



An RTX graphic illustrates “effectors, a term for missiles, mortars, and non-kinetic weapons that defeat targets and create data of their own.” (Illustration courtesy of Raytheon [RTX])

The Problem with Convergence

Dispelling the Illusion Surrounding the Tactical Application of Offensive Space and Cyberspace Capabilities

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Any sufficiently advanced technology is indistinguishable from magic.

—Arthur C. Clarke's Third Law

By the time the most recent update to Field Manual (FM) 3-0, *Operations*, was published in October 2022, convergence had already come to occupy a prominent position within the U.S. Army's lexicon. The term had been introduced in Training and Doctrine Command Pamphlet 525-3-1, *Multi-Domain Operations 2028*, published in 2018, and the Army's highest-profile venue for demonstrating emerging technologies had been named Project Convergence since 2020.¹ FM 3-0 officially codified convergence as one of four operational tenets underpinning the conduct of the U.S. Army's operational concept.² Although convergence encapsulates all domains, the concept has widely been viewed by tactical commanders as the principal means of incorporating offensive effects from the newly recognized warfighting domains of space and cyberspace. Yet in many of these formations, exactly what convergence is and how it should be incorporated into operations below the division level remained shrouded in speculation and mystery. Convergence—particularly when associated with the space and cyberspace domains—remained ethereal and distant akin to magic.

Although convergence continues to be a useful concept in shaping theater army and corps operations, its inclusion as a tenet of broader Army operations does more harm than good. The sheer complexity of achieving convergence remains at odds with the principle of simplicity and risks undermining mission command. As it is currently defined, convergence also only applies directly to a limited cross section of the broader force and its impact on echelons at and below the division level remains opaque. Finally, the understanding of convergence among the Army's tactical formations—particularly within the context of space and cyberspace—continues to be muddled and regularly distorted. Leaders at all echelons should approach the offensive space and cyberspace capabilities frequently associated with convergence as nothing more than an extension of combined arms. The rigors of large-scale combat operations (LSCO) dictate that Army leaders remain prepared to rapidly exploit opportunities by understanding and maximizing the utility of all

capabilities at their disposal regardless of domain. No magic is required.

Easier Said Than Done

Everything in war is very simple. But the simplest thing is difficult.

—Carl Von Clausewitz, *On War*³

In many ways, the term convergence embodies the very spirit of multidomain operations (MDO). FM 3-0 defines convergence as

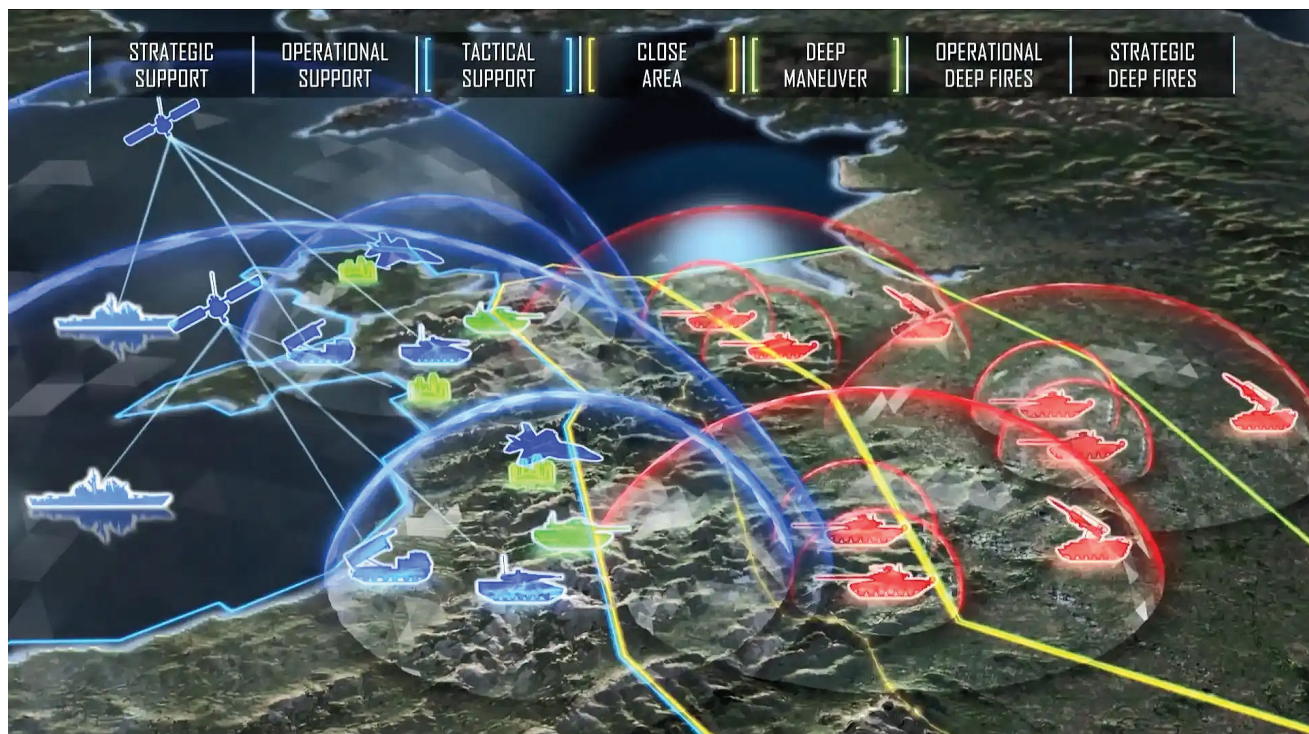
an outcome created by the concerted employment of capabilities from multiple domains and echelons against combinations of decisive points in any domain to create effects against a system, formation, decision maker, or in a specific geographic area.⁴

