Intersection of Commercial and Professional DoD Wargaming

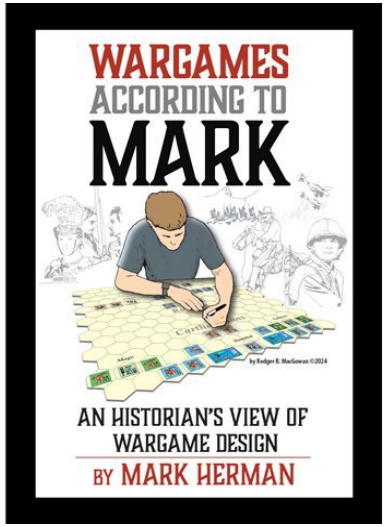
Mark Herman

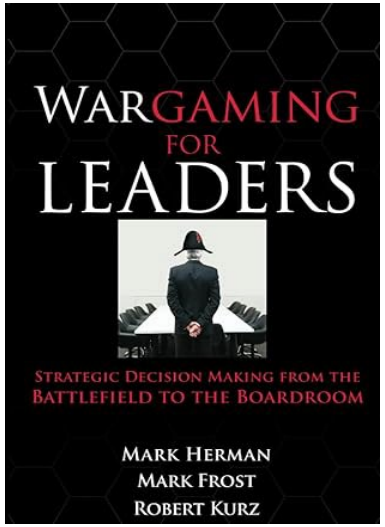
11 September 2025

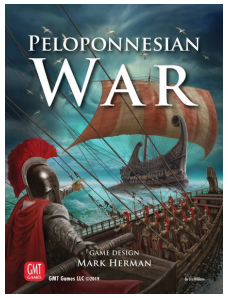
Peter Perla Commemorative Presentation

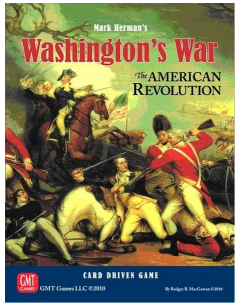
Who Am I?

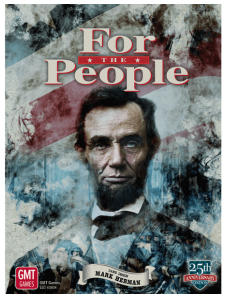
- Professional Historian (current book project: *Civil War Combat and Entropy*)
- Commercial Career from Front Desk to Designer to Head of Victory Games (1980
- Retired Senior Partner at Booz Allen Hamilton Inc.
- Conducted several hundred wargames for OSD and Joint Staff from 1979-2014
- Co-Designed CNA manual wargame: *War in the China Seas (Herman and Perla)*
- Designed and delivered around a hundred corporate strategy exercises/ simulations covering all topics including Pandemic viruses (Wargaming for Leaders, Chapter 14)
- Remain a commercial game designer with ~70+ published designs, majority historical wargames
- About to publish *Defiance: Battle for Kyiv-The Russo-Ukraine War*

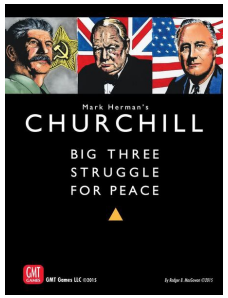


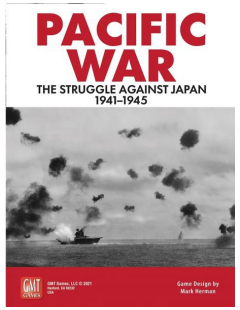


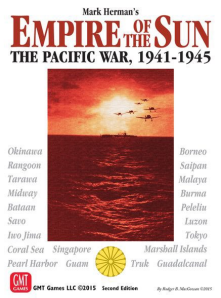


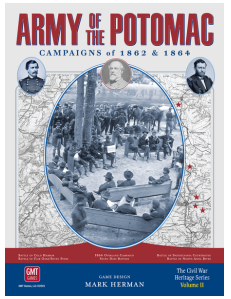












Peck of Pickled Peppers Team Photo

Peter (Team Captain), Zack, Rich, and Myself + some guy holding an Axe

World Boardgaming Championships (WBC)

Annual *Viking Fury* Match

Our Team holds the WBC record for most consecutive **Last** place finishes.

Today's Roadmap

- 3 Bee's: Be Brief, Be Brilliant, Begone (my reach will exceed my grasp)
- When World's Collide: How I have used commercial wargame techniques in professional Pentagon wargames
- Common issues I have seen in 35+ years of Pentagon Wargames
- I will use two analog wargames that fit in the seam of these worlds
  - *War in the China Seas* (Herman/Perla; CNA)
  - *Defiance!* (Herman/ Dockter; GMT Games)
- Both simulations use commercial techniques and open research to examine hypothetical and a current conflict.

Convergent Evolution

Definition: noun; the appearance of apparently similar structures in organisms of different lines of descent

- While Professional DoD wargames can have a similar 'look and feel' to Commercial Wargames I see them through the lens of this convergent evolution metaphor.
- Strategy games and Professional wargames (Prussian Kriegspiel, Lt. Reisweitz, 1812) have different origins, although the latter was certainly influenced by the former.
- First known strategy games (*Royal Game of Ur*; Mesopotamia and *Senet;* Egypt) go back to 2600 and 3100 BC respectively and were intended as Mental Sports/ Entertainment, to this day we are not entirely sure how they were played.
- Chaturanga(Chess, Northern India 550 AD) appears to have been a blend of military theme and strategy game, first Chess image in Persian manuscript 600 AD.
- Prussian *Kriegspiel's* purpose was training for war and while it borrowed the chess grid and other graphic elements from strategy games, its rules emphasized hidden movement, terrain, and chain of command.
  - Peter Perla's *Pratzen* (Austerlitz) tactical design uses *Kriegspiel's* combat tables.

Professional DoD Wargames

- List does not include any form of troop or live fire exercises
- Broad spectrum of designs and intent
  - Budget Planning Exercises (e.g., Build and Use)
  - War Plans Testing (e.g., always classified)
  - Technology Implementation (e.g., DARPA Tactical Technology Office)
  - Interagency Coordination (e.g., Non-Combatant Evacuation)
  - Defense program evaluation (e.g., B2 “Save the Whale”)
  - Staff Training (e.g., DoD Title X responsibilities)
  - BOGSAT: Bunch of Guys Sitting Around a Table (e.g., PATH wargames)
- Common that elements of several types are incorporated in parallel (e.g., DAWMS; Deep Attack Weapons Study)
- *Very common to have both manual and computer elements present*

What are Manual Wargames good for?

