NATO Armies' Approaches to Wargaming

1949-2020

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Introduction

The aim of this dissertation is to consider how NATO armies have used wargaming as a training aid and how this reflects the army's philosophy. This is appropriate as the first NATO doctrinal publication is about to be published. The date range encompasses from the formation of NATO in 1949 to 2020 when the COVID-19 Pandemic saw significant changes as armies moved to a more distributed form of wargaming (which really requires a study in itself).

A Brief History of military wargaming

Military wargaming has a long history, including games such as "Wei Hai" and "Chess" but the first modern wargame was the Prussian "Kriegsspiel" (which translates literally as War Game), which was created by a Prussian officer von Reisswitz in 1824. After the Chief of the General Staff, von Muffling watched a demonstration of the second version run by von Reisswitz's son, he remarked "this is not a game it is training for war[1]," and it spread rapidly through the army. This continued to spread quickly on continental Europe with a Swedish translation by 1830 until most European armies had a version. Interest spread especially fast after Prussian successes in the wars leading to German Unification.

Despite this, the amount of gaming used by countries varied considerably, the US and UK almost ignoring it for example. Germany in contrast saw a massive use of wargaming, correctly anticipating the likely failure of the 1918 Michael (or KaiserSchlacht) Offensive (which was launched regardless, due to a lack of alternative options), exponential growth under the Reichswehr and the infamous D-Day wargame where General Marcks was about to play the allies and correctly predicting the strategy they were actually performing (Normandy in sub-optimal conditions).

Post World War Two, there were a significant number of approaches to gaming, with no unified approach to wargaming across NATO. In fact there still is not a NATO doctrine on wargaming although this is due to change in late 2023 or early 2024.[2] As a result each country has developed it's own approach.

Definition of wargaming

"There is no single, commonly accepted, definition of 'wargaming'. NATO defines a war game as: a simulation of a military operation, by whatever means, using specific rules, data, methods and procedures. The importance placed on the decisions of the wargame players, not contained in the NATO definition, means this handbook uses the working definition of wargaming contained in the Red Teaming Guide: A scenario-based warfare model in which the outcome and sequence of events affect, and are affected by, the decisions made by the players."[3]

An alternative definition given in the later manual for units states a wargame is,

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[1] Quoted in Wilson, Andrew. Andrew Wilson's the bomb and the computer: The history of professional wargaming 1780-1968. Edited by John Curry. History of Wargaming Project, 2014.p19

[2] Dawson, James. "NATO Wargaming Handbook." Web log. Twitter (blog), June 9, 2023.

[3] Development, Concepts and Doctrine Centre. *Wargaming Handbook*. Shrivenham, Wiltshire: Ministry of Defence, 2017. p5

"adversarial and oppositional by nature, a wargame is an immersive simulation not involving the operation of actual forces, in which the course of events, and is shaped by, decisions made by the players."[4]

In order to clearly identify the scope of the dissertation given that each nation will have a slightly different version (or in the case of the US Army no official definition), for the purposes we will class a game as a wargame if it meets the following criteria:

1. Real units are not used on the ground
2. Players represent both sides (given computer use this can prove problematic as some games can be used opposed by humans or AI)
3. Decisions made by one side can affect the other
4. Decisions affect future events

Note that this differs from popular media accounts that refer to exercises involving real troops as wargames.

It is worth noting that there are now hybrid wargame/exercises, including the notorious Exercise Millennium Challenge of 2002 which used real troops for some aspects and wargame for others.[5]

Methodology

This study will look at three different forces and their respective approach to wargaming. While this obviously does not cover the whole of NATO, the examples chosen typify the three main approaches to wargaming, namely top down imposition, bottom up developing and improvised. Additionally each case study will examine how this reflects on the cultural ethos of the force.

The first type of gaming examined is that used by the US Army. Here model figures and vehicles are moved around on (usually) representative terrain or (occasionally) maps. This is the usual image of wargaming in the UK due to the popularity of Games Workshop's "Warhammer" series of games. This case study will show the way that the US Army has used a top-down approach to teach specific lessons to officers that it felt warranted teaching, often modifying the game (and the underpinning reality) to achieve this. Lessons were mainly technology focussed and ignored human factors. This will be done by looking at the "Dunn Kempf" game plus (briefly) it's precursor "Firefight," specialised sequel "Blockbuster" and the un-named current descendant.

Next we will consider the United States Marine Corps (USMC) who have taken a very different approach. While technically not an army, the USMC have a very army type mission and make a good case study. They believe that _**all**_ leaders should be exposed to wargaming in order to develop their skills using a bottom-up approach. In order to do this they have primarily adopted the use of commercial board and counter wargames (the most common form of gaming in the US), usually of a very low complexity level, exemplified by the wargame "Memoir '44.". Games are not technology focussed and emphasise the friction of war. This has resulted in a widespread culture of wargaming

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[4] Land Warfare Centre. *Unit Wargaming Guide*. 1.0ed. Warminster, Wiltshire: Ministry of Defence, 2023. p1-1

[5] "War Game Was Fixed to Ensure American Victory, Claims General." The Guardian, August 21, 2002. https://www.theguardian.com/world/2002/aug/21/usa.julianborger.

at grass roots level but little development at high level although there are indications that this is starting to change.

The final case study will be the British Army. British Army wargaming has traditionally been very dependent on individuals pushing gaming instead of a centralised policy. This typically British "muddling through" and relying on unofficial channels is best demonstrated by UK Fight Club's game "Take That Hill!" which despite being unofficial has had widespread distribution through the army. The result is the most varied approach but with frequent reinventing the wheel.

Germany as we have seen the traditional home of military wargaming, linked wargaming with militarism and the high level of knowledge was quickly allowed to atrophy. Gaming became very low profile and indeed initially did not provide any formal rules, regarding the issuing of these to be something that would limit the educational value, turning it into a "regimentation" (i.e. the results would be too predictable).[6] Only in 2023 did the Bundeswehr acknowledge on it's website it even uses wargames.[7] As a result German wargaming which was initially considered as one of the case studies has been relegated to Appendix 2.

Literature review

Secondary sources

There are a number of studies of how professional wargaming has developed. Possibly the best known is Perla although unfortunately for my purposes, he gives little information on military use post World War Two concentrating on hobby gaming.[8] For the purposes of the dissertation therefore it is of very limited utility.

Surprisingly given the title of his book, the early chapters of Wilson give a good international based account of early developments before moving into the computerised section which is almost exclusively American centric.[9] The fact it was written in 1968 limits it from my perspective, although it does give insights into the American games on Vietnam without hindsight.

Dunnigan was the first big historian of professional wargaming with multiple editions of his book starting in 1982.[10] Dunnigan, as would be expected from an American author who has been a regular consultant for the Pentagon, concentrates on the American perspective and on higher level gaming.

Turning to UK authors, the main standard text on wargaming is by Sabin, but there is very little on the military use of wargaming except in passing.[11] It does however give significant insights into the design process of games (especially useful as he was the initial author of "Take That Hill" used in the

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[6] Hofmann, Rudolf M. *War Games*. US Army Headquarters Europe: Historical Division, 1952 p ix

[7] "Wargaming - Military Meets Fiction." Bundeswehr, January 19, 2023. https://www.bundeswehr.de/en/organization/further-fmod-departments/bundeswehr-command-and-staff-college/wargaming-military-meets-fiction-5570824.

[8] Perla, Peter P. *Peter Perla's the art of wargaming: A guide for professionals and hobbyist*. Edited by John Curry. of *History of Wargaming*. Milton Keynes: Lightning Source, 2011.

[9] Wilson, Andrew. Andrew Wilson's the bomb and the computer: The history of professional wargaming 1780-1968. Edited by John Curry. History of Wargaming Project, 2014.

[10] Dunnigan, James F. How to make war: A comprehensive guide to modern warfare in the twenty-first century. 3rd ed. New York: Quill, 2003.

[11] Sabin, Phillip. Simulating war: Studying conflict through simulation games. London: Bloomsbury Academic, 2019.

British case study). His attempts to make wargaming recognised academically have however made it more acceptable to higher level officers unfamiliar with professional gaming.

There is a PhD thesis regarding the use of wargaming for training officers and officer cadets.[12] This is useful but it does by definition exclude lower level and unit wargaming. From my perspective it is also limited as he does not cover the USMC.

As a result, this dissertation is really the first attempt to consider the comparative role of wargaming across armies in NATO.

Primary sources

Turning to primary sources, significant numbers of the actual rules used are available online (mainly through the work of Major Tom Mouat, the head of the Defence Modelling and Simulation School and the biggest advocate of professional gaming within the British Army) and in print (through the History of Wargaming Project under John Curry). Obtaining copies of these allowed me to play out the various games giving insights that just reading them would not. Additionally both were very generous with their time and answered my many questions.

There are a number of conferences which look at professional and semi-professional gaming. I have attended the DSET Conference which featured a two-day wargaming sub-conference.[13] This gave me chance to chat with a number of people who specialise in the field of professional wargaming including John Curry and Tom Mouat as noted above. Further conversations were had by email and at the Conference of Wargamers (CoW) which brings together military and hobby gamers. There is a third conference aimed at professional wargamers in the UK, Connections UK. This takes place on an annual basis but unfortunately as this takes place in September has limited my ability to attend and incorporate material. A number of the lectures from previous years are available online through YouTube however and these have shed light on detailed aspects.[14]

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[12] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf.
[13] "Defence Simulation Education and Training," 05 June 2023-08 June 2023. Bristol, 2023.
[14] E.g. "Connections 2016 Creative Thinking in Games." YouTube, September 24, 2016. https://www.youtube.com/watch?v=y2yMiboS61o&t=226s.

US Gaming – 1. US Army: "Dunn Kempf"

Introduction

The US Army does not have a developed history of wargaming, instead relying more on computer-based simulations. Wargames have however played a role in training, in particular of officers. Rules have tended towards high complexity, technically detailed simulations at the expense of human factors. These wargames have often been developed to teach specific tactical lessons, even if this means that reality such as the terrain or capabilities had to be adjusted to teach these.

Historical Background

The US Army published a synthesis of a number of the German rules by Captain William R Livermore in the 1870s. These were often used alongside staff rides, often over one of the many Civil War battlefields. This contrasts with the British rules that looked forward to future battles (although Livermore did upgrade the casualty tables in line with US experience in the American Civil War). Little evidence of further activity occurs in the Army (although the US Navy created massive wargames that are very well documented and were given a major credit by Nimitz in the successful conduct of the Pacific War – he said only the kamikaze had been a surprise[15]). This very slow development of wargaming was probably as the Army was not a prestige career for gentlemen as it was in Europe. Additionally, the better educated officers tended towards the engineers, which was not seen as a combat arm and therefore needing combat skills.[16] Also while the tiny Army was distributed in penny packets across the frontier there was limited ability to pull together interested officers (identified as still a problem by Sayre in 1911[17]). This only started to change with the Cold War and the Russian threat. It was felt that the German Army had much to teach from the Eastern Front experiences against this enemy and in 1952 Hoffman[18] published a doctrine basing it on his study of German wargaming (rather ironically the soon to be formed Bundeswehr would almost abandon wargaming).

The main US Army activity in this field was in computer wargames which in most cases do not meet our definition of a wargame as few feature a human opposition. They also suffer a limitation for studying purposes as it is very difficult to "get under the hood" and conduct a detailed analysis of the mechanics and statistics. Instead I have concentrated on the most widely used of the manual wargames rules "Dunn Kempf."[19]

"Firefight" - The precursor game

In 1976 "Firefight" was created for the US Army by Dunnigan as a board and counter game (this being the main form of hobby gaming in the US). [20] Literature show little evidence of military use and

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[15] Wilson, Andrew. Andrew Wilson's the bomb and the computer: The history of professional wargaming 1780-1968. Edited by John Curry. History of Wargaming Project, 2014.p48

[16] It is of note that "Dunn Kempf", the main miniatures rules used by the US Army during the Cold War were under the imprint of the Army Corps of Engineers.