This definition evokes the broader concepts of mass and combined arms but remains sufficiently narrow to remain distinct. As FM 3-0 describes, it balances the principles of mass, objective, and economy of force.⁵ The synchronization of multiechelon and multidomain effects in space and time is central to the entire MDO concept, and FM 3-0's definition of convergence sufficiently encapsulates this approach. The most significant problem with convergence is best illustrated by the inclusion of the word “concerted” in the term's definition.

Achieving convergence as envisioned by FM 3-0 requires incredibly concerted efforts—not just in the “employment of capabilities” but across the full breadth of planning and intelligence activities required to employ these capabilities effectively.

FM 3-0 fails to fully address, much less reconcile, the inexorable tension between the principle of simplicity and the enormous complexity required to employ multidomain and multiechelon effects in this “concerted” manner.⁶ Combined arms

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The Waypoint 2028–29 initiative is a modernization effort to prepare the Army to be fully capable of multidomain operations by the end of the decade. (Illustration courtesy of U.S. Army Training and Doctrine Command)

is already hard. One needs to look no further than Russia's disastrous 2022 invasion of Ukraine or any of the Army's combat training centers to see this harsh reality on full display. Integrating offensive space and cyberspace capabilities makes this already challenging activity significantly more difficult. When considered within the bounds of current joint force capabilities, the integration of offensive space and cyberspace capabilities during LSCO pushes convergence to the very brink of feasibility for units below the corps echelon.

Although never stated explicitly in FM 3-0, the sheer complexity of achieving convergence virtually necessitates U.S. forces maintaining consistent initiative over its enemies during LSCO. Such a scenario, however desirable it may be, seems unlikely. Most foreseeable contingencies in which the U.S. Army would be drawn into LSCO are in response to adversaries' actions, ceding initiative—at least temporarily—at the very outset of a conflict. Even once a conflict is underway, history has consistently demonstrated the degree to which tactical initiative can shift precipitously between combatants. Convergence may not require deliberate planning or maintaining the initiative in theory. In practice, however,

all echelons will be incentivized to seek accrued advantage through relatively methodical planning processes intended to maximize effects within the ethereal domains of space and cyberspace. While FM 3-0 does not prescribe delayed action in achieving convergence, the potentiality—even likelihood—of such an outcome must be addressed directly in doctrine.

Army elements that have been conditioned to seek convergence within these domains risk creating a cascade of indecision as planning and command and control (C2) struggle to maintain pace with rapid changes on the battlefield. The implicit rigidity of convergence not only risks U.S. Army formations during periods in which they have ceded the initiative but, more broadly, incumbers commanders' ability to execute orders in accordance with the principles of mission command. Subordinate elements risk ceding their ability to exploit unanticipated successes and rapidly adapt to changing conditions within the operational environment if they are conditioned to await synchronized effects from higher echelons. Reliance on convergence at the tactical level virtually assures decision paralysis when applied to dynamic conditions, as leaders risk foregoing

the expedient actions necessary to regain the initiative over enemy forces in anticipation of achieving decisive effects in exchange for delayed action. While such effects may be achieved from either higher or lower echelons in accordance with doctrine, delays associated with coordinating for higher echelon effects may prove particularly damaging to gaining or maintaining momentum. Nowhere is this truer than within the space and cyberspace domains.