"Wargames approximate and illuminate the human dimension of warfare. All else is commentary. " Naval War College Professor

- Wargames offer the ability to observe human behavior within a conflict context.
- Wargames are to Modeling and Simulation (M&S) what Anthropology is to Mathematics.
- If wargames had a patron saint it would be Jane Goodall, not James Clerk Maxwell.
- *An insight is a human participant reaching a first order conclusion based on experiences and information uniquely produced in the wargame.*

Modeling and Simulations (M&S)

All Models are Wrong Some Are Useful

- Initial DoD M&S experience begins with late 50s with missiles (e.g., SIOP Strategic Integrated Operations Plan, USN COBOL Air Defense Software)
- My first computer simulation design team at BDM Corp in 1976
  - General Dupuy (former Head of TRADOC) supplied subject matter expertise
  - Written in Advanced BASIC on a PC that cost $15k
- Early computer wargames 'reach exceeded their grasp' due to faulty implementation and immature technology (e.g., NDU Prudent Stride SAS Manual 1983 vs Computer SAS 1984)
- Early computer wargames were designed by programmers not wargame designers (e.g., RAND RSAS vs SPI SAS Strategic Analysis Simulation)
- Biggest M&S lie ever told: Software will be produced on schedule and within budget.
- Currently every other word in M&S is AI; "I suspect its reach will exceed its grasp"

Canonical DoD Issues I Have Dealt With

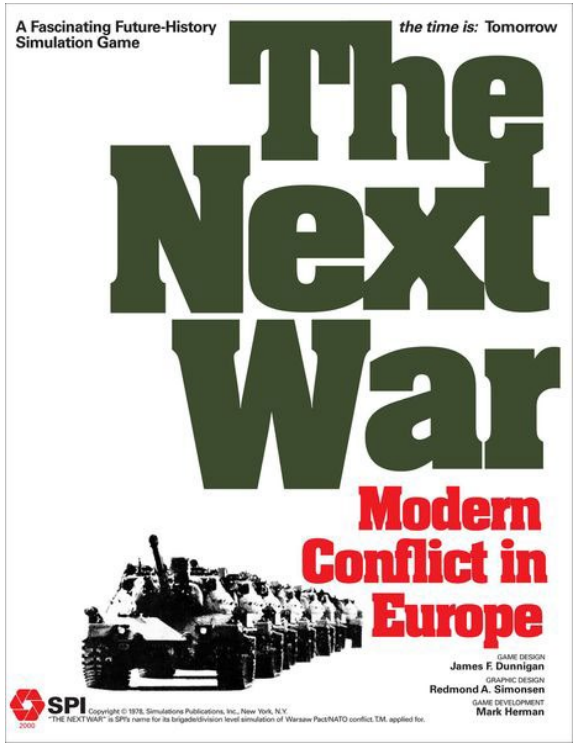
- Misuse of Wargames to answer M&S questions; vice versa
- Defining specific goals and desired outcomes from Wargame
- Computer fixation: Garbage in- Gospel out
- Mismatch between Wargame/ Simulation capabilities and Skill/ interest of Participants
- Communicating results in a compelling manner to Senior decision makers
- Difficulty in presenting unpopular results

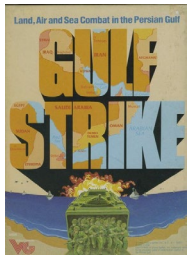
Key Reagan Era Wargame Findings

- **Enduring Deterrence**: Can the US fight and win a nuclear war?
  - US casualties from Nuclear Exchange were 100 M (+/- 10M casualties)
  - Subsequent collapse of all infrastructure and services created another 100M casualties
  - Hard to quantify 'victory'
- **Strategic Defenses** (Star Wars): How much defense would change strategic nuclear calculus?
  - March 23, 1983: Reagan's live to the nation Star Wars speech
  - 15,000 Soviet Warheads; no defense; ~35% required to meet all Soviet strike metrics
  - Defense community developed leakage metric; Damage = 1 minus *Ivory Soap* (99 $_{44/100}$%)
  - Test Game Surprise: Soviet planning impact of 15% defenses changed the nuclear calculus
  - 15k warheads insufficient to meet nuclear calculus; USSR did not know what was defended
  - Wargame series refuted leakage metric; enabled a credible and affordable SDI program
- **Proliferation**: Under what conditions might US Allies become Nuclear powers?
  - 1985; Examined Future Security Environment (US, USSR, EU, PRC, and Japan)
  - Wargame saw collapse of Warsaw Pact and US Budget Surplus in late 1990s (Peace dividend)
  - Japan became a nuclear power when it perceived that the US nuclear umbrella was not available in an embarrassing confrontation with the USSR over Kurile Islands

Commercial Manual Wargames

- Distinction between Historical (e.g., Pacific War) versus Science Fiction (e.g., Star Wars)
- SPI invented Contemporary Wargaming genre (JFD)
- Physical Components, no electricity required
- Computer versions merely emulate the boardgame in software, e.g., *Rebel Fury* on Steam
- Detailed rules that regulate play that usually run 20 pages but on occasion can exceed 100 pages (e.g., The Next War)
- Written rules create visible grammatical ‘bugs’ whereas code ’bugs’ often remain undiscovered (e.g., Thunder c3i algorithms)
- Simulation is physically manipulated by the player, no black box effect





Gulf War: 1990-91

Analog versus Computer

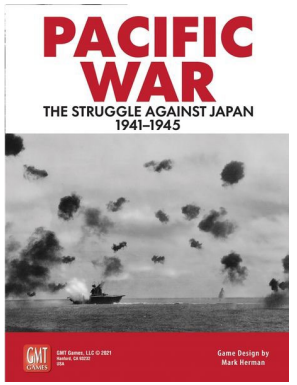
- 2nd August 1990, as the Iraqi invasion of Kuwait was still in progress, I was asked to conduct a 'quick' wargame.
  - Used rapidly modified Gulf Strike (analog version) as simulation for wargame.
  - Three participants: included former Ambassador who personally knew Saddam Hussein.
  - Report was delivered in less than 24 hours, invasion still ongoing
  - Findings laid out US options for responding to Kuwaiti invasion
  - Many elements were incorporated into what became Desert Shield; older F16s vs F15s.
- In early 1991, just prior to Desert Storm the US Army Staff used Gulf Strike to examine the 'left' hook war plan.
  - Wargame resulted in Iraqi surrender within 96 hours with low coalition casualties.
  - This result was orthogonal to official classified computer results
    - *Caused my J8 boss to defend results by using a popular profanity as a noun, verb, and adjective in one sentence.*

