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THE GENERAL BOARD
UNITED STATES FORCES, EUROPEAN THEATER
APO 408

STUDY OF THE ORGANIZATION AND EQUIPMENT
OF
FIELD ARTILLERY UNITS

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THE GENERAL BOARD
UNITED STATES FORCES, EUROPEAN THEATER
APO 408

STUDY OF THE ORGANIZATION AND
EQUIPMENT OF FIELD ARTILLERY UNITS

PART ONE

GENERAL

1. Purpose. The purpose of this study is to critically examine the organization and equipment of the field artillery units of the United States forces in the European Theater with a view to making recommendations for major changes thereto.

2. Scope. No tables of organization and equipment were prepared as a part of this study, but sufficient detail has been given to indicate the desired major changes.

3. Source Material. This study is based on reports of conferences of senior artillery commanders, previously submitted recommendations for changes to tables of organization and equipment, interviews with officers of all grades, and consultation with members of The General Board.

PART TWO

DIVISIONAL ARTILLERY

CHAPTER 1

INFANTRY DIVISION

SECTION 1

THE FIRING BATTERY

4. Light Artillery.

a. General. Artillery for direct support of infantry must be capable of rendering close support: namely, fire upon those hostile weapons which are holding up the immediate advance of the supported elements. It must be of a caliber capable of delivering sufficient volume of fire to destroy or neutralize the weapons normally employed by the enemy in the front lines. The radius of fragmentation of its projectiles must be such that foot elements can approach close to the point of impact, thus making it possible for our troops to rush the position promptly and close with the enemy before he has recovered from the effects of our fire. Mobility must be such that direct support artillery can keep up with the supported troops and be readily adapted to transport by aircraft, thus assuring strategic as well as tactical mobility.

b. Caliber. The 105mm howitzer was the principal light artillery weapon in the European Theater. It permits the advance of friendly infantry to within sufficient distance to close with the enemy when fire lifts.^{2, 3} It can also be fired over tanks (time fire) without damage to them. Its rate of fire is high. While a larger caliber has more destructive power, it is considered that larger calibers would force the supported troops to remain so far back that the enemy might recover from the neutralizing fire before friendly troops could close with him.³

c. Number of Pieces.

- (1) In the European Theater the light artillery batteries in the infantry divisions consisted of four pieces while in armored artillery they had six pieces. Since armored artillery reinforced infantry divisions a comparison can be made as to the relative value of a four and six piece battery.¹ Maintenance requirements of self-propelled artillery frequently reduced the number of active pieces; however, their effectiveness as six piece batteries was observed sufficiently to warrant comparison.

- (2) The advantages of the six piece light artillery battery are:^{2, 4}
- (a) The personnel overhead per piece is greatly reduced.
 - (b) The fire power of a battalion is increased by 50%.
 - (c) Greater frontage will be covered by the fire of each battery.
 - (d) Supervision of the gun crews, while admittedly difficult due to an increase of pieces, can still be efficiently performed.
 - (e) Fire commands are now transmitted by telephone to the piece so the addition of two pieces per battery will cause no difficulty.
 - (f) Normally, there would be no more difficulty in selecting positions for six pieces than for four.
- (3) The disadvantages of the six piece battery are:
- (a) This number of pieces is unwieldy in the occupation of position.
 - (b) The difficulty of supervision of the gun crews will cause less efficient work.
 - (c) The difficulty in selecting position in some types of terrain is increased.
- (4) Some senior artillery officers with combat experience have suggested a five piece battery which would have some of the virtues of the six piece battery.^{2, 3}
- (5) Commanders agree, that, if there be an increase in the number of pieces per battery, there should be no decrease in the number of batteries per battalion nor battalions per division.^{2, 4}

d. Prime Movers. All light artillery in infantry divisions was towed, save in one division. In every instance, whether the piece was towed or self-propelled, the artillery kept up with the supported unit. The comparative advantages of the two types are well discussed by Colonel M. K. Kurtz in pages 13, 14, and 15 of the report of Third Army Artillery Conference at Bad Wiessee, Germany.³ Only one artillery commander has suggested that the light artillery with the infantry division be self-propelled.^{2, 3, 4, 5, 9} Furthermore, most commanders prefer that this artillery be towed by trucks.³ The following are the advantages of towed artillery in infantry divisions: ease of concealment, light

weight on bridges; movement off roads in mud and on roads in icy conditions, readily adaptable for transport by aircraft, small size of target and ease of digging in, capability of using high angle fire, greater traverse on the carriage, small maintenance problem and fuel consumption, excellent strategic mobility, and less noise in movement near the front. Armored Artillery has greater mobility off roads in good weather, affords more protection for the gun crew during displacement and in the initial stages of the occupation of position, and can occupy position and displace faster for short distances than towed artillery. The advantages of the towed artillery for the infantry division outweigh the advantages offered by the self-propelled artillery.^{2, 3} This is at variance with the recommendation contained in The General Board Study Number 15 "Organization, Equipment, and Tactical Employment of the Infantry Division" as decided by the Final Review Committee, but represents the opinion of the Artillery Section, The General Board, as well as that of the majority of officers with experience with infantry division artillery.^{2, 3}

e. Observers. In infantry divisions it was common practice for the direct support artillery to furnish one forward observer with party to each supported infantry company.^{2, 3, 4} Since the use of reserve companies could not be foreseen, it was customary to have nine such parties available for each infantry regiment.^{2, 3} Sometimes it was possible to supplement the observer parties from the direct support battalion with parties from reinforcing battalions.² In any case, it placed a great strain on the direct support artillery because only one observer and party was authorized per firing battery. Most battle-field promotions in the field artillery came from the enlisted men of forward observer parties. These men would have performed their mission much more efficiently if they had had a better knowledge of and training in gunnery. One observer and party should be organically available in the direct support artillery for each infantry rifle company.

f. Personnel for six piece light howitzer batteries should be increased by that authorized in the Tables of Organization 6-27, 1 June 1945, contemplating redeployment to other theaters.

g. Transportation. Light artillery batteries need that additional transportation required for the increase in personnel and equipment discussed above. Most kitchen trucks were overcrowded because they were required to carry battery supplies in addition to the kitchen, rations, and water. An additional 2 1/2-ton truck has been frequently recommended for supply in all batteries.^{2, 5} The substitution of 1 1/2-ton trucks for the 3/4-ton truck has also been recommended.⁵ Special type ammunition trailers were not liked. The one ton cargo trailer is considered to be better for ammunition than the issue trailer MLO and has considerable more utility.^{2, 5}

5. Medium Artillery.

a. General. The infantry division was the only type having medium artillery organically assigned. The weapon employed was the 155mm howitzer, M-1, tractor-drawn, although in some divisions it was truck-drawn during the early stages of combat.

b. Caliber. The 155mm projectile had sufficient power to perform those missions of destruction and neutralization required of division artillery. Artillery commanders agree that it is the suitable caliber for medium artillery in a division.^{2, 3, 4}

c. Number of Pieces. The Third and Seventh Army Artillery Conferences agreed that the number of pieces in the medium artillery battery should be four.^{2, 3, 4} It was considered that four pieces gave sufficient weight of fire together with the necessary ease of handling in position.

d. Prime Movers. The tractor, M-5, was found to be superior to the truck except on icy roads and was used by all units.² The self-propelled 155mm howitzer, M-41, did not see active service in this theater.⁷ There is no apparent requirement for a self-propelled medium artillery weapon in the infantry division.^{2, 3, 4}

e. Observers. Medium artillery covered wide fronts requiring from four to six observers. This caused hardship on the personnel of the firing battery as only one forward observer was assigned to the battalion.² These observers were not assigned to an infantry company but they kept close contact with the front line infantry and were generally to be found very near them.² The effectiveness of the medium artillery fire would be considerably enhanced by placing one observer with party in each firing battery.²

f. Personnel. The observers and parties discussed above are the only increase in personnel required.^{2, 7}

g. Transportation. The two M-5 tractors and M-21 trailers in the 5th Section were unsuitable for resupply of ammunition.^{1, 2} In many units one tractor and trailer were turned in and replaced by two 4-ton trucks.² These trucks were considered to be a fine solution to the problem. One spare tractor should be left in the battery to act as a spare prime mover and could be used to tow an ammunition trailer.^{2, 7} One ton cargo trailers to be used as ammunition trailers with the 4-ton trucks should also be issued. Other transportation changes should conform to that outlined in paragraph 4g, above.

SECTION 2

THE BATTALION SERVICE BATTERY

6. General. The service batteries of the light and medium artillery were nearly identical, the difference being in the additional equipment and mechanics necessary for tractor maintenance. The service battery was generally satisfactory but did have certain deficiencies which should be corrected.