Herein lies the natural tension between the tenets of convergence and agility. When a commander attempts to apply agility, described as “the ability to move forces and adjust their dispositions and activities more rapidly than the enemy,” as a means of overcoming the challenges in implementing the “concerted employment of capabilities” necessary to achieve convergence, the tension between these tenets becomes clear.⁷ Should a commander seek to achieve convergence even at the cost of agility? The answer is no doubt dependent on the situation. Convergence may be a very useful concept when applied to an Army element contributing to joint efforts to penetrate enemy antiaccess/area denial (A2/AD) architectures. Attempts to achieve convergence may be less desirable, however, under more permissive conditions such as stability operations or during periods of dynamic maneuver in LSCO. Doctrine must address this dilemma head-on, providing commanders with guidance regarding the difficult decisions they must ultimately make by accounting for this tension within the context of risk—both to their formations and to mission accomplishment.

FM 3-0 does an admirable job of introducing some of the risks and challenges associated with convergence. It directly addresses this tension by describing the need for “balance” between the synchronization required to achieve convergence, agility, and initiative. It correctly concludes that commanders must “never surrender the initiative for the sake of synchronization.”⁸ The FM also succinctly describes several of the challenges confronting Army leaders attempting to achieve multidomain convergence in paragraph 3-22.⁹

Despite FM 3-0’s acknowledgment of the challenges confronting convergence efforts, however, the underlying risk associated with achieving convergence in the space and cyberspace domains is far more integral to the concept than the FM allows. The technologies necessary to implement convergence to the scale

envisioned by FM 3-0 suffer from diverse challenges including immaturity, lack of integration, and inadequate distribution. These obstacles are particularly acute within the domains of space and cyberspace and are unlikely to be sufficiently addressed within the next decade given pervasive delays in fielding new equipment. Worse still, the primary solution to overcome the challenges of overly centralized C2, degraded communications, and a dynamic operational environment are entirely paradoxical. The mission type orders and decentralized execution it prescribes to overcome these obstacles is an approach that is deeply ingrained in both the Army’s doctrine and historical experience. There is, however, an inevitable tension between mission command and centralized C2 that convergence merely highlights. Commanders’ ability to balance the often laborious, centralized planning processes demanded to achieve convergence with the flexibility required to enable mission command warrants further debate.

While convergence may not be as diametrically opposed to mission command as it is to simplicity, significant tension remains within the dynamic between these two concepts as well. Once again, this is particularly true when applied to the space and cyberspace domains. The allocation, coordination, and deconfliction of limited space and cyberspace enablers requires a considerable degree of centralized control. Commanders have already been incentivized to pursue the further centralization of C2 as they seek to exploit the often fleeting and elusive opportunities generated by convergence. Mission command will struggle to remain relevant in an environment where subordinate commands are afforded only limited awareness of convergence activities within these domains and possess even less ability to independently exploit their effects.

Put succinctly, attempts by corps and higher echelons to achieve convergence dynamically are unlikely to be both timely and effective. This is particularly true for the cyberspace and space domains where planners must overcome significant obstacles including specialized intelligence requirements, intelligence gain-loss assessments, legal authorities, murky measures of effectiveness, technical limitations, limited organic capabilities, and rigorous competition for joint force assets. While these complications are by no means unique to convergence and merely reflect ongoing challenges across the joint force, the inclusion

of convergence as an operational tenet should bring this reality to the forefront of intellectual debate within the U.S. Army. Given the implicit complexity of achieving convergence in the space and cyberspace domains, FM 3-0 appears at odds with its own guidance when it seemingly forewarns “the more compli-

division level in achieving convergence is less clear, however, and interpretations vary.

Certainly, one could expect a brigade to contribute its organic and assigned assets to achieve convergence as directed by its higher headquarters. In terms of offensive space and cyberspace effects, a brigade’s role in

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cated a plan is, the more vulnerable it is to friction.”¹⁰ Unfortunately for planners serving above the brigade echelon, convergence within these domains remains the very embodiment of friction.

A Tenet for Some, Not for All

Convergence is unique among the four tenets of multidomain operations in that it is not clearly applicable across all echelons. Unlike agility, endurance, and depth, which are desirable—or at least aspirational—attributes for any Army element from the land component command to the infantry company, the breadth of convergence’s applicability remains murky. It may be argued that operational tenets vary in their applicability between echelons. A corps, for example, may struggle to achieve agility due to its size and complexity. A company, on the other hand, may lack the organic assets to achieve endurance over extended periods of sustained combat. This view, however, overlooks the degree to which tenets are viewed as aspirational. Commanders at all echelons should seek to incorporate each of the operational tenets within the scope of their unit’s capabilities as prescribed by FM 3-0. Convergence should be no exception to this guidance.