War in the China Seas: Education

- PRC second largest economy with unknown debt profile
- Gulf War shocked People's War doctrine; per their contemporaneous writings.
- Twenty-five years of R&D and deployment
- Anti-access and Mechanization doctrine
- New Geography (South China Sea) and a Militia Navy (NYT 12/10/23)
- Regional pol-mil projection (South China Sea)
- PRC global alliances
  - Shanghai Cooperation Organization
  - Africa/ South America Economic Investments
  - Belt and Road Initiative
- DPRK proxy, close ties with Russia and Iran

War in the China Seas: Challenges

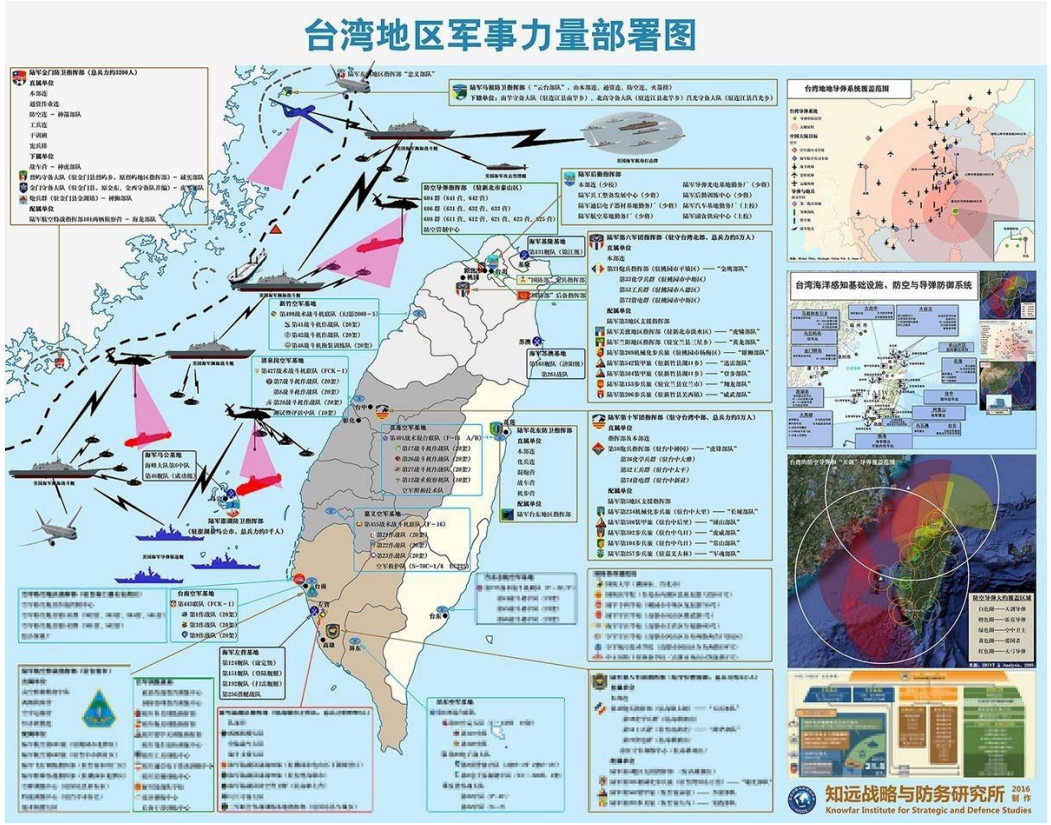
- Purpose was educational, so focused on military challenges of inserting US forces against PRC area denial systems
- Game systems had to be accessible to intelligent, but potentially uninterested participants, used simple 'bag of dice' combat system (probability of hit)
- Basic Game teaches the broad lessons of how integrated PRC sensors, missiles, and defenses operate in a war
- Advanced Game focuses heavily on missile/torpedo expenditure and resupply
- Abstractly included long range support capabilities
  - Cyber
  - Space
  - SOF
- Wargame assumes a long war, so used my earlier *Pacific War's* telescoping time mechanic to allow the war to be fast forwarded in multi-month segments



War in the China Seas: Hypothetical Conflict

- Designed for Military Education (Herman/Perla)
  - CNA Corp: DIM-2018-U-0188395
  - Unclassified; accurate but not precise
- Demonstrate PRC Area Denial Defenses
  - Focused on Naval/Subsurface/Air War
  - Tyranny of Precision Missile logistics
  - If you are seen, you can be engaged
  - Individual Ships with finite load outs
  - Land Combat in-hex FLOT model
  - Mines and other unmanned systems
  - Vulnerability of SLOC and Air Transport
- Based on multiple Pentagon wargames
  - One week does not a war make
  - Challenges of forward resupply (Darwin)
  - Vulnerability of US Regional bases
  - Battle of the Atlantic (Pacific) redux
  - Telescoping Time to enable long war
- Solitaire mode (Senior Experimentation)
  - 'Bot is US invading Spratley Islands
  - Solo player is PRC versus USA AI RoE

PRC Taiwan Wargame?

