Future of Cavalry: Multi-Domain Effects Battalions as New Theater Reconnaissance

by LTC Aaron Ritzema and LTC Thomas Burns

Since the dawn of warfare, commanders have looked for ways to increase the speed and range of their ability to find enemy forces, determine their location and develop an appropriate response. First with the horse, then through the air, commanders have depended on cavalry operations to provide time and space for decision making and inform their understanding of the battlefield faster than the adversary.

As technology has advanced, so have the means and methods for conducting reconnaissance, surveillance and security operations. The increased prevalence and reliance on multi-domain sensors and growth in importance of the electromagnetic spectrum have forced a re-assessment of how Army formations conduct these cavalry functions.[1, 2] While most of this analysis is focused on the division and below, the formation of the multi-domain task forces, and their multi-domain effects battalion (MDEB) represents the future of cavalry as it performs integrated reconnaissance, security and surveillance in support of targeting at the theater level. To further explore this, we will review the role and purpose of cavalry, review the current doctrinal perspective on reconnaissance, surveillance, and security in cyberspace operations and electromagnetic warfare. We will also discuss the task organization and employment concept of the MDEB, and then demonstrate how the MDEBs perform the traditional cavalry roles and functions in a new and innovative way.

Role, purpose of cavalry

Field Manual (FM) 3-98, *Reconnaissance and Security Operations*, describes the fundamental purpose of cavalry as "set(ting) conditions for successful operations of their higher headquarters."[3] To do this, cavalry units perform seven roles that directly enable the commander to visualize, understand, describe, and direct:

1) enable combat operations,
2) provide Accurate and Timely Information to the Operations process,
3) operate as combined arms air-ground teams,
4) provide reaction time and maneuver space,
5) preserve combat power,
6) facilitate movement and transitions, and
7) fight for information.

Historically, this has translated into three specific mission sets that fall under the information collection umbrella: reconnaissance, surveillance, and security operations.[4] Ultimately, these three roles facilitate the commander's ability to maneuver their forces and concentrate superior combat power at the decisive time and place.[5] The following paragraphs summarize Joint and Army doctrine on these mission sets to set the stage for demonstrating how the MDEB performs these tasks as the new face of cavalry.

Reconnaissance

According to Joint Publication (JP) 2-0, *Reconnaissance,* is a mission undertaken to obtain information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, geographic, or other characteristics of a particular area, by visual observation or other detection methods.[6] In the case of the MDEBs, this primarily takes the form of electromagnetic reconnaissance which JP 3-85, *Joint Electromagnetic Spectrum Operations* defines as "the detection, location, identification, and evaluation of foreign electromagnetic radiations using assigned electromagnetic warfare personnel and capabilities. Electromagnetic reconnaissance may result in electromagnetic protection modifications or lead to an electromagnetic attack against enemy capabilities."[7]

There are seven fundamentals of reconnaissance:
1) Ensure continuous reconnaissance.
2) Do not keep reconnaissance assets in reserve.
3) Orient on the reconnaissance objective.

4) Report all required information rapidly and accurately.
5) Retain freedom of maneuver.
6) Gain and maintain enemy contact.
7) Develop the situation rapidly.

There are five forms of reconnaissance:
1) Zone.
2) Area.
3) Route.
4) Reconnaissance in force, and
5) Special Reconnaissance.

Surveillance

FM 3-90 defines *Surveillance* as "the systematic observation of aerospace, cyberspace, surface or subsurface areas, places, persons, or things by visual, aerial, electronic, photographic, or other means."[8] Similar to reconnaissance in its purpose, surveillance is typically more passive, persistent, and feeds the targeting and target development processes in support of Intelligence Preparation of the Battlefield.

Security Operations

Army Doctrine Publication (ADP) 3-90, **Offense and Defense**, defines security operations as those operations performed by commanders to provide early and accurate warning of enemy operations, to provide the forces being protected with time and maneuver space within which to react to the enemy and to develop the situation to allow commanders to effectively use their protected forces.[9] Like reconnaissance, security operations are a means to determine enemy activity, disposition and intent. The primary difference is that security operations are oriented on the protected force or area rather than on the enemy or terrain.

There are five fundamentals of security operations:
1) provide early and accurate warning,
2) provide reaction time and maneuver space,
3) orient on the protected force, area or facility to be secured,
4) perform continuous reconnaissance, and
5) maintain enemy contact.