7. Ammunition Trailers. The ammunition trains were

equipped with 2 1/2-ton trucks towing M-10 ammunition trailers. These trailers carried no more ammunition than could have been placed in a one ton cargo trailer and in addition were very heavy. Numerous recommendations have been made that the one ton cargo trailer be used in lieu of the M-10 trailer because of the former's light weight and general utility when not being used in ammunition supply.⁵

8. Supply Vehicles. There is only one 2 1/2-ton truck now authorized in the battalion supply section. In order to meet the requirements for gasoline and rations, it was frequently necessary to use two trucks of the ammunition train for this purpose, thus overloading the other trucks.² To prevent such overloading and to provide adequate transportation two additional trucks are required for this purpose.²

9. Wreckers. The originally authorized wreckers were totally inadequate being 2 1/2-ton in the light battalion and 4-ton in the medium battalion. Recent changes have authorized the 4-ton wrecker for light artillery and the 10-ton wrecker for medium artillery for those units re-deploying to other theaters. These should be made standard for all artillery.²

SECTION 3

THE BATTALION HEADQUARTERS AND HEADQUARTERS BATTERY

10. General. The organization of the headquarters and headquarters battery has been proved to be basically sound. These units in all battalions have the same basic organization and will be discussed as a whole with modifications indicated for the different calibers.

11. Liaison.

a. Light Battalion. The present organization provides for three liaison officers and parties, one for each of the three infantry battalions of the supported regiment. It was contemplated that the direct support battalion commander would furnish sufficient liaison to the regiment by means of personal contact.^{2, 3, 4} This, in most instances, was impractical as it would have kept the battalion commander away from other important duties. Consequently, some other officer from the battalion staff was detailed for this function causing a shortage in the position from which this officer was taken.

b. Medium Battalion. At present there is one liaison officer in the medium battalion, which is considered to be sufficient.²

12. Observation. One observer with party is at present authorized in the medium battalion. If the observers discussed in paragraph 5e, above are authorized in each battery this observer and party can be deleted.²

13. The Fire Direction Center must be organized for around the clock operation, thus requiring additional computers. At present these necessary additional computers

are drawn from the batteries, the survey section or radio operators.² This causes a shortage somewhere in the battalion. To alleviate this, an increase of one computer has been recommended by Third and Seventh Armies.² Conversation with some fifteen battalion commanders indicated that the increase should be three.² Those battalions going to other theaters under new Tables of Organization 6-26, 1 June 1945, were authorized five additional computers.

14. Communications. All armies agreed that the number of wiremen and switchboard operators should be increased since these men perform what is perhaps the most arduous duties in the organization.^{2, 5} The number of radio operators was considered to be adequate by all except the Third Army.⁵

15. Air Section. The addition of one officer, air observer, per plane was unanimously recommended.^{2, 3, 4, 5} It was common practice to detail officers to such duty thus causing a further shortage of officers in their assigned duties.² An additional enlisted man is needed as a driver for the vehicles of the air section.²

16. Countermortar Section. This section has been recently authorized by Tables of Organization 6-26, 1 June 1945, for direct support battalions in those units going to other theaters. The section consists of one officer and fifteen enlisted men to operate special mortar detection equipment. This equipment arrived in this theater near the termination of hostilities and a few sections were trained in its use, but none saw action.⁷ Since countermortar fire is one of the missions of the division artillery, this section places the means for locating enemy mortars in the unit where the necessary fires can be promptly delivered.⁷

17. Transportation.

a. In addition to the transportation needed for the additional personnel there was a general shortage in 1/4-ton trucks for reconnaissance and messenger service. The 3/4-ton truck was found to be inappropriate for reconnaissance and 1/4-ton trucks were invariably used. Two 1/4-ton trucks should be added in the battalion headquarters battery for this purpose and one for messenger service.⁵

18. Signal Equipment.

a. Wire and Telephone. The basic wire allowance was found to be inadequate and should be increased.^{2, 7} Telephones were always in demand and an increase of five is desirable.^{2, 5, 7} The telegraph set TG-5 was not used extensively and should be deleted.

b. Radio. One additional SCR-608 radio is desired for use as a relay station.^{2, 5} Either the SCR-608 radio or a similar set more powerful than the SCR-610 should be capable of being mounted in a 1/4-ton truck.² Radio equipment to permit the forward observers to work in the infantry net should also be provided.^{2, 7} For details see Theater General Board Study Number 63 "Field Artillery

19. Other Equipment.

a. Engineer. Since command posts were installed in cellars, tents, and dark buildings on many occasions, electric lighting equipment was needed continuously, thus necessitating a spare generator.^{2, 7}

b. Ordnance. A time interval recorder for use in the fire direction center is needed.^{2, 5}

c. Quartermaster. The command post tent as authorized was totally inadequate to house the fire direction center and the other sections of the battalion headquarters. Fortunately, houses were generally available and the tents were seldom used. The new squad tent is better for the command post than the present command post tent and should be substituted therefor.^{2, 5, 7}

SECTION 4

THE BATTALION

20. Number of Batteries. The battalion is an administrative as well as a tactical unit; therefore, the number of batteries assigned can be such as to make the organization unwieldy. Every battalion in the theater had a headquarters battery, a service battery, and three firing batteries, except the airborne artillery which is discussed later. Five to six batteries are the most that any one battalion headquarters can properly command.^{2, 3, 5} The three firing batteries carry out the triangular formation of the arms. There has been no apparent reason for any change in the number of firing batteries except in the case of a non-divisional unit.^{2, 8} (See Paragraph 82)

21. Caliber of Weapons. Since the battalion has become the fire unit under current artillery doctrine and for the purpose of uniformity in training and operation within the battalion, all the artillery weapons within a battalion should be of the same caliber.^{2, 7}

SECTION 5

DIVISION ARTILLERY HEADQUARTERS AND HEADQUARTERS BATTERY

22. General. The headquarters and headquarters battery of the division artillery furnished the staff, communications, and survey personnel for the control and integration of the division artillery. However, this organization was inadequately provided with personnel to fulfill all these missions for 24 hour operation, thus requiring attachment of officers and men from other organizations.^{2, 3, 4, 5, 6, 7} It was common practice to use the enlisted men of the survey sections to strengthen the intelligence and operations sections. This could be done only because little survey was required in this theater.²

23. S-1, S-4. This section is headed by a major with a first lieutenant, athletic and recreation officer, as assistant. The amount of administrative work required of

this section varied greatly between units.² Although the division artillery headquarters is not an administrative headquarters, a certain amount of administration and administrative supervision must be done. With enlisted clerks competent to maintain routine records and reports, this section was not overburdened.²

24. S-2. A major heads this section with a captain assistant who is also the survey officer. As the survey section was not used extensively in this theater, the assistant was available for work in the section most of the time.² If the survey section had been used on survey work as would have been necessary in a theater where maps were not as good as those in Europe, at least two additional enlisted men would be required in the section.^{2, 4, 5} One additional officer as counter mortar officer has been authorized by Tables of Organization 6-10-1, 1 June 1945, for those units going to other theaters. This officer will collect, record, and evaluate mortar locations received from the battalions. He corresponds to the counterbattery officer in the corps artillery headquarters.

25. S-3. This section is headed by a major in the armored division and a lieutenant colonel in the infantry division. In the armored division there is no assistant while in the infantry division there is a captain, information and education officer, listed as assistant operations officer. It was recommended by the First, Third, and Ninth Armies that the head of the section be a lieutenant colonel and that there be a captain assistant, information and education officer.⁷ Many officers recommended that there be a full time assistant operations officer since most infantry divisions used three officers full time in the operations section.² The grade of major is believed to be appropriate for the responsibility of the senior full time assistant.⁷ Additional enlisted men are also required. The consensus of opinion of the infantry and armored division artillery commanders consulted was that there should be three additional enlisted men assigned to the operations section.²

26. Liaison. All division artillery headquarters maintained liaison with the adjacent artillery. Also, some divisions required a liaison officer from the artillery to be at division headquarters.² No liaison officers or parties were authorized so these had to be supplied from existing personnel or by some of the subordinate units. It was generally considered that a minimum of one liaison officer, captain, with party, be assigned and that an additional officer with reduced party (vehicle and driver) be also assigned for liaison with division headquarters.^{2, 3, 4, 5}

27. Air Section. Since the division artillery usually operated with all its observation planes under division control, most divisions organized a mess section which operated the mess for pilots, observers, ground crews and any antiaircraft personnel attached to protect the field.^{2, 3, 4, 5} Officer observers should be authorized for each plane of the division artillery headquarters battery, the same as for a battalion.^{2, 3, 4, 5} For the detailed study of the organization of all air sections see

28. Headquarters Battery Officers. At present the battery commander of the headquarters battery is also the communications officer. There should be a communications officer on the staff other than the battery commander, as has been authorized by Tables of Organization 6-10-1, 1 June 1945, for those divisions going to other theaters.⁵ One lieutenant and one warrant officer, motor transport, complete the officer complement.

29. Headquarters Battery Communications.

a. Wire. Wire teams were organized on the basis of one wire team for each subordinate battalion. There should be one more wire team than the number of subordinate battalions to handle the installation of wire at the command post and for wire recovery.^{2, 5} Two additional switchboards are needed in order that switchboards can be manned without calling for outside assistance.⁵

b. Radio. An increase of two radio operators is required to permit full time operation of all sets without making an operator responsible for more than one set.⁵ For details see Theater General Board Study Number 63 "Field Artillery Communications".