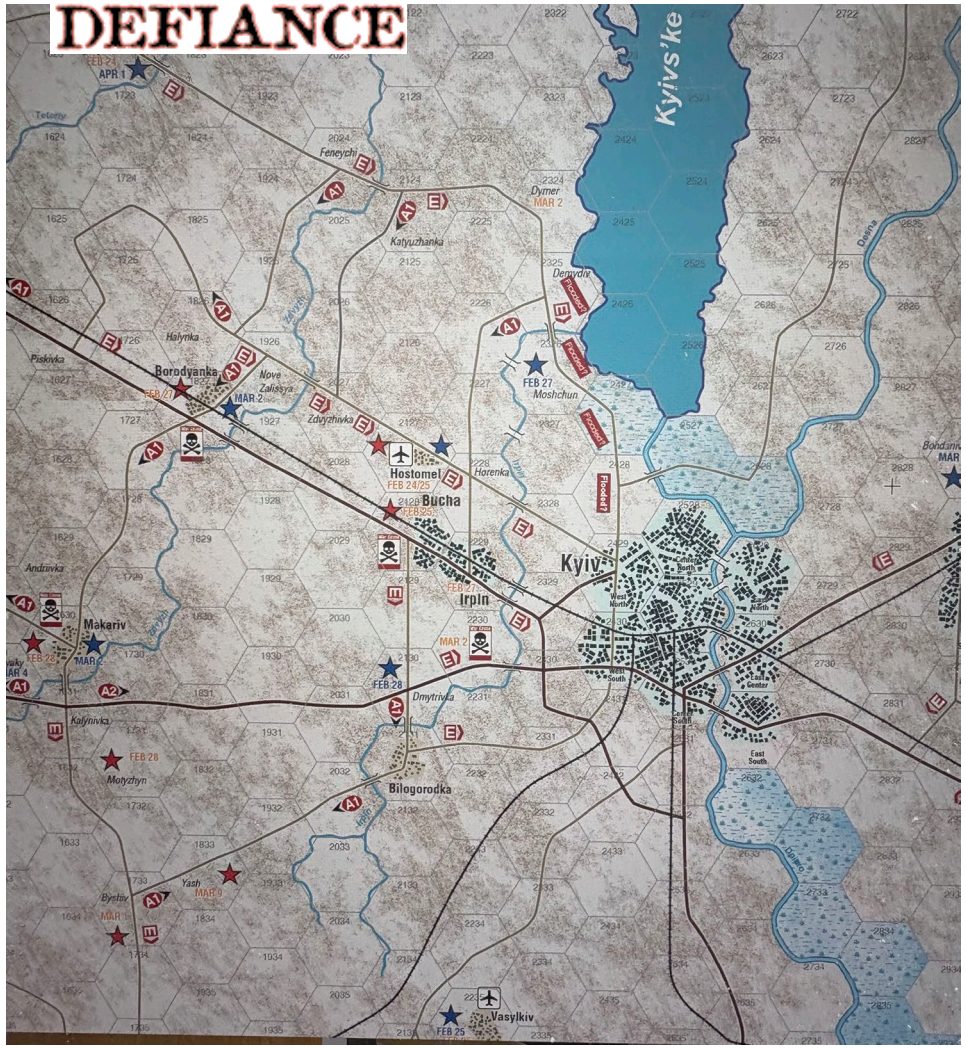


Chinese Dialect in diagram is believed PRC not Taiwan origin

- 1973 Arab Israeli War saw a large number studies on Surprise in War
  - Intelligence is always resident in the system, just unappreciated for what it is or belief that its credible
  - Tactical Surprise is usually achieved and preceded by exercises.
  - Diagram shows some details of how a PRC blockade would operate and has had several reported full scale live exercises.
- In World War II all major invasions were successful.
- PRCs Economic Exclusion Zone is basis for legal Blockade
  - Historical Wargame topics regularly deal with Surprise Attack scenarios (e.g., Pearl Harbor) with special one-time rules.
  - Techniques for breaking a blockade seem important.
  - What systems will best deter and repel PRC invasion forces?
- Based on multiple Pentagon wargames
  - Wargame needs to look beyond initial ‘shoot out’.
  - Precision “at sea” ammunition stocks are a critical variable
  - It's an away game, and the PRC is not stupid and has responses
  - War outcome likely to be determined by industrial strength and political will

Defiance! Second Russo-Ukrainian War 2022

- Attempt to create a 'first draft of history'
- Open-Source Research; accurate but not precise
- Nation State Warfare is alive and well.
  - Networked information systems
  - Industrial scale logistics
  - If you are seen, you can be engaged
  - Empty Battlefield: Armed Drones integrated with long range communications/ lethal fires
  - Manportable systems come of age; armor vulnerability
  - Modern ADA paradigm shift vs air superiority/ Missiles
- What was old is new again
  - History is alive: Nation State Attrition Warfare
  - Quantity still matters: WW1 1914 artillery depleted pre-war stocks
  - 20th Century Warfare alive and well: WW1 trenches,
  - Insufficient ordance production: WW1 1915
  - Stockpiles cause offensives: WW1 1916: Somme, Verdun
  - WWII tactics still work: Defense in depth: Kursk
- Dawn of Robotic Warfare: Drones will integrate with AI
  - Terminator Movies?