[17] Caffrey, Matthew B. On wargaming: How wargames have shaped history and how they may shape the future. Newport, RI: Naval War College Press, 2019. p23

[18] Hofmann, Rudolf M. War Games. US Army Headquarters Europe: Historical Division, 1952.

[19] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020.

[20] Dunnigan, Jim, and Irad B Hardy. "Firefight." New York: Simulations Publications Inc, 1976.

it became more popular as a commercial hobby game and is still in print today (ironically with the main selling point being the US Army use!). Griffith was very scathing over it when asked to evaluate it for British use although to be fair many of his criticisms were of factors that the US Army had asked Dunnigan to include or exclude.[21] Playtesting the game has shown that Griffith's criticisms are valid, examination of the ground through Google Street View shows (even allowing for changes over time) far less visibility than portrayed in the game (designed to emphasise ATGMs), the lack of morale (and to a degree training levels) and ATGM missiles being more effective than even contemporary data showed.[22] Many of these criticisms carry over into the "Dunn Kempf" rules that form our case study even though the mechanisms are new.

"Dunn Kempf"

Origins and use

Published in 1977, according to Kempf, they were developed from an earlier project[23]. As no rules were used prior to this for miniature gaming (as evidenced by the fact that all components such as terrain and figures were issued with the sets), it is probable that these were the "Firefight" board and counter rules. Alternatively this may refer to the fact that they were developed from Barker's hobby rules (intriguingly a set of these was included in the package distributed to units, although there is no evidence they were ever used).[24]

Curry notes that the game was used by other nations (Canada created their own version of the rules although these changed to percentage dice)[25], intriguingly he states Britain experimented with the rules (email discussion with Curry indicates that it was analysed by Griffith and found wanting for very similar reasons to his rejection of "Firefight"[26]) and was even used by the Soviets![27]

The game could be modified to unit requirements, adding details that they wanted to explore.[28] One benefit of the use of scale vehicle was a gain in vehicle recognition skills although this was only listed as a side benefit.[29] Given the scale of the vehicles and the distance they would be observed from I would suggest that this is a touch optimistic, most recognition models were 1:100, a significantly larger size.

Scale of Issue and Equipment

Sets were issued on a scale of one per battalion (armour and infantry). The rules were issued complete with a full set of figures for use:

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[21] Curry, John. Paddy Griffith's Game of War. of History of Wargaming. Amazon, 2021. P166-168

[22] McNab, Chris. Sagger Anti-tank Missile vs M60 Main Battle Tank: Yom Kippur War 1973.84 of Duel. Oxford: Osprey, 2018.p50-75

[23] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020. p10

[24] Barker, Phil. War Games Rules Armour & Infantry 1950-1975. Devizes, Wiltshire: Wargames Research Group, 1974.

[25] Donnelly. Contact! The Canadian Army Tactical Training Game (1980). Edited by John Curry. History of Wargaming Project, 2020.

[26] Curry, John. Email to Author, August 7, 2023.

[27] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020 p11

[28] Ibid p10-11

[29] ibid p17

1. American

Unit	Number	Notes
M60A1 MBT	17	
M113A1 APC	16	1 for M60A1 units, the remainder for the infantry
M125A1 Mortar carrier	3	
M113A1 TOW carriers	2	Presumably M150
Rifle squad	9	
M60 Machine gun teams	6	No sustained fire kits accounted for
M47 Dragon teams	12	

This provides for the recreation of a H series tank company and an infantry company (although here there are discrepancies such as more Dragon teams than required – perhaps to emphasise ATGMs).[30] Additional units such as additional TOW carriers, Redeye teams, M551, AH1G Cobra helicopters and M106 4.2" mortar carriers could also be issued depending on role.[31] Comparing this to contemporary Orders of Battle (ORBATs) indicates that this would allow for the deploying of cavalry reconnaissance units and the addition of some battalion level supports. Additionally it was noted that units could purchase more from the hobby manufacturer GHQ. Presumably this was the method used to update forces when later equipment such as the M1 and M2/M3 were introduced alongside the J series TOE (the statistics for these are shown on the 3rd Corps additions).[32]

2. Opposing Forces (OPFOR)

Unit	Number	Notes
T62 Medium tanks	31	
BTR50 APC	3	
BRDM with Sagger	2	Presumably 9P122 or 9P133 "Malyutka"
BMP IFVs	10	
Rifle squad	9	
Trucks	6	

This gives a full tank battalion supported by an infantry company. Additional forces could include ZSU57-2 anti-aircraft vehicles, PT76 light recce ranks, recon BRDM-2 and Hind helicopters.

There are a number of minor oddities on these forces, namely that there is no provision for the headquarters of the infantry company dismounting (for either side) and the additional forces can include the M88 and M578 recovery vehicles even though these were integral to the forces modelled.[33] An odd inclusion is the ZSU57-2 as these had started to leave service in the mid-1960s and had been completely replaced by the mid-1970s.

The choice of vehicles provides an interesting insight into the designers' thought process, American vehicles were all state of the art for the time, the Russian vehicles were often a generation older and were clearly intended to represent a tank battalion with infantry support (evidenced by the numbers and the fact that BMP IFVs were issued). If that were the case then the correct tank would be a T64

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[30] US Army. Infantry Rifle Platoon and Squad. Washington, DC: Headquarters, Dept. of the Army, 1986. Appendix A

[31] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020.p8

[32] Ibid p56-76

[33] Rottman, Gordon L., and Ron Volstad. Inside the U.S. Army Today. of Elite. London: Osprey, 1988. p20-27

as T62s were mainly used by Motor Rifle units (who would ride in BTR60 series APCs, there would be an extra tank per platoon and these were mostly replaced in the Group of Soviet Forces Germany (GSFG) by the T72). Initially I believed that this was due to incorrect intelligence at the time but "Firefight" (created a year earlier) clearly identifies these were known by the US Army to a point where it could be published in an unclassified source.[34] The lack of dismounted command elements and the use of T62s also mirror "Firefight," further reinforcing the idea that this is what Dunn referred to as the precursor set (or as a minimum the organisations were taken from this). Later data charts (created by 3rd Corps[35]) do include the T64, T72, BTR60 and ZSU23-4 showing that there was enough use and therefore interest to update the game rules. The obvious conclusion is that the rules were designed to highlight the technological edge the US had even at the expense of realistic opposition. This false confidence is not unique, The Tank Museum at Bovington includes a sectioned Soviet T55 with thicker than usual armour for the same reason.[36]

Target Audience
Given that the game was issued at the scale of one set per battalion and also used at the Command and Staff College, it is clear that the target audience was officers. It is likely that these would be the battalion officers playing the command elements with either the administrative staff of company commanders playing the on-table elements (given the number of vehicles and infantry issued and table size, it is unlikely that more than six players would be required per side even if extra units were purchased). It is probable that this could be pushed down another level with company teams replacing the battalion. Therefore troops are very unlikely to have opportunities to play, emphasising that the Army clearly intended the game to be used for officer training.

Terrain and Observation
The set came complete with instructions of how to make the terrain which was a vacuformed model of eight by ten feet (in two sections) allowing very realistic elevation changes and for players to fight over the area that would likely be used in wartime. Each inch on the table represented 50m in real life (1:1969 scale). This is significantly different to the vehicles which are 1:285 scale. This scale difference is normal for miniatures game (both hobby and professional) in order to not require a much larger table (or village hall!) or tiny vehicles but hobby games usually incorporate a contour system which provides full cover even if the vehicle rises above it. The vertical scale in Dunn Kempf however was doubled (to 1:885) compared to the ground scale to better create obstructions to line of sight. This vertical adjustment still however means that vehicles are roughly two and a half times

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[34] Dunnigan, Jim, and Irad B Hardy. "Firefight." New York: Simulations Publications Inc, 1976. Reference Data Book p8-20

[35] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020. p56-76

[36] The Tank Museum. "T55 Exhibit." Dorset: Bovington, n.d.

as high as the terrain should be, meaning that lines of sight are far less obstructed than they should

be.

Figure 1: The black line shows the terrain at the correct height scaled to the vehicles, the red line shows it at 50% of the correct height (and would allow a hull down shot).At the Dunn Kampf scale it is almost flat (providing no cover). It quickly becomes obvious that exaggerating the terrain height to less than the tanks scale height means that lines of sight are greatly increased above the 300-400m regarded as typical in Germany.

Observation distance was also massively optimistic, with for example an infantry squad moving in the open being visible at 1000m, dropping to 300m if stationary. Forest visibility was limited to 150m. From personal experience on exercise these are wildly excessive. This is very common in US games. Combining the increased visibility with the US advanced technology in the field of range finders this again gives US players an unrealistic advantage (the hit chances at longer ranges are clearly biased towards US players).

Combat

The ranges link into these excessive visibility rules and while a Challenger I achieved a verified kill at 5000m in Operation Desert Storm (1991) the fact that this has not been equalled since in a direct fire mode would indicate how rare this is[37]. In contrast these rules give a PT76 a 33% chance of a hit at the game maximum of 3000m (oddly better than the 115mm on the T62 which has a 3% chance (it is unlikely these are misprints as this is similar, if less pronounced at shorter ranges).[38] Both of these increase by 16% for a second shot! Given the note attached to the table that once realistic terrain is in place the maximum distances should be ignored for line of sight, this normalises the extreme.

Given that the US Army was concerned about the power of ATGMs (see "Firefight" above) often with authors quoting the Yom Kippur War (contemporary sources often saying a 90% hit rate). I would suggest that possibly Vietnamese use at the Battle of Kontum may have been more relevant to US minds (here the PAVN claimed 32 hits from 33 Saggers against the ARVN[39]).

Analysing the hit chance of a Sagger at optimum range (1000-3000m in the rules) shows a hit chance of 67%. The rules do not indicate which model of Sagger has been implemented in the rules but as we shall see when we compare to US hit chances this would probably indicate the early 9M14 Sagger A. This does not actually seem unreasonable against a target that was not taking countermeasures. Comparing this Manual Command to Line of Sight (MACLOS) to the Semi-Automatic Command Line of Sight (SACLOS) M47 Dragon, we see that the Dragon for some reason does not have the real-life minimum range and at an optimum range of 250-1000m has a hit chance of 70% (which is also the hit chance of TOW at it's optimum range). To my surprise not a significant increase statistically and

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[37] Although it has been beaten by a Ukrainian tank firing indirectly spotted for by a drone.

[38] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020 p22

[39] McNab, Chris. Sagger Anti-tank Missile vs M60 Main Battle Tank: Yom Kippur War 1973. of Duel. Oxford: Osprey, 2018.p5

this is less than the TOW achieved in Vietnam (83% although a number were against static targets such as bridges and bunkers).[40]

While it is clear that the US Army wished to emphasise ATGMs effectiveness, it is notable that the high kill rates were achieved against armies that did not have any doctrine to counter them (PAVN, ARVN and the IDF in the early part of the Yom Kippur War). As such it was clearly intended as a teaching point but may have had the unfortunate effect of making American soldiers believe that the ATGM was a super weapon.

