# GAME DESIGN HISTORY & THEORY

## Designing the Perfect Game

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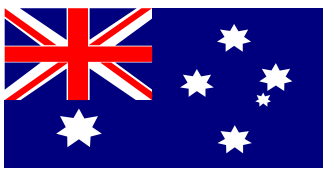

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# Introduction

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# The History of Game System Development

Anyone who has ever put a large effort in playing boardgames will always, at some point in time, think of designing his (or her) own game. I am not unusual in this respect and this strange desire has often come over me. I find the concept of designing a game an interesting mental exercise, which has the additional benefit of helping me to forget the work that pays my bills. Recently, I have been thinking a bit beyond designing games. Instead, I have been pondering the eternal boardgaming designer's question, what is the perfect game system.

While pondering these eternal truths, I realised there was one large and scientific attempt to create, if not perfect, a better game system. SPI devoted a great deal of energy in professionally analysing the problem of game system design. The visible examples of this were the so-called game system families. These were a series of games that shared most of the same rules and game systems. The theory behind this was that if a game system works well with game A, why not use it for game B.

This "trend" is most obvious when looking at **Operational Level** games of the **Second World War**. I single out **Operation Level** games of the **Second World War** only because so many games exist. It's hard to find a "trend" in a historic period with only two games. A good example of what I mean would be the Spanish American War. My game shelves are not exactly busting with games from this period. On the other hand I would possess twenty or more **Operation Level** games of the **Second World War**. With this large sample it becomes easier to ascertain any trends and game system development.

Any search for the perfect game system must start with a historic look at the period during which SPI was predominant. I wanted to know what occurred, why and what net effect did it have on the science of game design. If I could find this out, then I had a good chance of taking that trend farther and coming up with a better game system than even SPI. As you can expect the search I am undertaking needs to start at the beginning.

Back in the early days if someone wanted to design a game, they normally developed a whole new game system for it. Perhaps they borrowed ideas from other games, but basically each game was very different from any other. An example of this is the difference between Avalon Hills **Stalingrad** and Jedko's **Russian Campaign**. Both games deal with the same period and use a similar scale, but utilised very different game systems. This occurred because games had different designers. This person normally designed the entire game by himself (or herself), with minimal contact or co-operation with any other game designer. A series of games with a similar **Game System** could never occur in this environment.

This all changed when SPI started putting games in S&T magazine’s. One of the early significant acts of SPI was the regimentation of game rules. Creating the rules was normally the most horrible and unpleasant job of game design. When you are by yourself, you have little alternative but to create your rules from scratch. Initially, this copying of game rules may have not been done on purpose. However, it does not take much brain power to realise that if the guy before you had already created a set of rules, why not copy what you can of it. This trend developed rapidly at SPI, resulting in game designers being told to use a particular Game System for their game.

This standardisation of game rules indicated a high level professionalism at SPI. You can probably compare this with the car industry. When the car industry moved from hand making all components to mass production of those components, automation was the desired objective. This left the designers with more time to spend on R&D and refining the car, rather than working out how to hand make a door handle. This trend is especially evident in the computer industry today and is the bedrock of a concept called "Open Systems". What SPI did was set standards which most people followed, allowing those people to worry about the historic aspects of the game rather than what movement system to use. As long as SPI was dominant, most game designers followed these standards. What has occurred is that the standards fell apart when SPI went under, leaving us with the mess we now have.

We need to look at history. If we do not study history, we will repeat the mistakes of the past. This is never truer than in the area of game design. Many game designers have accidentally re-developed rules and game systems. In an attempt to avoid this dreadful waste of energy we need to look at the history of game design, which is of course the whole point of this article.

### *The Development Phases*

It is here that I need to make some arbitrary decisions in order to make the study of this topic easier to perform. We need to determine major events which signpost a period of game development. I have selected certain “signposts” and using this I have divided the history of game development into 4 periods. These were the

**Years of Discovery**, during which the idea of a family of game systems was in its infancy.
**Years of Development** where the family of game systems became established and the quadrigame appeared.
**Years of Professionalism**, during which the family of game systems became so established that it was norm (as game series).
**Years of Chaos**, which is with us today. (Although just recently I have noticed some hopeful trends that may indicate an end to this period.)

## The Years of Discovery

The games that were developed during the years of discovery, were each developed from scratch. Only some “ideas” were reused in new games. The event that changed all this was publishing of games in S&T magazines. When games appeared in S&T magazines, the number of games a single team of people had to work on became astronomical. Almost without any seeming intention the idea of a family of game systems began to manifest itself, simply because it was unavoidable.

The first really definable and consistent game system family was the ***Kursk System***. This game system was first used in the game **Kursk** (1971). Some people call this game system the ***France 1940 System***, as this game appeared before **Kursk** and used the same system. In this article I will call it the ***Kursk System,*** as I do not possess a copy of **France 1940**.

**Kursk** owes a lot of its ideas from even earlier games, **France 1940** and **The Battle of Moscow** being two of them. The table below is a list of all the ***Kursk System*** games and some

of the precursors. By looking at the Comparative Score of these games we can see that many games displayed a great degree of similarity to **Kursk**.

**Table 1 : Kursk System Games[1].**

| Game | CS# | Year | Designer |
|---|---|---|---|
| The Battle of Moscow | 9.5 | 1970 | David Williams |
| Kursk | **20** | 1971 | Sterling S Hart |
| Normandy | 14.5 | 1971 | ? |
| Turning Point | 19.5 | 1972 | James F Dunnigan |
| The Moscow Campaign | 17.5 | 1972 | James F Dunnigan |
| DAGC | 17.5 | 1973 | James F Dunnigan |
| NATO | 11.5 | 1973 | James F Dunnigan |
| The Ardennes Offensive | 11.5 | 1973 | James F Dunnigan |
| War in the East | 14 | 1974 | James F Dunnigan |

David Williams was originally going to design **Kursk**, but dropped out leaving the job to Sterling S. Hart. In turn Sterling S. Hart was going to design **Turning Point**, but dropped out leaving the job to James F. Dunnigan. This is a name that we will see a great deal of as we look at different game systems.

It's hard to exactly know just how much of the game system was James F. Dunnigan responsibility. As we will see most of the games in this family were fundamentally identical. James Dunnigan did not design the first games. This indicates to me that James had very little design input into this game system. However what occurred behind the scene is a mystery to me, so who really knows?

Using the Comparative Score we see that there was a core of games that shared so many features with **Kursk**, we cannot help but state they were members of a family of games. **Turning Point**, **Moscow Campaign** and **DAGC** are similar to **Kursk.** All the other games are loosely related, except fo**r The Battle of Moscow**. **Normandy** and **War in the East** display a high degree of similarity, with the other games displaying lesser similarity.

## *The Years of Discovery, History*

A good starting point in our history of this period is **The Battle of Moscow**. This game is fairly conservative in terms of its game systems and a quick look at the rules makes it clear how primitive and simple this game was. However, many of the basic foundations of current game systems were present. The supply rules, stacking rules, and unit strengths are all clearly familiar.

In order to analyse the development of game design, we need to make comparisons. We will start by comparing **The Battle of Moscow** with **Kursk**. It's this comparing that gives us the clues to how and why game systems changed and developed. By looking at what remains the same and what has changed we can get an idea of the kind of evolution occurring.

The areas that changed the most were the Zone of Control rule, the Sequence of Play and the modifiers for the Combat Results Table. **Kursk** used Elastic Zones of Control, as distinct

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[1] Key: "CS#" = Comparative Score. The game with a comparative score of 20 in the bold font is our control game. This score tells us how different the other games are to this control. The higher the score, the more similar. A score of 10 or less indicates little, if any significant similarity.

from Active Zones of Control. This occurred to encourage breakthroughs and the forming of pockets. As it turned out, it did this too well. An enhancement of the Sequence of Play occurred, resulting in the birth of the famous mechanised Movement Phase. Finally terrain modifiers effected the die roll, not the strength of the defender. This greatly reduced the effect of terrain and made attacking easier. One optional rule used in this game was the KampfGruppen rule, which was a very early version of step losses for units.

**Normandy** was published in 1971, which was the same year as **Kursk.** Like **Kursk**, **Normandy** was based on **The Battle of Moscow** and **France 1940**. As a result it displayed great similarity with **Kursk**. The only major difference was ground and unit scale, while the rest was significantly similar. The level of similarity in otherwise very different games tells us that games mechanics were being re-used as much as possible. This is a definite sign of an emerging game system family.

We now need to look at why game mechanics changed so much **between The Battle for Moscow** and the later games. **The Battle of Moscow** did work, however it worked in an unhistorical manner. There were few break through and generally no pockets. The front line simply moved forward. To resolve these problem breakthroughs were required. For this to occur, Zones of Control had to be weakened, terrain effects reduced and a second movement phase added. The result was **Kursk** and the ***Kursk System***.

**Turning Point** and **The Moscow Campaign** was published in 1972. Both these games shared all the basic mechanics of **Kursk**, however they did include some enhancements. **Turning Point** introduced the Supply Unit and **The Moscow Campaign** used Railroad units, which had the ability of repairing railways. These games also use the word Mechanised Movement Phase for the first time and made the use of KampfGruppen non-optional. No revolution occurred this year, only slow and sure development.

**DAGC**, **NATO** and **The Ardennes Offensive** appeared in 1973. **DAGC** was another classic ***Kursk System*** game, again enhancing the supply rules with the use of railhead units. On the other hand **NATO** and **Ardennes Offensive** were the beginning of a change.

Both **NATO** and **The Ardennes Offensive** used a rigid Zone of control. The elastic ZOC of the ***Kursk System*** proved too elastic. It was too easy to infiltrate and break through a front line. A common tactic was to pull your armour out of the front line and throw it against a weakly defended area in a single game turn. Once it was obvious no breakthrough was going to occur you simply moved your attack to a new part of the front line. Once people became aware of this tactic the games quickly degenerated into rather silly and unhistorical games.

Another change was terrain effects. We were now back to the multiply defender by two rule that **The Battle of Moscow** used. The die roll modifier proved not strong enough and it was too easy to break through even fortified positions. **The Ardennes Offensive** was fought over rather rough terrain, so there was a lot of terrain present on the map. Die roll shifts made the terrain features almost irrelevant for defence, as the effect on the defensive ability of a unit was minimal.

Other changes were the advent of attack-defence-movement values for units in **NATO**. Non-SPI games had previously used this system, but this was the first SPI game that used it. This occurred in order to add more realism, rather than representing a mechanics change of any great importance.

**NATO** and **The Ardennes Offensive** began to use a numeric result in their CRT. It was possible to get a Dr1 or Dr2 or even Dr3. **The Ardennes Offensive** used two CRT's, one for mobile combat and the other for assaults. The development that occurred this year was significant, as was the efforts in refining existing rules.

The rather famous **War in the East** was published in 1974. This game owed a great deal to the development that had occurred during the 1971 to 1973 period. **War in the East** represented the end of the ***Kursk System*****.** No other ***Kursk System*** game came out after 1973. This was probably because **War in the East** exposed so many problems that SPI decided to revamp the whole thing.

**War in the East** was heavily based on the ***Kursk System***. The ZOC went back to being elastic, although the terrain effects used the multiply system which **NATO** and **The Ardennes Offensive** used. The CRT did not use any numeric results and fell back to the fully Descriptive CRT, as used in the ***Kursk System***. **War in the East** used a multitude of CRT's used to reflect unit strength changes that occurred during the war. As an idea, this was first used in **The Ardennes Offensive**, but was taken to a ridicules level in **War in the East**, and generally considered a failure. The most important changes in **War in the East** were the birth of Overruns, the simple air system, and the extension of KG to all units.

We could almost say the period of 1974 to 1976 was the **War in Europe** period. SPI came out with **War in Europe** in 1976, which was a monster game of the entire European war. It was a massive effort and possibly one of the great disasters of game design. However, it was years before anyone realised this and a lot of fun was had setting this game up for attempts at play.

There were many reasons why **War in the East** was a failure, one is that the SPI team had squeezed the ***Kursk System*** into an impossibly large map scale (33 km to the hex). However the real reason was a simple failure of the game system itself. The failure of this game clearly indicated the end of this game system. What was needed was a new game system, one that resolved all the problems and difficulties experienced in **War in the East**. This came as a S&T game, **Panzergruppe Guderian**. It was to result in a game revolution and marked the beginning of the years of development.

## The Years of Development

Even though I have divided periods into years, with a start year and an end year, life was not in reality so neat. Many of the game design periods actually overlapped each other. I consider the development of the Quadrigame series of games to fit into what I call the **Years of Development**, even though it came out before **Panzergruppe Guderian**. In turn, Panzergruppe Guderian is my signpost dividing the Years of Discovery with the years of development.

It was this period that the family of game systems became an official concept. All games of a quadrigame were part of a standard game system. This was the beginning of the game system.

### *Modern Battles Quad*

The quadrigame were the first games, designed from the beginning, which were part of a game system family. These were four games packaged together in a single box. Each game

had the same basic standard rules and a small addendum covering special rules. Generally all ground, time and unit scales were the same.

The idea was excellent and proved to be very successful. People could buy a set of four small simple games that each had the same rules. If you could play one game, it only took a short while to pick up the other games. The first of these games came out in 1975, **Modern Battles**, **Blue and Grey** and **Napoleon at War**. For the purpose of simplicity I will only look at **Modern Battles**. This quadrigame was one of the most advanced and closest to our studied period, World War II.

There were two Quadrigame published which used the ***Modern Battles System***. Listed bellow are the games that constituted these quadrigames. We should note the Comparative Score. It was identical for all the games.

**Table 2 : Modern Battles Quadrigames.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Wurzburg | 20 | 1975 | James F Dunnigan |
| Chinese Farm | 20 | 1975 | Howard Barasch |
| Mukden | 20 | 1975 | David C Isby |
| Golan | 20 | 1975 | |
| Bundeswehr | 20 | 1977 | Virginia Mulholland |
| DMZ | 20 | 1977 | Joseph M Balkoski |
| Jerusalem | 20 | 1977 | Mark Herman |
| Yugoslavia | 20 | 1977 | Phil Kosnett |

The early quadrigames were all very simple and small games, normally one small map section and 100 pieces. The rules were equally short. The objective was to make these games as simple and easy to play as could reasonably be expected. The idea of having common rules was only one factor involved in this attempt at simplicity.

All the ***Modern Battles*** Quadrigames used the same scale, mechanics, sequence of play and Combat Results table. The Combat Results Table is of some interest and was the most innovative part of the game system. Instead of an odds' system, this game system used a differential combat system. It worked well for this game system, even if it failed to work well in any other game I know.

## *Panzergruppe Guderian System*

After struggling with trying to fit an imperfect game system into the monster that resulted in **War in Europe,** the ***Kursk System*** came to an end. In 1976 a new divisional level east front game came out, its name was **Panzergruppe Guderian.** It caused a game revolution that affected game design for years. So influential was this game that it spawned a family of games which all used the ***PGG System***, or Panzergruppe Guderian system.

**Panzergruppe Guderian** arrived at the right time. The older ***Kursk System*** games had proved unsatisfactory. After getting its customer's blood boiling with **War in Europe**, SPI filled a significant void with **Panzergruppe Guderian**. This game system soon spawned a host of games. A list of most of the ***PGG System*** games is as follows, along with **War in the East** and the ***Modern Battles System*** games for comparison reasons. The comparative Score is based on **Panzergruppe Guderian**.

**Table 3 : Panzergruppe Guderian Games.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| War in the East | 10 | 1974 | James F Dunnigan |
| Panzergruppe Guderian | 20 | 1976 | James F Dunnigan |
| Drive on Stalingrad | 16.5 | 1977 | B. E. Hessel |
| Cobra | 15 | 1977 | B. E. Hessel |
| Kharkov | 17.5 | 1978 | Stephen B Patrick |
| Kiev | 19.5 | 1979 | Joseph Angiolillo |
| Korsun | 17.5 | 1979 | Steve Patrick, Milton & Neil Rosenberg |
| Operation Star | 19 | 1979 | Brent Nosworthy |
| Rostov | 17 | 1979 | John H Butterfield |
| Modern Battles Quad | 4.5 | 1975 | |

We can see that **Drive on Stalingrad**, **Kharkov**, **Kiev**, **Korsun**, **Operation Star** and **Rostov** are all similar to **Panzergruppe Guderian**. We call these games part of the ***PGG System***. **Cobra** displays a high level of similarity, although we can only say this game is loosely related. Even though a score of 10 indicates **War in the East** is unrelated to **Panzergruppe Guderian**, I feel that **War in the East** had a great deal of influence on this game. Finally we can clearly see that the ***Modern Battles Quadrigames*** had little, if any relationship with **Panzergruppe Guderian**. It represents a totally separate development path.

It's very important to note that the designers of the ***PGG System*** games were all different people. This is a strong sign of a game system, different people using the same game rules. It's also of interest that James Dunnigan only designed the first game.

Like the ***Kursk System,*** games using the ***PGG System*** could have different ground scales. This occurred to fit the campaign onto a standard game map rather than to create a whole new game system. If we look at our comparative Scores we see all games are related in some degree with **Panzergruppe Guderian.** There seemed to be no intention of creating a game system family. It just happened.

After the first few games were printed people began to unofficially call this game system the ***PGG System***. It made learning a new game much easier, which was one of the benefits to players having a common game system.

## *Miscellaneous Game System*

There were also other games developed which used their own game system. Two of these games could of easily developed into their own game system families if SPI wanted this to occur. These were **Leningrad** and the second edition of **Kursk**.

**Leningrad** was an attempt to finally make **War in Europe** work. Here we had a game with the same ground, time and unit scale as **War in Europe**, which worked. The problem was this game system was that it only really worked for the Eastern Front.

**Table 4 : Leningrad, the attempt to make War in the East work.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| War in the East | 8 | 1974 | James F Dunnigan |
| Leningrad | 20 | 1979 | Dick Rustin |

The next game was **Kursk II**. This game was a beautiful work of art, but it was so complex it was difficult to play. Once again SPI could have used this game system for other games.

Possibly they could have retraced the steps of the original ***Kursk System*** of games. This never occurred, probably because of the collapse of SPI soon after.

None of these games were part of a game system, but we can see some interesting similarities. **Leningrad** used the same ground, unit and time scale as **War in the East**. However if we use the comparative score we quickly see both games share few similarities, apart from scale. The Mechanics of **Leningrad** was almost identical to th***e PGG System***. The Sequence of play was unusual, almost a retrograde movement in game design. This may have been done for simplicity sake.

**Table 5 : Doing Kursk again.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Panzergruppe Guderian | 13 | 1976 | James F Dunnigan |
| Kursk II | 20 | 1980 | Eric Goldberg |

**Kursk** seems to be loosely related to **Panzergruppe Guderian**. However, the mechanics seemed to differ. The biggest difference was the Combat Result System and the CRT. Using Comparative Score we could say both games are loosely related.

It was the Combat System that made **Kursk II** different. **Kursk II** used the mathematically excellent system of counting your attack points and spinning a die to determine the casualties you inflicted on the enemy. Unfortunately there were messy bits in this system and it seemed to fail to become popular.

## *Years of Development, History*

During 1975 the Quadrigame was born. These were the first games that used the concept of Standard Rules, the bedrock of any real game system family. Initially designed as nothing more than very simple games, they soon developed into something far more complex and formal.

It is of interest to see how the **Modern Battles Quadrigame** differed from the previous ***Kursk System***. The most significant was the CRT, it was differential and used, for the main, a numeric system of results. The terrain effects used a shift modifier system. There were some retrograde steps, the ZOC's were now active, similar to **The Battle of Moscow**, and the sequence of play lacked a mechanised movement phase. It's almost as if the designers at SPI wanted to do something very different, with **Modern Battles** they succeeded.

While the quadrigames were pioneering the concept of standard rules and exclusive rules, the successor to the ***Kursk System*** was found. This was the ***PGG System***, which was published in 1976. **Panzergruppe Guderian** was a revolution. This game introduced more new concepts and ideas than any single game before and since.

**Panzergruppe Guderian** used locked ZOC's, which were a middle ground between elastic and rigid ZOC's. Using locked ZOC's, units in a ZOC were locked into that position. As a result once you committed units to an attack, it was difficult to get those units out of the front line. In addition defenders had a difficult time retreating, which was all very historical.

The Overrun rule also represented a revolution. The previous overrun rules in **War in the East** were used to remove annoying little 1 or 2 strength units and in some exceptional circumstances help attackers break through. **Panzergruppe Guderian** introduced the concept of Combat during Movement as their Overrun rule. Now the overrunning units had to engage

in combat to overrun an enemy unit. That meant that overruns were easier to conduct, but riskier. It was an early step towards merging movement and combat and allowed an attacker to break through a defensive line that did not have depth.

Less significant changes were the advent of HQ units, to funnel supply and most importantly introduce the concept of command control. Untried units helped to increase the fog of war, and Division Integrity encouraged players to keep their divisions together. However the most important was the advent of steps, this was an enhancement of the KG/BG rule, but unlike KG/BG's each step loss was similar in value. So a division with four steps had 25% of its strength in each step, unlike the KG where a loss represented a massive drop in combat effectiveness.

Other refinements were the CRT results, they used for the first time a numeric step based result that allowed the player to choose to retreat or take step losses. In addition it was possible for both attacker and defender to be affected, which allowed successful attackers to be reduced in strength as they fought their way across a map. I have counted nine major or minor rules' developments that occurred with **Panzergruppe Guderian**. Only the original **Kursk** game can match this.

In 1977 **Drive on Stalingrad**, **Cobra**, and **Modern Battles II** were printed. **Modern Battles II** was identical to the original **Modern Battles** and represents no real development. **Drive on Stalingrad** used a usual scale of 7 days per game-turn and introduced the use of Trucks, Air Supply and Historical Hitler directives. Of these the most significant are the Hitler directive rules, which are really what I call political rules. Here a complex attempt at reproducing the historical pressures of the military commanders was implemented.

**Cobra** represented the first use of a pure step numeric system, not a revolution but did represent an important refinement. Generally the direction was away from simple descriptive results like De, or Ar2 and towards a more universal numeric system that gave the owning player a choice. More choice equals more skill, perhaps?

In 1978, the game **Kharkov** was printed. This was a pure ***PGG System*** game and in fact went backwards in the area of CRT results by using a D1/A1 system. Apart from this fact it was a non event as far as development in game systems.

Both the quadrigames and the ***PGG System*** merged in 1979 when a quadrigame was printed using the ***PGG System***, called **Army Group South Quadrigame**. Unlike the earlier quadrigames, the ***PGG System*** was not simple. It was a complex game system that required more than average amounts of rules. Unlike most quadrigames the ground scales differed between games. The scene was set for the development of the quadrigames into something far more refined and formal.

The **Army Group South Quadrigame** represented another small leap forward in the development of the ***PGG System***. The CRT was now a pure numeric step loss CRT, similar to **Cobra**. A great deal of experimentation occurred with ground and game-turn scale, but apart from this it was a pure ***PGG System*** game. The games that made up this quadrigame were **Kiev**, **Korsun**, **Operation Star** and **Rostov**.

In 1979 **Leningrad** and **Pattons 3rd Army** was published. I will deal with **Pattons 3rd Army** in the next section. **Leningrad** represented another leap forward, and to one side. **Leningrad** continued the move to a numeric step CRT by eliminating one of the only two

descriptive results left, the engaged result. We still had DE and AE, but if we study the game mechanics we see that DE results were necessary. The Sequence of Play seemed to represent a backward step by not using a mechanised Movement Phase, but in reality this was not the case. Instead, the effect of Overruns had been dramatically increased. Rather than using a mechanised movement phase to break through, you needed to overrun. This represented a new step towards the concept of combined combat and movement. Apart from this rather significant change it was very much like a ***PGG System*** game.

I personally think **Leningrad** was an attempt to make **War in the East** work by using an adaptation of the ***PGG System***. The ground, game turn and unit scales were identical. It would of not taken much to expand the game to other parts of the eastern front and then combine them to form an East Front monster game. It never occurred, but who knows what the future holds.

In 1978, the game **Tannenberg** was printed in a S&T. About the same time four more of these ***Great Wars of the East Series*** games were published. Even though all the games used the same game system, they were not called quadrigames. Instead they were called a **Series**. Most importantly each game was not a small simple game. Each used full sized map sheets and several hundred pieces. They were still simple games but used double the number of pieces and a map section that almost fitted on a full size map section. In short they were almost full sized games, rather than the beer and pretzel style games of the earlier quadrigames.

In 1976 a monster game called **Terrible Swift Sword** was published. In 1978 a smaller S&T game called **Stonewall** was published which used the same game system. In 1980 this game system was formalised and the games **Pea Ridge, Drive on Washington** and **Wilson's Creek** were published. Each was a member of the ***Great Battles of the American Civil War Series***. These were the earliest Game Series, however, the title of "Game Series" was only given to them in 1980. Before this date these games were independent games, which simply used the same game system. Game Series may have developed from these games, but they were not the first.

The concept of game system families had reached a new evolutionary step and was finally formalised. Theses' games did not have to be part of a quadrigame. Instead they could be a single game or a few games. This development continued and updated standard rules were published which could be used with the earlier games. The birth of "Open Systems" had entered the board gaming world.

In 1980 **Kursk (II)** and **5th Corp** was published. I will deal with **5th Corp** in the next section, but **Kursk (II)** represents an interesting development. **Kursk (II)** was almost like nothing we had ever seen before. It introduced a very unusual CRT, where combat represented each side attacking each other and removing losses simultaneously. This kind of system had been used in air, naval and ancient/Napoleonic games, but never Modern Land games.

In addition, stacking was step based, with stacking limited to six steps. The effect of this was that several badly damaged units could stack and be as powerful as a few full strength units. One problem with the ***PGG System*** was that if a division lost half its strength, it still had the same stacking value. So you could not put as much firepower in a hex if you used damaged units. The final major change was more information was placed on the counter than ever before.

**Kursk II** proved a very innovative game, but it failed to catch on in any large manner. It was too different, complex and difficult to play. It was obviously a game that put historical realism above playability, and suffered the fate of such a game.

The period 1978 to 1980 was the dividing period between the years of development and the years of professionalism. No more were game system families ad-hoc affairs or ways of making very simple easy to play games. It was an established concept at SPI that the best possible game system was developed and used by all game designers. It allowed those designers to concentrate on the history and events of the conflict, while ensuring you had the best possible game system. It even allowed improvements in older games. People could get the most up to date "Standard Rules" and use this for their older games. This was certainly used for the ***Great Battles of the American Civil War Series***.

This was a revolution that allowed SPI to print very large numbers of excellent games, all of which were professional. It also had a negative effect. Game complexity was not considered as detrimental as it use to be. It was considered that everyone followed the development of these game systems and could play the new enhanced version easily, as they would have played the previous game in the family. This was true, but it failed to cater for new players, who were simply overwhelmed with the explosion in the size of the rule book.

## The Years of Professionalism

The Years of Professionalism brought us the concept of The Game Series. A Game System was an unofficial concept normally describing a set of games that shared a similar game system, but which were nonetheless totally separate and distinctive games. The Quadrigames was a collection of games, normally four, which used Standard Rules and Exclusive Rules. The similarity between the games was far tighter. However, these games were normally quite small and simple games. The Game Series went far beyond Game Systems and Quadrigames as all games used Standard Rules and had their own Exclusive Rules, as in Quadrigames. However, unlike most quadrigames, each game in a Game Series was a far more complex and complete game than the typical quadrigame.

This may not be a significant issue at a first glimpse, but what it did was to make what had been occurring previously with ***PGG System*** games official. When a game was published it could be said to be a part of a particular game series, which allowed the consumer of this product to know exactly what they were getting. If they had previously player a game that was part of the same Game Series, they could be confident of knowing the rules.

The first Game Series designed from scratch were the ***Victory in the West Series*** and the ***Central Front Series***. Most game series that were published before this date did not start as a series but became series. Games such as ***The Great Battles of the American Civil War Series*** did not start out as a Series, but developed into one with time. The concept of Game Series simply further formalised this development of a common game system.

### *Victory in the West Series*

During very early 1980, S&T Number 78 to be exact, a game called **Pattons 3rd Army** was published. This was the first game of the ***Victory in the West Series***. **Pattons 3rd Army** was special as it was the first game designed from scratch to be a game series.

SPI only came out with two games in this series before it went under.

**Table 6 : Victory in the West Series.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Panzergruppe Guderian | 5 | 1976 | James F Dunnigan |
| Pattons 3rd Army | 20 | 1979 | Joseph M Balkoski |
| Operation Grenade | 20 | 1981 | Joseph M Balkoski |

As these games were specifically part of a game system family all aspects of the games were identical, scale, mechanics, etc. Note that this game system is virtually unrelated to **Panzergruppe Guderian**.

## *The Central Front Series*

Soon after **Pattons 3rd Army** was published, the first ***The Central Front Series*** game, **Fifth Corps** was also published. This also was a family of games designed from the ground up. This game system had one other interesting feature. When all the games became available, they could all be joined together and you could play a monster game. In many ways similar to the ***Napoleon's Last Battles Quadrigame*** concept where you could join the maps together and play out the entire Waterloo campaign.

**Table 7 : The Central Front Series.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Panzergruppe Guderian | 8 | 1976 | James F Dunnigan |
| Fifth Corps | 20 | 1980 | James F Dunnigan |
| Hof Gap | 20 | 1980 | Charles T Kamps Jr |
| BAOR | 20 | 1981 | Charles T Kamps Jr |

As these games were specifically part of a game system family, all aspects of the games were identical, scale, mechanics, etc. I have compared this system with **Panzergruppe Guderian**. As you can see there is little relationship between these two systems. It's of interest that James Dunnigan was involved in the development of both games. This is not a significant fact, only an interesting one.

The most innovative point about this game was the Sequence of Play. Combat and movement occurred together and in a constant cycle until either player had no more units to move. This was the first game of this type to use a simultaneous combat and movement Sequence of Play. It was an idea that was never sufficiently refined, as SPI soon collapsed after these first three games were published.

## *Years of Professionalism, History*

In 1979 the first game in the ***Victory in the West Series*** was printed, **Pattons 3rd Army**. This game represented another revolution in game design and also in game development. This game represented the beginning of a custom made game series. Previous to this game series simply come into being, they started as a normal game and after a while developed into a series. ***Victory in the West Series*** started from scratch as a game series.

The game design development that also occurred is of significance. This game represented a dramatic shift away from the ***PGG System***. Instead of achieving breakthroughs with overruns, this game series did it through the CRT results. There was no mechanised movement phase, Overruns no longer existed and the ZOC's were rigid, although unlike early rigid ZOC you

did need to pay MP's to leave. This style of rigid ZOC was a mixture of the early rigid ZOC and the later elastic ZOC.

These rule changes made the creation of a breakthrough difficult. However, the CRT results compensated for this. The CRT was the familiar numeric step CRT, however the results were more detailed, or fine grained. The results stipulated some compulsory results, so a combat result could stipulate a certain number of steps had to be taken in losses and other results included compulsory retreats. The effect of this was a fluid front line, few breakthroughs but a great deal of movement.

It hard to know if this truly represented a move forward, as after SPI failed this game system did not continue. However, many of the ideas in this game represented refinements and developments that need to be considered. The ***PGG System*** suited divisional scale games very well, however it did not suit smaller scale games as much. At the Battalion level narrow breakthroughs and pockets were not as common, or in fact required.

Most breakthroughs were a few divisions wide, specially during the early blitzkrieg period. At 2.4 km per hex an attack could be as much as 3 to 4 hexes wide. In addition they may take a couple of days to perform the breakthrough. As a result there was no need to create special rules that allowed one hex wide breakthroughs to occur and be exploited in a single Game-Turn. ***The Victory in the West Series*** attempted to show us these differences and provide us with a more realistic and historic game system for this scale. The realisation was that the ***PGG System*** did have limitations.

In 1980 the first game of ***The Central Front Series*** was printed, **Fifth Corp**. This game represented a real revolution in game design. ***The Central Front Series*** introduced the concept of combined Movement and Combat and friction. We were slowing moving away from the rigid structured approach of "everyone moves and then after all movement ends, we will have combat" to having combat during movement. This game took that to its logical conclusion, which resulted in one of the most dynamic games every designed. Perhaps too dynamic, as it was generally regarded as less than successful. This was perhaps due to the fact that this game system was so different.

The concept of friction brought step losses to a new height, as the unit accumulated friction points to the point it effected the combat ability of the unit. Here was a very flexible system, which like the Sequence of Play made the game even more dynamic.

Late in 1981 and early 1982 SPI experienced its financial woe's. It had reached the peak of professionalism and just when it seemed it could do no wrong it failed. I have no idea why this occurred and it's best to speak to others more closely involved. However, the end of SPI ended the orderly development of game systems.

We now entered a dark age, during which great ideas blossom, but normally withered and died due to lack of constant support. Without an orderly methodical of game design, each developer has to design game systems from scratch. They could use any existing game system, but all games designers had ego's too big for their own good. (In the computer industry programmers has this same ego issue.) Unless these creative people were disciplined and forced to follow guidelines, their games wandered everywhere.

The whole concept of families of game systems died, occasionally being revived by a single designer with a set of similar games, or an old SPI game system being revived. Besides these

sporadic events, the game system family idea has died. We are effectively back to where we began in 1970, a sort of creative chaos.

## Years of Chaos

An enormous amount of innovation occurred during this period, which continues with us today. However the innovation occurred in such a haphazard manner that many good ideas stagnated, died or were never used again. No one seemed to take up the mantle of SPI. For a while it seemed that Victory Games may, however their beautiful games failed to develop in any co-ordinate manner. A game system of sorts did occur with The ***Fleet Series*** (or ***Modern Naval Combat Series***) and the ***Gulf Strike System***, but when they finished being printed nothing took their place. It seemed to be more a creative explosion by a few people after the fall of SPI. An explosion that failed when the people left or ran out of ideas.

Some interesting development continued after the fall of SPI, such as Victory games **NATO** and Peoples Wargames **To the Wolf's Lair** in 1983. These games introduced even more refinement, such as having different ZOC types based on the unit that generated it and the 10 sided die. However, no significant consistent design development occurred and little of interest occurred for the following 10 years.

The next major moves forward seems to be GMT's **Victory in the West**, printed in 1993. This game seems to be a follow on from the ***PGG system*** and include some interesting and significant ideas. The most significant is its fine grain overrun rule, where different unit types paid different costs to overrun. In this situation it's impossible for a static division to overrun, as they were not trained or equip for this type of combat. This is a major development of an existing rule mechanics and represents a step forward. However, the question we need to ask is how many other games will use this idea in the future. If no one does, then the development has occurred in vain.

The period covered in the Years of Chaos has spawned a host of World War II and modern games. I have divided these games into 3 groups, the first group will deal with **Panzergruppe Guderian** like games;

### *PGG System*

**Table 8 : Panzergruppe Guderian style games.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Panzergruppe Guderian | 20 | 1976 | James F Dunnigan |
| NATO (Victory Games) | 7.5 | 1983 | Bruce Maxwell & Richard Trup |
| Singapore | 4.5 | 1984 | Charles T Kamps |
| Trail of the Fox | 7 | 1984 | Douglas Niles |
| Korea | 11.5 | 1987 | David J Ritchie |
| Case Green | 13 | 1992 | John Desch |
| Arctic Storm | 9 | 1992 | David James Ritchie |
| Victory in the West | 9 | 1993 | David James Ritchie |
| Britain Stands Alone | 10 | 1994 | Jim Werbaneth |

Some of the above games above have some similarity to the ***PGG System***. **Case Green** and **Korea** are loosely related, while **Victory in the West** and **Britain stands alone** are close to being loosely related. Even though the comparative score does not indicate this, I personally feel that **Victory in the West** represents a logical development of the ***PGG System***. This

game introduces some new rules and concepts and could very well indicate the next step in operational world war two game development.

The GMT **Victory in the West** game possesses a lot of similarities to **Panzergruppe Guderian**, and in fact introduce a host of improvements to that system. I am hopeful that if GMT Games **Victory in the West** turns into a common game system then we could say that it's a logical continuation of the ***PGG System***. However only time will tell if this will truly occur, so far we only have one designer working on this game system. If our designer was ever run over by a bus, it would end the development.

We do have a major difference when we look at Zones of Control between **Victory in the West** and **Panzergruppe Guderian**. **Panzergruppe Guderian** used a locked ZOC, while with **Victory in the West** we have a very fluid system. It's true that the unit density in France was much higher than the **War in the East**, however we should be able to design a single game system to cater for both fronts. This ZOC trend actually goes against the trend that existed at SPI at the end, so may represent designer preference. One trend that normally goes hand in hand with fluid ZOC's is weak Overruns. When overruns occur in this game they are actually very strong, but the number of units that can conduct an overrun is limited. Thus, we could say that overruns are weak, as most units cannot conduct them, but the blitzkrieg class units that can conduct them represents the fast advance of German armour. This is my guess and it seems reasonable. If true it means the designer is playing with a game system to make a historic event occur. This is normally bad practice if trying to design a common game system. This is the type of problems you experience when you do not have a formal standard game system. The designer uses basic game mechanics to reflect a specific historic condition or event in this game. As a result the game system becomes almost useless for any other game.

The CRT is one area that has changed a lot. If we only look at **Victory in the West** we see a 10 sided dice being used. I have no objections to experimentation, but generally feel this is an idea that offers no benefit. It would be easier to just stay with 6 sided dice, or two 6 sided dice. All that having a 10 sided dice does is increase the range of possible results of a combat, which increases the "luck" factor. I feel minimising "luck" helps to maximise "skill" and is preferable, but then I am a chess player so I may have a skewed view of life.

Regardless of this die issue the CRT results are similar to **Panzergruppe Guderian**. The range of results is greater, as would be expected, but is similar mathematically to the **Panzergruppe Guderian** 2-1 result. Forced retreats are emulated with an R result and a new Panic result is possible, so some "improvement" has occurred. The retreat result in particular overcomes one of the **Panzergruppe Guderian** problems, that of a stack of 3 units being unmoveable. As long as you can feed the front line with units no movement can occur, which can be unhistorical in certain situations. The Panic result also makes an effort to resolve this.

## *Central Front Series*

**Table 9 : Central Front Series related games.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Fifth Corps | 20 | 1980 | James F Dunnigan |
| North German Plain | 7 | 1988 | Ty Bomba |
| Donau Front | 7 | 1989 | Charles T Kamps |
| Flash Point: Golan | 12.5 | 1991 | Mark Herman |

The height of modern Regiment/Divisional games was ***The Central Front Series***. This game system represented the state of the art of this type of game. Can we identify any logical

successor to this. The **North German Plains** and **Donau Front** games used the same maps as ***The Central Front Series*** game, however the rules are different. This probably represents some form of rule's development. However, no more games were published after these two.

**Flash Point Golan** is the closest relative to The ***Central Front Series*** and is perhaps a true successor. It shared some characteristics with **North German Plain** and **Donau Front**, but is closer to ***Central Front Series*** than these games. In my humble opinion the **North German Plain** and **Donau Front** represented retrograde steps. It's almost as if the designers played ***The Central Front Series*** but did not like too many of the "unusual" aspects of the game system.

**Flash Point Golan** did not exhibit any of these retrograde characteristics. This game has taken the best of ***The Central Front Series*** and implemented some modifications and changes. This makes **Lash Point Golan** a logical development of ***The Central Front Series*** and ipso facto represents the end of the line for this game system.

## *Victory in the West Series*

**Table 10 : Victory in the West Series related Games.**

| Game | CS# | Year | Designer |
|---|---|---|---|
| Pattons 3rd Army | 20 | 1979 | Joseph M Balkoski |
| To the Wolf's Lair | 6 | 1983 | Gary Helmer |
| Ruweisat Ridge | 8.5 | 1986 | Douglas Niles |
| Patton goes to War | 7.5 | 1987 | Vance Von Borries |
| Objective Tunis | 7.5 | 1991 | Vance Von Borries |
| Sicily | 10 | 1991 | John Schattler |
| Salerno | 10 | 1992 | John Schattler |
| Anzio | 10 | 1992 | John Schattler |

In this group we have two specific systems, ***Battles for North Africa Series*** **(Patton goes to War** and **Objective Tunis**) and ***The Italian Campaign Series*** (**Sicily, Salerno** and **Anzio**). They also share designers, which may explain the similar game system. All these games possess a similar scale to ***Victory in the West Series*** games, once again the high points in rules design for this type of game.

It appears none of the game system are in any way are logical enhancements of the ***Victory in the West Series***. Even **Sicily**, which was covered by both ***Victory in the West Series*** and ***The Italian Campaign Series***, seems to be unrelated. The comparative scores all indicate no significant resemblance and we should assume this is the case. The ***Victory in the West Series*** obviously died with the death of SPI.

As for these new game systems, the ***Battles for North Africa Series*** did develop over a period of time. This system began well before **Patton goes to war** was printed and seemed to end with **Objective Tunis**. Some enhancement and work occurred, but it was a one man game system that failed to continue when the designer stopped developing his games.

The same can be said of ***The Italian Campaign Series*** games. It started, it developed and when the designer was sick of it, it ended.

### *Years of Chaos, Conclusion*

As I earlier indicated this period has seen some significant developments and the publishing of some excellent games. However, there occurred no coherent path of development. The development that occurred in the six years beginning in 1975 and ending in 1981 was astronomical. Clearly, no where near the same level of development occurred in the 13 years between 1981 and 1995. In short, more than twice the time has passed and far less than half the advancement has occurred since the fall of SPI. A sad commentary indeed.

I may be too harsh in my judgement. It's quiet possible that SPI brought the art of Operational World War II and Modern games to its height, leaving others very little to do. I somehow doubt it, but I must admit that the variety of periods that have been covered in that 13 year period is broad indeed. It's more than possible that most of the genius was devoted to other periods and other types of games. Once again I doubt it. I simply feel that the highly organised and professional approach of SPI gave us a golden age of board gaming. Once SPI was taken out of the picture we were left with a haphazard potpourri of games. Some good games, some bad games, but with no consistency at all.

## In Summary

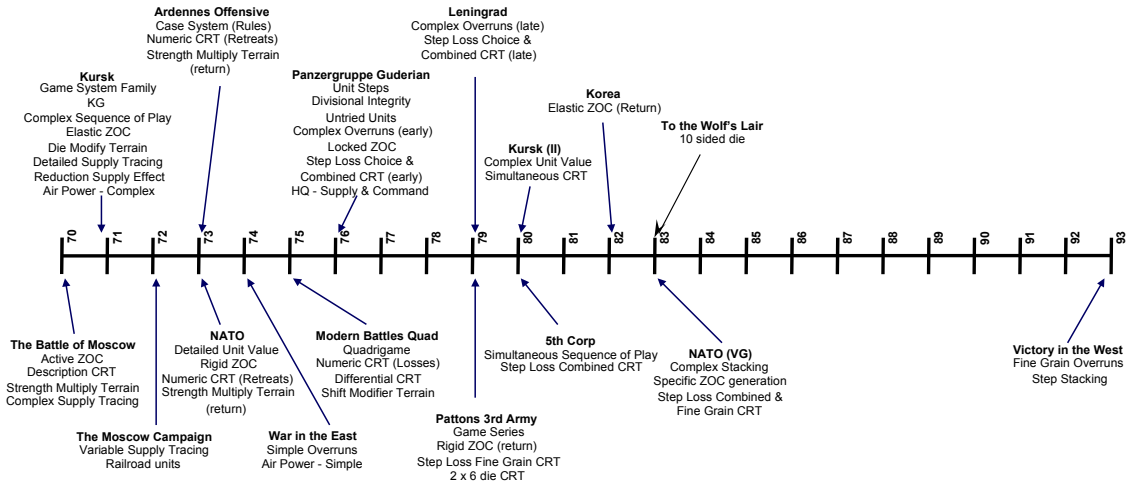
Perhaps the best summary I could provide is to chart out game development in a table. This I have done below and it does show us some very interesting trends, or observations.

As you can see by the table the amount of development that occurred during the SPI period is impressive, as is the lack of development that followed it. Perhaps by table is biased or incorrect, but surely not incorrect enough to negate the point it makes. SPI dramatically advanced the science of games design and when it failed we have not travelled much further at all.

When SPI died, a certain amount of invocation continued for a while but even this soon died away. It does seem that we are beginning to emerge from this dark age and continue the legacy which SPI left back in the early 80’s. Nonetheless we must all realise that nothing remains the same. This new resurgence in game design will probably be very different from the so called “good old days” of game development. Irrespective of the difference, at least we may be developing rather than stagnating.

I really also need to add an important caveat to the above comments. I have only covered operational games of the Second World War and the Modern period. I cannot make any opinion about games that cover other periods. My gut feel is that the story is much the same, but the effect is harder to see. SPI seemed to concentrate a large amount of effort in developing operational level games of the second world war and the modern period. As a result the standard is much higher than the current state of art covering the Spanish American wars. Nonetheless I feel the problem is much the same.

**Figure 1 : Time line of Game System Developments**




# Comparing the Games

In order to make any sort of rational decision in this article I required a system of comparing games with each other. This would allow me to identify a "game system" or "game series". The empirical test I finally decided upon was to select 20 basic game mechanics features and allocate 1 point for each. These features are described in the table below;

**Table 11 : Game System Points Comparison.**

| **Scale** | **Points and condition** |
|---|---|
| Game Scale | 1 point |
| Hex scale | 1 point (if within 5%, or 0.5 points if within 25%) |
| Unit Scale | 1 point |
| | |
| **Movement Mechanics** | **Points and condition** |
| Infantry Movement | 1 point |
| Mech Movement | 1 point |
| ZOC type | 1 point |
| ZOC | 1 point (if same, 0.5 point if similar) |
| Stacking | 1 point (if same, 0.5 point if similar) |
| Overruns | 1 point (if same, 0.5 point if similar) |
| | |
| **Sequence of Play** | **Points and condition** |
| Sequence of Play Type | 1 point (if the same) |
| Number of phases | 1 point (if the same) |
| Sequence of Play | 1 point (if Identical or the Same) |
| | |
| **CRT** | **Points and condition** |
| Steps | 1 point (if the same) |
| CRT Type | 1 point (if the same) |
| CRT Die Roll | 1 point (if the same) |
| CRT Mechanics | 1 point (if the same) |
| Terrain Effect | 1 point |
| | |
| **Misc Mechanics** | **Points and condition** |
| Supply Type | 1 point (if same, 0.5 if similar) |
| Unit Type | 1 point (if same, 0.5 if similar) |
| Air | 1 point (if same, 0.5 if similar) |

Using this points system we can compare how similar two games are. This is achieved by allocating 20 points to a "control" game. All other games have points allocated to them by comparing its game features to the "control" game. Thus if the control game used a differential CRT, other games obtain 1 point if they also used a differential CRT. If they used an odds' system, or a simultaneous attack system, they get 0 points. Thus a score of 20 indicates the game is identical while a score of 0 means the game is totally different. I call this resulting score a game comparative score.

We can group the "similarity" between games into general categories;

> **Closely Related**: All games use a common game system. Normally such games have a standard rule set and an exclusive rule supplement. These types of games are part of a common Game Series.
> **Similar**: These games share a common base or share a common game system.
> **Loosely Related**: The games share some ideas with each other. The game may have been based on some other game. However, no attempt was made to have the games as part of a common game system. These games may share a common game system, but normally do not.
> **None**: The relationship is so small that it's unlikely any significant relationship exists.

Closely related games should have comparative scores of 19 or greater. Similar games that share a common game system should have a score of 17 or greater. Loosely related games will vary a lot, but if their score is not at least 10 then they are more different from each other than they are similar to each other. A good score is about 12 for a loosely related game, but any number greater than 10 is sufficient.. None means the score is 10 or less. I have used this system extensively in this article.

# The History of the Development of Game Systems

In order to write a coherent history of game developments we need to identify some signposts and determine some method of comparing the games? Identifying signposts requires some knowledge of the game systems itself. As game developed over the last 20 plus years new ideas occurred, were used, and if successful were implemented and became almost public property. In its simplest form the use of the hex is one such game system signpost. Once it was used it was discovered to be superior to the square, or any other shape, and has been used by most game designers. Its these game system mechanical aspects which I need to identify and most importantly to identify when it was first used.

Its now time to determine sign posts in our history of development. In order to do this we need to identify the type of sign posts we should be looking for. We will ignore basic sign posts like the use of a hex and a dice, as these occurred far back in the history of game development and is not covered in this article. What we are looking for are basic game mechanics features. I have grouped the game features into the order that hey would be found in a standard SPI Standard Rules Booklet.

## Game Packaging

This basically deals with the way a game is packaged and organised. The main packaging concepts I will deal with are;

***Case System*** - Rules are organised using a numbering system, called case system.
***Game System families*** - A set of games which share very similar rules.
***Quadrigames*** - A set of games which share a set of standard rules and have their own Exclusive rules.
***Game Series*** - A specific set of individual games which share a set of standard rules and have their own Exclusive rules. They differ from the quadrigames in that each game stands on its own, rather than being packed into groups of four.

**Table 12 : Game package Development events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Game System Family | Kursk | 1971 | Not the first game in the family, France 1940 was the first, however it was also printed in 1971. |
| Case System | The Ardennes Offensive | 1973 | |
| Quadrigames | Modern Battles | 1975 | |
| Game Series | Pattons 3rd Army | 1976 | |

# [3.0] Units

There are several enhancements which occurred to units during the history of game development, we will look at;

Unit values
Untried Units
Divisional Integrity

## *Units - Unit Values*

The actual units changed as time progressed, starting with basically two numbers this could in some circumstances greatly increase. The general unit types are;

***Simple -*** Combat and Movement Value.
***Detailed -*** Attack Strength, Defence Strength and Movement Value.
***Complex -*** Other values such as morale, effectiveness, and stacking Value.

**Table 13 : Unit Values Development events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Simple | The Battle of Moscow | 1970 | Not actually the first game to use this system, but the first game we deal with. |
| Detailed | NATO | 1973 | One of the first SPI games to use this system. |
| Complex | Kursk | 1980 | |

## *Units - Step Losses, Divisional Integrity & Untried Units*

The concept of steps in a unit for causality calculations evolved slowly. The steps are summaries;

***KG -*** An eliminated unit is replaced with a KampfGruppen or Battlegroup. This is normally significantly weaken than the original unit.
***Steps -*** Each unit can have a number of steps. Normally each step has the same difference value, so a 4 step unit of 8 will have a strength of 6 if it loses a step, a strength 4 if it loses another step and finally a strength of 2 if it loses all but its last step. A further loss will result in its elimination.

In addition two rules which affected play a great deal was;

***Division integrity*** - The idea of a division fighting a whole more efficiently than as a sum of its parts.
***Untried Units*** - The concept of having units who's strength is unknown to any side until they are involved in combat for the first time.

**Table 14 : Other Unit Features Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| KG | Kursk | 1971 | |
| Steps | Panzergruppe Guderian | 1976 | |
| Division Integrity | Panzergruppe Guderian | 1976 | |
| Untried Units | Panzergruppe Guderian | 1976 | |

# [4.0] Sequence of Play (SofP)

A sequence of play will generally be one of the follows;

***Simple Sequential SofP*** - Move, then Combat
***Complex Sequential SofP*** - Move, then Combat, the mechanised Movement
***Simultaneous SofP*** - Move and Combat

There are other variations, like Move, Combat, Move and Combat again, however this is really two ***Simple Sequential SofP*** stringed together. Other variations are Move, Reaction, Combat and so one. These are normally ***Very Complex Sequential SofP*** systems which were developed for a tactical style of game. Some of the games we will be looking at exist on the border between Operational and Tactical, thus they use these types of sequence of plays. I will generally class these as ***Complex Sequential SofP*** for simplicity sake.

**Table 15 : Sequence of Play Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Simple Sequential SofP | | | Generally used before 1971 and still commonly used toady |
| Complex Sequential SofP | Kursk | 1971 | First use of mechanised movement |
| Simultaneous SofP | The Central Front Series | 1980 | |

# [6.0] Overruns

Overruns experienced an interesting development cycle. There are basically two types of Overruns;

***Simple Overruns*** : Achieve certain conditions and the enemy is removed and the overrun is successful.
***Complex Overruns*** : The overrun becomes normal combat during the movement phase, with some penalty attached.
***Fine Grain Overruns*** : A Complex overrun rule which was restricted to certain types of units, or which different units could perform at different levels of effectiveness. So German armour could do it easily and French infantry could not do it all.

The first Overruns were used to overcome the annoying problem of having an overwhelming force being held up by a line of expendable low strength units. This problem was experienced in **War in the East** in 1974 and it was solved by the use of a simple Overrun Rule.

**Table 16 : Overrun Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Simple Overruns | War in the East | 1974 | |
| Complex Overruns | Panzergruppe Guderian | 1976 | The original complex overrun was difficult to perform. |
| Complex Overruns | Leningrad | 1979 | The overrun differed little from Combat, prelude to combined Move & Combat |
| Fine Grain Overruns | Victory in the West | 1993 | Blitzkrieg rule, early version of this type of overrun |

# [7.0] Stacking

Stacking also developed from a simple concept. The steps of its evolution is as follows;

***Simple -*** 3 (or whatever) units of any sort with some special rules for small formations.
***Complex -*** Each unit type has a stacking value. A certain number of stacking points may occupy a single hex. This may vary based on the hex.
***Steps*** - Units which lose steps have their stacking value reduce in some manner.

The difference between the Complex and steps stacking is subtle, but none the less real. Using steps as a stacking value achieves much the same in the complex system, but steps may vary a great deal in strength. Having a separate stacking and step value overcame this issue. Overall a steps system is mathematically more accurate.

**Table 17 : Stacking Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Simple Stacking | The Battle of Moscow | 1970 | Used in most games before this one. |
| Complex Stacking | NATO (VG) | 1983 | |
| Steps Stacking | Victory in the West | 1993 | As a division lost steps, so did it lose stacking value. |

# [8.0] Zones of Control

As with CRT's Zones of Control can be complex. Generally we need to consider two factor when looking at Zones of Control;

What are there affect
How are they generated

## *ZOC - Effects*

Moves Number 2 goes into some detail concerning Zones of control. According to this magazine a Zone of Control effect was either Movement or Combat related.

The first group characterises the effect on movement.;

***Rigid ZOC*** - prohibit the same-phase movement of enemy units through the controlled hexes.
***Elastic ZOC*** - Require the expenditure of Movement Points on the part of Enemy units entering the controlled hexes, but does not absolutely prohibit movement through.
***Open ZOC*** - Have no effect upon enemy units.

The second group modifies the effect on Combat:

***Active ZOC*** - Requires that every enemy unit within a Friendly unit's ZOC be attacked during the Combat Phase.
***Semi-Active*** - Requires that some, but not all, of the Enemy units within the ZOC of a Friendly unit be attacked during the Combat Phase, by all eligible Friendly units.
***Inactive ZOC*** - Do not require attacks upon Enemy units within the ZOC of a Friendly unit.

Based on these selections it possible to have nine types of ZOC. IN real life the choice is much less. Normally a Active or Semi-Active ZOC will also be Rigid. Open ZOC's will also be Inactive, when they exist. Normally there is always a ZOC effect of some description. This leaves us with four types of ZOC. However we are not left off so easy, since that article a new ZOC effect occurred, the difficulty of leaving a ZOC, or a Locked ZOC. These are normally Rigid ZOC's which can only be exited by combat or special disengagement rules. This now leaves us with five ZOC effects.

***Rigid ZOC*** - Stop when you enter, You exit at no cost, You can't move from ZOC to ZOC
***Active ZOC*** - Same as Rigid ZOC, except you must attack all enemy units in your ZOC.
***Semi-Active ZOC*** - Same as Rigid ZOC, except all units which have an enemy unit in their ZOC, must attack during the Combat Phase. Not all of the enemy units need be attacked.
***Locked ZOC*** - Stop when you enter, You can exit using Combat or special disengagement rules, You can't move from ZOC to ZOC.
***Elastic ZOC*** - May MP's to enter, Pay MP's to exit, pay MP's to move from ZOC to ZOC.
***Open ZOC*** - No affect.

While its true there are other possible combinations, they were rarely ever used.

**Table 18 : Zones of Control Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Open ZOC | | | Used by some games before 1970. Not very successful. |
| Active ZOC | The Battle of Moscow | 1970 | Used in games before and occasionally used again. |
| Elastic ZOC | Kursk | 1971 | |
| Rigid ZOC | NATO | 1973 | |
| Locked ZOC | Panzergruppe Guderian | 1976 | |
| Rigid ZOC | Pattons 3rd Army | 1979 | Return of the Rigid ZOC |
| Elastic ZOC | Korea | 1987 | Return of Elastic ZOC |

## *ZOC - Generated*

The way a ZOC is generated can be broken up into two groupings;

***General ZOC generation*** : All units have a ZOC of equal effect.
***Specific ZOC generation*** : Only units with a specific strength have a specific ZOC effect.

***Specific ZOC generation*** was one of the true developments which occurred after the fall of SPI.

**Table 19 : Zone of Control Generation Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| General ZOC generation | | | Generally used in most games |
| Specific ZOC generation | NATO | 1983 | Used again in 1993 with Victory in the West |

# [9.0] Combat Results Table

The Combat Results Table is far more complex and need to be further broken down as follows;

**Results** - What do the results look like and how do they work.
**Mechanics** - Exactly how are the Combat Results Tables used and how do we determine the column and row's.

## *Combat Results Table - Results*

We can break up CRT results into the following sub groups;

***Descriptive Result CRT*** : A acronym for a sentence which described the results, such as Ex = Exchange, the lesser side is eliminated and the greater loses unit equal to or more. Other examples are De, Ar, Ax, Dr, Ar.
***Numeric Result CRT*** : A number which indicates the number of hexes to retreat, or the number of units to be eliminated, such as D1, retreat one hex or eliminate one unit. Other examples are D2, A1, etc.
***Step Losses - Choice & Combined CRT*** : A number which indicates the steps which need to be eliminated, or a number of hexes to retreat. In addition the result indicates a result for both attacker and defender, such as 1/2, the attacker loses one step and the defender loses 2 steps. (Obviously a retreat may be allowed also).
***Step Losses - Combined CRT*** - the result indicates a result for both attacker and defender, such as 1/2, the attacker loses one step and the defender loses 2 steps. (Obviously a retreat may be allowed also).
***Step Losses - Fine Grain CRT*** : The result gives us very detailed results, such as D1(3), which may indicate the defender must retreat one hex and can lose 3 further steps or retreat a further 3 hexes. Other results could look like D2R, defender loses 2 steps and must retreat.
***Step Losses - Combined & Fine Grain CRT*** : A fine grain result for both attacker and defender. Basically the combined variety and the fine grain variety.

No game ever seemed to use a ***Step Loss - Choice CRT*** without a combined option also, thus this option is not included.

