

FORMATION VARIANTS ANALYSIS OF FOUR-MAN INFANTRY SECTION FIRE TEAM

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In comparison with previous periods, in the process of professionalization of the Armed Forces small units have gained confidence and therefore greater responsibility to act more independently in order to be able to complete their assigned tasks. This fact came as a result of the implementation of new doctrines in which the number of troops is optimized and it fits to new missions. To be able to compensate the reduced number of soldiers, these troops are supplied with weapons and equipment that allows them greater mobility and effectiveness. According to simplified conclusions, this means that a smaller number of soldiers could be assigned with greater number of tasks, which they may accomplish by use of more advanced weapons and other systems.

The conducted research has been performed with the aim to establish acceptable method for analysing formation of small units. The conducted process satisfies basic requirements and determines formation variants, which will help in the decision-making process for the selection of formation to be used in operational use.

Key Words: formation, fire team, infantry section (squad), small units tactics

Introduction

Fire teams of infantry section have a prescribed size and a specific combat or support role within a larger military organization. To be able to perform every given role soldiers and weapons systems are organized in order to basically provide safety, maneuver capability, fire support and control. Particularly, when ordered to go to a specific facility they form formation that provides security to soldiers, manoeuvre capability for fire team, fire support and control by a team leader. Of course, every single formation has the characteristic that it can only correspond to the specific task and the conditions of the environment if it is chosen properly.

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The armed forces periodically implement new weapons and equipment in their units. This circumstance also requires a change in formation, so that the unit can adapt and perform old and new tasks. Besides traditional formation like line, column or row, which has been in operational use forever or at least from the period before World War II, there is also formation that, although not widely used, proves that it can be successful in solving specific tasks.

The fact that fire teams in infantry usually consist of four soldiers does not mean that their specified duties, weapons and equipment are the same in every combat or non-combat situations.

Formation of four-man fire team has different capability when instead of only automatic rifles soldiers are armed with machine gun, grenade launcher, sniper rifle and/or other weapons systems.

In the new environment, in order to successfully manage their units, which are now equipped with advanced weapons and other systems with less soldiers, small units commanders need to clearly see the possibility of deploying soldiers and weapons, so that they can perform assigned tasks.

By exploring the restrictions and good characteristics of weapons systems and the soldiers' duties it is possible to select useful variants of the formation of fire team and establish acceptable method for formation analysis.

Material and Methods

Using, as the case study, current organization and possible formation of infantry section of the Serbian Armed Forces (SAF)¹, the analysis has been carried out with the aim to determine formation variants, which will help in the decision-making process for the selection of formation to be used in operational use.

For research purposes, data are collected from open resources and the ones classified in nature, and that have been authorized for research. The research has been directed at fire teams as part of the infantry section. Fire team equipment is determined on the basis of what most units are issued with.

The whole research process has been done in the following order:

1. Defining fire team organisation and weapons systems that soldiers use.
2. Defining four-man fire teams' formation by reviewing the best practices of the other armed forces and comparing lessons learned from their engagement.
3. Marking soldiers' positions for each formation.
4. Marking weapons system and duties for each formation.
5. Creating a list of formation scenarios.
6. Defining the evaluation criteria for duties in a fire team.
7. Evaluation and selection of formation scenarios from a list of variants of the first and second orders.

Instead of selecting and evaluating only one or few formation scenarios, all formations are put in a single list. All listed formations have been analysed using criteria and many have been selected as non-valid and put aside. Remaining scenarios are called variants of formation and they are classified in the first and second order.

¹ GŠ VS, Komanda za obuku. *Pravilo vojnik-odeljenje pešadije*, (Belgrade, 2016), point 17.

Formation variants of the first order include scenarios, where soldiers are deployed in the most optimal way and fulfil all the criteria. Formation variants of the second order include scenarios, where deployment of soldiers is sometimes applied in practice, and it is not described as the rule, or it is in a conflict with regulations.

