THE BOX: BUILDING TACTICAL DECISION MAKING AND WARFIGHTING FUNCTION INTEGRATION EXPERTISE THROUGH WARGAMING

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE
Wargame Design

by

CARY J. FITZPATRICK, MAJ, U.S. ARMY
B.S., United States Military Academy, West Point, NY, 2007

Fort Leavenworth, Kansas
2018

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
15-06-2018	Master's Thesis	AUG 2017 – JUN 2018

4. TITLE AND SUBTITLE

The Box: Building Tactical Decision Making and Warfighting Function Integration Expertise Through Wargaming

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Cary J. Fitzpatrick
Major, Armor
United States Army

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORG REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

As the Army transitions from a seventeen-year focus on stability operations, the majority of leaders at the tactical level lack experience operating in a high intensity conflict environment. Realistically, no U.S. service member has experienced peer-level conflict lasting more than a few days since the Korean War in 1950-1951. When analyzing Combat Training Center (CTC) observations over the past decades, a common trend arises: tactical leaders and staffs struggle to make rapid tactical decisions and maximizing the effects of warfighting function integration, directly impacting success or failure at the CTCs.

Through the use of a tabletop wargame simulation, this thesis develops an easily-distributed, adaptable, and rapid method to develop leaders' abilities in tactical decision making and warfighting function integration. Titled *The Box*, this simulation is a turn-based, hex-mapped, brigade-level, peer-capable, force-on-force tactical wargame where players assume the role of a brigade commander and staff at the National Training Center. Players must use their knowledge of tactical maneuver, planning factors, and warfighting function enablers to achieve victory. *The Box* seeks to be a method through which a leader can develop organizations in preparation for future training events or combat deployments.

15. SUBJECT TERMS

Wargaming, Simulations, Leader Development, Tactical Decision Making, Warfighting Function Integration

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. PHONE NUMBER** *(include area code)*
(U)	(U)	(U)	(U)	99	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: Cary Joseph Fitzpatrick, MAJ, U.S. Army

Thesis Title: The Box: Building Tactical Decision Making & Warfighting Function Integration Expertise through Wargaming

Approved by:

_____, Thesis Committee Chair
Mr. Michael B Dunn, M.B.A., Directorate of Simulations Education

_____, Member
Dr. Dale F. Spurlin, Ph.D., Department of Tactics

_____, Member
Mr. William E. Stebbins Jr., M.M.A.S., M.A.B.T., Department of Tactics

Accepted this 30th day of June 2018 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE BOX: BUILDING TACTICAL DECISION MAKING AND WARFIGHTING FUNCTION INTEGRATION EXPERTISE THROUGH WARGAMING by MAJ Cary J. Fitzpatrick, 99 pages.

As the Army transitions from a seventeen-year focus on stability operations, the majority of leaders at the tactical level lack experience operating in a high intensity conflict environment. Realistically, no U.S. service member has experienced peer-level conflict lasting more than a few days since the Korean War in 1950-1951. When analyzing Combat Training Center (CTC) observations over the past decades, a common trend arises: tactical leaders and staffs struggle to make rapid tactical decisions and maximizing the effects of warfighting function integration, directly impacting success or failure at the CTCs.

Through the use of a tabletop wargame simulation, this thesis develops an easily-distributed, adaptable, and rapid method to develop leaders' abilities in tactical decision making and warfighting function integration. Titled *The Box*, this simulation is a turn-based, hex-mapped, brigade-level, peer-capable, force-on-force tactical wargame where players assume the role of a brigade commander and staff at the National Training Center. Players must use their knowledge of tactical maneuver, planning factors, and warfighting function enablers to achieve victory. *The Box* seeks to be a method through which a leader can develop organizations in preparation for future training events or combat deployments.

ACKNOWLEDGMENTS

First and foremost, I would like to thank my wife, Orienna, for her unlimited patience and unwavering support throughout this endeavor and my career. Without her encouragement I would be who I am today. Mr. Dunn, LTC Schoof, Dr. Spurlin, and Mr. Stebbins have been critical to the development of my thesis and their dedication to improving my simulation has allowed me to create a more detailed product. Additionally, Dr. Sterrett has opened my eyes to the benefits, and dare I say fun, of tactical wargaming and is directly responsible for my use of wargames in future positions of my career. Thank you to my fellow wargaming MMAS students, without whom I would still be on test number one. I am most grateful for the efforts of my thesis editor, Dr. Corinne Mahaffey during my eleventh hour. Thank you to all the people who sacrificed their personal time to play my game and enable me to make improvements after every iteration.

TABLE OF CONTENTS

Page

ACRONYMS

ABCT	Armor Brigade Combat Team
BCT	Brigade Combat Team
BLUFOR	Friendly Forces
CALL	Center for Army Lessons Learned
CAR	Combined Arms Rehearsal
CRT	Combat Resolution Table
CTC	Combat Training Center
D6	Six-sided Standard Die
DATE	Decisive Action Training Environment
ISR	Intelligence, Surveillance, and Reconnaissance
JTMC	Joint Multinational Training Center
MDMP	Military Decision Making Process
NTC	National Training Center
OC/T	Observer, Coach, Trainer
OPFOR	Opposing Forces
TSAR	Time, Space, Action, Resolution

ILLUSTRATIONS

Page

TABLES

Page

CHAPTER 1

INTRODUCTION

> Wargames are analytic games that simulate aspects of warfare at the tactical, operational, or strategic level. They are used to examine warfighting concepts, train and educate commanders and analysts, explore scenarios, and assess how force planning and posture choices affect campaign outcomes.
>
> —Rand Corporation, *Wargaming*

Background

While serving as a Brigade Staff Officer and as an Observer Coach Trainer (OC/T) at the Joint Multinational Training Center (JMTC), the author observed many units that did not deviate from the initial tactical plan, regardless of the opposing force's actions. This is a common trend across all brigades at the National Training Center (NTC); *CTC Trends No. 02-7*, the Center for Army Lessons Learned (CALL) found that units would "adhere to a plan without variation even though it is obvious the plan has failed."[1] Furthermore, "[b]rigade combat teams (BCTs) struggle in defining their role in the deep fight and how to set conditions by synchronizing lethal and non-lethal fires and close air support (CAS) for the close fight."[2] Similarly, CALL noted in the Military Decision Making Process (MDMP) Handbook in 2015 that "[u]nits continue to have

[1] U.S. Army, Center for Army Lessons Learned (CALL), *CTC Trends, National Training Center, No. 2-7: 1QFY00 and 2QFY00 with Techniques and Procedures that Work!* (Fort Leavenworth, KS; U.S. Army Training and Doctrine Command, June 2002), 135.

[2] Ibid., 173.

difficulty integrating and synchronizing assets into the combined arms fight."[3] During NTC Rotation 13-04, the Commander of 2nd Brigade, 1st Infantry Division, Colonel Jeffrey Broadwater, noted that battalions were "challenged with incorporating the various enablers […] because we had not had time to integrate certain enablers into training our training at lower levels."[4]

Colonel Johnnie Johnson, Commander of 3rd Armored Brigade Combat Team, 3rd Infantry Division, reflected that his unit had difficulties visualizing and replicating distance and terrain challenges inherent to the training center during training at their home station, which disrupted the brigade's ability to execute mission command.[5] Additionally, Colonel Christopher Doneski, Commander of 11th Armored Cavalry Regiment noted that his opposition force (OPFOR) was able to defeat the rotational units because "[the OPFOR] commanders understood the scheme of maneuver, the criteria for the identified decisions and their tasks in relation to the enemy, in time and space. [Comprehension of the initial plan was] the key to achieving this understanding, which then empowered them to execute restraint and audacity to shape the fight and accomplish the mission."[6] Furthermore, Colonel Broadwater asserted that "[l]eaders at all levels must

---

[3] U.S. Army, Center for Army Lessons Learned (CALL), *MDMP: Lessons and Best Practices* (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, March 2015), 51.

[4] U.S. Army, Combat Studies Institute (CSI), *Training for Decisive Action: Stories of Mission Command* (Fort Leavenworth, KS: Combat Studies Institute Press, 2014), 7.

[5] Ibid., 21.

[6] Ibid., 24.

confirm the proper use of [each warfighting function's] enabler[s] and report any changes to the commander so he can make informed decisions."[7]

Due to time and training space limitations, commanders and staffs would benefit from a simulation that allows them to visualize the battlespace and fosters critical thinking and tactical decision making abilities that enables them to deviate from the initial plan prior to executing a rotation at a Combat Training Center (CTC).[8] Simply reading a scripted execution matrix or walking around a terrain model does not enable company commanders nor junior battalion and brigade staff officers to effectively understand tactical decisions made at the battalion or brigade levels. By providing leaders with a tool to improve tactical decision making and warfighting function integration capabilities, this wargame aims to simulate a peer-level, force-on-force conflict that integrates the commander's ability to fight his formation tactically while simultaneously integrating staff functions into mission planning and execution in the pursuit of success.

Problem Statement

Tactical leaders and staffs struggle to make rapid tactical decisions and maximizing the effects of warfighting function integration, directly impacting success or

[7] CSI, *Training for Decisive Action*, 10.

[8] U.S. Army, Center for Army Lessons Learned (CALL), *Decisive Action Training Environment at the National Training Center, Volume IV: Lessons and Best Practices* (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, September 2016), 5.

failure at the CTC.[9] Despite a multitude of indicators and intelligence, BCTs remain tied to the initial, often linear, concept of operations and do not adjust the initial plan to account for enemy actions, changes to mission variables, and other elements of the fog of war during combat operations. Furthermore, when conditions on the battlefield indicate a change to the initial plan is necessary BCTs also struggle to integrate and synchronize the warfighting functions.[10] Brigades lack flexibility in their tactical decision making and do not demonstrate the ability to integrate warfighting functions adeptly or effectively. Moreover, current training, at least prior to a CTC rotation, does not provide the proper conditions at the brigade level for a staff to hone their skills in integrating warfighting functions and enabling rapid tactical decision making.

Purpose

CALL's *CTC Trends FY2016* notes that "setting conditions for complex operations requires: careful backwards planning; accurate time estimates for completing tactical tasks; and understanding the capabilities and requirements of […] enablers" which can be achieved through the use of simulations. [11] This simulation attempted to enable battalion and brigade commanders and their staffs (focusing on the S3 and S2) to conduct an alternate form of training beyond executing MDMP and the Combined Arms

[9] U.S. Army, Center for Army Lessons Learned (CALL*), CTC Observations, 3rd and 4th Quarters, FY2015* (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, May 2016), 38.

[10] Ibid., 50.

[11] U.S. Army, Center for Army Lessons Learned (CALL*), CTC Trends: FY2016* (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, October 2017), 15.

Rehearsal (CAR) prior to executing a rotation at a CTC. Utilizing scenarios designed around training operations at NTC, players will face a peer-level opposing force. Critical enabler differences (intelligence, surveillance, and reconnaissance (ISR); indirect fires; etc.) were accounted for so as to best simulate the advantages of each force. The game will develop common visualization skills in order to support the players' capacity to make recommendations for alternate courses of action to enhance their ability to make tactical decisions in combat to support a brigade's mission through analysis of the wargame.[12]

In the course of simulation development, the following design questions were addressed:

1. How should time, space, assets, and resolution be modeled to facilitate playability while reinforcing realistic decisions in tactical situations?
2. Weather has positive and negative effects on tactical operations; how should weather effects be best replicated?
3. How can the simulation incorporate more than two players (BLUFOR and REDFOR) to enable staff training without significant rule changes?
4. How should sustainment operations be replicated to minimize effects on maneuver planning?
5. How should fire support assets be best replicated to enable integration with maneuver planning?

[12] Peter P. Perla, *The Art of Wargaming* (Annapolis: The United States Naval Institute, 1990), 167.

6. How should time and timing be modeled to represent unit tactical operations realistically while minimizing the duration of gameplay?

Limitations and Delimitations

Simulations are unable to completely replicate reality and as such, limitations and delimitations are inherent in every wargame. As Peter Perla highlights in his book *The Art of Wargaming*, game designers must focus on the importance of "integrating realism and playability in a delicate balancing act designed to achieve a well-understood and well-chosen objective."[13] He continues stating "wargaming must be linked with the lessons of exercises, mathematical analysis, history, and current operational experience in a continuous cycle of research that allows each method to contribute what it does best to the ongoing process of understanding reality.[14] By recognizing limitations and imposing delimitations and understanding the linkages with other elements of professionalism, wargame designers are able to create a model that accounts for critical aspects of reality and ensures adequate use of the simulation to meet the goal of the wargame's purpose.

No wargame is capable of perfectly simulating the reality of combat. Wargame designer Tetsuya Nakamura argues that "neither detailed nor accurate simulation always leads to *correct* simulation."[15] Wargames are inherently abstract. Accounting for every vehicle, soldier, and weapon system organic to a unit in the simulation would be near

---

[13] Perla, *The Art of Wargaming*, 8.

[14] Ibid., 11.

[15] Tetsuya Nakamura, "The Fundamental Gap between Tabletop Simulations Games and the 'Truth'," in *Zones of Control: Perspectives on Wargaming,* eds. Pat Harrigan and Matthew G. Kirschenbaum (Cambridge: MIT Press, 2016), 43.

impossible. Additionally, paper-based wargames are unable to accurately represent terrain relief, unlike miniatures and modern computer wargames. Hexes represent the difficulty of units to maneuver through the terrain, which may be derived from a combination of real-world movement difficulty and the level of detail the designer wants to implement in the simulation.[16] Furthermore, units rarely occupy a specified hex-sized piece of terrain. As addressed by Greg Costikyan, "In a hex-based wargame, every unit occupies one hex, but that's not how real units behave. […] Units do not occupy hexes; units are squishy. They can concentrate on a small objective or expand out – not infinitely […] but over long distances."[17] This simulation, as the vast majority of wargames, simplifies and conceptualizes specific information of terrain, units, movement, and capabilities to focus on the importance of maneuver and warfighting function integration and divest the aspects of tactical combat operations outside the focus of this thesis. As Sabin states, "the real art in wargame design is to reflect the almost infinite complexities of warfare within a model that is simple enough to be played but still subtle enough to capture the key dynamics of the actual conflict it seeks to portray."[18]

Creating the same wargame as a digital simulation would have made *The Box* simpler to play and easier to distribute. A computer could execute all required

---

[16] James F. Dunnigan, *The Complete Wargames Handbook: How to Play, Design, & Find Them,* rev. ed. (New York: William Morrow and Company Inc., 1992), 83.

[17] Greg Costikyan, "The Unfulfilled Promise of Digital Wargames," in *Zones of Control: Perspectives on Wargaming,* eds. Pat Harrigan and Matthew G. Kirschenbaum (Cambridge: MIT Press, 2016), 682.

[18] Philip Sabin, *Simulating War: Studying Conflict Through Simulation Games* (Norfolk: Fakenham Prepress Solutions, 2014), 68.

calculations rapidly and storing the game digitally would allow for a rapid and wide distribution.[19] However, due to my lack of computer coding skills or funding for employing a professional coder, this simulation was designed to be played as a paper-based game. The author wanted players to remain focused on tactical maneuver in combat and, although logistical support is vital to long-duration combat operations, found it necessary to largely omit logistical operations from this simulation. The complexity of brigade-level logistics would distract from the goal of the simulation of developing tactical decision-making skills and could be its own simulation all together.[20] Limitations can be beneficial to game designers, such as how this exclusion provides the simulation and players with more focus during gameplay.

The goal of wargame design is not to create the perfect simulation nor completely replicate reality, but a simulation capable of achieving the desired learning objectives.[21] Considering these limitations of paper-based wargames and self-imposed delimitations of design methodology focused the approach to the design of this simulation.

Overview of Design Approach

Wargame creators utilize various different models when developing the simulation's design approach. The Army Problem Solving Process does this through its

---

[19] Martin Van Creveld, *Wargames: From Gladiators to Gigabytes* (New York: Cambridge University Press, 2013), 231.

[20] Rick Priestley and John Lambshead, *Tabletop Wargames: A Designers' & Writers' Handbook* (Barnsley: Penn & Sword Military, 2016), 18.

[21] During the group meetings with all Simulations MMAS students, this was repeated by Dr. James Sterrett, LTC Patrick Schoof, and Mr. Michael Dunn on multiple occasions.

fourth step of "Generate Possible Solutions" through which leaders "consider the guidance provided by their commander or their superior, and develop several alternatives to solve the problem."[22] Perla states that wargame designers must understand the "game's objectives and translate those objectives into infrastructure, information, and mechanics" to achieve the simulations objectives.[23] From Sabin's four key categories (geographic environment, orders of battle, generic capabilities, and decision environment) to Perla's seven elements of a wargame (objectives, a scenario, a data base, models, rules, players, and analysis), designers can use multiple models to ensure the simulation meets its intended purpose.[24] Developed by Dr. James Sterrett, the TSAR model addresses time, space, action, and resolution to be simulated in a wargame.[25] The TSAR model simplifies the elements of wargame design for a first-time wargame designer as opposed to the more complex processes of Sabin and Perla. The seven steps of the Army Problem Solving Process address situations where other problem-solving models, like the Military Decision Making Process and Troop Leading Procedures, are not appropriate.[26] The seven steps are: Gather information and knowledge; identify the problem; develop

---

[22] Headquarters, Department of the Army (HQDA), Field Manual (FM) 6-0, *Commander and Staff Organization and Operations* (Washington, DC: Government Printing Office, May 2014), 4-5.

[23] Perla, *The Art of Wargaming* 10.

[24] Sabin, *Simulating War: Studying Conflict through Simulation Games,* 47; Perla, *The Art of Wargaming,* 165.

[25] James Sterrett, A211 Course Notes, U.S. Army Command and General Staff College, Ft. Leavenworth, KS, September 2017.

[26] HQDA, FM 6-0, 4-6.

criteria; generate possible solutions; analyze possible solutions; compare possible solutions; and make and implement the decision.[27] As a first-time wargame designer, the author chose to use the TSAR model coupled with the Army Problem Solving Process for the design approach in this simulation's development.

Through reviewing wargaming literature, selecting applicable Army doctrine, analyzing combat training center observations, and playtesting other simulations, the author was able to collect the necessary tools to approach the game design.

The author identified problems through the analysis of Combat Training Center rotations concerning tactical decision making and warfighting function integration, followed by how the TSAR model may be used in the wargame's design of time, space, assets, and resolution to best simulate dilemmas and create an environment which enables the improvement of professional expertise. To ensure warfighting function integration and planning would not overshadow tactical maneuver, criteria were developed that fostered rapid and balanced gameplay. These criteria were limited maneuver space, focused enabler actions, and simplified combat resolution. These criteria allowed the author to focus the design of this simulation.

Development of wargames cannot be distilled into a singular step-by-step methodology to suit all different types (tabletop, card-based, miniatures, digital, etc.) of simulations. The author originally conceptualized the game as purely a hex-based combat and terrain maneuver simulation, but quickly found by adapting elements of a card-based game the simulation could better address the issues surrounding warfighting function

[27] HQDA, FM 6-0, 4-6.

integration than through a hex-based game alone. As Perla argues there is no secret method to developing a truly balanced wargame, applying the warfighting functions through card play this simulation ensures players account for both tactical maneuver and enabler integration in an attempt to achieve this balance while maintaining an appropriate level of realism and maximizing playability.[28] In addition to using playing cards to simulate the warfighting functions, multiple options (counters/markers, designated hexes, tables, etc.) were available for representing units, staff planning, and combat resolution.

The most arduous task of wargame design is analyzing the possible solutions. As with the Army Problem Solving Process's fifth step ("Analyze Possible Solutions"), the author had to analyze the merits and drawbacks of the simulation's design.[29] The draft design of the simulation was created through selecting the TSAR model for design, testing game mechanics, and ensuring playability. Playtesting in wargame design is very similar to the sixth step of the Army Problem Solving Process ("Compare Possible Solutions"), in which leaders compare each developed solution against the others to derive the most appropriate one.[30] Through solitary playtesting and iterations with other professionals, the simulation was refined and progressed towards the final product. This analysis allowed the author to compare possible solutions through discarding incompatible aspects of the rules, assets, and resolution in the simulation. The final

[28] Perla, *The Art of Wargaming,* 317.

[29] HQDA, FM 6-0, 4-6, 4-6.

[30] Ibid.

playtest of the simulation allowed the author to make and implement the solution, arriving at the finalized wargame design of all aspects of the simulation.

While a complex task, the Army Problem Solving Process and the TSAR model shaped the design of the simulation to ensure the initial problem statement would be effectively answered. Additionally, these models supported the validity of the simulation's design which directly contributed to the significance of this study.

Thesis Significance and Format

Using wargames to develop professional expertise is not a new concept. From Sun Tzu's abstract *Wei Hai* (meaning "encirclement") to Weikhmann's political- and military-figured *Königspeil* ("King's Game") in 1664, leaders have been using wargames to develop professional skills for centuries.[31] However, during research for this thesis, the author was unable to find a simulation that directly addresses the issues of tactical decision making and warfighting function integration simultaneously in an accessible format for use by those unfamiliar with the wargaming community. This simulation addresses those issues and the simulation's objectives through an easy-to-learn, streamlined, paper-based wargame, in line with Sabin's guidance for wargame design (objectives, a scenario, a data base, models, rules, players, and analysis).[32] Through developing the problem statement and designing the simulation, commanders and staffs may use this simulation to develop professional skills that are usually only stressed

[31] Perla, *The Art of Wargaming,* 16.

[32] Sabin, *Simulating War: Studying Conflict through Simulation Games,* 47.

during CTC rotations. Additionally, commanders and staffs can tailor this simulation to meet their other training needs.

Chapter Two provides descriptions of the principal sources used for research and context for the analysis. This literature review is divided into focus areas of information on simulation design concepts, simulation elements, and warfighting function capabilities and challenges. This chapter provides the bedrock of design for this simulation.

Chapter Three describes the methodology for approaching the game design. It discusses the process for selecting the components of the simulation using the TSAR model and why these elements are critical to game design. The chapter also highlights how these components address the issues of tactical decision making and warfighting function integration.

In Chapter Four, the author discusses how analysis of the critical components addressed in Chapter Three were integrated into the game design. This chapter answers how the simulation answers the core research question and subordinate thesis questions outlined in Chapter One.

Chapter Five summaries the critical elements outlined in preceding chapters. It reviews how the process of wargame development using the TSAR model produced the final prototype of *The Box*. Additionally, the chapter provides recommendations on how the wargame could be modified to accomplish other training objectives.

Summary

This chapter provided a brief background of this study and describing the research question and discussed the limitations and delimitations of this paper-based wargame in this chapter. Using the TSAR wargame design approach model, this simulation seeks to

increase players' tactical decision making and warfighting function integration capabilities through gameplay and analysis of their collective actions. While some capabilities and operations executed by brigade combat teams were omitted during the design of this wargame, this simulation is an appropriate tool to develop professional expertise of leaders at the tactical level.

CHAPTER 2

LITERATURE REVIEW

Introduction

Scholarly works that directly address the design of simulations and wargames for the professional development of military leaders are not as prolific as works dedicated to wargame theory and design, nor works describing methods for creating military leaders. Thus, the preponderance of literature available to tackle the problem statement was derived from scholarly works on wargame theory, available simulations to research wargame mechanics, and published U.S. Army doctrine and CTC observations.

This literature review first examines the works of experts in the wargaming community and how their writings lend to the development of a wargame. Next, the review looks at the mechanics of wargames and how these mechanics may be integrated into a new wargame. Finally, the review looks at current U.S. Army doctrine that addresses leader development and military problem solving, as well as observations of rotational units training at NTC by OC/Ts. Through the synthesis of this literature, the author addressed the methodology for developing a wargame capable of fostering tactical decision making and warfighting function integration capabilities.

Principles of Wargaming

Wargames: From Gladiators to Gigabytes, written by Israeli military historian and theorist Martin Van Creveld and published in 2013, provided a framework and detailed descriptions of how wargames have evolved throughout history. Through extensive historical research, Van Creveld's work explained how wargames have been

utilized throughout human history to simulate combat from the tactical to strategic level and evolve as combat has evolved. While little of *From Gladiators to Gigabytes* dealt directly with the design of wargames from the ground up, this work instilled an appreciation for the history of wargaming. Additionally, Van Creveld's examination of the merit of paper-based wargames compared to the modern digital wargame also provided invaluable insight concerning the importance of creating accessible game mechanics and understandable rules during this wargame's design.

Zones of Control edited by Pat Harrigan and Matthew Kirschenbaum was published in 2016 and is an anthology of 59 authors' perspective on different aspects, design, and utilization of wargaming. The articles range from how wargames provide historical context to how wargames will be used in the future. While many articles addressed the use of computers in wargaming and not as useful, the writings of Greg Costikyan and Tetsuya Nakamura's articles proved to be the most useful in supporting this thesis. Costikyan's and Tetsuya's arguments supported the abstractions made in this wargame, being that not all models need to be realistic, but appropriate in their abstraction in wargaming.

