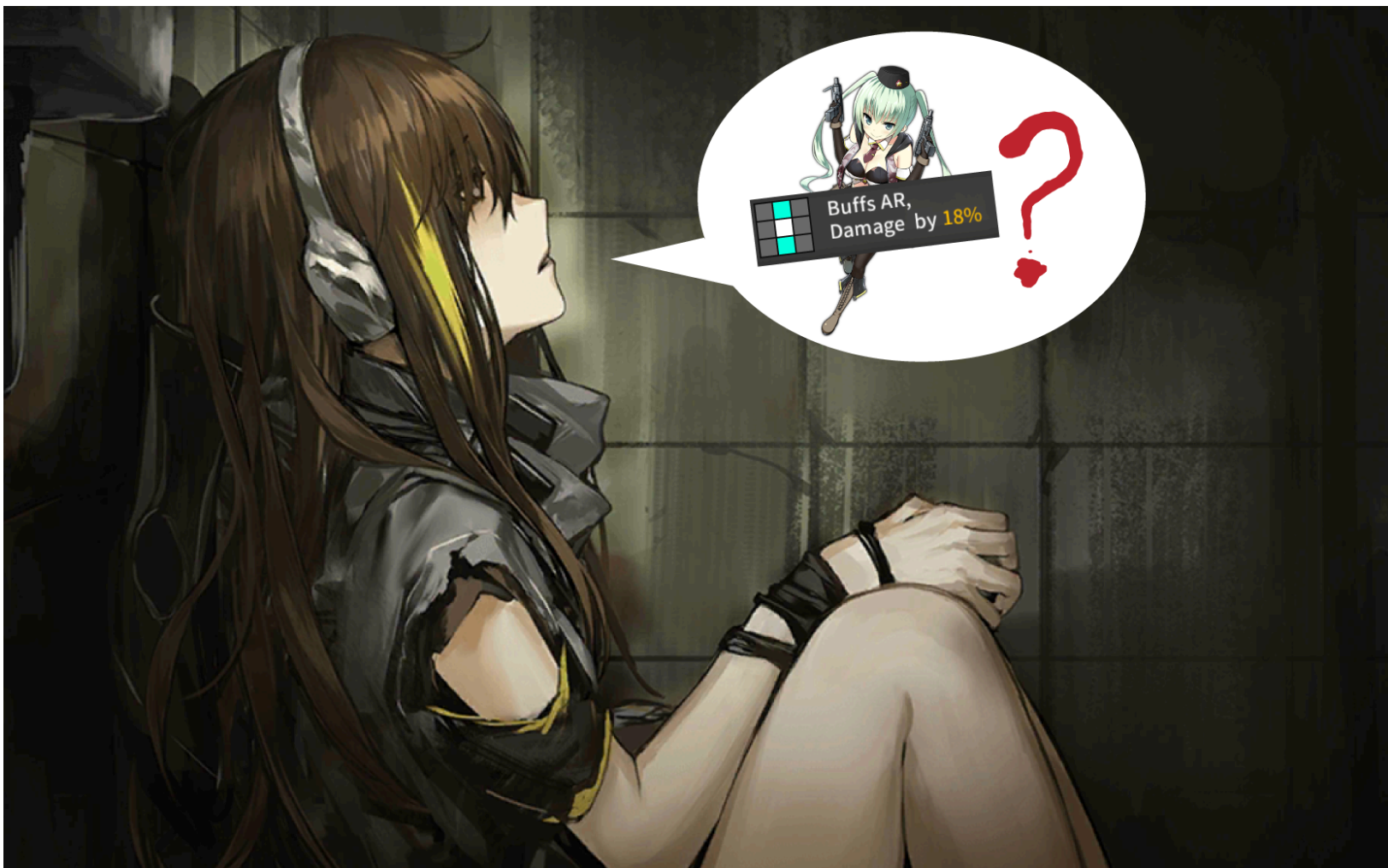# Introductory Principles of Doll Formations
A Guide for Girls' Frontline

Elementary Tactics for a New Age, First Edition

Brassyandclassy and Jetroyz

Summary and Foreword

Formation building is a major part of many collection-type games and how players build echelons in Girls' Frontline directly affects their success. We'll go over each of the corresponding Dolls' weapon classes, and how these roles synergize within the Echelon, as well as common team archetypes and advanced formation building for Echelons tailored to accomplish certain specific roles.

This guide was written for Commanders who have already grasped the basic concepts of dolls behavior and understand how to read the T-Doll Index. In addition, it assumes that the reader has already reached a state in the game in which they have an excess of choices when faced with building a team, and wish to improve their skills but don't know how.

This is the First Edition of the guide, made in May 2018 with information from version 2.011 of the game. Expect updated versions to be made as errors are found and fixed.

For those looking for a better understanding of the in-game interface or how to read the Index, the EN wiki has a guide here.

This should go without saying, but ask me before republishing this guide anywhere else.

Contents

Part One: The Basics

To understand the whole, first you must understand the parts. We begin by going over T-Dolls and how each of them contribute to a working team.

Chapter One: T-Dolls and their Roles

Every full echelon in Girls' Frontline is made up of 5 **Dolls** and one **Fairy**, each with their own set of **stats**, **skills**, and **buffs**. We'll begin by defining these three terms.