Looking at the air rules there seems to be a significant degree of optimism given to guns. Air defences have to roll to engage, then to hit and to achieve a result. I have summarised the results in this table:

Weapon	Target	Hit (x/6)	Effect (x/6)	Destroy (x/6)	Abort (x/6)	% kill	% abort	Combined
MG - vehicle or infantry	Helicopter	5	3	2	2	13.89	13.89	27.78
MG - vehicle or infantry	Jet	1	1	1	2	0.46	0.93	1.39
SA7/Redeye	Helicopter	5	1	3	3	6.94	6.94	13.89
SA7/Redeye	Jet	3	1	2	4	2.78	5.56	8.33
20mm Vulcan	Helicopter	5	3	4	2	27.78	13.89	41.67
20mm Vulcan	Jet	3	2	2	3	5.56	8.33	13.89
ZSU57-2	Helicopter	5	4	4	2	37.04	18.52	55.56
ZSU57-2	Jet	3	2	3	2	8.33	5.56	13.89

Figure 2: Air defence hit chances

These are for single weapons, a full US tank company firing MGs at a jet would have a 22% chance of affecting it (this rises to 99.6% chance against helicopters!). This becomes even more effective when it is realised that MGs can fire three times (raising the chance to affect a jet to over 99.9%!). Some of these seem reasonable enough although the MG seems massively overrated. The SA7 and Redeye are approximately right given the British experience in hit rate of Blowpipe in the Falklands War.[41] Given that missiles were a new technology that was an as yet unproven this was a surprisingly realistic result. The higher ratings for guns (especially MGs) probably results from experience in Vietnam where helicopters were more vulnerable due to roles (air assault instead of hunter killer gunships). It is a little unclear which units can shoot at aircraft as they appear and disappear in the attackers turn. The rules just note enemy fire and it is unclear if they need to be stationary like normal firing, etc. For playtesting I took a rule from hobby gaming and made an air defence unit stay stationary not firing in any turn where it wished to fire in the following enemy round. This seemed to work well and stop the vast amounts of fire otherwise inflicted on aircraft. I should note that these odds are not unusual for games written by a single service for their own use, service bias is common.

One factor that was unusual in the rules is that targets have a 50% chance of burning when destroyed.[42] If they do not catch fire they are noted as destroyed but remain unmarked. The rules

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[40] Hughes, Kaylene. "U.S. Army Air-to-Ground (ATG) Missiles in Vietnam." www.army.mil, February 6, 2017. https://www.army.mil/article/181893/u_s_army_air_to_ground_atg_missiles_in_vietnam.

[41] Given as kill rate of 10% (against an expected 20%) by Royal School of Artillery quoted in Curry, John, ed. Confrontation in the Falklands! (1982). History of Wargaming Project, 2020. p10

[42] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020 p33

remark that they will probably be fired at again and again. This very simple system is a massive step in realism that I have not seen replicated in hobby gaming until Gerrish's "Seven Days to the River Rhine" in 2019.[43] There is a contradiction here however, this implies that the roll to destroy and burn would need to be made either by the controller or the targeted player, the explanatory note however has the firing player do this. Unless playing a forgetful player this defeats the whole concept.

Command and Control

The command and control rules are worth quoting in full:

> "Command vehicles may be identified with a small strip of tape (your choice). Upon suppression, allow 2 turns before the leader may communicate. If killed allow three turns before command is resumed of the unit. Subordinate elements may logically follow instruction issued prior to suppression or a kill of a command vehicle."[44]

This is actually not even part of the rules but in the Tools and Tips section. This does not show the sheer chaos that the loss of a command element creates, especially in non-mission tactics armies. This section also makes an assumption that the players will issue orders to their subordinate commanders who are then restricted to following these. While watching military gamers this issuing of orders and intentions happens naturally (in contrast to hobby gamers who frequently discuss and then make changes on the fly!). Given there is no elaboration on this in the rules it is probably safe to assume that this was followed here as do the current rules developed from these.[45] It is of note though that the electronic warfare (EW) section has no impact on command and control, just on artillery fire support arrival chances. The US was clearly aware of the massive potential impact as "Firefight" remarks it made the game unplayable if implemented[46], another example of reality being secondary to the lessons the designer wished to emphasise.

Troop Quality

These take even less time to quote as they are actually non-existent. While this sounds very unrealistic, it is probably deliberate. Adding troop quality rules would complicate the system. Given that the rules are clearly intended to fight actions in Germany between US troops stationed there and the GSFG, differences in training are accounted for in the basic to hit charts. Modelling second- and third-line Soviet units and US National Guard units could easily be done by users if this was required (modifying was encouraged by the designers). Not doing so shows the clear bias towards technology over human factors, a typical US feature.

Playability

The rules note a one-minute time limit on turns (which represent 30 seconds). This is impossible to achieve from experience unless it refers only to the movement aspect of the turn (and even then this would require a player to command no more than about ten units). The rules are not overly complex (certainly compared to hobby games of the era), for a new wargamer however they could easily be overwhelmed. Once a game or two had been played it would be easily mastered. It is notable the current development (see below) has simplified many of the rules onto data cards for

[43] Gerrish, Roger. Seven Days to the River Rhine. Great Escape Games, 2019.

[44] Dunn, Hilton. Dunn Kempf: The U.S. Army Tactical Wargame (1977 -1997). Edited by John Curry. History of Wargaming Project, 2020 p47

[45] Curry, John. "Wargaming the Ukraine." Bristol, July 5, 2023.

[46] Dunnigan, Jim, and Irad B Hardy. "Firefight." New York: Simulations Publications Inc, 1976.

each unit type meaning a significant reduction of the information needed (especially if a unit with few vehicle types is used).

Legacy

In 1984 Blockbuster, a development of Dunn Kampf was published concentrating on urban warfare in a high intensity war.[47] There was a change to percentage dice (as also used by the current rules below) and much more detail added making the game far slower and harder to grasp (indeed playtesting frequently involved stopping and checking the rules). This used two different ground scales, one for outside the village (the maximum density terrain covered) and one for inside it (which was to figure scale). This was indicated on the terrain model by a coloured border. This can result in VERY strange anomalies when measuring distance and line of sight and when playtesting this never felt realistic. Further issues were encountered when playing the game, namely the time listed to clear buildings (up to 20 turns) means that given the 4-8 hour timescale listed means that only the initial break in would be played out (British doctrine would be to only hold the outer buildings with a light screen and defend with multiple lines behind this – ungamable using these rules). Burden also found this when editing the rules and playing them.[48] No rules are given for civilians, an odd omission for urban fighting. They are also the only rules I have ever seen with a written test to see if the rules have been understood!

Elg and Curry note that "Dunn Kempf" was superseded in the 1990s by the American movement to computer gaming but was still used at the Command and General Staff College as an after-hours elective activity.[49] Curry goes further stating that miniature gaming is no longer used by the US Army (except as noted by Elg), this is actually directly contradicted by the fact that Curry presented a later development of Dunn Kempf at CoW in 2023 comparing the 2020 and 2022 versions of the rules.[50] Curry confirmed that this was still used at Levenworth and might now be used in a wider context and that the previous statement was now outdated.[51] This game used the current US Army rules (in a declassified form) to simulate modern warfare (these are an updated version of the Dum Kempf rules but have reduced complexity, for example using a generic attack factor instead of making the player choose the ammunition type) and switching to the now widely available percentage dice.[52] These greatly sped up play at the loss of very little detail and as a result it made the game far more suitable for non-habitual gamers. The game featured a scratch company of Ukrainian defenders against a Russian battalion tactical group column attempting to overrun the village. The result was a narrow Russian victory (but with significant casualties and a delay to reorganise). Studying the data in the discussion forum afterwards was instructive, the Russian tanks had had their rate of fire reduced by a third, while the identical Ukrainian tanks had theirs increased by the same amount in line with data from the conflict (interestingly the tank was using an autoloader further highlighting

[47] Curry, John, and David Burden, eds. Blockbuster Wargame (1984): American Army Wargaming Rules for Military Operations in Urbanised Terrain. History of Wargaming Project, 2023.

[48] Burden, David. Discussion with the author, July 2023.

[49] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf. p211-212

[50] Curry, John. "Wargaming the Ukraine." Bristol, July 5, 2023.

[51] Curry, John. Email to Author, August 7, 2023.

[52] Interestingly the British Western Approaches Tactical Unit was using percentages in the 1940s! It has been suggested a modified bingo caller set might have been used.

crew quality). Curry also discusses this difficulty in modelling where there is little data in his published works (here in a naval context but the point applies to all types of warfare).[53]

Other Rules – Similarities

These were not the only rules used by the US Army, altogether three were developed for Vietnam and again these show the flaw that they represented the war the army wanted to fight not the one it was fighting. Griffith noted "…one of the main things which is interesting about guerilla warfare is the political, social and economic struggle. This must always be what guerilla warfare is all about."[54] "Tacspiel"[55] demonstrates this by the smallest unit being the company, direct fire engagement ranges being highly optimistic (up to half a kilometre - Griffith notes that most engagement ranges were usually 20m or less[56]), completely ignores civilians except for helping locate the enemy, absence of South Vietnamese forces, the regarding of the enemy as regular troops with no local forces capable of blending back into the population and the complete absence of armoured vehicles. It could be argued that this was the initial state of the war during the battles of the Ia Drang, it certainly did not follow the war after this point and evidence from Wilson indicates it was still in use in at least 1968.[57]

Contemporary to "Dunn Kempf" was "First Battle"[58] which was intended to fight divisional battles using a 1:25,000 map and counters. This required far more players, using the divisional staff (the set up illustration shows sub-tables nuclear officers and others that have no role in the rules!) plus small brigade staffs as well as the players moving the pieces on the table.[59] Playing these rules show many of the same issues as the case study, observation is unrealistically long, there are no morale rules and command and control is always considered to be perfect. Of particular note is the fact that the reconnaissance rules are an optional extra. Playing without these means that the Soviets blunder forward into American prepared positions making the game a turkey shoot (in the playtest games using them the results were more even). In other words it was again a fighting the war the US wanted to fight, not that which was the most likely.

Conclusion

The US Army clearly has developed a tradition of wargaming despite taking to it late and is the only army studied that regularly used miniatures for gaming (although other NATO forces have, for example Canada). It is however restricted to officers (often of field rank and above).

Looking at the rules as typified by "Dunn Kempf," we find that the rules are heavy on the technological factors at the expense of the soft factors making it a study of the war the US wished to

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[53] McHugh, Frank. United States Naval War College Manual Wargaming (1969): Wargames at the start of the missile era. Edited by John Curry. History of Wargaming Project, 2019. p 11

[54] Griffith, Paddy, and Greg McCauley. Battle in the Vietnam War: Including Buckle for your Dust! and other wargames. Edited by John Curry. History of Wargaming Project, 2023. p70

[55] Curry, John, and Peter Perla, eds. Tacspiel: The American Army's Wargaming Rules for the Vietnam War (1966). History of Wargaming Project, 2020.

[56] Griffith, Paddy, and Greg McCauley. Battle in the Vietnam War: Including Buckle for your Dust! and other wargames. Edited by John Curry. History of Wargaming Project, 2023. p35

[57] Wilson, Andrew. Andrew Wilson's the bomb and the computer: The history of professional wargaming 1780-1968. Edited by John Curry. History of Wargaming Project, 2014.

[58] US Army Combined Arms Training Development Activity. First Battle: American Army Divisional Level Wargaming in the Cold War (1979). Edited by John Curry. History of Wargaming Project, 1979.

[59] Ibid p9

fight, not the one that was most likely. Morale and troop quality are seen as being far less significant than the hardware. Games were clearly designed to act as a training aid and to teach specific lessons to officers, realism would be sacrificed if it helped teach these lessons (for example regarding visibility limits and effectiveness of certain weapons). Additionally there seems a built-in bias in US Army games to promote confidence in US equipment and tactics, perhaps understandable in "Dunn Kempf" given the state of US Army morale in the aftermath of Vietnam.