The Art of Wargaming by Center for Naval Analysis research analysist Peter R. Perla, published in 1990, provided a comprehensive and comprehensible debate and analysis of the nature of wargames. Considered one of the leaders of the wargaming community, Perla highlighted the use of wargaming in military communities and defined his fundamental principles of wargaming. Perla's descriptions of the limitations of wargaming, and how game designers can overcome these shortcomings to produce effective models, assisted with adapting the mechanics of this wargame to account for

both limitations and delimitations. Parallels between Perla's descriptions of wargame design and Clausewitz's assertions of the nature of war; while Perla uses examples of game mechanics to support his theories, he rarely instructs how a game designer needs to build a wargame.

Simulating War: Studying Conflict through Simulation Games, by King's College professor Philip Sabin, was published in 2012 with an update in 2014. Sabin described the theory and mechanics of wargames, using in-book examples of paper-based wargames he utilized as a professor to educate students. His examination of how to conduct simulations research established the focus of the development of mechanics in this wargame and ensured the simulation did not evolve into a complex, time-consuming monstrosity. Sabin also detailed how to develop components of a wargame by integrating his fundamentals into design and testing. This provided a focus for the expected outcomes and how to resolve identified issues when playtesting this wargame. His fundamentals further provided the author focus for the wargame's design. Perla's assertion that even non-expert wargamers can develop simple wargames can simulate selected aspects of real conflict through cost effective means to achieve active learning requirements gave the author confidence while developing this simulation with little experience and limited resources.

James Dunnigan's *The Complete Wargames Handbook: How to Play, Design, & Find Them* published as a revised edition in 1992 addressed the utility, history, and development of wargames. Dunnigan's work seems a good mix of Perla's theory and Sabin's application of wargame design. His definitions of wargaming terminology and descriptions of wargame design provided a framework for the development of this

wargame. Additionally, Dunnigan's section concerning the creation of wargames for soldiers was instrumental to this wargame's development process. Of Dunnigan's second and third "Golden Rules" for developing wargames for troops, "start with an existing model" and "be sure you know what you know" proved most critical for the development of this game. Existing simulations provided examples of viable game mechanics that could be adapted or modified for this wargame. Additionally, Dunnigan's third rule validated the author's interest in making a BCT-focused wargame taking place at a CTC, as the author recently served as an OC/T and hopes to serve in an ABCT in any capacity in the future.

A Theory of Fun for Game Design written by Ralph Koster, first published in 2004, is a great initial exposure to the world of gaming in general. Koster looks at what games are (and are not), how humans cognitively process games, as well as the future of games. Koster's experience in video gaming, as he developed *Ultima Online* and *Star Wars: Galaxies*, is immediately obvious throughout the work. The majority of his game references pertain to video games and the development of virtual simulations. In spite of Koster's involvement in the digital realm, his observations on the basic requirements for games (educational or for entertainment) open the door for further research in wargaming. The concept of fun and its importance plays a resilient role throughout Koster's theory on game design. Designing a wargame that is not only educational but also fun, for player and designer alike, was an underlying factor throughout the design of this game. In the spirit of Koster's work, the author hopes players have as much fun playing *The Box* as there was in designing the wargame.

Two works of lesser importance to this study, Tabletop Wargames: A Designers' & Writers' Handbook by Rick Priestley and John Lambshead and One-Hour Wargames: Practical Tabletop Battles for Those with Limited Time and Space by Neil Thomas provided insight on the design of an alternate wargame style with miniatures. Both works deal with the design of tabletop terrain and complex equations to discern the effectiveness of individual weapon systems based upon scaled, but specifically measured, ranges. While dismissing these works when designing this wargame would have been easy, by researching this alternate wargaming method the author discovered the overarching themes of abstraction and scale apply to all styles of wargame. Additionally, the complexity of combat resolution and the involved mathematical equations made it readily apparent that this simulation would simplify combat resolution not only to decrease the burden on the player, but on the designer as well.

Simulation Design and Game Mechanics

In *Battle for Moscow (Second Edition)*, designed by Frank Chadwick and published by Victory Point Games in 2009, two players assume the tactical roles of German and Russian forces during Operation Typhoon of September 1941. *Battle for Moscow* utilized unit counters on a hex-based map of varying terrain in which German armor and mechanized infantry forces maneuver into Russia to seize Moscow, where Russian forces use maneuver and lines of communication to establish a defensive belt to defeat the German attack. This simulation utilized a sequence of battle that exploits the real-world effect of weather on forces during the operation. Combat resolution was simplified through die rolls and the use of a combat resolution table (CRT); units were given two steps for combat power and a single die roll dictated the result of combat

through the use of the CRT. To simplify gameplay, *Battle for Moscow* omitted logistical operations, with the exception of maintaining Russian lines of communication through the railroad network. This simulation was the first simulation the author tested to examine game mechanics and inspired the hex-style gameboard for *The Box*, the use of a CRT for resolution, as well as the diluted use of logistics and simplified combat resolution. Additionally, the ease of set up and the ability to play a full game in under an hour while still effectively modeling the campaign inspired the intended duration for this wargame.

BCT Command: Kandahar, designed by Joseph Miranda and published by MCS Group in 2013, placed players in the role of either a multinational (American and Afghan) BCT commander or a Taliban insurgent force commander during Operation Enduring Freedom 10-11. The simulation utilized a map of Kandahar Province where players must control outlined areas to achieve dictated scenario objectives through the use of conventional and irregular forces and enablers. In a given scenario, Players combined operation and staff cards to execute tasks given on objective cards to achieve victory points. Combat was resolved through multiple die rolls, which can be modified using enabler counters. *BCT Command: Kandahar* also utilizes "Chaos" cards, which added uncertainty as the cards have either positive or negative effects on one or both players. Additionally, the simulation utilizes many abstractions of operations to ensure the wargame is playable. While not a hex-based wargame, *BCT Command: Kandahar*'s card play mechanics provided the outline for the use staff, objective, and SNAFU cards in the design of *The Box*.

Designed by Craig Besinque and published by GMT Games in 2015, *Triumph & Tragedy* is a strategic-level, geopolitical wargame for two or three players. *Triumph &*

Tragedy is begins during the interwar period through the conclusion of World War II in Europe and placed players in the roles of the Western Powers, the Soviet Union, or the Axis Powers. While the majority of the simulations tested by the author focused on military power, *Triumph & Tragedy* integrated economic, military, diplomatic, and technological components. The area map covers Eurasia, northern Africa, and the Americas. Some countries were divided into smaller zones. This simulation used infantry, armored, fortress, aerial, aircraft carrier, surface fleet, and submarine units; each unit's level of combat power was accounted for through the use of pips around the outside of the unit blocks. Although the game's timeframe begins in 1936, players are not constrained by actual historical events and could achieve victory through different applications of national power components in the turn-based gameplay. Players must distribute action points to the components of national power to increase variable factors like production time or military strength. *The Box* adopted the design of action points, unit pips, and the design of unit counters from the game mechanics in *Triumph & Tragedy*.

CTC Observations

Although not the only CALL resource available, these publications provided the best analysis and recommendations on how to address issues that were integrated into this wargame.

The Center for Army Lessons Learned (CALL) published NTC Trends Compendium, No. 01-11: 3rd Quarter Fiscal Year 1998 through 4th Quarter Fiscal Year 1999 (3QFY98 through 4QFY99) in 2001. This publication was a comprehensive analysis of common rotational unit successes and failures from the spring of 1998 to the

fall of 1999. The analysis is subdivided by Intelligence, Combat Service Support, Command and Control, Maneuver, Fire Support, Air Defense, and Mobility/Survivability/NBC battlefield operating systems sections of analysis. These observations are over two decades old, however the identified issues continue to be causes of concern for current rotational units. Additionally, as this analysis was conducted prior to 9/11, the simulated combat at NTC was still focused on a Russian threat and offers many areas in which rotational units might improve before their arrival at NTC, facing the modern Decisive Action Training Environment scenario. Although not referred to warfighting functions at the time, this compendium provides critical OC/T feedback for brigade and battalion commanders and their staff on how to leverage internal and external assets, plan, and focus efforts to gain a tactical advantage in near-peer combat.

CTC Trends, No. 02-7, 1QFY00 and 2QFY00 with Techniques and Procedures that Work!, published in June 2002, collects OC/T observations for unit sustains and improves for Intelligence, Maneuver, Command and Control, as well as four other Battlefield Operating Systems. Although Battlefield Operating Systems were replaced by the Warfighting Functions, this change does not diminish the applicability of the OC/T observations throughout this publication. Although there were over 150 observations to consider, the most applicable to this wargame were units' inability to mass effects, unit adherence to a plan without variation even after failure, and how BCTs struggle to integrate fires and CAS in the close fight.

CTC Observations, No. 16-03, 1st and 2nd Quarters, FY2015 compiled by CALL addresses issues with recommendations for rotational units at all three CTCs. The

analysis is separated by warfighting function, including joint, interagency, intergovernmental, and multinational observations. While the majority of the observations focus on the platoon-level and below, the mission command warfighting function section highlights how commanders from the company to brigade levels fail to use the "Plan, Prepare, Execute, and Assess" model when planning and executing tactical operations. An additional observation of importance, leaders at the battalion level and above would delay making decisions in hopes of receiving all information that was perceived as necessary. OC/Ts also noted that the CAR was a back-brief, restating the mission and concept of the operation rather than executing actions, enemy reactions, and counter-actions on a terrain model.

CTC Trends FY2016, another OC/T observations publication by CALL, was released in October 2017. This handbook looks directly at twelve different Army Tactical Tasks ranging from providing logistics support (Task 4.1) to conduct tactical maneuver (Task 1.2). When synchronization of operations was addressed, the document notes that complex operations require careful backwards planning, accurate time estimates for completing tactical tasks, and understanding the capabilities and requirements of joint enablers. CALL continues to stress how simulations can be used to train leaders and staffs through multiple iterations prior to executing complex operations. Further through the handbook, CALL notes staff shortcomings regarding how units fail to determine enemy course of action directly result in mission failure.

These resources provided context for the historical application of wargaming, outline for designing and testing the wargame with the use of simulation fundamentals, and focal areas to address tactical issues faced by rotational units at CTCs. Through the

synthesis of these and additional writings, the author sought to create a wargame that accounted for the critical components of tactical military simulations and provided a method to develop tactical decision making and warfighting function integration skills in all levels of tactical leadership.

Summary

While literature concerning the development of wargames directly for use by the military was relatively limited, through researching the principles of wargaming, testing different simulation mechanics, and considering observations by CTCs over the past three decades the author had the tools necessary to create a viable simulation. Through the support of the literature and other simulations, *The Box* is a tool capable of developing tactical decision making and warfighting function integration skills.

CHAPTER 3

METHODOLOGY

Army Leadership Requirements Model

The Army demands leaders to motivate others to pursue actions, focus thinking, and shape decisions for the greater good of the organization.[33] Outlined in its Leadership Requirements Model, the Army wants leaders to have attributes (character, presence, and intellect) and competencies (leads, develops, and achieves) that enable all levels of leadership.[34] The Army bases its leader developmental strategy in three domains: institutional, operational, and self-development.[35] The author anticipates this simulation will find application in all three domains of leader development to cultivate rapid and thoughtful tactical decision making capabilities in leaders without the necessity to conduct field exercises or wait until a major training event.

Professional Wargames

CALL's *CTC Trends FY2016* asserts that "[s]imulations to train staffs and […] leaders are an effective stepping stone prior to conducting multiple iterations of complex operations at home station training."[36] Game designer Ralph Koster states that games,

---

[33] Headquarters, Department of the Army (HQDA), Army Doctrine Publication (ADP) 6-22, *Army Leadership* (Washington, DC: Government Printing Office, August 2012), 2.

[34] Ibid., 22.

[35] Headquarters, Department of the Army (HQDA), Army Doctrine Reference Publication (ADRP) 6-22, *Army Leadership* (Washington, DC: Government Printing Office, August 2012), 2.

[36] CALL, *CTC Trends FY2016*, 15.

whether educational or for entertainment purposes, must incorporate preparation, a sense of space, a solid core mechanic, a range of challenges, a range of abilities required to solve the encounter, and skill required in using the abilities.[37] For a simulation to be considered a professional wargame, Perla states that the simulation requires objectives, a scenario, a data base, models, rules, players, and analysis.[38] The objectives are most critical, as the desired outcome of the simulation drives the design.[39] Whether designed for simple entertainment or to provide the most realistic training experience, the objective of the wargame provides the direction for the designer. James Dunnigan asserts that a wargame further "combines a map, pieces representing historical personages or military units, and a set of rules telling you what you can or cannot do with them" to look at alternate outcomes of military conflict.[40] Furthermore, Sabin emphasizes that the most important purpose of a wargame is to "convey a vicarious understanding of some of the strategic and tactical dynamics associated with real military operations.[41] The author integrated the design fundamentals of Perla, Koster, Dunnigan, and Sabin in concert with the TSAR model when developing this simulation.

---

[37] Ralph Koster, *A Theory of Fun for Game Design* (Sebastopol: O'Reilly Media, Inc., 2014), 122.

[38] Perla, *The Art of Wargaming,* 165.

[39] Ibid.

[40] Dunnigan, *The Complete Wargames Handbook: How to Play, Design, & Find Them,* 13.

[41] Sabin, *Simulating War: Studying Conflict through Simulation Games,* 31.

Scenario Selection

A simulation's scenario provides a framework for the simulation and context to the decisions players will have to make. Perla sees the scenario as the setting for exploring the objectives of the wargame; a detailed description of the scenario will allow players to understand the underlying assumptions that will affect the scope of their decision making.[42] Sabin asserts that game designers need to understand the geographic environment, order of battle, and generic capabilities of the forces simulated in the wargame.[43] Dunnigan defines a scenario more specifically as a "description of the event to be simulated in the game. Often a number of scenarios are represented in a single game."[44] In line with Dunnigan's assertion about scenario development, *The Box*'s overarching scenario focuses on an ABCT in a peer-level, force-on-force conflict, with sub-scenarios focusing on different types of combat operations.

When developing the principal scenario for *The Box*, the author focused on how to present the most effective method to foster tactical decision making and warfighting function integration capabilities. As the preponderance of identified unit shortcomings by CTC OC/Ts provided by CALL came from NTC, the author decided to set the simulation at NTC to address the identified issues on a representation of the actual terrain.

---

[42] Perla, *The Art of Wargaming,* 165.

[43] Sabin, *Simulating War: Studying Conflict through Simulation Games,* 47.

[44] Dunnigan, *The Complete Wargames Handbook: How to Play, Design, & Find Them,* 81.

Achieving the Wargame's Purpose

Developing the players' professional expertise in tactical decision making and warfighting function integration required that the wargame presents players with multiple dilemmas, forces players to select an appropriate answer for in-game problems and emphasizes the importance of massed forces and massing effects. To meet the desired purpose of this simulation's objectives, the author focused on these critical aspects of the wargame's design. Although not the only dilemmas integrated into the simulation, *The Box* needed to give the player a thinking enemy and finite resources to ensure complexity.

While the simulation could have been designed as a solitaire-style wargame, creating a simulation that required multiple players would ensure that players were not simply solving a puzzle. As Dunnigan states, solitaire wargames allow a player to perfect tactics and may be enabled through a detailed set of rules.[45] However, the issue with many single-player wargames lies in how, once a player discovers a method for achieving his or her given objectives, they will continually use that method in future gameplay iterations. By giving the player a live opponent, the author was able to address issues identified in CTC rotational units.

OC/Ts at NTC identified that many rotational commanders and staffs did not utilize "enemy event templates to identify multiple enemy courses of action and lack coordination during the planning and analysis phase. This cause[d] rotating units to fail [during the] transition from movement into maneuver prior to the likely line of

---

[45] Dunnigan, *The Complete Wargames Handbook: How to Play, Design, & Find Them,* 59.

contact."[46] Additionally, OC/Ts at NTC noted that the intelligence preparation of the battlefield (IBP) should involve all staff members, meaning that regardless of position [command or warfighting function focus], all unit leaders must be able to analyze the enemy's actions to provide their units with the best future course of action.[47] By giving the player an adaptive and thinking opponent, the simulation forces each player to consider second- and third-order effects of other player's actions.

Additionally, the simulation needed to provide players with a finite amount of resources. The observations recorded in the CALL record for Training for Decisive Action that the greatest lessoned learned for units during a rotation at NTC was "how to effectively employ and synchronize all […] enablers to properly set the conditions to successfully transition from one critical event of the operation to the next."[48] CALL CTC Observations 1st and 2nd Quarters Fiscal Year (FY) 2015 noted specifically that leaders fail to "incorporate enablers into the planning process" and "struggle to integrate […] assets due to a lack of understanding of enabler unit mission requirements, capabilities, and limitations."[49] To provide the players with associated dilemmas of resource allocation, the designer limited the resources available to players that was scalable to enabler resources available to a BCT during a NTC rotation. As described in Chapter 4,

---

[46] CALL, *CTC Trends: FY2016*, 74.

[47] U.S. Army, Center for Army Lessons Learned (CALL), *NTC Trends Compendium, No. 01-11* (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, May 2001), 29.

[48] CSI, *Training for Decisive Action*, 68.

[49] U.S. Army, Combined Arms Center, *CTC Observations: 1st and 2nd Quarters, FY2015* (Fort Leavenworth, KS: USA TRADOC, October, 2015), 47.

this wargame limits the number of units, enablers, and action points that players are allotted throughout gameplay to force players to plan operations and apply those assets appropriately to achieve the scenario's objectives.

Furthermore, the wargame needed to emphasize the importance of mass and synchronization of forces. As a brigade combat team is limited by the size of its forces and the available resources, the wargame needed to integrate this constraint as much as possible. Specific detail needed to be paid in the design of each unit counter's combat capability, as well as the effects of warfighting function enablers.

Exploring the CTC analysis of areas for improvement needed in rotational units and how these issues could be addressed in a wargame allowed the author to integrate these focal points into gameplay. A thinking opponent, as opposed to a solitaire-based game, as well as a realistic representation of forces enable this simulation to achieve the author's objectives for the wargame. Through the use of effective planning and appropriately applying combat power, players will be able to set conditions for victory in *The Box*.

Playtesting

Many ideas for this simulation appeared sound when first developed and written down, but the feasibility and effectiveness of the simulation was truly discovered during playtesting. The author drew from a population consisting of individuals from a myriad of different backgrounds, from civilians with no military or wargaming experience to retired field-grade officers with an extensive depth of knowledge of wargame simulation design and play.

While the majority of playtests were conducted by the author alone, the simulation was playtested over a dozen times with other players. During scheduled playtests, the author would record the individuals testing, their background, and the outcomes of the playtest to include recommendations. On average, 25 modifications were made to the wargame's design following each recorded playtest.

Each playtest focused on different mechanics of the simulation. From the maneuver of unit counters, to the use of warfighting function enablers, to combat resolution modifications, each playtest provided critical feedback to ensure the simulation's model was tactically and technically sound.

As discussed in the following chapter, the author used the TSAR model to account for the critical aspects of this simulation during game design. Without following this model and playtesting, game-breaking issues would have been overlooked, rendering the simulation incapable of achieving its objective of developing tactical decision making and warfighting function integration capabilities.

CHAPTER 4

ANALYSIS

> A practical wargame is one that everyone can play. One would have thought that this was true of all games by definition: for if somebody can play a particular wargame, it is necessarily practicable. Feasibility is not however synonymous with accessibility, for many wargames invariably fail to account for constraints of time or space.
>
> —Neil Thomas, *One-Hour Wargames: Practical Tabletop Battles for Those with Limited Time and Space*

Throughout the game design process, important factors to enable both development of expertise and playability were consistently modified. Using the TSAR model, the preliminary design for the simulation was very basic. After conducting a multitude of testing iterations, the simulation was able to achieve the initial goals of the simulation's design.

Time

In order to address the OC/T observation of unit's failing to consider available time to executing operations, *The Box* must present players with a constrictive timeline.[50] While some rotations would last up to 25 days of training in the late 1980s through the mid 1990s, typical modern rotations at the three Army training centers last between 14 to 21 days, depending on the rotational unit's training requirements.[51] The first design concern for time consideration was if player actions or set periods would advance time in the simulation. During a CTC rotation in a DATE environment, there are three major

[50] CALL, *CTC Trends FY2016*, 15.

[51] Anne W. Chapman. *The National Training Center Matures 1985-1993* (Fort Monroe, VA: U.S. Army Training and Doctrine Command, 1997), 13.

battle periods. Dividing the maximum modern rotation of 15 days into three five-day periods would allow for the simulation to have three separate sub-phases, referred to as battle periods", which would allow for a decisive victory for one of the players.

When dividing up each day, the initial design was for 12 turns per day, with each turn simulating two hours. The two-hour period accounted for the average amount of time it would take a company-sized armor or mechanized infantry unit to maneuver in a tactical formation if the movement was limited to a maximum of 4.5 kilometers, or three hexes. However, a M1A2 Abrams moves at a maximum speed of 45 miles per hour. To provide players with the capability to maneuver at the maximum capacity of the largest simulated weapons platform, the decision was implemented to allow each unit to maneuver ten hexes per turn. Night operations were initially planned to have additional rules to slow unit maneuver. However, to reduce the number of rules players would have to follow, the number of turns was again decreased to three day-turns and two night-turns.

The effect of night operations and the duration of each turn was again modified after further consideration; the fire and maneuver capability of armor and mechanized infantry formations is not greatly reduced during night operations, however movement may simply take longer.[52] This justifies not implementing different effects or periods for day or night turns, as units combat capabilities are not diminished but operations simply take longer to execute. To provide players with the maximum number of opportunities to

[52] Headquarters, Department of the Army (HQDA), Army Training Publication (ATP) 3-90.1, *Armor and Mechanized Infantry Company Team* (Washington, DC: Government Printing Office, 2016), 6-6.

make decisions each battle period and to best simulate the maneuver capabilities of armor formations at NTC, the final design had 24 turns per day. This requires some suspension of belief by not accounting for the increased amount of time maneuver units require to maneuver under limited visibility conditions. However to achieve this simulation's goal of developing tactical decision making and warfighting function integration skills, time had to be framed in a manner to enable the players to make decisions, setting the framework for time during this wargame.

The simulation's sequence of play during each player's turn was deliberately left vague. Beyond each player taking turns to move their units and use enablers, there is no specified order (such as movement, enablers, combat, resupply) to drive gameplay. Game designers, like Dunnigan, argue for a strict sequence of play to facilitate player's actions.[53] However, the author's intent was to force players to plan how they wanted to execute their operations rather than staying tied to a set of sequence rules. As the author wanted to enable planning of warfighting function integration, a planning table was added to allow players to play their enabler cards during later turns. This decision would allow players to maintain more enabler cards in their hand in following turns and simulate parallel planning.

Space

The vision for the setting of the simulation was at NTC. Initially, the design had three separate, identical maps. One map for each player and a map for the referee. The

[53] Dunnigan, *The Complete Wargames Handbook: How to Play, Design, & Find Them,* 181.

maps would be set on a table with dividers, similar to the commercial game *Battleship* or the design for *Kriegsspiel*.[54] The use of a referee and the map dividers would simulate the concept of the fog of war; each player would not know the location of his opponent's units until the units were inside of specified ranges or the player used an asset to identify enemy locations. However, to reduce the number of required players to two, the number of maps was reduced to a single map.

Unlike wargames like *Friedrich* which use a nodal map system, this simulation was initially designed with, and kept, a hex system like *Battle for Moscow*.[55] The first draft of the map called for each hex representing 250 meters. This presented an overabundance of hexes for the board, which would have been approximately 300 by 400 hexes to replicate the NTC maneuver area. To reduce the number of hexes, the size represented by each hex was increased to 1.5 kilometers.

Selecting 1.5 kilometers as the size for each hex served two purposes. First, a mechanized infantry or tank platoon operates across an approximate one-kilometer frontage. By integrating a zone of control of the company-size units equal to 4.5 kilometers, this allows each unit to occupy a relative amount of space on the gameboard as they would on actual terrain. Second, the optimal engagement distance for the long-range weapon systems in both types of companies is approximately three kilometers represented by two hexes.

---

[54] *Battleship* by Clifford Von Wickler (Milton Bradley, 1931); *Kriegsspiel* by Georg Heinrich Leopold Freiherrn von Reisswitz and Georg Heinrich Rudolf Johann Baron von Reiswitz (Johan Hörberg, 1824).

[55] *Friedrich* by Richard Sivél (Histogame, 2004); *Battle for Moscow,* 2nd ed. by Frank Chadwick (GMT Games, 2009).

Through the use of the mapping program *Hexographer,* the general design of the map was created.[56] Selecting the orientation of the hexes on the map would greatly affect gameplay. Vertical versus horizontal alignment would enable more rapid movement of units north to south or east to west respectively. As the majority of operations at NTC occur in east-west running maneuver corridors, and through simple luck, a horizontal alignment was selected initially and maintained throughout the simulation's physical design.

Hexographer served as an invaluable tool with respect to gameboard development. The initial concept was to overlay the hex-grid on a topographical map of NTC, which would reinforce players' ability to conduct a map reconnaissance. While this would be a good training exercise, it would slow gameplay and cause both players to physically move from their positions around a larger map to maneuver their units.

The decision to fill hexes with colors to indicate terrain effects was made to increase gameplay speed, which was made possible through the simple user interface of *Hexographer*.[57] Terrain was abstracted into four different categories: flat terrain (yellow), rolling terrain (tan), mountainous terrain (brown), and urban terrain (gray) based on an analysis of the terrain and validated by an observer/trainer stationed at the NTC. The first prototype designed terrain so it would affect maneuver but not combat between players. Depending on the restrictiveness of the terrain, players would be unable to move as

[56] *Hexographer* (Inkwell Ideas), accessed 10 October 2017, http://www.hexographer.com/.