Stats are the numbers that define a doll's characteristics. These include the four **enhanceable stats** *Firepower*, *Accuracy*, *Evasion*, and *Rate of Fire*, as well as their **static and level-based stats** such as *Critical Chance*, *Critical Damage Modifier*, *Ammo Capacity*, *Health*, and *Armor*. These stats are directly affected by buffs, equipment, and/or level.

Skills refer to the passive and/or active abilities that T-Dolls can use while in battle. These abilities work by boosting stats or using utilities that shift the battle in their favor. These skills play a huge factor in determining the **role** of each doll in a team.

Buffs are modifiers that change the stats of units on the battlefield. They come in two forms: **Skill Buffs** and **Tile Buffs**. **Tile Buffs** can be seen in the formation-building screen and usually depend on class. **Skill Buffs** are self-buffs or team-buffs from **skills** that are often several times more powerful than tile buffs but require a **cooldown**. Both types influence the makeup and shape of team formations.

The set of stats, skills, and buffs that a doll can provide is referred to as the doll's **attributes**. Attributes will determine how effective a doll is at performing a specific **role**, both as an individual doll and as part of a formation. Commanders should keep in mind these three characteristics when using dolls.

Roles in Girls' Frontline can be split into three categories: **DPS**, **Tank**, and **Buffer**. Although a doll's class is a major influence on what role she works best at, her role within a team will depend on the rest of the team's abilities and how she fits in with the other components. To further complicate things, these categories are not strictly exclusive and often a more specific role will require a doll to be proficient in more than one category. For example, a *Off-Tank* role is usually filled by an SMG or HG doll with above-average evasion and health as well as higher than normal damage output or a useful **utility skill**.

Chapter Two: The Grid

Now that we know what dolls can do, we can see where they go to work. The to right is the in-game team **formation grid**, with translated **buff icons** underneath and a color-coded overlay. As a standard, each tile is numbered from bottom left to upper right, first left-to right, then ascending (this is the standard grid for most keyboard numpads). During battle, the enemy will first shoot at the red tiles, then yellow/blue, and finally green. The **4** and **5** tiles are highlighted because they are common positions for **buffer** dolls.
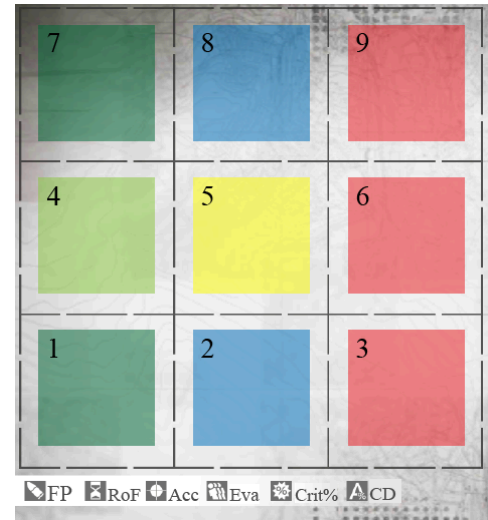
The type of **buff** a doll will give is determined by **class**. The following diagram illustrates what types of **buff interactions** are available, with arrows indicating the direction of the buff and icons indicating the type of buff given.
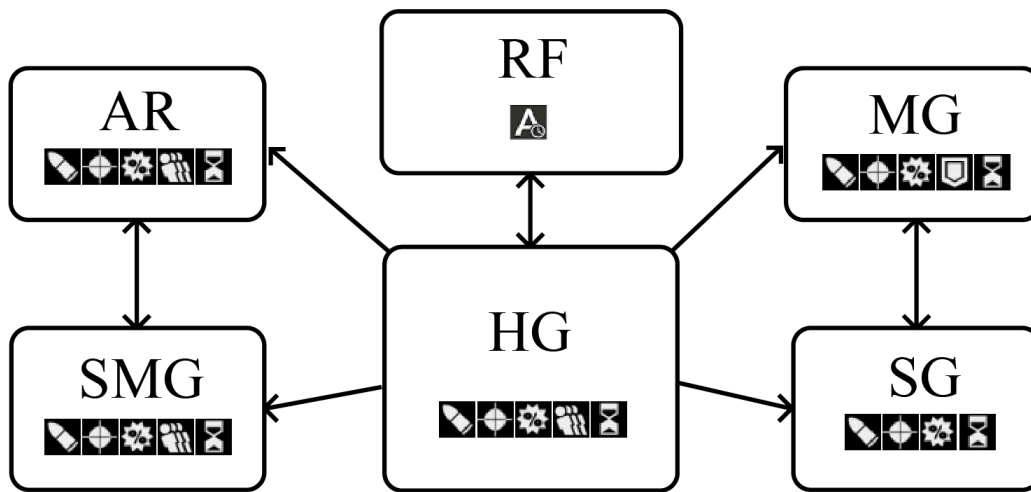
Note that unlike ARs and SMGs, MGs cannot buff evasion. Instead, MGs can buff armor, which only applies to SGs. While it's not shown on this diagram, SGs and MGs also have different buff tile placements which encourage a different team formation style compared to that of ARs and SMGs.

Also, note that certain dolls have special tiles which are exceptions to these rules. These include *Ribeyrolles*, *M4A1*, *AUG, UMP40*, *Carcano M1891*, and *Carcano M91/38* (see Appendix B).

Chapter Three: Introduction to General Team Formation

Now that we know the three main categories of roles, and the grid in which they can be placed, we can start thinking of how to determine the role each doll in an echelon should play, and how these roles interact. We can begin with the largest category, **DPS** roles, so-called because they usually have a very high damage rate (measured in Damage per Second, or DPS).