US Gaming – 2. USMC: "Memoir '44"

Introduction

In comparison to the US Army, the USMC have gone their own way, unsurprisingly given their independent nature and the differences in mission, doctrine and equipment. It has given a high priority to wargaming, creating a wargaming division based at Quantico following a directive by General Krulak in 1997[60]. Interestingly this promotes wargaming for all leaders in the USMC, including NCOs down all the way to fire team leaders. It has empowered staff and even included wargaming within NCO professional military education (PME).[61] Possibly as a reaction to the Work memo, recent years (and a resulting 2017 internal directive) have seen even further development of USMC wargaming, culminating in the 2019 announcement of a multi-million-dollar purpose built wargaming centre which would also support joint games.[62] There is also an understanding that unpredictability and randomness is a major factor on the battlefield[63], contrasting with the Army's approach where predictability is seen as a virtue. It is of note that McBeen has emphasised that the seriousness the USMC has given the topic has resulted in an almost ban on the word "game" as this devalues them in commanders' eyes.[64]

Historical Background

Given the US Navy's long history of wargaming and the fact that the USMC grew out of it, it is understandable that there was a tradition built up that the US Army did not possess. The mid-1960s saw the development of the "Educational War Game" an opposed manual game that looked to impose command difficulties such as communication delays before reports and orders were received.[65] This is an interesting comparison to the Army's "Dunn Kempf" which had no command-and-control mechanisms. The Vietnam War saw the decline of the game as the marines gravitated to the different circumstances of the war and it had vanished by the mid-1970s when the "TACWAR" series of games was developed.[66] This manual game was reasonable effective but as more and more modules were added to it, became unwieldy and withered.

The mid-1990s saw a very novel approach from the new Commandant General Krulak promoting wargaming, even authorising certain games to be placed on government computers including the

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[60] Thiele, Gregory A. "Marines Ought to Play More Games!" Marine Corps Gazette 100, no. 1 (January 2016): 65–67.p65

[61] It is notable that a Gunnery Sergeant was responsible for introducing matrix gaming to the USMC for example.

[62] Staff, Wargaming Division. "An Invigorated Approach to Wargaming: New Emphasis from the CPG." *Marine Corps Gazette*. Accessed August 10, 2023. https://mca-marines.org/wp-content/uploads/An-Invigorated-Approach-to-Wargaming.pdf. p19

[63] Walters, Eric M. "Developing Self-Confidence in Military Decision Making: An Imperative for Wargaming." Journal of Advanced Military Studies 12, no. 2 (2021): 167–81. Developing Self-Confidence in Military Decision Making An Imperative for Wargaming.

[64] Mouat, Tom, Brendan B McBreen, and John Curry. "Wargaming: Keynote Speech." DSET. Speech presented at the DSET, June 6, 2023.

[65] Bae, Sebastian J, and Ian T Brown. "Promise Unfulfilled: A Brief History of Educational Wargaming in the Marine Corps." Journal of Advanced Military Studies, September 22, 2021. https://muse.jhu.edu/article/805918.

[66] Ibid

"TACOPS" (later released commercially)[67] and even a mod for the popular "Doom 2" first person shooter "Marine Doom" to teach low level tactics.[68] The directive is still in force even in the current climate of cyber warfare worries. While these are not covered in depth here due to the difficulty in analysing computer wargames, they clearly illustrate the institutional trend towards pushing wargaming down to the lowest level. There was also clearly use of commercial board games at this point as McBreen makes clear reference to their use in 1998.[69] These games were also promoted by their sale through the Marine Corps Association bookstore where they were placed alongside the books listed in the Commandant's Professional Reading List.[70] Walters notes that these faded away with the takeover of Avalon Hill and their subsidiary Victory Games by Hasbro and their subsequent reduction in titles published.[71]

Little else was done until the late 2010s when another attempt was made to educate marines using wargames. This latest push involved again pushing wargaming down to unit level, making multiple copies of the introductory wargames available free to units. "Memoir '44" is a simple to learn game of World War Two European combat. [72] This is a slightly odd choice since the only USMC members to see combat in Europe were a handful of amphibious assault specialists advising on Operation Overlord but has probably been picked for it's accessibility to new players. The second game looks at the US actions in the Mediterranean in the early 1800s.[73] While this would seem an unusual choice at first glance, it is intended as a way to increase USMC esprit de corps as it features the attack on pirates in Tripoli (referred to in the Marine Hymn).

"Memoir '44"

Origins and use
Originally published commercially in 2004, the game won a number of international awards and was made the official game of the 60th anniversary of the D-Day landings.[74] The game has had significant commercial success not just among hobby wargamers but also among more traditional gamers, often being found in toy shops as well as hobby shops. This actually means that at least some of the Marines may already be familiar with the game before they are trained on it.

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[67] Hodridge, I L. "Tac Ops." Computer software. Battlefront, 1994.

[68] Brown, Ian T, and Benjamin M Herbold. "Make It Stick: Institutionalizing Wargaming at EDCOM." Marine Corps Gazette, 22–31. Accessed August 15, 2023. Institutionalizing wargaming at EDCOM.[22

[69] McBreen, Brendan B. "I Want to Be 'Ender.'" Marine Corps Gazette 82, no. 4 (April 1998): 46–48. http://www.2ndbn5thmar.com/dm/EnderMcBreen1998.pdf.p48

[70] Walters, Eric M. "Wargaming in Professional Military Education: Challenges and Solutions." Wargaming in PME. Accessed August 5, 2023. https://www.usmcu.edu/Outreach/Marine-Corps-University-Press/MCU-Journal/JAMS-Vol-12-No-2/Wargaming-in-PME/.

[71] ibid

[72] Borg, Richard. "Memoir '44." Days of Wonder, 2004.

[73] Thiele, Gregory A. "Wargaming." Marine Corps Association, May 8, 2023. https://mca-marines.org/decision-making-exercises/wargaming-2/#:~:text=Memoir%20'44%20is%20a%20unique,and%20objectives%20of%20each%20army.

[74] Board Game Geek. "Memoir '44." BoardGameGeek. Accessed August 26, 2023. https://boardgamegeek.com/boardgame/10630/memoir-44.

Scale of Issue and Equipment

Unlike the US Army's "Dunn Kempf," units are not automatically issued sets of the rules but must request them.[75] These are then issued a set of six games (although the form does allow units to request extra sets if there is a justification). The fact that the games must be requested obviously imposes a limit if the commanding officer is uninterested in wargaming. It is noticeable that most of the publicity around the game's use by the USMC comes from the 3rd Marine Division (it must be conjectured if that is due to a lack of interest in other divisions or better publicity by the 3rd.[76] These sets are then held at battalion level for issuing to companies.

The requirement to request the off the shelf games also highlights another aspect of the USMC requirements, namely cost effectiveness. The USMC has long been seen as the poor relation of the US armed forces and as such has often used less than ideal solutions for longer than ideal. Being able to purchase an off the shelf package ready for issue is an ideal fit.

Target Audience

The Marine Corps Association makes it clear that the game is intended to be used by all leaders down to section level.[77] The level of play is surprisingly low as the game is intended as an introductory wargame (the manufacturer recommends for age 8+).[78] This, while initially surprising actually makes perfect sense as this maximises the potential for participation unlike the much more complex games employed by the US Army and in officer training internationally (the only other reference to a commercial game of such simplicity is in German officer training where the same author's ancient period game "Command and Colors: Ancients"[79] is used as a non-controversial alternative).[80]

Terrain and Observation

The hex boards are double sided, one portraying open country and the other a beach (an ideal choice for the USMC). Once the scenario has been chosen, players then add extra terrain features such as built up areas, rivers, hills, woodland and bridges as detailed in the scenario. Each has a card which explains the rules associated with it. Summaries of a sample are included below:

Terrain	Movement	Combat
Clear	No effect	No effect
Beach	Maximum move is 2 hexes	No effect
River	Impassible except over bridges	No effect
Towns and villages	Stop movement on entering (may not attack afterwards)	Armour attacks out at -2 dice Blocks line of sight

[75] Mitchell, Preston. "Request a Wargame." Marine Corps Association, November 3, 2022. https://mca-marines.org/request-a-wargame/.

[76] It is possible that as the 3rd Marine Division is based in Okinawa, Japan it has a lower access to training areas than the 1st, 2nd and 4th Marine Divisions who are based in the United States making wargaming of higher importance in developing and maintaining tactical skills.

[77] Thiele, Gregory A. "Wargaming." Marine Corps Association, May 8, 2023. https://mca-marines.org/decision-making-exercises/wargaming-2/#:~:text=Memoir%20'44%20is%20a%20unique,and%20objectives%20of%20each%20army.

[78] Borg, Richard. "Memoir '44." Days of Wonder, 2004.box

[79] Borg, Richard. "Commands and Colors: Ancients." GMT Games, 2006.

[80] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesi0s.pdf.p118

	Infantry attack at -1 die
	Armour attacks at -2 dice

Some scenarios modify this further, for example a ruined town might not allow armoured units to enter at all.

This mechanism allows massive flexibility in creating scenarios and even allows players to experiment by replaying the scenario with a slightly different terrain (for example replaying the Goodwood scenario without the heavy air attacks on Caen making it a normal built up area instead of a ruin but allowing the German player more flexibility on set up as the road network would be intact)[81].

Combat

The rules here are very simple, units can take a number of hits before they are removed from the game and function at full efficiency until this point. Each until rolls a certain number of special dice when firing up to their maximum range (for example three hexes for tanks) and interprets the result as per the following table:

Die face	Result
Grenade	Inflicts one hit on anything
Infantryman	Inflicts one hit on infantry
Infantryman	Inflicts one hit on infantry
Tank	Inflicts one hit on armour
Star	May have a special effect depending on the scenario or activation method, otherwise miss
Flag	Forces unit to withdraw 1 hex

The number of dice rolled can be modified by range or the terrain in the target hex. While relatively simplistic, this has the benefit that it is accessible and the use of symbols instead of numbers further enhances this, reducing the need to look up charts.

Command and Control

This is the most important aspect of these rules and probably the reason the USMC have adopted them as a training aid. The battlefield is split into two flanks and a centre section, all of equal width. Units may move freely between these sectors but it is important which sector they are in at the start of each turn. At the start of the game players are dealt a number of command cards (the number depending on the scenario to simulate the command and logistic ability of the force represented but usually around 5-6). Each turn a player chooses one of these cards to play before picking up a replacement from the shared deck at the end of the turn. This card then determines which units can activate that turn. Activated units have different abilities based on their unit type, for example infantry can move 0-1 hexes and fire, armour can move up to 3 hexes and fire and artillery can move 1 hex or fire (these can of course be modified by the scenario).

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[81] All examples of modifications to scenarios used in this chapter were created by the author for illustrative purposes.

Examples of cards include:

Card	Effect
General advance	Activate 2 units in each sector
Recon	Activate 1 unit in the sector shown on the card (there is one for each sector). After activating draw 2 cards and choose which to keep.
Attack	Activate 3 units in the sector shown on the card (there is one for each sector)
Direct from HQ	Activate 4 units of your choice regardless of sector
Dig in	Activate 4 infantry units to improve their positions. Place sandbag markers on these.
Counter-Attack	Issue the same order as your opponent just played but reverse the sector (left becomes right and vice-versa)

There are a total of sixty cards in the base game with multiple of the basic actions and often only one of the more powerful cards. Some scenarios modify this further, for example giving the player certain cards at the start plus a random selection.

These cards form the main differentiating factor of this game, forcing players to constantly plan ahead, holding cards for the right moment to exploit an opportunity or to counter an enemy move. This interplay and planning can be very frustrating as players watch an opportunity pass them by as they can not coordinate their troops to seize it or their plans are disrupted by an enemy acting in a way they did not expect and they do not have the required cards to counter it. This constant decision making is the epitome of what Krulak wanted Marines to practice to improve decision making skills.