Unlike for the other three tenets, FM 3-0 is quite prescriptive regarding the echelons at which convergence efforts should be focused. It describes the corps as the echelon “best positioned” to achieve convergence and the division as the lowest tactical echelon at which multidomain convergence can be achieved during LSCO.¹¹ Meanwhile, theaters set conditions for convergence—particularly in the domains of space and cyberspace. The role of elements below the

achieving convergence can be reasonably interpreted as simply remaining prepared to exploit effects when generated by higher echelons. Regardless of their role in coordinating space and cyberspace effects, it remains unclear whether brigade commanders or those of their subordinate echelons should seek to achieve convergence in general or merely understand their role in achieving their higher command’s intent. On the one hand, this prescriptive approach is useful in guiding the conduct of convergence efforts above the brigade echelon. On the other hand, such an approach further muddles the breadth of convergence’s applicability as an operational tenet.

The inclusion of convergence as a central tenet of the Army’s operating concept is particularly confusing given that FM 3-0 states that tenets “should be built into *all* [author’s emphasis] plans and operations.”¹² Brigades and subordinate echelons simply do not possess the expertise, systems, authorities, or time to plan for convergence activities in the space and cyberspace domains. This does not mean that echelons below the division level should not take the space and cyberspace domains into consideration when planning. It is worth distinguishing here between warfighting domains and these domains’ role in achieving convergence. Brigades and their subordinate echelons have a variety of space and cyberspace considerations that must be accounted for during their respective planning processes (maintaining satellite communications, securing network-enabled devices, etc.). These echelons do not, however, possess the ability to contribute significantly to achieving convergence through the provision of effects within the space or cyberspace domains.



Participants at Cyber Guard 2016 work through a 16 June 2016 training scenario during the nine-day exercise in Suffolk, Virginia. Air Force Brig. Gen. Charles Moore, the Joint Staff's deputy director of global operations, told Congress on 22 June that Cyber Guard and exercises like it test the abilities of Cyber Mission Force teams to defend Defense Department networks. (Photo by Petty Officer 2nd Class Jesse A. Hyatt, U.S. Department of Defense)

If, as previously noted, a brigade's role is simply to remain prepared to exploit effects they can neither influence nor integrate into planning, convergence is not particularly useful as a tenet. Below the division level, convergence cannot accurately inform commanders' decision-making or course-of-action analysis as prescribed by FM 3-0.¹³ cursory knowledge of convergence at these echelons is therefore simply a matter of situational awareness. Convergence may possess utility as a concept, but it does not warrant inclusion as an operational tenet. To most of the U.S. Army, convergence in the space and cyberspace domains remains relegated to the mysterious higher headquarters, a faraway land of fairy tales and unintelligible operation orders that might as well be spell scrolls.

Behind the Emerald Curtain

Despite recent attempts to reduce classification levels across the Department of Defense, the

technical capabilities most frequently associated with convergence in space and cyberspace remain shrouded in mystery for most leaders serving in the Army's tactical formations. Classification, compartmentalization, and technical complexity have created a vacuum in operational understanding that is filled by a wide spectrum of conjecture ranging from dismissive hand-waving of U.S. joint force capabilities to outright delusional expectations about what convergence can be expected to achieve in support of Army objectives. Convergence is something concocted in the windowless rooms of higher headquarters' higher headquarters—something simultaneously arcane and incomprehensible. To inform the force beyond these vault doors, well-intentioned planners often discuss convergence in terms of desired effects rather than the technical means used to achieve them. This sidesteps concerns regarding classification but creates its own problems.

By conceptualizing convergence as a desired end state rather than a complex and imperfect activity that may or may not produce a desired effect, planners inadvertently rob tactical leaders of the ability to account for a variety of factors such as the activity's likelihood of success, second/third order effects, and risk of fratricide. Such

is critical in guiding commanders' understanding of convergence. Unfortunately, such knowledge not only rarely exists for space and cyberspace capabilities at the tactical level, but misconceptions regarding these domains are also frequently reinforced through well-intentioned efforts to integrate space and cyberspace

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an approach is akin to describing artillery as a series of mysterious explosions or an unmanned aircraft system as an elevated video feed. One simply cannot account for the impacts of that which they are neither habitually exposed nor adequately informed.