DPS dolls play a role as the major damage dealer of their formation. They benefit the most from firepower(FP) and rate-of-fire(ROF) buffs and will usually depend on these at least one of these two stats to function:

- **MG**-type dolls have a **magazine size** and a **reload time**. Their strength lies in the ability to cripple or outright kill the enemy formation within their first salvo of bullets, so they benefit the most from *firepower buffs*. In addition, they have *low accuracy* which will affect the types of enemies they do well against. They work the best with **SG** tanks.
- **AR**-type dolls do not have a clip size, but they don't have to reload, either. They offer **sustained DPS** against enemy units and can benefit from *both ROF and FP buffs*. They work the best with **SMG** tanks.
- **RF**-type dolls do not have a clip size, but they fire very slowly and do very high damage with every shot. However, much of this damage is often wasted when these dolls target an enemy with low remaining health. Because of this, RF dolls benefit more from *ROF boosts* than FP ones. They work the best with **HG** buffer/tanks.

Certain **SMG**-type and **HG**-type dolls can fulfill DPS roles too, in particular those with skills that *deal damage or self-boost firepower*. However, these are exceptions.

Next up are **Tanks**. Tanks are the frontmost dolls and should always be the first to get shot. Unlike DPS dolls, which can usually be moved around freely in the backline to fit their tile buffs, the effectiveness of a tank depends highly on it's position.

- **SMG** and **HG** tanks are often paired together into a duo consisting of one *Main-Tank* and one *Off-Tank*. The main tanker is usually put in the center tile and will draw the majority of fire, while the off-tanker sits in the top row (*F-formation*) or the bottom row (*b-formation*) and supports the team with utility skills or high damage output. These two dolls benefit the most from high evasion and high health, as well as from having a hearty supply of backup from the DPS dolls behind. **Note that HGs cannot equip exoskeletons until they reach level 80!**

- **SG** tanks are slow, armored dolls with a large supply of health made effectively larger by their exclusive **armor** stat, which reduces the damage they take. Due to tile buff placement, they're usually put in the 9-6-3 tile row to synergize with MGs. Armor for SGs is not an enhanceable stat and is automatically raised by levelling up. Their low evasion is difficult to raise, so the most common way to boost their survivability is through MGs with armor-buffing tiles.

Finally, we have **Buffers**. All dolls are buffers to some extent thanks to their tile buffs, but due to the potency of **team-buffing skills**, this is a role usually taken up by **HGs**. HGs are special in that both their tiles and their skills provide bonuses for the entire team, making them excellent force multipliers. In addition to their main role, some HG dolls can take up a role as an *Off-Tank*, however, they don't have much health, and without an **exoskeleton**, their evasion is not high enough, so Commanders with HGs in the front line must take caution.

There are certain non-HG dolls who can act as exceptional buffers as well:
- *Ribeyrolles 1918* is a good example of a **non-HG** buffer doll. Her tiles only affect other **ARs** despite being an AR herself, but they provide a sizable 20% FP increase, and her skill buffs dolls in her tiles even further, regardless of doll class.
- *M4A1* is another exception to the rule. Her tiles give a 18% firepower buff along with a 30% critical chance buff to other ARs, similar to Ribeyrolles.

Chapter Four: Things to Consider

In order to be a successful commander, it is not enough that your echelons have high attributes. Echelons must be suitably arranged to *combat several enemy formations while taking minimal to no damage.*

Enemies in Girls' Frontline will lock onto the first enemy that enters their **targeting range** and will not switch targets unless the target **dies**, **retreats**, **exits their targeting range**, or the enemy **triggers a skill** that resets their target. The majority of enemy units will approach your echelon head-on in battle, which means that incoming damage will be focused on the central row.

Always keep in mind the role you intend for your doll to have when placing them in a formation, rather than simply trying to maximize your tile buffs. For example, take a buffer doll like MP446. Her large damage buff makes it tempting to use her in position 5, where she can buff the entire team. However, since she's an HG, her base health is low and her evasion is subpar. **When coming across enemies, she's the first thing they'll shoot at!** Instead, let's move her to position 4, where she can still buff our DPS units AR-15 and SOP II, and leave the job of main tanking to Suomi, who has over twice the hitpoints.
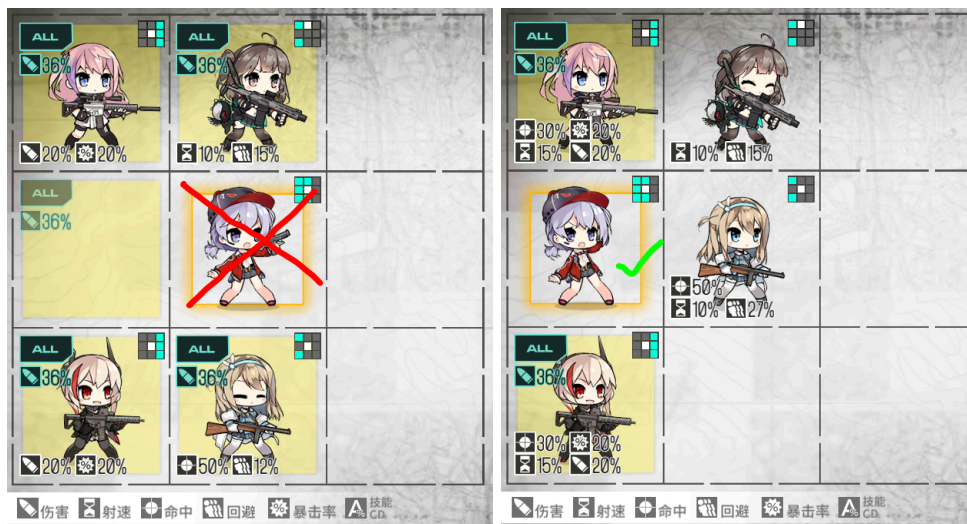
This example also is also handy for illustrating another point. Enemies in Girls' Frontline usually have a shorter targeting range than friendly dolls, so many players will try to move their squads towards the 7-4-1 backline and keep out of the 9-6-3 line to increase the amount of time the enemy has to spend walking to get into range.