There are four types of security operations that provide increasing levels of security for the protected force:
1) screen,
2) guard,
3) cover, and
4) area security.

Support to the operations process. Ultimately, the role and goal of reconnaissance, security operations, and surveillance is to provide the commander with accurate and timely information. This information helps the commander better understand and visualize the operating environment and further describe, direct, lead, and assess combat operations.[10] The primary source of information for the commander during battle is the reconnaissance and security organization, which at the theater level, is the MDEB.

Support to targeting. Targeting is the process of selecting and prioritizing targets and matching an appropriate response.[11] Targeting is an extenuation of the operations process and one of the three integrating processes for reconnaissance and security operations.[12] Cavalry organizations support targeting through timely and accurate reporting allowing for further refinement of target identification and location enabling the application of capabilities or weapons systems to achieve a desired effect.

Cyber domain, electromagnetic warfare

Recon, surveillance, and security in cyberspace and electromagnetic warfare. The emergence of the cyber domain and prevalence of electromagnetic warfare (EW) has driven the Joint Force and Army to further expand the definition of these roles.

Like cavalry, cyberspace forces and EW organizations' primary purpose is to enable situational understanding, protect friendly personnel and capabilities, and to deliver effects.[13] Additionally, commanders use cyberspace and EW capabilities in the same three roles as cavalry: reconnaissance, surveillance and security activities.

Electromagnetic reconnaissance is the detection, location, identification and evaluation of foreign electromagnetic radiations (energy) (JP 3-85). Commanders use electromagnetic reconnaissance assets to collect information in the electromagnetic spectrum (EMS), identify enemy attempts to regain the initiative and request offensive cyber operations support to conduct cyberspace exploitation in cyberspace.[14] Commanders and staff can also readjust targeting priorities and fire support plans, including cyberspace attacks and electromagnetic attack (EA), to keep adversaries on the defensive.[15] Further, ES missions conduct electromagnetic reconnaissance to attain information about the disposition of enemy threats in the EMS and modify security efforts.

Network surveillance is the collection of information in cyberspace and the EMS. It is the observation of organizational, social, communications, cyberspace, or infrastructure connections and relationships (FM 2-0, *Intelligence*). Surveillance can also include detailed information on connections and relationships among individuals, groups, and organizations, and the role and importance of aspects of physical or virtual infrastructure. The electromagnetic support task of *direction finding* is a relevant surveillance task. Direction finding obtains bearings of radio frequency emitters. Using electromagnetic support (ES) platforms with direction finding capabilities deployed in various formations to create a coverage area can locate enemy forces, akin to surveillance of a named area of interest.

Cyberspace defense, cyberspace security, and EP include security actions that allow early detection and mitigation of threats in cyberspace and the EMS. During security operations, information collected on an enemy's course of action in cyberspace and the EMS allows units to take preemptive measures that prevent enemy intelligence, surveillance, and reconnaissance assets from determining friendly locations, strengths, and weaknesses. Security operations also present opportunities to identify high value targets for future cyberspace attacks or EA. Akin to the counter-reconnaissance fight, Threat warning enables the commander and staff to quickly identify immediate threats to friendly forces and implement electronic attack and electronic protection countermeasures.

A common observation of units primarily operating in cyberspace and the electromagnetic spectrum is they are not maneuver units because they cannot hold terrain or fight for information. This view, in the authors' opinion, takes a dated and narrow view which focuses only on the dirt of the ground domain. FM 3-12, *Cyberspace Operations and Electromagnetic Warfare* is clear though, the electromagnetic spectrum is a maneuver space. Similarly, cyberspace operations require units to maneuver. These are both contested environments that require identifying key terrain and fighting for information.

Key terrain in both domains is just as critical to mission success as a hilltop may be to ground maneuver. Retaining it provides a marked advantage to whoever holds it. However, a change in traditional thinking is required as friendly and enemy forces may be occupying the same terrain, even without knowing each other is operating in the same space. EMS key terrain includes frequencies, devices, and infrastructure. Cyberspace key terrain includes locations to gather intelligence, locations that support network connectivity, entry points to friendly networks that require defending, and locations friendly forces requires access to. EMS and cyberspace have their own obstacles, avenues of approach, cover and concealment, and observation/fields of fire to identify for both friendly forces and the adversary. In this fight, step 1 of engagement area development is still, "identify likely enemy avenues of approach."

