concurrent coordination with the Intelligence Center of Excellence as you plan for space-based effect integration. Their “MDO in a Box” capability provides live electromagnetic stimulus that can stress your targeting kill chain.

Integrating joint elements with suboptimal command-and-control networks. While the Army and joint force address the network challenges mentioned earlier, divisions still need to prepare to integrate joint fires elements. The reality of global force management and time-phased deployments is that fighting a multicomponent, joint task organization is highly likely in any real-world contingency plan. The experience in Ivy Mass 24 highlighted two best practices. First, rapidly integrating liaison officers from direct support units into the joint air-ground integration cell is essential. Second, organizations must dedicate a small, talent-laden team from the G-6 (signal) section to understand and troubleshoot interservice communications integration.

Observations: Unit-Level Education

As we implement innovative training to learn and practice for MDO, the greatest barrier to success is our collective lack of knowledge about the specific friendly and threat capabilities on the battlefield. Educating our leaders is a nonnegotiable requirement. The security classification surrounding programs employed by both friend and foe has left many of our younger leaders unaware of these capabilities and the true implications for our formations. Not only does this ignorance pose an immediate roadblock to innovation and readiness, but it also slows the long-term development of leader cohorts who must build intuitive expertise in multi-domain thinking. Divisions can remedy this challenge with minor changes to existing leader development programs. The Army could follow by introducing additional material to officer, noncommissioned officer, and warrant officer professional military education.

The division commander has staff leaders who have detailed knowledge and access to the full spectrum of multidomain tools. These leaders can translate enough information at the “secret” level to ensure that our staff field grade officers and company commanders are sufficiently aware of even our most highly classified tools. Division commanders must selectively expand their leader development programs—traditionally focused on battalion and brigade command teams—to include focused education for majors and captains to learn about multidomain battlefield effects and threat assessments.

Conclusion: Moving Forward

Within the 4th Infantry Division, we are already setting conditions for the next iteration of Ivy Mass. In 2026, the exercise will add new layers, extend the depth of the battlefield, and synchronize live brigade-level maneuver. Our vision of being the Army’s marquee multidomain division has nothing to do with equipment modernization. Rather, we focus on developing a forward-thinking mindset and cultivating the unique team of joint, multidomain thinkers and doers in Colorado Springs. We believe we are postured to advance the MDO capability of the division, the Army, and the joint force through better integration at the unit of action.

For the broader force, future success in MDO demands that we orient on expertise in combined arms

maneuver while clearly defining roles and responsibilities relative to the multidomain battlefield. This action will drive unit-level refinement of doctrine and materiel solutions. Furthermore, the Army can accelerate the practical application of MDO by prioritizing network transformation and making modest resource investments that allow corps-, division-, and brigade-level commanders to use their initiative and creativity to iterate on Army-wide problems. Finally, with minor

adjustments to common programs and practices, divisions can effectively train and fight with live multidomain assets and educate the next generation of multidomain leaders.

The core truth of transforming in contact is that the future is already here. “Legacy” and “modernized” are useless terms. When war comes, we fight it with the soldiers and equipment we have today. The time to become MDO practitioners is now. ■

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