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Artillery Groups

1. The following artillery groups exist within the framework of the Army:

   a. Regimental artillery group (P.A.G.)
   b. Divisional artillery group (D.A.G.)
   c. Mortar group (M.G.)
   d. Artillery corps group (K.A.G.)
   e. Bombardment group (destruction)(A.R.)

   Counterbattery artillery groups

   f. Army group artillery (A.A.G.)
   g. Mobile anti-tank reserves (in regiment, division, corps and army) (P.P.T.R)

2. The regimental, divisional, corps and army artillery groups are, in consequence made up so that the commanders of units and regiments have at their disposal artillery (artillery groups), under their command by means of which they can influence the course of the battle, with a timely mass of artillery fire.

3. The army artillery groups can be divided into secondary groups according to the number of the corps which operate in the principal direction of attack, and, in the case of long range artillery, long range sub-groups can also be formed.

4. The temporary uniting of army, corps, divisional and regimental group artillery, gives in general to the military commanders the power to use the artillery and simultaneously to ensure the continuous cooperation of the artillery with the infantry and tanks during the whole battle.

Essentials of Command

5. The allotted artillery is entirely subordinated to the commander of the division (regiment, battery and company) as is, also, the artillery formation itself, and carries out its own task while at the same time maintaining contact with the commander of the artillery unit of which it forms part.

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6. The supporting artillery is used for the execution of tactical and fire tasks for the fighting units. It carries out the demands of the commanders of units as regards the fire, or, if not directly under their command, it keeps communication with them.

7. At the decision of the Senior Commander, the supporting artillery can at any time be completely or in part employed for the carrying out of fire task for the whole unit and, in the course of battle, it can be entirely or partly allotted to lower units. In the event of a breakdown of communications with the artillery commanders themselves, the artillery becomes subordinate to the company and battalion (regimental) commanders to which it is attached.

8. The task of the coordinated command is the coordination of the fire of the artillery under the command of the most senior artillery commander, and the planning of artillery tasks during all periods of the battle as well as the allotting of supplementary tasks during the battle.

9. The separate command of the artillery attached to the subordinate units, make possible the greatest measure of coordination with the smaller units, but at times slows up and altogether excludes the firing maneuver and the concentration of fire support of the larger units.

Regimental, Divisional and Mortar Divisions

10. For supporting operations of rifle regiments there are formed groupings of regimental artillery from the divisional artillery, and, in case of need, mortar artillery units attached to the division as reinforcements are also provided. These groups receive the number of the rifle regiment to which they belong.

11. The regimental artillery and regimental mortars are not included in the composition of regimental artillery groups. But, when considering the plan of fire in the preparation of artillery, the commanders of the regimental artillery groups also take both these weapons and the weapons of the rifle battalions into consideration.

12. In the auxiliary direction of attack, regimental artillery groups cannot always be formed. In this case the task of the regimental artillery group is carried out by artillery of respective rifle regiments, reinforced when necessary by mortars and individual batteries from divisional artillery.

13. Groups of divisional artillery are formed in divisions of the attached ARVAK (sic) units and of rocket artillery of 85 and 132 mm.

14. Mortar groups are formed in first line divisions (echelons) in the principal direction of attack, from mortar units of 82 and 120 mm of rifle regiments of the divisions, corps (armies), of the second and third echelon for the period of artillery preparation and of [illegible] supporting artillery in the attack.

Groups of Corps, Artillery, Counterbattery Groups of Army Artillery and Mobile Anti-Tank Reserves

15. Groups of corps artillery are formed in the corps from corps artillery attached to ARVAK units and from units of rocket artillery.

16. Counterbattery groups are formed in the corps when it becomes necessary to organize the counterbattery within the framework of the corps themselves. They are formed by corps artillery units and from attached ARVAK units.

17. Groups of bombardment artillery are formed in the corps by howitzer units and guns of heavier caliber (132 mm and mortars of 160 mm and heavier), and by rocket artillery of heavier caliber.

18. Groups of army artillery are formed in the army by army artillery and by attached ARVAK units.

19. Mobile anti-tank artillery reserve groups are formed by mobile anti-tank reserves from anti-tank rifle units and from sapper units.