30. Drivers. The headquarters battery was inadequately supplied with transportation. Additional personnel must be supplied as drivers for any additional transportation authorized.⁵ (See Paragraph 34 below)

31. Antitank. In some divisions this section was made a part of the G-3 section at division headquarters instead of being left in the division artillery.² While the additional personnel was welcome assistance in the division artillery, the proper place for this section is in the division headquarters since this section must coordinate engineers, infantry, and tank destroyers as well as artillery.^{2, 3, 4}

32. Attached Medical. This organization is satisfactory.^{2, 7}

33. Attached Chaplains. The number and grade of the attached chaplains should conform to the established policy.^{2, 7}

34. Transportation.

a. There was a shortage in light transportation in all division artillery headquarters batteries. There is a basic need for at least four additional 1/4-ton trucks for use of the artillery commander, staff, and liaison.^{2, 3, 4, 5}

b. The substitution of 1 1/2-ton trucks for some of the 3/4-ton trucks in the infantry division artillery has been recommended. This is sound in the case of radio sections and maintenance vehicles.^{2, 5}

c. Additional transportation must be provided for the added wire teams.

35. Signal Equipment.

a. Wire. The basic load of wire was insufficient; it should be doubled.^{2, 7}

b. Telephones and Switchboards. The authorized allowance of these two items was supplemented by captured equipment. The addition of ten telephones and one BD-72 switchboard is indicated for use in the fire direction center and for displacement.^{2, 5, 7}

c. Radio. One additional radio set is required to act as the base set at the air strip and another is required for the liaison officer.^{2, 5, 7}

36. Other Equipment. The deficiencies in engineer, ordnance, and quartermaster equipment are the same as shown in paragraph 19 above.^{2, 5, 7}

SECTION 6

THE DIVISION ARTILLERY

37. General. It was almost invariably found necessary to reinforce the artillery of the infantry divisions in the European Theater by attached or supporting artillery from higher headquarters.^{1, 2} The amount of artillery so attached or assigned as reinforcement depended upon the amount of artillery available, the mission and front of the division, and the resistance expected.

38. Quantity and Type.

a. The organic artillery of the infantry division consisted of three battalions of 105mm howitzer, truck drawn, and one battalion of 155mm howitzers, tractor drawn, with a division artillery headquarters and headquarters battery.

b. An additional battalion of 155mm howitzers is required to cover the division front, as division fronts were such that one battalion could not cover the entire sector.²

c. If this artillery be made self-propelled, the organization of the armored division artillery discussed below, with obvious modifications in vehicles and observers, is appropriate.

CHAPTER 2

ARMORED DIVISION

SECTION 1

THE FIRING BATTERY

39. Light Artillery.

a. General. The 105mm howitzer, M-7, self-propelled, was the organic artillery of the armored division in the European Theater. It is a suitable weapon for direct support and its armor permits movement across areas swept by enemy fire as was required in action with an armored division.

b. Caliber. The 105mm howitzer is capable of close support of both infantry and tanks as discussed in paragraph 4b above, and is considered to be the best weapon for direct support in armored divisions.

c. Number of Pieces. Armored artillery consisted of six pieces per battery. This size battery was very successful with the armored division and should be retained.² (See also Paragraph 4c)

d. Prime Movers. The self-propelled artillery with the armored division was very successful in filling its direct support mission. The armored self-propelled mount for the artillery with the armored division permits movement in close support of the division with maximum protection for the personnel, and provides speed (tactical mobility) in occupation of position and displacement.^{2, 3}

e. Observers. Tables of organization did not provide forward observers for each infantry rifle company. To furnish these observers it was necessary to take officers and men from other duties in the battery. Since these must be furnished by the direct support artillery two observers with parties are needed per battery.^{2, 7} (These observers are in addition to those tank observers in battalion headquarters; see paragraph 43, below.)

f. Personnel. With the increase afforded by the addition of the observer sections, the battery personnel situation will be satisfactory.

g. Transportation. The M-10 ammunition trailer was in some cases discarded. Units using this trailer were of the opinion that the one ton cargo trailer was better because of its varied utility.² An additional 2 1/2-ton truck for supply is needed. (See also paragraph 4g) (For details see Theater General Board Study Number 58 "Ammunition Supply for Field Artillery")

40. Medium Artillery.

a. General. The armored division had no organic medium artillery, but always wanted and usually was reinforced by medium battalions from army artillery.^{1, 2} Sometimes this artillery was the tractor drawn 155mm howitzer, and sometimes the 155mm gun, M1918, on the motor carriage, M-12. Although the 155mm gun on the M-12 carriage was classified as heavy artillery, its range and projectile corresponded closely to those of the 155mm howitzer.

b. Caliber. The 155mm howitzer is suitable for those reasons listed in paragraph 5b.²

c. Number of Pieces. If the piece be self-propelled the battery should have six pieces. This will

insure a heavy volume of fire even though some pieces may be undergoing maintenance and repair.

d. Prime Movers. The self-propelled 155mm. howitzer did not see active service in this theater. Medium artillery with an armored division should be self-propelled to conform to the other artillery in the division, and for the same reasons that the armored division requires self-propelled light artillery.²

e. Observers. One observer and party per battery are required for the same reasons shown in paragraph 5e.²

f. Personnel. The organization of the present light armored artillery battery should be taken as a basis for this organization. An addition of cannoners because of the weight of the ammunition, the observer section, and additional drivers for added transportation will be required.^{2,7}

g. Transportation. Because of the lack of cargo space on self-propelled weapons, additional cargo vehicles will be required. If these are added on the basis of one full track vehicle and one truck for each two pieces, full track vehicles will be available at the battery position while wheeled vehicles will be available for ammunition supply. Two 2½-ton trucks are needed, one for the kitchen and one for supply.⁷

SECTION 2

BATTALION SERVICE BATTERY

41. The Present Service Battery of the armored field artillery battalion is suitable for both the light and the medium artillery except that the one ton cargo trailer should be substituted for the ammunition trailer M-10.⁷

SECTION 3

BATTALION HEADQUARTERS AND HEADQUARTERS BATTERY

42. General. The organization of the headquarters battery of the armored field artillery battalion is basically sound and suitable for both the light and the medium battalion except for those minor modifications indicated below.²

✓ 43. Liaison and Observation.

a. The Light Battalion must furnish liaison with two infantry and one tank battalions as recommended in the Theater General Board Study Number 43 "Organization, Equipment, and Tactical Employment of the Armored Division"; this obviously requires three liaison officers and parties. One observer per tank company is required, in addition to those observers for the infantry companies listed under the firing battery. With the tank companies increased to four it follows that four observers, with tanks, must be available to these companies. A command tank for the artillery battalion commander is also needed.⁷

b. The Medium Battalion requires one liaison officer and party, the same as in the infantry division.⁷

44. The Fire Direction Center requires the same increase in personnel as shown in paragraph 13.²

45. Communications personnel should be increased as indicated in paragraph 14.²

46. The Air Section requires the changes noted in paragraph 15.⁷

47. The Counterartillery Section as shown in paragraph 16, should be included in the light artillery since armored artillery supports infantry as well as tanks.⁷

SECTION 4

THE BATTALION

48. General Organization. The battalions in the armored division artillery should consist of three firing batteries of the same caliber, a headquarters and headquarters battery, and a service battery for the same reasons given in paragraphs 20 and 21.^{2,7}

SECTION 5

DIVISION ARTILLERY HEADQUARTERS AND HEADQUARTERS BATTERY

49. General. Since the mission of the division artillery in all types of divisions is similar, it follows that the organization of their headquarters and headquarters batteries should be the same except for obvious modifications in radio equipment and personnel, and in vehicles necessary to work with armor.^{2,7} The discussion of the infantry division artillery contained in paragraphs 22 to 36 is applicable to the armored division.

SECTION 6

THE DIVISION ARTILLERY

50. The organic artillery of the armored division consisted of three battalions of armored artillery, 105mm howitzer, self-propelled, and a headquarters and headquarters battery similar to that in the infantry division for the light armored division; in the heavy armored division the headquarters and headquarters battery was formed by the addition of personnel and equipment on a special theater allotment.² This artillery is insufficient. The General Board has recommended that the artillery consist of three battalions of 105mm howitzer, self-propelled, and two battalions of 155mm howitzer, self-propelled, with a division artillery headquarters and headquarters battery as indicated above.⁷ This is a sound organization as it gives the minimum artillery support which combat experience has shown to be necessary.^{2,7} Reinforcement will be required when opposed by a powerful adversary.