Even worse, a purely effects-based understanding of space and cyberspace capabilities inherently assumes efficacy and often grossly distorts potential impacts. The complexity of integrating these capabilities into training and gaps in simulations architecture ensure that these misplaced expectations are inadvertently reinforced throughout training. The practice of “white carding” effects and relying on vaguely defined space and cyberspace capabilities to overcome complex problems has become ubiquitous within Army exercises at all echelons.¹⁴

This is particularly, although not exclusively, true of home-station command post exercises and Warfighters, which are solely reliant on war gaming and divorced from the myriad complexities of real-world operational environments.¹⁵ The majority of space and cyberspace capabilities continue to languish within the seam between the simulated environments relied upon to train echelons above brigade and the field exercises of their subordinate units. This not a problem that doctrine can be expected to resolve, but it is a reality for which doctrine must account.

A basic understanding of combined arms, increasing over the course of a soldier's career, provides valuable context to their decision-making. This knowledge

effects into planning and training at all levels.

In its current conceptualization, convergence risks becoming the magic wand relied upon to dispel tactical leaders' most challenging problems through the employment of nebulously defined offensive space and cyberspace effects, thereby absolving them of their responsibility to think through how best to overcome challenges using available resources. Offensive space and cyberspace capabilities are real, and they will play an important role in future conflicts. The current immaturity and the limitations of these capabilities, however, should give tactical commanders pause when considering their effects decisive or even reliable. Tactical commanders—particularly below the division level—should consider a plan to be suitable, acceptable, and feasible independent of space and cyberspace effects except under unique conditions warranting the acceptance of particularly high risk.

Dispelling the Convergence Illusion

Losing an illusion makes you wiser than finding a truth.

—Ludwig Börne¹⁶

Although convergence still has a role to play within FM 3-0, it should be removed as a tenet of operations. The FM's discussion of convergence and its current definition provide valuable context to understanding the Army's role in unified action, which is worth retaining. Overall, however, convergence's

inclusion in FM 3-0 should be limited to an overview. Convergence should feature far more prominently within Army Techniques Publication (ATP) 3-91, *Division Operations*; ATP 3-92, *Corps Operations*; and ATP 3-93, *Theater Army Operations*, where a thorough discussion of applications at the echelons above brigade is warranted.¹⁷ Discussion of convergence within FM 3-0 should also include an expanded discussion of the inherent tension between the centralized C2 required to facilitate convergence and the mission command needed to preserve agility. Army Doctrine Publication 6-0, *Mission Command: Command and Control of Army Forces*, and FM 6-0, *Commander and Staff Organization and Operations*, currently provide an excellent discussion of the tension between mission command and centralized C2 in general.¹⁸ These considerations should be applied to the tension between agility and the increasing need to achieve convergence to enable Army operations during LSCO. Balancing these conflicting tenets must be a deliberate, risk-based decision made by commanders based on the unique operational variables confronting their units. If modified, FM 3-0 can play a critical role in conditioning Army leaders to anticipate the necessity of making these decisions.

Convergence does not require replacement by an alternative operational tenet. Combined arms already encompass all aspects of convergence that are universally applicable across echelons including cross-domain effects.¹⁹ Further specificity associated with convergence can be expounded upon within ATP 3-91, ATP 3-92, and ATP 3-93 where the capacity to identify and evaluate potential decisive points is more feasible and relevant. FM 3-0 already includes a useful discussion of combined arms' application within MDO, which is often overshadowed by the more prominently featured tenet of convergence. This discussion should be further expounded upon to include the integration of offensive space and cyberspace capabilities to create and exploit relative advantages against enemy forces. Commanders across the Army will be best prepared to exploit opportunities within MDO when these domains are presented within the familiar context of combined arms.

Expansion of FM 3-0's discussion of offensive space and cyberspace capabilities within the context of combined arms will be insufficient to dispel the

aura of magic surrounding these capabilities on its own. Army leaders will continue to struggle with the employment of these emerging capabilities as long as they remain unfamiliar with the unique dynamics of the space and cyberspace domains. The Army should therefore seek to maximize soldiers' exposure to these domains throughout the duration of their careers to develop leaders that are well-acquainted with space- and cyberspace-enabled technologies. This approach requires a wide variety of reforms including more agile integration of commercial off-the-shelf technologies, improved simulations architecture, more thoughtful exercise design, reductions in classified/compartimentalized information, and targeted personnel management that rewards development of these vital skills. Such efforts should be applied at the lowest echelons and as broadly as possible.

An Alternative Approach

A good plan violently executed now is better than a perfect plan executed next week.

