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U.S. War Dept. General Staff, G-2.
The German armored division. [1942]

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The German Armored Division

MILITARY INTELLIGENCE SERVICE
INFORMATION BULLETIN NO. 18

WAR DEPARTMENT • WASHINGTON, D. C.

NOTICE

1. Information Bulletins, which have replaced Tentative Lessons Bulletins, have a dual purpose: (1) To provide all officers with reasonably confirmed information from official and other reliable sources, and (2) to serve as material for lectures to troops.

2. Nondivisional units are being supplied with copies on a basis similar to the approved distribution for divisional commands, as follows:

Inf. Div.		Cav. Div.		Armd. Div.	
Div. Hq.....	8	Div. Hq.....	4	Div. Hq.....	11
Rcn. Troop.....	1	Ord. Co.....	1	Rcn. Bn.....	1
Sig. Co.....	1	Sig. Troop.....	1	Engr. Bn.....	1
Engr. Bn.....	1	Rcn. Sq.....	1	Med. Bn.....	1
Med. Bn.....	1	Engr. Sq.....	1	Maint. Bn.....	1
QM Bn.....	1	Med. Sq.....	1	Supply Bn.....	1
Hq. Inf. Regt., 1 ea.	3	QM Sq.....	1	Div. Train Hq.....	1
Inf. Bn., 1 ea.....	9	Hq. Cav. Brig., 2 ea.	4	Armd. Regt., 4 ea....	8
Hq. Div. Arty.....	1	Cav. Regt., 4 ea....	16	FA Bn., 1 ea.....	3
FA Bn., 1 ea.....	4	Hq. Div. Arty.....	1	Inf. Regt.....	4
	—	FA Bn., 1 ea.....	3		—
	30		—		32
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Distribution to air units is being made by the A-2 of Army Air Forces. An additional distribution is being made to the armored forces, tank destroyer battalions, and antitank units.

3. Each command should circulate available copies among its officers. Reproduction within the military service is permitted provided (1) the source is stated, (2) the classification is not changed, and (3) the information is safeguarded. Attention is invited to paragraph 10a, AR 380-5 which is quoted in part as follows: "A document . . . will be classified and . . . marked *restricted* when information contained therein is for official use only, or when its disclosure should be . . . denied the general public."

4. Suggestions for future bulletins are invited. Any correspondence relating to Information Bulletins may be addressed directly to the Dissemination Branch, Military Intelligence Service, War Department, Washington, D. C.

Foreword

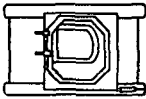
This bulletin is a translation of a captured German training manual on *The German Armored Division*, which was published in December 1940. At that time the number of German armored divisions was being increased and their organization changed. Comments by German commanders in Libya as late as October 1941 indicate, however, that the principles expressed in this manual have proved satisfactory with little or no modification.

The charts that follow have been added to the original German manuscript. They have been compiled from G-2 sources.

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GERMAN TANKS

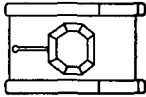


MARK I TANK

Length: 12 ft. 6 in.

Width: 8 ft.

Height: 5 ft. 7 in.

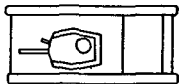


TANK HUNTER

47-mm antitank gun

mounted in chassis

of Mark I tank

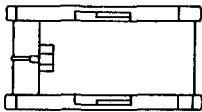


MARK II TANK

Length: 15 ft. 4 in.

Width: 7 ft. 2 in.

Height: 6 ft. 5 in.

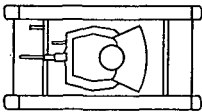


ASSAULT GUN

75-mm gun mounted in

chassis of Mark III

tank

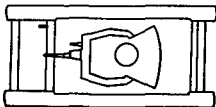


MARK III TANK

Length: 17 ft. 8 in.

Width: 9 ft. 9 in.

Height: 7 ft. 9 in.



MARK IV TANK

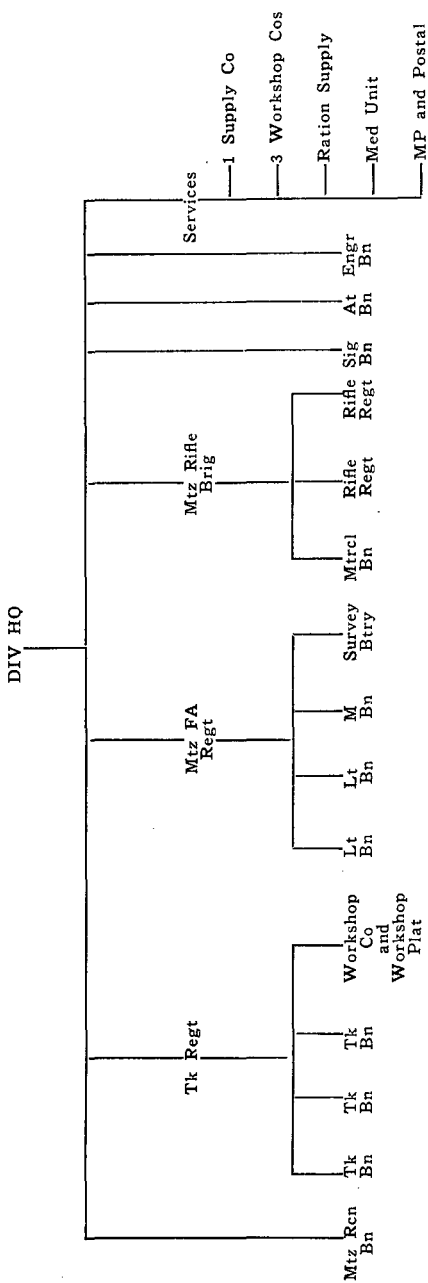
Length: 19 ft. 2 in.

Width: 9 ft. 5 in.

Height: 8 ft. 7 in.



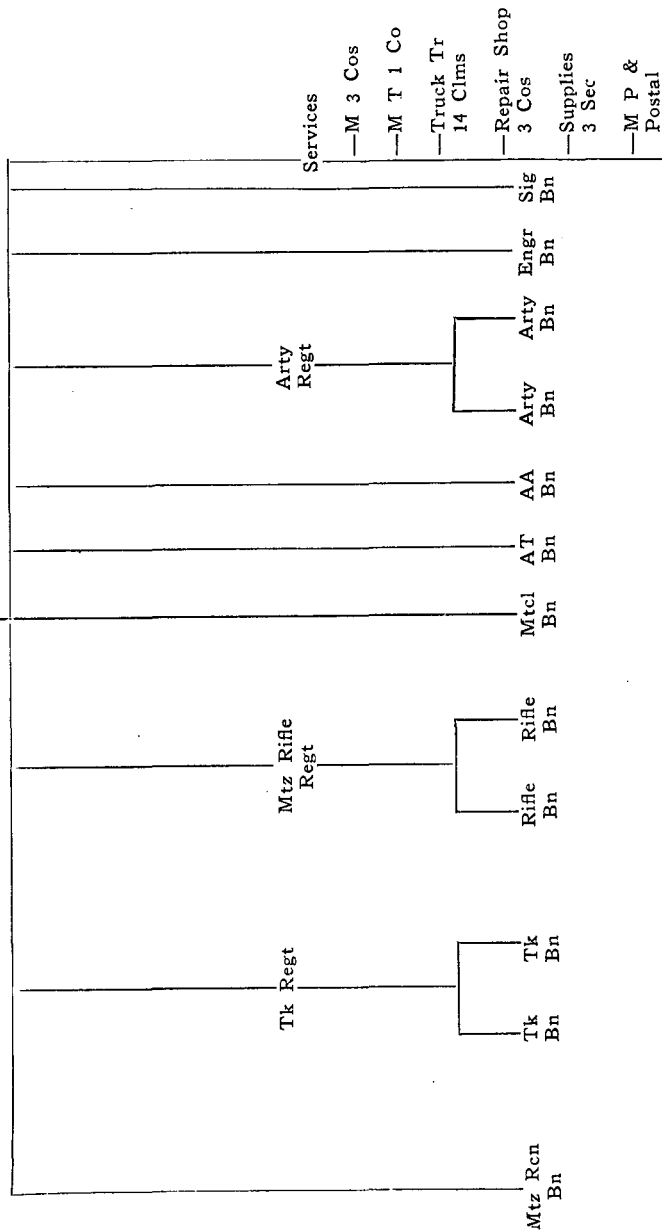
ARMORED DIVISION (STANDARD)



NOTE.—When engaged in operations, an armored division may have some of the following attached: assault artillery battalion, antitank battalion with self-propelled mounts, motorized anti-aircraft battalion, mixed anti-aircraft battery. It should be borne in mind that the organization of the armored division is very flexible, and is changed in accord with matériel available, the terrain, and the equipment of the enemy.