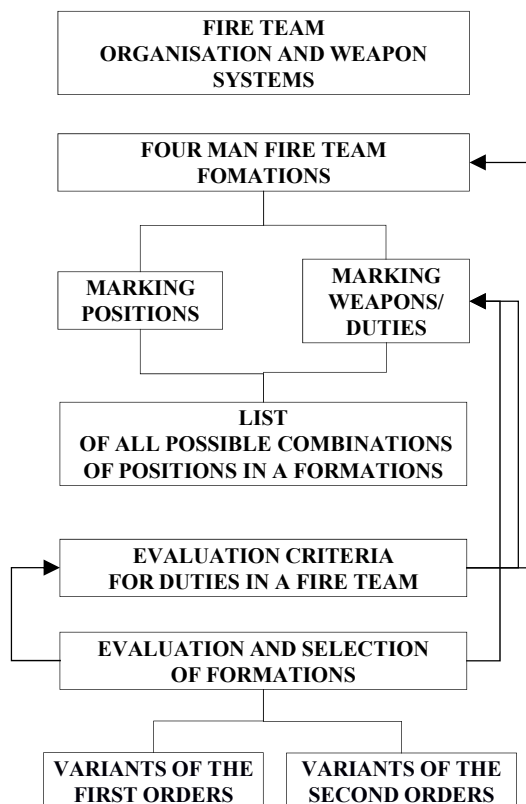


Figure 1 – Research process

Fire Team Organization and Weapons Systems

The research has been directed to formation of the fire team as a sub unit of infantry section. The organisation of infantry section has been taken from the Rule of the Infantry soldier – the section of the Serbian Armed Forces from 2016. According to this Rule, infantry section consists of nine soldiers, who, prior to the execution and depending on the situation, can be divided into two or three fire teams with the strength of three or four soldiers.² Therefore, the formed unit has a temporary character, it is formed for each

² GŠ VS, Komanda za obuku. *Pravilo vojnik-odeljenje pešadije*, (Belgrade, 2016), point 17 and 91.

concrete case and adapts to the type and characteristics of the task, the conditions of combat and the characteristics of the terrain.³

The section leader or other superior officer decides which activities, such as cleaning trenches, breaching obstacles, destroying certain objects, fighting vehicles, firing positions, reconnaissance, combat security, ambush, patrol and others may be executed by fire teams independently.⁴

Soldiers in such a formed fire team can be armed with three different types of weapons: (1) 7.62 mm M70 or 5.56 mm M21 assault rifles; (2) 7.62 mm M84 general-purpose machine gun; and (3) 7.9 mm M76 semi-automatic sniper/designated marksman rifle. In any case, they can carry hand grenades, as well.⁵ A soldier armed with a sniper rifle can move as an automatic rifleman within the formation of the fire team.

According to the practice in the Serbian Armed Forces machine gunners are commonly assigned as team leaders; however, in certain situations the section leader or other superior officer may delegate leadership responsibilities to others in order to create the required grouping of resources for the assigned tasks.⁶ Due to such formulation and illustrations,⁷ machine gunner is required to possess the skills that are rather demanding for a man. For a machine gunner it is difficult to act as an operator of the team's most lethal weapons and lead his fire team simultaneously, including duties such as observe the battlefield and the enemy in order to exercise situational awareness, communicate with neighbours and superiors and make decisions for the employment of his fire team. For these reasons, and for clarity in the research, it has been decided that the duty of the fire team leader is assigned to a rifleman, who is qualified and has completed the leadership course.

Four-Man Fire Team Formation

Fire teams can operate independently, and mostly they are embedded in the formation of infantry section. Therefore, fire teams' leaders should have knowledge of formation for every situation. Formation of lines and columns or files,⁸ are basic and most commonly used in the Serbian Armed Forces. In the current rules for three-soldier fire team the deployment of soldiers is described and illustrated in the form of line formation that is discontinuous and oblique to the terrain, and folder formation.⁹ Since no description has been given for the four-soldier fire team in the SAF, the NATO solution has been considered. As a representative example, in the US Army, infantry squad (section) consists of two fire teams and they are elements of the infantry platoon formation. The basic formation of these fire teams seems to be similar for the first view: file and wedge formation (right and left)¹⁰ instead of line formation (Table 1).

³ Adamović, Branko et al. . *Taktika. Borbena dejstva taktičkih jedinica KoV JNA i teritorijalne odbrane*. (IV U-135-1, Beograd: Vojnoizdavački zavod, 1981), strana 38.

⁴ GŠ VS, Komanda za obuku. *Pravilo vojnik-odeljenje pešadije*, (Belgrade, 2016), point 18. and 95.

⁵ *Ibid*, point 17.

⁶ GŠ VS, Komanda za obuku. *Pravilo vojnik-odeljenje pešadije*, (Belgrade, 2016), point 91.




⁷ *Ibid*, image 18, 19, 21, 22, 23

⁸ *Ibid*, point 95.

⁹ *Ibid*, point 95.

¹⁰ U.S. Army Field Manual FM 3-21.8: *The Infantry Rifle Platoon and Squad* (Washington D.C, 2007), Page 3-8.