Part Two: Generalist Formations

Now that we've gone through the basic concepts and framework upon which teams are built, it's time to look at some examples of teams. **Generalist** teams are designed to be able to handle a wide variety of situations, but this doesn't mean they don't have their own weaknesses and strengths.
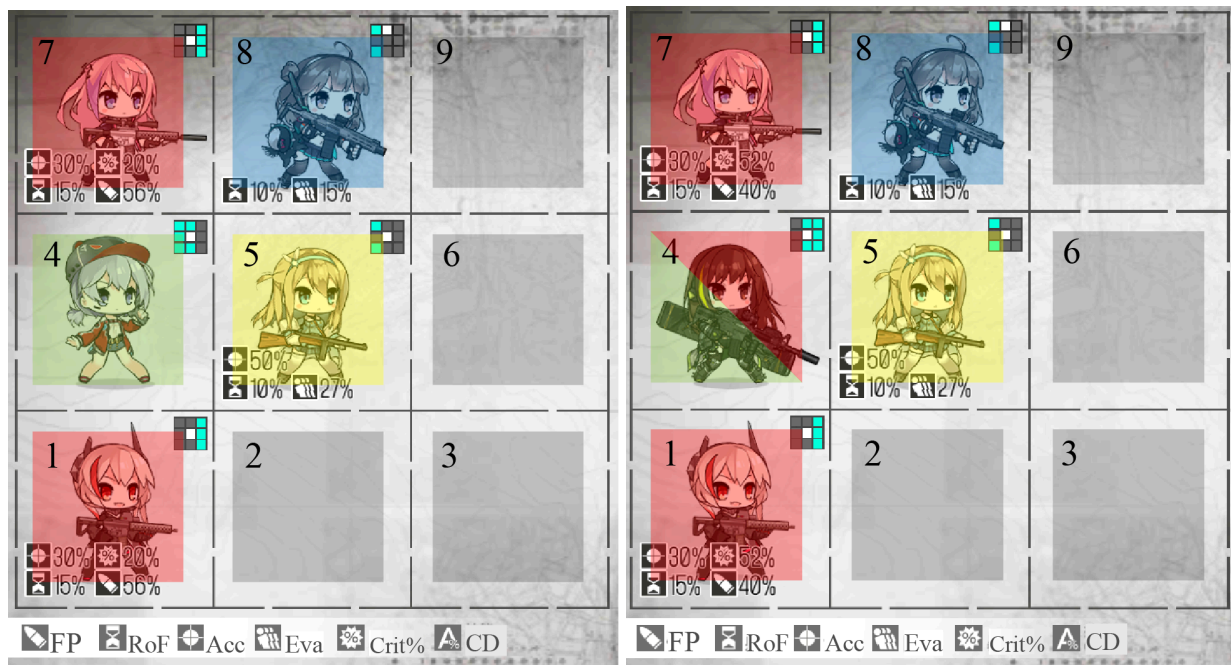

Chapter Five: 2-Column Formations

As you've probably noticed by now, most tile buffs land on tiles adjacent to the **source tile**. Because only 5 tiles out of 9 can be taken, this results in many Commanders preferring to keep their formations in 2 adjacent columns, for maximum tile buff coverage.

The most common format for such teams consists of **2 DPS** roles, **2 Tank** roles, and **1 Buffer**. This format is good for both AR/SMG and RF/HG teams.

F-Formation

The most popular choice for Commanders of all types, the **F-formation** is a well-rounded formation that makes use of one main tank (yellow), one off-tank (blue), and two DPSers (red) with the last slot taken up by either a buffer (green) or a third DPSer. Two-color squares are used to represent dolls that are performing two roles at once. Many variations of this design exist and it can be adapted for RF/HG teams as well as AR/SMG teams. Some examples:

Left grid:

7 (FP 5%, 15%)	8	9
4 (20%, FP 5%, 45%)	5 (115%, 80%, 35%, 47%)	6
1 (FP 5%, 15%)	2	3

Right grid:

7 (20%, 74%, 33%)	8 (20%, 17%, 42%, 18%)	9
4 (20%, 48%, 16%)	5 (15%)	6
1 (20%, 42%, 17%)	2	3

🡦FP 🡇RoF ✚Acc Eva ✳Crit% CD

While **highly versatile**, the F-formation is not infallible and, if built improperly, can have some glaring **weaknesses**. The most obvious weakness is the lack of a tank to cover the **123 line**, which can result in damage to your DPS units. To cover this weak spot, the **position 5** main tank or a **position 4** off-tank/buffer can be moved to position 2 at the beginning of a battle. Note that **moving a doll** after a battle starts will **NOT** affect her **tile buffs**, however, the doll will not be able to fire on-the-move and will take 1-2 seconds to reach her new position.