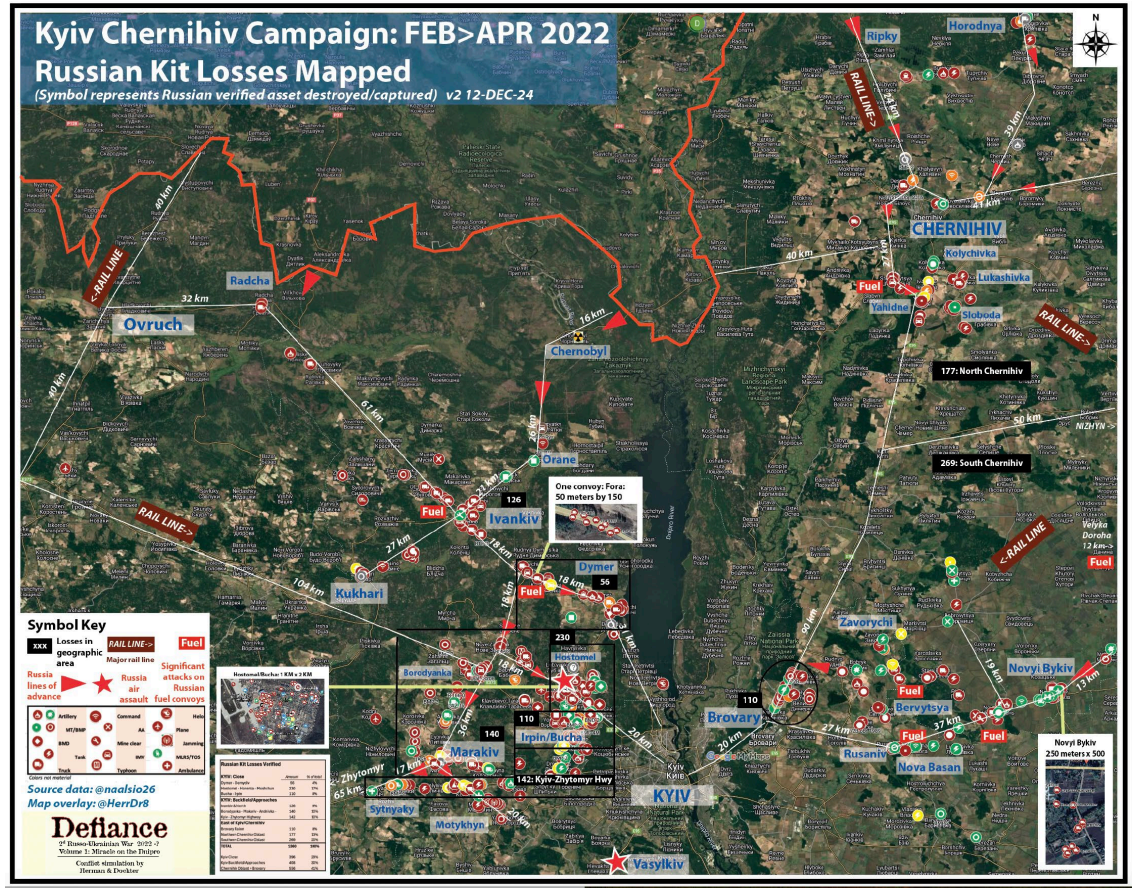


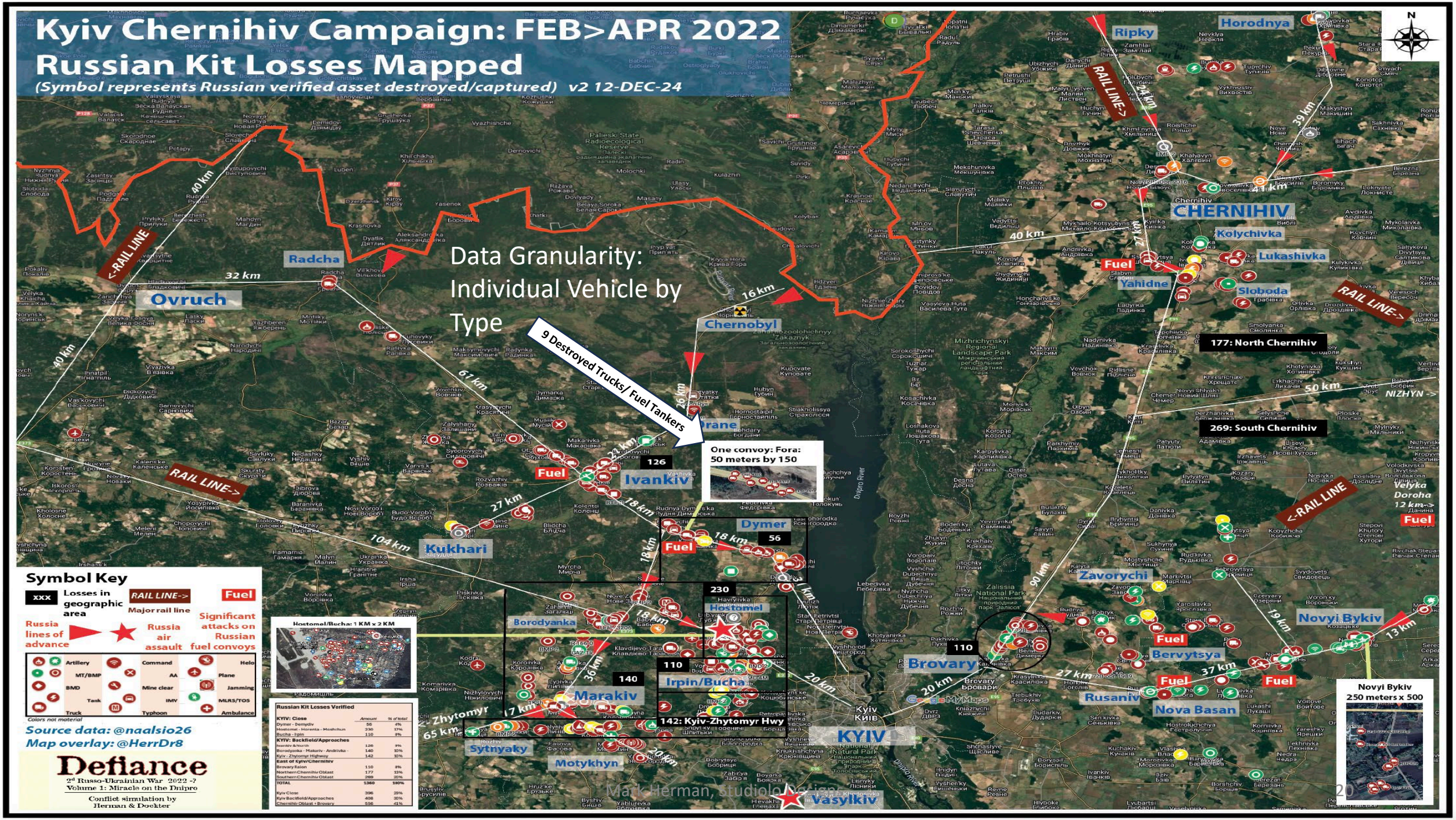
Defiance! Game Systems

- Headquarters activation system
  - Initiative confers who moves first, sometimes second
  - Chaos of Simultaneity: HQ activation via random draw without replacement
  - Map & Time scale: 7km/hex, three day turns
  - Maneuver elements are battalion scale, discrete Army level indirect fire units
  - Combat power measured as a function of strength and morale
  - Morale dominates combat outcomes
  - Combat Support elements integrated into simulation, e.g., bridging, EW, etc.
  - Maneuver allows for movement to contact that if stopped evolves into set piece engagements
  - Small scale tactics can often dominate larger maneuver formations
- Air superiority is broadly nullified by modern ADA systems
- HQ capabilities evolve from February 2022 in future modules: Drones

Information Age Public Data Collection

- Information Age open sources allow for time stamped, geolocation of smart phone battlefield pictures.
- Design team was able to track where and what kind of vehicles were destroyed.
- This information allowed us to both understand when and where the heaviest fighting occurred and the actual path taken by the Russian invasion forces.
- Where the dead vehicles are is where the fighting occurred, akin to various TV show methodologies such as Battlefield Detectives.