—George S. Patton²⁰

Convergence, when applied beyond the relatively narrow context of corps and theater levels, assumes too much in execution provided the current state of joint force capabilities within the space and cyberspace domains. Convergence in the space and cyberspace domains requires robust C2, dynamic and reliable intelligence, and subordinate elements that are adequately postured to exploit fleeting opportunities. During LSCO, the Army is likely to be confronted by strained and intermittent communications as well as a capable and adaptive enemy. Meanwhile, its subordinate units will be best postured to exploit opportunities within the domains with which they are the most familiar. Overreliance on convergence—particularly in the space and cyberspace domains—risks holding initiative hostage to cumbersome staff processes, unproven technologies, and uneven C2 architecture that will be under enormous strain during LSCO. All these factors translate to unacceptable delays in operational tempo, which is contradictory to the very intent of convergence and affords U.S. enemies the opportunity to regroup, adapt tactics, and reallocate forces, thus negating the U.S. joint force's attempts to accrue advantage over time.

An alternate view of convergence would be to assume that FM 3-0 has its focus backward. Under this approach, space and cyberspace effects coordinated at echelons above brigade and currently associated with convergence would be focused on exploiting opportunities generated by Army maneuver elements and the joint force rather than generating opportunities for exploitation. This change seems simple but has significant ramifications. As the elements charged with generating opportunities, reliance on mission command within the Army's tactical echelons would be reinforced rather than weakened. Intelligence processes would necessarily be brought into better alignment with these same elements.

The Army's focus of information collection and fire support would likely be drawn closer to the front lines. This change, however, would not necessitate a shift away from each echelon's respective "deep" areas as currently defined in FM 3-0, chapter 6, to remain effective.²¹ Maintaining effective information collection and fires within these ranges will maximize the contributions of staffs serving below the corps echelon while fully exploiting the operational reach of existing Army capabilities. Such an approach would contribute to unified action by exerting continual pressure on the enemy's forward echelons while maximizing support to localized maneuver of ground forces. Subordinates would be empowered to execute increased disciplined initiative, maximizing the Army's return on investment across the U.S. Army's highly professionalized force—its most decisive advantage in modern warfare.

Convergence as described in FM 3-0 is reliant upon an incredibly thorough understanding of enemy forces, which is difficult to achieve against a peer enemy, particularly when factors such as obfuscation, deception, and counter-reconnaissance are considered. Identifying opportunities within a relatively stable environment presents some unique opportunities for exploitation but is far less efficient than when an enemy exposes vulnerability through friction on the battlefield. Few activities inject more friction than combined arms warfare.

An approach to convergence that seeks to exploit rather than generate opportunities for exploitation better aligns with the Army's role as the most tactically oriented service in the joint force. The other services can be expected to continually seek to maximize their

contributions to unified action through focus within their respective domains. The Army should maintain the same level of focus regarding dominance within the land domain.

While FM 3-0 has taken a significant step forward by integrating space and cyberspace as warfighting domains, the Army must not risk losing its focus on enabling maneuver in the land domain in favor of generating A2/AD opportunities via convergence. The joint force must be trusted to play their respective roles within the context of unified action. Put differently, the U.S. Army risks losing sight of enabling its own subordinate echelons—those responsible for conducting ground maneuver—in favor of pursuing convergence. This may be a worthwhile goal for the service provided the rapidly evolving nature of conflict, but it is also one that the Army is insufficiently postured to conduct in space and cyberspace. The ongoing Russo-Ukrainian war has repeatedly demonstrated the limited utility of well-integrated effects from multiple domains when insufficient forces exist to effectively exploit the opportunities these effects generate.²² Overreliance on these capabilities beyond the operational reach of Army maneuver elements risks permitting conflicts to devolve into grinding attritional warfare that favors U.S. adversaries.

The U.S. Army remains a force that is trained, organized, and equipped to engage in maneuver warfare. The service has long assumed risk in the protection warfighting function in favor of continued investments in maneuver warfare capability. One need only look at the roles of the "Big Five" platforms that dominate Army formations to illustrate this point.²³ The constraints associated with the Army's current force structure, in addition to the immaturity of offensive space and cyberspace capabilities, should not be taken lightly. To risk any reduction in tempo and agility during LSCO—even that which is merely implicit—is to risk defeat. An approach to convergence that emphasizes support to exploitation of opportunities in the land domain reduces this risk by leveraging the advantages of the U.S. Army as it exists today and is likely to exist for the foreseeable future.

