Battlespace Next: Multi-Domain Operations
Instructor’s Guide – Version 1.0

Created by the Cyberspace Technical Center of Excellence (CyTCoE) and the Center for Cyberspace Research (CCR) at Air Force Institute of Technology (AFIT) at Wright-Patterson AFB, OH

Disclaimer: The views expressed in this guide are those of the authors and do not necessarily reflect the official policy or position of the Air Force, the Department of Defense, or the U.S. Government.

I. INTRODUCTION

This guide helps leaders, instructors, and facilitators effectively utilize Battlespace Next: Multi-Domain Operations (MDO), a card game designed to spark discussion concerning the implementation of MDO and Multi-Domain Command and Control (MDC2). This guide will not explain how to play the game, but is meant to be paired with the game instructions (see Appendix A for a summary of game instruction). The game is engineered to provide an engaging and hands-on experience for players as they consider the realities of modern peer-to-peer warfare. Please modify order of steps, discussion questions, or game instructions to best fit your context.

A comprehensive game tutorial can be accessed here: https://www.youtube.com/watch?v=GIEq3LNekXw

A trailer promoting the game can be found here: https://www.youtube.com/watch?v=2niX5I_MSBY

The game is available for the cost of supplies here: https://www.printplaygames.com/product/battlespace-next/

II. GAME OVERVIEW

1. Description: 2-4 player card-based game featuring military capabilities from Air, Space, Cyber, Ground, Maritime, and Cognitive/Human domains
2. Intended Audience: Ages 16 and up. Engineered for current military personnel (Active Duty, Guard, Reserve, civilian, and contractor), potential recruits, or those interested in military strategy
3. Resources needed: 1 set of cards (54 cards) for each player or team, game instructions, instructional video(s), this instructor’s guide, damage and resource chips, and 1 die for each game
4. Time; 1-1.5 hours to play the first game, 30-45 minutes for each subsequent game. If using the game in the classroom context, plan for students to interact with the game for 3-4 hours. This
provides sufficient time for the students to review game resources and instructions, play multiple games, and participate in a guided discussion (debrief) led by the instructor.

The game serves as a dynamic platform for teaching players about the considerations involved in choosing assets to deploy (strategic level of warfare) and leverage for attack and defense (operational level of warfare). It examines the impacts of one domain on another domain, including how a cyber and non-kinetic attacks and defenses can influence more conventional warfare (forces creating kinetic effects in and through Air, Sea, and Land Domains). It allows a player to create an individual strategy by starting the game with a set of cards that have been chosen from the full deck. In this way, the player must consider the benefits, weaknesses, and trade-offs of the assets by continually performing cost-benefit analysis, and adapting to the strategy of the opposing player. The player’s choices focus on the effects assets can create on the battlefield, especially as they are combined with other assets. This game provides a powerful engagement strategy to begin a deeper examination of MDO concepts for a wide range of populations.

III. LEARNING OBJECTIVES

The games learning objectives are classified using the Game Aesthetic from the Mechanics, Dynamics, and Aesthetics game development framework by Hunicke, LeBlanc, and Zubek (2004) and the appropriate level of Bloom's taxonomy (1956).

<table>
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<tr>
<th>Game Aesthetic</th>
<th>Lesson Objective</th>
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<td>Discovery</td>
<td>Recognize that both cyber and kinetic capabilities require a kill chain and advanced planning</td>
<td>Knowledge (Level 1)</td>
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<td>Discovery</td>
<td>Identify the two major phases of the “Spectrum of Conflict” (conflict and competition)</td>
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<tr>
<td>Challenge</td>
<td>Select and combine military capabilities to anticipate, adapt, and respond to surprise and uncertainty in the context of peer-to-peer warfare</td>
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<tr>
<td>N/A</td>
<td>Appreciate the complexity and effectiveness of executing Multi-Domain warfare and initiate multi-domain thinking across all operational contexts.</td>
<td>Valuing [Affective Goal]</td>
<td>All phases and elements</td>
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IV. MDO BACKGROUND

MDO is the broad term referring to the consideration of all six warfighting domains in any and every conflict. It has been discussed heavily at the highest levels of leadership in the Army and Air Force and increasingly across the Department of Defense. Summarizing the thoughts of General David Goldfein, Air Force Chief of Staff, MDO seeks to create warfighting synergy by integrating capabilities and effects from all domains (air, space, cyber, land, maritime, and human/cognitive) to create multiple and various
dilemmas against an enemy cannot sufficiently respond. Many resources exist for understanding, introducing, and teaching about MDO and MDC2. Refer to Appendix C for a list of recommended resources.