Allocation of Firing Tasks in Regimental, Divisional and Corps Artillery Groups

20. Regimental artillery groups (P.A.G.) have the task of assisting rifle regiments and tank units attached to the same. Divisions (one or more batteries) or regimental artillery groups are so disposed as to aid battalions (companies).

21. Divisional artillery groups (D.A.G.) have the task of reinforcing the operations of regimental artillery groups in the principal direction of attack, to destroy reserves and commands, and are also used for the carrying out of other tasks.

22. Corps artillery groups (K.A.G.) have the task of reinforcing the attacks of divisional groups with massed fire, and of hammering enemy reserves and commands, and also to carry out other tasks in the first line of attack.

23. Army artillery groups (A.A.G.) have the task of executing counter-battery fire, hammering enemy reserves, command posts, and of hindering the work in the enemy's rear.

24. If sub groups (D.D.) are formed they carry out similar tasks in greater depth.

Artillery Protection in Battle for Mobile Groups

25. Besides the basic and attached artillery, protection is given by the corps and army artillery and by regimental and divisional artillery groups.

26. Since the army corps artillery is protected from the front, it acts as an escort for the mobile group, with firing maneuver from its firing sites within the whole range of its own weapons.

27. Tank hunting and light artillery units move directly in the battle area of the mobile groups, as support artillery, and operate principally with direct fire, either on their own initiative or at the request of the commander of tank units.

Anti-Tank Defenses (P.T.O.)

28. This is generally organized by the senior commander. It is formed by the organization of a reconnaissance and observation system; coordination of artillery fire, mortars, infantry anti-tank weapons; by the use of tanks and aviation, with a wide application of natural and artificial anti-tank obstacles, with measures to inflict casualties.

29. Anti-tank protection is organized throughout the whole extension of defense and primarily, in the forward part of the principal defensive belt. The main bulk of anti-tank defense weapons is employed in protecting the principal defensive belt.

30. In the most effective direction of regiments, divisions and armies, use is made of mobile anti-tank reserves, composed of artillery weapons, self-propelled artillery, (P.O.Z) anti-tank rifles and sappers using mines. The nests of defense battalions and company lines in the zone of attack by tanks, are disposed like the anti-tank nests and areas.

31. The utmost attention is required in the coordination of the fire plan. The commander of the Army (corps, division and regiment), chooses the commanders who are responsible for the coordination itself and personally or through his staff will check the organization for fire where boundaries meet. The artillery fire positions must be selected as in the case of tank penetration; the bulk of the artillery can take part in repulsing the attack by tanks. The approaches to the fire positions must be defended with anti-tank obstacles and mines. The areas of fire positions are always arranged for anti-tank defense. The anti-tank areas, nests, points of resistance and anti-tank positions form the basic anti-tank defense.

32. Infantry defense is organized with the anti-tank defense system, and must be protected both by occupation by enemy infantry, as well as from penetration in gaps through anti-tank defense. The anti-tank areas must always be coordinated with the defense companies. The areas of anti-tank companies of a battalion form an anti-tank battalion strong point. Anti-tank areas, nests, resistance points and lines, especially in the possible direction of tank attacks, must be joined in the whole depth of defense by a simple system of anti-tank fire units and by a system of obstruction built by the engineers.

Anti-Tank Strong Points

33. These are organized in the main direction of a probable tank attack and must be coordinated with regimental and company defense areas outside the orders of the infantry. Anti-tank resistance points must, in each case, be covered by its own infantry. If the defenses are sited in depth, cover for the strong point can be obtained by organizing these points in reserve areas or, by means of infantry units specially assigned to this task.

34. In the organization of anti-tank strong points, the light anti-tank regiment takes chief part. The battle order of light anti-tank regiment or light anti-tank battery at the resistance point, is composed of battery strong points joined with a uniform fire plan which is connected with the engineering obstructions.

Mobile Anti-Tank Reserves

35. This coordinates analagously, like anti-tank units in anti-tank strong points, and areas of coordination are also disposed like these strong points, so that it can be ready at any moment in the briefest possible space of time to join the anti-tank defenses which have been previously organized.

Explosives and Instantaneous Fuse Shells

36. Explosive shell: steel or cast iron covering filled with explosive (tritolo). Slow burning fuse and detonator. Is intended for use against non-armored field defenses, trenches, fire positions, observation posts, et cetera. Its chief characteristic is its explosive effect. Penetration in depth of the projectile in the substance can be regulated chiefly by adjusting the fuse and its trajectory.