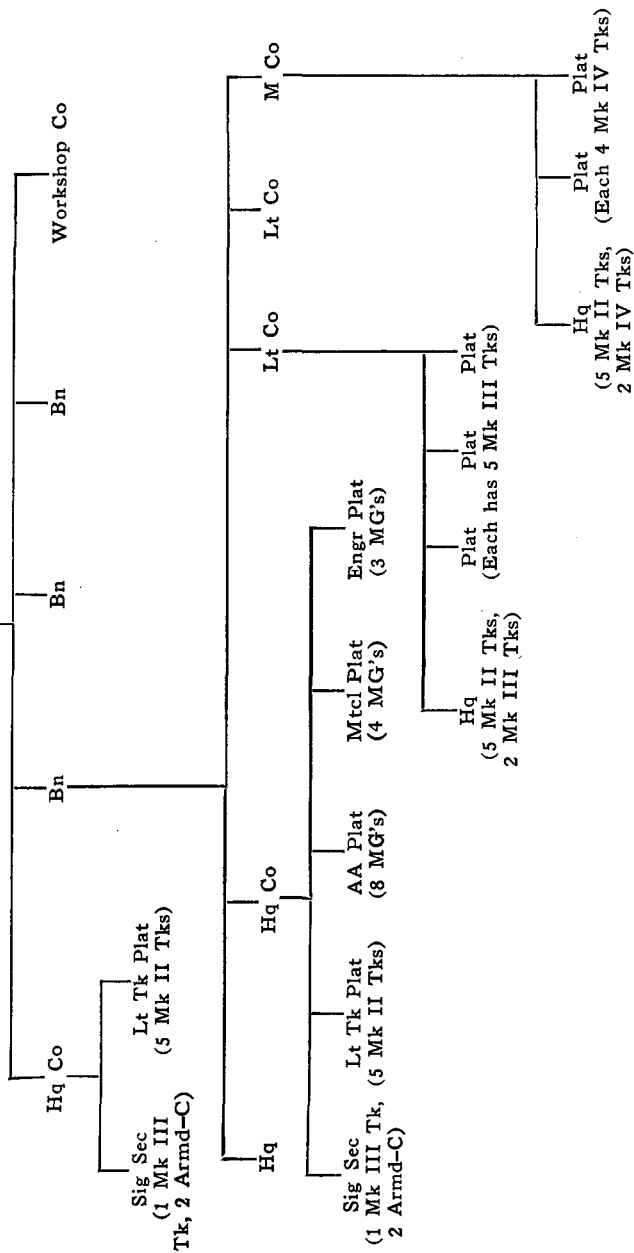
ARMORED DIVISION (LIBYAN)

DIV HQ



TANK REGIMENT OF ARMORED DIVISION

REGT HQ



THE GERMAN ARMORED DIVISION

Chapter 1

CHARACTERISTICS AND ORGANIZATION

1. The armored division is intended for strategic roles. It combines great fire power with high mobility, and its armor and speed restrict the effectiveness of enemy weapons.

2. Its strength lies in attack. It is especially suited for surprise appearances on the battlefield, rapid concentration of considerable fighting power, obtaining quick decisions by break-throughs, deep penetrations on wide fronts, and the destruction of the enemy. The attack of the armored division has a serious effect on the enemy's morale.

3. The nature of the terrain is a decisive factor for successful employment of the armored division. Full use of its speed can be insured by choice of good roads with bridges of adequate capacity, and by their being kept clear of other troops. Speed across country depends upon weather, formation of the ground, nature of the soil, and density of vegetation. It is slower than on roads. The full striking power of the armored division can best be developed in attack over rolling country with few features. Marshy, wooded, and rough country allows movement off the road only for short stretches, with reduced mobility. It may exclude the employment of tanks.

4. The components of an armored division are so proportioned that the detachment of individual units, especially of tanks, or their attachment to other units, restricts the fitness of the division for employment in strategic roles.

5. The main striking force of the division lies in its tank brigade. Its offensive infantry element is the motorized infantry brigade. In addition the armored division comprises motorized reconnaissance elements, motorized artillery, antitank units, armored signal units, antiaircraft machine-gun troops, and supply and maintenance services. In active campaigns an observation squadron (serves also for artillery observation) and a light antiaircraft battalion are attached to the division.

Chapter 2

ROLE OF THE ARMORED DIVISION

6. The armored division normally fights in the framework of the armored corps, but is also suited to carry out independent operations, in which case reinforcement with motorized infantry and artillery is usually necessary.

7. Its supreme role is to obtain decision in battle. Within the framework of the armored corps it can carry out the following tasks:

a. Break through an enemy protective screen to make early contact with the enemy's main force;

b. Obtain early possession of topographical features and sectors of decisive importance for further fighting;

c. Gain surprise in an attack on the advancing enemy to frustrate his plans and take the initiative from him;

d. Attack an enemy incompletely prepared for defense;

e. Attack on a narrow front against a prepared enemy;

f. Restore momentum to an attack which has come to a standstill;

g. Break through on a wide front against a demoralized enemy;

h. Exploit success and complete the destruction of the enemy by deep penetration or flank attack;

i. Pursue a defeated enemy;

j. Carry out strategic envelopment;

k. Attack to destroy enemy tank units;

l. Cooperate with parachute and air-borne troops.

8. The armored division acting independently can carry out the following strategic tasks:

a. Reconnaissance in force in cooperation with strategic aerial reconnaissance;

b. Early occupation of sectors important for further operations, of politically and economically important localities, and of industrial installations;

c. Delaying the enemy advance, providing a protective screen, or acting as a flank guard to a larger unit.

9. The armored division is equally suitable for breaking through a prepared position when the position is strengthened by isolated permanent fortifications. The cooperation of medium artillery and bombardment aviation then becomes necessary.

In an attack on a prepared position, the speed and mobility of an armored division cannot be exploited. There is a danger that tanks may be exposed to such heavy casualties against a prepared defense that the further employment of the division becomes impossible.

Armored divisions are therefore only to be used for breaking through a permanent front if infantry divisions are not available, if the delay in bringing them forward may result in losing an opportunity to exploit the success with armored divisions well forward, or if the enemy is already demoralized. The armored division must then be reinforced by motorized infantry, artillery, and motorized engineers, weapons capable of assaulting concrete works, and smoke troops. They must also be supported by bombardment aviation.

10. The armored division can attack across a river. The necessary amount of reinforcement by other arms, especially engineers, depends on the strength of the enemy and his defense, and on the width of the river.

11. The role of the armored division in a protective task is generally offensive. It carries out counterattacks to relieve parts of the front under heavy pressure, breaks up enemy tank attacks by surprise thrusts, is employed against the flanks of an enemy who has broken through, or attacks the enemy from the flanks or rear while he is held frontally.

If the armored division has to take part in a defensive operation, which will be exceptional, every effort must be made to relieve it as quickly as possible by infantry units.

12. The armored division can also be used independently to screen the withdrawal of large units. This task is usually carried out offensively.

Chapter 3

EMPLOYMENT OF THE ARMORED DIVISION

13. The speed and mobility of the armored division demand of all commanders boldness, powers of rapid decision, and ability to convert decisions into brief commands.

14. The strength of the armored division lies in concentrating the force of the tank brigade. This is the normal practice. It is the task of the commander to see that all arms of the division are used to support the tank attack. Individual arms must be mutually supporting, and each must be prepared to exploit the success of the other.

15. Task forces can be formed temporarily for specific missions:

a. In the attack, when the division is advancing on a broad front over several roads against a weaker enemy, or in traversing wooded or mountainous country;

b. In a rapid pursuit when the division has to anticipate the enemy in occupying important points, road junctions, potential bottlenecks, etc.;

c. In a withdrawal, to cover disengagement from the enemy.

Task forces are employed in accordance with the same principles that apply to the armored division as a whole. The division commander can influence the battle by employing reserves of all arms. Task forces, however, must be provided at the outset with all means necessary for the task allotted. The division commander must make every effort to reconcentrate all parts of the division under his direct command.

16. The object of the armored division in battle is destruction of the enemy, either by break-through or envelopment. The mobility of the armored division enables it to avoid a frontal engagement and to maneuver to the enemy's rear.

Foresight in choice of the terrain over which an anticipated engagement is to take place is of great importance. This terrain should be thoroughly covered by air reconnaissance. The art of

command lies in ability to choose the exact moment for deployment for battle so that the object may be achieved with maximum speed and minimum losses.

The armored division must be deployed in depth. When deep penetration is made, long flanks are frequently exposed. Anxiety on this cause must not, however, be allowed to hamper bold action nor divert the division from the decisive direction. Advance measures must be taken to screen the flanks and defend against air attack.

17. In battle the full striking force of the division must be used unsparingly. The more decisive the role of the division in the operation, the more important this becomes. The greater the forces that can be concentrated at one point, the greater will be the success and the smaller the losses.

18. The tank's ability to surprise by its speed and mobility must be fully exploited. Aids to this are the screening of movements, camouflage of bivouacs, and prevention of enemy air reconnaissance.

19. Accurate knowledge of the topography must be obtained by detailed study of maps and aerial photographs before orders are issued.