Kyiv Chernihiv Campaign: FEB>APR 2022
Russian Kit Losses Mapped
(Symbol represents Russian verified asset destroyed/captured) v2 12-DEC-24
Data Granularity:
Individual Vehicle by
Type
9 Destroyed Trucks/ Fuel Tankers
One convoy: Fora:
50 meters by 150
Symbol Key
xxx Losses in geographic area
RAIL LINE-> Major rail line
Fuel Significant attacks on Russian fuel convoys
Russia lines of advance
Russia air assault
Artillery
MT/BMP
BMD
Tank
Truck
Command
AA
Mine clear
IMV
Typhoon
Helo
Plane
Jamming
MLRS/TOS
Ambulance
Colors not material
Source data: @naalsio26
Map overlay: @HerrDr8
Defiance
2d Russo-Ukrainian War 2022 -?
Volume 1: Miracle on the Dnipro
Conflict simulation by
Herman & Dockter
Hostomel/Bucha: 1 KM x 2 KM
Russian Kit Losses Verified
KYIV: Close
Dymer - Demydiv 56 4%
Hostomel - Horenka - Moshchun 230 17%
Bucha - Irpin 110 8%
KYIV: Backfield/Approaches
Irpin' & North 126 9%
Borodyanka - Makariv - Andrivka 140 10%
Kyiv - Zhytomyr Highway 142 10%
East of Kyiv/Chernihiv
Brovary Raion 110 8%
Northern Chernihiv Oblast 177 13%
Southern Chernihiv Oblast 269 20%
TOTAL 1360 100%
Kyiv Close 396 29%
Kyiv Backfield/Approaches 408 30%
Chernihiv Oblast +Brovary 556 41%
Novyi Bykiv
250 meters x 500
Radcha
Ovruch
Chernobyl
Ivankiv
Kukhari
Dymer
Hostomel
Borodyanka
Irpin/Bucha
Marakiv
Sytniyaky
Motykhyn
Brovary
KYIV
Vasylkiv
Ripky
Horodnya
CHERNIHIV
Kolychivka
Lukashivka
Yahidne
Sloboda
177: North Chernihiv
269: South Chernihiv
Zavorychi
Novyi Bykiv
Bervytsya
Rusaniv
Nova Basan
Velyka Doroha
12 km->
<-RAIL LINE
RAIL LINE->
Fuel
126
56
230
110
140
142: Kyiv-Zhytomyr Hwy
32 km
40 km
61 km
16 km
27 km
104 km
18 km
36 km
65 km
90 km
39 km
50 km
NIZHYN ->
Mark Herman, Studiolo Design
20

Defiance! Information War

- Strategic Tracks that shift due to map conditions and context.
- Strategic Tracks respond to:
  - NATO level of logistic and weapon system support variable that responds to:
    - Political Calculation and evolving war weariness
    - Russian atrocities and nuclear capabilities
    - World Opinion as driven by politics, journalism, and entrenched agendas
  - Russian Support for War
    - Petroleum Politics; Western and Non-Aligned oil purchases
    - Arms market for ordnance and spare parts
    - War weariness and poorly understood domestic pressures
- What is Victory?
  - Kyiv and Army Status: Does not end war just who was advantaged in March 2022
  - Simulation limits conflict to first two months of war
  - Regardless of outcome, future modules will continue examining recent history

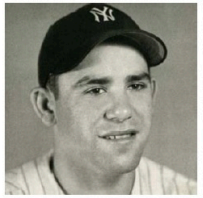
How to deal with new player training?

- Two commercial standards have emerged over the last decade:
  - Video ‘playthrough’ that both show how a game is played while broadly teaching how the game works.
  - Solitaire systems that play one side against the player so training and more importantly strategy/tactics experimentation can occur in private.
- If you do not worry too much about having ‘movie’ quality presentations, most current generation humans know how to do this.
- Solitaire systems, commonly known as ‘Bots can be used for varying purposes:
  - Visualize enemy warplans, *Defiance!* Yogi example
  - Teach Strategy, *Erasumus*, *Empire of the Sun* example

VII. Solo Play

20. The Russian Bot: YOGI

"When you come to a fork in the road; take it!"
-Yogi Berra –



Design Note: Solitaire systems attempt to be an opponent, an experience, a training tool, strategist, or filling out the roster in a multi-player game. It is rare that any solitaire mechanism can do all equally well but that is not a problem, just a feature of physical paper systems. YOGI is none of the above. YOGI is designed to do one thing, illustrate and implement how the Russian invasion forces attempted to capture the Ukrainian capital of Kyiv.

Based on our analysis since the war started in February 2022, we cannot really be sure WHAT all the individual elements of the invasion plan were intended to accomplish beyond its obvious intent to topple the Zelensky government. **Defiance**'s research is our best understanding on HOW the Russian military operation unfolded. Our intent is YOGI is not meant to be entertaining nor clever but is meant as a history lesson, no more, no less on.

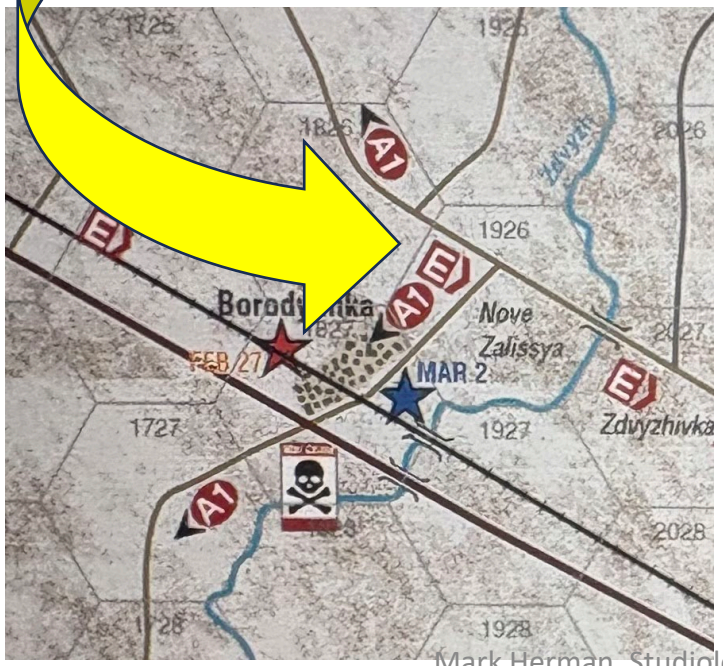
Player Note: If you manage to stop the Russian invasion, remember we are not trying to defeat you. If the Russian invasion forces the Zelensky government to displace to a new capital you haven't found some fascinating 'balance' issue, but just what a near run thing Ukraine's stalwart forces survived.