CHAPTER 3

AIRBORNE DIVISION

SECTION 1

THE FIRING BATTERY

51. General.

a. The 75mm pack howitzer was the principal artillery weapon of the airborne division. Since it could be conveniently broken down into its component parts and was very light in weight, it was the most logical weapon available. The 105mm howitzer, M-3, was available by special War Department authorization for one battalion per division in this theater. This 105mm howitzer has a shorter range than the 75mm pack howitzer.

b. Since the air transportation available is one of the controlling factors in the selection of weapons, both as to size and type, the 75mm pack howitzer and the 105mm howitzer, M-3, were the most suitable weapons for airborne operations.

c. When used on a ground mission the assigned artillery was found to be inadequate in caliber.⁶ The replacing of the 75mm howitzer and the 105mm howitzer, M-3, by the 105mm howitzer, M-2, and the 155mm howitzer respectively as the basic weapons has been recommended. The lighter weapons would be retained as special equipment for use in airborne operations; the basic weapons to join the division and replace the airborne weapons as soon as ground communications permit.⁶ This dual equipment can be handled with no increase in personnel.⁷

52. Caliber. The 75mm pack howitzer, while firing a lighter projectile than the 105mm howitzer, was the only light artillery piece available and suitable for parachute drops. In lieu of medium artillery, the 105mm howitzer, M-3 was suitable for glider operations. When airborne troops performed ground troop missions the lack of a heavier caliber piece was in part compensated for by reinforcing them with heavier artillery.⁷ Until such time as more and better air transport is available or new weapons are developed, these are the most suitable weapons for airborne operations. However, since airborne missions were of short duration as compared to ground missions, the basic weapons should be that of the infantry division.^{6, 7} (See paragraphs 4 and 5)

53. Number of Pieces. The batteries of the airborne division artillery consisted of four active pieces in the parachute artillery and six pieces in the glider artillery. Two additional pieces were authorized as spares in the parachute artillery. Given the necessary air and ground transport, there is no reason why this number should not be increased to six active pieces for the reasons given in paragraph 4c, above.⁷ Also, for ground missions the number of pieces per battery should be the same as that in the infantry division artillery.⁷

54. Prime Movers. The prime mover for the 75mm howitzer was the $\frac{1}{2}$ -ton truck. The trucks for the parachute artillery were brought in by glider when the glider troops arrived. This truck was adequate in size and suitable for the job.⁷ For the 105mm howitzer, M-3, the $1\frac{1}{2}$ -ton trucks of the division artillery headquarters battery were used. If the basic armament of the infantry division is adopted, the prime movers should be the same as those of the infantry division artillery.⁶

55. Observers. Airborne artillery should be capable of furnishing one observer with each rifle company.^{3,4,7} At present each airborne battery is authorized one observer and party, and other parties are made up from personnel in the battery. Since each regiment consists of nine rifle companies, at least nine observers (three per battery) should be organically authorized in the direct support battalions.⁷

56. Transportation. The transportation allotted to the airborne artillery is not sufficient to permit rapid movement when used in a ground role. The limiting factor on transportation is the available capacity and number of aircraft. At present the limited transportation forces shuttle during a displacement, so that for rapid ground movement there must be supplemental transportation furnished from other sources.⁷ If the artillery be equipped the same as the artillery of the infantry division, this transportation shortage will be relieved.^{6,7}

SECTION 2

THE BATTALION SERVICE BATTERY

57. No service battery was authorized in the airborne artillery in this theater, a service platoon being included in the headquarters batteries. If infantry division artillery equipment is adopted for the basic weapons, the service battery of the infantry division artillery battalions should be adopted for the airborne battalions.^{6,7} In airborne operations, only the necessary minimum supply personnel would be moved by air transport, with the remainder joining the division when ground communications permit.⁷

SECTION 3

THE BATTALION HEADQUARTERS AND HEADQUARTERS BATTERY

58. The organization of the headquarters and headquarters battery should conform to that of the infantry division artillery battalions.^{6,7} For airborne operations only the necessary minimum of personnel should be transported by air, the remainder to join the battery when ground communications permit.⁷

SECTION 4

THE BATTALION

59. General Organization.

a. The parachute battalion consisted of a headquarters and service battery combined, three field artillery

firing batteries, and an antiaircraft and antitank battery. The antiaircraft and antitank battery was armed with light .50 caliber machine guns and four 57mm antitank guns. This last battery was seldom used on its primary mission but furnished a convenient pool of men and transportation for other use when the battalion was on ground missions.^{6,7}

b. The glider battalion consisted of a headquarters and service battery and two firing batteries. The number of firing batteries can easily be increased to three with little increase in the battalion overhead.⁷

60. Number of Batteries. The antiaircraft and antitank battery has no value in its primary mission and should be discarded.⁷ All battalions should be organized with three firing batteries, a service battery, and a headquarters and headquarters battery as are the battalions in the other type divisions.^{6,7}

SECTION 5

DIVISION ARTILLERY HEADQUARTERS AND HEADQUARTERS BATTERY

61. Organization. The headquarters and headquarters battery of the airborne division artillery was basically organized the same as that of the infantry division, plus a transportation section. The same deficiencies existed here as in the infantry division artillery headquarters battery.⁷ With the artillery battalions basically organized the same as the battalions in the infantry divisions, the division artillery headquarters and headquarters battery should also be so organized.^{6,7} For airborne operations the minimum personnel and equipment would be used, and the remainder would be brought in later.^{6,7}

SECTION 6

THE DIVISION ARTILLERY

62. Organization.

a. The organic artillery of the airborne division consisted of two battalions of parachute artillery, two battalions of glider artillery and a headquarters and headquarters battery similar to that in the infantry division. Three battalions were armed with the 75mm pack howitzer, and one glider battalion with the 105mm howitzer, M-3.

b. The artillery organization of the infantry division is the most suitable for ground missions of airborne divisions.^{6,7} For airborne missions reduced personnel would be utilized until ground communications permit the remainder of the artillery to join.

63. Equipment. The basic equipment of the infantry division artillery is the best for ground action. Special airborne equipment should be issued for use on airborne missions, with the basic equipment joining as soon as ground communications are opened.^{6,7}

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PART THREE

NON-DIVISIONAL ARTILLERY

CHAPTER 1

LIGHT ARTILLERY

SECTION 1

THE FIRING BATTERY

64. General. Non-divisional light artillery has reinforced and supported cavalry groups, and infantry, airborne and armored divisions. Some of the non-divisional light artillery units were armored self-propelled 105mm howitzers.^{1,2} Since the non-divisional light artillery unit must be prepared to support varied organizations it must be equipped to work with any one. The armored self-propelled 105mm howitzer, M7, has proved its worth in support of armor and cavalry, and can readily support infantry.^{1,2} It has good tactical mobility.

65. Caliber. The 105mm howitzer was used as non-divisional light artillery and is considered suitable for the reasons outlined in paragraph 4.³

66. Organization of the Battery. If the battery be organized and equipped the same as the armored artillery light battery, except only one observer is required because of the reinforcing role of the battalion, it will be capable of filling all support missions to which it should be assigned.^{2,7}

SECTION 2

THE BATTALION SERVICE BATTERY

67. A service battery identical in organization and equipment with that in the armored artillery is suitable.^{2,7}

SECTION 3

THE BATTALION HEADQUARTERS AND HEADQUARTERS BATTERY

68. A headquarters battery identical with that of a battalion in the armored division is suitable, except that there need be but one tank observer, only one liaison officer, and no countermortar section.^{2,7}

SECTION 4

THE BATTALION

69. A battalion organized and equipped the same as the light battalion in the armored division, except for fewer liaison officers and observers, is the most suitable.^{2,7}

CHAPTER 2

MEDIUM ARTILLERY

SECTION 1

THE FIRING BATTERY

70. General. The non-divisional medium artillery in the European Theater consisted of the 155mm howitzer, M-1, and the 4.5-inch gun. The howitzer and the gun were both used on reinforcing and general support missions with divisions and corps.^{1,2} While it was unanimously agreed that the howitzer was a splendid weapon and thoroughly suitable for its task, only a few considered the gun to be of particular value for other than long range harassing missions.^{1,2,3}

71. Organization. Since the non-divisional medium artillery frequently played the same part in combat as the divisional medium artillery, the organization of the firing battery should be identical with that of the infantry division unit.^{2,7}

SECTION 2

BATTALION

72. The service battery and battalion headquarters and headquarters batteries should be identical with that of the medium battalion in the infantry division.^{2,7}

73. The battalion organization should be the same as that in the infantry division artillery.^{2,7}

CHAPTER 3

HEAVY ARTILLERY

SECTION 1

THE FIRING BATTERY

74. General.

a. The 155mm gun, M-1 and the 8-inch howitzer were both used to good effect in the European Theater.^{1,2} These weapons were towed by M-4 tractors. A companion piece was the 155mm gun, M1918, on the self-propelled carriage M-12. This latter weapon was used effectively in support of armor and for destruction of pillboxes and houses by direct laying methods.^{2,8} The range of the latter weapon is about 3500 yards greater than that of the 155mm howitzer and was on occasion used in lieu of the howitzer. The 155mm gun, M-1, self-propelled, although used little in the European Theater, should replace the 155mm gun, M1918, on carriage M-12, as the increased range will be of considerable advantage.^{2,7}

b. The 240mm howitzer and the 8-inch gun were the heaviest artillery pieces used in the European Theater.^{1,2,7,8} These were exceptionally heavy pieces and

were organized into batteries of two pieces each. The battalions in turn were often emplaced over a considerable area since the fire of more than two pieces, one battery, on a given target was seldom required. The 240mm howitzer was a very accurate and destructive weapon. The 8-inch gun was inaccurate particularly at the longer ranges. The gun was used primarily for long range harassing fire and was of value for this work. Its value would be definitely increased if its accuracy were improved. Both these weapons were tractor drawn at the end of the campaign.^{1,2,7,8}

75. Caliber.

a. The 155mm gun and howitzer were the principal counterbattery pieces. The gun permitted the attack of targets beyond the range of the howitzer. Also the gun, having a high terminal velocity, had good penetration for destruction missions. There have been no requests for a change of caliber.^{3,4}

b. The 8-inch howitzer was perhaps the most accurate weapon in the field artillery.¹ Its destructive and concussion effect were very high. It was used very effectively in operations against cities, in counterbattery, and was at times used in reinforcing missions usually thought to be more appropriate for the 155mm howitzer. It is of suitable caliber for the missions assigned.^{2,3,4}

c. The 240mm howitzer was used for all normal types of missions (except close support) as well as for special destruction missions. It had sufficient destructive and concussion effect to be exceedingly effective. There are no recommendations for a modification of caliber.²

d. The 8-inch gun was primarily used as a harassing weapon at long ranges. Because of its inaccuracy at long ranges care in the selection of targets was necessary. Those who used this piece were of the opinion that it had a place in a well organized army and that it was of suitable caliber for its mission.^{2,3}