Table 1 – US infantry fire team formation

Formation	Column	Wedge	
		Left	Right
Four man fire team			

In addition to those basic formations in the movement of units, there are others which can be used: column¹¹, staggered column¹², wedge¹³, vee¹⁴, echelon (left, right)¹⁵, box, diamond, Y-T¹⁶.

By analysing all possibilities in formation, the following list has been determined for specified four-soldier fire team: line, file, staggered column-1, staggered column-2, wedge-left, wedge-right, vee-left, vee-right, echelon-left, echelon-right, box, diamond, Y and T (Figure 1).

Marking Soldiers Positions

Solders positions are marked with a number in specified formation in order to be able to monitor positions. (Figure 1)

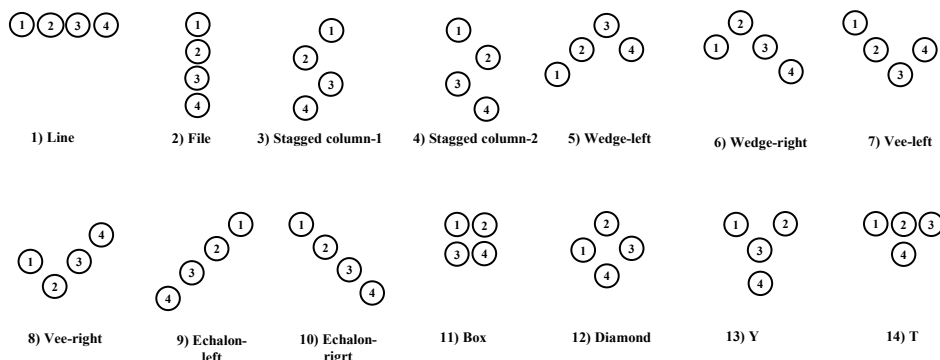


Figure 1 – Marked positions of soldiers in specified formation

¹¹ Uprava pešadije GŠ JNA, *Pravilo pešadijska (brdska, planinska) četa-vod* (Vojna štamparija: Split, broj 1770, 1977), tačka 163, strana 65. and U.S. Army Field Manual FM 3-21.8: *The Infantry Rifle Platoon and Squad* (Washington D.C., 2007), Point 3-29. Page 3-6..

¹² U.S. Army Tactics, Techniques, and Procedures, *ATTP 3-21.71 (FM 3-21.71) Mechanized infantry platoon and squad (Bradley)*, (Washington D.C., 2010), Chapter 3.

¹³ Uprava pešadije GŠ JNA, *Pravilo pešadijska (brdska, planinska) četa-vod* (Vojna štamparija: Split, broj 1770, 1977), tačka 163, strana 65. and U.S. Army Field Manual FM 3-21.8: *The Infantry Rifle Platoon and Squad*, (2007), Point 3-29.

¹⁴ U.S. Army Field Manual FM 3-21.8: *The Infantry Rifle Platoon and Squad*, (Washington D.C., 2007), Point 3-29.

¹⁵ Uprava pešadije GŠ JNA, *Pravilo pešadijska (brdska, planinska) četa-vod*, Point 163, Page 65. and U.S. Army Field Manual FM 3-21.8: *The Infantry Rifle Platoon and Squad*, Point 3-29, Page 3-6.

¹⁶ U.S. Army Field Manual, *FM 7-98 Operations In A Low-Intensity Conflict*, (Washington D.C., 1992 October 19), Point C-17, Page S-14.

Marking Soldiers Duties

Accordingly, based on function they have and type of weapons system they use, for specified four-soldier fire team, the soldiers duties are determined to be: a team leader (L), a machine gunner (M), an assistant machine gunner (A) and an automatic rifleman (R).¹⁷

Creating a List of Formation Scenarios

Marked duties are placed on marked positions and their combination is recorded in a list of formation scenarios. In this case, distribution of positions and duties involved places four duties on four positions (Table 2).