V. EQUIPMENT DESCRIPTION

A. Game Cards: 54 cards are included in each deck. 53 of those cards are divided into the 6 warfighting domains (see figure 1) and 1 card regulating the current level of conflict. Some cards include Electronic Warfare (EW) capabilities that are not marked with their own domain, but with the domain of the asset creating the EW effect. The player starts the game with 4 of these cards, 1 is shared by both players, and the rest are used to create the users hand (6 cards) and supply pile (42 cards).

B. Spectrum of Conflict Card: The final card in the deck is not tied to a domain but controls the elevation of the conflict level at the beginning of the game. This aspect of the game is very simplistic, but provides a way to introduce players to the difference between competition and conflict with a near-peer adversary. The competition phase allows users to setup kinetic defenses or try to cripple adversary using Information Operations (IO) and cyber capabilities. The spectrum of conflict makes the cyber capabilities in the game more valuable while reducing the value of “first [kinetic] strike.” This mechanic can be removed, but the player who goes first may have a distinct advantage because they can attack before the opponent has a chance to setup robust defenses.

C. Resource and Damage Chips: The small chips included help the players track how many resources (gold chips) they are spending and what units have received damage during play (red/black chips). The damage chips can also be used to mark cards that have an ongoing effect. For example, if a player gains access to the opponent’s network, they should add a damage chip to the card to show both players that this card has an on-going impact. IO cards can be marked in a similar way depending on the player’s roll.

D. Six-Sided Die: One is needed for each game (can be shared between opponents)

E. Turn Timer: Each player needs a turn timer. A smartphone app or 60 second sand timer can be used. Facilitators can increase the time allowed for each turn as necessary. Players should be encouraged to make decisions quickly as this is required during a real world-conflict. Because real-time strategy (RTS) games are typically more complex, the turn timer is used to speed up player decisions during this turn-
based game. This goes back to the OODA (Observe, Orient, Decide, and Act) Loop, created by John Boyd in the 1950s. The player who can make good decisions faster and is more familiar with the game environment will have an advantage, which mirrors a real-world conflict.

VI. ADAPTING THE GAME FOR YOUR CONTEXT

The game is highly adaptive to your context and instructors or facilitators are encouraged to make changes to the game instructions to more effectively address your lesson objectives and limitations. The cards themselves can be altered and reprinted if pre-coordination occurs with AFIT personnel. Current game rules and cards should not limit the creation of new capabilities and creation of new forms of gameplay.

VII. DEBRIEF INSTRUCTIONS AND SUGGESTED QUESTIONS

Debriefing is an essential part of using a game for an education or training purpose. Forethought is needed to craft discussion questions to guide students from the game experience to real-world application. The instructor should seek to push the group’s discussion toward realizing the lesson objectives without dominating the discussion. Specific focus should be used to identify the emotions felt by the players through the experience and introduce relevant examples from past and present military operations. The following questions are provided as examples and instructors are encouraged to create additional questions to drive home their specific learning objectives. In-depth discussion of game debriefing can be found in David Crookall’s article listed in Appendix C.

Questions specific to learning objectives [Bloom’s Taxonomy level identified within the brackets]

1. Recognize that both cyber and kinetic capabilities require a kill chain and advanced planning
   a. [Remember] What are the steps of the simplified cyber kill-chain (Scanning & Reconnaissance, Gaining Access, and Exploit)?
   b. [Understand] Did you execute any specific cyber attacks that did not use this progression (Man-in-the-Middle & Distributed Denial of Service)? Why did these attacks break the mold?
   c. [Evaluate] Do a majority of warfare planners and operators understand the effort and time required to create an effect from or through the cyber domain?