Troop Quality

The Marines place a much higher premium on troop quality than the other forces discussed, something often overlooked as noted by Curry.[82] Unlike the other rules considered here, there are rules for specialist units such as French Resistance units (with a number of extra rules) and elite troops. Some scenarios also include extra options such as heavier Tiger tanks. Because of the highly modular nature of the scenarios it is easy to create a special rule to simulate specific strengths or weaknesses that a designer wishes to create. For example a British armoured unit equipped with Sherman Fireflies might be ruled to hit armour on a star. This user ability to create rules massively increases the flexibility of the rules, player interest and to create specific teaching points.

Playability

With a play time of 30-60 minutes, the rules are designed for short games (in contrast to the much more complex Army rules). The rules are also highly modular, the book contains sixteen scenarios (plus a large battle using multiple sets) with many more available free on the web or in the many supplements for the game. This results in a large replayability factor for Marines. Additionally, scenarios may be written to teach specific learning points (for example conducting a fighting withdrawal which does not feature in the game's scenarios). The creation of such is a matter of minutes of design followed by playing it numerous times to ensure that it works as the designer intended. It can therefore be tinkered with to remain fresh (especially as the command and control and troops quality mechanisms can also be adjusted).

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[82] Mouat, Tom, Brendan B McBreen, and John Curry. "Wargaming: Keynote Speech." DSET. Speech presented at the DSET, June 6, 2023.

The rules have taken sufficient hold that the 3rd Marine Division has actually held gaming tournaments using "Memoir '44, it is notable that the official write up of this was by a corporal, emphasising that the grass roots approach the USMC has promoted appears to be working.[83]

Legacy

This has all produced a very robust interest in wargaming in the USMC as can be seen by the amount of material published in the Marine Corps Gazette referenced here, especially but not limited to the 3rd Marine Division. The institutional culture celebrating wargaming is now very widespread in the Marine Corps, to the point where the hobby wargaming YouTube channel Little Wars TV were invited by the National Museum of the Marine Corps to recreate the Battle of Chosin at the museum.[84]

The creation of a wargaming division shows that there is now also a move to look at higher level gaming, probably as those exposed reach places of influence. This division has created two main games, "Assassin's Mace" and "Zapad," both of these are set in 2025 and deal with the Pacific and Eastern Europe respectively.[85] Given the fact that the USMC is unlikely to operate independently, it unsurprisingly incorporates all the services (and even cyber warfare). As a result it has been used by the Army and Navy colleges (as yet I have found no evidence of it's use by the Air Force but given their highly developed gaming systems they may well have their own equivalent.

The promotion of innovative thinking appears to have borne fruit, in 2002 the US simulated a future war with a Middle Eastern country to test new force structures and tactics, the defender Lt Col Paul van Riper of the USMC used highly unorthodox tactics against his tri-service opponents, such as using motorcycle couriers instead of insecure radios. The result was a major red force success and the restarting of the scenario with the assumption being the red forces had adopted conventional tactics.[86]

Other Rules – Similarities

Simple easy to play games have been a feature of USMC wargaming for some time, including creating possibly the first PC based wargame intended as a training aid, the "TACOPS" game in 1994.[87] This was developed by Major Holdridge of the USMC but oddly in the first iteration featured the US Army verses the OPFOR (later versions added USMC specific equipment, Canadian, Australian and New Zealand forces plus a wider selection of OPFPR equipment). Players input their orders and then a one-minute play-through follows before players can amend orders. This was used more informally hoping to cash in on the growth of personal computing. Quite successful there were eventually four versions mainly to keep up with operating systems and hardware (when using 2002 v4.0[88] I could see little change from the version I remember using in the mid-late 1990s, other than

[83] Hernandez, Timothy. "3rd Marine Division Challenges Junior Marines with War Games." 3rd Marine Division, December 16, 2019. https://www.3rdmardiv.marines.mil/News/News-Article-Display/Article/2040459/3rd-marine-division-challenges-junior-marines-with-war-games/.

[84] Little Wars TV. "Massive Chosin Reservoir Wargame." YouTube, May 29, 2023. https://www.youtube.com/watch?v=I6JAoovjppk.

[85] "Wargame Design: The Marine Corps' Operational Wargame System W/ Tim Barrick." YouTube, July 21, 2021. https://www.youtube.com/watch?v=3A7JZ4MjIMM&t=206s.

[86] "War Game Was Fixed to Ensure American Victory, Claims General." The Guardian, August 21, 2002. https://www.theguardian.com/world/2002/aug/21/usa.julianborger.

[87] Hodridge, I L. "Tac Ops." Computer software. Battlefront, 1994.

[88] The only one modern hardware will run successfully due to hardware and software developments.

colour maps, although it is entirely possible that there were changes to the internal data). It is notable that the original boxed version of the game included a 244 page manual which included reproductions of US field manuals.[89]

Conclusion

It is notable that a lower tech approach is evident compared to the Army, favouring manual games although the Rand Corporation report of 2019 notes that when presenting options there was a request to emphasise computer options, possibly as there was becoming more of a move to inter-service co-operation and this would gain respectability.[90] It is possible that the experience of the 1960s game that took six months to adjudicate twelve hours of combat, hardly something that would allow repetition to try new ideas.[91]

Marine Corps Doctrinal Publication emphasises the fact that the enemy will act unexpectedly and unpredictably, stating "appreciating this dynamic/ interplay between opposing human wills is essential to understanding the fundamental nature of war."[92] This points towards the preference for human over machine and von Riper is a good illustration of how the USMC values innovative answers.

"Memoir '44" certainly fits these preferences and by pushing it down to the lowest levels of leadership it is in many ways the ideal game despite as noted earlier it's lack of relevance in the subject matter of the game.

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[89] An interesting contrast to the 2021 leaking of technical details of the Challenger II tank to support an argument on how well the tank was modelled in "War Thunder."

[90] .[90] Wong, Yuna Huh, Sebastion Joon, BAE, Elizabeth M Bartels, and Benjamin Smith. Rep. *Next-Generation Wargaming for the U.S. Marine Corps Recommended Courses of Action*. Accessed July 10, 2023. https://www.rand.org/content/dam/rand/pubs/research_reports/RR2200/RR2227/RAND_RR2227.pdf. p xiv

[91] Caffrey, Matthew B. On wargaming: How wargames have shaped history and how they may shape the future. Newport, RI: Naval War College Press, 2019. p81

[92] Quoted in Thiele, Gregory A. "Marines Ought to Play More Games!" Marine Corps Gazette 100, no. 1 (January 2016): 65–67.p65

UK Gaming – "Take That Hill!"

Introduction

British Army interest in wargaming can be best summed up as sporadic. Despite the increased professionalism of the officer class through the period it is clear that only the determined efforts of individuals have pushed wargaming forward (these can be external such as Paddy Griffith or internal such as Major Tom Mouat, SO2 DS Modelling and Simulation at Shrivenham Defence College). These individuals have resulted in a very patchy application of wargaming as a resource for training. Finally in 2017, a formal doctrine was issued[93] which was intended to encourage wargaming, making it more a corporate activity. Due to the diverse influences prior to this, British Army wargaming is the most diverse of the armies looked at, using a very wide range of activities from traditional wargaming through to some very novel activities such as matrix games (see Appendix 4).

A history of British Army Wargaming

By the 1870s there was interest in wargaming in the conservative UK although usually at allow level on an officer's own initiative. Some of these were privately published and a number have been reprinted individually and collectively by the History of Wargaming Project (covering such games as "Barings", "Bellum" and "Polemos").[94] The first official set of rules was issued in 1896 and were designed to use readily available maps[95](it is worth remembering that the Ordinance Survey was originally a military body). These used a very fixed rules structure (the so called rigid Kriegsspiel) and as a result needed to be regularly changed to match developments in technology and tactics and these can be traced through the rules. These culminated in the first high level wargame in 1905, Greirson's Strategic War Game which explored British reactions to a German invasion of Belgium as part of a war with France being played in real time. Wilson gives a good study of this[96] drawing on the papers of the National Archives.[97] The works of H G Wells and Fred Jane also resulted in the spread of wargaming into the civilian world through figure games.

The period of the First World War, interwar years and Second World War have little material published at present other than the Staff College exercises (which as they are not adversarial and no future effect of decisions are included are excluded here by definition). Most gaming was done by the RAF and most famously the Western Approaches Tactical Unit (WATU) of the Royal Navy. The British Army did however develop Operational Research (OR) designed to predict battlefield results.[98]

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[93] Development, Concepts and Doctrine Centre. Wargaming Handbook. Shrivenham, Wiltshire: Ministry of Defence, 2017.

[94] Curry, John, ed. *The British Kriegsspiel (1872): Including Rusi's Polemos (1888)*. Vol. 2 of *Early Wargames*. Raleigh, NC: History of Wargaming Project, 2022.

[95] War Office. Rules for the Conduct of the War-Game on a Map 1896. Reproduction ed. Forgotten Books, 2012.

[96] Wilson, Andrew. Andrew Wilson's the bomb and the computer: The history of professional wargaming 1780-1968. Edited by John Curry. History of Wargaming Project, 2014. p37-42

[97] Grierson, James. Records of a Strategic Wargame. National Archives, n.d. WO33/354

[98] This continued post war with possibly the best known and respected example being Rowland, David. David Rowland's The Stress of Battle: Quantifying human performance in battle for historical analysis and wargaming. Edited by John Curry. 2nd ed. History of Wargaming Project, 2022.

Immediately post war, British wargames drew heavily on the OR information from World War Two.[99] When using them to refight battles from Korea I found they produced accurate results. Games were intermittently produced at different levels and with different aims in mind. These were sometimes interspersed with prolific activity at a unit level. Many of the games produced were very specific such as the 1978 desert fighting set,[100] numerous counter insurgency games (based mainly around Northern Ireland)[101] and a series of games intended for use at Sandhurst (enquiries at Sandhurst stated that they no longer use wargaming but this is probably a definition issue as there is an inbuild bias against the word "game").

Mention must be made in passing of the 1974 wargame run jointly by the RMA and Staff College Camberley, namely Paddy Griffith's Operation Sealion which was an attempt to determine if the German invasion of 1940 would have succeeded. The published account refers to it by the subtitle "the book that launched academic wargaming."[102] Given the impact that this game had, this is not hyperbole and probably significantly raised the profile of wargaming at Sandhurst for some time. It is of note that Griffith met significant opposition locally but this was overcome by high level officers seeing the value and supporting it.

Currently however most wargaming in the British Army consists of smaller games developed for a specific purpose by individuals or small groups and this study considers "Take That Hill!" as a paragon of this.

"Take That Hill!"

Origins and use

"Take That Hill!"[103] was originally created by Sabin for students at King's College London as part of his courses using wargaming to teach military history. The aim was to "simulate the tension between concentration and dispersion in infantry tactics."[104] UK Fight Club however saw the potential for this to be used in the training at all levels by the British Army in line with their mantra "think – fight – learn- repeat."[105] As a result the game was expanded to allow for variations in support weapons and enemy defences.

Scale of Issue and Equipment

The rules are available in three formats, a freely available pdf version,[106] using the Steam Tabletop Simulator package or as a commercial style boxed game. While these are in different formats the

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[99] Ministry of Defence. BAOR Operational Wargaming 1950-1960: /the British Army Tactical Wargame (1956). Edited by John Curry and Peter Perla. History of Wargaming Project, 2020.

[100] Curry, John, ed. The British Army Desert War Game: MoD Wargaming Rules (1978). of Map Based Wargames. History of Wargaming Project, 2012.

[101] A number if which are collected in Griffith, Paddy. Paddy Griffith's Counter Insurgency Wargames (1980). Edited by John Curry. of History of Wargaming. History of Wargaming Project, 2016.

[102] Griffith, Paddy. Paddy Griffith's Wargaming Operation Sealion: The game that launched academic wargaming. Edited by John Curry. The History of WargamTake That Hilling Project, 2021.

[103] UK Fight Club, and Phillip Sabin. "Take That Hill!," n.d.