The strength of the F-formation lies in a compound effect that we'll refer to as the **789 effect** or the **top-lane effect**. We call it such because of the tendency for enemies in the game to become more concentrated towards the **middle and top lanes**. This effect is caused by two factors: firstly, dolls' **targeting algorithms** cause them to target the **bottommost** enemy within their range. Secondly, many enemy formations in the game tend to start off with a higher concentration of enemies towards the **top and middle**. Due to the **789 effect**, the **bottom lane** is the safest lane for dolls and can usually be left unprotected as long as the **DPS** units have enough damage output.

b-Formation

A variation of the F-formation, the **b-formation** is an inverted F-formation that is usually created in order to better fit a given team compositions' buff tiles, or as a method of preserving the health of a **DPS-oriented off-tank** in the safer bottom lane.

From this formation, the main tank at position 5 can be moved during battle to position 8 to defend the top row. Much like the F-formation, the b-formation consists of 2 Tanks, 2 DPS, and one Buffer or DPS unit to fill up the 4-position.
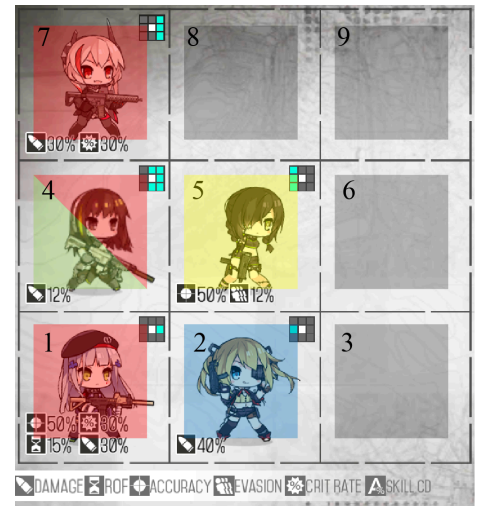
Other Formations

F- and b-formations make up the majority of the AR/SMG formations that exist, however, some derivatives and modifications such as C-formation, reverse-C-formation, and L-formation exist. Sometimes, these formations are crafted for entertainment, sometimes they take advantage of mechanics for fighting certain enemies. When making these formations, it is fine to play around- experimentation is highly encouraged, but be responsible and remember the mechanics you've learned to ensure that you are successful.

Finally, as a word of warning when using RF/HG teams, the low rate-of-fire of RF dolls means that they must make every shot count. This is complicated by a variety of factors, including **overkilling** and **whipping**. **Overkilling** happens when an RF's shot damage exceeds the maximum health of its' target, lowering a doll's effective DPS. **Whipping**, also known as **corpse-hitting**, occurs when multiple RFs focus on the same target. Thanks to bullet travel time, RFs with similar rates of fire will often fire at the same time at the same target, often leading to one of the shots being wasted when compounded with the effects of **overkilling**. Because of these two negative effects, it's recommended to use RFs with differing rates-of-fire and to use no more than two RFs in any given team.

Chapter Six: MG/SG Formations

The high resource consumption and required reload of MG dolls makes them unattractive for newer Commanders, but their immediate damage potential on the battlefield is a useful trait that makes them worth investing into during the mid-game. Similarly, SG dolls are expensive to make (and as of the time of writing, they are unavailable for the EN server), however their survivability and massive health pool allows them to accomplish feats no other classes can handle.

Unlike **AR** and **SMG** dolls, **MG** and **SG** dolls don't buff adjacent tiles, instead buffing the frontmost column from the backline for MGs and vice versa for SGs. As a result, the most common formations for these teams have shapes that depend on the number of tanks.

The **963 column** has the benefit of increasing the range of all dolls in the team (denoted by an orange curve on the right side of the battle screen). While this extra range allows your dolls to attack immediately, it also means that your dolls spawn within enemy targeting range, putting them at high risk of taking damage. Normally, this trade off isn't worth it for AR/SMG teams and is particularly counterintuitive for RF/HG teams, however, it is a special benefit to SG/MG teams as it puts them in immediate range to fire at **Jaguar** artillery units.

T-Formation

An all-or-nothing formation that uses only one tank and relies on using the heavy firepower provided by its MGs to obliterate the enemy before the frontline takes damage. Usually made up of 2 MGs, 2 HG, and 1 SG, or sometimes 3 MGs, 1HG, and 1 SG to clear large waves of enemies.

As a means for self-defense against evasive targets during night battles, some Commanders may choose to modify this formation into 2MG/1AR/1HG/1SG, or 2MG/1RF/1HG/1SG.
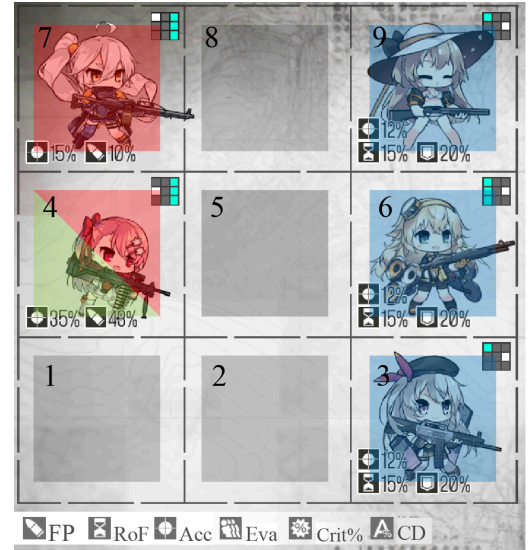
X/K-Formation