Table 2 – List of all possible formation scenarios

Formation	Position-1	Position -2	Position -3	Position -4
1	(L) Team leader	(M) Machine gunner	(A) Assistant machine gunner	(R) Automatic rifleman
2	(L) Team leader	(M) Machine gunner	(R) Automatic rifleman	(A) Assistant machine gunner
3	(L) Team leader	(A) Assistant machine gunner	(M) Machine gunner	(R) Automatic rifleman
4	(L) Team leader	(A) Assistant machine gunner	(R) Automatic rifleman	(M) Machine gunner
5	(L) Team leader	(R) Automatic rifleman	(M) Machine gunner	(A) Assistant machine gunner
6	(L) Team leader	(R) Automatic rifleman	(A) Assistant machine gunner	(M) Machine gunner
7	(M) Machine gunner	(L) Team leader	(A) Assistant machine gunner	(R) Automatic rifleman
8	(M) Machine gunner	(L) Team leader	(R) Automatic rifleman	(A) Assistant machine gunner
9	(M) Machine gunner	(A) Assistant machine gunner	(L) Team leader	(R) Automatic rifleman
10	(M) Machine gunner	(A) Assistant machine gunner	(R) Automatic rifleman	(L) Team leader
11	(M) Machine gunner	(R) Automatic rifleman	(L) Team leader	(A) Assistant machine gunner

¹⁷ GŠ VS, Komanda za obuku. *Pravilo vojnik-odeljenje pešadije*, (Belgrade, 2016), Point 1 (rifelman), Point 4 (sniper), Point 13 и 14 (fireteam leader).

Formation Variants Analysis of Four-Man Infantry Section Fire Team

Formation	Position-1	Position -2	Position -3	Position -4
12	(M) Machine gunner	(R) Automatic rifleman	(A) Assistant machine gunner	(L) Team leader
13	(A) Assistant machine gunner	(L) Team leader	(M) Machine gunner	(R) Automatic rifleman
14	(A) Assistant machine gunner	(L) Team leader	(R) Automatic rifleman	(M) Machine gunner
15	(A) Assistant machine gunner	(M) Machine gunner	(L) Team leader	(R) Automatic rifleman
16	(A) Assistant machine gunner	(M) Machine gunner	(R) Automatic rifleman	(L) Team leader
17	(A) Assistant machine gunner	(R) Automatic rifleman	(L) Team leader	(M) Machine gunner
18	(A) Assistant machine gunner	(R) Automatic rifleman	(M) Machine gunner	(L) Team leader
19	(R) Automatic rifleman	(L) Team leader	(M) Machine gunner	(A) Assistant machine gunner
20	(R) Automatic rifleman	(L) Team leader	(A) Assistant machine gunner	(M) Machine gunner
21	(R) Automatic rifleman	(M) Machine gunner	(L) Team leader	(A) Assistant machine gunner
22	(R) Automatic rifleman	(M) Machine gunner	(A) Assistant machine gunner	(L) Team leader
23	(R) Automatic rifleman	(A) Assistant machine gunner	(L) Team leader	(M) Machine gunner
24	(R) Automatic rifleman	(A) Assistant machine gunner	(M) Machine gunner	(L) Team leader

Analysing in this way, this means that there are $1 \times 2 \times 3 \times 4 = 24$ variants for each considered formation. By multiplying them with 14 specified formations, this means that there are 336 possible scenarios of deploying soldiers in formations.

Evaluation Criteria for Duties in a Fire Team

Obviously, not all combinations of positions in formations are applicable and that is why the assessing criteria for positioning duties in a formation have been defined. The assessing criteria are determined from the legal point of view (based on regulations), experience (based on practice) and logic (based on conclusion).¹⁸

Regulations indicate that certain duties could be placed and be regulated to perform tasks in a certain way, but practice and lessons learned suggest that there are situations in which it would be better to depart from the regulations. At the last, in certain scenarios, logic could prevail in relation to the regulations and practice.

The most important evaluation criteria, for positioning duties in formation, for selected case of the SAF infantry section, have been defined in Table 3.

Table 3 – Evaluation criteria for positioning duties in formation, for selected case of the SAF infantry section

Duties	Evaluation criteria
Team leader (T)	His position is to act as point man, in front of his soldiers, in the middle of the formation in order to allow him a better look at all the soldiers in the formation and he can issue orders.
Machine gunner (M) and assistant machine gunner (A)	They move together in order to be able to open fire as a crew. The assistant's position is on the right side of machine gunner, or behind him.
Automatic rifleman (R)	Has the ability to achieve solid fire at smaller distances and his position is not related to other duties in the formation.

Evaluation and Selection of Formation Variants

In order to make it easier to understand the whole process, the example in which all steps are visible is given.

In particular, four-man fire team line formation will be followed from the beginning to the end of the process of formation analysis.

The formation analysis includes the following seven steps:

1. Fire team organisation: four-man fire team.
2. Formation: line.
3. Positions for line formation: as marked in Figure 1.
4. Duties: team leader (L), a machine gunner (M), an assistant machine gunner (A) and an automatic rifleman (R).
5. List of combinations of positions in a formation: as listed in Table 2.
6. Criteria for duties in a fire team: as indicated in Table 3.
7. Evaluation and selection of formation:
 - Formation of the first order: formation number 19 (RLMA),
 - Formation of the second order: formation number 9 (MALR) (Table 4).