[104] Ibid p18

[105] Ibid p16

[106] Fight Club International. "Take That Hill!" Fight Club Intl. Accessed June 1, 2023. https://www.fightclubinternational.org/take-that-hill.

systems themselves are identical. This maximum availability shows the intent to make something unofficial and developed locally available for all regardless of level and unit. Funding was obtained to print the boxed games which were then given out as required with no formal scale of issue.

Target Audience

Given the widespread accessibility of these rules, it is difficult even for UK Fight Club to identify how far these have spread. It does however show the aim to distribute as widely as possible. One hundred were given to Sandhurst but Fight Club could not identify how much use these had received.[107] Additionally the game has been used beyond the Army itself, hobby gamers have used the game as have the Army Cadet Force (ACF). The time estimate of 20-30min[108]is deliberately designed to be achievable in an Army standard 40min teaching period and still allow time for discussion after the game. Interestingly the game is also designed for solo learning as it includes full AI opponent rules for choosing targets, etc.

Terrain and Observation

The rules here are incredibly simple, each of the hexes on the board is 100m across meaning the playing area is 300 x 500m. Three hexes at one end are wooded representing the furthest point that can be approached under concealment. At the other end is a fortified hill which is the objective. The rules note that the remaining hexes are all open grassland for simplicity's sake.[109] It is easily possible to create additional terrain rules at a further layer of complexity (indeed the author has created and shared to UK Fight Club a number of alternative map boards incorporating new terrain types such as dead ground and streams – I have ignored these here to concentrate on the game as issued). The simplicity of the terrain allows generic use and suits the intention of a beginner's game (often the line of sight rules are the most complex aspect of board and counter games).

Combat

Combat is handled very simplistically as is appropriate for the target audience and the clear stated teaching aim. As noted above there is no line-of-sight issue as all hexes can see each other, there are no rules to adjudicate if units are visible, all that is needed is a mechanism to see if the target is supressed when shot at (units are not killed except by close assault). The simple mechanism used is a simple six-sided dice roll with the blue (attacking) force requiring a roll higher than the number of hexes to the target and the red (defender) requiring equal or higher. This accounts for the difference of being in a prepared position.

Range	1	2	3	4	5
Attacker % hit	84	67	50	33	17
Defender % hit	100	84	67	50	33

While this seems somewhat simplistic it does give a result not too far removed from Rowland given the coarseness of the percentages from a single normal dice.[110] While the use of two dice to moderate extreme results through the bell curve would produce a more granular result, given the target audience and simplicity the single dice is effective and the large number of rolls during the

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107 UK Fight Club members. "Discussion." Bristol: DSET, July 6, 2023.
108 UK Fight Club, and Phillip Sabin. "Take That Hill!," n.d.box rear
109 Ibid p2
110 Rowland, David. David Rowland's The Stress of Battle: Quantifying human performance in battle for historical analysis and wargaming. Edited by John Curry. 2nd ed. History of Wargaming Project, 2022. p52-115

game will average out the luck (this obviously does not always occur – one wonderful piece of archive evidence of a WATU wargame included an obviously frustrated commander putting on an order sheet "get a new gunnery officer!").[111] What the rules do surprisingly well is simulate how effective fire is in supressing an enemy at different ranges.

Additional rules are included for support weapons in the advanced rules, allowing the player to have another platoon providing overwatch, a GPMG section and/or 81mm mortars (firing either HE or smoke). These add little to the complexity of the game as realistically the player has little control of these if they are chosen. For example the 81mm mortar firing smoke hits random hexes for the first three turns and the GPMGs fire until a blue section reaches row four. Introducing these (and other rules) gradually helps teach the value of each independently and in concert further enhancing the learning experience.

Command and Control

The attacking force represents a platoon and is made up of three section counters and a platoon headquarters counter. This headquarters counter is in many ways the most important of these despite the fact that it can not fire or assault. After a counter takes an action (either moving or firing) it is flipped over to it's spent side. This also occurs when a unit is successfully shot at. Spent units may not take another action until rallied. This occurs at the end of each turn and is not automatic, instead units in the same hex as the headquarters rally automatically, while units adjacent rally on a dice roll of 2-6 and units two hexes rally on a 3-6. This is expanded slightly in the advanced rules to take account of weight of fire, command distances and the impact of different types. This indicates an advanced understanding of tactical psychology.[112] Even the basic rules teach a very significant point, namely the importance of leaders and their need to be at the critical point. Given that the game is intended for junior leaders (and potential junior leaders) it is a very significant unstated teaching point. As the headquarters counter fulfils no other function it is clear that this was a deliberately included factor.

Troop Quality

There is no provision for different quality troops included. This is unsurprising as it is a common trend in British Army wargames (it can be traced to the 1950s BAOR rules[113] and was continued in the 1978 desert rules[114]). Given that this is a entry level game[115], this omission is understandable as incorporating this level of chrome on such a simple game would be difficult without changing the mechanisms. As most wargames actually tend towards underestimating an enemy this is not necessarily a bad thing forcing students to treat the enemy as better than they are.[116]

Playability

In a game designed to be used by newcomers to wargaming in order to teach basic lessons, this is a primary factor. Having a total of less than five pages of basic rules complexity is on a par with

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[111] Strong, Paul E. E-mail WATU Game, May 21, 2023.

[112] UK Fight Club, and Phillip Sabin. "Take That Hill!," n.d. p9 refers to the rules being developed in line with Murray, Leo. War Games: The Psychology of Combat. Faber Factory, 2018.

[113] Curry, John, ed. The British Army Desert War Game: MoD Wargaming Rules (1978). of Map Based Wargames. History of Wargaming Project, 2012.

[114] ibid

[115] UK Fight Club, and Phillip Sabin. "Take That Hill!," n.d. rear of box

[116] The author was taught many years ago the British Army maxim "train hard, fight easy," a saying believed to have originated with Peter the Great.

Monopoly or similar level games. The Instructors' Corner (which is actually longer than the basic rules) gives an excellent description of how to set up the game as a teaching session with multiple copies of the game being used and interestingly at least as much time dedicated to discussion. In using the game as a training aid for ACF cadets aged 12-18, it was found that the cadets (who were of very mixed abilities) understood the rules after watching a playthrough and could play unaided and enthusiastically after their first game (it was observed that on multiple occasions cadets were seen ignoring their break in order to continue playing). It is illuminating to read their feedback on the game and how it enhanced their understanding of the principles being taught (see Appendix 3 - while this is a small sample size, discussion on informal ACF networks suggest that this pattern is very similar when used elsewhere).

Legacy

Discussion with UK Fight Club shows that the game has been a substantial success and a reprint is intended once additional funding is confirmed.[117] This is in addition to the downloadable PDF of which no statistics are available (even if they were number of downloads is not an indicator of availability as the author has printed over fifty copies from one download to distribute to units in his chain of command). The success has also lead to a sequel based around urban operations entitled "Take That Street!" which is currently undergoing development.

What it does show however is that a grass roots idea can be pushed out throughout the army and as a result influence military education through gaming (it has now gone beyond the army and has been used by the RAF Regiment and the Royal Marines and is also starting to gain traction abroad for example in Australia due to the generic nature of the game).[118]

Other Rules – Similarities

Many other rule sets have been created over the years, these fall into three categories which all share some similarities with "Take That Hill!" so there is value in a brief examination of these.

Other grass roots games

The largest source of these has been Griffith who created large numbers of games for the unofficial Sandhurst Wargaming Club.[119] Given the fact that Griffith was active in both professional and hobby gaming and often developed one into the other there is a grey area here and it quickly becomes obvious that many of the comments under the section of in-house games also apply.

Developed in-house games

These form a significant part of British Army wargaming but do tend to blow hot and cold being developed, pushed out to units, used briefly then abandoned. While in the past these have often been typical wargames such as the BAOR rules referred to above or the Sandhurst Kriegsspiel[120], there is now a movement towards simpler games that can often be developed quickly and are almost intended as disposable and for only immediate use. A good example was Mouat was tasked with creating a game to examine the impact of the Wagner revolt within hours of it occurring for a

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[117] UK Fight Club members. "Discussion." Bristol: DSET, July 6, 2023.
[118] Ibid
[119] Some of which are collected in Griffith, Paddy. A Book of Sandhurst Wargames. New York, NY: Coward, McCann and Geoghegan, 1982.
[120] Curry, John, and Tim Price. The Sandhurst Kriegsspiel: Wargaming for the modern infantry officer. History of Wargaming Project, 2016.

game in two days' time only to have it cancelled once it was clear the revolt had ended.[121] Helping with this immediacy is the use of pdf distribution of files and often the recycling of elements such as counters from earlier or even commercial games.[122]

Similarly to many grass roots games, these are often intended to teach specific lessons. A good example is the card game "Powers of Persuasion" which looks at wargaming counter-insurgency operations from the perspective of influencing the local population to support the government forces.[123] Playing in many ways like a family card game the simplicity of play hides a very sophisticated scoring system that is designed to promote post-game discussion as to why one set of cards worked in one round but scored poorly in the next.

Outside of board games, British games are usually created from scratch, unlike the American and Canadian approaches that instead both started with the recreational gaming rules published by the Wargames Research Group.[124]

These games therefore can be regarded in their current format as almost identical to grass roots games but instead of being created from the end users they are created at a higher level and passed down.

Commercial off the shelf games

Commercial wargames have a mixed reputation in professional circles, as noted earlier, Griffith was very critical of the US training game "Firefight" given to him to test and later also sold as a commercial game by SPI.[125] [126] This is examined in the section on US Army gaming so is not repeated here.

Gardiner in contrast was very positive about his experiences in particular using Avalon Hill's Advanced Squad Leader.[127] He notes that he used other games in conjunction with battlefield studies to enhance learning outcomes. Interestingly he also discusses that the British light mechanised doctrine was evolved from the initial concept to it's current form after a battlefield study of the Ardennes offensive which included gaming it repeatedly prior to the tour. Elg however notes that a subordinate of Gardiner had some doubts about the value as practiced at the unit.[128] Given the statistics quoted by Gardiner however there does seem to be some value to officers attending promotion courses having been exposed to wargaming at unit level. While attending DSET

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[121] Mouat, Tom. Twitter Message, June 25, 2023.

[122] A good example being the counters in Curry, John, and Tiim Price. Modern Crisis Scenarios for Matrix Wargames. History of Wargames Project, 2017.which include extra counters for things not in the enclosed scenarios.

[123] Project Wire. "Powers of Persuasion: The Influence Effect," 2023.

[124] Barker, Phil. War Games Rules Armour & Infantry 1950-1975. Devizes, Wiltshire: Wargames Research Group, 1974.

[125] Dunnigan, Jim, and Irad B Hardy. "Firefight." New York: Simulations Publications Inc, 1976.

[126] Curry, John. Paddy Griffith's Game of War. of History of Wargaming. Amazon, 2021. P166-168

[127] UK Fight Club "Wargaming in Training and Education." YouTube, June 26, 2021. https://www.youtube.com/watch?v=g2La5aEgrAI&t=192s.

[128] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf. p157

2023 I observed that a number of commercial games were being used in order to teach the principles of wargaming to professionals with no gaming background.

While these games are not developed specifically to teach lessons, it is clear that a commander who sees the value of gaming can look for games that are directly relevant to what he or she wishes to achieve and use this in a similar way to UK Fight Club. It has even resulted in units undergoing counter-insurgency operation training purchasing the board game "Root"[129] which features woodland animals fighting a multi-sided unconventional war for control of the forest.[130]

Conclusion

There does appear to have been significant movement since Elg's survey of 2013 where he reported there was a feeling that wargaming was a good idea but there was not even a formal definition.[131] Of note is that British games are often not accepted initially or are modified shortly after launch. This evidences that the army obviously see value in the games and are willing to invest time and effort to develop them to suit it's needs (and it must be admitted prejudices).