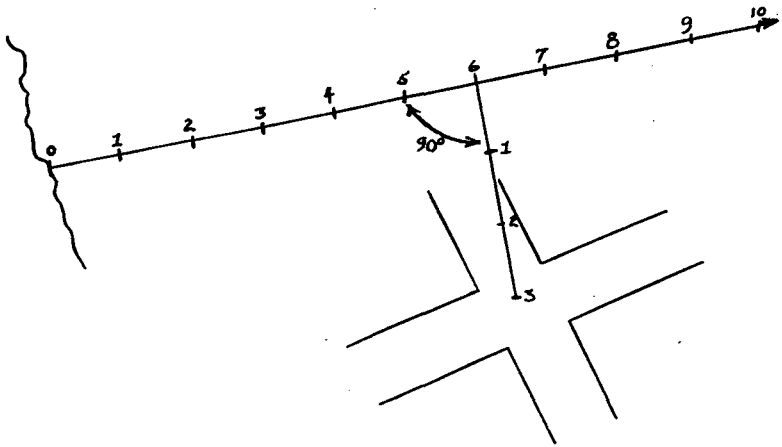
Subordinate commanders must be kept constantly informed of the current situation and the division commander's ultimate intention, in order to be able to adjust themselves to rapid changes in the situation which are often encountered as a result of the speed of movement, and in order to act in accord with the commander's general plan when unexpected difficulties and obstacles are encountered.

The cooperation of all parts of the division must be worked out in the greatest detail possible by the division commander. In order to avoid delays, frequent use will be made in the armored division of short warning orders. A thrust line (see note) will be given to the division during the attack in order that fresh directions of attack and objectives may be radioed in the clear. Important information gained by reconnaissance can also be communicated quickly and safely by this means.

Note.—The thrust line (*Stoßlinie*) method is much used by the Germans for sending map references in the clear. It consists of a line drawn upon a

The situation and necessity for rapid action may compel the division commander to intervene temporarily in the command of lower units by setting new objectives for the tanks or the motorized infantry regiments.

20. Commanders of all units must establish themselves with an advance headquarters well forward, and must be in a position to survey the battlefield frequently in time to issue their orders map which theoretically may run in any direction but actually usually extends in the proposed direction of advance or down the axis of a reconnaissance unit.



The line, which begins at a fixed point and continues indefinitely in the required direction, is usually divided into centimeters for convenience. To give a map reference a perpendicular is dropped from the reference point to the thrust line. Measurements are then taken from the point of origin to the point where the perpendicular cuts the thrust line, then along the perpendicular to the reference point. Since the point may lie on either side of the thrust line, the second figure must be prefaced by either "right" or "left" or as one looks toward the enemy.

A typical reference would be "6 right 3." The figures are always in centimeters; therefore the actual distance on the ground will vary with the scale of the map used. The scale may start with an arbitrary figure, have dummy figures interspersed, or start with the number of the thrust line when there are several in a given area. These devices make the code difficult to break rapidly.

Instruments have been found consisting of a transparent ruler graduated in millimeters, with a shorter ruler similarly graduated fixed to slide up and down at right angles to the long ruler. Operators with practice can give references very quickly.

early and note changes in the situation.¹ This applies especially to the division commander.² On the move he will usually have his headquarters with the commander of the advance guard. In action he will choose a position from which he can most quickly and directly influence the conduct of the battle.

A tactical headquarters group will remain as long as possible with the division commander. Terrain, enemy activity, liaison with superior headquarters, and necessity for insuring unified command may, however, lead to separation. Even so, the tactical group must make every effort to be well forward. The division commander communicates with his tactical group by radio or messenger. He must keep constantly in touch with his tactical group in order to keep abreast of the situation as a whole.

It may be desirable to specify in division orders the route to be followed by the tactical group and the proposed location of the command post. Higher headquarters and units protecting flanks must have early notice of these points.

It must be made clear in orders which units are to establish message-dropping grounds.

21. Signal communications must be established early so that information and orders may be transmitted quickly to meet changes in the situation. As the radio method of communication employed by the armored division betrays the latter's presence to the enemy, radio silence must be maintained, especially by tank units, until the moment operations commence. Orders must therefore be communicated as long as possible by means of messengers, telephones, and, over long distances, by aircraft.

¹ See par. 140, FM 100-5, FSR.

² In this connection, note the following excerpt from "Panzers across the Meuse," in *The Field Artillery Journal* (April 1941):

"Of interest is General Guderian's method of exercising command in the field. His headquarters is divided into two echelons. The rear one (headed by the Chief of Staff) contains the larger part of the staff, and remains in fairly quiet places to study situation maps, work on orders, and to act as a clearing house for the flow of information to and from the front. The forward echelon of headquarters is led by the general himself (he is the 'outside' man) in a small cross-country car. Apparently Guderian sits in the front seat of this vehicle, which he frequently drives himself. With him are two staff officers and an adjutant. Following are two aides in motorcycles with side cars; then two or three messengers on solo motorcycles; and finally the armored wireless truck, or CP—an open armored vehicle equipped with radios, map tables, etc. Guderian used this car throughout the Polish campaign. With this small circus he spends his time up at the very front, circulating back and forth between his subordinate units."

After battle begins, orders are issued chiefly by radio. It is essential to proper functioning of the armored division that radio communication should function perfectly, since it controls not only communications within the division, but also between the division and neighboring formations, and between air and ground reconnaissance forces.

Radio must be safeguarded. All messages regarding future intentions which allow the enemy sufficient time to take counter-measures must be camouflaged in accordance with regulations. Messages and orders which call for immediate action are sufficiently camouflaged by use of the thrust line and code names.

22. If there is likelihood of cooperation of fighter and bombardment aviation with the armored division, contact must be made beforehand with commanders of the units involved, and details thoroughly worked out.

An air liaison officer must be allotted to headquarters of an armored division. He must have an air signal section to maintain constant touch with flying units. Timing and targets must be worked out in advance in cooperation with dive-bomber and bomber units. Commanders of air units must have early information of the movement of the armored division. Targets must be clearly laid down in order of priority.

Those elements of the division which are to receive aerial support in the attack must know the objectives to be attacked and the time, number, and duration of attacks to be made.

23. Cooperation of the armored division with parachute and air-borne troops must be coordinated as regards time and plans. Each must know the task of the other. The armored division must endeavor to establish contact with air-borne troops by swift attack. Radio communication must be established between the armored division and commanders of the parachute or air-borne troops.

Chapter 4

COMPONENTS OF THE ARMORED DIVISION

Section I

TANK BRIGADE

24. Because of its large number of guns and machine guns of various calibers, its speed of going in to action and its maneuverability, the tank brigade can concentrate a heavy volume of fire on all targets. Its cross-country performance and armor enable it to exploit this fire power against the enemy at most effective ranges.

25. The success of the tank brigade depends upon its employment in mass formation and the concentration of the largest possible number of tanks to gain surprise in deep thrusts against the enemy's weak spots.

26. In all situations the success of the tank brigade is primarily dependent upon the personal leadership of the commander.

27. He carries out the reconnaissance of ground on which the conduct of the tank battle depends. On the basis of the division order, his knowledge of the terrain, and reconnaissance, he lays down the detailed order of battle for his brigade, its main line of attack, and its frontage and depth.

The tank brigade can be employed either in frontal or flank attack, and in several waves. The method depends upon the task, the terrain, the degree of resistance expected from the enemy, and the depth of the enemy's defensive zone. In general, flank attack is preferred.

When the situation is uncertain or the attack made over dead ground, it may be desirable to employ at first only a few elements, holding the remainder of the force in close reserve. The first wave of tanks must be given sufficient tanks with heavy caliber guns to insure that the enemy's antitank defense is quickly and surely neutralized.

28. On the basis of division orders, the brigade commander lays down the method of cooperation between tank regiments and supporting arms. During the battle he gives orders either verbally or by radio to the artillery regimental or battery commander accompanying him.

29. During the attack the brigade commander keeps the division constantly informed of the progress of the attack and of the objectives gained. On reaching objectives he decides whether the regiments are to be organized to pursue the attack or to reassemble under division orders.

30. During the attack the brigade commander directs his unit by means of radio. He has for this purpose the brigade signal platoon, which is detached from the division armored signal battalion. The nature of the task, the situation, and the allotment of other arms will from time to time necessitate change in the use of radio communications. Normally, the brigade commander will maintain radio contact with the division, his regiments, and the artillery. It may also be necessary, however, to establish radio communications with the motorized infantry and air force reconnaissance units, as well as with antitank troops. The brigade commander must make an early decision as to what communications are absolutely essential and whether an additional allotment is required from the division.

Radio communications from reconnaissance aviation working with the tanks may, if necessary, be supplemented by message dropping.

31. If task forces are formed, the commander of the tank brigade will normally command one of them.

Section II

MOTORIZED INFANTRY BRIGADE

32. The main effort of the armored division falls upon the motorized infantry brigade when the nature of the ground and tank obstacles prevent use of the tank brigade, and when it is essential to exploit the speed of the motorized infantry.

33. Equipment of the motorized infantry brigade with armored transport vehicles enables it to follow the tank brigade in vehicles over the battlefield, and to fight in close cooperation with the tanks.

The motorized infantry fights on foot. It can, however, engage an inferior or demoralized enemy without dismounting. These two methods supplement each other. Transport vehicle crews must therefore be kept close at hand while the infantry is fighting dismounted. In those cases where the motorized infantry brigade is not equipped with armored transport vehicles, it must dismount as soon as it comes within range of enemy infantry fire.

The motorized infantry brigade moves more quickly than the tank brigade on roads and tracks.