76. Number of Pieces.

a. The 155mm gun, M-1 and M-12, was organized into batteries of four pieces each. This was considered to be the maximum number that should be in the battery.³ The self-propelled 155mm gun should also have four pieces per battery since a greater number would cause the battery position to be spread over too large an area, and it is impracticable to fire high velocity guns from hexagonal or other compact formations.⁷

b. The 8-inch howitzer battery was organized with four pieces per battery, which is the maximum number required.⁷

c. The 240mm howitzer battery was organized with two pieces per battery. Test of batteries containing three and four pieces showed that three pieces is the maximum number that can be properly handled in a battery.^{2,8}

d. The 8-inch gun battery was organized with two pieces per battery. There is no reason for changing this number as it was considered to be sufficient for the mission assigned.²

77. Prime Movers. The tractor replaced the truck as a prime mover for all towed heavy artillery weapons in the European Theater. There was no one who recommended the retention of the truck as a prime mover for heavy artillery. The self-propelled 155mm gun, M1918, carriage M-12, was used but the self-propelled 155mm gun, M-1, appeared late in the theater. This mount is suitable for its mission.^{2,7} There was apparently no requirement for self-propelled mounts for any of the heavy artillery of caliber greater than 155mm.⁷

78. Transportation. In general the allowance of transportation was adequate.² However, the use of tractors in the ammunition section for ammunition resupply was found to be impracticable.^{1,2} Although one tractor should be left in the 5th section as a spare, trucks should be substituted for the other tractor. In the heavy artillery no ammunition train was provided in the service battery. This meant that the tractors of the ammunition section of the firing battery were supposed to handle ammunition resupply. Special allowances of trucks obviated this difficulty. Battalion commanders of heavy artillery felt generally that an ammunition train in the 155mm gun and 8-inch howitzer battalion service batteries was the proper solution, while those having experience with the 240mm howitzers and 8-inch gun were of the opinion that this should be handled by the battery because of the wide dispersion between batteries of the battalion.² A special authorization of eight 2½-ton trucks per battery of 240mm howitzer and 8-inch gun batteries was made to certain units in the Seventh Army.² A full track cargo carrier which can be used as a towing vehicle should be in the self-propelled 155mm gun batteries on the basis of one per piece to carry ammunition and personnel.⁷

SECTION 2

THE SERVICE BATTERY

79. General. In the heavy artillery battalions no ammunition train was organized in the service battery.¹ Except for this discrepancy in the 155mm gun and 8-inch howitzer battalion, their organization was satisfactory.²

80. Ammunition Trains, Heavy Artillery.² No ammunition trains were provided in the Table of Organization for the heavy artillery, since it was expected that resupply of ammunition could be carried on by the tractor drawn ammunition sections in each battery. When these sections were strengthened by additional trucks they were formed into battalion ammunition convoys in all battalions, except in the 240mm howitzer and 8-inch gun battalions.^{1,2} As these last named battalions were frequently widely spread by battery, it was more satisfactory to handle resupply by battery.² However, in the 155mm gun and 8-inch howitzer battalions the obvious solution is to have an organized ammunition train in the service battery for

ammunition resupply. In any case there should be an ammunition officer in all heavy battalions with no other duties. 2,7

SECTION 3

THE BATTALION HEADQUARTERS AND HEADQUARTERS BATTERY

81. The organization and equipment of the headquarters and headquarters battery is satisfactory at present except that the increased personnel and equipment as outlined in paragraphs 13, 14, 15, 17, 18, and 19 is needed. 2,7

SECTION 4

THE BATTALION

82. The organization of the battalion with three firing batteries, a service battery and a headquarters and headquarters battery is satisfactory, except in the 24Cmm howitzer battalion where four firing batteries will give better coverage of the front without excessive overhead or administrative difficulty. 2,3,4,8

CHAPTER 4

THE GROUP

SECTION 1

GENERAL ORGANIZATION

83. General. The group consisted of a group headquarters and headquarters battery and such separate battalions as were assigned from time to time. The only organic organization in the group was the headquarters and headquarters battery.

84. Details. For a complete discussion of the group see General Board Study Number 65 "The Field Artillery Group" which recommends that the present group be designated "Regiment" with no change in composition.

SECTION 2

THE HEADQUARTERS AND HEADQUARTERS BATTERY

85. General. The group headquarters and headquarters battery is similar in organization to the headquarters and headquarters battery of the division artillery except that it has no meteorological and survey sections. These latter sections are not required. 2

86. The Staff. The staff as now organized is adequate except for the lack of liaison personnel. One officer with radio operator and driver should be added for this duty. 2

87. Air Section. The requirements of the air section are the same as outlined in paragraph 15. 2

88. Communications.

a. Wire. There should be a total of four wire teams.²

b. Radio. Radio personnel is considered to be adequate.²

89. Transportation.

a. There is insufficient light transportation in the group headquarters battery. Four additional $\frac{1}{4}$ -ton trucks are needed for the group commander, staff, liaison officer and air officer.²

b. The present maintenance truck is a $\frac{3}{4}$ -ton truck. This should be a $2\frac{1}{2}$ -ton truck for use as shop truck and for towing.²

c. Additional transportation will be required for the additional wire teams and radio at the air strip.²

90. Signal Equipment.

a. Wire. An additional switchboard BD-72 is required for use in the fire direction center.²

b. Radio. A radio is required as a base set at the air strip and one for the liaison officer.²

91. Other Equipment. Command post tents are inadequate and should be replaced by pyramidal or squad tents.²

CHAPTER 5

THE FIELD ARTILLERY BRIGADE

SECTION 1

ORGANIZATION

92. General. The field artillery brigade consists of a headquarters battery and such battalions and groups as may be assigned. Brigades were authorized for the European Theater on the basis of one per army. This was the headquarters available to the army to command such artillery units as might be under army control.²

93. Headquarters and Headquarters Battery was organized, except for minor differences, the same as the division artillery headquarters and headquarters battery, infantry division. Its shortcomings are identical with that unit both as to personnel and equipment.²

SECTION 2

OPERATION

94. General. The brigade headquarters functioned somewhat differently in the various armies. At times it commanded heavy artillery which was retained under army

control, while at other times it was attached to corps where it was generally used as a second fire direction center or the same as a group. A brigade was used to supervise the training of special type units and in some armies to receive, orient, and supervise newly arrived units until they could be attached elsewhere.

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PART FOUR

CORPS ARTILLERY

CHAPTER 1

GENERAL ORGANIZATION

SECTION 1

ORGANIC UNITS

95. General. The only organic artillery units of corps artillery are the headquarters and headquarters battery and an observation battalion. All other artillery units were attached to the corps from army artillery. These units consisted of group headquarters and headquarters batteries and separate battalions, which were then organized into artillery groups by the corps artillery.

96. Headquarters and Headquarters Battery, Corps Artillery.

a. General. This battery is organized to permit a small detachment of about ten officers and fifteen men to work at corps headquarters, with the remainder at a fire direction center centrally located with respect to the corps artillery groups and division artillery command posts. In some corps, the corps antitank officer was assigned as a member of the corps artillery commanders staff.^{2,5,6}

b. The Artillery Organization at the Corps Headquarters consisted of the S-1 and S-4 section, representatives of the S-2 and S-3 sections, the artillery air officer, and the necessary clerks, drivers, and radio operators. This group collected the information needed by the corps artillery commander to properly control the artillery, maintained close liaison with the G-2 and G-3 sections of the corps headquarters, kept the fire direction center(s) properly informed and assisted in coordinating any required changes. All the administrative work of the S-1 and S-4 section was also done here.^{2,6}

c. The Corps Fire Direction Center was the coordinating and directing center for all corps artillery battalions and coordinated the divisional artilleries.^{2,6} It consisted of the remainder of the corps artillery headquarters and headquarters battery. The counterbattery officer operated here as a subsection of the S-2 section. Frequently a photo interpretation team was attached. If the corps front was too great, a second fire direction center had to be improvised by the use of a group headquarters or an artillery brigade headquarters.^{1,2,6} This was a common practice in many corps. A detailed discussion

of the operation of a corps artillery fire direction center will be found in the publication, "XII Corps Artillery in Combat".⁶

d. Liaison Officers were not included in the organization. These had to be supplied by battalions or groups attached to the corps for use by the corps artillery fire direction center as liaison with division artillery and groups. This caused a shortage of personnel in subordinate units.^{2,6}

97. Field Artillery Observation Battalion.

a. General. The field artillery observation battalion is an intelligence gathering organization primarily for artillery purposes. In addition, it furnishes survey control to artillery units with the corps. It consists of a headquarters and headquarters battery and two letter batteries each equipped to do both flash and sound ranging.²

b. The letter batteries were organized so that they could install, operate, and maintain several flash bases and two sound bases, although one sound base was the anticipated solution prior to combat. In most situations, the front was so great that one sound base could not give suitable coverage.^{1,5}

c. The headquarters and headquarters battery consisted of headquarters, supply, communications, and survey personnel. This organization is adequate except that the number of wire teams should be four.²

d. The future battalion organization should consist of three letter batteries since two batteries, even when reinforced by attachment, were insufficient to give suitable coverage of the corps front.^{1,5} (See General Board Study Number 62 "The Field Artillery Observation Battalion")