**Table 20 : Combat Results Table Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Descriptive Result CRT | | | Generally used before 1973 |
| Numeric Result CRT | NATO & Ardennes Offensive | 1973 | Firs use of numeric result, only for retreats. |
| Numeric Result CRT | Modern battles Quad | 1975 | Numeric Results extended to include casualties |
| Step Loss - Choice & Combined CRT | Panzergruppe Guderian | 1976 | Fist use of step losses, descriptive results mixed in. |
| Step Loss - Choice & Combined CRT | Leningrad | 1979 | Almost a pure step loss CRT, with only De & Ae |
| Step Loss - Fine grain CRT | Victory in the West Series | 1979 | First pure Step loss CRT |
| Step Loss - Combined CRT | The Central Front Series | 1980 | First pure Step Loss Combined CRT |
| Step Loss - Combined & Fine Grain CRT | NATO (VG) | 1983 | |

## *Combat Results Table - Mechanics*

Besides losses we need to look at basic CRT mechanics. There are the following basic mechanics;

***Odds CRT*** : Defender is divided into the attackers total, fractions rounded down, to arrive at a odds.
***Differential CRT*** : The defenders total is subtracted from the attackers total to give us a differential.
***Simultaneous CRT*** : Defender attacks, inflicting losses. Then the attacker attacks, inflicting losses.

A ***Simultaneous CRT*** has been used with other types of games, or games dealing with different historical periods. However Kursk was the first operational World War II game to do so.

**Table 21 : Combat Results Table Mechanics Developments.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Odds CRT | | | Generally used before 1973 and still commonly used toady |
| Differential CRT | Modern Battles Quad | 1975 | |
| Simultaneous CRT | Kursk | 1980 | |

## *Combat Results Table - Die*

Now we can look at the die roll used with the CRT.

**Die Used** : 1 six sided, 2 6 sided, etc.

The type of die used is not important in itself, it probably represents the growth in the availability of 10 sided dice or a dissatisfaction with the low number of results on a simple 6 sided die.

**Table 22 : Combat Results Table Die System Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| 6 sided Die | | | Generally used before 1979 and still commonly used toady |
| 2 x 6 sided Die | Victory in the West Series | 1979 | |
| 10 sided Die | To the Wolfs Lair | 1983 | |

Its true that other games used these die roll combinations well before the above dates, but I will to emphasise I am only looking at operational World War II and Modern games.

# [10.0] Terrain

The only real development in terrain which occurred was increasing the number of terrain types and the effects on combat. Terrain effects on combat was generally one of the following;

***Strength Multipliers -*** Defensive strength of defenders was multiplied by a number, or the attack strength of defenders was divided by a number.
***Die Modifiers -*** The attacking die roll was modified if attacking into certain terrain types, or over certain terrain types.
***Shift Modifiers -*** The attacking CRT column is modified if attacking into certain terrain, or over certain terrain types.

The development of these combat effects were mirrored in the type of Combat Result Table used. The systems don't represent any type of revolution, however the die roll modifier or shift modifier system is easier to use.

**Table 23 : Combat Result Table Modifier System Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Strength Multipliers | The Battle of Moscow | 1970 | I am sure this was not the first game to use this system |
| Die Modifiers | Kursk | 1971 | |
| Strength Multipliers | NATO & Ardennes Offensive | 1973 | Return of this system |
| Shift Modifiers | Modern battles | 1975 | |

# [11.0] Command

Command was tightly tied to HQ units, although leader units did appear occasionally. Command was generally broken up into the following types;

***Supply*** - In order for a unit to be supplied it needed to trace a line of supply to a HQ or commander.
***Combat*** - A unit received a bonus in combat, or did not receive a penalty, if it was within command radius of a HQ or commander.

Most early games did not possess any command rules, especially for the period my article is covering. Command was used in either tactical games or games covering past periods, such as the Seven Year War.

**Table 24 : Command Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| HQ - Supply | Panzergruppe Guderian | 1976 | |
| HQ - Combat | Panzergruppe Guderian | 1976 | |

# [12.0] Supply

This was another area which experienced great development. Basically supply rules consisted of the following groupings;

How to determine supply
Effect of supply
Special Supply features.

## *Supply - How to Determine Supply*

All supply was normally determined by tracing a line of hexes to a point called a supply source. This is assuming there are supply rules at all, some games had none and this would be the simplest type of supply rule. The types of supply line tracing are as follows;

***Simple Supply Tracing*** - Trace a line to a supply source, of any length.
***Detailed Supply Tracing*** - Trace a limited line of supply to a rail or road hex. (Normally a number of hexes) From a rail or road hex trace a line of supply to a supply source, of any length along the rail or road line.
***Complex Supply Tracing*** - Same as a detailed supply tracing, except the first tracing is limited by movement points. So the initial line of supply may be 5 Movement points in length.
***Variable Supply Tracing*** - Same as Detailed Supply Tracing, except supply is traced to a HQ, Supply depot, or a rebuilt railroad. (This would imply the existence of rail repair units).

Supply tracing went through a distinct evolution, starting with the unlimited line of supply to a supply source, which was normally a map edge, a city, or even a friendly railway. This quickly evolved into a complex tracing, where a unit had to trace to a supply source, or a friendly railroad which led to a supply source. This tracing was affected by the terrain. Finally items such as Railroad units, Air drop, Supply depots or HQ's appeared. In this case the tracing had to occur to one of these units, or a repaired railroad. After this point supply tracing did not seem to evolve too much, it has probably reached its evolutionary peak.

**Table 25 : Supply Determination Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Complex Supply Tracing | The Battle for Moscow | 1970 | |
| Detailed Supply Tracing | Kursk | 1971 | |
| Variable Supply Tracing | The Moscow Campaign | 1972 | The famous railroad unit appeared. |
| Simple Supply Tracing | Cobra | 1977 | Seemed like a reaction against complex supply rules. |

## *Supply - Effect*

Supply effects ranged a bit but were basically as follows;

***Elimination Supply Effect*** : Unit died if it was out of supply at a certain point.
***Reduction Supply Effect*** : Unit's movement and combat was affected if it was out of supply.

Its interesting to note that apart from **The Moscow Campaign**, all operation level games of World War II used a reduction supply effect of one sort or another. It was impossible to eliminate units die to lack of supply. The proved a problem **in War in Europe**, but was generally the best way of dealing with this matter.

**Table 26 : Supply Effects Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Elimination & Reduction Supply Effect | The Moscow campaign | 1972 | |
| Reduction Supply Effect | Kursk | 1971 | |

### *Special Supply features*

There were many special supply additions incorporated in games, some of the most significant one are as follows;

***Railroad units*** - The ability to trace supply along a rail road, destroy the railroad and rebuild it.
***Supply depots*** - A unit which could extend a supply line.
***HQ units*** - The ability to trace supply from a HQ, which in turn could trace a supply to a permanent supply source.
***Air supply*** - The ability to use air units to supply units.

***Railroad units*** were first used in 1972 in **The Moscow campaign**. By the time **War in Europe** was printed in 1976 the Railroad units had reached their height, after this game they were rarely used. A flash in the pan so to speak, however the supply depot and HQ supply capability can still be found in games today.

**Table 27 : Special Supply Rules Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Railroad units | The Moscow Campaign | 1972 | |
| Supply deports (units) | Turning Point | 1972 | |
| HQ unit supply | Panzergruppe Guderian | 1976 | |
| Air Supply | Drive on Stalingrad | 1977 | |

## [14.0] Air Power

Air combat is normally of a limited nature, however evolution did occur in this also.

***Simple*** - Each side has air points which can be allocated to combats.
***Complex*** - Air units are present normally. Air to air combat can occur as well as many more missions.

Most operation level games of the Second World War use a simple air system, however there are exceptions. **Britain Stands alone** has a rather complex system, but then the air war would of been important in this campaign.

**Table 28 : Air Power Development Events.**

| Development | Game | Year | Notes |
|---|---|---|---|
| Complex | Kursk | 1971 | |
| Simple | War in the East | 1974 | |

# History of Rules Development - SPI

It must be said that the most hated and annoying feature of designing a game is the rules. This seemingly thankless task is both labour intensive, exacting and as it normally occurs at the end of the game design process, tedious. By the time you need to write the rules you wish you had never started this project. All you want to do it get the whole thing over with so you can get back in front of the TV to watch your favourite show, in my case Men Behaving Badly or Absolutely Fabulous. You can imagine the result of this, poorly written and error prone rules.

The sad commentary about this is that badly designed, written and executed rules will almost certainly doom a game, especially a game which is meant to be played. (Some games are never meant to be played, only to be looked at. Any fan of SPI will know what I mean.) It must be remembered that the learning of rules is probably as hated a process as writing them, so your audience is not going to be forgiving. Some player's enjoy incorrectly playing games up front and slowing learning the rules, however these player will probably have a strong incentive to learn this game. If this incentive is missing then bad rules will kill the game before it even starts.

I wanted to discover and understand the key factors which make up a "Good set of rules" and to identify the "Don't do under any circumstances" factors. In order to do this I needed to approach this art in a scientific and logical manner. Logic is not normally a game designers strong point at the end point of a game design cycle, sheer exhaustion and rage is the normal strong point To try and minimise the rage factor a informative and helpful guide is required, which is the objective of this paper.

The ideal starting point is to study what has gone before. Their was only one real scientific effort to formalise and standardise rules. This was performed by SPI as an attempt to reduce the work load of their game designers. SPI was probably the only games company which attempted to pump games out in a automated manner. The result is a huge body of rules to study, which allows us to look at the way rules design developed in order to understand what makes a good set of rules, and what does not.

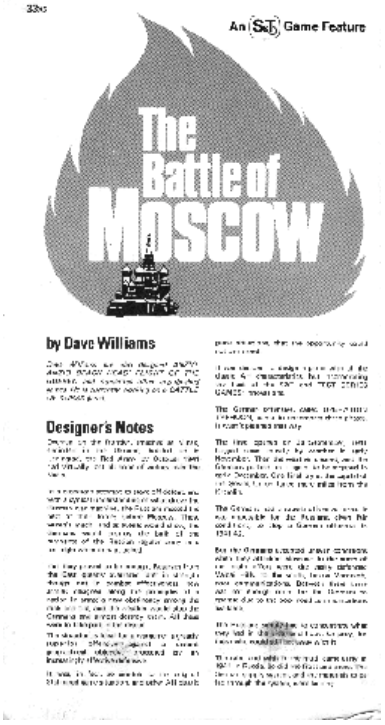
After **Winter War** SPI only ever designed games in house, taking some ideas from outside but doing all the work internally. Coupled with this was the amazing amount of games which SPI pumped out. They could print a dozen games a year, which would of put an amazing heavy work load on its staff. Other companies used different strategies, they took games from outside and cleaned them up before printing them, or they allocated one designer to do most of the work on each game so each designer ended up having his own style of game design and rules construction. Avalon Hill was a typical example of this and today most of the main "High Volume" publishes fall into this grouping. Decision Games and Command being the best examples. The result is we can't use these as a historical example of rules design. SPI is all we have at the moment, although their are other games companies which seem to have partially taken up the SPI mantle, GMT being the best example. The problem in these cases is a lack of volume.

# The Battle of Moscow (1970)

We will start our study with **The Battle of Moscow**, which was printed in 1970. This was not the earliest SPI game, but its the earliest one which I posses with a date on it. **Strategy I** was probably an earlier designed game, but it was published in 1971 so its not the oldest using this date.

The **Battle of Moscow** rules were packaged into a single long sheet of paper folded into 4 sections, which gave it 8 pages in total. Each page contained two columns of rules. While the physical appearance of rules may not be significant, it did show us an early SPI trait. Most SPI rules were as small in physical size as possible. They crammed lost of rules onto each page by the use of small fonts and as few pages as possible were used. This had an important psychological effect. It made the rules appear easy to read and learn, but most importantly it made referencing the rules easier. We will look at this in more detail later.

**Figure 2 : The Battle of Moscow Rules**


An S&T Game Feature

The Battle of Moscow

by Dave Williams

Designer's Notes

The main mechanism I use to compare rules is to look at the table of contents, or headings. This can give us an idea of how the rules were organised. The **Battle of Moscow** rules contained the following headings.;

Designer Notes
Rules of Play
- The Map Board
- Game procedure : Sequence of Play
- How to Win
- Setting Up the Game

Movement
- Railroads : Friendly Railroads, Use of Railroads, To Move by Rail, Zones of Control
- Stacking : Germans, Russians
- Weather : Fair, Mud, Hard frost, Snow, Special Terrain Rules, Swamps, Forests, Hills, Roads, Note

Combat
- Attacking, Multiple Unit Battles, Russian Demoralisation, City Isolation

Supply
- Supplied, Unsupplied, Isolated, Moscow and Leningrad

Replacements
- Russian : City Isolation, Replacement Counters, Tikhvin, 40th Army
- German

Fortification
- Fortification Troops

Special Units
- German : Security Troops, Finns
- Russian : Partisans, Worker Units, Paratroops

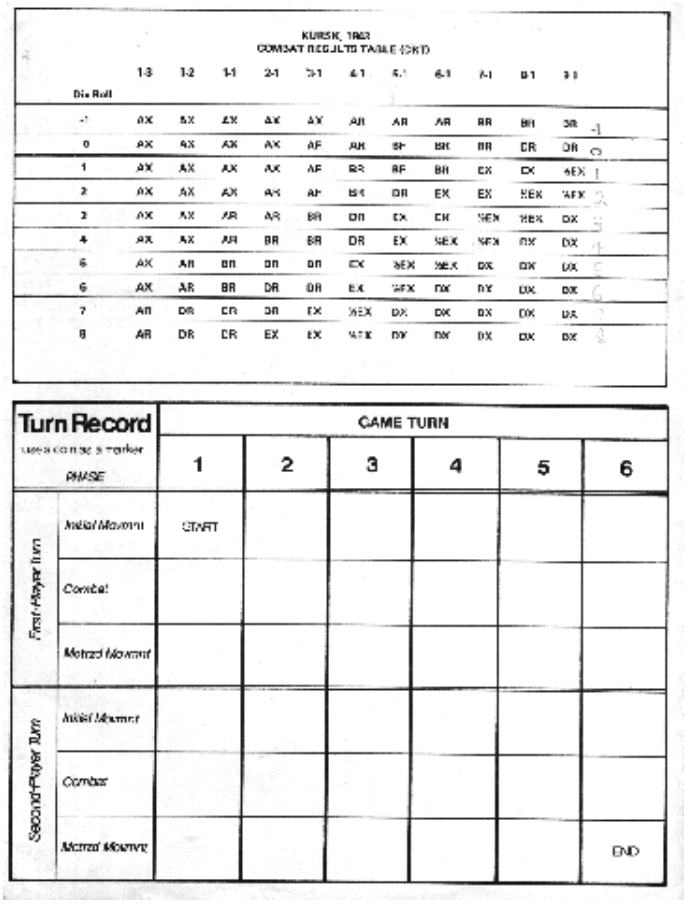
Notes
- Fractions, Unit Identification

People familiar with SPI games will probably recognise these headings, or Cases. SPI rules development did not represent any form of revolution, as was the case with game systems. The development of rules design was a slow evolutionary process. As a result we can see the table of contents of **The Battle of Moscow** has clear links to later games. Nonetheless their are several significant SPI developments which are missing, these are;

> General Rules & Procedures : While some of the headings have a paragraph immediately after it which feels like a General Rule or Procedure, its actually a rule. Considering these rules are so brief there may not been a need for a general description and a run down of the procedure
> No Case System : Nothing was numbered, as a result their was virtually no cross referencing.

The other common areas are of interest, for example, the tables and charts were on a separate piece of paper. This separation of the commonly referenced tables from the body of the rules is apparently an early development, although it normally only applied to the Combat Results Table and Turn Record Chart only, the Terrain Effects Charts were still in the body of the rules. However it was a clear beginning and soon we had all charts and tables put together, which made playing the game considerably easier. The logic of this was overwhelming, although their were other game companies which still mixed these tables with the body of the rules.

**Figure 3 : Kursk Charts & Tables**



KURSK, 1943
COMBAT RESULTS TABLE (CRT)

| Die Roll | 1-3 | 1-2 | 1-1 | 2-1 | 3-1 | 4-1 | 5-1 | 6-1 | 7-1 | 8-1 | 9-1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -1 | AX | AX | AX | AX | AX | AR | AR | AR | BR | BR | DR | -1 |
| 0 | AX | AX | AX | AX | AE | AR | BE | BR | BR | DR | DR | 0 |
| 1 | AX | AX | AX | AX | AE | BR | BE | BR | EX | EX | XEX | 1 |
| 2 | AX | AX | AX | AR | AE | BR | DE | EX | EX | XEX | XEX | 2 |
| 3 | AX | AX | AR | AR | BR | DR | EX | EX | XEX | XEX | DX | 3 |
| 4 | AX | AX | AR | BR | BR | DR | EX | XEX | XEX | DX | DX | 4 |
| 5 | AX | AR | BR | DR | DR | EX | XEX | XEX | DX | DX | DX | 5 |
| 6 | AX | AR | BR | DR | DR | EX | XEX | DX | DX | DX | DX | 6 |
| 7 | AR | DR | DR | DR | EX | XEX | DX | DX | DX | DX | DX | 7 |
| 8 | AR | DR | DR | EX | EX | XEX | DX | DX | DX | DX | DX | 8 |

| Turn Record<br>use counter as marker | | GAME TURN | | | | | |
|---|---|---|---|---|---|---|---|
| PHASE | | 1 | 2 | 3 | 4 | 5 | 6 |
| First-Player Turn | Initial Movement | START | | | | | |
| | Combat | | | | | | |
| | Motzd Movmnt | | | | | | |
| Second-Player Turn | Initial Movmnt | | | | | | |
| | Combat | | | | | | |
| | Motzd Movmnt | | | | | | END |

What we have is basically a very short, concise set of rules which would of been easy to read, cross reference and use. However many of these benefits were directly due to the small size of the rules. As these grew in complexity and size, minor problems grew also, thus, we will notice a move towards game design optimisation as the game systems increased in complexity.

# Kursk, Lost Battles & Normandy (1971)

A great deal of experimentation with rules design occurred in this year, much of it a failure but some important developments did succeed. The game which attempted the greatest amount of innovation was **Kursk**.

**Table 29 : Primary Cases of Games Published in 1971.**

| **Normandy (1971)** | **Kursk (1971)** | **Lost Battles (1971)** |
|---|---|---|
| Introduction | Introduction | General Course of Play |
| Game Equipment | Game Equipment | The Playing Pieces |
| General Course of Play | General Course of Play | Types of Units |
| Game length | The Sequence of Play | Armoured Units |
| Movement | Game Length | Definition of Terms |
| Combat | Movement | Game Charts and Tables |
| Naval Gunfire Support | Zones of Control | The Sequence of Play |
| Zones of Control | Stacking | Stacking |
| Stacking & | | |
| Unit Breakdown | Supply | Movement Phases |
| Supply | Combat | Combat |
| Entrenchment | Air Units | Zones of Control |
| Parachute Infantry | Victory Conditions | Engineers and Rivers |
| How to Set up and Play | Optional Rules | Artillery |
| German orders of Battle | | Supply & Command Control |
| How to Win | | Fortifications |
| | | Air Strike |
| | | Victory Conditions |
| | | Design Notes |

We can see that designers notes have been moved to the end of the rules. Besides some minor changes we can clearly notice a general trend, or commonality, in the way the rules were organised by SPI.

The rules start with a introduction and general overview of the components, map, and course of play. Following this we have a sequence of play. (**Normandy** has this in its General course of Play.) Once this is out of the way we see the main body of the rules, with the major rules such as movement and combat first, followed by the more specific specialised rules such as Parachute infantry, Air strikes or air units. Finally the game end with scenarios, victory conditions and design notes.

This is pretty much the way **The Battle of Moscow** was organised, although some odd areas have been resolved. For example **The Battle of Moscow** covered rail movement very early in the movement rules, which perhaps was not as logical as it could of been.

We can see that several sections (or Primary Cases) are common, such as Movement, Combat, Zones of Control, Stacking and Supply. They also seem to occur in the same order. We can see this same trend in games designed 10 years later by SPI. It was obviously a successful model.

One other development, or can I say reverse development, was the elimination of what I call major headings (or Major Cases). Modern SPI rules which used the case system broke up all Cases (or headings) into;

Primary Cases
Major Cases
Minor Cases

Primary Cases are headings such as Movement. Minor Cases are the individual rules, which are normally a sentence or paragraph in size. Major Cases fit in between and could be called, Movement Prohibitions and Inhibitions. These were present in **The Battle of Moscow**, but are missing in 1971. This was probably to make the game simpler, but as the rules got more complex we will see they reappear.

**Kursk** tried a few interesting, but unsuccessful experiments with the physical appearance of the rules. As this was never repeated again I will ignore it for now. With the way the rules were printed being ignored all three games possessed two new features of note;

General Rules, Procedure and Cases:
Each Major heading had all rules with a letter identifier (A - Z).

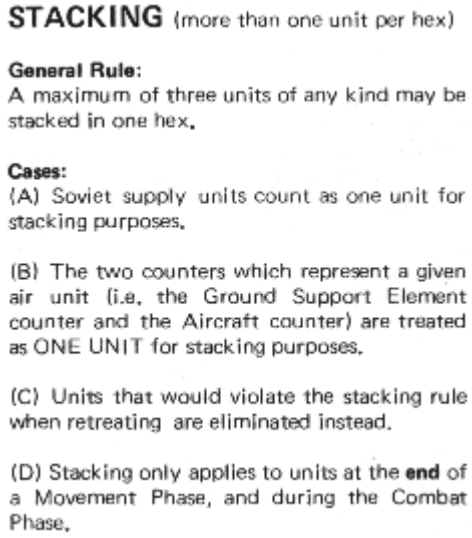
## *General Rules, Procedures & Cases*

The purpose of "General Rules" is to give players an idea of what the rule is all about. The "Procedure", in turn give players an idea of what needs to occur and if a specific situation needs to be resolved, where look for the specific cases. This allowed players to learn the rules by initially reading the General Rules and perhaps the Procedures. This was a realisation that rules was a training document, as well as a reference document. Rules had to implement whatever technique they could to make learning the rules both quick and painless, especially as rule complexity grew. It also made re-learning the rules fairly quick and painless.

## *Cross referencing (A-Z)*

All Minor Cases are identified by a letter. This allowed cross referencing, although this still did not occur too much as the cross referencing identifier was a bit cumbersome, for example See Zones of Control Case F. Apart from not knowing where the zones of control rules were in reference to the current position, the cross reference was rather long. None the less a realisation that rules are primarily a reference document, which needed every logical mechanism possible to allow quick referencing. This was used in other game outside SPI, but these were normally games with massive rules books. SPI began to implement this in what was still a short rules book.

**Figure 4 : Turning Point Rule Example**



**STACKING** (more than one unit per hex)

**General Rule:**
A maximum of three units of any kind may be stacked in one hex.

**Cases:**
(A) Soviet supply units count as one unit for stacking purposes.

(B) The two counters which represent a given air unit (i.e. the Ground Support Element counter and the Aircraft counter) are treated as ONE UNIT for stacking purposes.

(C) Units that would violate the stacking rule when retreating are eliminated instead.

(D) Stacking only applies to units at the **end** of a Movement Phase, and during the Combat Phase.

## Turning Point, Moscow Campaign & Winter War (1972)

1972 seemed to be a consolidation of the previous year, with little real changes and innovation in the area of rules design. The possible area of interest is the way the rules were organised. This was also the last year SPI took games from outside. Apparently the redesign of the **Winter War** Rules was so massive, SPI could of designed the game from scratch in about the same time. This gives a clue of how important good rules design was to SPI and how much effort went into designing rules.

**Table 30 : Primary Cases of Games Published in 1972.**

| **Turning Point (1972)** | **Moscow Campaign (1972)** | **Winter War (1972)** |
|---|---|---|
| Introduction | Introduction | Introduction |
| Game Equipment | Game Equipment | General Course of Play |
| Game Scale | Game Scale | Game Equipment |
| Game Components | Game Components | The Sequence of Play |
| General Course of Play | General Course of Play | Movement |
| The Sequence of Play | The Sequence of Play | Zones of Control |
| Game length | Movement | Stacking |
| Movement | Zones of Control | Combat |
| Zones of Control | Stacking | Supply |
| Stacking | Supply | Murmansk Defence |
| Supply | Combat | Fortification |
| Combat | Overrun | Initial deployment |
| Continuous Line | Continuous Line | Victory Conditions |
| Air Units | Weather | Victory Levels |
| Surprise Rule | Fortified Lines | Optional Rules |
| Victory Conditions | Rail Movement | |
| Victory Points Schedule | EB Units & Rail Lines | |
| Optional Rules | German Replacements | |
| Designers Notes | Victory Conditions | |
| | How to set-up the game | |
| | Designers Notes | |

We can see the rules developing in a specific manner. We saw a general trend in rules organisation last year and this breakdown of the rules have continued. SPI rules seemed to be made up of four segments, these are ;

**Introduction & Familiarisation** : Introduction and an attempt to provide educational guides to the games. Items such as general course of play, game term definitions, the components and the meaning of values on counters and other items like this. This is generally called Introduction, Game Equipment, Scale, Components, and General Course of Play.

**Core Game Rules** : These are the standard game rules which most if not all games posses. It always starts with a sequence of play and is generally followed by Movement, Zones of Control, Stacking, Combat, and Supply.

**Specific Game Rules** : These are the rules specific to the game. Experienced players would probably go straight to these rules after scanning the standard game rules. Rules which may fit into this area, based on the games above, are; Continuous Line, Air Units, Weather, Fortified Lines, and Rail Movement, Overrun, Murmansk Defence.

**Other, Non Significant Rules** : These would include optional rules, victory conditions, game set-up, and designers notes. The type of rules which are not constantly cross-referenced.

While the earlier games generally followed this sequence their were exception. These exceptions were getting more rare. A successful formula had been developed.

We can also note how unusual **Winter War** was, obviously a result of shoe horning in some-one else's game into the rigidly organised SPI rules.

# World War II, DAGC and PanzerArmee Africa (1973)

1973 can be said to be the year Primary Cases got a numbering system. The beginning of the famous SPI Case System.

**Table 31 : Primary Cases of Games Published in 1973.**

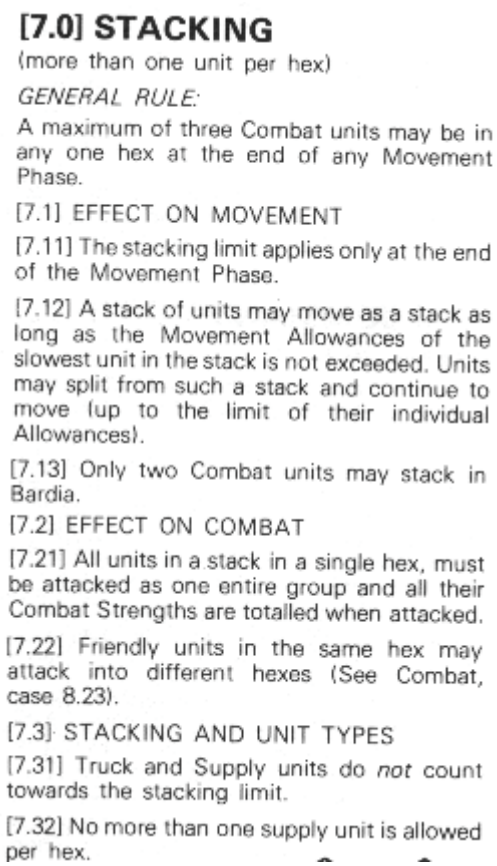
| **DACG (1973)** | **World War II (1973)** | **PanzerArmee Africa (1973)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] Course of Play | [2.0] Course of Play | [2.0] Course of Play |
| [3.0] Game Equipment | [3.0] Game Equipment | [3.0] Game Equipment |
| [4.0] The Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Movement | [5.0] Movement | [5.0] Movement |
| [6.0] Zones of Control | [6.0] Zones of Control | [6.0] Zones of Control |
| [7.0] Stacking | [7.0] Stacking | [7.0] Stacking |
| [8.0] Combat | [8.0] Combat | [8.0] Combat |
| [9.0] Supply | [9.0] Supply | [9.0] Overrun Attacks |
| [10.0] German Reinf | [10.0] Reinf & Repl | [10.0] Supply |
| [11.0] Russian Reinf | [11.0] Weather | [11.0] Truck Units |
| [12.0] Victory Conditions | [12.0] Neutral Countries | [12.0] Command Control |
| [13.0] German Optional Ukraine Reinforcements | [13.0] Victory Conditions | [13.0] Forts |
| [14.0] How to set up and play the game. | [14.0] Special Rules | [14.0] Replacements |
| [15.0] Scenarios | [15.0] How to set up and play the game | [15.0] Cadres |
| [16.0] Design Credits | [16.0] Optional Rules | [16.0] Removal of Allied Units |
| | | [17.0] Victory Conditions |
| | | [18.0] Optional Rules |
| | | [19.0] Designers Notes |
| | | [20.0] Design Credits |

The first important point to note is the use of Primary Case Numbers. Initially this was used by itself but it quickly became used in conjunction with Major Case headings, which in turn were numbered. Finally each individual rule was now numbered as a Minor case. The final development of the Case system had occurred, and each Major rule was clearly made up of the following components, in the following order;

[1.0] Primary Case
General Rule:
Describe the rule in general.
Procedure:
Describe the procedure related to the rule;
Cases;
[1.1] Major Case
[1.11] Minor Case

It was not to specifically cross reference in a quick and economical manner. For example you can now say (See Case 1.11) rather than (See Case A of the Movement Rule). In addition this allowed player to quickly cross reference. If you are going to case 1.11 you know where you need to be looking in the rules book. If you are staring at a rule numbered 6.12 you know the desired rule is forward of your current position. The people at SPI know the rules acted as a reference document, similar to a dictionary, and anything to aid finding what was required as quickly as possible was a boom.

**Figure 5 : PanzerArmee Africa example of a Primary Case**



**[7.0] STACKING**

(more than one unit per hex)

*GENERAL RULE:*

A maximum of three Combat units may be in any one hex at the end of any Movement Phase.

[7.1] EFFECT ON MOVEMENT

[7.11] The stacking limit applies only at the end of the Movement Phase.

[7.12] A stack of units may move as a stack as long as the Movement Allowances of the slowest unit in the stack is not exceeded. Units may split from such a stack and continue to move (up to the limit of their individual Allowances).

[7.13] Only two Combat units may stack in Bardia.

[7.2] EFFECT ON COMBAT

[7.21] All units in a stack in a single hex, must be attacked as one entire group and all their Combat Strengths are totalled when attacked.

[7.22] Friendly units in the same hex may attack into different hexes (See Combat, case 8.23).

[7.3] STACKING AND UNIT TYPES

[7.31] Truck and Supply units do *not* count towards the stacking limit.

[7.32] No more than one supply unit is allowed per hex.

## *Table of Contents*

Another development was the table of contents. The rules all listed all Primary and major Cases, so you could quickly find where in the rules you needed to look. What made the table of contents logical was the numbering of the Primary Cases.

**Figure 6 : DAGC example of a Table of Contents**



## *Numbering of Tables and Charts*

The other benefits of this numbering system was the numbering of tables and charts. You can now say see [4.2] Combat Results Table, which helps you specifically identify the table you want and also helps you find the rules relating to this table in the body of the rules.

**Figure 7 : Example of a Table from The Civil War**

**11.11 COMMAND CONTROL TABLE**

**Command Control Level**

| Die Roll | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1 | 1,4 | 1,3,6 | 1,3,5,8 | 1,3,5,7,9 | 1,2,3,6,8,9 |
| 2 | 2,7 | 2,4,8 | 0,4,6,8 | 2,4,6,8,0 | 1,3,4,6,8,0 |
| 3 | 3,8 | 5,7,9 | 1,3,7,8 | 1,3,5,7,9 | 1,3,5,6,8,0 |
| 4 | 4,7 | 1,4,9 | 2,4,6,9 | 2,4,6,8,0 | 2,4,5,7,8,0 |
| 5 | 5,9 | 2,5,0 | 2,4,6,0 | 1,3,5,7,9 | 2,4,5,7,9,0 |
| 6 | 6,0 | 6,8,0 | 2,5,7,9 | 2,4,6,8,0 | 2,4,6,7,9,0 |

Cross index current Command Control Level column with die-roll to yield hex ending-number of inactivated army units.

### *Major Case Organisation*

The additional formalising of the rules extended to within the Primary Cases, so we could see the following Major headings under each common Primary Case;

**[2.0] General Course of Play :**
[2.1] Game length, [2.2] Game Scale
**[3.0] Game Equipment :**
[3.1] The Game Map, [3.2] The Playing Pieces, [3.3] Game Charts and Table, [3.4] Game Equipment Inventory
**[4.0] The Sequence of Play :**
[4.1] The Game Turn, [4.2] Sequence Outline, [4.3] Game Length
**[5.0] Movement :**
[5.1] How to Move Units, [5.2] Movement inhibitions and Prohibitions, [5.3] Terrain effects on Movement, [5.4] Mechanised Movement
**[6.0] Zones of Control :**
[6.1] Movement effect, [6.2] Combat effect, [6.4] Supply Effect
**[7.0] Stacking :**
[7.1] Effects on Movement, [7.2] Effects on Combat
**[8.0] Combat :**
[8.1] Which units may attack, [8.2] Multiple Unit and Multi-hex Combat, [8.3] Combat Odds Calculation, [8.4] Effects on Combat Strength, [8.5] Advance after combat, [8.6] Combat Results Table, [8.7] How to retreat
**[9.0] Supply :**
[9.1] Supply Sources, [9.2] Judging Supply, [9.3] Supply Effects

The above example is a simplistic look at the Major cases of the three games, but within certain limitations are similar in all three games. We can see a very common threat running through all the rules, almost as if they all used the same template. There certainly existed a great deal of flexibility to suit the games, but you can see how similar **World War II** is to **PanzerArmee Africa**, considering the massive differences in scale.

## The East is Red, The American Civil War & Olympic (1974)

The ultimate game of this era was **War in the East**, unfortunately I do not posses an original copy of the rules so cannot revue it. Actually I had problems finding three games from this year to look at. After the burst of 1973 there seemed to be a lull in 1974, after which another burst of activity occurred in 1975. I possibly suspect **War in the East** had a hand in this, by absorbing an enormous amount of resources.

**Table 32 : Primary Cases of Games Published in 1974.**

| **The East is Red (1974)** | **The American Civil War (1974)** | **Operation Olympic (1974)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] Course of Play | [2.0] Course of Play | [2.0] Course of Play |
| [3.0] Game Equipment | [3.0] Game Equipment | [3.0] Game Equipment |
| [4.0] The Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Movement | [5.0] Movement | [5.0] Movement |
| [6.0] Zones of Control | [6.0] Zones of Control | [6.0] Zones of Control |
| [7.0] Stacking | [7.0] Stacking | [7.0] Stacking |
| [8.0] Soviet Unit build-up & Breakdown | [8.0] Combat | [8.0] Combat |
| [9.0] Combat | [9.0] Double March | [9.0] Reinforcements |
| [10] CRT | [10.0] Supply | [10.0] Amphibious Assault |
| [11.0] Supply | [11.0] Command | [11.0] Supply Beachhead |
| [12.0] Terrain Effects & Supply Chart | [12.0] Attrition | [12.0] Supply |
| [13.0] Chinese Major Cities & Industrial Hexes | [13.0] Cities | [13.0] Japanese Militia |
| [14.0] Soviet Air Power | [14.0] Forts | [14.0] Japanese Doctrine |
| [15.0] Tactical Nuclear Warfare | [15.0] Militia | [15.0] American Casualties |
| [16.0] Atomic Demolition's | [16.0] Reinforcements | [16.0] Scenario |
| [17.0] Scenarios | [17.0] Riverine Units | [17.0] Optional Rules |
| [18.0] Victory Conditions | [18.0] Victory Conditions | [18.0] Victory Conditions |
| [19.0] Soviet Strategic Strike | [19.0] How to set up and play (Scenarios) | [19.0] Game Notes |
| [20.0] Designer Notes | [20.0] Designer's Notes | [20.0] Design Credits |
| [21.0] Design Credits | [21.0] Design Credits | |

This shows us several things about the SPI standard rules organisation. The games above cover a wide historical range, yet the organisation of the rules is similar. With one exception, the first nine Primary Cases are identical and with some minor exceptions, the last four Primary Cases are similar. SPI were organising their rules into four major sections, which are;

**Introduction & Description**

[1.0] Introduction, [2.0] General Course of Play, [3.0] Game Equipment

**Primary Rules**

[4.0] The Sequence of Play, [5.0] Movement, [6.0] Zones of Control, [7.0] Stacking, [8.0] Combat, [9.0] Supply

**Rules Specific to the Game**

[xx.0] Chinese Industrial hexes, [xx.0] Air Power, [xx.0] Nuclear Weapons

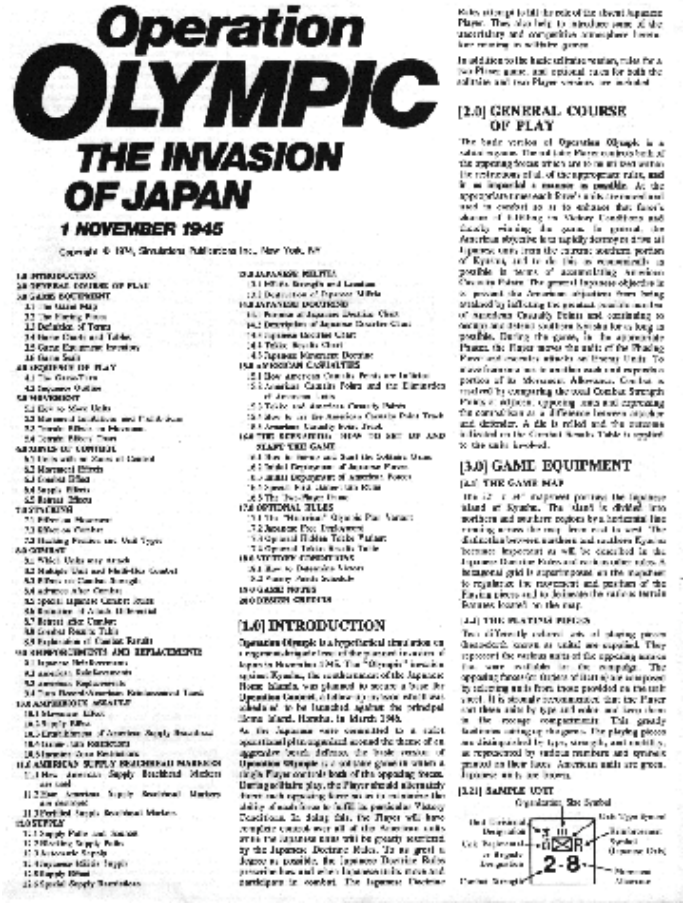
**Other, Non Specific Rules and Summing Up**

[17.0] Optional Rules, [18.0] Victory Conditions, [19.0] How to Set-up & Play (Scenarios), [20.0] Designers Notes, [21.0] Design Credit

## *Physical Change*

Another major change was the alteration of the physical rules. The issue before Operation Olympic used a standard A4 size, three column, rule book. Previously the rules books were generally a special narrow size with two column per page. Some additional experimentation was to follow, but the standard 3 column A4 sized rule book became the norm. Apart from simple economic reasons this type of rule book was still easy to handle and contained more rules per page. This reduced flipping pages as you cross-referenced rules.

**Figure 8 : Operation Olympic rules**



Operation OLYMPIC

THE INVASION OF JAPAN

1 NOVEMBER 1945

[1.0] INTRODUCTION

[2.0] GENERAL COURSE OF PLAY

[3.0] GAME EQUIPMENT

## Wurzburg, Battle for Germany, Global war (1975)

A great deal of activity occurred this year, both in quantity and quality of games. A lot more games were published and some exciting new ideas were emerging, the quadrigame being one.

In addition, its generally regarded that the Golden age of small, simple fun S&T games started in 1975 and probably ended that year also. S&T games of this period games normally had 100 pieces and used a half sized map. The rules were normally equally small and most importantly easy to read.

In addition to this burst of small and simple games (Quadrigames & S&T) some monster games came out this year, **Global War** being one.

**Table 33 : Primary Cases of Games Published in 1975.**

| **Wurzberg (1975)** | **Battle for Germany (1975)** | **Global War (1975)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] Game Equipment | [2.0] Course of Play | [2.0] Course of Play |
| [3.0] Setting up the Game | [3.0] Game Equipment | [3.0] Game Equipment |
| [4.0] The Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Movement | [5.0] Movement | [5.0] Land Movement |
| [6.0] Zones of Control | [6.0] Combat | [6.0] Land Zones of Control |
| [7.0] Combat | [7.0] Zones of Control | [7.0] Land Stacking |
| [8.0] Artillery | [8.0] Replacements | [8.0] Land Combat |
| [9.0] Air Power | [9.0] Terrain Effects Charts | [9.0] Land Supply |
| [10] Introduction | [10.0] Exiting the Map | [10.0] Weather |
| [11.0] Helicopters | [11.0] Garrisons | [11.0] Neutrals |
| [12.0] River Crossings | [12.0] Scenarios | [12.0] Naval Movement |
| [13.0] Reinforcements | [13.0] Historical Scenarios | [13.0] Naval ZOC's |
| [14.0] Exiting from the map | [14.0] Collapse in the East | [14.0] Naval Combat |
| [15.0] Nuclear Weapons | [15.0] Red Star/White Star | [15.0] Naval Supply |
| [16.0] Scenarios | [16.0] The 3 player Game | [16.0] Air Units |
| [17.0] Constructing Scenarios | [17.0] The 4 player Game | [17.0] Production |
| [18.0] Game Notes | [18.0] Game Notes | [18.0] Special Rules |
| | | [19.0] Special Rules |
| | | [20.0] Optional Rules |
| | | [21.0] Multi-Player Games |
| | | [22.0] Charts and Tables |
| | | [23.0] Scenarios & Victory Conditions |
| | | [24.0] Turn Record Chart |
| | | [25.0] Game Notes |

We can see that some major changed occurred in this year. The bust of creativity and energy was not excluded from the art of rules design.

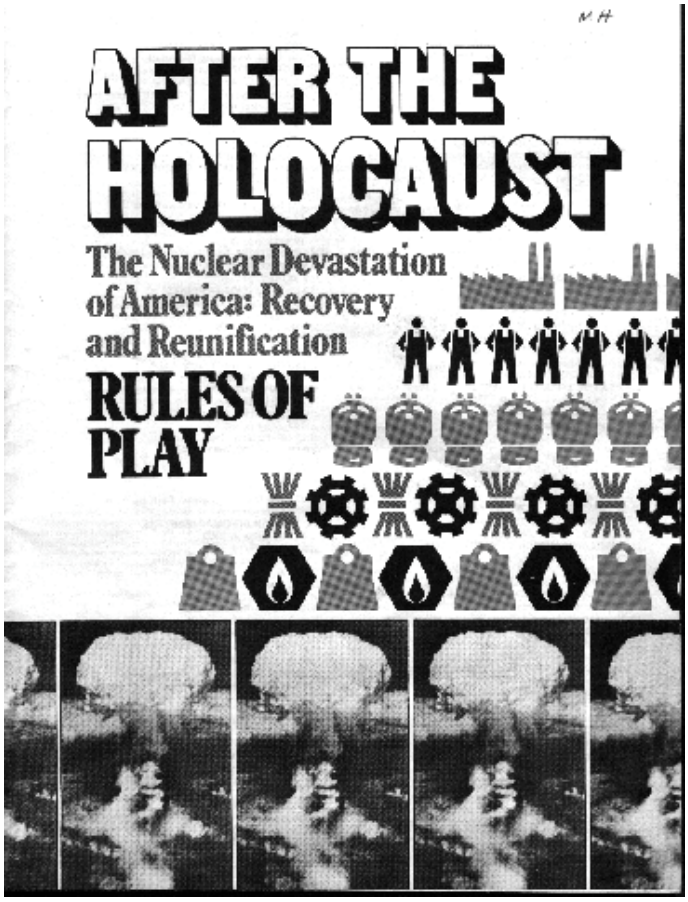
## *The Cover*

One interesting development was to make the rules more attractive by giving it a cover. There seemed to be two basic models, the SPI and S&T modes.

> **SPI games** had an attractive cover followed with a one page table of contents. The rules began on Page three. The Cover consisted of the title and a picture related to the game.
> **S&T games** also had a cover, but this was followed by the rules on page two. The rules began with a small table of contents, which conformed to the standard three column format of the rules..

Although SPI abandoned this in later years, other developers used this extensively. A good example of this was Victory games. It made the rules look good and thus the urge to read them was a bit stronger, without making the rules less effective in their primary function.

**Figure 9 : Cover of After the Holocaust**




## *Standard & Exclusive Rules*

The other development was the quadrigame, which divided rules into standard rules and exclusive rules. In many ways SPI has already been doing this in the body of their rules, however in these games it was formalised.

**Figure 10 : Modern Battles Standard Rules Title**

**Figure 11 : Wurzburg Exclusive Rules Title**


### *Compression of Rules*

Finally, in the smaller games (Quadrigames and S&T) the rules were cut down and compressed, probably because the games were simpler. Some common Primary Cases were merged in with other Primary Cases. So stacking may have been merged in with Movement, thus reducing the number of primary cases and probably reducing the size of the rules.

## Revolt in the East, Panzergruppe Guderian, Kassarine (1976)

The amazing amount of development which occurred in 1975 continued in 1976 and it was in this year that the rather famous **Panzergruppe Guderian** was published. This game revolutionised WWII operational mechanics and was the father of a host of games, which used the same mechanics.

This was coupled with the end of the first golden age of simple S&T games. The second golden age of S&T games replaced it. The games were now getting larger and more complex, although amazingly innovative and advanced. While this was good for the experienced players it was to begin to make it harder and harder to enter the hobby.

**Table 34 : Primary Cases of Games Published in 1976.**

| **Revolt in the East (1976)** | **PanzerGruppen Guderian (1976)** | **Kassarine (1976)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] Course of Play | [2.0] How to Play he game | [2.0] Game equipment |
| [3.0] Game Equipment | [3.0] Game Equipment | [3.0] Setting Up the Game |
| [4.0] Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Movement | [5.0] Initial Set-up | [5.0] Movement |
| [6.0] Stacking | [6.0] Movement | [6.0] Zones of Control |
| [7.0] Combat | [7.0] Stacking | [7.0] Combat |
| [8.0] Zones of Control | [8.0] Zones of Control | [8.0] Artillery |
| [9.0] Reinforcements | [9.0] Combat | [9.0] Ground Support |
| [10.0] Supply | [10.0] Soviet Leaders | [10.0] Minefields |
| [11.0] Warsaw Pact | [11.0] Supply | [11.0] Anti-tank Units |
| [12.0] Suppressing Revolts | [12.0] Untried Units | [12.0] Supply |
| [13.0] Terrain | [13.0] Interdiction | [13.0] Reinforcements |
| [14.0] The Scenarios | [14.0] Reinforcements | [14.0] Exiting the Map |
| [15.0] Victory Conditions | [15.0] Victory Conditions | [15.0] Introduction |
| [16.0] Players Notes | [16.0] Reinforcement | [16.0] Rough Terrain |
| [17.0] Simulation Notes | | [17.0] Supply Sources |
| | | [18.0] Limitations |
| | | [19.0] Withdraws |
| | | [20.0] Weather |
| | | [21.0] Optional Rules |
| | | [22.0] Victory Conditions |
| | | [23.0] Deployment & Reinforcements |

## *Initial Set-up-Up*

Perhaps the interesting item to note is the location of the Initial Set-up. In **Panzergruppe Guderian** its at the beginning of the rules, while in most games its at the end. During this period SPI seemed to have no standard approach to initial set-up rules. This had the effect of sometimes making it difficult to find them for people who played lots of different games. Players often had to look at the beginning as well as the end of the rules. I found it annoying at the time and it shows you what occurs when you do not have a standard approach to rules design.

In the final analysis it was better to put any deployment rules at the end of the rules, possibly with any historical rules, order of battle and the related pieces of information. The reason is easy to see, you should only need to refer to the initial set-up rules once in any game, the beginning. Once performed, the initial deployment rules can be ignored. Its easier to ignore rules in the back of the rules book than at the beginning. On the other hand it seems logical to place deployment rules before the body of the rules. This is one example where logic is perhaps not so helpful in understanding what makes people tick.

## *How to Play the Game*

The other major development is the inclusion of a **How to Play the Game** Primary Case. To understand why this is important you need to understand what rules are. A set of rules is primarily a reference document, similar to a dictionary or encyclopaedia. Its full of facts which need to be organised in such a manner as to make these facts easy to find. However, rules need also to be an educational document, similar to text books at school. This school book analogy is not so bad, as they are also a mix of training and reference material. The

inclusion of a **How to Play the Game** Primary case is an attempt to improve the educational content of the rules.

This was a trend which was probably driven by the increased complexity of the rules. Unlike companies like Avalon Hill, where people bought one game and played it to death, SPI needed people to learn and play as many games as possible. It was actually economic common sense. You either increase the market by increasing the number of people who buys a game, or you increase the number of games a person buys. SPI obviously moved down the path of extracting as much money from a given market, thus they had to make the rules as easy and quick to learn as possible.

## South Africa, Drive on Stalingrad & South Africa (1977)

1977 seemed to be a year of consolidation, with few dramatic game system changes occurring. It seemed like the end of a period of great exertion, where the last of the game system family games were pumped out. **The Drive on Stalingrad** is an example of this, it was one of the last ***Panzergruppe Guderian System*** game published with the same rules format as **Panzergruppe Guderian**. New ***Panzergruppe Guderian System*** games used a totally different rules structure before quickly dying out, to be replaced by another major creative period.

**Table 35 : Primary Cases of Games Published in 1977.**

| **South Africa (1977)** | **Drive on Stalingrad (1977)** | **Cobra (1977)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] Course of Play | [2.0] How to Play he game | [2.0] How to Play the Game |
| [3.0] Game Equipment | [3.0] Game Equipment | [3.0] Game Equipment |
| [4.0] Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Movement | [5.0] How to Set up the game | [5.0] Initial Set up |
| [6.0] Stacking | [6.0] Movement | [6.0] Movement |
| [7.0] Zones of Control | [7.0] Stacking | [7.0] Stacking |
| [8.0] Combat | [8.0] Zones of Control | [8.0] Zones of Control |
| [9.0] Guerrillas | [9.0] Combat | [9.0] Combat |
| [10.0] Supply | [10.0] Terrain | [10.0] Headquarters |
| [11.0] Mobilising & Demobilising | [11.0] HQ Units | [11.0] Supply |
| [12.0] How to set-up and play the game | [12.0] Supply | [12.0] Allied Supply Points & Command |
| [13.0] Varying the standard Scenario | [13.0] Untried Units | [13.0] Replacements |
| | [14.0] Air Units | [14.0] Reinforcements |
| | [15.0] Reinforcements | [15.0] Air |
| | [16.0] Hitler Directives | [16.0] How to win the Game |
| | [17.0] Continuous Front | [17.0] Summary for experienced players |
| | [18.0] Soviet retreats | |
| | [19.0] How to win the game | |
| | [20.0] Order of Battle | |

## *Summary for Experienced Players*

The most interesting development here is The Summary for Experienced Players in **Cobra**. SPI was making a lot of effort to make it easier to read and learn what was becoming longer and more complex rules. The Rules summary was a brief description of the game systems used in the game, such as ratio or differential CRT, Move/Combat/Mech Move sequence of play and so on. Experienced player could look at this and quickly work out which standard rules was being used. The idea died out simply because it took a lot of effort to put together and relevant. In **Cobra** the summary was too light on relevant information and was not as useful as it could of been.

## *Compressed Table of Contents*

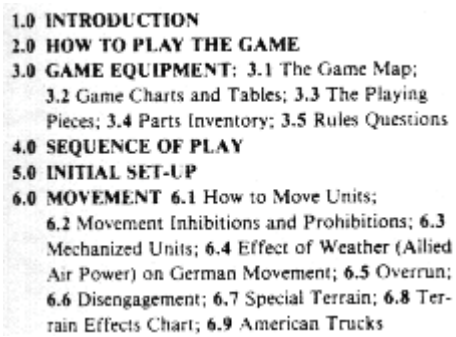
**Cobra** also used a compressed Table of contents, where Major cases were strung together into a single paragraph, thus reducing the amount of room used. It also had the effect of creating a paragraph which almost made some sort of sense, so the Movement rules read as follows;

> **6.0 MOVEMENT 6.1** How to Move Units; **6.2** Movement Inhibitions and Prohibitions; **6.3** Mechanised Movement; **6.4** Effect of Weather (Allied Air Power) on German Movement; **6.5** Overrun; **6.6** Disengagement; **6.7** Special Terrain; **6.8** Terrain Effects Chart; **6.9** American Trucks.

Although I must admit to not liking this idea at first, as I felt it was more logical to put each major case on its own line, in retrospect here is another example of the failure of logic to understand the human condition. This idea reduced the amount of white space in the rules,

which was always good, and made it possible to scan all the Major cases in a Primary case very quickly. In short it worked and it worked very well.

**Figure 12 : Table of Contents Example from Cobra.**



# Kharkov, Stonewall & Tannenberg (1978)

This was the third year the ***Panzergruppe Guderian system*** was being used as well as the year the Game Series appeared. In the area of rules we once again see a constant development. Unfortunately I do not have any SPI games from this year so all the games have to be S&T. One advantage of this is I have selected games from widely separate historical periods.

**Table 36 : Primary Cases of Games Published in 1978.**

| **Kharkov (1978)** | **Stonewall (1978)** | **Tannenberg (1978)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] How to Play he game | [2.0] Game Equipment | [2.0] Game Equipment |
| [3.0] Game Equipment | [3.0] How to set up the game | [3.0] Setting up the game |
| [4.0] Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] How to Set up the game | [5.0] Movement | [5.0] Movement |
| [6.0] Movement | [6.0] Formations | [6.0] Stacking |
| [7.0] Overrun | [7.0] Facing | [7.0] Zones of Control |
| [8.0] Stacking & Zones of Control | [8.0] Stacking | [8.0] Combat |
| [9.0] Combat | [9.0] Terrain Effect Chart | [9.0] Supply |
| [10.0] HQ Units | [10.0] Fire Combat | [10.0] Command |
| [11.0] Supply | [11.0] Zones of Control | [11.0] Fortresses |
| [12.0] Untried Units | [12.0] Supply | [12.0] Cavalry |
| [13.0] Air Power | [13.0] Melee Combat | [13.0] Replacements |
| [14.0] Division Integrity | [14.0] Rout | [14.0] Reinforcements |
| [15.0] Breakdown, Garrisons | [15.0] Retreats | [15.0] Modifications to standard Rules |
| [16.0] Reinforcements | [16.0] Exiting the map | [16.0] Rail Movement |
| [17.0] Victory Conditions | [17.0] Leaders | [17.0] Command Control |
| | [18.0] Cavalry & Artillery | [18.0] Hidden Movement |
| | [19.0] Union Army Morale | [19.0] Variable Reinforcements |
| | [20.0] Brigade Combat Effectiveness | [20.0] Russian Garrisons |
| | [21.0] Deployment | [21.0] Victory Conditions |
| | [22.0] Victory Conditions | [22.0] Scenarios |
| | [23.0] Optional | [23.0] Unit Designations |
| | [24.0] Rules summary for experienced players | |

Apart from **Kharkov** all deployment rules are in the rear of the rules books. It was almost as if their were two camps within SPI, one which believed in forward deployment rules and the other placing it in the rear. Apart from this aberration we can see amazing similarities in the way the rules were organised, even though the periods and scales differed. By looking at these games we begin to get an idea of why the core rules are organised in the order they were.

The core rules follow the sequence of play. In the case of **Kharkov** the sequence of play is basically Move, Combat. As a result Movement and all related rules come first, followed by combat and related rules. Their are minor exception, but these are always with non-core rules, such as Command or Weather.

One annoying factor was the Movement Primary Case in **Kharkov**, and for that matter any ***Panzergruppe Guderian System*** game, was rather long. They crammed a lot of rules into the Movement area, when breaking it up may have been a better option. For example 6.7

Additional Restrictions on Soviet Movement, Commitment of Reserves and Southern Sector troops. This does not belong in the core rules, its a specific rule for this game only. The whole purpose of separating core rules from specific rules was to help minimise learning the rules and reduced the distance cross referencing had to occur.

Experienced player would look at movement and briefly check to make sure it was standard. Once done when playing the rules the only cross referencing which may occur is with the specific rules. By placing these all together, after the core rules, the experienced players could simply flip between one or two pages at the most. By placing specific rules into the core rules the flipping could cover most of the rules.

As for beginners', its best to cover basic core concepts first before forcing complex specific rules onto the hapless player. Before a player has any idea what a zone of control is he is now forced to learn about special rules concerning southern sector troops.

SPI fixed this problem in later games, but its clear that rule design development almost stopped for ***Panzergruppe Guderian System*** games. This could of been because subsequent developers simply copied previous rules and added and removed what was required. While in principal this is a good idea, in practise it does not work too well when the rules you re working with are flawed.

## China War, Kiev & Leningrad (1979)

This year represented the death of the ***Panzergruppe Guderian system*** as far as SPI was concerned. The last games were published in the form of a quadrigame and a concerted effort was made to redesign the rules. The other significant factor was the publishing of **Leningrad**. This game represented an attempt to make **War in the East** work and could of possibly formed the backbone of a whole series of east front games. As it turned out this did not occur, but a lot of rule design innovation did occur for this game. SPI seemed to split into two basic design philosophies, the simple game grouping, of which **Leningrad** was a member of and the complex game grouping of which **China War** was a member.