20.1 Prime Directive

Prime Directive (like Star Trek): There are no wrong ways to implement YOGI if you follow its basic tenet that the Russian forces are trying to

- **YOGI: How does it work?**
- **"When you come to a fork in the road, take it"**
- **E indicates prime Road Exit …A1 is the alternative route.**

E = SE
A1= SW



DEFIANCE: YOGI: SOLO BOT: Russian Invasion of Ukraine: Intersections and movement direction: Take the fork.

WEST (40 intersections)

Extreme West

Intersection	Location	Exit Hex	Alt 1	Alt 2
Ovruch	415	515	416	
Korosten	222	322	122	
Khoroshiv	127	228		
Narodychi	717	818	618	617
Vas'kovyshi	319	320		
Radcha	1015	1115	915	
Pyrizhky	923	924	1024	823
Malyn	924	925		
Radomyshi	929	1030	1029	829
Chaikivka	628	528		

Southwest

Intersection	Location	Exit Hex	Alt 1	Alt 2
Chernlakhiv	231	232	331	
Zhytomyr (east)	433	532		
Kocheriv	1032	1132	1131	932
Bilka	1229	1129	1329	
Kalynivka	1331	1332	1431	1231
Khodorkiv	935	835	936	
Kotlyarka	936	837		
Brusyliv	1333	1434	1233	1234
Makariv	1630	1631	1529	
Kalynivka	1631	1632	1530	1730
Byshiv	1733	1734	1833	
Dmytrivka	2130	2230	2131	
Bilohorodka	2131	2231	2032	

Center (west of Dnipro)

Intersection	Location	Exit Hex	Alt 1	Alt 2
Termakhivka	1520	1621	1421	
Sukachi	1721	1722		
Orane	2020	1920		
Pripyat	1914	1915	1814	
Ivankiv	1722	1823	1622	
Feneychi	2024	2124	1924	
Borodyanka	1827	1927	1727	
Piskivka	1626	1726	1525	
Halynka	1826	1926	1825	
Nove Zalissya	1926	2027	1827	

EAST (63 intersections)

Northeast

Intersection	Location	Exit Hex	Alt 1	Alt 2
Ripky	3207	3208	3107	
Buyanky	3208	3308	3307	
Ryabtsi	3310	3211	3411	
Yuivka	3211	3311	3111	
Koshivka	3311	3312	3412	
MK	3113	3213		
Kyinka	3313	3314	3414	3214
Politrudnya	3807	3808	3707	
Horodyna	3905	3806		
Brusyliv	3711	3612		
Horodyshche	4311	4211		
Mena	4612	4512		
Koryukivka	4608	4508	4609	4507
Kholmy	5006	4906		
Lozova	4910	4911		
Male Ustya	4912	4812	4913	
Avdiivka	5208	5108	5207	

Center (east of Dnipro)

Intersection	Location	Exit Hex	Alt 1	Alt 2
Kolychivka	3414	3513	3514	
Yadine	3415	3414	3515	3416
Topchiivka	3416	3417	3516	
Olyshivka	3516	3517	3616	3416
Orlivka	3716	3816	3616	3715
Kulykivka	3915	3914	3816	4016
Kipti	3319	3320	3420	
Lykhachiv	3719	3720	3619	
Kozalets	3223	3123	3323	3322
Novista	3722	3622	3623	3721

Kyiv Vicinity

Intersection	Location	Exit Hex	Alt 1	Alt 2
Demydiv	2325	2326	2226	
Katyuzhanka	2124	2224	2025	
Zdvyzhivka	2027	2127		
Hostomel	2127	2228	2128	
Bucha	2128	2129	2229	
Horenka	2228	2328	2229	
Irpin	2229	2329		

Extreme East

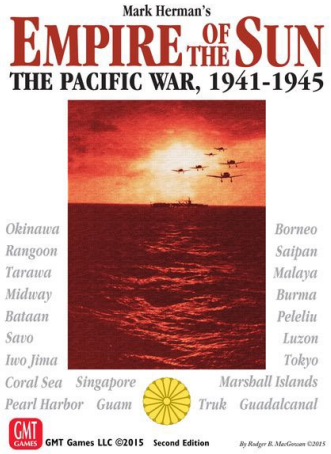
Intersection	Location	Exit Hex	Alt 1	Alt 2
Bobryk	4019	3918	4118	
Vertiivka	4118	4019	4117	
Nizhyn	4220	4120	4119	
Borzna	4817	4717	4818	
Velyka Zahor	4918	4919	4818	
Horodyshche	5315	5216	5316	
Baturyn	5415	5315		
Bakhmach	5317	5218	5318	
Kachanivka P	5122	5022	5123	
Ichnya	4823	4723	4722	4824
Svitanok	4524	4525	4425	
Sukhopolova	4827	4726	4828	
Zaizd	4627	4527	4626	
Pryluky	4828	4727	4728	
Okhyn'ky	**5126**	5027		
Sribne	5326	5227	5327	
Zhuravka	5030	4929		