MDEB

Primarily envisioned as a counter anti-area access denial organization,[16] the MDEB is equipped to function as multi-domain cavalry through the employment of a combination of terrestrial, air launched, and spaced based capabilities that operate primarily in the EMS.[17] In alignment with FM 3-12's electromagnetic warfare taxonomy, these platforms and capabilities can conduct the full spectrum of Electromagnetic Warfare helping the commander to see themselves (electromagnetic protection (EP)), the enemy (electromagnetic support) and deliver effects (electromagnetic attack).[18]

In the full objective build, an MDEB will consist of the following: a signal company and a military intelligence company that are in direct support to the task force; an extended range sensing and effects company that will

contain three high altitude sections with some form of (to be determined) high altitude balloon or platform, four Class III unmanned aerial systems, and an electromagnetic warfare section to manage the ES/EA payloads; and a space company with three sections of three crews to staff up to three Space Control Electromagnetic Warfare kits.
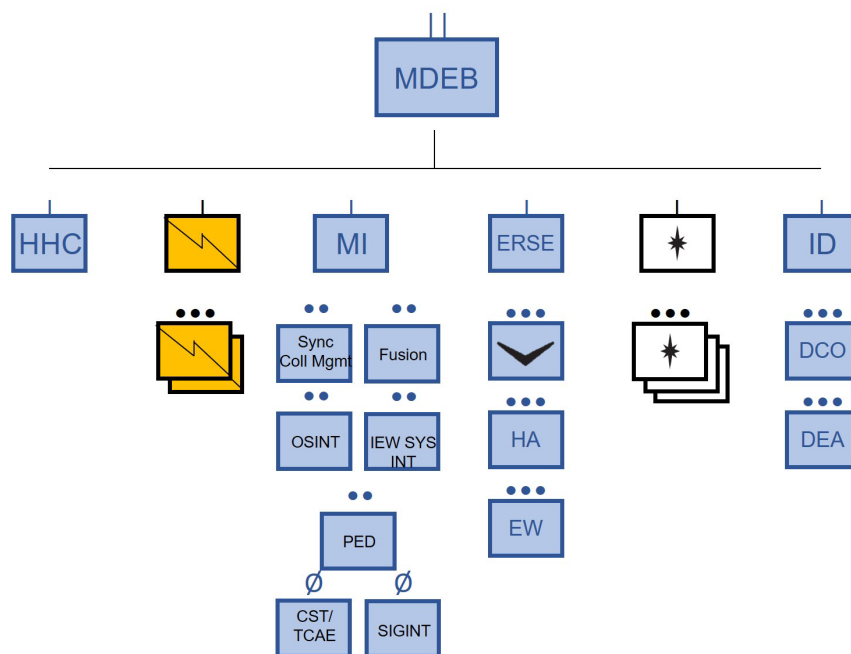

Figure 1. MDEB Force Structure.