| FP | RoF | Acc | Eva | Crit% | CD |
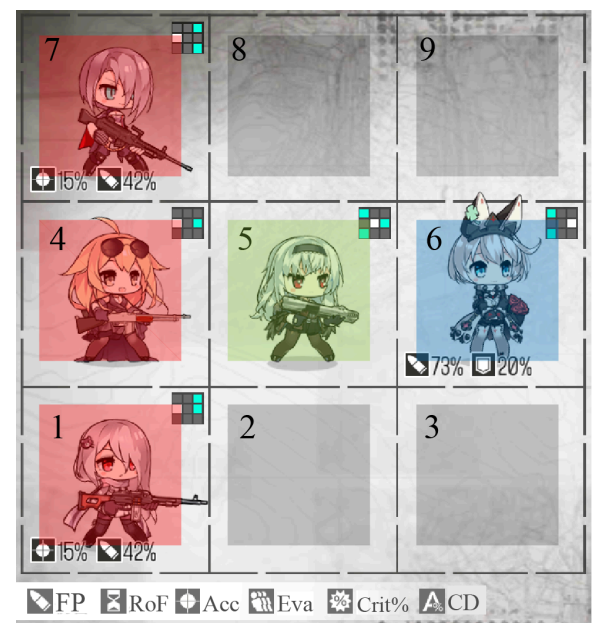
A more **balanced** formation that makes use of two tanks and two MGs along with a buffer in tile 4 or 5. Certain SGs and MGs have tile buffs that work well for this formation, however, beware of enemies with short attack range that can attack the 456 lane directly.

I-Formation

A *"wall"* formation that relies completely on **armor** along with two MGs to defeat the enemy. *Negev* is a popular choice due to her armor buff. Unlike the T-formation, the goal of this formation is not to burst down the enemy immediately but rather to outlast them with armor buffs and skills. Rarely used due to lack of efficiency.

Part Three: Specialist Formations

The basic formations in part two are designed to be easily put together from any available units while staying effective against a wide range of enemies. The formations we go over in chapter seven, however, may require specific dolls, or only be useful in serving one purpose.

Chapter 7: Specialist Formations

The world of Girls' Frontline is fluid and dynamic, constantly changing to offer its players new challenges. Sometimes, to meet these challenges, a **specialist team** might accomplish what a **generalist team** cannot. Specialist teams like the ones below often rely on **specific dolls** and are only effective against **specific enemy units**. The huge variety of possible specialist teams means that we can't possibly go over all of them. Instead, we'll go through three examples of such formations and attempt to explain the reasoning behind their design.
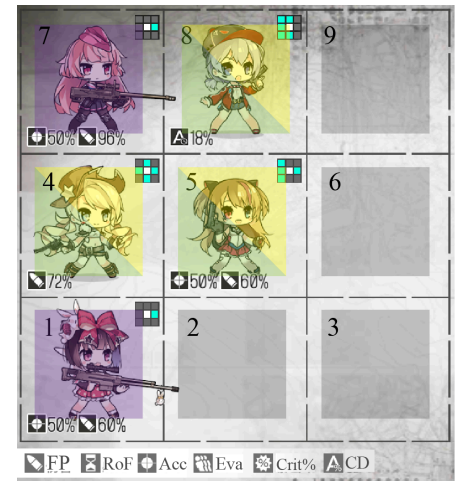
4HG Formation

A **2-column formation** that makes use of 4 HG **buffers** to supercharge a single **DPS** unit (purple). The most famous of these formations is the "Meme-Blaster" formation, which combines *IWS-2000's* high damage output skill with several firepower and rate of fire boosts to create a squad capable of shredding most **bosses** in a matter of seconds. Such formations have **varying weaknesses** depending on the units used. For example, IWS teams usually do well against enemy teams with a low number of high-HP targets, but suffer dramatically against larger teams with many fodder units.

Note that HG tile buffs are the only tile buffs that vary based on the number of dummy links.
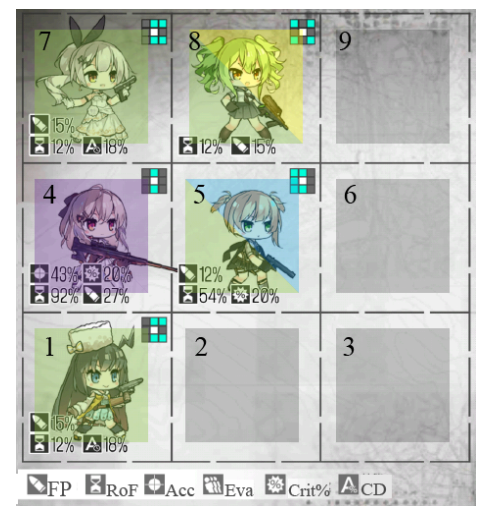
Big Game Hunters

A skill-based formation that relies on 3 HGs with firepower-enhancing skills along with two *Snipe* RFs (purple) with charged shot skills to eliminate a high-health boss. This team was popularized in Operation Hypothermia and Operation Cube+ as a method to bypass boss skills. In particular, many event bosses have *Force Shield* skills that activate at certain health percentages. Normally, these skills would prevent a boss from falling under a certain percentage of HP until they perform their special attack, however, a snipe team can coordinate their skills to wipe out the bosses' healthpool all at once, bypassing the Force Shield.