Of course, such an approach assumes its own risks. If the Army shifts its focus toward exploiting opportunities within the tactical fight, gaps may appear within enemy support areas that other services are

incapable of addressing in a timely manner. The joint force will already be hard pressed to meet the enormous challenges within the maritime, air, space, and cyberspace domains during LSCO. Conventional forces may also be exposed to risk deemed unacceptable given current force generation challenges, advance-

Conclusion

By affording offensive space and cyberspace capabilities the qualities of magic, the Army has unwittingly stifled leaders' ability to understand the concept of convergence and improve its implementation. For most soldiers who reside within the Army's tactical echelons,

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ments in automation and precision fires, and logistical hurdles. The Army's multidomain integration with the joint force may very well be reduced under such an approach, as Army staffs prioritize support to their subordinate echelons when conditions permit such freedom of action.

These are valid concerns that may supersede the potential advantages accrued by this alternate approach to convergence. The distinction between these two approaches may even prove irrelevant in practice. These differing interpretations of what convergence should be, however, are merely intended to spark an intellectual debate about the role of convergence in U.S. Army doctrine that is both warranted and overdue. The result of such a debate is likely to benefit the Army regardless of its outcome.

Convergence is ultimately a framework for gaining relative military advantage in the face of considerable challenges present within the current operational environment. It remains critical that Army leaders understand the doctrinal framework for achieving this result regardless of any perceived insufficiencies in the concept. Space and cyberspace are merely components of this framework, serving to instigate broader questions about the role of convergence in MDO. The relationship between convergence and the offensive application of these domains is integrally intertwined. Additional clarity regarding convergence will undoubtedly shed additional light on the proper employment of offensive space and cyberspace capabilities in future Army operations.

convergence is a paradox—an operational tenet that leaders must simultaneously seek to integrate into all planning and yet must accept will generally remain somebody else's responsibility. The aura of magic surrounding the space and cyberspace components of convergence is thus preserved by the virtually impenetrable barriers of classification, compartmentalization, technical jargon, convoluted authorities, and the sort of corrosive speculation that feeds off unmoored optimism. Conditioning leaders to withhold action as they wait for conditions to be set by capabilities of which they are inadequately informed is an exercise in faith that invites disaster and undermines the very foundations of mission command.

While convergence retains value as a technique for overcoming enemy A2/AD architectures at the theater and corps echelons, it makes little sense as an operational tenet. Reducing the role of convergence and deepening FM 3-0's discussion of combined arms will strengthen the MDO framework and better clarify tactical echelons' roles in exploiting the opportunities convergence seeks to create. The revision of U.S. Army doctrine alone will be insufficient to address the many challenges associated with the employment of offensive space and cyberspace capabilities, but it is a vital starting point for further reforms. These revisions, in addition to a candid debate regarding the applicability of convergence more broadly, will empower Army leaders to peer behind the emerald curtain and see the true nature of these emerging domains. When they finally do, they'll discover that no magic awaits

them in space or cyberspace, only a Gordian knot of tangled risks and opportunities in near equal measure.

The emerald curtain affords no safety, only a pretext for self-delusion. ■

Notes

Epigraph. Arthur C. Clarke, *Profiles of the Future: An Inquiry into the Limits of the Possible*, rev. ed. (New York: Popular Library, 1977), 39.

1. U.S. Army Training and Doctrine Command (TRADOC) Pamphlet (TP) 525-3-1, *The U.S. Army in Multi-Domain Operations 2028* (Fort Eustis, VA: TRADOC, December 2018), vii. TP 525-3-1 defines convergence as the “rapid and continuous integration of capabilities in all domains, the EMS [electromagnetic spectrum], and information environment that optimizes effects to overmatch the enemy through cross-domain synergy and multiple forms of attack all enabled by mission command and disciplined initiative.” This definition was later altered in Field Manual (FM) 3-0, *Operations* (Washington, DC: U.S. Government Publishing Office [GPO], 2022), 3-3. TP 525-3-1’s definition is considerably broader than FM 3-0’s and includes the EMS and information environment, which the TRADOC pamphlet leaves unmentioned. The inclusion of “integration of capabilities in all domains” has also resulted in lingering confusion regarding convergence as defined in the 2022 publication of FM 3-0.

2. FM 3-0, *Operations*, 3-2–3-5.

3. Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984), 119.

4. FM 3-0, *Operations*, 3-3.

5. *Ibid.* The FM clearly addresses convergence’s relationship with mass, economy of force, and objective. Of the remaining six principles of warfare, the term’s compliance with the principle of simplicity is by far the most concerning.