A fully mature MDEB will have the ability to support the Army service component commander in achieving situational understanding through the fusion of national intelligence, reconnaissance, surveillance and security data with data generated by organic assets to support the commander's decision-making cycle. The combination of air launched effects, space capabilities, and long loitering platforms and payloads will extend the operational reach of organic effects. This extended reach enables situational understanding and offers a high level of flexibility and synchronization across all domains to the commander. Subsequent paragraphs will further elaborate while the following concept map shows how the MDEB performs cavalry functions while supporting the multi-domain task force's (MDTF) synchronization of multi-domain operations and targeting functions.
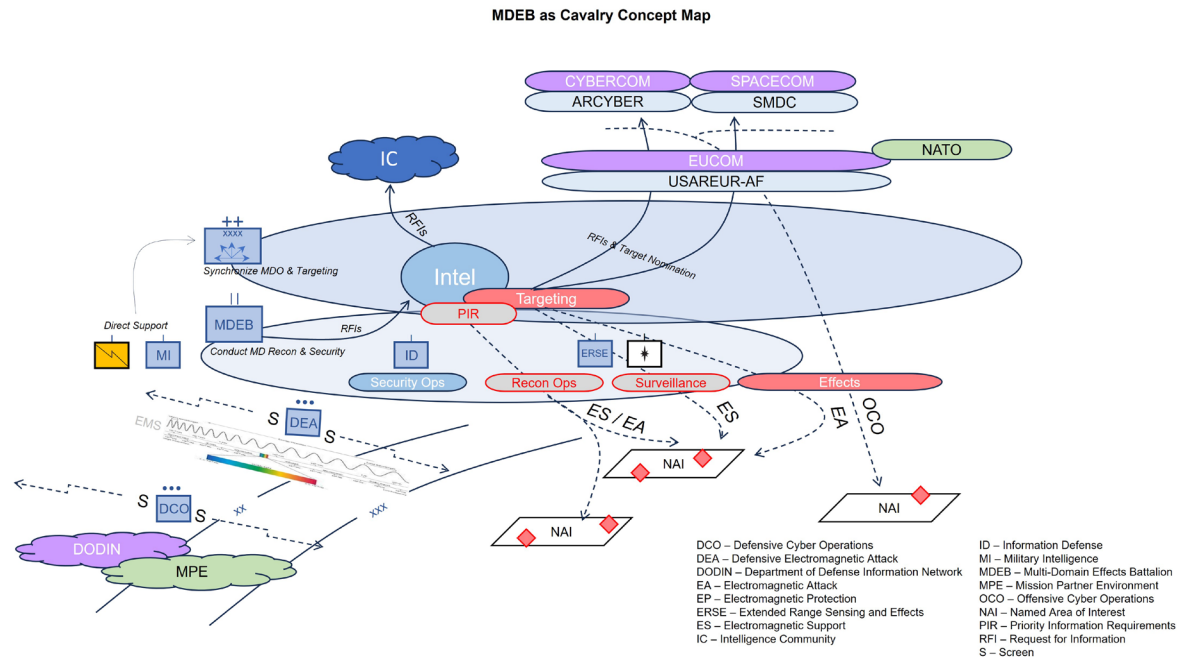
MDEB as Cavalry Concept Map

Figure 2. MDEB as cavalry concept map. *(U.S. Army graphic)*

How the MDEBs perform reconnaissance operations. Given the nature of electromagnetic reconnaissance, the MDEB almost exclusively conducts area reconnaissance oriented on enemy forces operating within named areas of interest across the strategic deep area. In competition and crisis, the MDEB enables intermediate target development and follow-on non-lethal reference points in support of the geographic combatant command. In conflict, the MDEB supports the operations process by answering priority intelligence requirements through the positioning of launched effects and airborne electromagnetic warfare assets to identify the position, composition, and intent of enemy forces homing in on their electromagnetic signatures. The MDEB provides additional reconnaissance and security capability to the Joint Force to offset the dispersion of signals intelligence collection assets.[19]

Principles of reconnaissance. While not all inclusive, the MDEB adheres to the fundamentals of reconnaissance by gaining and maintaining contact with enemy forces in the EMS and using a robust sensor network to feed information rapidly back into the all-domain operations center. Electromagnetic support sensors find and fix enemy electromagnetic signatures allowing the commander to gain a better understanding of the enemy disposition and feed that information back into the targeting process for follow on kinetic or non-kinetic effects. Additionally, the MDEB uses electromagnetic attack sensors to develop the situation by stimulating enemy capabilities to aid in identification or canalize them into a specific posture or means of communication to achieve other effects.

MDEBs inherently operate as multi-domain teams, or cells, that replicate the combined arms air-ground teams in the sense that they employ cyber, EW, and space assets with a variety of platforms and capabilities. The composition, size and scope of these teams can vary depending on mission, target set, and range required. The MDEB also can partner with special operations forces, expeditionary cyber teams, security force assistance brigades, other partners and allies to further extend operational reach, placement and access to overcome reconnaissance gaps when limited to organic assets.

How the MDEBs conduct surveillance in support of targeting. The MDEB is fully integrated with the targeting cycle through the employment of high altitude and space-based electromagnetic support sensors that provide a "persistent stare" in support of deliberate target development. Through the layering of electromagnetic support capabilities, the MDEB can tip and queues assets to develop and refine targeting data for MDTF organic effects or drive target nomination at the task force, joint and national levels.