SECTION 2

ATTACHED UNITS

98. Attached Artillery.

a. Artillery groups and battalions were attached to the corps by army. While it seemed necessary to frequently shift the battalions from group to group, corps to corps, and even from army to army, those corps which kept these separate units more permanently were generally the most successful in their operation. A complete discussion of this is found in General Board Study Number 65 "The Field Artillery Group".

b. Need for Artillery Administrative Headquarters. Lack of an administrative headquarters had a deleterious effect on morale, supply, and personnel in general. For this reason there should be some administrative headquarters to look after these separate units. Not all the artillery under corps control can be permanently assigned to a corps but there is a need for a permanent administrative and tactical organization to operate and administer all artillery

battalions with the corps not organically assigned to divisions. An artillery division is suggested as the solution to this problem and is discussed in the following paragraphs.⁷

CHAPTER 2

THE ARTILLERY DIVISION

SECTION 1

GENERAL ORGANIZATION

99. General. Some permanent artillery command is desired in the corps. This command could be based on the present corps artillery organization, supplemented by the necessary administrative personnel to give the commander the means to control the artillery of the corps such as is now exercised by an infantry division commander over his division. This would give the battalions with the corps artillery some headquarters to whom they could look for help and which is vitally interested in their welfare and performance of duty. It is suggested that this command be called an "Artillery Division", and be commanded by a Major General.^{2,3,4,7}

100. Details of Organization.

a. The staff of the proposed artillery division must be kept to the minimum consistent with efficient operation. The present corps artillery headquarters battery is capable of furnishing the necessary personnel for the proposed G-1, G-2, G-3 and G-4 sections as well as for the fire direction center. Additional personnel will be required for the special staff necessary for complete administration.²

b. The following supporting troops are proposed for permanent inclusion in the corps artillery:

- (1) Photo interpretation teams.⁷
- (2) An ordnance company, medium maintenance.⁷
- (3) Photo laboratory, for processing oblique and vertical photographs for division and corps artillery.⁷
- (4) A quartermaster unit of sufficient size to make ration breakdowns, establish Class I and III distributing points, and to handle Class II supplies.²
- (5) A division signal company.²
- (6) A division band.²

SECTION 2

ORGANIC ARTILLERY

101. General.

a. A study of operations in the various armies indicated that non-divisional artillery available per division was: 1,5

- .94 battalions of light artillery
- 1.5 battalions of medium artillery
- 1.4 battalions of heavy artillery

This artillery is considered to be the minimum. How much quicker the operations could have been concluded with more artillery is open to conjecture. No artillery commander admits to having more artillery than he needed or as much as he desired. 2,3,4

b. Since the number of divisions in a corps is a variable, the artillery permanently assigned should be that required by the minimum number of divisions expected to be in one corps. For the purpose of study, this was assumed to be two infantry and one armored divisions. If the number of divisions is increased a proportional increase of artillery must come from an army pool.

102. Amount of Artillery.

a. The division of the future is expected to contain three light and two medium battalions in both the infantry and the armored divisions. 5

b. Light Battalions. With the division having only three light battalions, an additional battalion per division is required for reinforcing missions on difficult fronts. 2 Then, too, there is frequently the necessity for support of a cavalry group. 2 On this basis a minimum of three light artillery battalions should be available in the corps artillery.

c. Medium Battalions. There should be a minimum of one 155mm howitzer battalion in corps general support for each division. This battalion would work primarily on corps long range missions, and could be used to cover the boundaries between the divisions. 2,3

d. Heavy Battalions. Each division front requires the coverage of one 155mm gun and one 8-inch howitzer battalion to suitably perform the missions in the corps range of targets, to reinforce the fires of the division artillery, and to cover the interior boundaries and flanks. 2,3 One of the 155mm gun battalions should be self-propelled for possible use with the armored division and for use on special direct laying destruction missions. 2,3 One 240mm howitzer battalion on the corps front will round out the organic artillery. 5

e. The Observation Battalion should be continued as part of this artillery organization. 2

f. Group or Regimental Headquarters in sufficient number to control this artillery will be required. 2 One group or regimental headquarters for the general support corps artillery in each division zone and one regimental headquarters to command the 240mm howitzer battalion and any other general support battalions, or to act as an additional corps artillery fire direction center are needed. 5

SECTION 3

SUMMARY

103. The organic units assigned to a corps of three divisions is then:

- 1 Headquarters, Artillery Division
- 1 Headquarters Battery, Artillery Division
- 1 Band
- 1 Ordnance Company, medium maintenance
- 1 Quartermaster Detachment
- 1 Signal Company
- 1 Field Artillery Observation Battalion
- 4 Headquarters and Headquarters Batteries, Field Artillery Group (Regiment)
- 3 Battalions 105mm howitzer
- 3 Battalions 155mm howitzer
- 2 Battalions 155mm gun M-1
- 1 Battalion 155mm gun (SP)
- 3 Battalions 8-inch howitzer
- 1 Battalion 240mm howitzer

This gives a total of thirteen battalions of field artillery in the "Artillery Division".

104. Additional artillery to support added divisions should be available in an army pool on the same basis as indicated above.²

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PART FIVE

ARMY ARTILLERY

CHAPTER 1

ARTILLERY SECTION, ARMY HEADQUARTERS

SECTION 1

ORGANIZATION

105. General. The artillery section was a special staff section of an army headquarters, and was headed by a brigadier general. Differing from the corps and division artillery commanders, the artillery officer of the army had no command function.^{1,2}

106. Organization. The section was organized with S-1, S-2, S-3, S-4, and Air Sections. The internal organizations varied slightly among armies; in some, the S-1 and S-4 sections were combined under one section chief. In the First, Seventh and Fifteenth US Armies, an Anti-tank or Tank Destroyer Section was added. Since the tank destroyer is a special weapon, this section could better have been placed as a separate staff section or combined with the G-3 or armored section of army headquarters.^{1,2}

SECTION 2

OPERATION

107. The staff sections functioned as prescribed in Field Manual 6-100.^{1,2}

CHAPTER 2

ARMY ARTILLERY POOL

SECTION 1

ARTILLERY BATTALIONS AND GROUPS

108. General. Since corps has no organic artillery and if organic artillery is to be assigned on the basis of the minimum (three divisions) size corps, army must have a pool of artillery that can be attached to the various corps as their size increases above the minimum. Since the unit of assignment to a corps is the division, the artillery available in the army pool should be on a per division basis.

109. Quantity. Using the same standard of requirements as outlined for the corps artillery in paragraph 85 above, it follows that the army pool should consist of:

- 1-105mm howitzer battalion per division
- 1-155mm howitzer battalion per division
- 1-155mm gun, towed, battalion per infantry or airborne division
- 1-155mm gun, self-propelled, battalion per armored division
- 1-8-inch howitzer battalion per division
- $\frac{1}{2}$ -240mm howitzer battalion per infantry division
- 1- or two 8-inch gun battalions per army
- 1- and one-third group headquarters per division
- 1-field artillery brigade headquarters and headquarters battery
- 1-observation battalion, field artillery

SECTION 2

OBSERVATION BATTALION

110. One observation battalion was assigned to each army over and above those assigned to the corps. This battalion was used to reinforce the organic corps battalions when the corps front became too long to be covered effectively by one battalion.^{1,2}

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PART SIX

HIGHER HEADQUARTERS

CHAPTER 1

THE ARMY GROUP

111. General. There is no table of organization for the artillery section of the army group. As established in the European Theater this section performed duties similar to the artillery section of an army.^{1,2} The artillery officer was a special staff officer and had no command function.

112. Organization. The artillery section 12th Army Group was organized as follows:²

- 1 - Brigadier General, Artillery Officer
- 1 - Colonel; Executive
- 1 - Colonel; Operations
- 1 - Colonel, Munitions and Equipment
- 1 - Colonel, Intelligence
- 1 - Lt Colonel, Artillery Air OP
- 1 - Major, Assistant Operations
- 1 - Major, Assistant Munitions and Equipment

113. Operation.

a. The artillery officer and the executive performed the same functions as prescribed in field manuals for the army artillery section.²

b. The Operations Section studied and prepared data for recommendations and plans for:²

- (1) Distribution of artillery between armies.
- (2) Changes in troop basis.
- (3) Standardizing procedures between armies.
- (4) Supervision of original experiments with new weapons.
- (5) Re-equipment program for tank destroyers.
- (6) Changes to Tables of Organization.

c. The Munitions and Equipment Section studied and made recommendations on:²

- (1) Ammunition requirements and allocations.
- (2) The functioning and use of new ammunition and equipment.

(3) Arrangements for the shipment and issue of counter mortar radar.

(4) Changes to Tables of Equipment.

d. The Intelligence Section prepared:²

(1) Studies on enemy artillery developments.