34. Equipment of the motorized infantry brigade with a large number of automatic weapons enables it to hold a broad front, even against an enemy of considerable strength.

35. The motorcycle battalion is an especially rapid and adaptable force. It is particularly fitted to anticipate the enemy in rapidly occupying important areas, to engage a weak enemy, to follow closely behind a tank attack, especially at night, in order to provide the tank brigade with necessary infantry protection, to reinforce the reconnaissance unit, to undertake wide and deep enveloping movements, to perform protective roles, and to act as a reserve.

36. The motorized infantry brigade has a signal platoon which is detached from the division armored signal battalion. On the move and when advancing deployed in vehicles, communications will be chiefly by radio. When attacking deployed on foot, wire communication becomes necessary.

37. If task forces are formed, the commander of the motorized infantry brigade will normally command one of them.

Section III

ARTILLERY REGIMENT

38. In keeping with the mobility of the armored division, the artillery must be employed in a mobile and elastic manner. Its equipment and speed in going into action enable it to give continued and effective support to the swiftly moving attack of the division. Its armor and its mobility on self-propelled mounts permit part of the artillery to follow the tanks, even within range of enemy infantry weapons, and to go into action from positions where fire by direct laying is possible. Armored command and

observation vehicles enable the officer observing and directing the artillery fire to accompany the tank attack and to cooperate closely with the commander of the tank brigade.

39. The relatively small size of the artillery component makes it necessary that it be allotted only a few tasks of major importance. Fire of the artillery must be strictly concentrated upon such targets as cannot be engaged by the tanks.

In an attack against an enemy organized for defense, every effort must be made to reinforce the division artillery, particularly with medium batteries. Artillery reinforcements obtained from the GHQ pool, by their equipment and training, are not so well fitted for direct support of the tank attack as is the division artillery. Their primary role should be to engage targets in the enemy's rear and flanks after the first penetration has been made.

Smoke troops can give effective assistance to artillery.¹

40. Artillery spotting planes and the armored observation battery report enemy gun positions and provide the commander with valuable supplementary information. They can undertake tasks of registering and spotting for their own artillery.

Spotting posts of the armored observation battery lying outside the division's sector must be given protection.

Section IV

ANTITANK BATTALION ²

41. As a result of its speed, mobility, cross-country performance, and protection against tanks, the antitank battalion can attack enemy tanks. It unites mobility and fire power in battle. Its object is to engage and destroy enemy tanks by surprise attack from an unexpected direction with concentrated fire.

¹ Smoke troops are probably attached to the armored divisions only on special missions. The smoke company is believed to consist of about 120 officers and enlisted men and 24 vehicles. In addition each company has eight 81-mm mortars, and it is possible that 100-mm mortars may be introduced.

² The antitank battalion comprises headquarters, signal section, three antitank companies, and probably one antiaircraft company. An antitank company consists of headquarters, signal section, and three platoons. Each platoon consists of four sections each armed with one 37-mm AT gun, and one section armed with two light machine guns. The 37-mm AT guns are now being replaced in many units by 50-mm AT guns. The antiaircraft company is believed to consist of twelve 20-mm superheavy AA and AT machine guns.

42. In addition to engaging enemy tanks, the antitank unit has the task of neutralizing enemy antitank defenses, thereby supporting its own tanks.

43. Antitank units, especially when supporting motorized infantry, can also use HE shell to neutralize especially troublesome enemy defense areas. Heavy antitank units can engage loopholes of permanent defenses and of fortified houses.

44. Antitank units will normally be employed in companies. In an attack against strong enemy tank forces, every endeavor should be made to employ the battalion in a mass formation. In engaging loopholes and enemy defense areas, antitank units will be employed by platoons or with single guns.

Section V

ARMORED ENGINEER BATTALION ³

45. The armored engineer battalion is able to follow tanks everywhere on the battlefield. In cases where not all the battalion vehicles are armored or capable of moving across country, only the armored engineer company of the battalion can be used in direct support of the tank brigade.

46. The task of the armored engineers is to provide the armored division on the march and in battle with the necessary facilities for movement. These include:

- a. Seeking out and removing obstacles in the line of advance;
- b. Clearing lanes through mine fields;
- c. Marking mined areas;
- d. Constructing crossings and bridges with improvised or standard equipment capable of carrying all vehicles of the armored division.

In addition, armored engineers cooperate especially in the attack against permanent defenses.

³ The armored engineer battalion consists of headquarters, 3 light motorized companies (possibly only 2 in some cases), 1 motorized heavy bridge column, and 1 supply park. The motorized companies have 4 officers and 183 enlisted men each, and are armed with 9 light machine guns, 153 rifles, and 34 pistols. The heavy bridge column comprises all the equipment and personnel necessary for construction of a bridge of 28-ton capacity. It has 6 officers, 184 enlisted men, and is armed with 1 light machine gun, 153 rifles, and 36 pistols. The supply park has 2 officers and 48 enlisted men, and is armed with 1 light machine gun, 36 rifles, and 14 pistols. The personnel and engineer equipment is moved in passenger cars, trucks, tractor trailers, and motorcycles.

47. The large number of engineer tasks necessitates economy of employment. The engineer force must not split up into small detachments. All other tasks must be subordinated to the main function of insuring a clear passage for advance of the tank brigade; therefore every endeavor must be made to employ the armored engineers before the tank attack begins.

48. The tank brigade, the motorized infantry brigade, and the reconnaissance unit each has its own engineer platoon. The nature of the task, the situation, and the terrain may in some cases necessitate its reinforcement by parts of the armored engineer battalion.

Section VI

ARMORED SIGNAL BATTALION ⁴

49. In keeping with the mobility of the armored division, the armored signal battalion is well equipped with radio and telephone equipment. Cross-country armored signal vehicles can accompany the tank attack wherever it goes and supply the communication necessary for its command.

50. The chief signal officer of the division must be kept informed of the current situation, plans, and employment of troops in order for him to make suitable arrangements for communications.

51. Radio communications must be insured by employment of sufficiently powerful sets in point-to-point traffic. In event of a rapidly moving attack by the armored division, the chief signal officer must have at his disposal a reserve of radio equipment.

52. Telephone communications, especially to superior headquarters, must be maintained as long as possible. It is important to cooperate with the corps signal unit in pushing forward a main artery as rapidly and as far as possible.

Existing civilian telephone lines are to be used when possible. In rapidly moving operations over wide areas, the division commander decides if and when wire communications are to be established.

⁴ The signal battalion of an armored division consists of headquarters, an armored radio company, an armored signal company, and a light combat train.

Section VII

LIGHT ANTI-AIRCRAFT BATTALION

53. The units of the armored division are vulnerable to attack by enemy aircraft. It is normally not possible to give protection to all parts of the armored division. If army anti-aircraft units and heavy air force anti-aircraft units are attached to the division, the employment of all anti-aircraft fire power must be unified.

54. The scanty proportion of fire power forces the command to limit tasks of the light anti-aircraft battalion, and to concentrate them at especially threatened localities.

55. In cases where the anti-tank battalion does not possess guns effective against tanks at longer ranges, heavy anti-aircraft units or single guns will be used in anti-tank defense and assault of fixed defenses, according to the principles in paragraphs 42 to 44.

Chapter 5

RECONNAISSANCE

Section I

GENERAL

56. The rapid movement of an armored division over wide areas demands forethought in directing and executing reconnaissance. Reconnaissance will be carried out by the air force reconnaissance squadron (attached to the armored division) and the motorized reconnaissance units, augmented by information collected by the armored observation troop.

57. Tasks given to the various reconnaissance units must supplement each other. In view of the small allotment of reconnaissance forces, supplementary tasks must be allotted for more detailed reconnaissance in a decisive direction only. Aerial and ground reconnaissance units must maintain close liaison.

Section II

AIR RECONNAISSANCE

58. The armored division can obtain its information about the enemy most rapidly from the air reconnaissance squadron.

59. This air reconnaissance squadron covers objectives 30 miles in front of the foremost parts of the division. At greater distances the army reconnaissance squadron of the armored corps is responsible. The limits of reconnaissance on the flanks are determined by the presence or absence of one's own troops, and the distances at which they are located.

60. The air force commander with the armored corps can take control of the armored division reconnaissance squadron, if direction of reconnaissance by the armored corps becomes necessary.

61. In tactical reconnaissance the squadron can be employed in the following special missions:

a. Watching railways and roads, especially for movements of tanks, antitank and motorized forces;

b. Reporting serious obstacles and barriers, and areas suitable for defense against tanks;

c. Reporting the nature of the terrain in the line of the division's advance.

It is of special importance to determine whether there are enemy forces concentrated to move against the flanks of the division.

62. Aerial photography must be planned in advance, as it provides valuable data for employment of the division.

63. In air reconnaissance during battle, watching over the tank brigade is of special importance when the latter is operating in advance of the other units of the division. Early confirmation of the positions of enemy antitank guns, the concentration of enemy tanks, tank obstacles, and ground suitable for tanks is important. The objectives reached by one's own tanks also should be reported.