BGH teams are awful against regular enemies due to **overkill** and **whipping** and must be escorted by other teams until they reach their intended target. (See Appendix A for definitions)

Hydra Killer Formation

An atypical 3HG/2RF formation that takes advantage of **kiting** and the **789 effect**. Because enemies take a second after stopping to aim before shooting, players can take advantage of HGs' high movespeed and move them back and forth between the 789 and 456 rows (purple) to "kite" enemy units, delaying their advance and keeping them from shooting. This setup was widely used in Operation Singularity's ranking map, as a method of killing the slow but deadly Manticore and Hydra miniboss teams.

When fighting regular enemies, the Hydra-Killer formation can be rearranged into a more familiar F- or b-formation on the battle map simply by double-tapping an echelon and going into the formation preset to manually change the grid layout. All formations can be changed on the battle map in this way!

All three of these examples were built with **goals** in mind. 4HG squads seek to capitalize on boosting a powerful doll, BGH teams seek to end otherwise grueling fights prematurely, and Hydra Killer formations were designed as an on-the-go adaptation for an otherwise unbeatable enemy.

Part Four: Formation Design and Experimentation

In this chapter we discuss how to adapt to new enemies and how to design formations when faced with limitations.

Chapter Eight: Generalist Design Process

Generalist formations are usually easier to design and use than specialist teams, but new players may come across some difficulties such as defining team positions and whether it's more important that a T-Doll is in a position to fulfill her role, or that a T-Doll's tile buffs can reach as many dolls as possible.

When building a generalist formation, prioritize the following:

1) Firstly, are all rows covered by at least one doll? The entire team will retreat if an enemy manages to reach behind them and it will count as an instant loss.
2) Are your tanks and DPS in the right place? The doll with the highest evasion and HP should be in the center row and in front of your DPS units. Unless you are using an SG/MG team, your formation should be a 2-column formation that lies as far back as possible.
3) Do your skills synergize? Preferably, every doll should be using a skill that benefits her role: DPS and Off-Tanks should have firepower and rof boosting skills, or a utility skill like grenades, molotovs. Main tanks should have evasion boosts or utility skills. Buffers should have a skill that fits the other members of the team: rate-of-fire for RFs, firepower for MGs.
4) Finally, do your tiles match up? The base in-game combat rating is a good guideline to check and see if your tile setup is optimized or not, however, keep in mind that it does not take the first three points into consideration! Tile buffs are considerably weaker than team skill buffs and should be the least of your priorities.

As an added note, while the built-in combat power system is a good way of approximating the strength of a squadron, it is an averaged value that takes certain factors into account more than others and does not necessarily represent combat capability. For example, boosting high armor and high armor penetration stats can "pad" combat power ratings to extremely high numbers (a common tactic for getting people to use your support echelon) despite displaying performance roughly equal to echelons with "just enough" armor and armor-penetration.

Chapter Nine: Specialist Design Process

Designing specialist formations is a process that requires a comprehensive understanding of game mechanics and experience. We'll go over the proper steps of building a team and take a look at problem solving when confronted with a limited set of dolls and multiple possible formations.

The first step of making a team is to have a **goal** in mind. Are you trying to level up a second echelon, but they always take damage? Maybe you're stuck fighting against *Dreamer* in the main storyline. Sometimes, these problems can be accomplished by levelling your dolls further, but maybe you can find another way.

Once you've got a goal in mind, it's time to take a look at what you can use to your advantage. Certain dolls such as a fully levelled and equipped *M16A1* can easily take on earlier maps on her own- maybe have her, or a similar doll babysit some of your less levelled dolls to grind at one of them? Dreamer's most deadly traits are her *extremely long range* and her *high damage per shot*. Maybe a team composed of *5 HGs* could use their speed to cover the distance faster?

All these solutions might seem outlandish to newer players, but they are legitimate strategies in use by late-game players. M16A1's unique ability to equip armor, along with her flashbang, makes her a powerful jack-of-all-trades doll for dealing with fodder teams. Dreamer's high damage shots can devastate even the most durable SMG links but are wasted against low HP handguns with similar evasion. High level 5HG teams can reach absurdly high damage and evasion thanks to all their interwoven tile buffs, and their fast movement speed allows them to easily catch up to Dreamer. These solutions may seem nonstandard or unorthodox, but they are simply the results of Commanders who have evolved their formations to adapt to the problems they face.

Of course, even if you think you've found a solution to your problems, you still have to act one it. What kind of dolls are you going to need for the job? Pick out your DPS units, your tanks, and your buffers, then think back on your intended goal. Apply **Murphy's Law**: What's the worst that could happen? What is your squadron capable of? Can it take on armor? Evasive scouts? How about mobs of Dinergates or Tarantulas, or a heavy Dragoon rush? Are your tanks fast enough that they can be moved from tile to tile or is it better to retreat them before they get damaged? How quickly can your formation move as a whole? Once you have a good idea of your formations' shortcomings, take a moment to think about its' benefits. Do the pros outweigh the cons?

It's rare that you'll ever manage to fully overcome these problems on your first try. Even if you think you've found a suitable advantage or weakness to exploit, it can take several tries to finally get the right "formula" to tackling a challenge, and even then you might occasionally be reminded of a fatal shortcoming. When building formations, don't be afraid to consult a community! The Girls Frontline subreddit, Official GF EN Discord server, and the en.gfwiki.com Discord server are common places to ask for help. Be courteous and polite and you may even make some new friends!