[57] Ibid.

rapidly through more difficult terrain.[58] Additionally, urban areas were not created to scale to simplify gameplay; whether a small village at NTC or a larger urban complex, the entire hex was shaded gray. By increasing the impact of an urban area to the whole hex, gameplay was simplified based on potential objectives in sub-scenarios.

The main supply routes were also added to the gameboard, which would have a positive effect on movement speed and reduce cost. The main supply routes were traced on the hexes, using the topographical map as an underlayer. Most hex-based simulations, like *Battle for Moscow*, have roads and rail lines passing directly through the center of hexes.[59] To maintain the effect of the routes on the players roads are hex to hex movements, however the roads were drawn to-scale with the actual map to facilitate possible transitions to planning at NTC for the players.

A third dimension for combat was omitted to simplify gameplay. During CTC rotation, units have aerial assets (unmanned aerial systems, combat aviation, close air support, etc.) available to enable operations. To reduce complexity, these assets were included in enabler cards which will be discussed in a later section. By adding these assets to the enabler cards rather than representing them through counters on the gameboard, the assets' effects and importance of integration could be maintained while reducing the burden on the players.

[58] HQDA, ATP 3-90.1, 1-4.

[59] *Battle for Moscow*.

Assets

Inspiration for how to simulate the resources for players to utilize in the simulation came from two very different games. The commercial game *Ticket to Ride* and the wargame *BCT Command: Kandahar* directly influenced the design of resources in *The Box*.[60] While having totally different audiences and styles of gameplay, both games use card-based systems for either building railroads across the United States or executing tactical operations. Additionally, the wargame *Friedrich*'s combat mechanic was transferred to movement and action points in *The Box*.

The first design dilemma confronted when designing the assets for players to use came with the size unit counters would represent. While the designer set the limitation of the highest echelon capped at the brigade-level, consideration had to be made for the level of detail required for subordinate units. As pointed out in *MDMP Handbook* and *NTC Compendium, No. 01-11*, commanders and staffs need to understand the capabilities of units two levels down.[61] In support of the wargame's space design, an armor or mechanized infantry company can typically occupy and control 1.5 kilometers of space during high intensity conflict and being that company-sized units were selected as the lowest echelon, each hex was designed to represent 1.5 kilometers of terrain on the map.

Using one map would allow players to see the location of their opponent's units and as a result the use of ghost or "dummy" units was implemented. The ghost counters

---

[60] *BCT Command: Kandahar* by Michael Anderson, Joseph Miranda, and Brian Train (MCS Group, 2013); *Ticket to Ride* by Alan R. Moon (Days of Wonder, 2004).

[61] CALL, *MDMP: Lessons and Best Practices*, 28; CALL, *NTC Compendium, No. 01-11*, 173.

would be identical to unit counters and deny each player from knowing the exact position of the opponent's units. The first use of ghost units saw only three per player, but once the ratio to actual units was further analyzed, the number was increased to five at the beginning of the game with the possibility of increasing to seven. Units and counters will be discussed in more depth in the assets section to follow.

The first draft concept for this wargame only used action points for movement. Other brigade-level operations and assets were not accounted for during the first draft. As *Friedrich* used decks of playing cards to give players points to use in combat, numbered action cards in *The Box* would allow players to move their units across hexes.[62] A distribution of cards was created to enable randomness in the draw of cards, forcing the player to consider following turns and the cards that would possibly be available for use. The action cards would be the only individual deck from which players could not select cards at will.

The value displayed on the action card was to be the number of movement points, taking into account terrain effects, that players could use to move maneuver units on the gameboard. However, the span of control for any commander should be between three to five units despite the responsibility to plan two-levels down.[63] Constraining players to movement based on the random values of drawn movement points placed the players replicating the brigade or battalion commander to making company level decisions for movement. It also reduced the realism of the simulation where players could expect all

[62] *Friedrich*.

[63] CALL, *MDMP: Lessons and Best Practices*, 28

units to move equally – adjusted for terrain – in a given period of time. Although M1A2 Abrams tanks can move at speeds up to 42 kilometers per hour, which would allow a unit to move almost across the entire gameboard, allowing each unit to move ten hexes per turn (twelve for reconnaissance and ghost units) would simulate how far a unit would move during a turn in a maneuver formation. The choice to allow units to move a set number of hexes each turn allowed for the focus of action point attribution to be on the use of internal and external enablers.

Following multiple tests of *BCT Commander: Kandahar* and *Fluvius Bellum*, the mechanic of using enabler cards to simulate the use of non-maneuver units was adopted. Rather than having players pull from a single deck of enabler cards, a deck for internal and a separate deck for external enablers was developed.[64] By having separate decks, the simulation was able to integrate how brigades in the newly developed DATE 3.0 scenario would fight as part of a division; the wargame would allow for the players to use assets not organic to a brigade combat team.

While some enabler cards were developed from examples of resources used in *Fluvius Bellum*, many were taken from known ABCT and division-level assets. The enablers simulate maneuver assets like unmanned aerial systems, indirect fires, and combat aviation as well as other advantages players can exploit. The first draft gave each player a finite number of each enabler card type at the beginning of the game that could be played during any turn. However, the number of cards needed for an entire playthrough of *The Box* would have overwhelmed players. To reduce the number of

[64] *BCT Command: Kandahar*; *Fluvius Bellum* by Chris Carnes (unpublished).

enabler cards required, the cards were separated into two separate categories: internal and external enablers. With the two separate decks, the initial intent was to allow players to use up to two internal and one external enabler card per turn.

Enabler cards were assigned an action point value to present players with the dilemma of which enabler card to use each turn, as there was a finite number of available action cards. Values were assigned to enabler cards to represent the amount of planning and the amount of resourcing required to use the asset or conduct the named type of operation. Enabler cards were also given a separate but small action point value that players could use in exchange for not being able to use the specified enabler card.

Initially, to avoid players using all of their enabler cards in a turn, players were allowed to draw five enabler cards. Use of internal enabler cards counted as one card, whereas external enablers cost two, which would force players to prioritize their efforts and better simulate the amount of available division assets during each turn. This was again modified during later testing to allow players to draw two external enabler cards per day and hold a maximum of three internal enablers each turn. This represents the longer planning cycle for use of higher echelon enablers compared to the BCT's ability to rapidly integrate internal enablers into operations. To promote planning of future operations, an enabler card map was created to allow players to play cards they currently held in later turns, which would not count against the number of cards held each turn.

Enablers were also assigned a return-to-deck value, resulting in the card being out of play until a following day or battle period, forcing players to decide when to play certain enabler cards to retain enablers if required for near-term future turns. Furthermore, enabler cards were not allowed to be played immediately, as planning for

the use of an asset would require time for the staff to plan. Additionally, coordination with higher echelons takes longer that using internal assets, so the decision to allow players to plan to use internal assets in the second following turn and external enablers no earlier than the following sixth turn would force players to plan and synchronize their units' maneuvers and the use of enablers to maximize effects.

As used in *Bulge 20*, staff cards were integrated to simulate planning efforts of the commander's staff to execute operations using the enabler cards.[65] In order for a player to use an enabler card, they would have to play the number of required action points and a corresponding staff card indicated on the selected enabler card. The staff cards were also assigned an action point and a return-to-deck value – like enabler cards – to force players to intentionally plan how they would execute operations. Each type of staff card was assigned a color and the enabler cards requiring the staff card for play had the name of the staff card with the corresponding color required to use to streamline gameplay and minimize confusion.

Finally, SNAFU cards were integrated to simulate the unknown or unforeseeable in war. Adopted from *BCT Command: Kandahar* the SNAFU cards would be drawn at the end of each day-period, one by each player.[66] The card would have an effect on the drawing player, his opponent, or both players. The cards ranged in effects from rain limiting use of unmanned aerial system for both players, to change of mission where players would have to select new objective cards. To further increase the impact of

[65] *Bulge 20* by Joseph Miranda (Victory Point Games, 2009).

[66] *BCT Command: Kandahar*.

unanticipated events on players, the frequency of SNAFU cards drawn by players was increased to every three turns to force players to plan their operations with built in flexibility to react to unforeseen events.

Resolution

As *The Box* is a brigade force-on-force simulation, movement and maneuver were critical to the design. Initially, each unit counter would be given five movement points to maneuver on the gameboard or players would roll a six-sided die (D6) for each unit, regardless of the unit type. As discussed in the previous section, the terrain would limit the distance each counter would be able to move.

After testing *Friedrich*, the mechanic of using points to execute combat became a viable mechanic to modify for this simulation.[67] While players draw a specified number of cards each turn depending on their role in *Friedrich* for combat resolution, the idea in this game was to use action points to drive a player's ability to maneuver his units.[68] During the first testing iteration, players were allotted 12 action cards to maneuver their units and apply towards enablers. The first issue discovered was that players would apply all of the action points to a few units, allowing the counters to move from one end of the gameboard to the other in a single turn.

To address this issue, movement speeds of armor and mechanized infantry formations were analyzed. To reduce player reliance on a few units and force the use of additional counters, reconnaissance units are given a maximum movement of four hexes

---

[67] *Friedrich.*

[68] Ibid.

and all other units are allowed three-hex movements. This proved beneficial during the following test but giving players 12 action cards did not properly simulate the appropriate amount of movement during the two hours simulated by each turn. However, as discussed in the *Assets* section, this did not accurately represent the maneuver capabilities of armor formations. By increasing the number of hexes a player could move their units to ten, this would force players to plan their maneuver in more detail while also forcing the players to be able to react to their opponent's maneuver more rapidly.

Combat in the simulation could have been made overly complex and complicated to adjudicate. The first prototype had each counter possessing differing combat, maneuver, and defensive strengths; players would have to do multiplication and division problems to assess combat strength before executing combat. Due to peer-capability level of each player, combat was simplified using a combat resolution table similar to the one used in *Battle for Moscow*. By using three-to-one as the maximum for both ends of the table, it required only one D6 for combat resolution. The result of the D6 roll will dictate the effect of combat on the opponent for that turn. The roller's opponent will not be affected by the roll until after his turn, to simulate the simultaneity of combat.

Combat effects on units were difficult to discern at first. Many wargames use counters with two sides; one side for full strength, and the other for reduced strength. Because of the necessity to simulate the fog of war, this would be impossible without revealing the unit composition of both players counters. Looking to the simulation *Triumph & Tragedy*, the use of pips (or blocks) surrounding the unit icons to indicate

combat strength was adopted.[69] Using pips to indicate combat power would negate the need for the previously mentioned separate combat, maneuver, and defensive strengths for each unit.

The initial concept was to have all units at full strength, or with four pips above the unit icon. However, for players to simulate units having the initiative or receiving reinforcements, the decision was made to have the beginning combat power for each unit at three pips. This would allow players to allocate additional resources through enabler cards to increase a unit's combat power to a four-pip maximum. Furthermore, company-level formations typically are comprised of three platoons in an ABCT, so each pip would represent a platoon's worth of combat power. Additionally, this would also assist with reducing the complexity of summations for the combat resolution table when more than one unit for a player was involved with combat.

The unit icons in the first draft were difficult to read; the icons were cluttered with information regarding their higher headquarters and combat power. The units were colored according to whether they were on the blue or red team; the unit symbol was colored with a white background, with the unit's battalion and company designations in small circles in the upper corners respectively and combat power below the icon. To reduce confusion and demonstrate that all units would have the same base level of combat power, each battalion was assigned a designated color and the combat power information was removed. This allowed for larger unit icons and enabled players to recognize each unit rapidly.

[69] *Triumph & Tragedy* by Craig Besinque (GMT Games, 2015).

Summary

Using the framework of the TSAR model and through the development of new and integration of existing mechanics allowed The Box to become a simulation capable of increasing players' tactical decision making and warfighting function integration capabilities. Regarding this thesis's problem statement, The Box provides players with a medium other than a CTC rotation to practice synchronizing warfighting functions and building flexibility in rapidly developed tactical plans. Furthermore, the secondary design questions were addressed and integrated into this wargame's design.

The design of this wargame used the TSAR model to directly address time, space, assets, and resolution integration into player's decisions. Whether considering how to maneuver units or when to plan for the use of an external enabler, players are presented with a playable simulation that reinforces good tactical decision making.

Weather is an uncontrollable aspect of combat, and as such, it was integrated into the random effects of SNAFU cards. This mechanic allowed for the simulation to constantly present players with unpredictable dilemmas and opportunities for exploiting their opponent's weaknesses.

Additional players are able to participate in gameplay by assuming roles on each force's staff, providing the acting commander with recommendations for enabler employment based on that staff sections availability of Staff cards. This would allow for this wargame to be used as a professional development tool for key leaders on a battalion or brigade staff.

Logistical operations would intensify the complexity of this simulation, which would increase the amount of time required for play. To focus the players on tactical

decisions and warfighting function integration, logistic planning was deliberately omitted from this simulation to best minimize the impact on maneuver planning.

Rather than physical representation through game pieces, fire support mechanics were developed in concert with Enabler cards to demonstrate the synchronization and planning required for indirect fire and combat aviation support with ground maneuver forces. This allowed players to focus on maneuvering direct fire units while maintaining the capabilities and limitations of fire support assets.

Modeling each turn as an hour of simulated time allowed for players to maneuver their units and plan for enabler integration in a realistic manner with regards to movement limitations and planning timelines. An hour of simulated time allowed for players to plan and maneuver forces while maintaining a rapid tempo of gameplay.

Through addressing the problem statement and secondary design questions, The Box provides players with a simulation capable of developing tactical decision making and warfighting function integration skills. Although not a perfect nor even possibly the final product, this wargame successfully presents a method to address this thesis's problem statement.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

While no perfect model exists in any simulation, The Box successfully achieves the desired outcome of developing tactical decision making and warfighting function integration capabilities in leaders, commanders, and staffs through its design and critical components. By developing a wargame grounded in peer level combat, the author gained a multitude of insights on how to further integrate the objectives of tactical decision making and warfighting function integration into a simulation to facilitate leader development. Through research, application, and testing The Box addresses the issues of limited time and resources facing many units in training to future missions.

Addressing all of the identified areas for improvement for BCTs during a CTC rotation in a single simulation would be nearly impossible, especially when wargames are abstract by nature. However, focusing at company- through brigade-level maneuver, using card play to represent warfighting functions, and integrating aspects of the fog of war, has enabled The Box to successfully represent the dynamics of combat to facilitate leader development in tactical decision making and warfighting function capabilities.

The most successful aspect of this wargame's design is its adaptability; this game can be tailored through minor modifications to utilize any of the three (armor, stryker, and infantry) brigade combat teams. Additionally, the terrain can be modified for anywhere on the globe. As Hexographer is a free software program, as long as players have a digital copy of the terrain they want to use for the simulation to use as an underlay, players can create a new map for any desired location.

Through simplifying combat and focusing maneuver at the company-level, all players regardless of rank can improve their collective and individual capacities in tactical decision making and warfighting function integration. While company- and battalion-level leaders may gain the most from utilizing this simulation, all levels of leadership will benefit from using this wargame to better understand tactical decision making and warfighting function integration in a BCT fight.

Improvements to this wargame could and should be made by future players. Integrating unaccounted for enablers and selecting differing terrain will yield not only different results, but additional expertise in every player. For example, reconnaissance was not given as much attention as the designer could have done. The concept of integrating the establishment of named areas of interest (NAIs) would have facilitated more detailed and deliberate planning. Additionally, expansions could be made to the game design to include logistical operations to increase the detail of the simulation. As the groundwork for this wargame is stable, players may modify the game to fulfill their training needs, from individual leader development to course of action analysis during the MDMP process.

Recommendations

Based on the development and design of this wargame, the author recommends three differing audiences. First, for brigade operations or executive officers can use this simulation to augment the wargaming step of course of action development during MDMP prior to a rotation at NTC. Second, junior leaders (lieutenants and captains) can utilize this simulation to better understand brigade-level tactical operations. Finally, any

leader may use this wargame to build personal tactical decision making and warfighting function integration capabilities.

This final iteration of development in The Box is a simplified simulation of a peer-level, force-on-force combat at the brigade-level. This simulation is intended not only for use by leaders anticipating a rotation at NTC, but all leaders to facilitate their own and subordinate professional development.

APPENDIX A

GAME RULES

1.0 INTRODUCTION

1.1 GENERAL *The Box* is a two-player, tactical-level wargame set in the National Training Center (NTC) at Ft. Irwin, California in the modern day. Both players assume the roles of an Armor Brigade Combat Team (ABCT) Commander, with one commanding the blue forces (BLUFOR) and the other commanding the red forces (REDFOR). Each player must accomplish objectives using tactical maneuver, operational planning, and warfighting function integration. Three battle periods divide the wargame, each of which will use a different scenario.

1.1.1 Each turn, players maneuver their units on the hex-based gameboard, use Action points to utilize capabilities in conjunction with the Staff to achieve the selected objectives for the given scenario. How players select their objectives paired with warfighting function integration will significantly impact the outcomes of each engagement, reactions to enemy Actions, intelligence efforts, and maneuver capabilities.

1.1.2 Game activity includes combat and planning, involving different subordinate units and warfighting functions that the players coordinate through the use of Enabler cards. Players earn Victory Points by achieving a given objective's goal at the end of each battle period. Consequentially, players must plan how to secure Objective goals in conjunction with destroying enemy forces by the end of a battle period.

1.1.3 The Box simulates many procedures currently used by brigade combat teams at the Combat Training Centers (CTCs). However, many abstractions have been made in the wargame's design to focus the players on making tactical decisions and integrating warfighting functions, through providing a playable game under limited time conditions. For example, anyone familiar with training operations at NTC, or familiar with any CTC for that matter, knows there is a disparity between the size of the rotational unit and the opposing force. To give players an opportunity to maneuver an entire brigade and to simulate actual peer-level combat, both red and blue units are full ABCTs. This game is intended to develop tactical decision making and warfighting function capabilities of the player, regardless of the individual's previous professional experiences.

1.2 SETTING UP THE WARGAME

1.2.1 Each player takes command of either the BLUFOR (blue markers) or REDFOR (red markers). The first battle period always uses "*Scenario 1: Movement to Contact*" (see section 5.0) unless the players agree to begin with a different scenario. Any modifications to the base rule set are in the scenario description.

1.2.2 After placing the gameboard, players shuffle their respective Action cards and place them face down. The blue player then shuffles the Chaos cards, allowing the red player to cut the deck, before placing the cards face down on a centered edge of the gameboard. Players then place their respective decks of Staff, Internal Enabler, and External Enabler cards in separate decks; these decks do not need shuffling.

1.2.3 Each player takes the unit markers designated by the selected scenario and arrays them in their initial deployment formation, placing the markers as described in the scenario setup information (see section 5.0). The player listed first in the scenario sets up first. The scenarios will typically direct players to set their unit markers along specific hex-lines, hex-rows or in proximity to a specified hex.

1.2.4 After arraying forces, players then roll a six-sided die (D6) to establish the order of play and initiative. Both players roll the die simultaneously. In following battle periods, the player with more victory points has the initiative.

1.2.5 The player with the higher value (or number of victory points) has the initiative throughout the battle period. Furthermore, the player with the higher value can draw additional Action cards equal to the difference between each players' die value at the start of any turn during each day period for that battle period. These additional cards do not change the player's hand limit. The additional cards are drawn once at any point during their chosen turn.

2.0 Components

2.1 Dice

2.1.1 *The Box* requires only two six-sided dice (2D6) to play. The 2D6 are used for combat resolution using the combat resolution table (see section 3.3.1) and for producing results of SNAFU cards (see section 2.2.5).

2.2 Cards

2.2.1 Action Cards

Table 1. Action Card Values

Card Values													
Card #	2	3	4	5	6	7	8	9	10	J	Q	K	A
# Points	2	3	4	5	6	7	8	9	10	10	11	11	12

Source: Created by author.

2.2.1.1 Action cards simulate a subjective amount of effort and resources that units need to plan and use additional assets in combat. These cards are the primary resource players need to be successful in The Box. Each player's Action card deck consists of two standard playing card decks with Joker cards removed. Action cards are the only deck players must draw blind throughout gameplay.

2.2.1.2 At the beginning of every battle period, players draw four Action cards; players may hold a maximum of seven Action cards in their hand at the end of each turn. If a player is holding more than seven, the opponent selects the necessary number of cards to return to the Action deck to bring the player's hand down to five cards. Players may request their opponent to count the number of held Action cards at any point during gameplay.

2.2.1.3 Action card point values are applied to Enabler cards (see section 2.2.3) to use the Enabler's capability. The point value of each card represents a subjective amount of effort a staff must use when planning an operation that uses the selected enabler.

2.2.1.4 Applying Action card points to multiple Enablers is not allowed. For example, if a player is trying to play an Enabler card that requires eight Action points but is holding Action cards with point values of four, three, and two, they may not apply the remaining single point Action point to an additional Enabler card.

2.2.1.5 Players have the option to play all or select Action cards held in hand during their turn to facilitate their style of gameplay best. Players may also choose to pass and not to play any Action cards, i.e., plan any Enabler card use, for their turn. Players must balance their use of Action cards to best exploit Enabler Card utilization.

2.2.2 Staff Cards

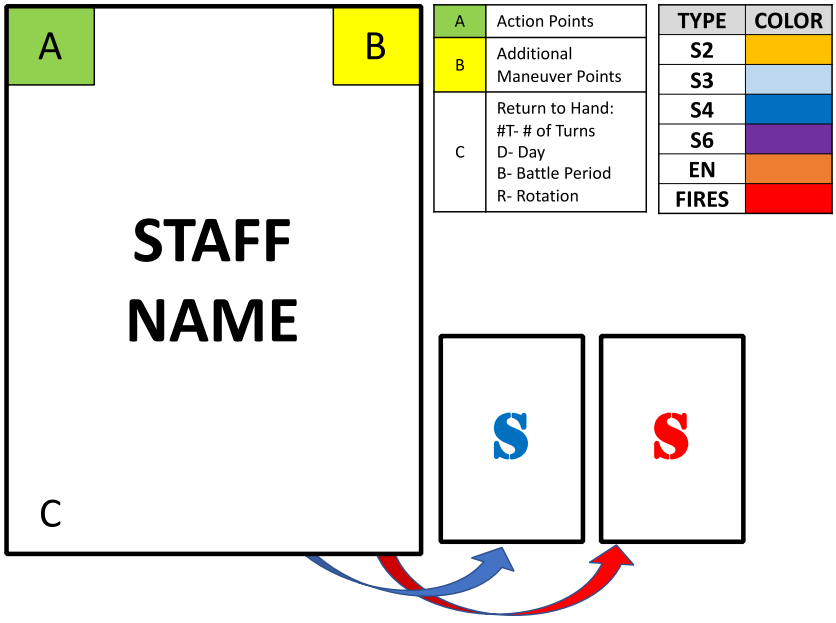


Figure 1. Staff Card Format

Source: Created by author.

2.2.2.1 Staff cards simulate planning efforts during combat operations by Warfighting Function; each Staff card represents a Staff section and Warfighting Function found in an ABCT. The Staff section planning effort is required to use an Enabler card. While multiple Staff sections share the responsibility for planning operations and the use of enablers in real-world combat operations, this has been simplified to a single Staff section to facilitate gameplay.

2.2.2.2 Players have the ability to view their entire Staff card deck throughout gameplay freely. At the beginning of each turn, the player selects the Staff card they want to use during that turn or for planning future operations. Staff cards must be played in conjunction with a corresponding Enabler card to represent the Staff sections planning focus. Staff cards return to players' decks as indicated in the lower left corner of the Staff card. Cards will either return to the players' decks after a specified number of turns, a day, a battle period, or not until after the rotation (end of the game) as dictated by the individual Staff Card.

2.2.2.3 There is no limit placed on the number of Staff cards a player may use as Staff cards each turn, so long as they have the required number of Action cards for use with an Enabler. Players may use two of the same Staff card for a single Enabler card, which will reduce the Action card value cost by half.

2.2.2.4 Staff cards also have Action and Enabler point values, through which players can sacrifice future staff planning for the ability to utilize an Enabler card when they do not have a sufficient number of Action points or to increase a unit's maximum maneuver.