2. Identify the two major phases of the “Spectrum of Conflict.” Figure 6 shows the cycle as explained by Kelly McCoy in this article from Modern War Institute.
a. [Knowledge] What were the two phases in the Spectrum of Conflict?

b. [Comprehension] What is the difference between the two phases? Which capabilities could be used in each? What allows cyber and IO to be used in this way?

c. [Application] Will the next major conflict move beyond the competition phase of the Spectrum of Conflict?

d. [Evaluation] Should the US and its allies focus on developing and using military capabilities during the competition phase of conflict with our near-peer competitors?

e. [Evaluation] Why should we consider the use of non-kinetic actions when responding to threats from other nations? Will this increase or decrease the level of conflict? How would it differ from a kinetic response (shooting a missile or dropping a bomb)?

4. **Match cyber defense capabilities to corresponding threats**
   a. [Knowledge] What were the key cyber defense and mitigation cards in the game? What cyber exploits or attacks did these capabilities help to protect against?
   b. [Application] Where are these cyber capabilities used within the military? How does your branch of service group defensive and offensive cyber capabilities?
   c. [Evaluation] Does the typical warfighter understand cyber defensive and offensive capabilities that might affect them?

5. **Develop and execute an MDO strategy in a complex and contested environment**
   a. [Analysis] What strategies did you employ during your game(s)?
   b. [Synthesis] How did you come to use this strategy? Did you consider other strategies?
   c. [Synthesis] What factors did you need to account for while executing your strategy?
   d. [Evaluation] How can capabilities from different warfighting domains be used in concert to create more potent effects? For example, how would an information operation or cyber attack create an advantage prior to a kinetic strike?

6. **Select and combine military capabilities to anticipate, adapt, and respond to surprise and uncertainty in the context of peer-to-peer warfare**
   a. [Comprehension] Did you accurately predict your enemy’s actions/tendencies?
   b. [Evaluation] What effects did you create while using capabilities? Did these effects make your opponent change their strategy?
   c. [Application] Does the US currently have peer adversaries? Are we prepared to fight peer-adversaries? Is there a way that our adversaries could leverage our technically-superior capabilities against us?

7. **Appreciate the complexity and effectiveness of executing Multi-Domain warfare and initiate multi-domain thinking across all operational contexts.**
   a. [Comprehension] Is this game complex? Was it too complex? If so, is this because the game itself was too complex or the idea of MDO a complex reality that is hard to model?
   b. [Application] How does this game represent the current real-world military?
   c. [Application] How/where does this game depart from reality?
   d. [Evaluation] What does the military need today to encourage and facilitate multi-domain thinking? What technology is necessary to enable MDO in the US military?

Use these additional example questions to highlight various aspects of MDO:

1. **What emotions were you feeling while playing the game?**
   a. Games engage the emotions, which is one of the reason they are so successful. Try to capitalize on players’ emotions and translate their experiences into real-world learning.

2. **What strategies worked for you during the game?**

3. **What strategies didn’t work?**
4. How can cyber capabilities be integrated into current military operations?
   a. Does the use of cyber capabilities increase our surface for kinetic attacks?
   b. Can cyber capabilities win against an enemy leveraging kinetic weapons?
   c. The Israeli air strike against the launch point of a Hamas cyber attack may be a good example (https://www.theverge.com/2019/5/5/18530412/israel-defense-force-hamas-cyber-attack-air-strike)

5. In the game, your assets had perfect communication unless specifically interrupted by enemy actions. Is this realistic?
   a. If one radar in our arsenal detects a stealth asset, will our ground, maritime, and air assets see it too?
   b. What innovations and improvements are needed to ensure machine to machine communication? How can we connect all of our sensors to our shooters? How do we efficiently share information?
   c. One example is the F-22 and F-35. We assume they can efficiently share information, but recent news debunks this view. https://www.military.com/daily-news/2019/11/08/first-air-force-will-send-secure-data-between-f-22-and-f-35.html
   d. General Goldfein’s comments from AFA Conference from September 2019 may be relevant to this question (https://www.youtube.com/watch?v=f43Z0jKLQ&feature=youtu.be). If you have time, this could be a helpful resource to watch in its entirety during your MDO instruction.