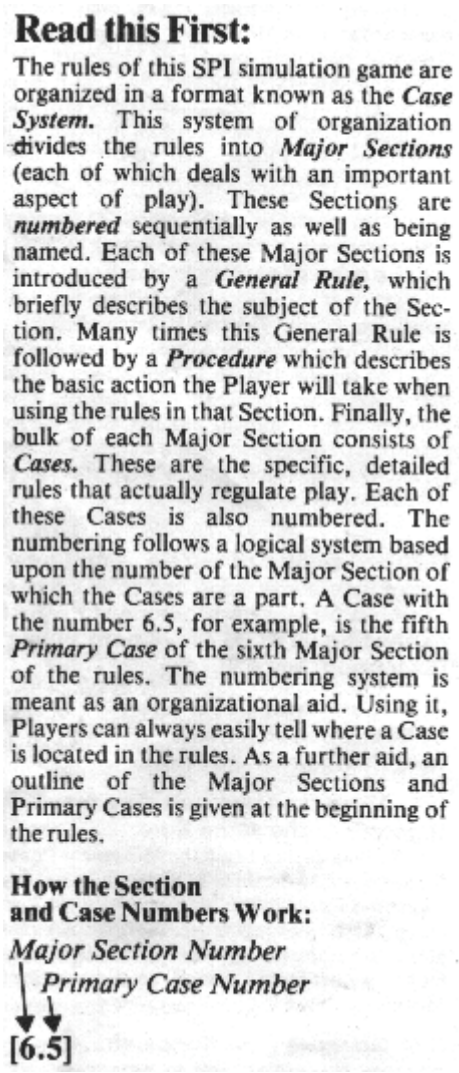
**Table 37 : Primary Cases of Games Published in 1979.**

| **China War (1979)** | **Kiev (1979)** | **Leningrad (1979)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] How to Start |
| [2.0] How to Play the game | [2.0] How to Play | [2.0] Equipment |
| [3.0] Game Equipment | [3.0] Game Equipment | [3.0] Basic Producers |
| [4.0] Sequence of Play | [4.0] Sequence of Play | [4.0] Movement of Units |
| [5.0] Political Events | [5.0] Movement | [5.0] Zones of Control |
| [6.0] Movement | [6.0] Overruns | [6.0] Disengagement |
| [7.0] Overrun | [7.0] Stacking | [7.0] Overrun |
| [8.0] Stacking | [8.0] Zones of Control | [8.0] Combat Preconditions |
| [9.0] Combat | [9.0] Combat | [9.0] Combat Resolutions |
| [10.0] Terrain | [10.0] Terrain | [10.0] Combat Results |
| [11.0] Supply | [11.0] HQ Units | [11.0] Supply |
| [12.0] Reinforcements | [12.0] Supply | [12.0] Armour |
| [13.0] Air Power | [13.0] Untried Units | [13.0] Air Power |
| [14.0] Army Reorganisation | [14.0] Air Power | [14.0] Soviet Untried Units |
| [15.0] Amphibious | [15.0] Reinforcements | [15.0] Soviet Forts |
| [16.0] Tactical Nuclear | [16.0] German Unit Org | [16.0] Reinforcements |
| [17.0] Scenario 1 | [17.0] Introduction | [17.0] Surprise |
| [18.0] Scenario 2 | [18.0] Setting up the game | [18.0] How to Win |
| [19.0] Scenario 3 | [19.0] Additions & Changes to the standard Rules | |
| | [20.0] Divisional Integrity | |
| | [21.0] German Leaders | |
| | [22.0] Stalin's Directives | |
| | [23.0] Reinforcements | |
| | [24.0] Victory Conditions | |

## *Read this First*

SPI began to print a standard description of the rules and how to learn the rules at the beginning of the rules. Once again a push towards the training aspect of the rules. Of all the attempts to improve the rules as a training document this one staying until the final collapse of SPI, so I assume it was successful. The rules of the games had now grown to the point new players found it very difficult to learn them. Even experienced players found it difficult to learn new games. SPI was beginning to search for ways to make games easier to learn. Overall they were not successful, as the real problem was the complexity of the games not the rules. However some of the techniques were useful, or which this was one.

**Figure 13 : Example of "Read Me First" from Leningrad.**



## Read this First:

The rules of this SPI simulation game are organized in a format known as the ***Case System.*** This system of organization divides the rules into ***Major Sections*** (each of which deals with an important aspect of play). These Sections are ***numbered*** sequentially as well as being named. Each of these Major Sections is introduced by a ***General Rule,*** which briefly describes the subject of the Section. Many times this General Rule is followed by a ***Procedure*** which describes the basic action the Player will take when using the rules in that Section. Finally, the bulk of each Major Section consists of ***Cases.*** These are the specific, detailed rules that actually regulate play. Each of these Cases is also numbered. The numbering follows a logical system based upon the number of the Major Section of which the Cases are a part. A Case with the number 6.5, for example, is the fifth *Primary Case* of the sixth Major Section of the rules. The numbering system is meant as an organizational aid. Using it, Players can always easily tell where a Case is located in the rules. As a further aid, an outline of the Major Sections and Primary Cases is given at the beginning of the rules.

**How the Section and Case Numbers Work:**

*Major Section Number*
*Primary Case Number*
**[6.5]**

## *Table of Contents Template*

The table of contents had slowly but surely developed and new Primary Cases became standard, such as Overrun, and some previous ideas were dropped, such as deployment at the beginning. We could say the rules template would look as follows;

Introduction & Description
- [1.0] Introduction
- [2.0] How to Play the Game
- [3.0] Game Equipment

Primary Rules
- [4.0] The Sequence of Play
- [5.0] Movement
- [6.0] Overrun
- [7.0] Stacking
- [8.0] Zones of Control
- [8.0] Combat
- [9.0] Terrain
- [10.0] HQ or Command
- [11.0] Supply

Rules Specific to the Game
- [xx.0] Untried Units
- [xx.0] Air Power
- [xx.0] Armour

Other, Not Significant Rules and Summing Up
- [17.0] Optional Rules
- [18.0] Victory Conditions
- [19.0] How to Set-up & Play (Scenarios)
- [20.0] Designers Notes
- [21.0] Design Credit

The Other rules varied a lot, as it was the best place to cut if you wanted the rules to fit into a specific sized rules book. It also didn't seem to be considered as important, although I feel this was a mistake. The Quadrigames also helped to mix the rules up, although the general above trend still seemed to remain.

## *Leningrad*

The biggest change was the way **Leningrad** was organised. This was obviously a massive attempt to change the whole way rules were organised. The terminology changed as did the whole order and organisation of the rules. It was clearly a game designed to introduce new players to boardgaming. Considering the massive changes I generally found the rules good, although some aspects were annoying, such as trying to find the effect of Zones of Control. Lets look at the changes in more detail;

> **Table of Contents :** Only the Primary rules are listed, thus reducing white space and making the rules smaller. This was done because Minor Cases no longer existed. While this had a simplifying effect, it also meant you needed to allocate three primary Cases to Combat, which seems wasteful. In addition it meant some rule cases were a bit long. Overall I feel the elimination of Minor cases a step backward. You could reduce the amount of rules by simply editing the rules.
>
> **Major Cases are divided into Bold and non-bold rules**. This is about the only concession to minor cases. The Bold sentence describes the rules and when required a non-bold paragraph is included to describe the rule in detail. Because of

the simplicity of the game this worked, but if the game was any more complex it would fall apart.

**Renaming of the Primary Cases** : The Primary cases are described in layman's terms, such as basic procedure instead of Sequence of Play. This is good for new players, but would annoy experienced players. However once you get the hang of it you can live with it. The non-technical descriptions are certainly more friendly, but I am not convinced the names are fully developed yet. After all one primary Case is called Disengagement, which is far more confusing than Sequence of Play, or Victory Conditions.

**Brevity :** This is the key to the rules and shows what you can do with good editing. What we have here is a ***Panzergruppe Guderian System*** game with rules 8 pages long, of which 2 pages are table of contents and designers notes and one page of tables and charts, which works. The key here is editing and careful though. This also highlights an interesting danger of having standardised rules. When its easier to copy 80% of the rules and do the minimal modification required you can end up with a set of rules both badly organised and too long. The ***Panzergruppe Guderian System*** games clearly show this and **Leningrad** is the test case which proves the point.

## Fifth Corp, Battle for Stalingrad & Kursk (1980)

We are getting into the period which I call the third golden age. The Panzergruppe Guderian games had ended and had been replaced with a new series of even more advanced and realistic games. As a result the standard trend was complexity and historical accuracy over playability. The effect was predictable. SPI was designing games for a static market and by making the games so complex the market was beginning to suffer a high degree of stress. (AT least I was)

**Table 38 : Primary Cases of Games Published in 1980.**

| **Fifth Corp (1980)** | **Battle for Stalingrad (1980)** | **Kursk (1980)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] How to Play the Game | [2.0] How to Play the Game | [2.0] General Course of Play |
| [3.0] Game Equipment | [3.0] Game Equipment | [3.0] Game Equipment |
| [4.0] Sequence of Play | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Movement | [5.0] Air power | [5.0] Movement |
| [6.0] Zones of Control | [6.0] Artillery Bombardment | [6.0] Overrun |
| [7.0] Stacking | [7.0] Movement | [7.0] Stacking |
| [8.0] Combat | [8.0] Stacking | [8.0] Zones of Control |
| [9.0] Friction Points | [9.0] Zones of Control | [9.0] Combat |
| [10.0] Artillery & Air Power | [10.0] Ground Attack | [10.0] Unit Modes |
| [11.0] Supply | [11.0] Initiative & Reaction | [11.0] HQ & Supply |
| [12.0] Reinforcements | [12.0] Special Soviet Units | [12.0] Replacements |
| [13.0] Introduction | [13.0] Supply | [13.0] AT & Artillery |
| [14.0] Scenario 1 | [14.0] Effects of Terrain | [14.0] Breakdowns |
| [15.0] Special Combat & Movement Rules | [15.0] Reinforcements | [15.0] Partisans |
| [16.0] West German Territorial troops | [16.0] Trans Volga Artillery | [16.0] Optional Rules |
| [17.0] Soviet Airborne | [17.0] Scenarios & Victory | [17.0] Air Warfare |
| [18.0] Engineers, Rivers & bridges | | [18.0] Scenario Organisation |
| [19.0] EW & Nuclear | | [19.0] Scenario 1 |
| [20.0] Scenario 2 | | [20.0] Scenario 2 |
| [21.0] Scenario 3 | | [21.0] Scenario 3 |
| | | [22.0] Order of Battle |

The **Battle of Stalingrad** was an unusual game, as it covered rather low level unit , ground and time scales. Nonetheless I have included it as an example of how SPI could be flexible in rules organisations when required.

I personally feel SPI realised how dangerous it was not to match the rules to the game and if they just copied the standard organisation it could actually make it harder to learn and play the game. While a standard rules organisation had some merits, the key was not the standard rules organisation but an understanding of what makes a good set of rules.

Their is not much to note for this year, in fact some retrograde steps seem in evidence. The Table of Contents are missing from some of the games published and we see How to Play the Game replaced by General Course of the Game, which was common several years ago.

**Kursk** could almost to be said as the best example of a standard rules organisation, with minimal experimentation. Considering the large amount of experimentation with the game system this was probably a good idea.

## *Commentary*

Their is one new facet which was appearing and that was the Commentary. This would be placed before the General Rule under some Primary cases and was used to explain the historical background of the rule. While interesting it added very little and in fact made the body of the rules longer and thus harder to use. I feel its better to place this historical background in the rear under Historical Notes or Game Notes or Designers Notes.

# The Desert Fox, BAOR & Sicily (1981)

This was a critical year for SPI, which resulted in its final demise. Some excellent games came out in this last year, but for whatever reasons the game company could not use their expertise to help them to survive. A sad year for the boardgames fraternity.

**Table 39 : Primary Cases of Games Published in 1981.**

| **Desert Fox (1981)** | **BAOR (1981)** | **Sicily (1981)** |
|---|---|---|
| [1.0] Introduction | [1.0] Introduction | [1.0] Introduction |
| [2.0] Game Equipment | [2.0] How to Play the Game | [2.0] Game equipment |
| [3.0] Sequence of Play | [3.0] Game Equipment | [3.0] Glossary |
| [4.0] Initiative | [4.0] Sequence of Play | [4.0] Sequence of Play |
| [5.0] Reinforcements | [5.0] Movement | [5.0] Movement |
| [6.0] Air Support | [6.0] Zones of Control | [6.0] Zones of Control |
| [7.0] Supply | [7.0] Stacking | [7.0] Stacking |
| [8.0] Movement | [8.0] Combat | [8.0] Limited Intelligence |
| [9.0] Stacking | [9.0] Friction Points | [9.0] Combat |
| [10.0] Zones of Control | [10.0] Supply | [10.0] Cadre Units |
| [11.0] Combat | [11.0] Artillery | [11.0] Supply |
| [12.0] Artillery & AT Units | [12.0] Attack Helicopters | [12.0] Entrenchment's |
| [13.0] Refit | [13.0] Air mobile operations | [13.0] Air Power |
| [14.0] Fortifications | [14.0] Air Power | [14.0] Reinforcements |
| [15.0] Scenarios | [15.0] Airborne Units | [15.0] Introduction |
| | [16.0] Engineers | [16.0] Sequence of Play |
| | [17.0] Reinforcements | [17.0] Setting Up the Game |
| | [18.0] Electronic warfare | [18.0] Amphibious Landings |
| | [19.0] Introduction | [19.0] Airborne Operations |
| | [20.0] BAOR Unit Deploy | [20.0] Weather |
| | [21.0] Special Rules | [21.0] Supply |
| | [22.0] Scenario 1 | [22.0] Support Points |
| | [23.0] Scenario 2 | [23.0] Air Operations |
| | | [24.0] Special Movement |
| | | [25.0] Special Combat |
| | | [26.0] Evacuation |
| | | [27.0] Reinforcements |
| | | [28.0] Victory Conditions |
| | | [29.0] Variable Campaign Game |
| | | [30.0] Scenarios |

**The Desert Fox**, as did **The Battle for Stalingrad** the year before, indicates a tendency for some game to follow no standard rules design. The reason could be a desire to follow the sequence of play of the specific game system, thus the rules organisation would follow the sequence of play. But in **The Desert Fox** their are still some aberrations, such as Supply. The problem with such a "different" system is experienced plays would have a bit of trouble learning the rules. **Leningrad**, which also used a non standard rules organisation, can get away with it because of its simplicity, however **The Desert Fox** can't get away with it due to its complexity. The lesson is clear, don't muck around with perfect unless you have a clear idea why and what you are doing.

This is my person opinion, but it seems to me that the increased complexity of SPI games resulted in less and less new players entering the hobby. This meant the buyers of SPI games were a core of experienced players, which could handle the increased complexity simply because of the commonalty between games. In the last two years of SPI the massive increase

in complexity and changes in some rules organisations left the experienced with a difficult job. SPI was hurting its critical and most important static market.

The final point of note is that SPI were moving more and more towards a game series approach, with two of the above games being a member of a game series. The end result of game series was a massive growth in rules size and complexity. **Sicily** is a classic example, here we have an operational game with 30 Primary Cases. In 1971 **Normandy**, a similar scale games, had only 15 Primary Cases.

# Monmouth & RDF (1982)

This was the year SPI finally died. **Monmouth** was the last real S&T game published and **Rapid Deployment Force** was the first TSR game published. I have included RDF in my study because it was actually a SPI designed game, with TSR simply publishing it as part of the take over. It was published in 1983, but was initially meant to be released in 1982, so it is a similar vintage to **Monmouth**.

**Table 40 : Primary Cases of Games Published in 1982.**

| **Monmouth (1982)** | **RDF (1982-1983)** |
|---|---|
| [1.0] Introduction | Introduction |
| [2.0] Game Equipment | [1.0] How to Play the Game |
| [3.0] Sequence of Play | [2.0] Game Equipment |
| [4.0] Movement | [3.0] Pre-Game Sequence |
| [5.0] Grand Tactical Movement | [4.0] Sequence of Play |
| [6.0] Facing | [5.0] Formations |
| [7.0] Formation | [6.0] Movement |
| [8.0] Stacking | [7.0] Line of Sight |
| [9.0] Morale | [8.0] Indirect Fire |
| [10.0] Fire Combat | [9.0] Direct Fire |
| [11.0] Shock Attack | [10.0] Assault Combat |
| [12.0] Retreat | [11.0] Multiple Weapons Systems |
| [13.0] Artillery | [12.0] Transportation & Mounted Combat |
| [14.0] Scenario | [13.0] Morale |
| [15.0] Fatigue | [14.0] Air & Air Defence |
| [16.0] Command | [15.0] Victory Conditions |
| [17.0] Activation | [16.0] Scenarios |
| [18.0] Rally | [17.0] Electronic warfare |
| [19.0] Scenario 1 | [18.0] Introduction |
| [20.0] Scenario 2 | [20.0] BAOR Unit Deploy |
| [21.0] Scenario 3 | [21.0] Special Rules |
| | [22.0] Scenario 1 |
| | [23.0] Scenario 2 |

Being the last verifiable S&T game, **Monmouth** should be viewed with interest. The game introduces some new visual ideas. The Read This First section has been shrunk and the Table of Contents only included Primary Cases. In addition to this the rules are organised in a similar manner to **Leningrad**, with no Minor Cases, only bold sentences followed by a paragraph if required. Some of the non-bold paragraphs are very long and detailed, with some occupying half a column. In addition to this more rules are placed into the procedures, with some procedures being rather long and detailed.

It seemed to me that a rather complex and detailed game system was crammed into a rules organisation suited for a simple game system. With **Leningrad** this worked, with **Monmouth** is certainly did not work.

As for **Rapid Deployment force** we go back to a more familiar feel, however we can't really tell who was responsible for what. As a result it has been included for curiosity more than anything else.

## Summary

We can clearly see that from 1970 till 1982 SPI slowly developed and refined the way they organised rules. In some cases the experimentation was unsuccessful and was never repeated again. In other cases their were retrograde steps, but which almost always returned back. But the most interesting development was the splitting of the rules into different families of rules organisations. **Panzergruppe Guderian** introduced an organisation which was carried through most of the ***Panzergruppe Guderian system*** games, but which was generally not used by any other game published at the time.

# The Perfect Set of Rules

In order to create a close to perfect set of rules we need to firmly understand the purpose of the rules and the physiology of the player. The purpose of the rules will help us determine how to organise them and what we should place in the rules. The Physiology of the player will help us determine how to make the rules attractive and desirable to learn and use. In many cases the logical approach is not necessary the best approach. This can be significant as the objective is to create the "best" rules, in human terms, not the best rigid system to use for rules design.

I have decided to approach this topic in a two stage approach, which can be best titled;

Physical Appearance
Organisation

While logic may tell us that the physical appearance of the rules should not be of any importance, in reality this is not the case. In this case logic does not help us to understand the psychology of the player and people in general. The whole science of marketing is based on appearance and emotions. I will begin my paper on this aspect, simply because its the easiest.

## Physical Appearance

Physical appearance covers such aspects as, page size, font size, rules length, pretty pictures, etc. This is a rather variable area but their seem to be some basic rules which need to be considered. Most of these rules are based on these two criteria;

"what the purpose of the rules are" and
"what makes rules attractive".

We must always remember the primary purpose of rules is to act as a reference document, which may need to be referenced many times during a game. The secondary purpose of rules is to act as a training document, which will help people learn the game. The final purpose of the rules is to be an interesting read. This can help us get the incentive to learn and play the game as well as allowing us to do something while our opponents takes an inordinate amount of time to move.

I have broken up the main rules of appearance into the following categories;

Ease of Handling
Quick Referencing
Logical Organisation

### *Ease of Handling*

Its important the rules can be easily handled while playing the game. Don't use enormous pages and don't use fold out rules. Its best to use a simple booklet form, which each page a reasonable size.

Rules need to be capable of being read almost anywhere, in bed, on a train, at a table while playing the game.

Rules are referenced a great deal. You need to make it possible to flip through the rules quickly and easily, as players will be referencing rules through out play.

The ideal size should be no greater than A4. Anyone who has tried to read a large format paper in a train will understand why. For those who have not performed this task and as a result don't understand, try it one day. A smaller format can also work, but we will discover later that this causes another problem. So over all an A4 magazine sized format seems to work best.

## *Quick Referencing*

Because players will be referencing rules a lot it best to put as much information on a page, or two pages, as possible. If you can fit all rules relating to Combat and Overrun on a single page, when a player is looking for a overrun rule he does need to flip pages. This is where the rules of;

No white spaces
Smallest readable font

comes into play.

White spaces are a nightmare as they achieve nothing and simply increase the page flipping required. The smallest possible font allows us to put a lot of rules on a single page.

You will need to break these up into columns, like a newspaper, as very long lines are unreadable. When you scan you can probably scan no more than 20 words across, long lines force players to read everything in order to find a rule.

You need to make sure the font and lack of white spaces don't make the rules totally unreadable. Eight point is about as small as you should consider. You do need to follow standard printing practises and break things up into sentences, paragraphs, headings and so on. But don't create white space for aesthetic reasons and don't try and make the rules attractive for its own sake. A good example is looking at a dictionary and how its organised.

## *Logical Organisation*

You need to be logical, placing all the charts and tables on the map or on a single page will greatly reduce cross-referencing. Placing these in the body of the rules is a double disaster. It both reduces the number of rules you can place on a page and it means you have to do wild cross-referencing as you play the game, as charts and tables are commonly accessed during play.

You also need to move unnecessary rules to the front or rear of the rules book. Scenarios, designers notes, optional rules, contents and other auxiliary rules should not be placed in the main body of rules. Placing these auxiliary rules in the body of the rules reduces the number of important rules per page and actually makes finding these auxiliary rules harder.

Diagrams and graphics are very useful, but make sure they are not solely for decorative purposes. Making sets of rules look good, while impacting the effectiveness of the rules, is just stupid, as when you are furiously trying to find that all important exception to the compulsory retreat rule who cares if their is a pretty picture of a tank in the top corner.

This does not mean graphics should not be used, if they serve a purpose they can be very useful. Putting a tank graphics in the mechanised movement rules makes sense as an indexing mechanism, as well as looking good.

### *Case System*

SPI developed the "Case System", which allowed for the numbering of all rules in some sort of logical order. This greatly facilitated cross referencing and general referencing. Unless their is a very good reason not too, you should always use this or something very similar. Cross references of rules is an excellent aid for players. The case system allows efficient and easy cross referencing.

Another addition to the case system is the concept of General Rules, Procedure and Cases. While this may initial seem to contradict my earlier statement of getting as many rules on a page as possible, we need to understand the rules have a additional purpose above referencing, they are a leaning tool also. We don't learn how to write from a dictionary, but we need to learn how to play the game from the rules. General Rules and Procedures help the learning process and are useful, however examples of play and more detailed learning efforts should be placed in the front or rear of the rules. This way you keep the rule density high, while keeping the readability high also.

SPI introduced a commentary section later in its career. I am not too sure about this as I find it adds little and uses up valuable space. It may be useful for non-standard rules, but a commentary for Combat should be avoided.

### *Summary*

Their are many other hints to consider, but it should be obvious by now the main thrust of this section. A set of rules is a useful tool, similar to a dictionary. It need to be designed in such a way to increase it usability and usefulness. Their is no need to market rules with pretty pictures, amusing stories, or whatever. When we reach out for the dictionary to look for a word, we don't care if the cover looks pretty, if their are pretty pictures present or if their are amusing stories or comments to read. We want to find out how to spell a word.

This is not to say we should total ignore aesthetics, but please don't put effort into something which will make the tool harder to use. When people get excited about a game they look at the map and pieces first, and only last at the rules. Put your marketing budget into the map and pieces.

## Organisation of the Rules

Now we come to the organisation of the rules. What do I put in them and in what order. We have already discussed some of the rules of rules design, which are;

> Keep the significant body of rules together, probably in the centre of the rules book.
> Place less significant rules sections at the beginning and end of the rules book.
> Keeps all tables and charts together, either on the map or a special tables & charts sheet.

We will cover the art of rules design by looking at the organisation of the rules from front to back. The first question begs answering, what should we place at the beginning. We should also note the rules have to follow some sort of logical order, especially considering the fact the rules will act as both a reference and learning document.

SPI tended to organise rules into the following sections;

Introduction
Core Rules
Specific Rules
Other Information

We should also add Cover and Tables and Charts to this list of items to consider.

## The Cover

We can do some of the more obvious suggestions first. The rules book should start with the title and table of contents. We could place some extra material such as a marketing picture on the front page and perhaps a guide on how to use the rules, as SPI did before it folded. The table of contents acts as a reference aid and should be included, preferably after the title and promotional stuff. It may be worth going over some of the type of titles SPI used.

When we go back to 1971 the rules failed to have much in the way of promotional graphics, perhaps having at most a small silhouette**. The Moscow Campaign** used a running German solder as its graphics. The tittle normally consisted of a short and snappy name, and then a description. so **Turning Point** was followed by "*The Battle of Stalingrad"*. Later games had more descriptive sub-titles, **The Moscow Campaign** had *"Strike and Counter strike, Russia 1941"*. The table of contents was normally totally missing.

The later games were more elaborate and fell into a few basic groups. These were;

SPI games, standard. Such as **After the Holocaust** (1977) or **Kursk** (1980).
S&T games, standard. (Such as **Kharkov**)
Game Series. (Such as the ***The Central Front Series***)
Quadrigames. (Such as ***Modern Battles***)

**Standard SPI game** : Back in 1977 the rules booklet for standard SPI games, and some S&T games, consisted of a flashy cover. This normally consisted of the title, subtitle and a full page picture. This was then followed by the Table of contents on the following page. By 1980 SPI had changed this system and the front cover rarely had a graphic or picture, only the title, subtitle and the Read this First section. This Read me First was a guide on how to learn the game and explained the features of the case system. From a marketing point of view **After the Holocaust** looked better, but the system used for **Kursk** was more practical. Logically I favour the latter system, but emotionally like the former, with flashy picture and graphic. I think the best solution is to merge both system, keep the flashy picture but decrease the font of the Read Me First and place it with the table of contents.

**Standard S&T game:** The standard later S&T system was similar to the older **Turning Point** game, except a table of contents was present. The earlier S&T system used the pretty picture on the front page and then a small table of contents on the same page as the beginning of the rules. If size of the rule book is an issue this is the way to go.

**Game Series**. This used two rules books, the standard rules have on the cover the title, subtitle and the Read Me First blurb. The following page has the table of contents on the same page as the beginning of the rules. Enclosed with this was the exclusive rules, which are similar to the standard S&T system.

**Quadrigames**. These are similar to the Game Series except minimalism is the key. The shorter the rules the better.

The system you wish to use depends on your personal preference and in many ways the type of game. This is why SPI has so many ways of starting their rules. It makes little sense to extend the size of the rules book if your game is small, on the other hand if you have designed a substantial game you may want substantial rules with all the required flashy marketing gimmicks..

# Rules - Introduction

Before we actually put rules down it would be a good idea to introduce the game, explain the general course of play, game scale, terms used, components and other such explanatory features. SPI tended to put these type of rules in the first 3 Major cases. The type of topics generally were as follows;

Table of Contents
[1.0] Introduction - Common to almost all games
[2.0] General Course of Play, How to Set-up and Play the Game or Glossary of Terms
[3.0] Game Equipment

Early games have “Game Equipment” as the second case, but this was moved to Primary Case [3.0] in most later games. “Glossary of terms” was often merged into “Game Equipment” leaving Primary Case [2.0] as “General course of Play”, which actually makes the greatest sense.

## *Objective - Training*

We need to consider the objective that is being achieved. The section before the core rules serve an education purpose, with a minor reference purpose.

You don’t want player referencing the beginning of your rules once they knew how to play, it would mean the cross referencing could become awkward and would restrict the ability to include training information. As a result the priority of this section was one of training and education.

## *Table of Contents*

You need a table of contents at the beginning of the rules. This is a reference aid and is not an educational one, but is a logical thing to do. Players who need to know about Restrictions of Overruns can find this quicker if they can reference a table of contents. The only decision to be made is how much information should you place here. If you make the table of contents too detailed it becomes an effort to read and thus defeats the purpose as a reference aid. If you put too little information here it loses its usefulness. The best system I have seen was used

only for a short period by SPI, it had the Primary cases in clear bold print and the major cases in small print merged together in a paragraph. **Cobra** used this to good effect.

> **6.0 MOVEMENT** **6.1** How to Move Units; **6.2** Movement Inhibitions and Prohibitions; **6.3** Mechanised Movement; **6.4** Effect of Weather (Allied Air Power) on German Movement; **6.5** Overrun; **6.6** Disengagement; **6.7** Special Terrain; **6.8** Terrain Effects Chart; **6.9** American Trucks.

I would probably separate the Primary case from the paragraph, but basically this does what is necessary and takes up the bare minimum amount of white space.

## *[1.0] Introduction*

You could easily leave an introduction out as it does not serve a logical purpose, but once again convention says you need an introduction. This should tell you a brief background of the historical situation and some broad information about the game. SPI tended to provide you with two basic pieces of information;

> Historical Background
> Game description

The game description would include the following information;

> Type of game : Tactical, Operational, Strategic, Land, Naval or Air.
> Description of the game : Scenarios, what they cover.
> Number of players : Solitaire, two or more.
> If more than two players the type of Multi-player game : Team or Multi player.

Other information could be included, but at this early stage rules details would be a waste of time.

We can see the effect of not putting this information in the beginning. Without an introduction the player may be a bit unsure of what he will be playing. The introduction should include general historical information, but also what the game is. Is it two player, is it solitaire, is it team player or Multi-player. Does it cover the air component of the battle, or the land, or the naval or any combination of these three. This may be significant for a Battle of Britain game, as this could cover the air war, the naval invasion or the land invasion. It could also cover some or all of these aspects. The Introduction will tell a player what the game covers.

## *[2.0] How to Play the Game or General Course of Play*

This is the critical training Primary Case. This Primary Case changed a great deal over the years at SPI, starting as a descriptive breakdown of such facts as scale and ending up as a short training primer on how to play the game.

Traditionally this Primary case provided us with a paragraph with some additional technical facts, such as the fact the game is played in Game-Turns and that the order of events is controlled by a sequential sequence of play. It could also include Game Scale and other descriptive information. Overall not too helpful, but later this was greatly extended out to include a breakdown of a game turn, play examples and whatever is required to make this a good primer or training manual. The key is that This Primary Case is you main chance to help players easily learn the game.

Without a general course of play players may not have any idea the game is sequential in nature, or simultaneous, or the order of play is determined randomly. They may have no idea units can engage in combat during a movement phase, or the fact their are phases at all. Experienced player may not need this and can go straight to the sequence of play, but if you are new to the hobby you could be in trouble. Later games use this section as an education exercise, providing examples and very detailed educational summaries of play.

I personally feel that this section has been the most neglected and the area which could do with the greatest development and improvement. Coming from an educational background I know the importance of a good training manual, unfortunately I also know how hard and time consuming this is to create. It may be best to create this last, which also has the additional disadvantage of being created by a fatigue ridden designer. The best answer may be to get someone else to write it, as this can be done separately.

## *[3.0] Game Equipment*

Game equipment, which included scales, glossaries and other related mechanics factors. Without this player may not be aware they are missing a map section or chart. The description of the counters will give player an idea of where the attack value is, the movement value and other values. They may be unaware of unit types, one units moves my air another by sea, etc. The scale information gives them historical perspective and the glossary helps them understand the body of the rules when they keep on using unfamiliar terms such as “steps”, attack strength, MPs, and many others.

A good example of this Primary Case is Kursk, which organised it as follows;

> **[3.1] THE GAME-MAP :** Apart from describing the map itself, such as number of map sections, size and the fact its superimposed by hexes, squares or areas, you need to describe any unusual map features. Examples could be deployment zones, symbols or any other unusual features.
> **[3.2] CHARTS AND TABLES :** You may have you charts and tables scattered between the map or special game aids. The charts and tables and their locations should be spelt out. Their is nothing more annoying than not being able to find a chart and later discovering its hidden in a corner of the map.
> **[3.3] THE PLAYING PIECES :** Next to the map the most important facet of any game is the pieces. You need to describe the counters, the meanings of the values and symbols and you need to include diagrams of the pieces. Once again it rather annoying being told to look at the Blitz value of the counter and having no idea what this is and where it is.
> **[3.4] GAME TERMINOLOGY :** Called a glossary in some games, this is a break down of the common terms and their meanings. Experienced player may never need to look at this, but I can assure you new players will need it. Understanding the difference between Step Value and Combat Value is vital.
> **[3.5] GAME SCALE :** This is perhaps not essential, but I find it rather interesting. It helps experienced players as well as new players understand what is happening.
> **[3.6] PARTS INVENTORY :** Obvious, if you game consists of many charts, tables, counter sheets and maps it may be best to list this out so players can quickly discover if something is missing.

This about covers everything you may need to cover in this Primary case. It serves a mix training and reference purpose. You may need to occasionally reference this, but reading it

will also help you learn important overall aspects of the game. It is the ideal purpose for a Primary case which straddles the training section and Rules section.

### *What not to do*

This is obviously not the only way to organise the beginning of the rules but it does make the most sense. Putting detailed scenario instruction at the beginning is pointless as player have no idea what they are reading. Putting Designers Notes here is also a bit illogical as the reader will probably have no idea what the game designer is talking about. You could have Historical Notes, explaining the historical background in more detail, although you could place this in the introduction. You could put orders of battles, but that is more an appendix thing and should go in the back. Tables and charts would not go here, as once again the reader has no idea what he is looking at this point and it would probably only serve to confuse.

## Core Rules

Now we are beginning to enter the actual rules. This is the areas players begin to use the rules as a reference document.

The Body of the Rules, should, begin with a sequence of play. This regulates play and needs to be covered initially. You can also use this as the key reference starting point. When we look at The Movement Phase it may ask us to see [5.0] Movement, [6.0] Overruns and other related rules. Once we know the game 99% of the sequence of play will be second nature to the player and will require no further referencing, but when its needed it can be quickly and easily done.

Now we need to look at the actual rules and perhaps an important objective is to determine exactly what is a core rule.

### *What is a Core Rule*

A quick definition of a core rule is “Rules which are used constantly and without knowledge of, makes the game impossible to play”.

If the game is a land based game then Land Combat and Land Movement would be considered as Core Rules. On the other hand Air Movement may not be considered as core rules in such a game, especially if movement of these units are rare.

Movement and Combat are the two main concepts which all the core rules revolve around. It makes a great deal of logic as the whole point of a game is the movement of counters in such a way that combat will be advantageous. In Chess all the excitement is movement, as combat is simple. In a boardgame Combat can be as complex and exciting as Movement. If we look at our sequence of play you will always find a Movement and a Combat phases, as without them nothing can occur.

It should be noted that you could have Combat and Movement rather than the traditional Movement and Combat, but almost no games has this type of sequence of play. If you think about it you will realise why. (**World War One** is an exception to an extent and suffers a terrible problem as a result).

## *Movement & Combat*

You could put all you core rules into a Movement and Combat primary Case, and very early SPI did try and do something like this, however we end up with unwieldy Primary Cases. Its best to break up you core rules into easy to disgust Primary Cases.

First we need to deal with Movement and all the core Movement sub areas. The common Movement related Primary Cases are;

[5.0] Movement
[6.0] Overrun
[7.0] Stacking
[8.0] Zones of Control

These are the functions which need to be understood to move counters. Enclosed in the Movement rules you could include terrain, weather and other effects. If these are too complex or long you will need to place them in their own Primary Case.

Now we look at Combat, generally this consists of one Primary Case;

[9.0] Combat

The final Core rules are those with affect Movement and Combat. You could put Overrun in here if you wish, as this is a combination of Movement and Combat. However, in early games, this was normally placed with Movement for historical reasons, as the first overrun rules did not involve combat. The rules which are normally placed here are as follows;

[10.0] Terrain
[11.0] Command
[12.0] Supply

Terrain was often not included as it would be merged in with the Movement and Combat primary Case, but if the terrain rules were complex enough it was included. Command was also sometimes omitted if their was no Command or HQ rules. Supply was almost always present. Other rules which fitted in this area were;

Unit Build-up & Breakdowns
Double March
Artillery, Anti-tank or other special common weapons
Untried Units or Limited Intelligence
Air Combat (If air combat was both common and significant)
Friction Points
Unit Modes

The common factor is that all these rules must be necessary for the completion of every Game-Turns Movement and Combat phases. Rare events do not belong here. Events which fall outside Movement and Combat do not belong here. The reason why is that the bulk of any successful game consists of commonly performed Movement and Combat functions, as these are the most exciting and interesting game tasks. If a game ends up taking up the most time doing production, it will fail.

## *Primary Case Organisation*

Now we need to discuss how to organise these Primary cases. To start off with we should use the standard format of;

General Rule
Procedure
Cases

However once these are performed we come into the area of Major Cases. How should we organised Major Cases? The Major Cases of a Primary Case needs to cover the following topics;

**When** can you do this act.
**What** stops you from doing this
**How** can you do this, or What is the effect

This is not a hard and fast rule but if we look at a typical Movement Primary Case we see;

[5.1] Expending Movement Points (When and How)
[5.2] Movement Inhibitions and prohibitions (What stops you)

This is then followed by special situations and cases such as Rail, Terrain Effects, and Infiltration. Most of these could be placed in its own Primary Case, but if they are not complex enough its best to place it here. If we look at Zones of Control the situation is clearer;

[8.1] When Zones of Control are Exerted (When and What stops you)
[8.2] Effects of Zones of Control (What is effect)
[8.3] Disengagement (Special What is effect)

The most complex Primary Case is Combat, looking at **Kursk** we see the following;

[9.1] Restrictions on Combat (What stops you)
[9.2] Multiple Unit Combat (When)
[9.3] Restrictions on Combat Resolution (What stops you)
[9.4] Explanation of Combat Results (How/Effect)
[9.5] Unit Substitution (How/Effect)
[9.6] Special Unit Resolution (How/Effect)
[9.7] Retreats (How/Effect)
[9.8] Advance after combat (How/Effect)
[9.9] Combat Tables (How)

We will look at this in more detail below as we go over each significant core rule.

## [4.0] Sequence of Play

When we look at a game the common threat is that everything occurs in some sort of sequence. Even a simultaneous movement game has some sort of sequence of play. These are the steps that need to be carried out to conduct a single unit of the game. This is the logical rule to have in the beginning of the body of the rules.

### Merging rules in the sequence of play

Their are many different ways of doing the sequence of play. Because the sequence of play actually involves almost all the rules its possible to build these rules into the sequence of play. So when we get to the movement phase, all the movement rules are listed under it. Avalon hill uses this for their latest version of Third Reich and while as a learning document its excellent, as a reference document its terrible.

Mixing the rules up in the sequence of play has two negative effects;

> The sequence of play is blurred, as the sequence of play may extend over many pages.
> Finding a special rule on something which straddles phases can be very difficult.

For example movement rules can be under movement and the mechanised portion can be under mechanised movement. When we get the mechanised movement you need to flip between movement and mechanised movement to get the while picture and trying to find a specific rule on mechanised movement may be hard as you may be unsure of weather its in the movement phase, or mechanised movement phase. Finally, not all rules can be incorporated in the sequence of play, so then you may have to refer to a third location for information about movement.

### Keeping the sequence of play separate

The next method is to provide a basic sequence of play, with as many references to other rules as possible. So the Movement phase may refer to Movement, Terrain, Weather and any other related rule. This has the advantage of making the sequence of play short and sweet. Its possible to keep this page open and following the sequence, when you re unsure of something you go the referred rule. After a while you never need to do this and you can just keep the sequence of play available as a reference.

Sequence of Play major cases would typically be made up of the following cases;

> [4.1] The Game-Turn (Sometimes put in the General Rule)
> [4.2] Game-Turn Sequence Out-line
> [4.3] Game length (Sometimes placed in Scenario details)

We can see in the above Major cases the Sequence of play gets a introduction and some form of summary, keeping the core rule together. In some ways a mini version of how your entire rules should look.

### Constructing the Sequence of Play

We need to look at how a sequence of play should be constructed. This to a large extend depends on the game systems used, but in almost all cases you will have a standard sequence

of play made up of the two player turns, each of which is made up a phases. Following this you will have a Game-Turn Advancement or Indication segment, which basically consists of advancing the game-turn marker by one. So we can say a basic set of rules would look as follows;

A. Blue Player Turn
B. Red Player Turn
C. Game-Turn Indication

If your game system required you could include additional segments, such as join segments of various descriptions and even more than two player-turns if the game is Multi-player.

Each player turn would consist of various phases, which would typically consist of the following;

1. Movement Phase
2. Combat Phase
3. Reinforcement Phase

This is a very simply sequence of play and you may need to add mechanised movement phase, air phases and a host of additional phases to suit your game.

## *Getting the terminology right*

One area often ignored is getting terminology right. In addition you should not mix terminology in such a manner which makes it confusing. For example a phase should be a specific part of the sequence of play which results in some action. It can be sequential, only one player does something, or it can be simultaneous, both player perform actions. You should not then call the Player-Turn a phase, as then the meaning of the work phase becomes confusing. In some cases phases are made up of sub-phases, these should be accordingly named. Also, some phases allow the player who's Player turn is not being performed do some work. These should be clearly named. The type of hierarchy which SPI uses is as follows;

Game-Turn
Player-Turn
Segments
Phases
Sub-Phases

It does not matter what hierarchy you use, make is clear, concise and consistent.

## *Sequence of Play determining rule order*

Irrespective of the system used we can quickly see the body of the rules should follow the basic construction of the sequence of play. Some logic has to be added here as the most important standard rules should stay together and the special rules also should stay together. None the less the rest of the major cases should follow the basic construction of a sequence of play.

## *[5.0] Movement*

The most basic function in any game is the movement of counters. As much as possible all movement rules should be placed here, unless its so specialised or complex it needs its own section. Most movement major cases are divided up into the following sections;

[5.1] How to Move Units
[5.2] Movement Inhibitions and Prohibitions
[5.x] Terrain or Weather effects on Movement (If simple placed in the Movement Inhibitions and Prohibitions) Could include Terrain effects Chart and Weather effects Chart.
[5.x] Special Movement (Mechanised, Air, Naval, Rail)
[5.x] Special Movement situations (Disengagement, Unit Modes and whatever the designer can dream up).

Logic dictates this order. You first need to know How to move followed by any restriction and inhibitions, thus the first two major Cases. The rest is arbitrary and can adopt any order you see fit.

It must be pointed out I am talking about the movement of land units. If this was an air game this would be the movement of air units. Movement of unusual unit types should be covered elsewhere, for example if this were a land based game you may have an Air Movement case covering the movement of air units. However if the movement occurred in the Movement Phase and the rules were simple then placing it in this major case makes some sort of sense.

The key here is you do not want to clutter common rules with unusual rules. If the movement of air units is as long as all the other movement rules together, then when a player wants to check up on a land movement rule he has to scan the air movement rules also. The same applies in reverse, when he does want to find out about Air Unit Movement, you player does not want to be forced to scan standard land movement rules.

A good overall rule is if it occurs in the Movement phase and it can fit in a single Major case, it should go here. The exceptions are items such as Zones of Control, Stacking and Overrun. This is normally because these rules can extend over more than a single major Case.

## *[6.0] Overruns*

This rule started as a special movement rule, but has become so common in most games it normally occupies its own major case. This is due to two factors;

Overrun has become a merging of movement & Combat.
Complexity of overruns have increased

This has resulted in this rules getting its own primary case. In addition Overrun's importance has dramatically increased until it has become a key rule to simulate the simultaneous nature of real combat.

Overrun is basically combat while moving. Because the key factor of overrun is movement its probably a good idea to place it directly behind movement rules. The main reason is overruns occur during the movement phase.

The main types of cases in this could be;

[6.1] Conditions for Overrun or Restrictions of Overruns

[6.2] Resolutions of Overrun
[6.3] Special Overrun situations (Disruption)

The logic behind this is obvious, you need to tell people how to overrun and when they can't overrun. This is then followed by the act of overrun. Finally any special overrun rules such as disruption should be covered.

Obviously if your game did not require overrun you would not have this Primary Case.

## *[7.0] Stacking*

Units can normally stack and stacking changes during movement. Players may need to know about stacking during movement and especially at the end of movement, as over stacked units are normally eliminated. Stacking Rules normally consist of the following cases;

[7.1] Stacking Point Values (Normally only an issue if using a complex stacking point system rather than a simple counter limit).
[7.2] Stacking Restrictions
[7.3] Stacking and Unstacking (If their is a cost to stack and unstack)
[7.4] Effects of over stacking (if the rule is complex enough to warrant its own case)
[7.5] Inspecting Stacks (If the rule is complex enough and is attempting to create some fog of war)

Again you first need to know what the stacking limits are. This can be placed in the stacking restrictions Major case, unless its so complex it needs its own Major case. The effect of over stacking should be placed in the stacking restrictions, unless it too is too complex. A definition of complex is if a rules uses up more than one Minor Case it may need its own major case. The stacking and unstacking rules are only relevant if their is a cost to do so, or if its restrictions are so complex it needs its own Major case. Finally some game attempt to create a fog of war by restricting the inspection of opposing stacks of units. If so you may need your own Major case.

If stacking was very simple, such as no stacking allowed, you could be tempted to place this in the Movement rules, however stacking has combat ramifications so it should always gets its own Primary Case.

## *[8.0] Zones of Control*

Zones of control have many affects, but inhibiting movement is the most important. This, like overruns, may have been part of the movement rules but as the complexity and affect of zones of control have grown it got its own major case. Zone of control major cases are typical made up of the following cases;

[8.1] When zones of control are exerted
[8.2] Effects of Zones of control
[8.3] Special Zones of Control rules, such as Disengagement

When dealing with zones of control we need to know who has a zone of control and the extent of the zone of control. Its normally only one hex, but may not extend into some terrain or over some Hexside terrain. Once we know who has a zone of control and under what situation we need to know what its affect is. Finally we may end this up with special rules such as

disengagement. You could put this in the Movement Primary case, but if the ZOC's are locked and require combat to exist then this is the best area for it.

This pretty much ends all the core rules which may be encountered during a movement phase. Now we will advance to the Combat Phase.

## *[9.0] Combat*

The combat phase is traditionally the most complex of all phases. While we can cleanly break up the Movement rules into smaller segments, such as Overruns, this is a much harder job for combat.

All the rules required to engage in combat would be included in this major case. The following cases may be found in this major case;

[9.x] Conducting Combat (May be included in the procedure)
[9.1] Restrictions on Combat or Which units may attack.
[9.2] Multiple Unit and Multi-hex Combat.
[9.3] Combat Modifiers or Calculations (May be included in Conducting Combat or Combat Resolutions)
[9.4] Combat Resolution or Explanations of Combat Results (May include Die roll modifiers, column shifts and unit steps)
[9.5] How to Retreat
[9.6] Advance after combat
[9.7] Terrain Effects on Combat (May include weather effects also)
[9.8] Special Rules (Paratroops drop, Amphibious attack, Divisional Integrity, Air Support etc.)
[9.9] Combat Results Table

AS you can see this Primary case is full on. In fact you would normally have a substantial Procedure so you did not need to have a special Major case for Conducting Combat. However you did it you need to start with a How to conduct combat, followed by any restrictions to combat. SPI tended to also have a Multi unit and Multi-hex Major case, which could of just as easily been placed in Conducting Combat or Restrictions on Combat. It really all depends on how many minor cases are required to cover all the rules. Organise them in the most logical manner, spreading the rules out.

We now need to cover modifiers. The actual calculation of combat should of already been covered in Conducting Combat, but if this occupied a procedure you may need to formalise the rule. The modifiers could include terrain and weather effects, if they can fit in. Once we have cover all these rules we can now conduct combat.

Apart from a single minor case to describe how to roll the die and cross reference the result we need to mainly cover the explanations of the combat results. Results will be in terms of losses or retreats, which is why the next rule should cover how to retreat. Some games allow an advance after combat, which is covered next. This ends the core rules, after this are special rules.

The classic special rules are terrain and weather effects. If the movement rules included terrain effects on movement we would be placing a terrain effects on combat here. If the movement rules did not contain this, their is a chance all terrain effects are in their own

primary case. Weather is a bit more difficult. If weather has a or affect every turn then it can be treated like terrain, if it does not then it should be placed outside the core rules.

We now come to special rules. If their are a lot of these we need to make sure their are sufficient Major cases left. If any special rule is long enough or unusual enough it should have its own primary case and left out of the core rules. For example, Paratroops combat may only be possible on a single game turn or on clear turns, which may only consist of half the available game turns. It would be best to move these rules out. On the other hand paratroops drops may occur at any time and may be common in the game, in this case include it here. The only caveat is if the rule was so simple it could fit in a single minor case, if you have room pout it here simply to keep the size of rules down.

We should end the Combat primary case with the Combat Results Table and the CRT Modifiers Table.

## *[10.0] Terrain*

You may wish to insert all terrain rules into the major cases which are affected by it. However if the affect is wide reaching or the rules are complex it may be best to have a major case for these features.

The terrain Primary case would probably look as follows;

[10.1] Terrain effects on Movement
[10.2] Terrain effects on Combat
[10.3] Terrain effects on (Supply, Zones of Control, etc.)
[10.4] Terrain effects Chart

Another way of organising it is by terrain feature, such as;

[10.1] Rivers, Lakes and Seas
[10.2] Cities, Towns, Roads and Railways
[10.3] Effects of Mixed terrain
[10.4] Terrain effects Chart

The system to adopt depends a great deal on the amount of terrain features and the rules which control them. Its probably more logical to organise this by terrain effects on game functions, as in the Movement phase you would be looking at the terrain effects on Movement, and in the combat phase the Terrain effects on Combat.

On the other hand if terrain features can be broken up into classes which differed a great deal it may be best to look at the problems from the angle of terrain feature. In my opinion the Terrain Effects Charts does this, meaning its best to organise terrain rules by their effect in specific phases.

## *[11.0] Command*

Command rules would cover items such as Headquarters, Leaders and other related rules. Some games restrict movement and combat by the use of command points, spend a point and you can move and fight. All these rules and related would go here. As command almost always affects combat and sometimes movement this is the ideal location.

Command rules generally fall into two basic classes;

> Command Restrictions : Units movement is restricted based on command rules, so xyz Corp can't move until abz occurs, or each side can move x units, or each side can activate y formations.
> HQ Control : Units can only function normally if under the command of a HQ. Supply may also funnel through a HQ.

The Command restrictions type of rules are normally special in nature and perhaps are best placed in their own Primary Case. Examples of this may be Reaction rules in Victory in the West. The more common Command rules require HQ to funnel command. As a result the Command & HQ rules could look as follows;

> [11.1] Determining Command (HQ and Command)
> [11.2] Effects of Command or HQ
> [11.3] HQ units (Values, Movement, Combat, Special rules)

The procedure rules will tell us what command is and how to trace or determining it. This should be initially covered in Command rules. This may extend out to tracing command, blocking lines of command, etc. but normally you should be able to describe how to ensure a unit is in command in a single Major Case. Now you need to tell player the effects of command, the benefits if in command or the penalties if out of command. Finally you should describe any special command units, such as HQs or leaders. This may include Values, Movement, Combat and special rules.

Obviously if you games does not have command rules you can ignore this entirely.

## *[12.0] Supply*

During Movement and Combat and also at the end of all movement and combat supply can have an effect. It may restrict movement if out of supply, it may affect combat if out of supply and units may be eliminated if they are out of supply. As a result supply rules would be placed here. Supply rules would be made up of the following;

> [12.1] Supply Sources (May be placed in next Major case if simple)
> [12.2] Determining Supply or Tracing Supply
> [12.3] Effects of Supply
> [12.4] Special Supply Rules (Air supply, sea supply, Rail repair etc.)

This is rather rough and the supply rules can explode in complexity if the game requires. However you will generally need to know where supply comes from. Once you know this you need to know how to trace it to your unit. This can include tracing supply over sea, tracing lines over rail and blocking supply lines. Its best to place these all together, but that may not be possible. Once we know how to trace supply we need to know the effects of supply. What happens when you are out of supply, when do you need to determine or judge supply. Finally any special supply rules need to be included.

## *Other Core Rules*

We have come to the end of the common core rules. Most of the other core rules exist because they don't fit in the previous Primary cases. For example Double March may not fit in the Movement rules, so it get its own Primary Case. Unit Build-up and Breakdowns may not fit in stacking. Artillery, Anti-tank and other special weapons may not fir in the Combat rules.

The next group of core rules are rules which normally would not be common enough to be placed here, but due to the nature of the game can be regarded as core. The classic example of this are Air rules. We will cover this in a moment.

The final core rules are unusual and special rules, such as Friction Points, Units steps, Units Modes and other mechanical rules. These don't naturally fit in the previous rules and can be too long to do so anyway.

## *[13.0] Air Power*

As explained before these would only be considered a core rule if it was very common. If a land game the air rules could cover air support and movement inhibitions to land combat and movement. It would rarely cover air to air combat or solely air functions. There are two basic types of air rules, these are;

> Air Points; Each side get x point of air power to use for combat or interdiction.
> Air Units ; Each sides gets air units, normally bases, from which air points are projected. The additional complexity is moving the bases, effects in land combat etc.

The rules would probably consist of;

> [13.1] Air Points
> [13.2] Combat effects of Air Points
> [13.3] Movement Effects of Air Points
> [13.4] Air bases/units (Values, Movement, Combat)
> [13.5] Special Rules (Supply, Air drops, air to air)

If a specific major case was simple enough you would merge it, so if the rules are very simple you may merge air points, combat and movement effects together into a single Major Case. If there was air bases you would need some rules to cover the counters and finally if air points could be used for other purposes you need to cover them. Finally you may have air to air, but only if it was very simple.

## *Commentary*

Backing in the late 70's SPI expended the Primary Case with the addition of a Commentary. This would sit in front of the General Rule and attempted to provide some historical background to the Primary Case. Initially SPI went berserk and provide commentaries for almost every Primary Case (Example was Army Group South Quadrigame). The initial purpose was a mix of marketing and education. Players learning the game could read the commentary to discover the historical background and justification for the rule, before going on to the General rule which describes the rule.

Overall the idea when taken to this extend failed. It makes little sense in having a commentary for Movement, which describes how the commander has to appreciate terrain or such nonsense. It makes the rules harder to use by reducing the density of useful rules. The General Rule is bad enough without adding even more padding, its better to place this sort of information in the Designers Notes, or similar.

The only except to this are unusual and new rules. For example in Kursk we have a commentary for Anti-tank units and Artillery, which go on to explain why the designer bothered to have such units and why. An argument could be made than unusual Primary

Cases could have a commentary, so if the rules introduced a new game concept such as Unit Modes we could get a commentary for this. I still don't feel comfortable with Commentaries, but if you do have them use them sparingly. By this definitions you should never have a commentary in the Core Rules, unless the designer is introducing some significant new game concept.

## *General Rule*

Now that we have covered the core rules we should pause a moment and consider the contents of the General Rule. We can use this paragraph for many things, but its basically designed to describe the general Primary case in a single paragraph. Traditionally the General rules only exist in actual rules, so the Introduction, general Course of Play, Game Equipment and Sequence of play does not normally get one. Some games makes the first Major Case in the sequence of Play the General Rule, as it satisfies the same requirement. ([4.1] The Game Turn).

The General Rule tends to be made up of sentences which describe some rule, so in the Movement Primary case you could have a sentence such as;

> *During the first Movement phase, the Phasing Player may move some, none , or all of his units.*

By itself it does not act as a rule, but it does impart some significant general descriptive information. Its actual purpose is training or educational. People new to the game can read all the General rules and get a good idea of what is occurring.

You may find cross referencing in the General Rule, however this should not occur. No rules should be excessively covered in the General Rule. You normally find cross referencing occurring when the General Rule and Procedure has been merged, which occurred in Zones of Control often.

Looking at SPI games we begin to see some common areas covered in General Rules. The following are a list of these overall common General Rules;

> **[5.0] Movement** (General Rule) Movement occurs during the Movement Phases of each Player Turn. During the first Movement Phase the Phasing Player may move some, none, or all of his units. During the Mechanised Movement Phase, the Phasing Player may move mechanised and armour units.
> **[6.0] Overruns** (General Rule) The Phasing player may move a unit or stack of units into an Enemy-occupied hex in an attempt to overrun the Enemy unit(s). A successful overrun results in either the elimination or retreat of Enemy units. Successful overrunning units must occupy the hex formally occupied by the Enemy unit(s); such overrunning units may continue movement if they have Movement Points remaining. Units which unsuccessfully attempt overrun must cease movement for the Phase. A successful overrun is defined as the occupation of the hex in which the overrun took place, regardless of losses to the attacking units.
> **[7.0] Stacking** (General Rule) A Player may never have more than ----- units in the same hex during any Phase but the Movement Phase. During the Movement Phase, any number of Friendly units may move through a given hex.
> **[8.0] Zones of Control** (General Rule) The size hexes immediately adjacent to the hex a unit occupies constitute the Zone of Control (hereinafter ZOC) of that

unit; such ZOC's inhibited Enemy movement, lines of supply and retreats. (A brief description of the restrictions can occur here)

**[9.0] Combat** (General Rule) Combat occurs between adjacent opposing units at the Phasing players discretion. The Phasing player is the attacker, the non-Phasing player is the defender, regardless of the overall strategic position.

**[10.0] Terrain** (General Rule) The type of terrain that is present in a hex or on a Hexside affects the movement of units into that hex or through that Hexside and may increase the Defence strength of a unit in that hex or being attacked through that Hexside. (Could be, may affect combat by modifying the die roll or shifting the odds column that is being utilised).

**[11.0] Command** (General Rule) Units depend upon HQ units for supply and attack co-ordination. HQ units may be used to enable combat units to attack and/or maintain them in supply. HQ can also provide combat bonuses in attack or defence. (This is rather variable as it depends on the type of Command being utilised).

**[12.0] Supply** (General Rule) In order to be moved up to its full allowance and attack and defend at full strength, a unit must be in supply. (You can add a lot to this depending on the complexity of supply).

**[13.0] Air Power** (General Rule) Each Game-Turn, the Players receive a number of Air Points which they may use in combat, or other purposes. (This assumes a simple air power rule).

The above may seem like an exaggeration of the commonality of General Rules, but SPI did reuse a lot of words here. In early games the General Rules were very long, but as time progressed they have been cut down to essentials. You always need to ask yourself if this sentence adds something to the rules, if it does not don't have it. Putting a detailed rule in here and repeating it later is such a waste.