64. Reconnaissance aircraft can give advance warning of approaching enemy aircraft.

Section III

MOTORIZED RECONNAISSANCE BATTALION ¹

65. The division puts the motorized reconnaissance battalion well in front when it needs to supplement air reconnaissance

¹ The motorized reconnaissance battalion of an armored division consists of headquarters, a motorized signal corps platoon, 2 armored car companies, 1 motorcycle company, 1 heavy weapons company, and a light ammunition column. The motorized reconnaissance battalion has 12 heavy armored cars and 42 light armored cars and is armed with 63 light machine guns, 6 heavy machine guns, 12 20-mm machine guns, 3 37-mm antitank guns, 2 75-mm cavalry howitzers, 3 81-mm mortars, and 3 50-mm light mortars. The armored car companies consist of 6 heavy armored cars and 21 light and superlight armored cars, and their armament consists of 24 light machine guns, 1 heavy machine gun, and 6 20-mm machine guns. The motorcycle company has 8 solo motorcycles, 41 motorcycles with side cars, and 10 light trucks, and is armed with 9 light machine guns, 4 heavy machine guns, and 3 50-mm light howitzers. The heavy weapons company has 6 light machine guns, 3 37-mm antitank guns, 2 75-mm cavalry howitzers, and 3 81-mm mortars.

quickly, and when a clear picture of the enemy's dispositions can be obtained only by fighting. The reconnaissance battalion is fitted for this because of its equipment with armored vehicles and numerous automatic weapons. To carry out reconnaissance in battle against a stronger enemy, it must be reinforced.

66. The motorized reconnaissance battalion is fast, and has a wide radius of action. It can be employed for distances up to 60 miles. The frontage on which reconnaissance is carried out will generally be decided by the armored corps. In independent employment of the division, conditioning factors are estimated strength of the enemy, number of areas to be reconnoitered, road conditions, and nature of the terrain. It may extend to 35 miles, and frequently even more on open flanks.

67. The abundance of reconnaissance tasks makes it necessary for the command to concentrate on the essential. Apart from tasks which any reconnaissance unit may be called upon to carry out, the motorized battalion must also give early information of enemy antitank defenses, and by reconnaissance of the terrain prepare the way for movement of the armored division.

68. As soon as battle begins, the motorized reconnaissance battalion must receive orders as to whether it is to continue its reconnaissance activity, hold temporarily important features, withdraw through the division, clear the front, or carry out reconnaissance on the flank. Because of the nature of its composition, the motorized reconnaissance battalion is not suited for defensive missions. For example, an open flank may be watched over by long-range reconnaissance but must be protected by other troops.

Section IV

UNIT COMBAT RECONNAISSANCE

69. Combat reconnaissance must be initiated as soon as the division is deployed. It is supplemented by reconnaissance platoons of regiments, by the armored observation troop, and by reconnaissance patrols on foot.

70. In combat reconnaissance, the location of enemy anti-tank weapons by all arms of the armored division is of special importance.

71. In cases where the tank brigade and the motorized infantry brigade are not equipped with tanks for battle reconnaissance, motorcyclists, infantry in armored transport vehicles, and bicyclists will carry out the reconnaissance.

Section V

COOPERATION BETWEEN AIR AND GROUND RECONNAISSANCE

72. Cooperation between air and ground methods of transmitting reconnaissance reports must be laid down by the division. Air reconnaissance will frequently show the motorized reconnaissance unit the direction in which reconnaissance must be developed. The motorized reconnaissance unit must have direct radio communication with the reconnaissance aircraft. If this is not possible, it will tune in to the reports of the reconnaissance plane.

73. In order to screen radio traffic, the reconnaissance unit will, as far as possible, communicate its reports to a station already known to the enemy. The division will listen in to messages.

74. Reconnaissance pilots can report either by means of radio, message dropping, or verbally on landing. The most rapid means is by radio, or by message dropping during flight. Radio communication is to be preferred as it offers the advantages of allowing queries to be made from the ground and new tasks to be communicated to the observer.

As far as radio equipment permits, units of the division should listen to the air observer.

Chapter 6

MOVEMENT

Section I

GENERAL

75. On good roads free of traffic, the following speeds are possible: full-track vehicles—day 12 mph, night 7.5 mph; half-track vehicles—day 18 mph, night 9 mph; motorcycles—day 24 mph, night 12 mph.

In 24 hours the division can move 90 to 120 miles with full-track vehicles, and 150 to 210 miles with other vehicles.

76. Distances covered by the armored division and its freshness for the battle are influenced to a decisive degree by the terrain and the road network. Movement of the armored division is appreciably influenced by unfavorable weather conditions. This must be taken into account when missions are assigned.

77. Early and continuous reconnaissance of roads to be used in the advance is necessary to insure speed of movement. Engineer reconnaissance of roads must be combined with that of the reconnaissance units. Valuable assistance can be obtained from visual reconnaissance and aerial photographs. This road reconnaissance will be carried out by reconnaissance detachments under the command of officers. Normally they will be assigned their tasks by the commanders of the march columns. Frequently they will have engineers attached so that any obstacles can be speedily removed. These detachments may also be called upon to carry out reconnaissance of rest and assembly areas.

The advance of the division must not be delayed by waiting for fresh reports as long as the division can withdraw in case of necessity.

78. Movement and traffic control will be carried out in accord-

ance with the principles laid down in *Movement and Traffic Control*.

79. The speed with which all troops of the division can catch up permits large intervals between individual units and groups within the march columns, provided the division is allotted roads with no time limit. In this case, unified control of the march columns is unnecessary. Individual units form at the times allotted them, and are in turn given the order to move. By this means the commander maintains control over movements of the division. If the foremost elements of the columns are held up, units behind are not necessarily held up in their turn. The different speeds of movement in the division are compensated for. Complete march columns may also be formed without previous assembly.

Large intervals between individual columns necessitate strict traffic control in order to prevent other troops from mingling in the movement of the division. If the higher command lays down definite times during which the division is to use certain roads, intervals between individual march columns must be so regulated that the roads are cleared within the time allotted.

80. If sufficient roads are available, the advance will normally be made in several columns, but if there is a possibility of contact with the enemy, the lateral interval between march columns must be such as to allow the division to concentrate swiftly for unified employment.

81. The intention of surprising the enemy, as well as the threat of air attack, frequently makes night marches necessary. The division will lay down the degree of lighting necessary.

Speed in night marches depends upon visibility. When no lights are used for driving, speed must be dictated by considerations of safety. Road reconnaissance and clear signposting are indispensable in night marches.

82. Liaison between the division commander and his tactical group and the march columns, march groups or individual units on the move must be insured by liaison officers, messengers, and radio. Radio sections detached for this purpose listen in, even during periods of radio silence.

It is desirable to establish points along the main route of advance with which units moving on other roads can establish timely liaison. Liaison over long distances can be established

by means of aircraft. They can also be employed to cover the movement of the division and report the points reached by individual columns. Within the march columns and march groups liaison will be maintained by messengers.

83. Halts of 20 minutes should be made every 2 hours, or when necessary. Unified divisional control of timing for the individual march columns and march groups is essential. Within a march column no commander may halt independently, even for a short time, as each halt extends itself to the rear and causes undesirable blockages and increased gasoline consumption.

A rest is essential under normal conditions after a 4- to 5-hour movement. It conserves the gasoline supply and can be used to give the drivers food and rest. It should last for at least 3 hours.

Rest areas must be reconnoitered in advance. They must permit a rapid resumption of the advance. Rest areas for troops on wheeled vehicles and motorcycle troops are generally close to the road; for tracked vehicles they are some distance from the road.

84. Long marches make the same demands on vehicles of the division as does battle itself. After 4 or 5 days' operations it is essential, in order to maintain efficiency of the armored division, that time be allotted for recovery and overhaul. If the situation or military necessity forbid this, the commander must accept the fact that parts of the division will be temporarily unfit for service.

Frequently a rest of several hours will be sufficient to repair damaged vehicles. Troops must be informed of the duration of the rest period.

Section II

MARCH ORGANIZATION

85. With the rapidly changing situation of the armored division, there is no hard and fast rule for march organization. The command must adjust march organization to suit a wide variety of demands.

86. If combat is not expected during the march, wheeled, half- and fully-tracked vehicles move together.

87. If contact with the enemy is expected during the march, the controlling factors are the task, enemy resistance to be expected, and the terrain.

88. At the same time, care must be taken to see that units are allowed to overtake march columns only if the advance elements of the column are halted in order to leave the road clear and all traffic from the other direction is held up.

89. If the situation indicates that contact with the enemy will require immediate employment of the tank brigade, the latter must be placed well forward in the columns. If, on the other hand, it can be seen from the situation or the nature of the ground that tanks cannot be used on first contact with the enemy, then the motorized infantry will lead. The tanks will follow, be given a separate route, or will be kept in readiness off the road.

If the situation requires the division to be employed in task forces, movement will be carried out in mixed march groups. Their composition will be dictated by requirements of the impending battle. An attempt should be made, even within mixed march groups, to assign separate roads to tanks and to other arms. This must, of course, depend upon the tactical situation and a suitable road system which allows advance on a broad front.

If important sectors are to be occupied in advance of the enemy or during pursuit, special mobile advance detachments may be formed. They hurry on without regard to maintaining contact with the division behind them. Their composition must be such that they can quickly break any expected enemy resistance and brush aside obstacles. Engineers must be allotted to these detachments.