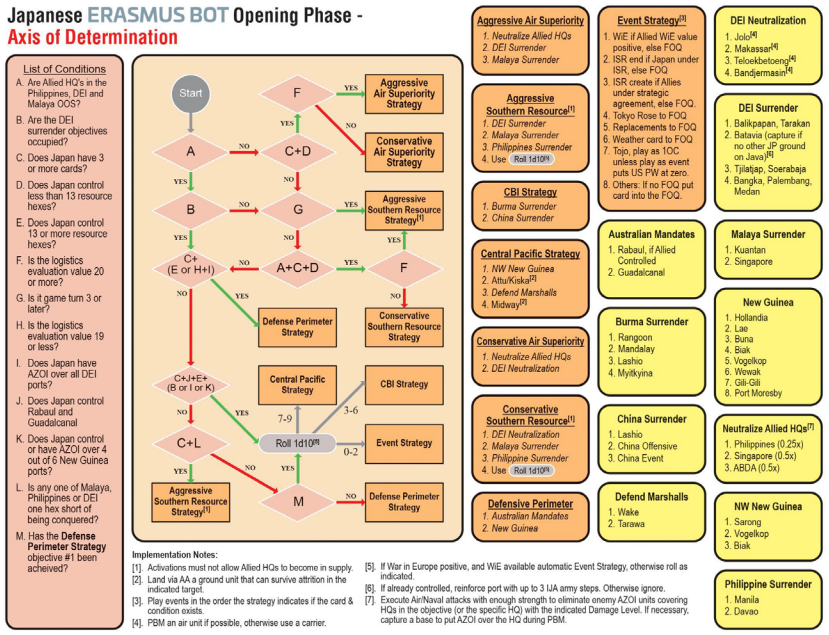
South East/South Central

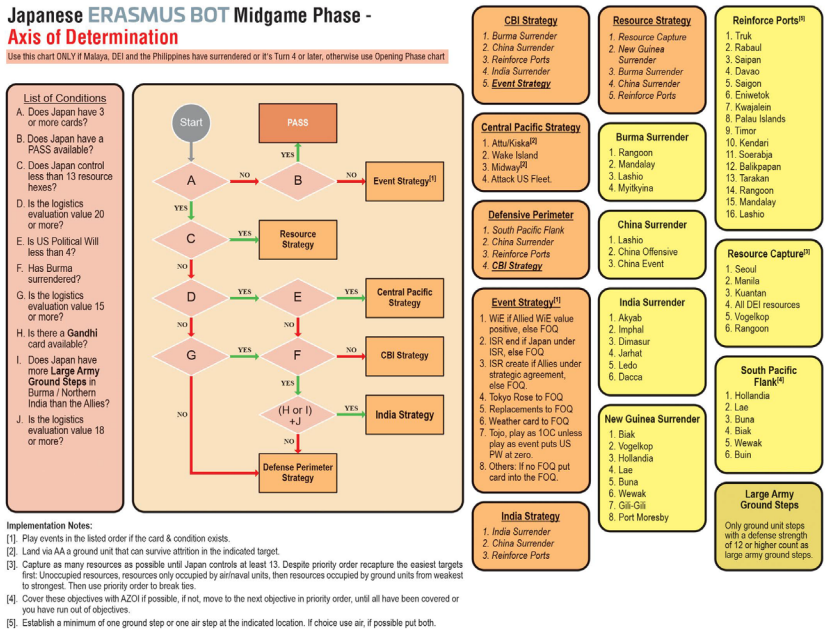
Intersection	Location	Exit Hex	Alt 1	Alt 2
Bobrovytsya	3525	3524	3626	
Semypolky	3026	2926	3126	
Brovary	2928	2829	2929	3029
Kvitneve	3129	3029	3230	
Bezuhlivka	2930	2831		
Hora	3031	2930		
Horobiivka	3131	3032	3031	
Boryspil	3032	2931		
Dernivka	3529	3429	3530	
Korzhi	3531	3432	3530	
Berezan	3732	3632		
Nova Basan	3728	3629	3727	
Novyi Bykiv	3927	3828	3928	3926
Zhurivka	4029	3929	3928	4030
Soko	3933	3833	3934	
Panfyly	3934	3834		
Cherkasivka	4032	4033		
Raikivshchyna	4033	3933	4034	
Yahotyn	4034	3933	3934	4033

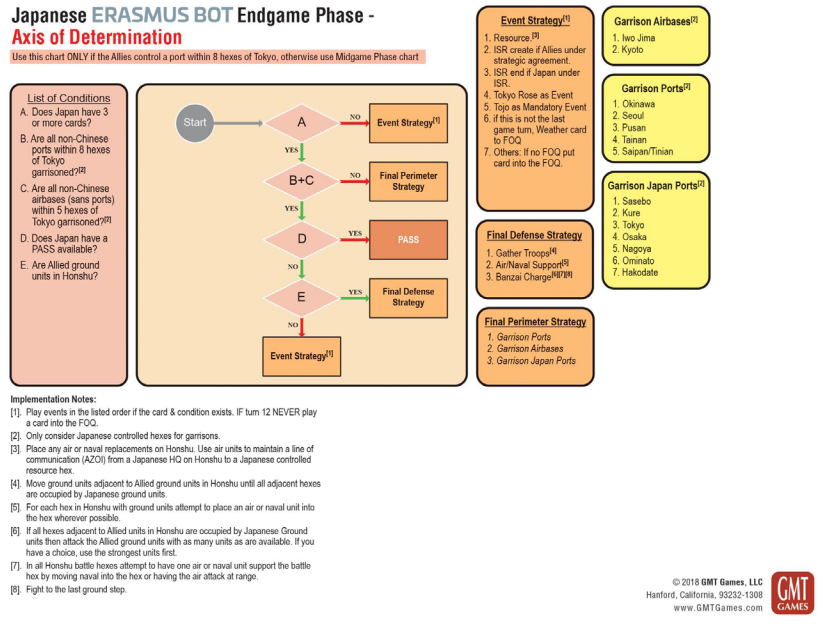
Capturing Human Wargame Decisions

- Human Decisions:
  - Strategy Path Forward
  - Post wargame, paths taken
- Easy to discuss insights and findings, hard to analyze the process
- Erasmus (*Empire of the Sun*) designed to make strategy decisions but can be reversed engineered to capture decisions made









Wargame Design Musings

Useful

- Rapid prototyping capabilities
- Rapid ‘off the shelf’ modifications (e.g., Gulf Strike in early hours of Gulf War)
- Detailed rules organically create detailed computer design documents
- Video training playthroughs
- Commercial Organized play (e.g., tournaments)
- Manual Artificial Intelligence (‘Bots)

Challenges

- Player training uneven and difficult without interest
- Misplaced belief in verisimilitude of AI computer simulations
- Difficult to integrate computer simulations with manual processes
- Zero Sum tradeoff of simplicity to value

Questions?