The UK has a culture of sharing good practice with a number of conferences, including DSET and Connections both held annually. These are open to the whole of NATO (in the High Arctic game the author played at DSET, the other players included an Italian admiral and a Canadian colonel). They are also open to academics. The Conference of Wargamers (originally set up by Paddy Griffith) is also of note as while this includes hobby gamers there is significant attendance from military gamers (who regularly bring declassified versions of military games). This allows for significant exchanges of ideas, something that Elg noted the British Army was good at, citing the 2014 symposium that introduced 100 middle ranked officers to wargaming.[132]

This all being said, most wargaming in the British Army is currently being pushed in two ways, the grass roots movement (typified by UK Fight Club) and individuals such as Mouat (who is very much a grass root movement leader who has now been accepted by the system). Little wargaming is centrally directed and every so often there is an individual such as Gardiner who will promote gaming at unit level but given the nature of the postings system will move on and the new commander (often external) allows it to wither. Little seems to have changed since the days of the interested Victorian officer leading by example and often publishing their own work.

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[129] Wehrle, Cole. "Root." Ledr Games, 2018.

[130] It is often said that insurgents play by different rules to conventional armies in this game it is literally true with different turn sequences and actions available for each force.

[131] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf.p158

[132] Ibid p145-146

Conclusion

A lack of a standardised approach to wargaming in NATO has resulted in each's approach very much suiting how it's philosophies on training and PME have developed over time. While I have concentrated on just three forces and one rule set from each force, these games have been picked to epitomise the priorities and methodology of each force. No effort has been made to quantify which is the best approach as there is clearly a case to be made that one size does not fit all, especially as the games have been developed with different aims in mind.

The US Army has clearly gone down the route of a top-down imposed approach to wargaming, games are usually high-level affairs running on big computer systems. Rules tend towards the complex and are frequently developed further to suit users before falling into disuse and a new system brought along to replace it as the next "big thing." A game for fighting the war in Afghanistan according to Mouat took $8 million and three years to develop for example.[133] The use of off the shelf commercial games is unusual enough to be remarked on such as the use of "Gulf Strike" in 1990 to consider options in the aftermath of the Iraqi invasion of Kuwait. Rules tend to concentrate on the mechanics of warfare at the expense of the soft factors such as morale and training. Players tend to be senior officers (or often multi-service) with only a little cascade down to junior officers and there is no evidence of any further cascade to NCOs. Exposure to gaming tends to happen about the time that the officers are preparing for staff roles and therefore with no previous exposure, organisational culture does not feature wargaming and without this value the trickling down does not often occur. The main aim is to teach specific lessons even if the underlying data does not support this conclusion (modifying the rules to match the lesson not the reality). A subsidiary aim was to promote confidence, particularly in the technological edge the US Army had.

In direct contrast to the Army, the USMC have developed a grass roots approach to wargaming, many of the most active proponents being junior NCOs although officer involvement is also high (especially compared to other forces). They are the only force that have actually included wargaming in NCO PME despite the very limited time window available. Marine doctrine specifically includes the use of wargames as a training aid. Unconventional options have been used in order to achieve this and while there have been gaps in the promotion of the effort, there has clearly been a sustained effort from the leadership to promote gaming (probably as a result of those exposed now having reached higher positions of influence and there already being a culture supporting the promotion). The wargames used have as a result been less about simulating the minutiae of a battlefield but instead promote flexible thinking and reaction to the Clausewitzan friction of war. As a result the rules have been designed around playability and simplicity (especially as it has to be usable by NCOs and not just officers[134]) instead of technical accuracy as far as the hard factors are concerned. In contrast the command-and-control systems of the games are much more important as this is what the USMC focus is on.

The British approach to wargaming can best be described as patchy and ad hoc or in British parlance "muddling along." Ever since the start of British involvement in wargaming there has been little centralised organisation and direction (until the 2017 handbook) but instead the guiding light has been individuals who have understood the utility and promoted it such as Greirson and Gardiner. Once they have moved on, especially with the British habit of fairly short officer postings, because

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[133] Mouat, Tom, Brendan B McBreen, and John Curry. "Wargaming: Keynote Speech." DSET. Speech presented at the DSET, June 6, 2023.

[134] The USMC requires a high school diploma for entry as a marine and a bachelor's degree for officer entry.

there is no centralised culture promoting wargaming it has withered. Even officer training at Sandhurst has been seen to follow this pattern, the highpoint being during Paddy Griffith and David Chandler's tenure. With this lack of a centralised guiding light, there are only a few centralised rules that do not ever appear to have seen widespread use. Instead games are developed locally to suit user requirements (often to a very short time scale, especially when reacting to current events). Few of these have had any long-term use or spread beyond the sponsoring unit ("Take That Hill!" is unusual in that respect). The British Army is also the most flexible in game use from commercially available games (as varied as "Root" and "Advanced Squad Leader"), through matrix games (the UK being almost the sole user in the timescale considered), the traditional map games and even to unconventional approaches such as "Powers of Persuasion." The level these games are pitched at also varies through all levels of command. This wide range makes it hard to generalise about the emphasis of the games as each will be chosen to meet a very diverse audience. Whie this has the advantage of maximising opportunity there is also a resulting duplication of effort.

Glossary

All terms are explained on first use in the text but are repeated here for convenience.

ACF	Army Cadet Force - a youth organisation run by the British Army for 12–18-year-olds and staffed by civilian part -time volunteers
APC	Armoured Personnel Carrier
ARVN	Army of the Republic of Vietnam – the former South Vietnam
ATGM	Anti-Tank Guided Missile
BAOR	British Army of the Rhine – British troops deployed to Germany during the Cold War and the immediate aftermath
BMP	Boyevaya Mashina Pyekhoty (Russian) – Infantry Fighting Vehicle
BRDM	Bronirovannaya Razvedyvatelnaya Dozornaya Mashina (Russian) - armoured reconnaissance/patrol vehicle
BTR	Bronetransporter (Russian) - armoured transporter, i.e. an APC
CoW	Conference of Wargamers - a conference held by Wargames Developments
DS	Directing Staff
DSET	Defence Simulation Education and Training – conference
GPMG	General Purpose Machine Gun – the British L7A2 version of the FN MAG
GSFG	Group of Soviet Forces Germany
HE	High Explosive
HQ	Headquarters
IDF	Israeli Defence Force or in other contexts Indirect Fire
IFV	Infantry Fighting Vehicle
MACLOS	Manual Command to Line Of Sight
MBT	Main Battle Tank
MG	Machine Gun
NATO	North Atlantic Treaty Organisation
NCO	Non-Commissioned Officer
OPFOR	OPposing FORces – friendly troops playing the enemy on exercise
OR	Other Ranks (non-officers)
ORBAT	ORder of Battle
PAVN	Peoples Army of VietNam - the North Vietnamese army
PME	Professional Military Education
RAF	Royal Air Force
RMA	Royal Military Academy (Sandhurst)
RN	Royal Navy
SACLOS	Semi-Automatic Command to Line Of Sight
SO2	Staff Officer 2
TACOPS	TACtical OPerationS – a USMC computer wargame
TOE	Table of Organisation and Equipment
TOW	Tube launched, Optical tracked, Wire guided missile
USMC	United States Marine Corps
WATU	Western Approaches Tactical Unit – a World War Two Royal Navy training unit that included significant wargaming elements

Appendix 1: Rule set comparison expanded from Curry

Curry notes in his article[135] that the data in a number of games can vary considerably. The rules he uses are:

Rules	Nationality	Date	Notes
British Army Desert Wargame	British	1968	Uses a higher level than the other rules using platoons not individual vehicles
Firefight	American	1976	Board and counter game
Dunn Kempf	American	1977	
Contact!	Canadian	1980	Developed from the same base rules as Dunn Kempf
Block Buster	American	1984	Urban development of Dunn Kempf

Details of all of these can be found in the main body.

The first table of comparison is a Russian T62 tank with a 115mm gun firing at a UK Chieftain tank that is stationary at a range of 750m.

Rules	Probability of hitting and killing	Notes
British Army Desert Rules	96%	Does not accurately reflect individual tank v individual tank but instead unit verses unit fire and reduces effectiveness not individual kills
Firefight	69%	
Contact	50%	
Dunn Kempf	6%	

This brings up an interesting anomaly, namely that the Chieftain is only present in the first set of rules. Using the data sheets I have worked backwards and identified that Curry appears to have used the M60 data chart modified down by approximately 25%). This is not unrealistic as comparing publicly accessible data across multiple sources this is broadly in line. I therefore extended this to the following additional rules using the same modifier for Blockbuster that does not feature the Chieftain.

Additional Rules	Probability of hitting and killing	Notes
Blockbuster	21%	
Wargames Research Group (WRG)	14%	Commercial set that Contact! and Dunn Kempf were based on

Even if we discount the British rules this produces a significant difference between sets, of especial interest is the difference between the WRG set and the games developed from it, most notable is the change from Dunn Kempf and the Blockbuster rules that are a development of it. Unfortunately while these tanks have actually faced each other in the Iran-Iraq war, there is no publicly available data to compare against.

This clearly demonstrates that even professional rules do not agree on effectiveness. It is possible that later rules used better data on the T62 (or possibly better models such as the T62M

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[135] Curry, John. "Professional Wargaming: A Flawed but Useful Tool." Simulation &amp; Gaming 51, no. 5 (October 17, 2020): 612–31. https://doi.org/10.1177/1046878120901852.

Curry also notes that during playtesting there were significant differences in the time taken to complete actions. This is not surprising in light of experience (the British Army for example after the Falklands War changed the time estimated to conduct a flanking attack by a platoon from 10 minutes to an hour and a half[136]).

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[136] Friend of the author in conversation approx. 1991

Appendix 2: German Gaming

Military wargaming goes back a long way, including games such as "Wei Hai" and "Chess" but the first modern wargame was the Prussian "Kriegsspiel" (which translates literally as War Game), which was created by a Prussian officer von Reisswitz in 1824. After the Chief of the General Staff, von Muffling watched a demonstration of the second version run by von Reisswitz's son , he remarked "this is not a game it is training for war[137]," and it spread rapidly through the army. This continued to spread quickly on continental Europe with a Swedish translation by 1830 until most European armies had a version.

The period of the First World War, interwar years and Second World War saw a massive use of wargaming, correctly anticipating the failure of the Michael Offensive (which was launched regardless, due to a lack of options), exponential growth under the Reichswehr and the infamous D-Day wargame where General Marcks was about to play the allies correctly predicting the strategy they were actually performing.

Having led the world in the field of military wargaming until 1945, post-war there was an atrophy of wargaming in the Bundeswehr with little activity (perhaps in a reaction to the Nazi's militarism?). Indeed when forming the first staff courses, the US Air Force was requested to provide an officer with wargaming experience (although research indicates that this resulted only in air combat wargames and outside our scope) [138] In 2006, die Führungsakademie der Bundeswehr (German Army Command and Staff College) published a detailed handbook on how to organise and conduct a course of action (CoA) wargame.[139] Eig does point out that the high popularity of board games in Germany has resulted in a gaming culture and even the educational use of games in civil education for leadership, team work, conflict resolution and world affairs (actually run by German officers).[140] I would suggest that while these games are indeed evidence of a gaming society, the lack of overt militarism (understandable in the context), mitigate against the German Army being adept in wargaming although it certainly indicates an interest in influence gaming (at least since German involvement in wider affairs post-Cold War). There now appears to regard wargaming as an acceptable aspect of military training.[141]

Given the origin of the wargame in the German military systems, it is surprising how little is actually now undertaken. A typical graduating officer would have a total of three days of gaming (all using a system that does not fit our definition as it is not opposed). Each year will then add one day to this followed by a little more exposure on courses as they progress. Attending staff college will add a less

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[137] Quoted in Wilson, Andrew. Andrew Wilson's the bomb and the computer: The history of professional wargaming 1780-1968. Edited by John Curry. History of Wargaming Project, 2014.p19
[138] Caffrey, Matthew B. On wargaming: How wargames have shaped history and how they may shape the future. Newport, RI: Naval War College Press, 2019. p71
[139] die Führungsakademie der Bundeswehr, Kriegspiel: Leitfaden zur Vorbereitung und Durchführung (2006).
[140] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf. p 23
[141] The Bundeswehr now actually publicise the fact that they wargame, see "Wargaming - Military Meets Fiction." Bundeswehr, January 19, 2023. https://www.bundeswehr.de/en/organization/further-fmod-departments/bundeswehr-command-and-staff-college/wargaming-military-meets-fiction-5570824.

than two weeks. It is also of note that all gaming is operational and strategic levels with no evidence of tactical gaming.