It may be advisable to place the reconnaissance forces and the advance units temporarily under the same command. This must be ordered by the division.

90. The artillery must be well forward so that it will be prepared for action.

Engineers are to be assigned to all march columns if special tasks do not require the concentration of engineer forces.

91. Combat vehicles of all units will be divided into vehicles which the troops require during action and those which are not apt to be required immediately. The first group moves with units, the second will follow either under control of commanders of the

march columns or under unified control of the division, according to the division commander's decision.

Section III

SECURITY ON THE MOVE

92. The armored division protects itself against a ground enemy by early initiation of ground and air reconnaissance.

93. If early contact with the enemy is expected, the advance will be covered by an advance guard. If the advance is made along more than one road, each march column will be allotted an advance guard.

Strength and composition of the advanced guard are dictated by the situation, terrain visibility, and strength of the march column. If the tank brigade follows immediately behind the advance guard, the fighting strength of the latter may be kept relatively small. In suitable country, the tank brigade, or part of it, may take over the duties of advance guard in order to destroy enemy resistance immediately. If considerable antitank opposition, road blocks, or natural obstacles are apt to be encountered, the advance guard should be composed predominantly of motorized infantry. In most cases artillery, engineers, and antitank units must be allotted.

94. Areas which have been reported clear of the enemy will be covered by the advance guard in one bound, except for short halts, in order to enable the division to advance without hindrance. If enemy activity is likely, the advance guard may be ordered to proceed by bounds. This must not interfere with forward movement of the division.

The interval between the advance guard and units following will vary according to the strength of the formation and probability of enemy activity. It may be as much as 1 hour.

If the advance of the division is delayed by road blocks in great depth or by the enemy rearguard, it may be desirable to separate those parts of the division which are not immediately required for removal of obstacles or enemy resistance, and to allow them to rest off the road until the advance can be resumed smoothly. This avoids traffic jams and lessens wear and tear on both troops and engines.

95. March columns guard against threats to their flanks by reconnaissance. When necessary, forces must be sent along parallel roads to protect the main group, or must be pushed out to the flanks of the main route of advance.

96. Antitank defense during movement will be provided by incorporating antitank detachments in columns which are inadequately equipped with antitank weapons. The companies of antitank battalions will, for this purpose, be placed under command of those groups to which they are to be assigned on deployment.

97. For antiaircraft defense, light antiaircraft machine-gun units will usually be assigned to each march column. At bottlenecks and when the columns are halted, antiaircraft machine-gun units must be employed *en masse*. Frequently antiaircraft troops or antiaircraft machine-gun companies must be sent ahead with the advance guard in order to provide early antiaircraft defense at threatened points. Antiaircraft units can be employed leapfrog fashion during the advance only if halts of considerable length are made to enable them to push forward again.

Protection from daylight air attack demands full use of cover and dispersion. The advance must be continued despite enemy air attack. If this is impossible, the commander will order vehicles to seek cover off the road with troops dismounted.

All troops and all suitable weapons will be employed in antiaircraft defense. If road conditions permit, machine gunners will open fire against low-flying aircraft independently, at the same time warning other troops. Efforts must be made to obtain fighter aircraft protection.

By night the advance will be halted only if enemy aircraft directly attack the troops.

98. The possibility of gas-spray attack from aircraft must always be borne in mind. Orders must be issued before the advance, stating whether vehicles will use tarpaulins and whether troops are to wear antigas capes.

Chapter 7

DEPLOYMENT

99. As a rule, deployment precedes the division's organization for battle. It enables units in the rear of the columns to move quickly into battle, making full use of space for maneuvering. The longer the columns, the earlier deployment must be ordered. Increased readiness for battle compensates for the reduction in speed resulting from advancing deployed.

100. The advance in deployed order is protected by combat reconnaissance. If the tactical situation demands it, artillery elements may be employed to cover deployment. Special routes must then be allotted to the artillery, so that it may take up its proper position after its support mission is completed.

101. If the division commander has insufficient data at the time of deploying to lay down objectives to commanders of subordinate units, the latter must advance by bounds deployed. New bounds must be ordered early in order to obviate unnecessary delays when bounds have been reached.

102. Early orders are necessary for employment of anti-aircraft machine-gun units for the protection of deployment.

Chapter 8

ATTACK

Section I

GENERAL

103. In armored division combat, the decision is gained by attack of the entire tank brigade in one body. Employment of the brigade is therefore of decisive importance. The main effort will be made where the tanks can find suitable terrain and battle conditions.

The role of the other units of the armored division is to provide conditions necessary for employment of the armored brigade, to support the tank attack, to protect the flanks, and to insure that success is exploited by close support. The motorized infantry enables the armored division to seize ground taken by the tanks and hold it for a considerable period.

104. The armored division must endeavor, by obtaining early possession of vital points, to open the way for an attack.

105. If the armored division succeeds in surprising an enemy ill prepared for defense, the division will attack without deploying. Attack without deploying can also be considered if the enemy is advancing to attack. The rapidity with which fire can be brought to bear and the combination of fire power and movement in the tank brigade compensate for the enemy's advantage in being prepared for attack.

Attack is preceded by detailed preparation if the enemy's defense is organized and antitank defense is expected.

106. The armored division's actual frontage of attack is normally less than frontage of the sector allotted to it. It depends upon the tactical situation, the terrain, and the nature and strength of opposing forces.

An attack against an enemy whose defense is organized requires concentration of the armored division's forces. Against an inferior

or demoralized enemy, or where there is little antitank opposition, a series of attacks at several separated points is frequently successful. Areas which have natural antitank defenses are well mined, or are protected by strong antitank organization, may narrow the attack or impose a temporary division of the attacking forces.

107. Attack is made easier where the enemy has limited visibility. Attack at dusk or during darkness may lead to decisive results and completely disrupt the enemy. Suitable ground and good roads along which to press home the attack are essential.

Fog precludes observed defensive fire, restricts the movements of tanks, and makes it difficult to identify the objectives allotted to them.

Smoke assists the attack of the tanks if it is used to screen flanks and blot out antitank defenses and observation posts in the enemy's rear. It can be laid down by attached smoke units, tanks, or artillery, or can be sprayed or dropped in bombs by aircraft. Spray from low-flying aircraft is possible only when the enemy's anti-aircraft defense is negligible or neutralized.

Section II

CONDUCT OF THE ATTACK

108. Rapid and unexpected attack is the secret of success and leads to decisive results.

109. In an attack without deployment, the objectives allotted will generally be distant. Over difficult terrain or where the situation is not clear, especially when the attack has not been preceded by ground reconnaissance, the division may move forward by bounds in order to keep its forces together in readiness for unified action. Orders must be given early enough so that a steady, unimpeded advance is maintained and the enemy is given no time to organize his defense.

110. An axis will be laid down for the attack.

111. Wherever possible the attack will be led by the tank brigade. A short halt will usually be necessary in order to provide the attack with requisite breadth and momentum. A favorable opportunity will be exploited without delaying to make this preparation, even if only part of the armored brigade is immediately

available. In such a case the remainder of the tank brigade will follow deployed, so that it may immediately be thrown into the attack if the enemy's resistance stiffens.

112. The success of the tank attack depends upon neutralizing the enemy's antitank defense. All arms must support the tank attack to this end.

113. The motorized infantry follows the tanks in vehicles, deployed, as long as the enemy's fire allows. Troops dismount in order to attack defense areas which the tank brigade has not destroyed.

Contact between the tank brigade and the motorized infantry following must not be broken. If there are enemy elements which have not been attacked by the tanks, or if there is a likelihood of enemy defense areas resuming activities after the tanks have passed, the tank brigade must set aside part of its force to assist the forward movement of the motorized infantry. It may be desirable to attach part of the tank brigade to the motorized infantry for this purpose.

114. The attack must be pressed home to the objective regardless of threats to flanks. Threatened flanks will be protected by motorized infantry or elements of the antitank battalion. Frequently sufficient flank protection can be given by reconnaissance. If the situation allows, it may be advisable to employ forces farther in rear against an enemy attacking in the flank. This is not done by diverting them so that they meet the enemy in a frontal attack, but by using them even farther back so that they in turn strike at the enemy's flank.

115. An attack without deployment allows insufficient time to organize any artillery preparation.

The artillery engages targets which have not been reduced by the tanks and which impede the progress of tanks and infantry. Such targets are primarily antitank weapons and defense areas in country possessing natural tank defense (built-up areas, woods) within and on either side of the sector in which the tanks are attacking.

116. In order to obviate the danger of dispersion of fire in a rapidly moving battle, the commander must always make sure that the fire of several batteries is concentrated on a single objective. The main artillery effort should be concentrated either

far ahead of the tanks or outside their sector of attack. No time can be laid down for the artillery fire to be lifted. Isolated targets which appear in the paths of the tanks must be engaged by the tanks themselves.

117. It must be possible to support the tank attack throughout its depth with observed fire. Accordingly, observation and command posts must be pushed well forward before the attack begins, and fire positions must be so chosen that the artillery fire follows the line of attack as long as possible.

As a rule, part of the artillery, preferably batteries on self-propelled mounts, will be assigned to cooperate with the tank brigade. The commanders of the tank and artillery units must make every effort to confer. At the beginning of the battle the artillery commanders will be at observation posts from which they can give definite support in early stages of the attack.