6. *Ibid.*

7. *Ibid.*

8. *Ibid.*, 3-5.

9. *Ibid.*, 3-6.

10. *Ibid.*, A-4.

11. *Ibid.*, 2-19.

12. *Ibid.*, 3-2.

13. *Ibid.*

14. Jon Harper, “Just In: Army Struggling to Simulate All-Domain Warfare,” *National Defense*, 18 October 2021, <https://www.nationaldefensemagazine.org/articles/2021/10/18/army-struggling-to-simulate-all-domain-warfare>. In the article, Col. Christopher Budihas, director of the Maneuver Battle Lab, describes “white-carding” as a scenario inject—often written on a physical 3x5 card—which is not integrated into the training simulation. He acknowledges the deficiencies in this methodology and requests assistance from industry in developing better solutions for effects associated with space, cyber, and electromagnetic spectrum.

15. Barry Rosenberg, “How the Army Is Driving Enterprise Training across Five Warfighting Domains and Three Dimensions,” *Breaking Defense*, 23 May 2024, <https://breakingdefense.com/2024/05/how-the-army-is-driving-enterprise-training-across-five-warfighting-domains-and-three-dimensions/>. In the article, Brig. Gen. Scott Woodward accurately assesses that the current

Warfighter simulation architecture “doesn’t do space and it doesn’t do cyber at all.”

16. Susan Ratcliffe, ed., *Oxford Essential Quotations*, 6th ed. (New York: Oxford University Press, 2018), <https://www.oxfordreference.com/display/10.1093/acref/9780191866692.001.0001/q-oro-ed6-00020959?rskey=fGZMYT&result=8>.

17. Army Techniques Publication (ATP) 3-91, *Division Operations* (Washington, DC: U.S. GPO, 2014); ATP 3-92, *Corps Operations* (Washington, DC: U.S. GPO, 2016); ATP 3-93, *Theater Army Operations* (Washington, DC: U.S. GPO, 2021). None of these publications incorporate language associated with convergence, and all are in dire need of an update following the major structural changes included in *Army Force Structure Transformation* (Washington, DC: Headquarters, Department of the Army, February 2024), <https://api.army.mil/e2/c/downloads/2024/02/27/091989c9/army-white-paper-army-force-structure-transformation.pdf>.

18. Army Doctrine Publication 6-0, *Mission Command: Command and Control of Army Forces* (Washington DC: U.S. GPO, 2019), 3-1–3-3; FM 6-0, *Commander and Staff Organization and Operations* (Washington DC: U.S. GPO, 2022), 1-1–1-3.

19. FM 3-0, *Operations*, 3-1.

20. Ratcliffe, *Oxford Essential Quotations*, <https://www.oxfordreference.com/display/10.1093/acref/9780191866692.001.0001/q-oro-ed6-00016315?rskey=OojzB&result=2>.

21. FM 3-0, *Operations*, 6-8, 6-11. Figure 6-1, “Doctrinal Template of Depths and Frontages,” and figure 6-2, “Notional Roles and Responsibilities in Terms of Time, Space, and Purpose,” provide a useful framework for the employment of effects to achieve convergence regardless of whether the existing framework or a modified, exploitation-centric framework are adopted. This article does not propose any reduction in higher echelons’ responsibility to employ organic assets to disrupt enemy freedom of movement and shape the operational environment within these frameworks.

22. Amos Fox and Shashank Joshi, “Russia, Ukraine, and Armed Conflict with Shashank Joshi,” 27 March 2024, in *Revolution in Military Affairs*, hosted by Amos Fox, podcast, 38:00–43:00. <https://shows.acast.com/revolution-in-military-affairs/episodes/russia-ukraine-and-armed-conflict-with-shashank-joshi>.

23. David C. Trybula, “Big Five Lessons for Today and Tomorrow” (research paper, Carlisle, PA: U.S. Army War College, 29 May 2012), 7–64, <https://apps.dtic.mil/sti/pdfs/ADA592510.pdf>. Of the “Big Five” platforms—the Abrams main battle tank, Bradley fighting vehicle, Apache helicopter, Black Hawk helicopter, and Patriot air defense system—only the Patriot is a dedicated defense asset. The addition of other capabilities to this list such as the Stryker fighting vehicle, Paladin artillery system, Multiple Launch Rocket System, and High Mobility Artillery Rocket System only serve to further highlight the premium the U.S. Army places on maneuver warfare. Such an approach mitigates risk by maximizing mobility and contrasts with positional or attritional approaches to warfare in accordance with the move-strike-protect framework.



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