## *Procedure*

The procedure begins to look like a specific rule. It describes the procedure which the primary case covers, often cross referencing other rules. You should be able to conduct overruns by reading the procedures and reading the cross referenced rules. An example of the procedure for Movement is as follows;

> *Each unit of stack of units is moved individually hex-by-hex in any direction or combination of directions. Movement of a unit into a hex "costs" a certain number of Movement Points (See x.xx Terrain Effects Chart). As a Player moves a unit, he keeps track of the number of Movement Points expended for each hex. Once a units Movement allowance is expended or the unit is affected by enemy Zones of Control (See x.xx Zones of Control), the units movement has ceased. Once a Player's hand is removed from the unit (stack), movement is completed for that unit for that Phase.*

You almost don't need to read any further, as long as you know what the Movement allowance of a unit is. As with the General Rule there seems to be some standard procedures;

**[5.0] Movement** (Procedure) See above

**[6.0] Overruns** (Procedure) By expending xxx Movement Points, the Phasing Player can have a Friendly unit (or stack of units) execute an overrun against an adjacent Enemy unit. --- The Overrun Process goes here --- If the overrun is successful, the overrunning units are moved into the vacated hex, and the Phasing

Player may then continue moving the overrunning units (assuming it still retains any unexpended Movement Points.)
**[7.0] Stacking** (Procedure) Normally has none
**[8.0] Zones of Control** (procedure) Normally has none
**[9.0] Combat** (Procedure) Total the attack strength of all attacking units involved in a specific attack and compare it to the defence Strength of the units in the hex under stack. State the comparison as a ratio of the attacker's strength to the defenders strength. Round off the ratio in favour of the defender (e.g. 29 to 10 = 2 to 1) to conform to the simple ratios found on the Combat Results Table. Ally any required modifiers, either column shift or die roll, (See x.xx Terrain Effects Chart) and roll one die and read the results on the appropriate line under the ratio. Apply the results immediately, before resolving any other combat.
**[10.0] Terrain** (Procedure) Normally has none
**[11.0] Command** (Procedure) Normally has none
**[12.0] Supply** (procedure) At the beginning of each Movement Phase - prior to the movement of any units - the Phasing player determines which of his units are in supply. Only those units may be moved up to the limit of their Movement Allowances and utilised to execute overruns. During each Combat Phase, immediately prior of each attack in turn, the supply status of the attacking and defending units is determined. Those in supply (only) attack and defend at full strength, respectively.
**[13.0] Air Power** (procedure) This can be rather variable.

As you can see procedure seem to only be relevant when the Primary case covers something which is done, such as Move or fight. Zones of Control and Stacking are passive primary cases and such do not have a procedure, although you could easily have one if you wished. Stacking in particular may find it useful to discuss when excessive stacking is resolved and what happens. Some SPI games tended to put most of the rules in procedures, keeping the remaining cases as simple and sparse as possible.

## *Major Cases Overview*

One area I have not covered is the mechanism of giving each Major Case a Overview, or General Rule. This is not required for many Major Cases, but in some cases it does make sense. The objective is to give players an idea of the Major Case. A good example is as follows;

**[5.1] HOW TO MOVE UNITS**
Movement is calculated in terms of Movement Points. Each unit has a Movement Point Allowance, indicating the maximum number of Movement Points that can be expended for the movement of that unit in any one Movement Phase.

The above paragraph is not a specific rules, its more a general description of the basis of movement, which make up the key thrust of HOW TO MOVE UNITS. This technique is especially useful if you have a large Major Case, as this paragraph does not occupy a Minor case number and does serve a purpose, more educational. Once again we come back to the key of these Overview, General Rules and procedures. We are trying to make learning the rules as easy as possible.

The only caveat is that this overview must be serving a valid purpose, otherwise its best not to have it at all. The balancing act of weighing up the pros and cons and coming down in favour of one side.

### *Cases*

The cases are the specific rules. In most cases they are divided up into Major Cases, each of which has a succession of cases each. All this is fairly standard and understood. The issue is how should we create our cases.

A case is normal made up of several sentences making up a paragraph, each sentence is a specific rule. A Specific rules tells the player something is possible or not possible. An example is as follows;

> **[5.13]** The cost to enter a clear terrain hex is one Movement Point.

This tells us a specific fact.

> To do X1 costs Y1.
> You can do X2 up to Y2 limit.
> You may not do X3.
> The effect of X4 is Y4.
> When X5 occurs, Y5 happens.
> You may always X6.
> X7 never affects Y7.
> Only X8 may do Y8.
> X9 may not happen, unless Y9.

The above are all examples of valid specific rules. There are many more and they can be joined together to create rather complex rule conditions. It is best to avoid overly complex rules and try and keep them into simple short clear sentences, but sometimes its not possible.

The last type of material you may find in a Minor Case is some sort of support material for a rule. This can be a detailed explanation, a repeat of a previous rule which is relevant here, or a reference to another rule. Examples are;

> **[5.21]** Only the Phasing Player may move units during a given Movement Phase. (i.e., the non-phasing Player may not move his units).
> **[5.25]** Combat may not occur during a Movement Phase; however overrun, a combination of movement and combat, may take place.
> **[5.27]** A unit may never be moved into a hex containing an Enemy unit (exception, see Case 6.0, Overrun).

The above contains a specific rule, followed by some form of support statement. These support sentences can get rather complex, almost acting as a detailed example of the rule. These are useful for both education and reference, although they should be kept short and should not be over used. Again, you need to assess the benefit over the cost, the cost being longer and harder to use rule, the benefit is the ability to quickly understand a possibly complex rule. Excessive long examples should be kept for the front or rear of the rules, not in the body of the rules. The reason for this is that Examples are really an educational or training aid, not a reference aid.

## Specific Rules

Specific rules are specific to the game being presented, although there are some common specific rules. One common Primary Case not covered so far is Reinforcement and replacements. Most games have reinforcements, but these rules should be placed after all the actual game mechanics rules, simple because the reinforcement phase is at the end of the

sequence of play. Although we do have this Primary case in most games, the differ a great deal between games. As a result they do deserve to be placed in the Specific Rules section.

## *What is a Specific Rule*

Simply put a specific rule is any game mechanics primary case which is not in the Core rules. They are specific to the game being played and very little is common between games, or they are rules which cover rather rare events. You should be able to learn how to play a game without looking at specific rules (exception, reinforcements). Examples of common type of rules are as follows;

Weather
Fortifications
Entrenchment
Untried Units
Division Integrity
Rail Movement
Sea Movement

Some which refer to special unit types are as follows;

Special Units
Parachute Infantry
Engineers and Rivers
Artillery
Guerrillas
Militia
Riverine Units
Amphibious Assault
Helicopters
Minefields
Anti-tank Units
Armour

Less than common other rules;

Naval Gunfire Support
Industrial Hexes
Tactical Nuclear Weapons
Murmansk Defence
Production
Continuous Line
Cadres
Attrition
Hitler Directives
Garrisons
Suppressing Revolts
Withdraws
Interdiction
Hidden Movement
Cities
Neutral Countries

These are a list of rules from a host of SPI games. I am sure you can create more if required. Some are very specific, such as Murmansk Defence, some rules cover new units, such as Artillery Units, other affect mechanics such as Untried Unites or Divisional Integrity. The key is that these rules may not be cross referenced much during the learning process. This way the new player can quickly learn the core rules and experienced player know what is different and unusual and go straight their.

Their is no way I can start to cover these Primary Cases in more detail, by now you should have an idea ofd how to construct and organise them. The only point I wish to make here is Commentary could be used to describe what the Murmansk Defence is.

## Other Rules

The construction of these rules is fairly well set out. Other rules are simply everything that does not fit above goes here and lets sum up the game. It does have a general format, which is as follows;

[xx.x] Optional Rules
[xx.x] Scenarios
[xx.x] Victory Conditions
[xx.x] Rules Summary
[xx.x] Unit Manifest (Order of Battle)
[xx.x] Historical Notes
[xx.x] Designers Notes
[xx.x] Design Credits

Strangely enough SPI started to remove the Historical, Derringers Notes and Design Credits from the numbering system in the late 70's, but these normally still existed. Optional Rules and Scenarios often took up more than one Primary Case each, which victory conditions could be merged in with Scenarios.

The Rules summary was a good idea which never good off the ground. The idea was to provide a detailed summary of the rules for experienced players. It did not work because of the effort involved in doing this well. Unless you are prepared to put the effort in it, it best to omit.

The last four titles were often merged into together under no numbering system. They are useful sections which add sizzle to the steak, without making the rules less useful. Placing these basically useless sections at the rear did no affect the cross referencing of rules and could get people a bit more interested in the game. Like a good looking cover, this Notes section adds a sort of sex appeal to the game.

## Standard & Exclusive Rules

One of the great development of SPI was the creation of standard rules and exclusive rules. You could pump out a host of games all using the same standard rules, only placing specific rules and scenario details in the exclusive rules section. Unless this was designed carefully it had the affect of making very long rules.

A successful combination would have all Core rules in the standard rules, as well as many of the specific rules. The Exclusive rules should have all the specific rules which only applies to

that game and the “Other” Rules. You may allow a single Primary Case to cover changes in the core rules. This way we could end up with a set of rules which are not too long. The problem with SPI was that some of their exclusive rules were massive and changed too much. If you avoid this you could have a good idea.

## Conclusion

By a careful and detailed look at rules design we have ended up with a rules template, which you can use in the design of your games. This may be limiting and stifling, but I hate writing the rules so much I am prepared to take any help I can get. I wrote this article simple because of my frustration in re-inventing the wheel every time I came up with a new set of rules. I now have a useful template which I can use to help me design the perfect set of rules, with minimum effort.

# Determining the Optimum Game System

Anyone who has ever put a large effort in playing boardgames will always, at some point in time, think of designing his (or her) own game. I am not unusual in this respect and this strange desire has often come over me. I find the concept of designing a game an interesting mental exercise, which has the additional benefit of helping me to forget the work that pays my bills. Recently, I have been thinking a bit beyond designing games. Instead, I have been pondering the eternal boardgaming designer's question, what is the perfect game system. We all know the basic conundrum, realism versus playability, however I have begun to see the real story is nowhere as simple as just this play balance issue. It's possible to have a very realistic rule, or rule system, which is more than playable. Its also possible to have a seemingly simple game concept that is not playable. It did not take me long to discover that playability did not come from simplicity. It's achieved by compatibility with the human condition and the human player. This "compatibility" is not the antithesis of realism and can easily go hand in hand with realism.

So simplicity for simplicity's sake is not the real answer, it's this concept of "compatibility" that needs to be considered. How do we measure and determine "compatibility"? Unfortunately it's here where the difficulty lies, because we are talking about achieving compatibility with an incredibly complex creature, man (or woman). We can make educated guesses, but fundamentally this compatibility determination requires many hours of play testing. In short we need to play the game in order to determine how compatible a specific rule or game system is.

We quickly can determine that stacking limits of 6 are simply too cumbersome, which make the game inconvenient to play. Stacking limits of one are far more convenient. On the other hand, we can now clearly see the entire enemy army, thus reducing the intangible concept of limited knowledge. Step losses of beyond 2 become unpleasant if the units are not standard. (If the 69th division loses 2 steps and you need to find the second 69th division, in order to reflect that loss, it annoys you. If the numbers of units are low you may be able to live with it, if they are high forget it). Finally, and most interestingly, if you need to do any writing in a game, the measure of human compatibility drops dramatically. People do not want to write anything while playing.

All these examples are very simple and common sense ensures they are avoidable. However, there are other examples where common sense is not useful. We need to test the game in order to determine their measure of human compatibility or convenience. Combined with convenience, you also need historical accuracy. It's the perfect harmony between convenience and realism that give us better game systems.

To search for a better way of performing a task you need to see what has already been done previously. By studying the game system development which has occurred over the previous 20 years we can ascertain trends, directions and dead ends. By looking at the

period of development we certainly have a great deal of empirical data on which game systems work and which do not work as well. As this development occurred over a period of almost 20 years and most importantly this development occurred in an evolutionary sense we can ascertain trends and directions. By looking at these trends we can make educated guesses on what future game system development may have occurred.

In addition to determining the future, by looking at the game development which did occur at SPI we can also develop some basic good game design rules to follow. Many ideas and game systems did not work for very basic reasons, for example mismatched scales, excessive record keeping, excessive stacking and so on. By understanding the basic theory of game design we can avoid a great deal of problems. SPI shoed us the way and its up to us to determine the lessons they discovered.

There are many aspects to a game which need to be considered. One way of breaking these down into a more manageable form is to go back to the way SPI organised its rules. These were as follows;

[2.0] Game Scale
[3.0] Units
[4.0] Sequence of Play
[5.0] Movement
[6.0] Overruns
[7.0] Stacking
[8.0] Zones of Control
[9.0] Combat
[10.0] Terrain
[11.0] Command
[12.0] Supply
[14.0] Air Power

No man is an island, as the line goes. The same applies with rule systems. All the rules titles above all interrelate and coexist in a host of ways. This also has to be considered and dealt with. As a result its very possible that the perfect Stacking rule conflicts with the perfect Zone of Control rule. This conflict needs to be resolved, and it needs to be done by the game designer. What I intend to cover is the bedrock of a possible “Perfect” set of rules.

## [2.0] Game Scale

If we are to study the theory of game design logically we need a start point. Possibly the most important start point in any game design is a game's scale. The designer needs to determine what conflict is too be simulated and what scale to use to adequately cover it. A games scale determines the size of the map, number of the pieces and in many cases the length of the game. We would need this information in order to determine the game system mechanics to utilised. The game system that suits a Battalion level game can be very different from that which suits a Corp level game. SPI realised the importance of Game Scale and resolved it first, which is why one of the first sections in any of their

rules was “Game Scale”. Knowing the game scale may not of been important in order to play a game, but it certainly was significant if designing a game.

Unfortunately determining the “correct game scale” is not as simple as it may initially seem. Once you select a particular game scale, you need to make sure all the other game scales are in harmony with it. Ground scale, unit scale and Game-Turn scale all needed to be in balance with each other. This balance is far more significant and important than we may initially suspect. Games with incorrect “game scale balance” are fatally flawed. The best example of such a game is the old ***Kursk System*** of games. The scale imbalance was not great, but it did exist. This is why its successor, **Panzergruppe Guderian**, used a significantly different scale balance. A clearer example is **War in the East** and **War in Europe**. The game scales were so out of sync with each other that it created insurmountable problems of playability and realism. Problems that were so serious they were not resolvable.

The next step is to ensure the scales selected are both playable and are in harmony with several basic game mechanics. The issue of playability is obvious, a game with a too small game-turn scale will result in a game that is slow and boring. Playing for several hours to advance a few hexes is not too much fun. Consequently a too long game-turn scale could result in too must mobility. A single mistake could result in total and utter defeat. We need a carefully considered balance here.

The next problem is how the different game-scales interact with basic game mechanics. The game scales must interact and be in harmony with the following basic game mechanics, at least.

Stacking
Zones of Control
Overruns
CRT

A simple example is stacking and zones of control. You must allow a player to achieved a historic maximum concentration for attack and allow a player to defend the maximum historic frontage allowed, with a given formation. This is achieved by balancing stacking (to achieve the attack concentrations required) and Zones of Control (to allow historic defensive frontages). If you get this basic rule wrong then you end up with serious historic difficulties. You may be able to overcome these difficulties for certain games, but if you want to make a universal game system you cannot afford to ignore it.

The best example of incorrect scale balance is **Leningrad**. This is a good game that works, but if you try and make the game system and scale work in France during 1940, it’s not possible. You end up with too many units, which result in several defensive lines of fully stacked up units, impossible to break through. This is because it's impossible to achieve historic attack frontages, thus you don’t have to have such a strong defence. The result is that you can have a lot more “strong” defensive positions that ever occurred in reality.

So the lessons are clear, get the scale balance and interaction right at the beginning of the game design process and you end up with an easier job designing your "perfect" game.

## *Historical Evidence*

A good starting point in our search is to look at how SPI dealt with the vexing issue of game scale. Looking at various SPI game system families we can see what scales they utilised. The objective is to discover an underlining similarity, trend or formula.

**Table 41 : Scale Ratios commonly used in SPI Games[2]**

| Game | Game-Turn Scale | Hex Scale | Unit Scale |
|---|---|---|---|
| Kursk System | 2 days | 10 - 21 km | Division |
| PGG System | 2 days | 8 - 17 km | Division/Reg |
| Leningrad | 7 days | 33 km | Division |
| Kursk II | 2 days | 10 km | Division/Reg |
| Victory in the West Series | 1 day | 2.5 km | Reg/Batt |
| The Central Front Series | 1/2 day | 4 km | Reg/Batt |

If we use the unit scale as our reference point we see some definite correlation's between the unit, hex and game-turn scale.

**Table 42 : The Scale Relationship**

| Unit | Hex Scale | Game-Turn Scale |
|---|---|---|
| Divisional | 10 km to 33 km per hex | 2 to 7 days per Game-Turn |
| Division & Regimental | 8 km to 17 km per hex | 2 days per Game-Turn |
| Regimental & Battalion | 2.5 km to 4 km per hex | 1/2 to 1 day per Game-Turn |

The largest range is reserved for Division scale games, which makes it rather hard to find any trend here. A possible explanation is that the ***Kursk System*** was an old game system and that **Leningrad** was most probably an attempt to make **War in the East** work, which in turn was an old game. As a result we probably do not have a good sample of division scale games to make any broad scale statements. The same does not apply to the other two unit scales, so we can look at these in more detail.

Divisional/Regimental games are fairly straight forward, an average of about 12 km per hex and 2 days per Game-Turn. The same applies to Regimental/Battalion scale games, a ground scale of about 3 km per hex and about 1 day per game-turn. (We need to remember that ***The Central Front Series*** was a modern game, where 24 hour combat is considered both possible and imperative. In World War Two the intensity of combat dramatically dropped during the night time hours. This could explain the difference in game-turn scale.)

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[2]Game-Turn scale represents the length of each game-turn in days. Hex scale represents the width of a hex, in kilometres. The Unit scale is the standard unit scale used in the game, such as Divisional or Regimental. If there are two formations in this column, the larger represents infantry and the smaller armour. So Reg/Batt means the infantry will normally be regimental and armour battalion sized.

Ignoring our Divisional Scale games there is obviously a direct correlation between time, ground and unit scale. We could look at this mathematically except for one annoying fact. The unit scale column is not a numeric value, which makes it hard to involve this in any sort of formula. Assumption and logic can come to the rescue here.

A Regimental/Battalion scale game will have infantry regiments and battalion based armour. Let us give this a scale value of 1. Division/Regimental games use infantry divisions and armoured regiments. As there are three battalions in a regiment and three regiments in a division, we can give this a scale value of 3. The pure division level games are a bit of a problem as here the armour is the same unit scale as the infantry. The infantry is the same scale, so a minimum scale value of 3 applies. The Armour is divisional. As there are 3 regiments in a division we can allocate a maximum scale value of 9. So the scale value sits between 3 and 9 and a mid point would be 6. We now have a numerical value for unit scale.

**Table 43 : Numeric Value for Unit Scale[3]**

| Infantry Scale | Armour Scale | Value |
|---|---|---|
| Regimental | Battalion | 1 |
| Divisional | Regimental | 3 |
| Divisional | Divisional | 6 |
| Corps | Divisional | 9 |
| Army | Corps | 18 |

We can now compare all the scales mathematically. What we will do is compare the three scale's, Game-Turn, Hex and unit, to each other as a ratio.

**Table 44 : Scales compared as a ratio against each other[4]**

| Game | Hex/Game-Turn Ratio | Unit/Game-Turn Ratio | Hex/Unit Ratio |
|---|---|---|---|
| Kursk System | 7.5 (ignore) | 3.0 (ignore) | 2.5 |
| PGG System | 6.5 | 1.5 | 4.3 |
| Leningrad | 4.7 | 1.2 | 5.5 (ignore) |
| Kursk II | 5.0 | 1.5 | 3.3 |
| Victory in the West Series | 2.5 (ignore) | 1.0 | 2.5 (ignore) |
| The Central Front Series | 8.0 (4.0) | 2.0 (1.0) | 4.0 |
| | 4.7 to 6.5 | 1.0 to 1.5 | 3.3 to 4.0 |

***The Central Front Series*** Game-Turn Scale needs modification, as it reflects a style of warfare where combat is a 24 hour affair. In World War Two this is not the case, so we need to change the Game-Turn Scale to one to bring it in line with our other games.

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[3] It is assumed that their are three Divisions in each Corps and three Corps in each Army.

[4] Hex/ Game-Turn Ratio. This represents the hex scale, in kilometres, divided by the game-turn scale, in days. Unit/ Game-Turn Ratio. This represents the Unit Scale, where an infantry regiment has a value of one, divided by the game-turn scale, in days. Hex/ Unit Ratio. The represents the hex scale, in kilometres, divided by the Unit Scale, where an infantry regiment has a value of one. These ratios are used for comparison only and have little meaning in themselves.

The second point that needs understanding is that the ***Kursk System*** is an old game system, which is far from perfect. We need to be very careful when using the figures arrived from this Game System. I find if any number from this game system represents the maximum or minimum range, I ignore them.

Finally, ***Victory in the West*** uses very small scales, in fact it almost borders on a "tactical" level game, instead of "operational". As a result I tend to ignore any results from this game if they seem to be out of balance, such as any result including the hex scale. All this caveat's may seem like cheating, but we are looking for a trend and need to narrow down our range using any form of logic we can.

After applying our gut-feel logic we can see there are some clear trends visible. We can say the mean average Unit Scale to Game-Turn ratio is probably around 1.0 to 1.5. This means a Battalion/Regiment game needs Game-Turns of 1 to 1.5 day and a Division/Corps game needs Game-Turns of 9 to 13.5 days.

The mean average Hex scale to Game-Turn ratio is 4.7 to 6.5, with ***Victory in the West Series*** falling outside this range. This means that if you use 1 day Game-Turns you need a hex scale of 4.7 to 6.5 km. A 7 day Game-Turn game requires a hex scale of 32.9 to 45.5 km.

The mean average Hex scale to Unit scale ratio is 3.3 to 4.0, with **Leningrad** and ***Victory in the West Series*** falling outside. This means a Battalion/Regiment scale game needs a hex scale of 3.3 to 4 km. A Corp/Divisional level game requires a hex scale of 29.7 to 36 km.

At this point in time we should not try and make anything too much about this figures, as we can also see there are exceptions to the rules. The point I am making is that there is some sort of optimum ratio between these three game scales. There must be a reason for it and it's this reason that will tell us the magic formula of scale ratios.

## *Hex Scale and Unit Scale*

We have already determined that some sort of logical ratio exists among the three basic game scales. The first scale ratio we should look closely at is the one of hex scale to unit scale, as this is actually the easiest one to determine. Considering German army manuals of World War I a German infantry division could defend about 9 km in an ideal situation and would normally attack out of a 3 km frontage. Considering this information we can make some observances on what unit scale is required for different ground scales. Lets put this information into a table;

**Table 45 : Recommended frontages of formations in attack and defence**[5]

| Ground Scale | Divisions Defend Per hex | Formation Defend per hex | Divisions Attack per hex | Formation Attack per hex | Ideal Unit Scale |
|---|---|---|---|---|---|
| 1 km | 1/9 | 1 Battalion | 1/3 | 1 Regiment | Battalion |
| 3 km | 1/3 | 1 Regiment | 1 | 1 Division | Regiment |
| 9 km | 1 | 1 Division | 3 | 1 Corp | Divisional |
| 27 km | 3 | 1 Corp | 9 | 1 Army | Corps |
| 81 km | 9 | 1 Army | 27 | 1 Army Group | Army |

The result of this table is to provide the required unit scale for the desired ground scale or vice versa. We have seen that stacking has a dramatic influence on this outcome, as does Zone of Control, as we shall see later. If we did not have stacking it would be impossible to achieve historic attack and defensive frontages, or at least it would be impossible without zones of control. There is a fine balancing act between stacking and zones of control, a balancing act that will get more difficult as we go into more historic detail. The point is that a relationship does exist, and if we do not take note of this relationship we would fail in creating our perfect universal game system.

Now we come to the additional historic information that makes our job harder. The figure of 9 km per division is based on World War One German infantry divisions. In 1940 these frontages were used on the Western Front, however World War Two divisions could cover greater defensive frontages. On the Eastern front single divisions were required to cover 18 km in many exceptional circumstances. The main difference related to depth.

In an idea circumstance a division would have two regiments in the front and one in reserve. In turn each regiment had two battalions in the front and one in reserve. You can double your normal defensive frontage by greatly reducing your depth. The other factor to consider was technology. Machine guns and longer range artillery all had its effect on defensive capabilities. In addition doctrine had changed to take into account newer weapons systems. Defensive lines were more fluid in World War II, while in World War I troops had to man a static trench line. Finally, German World War Two infantry divisions were larger than World War One divisions.

The result of this is that the attack/defence ratio changes from 3/9 to 3/18, or 1/3 to 1/6. This means that our attacking regiment needs to be able to spread out to defend 6 hexes, not 3. In this situation stacking alone is not sufficient, we need both stacking and zones of control to give us our historic result.

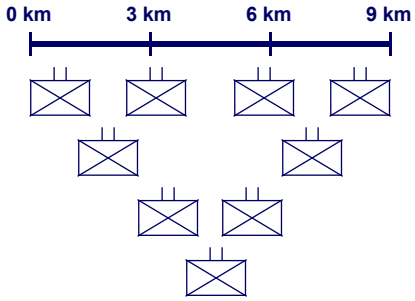
---

[5] If we have a ground scale of 1 km per hex, then a division could defend a front line of 9 hexes, and would attack out of a frontage of 3 hexes. This means that each hex would contain 1/9 of a division, or a battalion, when defending and 1/3 of a division, or a regiment, when attacking. The "Ideal Unit Scale" column assumes a stacking limit of 3 units, as this is actually an optimum stacking level. As a result, for our example, the ideal stacking should be a battalion. This table assumes their are three Divisions in each Corps and three Corps in each Army.

## *Getting the frontage right*

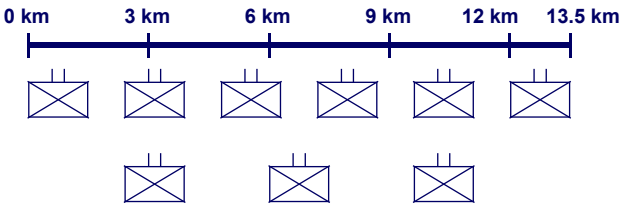
Lets us look at the different ways German divisions occupied frontage for defence and attack during World War Two.

**Figure 14 : German Infantry Division, Optimum Defence with adequate Reserves.**



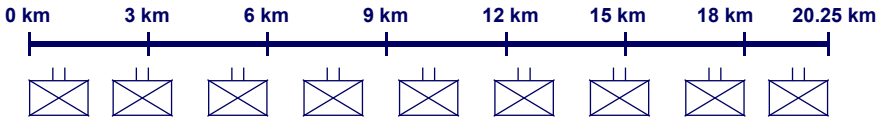

This is regarded as the optimum frontage for defence, two regiments in the front line, each of which has one Battalion in reserve. Finally, with one regiment in the rear to act as the divisional reserve our defensive formation is complete. Apart from the early western front period, this formation was not used as it was considered as overkill. It was better to have a thinner front line and some central reserve divisions.

**Figure 15 : German Infantry Division, Defence with Regimental Reserves only.**



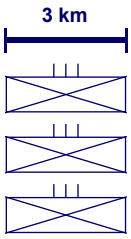

In this case we once again have two regiments in the front line, however there are no reserve battalions. One regiment is kept in the rear to act as the divisional reserve, however this was normally spread out in the rear and battalions allocated as required. In some cases some of the reserve regiment's strength was placed in the front line leaving a weaker reserve. This was the normal frontage adopted by most full strength divisions during the war.

**Figure 16 : German Infantry Division, Defence with no reserves.**




In this example we have no reserves at all. In reality at least one battalion would be kept as reserves, which would give us out 18 km frontage. The above formation would only act as a trip wire and would be only adopted in an emergency. (This tended to become more and more common as the war progressed.)

**Figure 17 : German Infantry Division, Optimum Attack Frontage.**




The way a division attacked varied a great deal, but put simply troop density increased dramatically and so did reserves. The rule of thumb was a 2-1 or 3-1 advantage was required to attack.

On the Eastern Front the attack frontages for a German Infantry Division could be as great as 5 km, although a 3 km attack frontage was still possible and common. Its defensive frontage was as great as 10 km in what would be considered a normal situation and 18 km in what could be considered an exceptional situation. The exceptional circumstances become more and more normal as the war progressed. Considering this information we could make the following ground scale assumptions.

**Table 46 : German Infantry Formation Practical Defence and Attack Frontages.**[6]

| Unit Scale | Defence Frontage (Max) | Attack Frontage (Max) | Ground Scale Stacking = 1 | Ground Scale Stacking = 3 |
|---|---|---|---|---|
| Battalion | 2 km | 1/3 km | 1/3 km per hex | 1 km per hex |
| Regiment | 6 km | 1 km | 1 km per hex | 3 km per hex |
| Division | 18 km | 3 km | 3 km per hex | 9 km per hex |
| Corp | 54 km | 9 km | 9 km per hex | 27 km per hex |
| Army | 162 km | 27 km | 27 km per hex | 81 km per hex |

It may be acceptable to have a division level game using any hex scale, but you need to always consider than in attack an Infantry Division could adopt a frontage of 3 km. When the Germans wanted to perform a serious attack they achieved the maximum possible frontage density, even on the Eastern Front. It is actually this "attacking" frontage that is the significant factor. You need to ensure that you can attack out of a single hex with a realistic number of formations. With a hex scale of 9 km you need to allow up to three divisions to attack out of a single hex, thus the stacking needs to be 3. With a hex scale of 15 km you need to allow five divisions to attack out of a single hex, thus a stacking limit of 5 is required.

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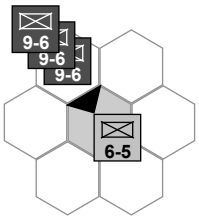
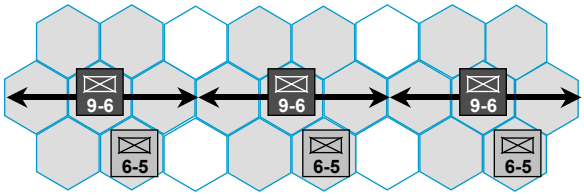
[6] Defence Frontage. This is the typical frontage adopted by the unit for defence. Attack Frontage. This is the typical frontage adopted by the unit for attack. Ground Scale, Stacking = 1. Assuming the stacking limit was one unit, this would be the optimum hex scale required to achieve historic attack frontages. With a stacking of one we need very strong zones of control to achieve our defensive frontages, as we will see. Ground Scale, Stacking = 3. Assuming the stacking was three, this is the optimum hex scale required to achieve our historic attack frontages. Even here we need zones of control to achieve historic defensive frontages. This table assumes their are three Divisions in each Corps and three Corps in each Army.

The second problem we have is to match this up with defensive frontages. If we have a divisional game we need to remember that a division can defend up to 18 km, so at 9 km per hex a division needs to defend 3 hexes. You can only do this with Zones of control.

**Figure 18 : Attack and Defence Frontage Example. (Stacking = 3)**[7]




Attack frontage of each unit equals 1/3 hex scale.




Defence frontage of each unit is up to 3 hexes. This is achieved by the use of Zones of Control.

With the information we have assembled so far we have determined our first important equation;

**Equation 1 : Stacking Limit Equation.**

$$\text{Stacking Limit} = \frac{\text{Hex Scale}}{3}$$

In Kilometres per hex

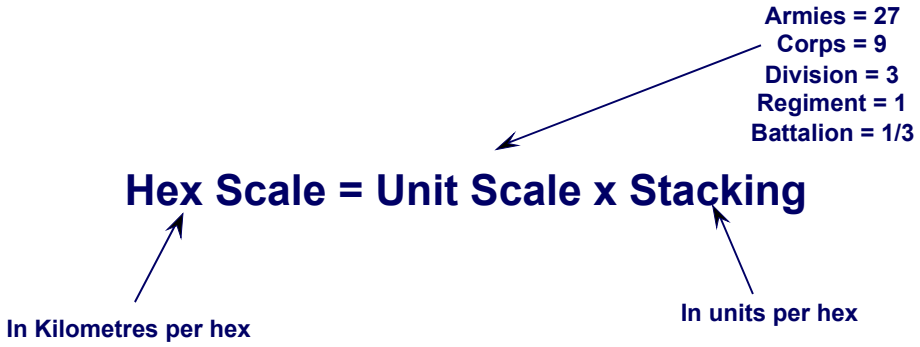
In Divisions
Regiment = 1/3
Battalion = 1/9

So a divisional scale game with a ground scale of 9 km per hex should have a stacking limit of 3 divisions per hex. If the ground scale is 3 km per hex, then the stacking becomes 1 division (or 3 regiments) per hex.

| **Stacking Limit =** | **Hex Scale =** |
|---|---|
| 1 Division | 3 km per hex |
| 2 Division's | 6 km per hex |
| 3 Division's | 9 km per hex |
| 9 Division's | 27 km per hex |

[7] Explanation: The above example assumes a stacking of 3. In this case the attack frontage of each unit must be 1/3 of a hex, so a stack of three units can achieve their desired attacking frontage of one hex. Defensive frontage is from 3 (optimum) to 9 (typical) times the units attack frontage. In this case the defence frontage of each unit should be from 1 to 3 hexes. This is achieved by the use of zones of control of varying strengths, depending on the ability to penetrate them.

**Equation 2 : Hex Scale Determination Equation.**




So a Divisional level game with a stacking limit of 3 should have a hex scale of 9 km per hex. If the game is regimental with a stacking limit of 3 the ground scale moves to 3 km per hex. If we change the stacking to 5, our divisional game can get away with a hex scale of 15 km per hex.

| **Hex Scale =** | **Unit Scale =** | **Stacking Limit =** |
|---|---|---|
| 3 km per hex | Division (3) | 1 unit (Division) |
| 3 km per hex | Regiment (1) | 3 units (Regiments) |
| 9 km per hex | Division (3) | 3 units (Divisions) |
| 27 km per hex | Division (3) | 9 units (Divisions) |
| 27 km per hex | Corp (9) | 3 units (Corps) |

We can vary from the above formulas a bit, but if we go overboard problems arise with the game system. The best example of going overboard is **Leningrad**. **Leningrad** is a divisional level game with a ground scale of 33 km per hex. It was an eastern front game so unit density was not an issue, however the problem with this is that you cannot achieve historic unit densities if you wished to attack. At 33 km per hex you should be able to put at least 9 infantry division in each hex that can attack, yet the stacking is 3 units per hex. As a result both players are forced to spread out in a non-historical manner. With **Leningrad** this was not a serious problem, as being an Eastern Front game unit density were unusually low. However if you wanted to use this system for the German invasion of France in 1940, it will fail miserably. A sign of a good game system is its universality. **Leningrad** would only work on the western front if the infantry was Corp level and the armour division level.

## *What about Armour*

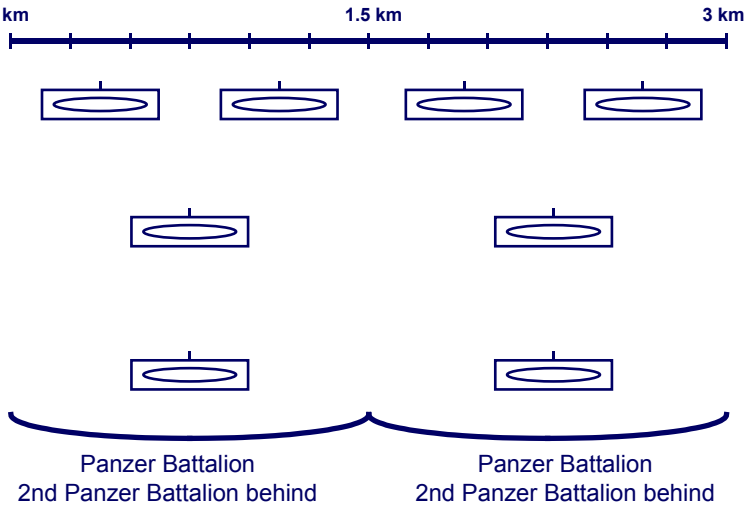
One area I have not gone into in any detail is armoured formations. Armoured formations were not very good at defence, however they excelled in attack. They normally attacked in a very narrow wedge, probably no more than a Battalion wide. Once the Battalion had broken through the enemy line, the mass of armour behind it would strike out. This was a different form of attack to that employed by infantry. An infantry division attacked on a much wider frontage, about one regiment wide with the rest of the division behind.

A German Armoured Battalion in 1940 attacked with a frontage of 1.2 km, so we have a very narrow point here. On the Eastern Front the German Panzer Division attacked on a frontage of 1.8 km to 3 km, possible one battalion or two battalions wide[8]. The rest of the division was in the rear waiting for the breakthrough, so they could advance through the hole and fan out.

We now need to compare this with the infantry divisions. An infantry division would attack on a frontage of about 3 km, similar to the widest attack by an armoured division. Based on this we can say the attack frontage of armour should be similar to that of infantry, for the purposes of our game system and simplicity.

The problem with armour is not its attack frontage, but its depth. Armoured formations took up a great deal of space, which would restrict the amount of these formations you could have together. When the Germans attacked in 1940 their armoured formations trailed back over a hundred kilometres. It's this depth that is normally overlooked and which is a serious limiting factor.

**Figure 19 : Optimum Attack Frontage of a German Panzer Division.**




**Explanation:** In the above example we see about the widest frontage attack that would be conducted by a Panzer Division on the Eastern Front. In this case the attack is two Battalions wide, each of different Panzer Regiments, or both belonging to the same Regiment. In either case the second half of the Panzer forces and the Panzer Grenadier Regiment would be waiting behind to exploit the breakthrough. In the above case the battalions would be about 1,500 metres deep, or as deep as they are wide. There would be a further gap and the rest of the division may take up as much as an additional 3,000

[8] This could increase to 5 km, which occurred often in 1943 during the Battle of Kursk. However in 1940 and 1941 the frontages were much less.

metres. The whole division could be over 4,500 metres deep, if we only include the fighting troops and ignore artillery and support formations.

The issue now is how do you reflect this in a game. SPI in it's ***PGG System*** reflected this by giving armoured formations a lesser stacking capacity. It did this by representing armour in Regiment sized formation, while the infantry was Divisional. All units could only stack 3 units, so we end up with a ratio of 3 to 1 for armour, or one armoured regiment was the same as one infantry division for stacking and frontage.

While this may not be technically accurate, it does have its benefits. In fact SPI felt the benefits were so great that many games after this used this 3 to 1 ratio**.** ***Victory in the West Series*** uses infantry regiments and armoured battalions, for example. Earlier games such as **Kursk**, allowed you to stack Panzer and Infantry divisions in the same manner, and we all know that **Kursk** did have problems. Overall I feel ***PGG System*** idea was good, historic and simple and should be utilised.

## Game-Turn Scale

We have so far ignored the issue of Game-Turn Scale. We know that our SPI games seemed to use a standard Game-Turn scale, based on the unit scale. The question I wish to answer is what is the magic formula. Actually this is fairly easy to determine. The length of a game-turn is directly proportional to the ground scale and the movement allowances of units. However this is only half the story. To determine the Game-Turn scale we need to look at two things;

The Game-Turn Scale that must be adopted based on ground scale and movement allowance.
The Game-Turn Scale that should be adopted to make the game playable.

### *Game-Turn Scale - What is needed*

We can say a particular formation could travel 100 km in 1 week. If the ground scale was 10 km per hex then this translates to 10 hexes in 1 week. If the movement allowance was 10 MP's, then each Game-Turn should be 1 week in length. This seems a very simple concept, however, there is one major difficulty. What were the true movement rates of particular formations?

### *How fast can we move*

Lets select the Infantry Division filled with foot propelled infantry as our control, for want of a better concept. What was the movement rate of this type of formation? We can look at the historic records for a clue.

Donald Engels gives us the average march rate of the Macedonian army (supply, troop's etc.) as 31 km per day, over flat good terrain. Nero managed to achieve a rate of 57 km per day, over 7 days, with 7,000 picked men along friendly roads and with supplies prepared for him along the way. In both these examples we are speaking of exceptional

circumstances and exceptional armies. Most average armies would generally achieve a movement rate of 16 km per day over any considerable period of time.

The Romans were the other race that could achieve impressive marches and coupled with their roads could achieve consistent marches of 48 km per day, in a 7 hour march. This left it with sufficient time to build a camp.

Closer to our time the Zulu impis could achieve rates of 80 km per day, or at least a peak of 80 km in a single day. On the other hand when they were advancing to combat they were ordered to slow to 14 km per day for the 2 days before making contact. Both these marches occurred in "friendly" territory. At the same time European columns could achieve 24 km per day, although this was in "unfriendly" territory.

The next problem we have is the movement rate was seldom constant, for example the Macedonian march would look as follows;

| | |
|---|---|
| 30 km | per day for 3 days over flat terrain in the spring, then (Therma to Amphipolis) |
| 28.4 km | per day for 4 days, then (Amphipolis to Abdera) |
| 25.6 km | per day for 2 days, then (Abdera to Maroneia) |
| 29.3 km | per day for 3 days, then (Maroneia to Hebrus) |
| 29.3 km | per day for 3 days, then (Aenos to Melas) |
| 25.1 km | per day for 3 days over rough terrain. (Melas to Sestos) |

Two days during the journal was spend resting and grazing the animals, giving us a total average rate of movement of 26 km per day. This was a fairly rapid long term march and would not be repeated often. Nonetheless it shows us that the rate of movement depended on the time frame you looked at. From 30 km per day to 25 km per day, which shall we select.

Another important fact was rest. All men need rest in order to function in an optimal manner. The Romans allowed a day of rest every 3rd or 4th day. In other armies the rest was from 5 to 10 minutes per hour. However you achieve it the average long term rate of marching was not the same as the maximum march capacity.

What about opposition, the best area to look at is the German invasion of France in 1914. The Germans expected a rate of advance of 24 km per day for 3 days. The 1st Army was required to cover 640 km in 25 days, or 25.6 km per day with no rest and 28.8 km per day with a rest day for every 7th. The modified plan reduced the advance to only 480 km, reducing the rate of advance to only 22 km per day with no rest. This was over the relatively flat and road-rich terrain of Western Europe. This proved totally impossible to achieve, especially when fighting over the terrain. The German 1st Army was delayed early in the campaign and was forced to make up for lost time. After advancing for 40 km per day for 4 days the formations become useless, with men being captured while asleep.

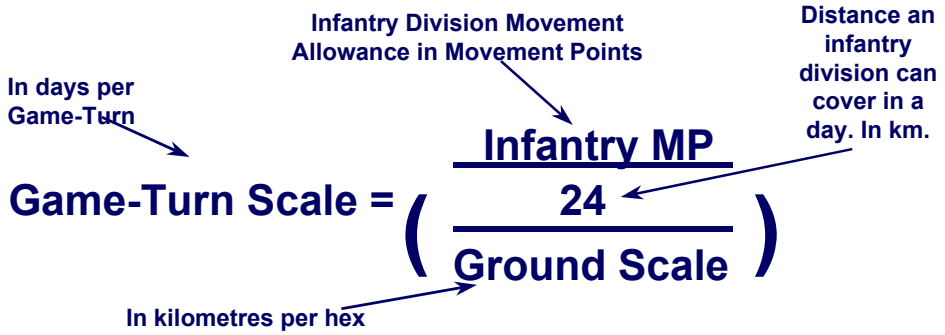
What are we left with, or what conclusion can we make. A good maximum advance rate would probably be the Roman legions. They could, over their roads, advance at a rate of 36 km per day. A more reasonable average rate of advance over good terrain and roads would be about 24 km per day. In World War I this was a very high number, however in World War II the introduction of trucks began to make it more practicable, at least if

there was no opposition. This is a nice round number and would represent a good rate of advance in unfriendly territory, but with no opposition.

## *Calculating the ratio*

Now that we have determined a historic movement rate, we can now begin to determine the optimum Game-Turn scale. We can now create an equation that may help us to determine Game-Turn Scale.

**Equation 3 : Game-Turn Scale Equation.**




Assuming our ground scale was 12 km per hex. We divide this number into 24 giving us 2, which is the number of hexes an infantry unit can cover in one day. Divide this number into the movement rate of an infantry division, lets say 4 MP's, and we end up with 2. This should be the length of a Game-Turn in days. It should be noted this is a very rough way of calculating Game-Turn scale and for that matter the movement rates of infantry divisions in a combat situation. We will look at calculating infantry movement rates in more detail later.

| **Game-Turn Scale =** | **Infantry MP's =** | **Ground Scale =** |
|---|---|---|
| 7 days | 18.6 MP's | 9 km per hex |
| 2 days | 5.3 MP's | 9 km per hex |
| 7 days | 6.2 MP's | 27 km per hex |

This formula can give you the basic's of determining Game-Turn scale. How does it work with the SPI games covered so far? Lets investigate this in more detail.

**Table 47 : Testing our Equation with SPI Games[9].**

| Game | Game-Turn Scale (days) | Infantry Movement Rate | Ground Scale (km) | Equation Answer |
|---|---|---|---|---|
| Kursk System | 2 | 5 or 4 | 21 | 4.4 to 3.5 |
| PGG System | 2 | 6 or 7 | 10.5 | 2.6 to 3.0 |
| Leningrad | 7 | 5 or 6 | 33 | 6.9 to 8.3 |
| Kursk II | 2 | 4 or 5 | 10 | 1.7 to 2.1 |
| Victory in the West Series | 1 | 4 | 2.4 | 0.4 |

Over all it works very well, especially if we ignore **Kursk** and ***Victory in the West Series***. Generally the lesser infantry movement rates give us the correct game-turn scale, give or take a bit. The greater infantry movement allowance in these games were for the German's, who tend to be given superhuman capabilities. Generally this occurred with good reason. We can ignore **Kursk** and simply claim it's an early imperfect game, however, this is not as easy with ***Victory in the West Series***. Considering this game and our formula we should have 1/2 day Game-Turns, rather than 1 day Game-Turns.

The answer to this is related to the fact this game is the most tactical of the games we cover. It is a known fact that military formations do not tend to move as quickly when in close proximity to the enemy, this is especially true of infantry. Moving through safe territory is easy, with men and animals concentrating only one thing, getting to their objective. In close proximity to the enemy and men become more cautious and the way ahead needs to be investigated, to ensure ambushes do not occur. In ***Victory in the West Series*** most if not all movement occurs in close proximity to the enemy, which reflects its tactical nature. As a result the movement rates printed on the counter is the movement rate while in close proximity to the enemy, rather than a maximum rate. The other games reflect this through the use of zones of control, thus the movement allowance printed on the counter is the maximum rate.

The formula seems to work, but as we can see there is still a great deal of flexibility allowed. I personally would start with a perfect ratio and then modify this as required. The choice is up to the game designers.

## *Game-Turn Scale - What is best*

We have determined a Game-Turn Scale formula, however, this is looking at the problem upside down. Rather than determine the Game-Turn Scale from other game factors, we need to consider what makes a good Game-Turn Scale from the point of view of playability of the game.

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[9] Key: Game-Turn scale is in days. Infantry Movement Rate is in Movement Points, assuming a clear hex cost one movement point to enter. Ground Scale is in kilometres per hex. "Formula answer" give us the Game-Turn Scale based on the ground scale and movement allowance. You compare this figure with the Game-Turn Scale given to see how accurate the formula is.

The easiest way to determine a Game-Turn scale is calculate the distance that an attacker needs to cover in a game and determine how much they should advance each game turn. If the distance is too small the game becomes boring, if the distance is too great it becomes too short a game and too dynamic.

Having 1 day game turns in a game that lasts for 2 months means you have too many game turns. In addition you are probably restricting the rate of advance to 1 hex per two game turns. This is a long and boring game.

Having weekly turns in a game that lasts for two weeks means the game is either ridiculously short, or advances will be in the order of 15 hexes per game-turn. One minor error by one side could see total defeat in such a game, as reaction times and capabilities are restrictive.

The issue really becomes one of playability and not historic accuracy. The game system needs to be able to allow the advances required to make the game historical. If this does not occur then the game becomes unrealistic and simply fails to work. This is a very difficult factor to quantify, however, there normally is a great deal of flexibility in dealing with this when designing your game.

Unit Movement rates can be altered to suit your requirement, if this fails then the following other mechanisms can be used.

> Reinforcements, supply restrictions and special rules can always be used to reduce a rate of advance.
> Its harder to speed a rate of advance up, however special rules can be employed to achieve this.

The whole issue of scale is complex enough without trying to factor in time scale. Again I suggest using the perfect scale and if the games fails to work during play testing modify the scale if required. If you are lucky you never need to get to this stage.

Once again lets look at the ratio's used in SPI games as a guide. The ratio seems to be 1 to 1.5 day game-turns for a battalion/regimental level game, 3 to 4.5 days for a regimental/divisional level game and 6 to 9 days for a divisional/Corp level game. There is a good reason for this, the average rate of advance. Let us say a rapid advance of 30 km per day was achieved, how many hexes per game turn are required to be taken to achieve this average advance.

**Table 48 : Hexes per Game-Turn required to simulate a rapid 30km advance[10].**

| Unit Scale | Hex Scale | Game-Turn Scale | Hexes per Game-Turn |
|---|---|---|---|
| Batt/Reg | 3 km | 1 day | 10 hexes |
| Reg/Div | 9 km | 2 days | 6.6 hexes |
| Div/Corp | 27 km | 7 days | 7.7 hexes |

This table explains why Game-Turn scale needs to change to match unit and ground scale. If our Divisional/Corp level game used 1 day Game-Turns, the average advance would be one hex per game-turn. Imagine taking 1 hex per Game-Turn for 60 Game-Turns, representing the first 2 months of Barbarossa. This would not be much fun at all. So we have another valid equation here;

**Equation 4 : Game-Turn Scale Equation**


This formula, of course assumes we have a stacking of 3 and the corresponding ground scale. In the above example a Divisional level game should have game-turn consisting of 3 days, plus or minus 2. If the stacking was 1 then the ground scale would force a reduction in Game-Turn length. For example, a Batt/Reg game would normally use a ground scale of 3 km. If the stacking was one the ground scale would become 1 km per hex. This means an advance of 30 km per day would require a movement of 30 hexes, which is far too large for a single Game-Turn. We need to use 8 hour Game-Turns for such a game, which is why games with a stacking of one are not too common.

## Making our job easier

You can quickly see that selection of the scale of the game can affect a game greatly. Its a complex interaction of many factors which will affect your final choice of ground scale, unit scale, time scale, stacking, zones of control, Combat Results Table and Overruns.

---

[10] Key : Hexes per game turn. This is the number of hexes which need to be covered in an offensive achieving 30 km per day advances. The range of 7.7 to 10 hexes per game-turn is a good maximum rate of advance figure. Any greater and the game becomes too dynamic and any less and the game would last too long.

One way of achieving this balance is simplifying the factors involved which must be dealt with. SPI does this by eliminating the following factors and assigning a default affect;

**Time Scale** (Based on the duration of the campaign & advance rates. However normally is matched to unit scale, so Divisional/Regimental games have a game-turn scale of 2 days per game-turn and so on.)

**Stacking** (Normally 3)

**Zone of Controls** (Locked, stop when enter, penalty to leave, no ZOC to ZOC movement)

This is probably a good way of setting your games scales, now we only have to consider;

Ground Scale
Unit Scale

Looking at the ***PGG System*** we see their normal Divisional level games use a ground scale which varies from 3.2 km to 17 km per hex. If we ignore the extremities, which have a host of special rules to cover the ground scale issue, the normal range is 6.9 km to 10.5 km per hex. This fits my suggested 9 km per hex scale very nicely.

For ***Victory in the West Series***, which is a Regimental scale game, the ground scale is about 2.5 km per hex, which is not too far from my suggested 3 km per hex scale.

The great aberrations seem to be the earlier games, like the **Kursk** family or **War in Europe** System, or the newer **Leningrad** game. All these games have a game scale which is too large for the unit scale. The **Kursk** Series seemed to use 16 km per hex while the others 33 km per hex, all for division level games. Only **Leningrad** works and only because of the historical nature of the situation. So in summary its best to use the ground scales I have suggested earlier, based on the unit scale you wish to employ.

The Unit scale is possibly the best starting point, like time scale you know the area the fighting occurred, the size of the battle and so on. As a result select this first and everything else will flow from it.

## *Summary*

Game scale is only the beginning of our game design process. None the less it is no less important for being first and if considered carefully it will provide the solid bedrock of a successful game. It is true that special rules can compensate for faulty game scales in some situations, however, relying on special rules and special circumstances is not a successful model for the creation of a game system which can be reused for a variety of games.

Once this fact has been established the matter of selecting and matching up the games scales is a fairly easy affair. The only complexity involved is making playability decisions, which of course depends on the game your are creating. However its this “playability” issue that makes the difference between a good historical game and a

excellent game which is fun to play and popular. This must be generally left to the game designer to decide upon, all I can deal with are the "logical" issues.

# [3.0] Units

In this section we need to deal with a host of special rules, such as what numbers should be placed on the units, should units have untried values, and can we simulate divisional integrity.

## *The numbers on a Unit*

Perhaps the best point to start a is what information do you need to place on a unit. The simplest example would be something like draughts or monopoly. In these cases all units are identical, the only difference is perhaps colour or shape. However apart from ownership all units are identical. In this case we do not need anything on the unit, as they are all the same and this information could be placed in the body of the rules.

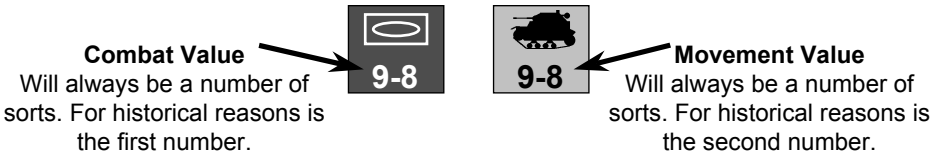
**Figure 20 : Simple Counter types, the only difference is colour.**


The next step is unit type, for example chess. Here units are owned by one side or another, but in addition the units are different. We could represents this with a symbol or silhouette. In chess the pieces have a unique shape, so we could say this is done by a silhouette. Boardgames could use a symbol. One variation on this is the use of a quantity number, so 10 units in a single hex may be represented by a unit with the number 10 on it.

**Figure 21 : Unit Types on your Counters.**

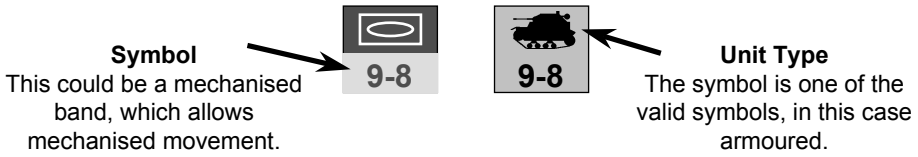

However in most cases units in a boardgame will have different combat strengths or movement rates. Generally if different units do have different movement rates its better to place this on the unit. The only exception is if there are very few types, such as a maximum of two movement rates for example. As for combat values, if units do have different combat rates this should be placed on the unit. Players can remember a few facts such as cavalry moves at 6 and others at 4, and possibly cavalry are worth 2 combat points and others 1, but if the complexity is any greater put the numbers on the unit. One variation is to separate attack and defence values, giving us 3 numbers on the piece.

**Figure 22 : Movement and Combat Strengths on your Counters.**




Now we get into the area of special rules. The first special rule or capability was who could move in the mechanised movement phase. This was traditionally determined using the unit type, so any armoured, motorised, mechanised and cavalry could move in the second movement phase and other units could not. Later games began to specifically display this on the piece itself. This was normally done by the use of a colour or symbol.

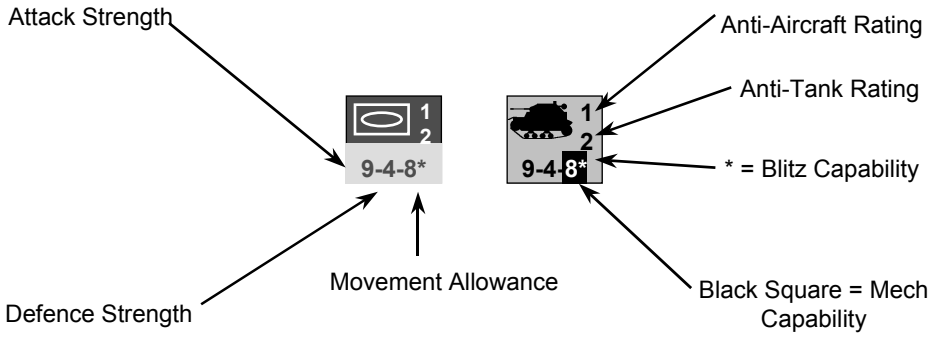
**Figure 23 : Mechanised Capacity on your Counters.**




The next special characteristics were simply extra numbers, which could represent artillery range, anti-tank capability, anti-aircraft capability and other combat related numbers. The more numbers you need, the more complex the game system. It best to put as many numbers on the piece, but remember that if you have a high density of units and a high stacking rate, it will dramatically reduce playability. With a low unit density is it probably acceptable, especially if the stacking rate is low or stacking is not too common.

A new special symbol is becoming common, that is special combat or capability symbols. A good example is Blitzkrieg capability in Victory in the West. Units with this symbol can perform overruns, without the symbol you cannot perform overruns. These will normally be symbols and all I can say is the more information on the unit, the less unit density is permitted.

**Figure 24 : Going Overboard**




Apart from these basic observations the information you place on a unit depends on mechanics, unit density and the type of game period you are dealing with. People who

play modern armoured conflicts will be more likely to accept lots of information than someone playing ancient strategic battles.

## *Untried Units*

**Panzergruppe Guderian** introduced the concept of Untried Units. In this case all Soviet units were one step in strength. On one side was their normal combat, type and movement values. On the other side we had only the type and movement capability of the unit. All the units were randomly placed on the map and were only flipped when involved in combat. This had the effect of making combat an unscientific affair and for this game it worked very well.

On of the biggest problems in most games is the god like knowledge and command control each player has over his, or her, army. This is only small way of reducing this. There are many other techniques, however most are too complex, unpleasant and simply not playable. Untried units works because its simple, easy to implement and matched the historical situation.

The problem is that this rule only works if all units have different strengths. The Soviet army in 1941 and early 1942 was a irregular weapon. Some units did well, other failed. This situation does not really occur too much in history. We know that most German infantry divisions had a specific combat strength, only modified a small amount. Later in the war the strengths were not even, but then both sides had a good idea of a divisions strength based on its previous battles.

Divisional Integrity is a nice idea which could only work in certain limited historical situations.

## *Formation Integrity*

**Panzergruppe Guderian** introduced the concept of division integrity. In this game all the German Panzer Divisions were regiment strength. If all regiments of a division were stacked together its strength was doubled. The idea was that together the divisions artillery was also involved in the combat. However when a breakthrough occurred the division may fan out in order to pocket the enemy. In this situation the artillery was not present.

Apart from the fact I feel uneasy about this reasoning, as why not include the artillery piece also, it did have an interesting effect. It caused the division to stick together, which was a historical factor. In most games there was little reason for units to stay together in their higher formations. The integrity rule caused this to happen.

# [4.0] Sequence of Play

The Sequence of Play is one area which have never been modified much. Back in the beginning lots of odd system were tried but after a while they all fell into three groups. The styles of Sequence of plays which are most common look as follows;

**Table 49 : Basic Types of Sequence of Play**

| **Type** | | | |
|---|---|---|---|
| Traditional | Movement | Combat | |
| Mechanised | Movement | Combat | Mechanised Movement |
| Simultaneous | Movement & Combat | | |

There are several variations of a theme, like reaction movement phases and so on, but all sequence of plays broadly falls into the above.