2.2.3 Internal and External Enabler Cards

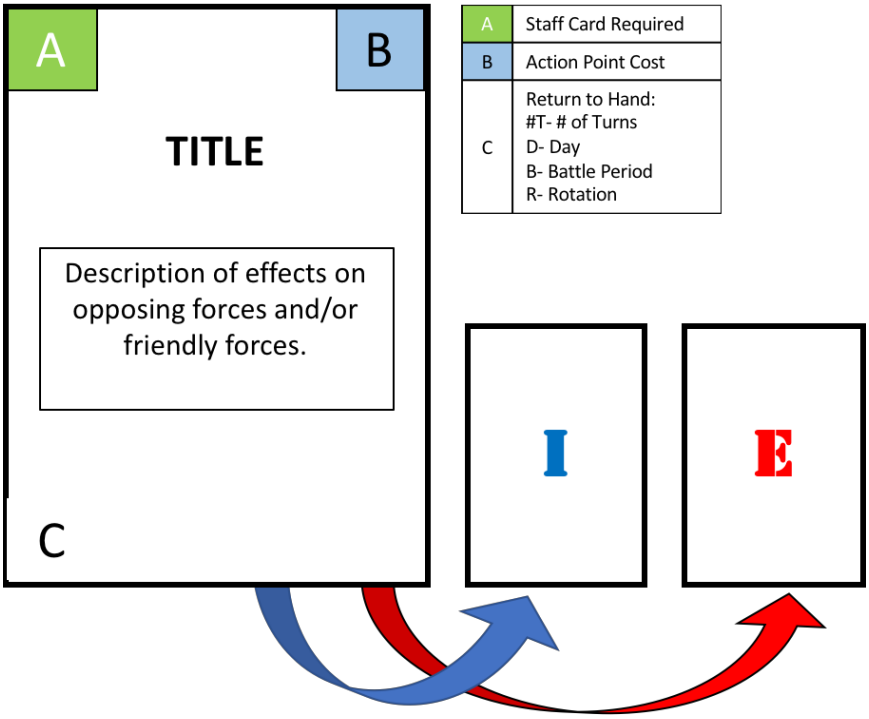


Figure 2. Enabler Card Format

*Source:*Created by author.

2.2.3.1 Enabler cards constitute two different decks: Internal and External decks. Enabler cards allow players to use assets Internal to an ABCT (represented by Internal Enablers) or generally held at the division level (represented by external Enablers). They simulate the integration of Warfighting Functions into brigade-level tactical operations.

2.2.3.2 Each of the cards has four essential characteristics. First, the title and description inform the player of the effect created by playing the specific card. Enabler cards give players a range of abilities from using indirect fires to

reconstituting destroyed units (reference Section 6.0 for a list of all Enabler card capabilities). Second, the upper right corner of the card gives the number of Action points required to use the Enabler card. Players need the given value of Action cards to use the Enabler card. The upper left corner of the card gives the Staff card to play that Enabler card. Finally, the lower left corner of the card gives the point at which the card will return to the player's Enabler deck, similar to Staff cards. Players must plan and rationalize the use of each Enabler card, as similar card effects may require a different amount of Action points and will return to the players' decks at different points in the game.

2.2.3.3 Players add three Internal Enabler cards to their hand each turn and draw an additional External Enabler card every three turns. Players may use a maximum of five Enabler cards each day and may hold a maximum of seven total Enabler cards in their hand at the end of each turn. If a player exceeds this limit, the opponent randomly selects the necessary number of cards to bring the total number of cards left in the player's hand down to five. It is highly recommended players view and compare all of the Enabler cards in detail before play. Doing so will dramatically assist with the player's ability to plan for future turns.

2.2.3.4 The designated Staff card and required number of points from Action cards must be placed with the Enabler card on the planning mat. Cards played on the planning mat do not count against the total number of cards in a player's hand. A maximum of two sets (Enabler, Action, and Staff cards are a set) may be placed on each space on a player's planning mat.

2.2.3.5 Players use the Planning Mat (see section 2.3.4) to plan for the use of their Enabler cards. Internal Enablers can be placed anywhere on the planning mat after "T+1" (the following turn). External Enablers are placed no earlier "T+6" (six turns further into play).

2.2.4 Objective Cards

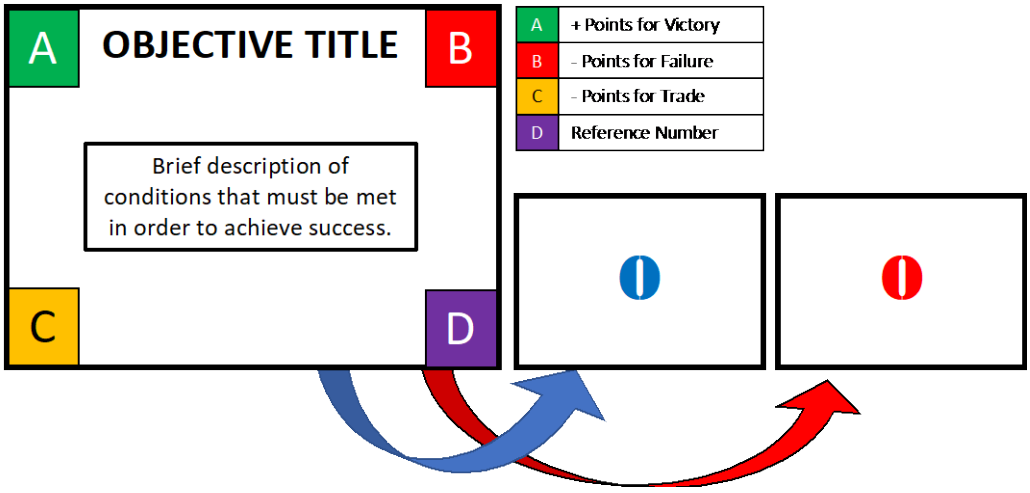


Figure 3. Objective Card Format

Source: Created by author.

2.2.4.1 Objective cards are the primary method through which players achieve victory during play. Objective cards are supporting objectives that represent more specific missions the ABCT may undertake or order to enable the battle period's selected scenario victory conditions.

2.2.4.2 Objective cards have five key elements. First, the objective's title and description are in the center of the card. Second, the number of victory points players receive for successful completion at the end of the battle period is in the

upper left corner, indicated in green. The penalty for not achieving the objective at the end of the battle period is red in the upper right corner. The number of Action points required for the player to trade the held Objective card for an Objective card not in play is in the lower left corner in orange. The Objective card's reference number is in purple in the lower right corner.

2.2.4.3 At the beginning of each battle period, players select a minimum of two Objective cards from the given scenario's pool of Objective cards. It is critical for players not show their opponent their Objective cards accidentally during gameplay. Players reveal the number of accumulated victory points at the end of each battle period. The player with the most victory points is declared the winner of the current battle period and has the initiative at the beginning of the next battle period, allowing the player to select to go first or second. Additionally, the difference between the players' total number of victory points at the end of the preceding battle period give the number of additional Action cards available to the player to draw during a single turn the next battle period.

2.2.5 SNAFU Cards

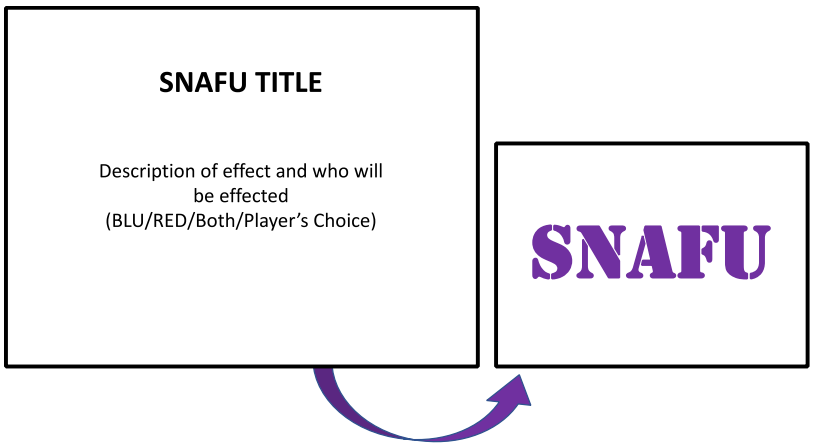


Figure 4. SNAFU Card Format

Source: Created by author.

2.2.5.1 SNAFU cards are a mechanic in the simulation to reflect the unknowns and uncontrollable elements of combat. Unforeseen vehicle issues or the impact of the weather can deliver an unpredictable disruption to a unit's plans and operations.

2.2.5.2 The SNAFU cards range in effects from rain limiting use of unmanned aerial system for both players, to change of mission where players would have to select new Objective cards.

2.2.5.3 A SNAFU card is drawn by each player at the end of every third turn. Players read the SNAFU card aloud, indicating the effect of the card. The SNAFU card effect last for the following 24 turns, or one day of game time, unless the affected player uses the appropriate Enabler card to negate the

SNAFU card's effects. Once time has expired, SNAFU cards are returned to the SNAFU deck and reshuffled.

2.2.5.4 Some SNAFU cards apply to a specific unit in the player's formation. To find what unit will be affected by the SNAFU card, use the table below.

Table 2. SNAFU Resolution Table

Roll	Die 1	Die 2
1	1st BN	HQ
2	2nd BN	A CO
3	3rd BN	A & B CO
4	RECON SQDN	B CO
5	Roll Again	B & C CO
6	Roll Again	C CO

Source: Created by author.

2.3 Gameboard

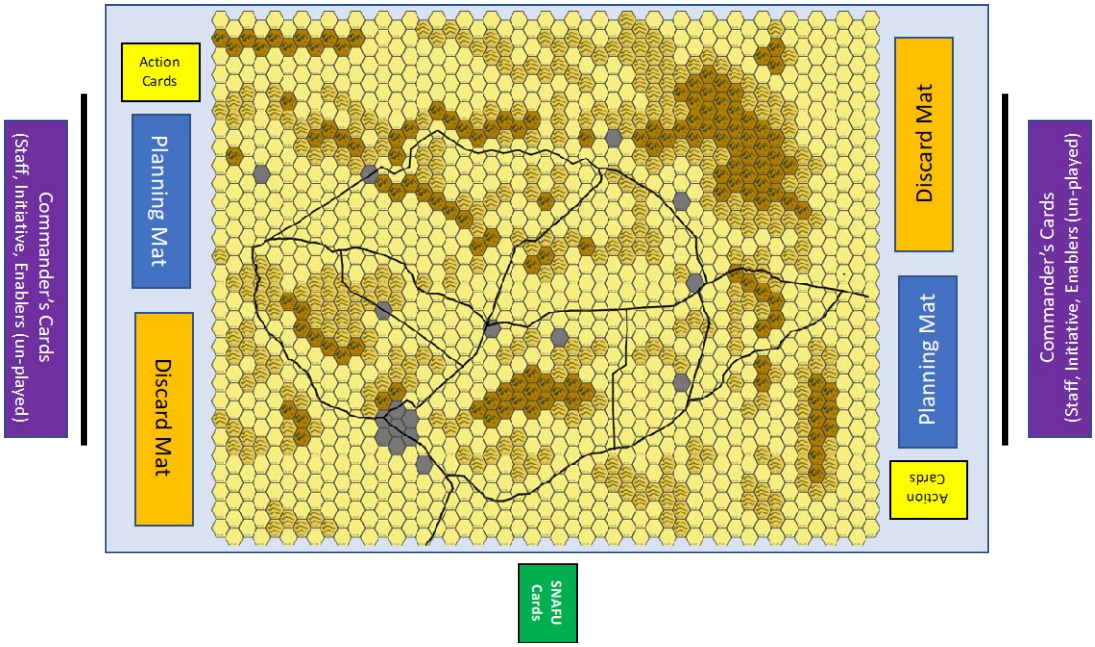


Figure 5. Gameboard Format

Source: Created by author.

2.3.0.1 The main features of the gameboard include the hex-terrain map, time map, discard mat, and planning mat. Players normally sit with one player on the west (left) side of the gameboard and the other on the east (right) side.

2.3.1 The Map

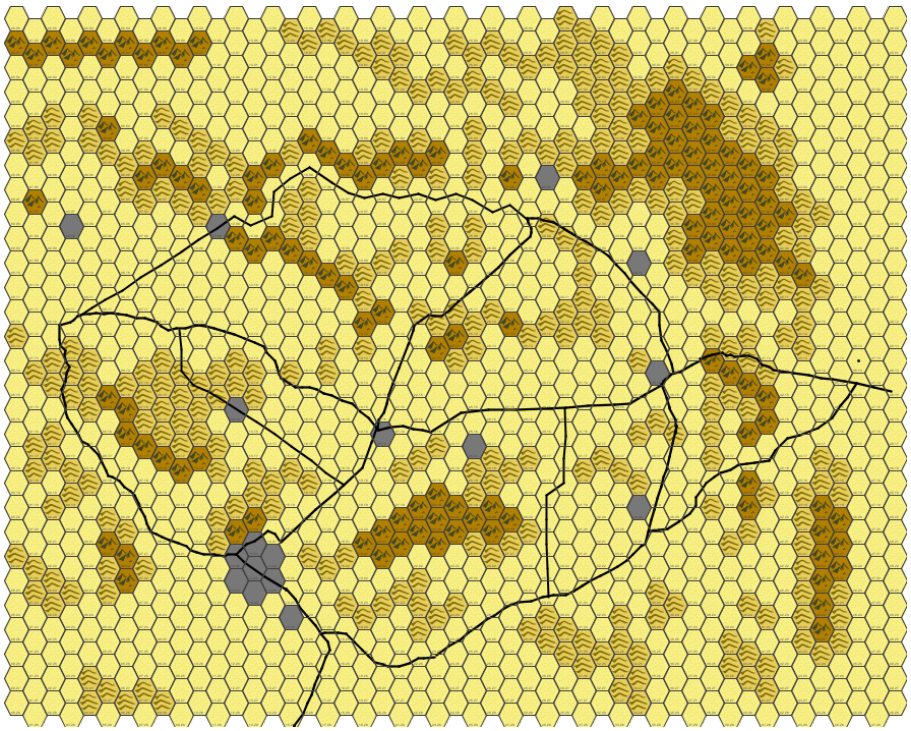


Figure 6. Map Format

Source: Created by author.

2.3.1.1 The map is a feature-reduced, topographical, hex-arrayed map of the National Training Center at Ft. Irwin, California. Each hex is approximately a 1.5 kilometers area. The terrain is represented by different shades to indicate the general restrictiveness of the area, to include urban areas and major road networks. If a road network appears to be on the line between two hexes, count the maneuver through that space as a single hex. Terrain effects do not apply while moving units along a road.

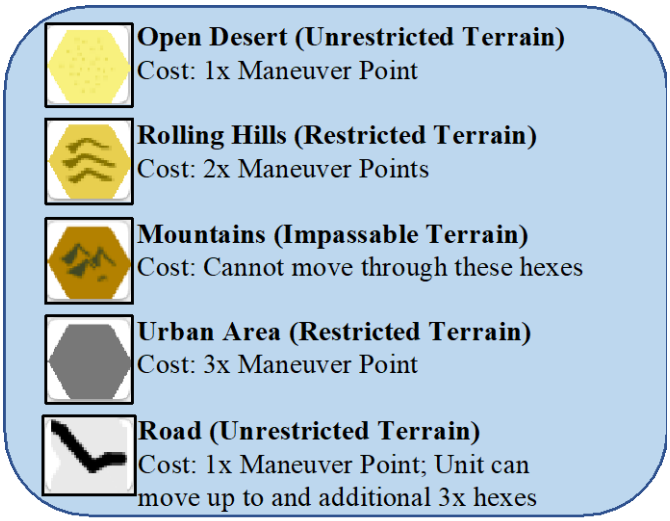


Figure 7. Map Legend

Source: Created by author.

2.3.1.2 Every hex on the game map is identified by a hex number (e.g. 16.15). The digits before the decimal point (16.xx) indicate the vertical hex column, reading along the map from left to right. The digits after the decimal point (e.g. xx.15) identify the exact hex in the column, reading from bottom to top.

2.3.2 Time Map

Table 3. Time Map Format

THE BOX		T-1	T-2	T-3	T-4	T-5	T-6	T-7	T-8	T-9	T-10	T-11	T-12	T-13	T-14	T-15	T-16	T-17	T-18	T-19	T-20	T-21	T-22	T-23	T-24
BATTLE PERIOD	DAY 1																								
	DAY 2																								
	DAY 3																								
	DAY 4																								
	DAY 5																								

Source: Created by author.

2.3.2.1 The time map allows players to keep track of the current turn of play. Each row represents a day, with the larger section as the whole battle period. Each row represents an hour of in-game time. Using a two-sided, blue/red marker, players keep track of which player is currently active for each turn.

2.3.3 Discard Consolidation Area

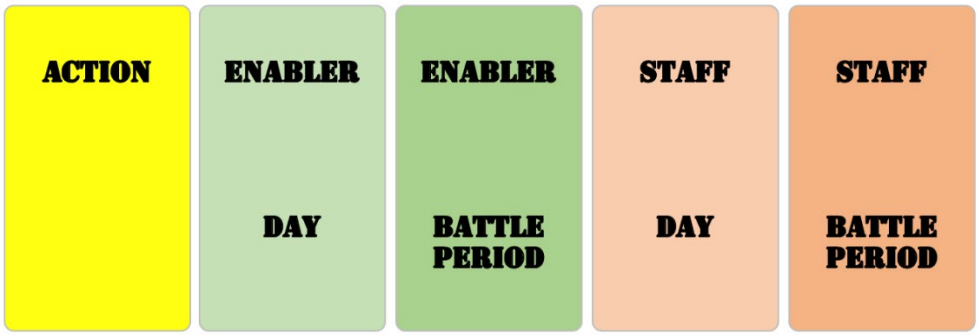


Figure 8. Discard Consolidation Area Format

Source: Created by author.

2.3.3.1 The discard mat allows players to keep track of the cards they have played in previous turns that will return to their decks in future day or battle periods. Each type of card has a section for whether the card returns following a turn, day, battle period, or rotation. It is the player's responsibility to return the cards to their decks at the designated time. Should a player forget to return their cards to the appropriate deck, the cards remain on the discard mat until the following day or battle period has concluded.

2.3.4 Planning Mat

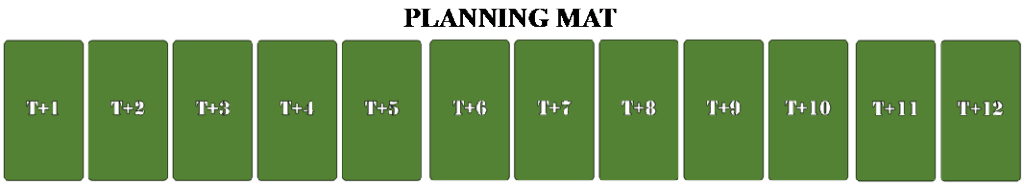


Figure 9. Planning Mat Format

Source: Created by author.

2.3.4.1 The planning map allows players to allocate Enablers, Staff, and Action cards to future turns. This simulates how Staff planning efforts are not immediately completed and executing the planning process takes time. Internal Enabler cards cannot be played on the T+1 position to simulate the minimum amount of effort required to plan an operation with only assets internal to the ABCT. External Enabler cards cannot be initially laid on the T+1 through the T+5 position, which simulates the necessary coordination with higher headquarters. The planning mat is arrayed with future turns, where players shift the laid cards at the end of each turn. If players forget to shift the cards on the planning mat at the end of each turn, they must wait until the following turn to move the cards. This simulates the Staff lagging in the planning process.

2.4 Units

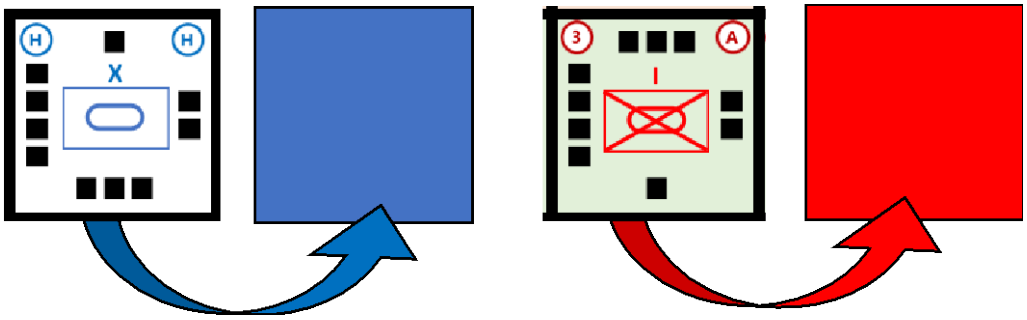


Figure 10. Unit Counter Example Format

Source: Created by author.

2.4.1 Maneuver units represent the ground force of an ABCT. Units include: brigade headquarters, battalion/squadron headquarters, mechanized infantry companies, armor companies, and reconnaissance troops.

2.4.2 Unit combat power is represented by the number of pips, or black square boxes, on each edge of the face of the unit icon. All maneuver companies and troops start with a combat power of three pips above the unit icon. Headquarters start with a combat power of one pip. Increasing a unit's combat power is possible through the use of Enabler cards. Units are to be placed upright with the unit icons facing the owning player.

2.4.3 Each unit occupies a single hex; stacking of multiple units in a single hex is not allowed and units cannot pass through occupied hexes.

2.4.4 Company units must remain within seven hexes of their battalion headquarters to maintain maneuver capabilities. Should a company be eight

hexes or further from its higher headquarters, the cost of maneuver is doubled. There is no restriction placed on the distance of battalion headquarters from the brigade headquarters. However, the brigade headquarters must be placed on the board by the end of turn 2 in any scenario for victory point purposes. If a unit is destroyed during play, the unit's marker is removed from the gameboard until reconstituted through the use of Enabler cards.

2.4.5 Ghost units are used to simulate the fog of war in combat. These units deny the player's opponent from knowing the exact location of his units during gameplay. Unless otherwise dictated by the scenario, both players are allocated five ghost unit markers. Players must use Enabler cards to move new ghost units on to the gameboard. Should a player engage an opponent's ghost unit without using an Enabler to properly identify the unit, the effect of combat is applied to the engaging unit despite the lack of combat power associated with a ghost unit.

2.5 Cubes

2.5.1 Colored cubes represent either an effect of an enabler card or a lower echelon unit with a specific capability. These cubes are used to provide visual representation of Enabler card effects. The colors and the cube uses are described in the Enabler Card Matrix (see section 6.0).

3.0 Game Play

3.1 General

3.1.1 During a turn, each player will act in sequence, but not necessarily in the same order throughout gameplay. The player to go first is designated by whomever holds the initiative, as dictated through the roll at the beginning of the

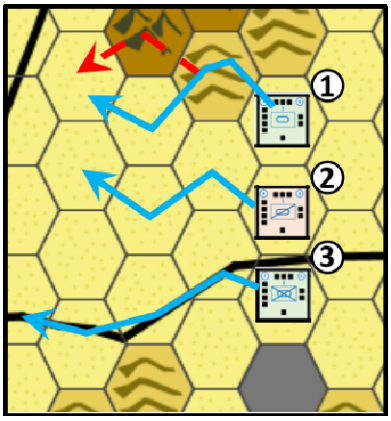
game or the player with the most victory points at the end of each battle period. If it is a player's turn, the player is referred to as the "active player."

3.1.2 Regardless of the order of player actions, both players should begin the turn by sliding all planned enabling operations one slot to the left on the planning mat. This will indicate what actions are available in the current turn. The inactive player might therefore have actions to mitigate active player actions as they occur in the active player's actions.

3.1.3 When a player is the active player, the player then draws their Enabler cards to be played. Afterwards, the player draws the two Action cards.

3.1.4 The player may decide to move units or play Enabler cards in any sequence he or she deems fit. Should Enabler cards from the planning mat be in play for this turn, the active player may choose to either use the asset dictated by the Enabler card first or choose to maneuver units first; whichever method the active player decides is best for the unit's scheme of maneuver is acceptable. During each turn, each player earns one victory point for each opponent unit destroyed. The active player's turn continues until either no Action cards remain in their hand or the active player chooses to pass play to their opponent.

3.2 Movement



1: Armor Company – Moves through one restricted hex (2x points), and two unrestricted hex (1x point each) for a total of four required movement points. The unit cannot move through the impassable terrain
2: Recon Troop – Moves through three hexes of unrestricted terrain for a total of three required maneuver points
3: Mechanized Infantry Company – Moves along the road for four hexes for a total of four required maneuver points

Figure 11. Maneuver Examples

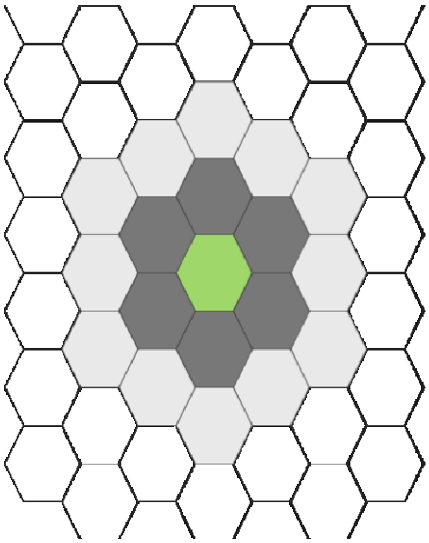
Source: Created by author.

3.2.1 All mechanized infantry companies, armor companies, and headquarters units are allotted ten movement points per turn. Reconnaissance troops and Ghost Units are given twelve movement points per turn. Movement points are deducted while moving into a new hex. For example, if a player is in unrestricted terrain and wants to move into an urban area, but they only have one remaining movement point, they may not move into the urban hex.

3.2.2 Movement into open terrain costs one movement point. Movement into restricted terrain cost two movement points. Movement into an urban area costs three movement points. Movement along the road network costs one movement point and all units beginning and ending movement along a road may move an additional three hexes.

3.3 Combat

3.3.1 Zone of Control



Green: Unit's location
Dark Gray: Combat automatically initiated
Light Gray: Maneuvering player decides if they want to start combat, unless opponent's unit is in a defensive position.
White: Outside of Zone of Control

Figure 12. Zones of Control Example

Source: Created by author.