Surveillance and target development in competition. In competition, surveillance allows for the deliberate development of target packets through target identification and discovery along with vulnerability analysis provided by intelligence and cyber analysts. This supports the development of concept of operation packets and specific electromagnetic attack and cyber tools that can be prepared ahead of crisis and conflict.

Surveillance and targeting in crisis and conflict. In crisis and conflict, the surveillance capabilities of the MDEB provide the initial que for follow-on air launched effects and airborne sensors that converge to provide refined targeting data for organic and external fires and effects. MDEB sensors and non-kinetic effects capabilities integrate with the Joint Targeting Cycle and Air Tasking Order cycle to find, fix, track and on-order engage.

How the MDEBs perform security operations. While it is easy to see how the MDEBs perform reconnaissance and surveillance, visualizing how they perform security operations is a little more abstract. As previously pointed out, security operations differ from reconnaissance in that they orient on the protected force. The MDEB's ability to conduct security operations provides the commander with reaction time and maneuver space through a combination of defensive cyber operations and defensive electromagnetic attack capabilities. These teams and assets can perform a variety of support and protection functions in cyber and the EMS buying the commander decision space to react to the enemy's disposition, unanticipated actions, and further developments in the strategic deep. The MDEB's Information Defense company executes security operations in the cyber domain and EMS through the defensive electromagnetic attack platoon and three defensive cyber operations (DCO) mission elements.

The defensive electromagnetic attack element enables the MDEB to perform counter reconnaissance and electromagnetic counter measure tasks to prevent the enemy from determining friendly locations, strengths, and weaknesses by protecting and screening the electromagnetic signature of friendly forces. They provide early warning to the protected force and allows for additional force protection and emission control measures to be put in place reducing the threat of enemy contact and observation in the EMS. Limited electromagnetic attack capabilities also allow for counter reconnaissance to defeat or disrupt enemy EMS reconnaissance elements and capabilities.

Likewise, the DCO mission elements screen the key cyber terrain of organic and theater level network and cyber assets providing early warning of compromise and coordinating and synchronizing cyber effects to neutralize or defeat enemy cyber elements.

Conclusion

The MDEBs are uniquely postured to become the cavalry of the future by adding additional depth to the Joint Force Land Component Commander's ability to gain and maintain contact through the electromagnetic spectrum, developing the situation rapidly, and feed information into the operations process and targeting cycle. The MDEB is capable of far more than support through just intelligence and surveillance. While finding, fixing, and tracking the enemy is a large part of that, the MDEB can also determine enemy strengths, weaknesses, disposition, and intentions and provide early and accurate warning about the enemy. Viewed as a maneuver force, the MDEB actively conducts reconnaissance and security operations in conflict to help commanders ascertain adversary aims, gain initiative and ultimately present dilemmas for the adversary.
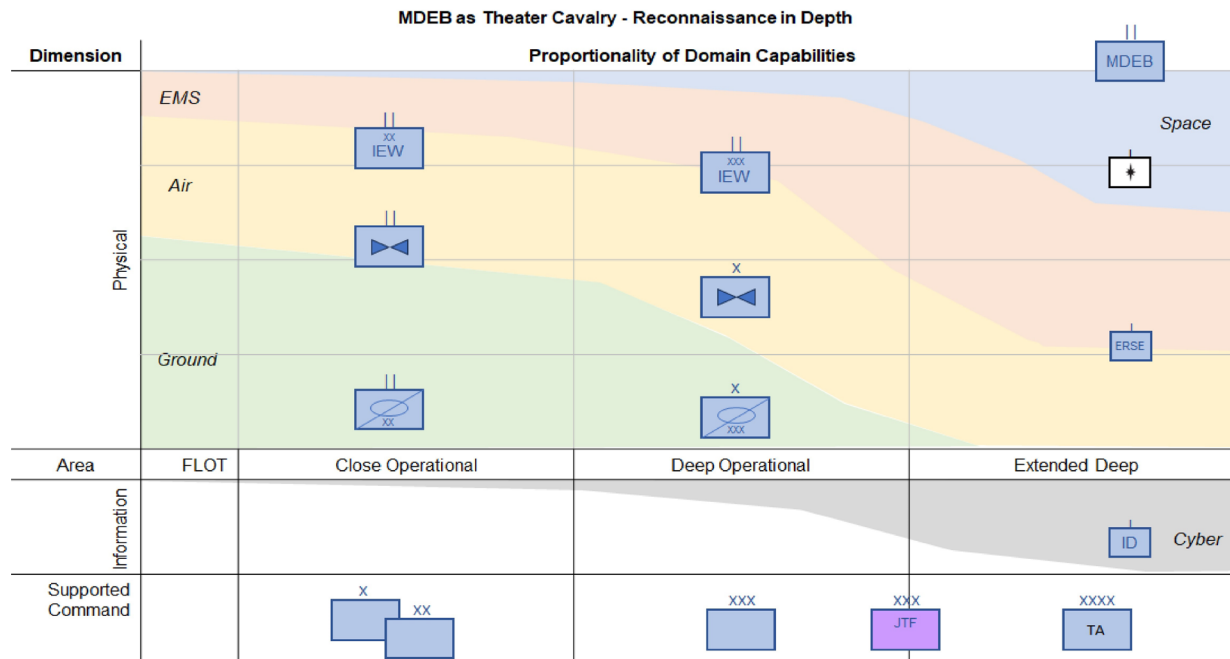
Figure 3. MDEB as Theater Cavalry – Reconnaissance in Depth.