37. Instantaneous shell: covering of steel and cast iron filled with explosive, igniter adapted for instant effect, and detonators. It is intended for anti-personnel purposes, for the demolition of weak field works, for the opening of passages through barbed wire obstacles, and for firing at loopholes of concrete emplacements. The chief element of success is the killing section of the grenade. The killing splinters are those which weigh at least five grams and, in the instant explosion against personnel, ten grams.

38. At the moment of explosion the "instant effect" shell fires three "sticks of splinters", i.e. one containing twenty percent of the splinters, one from the blank part containing seventy percent, and one from the

bottom section of the projectile which contains ten percent. For calculation one takes the area of the effective zone and the area of the 100 percent zone of the shell as follows: The size of the effective zone (area in which at the moment of the explosion of the grenade, fifty percent of the target is hit):

76 mm	30 m	of front	and	15 m	in depth
107 mm	40 m	of front	and	20 m	in depth
122 mm	60 m	of front	and	20 m	in depth
152 mm	75 m	of front	and	25 m	in depth

39. The size of the 100 percent zone (area in which, at the moment of explosion of a shell 90 percent (sic) of the target is hit):

76 mm	8 m	of front	and	6 m	in depth
107 mm	14 m	of front	and	6 m	in depth
122 mm	18 m	of front	and	8 m	in depth
152 mm	22 m	of front	and	12 m	in depth

The richocet effect is seen in the explosion in mid-air after the grenade has hit the ground.

Time Fuse, Armor Piercing and Penetrating Shell

40. Time shell: the covering of the projectile is in steel and cast iron, filled with explosive, double igniter with time fuse and/or contact fuse with detonator. Its task is to hit aerial targets, and personnel when the ground is very marshy or when the targets are deeply dug in. In the case of live targets, the best height for explosions is at about 20 meters.

41. Armor piercing shell: covering of the projectile is specially treated steel filled with a small amount of explosive and equipped with a special slow burning fuse or even without a fuse. The projectile has a soft steel nose and a ballistic cap. It is used for firing at armored targets and the destruction of permanent defenses. The effect of this projectile is composed of the penetrating and explosive shell. The best effect is achieved with fire at an angle of 90°.

42. Penetrating shell: covering of the projectile is in specially treated steel, charged with explosive and with a lower slow burning fuse. It is used for the destruction of cement fortifications. The best effect is obtained with the 150 mm caliber and over.

Shrapnel and "Kartec"

43. Shrapnel: projectile filled with lead or steel bullets. The bullets are mixed in the cylindrical part of the covering and covered with the "calofonia" (sic). At the bottom of the covering is the chamber for black powder and this is divided from the bullet by means of a diaphragm. Through the middle of the projectile is mounted a small tube with compressed black powder, through which the flame from the igniter spreads. The fuse is a time fuse and is set for time and percussion. The shrapnel is used for firing at live unprotected targets. For the ignition of the powder chamber a pressure is produced which works on the diaphragm and which drives out the contents of the case, together with the upper part of the projectile, so that the case is nearly intact and the splinters and bullets branch out in the form of a funnel.

44. Kartec: cylindrically shaped projectile of steel plate and filled with iron and with steel bullets which are coated with wax. Its action is that the shell which contains the bullets bursts through the cartridge in the barrel itself and the bullets, under the pressure exerted by the gas from the powder, spread out from the barrel in the form of a funnel. It is intended for action against personnel of batteries.

Sub-Caliber Projectiles

45. Composition: ballistic cover of light aluminum or iron alloy, designed for the improvement of the ballistic shape of the projectile. Case of the projectile is made of light steel. At the top part there is a small circular protuberance like a centering piece, and in the lower part a protuberance with a circular canal which has the role of a canalizing ring and a ribbed hollow serves as a chamber for the shell. The center of the projectile has an oval-shaped top and is formed by an alloy of special metal which has a high specific gravity and a high degree of hardness.

46. Effect: At the moment of striking against the armor, the ballistic cover is broken and the center of the projectile with its sharp parts penetrates the metal of the armor, forming a hole during its passage. The case of the projectile has no effect because it is of soft metal and disperses at the moment of firing. Its kinetic energy is given to the core of the shell.