The German Army have two main systems in place during officer training, Simulationssystem zur Rahmenubungen (Simulation in support of Exercises – SIRA) and Simulationsbasiertes Training für Militärakademien (Simulation-based Training for Military Academies – SITA). These were developed in the 1990s for company and battalion level command respectively. They are used only for a total of three days during the officer training course.[142] The aim is that post officer training, every battalion undertakes one SIRA exercise per year. These pit the students in a realistic chain of command against a computer opponent. Elg note that subordinates are not allowed to deviate from the plans to stop them being "cowboys".[143] As such with no opposition and limited freedom of choice, it does not meet the definition of a wargame.

Of more relevance are the higher level Korpsrahamen Simulationsmodell zur Offizierausbildung (KORA) and Simulationssystem zur Unterstutzung von Rahmenbungen (SIRA) for corps/division and brigade/battalion level training respectively. This does use an opposition red force with both sides having their decisions input to the computer.[144] Additionally a human director is used to moderate unrealistic results (it is felt that AI does not have the capability to act realistically enough yet). While limiting the random factor, this can result in unconscious bias and a tendency towards the orthodox solution (such as the infamous Midway wargame where the presiding admiral reversed decisions he did not approve of). Elg also notes that scripted exercises are the main aim with free play discouraged.[145] This also pushes the game towards reinforcing the orthodox.

Each German officer training classroom has access to a small (1m x 1m) sand table and an annual budget of €40 to buy extra teaching resources. This can include the purchase of model vehicles. Elg notes from personal observation that these are rarely used for wargaming, instead mainly being used to visualise problems.[146] I have found no evidence of such facilities at unit level.

German use of commercial games is very limited Elg notes that when officers attend university as part of their education there is an option to look at combat modelling using boardgames ("Days of Battle: Golan Heights" is cited as an example[147])[148]. This is an interesting choice for such a game (even though the battle is now fifty years old, it is a recent example of two well equipped armies in high intensity warfare) as it is relatively simple for such a game with a total of under fifty unit

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[142] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf.p113-118
[143] Ibid p117
[144] Ibid p127-128
[145] Ibid p130-131
[146] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesis.pdf.p118
[146] Ibid p123
[147] Chadwick, Frank. "Days of Battle: Golan Heights." Banana Games, 2013.
[148] Elg, Johan Erik. "Wargaming in Military Education for Army Officers and Officer Cadets," 2017. https://kclpure.kcl.ac.uk/ws/portalfiles/portal/86127641/2018_Elg_Johan_1275392_ethesi0s.pdf.p118

counters and is from a designer known for introductory wargames. Of note is the fact that numbers of students undertaking this are low (a total of eight in 2015).[149] At a higher (staff level) some commercial games are used, these are however subject to a major limitation, namely that games set in the 20th Century onwards are politically unacceptable, the most modern game played appears to be set in the Middle Ages ("Crusader Rex"[150]). Interestingly given that the games are aimed at staff officers, another game is "Command and Colours Ancients.[151]" This is a variant of the "Memoir '44" game used by the USMC to train all troops at a unit level! The introductory nature probably is caused by a lack of exposure to gaming at prior stages of their careers. There appears to be some change here, possibly due to the war in the Ukraine, the Bundeswehr website alludes to a (unfortunately not identified) game on the war in the Ukraine being used at the Command and Staff College.[152]

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[149] Ibid p118

[150] Dalgleish, Tom, and Jerry Taylor. "Crusader Rex." Columbia Games, 2005.

[151] , Richard. "Commands and Colors: Ancients." GMT Games, 2006.

[152] "Wargaming - Military Meets Fiction." Bundeswehr, January 19, 2023. https://www.bundeswehr.de/en/organization/further-fmod-departments/bundeswehr-command-and-staff-college/wargaming-military-meets-fiction-5570824.

Appendix 3 – Summary of Feedback on "Take That Hill!"

Methodology

This section consists of the feedback forms from a total of 8 sessions of gaming "Take That Hill!" conducted by the author as part of his ACF duties over the period January – June 2023. In each case the whole detachment of between 8 and 32 cadets (plus in most cases adult staff) were involved. Blue players worked in pairs to discuss decisions and depending on numbers either a single or pair of red players (on the initial session red was a single player with an observer on each game to give neutral feedback as recommended in the PDF version of the rules). This was found to be ineffective with the observer frequently becoming disinterested. With two red players it was observed that discussion of red targeting priorities enhanced the learning outcomes.

In each session only the basic game was used although once players were aware there were advanced rules I was frequently asked where these could be obtained (all students were given a link to where they could download the game without mentioning the advanced rules were also there).

Sample Size

The games totalled the following numbers of players:

Game	Participants	Feedback forms
1	8	7
2	14	11
3	17	16
4	32	23
5	14	12
6	12	10
7	9	8
8	12	13
Total	118	100

After each game the players filled in a group feedback form before changing roles and playing again. As forms were completed at game ends and training time was restricted by the length of the parade evening some games were uncompleted and had no feedback form.

Feedback Format

The feedback form used the questions from the boxed set, namely:

"1. What was your plan?
2. Did it work?
3. Why did it work/not work?
4. What did you learn about the simulation that you did not know before?
5. How realistic do you think the wargame is (1-5 rating?"[153]

All feedback was anonymous to encourage completion.

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[153] UK Fight Club, and Phillip Sabin. "Take That Hill!," n.d.p11

Answer tabulation

Question 1: What was your plan?

This has not been tabulated as nearly all plans were listed as a variation on advancing using fire and movement although 12% noted that they would form a firebase.

Question 2: Did it work?

Answer	%
Yes	41
No	49
Unanswered	6
Unreadable	1
Partially	3

This was broadly in line with what I was expecting as the instructor notes indicate that a direct following of doctrine will likely fail.[154] If I was running this again I would probably add an extra question to see if players were more successful in later games if they changed tactics. Unfortunately the answers to question 1 were not detailed enough to discern if different tactics were being used.

Question 3: Why did it work/not work?[155]

Answer	%
Unable to flank position	28
Open ground	26
Unlucky dice rolling	18
Poor command positioning	12
Enemy advantage of a prepared position	12
Not enough manoeuvre elements	10
Lack of fire support	8
Ineffective firing	7
Lack of smoke	7
Lucky dice rolling	5
Initial suppression of the enemy	5

It is interesting that very little weighting was given to factors for success and much more emphasis was given to factors that caused failure. This is not necessarily a bad thing as failure is often a better teacher than success. I was however pleasantly surprised to see that luck was not regarded as the most important factor.

Question 4: What did you learn about the simulation that you did not know before?[156]

Answer	%
Need for supporting fire	36
Importance of where to lead from	32
Value of suppression fire	27
Need to close on the enemy	22
Value of momentum	22
Value of a prepared position	18
Fire decreasing effect at range	18
Importance of luck	15
Value of outnumbering the enemy	10
Ground appreciation	8
Need to act quickly	7

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[154] Ibid p10

[155] Answers have been grouped into categories and answers below 5% ignored

[156] Answers have been grouped into categories and answers below 5% ignored

Value of smoke	6

There were some surprising answers here as to what cadets had learned. However the issue may be the wording of the question as it puts the emphasis on what they did not previously know and the groups were very mixed from cadets who had only joined that night through to cadets who were experienced in conducting section attacks on exercise. As a result if I was reundertaking this I would change the question to include what they already knew.

Question 5: How realistic was the game?

Answer	%
1	0
2	5
3	10
4	32
5	52
Unanswered	1

It can clearly be seen that cadets found the game to be realistic (although it is fully recognised that cadets have limited experience in judging this).

Appendix 4 – Matrix Games

These were actually developed in the United States but were popularised in the United Kingdom by Wargames Developments and then grew in use in the military world through the work of Tim Price.[157] Price actually found himself in the position of creating plans on something he had created games about and then ended up on the ground when troops deployed[158]. These are probably now the most accepted face of wargaming in the military world. Matrix games require a reasonable level of knowledge from at least the organiser (player knowledge can be helped by a well written briefing).

Matrix games are a relatively new addition to the categories of wargame and need some description. These were developed by Chris Engle although it could be argued that they have some link to Griffith's "mugger game" where players discussed what the probabilities of events occurring during a battle were before coming to a consensus. While the mugger game is not a wargame by our definition (and not used by the military), the matrix game is used, mainly (but not exclusively) at higher levels.[159] Exceptions occur however and an example of tactical games is "Lagah Pol – Afghanistan," with the players taking roles such as a Coalition company commander, the local police chief, the local mayor and the insurgent commander.[160]

In a matrix game each player makes an argument in the following format:

> Action + reasons = result

After this players can make comments on how realistic they feel the plans are and what their chance of succeeding is.

For example, in a game at DSET 2023 aimed at looking at the future of the High Arctic over the next forty years, as the Russian player I used the following argument:

> Action - In areas I have access to I wish to increase the search for new resources
> Reason 1 – I already have survey teams operating in the area and I can use these as the base to increase numbers (from my initial briefing)
> Reason 2 – I have developed advanced search and rescue techniques and teams that can assist with transporting (this was a successful argument from a previous round)
> Reason 3 – The American player has agreed to give me advanced satellite surveys of the areas (this had been verbally agreed in the negotiation phase but required the American player to publicly agree when the argument was made).
> Result – I will locate resources that can then be exploited on future turns.

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[157] Curry, John, Chris Engle, and Peter Perla. *The Matrix Games Handbook*. History of Wargames Project, 2022. p3-20

[158] Curry, John, and Tim Price. Matrix Games for Modern Wargaming. Vol. 2 of Innovations in Wargaming. History of Wargaming Project, 2014.p27-28

[159] Although these do show a lot of similarities to staff rides and tactical exercises without troops (TEWTs), given that these are one sided they are outside my scope unless accompanied by other activities.

[160] Curry, John, and Tim Price. Matrix Games for Modern Wargaming. Vol. 2 of Innovations in Wargaming. History of Wargaming Project, 2014. p43-48

One player questioned if the search and rescue experience would be of much help and it was agreed it would but only at the cost of degrading it while they were being used for this. The umpire after checking with the American player agreed this was a strong argument and decided that I would have new teams available on a roll of 5+ on two six sided dice and if this was achieved I would find new resources for each following turn on 8 or more (instead of the 10 I was currently rolling against).[161]

Matrix gaming was unique to the UK despite actually being an American development (although in the years post this study's timeframe there has been limited use outside of the UK, particularly in the USMC who have used "Lagah Pol – Afghanistan" as a training aide for both officers and NCOs (modified slightly to suit USMC TOEs).[162]

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[161] Game run by Major Tom Mouat at "Defence Simulation Education and Training," 05 June 2023-08 June 2023. Bristol, 2023.

[162] Brown, Ian T, and Benjamin M Herbold. "Make It Stick: Institutionalizing Wargaming at EDCOM." Marine Corps Gazette, 22–31. Accessed August 15, 2023. Institutionalizing wargaming at EDCOM.p23-25

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