## *Traditional*

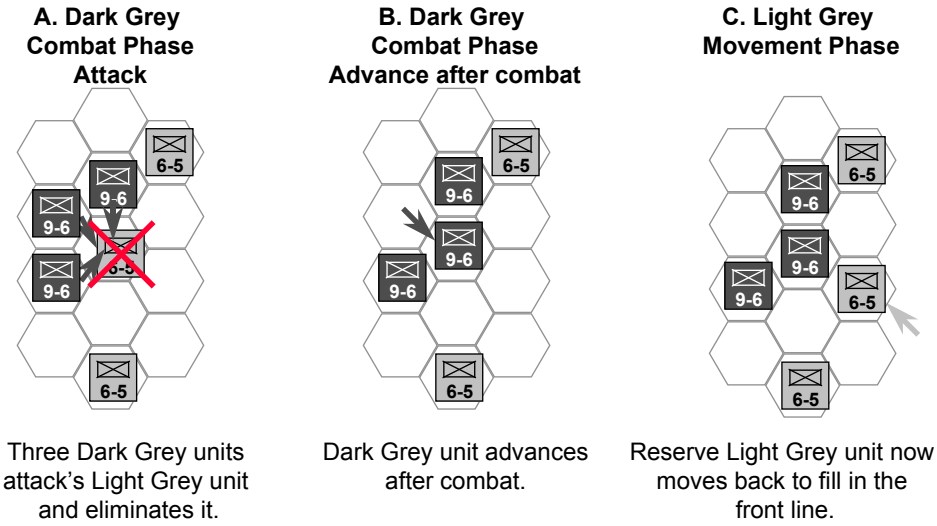
The traditional sequence of play which made combat followed by movement was the oldest successful Sequence of Play. Strangely enough this type of Sequence of play came back into fashion near the end of the SPI period, and even during the hey day of the mechanised movement phase was still used.

The benefits of this sequence of play is that it is simple and does not produce a very dynamic front line. World War One games or even tactical games would find this most appropriate. The problem with this Sequence of Play is that it was difficult to create breakthroughs, pockets and any type of dynamic advance. This made it very difficult to simulate operational level games of the Second World war.

In order to over come this some Sequence of plays were doubled, that is you move, fight, move again and fight again. Normally the second movement was greatly restricted, it had to be otherwise the nature of combat became so dynamic as to be silly. The trouble is that if you restricted it too much, you defeated the point of the sequence of play change.

It did not take long to realise that all the wild breakthroughs and sweeping motions were performed by only one type of unit, mechanised. Why not allow only the mechanised units to perform this second movement, and why bother to restrict them. The second combat phase was not really needed, so why not drop it. You end up with the second Sequence of Play, the mechanised sequence of play.

**Figure 25 : Traditional Sequence of Play Example, High Stability.**

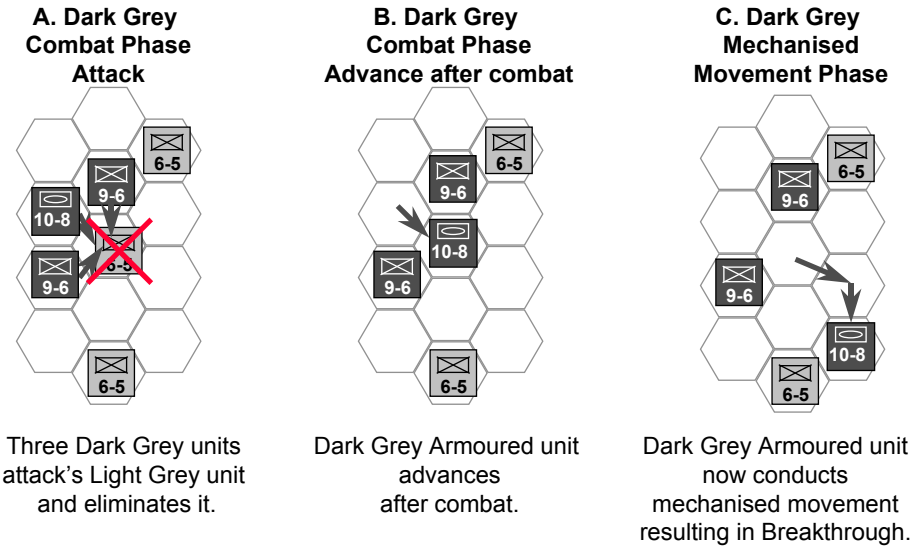



## *Mechanised Movement*

The mechanised movement phase was only added to give mechanised forces some special advantage and to allow breakthrough's. At least this was the original reason for having them. Today we know you can simulate this by having powerful Overrun rules, such as **Leningrad**, or bloody/mobile CRT's like ***Victory in the West Series***.

However, it does seems more historical to have mechanised movement as it allows those units to move the distance they are meant too. On the other hand it does tend to develop into a stop start situation, as the greatest advances occur if a breakthrough occurs. So advances are a series of almost no advance assaults punctuated by an occasional breakthrough which results in a massive advance. Its hard to have a intact fluid front line using this system. On the other hand this seemed to be the way combat occurred in World War II, so possibly for a World War II game its the best overall system.

**Figure 26 : Mechanised Sequence of Play, Breakthroughs possible with Armour.**




It only falls apart when we go to small scale battles, such as regiment or battalion level. Here battles could consist of several days of regular, but hard advance before any real breakthrough occurred. This could be why the Mechanised Movement Phase is rarely used for these scale games.

As I earlier indicated you can almost simulate a mechanised movement phase by using very strong overrun rules. If the overrun rules are strong enough you don't need the mechanised movement phase at all. The question is why eliminate the mechanised movement phase at all. Perhaps this is the wrong question, a more apt statement is that strong overruns are required to simulate history more accurately and with strong overruns there is no need for a mechanised movement phase.

The mechanised movement phase does structure breakthroughs into a two step process. You move to your target hex, you attack and then you advance through the hole. The problem is that with steps, another rule, you never really eliminate the defender. You are always left with some very weak residue. The only way to get through this residue is to have an overrun rule. If you have an overrun rule, why bother to wait till the mechanised movement phase. Why not overrun from the word go, have combat and overrun again.

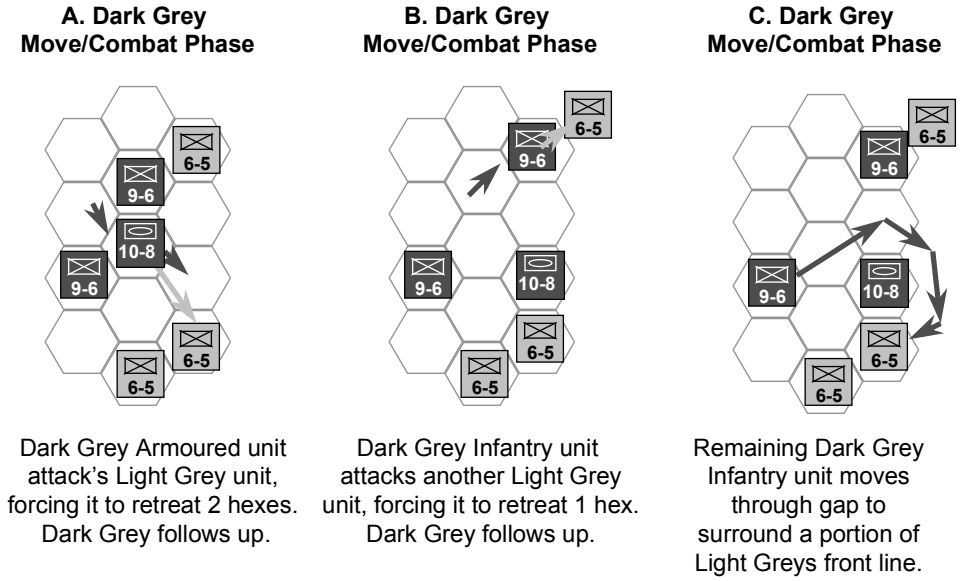
We can see that the development of overruns and step's as well as a desire for more realism, made the mechanised movement phase almost obsolete. **Leningrad** is a good example of this trend. We are back to the traditional Movement Phase, however another trend is occurring. If a great deal of combat is now occurring during the movement phase, why not combine movement and combat into one phase. We now end up with the Combined Sequence of Play.

## *Combined Movement & Combat*

Near the end of the great SPI experiment several attempts to play around with Sequence of Play occurred. The most radical was ***The Central Front Series*** games, which used a constant rotating series of movement phases. Combat occurred during movement, rather than at the end of a movement phase. The amount of combat was controlled by MP expenditure and friction points. It seemed to work well in this game system, although did result in some pretty spectacular advances.

The SPI games had all been progressing towards the concept of combined Movement and Combat. The way overruns developed into a combined Movement and Combat Phase is evidence of this. This trend was only beginning, it did not get much further than The Central Front Series when it died. Its quite possible a successor to **Panzergruppe Guderian** may have emerged and it may have used this style of Sequence of Play. The answer to this question we will never know.

**Figure 27 : Combined Movement with Combat, Very fluid situation.**




## *Which System to Select*

As you may have guessed by now the type of Sequence of Play selected depended a great deal on the fluidity of your game, as well as simplicity. The Traditional sequence of play was the simplest, but was rather static. Games which require a high hex advance per Game-Turn to be historical, would have problems adopting this Sequence of Play. Games which required a low hex advance per Game-Turn would suit this sequence of Play. Of course if your unit density was low you could simulate a rapid advance when one side ran out of units to create a front line. In my opinion a rather risky option which should be avoided.

We can plot out the expected advances of each system using a 3-1 odds average, the minimum odds required to attack, but an odds which would not result in eliminating the defender on average. If we also assume a defensive frontage of unit, gap, unit, we can make the following advance assumptions;

**Table 50 : Sequence of Play Advance expectations**[11]

| Sequence of Play Type | Advance per G/T |
|---|---|
| Traditional | 1 hex |
| Mechanised Movement | 1 to 8 hexes (Unit MP = 8) |
| Combined | 8 hexes (Unit MP 8) |

Of course you can simulate mobility via other mechanisms, such as overruns, and restrict mobility via zones of control, so the optimum sequence of play needs to be selected at the same time as the other game mechanics.

# [5.0] Movement

If we have already determined our three main game-scales, movement rates should come out automatically. We have determined that 24 km per day is a reasonable maximum movement rate for infantry. From this point we need to make sure that an infantry unit can move this distance in a single day over clear terrain. The more complex issues are related to movement costs for terrain, enemy zones of control and any other specific movement cost.

The Movement affect of terrain is rather arbitrary and needs to be determined based on common sense. The Movement affect of enemy units is another area of arbitrary decisions. If the Zones of Control are Locked, then there will be a cost to leave a Zone of Control and in some cases enter a Zone of Control. This can represents the affect of enemy units, apart from the fact they stop your forward movement.

[11] Assuming a units Movement rate is 8 hexes, the attackers advantage is about 3-1 and the defender is only occasionally eliminated. The defenders are positioned in every second hex, Zones of Control are rigid and there is no stacking. This is a contrives example, but does provide some comparative ideas.

Let us look at the optimum movement rates for the standard game scales, that we have earlier determined;

**Table 51 : Optimum Infantry Movement Rates based on Ground and Game-Turn Scale[12].**

| Unit Scale | Ground Scale (km per hex) | Game-Turn Scale | Inf Movement Rates |
|---|---|---|---|
| Battalion/Company | 1 km | 1/4 day | 6.0* |
| Regiment/Battalion | 3 km | 1 day | 6.0 |
| Division/Regiment | 9 km | 2 days | 5.3 |
| Corp/Divisional | 27 km | 7 days | 6.2 |
| Army/Corps | 81 km | 27 days | 8.0 |

For all Regimental/Battalion and Corp/Divisional level games we seem to get a magic 6 Movement Points per Game-Turn for infantry. We would probably give below average units a movement rate of 5 Movement Points and above average units a movement rate of 7 movement points, but this is the range. Divisional/Regimental games will probably use the movement rate of 5, 4 for slow units and 6 for fast units. The one real problem is Battalion/Company. The problem with these games are game turns drop to below 1 day in length. The movement rate of 24 km per day assumes 8 hours of sleep, 4 hours of assembly and a maximum of 12 hours of movement. How do you represent this in a game where each game is 6 hours long. This is a mechanics issue and need to be resolved in different ways for different games. Victory in the West resolves it by having a very low tactical movement rate, but a very fast strategic movement rate. This is only one way of doing it.

The next challenge is to determine the movement rates of other units, such as Armour, and to modify our maximum rate of infantry movement based on history. For example the Germany infantry divisions could move faster than the French, due to a combination of doctrine, training, and morale.

Lets look at some basic units and what their movement rates would be. The main types of formations are;

**Infantry** (This is our control at 24 km per day)
**Mountain or Light** (These will be lightly equipped infantry, which may allow them to move a bit faster than normal infantry).
**Static or Fortified** (These will be formations not designed to move by themselves. If they move they move normally with no heavy equipment, or very slow with their heavy equipment).
**Cavalry** (Horse mounted troops)
**Motorised** (Truck mounted troops, designed to move along roads.)

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[12] Key : Ground scale is in kilometres per hex. Game-Turn Scale is in days per Game-Turn. Infantry Movement rates are an infantry units movement allowance in movement points, assuming to enter a clear hex costs one movement point.

> **Mechanised** (Tracked, or half track mounted troops and armour. Most early mechanised formations had motorised formations mixed in, affected the movement rate of the entire formation.)

Mountain, Light, Static and Fortified formation will need to have their movement rates determined by the game designer.

Cavalry is of more interest. Cavalry are capable of bursts of impressive speeds, but are generally not much faster than foot over any prolong period of time.

Mechanised and motorised are the most important. At the divisional level there were no pure mechanised formations, somewhere there was always trucks present. Using the German advance in France in 1940 and Russia in 1941 as a good example of a maximum advance against opposition we can say a armoured division could cover about 80 km per day.

What about the maximum rate of advance by a tank. A tank was a noisy and stressful environment for a crew. Driving for more than 12 hours would be both difficult and counter productive. Assuming the path was over roads, or flat terrain, we could expect an average speed of 24 kph, giving us a possible movement of 288 km in one day. In real terms this is actually excessive. If a command drove his tanks at this rate, after a few days all of them would be out of action. The British managed 192 km in a single day in 1940, which surprised the crew. As it was they still needed to rest before becoming involved in combat.

Perhaps it would be useful to compare the movement rates of mechanised in our collection of games.

**Table 52 : Mechanised Movement Rates based SPI Game Examples[13].**

| Game | Ground Scale | Game Turn Scale | Mech Movement Rate | Speed in km covered per day |
|---|---|---|---|---|
| Kursk System | 21 km | 2 days | 12 to 16 | 126 to 168 |
| PGG System | 10.5 km | 2 days | 12 to 14 | 63 to 74 |
| Leningrad | 33 km | 7 days | 7 to 8 | 33 to 38 |
| Kursk II | 10 km | 2 days | 14 to 16 | 70 to 80 |
| Victory in the West Series (Road) | 2.4 km | 1 day | 48 to 56 | 116 to 134 |
| The Central Front Series | 4 km | 1/2 day | 12 to 14 | 96 to 112 |

The movement rates given for **Victory in the West** are for road movement only. As we can see this gets close to our suggested maximum movement rate of 192 to 288 km per day. If movement occurs across clear terrain, halve these rates. This now gets close to our realistic rate of advance of 80 km per day. **Leningrad** does not use mechanised

[13] Ground Scale is in kilometres per hex. Game-Turn Scale is in days per game-turn. Mechanised Movement Rate is the movement allowance of mechanised units in the specified game. The range represents the slowest mechanised unit to the fastest mechanised unit. Average Speed if the distance these units could cover in a single day based on the games movement allowance.

movement, which is why its average rate of advance is so small. This unusual figure actually indicates to me another possible basic system fault in this game. So ignoring the unusually high and unusually low rates we are left with a mechanised movement rate of between 63 km to 80 km per day. Isn't this amazing, we get to our figure of 80 km per day.

Unless we have any evidence to suggest otherwise a good fast average rate of movement must be 80 km per day. Lets see how this works with our ideal game scales;

**Table 53 : Optimum Mechanised Movement Rates based on Ground and Game-Turn Scale.**

| Unit Scale | Ground Scale | Game-Turn Scale | Mech Movement Rates |
|---|---|---|---|
| Battalion/Company | 1 km | 1/4 day | 20.0* |
| Regiment/Battalion | 3 km | 1 day | 26.6 |
| Division/Regiment | 9 km | 2 days | 17.7 |
| Corp/Divisional | 27 km | 7 days | 20.7 |
| Army/Corp | 81 km | 27 days | 26.6 |

We need to beware of the Battalion/Company movement rate, as the game turns length is less than our 1 day. However for the other games we are left with movement rates of between 18 and 27. If we employ mechanised movement rate this changes to 9 and 14. So our magic equation is as follows;

**Figure 28 : Preliminary Optimum Movement Rates**

## Foot (Infantry) = 24 km per day

## Motorised (Panzer) = 80 km per day

Of course we would still need to modify the movement rates to reflect other historical factors that are particular to the game, however their are two major problems with the above equations. This relates to the two extremes of the scales utilised, Battalion/Company and Army/Corp.

The movement rates of 24 km for infantry and 80 km for armour are practical rates for a period of a few weeks at most. At some point in time the formation has to stop to rest. It is unreasonable to expect infantry and armour to keep up these maximum rates for a solid month. In France the German armour advanced about 320 km in 11 days and had to rest before lunging south. The lunge south covered about 400 km in 12 days and while the Germans could of kept going they were probably happy to stop at this point to rest.

The German invasion of Russia in 1941 would of been the best example of the maximum possible rate of movement possible and in this example the German armour had lost some many of their vehicles after a few months of advance they were only a fraction of their original strength. In the first 64 days of Barbarossa the 1$^{st}$ and 2$^{nd}$ Panzergruppe advanced about 840 km. The 2$^{nd}$ Panzergruppe advanced another 240 km in the next 21 days and an

insignificant distance in the following 15 days. It had simply run out of steam and needed a refit. Its true that after a short refit it was once again advancing, but we can clearly see the daily rate of advance change as the campaign continued. From 13km per day to 11 km per day and after this no advance while the refit occurred.

We can see in our examples armour could not keep up an advance of 80km per day over any long period of time. You could probably do this for a few days before you had to stop, so for a game which measured game-turns in periods greater than a week you need to modify your movement rates. You would probably have to halve them to 40km per day average over a period of a month. This is my gut feel guess and assumes no opposition, so it would be less if the armour had to fight for terrain. Using this assumption our advance rates of 13 km per day in Russia are reasonable advances.

The next problem is at the other end of our scale, Battalion/Company. The maximum movement rates assume no enemy interference. Enemy interference can be as insignificant as proximity to the moving formations. Formations will dramatically slow down when moving in close proximity to enemy formations. At a Division level game this can be reflected by zones of control, but at Battalion/Company level all formations are in close proximity to the enemy. The map is probably not big enough to have it any other way. As a result the normal movement allowance should not be the maximum possible, but the maximum in close proximity to the enemy. Again its best to halve movement rates to reflect this and simply have special strategic movement rules in those occasions when units are not close to the enemy.

**Figure 29 : Final Optimum Movement Rates**

## Standard

**Foot (Infantry) = 24 km per day**
**Motorised (Panzer) = 80 km per day**

## Army/Corp or Battalion/Company Scale

**Foot (Infantry) = 12 km per day**
**Motorised (Panzer) = 40 km per day**

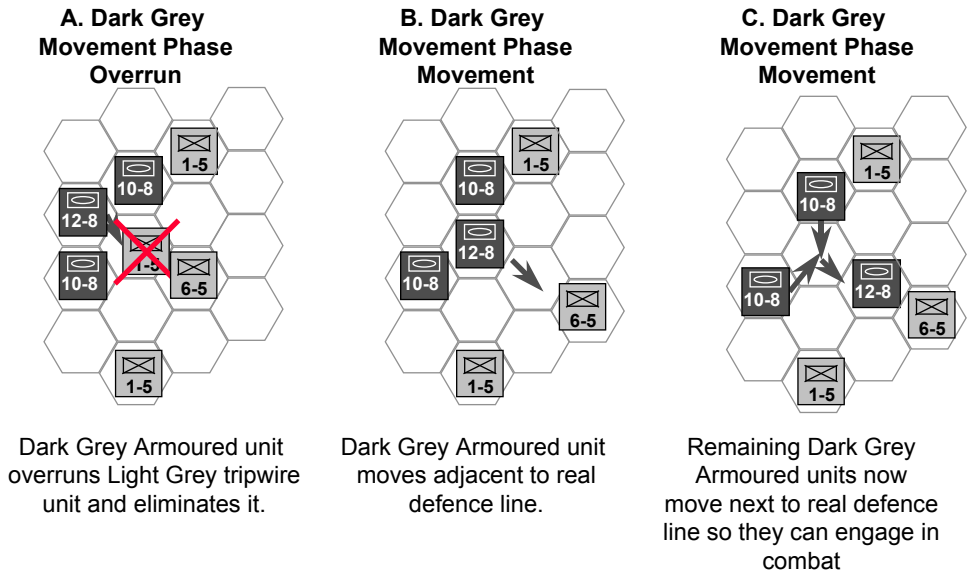
# [6.0] Overruns

Overruns were very important in making early game system work. In most cases the stacking rate was too high, ground scale too great and the unit scale inappropriate. In order to overcome the possible bogging down affect of having too many units on the map, overruns were made more powerful. This allowed a player to throw a great concentration of units into a single point and break through. Once again it encourage break through and encirclement.

## *Initial Development*

A good example of the early use of Overruns was **War In the East**. This game had a very high density of units in the front line. On problem with this is it becomes possible to greatly delay any rapid advance by having a front line of "1" Strength point units. The attackers can get through, but they need to expend a whole Combat Phase to do it. In addition the defender has not really suffered very much, only losing a very small part of his strength. To prevent this type of trip wire defence Overruns were introduced. This continued to develop to the point of making Overruns a normal form of combat during movement.

**Figure 30 : Overruns, Initially designed to overcome trip wire defence.**

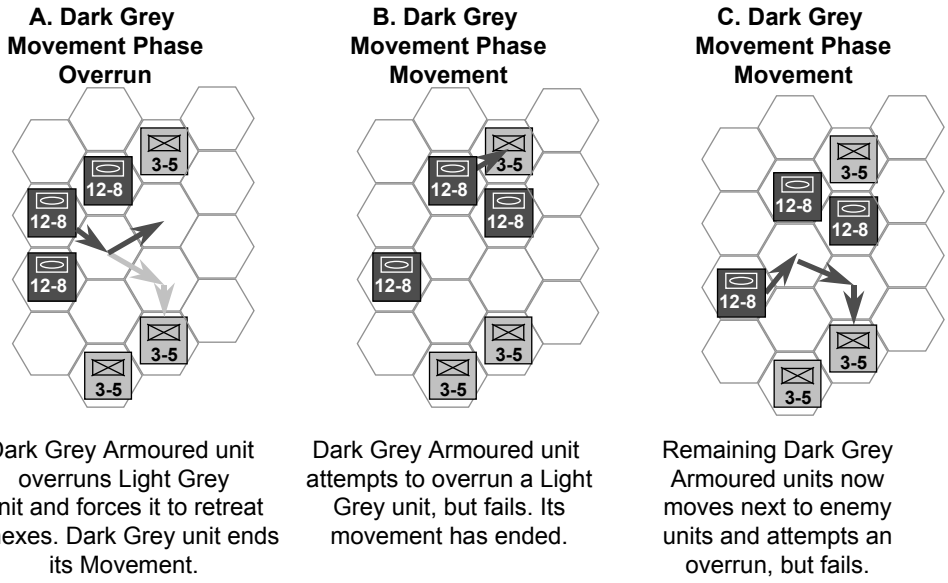



## *Later Development*

One major problem confronting the SPI designers was to make it possible to perform breakthroughs and pocket enemy troops. Older games simply did not allow this to occur, due mainly to the sequence of play. **Kursk** introduced Mechanised movement phase, which helped a lot. However another way of allowing this to occur was through the use of overruns. **Panzergruppe Guderian** introduced this new type of overrun rule, which

was in reality a combat while movement mechanism. The problem with only relying on the mechanised movement phase was that a dual line of defence ensured no breakthrough could occur. The was especially a problem in games with a high density of units.

**Figure 31 : Overruns - Later more fluid versions made the front line more fluid.**




The final evolution was to combine movement and combat and eliminate overruns entirely, see Sequence of Play for more information about this.

## *Overrun Mechanics*

There are two basic types of overruns, these are;

> Achieve a magic odds, or differential and overrun occurs automatically.
> Engage in combat while moving.

Examples of the automatic overrun are rules such as, achieve 10-1 with a single stack and overrun occurs, or, if in combat the defender is guaranteed to be eliminated the overrun occurs. Once the magic condition was reached the overrun stack normally only paid a movement penalty and continued its movement. This was specifically designed to overcome trip wire defences and would only be used if this was the only objective.

The combat while moving system tends to be the one used by most games employing overrun. In this case the attacker expends some movement point, attacks the defender with some sort of penalty and if the defender retreats or is eliminated the overrun succeeds. Not only does it overcome any possible trip wire defences, it also makes the game more fluid. If the game is well designed this is a good objective, as well as feeling more historical. The other advantage of this rule is you can fine tune the strength of the overrun to suit your games conditions.

## *Fine Tuning Overruns*

Their are three major ways of fine tuning overruns, these are;

Cost of Overrun.
Combat penalty when engaging in overruns.
Restrict the units which can overrun.

Increasing the movement cost of engaging in an overrun reduces the incidents of overruns, but still allows an attacker to break a line using overruns with sufficient preparation. Strangely enough few games control overruns in this manner and most apply a standard cost of 2 MPs, which is normally 20% to 25% of the units total movement allowance (if armour).

The next way of controlling overruns is modifying the combat penalty when engaging in this style of combat. This varies from shift CRT column two to the right to attacker is halved in attack strength. The trends seems to be towards the shift strategy, as this makes low odds overruns attacks difficult and high odds overruns much easier than if we simply halved the attacker.

If we look at historical precedents we can say that at real odds of less than 3-1 overruns should always fail and as the odds increases the chances also increase. This tends to favour the shift the column two to the right, as this would convert a 3-1 attack to a 1-1 attack, which feels about right.

The last method, that of restricting the units which can overrun, is fairly new. In this case we can say only armour can overrun, or such like. This can be coupled with modifying the combat penalty of overruns. Victory in the West does this very well. In this case units are rated by their mobility doctrine, so German armour are well training in the art of overrun, while French static division are unable to perform this function. This is probably the latest in the state of overrun art at the present.

## *When to use Overruns*

I need to make some attempt to scientifically determine when overruns should be used and what strength they should have. As a general rule of thumb Overruns are required when unit density is high and zones of control too strong. In a game with stacking limits of one you probably don't need overruns. As the stacking increases, so does the power of overruns.

For a game like the ***PGG System***, where the ground scale, unit scale and stacking matched up very well, the power of overrun was limited. You could do it, but it normally resulted in step losses of valuable units. This seemed to work very well. For a game like **Leningrad** where the ground scale was 3 times too great, overrun were almost as easy as normal combat. The game system had no choice but to allow this. Lets look at an example of the different affects of Overruns in these two games;

Assume the following case, the defender has 2 SP's in a hex. The attacker has a total of 20 SP's for attack. The effect for normal combat, ***PGG System*** overrun and **Leningrad** Overrun is considered;

**Table 54 : Comparing Overruns to Combat in Panzergruppe Guderian and Leningrad.**

| | **Attackers Step Loss Average** | **Defenders Step Loss Average** | **Difference** |
|---|---|---|---|
| Normal Combat (PGG) (10-1) | 0.0 | 2.0 | Attack Favour 2.0 |
| Overrun (PGG) (5-1) | 0.3 | 1.6 | Attack favour 1.3 |
| Normal Combat (Len) (10-1) | 0.0 | 2.0 | Attack Favour 2.0 |
| Overrun (Len) (8-1) | 0.0 | 1.8 | Attack favour 1.8 |

In both cases the defender will always be wiped out in the normal combat. In an overrun, with ***PGG System*****,** the attacker can lose some strength and the defender has a 1 in 3 chance of surviving with half its strength. In **Leningrad** the attacker can't lose anything and the defender has only a 1 in 6 chance of surviving with half its strength. In short **Leningrad** has a 38% more powerful overrun than ***PGG System***.

If we compare the affect of Overrun attack to normal attack we see that in ***PGG System*** Overrun attack is 65% as effective as a normal attack and in **Leningrad** it is 90% as effective as a normal attack. It is this figure which really shows the difference. At 90% effectiveness why do the players need normal attack at all. There are two main reasons why overruns can't replace combat,

> Only one stack can overrun, in combat up to six stacks can be involved.
> All attackers casualties need to be taken, in combat you can involve some low value units to take losses, or if the attack is unsuccessful you can retreat instead.

For the really big attacks against good defensive positions, you need normal combat. So once again we have a general rule;

> Overruns are required when unit density is high and zones of control are too strong.

Lets look at **Panzergruppe Guderian** in more detail and see if this game has achieved some form of optimum overrun state. **Panzergruppe Guderian** almost achieves a perfect balance between ground scale, unit scale, Game-Turn scale and stacking. Another game which also achieves this is **Victory in the West**. Lets look at these games and a possible optimum perfect balance. Once we have done this we can look at the overrun rules.

**Table 55 : Overruns and Panzergruppe Guderian and Victory in the West.**

| | **Panzergruppe Guderian** | **Victory in the West** | **Perfect** |
|---|---|---|---|
| Ground Scale | 10.5 | 11 km | 9 km |
| Game-Turn Scale | 2 days | 2 days | 3 days |
| Unit Scale | Div/Reg (6) | Div/Reg (6) | Div/Reg (6) |
| Stacking | 3 Div | 2 Div | 3 Div |
| ZOC (enter/leave/both) | Lock/Combat/NA | 1/2/3 | Lock/Combat/NA |
| Overrun (Move/Combat) | 3MP/1/2 str | 1MP/+2 shift | 2MP/+2 shift |
| Combat Value of Overrun | 60% | 90% | 90% |
| Movement effect of Overrun | 33% penalty | 10% penalty | 20% penalty |

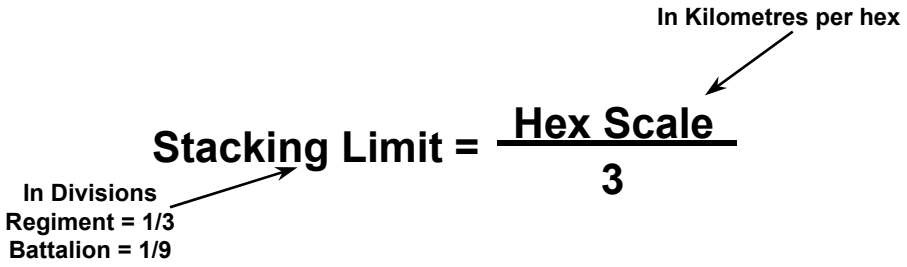
What is the purpose of this, well because determine overrun's is so subjective we can only look at real life examples and see how they worked. The reason why I have selected **Panzergruppe Guderian** and **Victory in the west** is due to the different unit densities. In Panzergruppe Guderian units were thin on the ground, far thinner than normal. On the other hand unit density in **Victory in the West** was very high, probably a bit too high. We can see the dramatic differences between these two games. Ignore the ZOC's for now, we can quickly see overruns are a lot easier and more effective in **Victory in the West**. This is probably a bit too easy, however they temper this with restricting what units can overrun. On the other hand **Panzergruppe Guderian** has a much weaker and more difficult overrun rule. Both are probably at the extremes of the permissible range, thus we have determined an optimal overrun rules based on this.

I must emphases the arbitrary nature of this table, but if we go into more detail what I am saying is the optimum overrun rule in the optimum game is overrun costs about 20% of a mechanised units movement rate and allows that stack to attack at 90% of its normal effect. In addition the Zone of Control rules should be Active Locked, although this can vary. If unit density goes up, such as stacking increases, overrun power should increase. If unit density drops, such as stacking drops, overrun power should also drop. Apart from this vague and not too helpful statement we can do little more than trying it out.

## *[7.0] Stacking*

Stacking, like movement is a fairly easy thing to determine. This is because there is a strong link between ground scale and unit scale and stacking. A unit will have a specific attack frontage and defensive frontage. If the ground scale is 9 km per hex and the unit scale is divisional/regimental, then we need a stacking of three. This is because an infantry division has an attack frontage of 3 km, so we need to allow three divisions to attack out of a single hex. The result is the following formula;

**Equation 5 : Stacking Limit Equation**




So a 9 km per hex game should have a stacking limit of 3 divisions per hex, if its 3 km per hex the stacking becomes 1 division (or 3 regiments) per hex.

This gives us our stacking rate, which will probably range from 1 to 4 units per hex. The real difficulty is that when we determined our game scales we pre-ordained stacking. When we selected our game scales we were determining the stacking to use, but what did we use to help us with this.

What we don't have is some general rules on what the stacking should be. After all it becomes very easy to resolve the stacking problem with **Leningrad** by increasing the stacking limits to 9 division sized units. In this case **Leningrad**, using 33 km hexes will work with almost any other historical situation. The real issue becomes one of practicality, 9 units in a single hex is difficult to handle. The issue of compatibility or ease or practicality of play comes into play. It does not take much grey matter to determine that the smaller stacking limit you use, the easier the game becomes to play. Ideally your game should use a stacking of one unit per hex as this makes the game very playable. Unfortunately there are many additional issues which need to be considered.

A units defensive frontages could would be three times its attack frontage in an ideal circumstance and up to six times its attack frontage in a exceptional case. If we ignore the exception situations, then if you use a stacking of one then the frontage adopted for attack must be equal to a single hex. For defence you must assume your unit can defend 3 hexes. The only way you can do this is by allowing the unit to somehow defend the hex on each side also. There is only one way that a unit can somehow defend the hex on either side of it and that is by the use of Locked Zones of Control. It is by the used of strong ZOC's that a unit can defend the hex on either side of it. This type of system is used in the ***Modern Battles Quadrigame*** and it does work. The problem with stacking limits of one is that it prevents units from adopting exceptional defensive frontages.

As a general rule if we reduce stacking we need to strengthen zones of control, consequently when we increase stacking we need to weaken Zones of Control. You must remember that stacking limits are determined by the ground scale and unit scale. If we have a stacking limit of nine, then the normal defensive stack is 3 units to a hex. In this situation Zones of Control are probably not required at all. For a variety of reasons you do need zones of control, so stacking limits of 9 are unacceptable.

SPI tends to use a range of stacking of 1 to 4, with 3 being the most common. The 4 stacking limit is only used with **War in Europe** and I personally feel that a stacking range of between 1 and 3 are all practical and optimum. So we can now make a new rule;

> Stacking should range from 1 to 3 units, with 4 only being used in exceptional circumstances.

But we can see there is another interesting relationship here, the relationship to stacking and the Zone of Control. Lets look at this in more detail.

# [8.0] Zones of Control

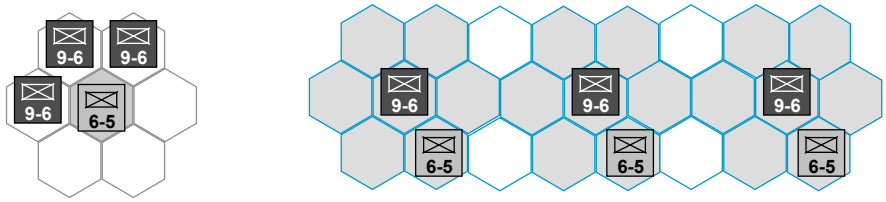
The purpose of Zones of control are two fold;

> They extend the defensive frontage of units.
> The lock units into a front line

## *Extending the Front Line*

If you had no Zones of Control, then the units used in a game could only defend the frontage of one hex. For example, if you had division sized units in a 9 km per hex game, then you end up with a problem. This is because a division could defend a front line of 18 km, so you end up with the situation of having divisions unable to defend their historical frontage. In my example you would need a fairly strong Zone of Control to simulate the historical defensive capacity of a division.

**Figure 32 : Example One : Very strong ZOC's (Stacking =1)**



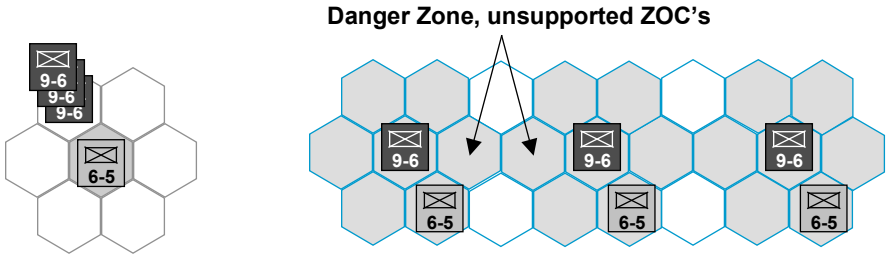

Attack frontage of each unit equals 1 hex.

Defence frontage of each unit needs to be 3 to 9 hexes. The lower figure of 3 hexes can be achieved by the use of Zones of Control, but there is no way 9 hexes can be achieved.

> In this example it is impossible to simulate a defensive frontage more than 3 times that of attack frontage. As a result a 3 hex defensive frontage would be considered a normal, solid defensive frontage. This would be hard to break through.

There is another interesting relationship, that is to stacking. We always need to make sure you could stack enough units in a hex to achieve historical attack frontage. This frontage is normally 1/3 that of defensive frontage. So if your scale was divisional and 9 km to a hex, then a stacking of 3 allows you to achieve historical attack frontage. For defence, each division needs to be able to defend the equivalent of 2 hexes. This means you need strong Zones of Control.

**Figure 33 : Example Two : Average ZOC's. (Stacking = 3)**



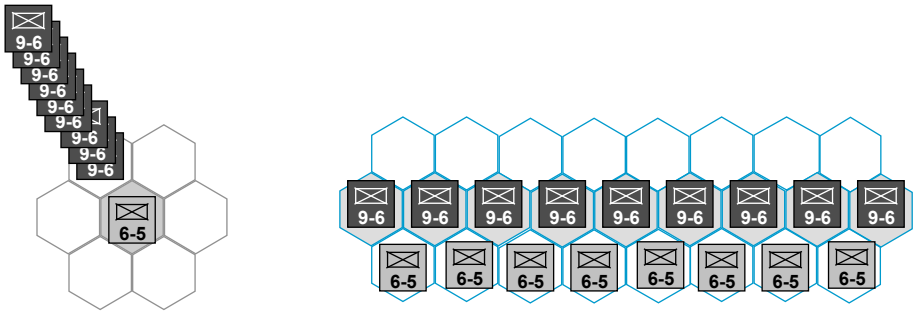

Attack frontage of each unit equals 1/3 of a hex.

Defence frontage of each unit needs to be 3 hexes. This can be achieved by the use of Zones of Control. However unsupported Zones of Control can still be penetrated.

The optimum defensive frontage for units in this example is 1 hex. For a unit to defend a frontage more than this it would have to extend itself, thus the Zones of Control can't be too powerful. It should be pointed out another way of achieving the above effect is to stay with Very Strong ZOC's, but to introduce Overruns.

If the stacking was 9, the ground scale would need to be 27 km per hex, otherwise you can concentrate too much strength in a hex. With this scale a single unit would only need to be able to defend the hex it occupied. This would mean you did not need any Zones of Control.

**Figure 34 : Example Three : No ZOC's. (Stacking = 9)**




Attack frontage of each unit equals 1/9 of a hex.

Defence frontage of each unit needs to be 1 hex. In this case you can't have Zones of Control.

The optimum defensive frontage of each unit is actually 1/2 of a hex, however using an extended defensive frontage they can just defend one hex. In this case a single unit should be easy to break through, probably with overruns. Stacking of 2 is required to prepare a really solid defence.

As the stacking rate increases the effect of Zone of Control can be less. You can weaken Zones of Control in three ways;

Allow ZOC to ZOC movement. (This allows you to break through unsupported ZOC's, apply to Example Two.).
Allow flexible and powerful Overruns (***PGG System***) (See Overruns)

Allow the Combat Results Table to have lots of defender retreats or special break out rules. (***Victory in the West Series***) (See Combat)

All these methods allow a defensive line defended by too few units to be broken by a high concentration of enemy units. If you can't achieve a break through with a nine to one superiority, then the game system has problems.

**Leningrad** attempts to overcome its scale problem by making Overruns very easy. This works well when unit density is not too large, but seems to fall down when the fighting reaches Leningrad or any other well defended position. This has been built into the game, but makes using this game system for any other game rather difficult. (Unless unit densities were low).

On the other hand as stacking decreases then Zones of Control need to be more powerful. This can be achieved by the following;

No enemy Zones of Control to enemy Zone of Control movement. (Basis of Strong ZOC, Example One)
Compulsory attack when in an enemy zone of control.
Fixed Zones of control, stop movement when enter, not allowed to leave except by combat.
No Overruns.
Low casualty combat results table.

***Modern Battles Quadrigame*** has a stacking of one and uses most of the above mechanisms to allow a unit to defend three hexes fairly well.

If we assume a formation can defend its standard frontage and can influence enemy movement to double that distance we can make the following assumptions to determine the maximum possible stacking. The example below all use divisions.

**Table 56 : Relationship between Stacking and Zones of Control[14].**

| Stacking limit (Divisions) | Hex Scale | Hexes to Defend | ZOC |
|---|---|---|---|
| 1 | 3 km | 3 to 9 hexes | Strong |
| 2 | 6 km | 2 to 3 hexes | Strong |
| 3 | 9 km | 1 to 2 hex | Elastic |
| 4 | 12 km | 0.75 to 1.5 hex | Elastic |
| 5 | 15 km | 0.6 to 1.2 hex | Elastic or None |
| 6 | 18 km | 1/2 to 1 hex | None |

Once we get to a stacking of 5 or 6 units there is no need for Zones of Control. As we have determined we can't do without Zones of Control we should never consider a stacking of more than 4.

[14] A Strong ZOC does not allow ZOC to ZOC movement at all. Elastic allows ZOC to ZOC movement in some circumstances. No ZOC is self explanatory.

SPI made the final decision that strong Zones of Control was the only way to allow the deployment friction that I will cover in the following section[15]. Yet they tended to use stacking limits of 3 units which only require an elastic Zone of Control, so how did they overcome the difficulty of breaking through the enemy line when strong Zones of Control are utilised. They achieved this by allowing Zones of Control to be negated in a pure combat situation by the use of Overruns or a very mobile CRT. This way it was difficult for players to redeploy[16] previously committed units and still allowed you to break through a line if you had sufficient forces. This helped to encourage breakout's and encirclements. So once again we have a new rule;

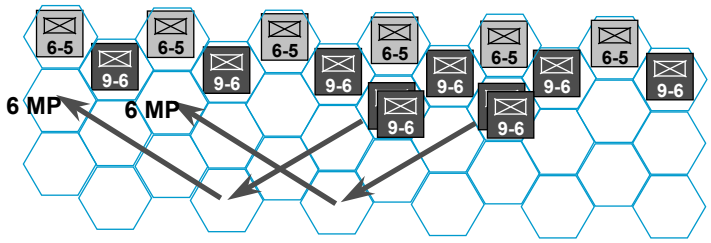
Zones of Control need to be strong and fixed, in all circumstances.

Once again we come to a new relationship, that of Overruns and mobile CRT's to the strength of Zones of Control.

## *Locking units in*

Now Zones of Control have more uses that just being a way for a unit to defend the hexes to each side of it, they are used to force historical friction in a front line. When formations were deployed into a portion of the front line it took a lot of effort to disengage them and redeploy them to another part of the front line. Early games did not reflect this effect, the only related effect was that all movement stopped when you enter an enemy zone of control. This did not stop the effect displayed below.

**Figure 35 : The Battle of Moscow (1970) - No Locking ZOC.**




If the enemy defence is too strong, the entire axis of attack can be changed in a single Game-Turn. No Combat Phase is left unused and this major change has no cost to the attacker.

The ***Kursk System*** attempted to address this problem by the use of elastic Zones of Control which cost Movement points to enter and leave. This way a unit needed to expend a part of its movement allowance to leave a ZOC and part of its movement allowance to enter a ZOC. This way it was slightly difficult to redeploy an attack to another part of the front line. Unfortunately it was not difficult enough.

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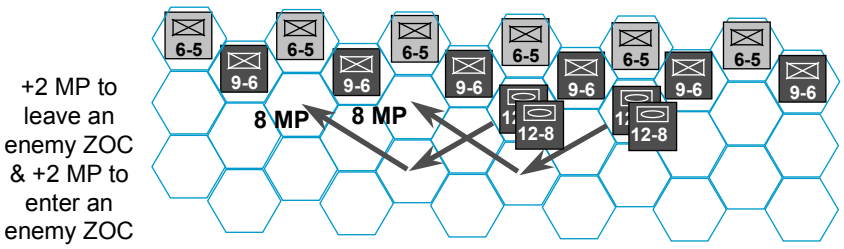
[15] Locking units into a position.

[16] Locking a unit in its position via the use of Zones of Control.

**Kursk** relied on the ability of units to move from one ZOC to another. Thus an infantry units had to have sufficient Movement points to move from one ZOC to another, which it did just. Unfortunately Armoured units could easily do it, and they had 3 movement points left over. This still allowed to much flexibility at no cost.

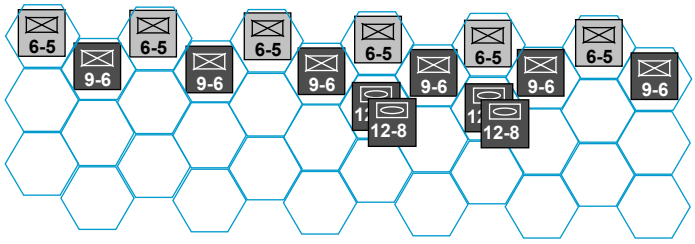
**Figure 36 : Kursk (1971) - Elastic Locking ZOC.**




Its now more difficult to change the axis of attack, but with armour its still possible. This tactic became the standard mechanism of avoiding defences in this Game System

The final answer was the use of locked Zones of Control. These zones of control could only be left by combat or special disengagement rules, which normally left some formation behind. This worked and worked very well to prevent unhistorical flexibility in attack paths. The difficulty with this was that Locked ZOC's had to be also strong ZOC, or to put it bluntly you could not move from enemy ZOC to another enemy ZOC. The problem we have here is how do we now achieved breakthroughs, the answer was overruns and it was only once the modern combat while moving overrun appeared that Locked Zones of Control became practical.

**Figure 37 : Panzergruppe Guderian (1976) - Locking ZOC's.**




Its not possible to leave an enemy ZOC, except as a result of overrun or combat. This is a fully locked ZOC. Later games allowed limited disengagement's as long as a unit was left behind. Using this system changing your axis of attack required a few Game-Turns and a lot of effort.

**Panzergruppe Guderian** was the first game to use Locked Zones of Control. Initially you could only exit by the use of overrun or combat. Later **PGG System** games introduced disengagement rules, which allowed you to leave an enemy Zone of Control as long as you left a unit behind. This overcome one of the most common problem with the early Locked Zone of Control Rule.

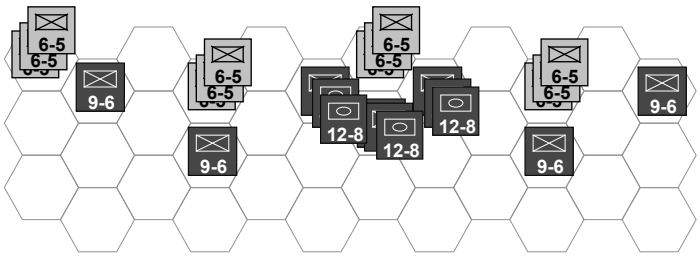
If we had a stacking limit of nine we would not need zones of control at all, in fact we would need to make sure they did not exist. In this situation a player can freely redeploy forces in the front line to new positions with far too much ease. This is the real limit of stacking, we always need Zones of Control which means we can't have stacking much over 3 units to a hex.

## *Point Defence*

While its imperative we utilise Locking Zones of Control, there are issues with this in the game. The stronger the Zones of Control, the greater the benefit to the defender. While part of this advantage can be nullified by allowing overruns and mobile CRT's, both the mechanisms require a combat to occur first.

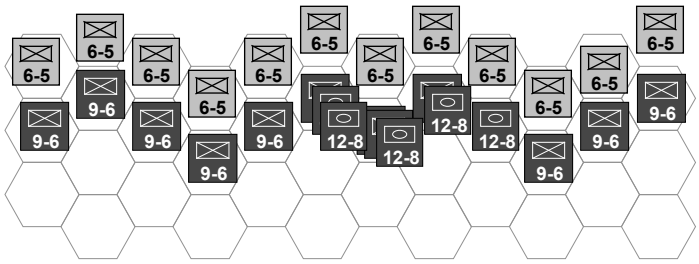
If Zones of Control were powerful then defensive lines would always consist of alternating point defences of stacked units. Thus when an attacker attacked a single hex, he was really attacking a 3 hex frontage which required a corresponding greater attack force. While this problem only occurred if the defender was capable of stacking, it became a major problem when unit densities were high. Leningrad was the classic example of this issue, once the defender could stack a 3 units it was impossible to break through. The attacker had to launch massive attacks hoping the loss of units would allow the break through required.

**Figure 38 : Point Defence example with strong ZOC's**




In reality each defending unit is defending a single hex, however due to strong Zones of control the defender has deployed them into a 3 unit stack each 3rd hex. Thus the smallest attack frontage allowed is a 3 hex attack frontage.

**Figure 39 : Non-Point Defence example**




In this example each hex is being defended by a single unit, allowing the attacker to launch an attack against a 1 hex frontage.

We can't get rid of strong ZOC's, so how do we force the defender to deploy his forces in a more historical manner. One option is to allow an enemy ZOC to enemy ZOC move via the mechanism of combat. In short, you can allow a unit to attack an empty hex. You need to ensure some casualties can result, otherwise the player will use this as a mechanism to quickly change the point of attack thus negating one major benefit of strong Zones of Control. This allows an attacker to slowly surround the defender if he leaves gaps.

The only problem is when unit densities are very low and a defender is not able to cover each hex. If the attackers unit densities are also low you do not want a constantly shifting front line when no one is attacking. You would need to restrict the ZOC to ZOC attack in some manner, possibly requiring a minimal attack unit density. One viable option is to assume each empty hex has an intrinsic defencive value, normally 50% the strength of an average infantry unit. If this value was 3, then an attacker would need to attack a 3 strength point empty hex. In some cases this would fail, in other cost casulaties. While a reasonable idea it has never been tried out, thus making me think there is a fundamental problem somewhere.

# [9.0] Combat

However there is another way to overcome high unit density and over strong zones of control, you can have a very mobile or casualty causing Combat Results Table.

Perhaps the best way of dealing with the combat system is to go over the steps that need to be performed in order to resolve a combat. In most games this consists of consulting a Combat Results Table and performing the following steps;

Determining the Column to use (Normally the odds or differential)
Determining the Row to use (Normally done by spinning one, or more die.)
Determining the result (Normally done by cross indexing the column and row and performing the result displayed.

So we really have three aspects to look at. Before we go any further we need to cover the cases which do not fit into the above. Simultaneous combat systems require the above to be done twice, once for each side. None the less the three steps need to be performed. We will take a special look at simultaneous combat systems later.

## Column

In most combat systems you need to somehow compare the attackers strength with the defenders strength. The result of this comparison is normally the number you use to determine the column to use. The combat systems used to determine the column are generally;

Odds
Differential
Sum (Simultaneous)

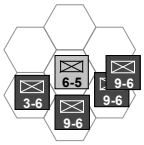
Most early games used the odds system and even up to today this has always been the most popular system, however in between some series experimentation occurred with differential and simultaneous systems. In simple terms an odds system has the attackers strength divided by the defenders strength to give an odds. So 24 attacking SP's against 6 defending SP's will result in an odds of 4-1, attackers benefit. On the other hand a differential system had the defenders strength subtracted from the attacking strength. So in the above situation the differential would by +18, attackers favour. Finally a simultaneous system has the attacker totally its attack strength and spinning a single die, the defender now does the same. All losses are now removed. In the above situation the attacker uses the 24 column and spins and then the defender uses the 6 column and spins.

### *Odds Combat System*

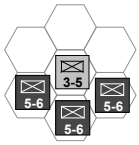
This is the oldest and in the long run the best system. The disadvantages are that a 2 to 1 attack could involve a wide range of strengths ( 2 SP’s against 1 SP or 20 SP against 10 SP’s), yet the results would be the same. This is especially a problem is we use step losses as a result. The problem is minimised if we have a low strength range, such as a maximum of 30 SP’s in a hex to a minimum of 5 SP’s in a hex. But the problem is

always with us and as we move closer and closer to the pure step CRT it becomes an issue which needs to be considered.

**Figure 40 : The Problem with Odds CRT systems.**




In this example we have a defender with 6 SP's and 2 steps. The attacker has 30 SP's and 10 steps. Attacking at 5 to 1 the result could be a 1/3, with the attacker losing 1 step and the defender 3 steps.




In this example we have a defender with 3 SP's and 1 steps. The attacker has 15 SP's and 6 steps. Attacking at 5 to 1 the result could be a 1/3, with the attacker losing 1 step and the defender 3 steps.

Even though the forces involved in these two attacks differ by a factor of 2 the losses are the same. You would expect higher losses if the forces involved are greater. This encourages large attacks at the expense of smaller ones.

One possible solution is to not provide a step losses, but a percentage step loss. So the attacker may lose 10% of all steps, which means casualties differ based on the size of the force involved. This only works if the number of steps are great, otherwise you get into difficulties with fractions. This probably would suit a game like Global War, but would not suit any other game.

## *Differential Combat System*

The differential system is easy to use and overall very good, however it only works if most of the units have a similar strength. In ***Modern Battles*** most units had a strength of 1 to 4 for defence or attack. In addition there was no stacking, so when 3 units gang up on one unit the differential was normally +2 to +11. Artillery and air power would move this up and down a bit, but the range was not great.

On the other hand in **Global War** you could stack up to 10 SP's in a single hex, so if three stacks attack one stack your range could be as great as +20 to +29. The range was not a problem, but what occurred when 2 SP's attacked 1 SP, you had a differential of +1. So your CRT had to handle from +1 to +29 to be realistic.

Finally if a stack of 10 SP's attacked a stack of 10 SP's the casualties were the same as if 1 SP attacked 1 SP. This system only worked if the difference between the maximum strength in a hex to the minimum strength in a hex did not differ too much. In ***Modern battles*** the difference was 3, in **Global War** it was 9.

**Figure 41 : Problems with Differential CRT Systems.**


In this example we have a defender with 4 SP's. The attacker has 8 SP's and 10 steps. Attacking at +4 the result could be a 1/2, with the attacker losing 1 SP and the defender 2 SP.

In this example we have a defender with 1 SP's. The attacker has 5 SP's. Attacking at +4 the result could be a 1/2, with the attacker losing 1 SP and the defender 2 SP.

Even though the forces involved in these two attacks differ by a factor of 4 for the defender, the losses are the same. You would expect higher losses if the forces involved are greater. This encourages large attacks at the expense of smaller ones.

## *Simultaneous Combat System*

The simultaneous system has some advantages and some disadvantages. The main problems are as follows;

How to you determine when a retreat, or advance is required.
How does terrain affect combat.
How do you determine is a overrun was successful or unsuccessful,

However the biggest problem was that this system encouraged constant and combat was both clumsy and involved double the dire rolls.

The advantages was that it provided a mathematically accurate casualty representation. If 10 SP's attacked 5 SP's the casualties would be very different from 20 SP's attacking 10 SP's, while in an odds system the results would be identical.

Overall a mathematically good system, but it seems to fail in the area of usability. Only Kursk (II) used this system in a modern game, although this system is commonly used in ancient and Napoleonic style games.

## *Row*

Once again in most cases the row was the random factor in any Combat Results Table. You calculated the column and then you spun a dice or die to arrive at the row number to use. As a result the determining of the row revolves around the type and number of dice you wish to use.

This is one area which experienced constant development. Except for the very latter days most CRT's used a simple 6 sided dice. Rarely some games used two 6 sided dice, like ***The Central Front Series***. Some early 10 sided experiences were conducted, **Starforce**,

but it was well after SPI fell that 10 sided dice became common and were used in games. Whatever dice you used the main difference seemed to be allowing a greater or less spread of results, or making calculating odds harder.

## *CRT Spread*

There are two CRT schools of though when it comes to result spread. If you make results dramatically different on the CRT you bring the factor of luck more and more into the game. If a CRT column ranged from total disaster to the attacker to total disaster to the defender, then the result of the combat becomes more a factor of luck than skill. If your spread was less then the important factor was the odds and not the die roll spun. The choice is yours, although I favour a minimum spread CRT to a maximum spread CRT. That way the game becomes more like chess, dependent on skill, rather than Monopoly, depended on luck. (This is not to say there is no luck in chess or skill in Monopoly, only that the emphasis is different.

## *Calculating Odds*

One disadvantage of making a CRT too simple and reducing the result spread is that you can make it very predictable. Although I don't like the idea of skill being defeated by luck, making combat less computer precise will make predicting the game harder. One way of doing this is to make reading the CRT harder. A possible method is to use lots of modifiers or to use 2 six sided dice. It becomes simply too hard to calculate the best odds of an attack if you can't work out the effect of modifiers on a CRT which uses 2 six sided dice. Instead you simply know this attack is important and you throw everything you have against it.

The negative about this is that if a game has many die rolls in it your game will extend a great deal. Its harder to use a CRT which uses 2 six sided dice. In addition you will always worry about an attack and will make the effort to calculate the odds anyway. I generally find making a single die roll more complex and more random is best suited to games where the die is not rolled much, such as ancient games. For World War Two games a simple 6 or perhaps 10 sided die and a easy to read and use CRT is the best.

## *Result*

This is where the action lies. Once you have determined the column and row, you can now cross reference the result. The result will tell us casualties, retreats and who won and who lost this particular battle.

## *CRT Results*

One of the most notice development of the CRT was the move to descriptive results to step loss results. Early CRT's had results such as De (Defender Eliminated), Ex (Exchange), Ax (Attacker Exchange) and so on. These results attempted to describe the result of combat, such as Defender eliminated meant the attacker totally blew away the

defender. Special rules then covered such aspects as advance after combat in this situation.

The problem with these results is they were too limiting. A De always resulted in the total destruction of the defender. A Dr always resulted in the defender retreating. Beside the absolute nature of the results the players had little choice in the results. It was impossible to tell a formation to defend at all costs, if it got a Dr it had to retreat. A formation could also not be told to delay, a De always resulted in the elimination of the unit.