6. How might the addition of nuclear capabilities change the nature of the game? How does this apply to real-world conflict?
   a. Tactical nuclear weapons may be used in future conflicts. How does this change the nature of warfare? How should military leaders respond when faced with an enemy who used a tactical nuclear weapon?

7. Were you able to build effective force packages?
   a. Force packaging in the game is the sequence of cards a player uses on a single turn. This may be unclear to students unless it is specifically identified.
   b. Have students share what combinations of cards worked well and what purpose they were trying to accomplish (effect) at the time. What effect were they trying to create?

8. How does this game relate to your career field or current position?
   a. How does your current role fit into the military’s role in peer-to-peer warfare?
   b. Several previous debriefs conversations revealed that after playing, students did not see the game as relevant to their career field or current position. This view seems to come from military personnel and others who are hyper-focused on their field and have difficulty relating their role or function to the bigger picture of competition and conflict.

9. Given the current power competition with peer adversaries, are you (player) seeing the big picture of competition and (potential) conflict in all domains?
   a. This is a key take-away for those that do not currently possess an “attack and defense” mindset in cyber, space, and cognitive (or other) domains.

10. Are you (player) preparing now to lead a multi-domain force in the future?
    a. What knowledge gaps do you need to fill in order to effectively leverage and command multi-domain capabilities?
    b. What skills will a future Component Command (COCOM) Commander need to effectively execute a multi-domain strategy?

VIII. EXPLANATION OF GAME CONCEPTS
1. *Cyber Kill-Chain* – The cyber capabilities are separated into five categories: (1) scanning and reconnaissance, (2) gaining access, (3) exploits, (4) mitigations, and (5) defense. Offensive Cyber Operations (OCO) capabilities follow a simplified version of the Cyber Kill Chain first created by Lockheed Martin. A majority of cyber attacks require the players to first perform scanning and reconnaissance actions. Second, players must gain access to the enemy’s network. Third, players can use certain exploits and cyber ISR capabilities. Some of the gaining access capabilities have a negative impact on the enemy, but the more potent effects come after gained access is obtained. Most of the cyber mitigations and defenses are aimed at preventing the adversary from gaining access. In real-world cyber conflict, it is (relatively) more difficult to hunt down an adversary within a network then to build and deploy secure systems to the battlefield. The three step cyber kill-chain is a key point to drive home during debrief. If you have more specific cyber/Electro-Magnetic Spectrum (EMS) domain objectives, it may be helpful to identify where the game simplifies or abstracts a key concept and then fill in the gap to match your learning objectives. As players become more experienced in using cyber capabilities, they will see that both cyber and kinetic capabilities require pre-planning and logistical support.

2. *Multi-Domain Operations Center (MDOC)* – This card and game concept was drawn from observations of the Doolittle Serious 18 war game. The event featured three teams of experienced operators assigned to develop the most appropriate C2 architecture for fighting future wars given various constraints. Each team independently included the idea of an MDOC into their architecture. This idea led to the creation of the MDOC card and made destroying it the central objective of the game. Although in real-world conflict the military objective may be different, destroying the MDOC represents removing the enemy’s ability to plan and execute operations. A full discussion can be found in Saltzman and Rothstein’s LeMay Paper found in Appendix 3. Additionally, Doolittle Series 19, held in October 2019, focused on developing the role of the MDOC in future warfare.