(2) Artillery comments for the weekly G-2 report.

e. The Air OP Section handled all matters pertaining to the operation and maintenance of field artillery air sections.²

114. An organization for this section should generally follow the organization of the army artillery section including an artillery air section and should consist of about ten officers, one warrant officer, and approximately 15 enlisted men including airplane mechanics.² With this increase in personnel greater service could be rendered to subordinate headquarters by permitting personal visits for the securing and transmitting of information and its collation and preparation for dissemination in the headquarters.

CHAPTER 2

THE THEATER

115. General. The artillery section in the headquarters, European Theater, was organized about 15 December 1944. Prior to that time the functions of this section were performed by the G-3 section. This section maintained close contact with G-1, G-4, and the various technical services. The Artillery Section was occupied on artillery matters and did not become involved in the general work of the G-3 section.¹

116. Personnel of the section consisted of:¹

Brigadier General, Chief of Section
Lt Colonel, Executive
Lt Colonel, Organization and Equipment
Major, Artillery Air Observation Post
Captain, Statistics

117. The Duties of the Section included:

a. Advising the Theater Commander on the distribution of artillery to the various United States army groups.

b. Receiving and collating reports from artillery commanders in the field on:

- (1) Field Artillery technique.
- (2) Materiel deficiencies and recommended modifications.
- (3) Ammunition deficiencies in supply, effectiveness, and type.

- (4) Recommendations for changes to Tables of Organization and Equipment.
- (5) Personnel status and replacements.
- (6) Collecting information on specific questions for Army Ground Forces.
- (7) Preparing theater recommendations on artillery matters for transmittal to the War Department.

Because of the lack of personnel very little field work could be done.¹ Much data had to be collected by circularizing field commanders. Insufficient opportunity was found to visit units and investigate deficiencies reported in the field.¹

CHAPTER 3

SUPREME HEADQUARTERS

118. General. The Artillery Section, Supreme Headquarters, Allied Expeditionary Forces, was organized as a subsection of the G-3 section. Within itself it contained a section for field artillery and a section for coast and antiaircraft artillery. The Field Artillery Subsection consisted of one Lieutenant Colonel (British); one Captain (United States), and one Captain (British), together with a small clerical staff. This section was dissolved in the latter part of October 1944.¹

119. Duties and Operations. The Field Artillery Subsection arranged for and published memoranda to coordinate ground and naval fire support and fire support between the two nations' artillery. Memoranda were also published to clarify the technical terms, technique, differences in artillery organization between the British and United States formations, and map grid instructions. All policy matters were dealt with through the G-3 Section, but all technical matters were taken up direct with the artillery officers of the various army groups.¹

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PART SEVEN

CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 1

CONCLUSIONS

SECTION 1

INFANTRY DIVISION ARTILLERY

120. The Firing Battery.

a. Light. That:

- (1) The 105mm howitzer is of suitable caliber.
- (2) The battery should consist of six pieces..
- (3) The truck is a suitable prime mover.
- (4) There was an insufficient number of observers.
- (5) Transportation for supply and maintenance was inadequate.

b. Medium. That:

- (1) The 155mm howitzer is of suitable caliber.
- (2) No change in the number of pieces per battery is indicated.
- (3) The tractor is a suitable prime mover.
- (4) There were insufficient observers.
- (5) Transportation for supply and maintenance was inadequate.

121. The Battalion Service Battery. That:

a. The organization of the battery is suitable for its mission.

b. The ammunition trailer M-10 should be replaced by the one ton cargo trailer.

c. Additional supply vehicles are needed.

122. The Battalion Headquarters and Headquarters Battery. That:

a. Personnel is insufficient in the following

categories:

- (1) Liaison (in the light battalion).
- (2) Fire direction center computers.
- (3) Communications.
- (4) Air Observers.

b. Equipment is insufficient as follows:

- (1) Light transportation.
- (2) Signal equipment.
- (3) Lighting equipment.
- (4) Tentage for the command post.

123. The Battalion. That the battalion is suitably organized except for the lack of a counter-mortar section in the headquarters battery of the light battalions.

124. The Division Artillery. That:

a. One additional 155mm howitzer battalion is needed.

b. The headquarters and headquarters battery needs an increase in personnel and equipment but does not require an antitank section.

SECTION 2

ARMORED DIVISION ARTILLERY

125. Armored Division Artillery. That the armored division artillery needs medium caliber artillery organically assigned and that personnel requirements are similar to that of the infantry division artillery outlined above.

SECTION 3

AIRBORNE DIVISION ARTILLERY

126. Airborne Division Artillery. That the artillery of the airborne division should be organized and equipped the same as the artillery of the infantry division and have additional equipment suitable for airborne operations.

SECTION 4

NON-DIVISIONAL ARTILLERY

127. Non-divisional Artillery. That:

a. The light artillery battalions should be organized and equipped similar to the light artillery of the armored division.

b. The medium artillery battalions should be organized and equipped the same as the medium battalions of the infantry divisions.

c. The heavy artillery battalions are suitably organized except for the lack of an ammunition train in the 155mm gun and 8-inch howitzer battalions. The 240mm howitzer battalion can be organized with four firing batteries of three pieces each. Trucks are required for ammunition resupply.

d. The group should be retained as presently organized. The headquarters and headquarters battery requires some additional personnel and equipment.

e. The field artillery brigade performed a useful function and is properly organized at present except for minor shortages in personnel and equipment in the headquarters and headquarters battery.

SECTION 5

CORPS ARTILLERY

128. Corps Artillery. That:

a. An administrative headquarters is needed in the corps artillery to administer organic and attached artillery units.

b. Some artillery battalions should be organically assigned to the corps artillery.

c. The field artillery observation battalion was not large enough.

SECTION 6

ARMY AND HIGHER HEADQUARTERS

129. Army Artillery. That:

a. An army artillery pool should be established.

b. The artillery section, army headquarters, is suitably organized.

130. Higher Headquarters. That:

a. The army group artillery section was inadequately staffed.

b. The theater artillery section was inadequately staffed.

c. The supreme headquarters artillery section is not required.

CHAPTER 2

RECOMMENDATIONS

SECTION 1

INFANTRY DIVISION ARTILLERY

131. The Firing Battery. That in:

a. The light artillery,

- (1) The caliber remain at 105mm.
- (2) The number of pieces be six.
- (3) The prime mover be the 2½-ton truck.
- (4) The number of observers be three.
- (5) The transportation be increased by one 2½-ton truck for supply, a 1½-ton truck be substituted for the ¾-ton maintenance truck, and the 1-ton cargo trailer be substituted for the ammunition trailer M-10.

b. The medium artillery,

- (1) The caliber be 155mm.
- (2) The number of pieces be four.
- (3) The prime mover be a tractor.
- (4) The number of observers be one.
- (5) The transportation be changed as in paragraph 131, a, (5) above and the fifth section consist of one tractor and two trucks.

132. The Battalion Headquarters and Headquarters Battery. That:

by:

a. The Light Artillery personnel be increased

- (1) One Liaison officer.
- (2) Two Air Observers.
- (3) Three fire direction center computers.
- (4) Two switchboard operators.
- (5) Four wire men.
- (6) A countermortar section.
- (7) Drivers for additional transportation.

b. The equipment be increased by:

- (1) Three ¼-ton trucks.

- (2) One 2½-ton truck for supply.
- (3) Substitution of three 1½-ton trucks for two radio trucks and one maintenance truck.
- (4) Doubling the wire allowance.
- (5) Five telephones.
- (6) Deleting the telegraph set.
- (7) One radio set 608.
- (8) Spare lighting equipment for the command post.
- (9) Larger tents for the command post.

c. The medium artillery personnel be increased as shown in paragraph 132 a, except for the liaison officer.

133. The Battalion Service Battery. That:

a. The one-ton cargo trailer be substituted for the M-10 ammunition trailers.

b. The transportation be increased by two 2½-ton trucks (one for gasoline and one for rations).

134. The Battalion. That the battalion consist of three firing batteries, all to be armed with the same caliber and type weapons, a headquarters and headquarters battery, and a service battery.

135. The Division Artillery Headquarters and Headquarters Battery. That the following changes be made:

a. The Personnel be increased to provide:

- (1) One Captain, communications officer on the staff.
- (2) One Captain, countermortar officer.
- (3) One Major, assistant S-3.
- (4) Two First Lieutenants, air observers.
- (5) One Captain, liaison.
- (6) Two additional enlisted clerks for the S-2 section.
- (7) Three additional enlisted clerks for the S-3 section.
- (8) Sufficient wire personnel to provide one more wire crew than the number of organic battalions (six).
- (9) Two enlisted cooks for the air section.

(10) Two additional switchboard operators.

(11) Two additional radio operators.

(12) Drivers for any additional vehicles.

b. The Antitank Section be deleted and placed in the division headquarters.

c. The transportation be increased by four $\frac{1}{4}$ -ton trucks, one $1\frac{1}{2}$ -ton truck for motor maintenance, the necessary wire laying trucks for the increase in the number of wire crews, and one radio truck for the air section. All radio section trucks and the supply truck to be $1\frac{1}{2}$ -ton.

d. Communications equipment be increased by doubling the basic allowance of wire, adding ten telephones, one BD-72 switchboard, one radio set as a base set for the air section and one radio set for the liaison officer.

e. Command Post Tents be eliminated and pyramidal or squad tents be substituted.

f. Cooking equipment be supplied for the air section.

g. Spare lighting equipment for the command post.