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Notes

[1] Sean Parrott and Anthony Perez, "The Future of Army Reconnaissance: Lessons from a Marine Corps Exercise in the Mojave Desert," **Modern War Institute,** March 31, 2023, The Future of Army Reconnaissance: Lessons from a Marine Corps Exercise in the Mojave Desert - Modern War Institute (westpoint.edu).

[2] MG John B. Richardson IV, and MAJ John T. Pelham IV, "The Division Cross-Domain Task Force," **ARMOR** magazine Fall 2023, pages 16-19. ARMOR Fall 2023.pdf (sharepoint-mil.us). https://www.moore.army.mil/armor/earmor/content/issues/2023/Fall/ARMOR%20Fall%202023.pdf.

[3] U.S. Army FM 3-98, **Reconnaissance and Security Operations**, Jan. 10, 2023, Para 1-5.

[4] FM 3-90, **Tactics**, May 1, 2023, Para 12-1.

[5] FM 17-95: **Cavalry Operations** (Superseded), Dec. 24, 1996, Paragraph 1-1.

[6] Joint Publication (JP) 2-0, **Joint Intelligence**, May 26, 2022.

[7] JP 3-85, *Joint Electromagnetic Spectrum Operations*, May 22, 2020.

[8] JP 3-0, *Joint Campaigns and Operations*, June 18, 2022.

[9] U.S. Army Doctrine Publication (ADP) 3-90, *Offense and Defense*, July 31, 2019.

[10] FM 3-98, *Reconnaissance and Security Operations*, Jan. 10, 2023, Para 1-7.

[11] JP 3-0, *Joint Campaigns and Operations*, June 18, 2022.

[12] FM 3-98, *Reconnaissance and Security Operations*, Jan. 10, 2023, Para 3-123.

[13] FM 3-12, *Cyberspace Operations and Electromagnetic Warfare*, Aug. 24, 2021, para 1-7.

[14] Ibid, para 4-15, 4-48.

[15] Ibid, para 4-15.

[16] *Intelligence, Information, Cyberspace, Electronic Warfare, and Space (I2CEWS) Operational and Organizational Concept 2019-2024* v0.9 DRAFT.

[17] Chief of Staff Paper #1, *Army Multi-Domain Transformation, Ready to Win in Competition and Conflict*, https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN32547-SD_01_CSA_PAPER-01-000-WEB-1.pdf

[18] FM 3-12, *Cyberspace Operations and Electromagnetic Warfare*, Aug. 24, 2021, para 2-8.

[19] Cyber Center of Excellence, *120-Day Study of U.S. Army Electromagnetic Warfare, Cyberspace Operations, and Information Advantage Capabilities and Organizations*, Coordinating DRAFT, Oct. 14, 2023.

Acronym Quick-Scan

ADP – Army Doctrine Publication
DCO – defensive cyber operations
EA – electromagnetic attack
EMS – electromagnetic spectrum
ES – electromagnetic support
EW – electromagnetic warfare
FM – field manual
JP – Joint Publication
MDEB – multi-domain effects battalion
MDTF – multi-domain task force