The next development was steps results. This probably came from the retreat results that were occurring. It was possible to get a Dr2, retreat 2 hexes. It becomes quickly obvious that instead of retreating why not let a defender the option of losing a unit and holding its position. Coupled with this single units developed a flip side, probably beginning from the Battlegroups of War in the East. A D1 could mean retreat one hex or lose one step and a step no longer meant a whole unit. A unit could just flip and lose a step.

We still saw De, Ae, Ax and Ex results, however how would we resolve Br results (Both retreat). This affect both sides. The answer was having two results, an attacker and a defender result. So now the Br result was replaced by the D1/A1 result. This also allowed us to eliminated the Ex and Ax results and replace it with D1/A1 and De/A1 respectively. There was a problem, the Ex result could now be translated into a retreat for both sides. No losses occurred. So an Eng result was brought in, this was the true replacement for Ex and involved each side losing one step and not retreating.

Over time the D1/A1 was replaced with a simple 1/1 and even the De and Eng result began to disappear. The mandatory losses were now being represented by a new result D1(2), which meant 2 steps must be lost and 1 must be taken as a retreat or a step loss. However the off shoot is that results were no longer duel, it affected only the attacker or defender. This system did work if enough die rolls were spun, because at some point the attacker was forced to lose a step.

The two main systems seem to be ***PGG system***, with duel results and ***Victory in the West Series*** system with single results but with mandatory losses. Each seem to work well and beyond this I have little comment. Best to select a system and besides moving numbers around leaving it alone.

## *Combat Results Table Developments*

The last way of resolving this bogging down issue is by the use of a bloody or mobile CRT. ***Victory in the West Series*** does this by having a bloody CRT. They have eliminated Overrun's and retained locked ZOC's. On the other hand their CRT does force mandatory defenders casualties and mandatory attackers advances.

They achieve the mandatory attackers advances by the creation of breakthroughs. If a breakthrough occurs, indicated by bold results, the defender's lose their ZOC's for the following player turn and the attacker can advance one additional hex.

The mandatory defenders casualties is achieved by having two results on the CRT. One is the number of steps which must be lost and the second is the number of steps lost and/or hexes to retreat.

This allows the attacker the possibility of a break through if he can concentrate sufficient attack strength at a single point in the enemy line. This is the mobility factor. In addition it becomes impossible to slowly retreat and not take losses. If you batter an enemy line long enough, then its strength slowly dwindles away until a break through can occur.

What about attacker losses, the new CRT does not have losses for both sides in a result. This is resolved by having the mandatory attacker losses. If a result goes against the attacker, he can't simply retreat the units away thus sparing them any losses. This seems to simulate the affect of attackers losses well enough.

Possibly looking at a comparison would be beneficial. Looking at ***PGG System*** and ***Victory in the West Series*** lets compare a 6-1 attack. The defender has two steps and a defence of 4 SP, the attackers total 24 SP's and possess 8 steps. Lets compare the mandatory movement and losses of the two CRT's;

**Table 57 : Comparing Panzergruppe Guderian with Victory in the West Series.**

| Game | Mandatory Attackers Advance | Mandatory Defenders Losses | Defenders Retreats or Losses | Attackers Losses | Defenders Losses |
|---|---|---|---|---|---|
| PGG | 0.2 | 0.6 | 1.5 | 0.3 | 2.1 |
| VITW | 0.2 | 1.25 | 1.4 | 0.08 | 2.65 |

The mandatory attackers advances were the result of a DE result (for PGG) or Breakthrough result (for ***Victory in the West Series***). By comparing losses the ***Victory in the West Series*** is far more bloody for the defender and less for the attacker at 6-1 odds. This is due to ***Victory in the West Series*** having more steps and having no DE results. In addition the lack of overruns reduces the chance of combat greatly. Even taking this into account mandatory casualties are much greater, in fact more than double.

In ***PGG System*** if you decided to retreat before an attacker, and you have sufficient reserves to plug holds and unusual front lines, you can suffer very few casualties indeed. In the above case one step in two out of 3 combats. In ***Victory in the West Series*** if you do the same your casualties increase a great deal. In the above case at least one step per combat and a second 1 in 4 combats. In summary if you want to hit a section of the enemy front line and you have sufficient forces you can quickly weaken it to destruction in ***Victory in the West Series***, while in ***PGG System*** it would feel like attacking a rubber band. It simply stretched back, suffering little casualties as a result.

Now to determine the difference between using Overruns or mobile/bloody CRT's. The main difference seems to be the speed of breakthrough. Using Overruns you could achieve a clean breakthrough in a single game turn. Using a mobile or bloody CRT if would take several game-turns of weakening the enemy line before a break though occurs. As ***PGG System*** has 2 day game turns a*nd* ***Victory in the West Series*** 1 day games turns, the reason between the use of these two mechanisms becomes a bit obvious.

Which system is superior is hard to determine, it depends a great deal on the game and the conflict. I personally feel having Overruns is the better and possibly more historic system, as it allows armour to shine as the main breakthrough forces.

# [10.0] Terrain

This should be a simple area, however its not. Terrain can be a fiendishly complex area in terms of how it affects movement and combat. I can only really deal in terrain type and effect.

The first step is to determine what terrain types to display on our map. This actually depends a bit on the ground scale and the area the map covers, but in the bulk we will probably require the following terrain types.

**Table 58 : Terrain Types and their real effect.**

| Terrain Type | Description |
|---|---|
| Clear | Generally flat clear terrain, a walking man would not be impeded by this terrain. |
| Broken | Broken represents a mix of rough and clear terrain. |
| Rough | Generally hilly, with ridges and generally difficult to walk over. |
| Mountain | This is very difficult to cross, except along difficult to manage paths. |
| Woods | Enough trees to make crossing this terrain difficult, or allowing some cover in combat. |
| Swamps | Like Mountain terrain, except the ground is bogy and swampy |
| Rivers | Rivers, ranging from Major, Minor to streams. |
| Roads | Man made path |
| Railways | Rail roads |
| Cities | Man made habitation, allows some defensive advantage. |

As its becoming very obvious I am using Panzergruppe as a sort of base control, lets see how it dealt with terrain.

**Table 59 : Panzergruppe Guderian terrain effects.**

| Terrain Type | Movement Effect | Combat Effect |
|---|---|---|
| Clear | None | No effect |
| Forest | Mech +1MP | Defender doubled |
| Swamp | +1 MP | No effect |
| Major City | None | Defender Doubled |
| River Hexside | +2 MP to cross | Defender doubled |

Other games used shift or die roll modifiers, such as Leningrad which tended to use odd shifts. Some game associated a host of special rules to different terrain features which has some type of combat effect. Victory in the West restricted special blitz combat and overrun in certain terrain features rather than providing units with specific defence advantages.

You can make terrain rules as complex as you desire, however in the attempt to make a fun playable game you should identify the significance of terrain and try and reflect that in your game. Apart from this point you need to match your terrain affect with the movement allowance and system used and the CRT employed.

# [11.0] Command

Command was generally not present in early games, but has slowly occurred more and more. As our game systems become more and more perfect and units are capable of performing what they were capable of in reality we quickly realise that most units in most circumstances did not perform to their optimum. There are many minor reasons why, but the major one was command.

In most games each player is a god which is capable of moving and utilising each unit to their maximum. While this is acceptable in chess, it is clearly silly for an accurate military simulation. Units needs effective command in order to operate effectively.

Panzergruppe Guderian introduces Command in a simplistic manner. In this game HQ units could channel supply and provide a combat bonus if required. Ignoring the supply aspect, the initial use of Command was simplistic.

The most complex command rules are found in tactical games. Here we have HQ units with command points, which need to spent on a unit for it to move. While realistic these command rules made the game more difficult to play, which reduced its popularity and playability.

The important factor here is to determine if command has a major affect in the campaign and if not, or if both sides were similar, don't try and do anything too complex. Situations where command differences were significant require some form of command rule, but even here its best to keep it simple.

# [12.0] Supply

Supply in some situation had a significant affect, especially in the more strategic games. However most games portray a battle of some description rather than a long term campaign, which means supply had a lesser affect. When creating a France 1940 game you can probably get away with very simple supply rules, however when playing a Russia 1941 game you need to consider supply very carefully, simply because it had a major affect on the German advance. In order to determine which supply rule suits your situation lets look at the standard supply considerations;

How to judge supply (Tracing Supply)
Affects of supply

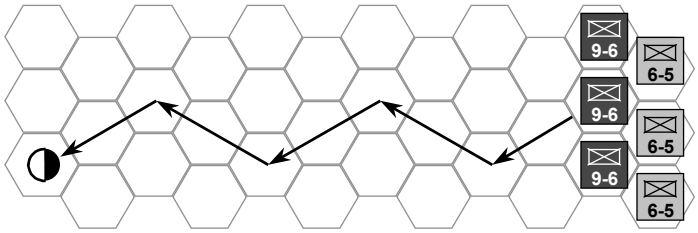
## *Tracing Supply*

There are three basic types of supply tracing rules.

No Supply
Simple Supply
Composite Supply

Simple supply generally represents the tracing of a line of hexes from a unit to a supply source on the map. Some early games called this tracing a line of communications, however some more tactical games used this as a system of supply.

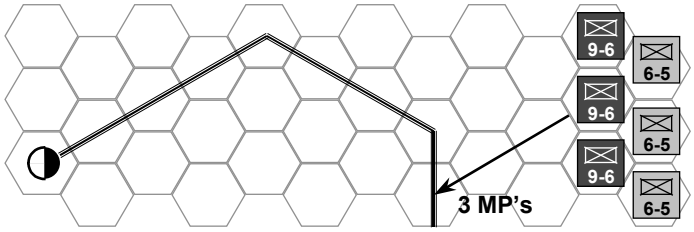
**Figure 42 : Simple Supply Tracing**




Units trace a line of hexes, free of enemy units or their zones of control, to a supply source. This can be any length. Used to allow units to be cut off and pocketed.

Composite supply is the most common force of supply, when supply is used at all. This represents a unit tracing a limited line of supply to a hex, which can trace an unlimited line of hexes to a supply hex. Normally the unlimited line is traced over rail or road hexes. In some cases this got more complex by involving HQ or Supply units.

**Figure 43 : Composite Supply Tracing**




Units trace a limited line of hexes, free of enemy units and zones of control, to a rail hex, which can in turn trace a line of supply to a supply source. This will be over continuos rail hexes..

## *Supply Effects*

Now that you have worked out how to determine supply you need to consider affects.

At very low level games such as Battalion/Company, cutting off supply has more of a psychological affect. Most formations probably carried enough supply to keep going for a few days, even a week if prepared. The real affect at this level was knowing their was no retreat route. This could affect a formations ability to attack or move away from the source of supply. The other possible affect was in attack. An offensive used up an enormous amount of ammunition, so units without constant re-supply probably did have a restricted attack capacity.

As we move up the scale to Division/Regimental level cutting off supply would have at least an attack and movement affect. Attack because it required a large amount of

ammunition and movement because it may have required a large amount of fuel, although this can be debatable.

When we go further up the scale supply becomes very important. At 1 week game turns units out of supply would be severally affected in attack, probably in defence also and in this case certainly in movement. At one month game turns units can become eliminated due to lack of supply.

We have identified possible escalating supply affects, these are in order of severity.

**Psychological affect**, inability to move away from supply.
**Attack affect**, unable to launch major attacks. Attack strength could be greatly reduced, either as a percentage or as a shift on the CRT.
**Defence affect**, ability to defend is reduced to lack of ammunition. Defence strength could be reduced as a percentage or as a shift on a CRT.
**Movement affect**, ability to move is reduced due to lack of fuel. Would have a major affect against motorised, lesser affect against foot.
Elimination, due to lack of supply the formation is eliminated, or falls apart.

Its up to the designer to determine what affect in what situation is appropriate.

## *Do you need Supply*

The whole objective in creating supply rules is to balance playability with historical requirement. Generally supply rules are annoying, so before implementing any complex rules you need to consider if you really need the rules.

Supply rules are normally inserted for two reasons;

Allow units to be cut off.
Restricted a rapid advance.

If your game-turn scale is 1 day per game-turn or less, there is a chance you do not need any supply rules. Most formations carried a few days to a week worth of supply with them. Games with 2 day or more game-turns may need to consider supply rules, so units cut off are affected by this action.

In early games, such as The Battle for Moscow, railroad units were introduced to try and restrict an advance. This was done by forcing the Germans to repair rail hexes at a slow rate, thus acting as a break on advance. This has generally fallen from favour, as if required any army can do what is necessary to supply it troops. Anyway, being slowed down because of supply is not as interesting as being slowed down due to enemy action. Finally, determining who owned which raid hex simply gets too difficult.

# [13.0] Air Power

When we move to air power we are almost entering the special rule zone. Overall I feel land conflicts should have the most simplistic air rules possible, which is the system initially used by many games. Air power rules consist of two main sections;

Air units, where are they and how to deploy.
Affect of air power.

## *Deploying Air units*

Some games have simple air points, kept off map and deployed as required. This is probably the best system for games up to and possibly including Divisional/Regimental. Tactical air units may travel from 100 to 200 km to their targets, which means they could cover over 10 to 20 hexes if the hex scale was 9 km per hex. This pretty much covers most maps at this scale. Once we move to a higher scale such as 27 km per hex the situation changes.

The next system is to have air units on the map. This is appropriate with Corps/Divisional and higher scale games, as at 27km per hex most tactical air units would only range from 4 to 10 hexes. Even here two engine bombers could range over 20 hexes, so you would mainly have tactical air units on map. At a higher scale, such as Army/Corps you could deploy all units on the map.

The next factor to consider is, will their be air to air combat. Strangely enough in most cases one side tended to dominate the air and had the ability of always getting the bombers through. They may take losses when returning, as by now the enemy may have scrambled enough fighters to take them on, but the bombs had normally done the damage. As long as you are representing tactical support of military units air to air combat could easily be ignored, if you are included deep interdiction in your game, you may have a combined air-land game on your hands, which is outside the scope of this article.

## *Effect of Air*

The effect of air is a complex issue, one which requires great study. In 1939 the German stuka has a massive effect, mainly because the enemy was not use to this sort of air support and the lack of anti-aircraft capacity in most allied formations. By 1944 the Allies has many times greater air power, which while it had an effect, the Germans managed to nullify many of its effects. The Germans were well equip with anti-aircraft weapons, moved during the night or bad weather and had excellent camouflage techniques. Because of these complex factors the designers probably need to look at the historical affect of air power and try and reflect it in his or her game using the method of gut feel.

# Conclusion

Contained in this article are many, but by no means all, the factors needed to design a game. I must point out I am assuming people are designing a playable historical game. You can ignore the historical aspect and design a piece of fantasy which can afford to ignore many of the rules I have established. On the other hand you can ignore playability and design a highly historical game which may also ignore many of my "Rules of Game Design". However overly unplayable games always fail.

# Comparative Qualifiers : Know the enemy's Strength

One of the problems' readers of military history have is determining the relative strength's of various opposing military formations. Without a method of comparison it's difficult to compare the real military effectiveness of opposing armies. Without the ability of comparing the combat effectiveness of opposing armies, we are left in the dark when it comes to determining why a conflict ended in a particular way. A good example was the German invasion of Poland in 1939. The Germans won, but did they win because they had a much larger army, or perhaps it was because they have superior leaders. If we could compare the armies we could possible answer this question.

The most basic comparison is number of men, however, except superficially this does not tell us very much. Many other factors need consideration when determining the combat effectiveness of opposing military formations. Trying to determine these factors is one of the challenges of any military historian.

When making a comparison of the true combat effectiveness of military formations, military historians can use many methods. This ranges from simple gut feel to an attempt at scientifically determining a unit comparative strength. The best system is a combination of both "gut feel" and "scientific method". However, before we involve gut feel it may be a good idea to look at the scientific method first. Once we determine the start point using scientific method, we can involve the less tangible "gut feel".

My attempt is to try and determine this scientifically arrived start point and briefly cover issues that you should consider when involving the almighty gut. This is, in fact, the objective of this article.

Determining a good name for a "comparative unit" strength measurement caused me much heart ache. Originally, I though about calling my comparative unit measurement scheme "Unit Strength Factors", or USF. However, this acronym sounding too much like the name of a well-known country. In the end I ended up using CQ's, which was the name that SPI used.

## The Objective

We need to initially determine exactly what we are trying to achieve. The objective I have set is to determine some sort of comparative unit strength measurement system, or to determine a military formation true **combat effectiveness**. This will allow us to compare the effectiveness of any military formation with any other military formation. Once we have achieved this we can make scientific guesses on how different military units would fare if they engaged in combat with each other.

This sounds simple enough, however its application is anything but simple. The first thing we need to determine is how we can arrive at such a measurement. We could simply count men, or guns, or use a similar simple system. It does not take much grey matter to determine that such a simple system is fatally flawed. A simple system will always arrive at a simple

measurement, which reflects the simplicity of the system. Gut feel, in many cases, would be superior to such a system. We require far more detail than this.

We could add complexity to a system by allocating a numeric strength to each weapon type and then add them together. The problem here is what numeric strength should we use, and even if we can determine this magic number, can we be sure it would apply in all cases. We need to consider a wide range of different situations, such as attack strength, defence strength, defence against armour strength and defence against aircraft strength, to name a few. However the problem gets even more complex the deeper we look, what about morale, training, condition or supply.

The problem we have undertaken to solve is anything but simple. We need to logically approach the problem and work towards a solution. In short, we need to start with a simple model and work towards making it more accurate.

## Throwing weight around

The simplest meaningful system is to calculate the amount of metal a formation can throw out in a single minute. The US army calls this the "Mad Minute" and will often perform an act called a fire demonstration. This results in a battalion sized formation forming up and then allowing all weapons to fire at maximum rate for a full minute. This is an artificial event and we would not expect it to occur in combat, although in some rare cases it did. The US army, which was lavishly supplied during World War Two, used this tactic to intimidate the enemy. Hopelessly wasteful of ammunition it could nonetheless have a psychological effect out of proportions to its true material effect.

Apart from its true battlefield **combat effectiveness** this calculation of fire power allows us to make some sort of comparisons that can form the basis of a common measurement system.

I should point out that this idea is not new. Back in 1970 Strategy & Tactics used this measurement system to give its readers some ways of comparing a unit **combat effectiveness**. Back then, Strategy & Tactics called this measurement system FP or FPF (Fire Power or Fire Power Factor). This measured, in imperial tons, the amount of metal a formation could throw out in a single minute. I have based my study of this topic on this start point, in effect the system that is described in Strategy & Tactics Magazine, issues 20, 21, 23, 28 and 30.

## *S&T FPF System*

Considering the various issues of Strategy & Tactics, related articles and books, we have listed some of the FPF or FP ratings below.

**Table 60 : Soviet S&T FPF Examples[17]**

| Unit | FPF Imperial | FPF Metric |
|---|---|---|
| Soviet Tank Corps | 9.3 tons | 9,449 kg |
| Soviet Mechanised Corp | 12.3 tons | 12,497 kg |
| Soviet Cavalry Corps | 9.7 tons | 9,855 kg |
| Soviet Infantry Division 9/39 | 4.9 tons | 4,978 kg |
| Soviet Infantry Division 7/41 | 1.3 tons | 1,320 kg |
| Soviet Infantry Division 12/41 | 2.4 tons | 2,438 kg |
| Soviet Infantry Division 3/42 | 2.7 tons | 2,743 kg |
| Soviet Infantry Division 7/42 | 3.0 tons | 3,048 kg |
| Soviet Infantry Division 12/42 | 4.0 tons | 4,064 kg |
| Soviet Infantry Division Guards | 4.3 tons | 4,369 kg |
| Soviet Cavalry Division | 1.7 tons | 1,727 kg |
| Soviet Artillery Division | 11.2 tons | 11,379 kg |
| Soviet Infantry Brigade | 1.8 tons | 1,829 kg |
| Soviet Tank Brigade | 1.5 tons | 1,524 kg |
| Soviet Motorised Rifle Brigades | 1.7 tons | 1,727 kg |
| Soviet Mechanised Brigade | 2.1 tons | 2,133 kg |
| Soviet Rocket Brigade | 57.6 tons | 58,521 kg |

**Table 61 : German S&T FPF Examples[18]**

| Unit | FPF Imperial | FPF Metric |
|---|---|---|
| Germans Infantry Division (1939) | 6.2 tons | 6,299 kg |
| German Infantry Division (1944) | 7.0 tons | 7,112 kg |
| German Luftwaffe Infantry Division | 4.8 tons | 4,876 kg |
| German Infantry Division (1945) | 6.6 tons | 6,705 kg |
| German Landwehr infantry Division | 5.9 tons | 5,994 kg |
| German Mountain Division (1939) | 3.7 tons | 3,759 kg |
| German Light Division | 4.7 tons | 4,775 kg |
| German Tank Division (1941) | 9.6 tons | 9,753 kg |
| German Tank Division (1944) | 10.0 tons | 10,160 kg |
| German Tank Division (1945) | 8.1 tons | 8,229 kg |
| German SS Tank Division | 14.2 tons | 14,427 kg |
| German Mechanised Division (1941) | 7.4 tons | 7,518 kg |
| German Mechanised Division (1944) | 9.1 tons | 9,246 kg |

**Table 62 : US S&T FPF Examples[19]**

| Unit | FPF Imperial | FPF Metric |
|---|---|---|
| US Infantry Division (1944) | 8.2 tons | 8,331 kg |
| US Armoured Division (1944) | 12.1 tons | 12,293 kg |
| US Paratrooper Division (1944) | 1.3 tons | 1,320 kg |

[17] Key: "FPF imperial" = The amount of metal that this formation can fire in a single minute, using imperial measurement. "FPF metric" = The same value, but using metric measurement.

[18] Key: "FPF imperial" = The amount of metal that this formation can fire in a single minute, using imperial measurement. "FPF metric" = The same value, but using metric measurement.

[19] Key: "FPF imperial" = The amount of metal that this formation can fire in a single minute, using imperial measurement. "FPF metric" = The same value, but using metric measurement.

By looking at the above table we can see that we can compare different formations based on their FPF rating. The difficulty is that we do not know how these figures are calculated and with what caveats.

## *Strategy & Tactics FPF Calculation*

In Strategy & Tactic issue 28 and 30 we get an idea of how this "weight of metal per minute" figure was calculated. For each given weapon system, its practicable "Rate of Fire" was multiplied by the weight of its projectile. This gives us a total weight of metal that could be fired in a single minute. From then on its easy, we simply multiply this figure by the number of each weapon in the formation.

Using the Strategy & Tactics articles that cover this FPF value, we have created the following table that tells us how the FPF rating was calculated. As many of the gaps as possible have been filled and additional weapons have been added for completeness.

**Table 63 : German Weapons[20]**

| Weapon | ROF Practical | Wt/round (lb) | Wt/round (kg) | Unit of fire |
|---|---|---|---|---|
| Rifle (Gew. 98) | 10 rpm | 5.8/100 | 2.63/100 | 261 |
| SMG (MP 41) | 90 rpm | 2.6/100 | 1.18/100 | 1,803 |
| Assault Rifle (SG 44) | 80 rpm | 3.7/100 | 1.68/100 | 1,890 |
| LMG Biped (MG 42) | 150 rpm | 5.8/100 | 2.63/100 | 8,932 |
| HMG Tripod (MG 42) | 250 rpm | 5.8/100 | 2.63/100 | 16,575 |
| Medium Mortar (81 mm) | 45 rpm | 7.7 | 3.49 | 414 |
| Heavy Mortar (120 mm) | 15 rpm | 35 | 15.88 | 360 |
| Light Infantry Gun (75 mm) | 6 rpm | 12 | 5.44 | 514 |
| Heavy Infantry Gun (150 mm) | 2 rpm | 84 | 38.1 | 240 |
| Light Howitzer (105 mm) | 6 rpm | 33 | 14.97 | 526 |
| Medium Howitzer (150 mm) | 4 rpm | 96 | 43.54 | 315 |
| Rocket (150 mm) | 4 rpm | 75 | 34.01 | NA |
| AT (PzFst 60) | NA | 6.75 | 3.06 | NA |
| AT (RPzB 43) | NA | 7.2 | 3.27 | NA |

**Table 64 : Soviet Weapons**

| Weapon | ROF Practical | Wt/round (lb) | Wt/round (kg) | Unit of fire |
|---|---|---|---|---|
| Rifle (M 91/30) | 9 rpm | 5/100 | 2.27/100 | 260 |
| SMG (PPSH) | 80 rpm | 2.5/100 | 1.13/100 | 780 |
| LMG (DP) | 120 rpm | 5/100 | 2.27/100 | 2,188 |
| HMG (DS) | 250 rpm | 5/100 | 2.27/100 | 6,750 |
| Light Mortar (50 mm) | 30 rpm | 2 | 0.9 | 310 |
| Medium Mortar (82 mm) | 25 rpm | 7.4 | 3.36 | 310 |
| Heavy Mortar (120 mm) | 15 rpm | 35 | 15.88 | 213 |
| Infantry Howitzer (76.2 mm) | 6 rpm | 13 | 5.9 | 366 |
| Light Howitzer (122 mm) | 5 rpm | 48 | 21.77 | 200 |
| Medium Howitzer (152 mm) | 4 rpm | 96 | 43.54 | 154 |
| Rocket (132 mm) | 4 rpm | 58 | 26.3 | NA |
| ATR (PTRD) | NA | 16/100 | 7.26/100 | NA |

[20] Key: "ROF practical" = The practicable Rate of fire, per minute, of this weapon. "Wt/round (lb)" = The weight of each projectile in pounds. If /100 follows the weight, then the figure is for 100 projectiles. "Wt/round (kg)" = The same measurement in kg. "Unit of fire" = The amount of projectiles normally carried. “(est)” = Accurate figures are unavailable and thus this is an estimate. “Unknown” = Accurate figures are unavailable and for various reasons no estimates could be provided. “rpm” = rounds per minute. “NA” = Not applicable.

**Table 65 : US Weapons**

| Weapon | ROF Practical | Wt/round (lb) | Wt/round (kg) | Unit of fire |
|---|---|---|---|---|
| Rifle (M.1) 7.62 mm | 20 rpm | 5/100 (est) | 2.63/100 (est) | NA |
| Rifle (M.1 Carbine) 7.62 mm | 30 rpm | 5/100 (est) | 2.63/100 (est) | NA |
| SMG (BAR) 7.62 mm | 60 rpm | 5/100 (est) | 2.63/100 (est) | NA |
| LMG (.30 cal) 7.62 mm | 120 rpm | 5/100 (est) | 2.63/100 (est) | NA |
| HMG (.50 cal) 12.7 mm | 100 rpm | Unknown | Unknown | NA |
| Light Mortar (60 mm) | 30 rpm | 3 | 1.36 | NA |
| Medium Mortar (81 mm) | 45 rpm | 7 | 3.18 | NA |
| Infantry Howitzer (75 mm) | 8 rpm | 15 | 6.8 | NA |
| Light Howitzer (105 mm) | 6 rpm | 35 | 15.88 | NA |
| Medium Howitzer (155 mm) | 4 rpm | 95 | 43.09 | NA |
| Medium Field Gun (155 mm) | 1/2 rpm | 95 | 43.09 | NA |
| Heavy Howitzer (8 ") | 1/2 rpm | 280 | 127 | NA |

**Table 66 : UK Weapons**

| Weapon | ROF Practical | Wt/round (lb) | Wt/round (kg) | Unit of fire |
|---|---|---|---|---|
| Rifle (Lee-Enfield) (.303) | 10 rpm (est) | Unknown | Unknown | NA |
| SMG (Sten Mk 2) (9 mm) | 90 rpm (est) | 2.6/100 (est) | 1.18/100 (est) | NA |
| LMG (Bren) (.303) | 120 rpm | Unknown | Unknown | NA |
| HMG (Vickers) (.303) | 250 rpm | Unknown | Unknown | NA |
| Light Mortar (2 inch) | 10 rpm | 2 | 0.9 | NA |
| Medium Mortar (3 inch) | 10 rpm | 10 | 4.5 | NA |
| Light Gun (25 lb, 3.45") | 6 rpm | 25 | 11.3 | NA |
| Medium Gun (4.5") | 4 rpm | 50 | 22.7 | NA |

We now have some numbers we can work with. Included in these Strategy & Tactics issues were break down's of each formation, giving us numbers of its component weapons. If we wish to, we can now calculate our own FPF rating.

Using this measurement alone creates problems. A unit FPF rating will only give you an idea of the defensive capability of that formation. It does not tell you anything about its offensive ability. Even in a simple defensive situation its message can be warped. If we only use FPF ratings to measure **combat effectiveness**, the most powerful formation of World War Two was a Soviet Rocket Brigade, which does seem odd.

We can see that reality is far more complex than just calculating how much metal a formation can throw in a single minute. Strategy & Tactics realised this and created a new measurement of a unit **combat effectiveness**. This measurement system was initially called SUF and later CQ's.

## *SUF or Standard Unit Factors*

SUF stands for Standard Unit Factors. First used in Strategy & Tactics issue 20, it was enhanced and modified in issues 21 and 23. Strategy & Tactics attempted to allow readers to, at a glance, determine the combat effectiveness of different units. A good way to describe how this worked was to reprint the description given in Strategy & Tactics issue 23.

*(S&T 23, Page 21) I took the time to do a thoroughgoing analysis of the number and effect of various weapons employed during World War II. I also reviewed the effect each individual type of weapon played in causing casualties (rifles, for example, produced only a few per cent of the total casualties and bayonets, for all practical purposes, none at all). After tabulating*

*all of the weapons data I assigned each weapon a "weight" based upon its relative contribution to casualty causation. These weights were;*

*SMG's - 1*
*MG's - 3*
*ATR - 1*
*50 mm mortar - 2*
*82 mm mortar - 7*
*120 mm mortar - 30*
*light flak - 5*
*light anti-tank guns (40 mm to 57 mm) - 4*
*76 mm guns/howitzers - 20*
*88 mm to 122 mm field artillery - 120*
*150 mm to 155 mm field artillery - 180*
*medium tanks - 40*

*Finally, a raw "weight" was computed for each organisation. Based upon this "weight" standard factors were arrived at. Now this method is far from perfect. It has numerous built-in flaws.*

The last sentence sums it all up very well. The article goes on to explain what some of these flaws could be and frankly some of them cannot be scientifically solved. It's here that the famous gut feel must be utilised.

The SUF measurement seemed to be based on a combination of the "casualty causation ability" of a weapons class and the "weight of metal" a weapons class could throw out. In short the FPF measurement was used as a starting point and it was modified by some other measurement system. In this case the amount of casualties that weapon class inflicted. Additional complexity creates additional accuracy, as well as additional headaches.

## *CQ's or Comparative Quantified unit's*

CQ's stands for "Comparative Quantified unit's" and was a development of the SUF system. It was first used in Strategy & Tactics issue 28 and again in issue 30. We have no idea how this system worked, although the numbers arrived matched up perfectly with SUF. It seemed to be a simple change of name. It seems that "CQ's" sounds far more sexy than "SUF".

One interesting point I notice was that the whole concept disappeared after these Strategy & Tactics issues. It seemed that it became all too hard to continue this scientific effort at determining a units **combat effectiveness**, or Strategy & Tactics decided to keep it secret. From this point on we are alone.

## *Comparing FPF and SUF (CQ's)*

It would be interested to try and work out how Strategy & Tactics calculated SUF or CQ's and how these figures related to the FPF of a unit. Lets compare the SUF points of different weapons systems with the FP factor of that weapon (we will use an average German weapon).

**Table 67 : Comparing S&T's SUF measurement with the FPF in kg/min[21].**

| Weapon | SUF | FPF Kg/m | Divisor or ratio |
|---|---|---|---|
| SMG's | 1 | 1.06 kg/m | 1 |
| MG's (LMG) | 3 | 3.95 kg/m | 1.3 |
| MG's (HMG) | 3 | 6.58 kg/m | 2.2 |
| 50 mm Mortar | 2 | 27 kg/m | 13.5 |
| 82 mm Mortar | 7 | 157 kg/m | 22.4 |
| 120 mm Mortar | 30 | 238 kg/m | 7.9 |
| Light flak | 5 | 56 kg/m | 11.2 |
| Light AT Guns (40 mm to 57 mm) | 4 | 29 kg/m | 7.25 |
| 76 mm Guns/Howitzers | 20 | 32 kg/m | 1.6 |
| 88 mm to 122 mm field artillery | 120 | 90 kg/m | 0.75 |
| 150 mm to 155 mm field artillery | 180 | 174 kg/m | 1 |
| Medium tanks (1 x 75 mm + 2 x HMG) | 40 | 45 kg/m | 1.1 |

It obvious that FPF ratings are not exclusively being used here to determine a unit **combat effectiveness**. Other factors are being brought into play that we are not yet aware of. None the less, based on this table we can make some basic statements;

For small arms and artillery we generally have a 1-1 ratio, give or take a bit. (1 kg/m equals 1 SUF)
For anti-tank and anti-aircraft weapons we have an average of 9 to 1. (9 kg/m equals 1 SUF)
For mortars the ratio varies a great deal, but an average of 15 to 1 seems correct. (15 kg/m equals 1 SUF)

We must point out that we are only looking at German weapons, as a result we should take these ratio's with a pinch of salt. A more detailed study of the different weapons classes will occur later in the article, but for now we are getting some basic ideas on how Strategy & Tactics calculated SUF and later CQ's.

## *Problem's with Weight*

Lets look at the major problems involved when we only use a weight based measurement system like FPF. There are three basic problem when only using a weight based system, these can be grouped as follows;

In some case's weight is not important, instead the amount of individual projectiles sent out in a given time span is of most significance.
The ability to project the weight of metal to were it is needed does differ.
The ability to project the weight for a meaningful period of time must be considered.

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[21] Key: "SUF" = Standard Units Factors. "kg/m" = Kilograms of projectiles that can be fired in a single minute. "Divider or ratio" = The SUF figure divided into the kg/m figure to obtain a ratio.

Lets look at each of these points in more detail.

## *Numbers of projectiles*

When using small arms it does not really matter if you are hit by a light 7.92 mm bullet fired from a SMG, or a much heavier .50 cal HMG bullet. Both will put the soft target out of business. (It's true the 7.92 mm may wound while the .50 cal will kill, but in an immediate combat situation this is not important. In both cases the soldier is out of action, dead or screaming in agony is the only difference).

We can make the following summation, especially on the effect of small arms against soft targets. The significant factor is number's of projectiles sent out rather than the total weight of metal sent out. We should not look at weight, but total projectile numbers when considering small arms. This also applies to anti-tank weapons. However, this is not true for all other weapons classes.

## *Where its needed*

The effectiveness of your firepower is going to be greater if it can be projected where it's needed. This is a function of both range and accuracy. A good example is comparing mortars with field artillery. A mortar will get more weight out than a field gun, but the greater range of the field gun gives it a significant advantage. As a result we can say that mortar firepower should be rated less, per kg, than field gun firepower.

In the area of accuracy field guns also have an advantage over mortars and certainly have an advantage against rockets. A Rocket battery can project an enormous amount of metal in a short time, however its accuracy will be nowhere as great as field guns. So rocket battery firepower should be rated less per kg than field gun firepower.

Another way that the affective firepower of a formation will differ is when we compare different armies. German artillery was far more effective than Soviet artillery and in turn the most effective artillery was US owned. Even taking this into account all artillery was equally effective if it was laying down a pre-planned offensive bombardment, something the Soviets did a lot. For the purposes of this article I will not consider quality. This is a "gut feeling" issue so get your guts churning.

## *How Long*

We need to work out how long different weapons could be expected to output metal. We have only been calculating firepower output in a single minute, not constant firepower over several hours or even days. The key factor here is logistics.

A good example is once against comparing mortars with field artillery. Because field artillery is normally at the rear of a formation its logistic support is good. It carries more ammunition and can get re-supply much easier. Mortars are much closer to the action and are normally man portable. This means they carry less ammunition and are harder to re-supply. So over a battle lasting a day the field artillery will get more metal out than a mortar. Once again the mortar must be discounted.

However, even when a weapon has good range it may suffer ammunition shortages. The best example here is rockets. No matter how close to the source of supply a rocket battery is, it can

fire so much ammunition that no army can handle the re-supply problem. Due to the low accuracy of this weapon it's more logical to allocate logistics to the more affective field artillery. Rockets are best suited for very short intense periods of fire, not constantly over a long period. The result is further discounting of the rocket batteries.

### *Casualties*

Strategy & Tactics indicates it's SUF or CQ's were based on firepower and the number of casualties they cause. Casualty causation is another way of saying how effective this fire power really is, which is exactly what I have been covering. By taking into account the three above factors we can arrive at an average **effective** fire power rating.

We can create the following modifiers to the raw firepower rating to arrive at an effective firepower measurement;

100 to 150 bullets per minute is worth 1 kg of effective firepower.
1 kg of field artillery and howitzer firepower is worth 1 kg of affective firepower.
15 kg or mortar or rocket firepower is worth 1 kg of affective firepower.

These numbers should not be cast in stone, but they would allow us to convert raw firepower into something similar to the Strategy & Tactic's SUF or CQ's measurements.

## Soft and Hard Targets

Up to now we have assumed that all targets are the same, in short soft targets. A soft target has no ability to withstand a direct hit by any weapon. Men, animals and soft skinned vehicles such as trucks and cars would be considered as soft targets.

Not all targets are soft, some are hard, or armoured. These hard targets are not destroyed by pure weight of fire or impact by any weapon. Hard targets are only destroyed by projectiles of a certain type. Projectiles that are not the correct type may have no effect on a hard target. For example, a bullet will probably have no effect against 2 metres of concrete or 20 cm of metal, no matter how many you fire at the target.

A classic hard target weapon is the Anti-tank gun. This fires a projectile that is optimised to penetrate armour. So when used against tanks a 1 kg anti-tank shell may have more effect than thousands of 22 gram 7.92 mm bullets.

Now we discover another interesting problem. Weapons that are designed to destroy hard targets may be far less effective against soft targets. An Anti-Tank gun does not project much weight of shell and the shells they do project are not normally explosive. A soft target, such as a person, would have to take a direct hit from such a shell. In a world of soft targets this is a useless weapon.

So we have determined a formation has a Soft target Effective firepower and a Hard target effective firepower. We can say the following;

Small arms have no effect on hard targets.
Mortars have a minor effect against hard targets.
Field artillery has an effect on hard targets.

We could now go into a detailed study of which weapon has whatever effect on hard targets. Most fortification and tanks will probably not be effected by mortars, due to the nature of the

shells. Mortar shells normally explode on impact. Field artillery, on the other hand, has a range of ammunition they can use. From delayed action shells that penetrate the fortification before exploding, or even armour piercing ammunition that can knock out a tank.

Finally there are a range of specific anti-tank weapons to consider, such as Anti-Tank Rifles or Anti-Tank Rockets. All these weapon types have a different effect against soft and hard targets.

### *Effective Firepower*

Using the information we have assembled so far, lets expand our fire power table to take into account hard and soft target ratings. As before we will use a selection of German weapons only.

**Table 68 : Soft and Hard CQ's[22].**

| Weapons | FPF in Kg/m | Number of Projectiles | Soft CQ Effective | Hard CQ Effective |
|---|---|---|---|---|
| Rifles (Bolt action) | 0.58 kg | 10 | 0.1 | 0 |
| Rifles (Automatic) | 1.16 kg | 20 | 0.2 | 0 |
| SMG's | 1.06 kg | 90 | 1 | 0 |
| LMG | 3.95 kg | 150 | 1.5 | 0 |
| HMG | 6.58 kg | 250 | 2.5 | 0 |
| ATR | 1.00 kg | 10 | 0.1 | 0.1 |
| Light Mortars (2" or 46 mm - 61 mm) | 27 kg | 30 | 2 | 0 |
| Medium Mortar (3" or 80 mm - 81 mm) | 157 kg | 45 | 10 | 0 |
| Heavy Mortar (120 mm) 238 kg | 15 | 15 | 0 | |
| Light Flak (20 mm to 57 mm) | 20 kg | 200 | 2 | 5.6 |
| Light Anti-Tank Guns (20 to 57 mm) | 18 kg | 20 | 0.2 | 1.8 |
| Guns/Howitzers/AT/AA (75 to 76 mm) | 33 kg | 6 | 30 | 30 |
| Guns/Howitzers/AT/AA (88-120 mm) | 90 kg | 6 | 100 | 100 |
| Guns/Howitzers/AT/AA (150-155 mm) | 174 kg | 4 | 180 | 180 |

Of course the above figures are based on the rough ratio's we have already determined, however they are giving us an idea of what a final measurement system may look like.

In order to get more accuracy we need to go into each weapon category in more detail. We are currently only covering German weapons, and only a few of them at that. Our next step is to obtain an average effectiveness of the weapons of all the major combatants.

## The Weapons

### *Small Arms*

We have determined the key factor for small arms is its practicable rate of fire. Range, weight of shell and accuracy are all of lesser importance. Lets look at the various small arms of the major nations and determine their practicable rate of fire.

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[22] Key: "FPF" = Fire Power factor, or the weight of metal this weapon can fire in a minute. "Number of Projectiles" = The number of projectiles this weapon can fire in a single minute. "Soft Effective CQ's" = A measurement of the effect of this weapon class against soft targets. "Hard Effective CQ's" = A measurement of the effect of this weapon class against hard targets.

**Table 69 : Rifles and Assault Guns[23]**

| Weapons | Type | Calibre | Feed | ROF | Max ROF Pracftical |
|---|---|---|---|---|---|
| Germany: Gewehr 98 | Rifle - Bolt | 7.92 mm | 5 | NA | 10 |
| Germany: Gewehr 41(W) | Rifle - Auto | 7.92 mm | 5 | NA | 20 (est) |
| Germany: MP 44 (Assault Rifle) | SMG | 7.92 mm | 30 | 500 | 80 |
| Great Britain: Lee-Enfield | Rifle - Bolt | .303 inch | 10 | NA | 10 (est) |
| Great Britain: Number 4 | Rifle - Bolt | .303 in | 10 | NA | 10 (est) |
| Soviet Union: Mosin-Nagant | Rifle - Bolt | 7.62 mm | 5 | NA | 9 |
| Soviet Union: SKS | Rifle - Auto | 7.62 mm | 10 | NA | 20 (est) |
| USA: Garand M1 | Rifle - Auto | .30 in | 8 | NA | 20 |
| USA: M1 Carbine | Rifle - Auto | .30 in | 30 | NA | 30 |

**Table 70 : SMG's (Sub-Machine Gun)**

| Weapons | Type | Calibre | Feed | ROF | Max ROF Pracftical |
|---|---|---|---|---|---|
| Germany: Bergmann MP28 | SMG | 9 mm | 50 | 500 | 90 (est) |
| Germany: Maschinenpistole MP40 | SMG | 9 mm | 32 | 500 | 90 (est) |
| Great Britain: Lancaster Mark I | SMG | 9 mm | 50 | 600 | 90 (est) |
| Great Britain: Sten | SMG | 9 mm | 32 | 550 | 90 (est) |
| Great Britain: Owen | SMG | 9 mm | 32 | 700 | 90 (est) |
| Soviet Union: PPD 34/38 | SMG | 7.62 mm | 71 | 800 | 80 (est) |
| Soviet Union: PPSH 41 | SMG | 7.62 mm | 71 | 900 | 80 |
| USA: Thompson M1928A1 | SMG | .45 in | 50 | 800 | 60 (est) |
| USA: Thompson M1A1 | SMG | .45 in | 30 | 700 | 60 (est) |
| USA: M3A1 | SMG | .45 in | 30 | 400 | 90 (est) |

**Table 71 : Machine Guns**

| Weapons | Type | Calibre | Feed | ROF | Max ROF Pracftical |
|---|---|---|---|---|---|
| German: MG42 (Bipod) | LMG | 7.92 mm | 75 | 1,200 | 150 |
| German: MG42 (Tripod) | HMG | 7.92 mm | Belt | 1,200 | 250 |
| Great Britain: Bren | LMG | .303 in | 30 | 500 | 120 (est) |
| Great Britain: Vickers .303 | HMG | .303 in | Belt | 550 | 250 |
| Soviet Union: DP | LMG | 7.62 mm | Unknown | Unknown | 120 |
| Soviet Union: DS | HMG | 12.7 mm | Belt | 600 | 250 |
| USA: .30 Cal | LMG | 7.62 mm | Unknown | Unknown | 120 |
| USA: Browning .50 Cal | HMG | 12.7 mm | Belt | 450 | 100 |

As you can see from the above tables, further assumptions can be made about each weapon class.

**Table 72 : The Standard Rate of Fire of different weapon classes.**

| Weapon | Rate of Fire |
|---|---|
| Bold Action Rifle | 10 rpm |
| Automatic Rifle | 20 rpm |
| Assault Rifle | 80 rpm |
| SMG | 90 rpm |
| LMG | 120 rpm |
| HMG | 250 rpm |

[23] Key: "Type" = Functional description of the weapon. "Calibre" = The calibre of this weapon. "Feed" = The normal amount of ammunition held in a single clip or belt. "ROF Max" = The maximum possible rate of fire over a full minute, sometimes called cyclic rate of fire. "ROF practical" = The practicable rate of fire over a full minute, included reloading time.

There are minor exceptions, the most significant being the very heavy Browning .50 cal Heavy Machine Gun, but overall the above table's can be used as a basis for firepower calculation.

One minor difficulty we need to resolve is the difference between a Light Machine Gun and a Heavy Machine Gun. The ROF differences are basically due to the way ammunition was fed into these weapons. The LMG would have a clip of ammo and the HMG a belt. The ROF of a Heavy Machine Gun can be kept high by reducing the time involved in changing clips. If you fed ammunition into a LMG using a belt, its ROF would increase. Strategy & Tactics gives all these weapons the same rating, however I feel this is not correct. How a weapon was used in practice would be a more reasonable way of looking at weapon effectiveness, rather than looking at what was theoretically possible. As a result I will consider both weapons differently, even when they may be physically identical.

We need to consider that both LMG's and HMG's had a much greater range, increasing their real effectiveness. So the following firepower effective could be allocated to these weapons;

**Table 73 : Value of fire power based on weapon class.**

| Weapon | Points | Ratio |
|---|---|---|
| Bold Action Rifle | 0.1 point | 100 bullets = 1 point |
| Automatic Rifle | 0.2 point | 100 bullets = 1 point |
| Assault Rifle | 1.0 point | 100 bullets = 1 point |
| SMG | 1.0 point | 100 bullets = 1 point |
| LMG | 2.0 points | 50 bullets = 1 point |
| HMG | 5.0 points | 50 bullets = 1 point |

Obviously these weapons would have no effect against hard targets.

# Mortars

**Table 74 : Specifications of Different Mortars[24].**

| Weapon | Type | Calibre | Shell Weight | ROF Max/Sust | Firepower Max | Firepower Sust |
|---|---|---|---|---|---|---|
| German: Gr.W 36 | Light | 50 mm | 0.9 kg | 30/20 | 27 kg | 18 kg |
| German: Gr.W 34 | Medium | 81 mm | 3.5 kg | 45/12 | 157 kg | 42 kg |
| German: Gr.W | Heavy | 120 mm | 15.9 kg | 15/12 (est) | 238 kg | 190 kg |
| UK: 2 inch | Light | 51 mm | 0.9 kg | 30/20 | 27 kg | 18 kg |
| UK: 3 inch | Medium | 77 mm | 4.5 kg | 30/20 | 135 kg | 90 kg |
| Soviet: 50 mm | Light | 50 mm | 0.9 kg | 30/20 (est) | 27 kg | 18 kg |
| Soviet: 82 mm | Medium | 82 mm | 3.4 kg | 25/12 (est) | 85 kg | 41 kg |
| Soviet: 120 mm | Heavy | 120 mm | 15.9 kg | 15/12 (est) | 238 kg | 190 kg |
| USA: Light Mortar | Light | 60 mm | 1.4 kg | 30/20 (est) | 42 kg | 28 kg |
| USA: Medium Mortar | Medium | 81 mm | 3.2 kg | 45/12 (est) | 144 kg | 38 kg |

We can see most similar sized mortars had similar performance characteristics. The only area of interest is the ROF figure. It was possible to perform at the maximum possible rate of fire for a minute, or more. However for long term sustained fire the ROF was less. This is the difference between the maximum ROF and sustained ROF. Lets look at these two weights and compare them to the Strategy & Tactics SUF points;

**Table 75 : S&T SUF values of mortars[25].**

| Weapons | Firepower Max | Firepower Sustained | Ratio Max | Ratio Sustained | S&T SUF |
|---|---|---|---|---|---|
| 50-51 mm | 27 kg | 18 kg | 14 | 9 | 2 |
| 77-82 mm | 85 to 157 kg (144 kg av) | 38 to 90 kg (41 kg av) | 21 | 6 | 7 |
| 120 mm | 238 kg | 190 kg | 8 | 6 | 30 |

We can see a closer relationship in ratio's when we use the sustained firepower rating, rather than the maximum firepower rating. If we rely on the Maximum firepower our ratios are all over the place, but not so if we use sustained firepower.

For Medium and Heavy Mortars a ratio of 6 kg/m equalling one SUF point seems correct. Light mortars seem to throw this out a bit with their 9 kg/m to 1 SUF ratio. Using a 6 kg/m to 1 SUF ratio a value of 3 SUF's would be expected rather than the Strategy & Tactics 2 SUF's. A possible explanation is the true effectiveness of the light mortars. We do know the smaller mortars had a very small range and in the German army were phased out as unsuitable. To cover this an addition discount of these weapons would be required, thus the 9 kg/m to 1 SUF ratio.

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[24] Key: "Type" = General weapon type. "Calibre" = The calibre of the weapon. "Shell weight" = The weight of each projectile. "ROF Max" = The maximum possible rate of fire, per minute. "ROF Sust" = The practicable rate of fire, per minute, over a sustained time. "Fire power max" = The amount of metal this weapon can project in a minute, using the maximum ROF figure. "Fire power Sust" = The amount of metal this weapon can project in a minute using the sustained ROF figure.

[25] Key: "Fire Power Max" = The amount of metal this weapon can project in a minute, using the maximum ROF figure. "Fire power Sustained" = The amount of metal this weapon can project in a minute, using the sustained ROF figure. "Ratio Max" = The SUF figure divided into the maximum fire power figure giving us a ratio of kg per SUF point. "Ratio Sustained" = The SUF figure divided into the sustained fire power figure giving us a ratio of kg per SUF point. "S&T SUF" = The Strategy & Tactics combat effectiveness rating.

Assuming the above facts, the Strategy & Tactic firepower points ratings are reasonable. These would only apply to soft targets. The light and medium mortar would have virtually no effect on any hard target, however we may expect some effect for the heavy weapons. After all, having a 16 kg bomb drop on top of your tank or fortifications could be expected to cause some damage. On the other hand the shell would not impact as hard as a field artillery shells and has a more spread out effect. It would be safe and much simpler to assume these weapons have no effect against hard targets.

# Artillery

**Table 76 : Artillery Specifications[26].**

| Weapons | Type | Calibre | Shell Weight | ROF | Fire Power |
|---|---|---|---|---|---|
| (Germany) | | | | | |
| 75 mm L12 Infantry Gun | Infantry | 75 mm | 5.5 kg | 6 | 33 kg |
| 75 mm L46 Field Howitzer | Infantry | 75 mm | 5.5 kg | 6 | 33 kg |
| 150 mm L11 Infantry Gun | Infantry | 150 mm | 38 kg | 2 | 76 kg |
| 105 mm L28 Field Howitzer | Light | 105 mm | 15 kg | 6 | 90 kg |
| 150 mm L30 Field Howitzer | Medium | 150 mm | 44 kg | 4 | 176 kg |
| 170 mm Howitzer | Heavy | 170 mm | 64 kg | 1 | 64 kg |
| 203 mm Howitzer | Heavy | 203 mm | 114 kg | 1/2 | 57 kg |
| (Great Britain) | | | | | |
| 25 pounder | Infantry | 88 mm | 11 kg | 6 | 66 kg |
| 4.5 inch | Light | 115 mm | 23 kg | 4 | 92 kg |
| 5.5 inch Medium Gun | Medium | 140 mm | 45 kg | 2 | 90 kg |
| 6 inch 26 cwt Howitzer | Medium | 153 mm | 39 kg | 2 | 78 kg |
| 7.2 inch Howitzer Mk 1 | Heavy | 183 mm | 91 kg | 1 | 91 kg |
| (Soviet Union) | | | | | |
| 76.2 mm Infantry Howitzer | Infantry | 76.2 mm | 5.9 kg | 6 | 35.4 kg |
| 100 mm Light Gun M44 | Light | 100 mm | 16 kg | 6 | 96 kg |
| 122 mm Light Gun M31 | Light | 122 mm | 22 kg | 5 | 110 kg |
| 152 mm Medium How M43 | Medium | 152 mm | 44 kg | 4 | 176 kg |
| (USA) | | | | | |
| 75 mm Inf Howitzer Pack M8 | Infantry | 75 mm | 6.8 kg | 8 | 54.4 kg |
| 105 mm Light How M2A1 | Light | 105 mm | 16 kg | 6 | 96 kg |
| 155 mm Medium How Mk 1 | Medium | 155 mm | 43 kg | 4 | 172 kg |
| Medium Field Gun | Medium | 155 mm | 43 kg | 4 | 172 kg |
| US 8 inch Heavy How Mk 1 | Heavy | 204 mm | 127 kg | 1/2 | 63.5 kg |

Once again we can see similar artillery did tend to have similar characteristics. Lets now do the ratio exercise.

[26] Key: "Type" = General weapon type. "Calibre" = The calibre of the weapon. "Shell weight" = The weight of a single projectile. "ROF" = Rate of fire, per minute. "Fire Power" = The amount of metal this weapon can throw in a single minute.

**Table 77 : S&T SUF values of Artillery[27].**

| Weapons | Fire Power Range | Fire Power Averages | Ratio | S&T SUF |
|---|---|---|---|---|
| 75 mm to 76.2 mm | 33 kg to 45 kg | 35 kg | 1.75 | 20 |
| 88 mm to 122 mm | 66 kg to 110 kg | 90 kg | 0.75 | 120 |
| 140 mm to 155 mm | 90 kg to 176 kg | 135 kg | 0.75 | 180 |
| 170 mm to 203 mm | 57 kg to 91 kg | 75 kg | NA | none |

It seems a ratio 0.75 kg of weight per point applies for Medium and Heavy artillery. Light artillery does not fit this ratio and possesses a much worst ratio. The only explanation I can give is that Light Artillery is normally direct line of sight weapons. The larger guns are normally indirect and as a result has a much greater affective range.

The reduced range could be significant. With a reduced real range, the 75 mm Guns effectiveness would also reduce. This may be true, however I feel uncomfortable with the ratio difference, feeling it's too large. I would prefer to use a light artillery figure of 30 points. This way the effectiveness of these weapons is exactly half that of the larger weapons, per kg of deliverable shells.

Now the hard target issue. All these weapons would be able to affect hard targets, the only issue is what points rating to give them. When we look at anti-tank guns in more detail we will come back to consider this question.

[27] Key: "Fire Power Range" = The maximum and minimum amount of metal this weapon class could throw in a minute. "Fire Power Average" = The average, per weapon class, of metal that this weapon could throw in a minute. "Ratio" = The SUF divided into the Fire power average figure, giving us a kg/m per SUF.

# Anti-Tank Guns

Anti-tank guns of 75 mm or greater would use the standard artillery fire power effectiveness rating for soft targets. Anti-tank weapons under this size normally could not fire high explosive shells. They could only fire anti-tank shells, which do not explode. As a result their soft target effectiveness was limited.

**Table 78 : Anti-Tank Guns Specifications[28].**

| Weapon | Calibre | Projectile Weight | ROF Pract/Max | Ammo | Fire Power |
|---|---|---|---|---|---|
| (Germany) | | | | | |
| 2.8 cm SPzB41 Gun (Taper) | 28/20 mm | 0.1 kg | 25 rpm (est) | AP only | 3 kg (?) |
| 3.7 cm PAK 36 Gun | 37 mm | 0.9 kg | 20 rpm | AP only | 18 kg (?) |
| 4.7 cm PjJK41 (Taper) | 42/29 mm | 0.3 kg | 15/20 rpm (est) | | AP only5 kg (?) |
| 5 cm Pack 38 | 50 mm | 1.9 kg | 15 rpm | AP only | 29 kg (?) |
| 7.5 cm PAK 40 | 75 mm | 6.8 kg | 15 rpm | AP only | 102 kg (?) |
| 7.5 cm PAK 41 (Taper) | 75/55 mm | 2.6 kg | 15 rpm (est) | AP only | 39 kg (?) |
| 76.2 cm PAK 36(r) | 76.2 mm | 7.5 kg | 15/20 rpm | AP & HE | 131 kg |
| 8.8 cm PAK 43 & 43/41 | 88 mm | 10.4 kg | 15/20 rpm | AP & HE | 182 kg |
| 12.8 cm PAK 44 | 128 mm | 28.3 kg | 8 rpm (est) | AP & HE | 226 kg |
| (Great Britain) | | | | | |
| 2 pounder | 40 mm | 0.9 kg | 20 rpm (est) | AP only | 18 kg (?) |
| 6 pounder | 57 mm | 3.2 kg | 15 rpm | AP only | 48 kg (?) |
| 17 pounder | 76.2 mm | 7.7 kg | 10/20 rpm | AP only | 116 kg (?) |
| (Soviet Union) | | | | | |
| 45 mm M1942 | 45 mm | 1.5 kg | 25 rpm | AP & HE | 45 kg |
| 57 mm M1943 | 57 mm | 3.1 kg | 10/20 rpm | AP & HE | 37 kg |
| 100 mm M1944 | 100 mm | 15.7 kg | 10 rpm | AP only | 157 kg (?) |
| (USA) | | | | | |
| 37 mm M3 | 37 mm | 0.9 kg | 20 rpm | AP only | 18 kg (?) |
| 57 mm M1 | 57 mm | 3.3 kg | 15 rpm (est) | AP only | 50 kg (?) |
| 3 inch M5 | 76 mm | 7.0 kg | 10/20 rpm (est) | | AP & HE105 kg |
| 90 mm M1 | 90 mm | 11.1 kg | 15 rpm (est) | AP & HE | 166 kg |

Apart from the Soviets, most Anti-tank Guns of 75 mm or less only fired Armour Piercing shells (AP). Guns that only fired AP shells would have virtually no effect against soft targets, so a soft target firepower figure would have little meaning here.

The larger anti-tank guns could fire HE (High Explosive) shells, which would have an effect against soft targets. Thus we need to divide Anti-tank Guns into two groups, AP capable only and normal Guns.