3.3.1.1 Direct fires combat begins when opposing units occupy immediately when occupying an enemy unit's zone of control, or adjacent hex. Players may choose to start combat when units are separated by no more than one hex. When the active player declares the intent to engage using direct fires, both players lay the unit markers face up to reveal the unit's composition to their opponents.

3.3.2 Combat Resolution

Table 4. Combat Resolution Table Format

Attacker Ratio

D6 Result	1:3	1:2	1:1	2:1	3:1
1	AL3	AL3	AL2	AL1	N
2	AL3	AL2	AL1	N	DL1
3	AL2	AL1	N	DL1	DL2
4	AL1	N	DL1	DL1	DL3
5	N	DL1	DL1	DL2	DL3
6	DL1	DL1	DL2	DL3	DL4

- **A** or **D**: The result applies to the attacker or defender
- **L**: Loss of # of pips of combat strength
  - **1-2**: Losing unit can reduce loss of one pip by withdrawing two hexes
  - **3-4**: Losing unit can reduce loss of one pip by withdrawing three hexes
- **N**: No effect

Source: Created by author.

3.3.2.1 Combat results are determined using the combat resolution table. Players add up the total number of pips of their units involved in the engagement and compare the total to their opponent's total find the ratio of forces. Adjustments to the attack ratio given an Enabler card modifier are made after the force ratio is complete.

3.3.2.2 Unless a unit is in a defensive posture through the use of an Enabler card, the attacking player always rolls first. The second player to roll can elect to roll or not pending the results of the first player's roll outcome. After both players have rolled, the first player to roll can choose to continue combat or break contact. If the first player decides to break contact after combat resolution, the player may move their units two hexes in a direction away from their opponent's

units, regardless of terrain restrictions. Should a unit's direction of retreat place it next to an enemy unit, combat will be initiated during the opponent's following turn, where the opponent will automatically have the initiative regardless of Enabler card use.

3.3.3 Indirect Fires Through the use of Enabler cards, players can use Internal and external indirect fire assets. Should a player use an indirect fires Enabler card, the player selects the hex on which they want to use indirect fires and follows the instructions on the card for combat resolution.

3.3.3. 1 Should the player using indirect fires take a step loss as a result of the roll, the loss is taken by the nearest unit to the hex receiving the indirect fires. The effects against the player using indirect fire simulate the opponent's use of counterbattery fires and does not require the opponent to use an indirect fires Enabler card.

3.3.3.2 If the player uses indirect fires without first identifying the unit in the target hex and the unit is a ghost unit, the effect of the roll designated by the combat resolution table is applied to the closest unit of the player using indirect fires to the point of impact automatically. This simulates calling indirect fires on non-combatants and the negative impact on a unit's operations in the area.

3.3.4 Losses When the combat resolution table indicates a loss, the losing player rotates the unit marker the requisite number of pips. If multiple units are engaged in combat, the opponent of the affected unit designates which unit or units are to be reduced. Should a unit be reduced below one pip, the marker is removed from

the gameboard until the player is able to reconstitute the unit, unless otherwise dictated by the scenario.

3.4 Transition Between Battle Periods

At the beginning of the wargame, players must agree on the following two options for transitioning between battle periods during the wargame. Transitions do not affect Enabler and Staff cards; these cards still return to the players' hands as dictated by the individual card.

3.4.1 Redistribution of Forces The first option is to array forces as described in the following scenario's description. This simulates the use of a Reduction of Battlefield Effects (ROBE) at CTCs that allow both forces to resupply and maneuver forces without the possibility of direct fire combat in preparation for future operations. A ROBE can last between four to eight hours at a CTC. While unrealistic in actual warfare, this option will better prepare players for future training at a CTC.

3.4.2 Maintain Current Force Array The second option is for players to keep the units arrayed on the map as they are at the end of the previous battle period without reconstituting any destroyed units or restoring units to initial combat power. This simulates actual combat operations where units will have to continue to fight with the current amount of combat power. Should players select to transition using this option, at the beginning of each day, players can choose to either restore four units to the initial level of combat power or reconstitute two destroyed units. Players can elect to reconstitute one unit and restore the combat power of two units as well.

3.5 Sequence of Play

1) Players agree on battle period scenario and transition method
2) Players roll for initiative; player with initiative becomes Player 1
3) Begin Day 1 Turn-1 (T-1)
4) Both players draw 4x Action cards
5) Both players choose 5x External Enabler cards they want to use that day
6) Both players choose 3x Internal Enabler cards for that turn
7) Both players draw 2x Action cards
8) Player 1 can either plan future use of Enabler cards, use active Enabler cards, or maneuver their units as they see fit.
9) Combat (as necessary)
10) Player 1 declares complete with turn; Player 2 executes steps 8 and 9.
11) Player 2 declares complete with turn
12) Execute Day T-2 through T-12 for steps 6 through 11
13) At the end of T-12 or T-24, both players draw a SNAFU card; apply effects of SNAFU card to one or both players
14) Execute Day T-13 through T-24 for steps 6 through 11
15) Repeat steps 5 through 14 for each of the next 5 simulated days of play
16) End of first battle period; players calculate total number of Victory Points
17) Player with the most victory points wins the current battle period and has the initiative for the following battle period
18) Repeat steps 5 through 16 for the following two battle periods

4.0 End of Game

4.1 Victory Points Players achieve Victory Points for each battle period by completing parameters outlined on their Objective Cards and by destroying their opponent's maneuver units. Destroying a maneuver company/troop is worth one victory point, destroying a battalion/squadron headquarters is worth three victory points, and destroying the brigade headquarters is worth six victory points. Should a player destroy all of the opponent's units during gameplay, the player is automatically the victor.

4.2 Victory Conditions The player with the most battle period victories is the overall winner. Even if the player has fewer total Victory Points but has won the majority of the battle periods, that player is still the victor. Should a battle period end in a draw, carry the total number of victory points to the following battle period. If the end of the wargame also ends in a draw, each player calculates the total number of earned Victory Points to find the winner. If the total number of Victory Points are still equal, the player with the most units remaining on the gameboard is the overall victor. If both players have equal numbers of remaining unit markers, the player that can drink a beer out of their Stetson the fastest is the winner.

5.0 Battle Period Scenarios

5.0.1 The scenarios are designed to allow players to experience different types of combat operations, force players to make rapid tactical decisions, and plan for the appropriate integration of enablers.

5.0.2 While each scenario refers to BLUFOR and REDFOR, the scenario is built for either player to assume either role following the initial battle period. Read the bottom-line-upfront (BLUF) for each scenario to determine which conditions set applies to which player. The REDFOR conditions set most often refers to the player with initiative.

5.0.3 Players are also free to design their own Scenario conditions set to support their learning objectives.

Table 5. Scenario 01 Description

Scenario 01- Movement to Contact	**Duration: One Battle Period**
BLUF: Both BLUFOR and REDFOR are moving onto the battlefield as the advanced guard for their division. This is the first time the units will engage in direct fire combat.	
BLUFOR	***REDFOR***
Units All units are available	**Units** All units are available
Start Locations All: Player's side, off of gameboard	**Start Locations** All: Player's side, off of gameboard
Objective Cards *Civil Control (#1)* *Defeat (#2)* *Advance (#3)* *Deny (#4)* *Seize Urban Center (#5)*	**Objective Cards** *Civil Control (#1)* *Defeat (#2)* *Advance (#3)* *Deny (#4)* *Seize Urban Center (#5)*
Modifications None	**Modifications** None

Source: Created by author.

Table 6. Scenario 02 Description

Scenario 02 - Build Combat Power	**Duration: One Battle Period**
BLUF: Following initial contact, BLUFOR has been significantly reduced. Using the Reconnaissance Squadron augmented by two armor companies, the trailing player guards along the 25 Easting to prevent the lead player from disrupting reconsolidation operations.	
BLUFOR	***REDFOR***
Units Minimum: Recon Squadron(+) and 1x CAB 4x additional Ghost Units (9x total)	**Units** All units are available
Start Locations Recon SQDN(+): within 3x hexes of 25 Easting CAB: within 3x hexes of grid 35.14	**Start Locations** All: Player's side, off of gameboard
Objective Cards *Defeat (#2)* *Deny (#4)* *Retain Stregnth (#8)* *Scouts Out! (#9)*	**Objective Cards** *Defeat (#2)* *Advance (#3)* *Destroy TOC (#6)* *Fighting Commanders (#7)*
Modifications Should the REDFOR bypass the guard with more than a battalion's strength, activate a reserve of 1x CAB. For every 12 turns the opposing player does not cross the 25 Easting, bring one additional company-size unit into play	**Modifications** Each turn one unit may be placed into play until all units are on the gameboard. A Headquarters unit may not be the first unit placed into play from a CAB or Squadron

Source: Created by author.

Table 7. Scenario 03 Description

Scenario 03 - Urban Control	**Duration: One Battle Period**
BLUF: REDFOR has taken control of a major city and nearby urban areas. BLUFOR must remove REDFOR and regain influence on the local population.	
BLUFOR	***REDFOR***
Units All units are available 2x additional Ghost Units (7x Total)	**Units** Recon SQDN 2x CABs
Start Locations All: Player's side, off of gameboard	**Start Locations** 3x units in 12.22 - 14.23 urban area 1x unit in 12.16 1x unit in 20.17 1x unit in 15.24 1x unit in 25.17
Objective Cards *Defeat (#2)* *Seize Urban Center (#5)* *Fighting Commanders (#7)* *Scouts Out! (#9)*	**Objective Cards** *Civil Control (#1)* *Defeat (#2)* *Deny (#4)* *Destroy TOC (#6)*
Modifications Player brings 1x unit into play each turn until all units are on gameboard.	**Modifications** All units located in urban areas automatically are placed into Battle Positions. FIRES Enabler cards have double the normal effect. For example, "Precision Artillery Strike" may select two targets

Source: Created by author.

Table 8. Scenario 04 Description

Scenario 04 - Zone Reconnaissance	**Duration: One Battle Period**
BLUF: BLUFOR must recon the route for the Division advance. Secure the major east-west running route in the battle space.	
BLUFOR	***REDFOR***
Units Recon SQDN 2x CABs	**Units** 3x CABs 2x additional Ghost Units (7x Total)
Start Locations All units start east of the 43 Easting	**Start Locations** 1x CAB west of the 09 Easting 2x CABs player's side, off gameboard
Objective Cards *Defeat (#2)* *Seize Urban Center (#5)* *MSR Control (#10)* *Fighting Commanders (#7)*	**Objective Cards** *Defeat (#2)* *Advance (#3)* *Deny (#4)* *Destroy TOC (#6)*
Modifications This player's S2 Enabler cards have double their effectiveness. For example, if "Launch UAS" is played, look at two units in separate hexes	**Modifications** After destroying a reconnaissance troop, OP cube, or FO cube, draw an additional Action card the following turn

Source: Created by author.

Table 9. Scenario 05 Description

Scenario 05 - Defensive Belt	**Duration: One Battle Period**
BLUF: REDFOR is attempting a spoiling attack on the BLUFOR's division's headquarters. BLUFOR must defeat the REDFOR attack by establshing an area defense	
BLUFOR	***REDFOR***
Units 2x CABs 2x Recon Troops	**Units** All units are available
Start Locations All units within 3x hexes of the 25 Easting	**Start Locations** All: Player's side, off of gameboard
Objective Cards *Defeat (#2)* *Deny (#4)* *Fighting Commanders (#7)* *Scouts Out! (#9)*	**Objective Cards** *Defeat (#2)* *Deny (#4)* *Destroy TOC (#6)* *MSR Control (#10)*
Modifications Engineer cards have double effectiveness this turn. For example, if "Battle Positions" is played, mark two units with green cubes every turn for the next five turns	**Modifications** Player starts battle period with 3x OPs (yellow cubes) and 2x FOs (red cubes) available for use without Enabler cards. Cubes must be placed within 5x hexes of a friendly unit

Source: Created by author.

Table 10. Scenario 06 Description

Scenario 06- War of Attrition	**Duration: One Battle Period**
BLUF: Fight to the death! The player that destroys all of their opponent's units first is the victor. The only way to victory is through total annailation!	
BLUFOR	***REDFOR***
Units All units are available (No Ghost Units)	**Units** All units are available (No Ghost Units)
Start Locations All: Player's side, off of gameboard	**Start Locations** All: Player's side, off of gameboard
Objective Cards *None*	**Objective Cards** *None*
Modifications None	**Modifications** None

Source: Created by author.

6.0 Enabler Card Matrix The below matrix describes each of the Enabler cards in the wargame. The Title, return period ("Return"; "#x T" for number of turns, "D" for day, "B" for battle period), a description of the Enabler card's effect, number of Action card points required to use ("Cost"; 4-20 points), and the number of this Enabler card in each player's deck ("Count"; 1 or 2). Additional blank Enabler cards are provided for players to develop their own Enablers for gameplay.

6.1 Internal Enabler Cards

Table 11. Internal Enabler Matrix

	Title	Return	Description	Cost	Count
S2	INTEL UPDATE	12x T	Opponent removes one of their Ghost Units from the gameboard	10	1
	LAUNCH SHADOW	6x T	Freely inspect 1x unit; unit remains revealed for remainder of day	6	1
	SITTEMP UPDATE	D	Freely inspect 3x units in a 3-hex radius; units return to hidden status at end of turn	12	1
	OBSERVATION POSTS	D	Deploy 3x **yellow** cubes forward; OPs reveal enemy units in a 2-hex radius. OPs cannot be deployed adjacent to enemy units and must be within 4x hexes of a friendly unit. **Yellow** cubes may maneuver 1x hex per turn	9	2
S3	AUFTRAGSTAKTIK	12x T	Each unit in a battalion (including nearby Ghost Units) may move 15x Hexes this turn. Terrain effects still apply	10	1
	HASTY DEFENSE	6x T	Mark all units in a battalion (Ghost Units within 7x hexes of BN HQ optional) with **blue** cubes. Shift CRT in favor of player for all opponent rolls involving these units. Remains in effect until units are moved	9	1
	CLOSE AIR SUPPORT	D	Increase CRT odds one column in favor of player for ALL rolls this turn	12	2
	QUICK REACTION FORCE	D	Move one unit up to 20x hexes this turn; span of control limits do not apply to this unit for the next 6x turns	6	1
S4	EMERGENCY RESUPPLY	6x T	Increase combat power of one unit one pip	10	1
	CL V RESUPPLY	12x T	Return "BATTLE POSITIONS" or "3X CONCERTINA WIRE" card to deck immediately	6	1
	FIELD MAINTENANCE	D	Increase combat power of a unit one pip each turn for the follow 4x turns.	12	2
	LOGPAC	D	Effect of "Maintenance" SNAFU negated	15	1
S6	MISSION COMMAND	6x T	Player may draw an additional Action Card each turn for the next 2x turns	6	2

	COMMO UPDATE	D	Effects of "Comms Loss w/..." SNAFU negated	15	1
	TENACIOUS FLEXIBILITY	D	Switch the positions of any cards on T+4 or sooner on the planning map. Can switch all four positions	9	1
	SYNC WITH HIGHER	12x T	Enable one External Enabler to be planned as Internal Enabler Card (at T+2) during this turn	12	1
ENG	BATTLE POSITIONS	12x T	Mark one unit with a **green** cube every turn for the next 5x turns; Effects on marked unit(s) reduced one column on CRT. Remains in effect until unit is moved	9	1
ENG	TANK DITCH	D	Mark one hex border line with a **black** cube; units are unable to cross that border	10	1
ENG	3X CONCERTINA WIRE	6x T	Mark one hex border line with a **brown** cube each turn for the next 4x turns; units moving across marked border must halt inside the occupied hex	6	2
ENG	BREACH OR BRIDGE	D	Remove one black cube, one pink, or 2x brown cubes; must have unit within 2x hexes	12	1
FIRES	PRECISION ARTILLERY STRIKE	6x T	Indirect Fires on one hex; Automatic 3:1 CRT odds. Player must have unit within five hexes of strike location.	9	1
FIRES	OBSCURATION	12x T	Mark two adjoining hex borders with **white** cubes; all units cannot engage across borders for this and the next turn. Must have unit within 2x hexes of border	6	1
FIRES	ARTILLERY SUPPORT	D	Shift CRT one column in favor of player during all rolls this turn	12	2
FIRES	FORWARD OBSERVERS	D	Deploy 3x **red** cubes forward; FOs can use Fires enablers on units within a 3-hex radius. FOs cannot be deployed adjacent to enemy units and must be within 4x hexes of a friendly unit. **Red** cubes may maneuver 1x hex per turn	10	1

Source: Created by author.

6.2 External Enabler Cards

Table 12. Internal Enabler Matrix

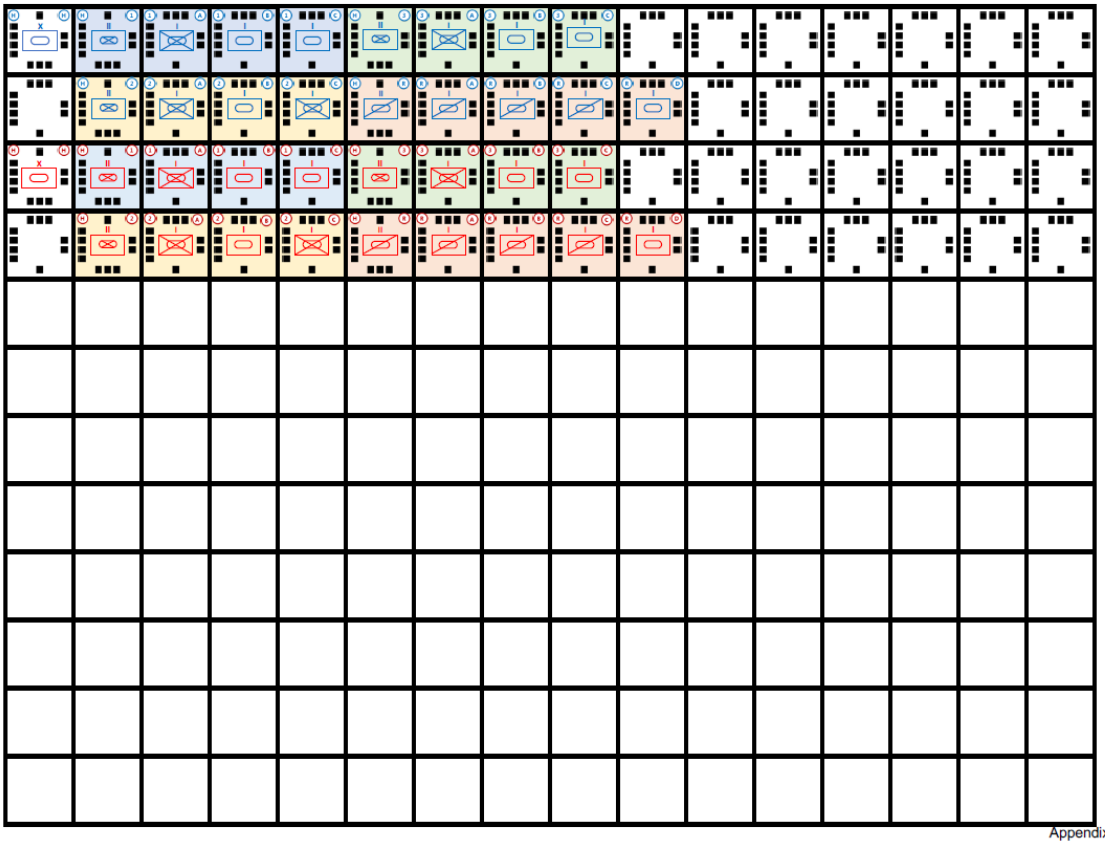
	Title	Return	Description	Cost	Count
S2	GRAY EAGLE	B	Freely inspect up to 3x units in a 3-hex radius; units remain revealed for the next 6x turns	15	1
	INSIDE THE OODA LOOP	B	Select one opponent Objective Card to view; card remains in play	12	1
	TWO BIRDS	B	Double the effectiveness/range of any UAS enabler card played in the next 6x turns	18	1
S3	SOF STRIKE	B	Immediately reduce opponent unit one pip. If unit is in urban area, reduce the unit 2x pips and retreat the unit 2x hexes	10	1
	BATTALION AIR ASSAULT	B	Deploy one **purple** cube forward each turn for up to the next three turns. Reduce one unit one pip per **purple** cube; each cube is worth one pip. **Purple** cubes can occupy the same hex as other cubes or units. Span of control restrictions still apply	12	1
	THUNDER RUN	B	Terrain modifiers do not affect unit movement for this turn; Impassable terrain remains impassable	18	1
S4	RECONSTITUTION	B	Bring 1x unit back into play each turn for the next 5x turns; all reconstituted units begin movement from edge of gameboard. Span of control restrictions do not apply for the next 3x turns	18	1
	ADDITIONAL GHOST UNIT	B	Player adds additional Ghost Unit into play; Ghost unit may be placed adjacent to a friendly unit and swap positions	12	1
	MAIN EFFORT	B	Return 3x External Enablers to available deck	20	1
S6	DESYNCHRONIZE	B	Deny opponent play of all Enabler Cards during the next turn	18	1
	COMMS JAMMING	B	Deny opponent the ability to plan future operations during the next turn	18	1

	LOW-LEVEL VOICE INTERCEPT	B	Select two Enabler cards from opponent's planning mat to view	15	1
ENG	ENGINEER BDE SUPPORT	B	Double capabilities of all Internal Engineer Enablers for the next 3x turns	12	1
	VOLCANO	B	Mark one hex with a **orange** cube; any unit occupying or traveling through hex must roll D6 and use 1:3 odds for effect on unit	15	1
	ROAD BLOCK	B	Place a **black** cube along any road; all units must bypass or bridge the road block. Cube must be placed within 5x hexes of a friendly unit	9	1
FIRES	MLRS	B	Indirect fires on all units within a 2-hex radius; use 2:1 CRT for effects on all units within radius	15	1
	SUPPRESSION OF ENEMY AIR	B	Deny enemy use of CAS or any S2 Enabler for the next 4x turns	12	1
	IMMEDIATE COUNTERBATTERY	B	If the opponent uses any IDF in the next 3x turns, roll with CRT odds of 3:1 on furthest enemy unit. If unit is Ghost Unit, remove unit without negative effect on player	15	1

Source: Created by author.