118. If the tank attack gains ground, the artillery must be kept in close support in order to prevent its losing contact in subsequent stages of the assault. Constant support must be insured by employing artillery troops in leapfrog fashion.

Artillery commanders will move quickly in command cars to points from which they can follow the progress of the attack and support it by concentrated, observed fire. Forward observers in armored observation vehicles will move with the foremost tanks.

Artillery liaison officers, who accompany commanders of the tank units, communicate the latter's requirements to artillery commanders. In addition, personal contact with commanders of the tank units should be sought. Radio communication must be established.

If, after a successful break-through, the tanks find themselves in country clear of the enemy, all available routes must be used in order to push the artillery forward with the last wave of tanks so that they may be ready for action immediately if fresh enemy resistance is encountered.

119. There must be close cooperation between artillery not employed in direct support of the tank brigade and one or more artillery spotting planes. This is essential if enemy artillery is to be rapidly and effectively engaged and fire brought on important targets concealed from ground observation.

Parts of this artillery will, if their fire can be controlled by spotting planes, remain in their fire position as long as range of the guns allows.

One of the most important tasks of the artillery spotter plane is to keep watch for the appearance of enemy antitank and tank forces, and to direct artillery fire against these targets. Valuable data for the choice of fresh targets can be gained by the artillery commander from listening to the reports of reconnaissance aircraft.

120. The armored engineer battalion will usually be attached to the tank brigade. It accompanies the tank brigade, removing tank obstacles encountered during the attack. Material for improvising crossings over small cuts should be carried. Those parts of the engineer battalion which are not yet equipped with engineer tanks must follow as closely as possible behind the tank brigade.

121. The antitank battalion accompanies the tank brigade in the attack, covering its flank and supporting it in neutralizing enemy tank and antitank defenses. Antitank units not yet armored or equipped with self-propelled mounts follow the armored brigade by bounds, with the special task of engaging enemy tanks attacking the flanks and rear of the tank brigade.

Parts of the antitank battalion can be employed to provide anti-tank defense for the motorized infantry.

122. Depending upon the air situation and nature of the terrain, light antiaircraft artillery and machine-gun units attached can be assigned the task of protecting the tank brigade, artillery, reserves, and transport vehicle assembly points against enemy air reconnaissance and attack. Headquarters and important supply centers, especially for ammunition and gasoline, must frequently be given protection.

123. Rapid progress of an attack while the division is in motion rarely allows telephone communications to be established. Frequently only the most important radio communications will be possible because of the necessity of maintaining an adequate reserve to meet unforeseen demands. There must always be communication with the superior commander, the tank brigade, the motorized infantry brigade, the artillery, the armored reconnaissance unit, and the air reconnaissance unit.

124. If, in attacking on the move, the commander of the armored division decides to use his motorized infantry as the spearhead of

attack, it will remain in vehicles as long as the enemy and the terrain permit. After dismounting, its tactics will follow the principles laid down for infantry in the attack.

As long as the infantry is moving in vehicles, artillery elements on self-propelled mounts will follow closely in order to support their attack rapidly with observed fire.

As soon as the enemy's resistance weakens, the motorized infantry should return to its vehicles in order to make full use of their speed.

The tank brigade should be held back until it can be used in support of the motorized infantry.

Envelopment should be attempted.

The antitank battalion accompanies the motorized infantry brigade in order to destroy enemy tanks. It may be advisable to hold back the greater part of the battalion—frequently in rear of the flanks—in order to exploit its speed, mobility, and ability to carry out surprise attacks against tanks. If the enemy's resistance has been broken by the motorized infantry, the antitank battalion can be pushed ahead of the foremost infantry in order to attack and destroy enemy tanks. Advance artillery observers should be assigned for this purpose.

125. If, after attaining the objectives, the task allotted does not involve pursuit, the motorized infantry will hold the ground gained, and will be supported by the tank brigade. This will be done in accordance with principles laid down for the defense.

If the attack fails or appears likely to lead to no result, the attacking forces should disengage and attack afresh at another point.

126. If the armored division encounters enemy tanks during the attack, engaging them must take precedence over all other tasks. The tank brigade must quickly find covered positions from which it can fire effectively at the halt, while the enemy is compelled to fight at a disadvantage (attacking over open country, against the sun, with the wind). This method is particularly recommended when the enemy is superior in numbers of antitank weapons. Success in these circumstances can also frequently be gained by quick and determined attack, especially against the enemy flanks.

If the enemy is inferior in numbers or armament, or if it is im-

possible to find a favorable position, a short halt should be made during which all armor-piercing weapons should be brought to bear on him. The attack should then follow immediately, and should, if possible, be supported by some elements firing at the halt.

The rear waves of the tank brigade should be employed as far as possible in enveloping attacks against the flanks and rear of the enemy tank forces.

Extensive combat reconnaissance must be carried out by the division, especially in the flanks and rear of the tank brigade, to insure that the latter is secure from surprise attacks by enemy tanks.

The artillery's task is to attack the enemy tanks while they are deploying, breaking up their attack with concentrated fire.

Section III

ATTACK FROM AN ASSEMBLY POSITION

127. The purpose of an assembly position is to enable detailed reconnaissance to be carried out, to allow units to take up their allotted positions for the battle, and to insure cooperation of all arms participating in and supporting the attack.

128. The assembly area must provide cover against enemy air and ground observation; it must be situated far enough forward to enable the division to advance in battle order; the artillery must be able to carry out its tasks of supporting a break-through without changing its positions, and heavy weapons must be able to neutralize the enemy defenses, particularly his antitank weapons.

Usually the tank brigade and those parts of the motorized infantry which are to follow in vehicles behind the tank advance will be held back, so that they remain unexposed to enemy fire and can eventually be employed with surprise effect. The more thorough the reconnaissance, the longer it is possible to delay the approach march and deployment of the tank brigade. If the terrain permits the tank brigade to adopt its battle formation well in rear of the battle area and to advance in this order, only a short halt will be necessary in the assembly area.

The vehicles of those parts of the division which have previously

moved into the assembly area must not be allowed to impede movement of the tank brigade.

129. Surprise is assisted if the division moves into its assembly area during dusk or darkness.

130. Movement into the assembly area and the area itself must be protected from enemy reconnaissance and surprise attack. Antiaircraft machine-gun units must be assigned for defense against enemy reconnaissance and attacking aircraft.

131. The artillery moves up during the assembly. The armored observation battery establishes its sound-ranging and flash-spotting posts and plots enemy positions.

As far as is possible without sacrificing surprise, the engineers remove tank obstacles in front of enemy positions and make all necessary preparations for removing obstructions.

The armored signal battalion establishes line communications within the division in order to supplement radio communications during battle.

132. The object of the attack is to break through the enemy's defensive zone. This object is achieved when the enemy artillery is destroyed and the enemy's main line of resistance is so broken that the motorized infantry can follow up in vehicles. Only after a successful break-through must a distant objective be assigned.

133. If there are tank obstacles or natural antitank defenses in front of or within the enemy defensive position, the first stage of the attack will be carried out by the motorized infantry alone. It advances through the enemy main line of resistance until the obstacles barring the tank advance are removed.

The advance of the tank brigade must be so arranged that when obstacles are removed it can penetrate deeply into the main enemy defensive zone, accompanied by the motorized infantry.

134. If it has been possible to remove obstacles in front of the enemy position before the attack, and no obstacles are likely to be encountered in the main line of resistance, the attacks of the tank brigade and the motorized infantry will be launched simultaneously. By this means the armored division brings all its weapons to bear effectively at the decisive moment of attack to destroy the enemy's defenses and lend momentum to the advance.

135. If the terrain is favorable and no tank obstacles have been

reported, the tank brigade will precede the motorized infantry in attack on the enemy position. This assists the movement of the motorized infantry to the enemy position, speeds the operation, and reduces casualties.

136. The attack of the tank brigade is carried out according to the principles of an attack not preceded by deployment.

137. Targets against which the artillery is to concentrate its fire before and during the attack depend upon the method of attack. If the attack is led by the motorized infantry, the main effort will be directed against enemy infantry weapons. If tanks precede the motorized infantry in the attack, the artillery's main task will be to destroy or neutralize with smoke the enemy anti-tank weapons. It may be desirable to lay down smoke shortly before the attack in order to neutralize enemy observation posts and antitank weapons.

If the enemy is occupying strongly prepared positions, it will usually be necessary to lay down an artillery preparation which should be preceded by careful target reconnaissance.

If surprise is to be gained, or if the tactical situation is obscure, it is frequently advisable to delay opening fire until enemy resistance is encountered, and then to destroy it with concentrated fire. As the attack progresses, artillery support is governed by the same principles that apply to an attack not preceded by deployment.

138. If the motorized infantry leads the attack, it will have armored engineers attached. Elements of the armored engineer battalion follow closely behind the motorized infantry brigade to clear the way for the tanks following.

139. The bulk of the antitank battalion will be attached to the motorized infantry leading the attack; elements will be allotted to protect movement forward from the assembly positions.