¹⁸ Ritchey, Tom, *General Morphological Analysis: A general method for non-quantified modelling* (1998), page 6.

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Table 4 – Four-man fire team line formation analysis

Formation	Position				Formation – visually	Formation evaluation of line formation
	1	2	3	4		
1	L	M	A	R		x
2	L	M	R	A		x
3	L	A	M	R		x
4	L	A	R	M		x
5	L	R	M	A		x
6	L	R	A	M		x
7	M	L	A	R		x
8	M	L	R	A		x
9	M	A	L	R		2
10	M	A	R	L		x
11	M	R	L	A		x
12	M	R	A	L		x
13	A	L	M	R		x
14	A	L	R	M		x
15	A	M	L	R		x
16	A	M	R	L		x
17	A	R	L	M		x
18	A	R	M	L		x
19	R	L	M	A		1
20	R	L	A	M		x
21	R	M	L	A		x
22	R	M	A	L		x
23	R	A	L	M		x
24	R	A	M	L		x

Using the criteria based on regulations, practice and logic, a set of 24 formations has been evaluated. Only two of those 24 formations are marked as eligible. Formation number 19 is marked as formation of the first order, and formation number 9 is marked as formation of the second order (Table 4).

Following the adopted procedure, all selected formations have been evaluated and the results are shown in the table (Tabela 5).

Table 5 – Four-man fire team formation scenarios analysis

Formation		Scenario																							
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		L	L	L	L	L	L	M	M	M	M	M	M	A	A	A	A	A	A	R	R	R	R	R	R
2		M	M	A	A	R	R	L	L	A	A	R	R	L	L	M	M	R	R	L	L	M	M	A	A
3		A	R	M	R	M	A	A	R	L	R	L	A	M	R	L	R	L	M	M	A	L	A	L	M
4		R	A	R	M	A	M	R	A	R	L	A	L	R	M	R	L	M	L	A	M	A	L	M	L
Line		x	x	x	x	x	x	x	x	2	x	x	x	x	x	x	x	x	x	1	x	x	x	x	x
File		1	x	x	x	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Staggered column-1		1	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Staggered column-2		x	1	x	x	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Wedge-left		x	x	x	x	x	x	x	x	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Wedge-right		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	1	x	x	x	x	x	x
Vee-left		x	x	x	x	x	x	x	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Vee-right		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	2	x	x	x	x	x	x
Echelon-left		2	x	x	x	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Echelon-right		1	x	x	x	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Box		x	1	x	x	1	x	1	x	x	x	x	x	x	x	x	x	x	1	x	x	x	x	x	x
Diamond		x	x	x	x	x	x	1	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Y		x	x	x	x	2	x	x	x	x	1	x	x	x	x	x	x	1	x	2	x	x	x	1	x
T		x	x	x	x	x	x	1	1	x	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Those formation variants are in the end of processes separated into formation of the first and second order (Table 6).

Table 6 – Scenarios (formation variants) separated into the first and second order

Four man fire team					
Formation	First order formation	Second order formation	Formation	First order formation	Second order formation
Line			Echelon-left		
File			Echelon-right		
Staggered column-1			Box		
Staggered column-2			Diamond		
Wedge-left			Y		
Wedge-right			T		
Vee-left					
Vee-right					

This material is prepared for decision-makers in order to support their process of deciding what formation variants will be accepted and applied for future operational use.

Therefore, the further research has to be conducted and in this future study the result will be formation of fire team for one situation.

Conclusion

The result of conducted research has not been the only one and the best formation, but the set of possible variants of formation.

From 14 considered formations, the results show that except 3 formations: Wedge-left, Vee-right and Echelon-left, all other 11 formations have the possibility of deploying soldiers in formation of the first order.

This process is not complicated, but it requires competence in theory and practice of weapons systems, duties and needs of fire teams.

If they were put into operational use a large number of formation variants would certainly be a factor that would confuse both soldiers and leaders. Therefore, this research is only one part of much greater problem solving process, which aims to clarify and simplify formation for fire teams, sections and platoons as the final goal.

This has been the research focused on the topic of finding all possible and usable formations and their variants, which can be put in operational use. Therefore, the variants of the first and second order are the initial material for determining several formations that would apply to most situations. It is up to decision-makers to consider all other indicators and decide which formation variants will be accepted.

Literature

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