Hollow Charge Cumulative Shell

47. Composition: case similar to that of the explosive shell. Steel or cast iron top screwed into covering. Explosive charge placed in the case which consists of several parts. The head is empty while the explosive charge in the higher part has a hollow which is rather similar to the hollow of the surface of a searchlight. Instant effect igniter without safety device, central guiding tube through the center of the explosive material, empty and made of aluminium. Detonator and detonating capsule arranged at the bottom of the explosive.

48. Effect: at the moment of striking a hard object the fuse sets off the detonator which explodes the charge. The buring gasses which are generated as a result of the explosion, in consequence of the concave shape of the front end of the charge, concentrate in the direction of the top of the shell. These gases collect at the top of the shell with great heat, speed and pressure similar to the light collected on the reflector of a searchlight. This burst penetrates the armor. According to the penetration of the armor the gases have a great pressure and heat effect on the crew and equipment inside a tank.

Artillery Attack

49. The artillery attack consists in the neutralization of the enemy defense system before the beginning of the attack, with continued support of infantry and tanks, with a concentration of effective artillery fire and mortars throughout the whole attack. The artillery and mortar fire leads the infantry and tanks from one defense objective to the other.

50. The artillery attack is divided into the following phases:

Preparation for the attack
Supporting the attack
Defense of the success of the infantry and of the tanks in the depth of the enemy defenses.

Artillery Preparation

51. Before the beginning of the attack, the artillery disorganizes the enemy command and observation, throwing the firing systems of the defense preparations into confusion and preparing a passage through obstacles. This is carried out only on the day of attack, and represents the most important means of assuring success.

Artillery Support

52. This confuses the enemy fire plan, neutralizes the fire points, protects infantry and tanks when attacking enemy defenses, and during the occupation of the strong points of the first line.

Artillery Defense of the Battlefield

53. This gives, in depth, sustained support of units in overcoming of enemy resistance. The artillery, maneuvering with fire and movement, accompanies the infantry and tanks from one objective to the other throughout the entire action.

Conception of the Letter "C"

54. At the moment of opening the attack, infantry and tanks are given the signal "C". This signifies the opening of the attack, the end of artillery preparation and the lengthening of artillery range. The letter "C" serves as a basis for carrying out all the calculations of the artillery attack. The exact moment for giving the "C" signal (for instances 5.00) is announced a little later so as to keep the hour for the opening of the attack secret a little longer, but it is necessary to announce it in good time, so that artillery preparation can begin in time (e.g. for "C" - 5.00, "C" - 50 = 4.10).

Cooperation of the Artillery with Other Arms

55. Coordination is organized by Army commanders and in conjunction with other ground forces and also with the assistance of their staffs and commanders of other arms. They are responsible for establishing clearly: what, with whom, when, how, which targets, and where it is necessary to cooperate.

56. The general documents for this cooperation are: orientation plan, plan of the target, numbering of the targets, artillery panoramic sketch, table of the signals and time table of battle.

57. The artillery gives the following documents to the infantry: plan of orientation, copy of the artillery, panoramic sketch, plan of the targets fire table, graph of artillery attack, fire plan, plan of order of battle of the artillery.

58. The infantry issues to the artillery: operation orders, time table, plan of targets, orientation plan and plan of order of battle for the infantry.

59. Report by the Commander of the Artillery Group to the Commander of the Rifle Regiment:

a. Composition of the group (type and number of arms), quantity of munitions and fuel supplies.

b. Fire power of the group

c. Orders received from the higher command of the artillery: how much these orders will employ his artillery and how much he will have left at the disposal of the regimental commander.

d. Proposal for the division of the artillery for support of rifle regiments

e. Areas of fire positions and observation posts

f. Time in which the artillery will be ready

60. Indications given by the Commanding Officer of the Rifle Regiment to the Artillery Commander:

a. General orientation, nature of the terrain, particulars concerning the enemy.

b. Tasks of the regiment

c. Tasks of the battalions

d. Starting points for the attack

e. To arrange numerically and by types of batteries (mil - mortars) artillery for the support of the battalions.

f. Targets

g. Tasks for the artillery.