136. Division Artillery. That the infantry division artillery consist of a headquarters and headquarters battery; three battalions, 105mm howitzer; and two battalions, 155mm howitzer; with such attached medical personnel and chaplains as are required.

SECTION 2

ARMORED DIVISION ARTILLERY

137. The Firing Battery. That:

a. The light artillery be changed by adding two observers with parties and equipment and increasing the transportation by one $2\frac{1}{2}$ -ton truck for supply.

b. The medium artillery be 155mm howitzer, self-propelled, organized the same as the light artillery except that one observer with section is required and three full track cargo carriers and three 4-ton trucks be added for ammunition and personnel.

138. The Battalion Headquarters and Headquarters Battery. That:

a. The light artillery personnel be increased as indicated in paragraph 132 a, except as follows:

(1) Liaison officers to total four, three to have complete parties.

(2) Observers with tanks to total four.

b. The light artillery equipment to be increased

as shown in paragraph 132 b, plus two additional tanks, one for command and one for the added observer.

c. The medium artillery to be organized and equipped the same as in the light battalion except that only one liaison officer and two tank observers are required.

139. The Battalion Service Battery. It is recommended that the service battery as organized at present in the armored field artillery battalion be used for both light and medium artillery except that the 1-ton cargo trailer be substituted for the M-10 ammunition trailer.

140. The Battalion. That the battalion consist of three firing batteries, all armed with the same type and caliber of weapon; a headquarters and headquarters battery; and a service battery.

141. The Division Artillery Headquarters and Headquarters Battery. That this battery be organized the same as the headquarters and headquarters battery, infantry division artillery, except for the necessary substitution of armored vehicles and radios to work with the armored division.

142. The Division Artillery. That the armored division artillery consist of a headquarters and headquarters battery; three battalions, 105mm howitzer, self-propelled; and two battalions, 155mm howitzer, self-propelled; and with each firing battery containing six howitzers.

SECTION 3

AIRBORNE DIVISION ARTILLERY

143. General. That the artillery of the airborne division be organized and equipped the same as the artillery in the infantry division, and in addition, that it have equipment for airborne operations as follows: light artillery battalions to be equipped with the 75mm pack howitzer and the medium battalions to be equipped with the 105mm howitzer, M-3, or other newly developed weapons suitable for airborne operations.

SECTION 4

NON-DIVISIONAL ARTILLERY

144. Light. That non-divisional light artillery be organized the same as the light artillery of the armored division except there need be but one observer per battery, one tank observer, one liaison officer and no counter-mortar section.

145. Medium. That non-divisional medium artillery be 155mm howitzer, tractor drawn, organized the same as the medium battalion, infantry division.

146. Heavy. That:

a. Caliber and type be 155mm gun, 8-inch gun,

8-inch howitzer, and 240mm howitzer.

b. The prime mover be the tractor except for certain 155mm gun battalions which should be self-propelled.

c. The number of pieces per battery in the 155mm gun, 8-inch howitzer and the 8-inch gun remain unchanged, but that the number be increased to three in the 240mm battery.

d. Trucks should replace all but one tractor in the fifth section of the firing battery for ammunition supply.

e. The Battalion Headquarters Battery be organized the same as the medium battalion, infantry division, except that the liaison officer is not required.

f. The Battalion Service Batteries have ammunition trains, except in the 8-inch gun and 240mm howitzer battalion.

g. The Battalion consist of a headquarters and headquarters battery, a service battery, and three firing batteries except in the 240mm howitzer battalion in which the number of firing batteries should be four.

147. Group. That:

a. The present field artillery group organization be redesignated field artillery regiment with the regiment having the same organization as the present group. (See General Board Study Number 65, "The Field Artillery Group".)

b. The group headquarters and headquarters battery be changed as follows:

(1) The Personnel be increased by adding:

(a) One Captain, liaison officer.

(b) Two First Lieutenants, air observers.

(c) One wire crew.

(d) Two cooks for air section.

(e) Necessary drivers for additional transportation.

(2) The Transportation be increased by four $\frac{1}{2}$ -ton trucks, one $2\frac{1}{2}$ -ton truck for maintenance, one wire laying truck and one radio truck for the air section. All radio section trucks and the supply truck to be $1\frac{1}{2}$ -ton trucks.

(3) Communications equipment be increased by adding one switchboard, and one radio for the liaison officer and one radio

for the airstrip.

- (4) Other Equipment be changed by substituting squad tents for the command post tent and adding cooking equipment for the air section.

148. The Headquarters and Headquarters Battery, Field Artillery Brigade. That this unit be organized the same as the headquarters and headquarters battery, infantry division artillery.

SECTION 5

CORPS ARTILLERY

149. General. That the artillery allotted to corps be organized into an "Artillery Division", commanded by a Major General, to administer and command the organic artillery and such additional artillery as may be attached from the army pool.

150. Artillery Division. That the artillery division consist of:

- a. One headquarters.
- b. One headquarters battery to include two photo interpretation teams and one photo laboratory, mobile.
- c. One ordnance company, medium maintenance.
- d. One quartermaster detachment.
- e. One band, division strength.
- f. One signal company.
- g. One field artillery observation battalion.
- h. Four headquarters and headquarters batteries, field artillery group, and battalions as follows:
 - (1) Three battalions, 105mm howitzer, self-propelled.
 - (2) Three battalions, 155mm howitzer, towed.
 - (3) Two battalions, 155mm gun, towed.
 - (4) One battalion, 155mm gun, self-propelled.
 - (5) Three battalions, 8-inch howitzer, towed.
 - (6) One battalion, 240mm howitzer, towed.

151. The Field Artillery Observation Battalion. It is recommended that this Battalion consist of a headquarters and headquarters battery and three observation batteries, organized as recommended in The General Board Study Number 62 "The Field Artillery Observation Battalion".

SECTION 6

ARMY ARTILLERY

152. The Artillery Section. That the artillery section, army headquarters, is satisfactorily organized, except that the antitank or tank destroyer section should be placed elsewhere.

153. The Army Artillery Pool.

a. That the army have available for attachment to the corps artillery, when the corps contains more than three divisions, the following artillery units:

- (1) One battalion, 105mm howitzer, self-propelled, per additional division.
- (2) One battalion, 155mm howitzer, towed, per additional division.
- (3) One battalion, 155mm gun, towed, per additional infantry or airborne division.
- (4) One battalion, 155mm gun, self-propelled, per additional armored division.
- (5) One battalion, 8-inch howitzer, towed, per additional division.
- (6) One-half battalion, 240mm howitzer, towed, per infantry division.
- (7) One and one-third group headquarters per division.

b. That the army have available for use or attachment where needed:

- (1) One battalion, 8-inch gun, towed.
- (2) One battalion, observation, field artillery.
- (3) One headquarters and headquarters battery, field artillery brigade.

SECTION 7

HIGHER HEADQUARTERS

154. The Army Group. That there be no basic change in the organization of the artillery section at army group; however, the artillery officer should be a brigadier general and his staff should be maintained at an adequate level to carry on the work of the section.

155. The Theater.

a. General. That the artillery section of the theater headquarters have approximately the same strength as the army artillery section. All officers should have had

wide experience and have sound tactical and technical background and judgment. The senior assistant of each subsection should be capable of giving advice and recommendations in the absence of his subsection chief. At least one-half of the officers should be expected to spend a large part of their time in the field securing first hand reports from combat echelons on the ground.

b. Personnel. That the personnel consist of:

Major General	-- Theater Chief of Artillery
Brigadier General	-- Assistant Chief of Artillery
Lt Colonel	-- S-1
Lt Colonel	-- Assistant S-1
Colonel	-- S-2
Colonel	-- Assistant S-2
Colonel	-- S-3
Colonel	-- Assistant S-3
Colonel	-- S-4
Colonel	-- Assistant S-4
Lt Colonel	-- Assistant S-4 (Technical Expert on Field Artillery Materiel)
Lt Colonel	-- Artillery Air
Major	-- Assistant Artillery Air

Sufficient clerks, draftsmen, and drivers.

c. Duties. That this section be charged with:

- (1) Estimating artillery requirements.
- (2) Recommending allotment of non-organic artillery to the various army groups.
- (3) Exercise surveillance over personnel replacements.
- (4) Study and recommend changes to Tables of Organization as recommended from the field.
- (5) Study the effect of personnel policies in the field.
- (6) Secure information on enemy artillery and new developments in technique.

- (7) Publish artillery information bulletins on changes and developments in friendly and enemy artillery materiel, technique, and allied subjects.
- (8) Prepare reports to the War Department on enemy artillery developments.
- (9) Supervise training in special weapons and for special missions.
- (10) Study new techniques.
- (11) Prepare reports to War Department on training recommendations.
- (12) Check to assure expeditious dissemination of new directives and official publications.
- (13) Check equipping of new units.
- (14) Investigate field failure of materiel, field modifications, development of new equipment, and study ammunition supply.
- (15) Study and recommend changes to Tables of Equipment.
- (16) Make recommendations on special theater allowances of personnel and equipment.

156. Supreme Headquarters. It is recommended that in forces of two or more allies there be no artillery section as such after the initial phases of coordination of technique is assured. Arrangement should, however, be made for the exchange of information on tactics and technique between the forces of the various allies.