3. **Levels of Playing Area**

   a. **Level 1** – Cards in Deployment. These cards are only in deployment during the player’s current turn and then assigned to the appropriate level (2 or 3) at the end of the turn. This game mechanic forces the player to wait to attack with the cards that they just bought from their hand. This simulates the wait time needed to bring a cyber capability online, fly a plane from its home country to the area of conflict, or coordinate the relocation of a space asset. The game has been simplified so that all cards are in the deployment phase for the same amount of time, however more complex versions (especially an electronic version) of the game could specify wait times for various capabilities to more closely resemble reality. For example, travel time for ships is greater than planes which is greater than cyber capabilities. This change would make time another dimension for the player to consider while making game decisions. Such changes bring more realism to the game and reduce abstraction but at the same time may add complexity.

   b. **Level 2** – Cards without Defensive Capabilities. Cards that don’t have any defense are placed in level 2. These capabilities are those that need to be defended against opponent attacks. If an opponent attacks this level, the player may intercept the attack with cards in level 3. This simulates a geographic separation that allows the attacking card to be intercepted.

   c. **Level 3** – Cards with Defensive Capabilities. Cards with DEF options are placed in level 3 and are the primary attack and defense assets. In many cases these assets can be used to intercept enemy attacks.
IV. FREQUENTLY ASKED QUESTIONS

A. Can I add my own cards/capabilities to the game? Yes, instructors are encouraged to make changes to the game to best fit their context. However, care should be taken to consider the effect that new capabilities will have on the game (balancing). A specific scenario could be the best way to introduce new learning objectives. Playtesting and evaluation will be needed when introducing new game mechanics, cards, or capabilities.

B. Can I print new cards to use in my classroom? Yes, the AFIT POCs listed in this guide can help with the card creation and ordering process. If you would like to brand the cards with your organization’s logo, please work with AFIT CyTCoE for approval.

C. Why do some of the capabilities depart from actual military weapon systems? In order to reduce the complexity of the game and make it playable by students in a classroom setting, abstractions had to be made. These abstractions may lead to negative results, meaning that players will learn the wrong lessons and take-away inaccurate perceptions of military operations and MDO. Facilitators should use the debrief session to de-emphasize lessons learned that mislead students. One example of this is the F-22. Although the actual weapon system has ground strike capability (depending on the available munitions) the game card was simplified to focus on the key capability the F-22 provides to current operations (offensive and defensive counter-air and air superiority). This simplification of capabilities also requires players to decide between more powerful assets dedicated to a single function versus weaker multi-role assets. Sources and links are provided on many of the cards to assist players in personal research of real-world military systems and their application.

V. CONCLUSION

Thank you for considering Battlespace Next: MDO for your education and training purposes. Editable versions of the game cards and instructions are available upon request. If you have any questions about the game or feedback in how to improve the game or this guide, please contact Capt Nathan Flack (Nathaniel.flack@afit.edu) or the AF Cyberspace Technical Center of Excellence at AFIT (cytcoeworkflow@afit.edu).

VI. ACKNOWLEDGEMENTS

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APPENDIX A:
Summary of Game Instructions

1. Place the following cards in the middle (only 1 of each per game):
   a. GPS II
   b. Spectrum of Conflict

2. Place these cards in your playing area face-up (level 2)
   a. Multi-Domain Operations Center (MDOC) – Ground Domain
   b. Combined Space Operations Center (CSpOC) – Space Domain
   c. Cyber Operations Center – Cyber Domain
   d. IADS Command Center – Ground Domain

3. Roll to see who goes first – highest roll wins (2nd player receives 1 additional resource chip on first turn)

4. Turn overview:
   a. Reset turn timer
   b. Gain 4 resources
   c. Draw additional cards until you have 6 in your hand
   d. Deploy cards – pay the cost and place on the table nearest to you (level 1) in a revealed or unrevealed state. These cards will be become active at the end of your turn. Any card can be played in the “unrevealed” state, but it will not have any effect until revealed
   e. Attack opponent’s cards with previously deployed cards
      i. Note: No ATK actions are allowed in the first round. No kinetic ATK actions are allowed before the conflict level crosses the threshold
   f. Move any deployed cards from level 1 to levels 2 or 3 (depending on DEF options)
   g. You MAY discard some or all remaining cards in your hand

5. Each player starts with 4 resources and 6 selected cards in their hand, therefore no additional resources will be collected and no additional cards will be drawn on the first turn

6. After each round (both players take 1 turn each) roll to increase Conflict Level. Once the Conflict Level reaches 8 or higher, you can stop rolling