When determining hard targets effectiveness the normal firepower rating method, based on weight, would be relevant. The larger weapons fire fewer, but much heavier shells. A heavy shell could do more damage, so using a weight based firepower rating makes a great deal of sense. This would also apply to normal field artillery as they could fire AP shells if they

[28] Key: "Calibre" = The calibre of this weapon. "Projectile weight" = The weight of a single projectile. "ROF practical/max" = If two numbers, the first is the maximum ROF in a minute, with the second figure being the practicable sustained ROF in a single minute. When there is only one figure assume it is sustained ROF. "Ammo" = The type of ammunition this weapon can fire, HE is High explosive and AP is armour piercing. "Fire Power" = The amount of weight this weapon can throw out in a minute.

wished to. The key here is ratio, or how many CQ points do we allocated per kg/m of fire power.

My preferred ratio is 5 to 1, or 5 kg/m of shell will give us 1 Hard Target CQ point. It's a gut feel guess, but does seem to make some sense. We now have a ratio. Lets put all out guns into groups, to determine their relative effectiveness and try and determine some figures.

**Table 79 : Hard and Soft CQ's of Anti-Tank Guns[29].**

| Weapon | ROF (Practical) | Firepower (Practical) | Soft CQ's | Hard CQ's |
|---|---|---|---|---|
| 28 mm to 57 mm | 10 rpm to 25 rpm (Av 15) | 3 kg to 48 kg (Av 25 kg) | 4 | 5 |
| 58 mm to 76 mm | 10 rpm to 15 rpm (Av 15) | 102 kg to 131 kg (Av 115 kg) | 30 | 20 |
| 88 mm to 90 mm | 10 rpm to 15 rpm (Av 15) | 157 kg to 182 kg (170 kg) | 120 | 30 |
| 128 mm | 8 rpm | 226 kg | 180 | 30 |

The Soft Target points are based on the ratio's that applies to Artillery of 75 mm to 76.2 mm. The rate of fire here is high, as AT shells are normally lighter than HE shells. As we are firing HE shells we need to reduce the ROF for each Gun. We get a Firepower figure of 4 points for your light Anti-tank Guns, which is what S&T claim it should be.

[29] Key: "ROF Practical" = The practicable Rate of Fire, measure in rounds per minute. The ROF range of all weapons in that class is given, along with an average Practicable ROF figure. "Fire Power Practical" = The practicable FPF of that weapons class. The ROF range as well as an average figure is given. "Soft target CQ's" = The CQ value of that weapon class against a soft target using the average practicable fire power rating. "Hard target CQ's" = The CQ value of that weapon class against a hard target using the average practicable fire power rating.

# Anti-Aircraft Guns

There is one final aspect of defence not yet covered, defence from air attack. So far we have only considered weapons affect against soft and hard ground targets. We now need to look at the effect of weapons against aircraft.

The main anti-aircraft weapons were the anti-aircraft guns, or AA Guns. All Anti-Aircraft guns can be used as Anti-Tank weapons and in some cases can be used against soft targets. However their main use was against aircraft. Lets look at some of these weapons in more detail;

**Table 80 : Anti-Aircraft Specifications[30].**

| Weapon | Calibre | Projectile Weight | ROF Sust/Max | Ammo | Fire Power (kg/m) |
|---|---|---|---|---|---|
| Germany: 20 mm L113 Gun | 20 mm | 0.1 kg | 200/480 | AT & HE | 20 kg |
| German: 20 mm Flak 38 (Quad) | 4 x 20 mm | 4 x 0.1 kg | 200/480 | AT & HE | 80 kg |
| German: 37 mm Flak 43 | 37 mm | 0.7 kg | 80/180 (est) | AT & HE | 56 kg |
| German: 88 mm Flak 36 | 88 mm | 9.2 kg | 15/20 | AT & HE | 138 kg |
| German: 105 mm Flak 39 | 105 mm | 14.8 kg | 10 (est) | AT & HE | 148 kg |
| Great Britain: 20 mm Oerlikon | 20 mm | 0.1 kg | 250/650 (est) | AT & HE | 25 kg |
| Great Britain: Bofors 40 mm L/60 | 40 mm | 0.9 kg | 60/120 | AP & HE | 54 kg |
| Great Britain: 3.7 inch AA Mk 2C | 93 mm | 12.7 kg | 20 | AP & HE | 254 kg |
| Soviet Union: 37 mm AA M39 | 37 mm | 0.7 kg | 80/180 | AP & HE | 56 kg |
| Soviet Union: 85 mm AA M39 | 85 mm | 9.2 kg | 15 | AP & HE | 138 kg |
| USA: 40 mm M1 | 40 mm | 0.9 kg | 60/120 | AP & HE | 54 kg |
| USA: 90 mm AA gun M1 | 90 mm | 10.6 kg | 22 | AP & HE | 133 kg |

Unlike Anti-Tank weapons, the Anti-Aircraft Gun could always fire HE shells. In fact it was a type of HE shells that were mainly used against aircraft. As well as aircraft, these HE shells could also be used against soft ground targets.

We have already discussed classifying weapons for use against soft and hard targets, now we need to determine how to do this for air targets. The simplest method is to measure the amount of weight each weapon could throw up using the Practical Rate of Fire. The ratio we select is purely a number out of the air. Using a ratio of four to one, or 4 kg/m of shell gives us 1 Air CQ point. As long as all weapons use this ratio we can compare them with each other.

Using this same system we can look at some other weapons that could be used against aircraft, mainly LMG and HMG. We can now determine the effect against all three target classes, soft, hard and air.

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[30] Key: "Calibre" = The calibre of the weapon. "Projectile weight" = The weight of each projectile in kg. "ROF practical/max" = If two numbers, the first is the maximum ROF in a minute, with the second figure being the practicable sustained ROF in a single minute. When there is only one figure, assume it is the sustained ROF. "Ammo" = The type of ammunition this weapon can fire, HE is High explosive and AP is armour piercing. "Fire Power (kg/m)" = The amount of metal this weapon can throw in a single minute.

**Table 81 : Hard and Soft CQ's of Anti-Aircraft Guns[31].**

| Weapons | ROF | Fire Power | Air Target CQ | Soft Target CQ | Hard Target CQ |
|---|---|---|---|---|---|
| LMG | 120 rpm | 4 kg | 1 | 2 | 0 |
| HMG | 250 rpm | 7 kg | 2 | 5 | 0 |
| 20 mm to 57 mm | 60 to 200 rpm (Average 120 rpm) | 20 to 56 kg (Av 40 kg) | 10 | 5 | 5 |
| 85 mm to 90 mm | 15 rpm to 22 rpm (Average 20 rpm) | 133 to 138 kg (Av 135 kg) | 40 | 120 | 30 |
| 105 mm | 10 rpm | 148 kg | 40 | 120 | 30 |

We now need to verify what effect other non-AA weapons have against aircraft. Mortars, Anti-Tank Guns and Artillery would have no effect against aircraft. Small arms would have an effect against aircraft, although it would be so minor as to be negligible. However there would be one exception, LMG and HMG. Both weapons were used against aircraft and both could be expected to have some effect. So for my purposes only specific Anti-Aircraft weapons and Machine Guns would have an Air FPF.

### *Tanks & Armoured Cars*

If we only use a fire power rating to determine combat effectiveness all we can do with tanks and armoured cars is calculate the combined effectiveness of all weapons mounted on them. So a tank with 2 machine guns and a 50 mm anti-tank weapon would have the combined firepower, and CQ rating, of all its weapons.

Now clearly having your weapons mounted in a mobile and armoured platform should give you some additional advantages. It's true that in a fully defensive situation this would not be the case, so we only need to consider this weapon when it is attacking.. We will deal with attack strength later. As a result the **combat effectiveness** of a tank in a defensive situation is equal to the weapons it carries.

## Defensive Fire Power

So far we have only looked at a weapons defensive firepower capability. Lets put all our figures together to give us an affective defensive firepower rating for soft, hard and air targets for all weapons classes.

[31] Key: "ROF practical" = The practicable Rate of Fire, measure in rounds per minute. The ROF range of all weapons in that class is given, along with an average Practical ROF figure. "Fire Power Practical" = The practicable FPF of that weapons class. The ROF range as well as an average figure is given. "Air target CQ's" = The CQ value of that weapon class against a soft target using the average practicable fire power rating. "Soft target CQ's" = The CQ value of that weapon class against a soft target using the average practicable fire power rating. "Hard target CQ's" = The CQ value of that weapon class against a hard target using the average practicable fire power rating.

**Table 82 : Determining FPF[32]**

| Weapons | FPF (kg/m) | ROF Sust | Soft Target FPF | Hard Target FPF | Air Target FPF |
|---|---|---|---|---|---|
| Rifles (Bolt action) | NA | 10 | 0.1 | 0 | 0 |
| Rifles (Automatic) | NA | 20 | 0.2 | 0 | 0 |
| Assault Rifles (SMG) | NA | 80 | 1 | 0 | 0 |
| SMG's | NA | 90 | 1 | 0 | 0 |
| LMG | NA | 150 | 2 | 0 | 1 |
| HMG | NA | 250 | 5 | 0 | 2 |
| ATR | 1.00 kg | 10 | 0 | 0.2 | 0 |
| Light Mortars (2" or 46 mm - 61 mm) | 18 kg | 20 | 2 | 0 | 0 |
| Medium Mortar (3" or 80 mm - 81 mm) | 41 kg | 12 | 7 | 0 | 0 |
| Heavy Mortar (120 mm) 190 kg | 12 | 30 | 0 | 0 | |
| Light Flak (20 mm to 57 mm) | 20 kg | 200 | 5 | 5 | 10 |
| Heavy Flak (58 mm to 105 mm) | NA | NA | NA | NA | 40 |
| Light Anti-Tank Guns (20 to 57 mm) | 18 kg | 20 | 4 | 5 | 0 |
| Guns/Howitzers/AT/AA (75 to 76 mm) | 33 kg | 6 | 30 | 20 | 0 |
| Guns/Howitzers/AT/AA (88 - 120 mm) | 90 kg | 6 | 100 | 30 | 0 |
| Guns/Howitzers/AT/AA (150-155 mm) | 174 kg | 4 | 180 | 30 | 0 |

There are almost certainly some problems and errors with this table, but it's probably reasonably correct. The only unusual aspect of the above table is for heavy AA Guns. A 105 mm AA gun could fire AP and HE shells, as well as having the elevation and accuracy to shoot at aircraft. A normal 105 mm Field Gun could fire AP and HE shells, but would have no effect against aircraft. Thus the Heavy AA Gun row, which is only used for Air Target FPF effectiveness calculations.

At some point in time you will be required to attack. On the offensive, weapon characteristics change and weapon systems like tanks gain a special advantage. We need to look at a unit offensive capacity.

# Offensive Effectiveness

We need to determine the most important factors to consider when attacking. We need to consider exactly what an attack is. A simple explanation could be as follows;

*Forward advance until enemy fire stops you, then a maximum concentration of fire power at the enemy strong point to destroy the enemy or suppress the enemy fire so the advance can continue.*

There are two key words here, "enemy fire stops you" and "maximum concentration of firepower at the enemy".

## *Stopping the Advance*

An advance will stop when enemy fire results in physiologically significant casualties. If your attackers are soft targets then almost any weapon system can stop an advance. If your

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[32] Key: "FPF (kg/m)" = Fire Power Factor in kg of metal that can be fired in a minute. "ROF practical sustained" = Rate of fire, the practicable sustained rate. "Soft Target FPF" = Fire power factor against a soft target. "Hard Target FPF" = Fire power factor against a hard target. "Air target FPF" = Fire power factor against an air target.

attackers are hard targets, then a whole range of weapons has no effect. An armoured advance is far harder to stop than an unarmoured advance, simply because the defenders can only use a sub-set of all their weapons.

## *Suppress the Enemy*

If for whatever reason your advance has stopped, you need to concentrate the maximum amount of firepower at the enemy to either destroy him (unlikely to occur, as the enemy will be dug in, taking cover, or be a semi-hard target) or to suppress his fire, so your advance can continue. In this later case any weapons system can be used to suppress the enemy.

Now this means that the same fire power that helps you in defensive situation has an effect when you attack. The only difference is that the weapons effectiveness may change, or will it. Lets look at this in more detail.

## *Weapons in Attack*

We need to look at our weapons and determine how their effectiveness will change when you are attacking. The key factors to consider are mobility and range.

The two differences between an attack and defence are that on the defensive you are normally dug in and possess more ammunition than could be normally carried. Units on the attack are in the open and possess only the weapons and ammunition they can carry. This may indicate defensive fire power should be greater the offensive fire power. In addition, defensive troops are affected less by fire power than the attackers, as they are not as exposed.

The ammunition theory is eliminated when you consider that when you attack, you select your targets and the men you wish to use. On the defensive you do not have this luxury. One sector may not be attacked at all, while another attacked constantly by double their number of men. As a result the defenders may have more ammunition over all, but at the point of contact, where it counts, that is probably not the case.

The vulnerability theory is valid, however the attackers only need to keep the defenders heads down. This can be achieved by firing off weapons at the defenders and not achieving any casualties. So attackers will suffer more casualties, but will still advance anyway. So this point is not relevant, except to the men who are hit.

Finally, the range of many artillery weapons is so great that mobility is not significant during the initial break through. Certainly in an Operational or Strategic situation, mobility of these weapons becomes important, but for the initial break through its not that significant.

Over all the effectiveness of fire power of all weapons will remain the same, irrespective of weather you are on the defensive or offensive.

## *Tanks*

The tank does change things a great deal. The tank makes its harder to stop an advance, simply because the fire power of a defender has less effect. The key here is how to calculate the effect of the tank in some sort of meaningful sense.

There are two ways of looking at this;

How does a tank multiply the effectiveness of the weapons carried?
How does the hard target aspect of a tank affect its offensive capability?

We have to say that mounting a weapon in a mobile armoured vehicle must increase its effectiveness. The weapon can get closer, has lots of ammunition, and is very mobile. You could say any weapon carried in a tank has its effectiveness doubled for attack. This is basically a gut feel decision, but it's one I feel is accurate.

As for the second aspect, we simply cannot even begin to guess how to reflect this. One way of dealing with this is to downwardly effect the defender's strength when attacked by tanks. But what do we do if the attackers are a mix of tanks and infantry. If the scale of the units are divisional, then you could work out the average anti-tank strength in all the units and give the attacker some sort of bonus when they attack. For example, if the Hard defensive CQ strength of a unit is half that of it's Soft defensive CQ strength you could say a pure armoured unit's strength is doubled when attacking non-armoured units. If the scale is very small, then you could give units different Soft and Hard defensive strengths. The key seems to be scale and "gut feel". For the sake of simplicity we need to ignore this aspect and deal with it, case by case.

In summary, we can double the effect of weapons carried in a tank for offensive purposes and that about deals with the tank.

**Table 83 : Tank Combat Effectiveness**[33]

| Weapon | S&T SUF | Soft Target CQ | Hard Target CQ | Air Target CQ |
|---|---|---|---|---|
| Light MG Tank (2 x HMG) | NA | 10 | 0 | 0 |
| Light Tank (1 x 20 mm - 57 mm and 2 x HMG) | 20 | 14 | 5 | 0 |
| Medium Tank (1 x 75 mm - 76 mm and 2 x HMG) | 40 | 40 | 20 | 0 |
| Heavy Tank (1 x 85 mm - 120 mm and 2 x HMG) | NA | 110 | 30 | 0 |
| Super Heavy Tank (1 x 122 mm - 128 mm and 2 x HMG) | NA | 190 | 30 | 0 |

Simply adding the weapons a tank carried allows us to calculate the above defensive **combat effectiveness**. If we double the defensive CQ value when attacking, we may be achieving a reasonable offensive CQ value. As you can see our figure seems to closely match the Strategy & Tactic SUF ratings, probably because Strategy & Tactics only every considered the weapons a tank carried when calculating its SUF value.

As you can see by the above table we have classed tanks into groups based on the weapon it carried. As a result we have not taken into account the armour a tank may possess. Luckily for us the heavier the weapon carried, the heavier the armour on the tank. So the key factor is the type of gun carried on the tank, not its armour. Using these criteria we can quickly and easily classify tanks. In most cases this works well, however there are some examples where a problem seems to exist. For example, the Pzkfw III would always be classed as a light tank, along with the Pzkfw II. The T-34/76 is classed as a medium tank, while the T-34/85 would

[33] Key: "S&T SUF" = S&T's Standard Unit Firepower rating. "Soft Target CQ's" = CQ value against a soft target. "Hard Target CQ's" = CQ value against a hard target. "Air target CQ's" = CQ value against an air target.

be classed as a Heavy Tank. This may seem a bit unreasonable, however in the cause of simplicity it will have to be accepted.

Armoured Cars would be classed in the same manner as tanks, with most being either classed as a Light MG tank or Light Tanks. Half tracks would be all classed as Light MG tanks. The result is an amazingly simple and complete system.

# CQ's

We have now created a rating system of **combat effectiveness**, which was the objective we set ourselves at the beginning. As with the Strategy & Tactics version of SUF, this is primarily based on the sum total of a formation practicable firepower. We have made some alternations to this basic premise in the name of realism, but they are minimal. This is the bedrock that we will use as a start point, before we start considering all those other, hard to measure, factors that affected the **combat effectiveness** of any formation.

**Table 84 : CQ Table**[34]

| Weapon | Soft Target CQ | Hard Target CQ | Air Target CQ | Attk Soft CQ | Attk Hard CQ |
|---|---|---|---|---|---|
| Rifles (Bolt action) | 0.1 | 0 | 0 | 0.1 | 0 |
| Rifles (Automatic) | 0.2 | 0 | 0 | 0.2 | 0 |
| Assault Rifles (SMG) | 1 | 0 | 0 | 1 | 0 |
| SMG's | 1 | 0 | 0 | 1 | 0 |
| LMG | 2 | 0 | 1 | 2 | 0 |
| HMG | 5 | 0 | 2 | 5 | 0 |
| ATR | 0 | 0.2 | 0 | 0 | 0.2 |
| Light Mortars (2" or 46 mm - 61 mm) | 2 | 0 | 0 | 2 | 0 |
| Medium Mortar (3" or 80 mm - 81 mm) | 7 | 0 | 0 | 7 | 0 |
| Heavy Mortar (120 mm) | 30 | 0 | 0 | 30 | 0 |
| Light Flak (20 mm to 57 mm) | 5 | 5 | 10 | 5 | 5 |
| Heavy Flak (58 mm to 105 mm) | NA | NA | 40 | NA | NA |
| Light Anti-Tank Guns (20 to 57 mm) | 4 | 5 | 0 | 4 | 5 |
| Guns/Howitzers/AT/AA (75 to 76 mm) | 30 | 20 | 0 | 30 | 20 |
| Guns/Howitzers/AT/AA (85 - 120 mm) | 100 | 30 | 0 | 100 | 30 |
| Guns/Howitzers/AT/AA (150-155 mm) | 180 | 30 | 0 | 180 | 30 |
| Light MG tanks, Armoured Cars & Half tracks | 10 | 0 | 0 | 20 | 0 |
| Light Tank (20 to 57 mm Main Gun) | 20 | 5 | 0 | 40 | 10 |
| Medium Tank (75 - 76 mm Main Gun) | 40 | 20 | 0 | 80 | 40 |
| Heavy Tank (85 - 120 mm Main Gun) | 100 | 30 | 0 | 200 | 60 |
| Super Heavy tank (122 mm to 128 mm Main Gun) | 200 | 30 | 0 | 400 | 60 |

[34] Key: "Soft Target CQ's" = CQ value against a soft target. "Hard Target CQ's" = CQ value against a hard target. "Air target CQ's" = CQ value against an air target. "Attack Soft CQ" = CQ value against a soft target if attacking. "Attack Hard CQ" = CQ value against a hard target if attacking.

## *Example of CQ's*

We have created our CQ system. The final test would be to use this system on some real life example. I have information concerning the break down of German and Polish divisions in late 1939 and it is with these formations that we will calculate our CQ's.

**Table 85 : 1939 German Divisional CQ Rating.**

| Formation | Soft CQ's | Soft Attack CQ's | Hard CQ's | Hard Density | Ait CQ's |
|---|---|---|---|---|---|
| German Infantry Division (1st Wave) | 10,566 | 10,586 | 2,477 | 23% | 1,005 |
| German Infantry Division (2nd Wave) | 10,204 | 10,224 | 2,471 | 24% | 897 |
| German Infantry Division (3rd & 4th Wave) | 8,992 | 9,012 | 2,111 | 23% | 891 |
| German Motorised Division (3 Reg) | 10,478 | 10,768 | 2,477 | 24% | 1,123 |
| German Motorised Division (2 Reg) | 9,384 | 9,404 | 2,229 | 24% | 865 |
| German Mountain Division (1st) | 10,240 | 10,240 | 2,251 | 22% | 1,430 |
| German Mountain Division (2nd & 3rd) | 7,049 | 7,049 | 1,599 | 23% | 1,030 |
| German Panzer Division (1st, 2nd, 3rd & 5th) | 14,968 | 21,848 | 3,830 | 26% | 1,491 |
| German Panzer Division (4th) | 15,764 | 22,644 | 3,955 | 25% | 1,669 |
| German Panzer Division (10th) | 11,605 | 15,365 | 2,910 | 25% | 1,225 |
| German Light Division (1st) | 14,014 | 20,284 | 3,087 | 22% | 1,452 |
| German Light Division (2nd & 4th) | 9,104 | 10,964 | 1,760 | 19% | 1,042 |
| German Light Division (3rd) | 9,591 | 11,681 | 1,757 | 18% | 1,186 |
| German Cavalry Brigade | 2,542 | 2,582 | 710 | 28% | 415 |

**Table 86 : 1939 Polish Divisional CQ Rating[35].**

| Formation | Soft CQ's | Soft Attack CQ's | Hard CQ's | Hard Density | Ait CQ's |
|---|---|---|---|---|---|
| Polish Regular Infantry Division | 4,091 | 4,091 | 1,179 | 29% | 572 |
| Polish Border Infantry Division | 4,723 | 4,723 | 1,190 | 25% | 734 |
| Polish Reservist Infantry Division | 3,611 | 3,611 | 1,179 | 33% | 410 |
| Polish Mechanised Brigade | 2,453 | 2,923 | 840 | 34% | 149 |
| Polish Mountain Brigade | 3,348 | 3,348 | 999 | 30% | 400 |
| Polish Cavalry Brigade | 1,747 | 1,947 | 433 | 25% | 344 |
| Polish Ind Light Tank Battalion (1st & 2nd) | 980 | 1,950 | 245 | 25% | 0 |
| Polish Ind Light Tank Battalion (21st) | 900 | 1,800 | 225 | 25% | 0 |
| Polish Ind Light Tank Battalion (Misc) | 450 | 900 | 0 | NA | 0 |
| Polish Ind Tank Company | 130 | 260 | 0 | NA | 0 |
| Polish Ind Artillery Regiment | 4,720 | 4,880 | 1,120 | 23% | 0 |
| Polish Ind Heavy Artillery Battalion | 1,200 | 1,200 | 360 | 30% | 0 |
| Polish Ind Heavy Howitzer Battalion | 2,160 | 2,160 | 360 | 17% | 0 |

## *How to interpret CQ's*

Using our CQ system we can now obtain several measurements of **combat effectiveness**. The difficulty now is to interpret them.

---

[35] Key: "Hard CQ Density" = The Hard CQ value as a percentage of Soft CQ density. Its purpose is to show proportions.

We can see by our table above that a 1st Wave German Infantry Division is more than double the **combat effectiveness** of a Regular Polish Infantry Division. In order to determine this we have used the Soft CQ's ratings. We can compare all our units and compare their comparative ability to defend themselves. We could also do the same with the Soft Attack CQ's rating and compare all the different formation's ability to attack. All this is very easy to do, because we are comparing the same thing.

The real problem occurs when we try and compare the Soft Attack CQ's rating of a German Panzer Division with the Soft CQ's rating of a Polish Infantry Division. Here is where the gut comes into play. The normal rule of thumb is that when you attack you need a three to one advantage to win. We can assume a two to one advantage will result in a draw and in a one to one situation, will cause any attack to automatically fail. Using this rationale the Panzer division needs 2 attack CQ points to each Polish infantry division defensive CQ point, in order to achieve a draw. As it turns out the Panzer Division has a five to one advantage, so we can say that a Panzer Division attacking is only stopped by two and a half Polish Infantry Divisions. It sounds nice and probably does resemble the truth sufficiently to be useful. Using this system we can now compare both offensive and defensive CQ's with each other.

What about the hard CQ's rating, how can this be compared with the other CQ values? We can quickly see that the Polish infantry division Hard CQ's rating is generally half that of a German infantry division. This means an armoured attack against a Germany infantry division was much more difficult. Apart from this it tells us very little, unless we compare it with the standard Soft CQ's rating of a formation.

By comparing the hard CQ's rating as a ratio of the Soft CQ's rating we can determine the "density" of anti-tank capacity in a formation. When we look at the German army the Hard CQ's rating is generally about 24% of the Soft CQ's rating, while in the Polish army this figure is slightly higher. Generally we can say the ability of the Polish army to stop an armoured attack is the same as the German army's ability, assuming a similar number of men. If there was a great difference in these densities, we could assume armour would be more effect against one side than the other.

We can play with figures until we are blue in the face. With hard CQ's ratings we only need to worry about asking the correct question and manipulating the numbers to gain our possible answer. As a result this all depends on what you need to know.

The Air CQ's ratings, like the Hard CQ's rating, can be compared with each other. A density can be determined to see if one army was more vulnerable to aircraft attack. We could continue this article to determine the effect of aircraft against ground targets and then using the Air CQ's rating to modify this. However I am keeping my feet planted firmly on the ground and will leave it to some other person to expand CQ's to the air. In the short term we can simply compare formations and guess an air defensive effect.

So we now have the basic tool required to determine a formations combat effectiveness, in certain situations. It's now up to each individual to use these tools and apply their gut feels to get a more "realistic" combat effectiveness for a specific historic situation. In this I wish you luck and good bye.

# Using CQ's

At the beginning of this article I used as an example the German invasion of Poland in 1939. Lets use CQ's to determine the true strength of each opposing army. Using this comparison we can determine how important German military planning was to this invasion, or weather any half wit could have done the same.

**Table 87 : Polish Army, 1939**

| Formation | Defence Soft CQ | Attack Soft CQ | Def/Attk Hard CQ | Anti-Air CQ |
|---|---|---|---|---|
| Modlin Army | 21,580 | 22,240 | 5,176 | 2,696 |
| Pomorza Army | 26,968 | 27,298 | 6,653 | 4,338 |
| Poznan Army | 29,317 | 30,238 | 7,196 | 3,732 |
| Lodz Army | 34,712 | 36,742 | 8,929 | 3,540 |
| Krakow Army | 41,172 | 42,362 | 11,538 | 4,841 |
| Carpathian Army | 24,886 | 24,886 | 6,897 | 2,388 |
| Narew Group | 12,812 | 12,812 | 3,415 | 2,048 |
| Coastal Defence Group | 3,727 | 3,997 | 461 | 936 |
| **Front Line Total** | **195,174** | **200,575** | **50,265** | **24,519** |
| Prusy Army | 35,389 | 35,589 | 10,211 | 4,114 |
| Grodno Group | 2,229 | 2,229 | 585 | 306 |
| Wyszkow Group | 16,033 | 16,033 | 4,657 | 1,392 |
| Kutno Group | 7,702 | 7,702 | 2,358 | 982 |
| Pyskow Group | 8,474 | 11,194 | 2,489 | 559 |
| Przemysl Group | 7,702 | 7,702 | 2,358 | 982 |
| Hungary Border Guard | 1,355 | 1,355 | 184 | 324 |
| Eastern KOP | 5,143 | 5,522 | 113 | 1,341 |
| Warsaw Garrison | 492 | 492 | 90 | 108 |
| **Rear & Reserve Total** | **84,519** | **87,818** | **23,045** | **10,108** |

**Table 88 : German Army, Eastern Front, 1939**

| Formation | Defence Soft CQ | Attack Soft CQ | Def/Attk Hard CQ | Anti-Air CQ |
|---|---|---|---|---|
| 3rd Army | 148,052 | 134,028 | 30,267 | 16,814 |
| 4th Army | 118,273 | 125,313 | 28,109 | 14,459 |
| 8th Army | 65,088 | 65,268 | 15,350 | 9,198 |
| 10th Army | 163,437 | 187,577 | 38,209 | 18,854 |
| 14th Army | 135,403 | 151,123 | 32,001 | 22,051 |
| **Front Line Total** | **630,253** | **663,309** | **143,936** | **81,376** |
| German Reserves | 28,550 | 28,610 | 6,699 | 2,787 |
| Army Group North Res | 69,555 | 73,435 | 16,662 | 6,697 |
| Army Group South Res | 100,009 | 100,209 | 23,881 | 9,282 |
| **Rear & Reserve Total** | **198,114** | **202,254** | **47,242** | **18,766** |

## *The Comparison*

It does not take long to realise the poor old polish never had a chance. The general military rule of thumb is that you need a 3 to 1 advantage to win. If we look at the forces that were initially involved on the Polish front line we see the German attack CQ is 663,309 against the Polish defensive CQ of 195,174. The Germans have a 3.4 to 1 advantage.

If we look at the entire army of both countries we have the German attack CQ of 865,563 against the Polish defensive CQ of 279,693. The Germans have a 3 to 1 advantage, which still gives an automatic victory to the Germans.

The best option for the Polish is if they were fully prepared when the Germans attacked. In this case the front line German attack CQ is 663,309 against the total polish army defence CQ of 279,693. This gives the Germans an advantage of 2.4 to 1, which gives the Polish a thin chance. The problem with this is that is assumes the Polish do not defend any other part of their front line and that the German reserves need to go elsewhere, perhaps due to a western allied attack. We would also have to assume no Soviet attack is coming. Combine all these factors and the conflict becomes interesting.

By looking at the CQ's of both armies we see that the Germans did not need any troop superiority or command superiority to win the battle. All they had to do was equal the Polish army in troop quality and command and victory was ensured. This is a classic example of how CQ's could be used in analysing a conflict.

# Designing a Strategic Level Game

After expending a great deal of effort in determining systems and methods of designing games the next objective is to put this to practice and design a game, or games. The game I will design is a reworking of a Strategic World War II game which SPI printed in 1973 called, strangely enough, World War II. It used a system, which I have called the WWII system, which was later used in Global War and World War II. Unfortunately both these games were far from perfect, or even good. However WWII proved to be an excellent game, being both playable and reasonably historical. Other similar games were Avalon Hills Third Reich and World in Flames, and for comparison purposes I will look at both these games. There were other European scale games covering the war in Europe during WWII, both most of these lacked any historical authenticity. Games such as Hitler's War and xxxxxx were far more interested in playability than historical accuracy. In fact you could say this about Third Reich and World in Flames also, but at least both these games had some sort of authenticity.

## Comparing the Games

A good start point is to look at other similar games and see what mechanics they used.

| **Game Mechanic** | **WWII (1st)** | **Third Reich[36] (3rd)** | **World in Flames (4th)** |
|---|---|---|---|
| Year Published | 1973 | 1981 | 1985 |
| Game Turn Scale | 3 months | 3 months | 2 months ( 2 weeks[37] ) |
| Hex Scale (km) | 192 km | 110 km | 70 km |
| Unit Scale | Army/Corp | Army/Corp | Army/Corp |
| Inf Move | 5 | 3 or 4 | 2 to 4 |
| Mech Move | 5 | 5 or 6 | 5 or 6 |
| ZOC Type | Rigid | Elastic | Rigid |
| ZOC Generate | General | General | General |
| ZOC Enter | 0 | 0 | Stop |
| ZOC Leave | 0 | +2 MP | 0 |
| ZOC to ZOC | Prohibited | +2 MP | Stop |
| CRT Step | Yes | No | No |
| CRT Type | Numeric | Descriptive | Numeric |
| CRT Die | 6 | 6 | 6 |
| CRT Mech | Differential | Odds | Odds |
| Stack Type | Simple | Simple | Simple |
| Stack Rate | 2 Units | 2 Units | 3 Units |
| 2-1 or +2 : 1 | 2 | Ex | 2/- |
| 2-1 or +2 : 2 | 2 | CA2 | 1/- |
| 2-1 or +2 : 3 | 1 | CA2 | 1/1 |
| 2-1 or +2 : 4 | 1 | CA1 | 1/1 |
| 2-1 or +2 : 5 | 1 | D | -/1 |
| 2-1 or +2 : 6 | 1 | D | 1/2S |
| Seq of Play Mechanic | Complex | Complex | Simple |

[36] I should point out that Third Reich is in fact the oldest of the games above, I don't know which year the 1st edition of the game was printed but it was certainly before WWII.

[37] World in Flames can have up to six move-combat cycles in a single game turn. On average you will end up with four, so each move-combat cycle probably represents about 2 weeks.

| | | | |
|---|---|---|---|
| Seq of Play Phases | 3 | 3 | 2 |
| Sequence of Play | Move<br>Combat<br>Mech | Move<br>Combat<br>Exploit | Move / Combat<br>Combat |
| Overrun Type | Simple | NA | NA |
| Overrun Cost | +1 MP | NA | NA |
| Supply Type | Simple | Simple | Detailed |
| Supply Features | To Supply Source | To Supply Source | To Supply Source |
| Supply Effect | No attack, ½ defence, elim | No Move, eliminated | No attack, Move 1 |
| Unit Type | Simple | Simple | Simple |
| Unit Data | Combat | Combat/Move | Combat/Move |

You can see many similarities in the above three games, however both World and Flames and Third Reich differ in an important factor from WWII. Both of these games take a long time to play, involve much additional strategic complexity and are excellent team games. World War II is a land game pure and simple, can be played in a single day and is primarily a two play, or at a pinch a three player game. It is this concentration on the land conflict in Europe that I wish to most simulate, as I will cover later.

# [2.0] Game Scale

The first area to cover is the map. This is more significant with strategic games as the size of the map has a massive affect on complexity, and size, of the game. I wanted to stick to the magic WWII and Third Reich formula of having a single standard map to cover the conflict. Even World in Flames does this for Europe. Once we move to two maps the game becomes massive. A good example of what a mistake this would be is to look at TSR 2nd edition of World War II. For a variety of reasons it was a disaster, one reason was the fact it had 2 map sections which made the game too difficult to play. So Rule one is;

> The game had to fit on a single standard map section.

Their are many reasons why this is desirable. A single map section makes is easy for players to set-up on a standard table and play solitaire. It also makes it easy for a standard two player game as the map can fit on any type of table. Its small size makes it possible to leave set-up, so it can be played over a few days and if you play a multi-player game, everyone can sit around the may and easily reach out to any point on the map. These are a few reasons, but in summary the game's utility increases.

With this decision made we now can decide upon a game map scale. A standard US map is 22 7/8 inch by 34 1/8 inch, which translates to about 62 by 33 hexes in size. A metric map is 59.4cm by 168cm, which is probably 35 by 60 hexes. The map must fit into this area. When we look at a map of Europe the critical dimension is North - South. The distance from the Suez to the north tip of Norway is about 4,730km. The distance from the east most tip of Portugal to Stalingrad is about 4,640 km. If we stretch the point and go from Kuwait to Gibraltar the distance is 5,400 km. In short the map ratio is 1 to 1.2 at worst. We need to fit about 4,730 km into 33 hexes, which means the scale is going to be about 143km per hex.

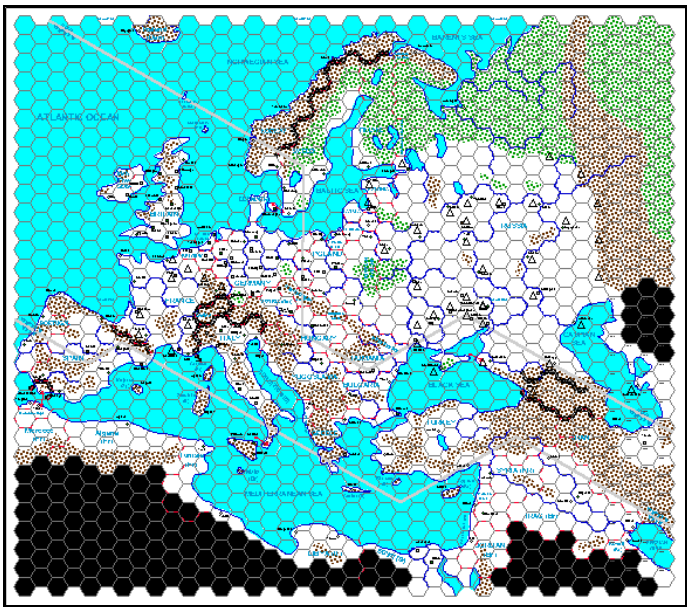
Their are two ways of overcoming this, and both Third Reich and World in Flames does this. The easiest way is the increase the size of your standard map section. World in Flames uses a much large may section, giving it 46 hexes North to South. This is an option but one I would prefer not to use, as it is basically cheating. The second way of overcoming this bottleneck is by cutting off all of Scandinavia except the southern portion. Apart from the German invasion of Norway and the small scale fighting which occurring in the North of Finland, not much fighting occurring in this cut off area. Both Third Reich and World in Flames uses this

technical, which means the North South axis distance drops to 3,790 km and the map ratio changes to 1 to 1.4. As the stand map section has a ratio of 1 to 1.5 your scale can now change to 115km per hex.

While this is a valid mechanism I will not opt to use it, much preferring to include all of Europe. This also leaves me with spare areas on the map section which will allow me to place tables and charts. This is a valid mechanism to increase the playability of a game and I will select it.

While historical "credibility" is important, I am not creating a historically accurate game. This will be a playable game with historical credibility and that makes the map decision very easy. In the end I select a game scale of 150km per hex and a map which is 31 hexes by 40 hexes.

**Map 1 : A possible map for my game**



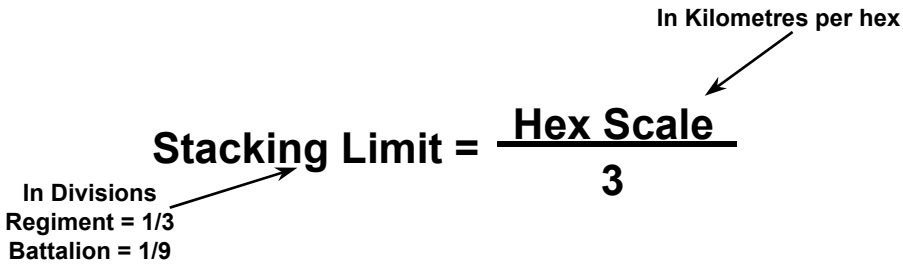
We now have the start point for the game, which I will call WWII 3rd Edition. The ground scale will be 150km. If we compare this ground scale with our control games.

**Table 89 : Map Scales of the Games.**

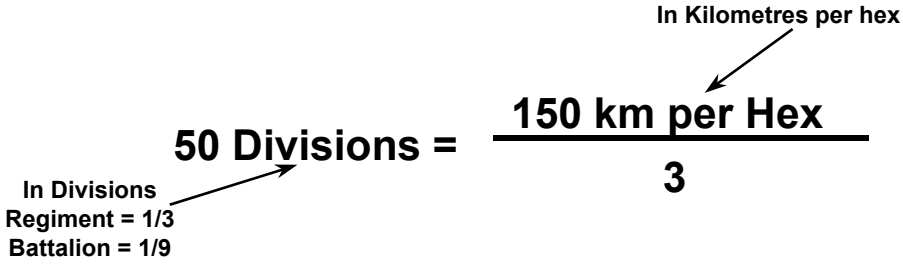
| Game Mechanic | WWII (3rd) | WWII (1st) | Third Reich (3rd) | World in Flames (4th) |
|---|---|---|---|---|
| Hex Scale (km) | 150 km | 192 km | 110 km | 70 km |

We can see quiet a range, however the closest game is the original WWII, which was always my intention. Let us now start applying our standard scale formulas to determine the other major scales to use.

**Equation 6 : Stacking Limit Equation**




**Equation 7 :" Applying the equation**



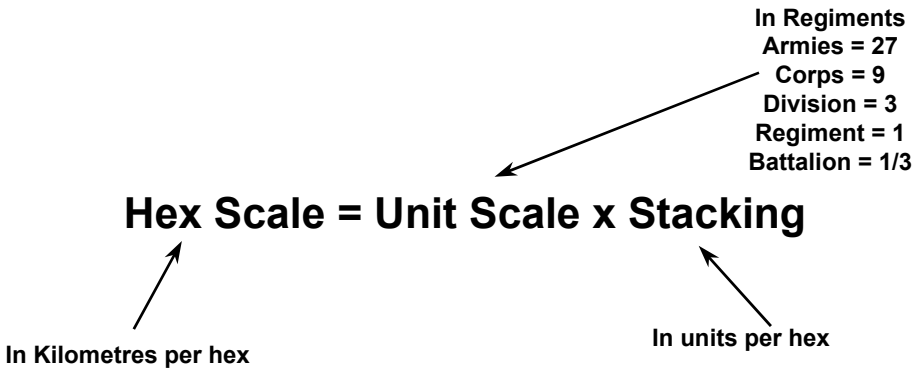

The first thing this equation tells us is we need to be able to place about 50 divisions in each hex, plus of minus some. Failure to do this would cause some serious unbalancing effects. 50 divisions equate to about 16 corps (3 divisions each), which in turn equate to about 5 armies of 3 corps. If our scale is armies our stacking will be 5, which is too much. If we go for army groups, a rather intangible scale, we end up with about 1.6 in each hex, which is too little. All these scales assume a 3 to 1 ratio, i.e. 3 armies to an army group. At Corp level and above this was not the case. Formation size varied a great deal and we can use this to our advantage. If we have a stacking of three, then each unit must be able to represent about 16 divisions, which is probably a good size for an army. This can be 5 corps of 3 divisions, or 4 corps of 4 divisions, or whatever you feel is acceptable.

We have now established our unit scale, armies of 16 divisions will be the basic unit and they can stack up to 3. The ideal multiple here is 4 corps of 4 divisions each, which can give us our steps. The basic step can be a Corp of 4 divisions, so each army can have up to four steps and each player can deploy units as small as a corp.

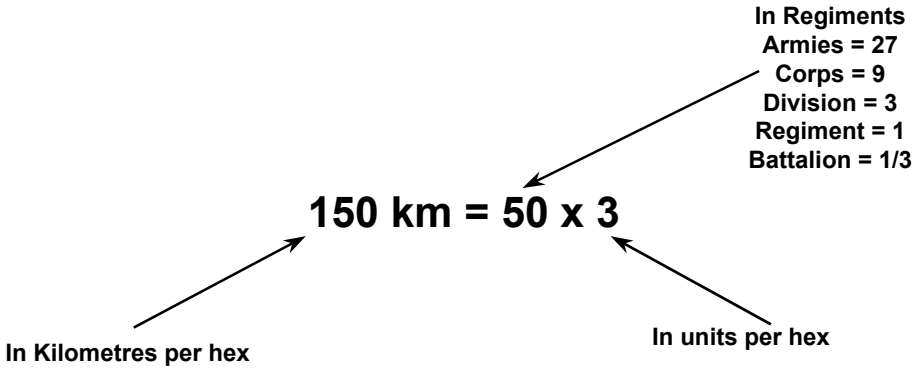
The second stacking issue is the difference between armour and infantry. It may be an idea to alter the ratio for armour. We can range from one unit equals a armoured Corp to an armoured army. Probably a two to one ratio is best for both playability and reduction of future problems, so the basic armoured unit is 2 corps of 4 divisions each, or 8 armoured divisions. This allows us to have armoured formations as small as divisions, so we can give rommel his two armoured divisions in the desert.

The scale value of this is about 48 or greater, according to my unit scale numeric value. We will settle on a value of 50. Lets now apply this to the next equation and see how we go.

**Equation 8 : Hex Scale Determination Equation.**

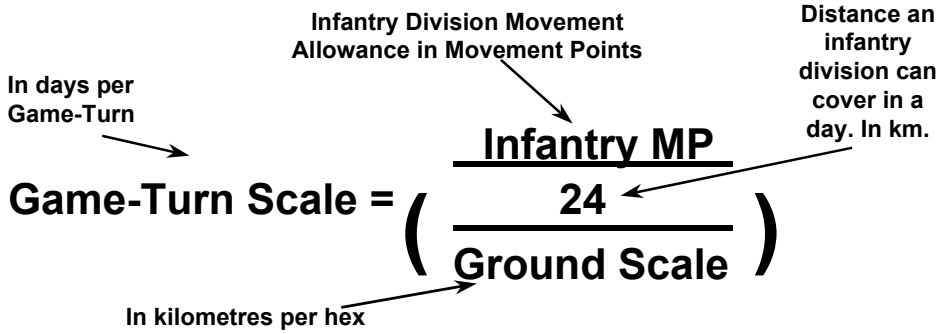



**Equation 9 : Applying the Equation**



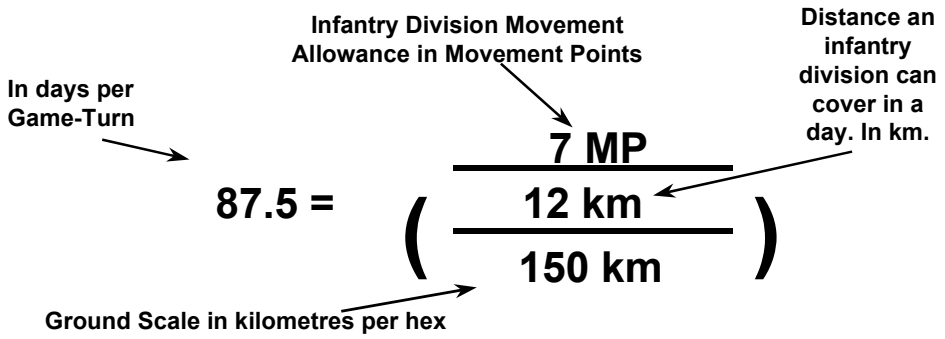

Guess what it all matches up. Isn't science wonderful. Now lets look at game-Turn length and see what we should be doing their.

**Equation 10 : Game-Turn Scale Equation.**



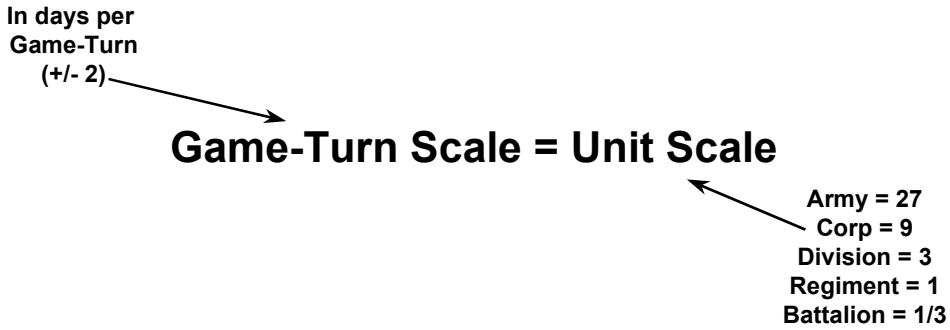

The only thing we need to modify is the distance infantry can travel. This is a strategic game and if you forced infantry to do 24 km for 3 solid months, they simply would not be able to. A more reasonable, but still very high figure, is half this distance. We will use 10 km per day.

**Equation 11 : Applying the Equation**




This is amazing, 87.5 days is almost 3 months so we will be using this as our optimum game-turn scale. Another option is to reduce the infantry movement rate to 5. This allows us to use 60 day game-turns. The choice is really up to the designer, but for the purpose of simplicity I will select 3 month game turns. Using another of my formulas we will discover this is not optimum.

**Equation 12 : Game-Turn Scale Equation**




This equation tells us the optimum game-turn length is 50 days, or if we round to the closest month 2 month game turns. The reason for this is the movement rate for the infantry. A movement rate of 7 is probably too high, a better movement rate is 5. But as I indicated earlier for the sake of reducing the length of the game down from 36 to 24 Game-Turns I think I will ignore my optimum rule.

We need to now look at the movement rates of armour, or mechanised. Using my standard formula armour should be able to move 40 km per day, or have a movement rate of 23 MP's. We could do this by having a movement rate of 12 and a mechanised movement phase. Luckily in reality armour could not maintain these types of advances over any long period of time. We have permission to discount these movement allowances dramatically, possibly a movement allowance of 9 with a mechanised movement phase.

These seem like enormous distances, but it must be remembered these are unopposed distances. When opposed by the enemy zones of control will dramatically reduce the movement, and if we look at the German advance into Russia the Germans should average a maximum advance of 12 km per day, or a movement allowance of 7.

We are dealing with such large numbers simply because of my decision to go for 3 month game-turns. It would be better all-round if I decreased the map scale to 81 km per hex and made each game turn either 2 months or 1 month. However I don't have that luxury and I

need to overcome this scale imbalance with some crafty rule fudges. In this case I need to look at Zones of control very carefully and possibly introduce some sort of attrition or cost for armour to use both movement phases, to represent wastage.

# [3.0] Units

Lets now look at the units. We need to make some basic decisions, the first being the composition of the units in turns of steps. I have decided to use steps, four per counter to be exact. So the first decision has been made. I need to have armour, or mechanised and infantry. I will add some additional unit types such as paratroopers, partisans, etc. But these are all part of the special rules so I will not cover these in this section.

I will need to place on the counter a movement rate, as well as combat or step value. Because I have selected steps which are made up of formations, in this case divisions, I need to somehow reflect the true combat effectiveness of these steps. After all an Italian division is probably not as effective as a German divisions. So in summary their needs to be a combat value which is separate from the step value. A good example is to compare the CQ value of German and Polish Infantry divisions. If we are saying a single infantry step equals a 4 division Corp, lets look at the true combat effectiveness of a Polish step versus a German step.

**Table 90 : German & Polish Infantry Step CQ.**

| Formation | Soft CQ | Soft Attack CQ | Hard CQ |
|---|---|---|---|
| German Step (4xDiv) | 42,264 | 42,344 | 9,908 |
| Polish Step (4xDiv) | 18,892 | 18,892 | 4,760 |

Using this table if we assume a Polish step has a combat strength of 1, then a German step will have a combat strength of 2.2.

Their are two ways of reflecting this in a game. You can simple have a flexible unit scale, so a German step is actually equal to 3 divisions while a Polish step is equal to 6 divisions. Coupled with this you need to have flexible stacking levels, so the Germans can stack 4 steps while the Polish only 2 steps. World War II does this by breaking down all nations into three groups;

> **Germans and later Allies**: 4 Step units possible, which allow stacking of 8 steps.
> **Early Western Allies and mid period Russians** : 3 Step units, which allow stacking of 6 steps.
> **Early Russians, Italians and all minors** : 2 Step units, which allow stacking of 4 steps.

This works up to a point, but the great difficult of this is when we compare divisions of similar sizes, but very different combat effectiveness due to equipment and morale, we end up with historically unbalanced losses. Russian 1941 divisions were as large as German ones, but not where near as effective. As a result twice as many need to make up a step and stacking is halved. But when a Russian unit loses one step, they actually lose about 120,000 men while a German step loss only represents 60,000 men. The other problem is we don't have a feel of the real forces involved and the quality differences between the two armies using this system. However I need to admit it does work and World War II proves it works very well.

The other method is to separate the step value from the combat value. So a Polish step will have a combat value of 1, while a German step will have a combat value of 2. Using this system we could break down our nations into the following groups;

Germans, British, US and Guards Russians : 4 SPs per step.
French, Standard Russians : 3 SPs per step.
Early Russians, Italians, All other minors : 2 SP per step.

The advantage of this system is it removes special rules and allows greater flexibility. In World War II their are special rules which govern when different nations can create larger units. In addition their are strict stacking and un-stacking rules which have the affect of making unit sizes significant, rather than allowing free breaking down and building up of steps. The second system eliminates most of these rules, replacing them with a chart showing when different units can be build. However the most important difference is allowing different unit qualities in each army at the same time.

The Russians can have Guards units which are better than standard units. The Germans can have militia units which are less effective than standard units, but which can be raised quickly. The Italians can have a single good unit, which represents the mechanised forces sent to Africa, which leaving the bulk of their army as poor quality. Most importantly armoured formations can be especially powerful if historically accurate, although in our game their unit scale is less so this may not be required.

Their is another side to the coin. The World War II system is simpler and requires less units. It also makes it easier for combat, as the values are low. 8 steps equal 8 SPs, versus 8 step equalling 32 SP's.

After considering all the pro's and cons I will go with the more detailed latter system. Their are many reasons why I want to do this, apart from historical accurate. The most important is the combat results table I wish to employ. It will be a simultaneous loss odds system.

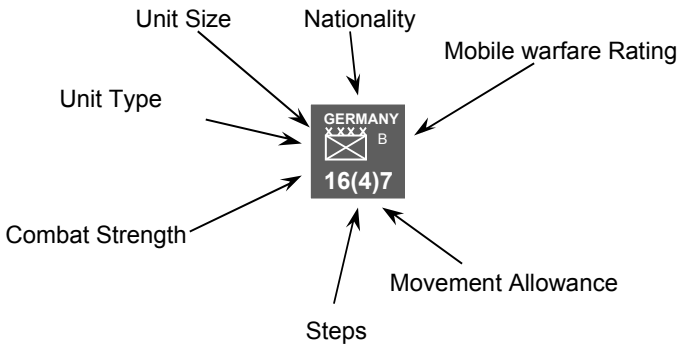
## *Special Values*

The final figure I want to place on the counter is a Mobile Warfare value. One special rule I liked a lot was rating all units into their ability to perform mobile warfare. This way we can have as many armour in the French army in 1940 as the Germans, but their mobile warfare rating can be low and as a result they can't fight as effectively. It always annoyed me the French were not allowed to have armour in 1940, when they clearly did. The other annoying factor was armour type. The British army was always fully motorised, but being motorised does not give you the ability to engage in the same type of mobile warfare as armour. The final factor were units clearly in no condition to battle in a mobile form, such as static French divisions. These divisions would never be able to overrun anyone.

I will allocate three mobile warfare values, A, B and C. A means the formation was designed and trained to fight in this manner. B means the formation had the capability, but were not specifically trained or designed to perform this task and C means their was no way this formation could perform in this manner. The effect would be restricted to overrun effects, so a A class unit suffered a minimal disadvantage overrun while a C unit was not able to perform this as all. You could also link in advance after combat rules and such like.

You could reflect this with special rules, French armour in 1940 are rated B, while in 1943 this goes up to A. But this means flexibility is lost, so we can't have a mix of A and B value units in a single army. The disadvantage is the number of units have just gone up. I will however accept this disadvantage.

**Figure 44 : The Final Units**




About the only part I may consider changing is the unit type, I could use a silhouette instead of this unit symbol.

# [4.0] Sequence of Play

The big decision here is if I should go for a standard move-combat-mech move sequence, or if I should do a simpler move-combat and have strong overruns. For a variety of reasons I will go with the former. This is mainly due to the high movement rates I would need to implement if armour has to do all its movement in a single phase. Also excessively strong overruns may have the effect of creating a volatile unstable games, which could quickly degenerate into silliness if a simple mistake was made. I felt the game was volatile enough without going overboard, so a standard Move - Combat - Mech Move sequence will be my selection in this game.

# [5.0] Movement

We have already discussed movement in the scale area. The standard movement rates will be;

Infantry : 7 MP's
Armour : 9 MP's (x2)

These values may seem excessive, however the map I am selecting will have lots of rivers which could help to slow things down, as well as other terrain. We could also consider modifying these values for historical reasons, such as giving French and soviet infantry a lower movement rate, such as 6 MP's for infantry. Finally weather conditions will affect movement in a downward manner.

# [6.0] Overruns

Overruns, these will be essential in allowing the rapid advances necessary. The German blitz into France and Russia require opposed advances of between 4 and 5 hexes. A historical game should allow the Germans to pocket large Russian armies using overruns and allowing the infantry to attack the out of supply Russians. On the other hand an excessively effective overrun rule will unstableness the game, so we need to consider this carefully. One ally we have it our mobile warfare value, this will restrict the units which can overrun. Coupled with zones of control and terrain effects we should allow a fairly powerful overrun rule.

This needs to be coupled with the CRT, but rules such as the following;

A Class : Overruns shift two columns and pay an additional +2 MPs for overruns.
B Class : Overruns units are halved. Pay an additional +4 MPs to overrun.

## [7.0] Stacking

Stacking will be simply 3 units. One option I have is to allocate a stacking based on steps, such as 12 steps per hex. This would also work and would require less rules and be more flexible and historical. The only problem is that it may allow excessive stacks. The other problem in counter mix confusion. Most of the rules I have discussed has increased the counter mix and type, such as the mobile warfare rating, etc. Having stacks of 6 different units, with 2 steps each, simple will make life difficult for players when they try and work out what the attack/defence strength of stacks are.

You could probably use both systems equally well and I will probably opt for the simpler system of 3 units per hex. This is actually required considering the type of ZOC I wish to utilise, a strong fixed variety.

## [8.0] Zones of Control

The games so far is shaping up to be a volatile one. With high movement rates and effective overruns rules, as well as mechanised movement rules, we need something to stabilise things. This is where zones of control come in. Because we have established the correct stacking/unit/ground scales we need to make zones of control powerful. Their should be no ZOC to ZOC movement allowed and ZOC will be fixed with limited disengagement. This is mainly designed for the Eastern Front. If we look at army level the German armies did not swap front line positions too much. Unless the ZOC is fixed and only limited disengagement allowed we can end up with units freely swapping front line positions, especially considering the high movement allowance. The distance between Stalingrad and Leningrad is only 12 hexes, so an armoured unit could do this in a single game turn even if it had to pay hefty exit and enter ZOC costs.

## [9.0] Combat

The differential CRT used in World War II had a major flaw, losses were identical for a given differential irrespective of the forces involved. In addition as we have divorces steps from combat strength the values we are dealing with have increased dramatically. A German stack of 3 units could total 48 SP's, which is too high a figure for odds. So I will be employing an odds system to start off with.

The next step is how to specify losses. We have two basic systems, the dual loss system where both defender and attack could lose steps and the mandatory loss system, where only the defender suffers and must take certain losses before given a chance to select retreats. The later system will not work with a strategic game at all, due to the high number of steps in a hex. We need to employ the dual loss system, but we are once again left with the problem of losses being identical for a given odds, irrespective of the forces involved.

Lets investigate the seriousness o the problem first. If the step range is low enough this problem is not serious, as the possible range of attack/defender is limited. In Leningrad, where the system works very well, you can place 6 steps in a single hex. The Russians can only place 3 steps in a hex and are almost always the defender. The defenders strength is the key

here so we can see the range is 1 to 3. In our WWII 2nd Edition the range is 1 to 12 steps, which is too great a range. The maximum possible range is probably 1 to 6, once above this and the problem becomes annoying.