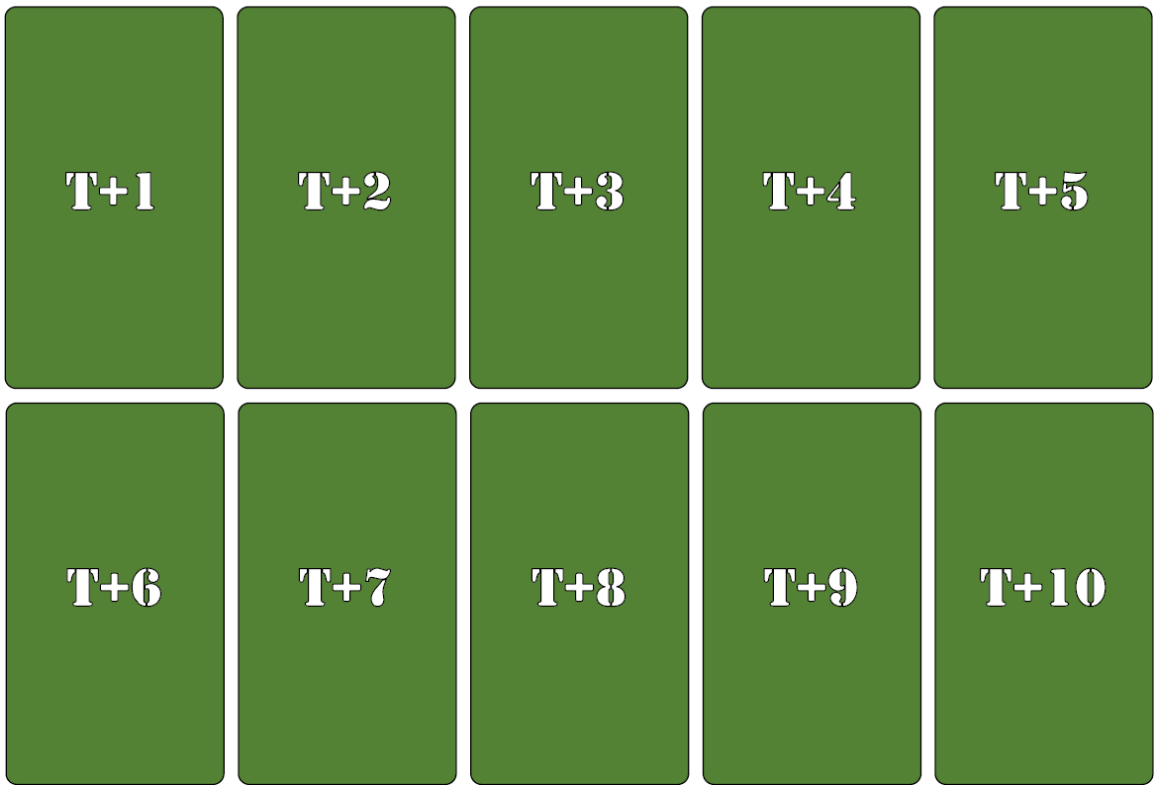
APPENDIX B

GAME PIECES



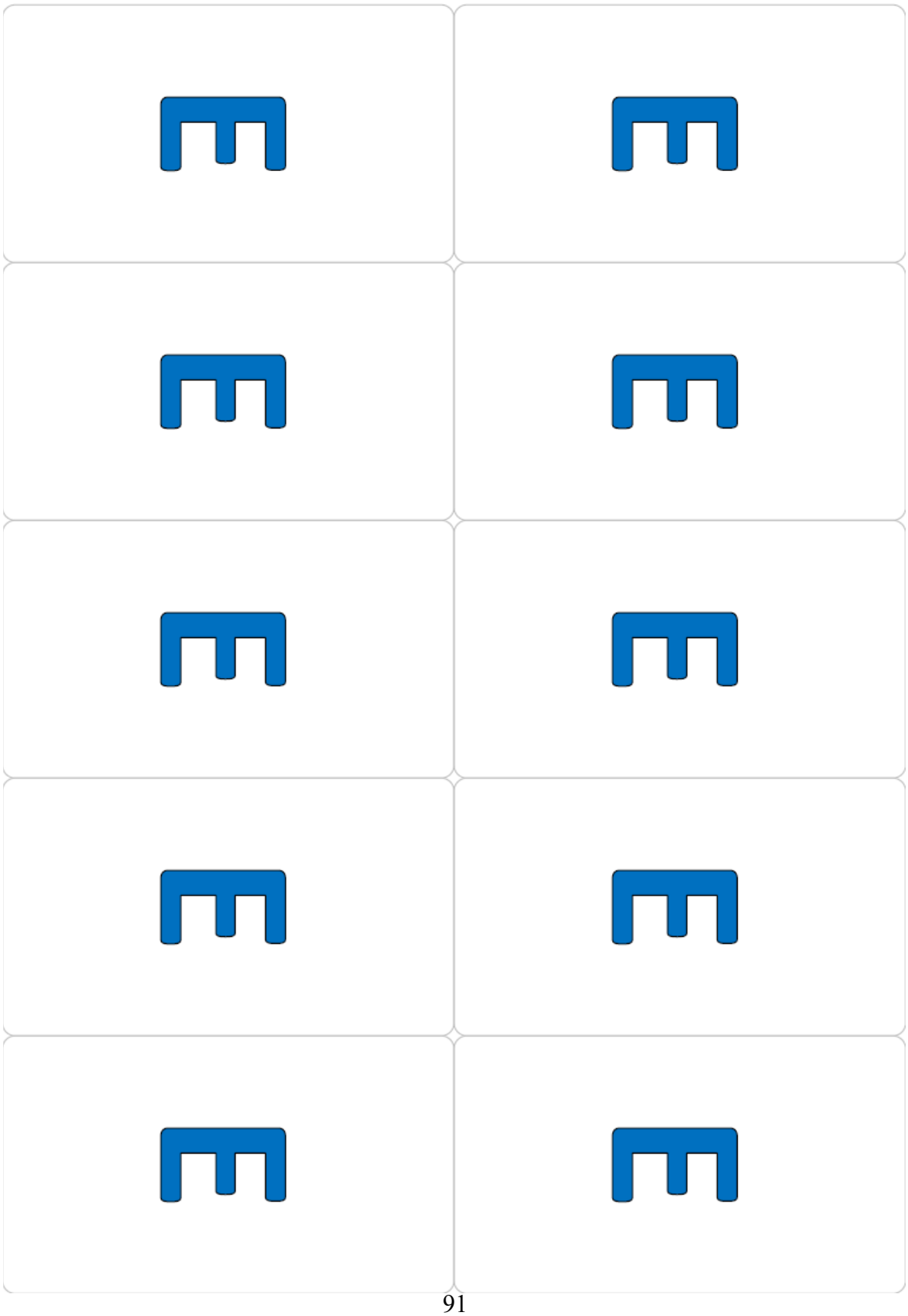
Appendix I

PLANNING TABLE



THE BOX

BATTLE PERIOD					
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	
					T-1
					T-2
					T-3
					T-4
					T-5
					T-6
					T-7
					T-8
					T-9
					T-10
					T-11
					T-12
					T-13
					T-14
					T-15
					T-16
					T-17
					T-18
					T-19
					T-20
					T-21
					T-22
					T-23
					T-24



12 E

ENGINEER BDE SUPPORT

Double capabilities of all Internal Engineer Enablers for the next 3x turns

B

15 E

VOLCANO

*Mark one hex with a **orange** cube; any unit occupying or traveling through hex must roll D6 and use 1:3 odds for effect on unit. Cube must be removed after 4x turns*

B

9 E

ROAD BLOCK

*Place a **black** cube along any road; all units must bypass or bridge the road block. Cube must be placed within 5x hexes of a friendly unit*

B

E

E

15 F

MLRS

Indirect fires on all units within a 2-hex radius; use 2:1 CRT for effects on all units within radius

B

12 F

SUPPRESSION OF ENEMY AIR

Deny opponent use of CAS or any S2 Enabler for the next 4x turns

B

15 F

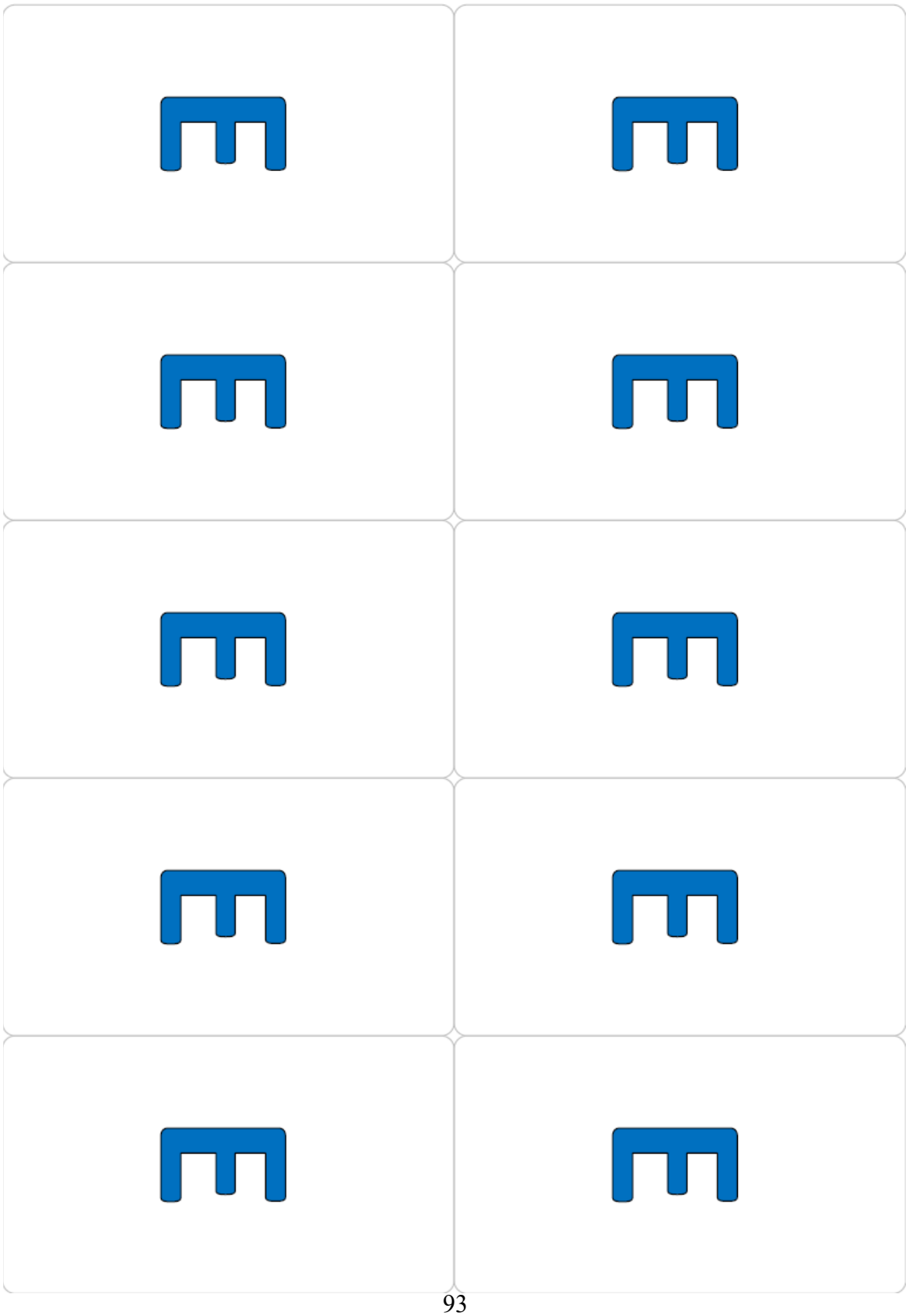
IMMEDIATE COUNTERBATTERY

If the opponent uses any IDF in the next 3x turns, roll with CRT odds of 3:1 on furthest enemy unit. If unit is Ghost Unit, remove unit with zero negative effect on player

B

F

F



10 S-3

SOF STRIKE

Immediately reduce any opponent unit one pip. If the unit is in an urban area, reduce the unit 2x pips and retreat the unit 2x hexes

B

12 S-3

BATTALION AIR ASSAULT

*Deploy one **purple** cube forward each tum for up to the next 3x turns. Reduce one unit one pip per purple cube; each cube has the value of one pip. **Purple** cubes may occupy the same hex as other cubes or units. **Purple** cubes can maneuver 1x hex per turn*

B

18 S-3

THUNDER RUN

Terrain modifiers do not affect unit movement for this turn; Impassable terrain remains impassable.

B

S-3

S-3

15 S-2

GRAY EAGLE

Freely inspect up to 3x units in a 3-hex radius; units remain revealed for the next 6x turns

B

12 S-2

INSIDE THE OODA LOOP

Select one opponent Objective Card to view; card remains in play

B

18 S-2

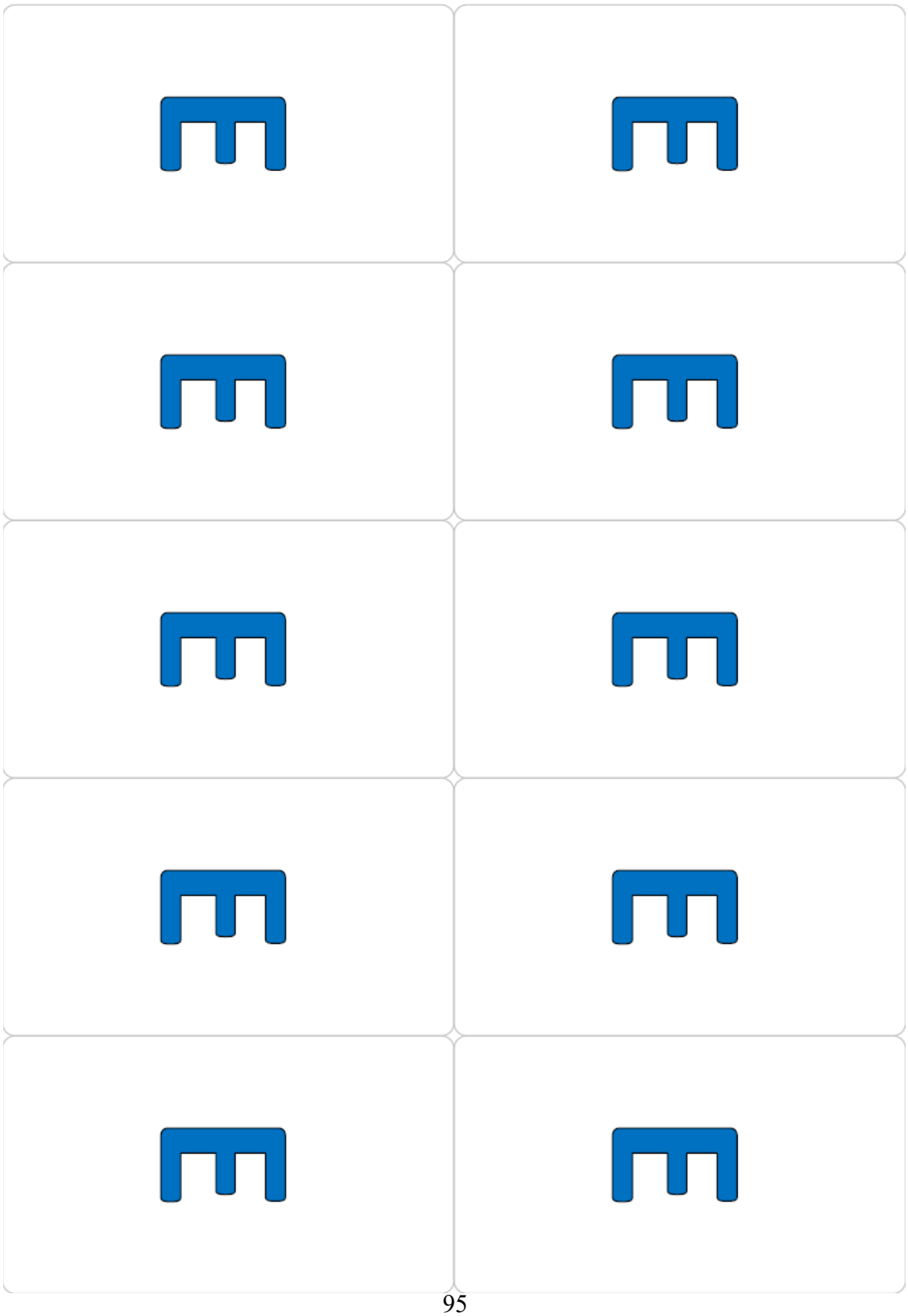
TWO BIRDS

Double the effectiveness/range of any UAS enabler card played in the next 6x turns

B

S-2

S-2



18 S-4

RECONSTITUTION

Bring 1x unit back into play every turn for the next 5x turns; all reconstituted units begin movement from edge of gameboard. Span of control restrictions do not apply for these units for the next 3x turns

B

12 S-4

ADDITIONAL GHOST UNIT

Player adds additional Ghost Unit into play; Ghost Unit may be placed adjacent to a friendly unit and swap positions

B

20 S-4

MAIN EFFORT

Return 3x External Enabler cards to deck immediately

B

S-4

S-4

18 S-6

DESYNCHRONIZE

Deny opponent play of all Enabler Cards during the next turn

B

18 S-6

COMMS JAMMING

Deny opponent the ability to plan future operations during the next turn

B

15 S-6

LOW-LEVEL VOICE INTERCEPT

Select two Enabler Cards from opponent's planning mat to view

B

S-6

S-6

E	E
E	E
E	E
E	E
E	E

12 E

ENGINEER BDE SUPPORT

Double capabilities of all Internal Engineer Enablers for the next 3x turns

B

15 E

VOLCANO

*Mark one hex with a **orange** cube; any unit occupying or traveling through hex must roll D6 and use 1:3 odds for effect on unit. Cube must be removed after 4x turns*

B

9 E

ROAD BLOCK

*Place a **black** cube along any road; all units must bypass or bridge the road block. Cube must be placed within 5x hexes of a friendly unit*

B

E

E

15 F

MLRS

Indirect fires on all units within a 2-hex radius; use 2:1 CRT for effects on all units within radius

B

12 F

SUPPRESSION OF ENEMY AIR

Deny opponent use of CAS or any S2 Enabler for the next 4x turns

B

15 F

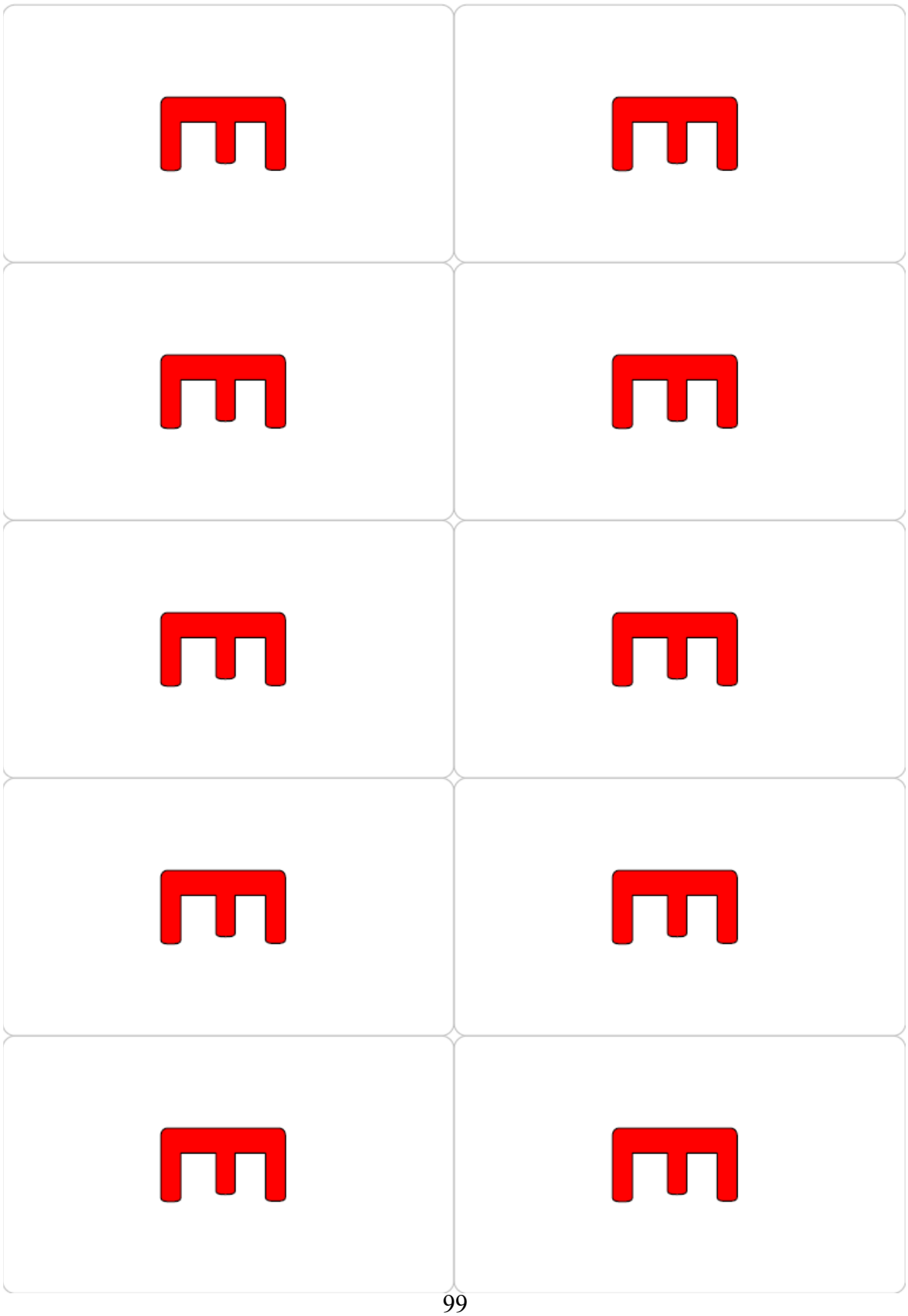
IMMEDIATE COUNTERBATTERY

If the opponent uses any IDF in the next 3x turns, roll with CRT odds of 3:1 on furthest enemy unit. If unit is Ghost Unit, remove unit with zero negative effect on player

B

F

F



10 | S-3

SOF STRIKE

Immediately reduce any opponent unit one pip. If the unit is in an urban area, reduce the unit 2x pips and retreat the unit 2x hexes

B

12 | S-3

BATTALION AIR ASSAULT

*Deploy one **purple** cube forward each tum for up to the next 3x turns. Reduce one unit one pip per purple cube; each cube has the value of one pip. **Purple** cubes may occupy the same hex as other cubes or units. **Purple** cubes can maneuver 1x hex per turn*

B

18 | S-3

THUNDER RUN

Terrain modifiers do not affect unit movement for this turn; Impassable terrain remains impassable.

B

S-3

S-3

15 | S-2

GRAY EAGLE

Freely inspect up to 3x units in a 3-hex radius; units remain revealed for the next 6x turns

B

12 | S-2

INSIDE THE OODA LOOP

Select one opponent Objective Card to view; card remains in play

B

18 | S-2

TWO BIRDS

Double the effectiveness/range of any UAS enabler card played in the next 6x turns

B

S-2

S-2

E	E
E	E
E	E
E	E
E	E

18 S-4

RECONSTITUTION

Bring 1x unit back into play every turn for the next 5x turns; all reconstituted units begin movement from edge of gameboard. Span of control restrictions do not apply for these units for the next 3x turns

B

12 S-4

ADDITIONAL GHOST UNIT

Player adds additional Ghost Unit into play; Ghost Unit may be placed adjacent to a friendly unit and swap positions

B

20 S-4

MAIN EFFORT

Return 3x External Enabler cards to deck immediately

B

S-4

S-4

18 S-6

DESYNCHRONIZE

Deny opponent play of all Enabler Cards during the next turn

B

18 S-6

COMMS JAMMING

Deny opponent the ability to plan future operations during the next turn

B

15 S-6

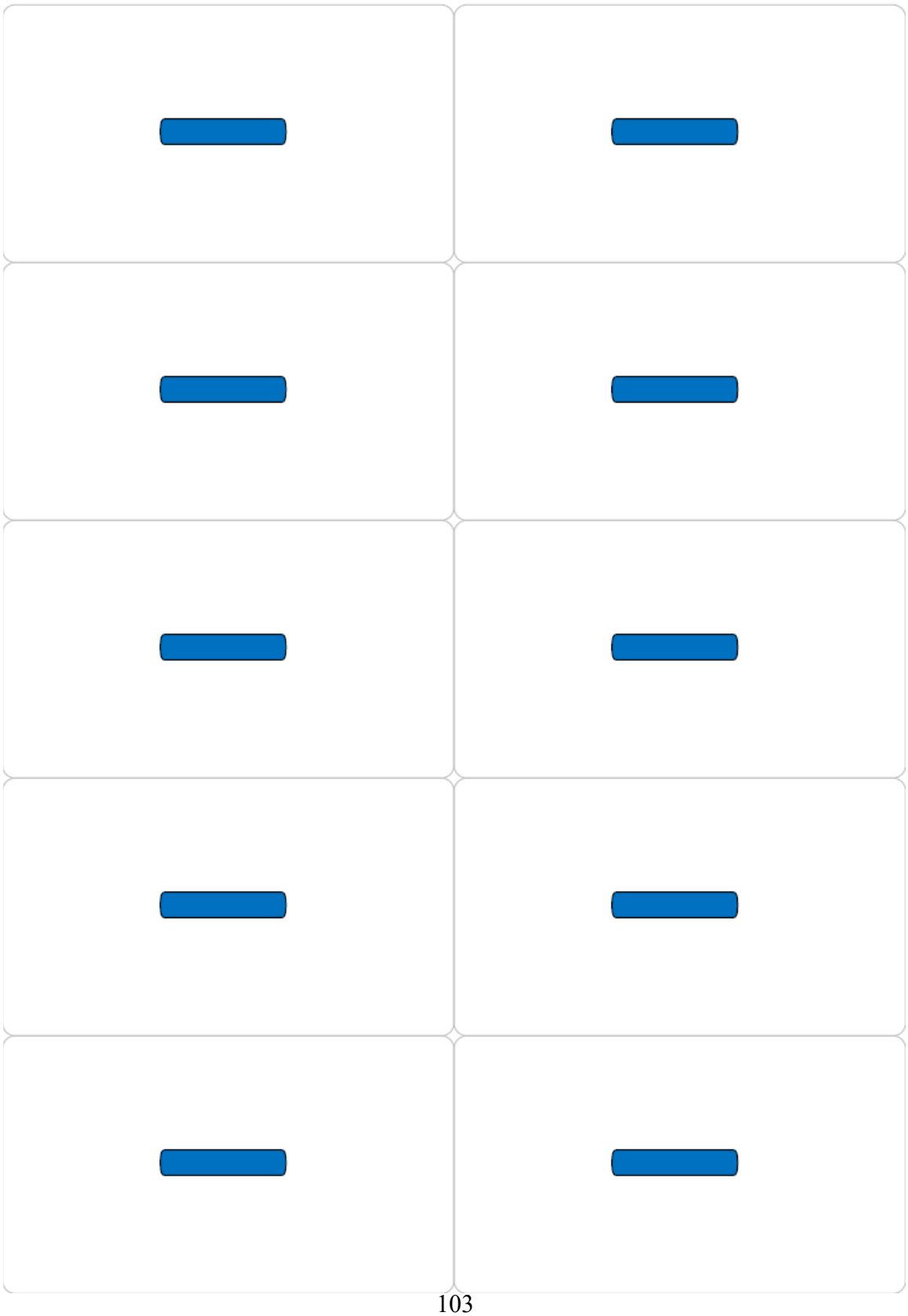
LOW-LEVEL VOICE INTERCEPT

Select two Enabler Cards from opponent's planning mat to view

B

S-6

S-6



9 E

BATTLE POSITIONS

*Mark one unit with a **green** cube every turn for the next 5x turns. Direct fires effects on marked unit(s) reduced one column on CRT. Indirect fires have no effect. Card remains in effect until unit is moved*

12x T

10 E

TANK DITCH

*Mark one hex border line with a **black** cube; units are unable to cross that border*