7. Order of Battle:
   a. Attacker chooses 1 card to attack and chooses a revealed enemy card as the target
   b. Defender Intercepts - IF the target does not have applicable DEF options, the defender may intercept with one other card (she can reveal cards for interception). All applicable cyber defenses MUST be revealed
   c. Resolution - The players determine the outcome of the battle. IF the attacker is not destroyed, it will continue to the original target. In this case its Attack Points (target icon) is applied to both the interceptor and the original target (if the ATK options apply)

8. Attack/Defense:
   a. To attack, your card’s ATK options must match the target card’s type. To defend or intercept, the DEF options must match the attacking card’s type
   b. Attack Points (target) go against Health Points (shield) for both ATK & DEF
   c. Attacker can only attack revealed cards
   d. Both cards will take damage unless “Long Range Fires” or another element is present (stealth, domain mismatch, disabled card, etc.)

9. Long-Range Fires: means a card can attack or defend and the opposing card cannot do damage back. Cruise Missiles can still be defended against if an asset possess “Cruise Missile Defense” but cannot damage the launcher

10. Die Rolls: All modifiers are added or subtracted to the roll (not the threshold)

11. Once player depletes their supply, they must shuffle the discard pile which becomes their new supply pile. Reduce resources gathered per turn by 2. If player depletes their supply pile twice, they automatically lose the game. For example, the first time a player cycles through their supply, they will only receive 2 resources at the beginning of each turn instead of 4
APPENDIX B: Experiment Procedures

If you are conducting an experiment using Battlespace Next (BSN) use this appendix to help you use the game effectively in your classroom and collect data to further improve BSN and shape future learning tools. Please coordinate each in-class playtest with Capt Nathan Flack (nathaniel.flack@afit.edu). Thank you!

SESSION 1 – PRE-SURVEY, EXPLANATION, & DEMO GAME

After an introduction of MDO, show the game to your classroom or audience. For best results, introduce the game at least one day before playing to ensure that players have time to examine cards and choose their starting hand.

1. Coordinate with Capt Flack to send a Pre-Survey link to all players. This is an individual link that each participant will receive in their email. The Pre-Survey take approximately 5 minutes to complete.
2. Distribute a game box and game instructions to each player or team of two.
   a. The game box will contain a deck of 54 cards, 25 black chips, and 8 gold chips, (approximately)
   b. You may provide game instructions electronically, but only if they are easily accessible during preparation and game play.
   c. Players may download turn timer apps on their smartphones (this is optional)
3. Show the video tutorial(s) provided.
4. Briefly explain the details (day, timeframe, opponent, etc.) of how you will play the game in the future (more information on this in the “Play the Game” section of this document).
   a. Providing incentives or prizes to top ranking players will increase motivation and engagement, however, you cannot link game performance to course grade/rating.
5. Have players or teams choose opponents and play a demo game. This allows players to learn some of the mechanics of the game. The goal should be to play through several rounds to see how the Spectrum of Conflict, turn progression, and attack/defense actions are performed.
   a. During play, show a slide (provided) that identifies each of the turn phases, the card pile layout, and any card corrections (provided by Capt Flack)
6. Instruct players to select the 6 cards for their starting hand. This will require the player to do in-depth strategy development. If desired, strategy development can be done with a partner or teammate to increase engagement and innovation.
   a. This is a key element to the learning objectives of the game, as players must look through all available cards to find dependencies and connections as well as build an overall warfighting strategy.
   b. The beginning hand represents the capabilities that are ready to immediately deploy to the battlespace (the cost still must be paid).