What is the answer, the best solution is to use a percentage loss system. Attacker loses 10%, defender losses 60%. Another solution is a simultaneous loss combat system, attacker spins and defender does the same. Results are enemy losses. I feel the percentage loss option is the better one, as long as we provide a percentage loss chart and the number of combats are not excessive we can possibly get away with this.

## [10.0] Terrain & Weather

At this scale terrain should be simple. Clear, rough and prohibited. I have included rivers and made a difference between rough terrain and forest/swamp. In addition I have mountain ranges. Actually I have copied the original World War II, adding rivers and making rough look different from forest/swamp. Now for the hard part, how should terrain affect movement and combat.

We have a volatile system, zones of control can help to restrict this but good terrain rules will also help to slow things down. World War II uses a simple doubling rule for bad terrain. This is probably not a bad idea as it helps to match up with overruns. It makes it very difficult to overrun through bad terrain, which is probably fairly historical. As for mountain Hexside, combat was prohibited. Possibly a bit extreme, it may be better to allow tripling or quadrupling when attacking over these Hexside.

The other affect is movement, we can do some simple rules here;

Cross river Hexside : +1 MP (possibly +2MP for armour)
Rough Terrain : 2MP
Cross Mountain Hexside : +2MP

Weather is another factor to consider. At this scale weather needs to have some hefty effects, in terms of movement and combat. Following the original WWII game seems safe.

## [11.0] Command

At this scale command rules are probably not appropriate. We could have a mansein counter, of a Zukov counter, but their effects would need to be minimal.

## [12.0] Supply

We need a simple supply rule. Unbroken line of hexes to a supply source type of rule. Zones of control can block these lines, which is probably all you need. Units out of supply have movement and combat problems and will be eliminated. Unless formations are supplied by air no pocket ever survived 3 months of being cut off.

## [13.0] Air Power

Air power will almost certainly be needed, especially for the western front. However in order to prevent the game ending up a air game the rules need to be very simple.

# [14.0] Reinforcements

With a game such as this you need to cover many other factors, such as production. The problem with product rules in this style of game is the difficulty of factoring naval and strategic air into it. We could easily have production for Russia as its entire product was concentrated on land combat, thus we do not have to worry about naval or strategic air. But for Germany, who allocated some resources to naval its a bit more difficult. But even here we can factor it in. The real problem is the west, where the bulk of their product was allocated to naval and a significant amount to strategic air.

In a historical game you can simply factor this in also, allocating a reasonable amount of product point each turn to build the land forces that were required, but as soon as we exit the historical area we can have problems.

The best overall solution is to have a simple and easy to use product system for all nations and to have special rules to cater for the unusual.

# Designing an Operational Level Game

The next game design I wish to cover is an Operational Level WWII game. The use of the word operational is possibly a bit misleading, as the objective I have in mind is no less than the redesign of an old classic, Europe at War. This was actually a strategic level game, but its scale was closer to the operational level games that were published before and after this classic. A more accurate description would be to call the game Corp/Division level.

The original War in Europe, and its part games War in the East and War in the West, suffered from some major scale issues. The game originated from War in the East, which covered a theater of war which saw very thin lines of defence. Projected onto the western theater it proved almost impossible to deploy all the availiable divisions into the availiable front line. It was impossible to achieve historically accurate frontages.

The game was also very old and basically utilised the Kursk System, which started out in 1970 and by 1976 was basically obsolete. War in the East was designed in 1974 and this game pushed the old Kursk System beyond its ability. So the second issue is the adoption of a more modern Game System. This was attempted in 1979 with the publishing of Leningrad. This game utilised the same scale, but used a very different game system which made the game system far more enjoyable to play. It still had many scale issues, but this game did a good job hiding these flaws.

The other problems are more preference related, the air system was too abstract and the changing CRT idea didn't feel right.

## A Look at War in Europe

We need to first analise War in Europe and compare it with some more modern, but similar games.

| **Game Mechanic** | **War in the East** | **Leningrad** | **NATO (VG)** |
|---|---|---|---|
| Year Published | 1974 | 1979 | 1983 |
| Game Turn Scale | 1 week | 1 week | 1 day |
| Hex Scale (km) | 33 km | 33 km | 25 km |
| Unit Scale | Corp/Div | Div | Div/Br |
| Inf Move | 5 or 4 | 5 or 6 | 23 |
| Mech Move | 8 or 6 | 7 or 8 | 4 or 5 |
| ZOC Type | Elastic | Locked | Rigid |
| ZOC Generate | General | General | Complex |
| ZOC Enter | +2 MP | Stop | +1 MP |
| ZOC Leave | +2 MP | Combat | +1 MP |
| ZOC to ZOC | +4 MP | Prohibited | Prohibited |
| CRT Step | No | Yes | Yes |
| CRT Type | Descriptive | C&C | C&FG |
| CRT Die | 6 | 6 | 6 |
| CRT Mech | Odds | Odds | Odds |
| Stack Type | Simple | Simple | Complex |
| Stack Rate | 3 or 4 units | 3 units | 6 steps |
| 2-1 or +2 : 1 | Ae | -/1 | 1/- |
| 2-1 or +2 : 2 | Ax | 1/2 | 1/- |
| 2-1 or +2 : 3 | Ax | 2/2 | 1/1r |
| 2-1 or +2 : 4 | Br | 1/1 | 1/1r |

| | | | |
|---|---|---|---|
| 2-1 or +2 : 5 | Br | 2/1 | 2/1 |
| 2-1 or +2 : 6 | Dr | 1/- | 1/1 |
| Seq of Play Mechanic | Complex | Simple | Simple |
| Seq of Play Phases | 3 | 2 | 2 |
| Sequence of Play | Move | Move | Move |
| | Combat | Combat | Combat |
| | Mech | | |
| Overrun Type | Simple | Complex | NA |
| Overrun Cost | 13-1 & +2 MP | 3MP & 2 shift | NA |
| Supply Type | Variable | Variable | Complex |
| Supply Features | RR, Rail, Depot | 5 MP to road | |
| Supply Effect | Reduced | Reduced | Reduction |
| Unit Type | Simple | Detailed | Simple |
| Unit Data | Attack-Movement | Attack/Defence/Move | Combat/Move |

War in the East and Leningrad are chosed, as they reflect the type of game system I wish to design. NAT, by Victory Games, was included simply because the ground scale was similar, however apart from that there is little commonality with this game and what I wish to achieve. It was selected for comparison purposes only.

# [2.0] Game Scale

Our starting point will be the map scale. The game will take up more than one map sheet, so map size is not an issue for this game. The issue is game scale, what scale shall we utilise. It will be similar to the original War in the East, but will need to be carefully balanced with the unit scale selected, which will be also similar to War in the East.

Just to show you the problems with War in the East's scale lets look at scale and hex frontage. Each hex is eqivalent to 33 km and the stacking is 4 German Divisions. Each Division could defend 9 km, which means that 3.7 Divisions would optimaly defend in a single hex. So the stacking limit of 4 matches up with relaistic defensive frontages. In attack a divisions frontage would be typically 3 km, which means we should allow up to 11 Divisions to attack out of a single hex. This is not possible in the original War in the East.

One answer is to increase stacking to 11, and this is indeed part of the answer. A better number is 9, as this is about equal to three corp's of 3 divisions. Another option is 12, which is four corps of 3 divisions. If we use 9 divisions per hex, we need a ground scale of 27 km to the hex, if we use 12 divisions per hex the game scale should become 36 km per hex.

To decide on the best option we next need to look at Armoured formations. The Panzer Divisions optimum attack frontage ranged from 3 to 6 km. At 3 km its depth was inspiring, as it was in the invasion of France in 1940, while at 6 km the depth decreased to a more reasonable level as it did at Kursk in 1943. In either example the stacking for Panzer divisions needed to be far less than infantry, probably ½ to 1/3 the stacking level. So in this case the stacking/ground scale matrix looks as follows;

**Table 91 : Stacking & Ground Scale Matrix**

| **Formation** | **27 km per hex Stacking** | **36 km per hex Stacking** |
|---|---|---|
| Infantry Division | 9 | 12 |
| Panzer Division | 3 | 4 |

We now approach our first major decision point. In simple terms we can say infantry scale is Corp and Armoured Scale is Divisions. In this case the option is between a stacking limit of 4

or 3. The optimum stacking is 3, but a stacking of 4 means we end up with a much more managablly sized map. The lower stacking option would result in a more operational game, with more tactical activity, while the higher stacking option would result in a more abstract game.

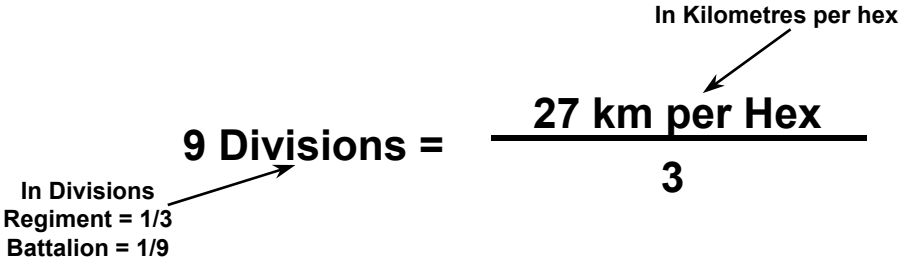
Lets look at the french frontieer. The border between Germany and France/Belgium is about 480 km. About 60% of this is the Magiot line, leaving us with an active frontage of 160 km. We can probably add an additional 160 km for Holland's Peel line. This leaves us with the following ratios of hex's to scale.

**Table 92 : France 1940 Campaign frontage**

| **Frontage** | **km** | **27 km per hex Hex frontage** | | **36 km per hex Hex Frontage** | | **War in Europe** |
|---|---|---|---|---|---|---|
| Magiot Line | 320 | 12 | (11.9) | 9 | (8.9) | 9 |
| Belgium | 160 | 6 | (5.9) | 4 | (4.4) | 5 |
| Netherland | 160 | 6 | (5.9) | 4 | (4.4) | 5 |
| **TOTAL** | | **20** | | **17** | | **19** |

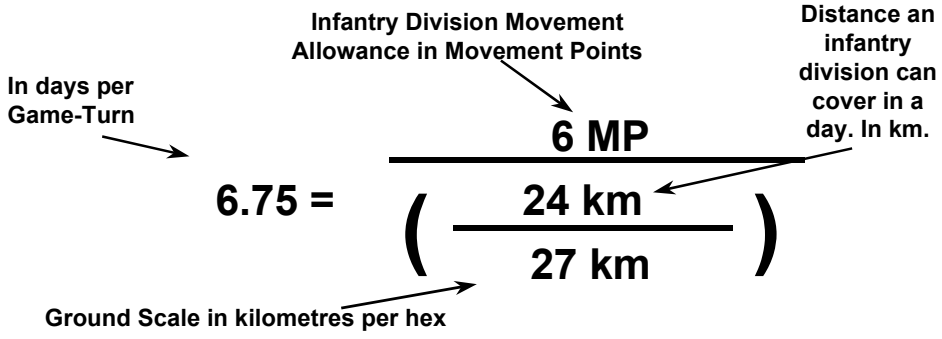
At this point in time I must favour the higher scale of 27 km to the hex, simple because I feel the greater map area would result in a more dynamic and enjoyable game, while the increase in map size can be handled by better map organinsation and removing unneccessary pieces. I may be wrong, but for this game the lower stacking limit wins.

**Equation 13 : War In Europe II Unit Ground Scale**




With the ground scale and stacking determined we can now determine average infantry movement rates and game turn scale.

**Equation 14 : War in Europe II Game-Turn Scale**




If we pick 6 MP's we will end up with a Game-Turn Scale of 6.75. If we use a Game-Turn scale of 7 days our average infantry rate rises to 6.2 MP's.

# [3.0] Units

Lets now look at the units in the game. We have already decided the basic scale will be Infantry Unit = Corp, Armour/Mechaninsed = Division. The infantry should be allowed to break down into divisions when necessary, so our basic unit of measure remains the division. The real strength of divisions varied a great deal, as much as a factor of 2, thus each strong division need up to 2 steps, while a weak division remains 1 step. Lets look at examples of strong and weak divisions.

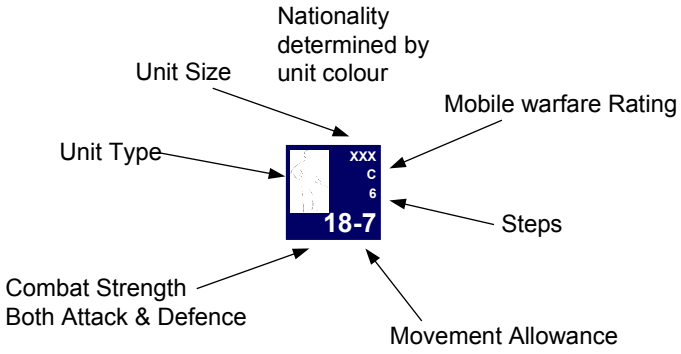
**Table 93 : CQ ratings of German and Polish Regular Infantry Division (1939)**

| Formation | Soft Def CQ | Soft Atk CQ | Hard Def CQ | Air Def CQ |
|---|---|---|---|---|
| German Infantry Division (2nd Wave) | 10,204 | 10,224 | 2,471 | 897 |
| Polish Infantry Division (Regular) | 4,091 | 4,091 | 1,179 | 572 |

While we don't see an exact 2 to 1 ratio, we would only give the Polish divisions one step and the Germans 2 steps. The German step would be a greater value than a Polish step. So if we assume the German infantry division strength is 6, or two steps of 3, the Polish division's strength would be 2 to 3, or an average strength of 2.4.

As for the values on the counters, you need attack, defence, movement, steps and a mobility value. You could include AA and AT values, but at this scale that is probably unneccessary. In most cases attack and defence would be the same. Historical designations at this level would not make any sense either, so those would be ignored apart from special cases such as SS and Guards. You would probably go for a sillohette rather than a military symbol if no historical designations are used. This should give the game a better feel, although it would make it less histroically accurate.

**Figure 45 : Example Unit**



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# Appendix A : S&T Games Published

**Table 94 : Games Published during the years of Discovery in S&T.**

| Game | S&T | Year | Designer(s) |
|---|---|---|---|
| The Battle of Moscow | 24 | 1970 | David Williams |
| Centurian | 25 | 1971 | |
| Grunt | 26 | 1971 | |
| Fall of France* | 27 | 1971 | |
| Lost Battles | 28 | 1971 | James F Dunnigan |
| USN | 29 | 1971 | James F Dunnigan |
| Combat Command | 30 | 1972 | |
| Flying Circus | 31 | 1972 | |
| Borodino | 32 | 1972 | |
| Winter War | 33 | 1972 | James F Gott |
| Armageddon | 34 | 1972 | |
| Year of the Rat | 35 | 1972 | John Padros |
| DAGC | 36 | 1973 | |
| Scrimmage | 37 | 1973 | James F Dunnigan |
| CA | 38 | 1973 | James F Dunnigan |
| The Fall of Rome | 39 | 1973 | John Michael Young |
| PanzerArmee Africa | 40 | 1973 | James F Dunnigan |
| KampfPanzer | 41 | 1973 | James F Dunnigan |
| The East is Red | 42 | 1974 | James F Dunnigan |
| The American Civil War | 43 | 1974 | James F Dunnigan |
| Tank (Expanded Rules) | 44 | 1974 | |
| Operation Olympic | 45 | 1974 | James F Dunnigan |
| Combined Arms | 46 | 1974 | James F Dunnigan |
| WolfPack | 47 | 1974 | James F Dunnigan |
| Sixth Fleet | 48 | 1975 | |
| Frederick the Great | 49 | 1975 | Frank Davis & Edward Curran |
| Battle for Germany | 50 | 1975 | James F Dunnigan |
| World War 1 | 51 | 1975 | James F Dunnigan |
| Oil War | 52 | 1975 | James F Dunnigan |
| The Punic Wars | 53 | 1975 | Irad B Hardy |
| Dixie | 54 | 1976 | Redmond A Simonsen |
| Breitenfeld | 55 | 1976 | J.A Nelson |
| Revolt in the East | 56 | 1976 | James F Dunnigan |

**Table 95 : Games Published during the Years of Development in S&T.**

| Game | S&T | Year | Designer(s) |
|---|---|---|---|
| Panzergruppe Guderian | 57 | 1976 | James F Dunnigan |
| Conquistador | 58 | 1976 | Richard Berg |
| The Plot to Assassinate Hitler | 59 | 1976 | James F Dunnigan |
| Road to Richmond | 60 | 1977 | Joe Angiolillo |
| October War | 61 | 1977 | Irad B Hardy |
| South Africa | 62 | 1977 | Irad B Hardy |
| Veracruz | 63 | 1977 | Richard Berg |
| RAID | 64 | 1977 | Mark Herman |
| Cobra | 65 | 1977 | B.E Hessel |
| Constantinople | 66 | 1978 | |
| Kharkov | 67 | 1978 | Stephen B Patrick |
| Stonewall | 68 | 1978 | Mark Herman |
| Tannenberg | 69 | 1978 | David C Isby |
| Crusades | 70 | 1978 | Richard Berg |
| Armada | 71 | 1978 | Sterling S Hart |
| Cassino | 72 | 1979 | John Padros |
| Panzer Battles | 73 | 1979 | Thomas Walczyk |
| Ney v Wellington | 74 | 1979 | Joseph M Balkoski |
| Napoleons Art of War | 75 | 1979 | Bob Jervis & Omar DeWitt |
| The China War | 76 | 1979 | Brad Hessel |
| Paratroops | 77 | 1979 | John H Butterfield |

**Table 96 : Games Published during the Years of Professionalism in S&T.**

| Game | S&T | Year | Designer(s) |
|---|---|---|---|
| Pattons 3rd Army | 78 | 1979 | Joseph M Balkoski |
| Berlin 85 | 79 | 1980 | James F Dunnigan |
| Wilson's Creek | 80 | 1980 | Wilson's Creek |
| Tito | 81 | 1980 | Dick Rustin |
| Fifth Corp | 82 | 1980 | James F Dunnigan |
| Operation Grenade | 83 | 1980 | Joseph M Balkoski |
| The Kaiser's Battle | 84 | 1981 | Joseph M Balkoski |
| Fighting Sail | 85 | 1981 | Joseph M Balkoski |
| Cedar Mountain | 86 | 1981 | David Bush, Jim Simon & Anthony Williams |
| The Desert Fox | 87 | 1981 | Richard Berg |
| BAOR | 88 | 1981 | Charles T Kamps Jr |
| Sicily | 89 | 1981 | Dick Rustin |
| Monmouth | 90 | 1982 | Dr David Martin, Leonard Millman & Eric Lee Smith |

**Table 97 : Games Published during the Years of Chaos in S&T. (TSR)**

| Game | S&T | Year | Designer(s) |
|---|---|---|---|
| RDF | 91 | 1983 | Mark Herman & Joseph Reiser |
| Iwo Jima | 92 | 1983 | David Rohde & Gary Gillette |
| The American Civil War | 93 | 1983 | Bruce Shelley & Joseph Reiser |
| Nord Kapp | 94 | 1983 | Charles T Kamps |
| Soldiers of the Queen | 95 | 1984 | Richard Berg |
| Singapore | 96 | 1984 | Charles T Kamps |
| Trail of the Fox | 97 | 1984 | Douglas Niles |
| Central Command | 98 | 1984 | Charles T Kamps |
| Thunder at Lutzen | 99 | 1984 | Bowen Simmons |
| Superpowers at War | 100 | 1985 | David Cook & Douglas Niles |
| Cromwells Victory | 101 | 1985 | James Ritchie |
| Monty's D Day | 102 | 1985 | John Padros |
| The Road to Vicksburg | 103 | 1985 | Robert Land |
| The Colonies in Revolt | 104 | 1985 | Richard Berg |
| Ruweisat Ridge | 105 | 1986 | Douglas Niles |
| The Red River Campaign | 106 | 1986 | |
| Warsaw Rising | 107 | 1986 | John Padros |
| Remember the Maine | 108 | 1986 | Vance Von Borries |
| Target Libya | 109 | 1986 | David James Ritchie |
| Hastings, 1066 | 110 | 1987 | Richard Berg |

**Table 98 : Games Published during the Years of Chaos in S&T. (WWW)**

| Game | S&T | Year | Designer(s) |
|---|---|---|---|
| Korea, the Mobile War | 111 | 1987 | David J Ritchie |
| Patton goes to War | 112 | 1987 | Vance Von Borries |
| The Battle of Abensberg | 113 | 1987 | Keith Poulter |
| The Battle of Eckmuhl | 114 | 1987 | Keith Poulter |
| Kanev | 115 | 1987 | John Padros |
| Manchu | 116 | 1988 | Richard H Berg |
| North German Plains | 117 | 1988 | Ty Bomba |
| The Tigers are Burning | 118 | 1988 | Charles T Kamps |
| The Horse Soldiers | 119 | 1988 | Richard H Berg |
| Nicaragua | 120 | 1988 | John D Burtt & Joseph Miranda |
| The Indian Mutiny | 121 | 1988 | Robert Markham & Mark Seaman |
| Pegasus Bridge | 122 | 1988 | Robert Markham & Mark Seaman |
| Campaigns in the Valley | 123 | 1988 | Robert Markham & Mark Seaman |
| Fortress Stalingrad | 124 | 1988 | Ty Bomba |
| The Far Seas | 125 | 1989 | Marting Anderson |
| Beirut 82 | 126 | 1989 | Thomas M Kane |
| Rush for Glory | 127 | 1989 | |
| Africa Orientale | 128 | 1989 | Jeff Brown |
| Harvest of Death | 129 | 1989 | Dr David Marting & Leonard Millman |
| The Battle of Tsushima | 130 | 1989 | Jack Greene |
| Donau Front | 131 | 1989 | Charles T Kamps |
| Iron Cross | 132 | 1990 | Mark Sprock |
| Baton Rouge | 133 | 1990 | Richard Berg |
| Anzio | 134 | 1990 | Dave Williams |
| Sideshow | 135 | 1990 | Richard Berg |
| Doomed Victory | 136 | 1990 | Gary C Morgan |
| Men at Arms | 137 | 1990 | James F Dunnigan & Albert A Nofi |
| Napoleon at Eylau | 138 | 1990 | Ken Broadhurst |
| Arabian Nighmare | 139 | 1990 | Austin Bay |

**Table 99 : Games Published during the Years of Chaos in S&T. (Decision)**

| Game | S&T | Year | Designer(s) |
|---|---|---|---|
| Objective Tunis | 140 | 1991 | Vance Von Borries |
| Hannibal : The 2nd Punic War | 141 | 1991 | John Sutcliffe |
| Tarawa | 142 | 1991 | Michael Joslyn |
| Rio Grande | 143 | 1991 | Richard Berg |
| Chad | 144 | 1991 | LtCol Richard Davis |
| Trajan | 145 | 1991 | Joseph Miranda |
| Sicily | 146 | 1991 | John Schettler |
| Holy War : Afghanistan | 147 | 1991 | Joseph Miranda |
| Cropredy Bridge | 148 | 1992 | Dr Michael J Grace |
| The France-Prussian War | 149 | 1992 | Joseph Miranda |
| Salerno | 150 | 1992 | John Schettler |
| Vittoria & Friedland | 151 | 1992 | Vance Von Borries & Joseph Miranda |
| Case Green | 152 | 1992 | John Desch |
| Felix & Zama | 153 | 1992 | Christopher Cummins & Larry Baggett & Wayland Grace |
| The Russo-Turkish War | 154 | 1992 | Joseph Miranda |
| Anzio | 155 | 1992 | John Schettler |
| White Eagle Eastward | 156 | 1992 | Thomas Kane & Christopher Cummins |
| Roman Civil War | 157 | 1993 | Joseph Miranda |
| Red Sun/Red Star | 158 | 1993 | Mark Stille |
| Zeppelin | 159 | 1993 | William Koff & Mike McVeigh |
| MedWar | 160 | 1993 | John Schettler |
| Successors | 161 | 1993 | |
| Clontarf & Saipan | 162 | 1993 | Adrian McGrath & Erich Faust |
| The 7 year War in Europe | 163 | 1993 | Joseph Miranda |
| Balkan Wars | 164 | 1993 | Joseph Miranda |
| Caesar in Gaul | 165 | 1993 | Joseph Miranda |
| The Seven Days Battles | 166 | 1994 | Rob Markham |
| The Austro-Prussian War | 167 | 1994 | Joseph Miranda |
| Operation Shock Troop | 168 | 1994 | Perry Moore |

# Appendix B - Game System Details

**Table 100 : Scale & Movement**

| Game | Game Turn Scale | Hex Scale (km) | Unit Scale | Inf Move | Mech Move |
|---|---|---|---|---|---|
| **Years of Discovery** | | | | | |
| The Battle of Moscow | 1 week | 20 | Div/Army | 4/3 | 8/4 |
| Kursk | 2 days | 21 | Div/Corp | 5/4 | 8/6 |
| Normandy | 1 day | 2 | Batt/Br | 2/4 | 6/12 |
| Turning Point | 2 days | 16 | Div/Corp | 5/4 | 8/6 |
| The Moscow Campaign | 2 days | 9.6 | Div/Corp | 5/4 | 8/6 |
| DAGC | 2 days | 16 | Div/Corp | 5/4 | 8/6 |
| NATO | 2 days | 16 | Br/Div | 4 | 8/6 |
| The Ardennes Offensive | 1 day | 3.15 | Br/Reg | 4 | 10/12 |
| War in the East | 1 week | 33 | Div/Corp | 5/4 | 8/6 |
| **Years of Development** | | | | | |
| All Modern Battles Quad | 12 hours | 1.6 km | Batt/Br | 6 | 12 |
| Panzergruppe Guderian | 2 days | 10.5 km | Div | 6/7 | 10 |
| Drive on Stalingrad | 7 days | | Reg/Div | 8/9 | 12/13 |
| Cobra | 3 days | 3.2 km | Reg/Div | 6/9 | 12 |
| Kharkov | 1 day | 6.9 km | Reg/Div | 7/8 | 11/12 |
| Kiev | 2 days | 8 km | Reg/Div | 6/7 | 10 |
| Korsun | 2 days | 7.5 km | Reg/Div | 5 | 8 |
| Operation Star | 5 days | 10.5 km | Reg/Div | 6/7 | 8/10 |
| Rostov | 5 days | 17 km | Reg/Div | 8 | 7/10 |
| Leningrad | 7 days | 33 km | Div | 5/6 | 7/8 |
| Kursk | 2 days | 10 km | Div/Reg | 4/5 | 7/8 |
| **Years of professionalism** | | | | | |
| Pattons 3rd Army | 1 day | 2.6 km | Br/Batt | 4 | 12/14 |
| Operation Grenade | 1 day | 2.4 km | Br/Batt | 4 | 12/14 |
| Fifth Corps | 12 hours | 4 km | Batt/Reg | NA | 12/14 |
| Hof Gap | 12 hours | 4 km | Batt/Reg | NA | 12/14 |
| BAOR | 12 hours | 4 km | Batt/Reg | NA | 12/14 |
| **Years of Chaos** | | | | | |
| To the Wolf's Lair | 1 day | 8 km | Div/Corp | 6 | 6 |
| NATO (Victory Games) | 1 day | 25 km | Div/Br | 3 | 4/5 |
| Singapore | 1 week | 25.6 km | Br/Reg | 6/8 | 12 |
| Trail of the Fox | 1 month | 16 km | Div/Batt | 14 | 14/28 |
| Korea | 1 week | 19 km | Div/Reg | 10/12 | 15 |
| Case Green | 2 days | 12 km | Reg/Div | 6 | 8 |
| Artic Storm | 1 week | 24 km | Div/Reg | 3/4 | 5 |
| Victory in the West | 2 days | 11 km | Div/Reg | 6/8 | 9/10 |
| Britain Stands alone | 3 days | 16 km | Div/Br | 5 | 8 |
| North German Plain | 1/3 day | 4 km | Reg/Batt | NA | 6 |
| Donau Front 1/3 day | 4 km | Reg/Batt | NA | 6 | |
| FlashPoint : Golan | 1 day | 4 km | Br/Batt | NA | 6 |
| Ruweisat Ridge | 1 day | 2.4 km | Br/Coy | 9 | 9/12 |
| Patton goes to War | 1/2 day | 3.2 km | Batt/Coy | 5 | 10/12 |
| Objective Tunis | 1/2 day | 3.2 km | Batt/Coy | 5 | 10/12 |
| Sicily | 2 days | 8 km | Br/Batt | 4/6 | 12 |
| Salerno | 2 days | 8 km | Br/Batt | 4/6 | 12 |
| Anzio | 2 days | 8 km | Br/Batt | 4/6 | 12 |

**Table 101 : Zones of Control.**

| Game | ZOC Type | ZOC Gen | ZOC Enter | ZOC Leave | ZOC to ZOC |
|---|---|---|---|---|---|
| **Years of Discovery** | | | | | |
| The Battle of Moscow | Active | Gen | Stop | NA | Proh |
| Kursk | Elastic | Gen | +3 MP | +2 MP | +5 MP |
| Normandy | Elastic | Gen | +2 MP | +3 MP | +5 MP |
| Turning Point | Elastic | Gen | +3 MP | +2 MP | +5 MP |
| The Moscow Campaign | Elastic | Gen | +3 MP | +2 MP | +5 MP |
| DAGC | Elastic | Gen | +2 MP | +2 MP | +4 MP |
| NATO | Rigid | Gen | Stop | 0 MP | Proh |
| The Ardennes Offensive | Rigid | Gen | Stop | 0 MP | Proh |
| War in the East | Elastic | Gen | +2 MP | +2 MP | +4 MP |
| **Years of Development** | | | | | |
| All Modern Battles Quad | Active | Gen | Stop | Combat | Proh |
| Panzergruppe Guderian | Locked | Gen | Stop | Combat | Proh |
| Drive on Stalingrad | Locked | Gen | Stop | Combat | Proh |
| Cobra | Locked | Gen | Stop | Combat | Proh |
| Kharkov | Locked | Gen | Stop | Combat | Proh |
| Kiev | Locked | Gen | Stop | Combat | Proh |
| Korsun | Locked | Gen | Stop | Combat | Proh |
| Operation Star | Locked | Gen | Stop | Combat | Proh |
| Rostov | Locked | Gen | Stop | Combat | Proh |
| Leningrad | Locked | Gen | Stop | Combat | Proh |
| Kursk | Locked | Gen | Stop | +2 MP | Proh |
| **Years of professionalism** | | | | | |
| Pattons 3rd Army | Rigid | Simple | Stop | 1/2 MP's | Proh |
| Operation Grenade | Rigid | Simple | Stop | 1/2 MP's | Proh |
| Fifth Corps | Locked | Simple | Stop | Pay OP's | Proh |
| Hof Gap | Locked | Simple | Stop | Pay OP's | Proh |
| BAOR | Locked | Simple | Stop | Pay OP's | Proh |
| **Years of Chaos** | | | | | |
| To the Wolf's Lair | Rigid | Simple | Stop +1/2MP | NA | Proh |
| NATO (Victory Games) | Rigid | Complex | +1 MP | +1 MP | Proh |
| Singapore | Rigid | Simple | Stop | NA | Proh |
| Trail of the Fox | Rigid | Simple | +1 MP Stop | NA | Proh |
| Korea | Elastic | Simple | +1 MP | +2 MP | Proh |
| Case Green | Rigid | Simple | Stop | NA | Proh |
| Artic Storm | Rigid | Simple | +1 MP | +1 MP | +2 MP |
| Victory in the West | Elastic | Complex | +1 MP | +2 MP | +3 MP |
| Britain Stands alone | Rigid | Simple | Stop | NA | Proh |
| North German Plain | Rigid | Simple | Stop | +1 MP | Proh |
| Donau Front | Rigid | Simple | Stop | +1 MP | Proh |
| FlashPoint : Golan | Rigid | Simple | Stop | NA | Proh |
| Ruweisat Ridge | Open | NA | NA | NA | NA |
| Patton goes to War | Rigid | Simple | Stop | NA | Proh |
| Objective Tunis | Rigid | Simple | Stop | NA | Proh |
| Sicily | Open | NA | Restr | Restr | Proh |
| Salerno | Open | NA | Restr | Restr | Proh |
| Anzio | Open | NA | Restr | Restr | Proh |

**Table 102 : CRT and Stacking**

| Game | CRT Step | CRT Type | CRT Die | CRT Mech | Stack Type | Stack Rate |
|---|---|---|---|---|---|---|
| **Years of Discovery** | | | | | | |
| The Battle of Moscow | No | Desc | 6 | Odds | Simple | 3/2 |
| Kursk | No | Desc | 6 | Odds | Simple | 3 |
| Normandy | No | Desc | 6 | Odds | Simple | 3 |
| Turning Point | No | Desc | 6 | Odds | Simple | 3 |
| The Moscow Campaign | No | Desc | 6 | Odds | Simple | 3 |
| DAGC | No | Desc | 6 | Odds | Simple | 3 |
| NATO | No | Num | 6 | Odds | Simple | 2/3 |
| The Ardennes Offensive | No | Num | 6 | Odds | Simple | 3 |
| War in the East | No | Desc | 6 | Odds | Simple | ¾ |
| **Years of Development** | | | | | | |
| All Modern Battles Quad | No | Num | 6 | Diff | Simple | 1 |
| Panzergruppe Guderian | Yes | C&C | 6 | Odds | Simple | 3 |
| Drive on Stalingrad | Yes | C&C | 6 | Odds | Simple | 3 |
| Cobra | Yes | C&C | 6 | Odds | Simple | 3 |
| Kharkov | Yes | C&C | 6 | Odds | Simple | 3 |
| Kiev | Yes | C&C | 6 | Odds | Simple | 3 |
| Korsun | Yes | C&C | 6 | Odds | Simple | 3 |
| Operation Star | Yes | C&C | 6 | Odds | Simple | 3 |
| Rostov | Yes | C&C | 6 | Odds | Simple | 3 |
| Leningrad | Yes | C&C | 6 | Odds | Simple | 3 |
| Kursk | Yes | C&C | 6 | Sim | Complex | 6 steps |
| **Years of Professionalism** | | | | | | |
| Pattons 3rd Army | Yes | C&FG | 2x6 | Odds | Simple | 3 |
| Operation Grenade | Yes | C&FG | 2x6 | Odds | Simple | 3 |
| Fifth Corps | Yes | C | 6 | Odds | Simple | 2/3 |
| Hof Gap | Yes | C | 6 | Odds | Simple | 2/3 |
| BAOR | Yes | C | 6 | Odds | Simple | 2/3 |
| **Years of Chaos** | | | | | | |
| To the Wolf's Lair | Yes | C&C | 10 | Odds | Complex | 10 SP |
| NATO (Victory Games) | Yes | C&FG | 6 | Odds | Complex | 6 steps |
| Singapore | Yes | Desc | 6 | Diff | Simple | 5 Reg |
| Trail of the Fox | Yes | C&FG | 6 | Odds | Simple | 6 Reg |
| Korea | Yes | C&C | 2x6 | Odds | Simple | 3 Div |
| Case Green | Yes | C&C | 2x6 | Odds | Simple | 3 Div |
| Artic Storm | Yes | C&C | 2x10 | Odds | Simple | 2 Div |
| Victory in the West | Yes | C&FG | 10 | Odds | Steps | 2 Div |
| Britain Stands alone | Yes | C&FG | 10 | Odds | Simple | 3 Div |
| North German Plain | No | Desc | 6 | Odds | Simple | 1/2 |
| Donau Front No | Desc | 6 | Odds | Simple | 1/2 | |
| FlashPoint : Golan | Yes | C | 10 | Odds | Simple | 6 Batt |
| Ruweisat Ridge | No | C | 2x6 | Odds | Simple | 3 |
| Patton goes to War | Yes | Num | 6 | Odds | Simple | 2 Batt |
| Objective Tunis | Yes | Num | 6 | Odds | Simple | 2 Batt |
| Sicily | Yes | C | 6 | Odds | Simple | 2 Br |
| Salerno | Yes | C | 6 | Odds | Simple | 2 Br |
| Anzio | Yes | C | 6 | Odds | Simple | 2 Br |

**Table 103 : CRT Results.**

| Game | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Years of Discovery** | | | | | | |
| The Battle of Moscow | De | Ex | Db2 | Db1 | Ab1 | A-1b2 |
| Kursk | Ax | Ar | Ar | Br | Br | Dr |
| Normandy | Dr | Dr | Ar | Ar | Ar | Ax |
| Turning Point | Ae | Ar | Ar | Br | Br | Dr |
| The Moscow Campaign | Ae | Ae | Ar | Ar | Ar | Ar |
| DAGC | Ae | Ar | Ar | Br | Br | Dr |
| NATO | Dr2 | Dr1 | Dr1 | Ar1 | Ex | Ae |
| The Ardennes Offensive | Dr1 | Dr1 | Dr1 | Ar1 | Ar2 | Ar2 |
| War in the East | Ae | Ax | Ax | Br | Br | Dr |
| **Years of Development** | | | | | | |
| All Modern Battles Quad | D3 | D2 | Ax | Ex | Ex | Br |
| Panzergruppe Guderian | D2 | D1 | D1/A1 | D1/A1 | Eng | A1 |
| Drive on Stalingrad | D2 | D1 | D1/A1 | D1/A1 | Eng | A1 |
| Cobra | -/1 | -/1 | 1/1 | 1/1 | 1/- | 1/- |
| Kharkov | D2 | D1 | D1/A1 | D1/A1 | Eng | A1 |
| Kiev | -/1 | -/1 | 1/1 | 1/1 | Eng | 1/- |
| Korsun | -/1 | -/1 | 1/1 | 1/1 | Eng | 1/- |
| Operation Star | -/1 | -/1 | 1/1 | 1/1 | Eng | 1/- |
| Rostov | -/1 | -/1 | 1/1 | 1/1 | Eng | 1/- |
| Leningrad | -/1 | 1/2 | 2/2 | 1/1 | 2/1 | 1/- |
| Kursk | 1m2 | 2/2 | 2/2 | 3m1 | 3/1 | 3/1 |
| | | | | | | |
| **Years of professionalism** | | | | | | |
| Pattons 3rd Army | A2(2) | D2(1) | D1(1) | D1 | A1(2) | A1(1) |
| Operation Grenade | A2(2) | D2(1) | D1(1) | D1 | A1(2) | A1(1) |
| Fifth Corps | 1/2 | 0/1 | 1/1 | 1/1 | 1/0 | 1/0 |
| Hof Gap | 1/2 | 0/1 | 1/1 | 1/1 | 1/0 | 1/0 |
| BAOR | 1/2 | 0/1 | 1/1 | 1/1 | 1/0 | 1/0 |
| | | | | | | |
| **Years of Chaos** | | | | | | |
| To the Wolf's Lair | 3/- | 3/1 | 3/1 | 2/1 | 2/2 | 2/2 |
| NATO (Victory Games) | 1/- | 1/- | 1/1r | 1/1r | 2/1 | 1/1 |
| Singapore | A1 | A1 | BR | BR | D1 | D2 |
| Trail of the Fox | 1 | 2 | p | d3p | d4p | d3D |
| Korea | 1/- | 1/- | 1/1 | 1/1 | 1/1 | -/1 |
| Case Green | 1/2 | 0/1 | 0/1 | *1/2 | 0/1 | ? |
| Artic Storm | 2/1 | 2/- | 1/- | 2/1 | 1/1 | -/1 |
| Victory in the West | 2/- | 2/1 | 2/1R | P/1 | -/- | 1/1 |
| Britain Stands alone | D2R | D2R | D1 | D1 | A1/D1 | A1/D1 |
| North German Plain | AR | AX | D1 | D2 | D3 | EX |
| Donau Front AR | AX | D1 | D2 | D3 | EX | |
| FlashPoint : Golan | 1/8 | 3/6 | 3/6 | 4/6 | 4/6 | 4/5 |
| Ruweisat Ridge | E/1 | (3)/1 | (2)/- | -/(1) | 1/(3) | 2/(3) |
| Patton goes to War | Dr | Dr | E2 | E1 | Ar | Ar |
| Objective Tunis | Dr | Dr | E2 | E1 | Ar | Ar |
| Sicily | 1/0 | 1/1 | 1/2 | 1/2 | 0/3 | 0/3 |
| Salerno | 1/0 | 1/1 | 1/2 | 1/2 | 0/3 | 0/3 |
| Anzio | 1/0 | 1/1 | 1/2 | 1/2 | 0/3 | 0/3 |

**Table 104 : Sequence of Play**

| Game | SofP Mech | SofP Phases | Sequence of Play |
|---|---|---|---|
| **Years of Discovery** | | | |
| The Battle of Moscow | Simple | 2+2 | Move/Combat/Move (1/2 rate)/Combat |
| Kursk | Complex | 3 | Move/Combat/Mech Move |
| Normandy | Complex | 3 | Move/Combat/Move |
| Turning Point | Complex | 3 | Move/Combat/Mech Move |
| The Moscow Campaign | Complex | 3 | Move/Combat/Mech Move |
| DAGC | Complex | 3 | Move/Combat/Mech Move |
| NATO | Complex | 3 | Move/Combat/Move |
| The Ardennes Offensive | Complex | 3 | Move/Combat/Mech Move |
| War in the East | Complex | 3 | Move/Combat/Mech Move |
| **Years of Development** | | | |
| All Modern Battles Quad | Simple | 2 | Move/Combat |
| Panzergruppe Guderian | Complex | 3 | Move/Combat/Mech Move |
| Drive on Stalingrad | Complex | 3 | Move/Combat/Mech Move |
| Cobra | Complex | 3 | Move/Combat/Mech Move |
| Kharkov | Complex | 3 | Move/Combat/Mech Move |
| Kiev | Complex | 3 | Move/Combat/Mech Move |
| Korsun | Complex | 3 | Move/Combat/Mech Move |
| Operation Star | Complex | 3 | Move/Combat/Mech Move |
| Rostov | Complex | 3 | Move/Combat/Mech Move |
| Leningrad | Simple | 2 | Move/Combat |
| Kursk | Complex | 3 | Move/Combat/Mech Move |
| **Years of Professionalism** | | | |
| Pattons 3rd Army | Simple | 2 | Move/Combat |
| Operation Grenade | Simple | 2 | Move/Combat |
| Fifth Corps | Simult | 1 | Move & Combat |
| Hof Gap | Simult | 1 | Move & Combat |
| BAOR | Simult | 1 | Move & Combat |
| **Years of Chaos** | | | |
| To the Wolf's Lair | Complex | 4 | Move/Reserve Move/Combat/Exploitation |
| NATO (Victory Games) | Simple | 2 | Move/Combat |
| Singapore | Simple | 2 | Move/Combat |
| Trail of the Fox | Complex | 4 | Move/React/Combat / Mech/Mech React |
| Korea | Complex | 3 | Move/Combat/Move |
| Case Green | Complex | 3 | Move/Combat/Exploit |
| Artic Storm | Complex | 3 | Move/Combat/Reaction |
| Victory in the West | Complex | 3 | Move/Combat/Exploitation |
| Britain Stands alone | Complex | 3 | Move/Combat/Mech |
| North German Plain | Simple | 2 | Move/Combat |
| Donau Front | Simple | 2 | Move/Combat |
| FlashPoint : Golan | Simult | 1 | Move & Combat |
| Ruweisat Ridge | Simple | 3 | Move/Reaction/Combat |
| Patton goes to War | Complex | 4 | Move/React/Combat/Move |
| Objective Tunis | Complex | 4 | Move/React/Combat/Move |
| Sicily | Simult | 1 | Move & Combat |
| Salerno | Simult | 1 | Move & Combat |
| Anzio | Simult | 1 | Move & Combat |

**Table 105 : Overrun and Special Rules.**

| Game | Overrun Type | Overrun Cost | Special Rules |
|---|---|---|---|
| **Years of Discovery** | | | |
| The Battle of Moscow | NA | NA | |
| Kursk | NA | NA | Air Bases, KG |
| Normandy | NA | NA | Naval Support, Paratroopers |
| Turning Point | NA | NA | Air Bases, KG, Supply Units |
| The Moscow Campaign | NA | NA | Two CRT's, RR, KG |
| DAGC | NA | NA | railhead, KG |
| NATO | NA | NA | Nuclear |
| The Ardennes Offensive | NA | NA | Paratroopers |
| War in the East | Simple | 13-1 & +2MP | KG/BG, RR, Depots, Multiple CRT |
| **Years of Development** | | | |
| All Modern Battles Quad | NA | NA | Artillery |
| Panzergruppe Guderian | Complex | 1/2s 3 MP | Untried Units, HQ, Div integrity |
| Drive on Stalingrad | Complex | 1/2s 3 MP | Trucks, HQ's, Untried Units, Div integrity, Air Bases, Hitler rules |
| Cobra | Complex | 1/2s 3 MP | HQ, Div integrity |
| Kharkov | Complex | 1/2s 3 MP | Untried Units, HQs, Div integrity |
| Kiev | Complex | 1/2s 3 MP | Untried Units, HQ's, Div integrity |
| Korsun | Complex | 1/2s 3 MP | HQ's, Div integrity, Supply Depot |
| Operation Star | Complex | 1/2s 3 MP | HQ's, Div integrity |
| Rostov | Complex | 1/2s 3 MP | Untried Units, HQ's, Div integrity |
| Leningrad | Complex | 3 MP 2 sh | Untried Units, Forts, Corp integrity |
| Kursk | Complex | 3 MP | Artillery, HQ, Partisans |
| **Years of professionalism** | | | |
| Pattons 3rd Army | NA | NA | Artillery, Limited Intelligence |
| Operation Grenade | NA | NA | Artillery, Limited Intelligence |
| Fifth Corps | Complex | -1 def loss | Artillery, Helicopters, Nuclear Wp |
| Hof Gap | Complex | -1 def loss | Artillery, Helicopters, Nuclear Wp |
| BAOR | Complex | -1 def loss | Artillery, Helicopters, Nuclear Wp |
| **Years of Chaos** | | | |
| To the Wolf's Lair | NA | NA | HQ, Trucks, |
| NATO (Victory Games) | NA | NA | HQ |
| Singapore | NA | NA | |
| Trail of the Fox | Simple | 10-1 | Trucks, Supply Dumps |
| Korea | NA | No | HQ |
| Case Green | NA | NA | |
| Artic Storm | NA | NA | HQ, Paratroops |
| Victory in the West | Fine Grain | +2 shift | HQ, Panic, Refugees, Paratroops |
| Britain Stands alone | Complex | +2 MP (Mech) | Air, Naval |
| North German Plain | NA | NA | Helicopters |
| Donau Front | NA | NA | Helicopters |
| FlashPoint : Golan | NA | NA | HQ, Artillery |
| Ruweisat Ridge | Complex | +1 | HQ, Artillery |
| Patton goes to War | Simple | Elim | HQ, Artillery |
| Objective Tunis | Simple | Elim | HQ, Artillery, SupplyHead |
| Sicily | NA | NA | HQ |
| Salerno | NA | NA | HQ |
| Anzio | NA | NA | HQ |

**Table 106 : Supply**

| Game | Supply Type | Supply Feature | Supply Effect |
|---|---|---|---|
| **Years of Discovery** | | | |
| The Battle of Moscow | Complex | Rail | Reduced & Eliminated |
| Kursk | Detailed | Rail | Reduced |
| Normandy | Detailed | Road | Reduced |
| Turning Point | Detailed | Rail, Supply Units | Reduced |
| The Moscow Campaign | Variable | Rail, RR | Reduced |
| DAGC | Variable | Rail, RR | Reduced |
| NATO | Variable | Rail, Depot | Reduced |
| The Ardennes Offensive | Detailed | Road | Reduced |
| War in the East | Variable | Rail, RR, Depot | Reduced |
| **Years of Development** | | | |
| All Modern Battles Quad | None | None | None |
| Panzergruppe Guderian | Variable | 12 MPs to HQ, Rail | Reduced |
| Drive on Stalingrad | Variable | 12 MPs to HQ, Rail, Truck, Air Supply | Reduced |
| Cobra | Simple | None | Reduced |
| Kharkov | Variable | HQ, Road | Reduced |
| Kiev | Variable | No Limit, HQ | Reduced |
| Korsun | Variable | No Limit | Reduced |
| Operation Star | Variable | 8MP to HQ, Rail | Reduced |
| Rostov | Variable | 6MP to Depot, HQ | Reduced |
| Leningrad | Variable | 5MP to Road | Reduced |
| Kursk | None | None | None |
| **Years of professionalism** | | | |
| Pattons 3rd Army | Detailed | 6 hex to road | Reduction |
| Operation Grenade | Detailed | 6 hex to road | Reduction |
| Fifth Corps | Simple | No Limit | Reduction |
| Hof Gap | Simple | No Limit | Reduction |
| BAOR | Simple | No Limit | Reduction |
| **Years of Chaos** | | | |
| To the Wolf's Lair | Variable | 4 hex to HQ, then Rail or Trucks | Reduction |
| NATO (Victory Games) | Complex | | Reduction |
| Singapore | Complex | MP's to Rail | Elimination |
| Trail of the Fox | Variable | MP's to Supply Dump or Trucks | Elimination & Reduction |
| Korea | Variable | MP's to HQ | Elimination & Reduction |
| Case Green | Complex | 6 MP's to Road | Reduction |
| Artic Storm | Variable | MP's to HQ | Reduction |
| Victory in the West | Simple | 2 hex to rail/road | Reduction |
| Britain Stands alone | Simple | 5 hex to railroad | Reduction |
| North German Plain | NA | NA | NA |
| Donau Front | NA | NA | NA |
| FlashPoint : Golan | Variable | 4 hexes to HQ/Road | Reduction |
| Ruweisat Ridge | Complex | 6 MP to road/track | Reduction |
| Patton goes to War | Complex | 7 hexes to road | Reduction |
| Objective Tunis | Complex | 7 hexes to road | Reduction |
| Sicily | Variable | 6 MP's HQ | Reduction |
| Salerno | Variable | 6 MP's HQ | Reduction |
| Anzio | Variable | 6 MP's HQ | Reduction |

**Table 107 : Units**

| Game | Unit Type | Unit Data Format |
|---|---|---|
| **Years of Discovery** | | |
| The Battle of Moscow | Simple | Attack-Movement |
| Kursk | Simple | Attack-Movement |
| Normandy | Simple | Attack-Movement |
| Turning Point | Simple | Attack-Movement |
| The Moscow Campaign | Simple | Attack-Movement |
| DAGC | Simple | Attack-Movement |
| NATO | Detailed | Attack-Defence-Movement |
| The Ardennes Offensive | Simple | Attack-Movement |
| War in the East | Simple | Attack-Movement |
| **Years of Development** | | |
| All Modern Battles Quad | Detailed | Attack-Defence-Movement |
| Panzergruppe Guderian | Detailed | Attack-Defence-Movement |
| Drive on Stalingrad | Detailed | Attack-Defence-Movement |
| Cobra | Simple | Combat-Movement |
| Kharkov | Detailed | Attack-Defence-Movement |
| Kiev | Detailed | Attack-Defence-Movement |
| Korsun | Detailed | Attack-Defence-Movement |
| Operation Star | Detailed | Attack-Defence-Movement |
| Rostov | Detailed | Attack-Defence-Movement |
| Leningrad | Detailed | Attack-Defence-Movement |
| Kursk | Detailed | Attack-Step-Movement-Indicator |
| **Years of professionalism** | | |
| Pattons 3rd Army | Complex | Combat-Morale-Movement |
| Operation Grenade | Complex | Combat-Morale-Movement |
| Fifth Corps | Simple | Combat-Movement |
| Hof Gap | Simple | Combat-Movement |
| BAOR | Simple | Combat-Movement |
| **Years of Chaos** | | |
| To the Wolf's Lair | Detailed | Strength-Barrage-Tank or anti-tank |
| NATO (Victory Games) | Detailed | Attack-Movement-Defence-Steps |
| Singapore | Detailed | Attack-Defence-Movement-Stacking |
| Trail of the Fox | Complex | Stacking-Strength-Morale-Move |
| Korea | Detailed | Attack-Defence-Movement |
| Case Green | Simple | Combat-Movement |
| Artic Storm | Complex | Attack-Defence-Move-Mech-Stacking |
| Victory in the West | Complex | Attack-Defence-Movement-Efficiency-Blitzkrieg-Motorisation |
| Britain Stands alone | Detailed | Attack-Defence-Movement |
| North German Plain | Complex | Mobile Combat-Close Support Combat |
| Donau Front | Complex | Mobile Combat-Close Support Combat |
| FlashPoint : Golan | Simple | Combat Strength |
| Ruweisat Ridge | Complex | Firepower Strength-Assault Strength-Move-Armour Rate |
| Patton goes to War | Detailed | Attack-Defence-movement |
| Objective Tunis | Detailed | Attack-Defence-movement |
| Sicily | Complex | Armour Bonus-Combat Class-Tactical Rating-Move-Morale |
| Salerno | Complex | Armour Bonus-Combat Class-Tactical Rating-Move-Morale |
| Anzio | Complex | Armour Bonus-Combat Class-Tactical Rating-Move-Morale |

**Table 108 : Air and Terrain**

| Game | Air | Air Units / Points | | Terrain Effect |
|---|---|---|---|---|
| **Years of Discovery** | | | | |
| The Battle of Moscow | | None | No | Multiply Str |
| Kursk | | Complex | Units | Modify Die |
| Normandy | | None | No | Modify Die |
| Turning Point | | Complex | Units | Modify Die |
| The Moscow Campaign | | None | No | Modify Die |
| DAGC | | None | No | Modify Die |
| NATO | | None | No | Multiply Str |
| The Ardennes Offensive | | None | No | Multiply Str |
| War in the East | | Simple | Points | Multiply Str |
| **Years of Development** | | | | |
| All Modern Battles Quad | | Simple | Points | Shift Column |
| Panzergruppe Guderian | | Simple | Points | Multiply Str |
| Drive on Stalingrad | | Simple | Points | Multiply Str |
| Cobra | | Simple | Points | Multiply Str |
| Kharkov | | Simple | Points | Multiply Str |
| Kiev | | Simple | Points | Multiply Str |
| Korsun | | Simple | Points | Multiply Str |
| Operation Star | | Simple | Points | Multiply Str |
| Rostov | | Simple | Points | Multiply Str |
| Leningrad | | Simple | Points | Shift Column |
| Kursk | | Complex | Points | Shift Column |
| **Years of professionalism** | | | | |
| Pattons 3rd Army | | Simple | Points | Shift Column |
| Operation Grenade | | Simple | Points | Shift Column |
| Fifth Corps | | Simple | Points | Shift Column |
| Hof Gap | | Simple | Points | Shift Column |
| BAOR | | Simple | Points | Shift Column |
| **Years of Chaos** | | | | |
| To the Wolf's Lair | | Complex | Points | Die Mod |
| NATO (Victory Games) | | Simple | Points | Multiple Str |
| Singapore | | Simple | Units | Column Shift |
| Trail of the Fox | | Simple | Points | Column Shift |
| Korea | | Simple | Points | Column Shift |
| Case Green | | Simple | Units | Str Multiply |
| Artic Storm | | Simple | Points | Column Shift |
| Victory in the West | | Complex | Points | Column Shift |
| Britain Stands alone | | Complex | Units | Shift Column |
| North German Plain | | Simple | Points | Multiply Str |
| Donau Front | | Simple | Points | Multiply Str |
| FlashPoint : Golan | | Simple | Points | Column Shift |
| Ruweisat Ridge | | Simple | Points | Die Mod |
| Patton goes to War | | Simple | Units | Die Mod |
| Objective Tunis | | Simple | Units | Die Mod |
| Sicily | | NA | NA | Column Shift |
| Salerno | | NA | NA | Column Shift |
| Anzio | | NA | NA | Column Shift |

# Appendix C - Key to Terms used

| Column | Detail | Explanation |
|---|---|---|
| Game Turn Scale | | The length of a Game Turn |
| Hex Scale | | The distance covered by a single hex in km |
| Unit Scale | | The formation size used in the game, ranging from smallest to largest |
| | | |
| Inf Move | | The movement allowance of an infantry unit, from minimum to maximum |
| Mech Move | | The movement allowance of a mechanised unit, from minimum to maximum |
| | | |
| ZOC Type | Active | |
| | Elastic | |
| | Locked | |
| | Rigid | |
| | Open | |
| ZOC Gen | General | ZOC generated by any unit |
| | Specific | ZOC generated by a specific density of units in a hex. |
| ZOC Enter | | Effect of entry into an enemy ZOC |
| ZOC Leave | | Effect of exiting an enemy ZOC |
| ZOC to ZOC | | Effect of moving from one enemy ZOC to another enemy ZOC |
| | | |
| Stack Type | Simple | |
| | Complex | |
| | Steps | |
| | | |
| CRT Step | Yes or No | |
| CRT Type | Desc | Descriptive Results |
| | Num | Numeric Results |
| | C&C | Step Loss - Choice and Combined Results |
| | C | Step Loss - Combined Results |
| | FG | Step Loss - Fine Grain Results |
| | FG&C | Step Loss - Fine Grain and Combined Results |
| CRT Die | 6, 2x6, or 10 | |
| CRT Mech | Odds or Differential | |
| 1,2,3,4,5,6,7,8,9,10 | | 2-1 or +2 CRT results, as an example of results |
| | | |
| Sequence of Play Mech | Simple | |
| | Complex | |
| | Simultaneous | |
| Sequence of Play Phases | | Number of movement and combat phases in a Player Turn |
| Sequence of Play | Example Sequence of Play, showing Movement and Combat Segments | |
| | | |
| Overrun Type | Simple | |
| | Complex | |
| | Fine Grain | |
| Overrun Cost | | The movement and combat effects of attempting an overrun |
| | | |
| Supply Type | Simple | |
| | Detailed | |
| | Complex | |
| | Variable | |
| Supply features | | A description of supply features, or the basic mechanism for tracing supply. |
| Supply Effect | Reduced & Eliminated | Combat & Movement is reduced, and elimination is possible |

| | | |
|---|---|---|
| | Reduced | Combat & Movement is reduced |
| Unit Types | Simple | |
| | Detailed | |
| | Complex | |
| Unit Data | | The information contained on a unit |
| Air | None | |
| | Simple | |
| | Complex | |
| Air Units | Units | There are air units on the map. |
| Air Points | Points | There are only air points, although air markers may exist off map. |
| Terrain Effect | Multiple Str | Defender's strength is multiplied, or attackers strength is divided due to terrain |
| | Modify Die | The die roll is modified due to terrain. |
| | Shift Column | The CRT column is shifted due to terrain |
| Special | | Special features of the game worth noting. |

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end

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