Appendix A: Glossary of Game Mechanics

Accuracy (Acc)
A stat that dictates a doll's hit rate. Midnight battles have a -90% accuracy penalty that can only be alleviated using PEQ equipment. The formula for night accuracy is as follows:
Night Acc = Base Acc*[1 - (0.9*(1 - PEQ%))]*(1 + Tile%)*(1 + Skill%)
Hit Rate = Self Accuracy / (Self Accuracy + Target Evasion)

Armor
A stat that reduces incoming damage. All armored enemies have 0 evasion except for Manticores. Grenade skills will ignore armor, and all dolls have a base armor penetration of 10. The damage calculation formula is:
IF AP > Armor: DMG = FP + 2, ELSE: DMG = FP - (Armor - AP)

Buff Aura
The arrangement of tile buffs that a T-Doll can give. This buff aura stays stationary after a battle starts, and does not move with the doll. Tile buffs from multiple dolls are additive.

Bullet Travel Time
The time it takes for an attack to travel across the battlefield and hit its target. Damage is not calculated until the shot hits and the attack is canceled if an enemy moves immediately after firing.

Critical Chance
Chance for dolls to deal a critical hit. Base crit chances are:
HG/AR: 20%   SMG/MG: 5%   SG/RF: 40%
Critical chance after modifiers is calculated by:
(Base Crit% + Equipment Modifier) * (100% + Buff%) $\leq$ 100%

Critical Damage Modifier
Damage modifier for critical hits. Base is 150% (1.5x damage).
Damage for critical hits (before armor calculations) is calculated by:
Hit Damage * (150%+ Equipment Modifier) * (100% + Buff%)
= Crit Damage (After ver. 2.011)
Hit Damage + [(50%+ Equipment Modifier) * (100% + Buff%)]
= Crit Damage (Before ver. 2.011)

Evasion (Eva)
Stat that influences dodge rate. Dodge calculations are:
Dodge Rate = 1 - (Enemy Accuracy / (Enemy Accuracy + Self Evasion)

Emergency Force Shield
A skill exclusive to certain enemy event bosses. Activates at certain health percentages (varies depending on boss) and prevents all further damage until after the boss finishes their special attack.

Firepower (FP)
A stat that represents damage per shot. After all other calculations have been made, a random percentage bonus between -15% and +15% is applied to give the final damage number.

Kiting	A method of moving dolls in and out of enemy targeting range with the intent of delaying their attacks as well as forcing bosses to target different dolls. A successful kite requires a player to retreat or move a doll out of range right as the enemy fires, taking advantage of the bullet travel time to nullify incoming fire.
Magazine Reload	A mechanic that forces MGs and SGs to pause and reload after using up all the attacks defined by their magazine size stat. Skills will not activate during reloads. Reload time is decided by the rate-of-fire stat: *Reload time = 4 seconds + (200/RoF)*
Magazine Size	The number of attacks an MG or SG can do before they're forced to reload. MG mag size can be raised with equipment.
Overkill	An attack that does more damage than the enemy has health left. Inefficient and wastes firepower.
Skill Buffs	Stat buffs that are activated as skills. HG skill buffs will affect the entire team, while all other classes usually buff themselves. These offer significantly higher boosts than tile buffs, however, multiple skill buffs are multiplicative and offer diminishing returns.
Targeting Range	The range at which a doll stops to fire. Depends on type of enemy and dolls will always target the closest, bottommost enemy within the range circle. Targeting range for friendlies is shared between all T-Dolls within an echelon and can be increased by having a doll in the 963 column.
Rate of Fire (RoF)	A stat that decides how quickly a doll attacks. This value is capped at 120 for post-2.011 clients, and 116/108 for pre-2.011 clients. *Number of Attacks per Second = RoF/50*
Reload Cancel	An exploit accomplished by moving an MG doll after half the reload animation has finished, then immediately moving back. Since animation timers round up, the reload timer is counted as finished and the MG can immediately resume firing.
Retreating	A manual action that allows a selected doll to retreat from the battlefield, gaining instant immunity to further damage. Often used in conjunction with kiting to prevent damage to the front lines.
Whipping	An attack targeting an enemy that dies before the bullet can hit. Common in RF squadrons where two RFs target the same low-health enemy. Detrimental to effective DPS, avoided by varying RoF stat.

Appendix B: Special Cases

Not all dolls in Girls' Frontline are made equal. Certain dolls have abnormal attributes, special equipments, or don't follow the same patterns as their peers.

6P62	Equipment slots: 1] Scope 2] AP Ammo/HV Ammo, 3] Exo
AUG	Tiles buff any doll
Carcano M1891	Tiles buff RFs
Carcano M91/38	Tiles buff RFs
C-MS	Equipment slots: 1] Exo 2] AP Ammo/HP Ammo 3] Scope
Contender	Equipment slots: 1] Scope 2] AP Ammo/HP Ammo 3] Exo
M16A1	Equipment slots: 1] HV Ammo 2] Armor/Exo 3] Armor/Exo
M4A1	Tiles buff ARs
M4 SOPMOD II	Equipment slots: 1] Scope, 2] Scope, 3] HV Ammo
RFB	Base crit chance: 30%, Skill targets back line
Ribeyrolles	Tiles buff ARs. Skill buffs ANY doll inside tile aura
ST AR-15	Equipment slots: 1] Scope, 2] Scope, 3] HV Ammo
UMP40	Tiles buff SMGs
Welrod	Base crit chance: 40%