SESSION 2 – EXHIBITION GAMES & DEBRIEFING (2 HOURS)

Players should now grasp how to play the game and have developed an initial strategy with a corresponding starting hand. Now play more “official” games in which scores will be tallied. Instructors may also want to post the highest performing teams/players on a scoreboard visible to the class. As multiple games are played, the best teams should be matched to one another to keep the exercise challenging or all. This session concludes with a 30-minute debriefing session to emphasize the learning objectives and allow time for players to learn from others’ experiences.
1. Review strategies with partner or teammate from session 1 (5-10 mins)
2. Match teams with opponent (individual or team)
3. Play first exhibition game (50 mins)
   a. Record game results from each game (scorecard provided)
   b. Post scores to a scoreboard if available (1 point for each damage point inflicted against enemy MDOC and each health point remaining on their MDOC). Point range: 0-24
4. Allow players to adjust their game deck and their strategy (10 mins)
5. Match new opponents using the leaderboard
   a. 1 vs 2
   b. 3 vs 4
   c. 5 vs 6
   d. Etc.
6. Play second game (30-40 mins)
7. Record game results and update leaderboard
8. If you have time you can play additional games. As much as possible players should be matched with those about their skill level. Players should be playing someone new each match.
9. Conduct Debriefing
10. Administer Post-Survey (email with link will be delivered to students during Session 2 with coordination with Capt Flack). Post-survey takes approximately 12 minutes to complete.
11. Conclude the session
   a. Encourage students to continue to experiment with the game by play more rounds or developing cards of their own to submit to AFIT or local game development cell.

Figure 7. High-Level Experiment Procedures
Figure 8. Detailed Experiment Procedures

1. **Send Pre-Survey and Grant access to game resources**
   - Email Pre-Survey links through Limesurvey
   - Artifacts will not contain game purpose or lesson objectives
   - Include a digital copy of the cards if physical cards cannot be distributed

2. **Session 1 - Setup**
   - Administer Paper Pre-Survey
   - Explain test procedures
   - Review instructions
   - Review tutorial video
   - Answer questions
   - Break (5 mins)
   - Forms teams of 2
   - Play initial game without turn timers
   - Allow time for strategy development and selection of starting hand

3. **Session 2 - Game 1**
   - Review strategies with partner (10 mins)
   - Randomly matchup teams with opponent
   - Play first game (40 mins)
   - Record game results
   - Create leaderboard
   - Strategy adjustment period (10 mins)

4. **Session 2 - Game 2**
   - Match teams with different opponent teams based on skill
   - Play second game (~30 mins)
   - Record game results
   - Update leaderboard

5. **Debrief & Post-Survey**
   - Led by instructor/facilitator
   - Use pre-formulated questions to begin conversation
   - Guide conversation to lesson objectives
   - Distribute Post-Surveys or send emails using Limesurvey
APPENDIX C:
Sources and MDO/MDC2 Recommended Reading List


CSAF Address to Air War College and AU Faculty/Staff All Call (start at 32 minutes): https://youtu.be/LAW3VDNOmM

CSAF’s MDO Explanation and Vignette at AFA’s 2019 Air, Space, & Cyber Conference: https://go.af.a.org/e/285922/f4320-jk-LQ/71h23s/694054381?h=G47HT_JSCloeP0OFPJqpGFwuZwOW67XRkbaJoykIU. The full remarks can be found here: https://youtu.be/wyQG29uiiy8

Over The Horizon - MDO Journal https://othjournal.com/author/overthehorizonmdos

https://go.af.a.org/e/285922/f4320-jk-LQ/71h23s/694054381?h=G47HT_JSCloeP0OFPJqpGFwuZwOW67XRkbaJoykIU


Competing in Space – Report published by the National Air & Space Intelligence Center (NASIC) https://media.defense.gov/2019/Jan/16/2002080386/-1/-1/1/190115-F-NV711-0002.PDF

At Our Own Peril: DoD Risk Assessment in a Post-Primacy World
https://ssi.armywarcollege.edu/pdffiles/PUB1358.pdf

The U.S. Army in Multi-Domain Operations 2028
https://www.tradoc.army.mil/Portals/14/Documents/MDO/TP525-3-1_30Nov2018.pdf

Winning the Airwaves: Regaining America’s Dominance in the Electromagnetic Spectrum - CSBA

OTH: Vulnerabilities of Multi-Domain Command and Control

OTH: Multi-Domain Operations at the Strategic Level
https://othjournal.com/2018/03/02/multi-domain-operations-at-the-strategic-level/