D

6 E

3x CONCERTINA WIRE

*Mark one hex border line with a **brown** cube each turn for the next 4x turns; units moving across marked border must halt inside of the occupied hex. Must be within 2x hexes of friendly unit*

6x Tx

6 E

3x CONCERTINA WIRE

*Mark one hex border line with a **brown** cube each turn for the next 4x turns; units moving across marked border must halt inside of the occupied hex. Must be within 2x hexes of friendly unit*

6x Tx

12 E

BREACH OR BRIDGE

*Remove one **black,** one **orange**, or 2x **brown** cubes; must have unit within 2x hexes*

D

9 F

PRECISION ARTILLERY STRIKE

Indirect Fires on one hex; Automatic 3:1 CRT odds. Player must have unit within five hexes of strike location

6x T

6 F

OBSCURATION

*Mark 2x adjoining hex borders with **white** cubes; all units cannot engage across borders for this and the next turn. Must have unit within 2x hexes of border*

12x T

12 F

ARTILLERY SUPPORT

Shift CRT one column in favor of player during ALL rolls this turn

D

12 F

ARTILLERY SUPPORT

Shift CRT one column in favor of player during ALL rolls this turn

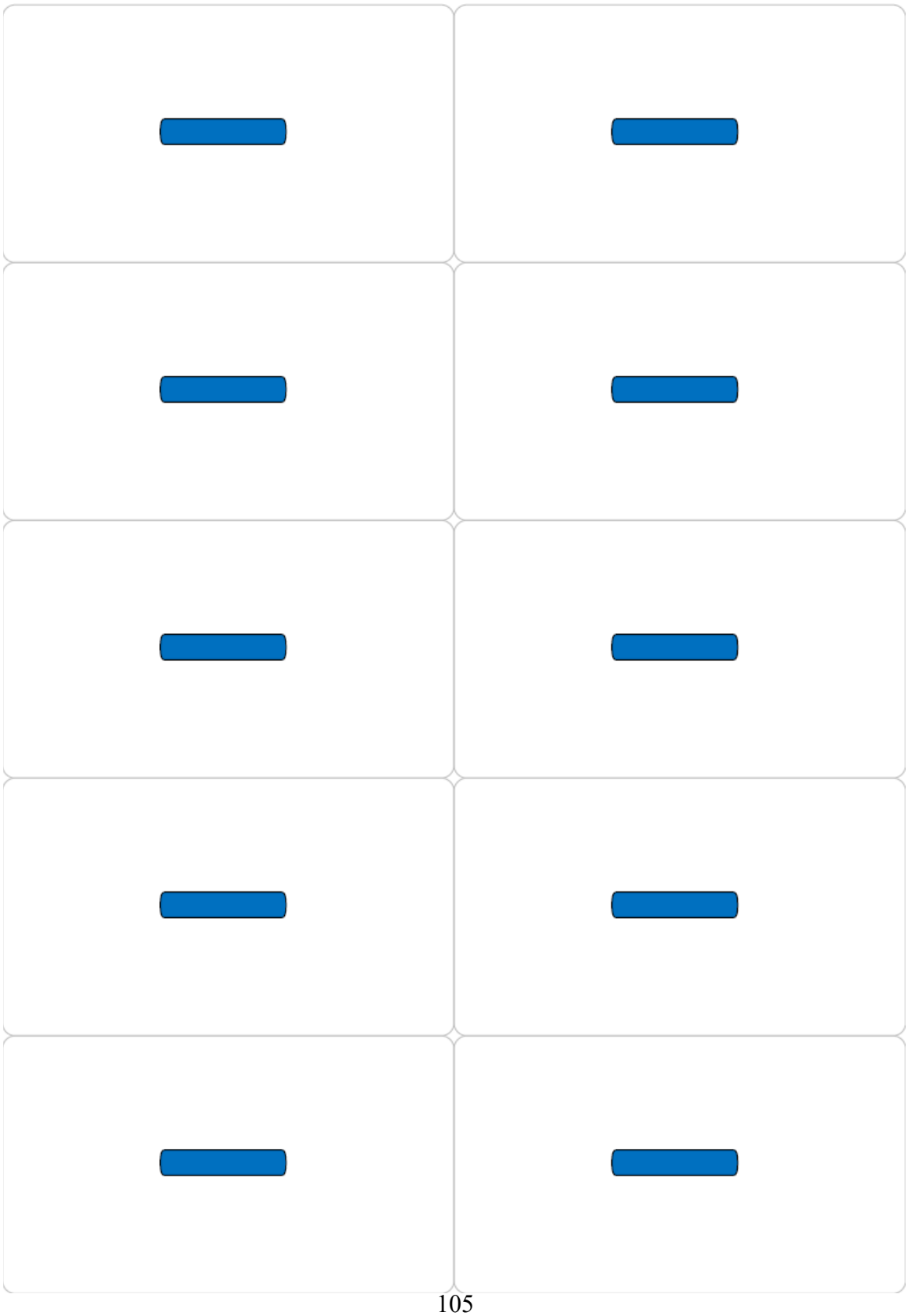
D

10 F

FORWARD OBSERVERS

*Deploy 3x **red** cubes forward; FOs can use any FIRES Enabler (when played) on units within a 3-hex radius. FOs cannot be deployed adjacent to enemy units and must be within 4x hexes of friendly unit. **Red** cubes may maneuver 1x hex per turn*

D



10 | S-3

AUFTRAGSTAKTIK

Each unit in a battalion (including Ghost Units within 7x hexes of BN HQ) may move 15x hexes this turn. Terrain Effects still apply

12x T

9 | S-3

HASTY DEFENSE

Mark all units in a battalion (including Ghost Units within 7x hexes of BN HQ) with blue cubes. Shift CRT in favor of player for all opponent rolls involving these units. Remains in effect until units move

6x T

12 | S-3

CLOSE AIR SUPPORT

Increase CRT odds one column in favor of player for ALL rolls this turn

D

12 | S-3

CLOSE AIR SUPPORT

Increase CRT odds one column in favor of player for ALL rolls this turn

D

6 | S-3

QUICK REACTION FORCE

Move one unit up to 20x hexes this turn; span of control limits do not apply to this unit for the next 6x turns

D

10 | S-2

INTEL UPDATE

Opponent removes one of their Ghost Units from the gameboard

12x T

6 | S-2

LAUNCH SHADOW

Freely inspect one opponent unit; unit remains revealed for the remainder of the day

6x T

12 | S-2

SITTEMP UPDATE

Freely inspect 3x units in a 3-hex radius; units return to hidden status at the end of this turn

D

9 | S-2

OBSERVATION POSTS

*Deploy 3x **yellow** cubes forward; Ops reveal enemy units in a 2-hex radius. Ops cannot be deployed adjacent to enemy units and must be within 4x hexes of a friendly unit. **Yellow** cubes may maneuver 1x hex per turn.*

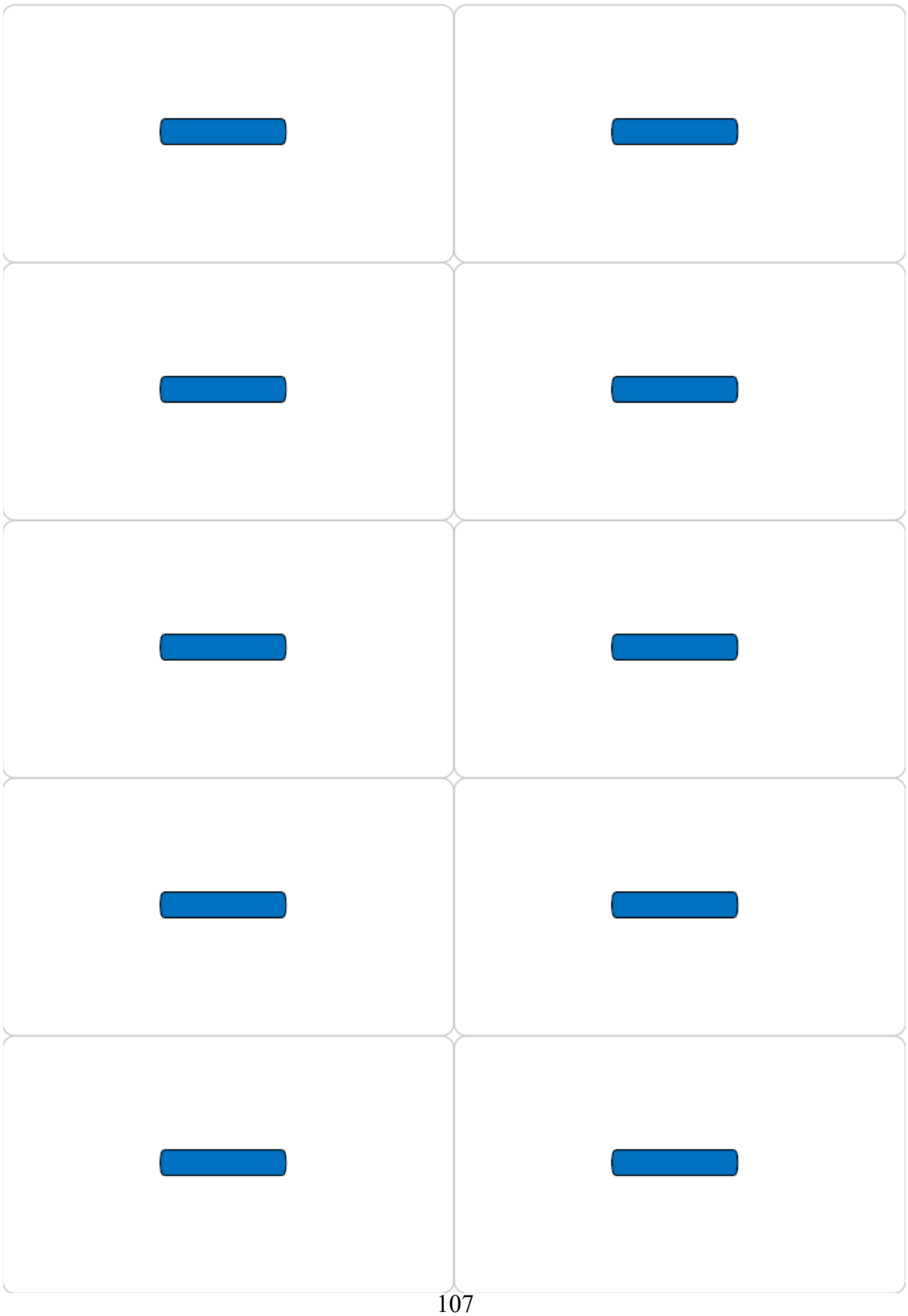
D

9 | S-2

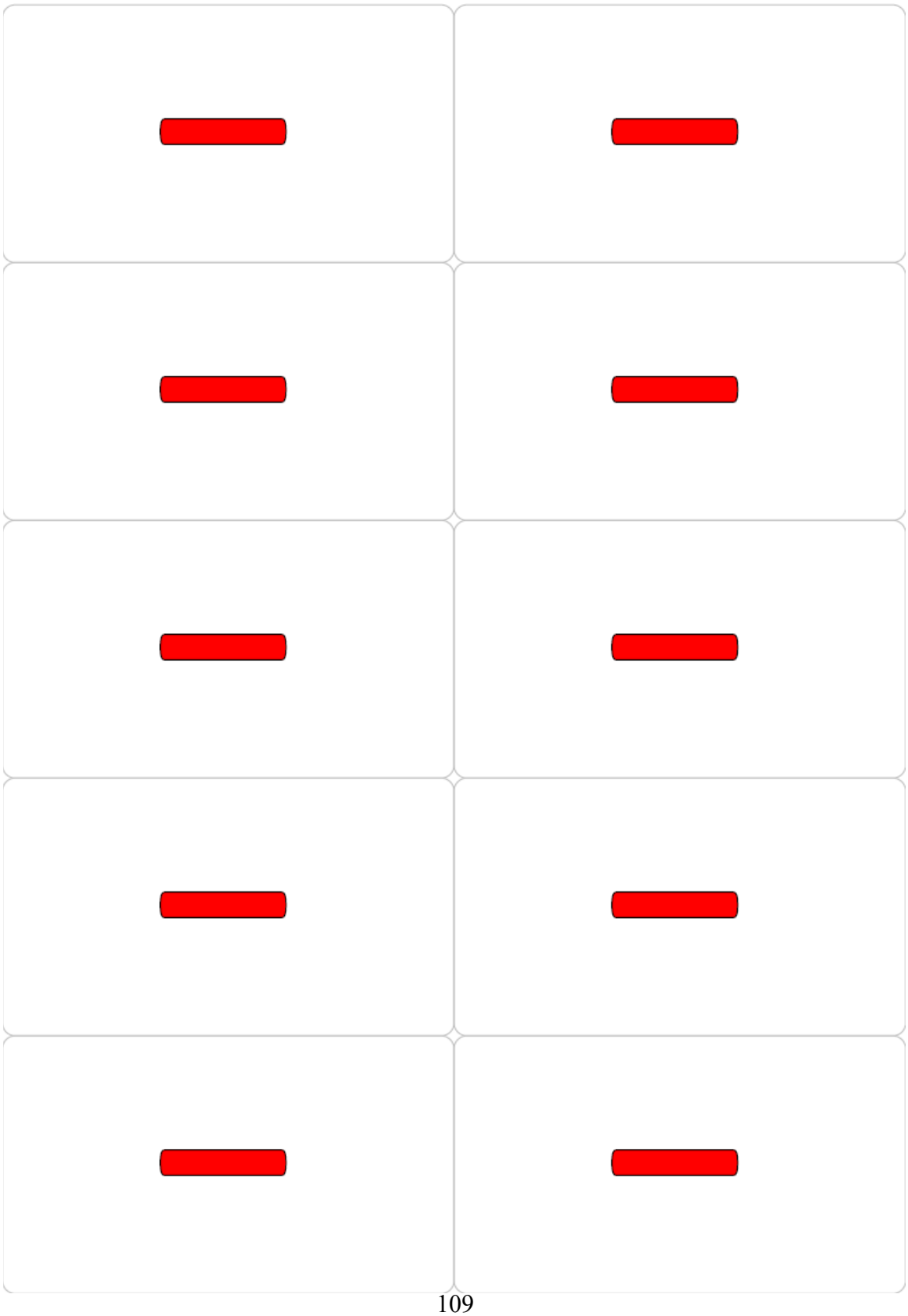
OBSERVATION POSTS

*Deploy 3x **yellow** cubes forward; Ops reveal enemy units in a 2-hex radius. Ops cannot be deployed adjacent to enemy units and must be within 4x hexes of a friendly unit. **Yellow** cubes may maneuver 1x hex per turn.*

D



6	S-4	6	S-4	12	S-4	12	S-4	15	S-4
EMERGENCY RESUPPLY		**CL IV RESUPPLY**		**FIELD MAINTENANCE**		**FIELD MAINTENANCE**		**LOGPAC**	
Increase combat power of one unit by one pip		*Return "BATTLE POSITIONS" or "3x CONCERTINA WIRE" card to deck immediately*		*Increase combat power of a unit one pip each turn for the following 4x turns*		*Increase combat power of a unit one pip each turn for the following 4x turns*		*Effect of "MAINTENANCE" SNAFU Card negated*	
6x T		**12x T**		**D**		**D**		**D**	
6	**S-6**	**6**	**S-6**	**15**	**S-6**	**9**	**S-6**	**12**	**S-6**
MISSION COMMAND		**MISSION COMMAND**		**COMMO UPDATE**		**TENACIOUS FLEXIBILITY**		**SYNC WITH HIGHER**	
Player may draw an additional Action Card each turn for the next 2x turns		*Player may draw an additional Action Card each turn for the next 2x turns*		*Effects of "COMMS LOSS WITH..." SNAFU Card negated*		*Player may switch positions of any cards on T+4 or sooner on the planning map. Can switch all four positions*		*Enabler one External Enabler to be planned as Internal Enabler Card (at T+2) during this turn*	
6x T		**6x T**		**D**		**D**		**12x T**	



9 E

BATTLE POSITIONS

*Mark one unit with a **green** cube every turn for the next 5x turns. Direct fires effects on marked unit(s) reduced one column on CRT. Indirect fires have no effect. Card remains in effect until unit is moved*

12x T

10 E

TANK DITCH

*Mark one hex border line with a **black** cube; units are unable to cross that border*

D

6 E

3x CONCERTINA WIRE

*Mark one hex border line with a **brown** cube each turn for the next 4x turns; units moving across marked border must halt inside of the occupied hex. Must be within 2x hexes of friendly unit*

6x Tx

6 E

3x CONCERTINA WIRE

*Mark one hex border line with a **brown** cube each turn for the next 4x turns; units moving across marked border must halt inside of the occupied hex. Must be within 2x hexes of friendly unit*

6x Tx

12 E

BREACH OR BRIDGE

*Remove one **black,** one **orange**, or 2x **brown** cubes; must have unit within 2x hexes*

D

9 F

PRECISION ARTILLERY STRIKE

Indirect Fires on one hex; Automatic 3:1 CRT odds. Player must have unit within five hexes of strike location

6x T

6 F

OBSCURATION

*Mark 2x adjoining hex borders with **white** cubes; all units cannot engage across borders for this and the next turn. Must have unit within 2x hexes of border*

12x T

12 F

ARTILLERY SUPPORT

Shift CRT one column in favor of player during ALL rolls this turn

D

12 F

ARTILLERY SUPPORT

Shift CRT one column in favor of player during ALL rolls this turn

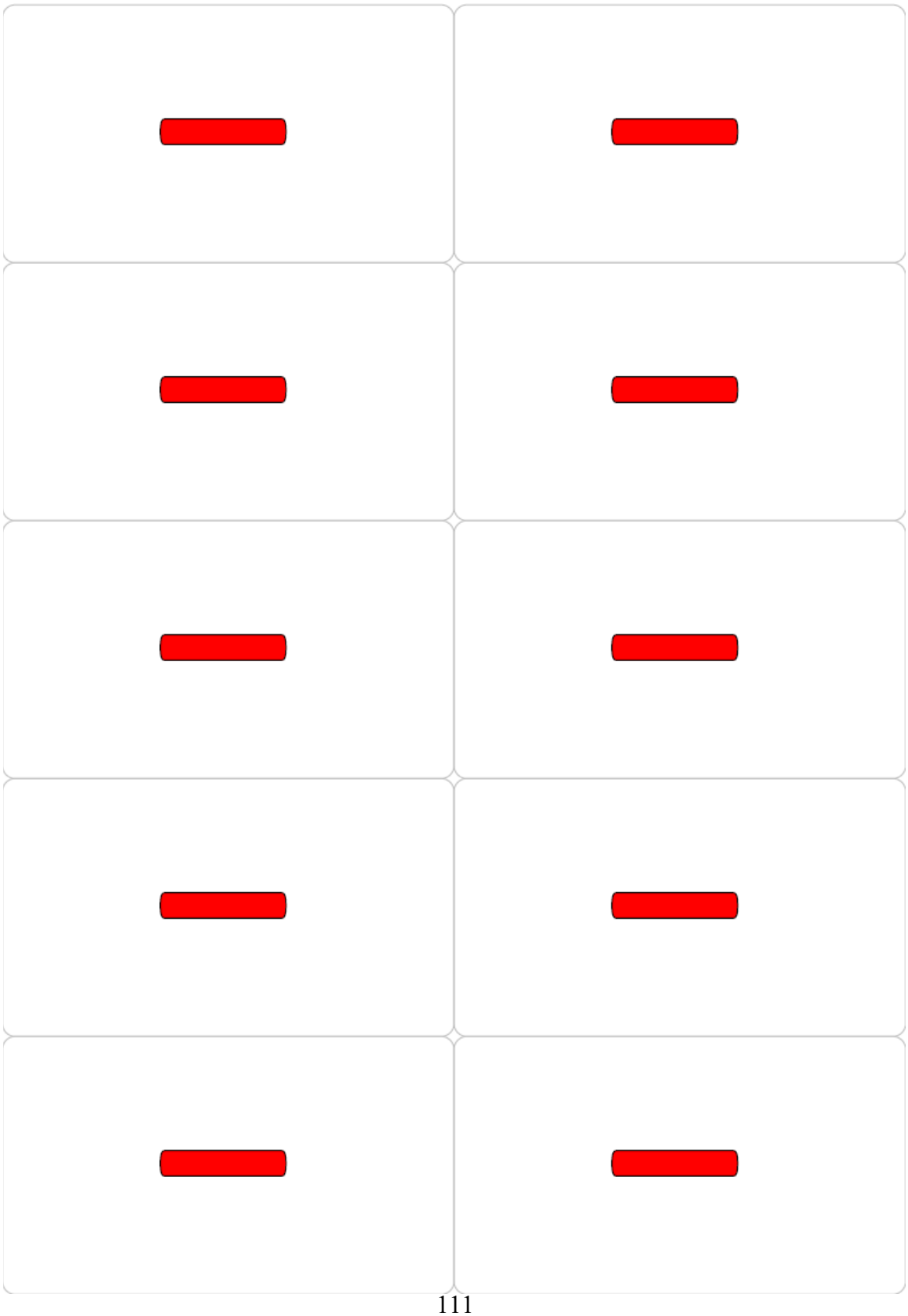
D

10 F

FORWARD OBSERVERS

*Deploy 3x **red** cubes forward; FOs can use any FIRES Enabler (when played) on units within a 3-hex radius. FOs cannot be deployed adjacent to enemy units and must be within 4x hexes of friendly unit. **Red** cubes may maneuver 1x hex per turn*

D



10 | S-3

AUFTRAGSTAKTIK

Each unit in a battalion (including Ghost Units within 7x hexes of BN HQ) may move 15x hexes this turn. Terrain Effects still apply

12x T

9 | S-3

HASTY DEFENSE

Mark all units in a battalion (including Ghost Units within 7x hexes of BN HQ) with blue cubes. Shift CRT in favor of player for all opponent rolls involving these units. Remains in effect until units move

6x T

12 | S-3

CLOSE AIR SUPPORT

Increase CRT odds one column in favor of player for ALL rolls this turn

D

12 | S-3

CLOSE AIR SUPPORT

Increase CRT odds one column in favor of player for ALL rolls this turn

D

6 | S-3

QUICK REACTION FORCE

Move one unit up to 20x hexes this turn; span of control limits do not apply to this unit for the next 6x turns

D

10 | S-2

INTEL UPDATE

Opponent removes one of their Ghost Units from the gameboard

12x T

6 | S-2

LAUNCH SHADOW

Freely inspect one opponent unit; unit remains revealed for the remainder of the day

6x T

12 | S-2

SITTEMP UPDATE

Freely inspect 3x units in a 3-hex radius; units return to hidden status at the end of this turn

D

9 | S-2

OBSERVATION POSTS

*Deploy 3x **yellow** cubes forward; Ops reveal enemy units in a 2-hex radius. Ops cannot be deployed adjacent to enemy units and must be within 4x hexes of a friendly unit. **Yellow** cubes may maneuver 1x hex per turn.*

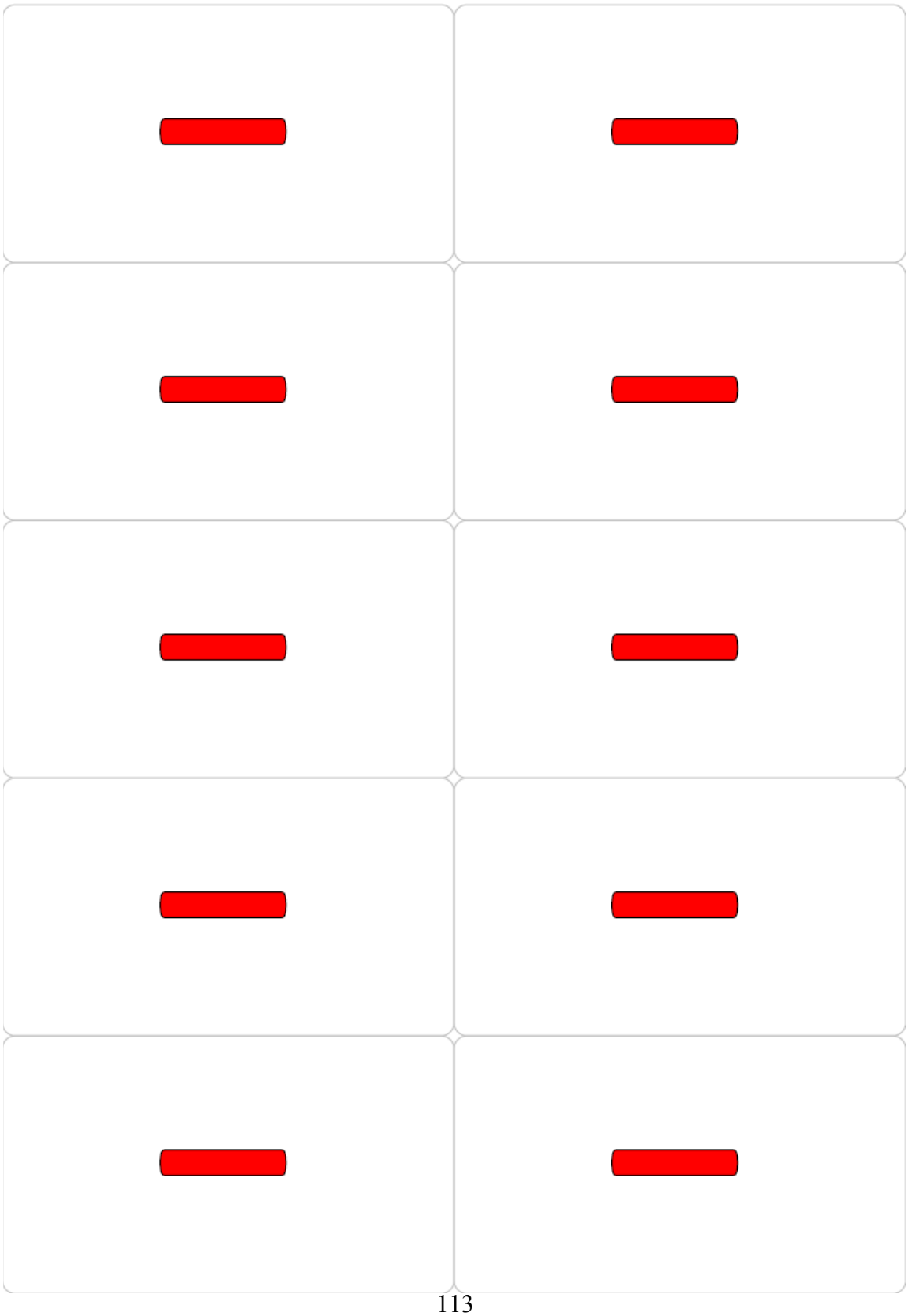
D

9 | S-2

OBSERVATION POSTS

*Deploy 3x **yellow** cubes forward; Ops reveal enemy units in a 2-hex radius. Ops cannot be deployed adjacent to enemy units and must be within 4x hexes of a friendly unit. **Yellow** cubes may maneuver 1x hex per turn.*

D



6 | S-4

EMERGENCY RESUPPLY

Increase combat power of one unit by one pip

6x T

6 | S-4

CL IV RESUPPLY

Return "BATTLE POSITIONS" or "3x CONCERTINA WIRE" card to deck immediately

12x T

12 | S-4

FIELD MAINTENANCE

Increase combat power of a unit one pip each turn for the following 4x turns

D

12 | S-4

FIELD MAINTENANCE

Increase combat power of a unit one pip each turn for the following 4x turns

D

15 | S-4

LOGPAC

Effect of "MAINTENANCE" SNAFU Card negated

D

6 | S-6

MISSION COMMAND

Player may draw an additional Action Card each turn for the next 2x turns

6x T

6 | S-6

MISSION COMMAND

Player may draw an additional Action Card each turn for the next 2x turns

6x T

15 | S-6

COMMO UPDATE

Effects of "COMMS LOSS WITH..." SNAFU Card negated

D

9 | S-6

TENACIOUS FLEXIBILITY

Player may switch positions of any cards on T+4 or sooner on the planning map. Can switch all four positions

D

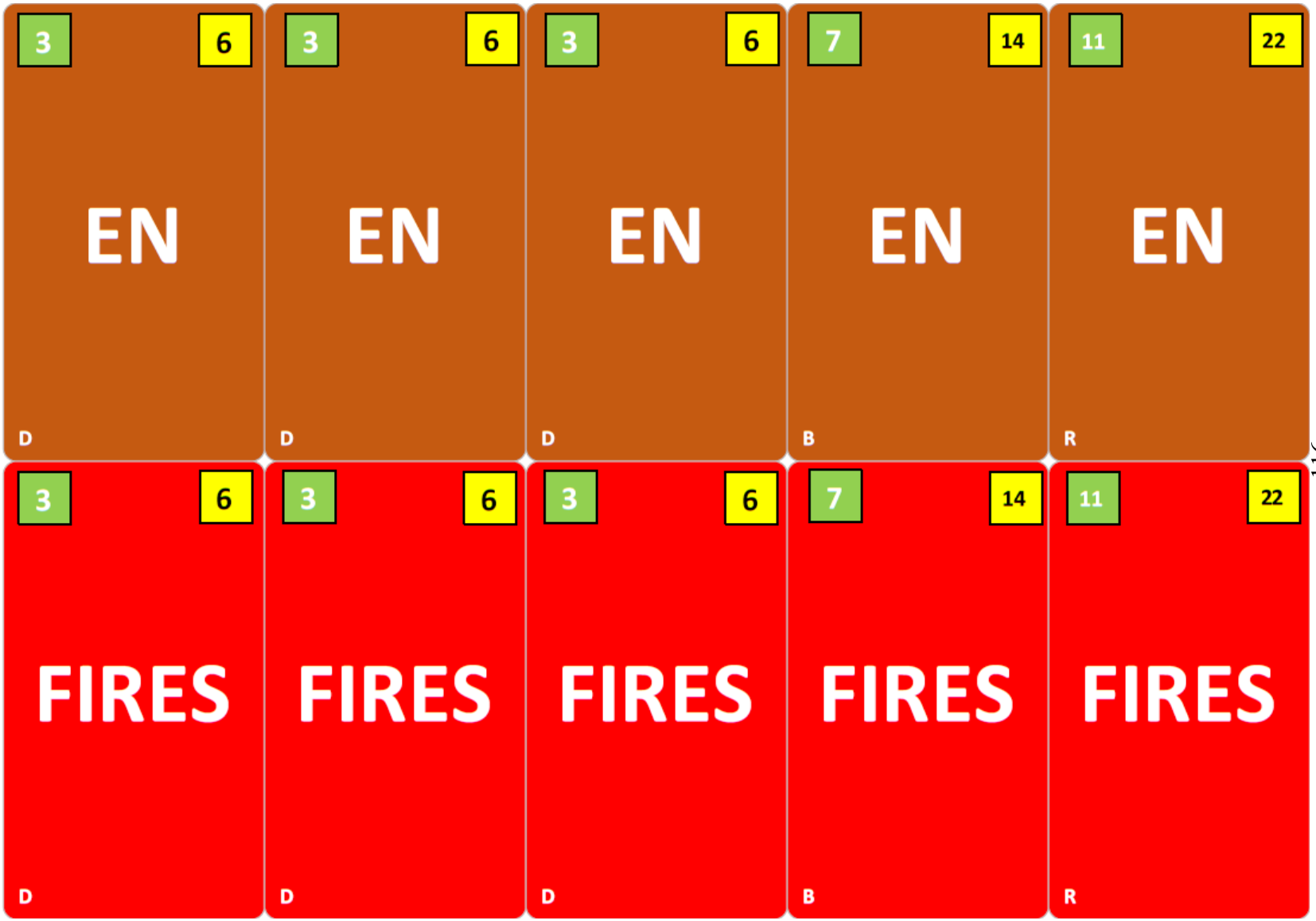
12 | S-6

SYNC WITH HIGHER

Enabler one External Enabler to be planned as Internal Enabler Card (at T+2) during this turn

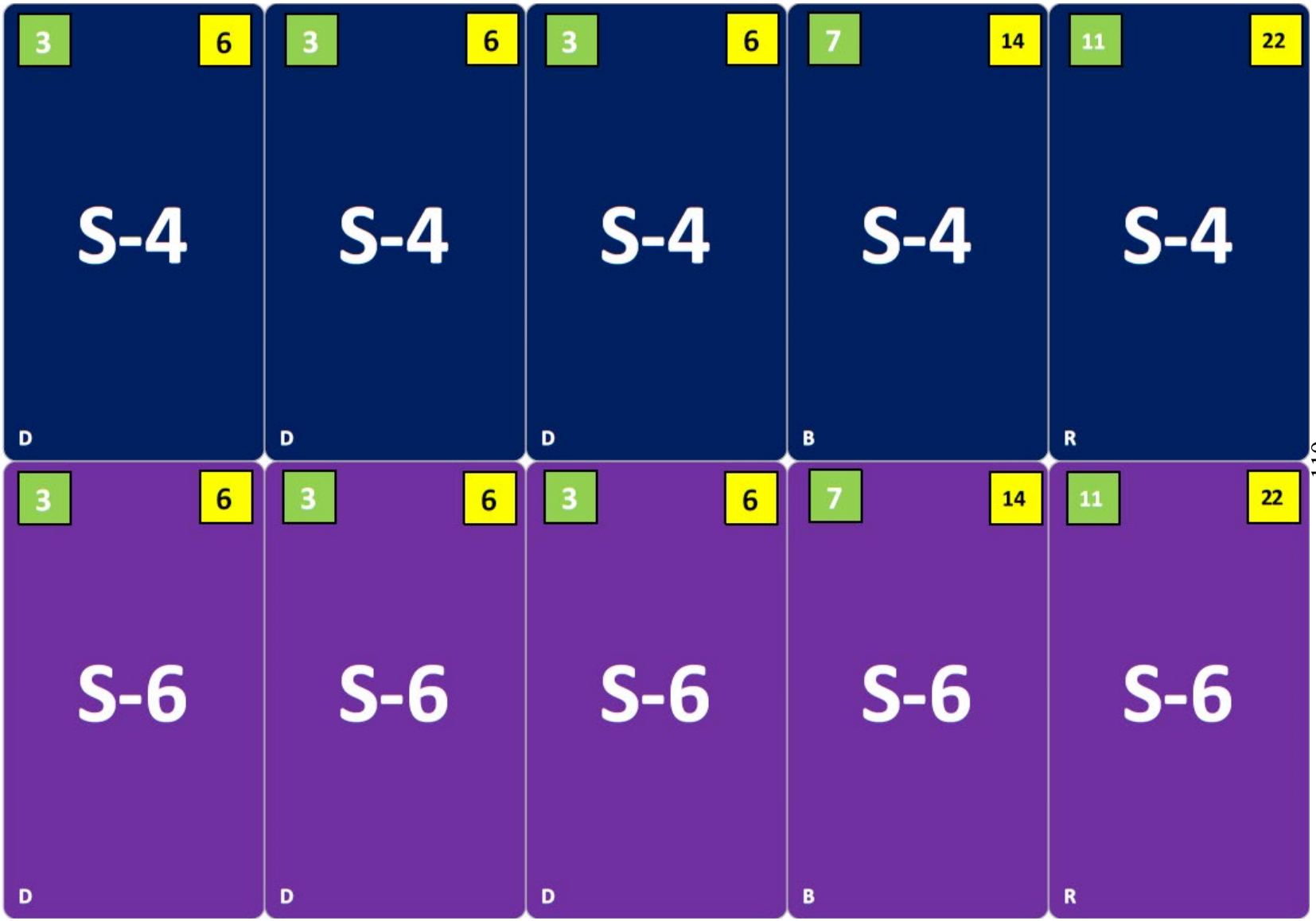
12x T

S	S
S	S
S	S
S	S
S	S


3
6
EN
D
3
6
EN
D
3
6
EN
D
7
14
EN
B
11
22
EN
R
3
6
FIRES
D
3
6
FIRES
D
3
6
FIRES
D
7
14
FIRES
B
11
22
FIRES
R

S	S
S	S
S	S
S	S
S	S


3
6
S-3
D
3
6
S-3
D
3
6
S-3
D
7
14
S-3
B
11
22
S-3
R
3
6
S-2
D
3
6
S-2
D
3
6
S-2
D
7
14
S-2
B
11
22
S-2
R


3
6
S-4
D
3
6
S-4
D
3
6
S-4
D
7
14
S-4
B
11
22
S-4
R
3
6
S-6
D
3
6
S-6
D
3
6
S-6
D
7
14
S-6
B
11
22
S-6
R

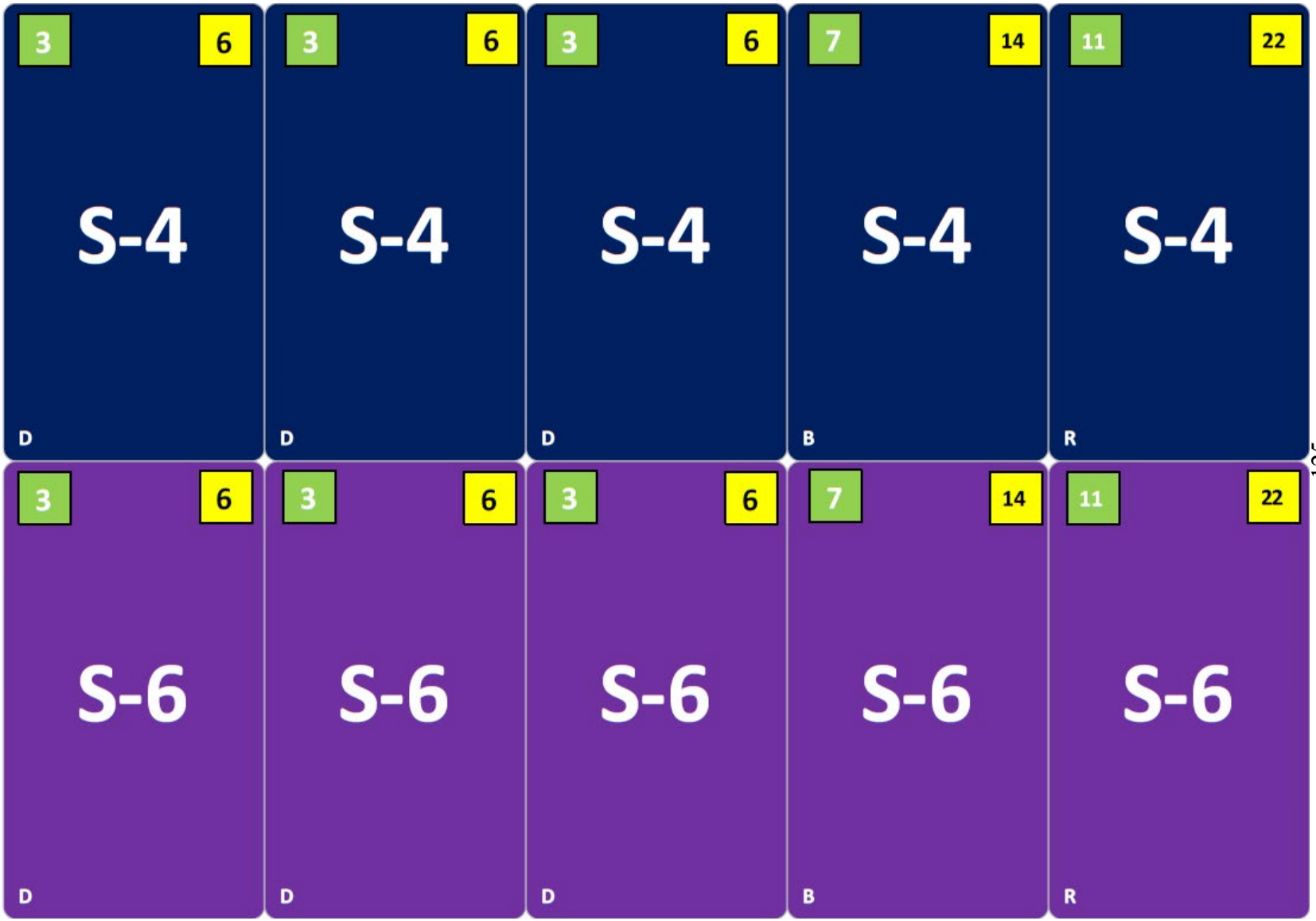
S	S
S	S
S	S
S	S
S	S


3
6
EN
D
3
6
EN
D
3
6
EN
D
7
14
EN
B
11
22
EN
R
3
6
FIRES
D
3
6
FIRES
D
3
6
FIRES
D
7
14
FIRES
B
11
22
FIRES
R

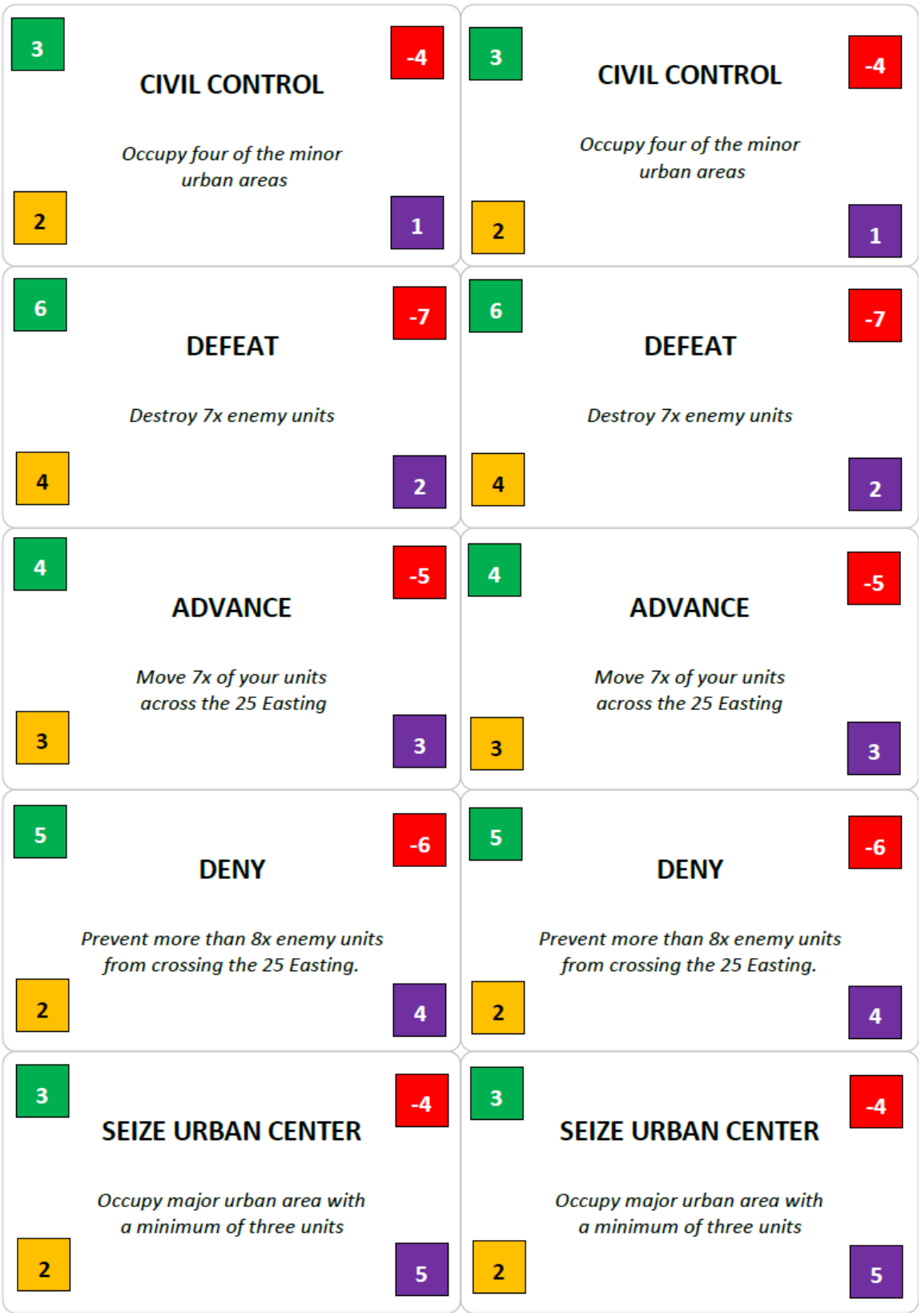
S	S
S	S
S	S
S	S
S	S


3
6
S-3
D
3
6
S-3
D
3
6
S-3
D
7
14
S-3
B
11
22
S-3
R
3
6
S-2
D
3
6
S-2
D
3
6
S-2
D
7
14
S-2
B
11
22
S-2
R

S	S
S	S
S	S
S	S
S	S


3
6
S-4
D
3
6
S-4
D
3
6
S-4
D
7
14
S-4
B
11
22
S-4
R
3
6
S-6
D
3
6
S-6
D
3
6
S-6
D
7
14
S-6
B
11
22
S-6
R

O	O
O	O
O	O
O	O
O	O


3
-4
CIVIL CONTROL
Occupy four of the minor urban areas
2
1
3
-4
CIVIL CONTROL
Occupy four of the minor urban areas
2
1
6
-7
DEFEAT
Destroy 7x enemy units
4
2
6
-7
DEFEAT
Destroy 7x enemy units
4
2
4
-5
ADVANCE
Move 7x of your units across the 25 Easting
3
3
4
-5
ADVANCE
Move 7x of your units across the 25 Easting
3
3
5
-6
DENY
Prevent more than 8x enemy units from crossing the 25 Easting.
2
4
5
-6
DENY
Prevent more than 8x enemy units from crossing the 25 Easting.
2
4
3
-4
SEIZE URBAN CENTER
Occupy major urban area with a minimum of three units
2
5
3
-4
SEIZE URBAN CENTER
Occupy major urban area with a minimum of three units
2
5

O	O
O	O
O	O
O	O
O	O

6 4	**DESTROY TOC** *Destroy the enemy brigade Headquarters or two battalion Headquarters units*	-7 6	
6 4	**DESTROY TOC** *Destroy the enemy brigade Headquarters or two battalion Headquarters units*	-7 6	
3 2	**FIGHTING COMMANDERS** *Defeat an enemy unit with A headquarters unit involved in combat*	-4 7	
3 2	**FIGHTING COMMANDERS** *Defeat an enemy unit with A headquarters unit involved in combat*	-4 7	
4 3	**RETAIN STREGNTH** *Finish this battle period with a minimum of three battalions' combat power*	-5 8	
4 3	**RETAIN STREGNTH** *Finish this battle period with a minimum of three battalions' combat power*	-5 8	
3 2	**SCOUTS OUT!** *Identify five enemy units using Scout Observation Posts*	-4 9	
3 2	**SCOUTS OUT!** *Identify five enemy units using Scout Observation Posts*	-4 9	
5 3	**MSR CONTROL** *Secure three road intersections at the end of this battle period*	-6 10	
5 3	**MSR CONTROL** *Secure three road intersections at the end of this battle period*	-6 10	

BIBLIOGRAPHY

Literature

Dunnigan, James F. *The Complete Wargames Handbook: How to Play, Design, & Find Them*. Rev. ed. New York: William Morrow and Company, Inc., 1992.

Harrigan, Pat, and Matthew G. Kirschenbaum, eds. *Zones of Control: Perspectives on Wargaming*. Cambridge: MIT Press. 2016.

Koster, Ralph. *A Theory of Fun for Game Design*. Sebastopol: O'Reilly Media, Inc.. 2014.

Perla, Peter P. *The Art of Wargaming*. Annapolis: The United States Naval Institute, 1990.

Priestly, Rick, and John Lambshead. *Tabletop Wargames: A Designers' & Writers' Handbook*. Barnsley: Pen & Sword Military. 2016.

Sabin, Philip. *Simulating War: Studying Conflict through Simulation Games*. Norfolk: Fakenham Prepress Solutions, 2014.

Thomas, Neil. *One-Hour Wargaming: Practical Tabletop Battles for Those with Limited Time and Space*. Croydon: Pen & Sword. 2016.

Van Creveld, Martin. *Wargames: From Gladiators to Gigabytes*. New York: Cambridge University Press, 2013.

United States Army Documents

Headquarters, Department of the Army. Army Doctrine Publication 6-22, *Army Leadership*. Washington, DC: Government Printing Office, August 2012.

———. Army Doctrine Reference Publication 6-22, *Army Leadership*. Washington, DC: Government Printing Office, August 2012.

———. Army Training Publication 3-90.1, *Armor and Mechanized Infantry Company Team*. Washington, DC: Government Printing Office, 2016.

———. Field Manual 6-0, *Commander and Staff Organization and Operations*. Washington, DC: Government Printing Office, May 2014.

U.S. Army, Center for Army Lessons Learned. *CTC Trends: National Training Center, No. 2-7*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, June 2002.

———. *CTC Trends: FY2016*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, October 2017.

———. *CTC Observations: 1st and 2nd Quarters, FY2015*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, October 2015.

———. *CTC Observations: 3rd and 4th Quarters, FY2015*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, May 2016.

———. *Decisive Action Training Environment at the National Training Center, Volume IV*: *Lessons and Best Practices*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, September 2016.

———. *MDMP: Lessons and Best Practices*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, March 2015.

———. *NTC Trends Compendium, No. 01-11*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, May 2001.

U.S. Army, Combat Studies Institute. *Training for Decisive Action: Stories of Mission Command*. Fort Leavenworth, KS: Combat Studies Institute Press, 2014.

Simulations

Battle for Moscow. 2nd ed. Frank Chadwick. GMT Games, 2009.

Battleship. Clifford Von Wickler. Milton Bradley, 1931.

BCT Command: Kandahar. Michael Anderson, Joseph Miranda, and Brian Train. MCS Group, 2013.

Bulge 20. Joseph Miranda. Victory Point Games, 2009.

Fluvius Bellum. Chris Carnes. Unpublished.

Friedrich. Richard Sivél. Histogame, 2004.

Hexographer. Inkwell Ideas. Accessed 10 October 2017. http://www.hexographer.com/.

Kriegsspiel. Georg Heinrich Leopold Freiherrn von Reisswitz and Georg Heinrich Rudolf Johann Baron von Reiswitz. Johan Hörberg, 1824.

Ticket to Ride. Alan R. Moon. Days of Wonder, 2004.

Triumph & Tragedy. Craig Besinque. GMT Games, 2015.