140. If the armored division attacks through an infantry division, all forces of the infantry division operating in its sector will be attached to the armored division. This insures that:

a. All weapons and troops of the infantry division are concentrated under a unified command in support of the tank attack.

b. Movements of the armored division and the infantry division are coordinated.

This arrangement will end when the main body of the armored

division is no longer in contact with the infantry. It will frequently be necessary for the higher command to hold up movement of the infantry division in order to allow the armored division to continue its advance.

141. If the armored division is ordered to give fresh momentum to an attack by other troops, the attack will be carried out either by the tank brigade or simultaneously by the tank brigade and the motorized infantry brigade. The attack will be supported by the mass of the armored division's artillery and antitank units.

142. The higher commander will decide whether the whole or parts of the division shall be temporarily diverted from the original axis of attack in order to widen a breach in the enemy's position. Provision will be made to cover the new flank which is thus formed.

143. If the armored division is ordered to exploit success gained by an infantry division with the object of developing it into a complete break-through, the attack will always be carried out by the tank brigade. The motorized infantry will follow in vehicles as closely as possible behind the tank brigade. Strategic objectives will be assigned. As it is important not to dissipate efforts of the armored division but to maintain strictest concentration in view of tasks which remain after the break-through, the artillery and other heavy weapons will be employed only insofar as they are necessary for completion of the break-through.

Chapter 9

PURSUIT

144. Success must be exploited without respite and with every ounce of strength, even by night. The defeated enemy must be given no peace. The only factors which must be allowed to cause a temporary halt are exhaustion of fuel and ammunition, and even then contact must be maintained. The attack must be resumed as soon as fresh supplies have been received.

145. Every effort should be made in pursuit to overtake the enemy. If the enemy succeeds in maintaining a front in its withdrawal, the armored division must break through the enemy resistance at several points and use its speed to occupy ground in the path of retreat. The nature of the terrain and strength and attitude of the enemy decide whether the tank brigade is to be pushed forward in mass formation or in task forces.

Night attacks are likely to be particularly successful.

146. If there is danger of losing contact with the enemy, elements possessing greater speed, i. e., motorized infantry, motorcyclists, and antitank units, will be employed in the pursuit. In this case, engineers will be assigned. If reinforced by equally mobile forces, the armored reconnaissance unit can strike swiftly and with decisive results.

147. If the division has penetrated deep into the enemy lines in its pursuit, it will establish a system of defense areas for its protection at rest and by night. They should be designed to enable heavy fire to be directed from every side.

148. If enemy resistance stiffens, all forces engaged in pursuit must be concentrated quickly under unified command for a fresh attack.

149. Strong artillery forces must always move directly behind the foremost elements. Strict cooperation with division reconnaissance aircraft is essential. Fighter and bomber support increase the chances of success.

Chapter 10

DEFENSE

150. If the division is compelled to assume a defensive role, it will either attack with limited objectives before the enemy has completed his preparations, or it will employ the motorized infantry brigade, supported by other arms of the division, keeping the tank brigade in readiness for a counterattack.

If the enemy attacks with tanks, the attack of the tank brigade will be concentrated against them. The principles laid down in paragraph 126 are applicable.

Chapter 11

WITHDRAWAL FROM ACTION

151. Withdrawal from action will often be preceded by an attack with limited objectives by the tank brigade. Screened by the more mobile infantry, motorcycle, and antitank units, first the tanks and then other parts of the division will disengage from the enemy.

If the enemy follows up rapidly with superior forces, especially tanks, the division will be screened during disengagement by tanks and antitank units, supported by artillery and engineers. Smoke can be used to assist disengagement.

Planning and timely orders are necessary to insure that troops, after the first stage of withdrawal on a broad front, are quickly and smoothly formed into march columns. Traffic control points must be established in advance.

152. The last troops to be withdrawn will normally be adequately covered by antitank units reinforced by motorized infantry or motorcyclists. Mines can be laid to assist in the final disengagement. In this case there must be close cooperation between engineers and the last troops to move. The division commander will decide how mines are to be employed.

153. In the absence of antitank units equipped with self-propelled mounts, rear protection will be provided chiefly by tank units.

154. The situation may favor the formation of task forces.

Chapter 12

SPECIAL CONDITIONS

Section I

ATTACK AGAINST A PERMANENTLY FORTIFIED POSITION

155. If by reason of exceptional circumstances the armored division is employed to break through a permanently fortified front, the attack will be carried out by the motorized infantry brigade reinforced with engineer assault detachments, attached infantry units, strong forces of artillery and engineers and will follow the principles laid down for *Attack against a Permanently Fortified Front*.

Heavy tanks and heavy antitank guns may be used singly to engage loopholes. They will be attached to the motorized infantry. Part of the tank brigade may be employed to engage enemy forces holding intermediate ground, and to cover the advance of assault parties, thereby relieving strain on the artillery.

The main body of the tank brigade will not be employed until tank obstacles have been removed. Its task will be to extend the breach achieved by the infantry, and turn it into a complete break-through. Search for tank traps and obstacles must be carried out deep into the enemy's position in order to prevent abortive employment of the tank brigade.

156. Cooperation with the air force is particularly important when the armored division is attacking a permanently fortified position. The air force can have a decisive influence on the armored division's attack by reconnaissance of targets, bombing attacks on enemy fortifications, tank traps, sleeping quarters, headquarters, switchboards, and reserves, and by providing defense against enemy aircraft. The air force bombardment timetable must be coordinated with the fire plan of ground troops.

Parachutists dropped in or behind the enemy positions can give material assistance.

Close liaison with the air force is essential. Foremost elements of the division must be clearly distinguished. There must likewise be no possible doubt regarding the line beyond which the division must not advance before the bombing attack. There must be air liaison officers provided with all necessary means of communication, not only at division headquarters, but also with the foremost troops.

Section II

ATTACK ACROSS A RIVER

157. When a river must be crossed in the attack, the motorized infantry will first carry out the crossing according to principles laid down for the infantry division. Its small numerical strength permits attack only on a narrow front. Tanks with heavy guns can be sited to fire from cover from the near bank while the crossing is being made.

The bridgehead formed on the far side should at first not be larger than can safely be held by the division infantry and artillery.

158. Ferry crossings should be started as soon as possible and used to move tank units. The latter will extend the bridgehead so that construction of a permanent bridge can begin.

Antiaircraft machine-gun units must be included in advance parties in order to protect the crossing.

The main body of tanks and those parts of the motorized infantry which are not required to establish the bridgehead should be kept well in rear in order to keep clear the crossing points allotted for vehicles. When the bridge is completed—and not before—they will cross and carry out deep thrusts into the enemy lines. The vehicles of troops engaged in the river operation follow them.

159. The division must lay down in detail the order in which troops and vehicles are to be ferried or are to cross the bridge. Points at which columns are to separate and assembly positions must be located well in the rear of crossing points. The division commander will appoint officers to regulate traffic at separation points. They will prevent other units from using the bridge with-

out authority of the division. They will have telephone communication with the bridge and with the troops waiting to cross. Commanders of troops which have crossed will see that crossing points are quickly freed for the passage of following troops.

Section III

FIGHTING IN BUILT-UP AREAS

160. Except when necessary, tanks should not be employed in built-up areas, since their movements are restricted and they are easy targets for antitank weapons. When the armored division is compelled to fight in a built-up area, the task should be assigned to the motorized infantry. As in the case of an attack against a permanently fortified front, the motorized infantry may be strengthened by single heavy tanks, heavy antitank guns, and engineer assault detachments. They give support by engaging particularly strongly fortified defense areas.

Built-up areas can be overcome more rapidly and with fewer casualties if smoke is used to blind the enemy, if he is paralyzed by artillery and bombing attacks, or if the area is burned down. Tank and motorized infantry units following in rear of the first wave will be employed to flank the locality and take it from the rear. Liaison must be insured between forces carrying out the frontal and flank attacks.

Section IV

FIGHTING IN WOODS AND MOUNTAINS

161. Woods and mountains limit the mobility of tanks, interfere with their deployment, and appreciably weaken the armored division's power of attack. The division should, therefore, avoid fighting in woods and mountains. If it has to fight the enemy across wooded country and mountains, it must employ the motorized infantry brigade, reinforced by other arms or task forces.

To prevent tanks from falling into enemy traps when fighting in woods and mountains, especially thorough reconnaissance is necessary.

Fighting in woods and mountains must be conducted in a narrow front along roads, but must be in great depth. The

terrain prevents lateral reinforcement of several combat teams attacking along separate routes.

Employment of engineers assumes increased importance in fighting in woods and mountains.

In particularly difficult country, it may be necessary to hold back the tanks in early stages, and to advance protected by motorized infantry and by motorcycle troops when the motorized infantry has dislodged the enemy.

Section V

FIGHTING IN SMOKE AND FOG

162. In advance and attack in smoke or fog, the armored division must rely on tracks and notable features which point the direction of the objective. Advance by bounds will frequently be necessary. The division must be organized in depth, and units must be held in close contact with each other. Even while advancing, units must be organized in their battle formations. Early allotment of necessary supporting arms and signal equipment is essential.

163. In advancing, deployed and in attacking an enemy unprepared for defense, the tank brigade will lead. Generally motorcycle troops will be attached to insure maintenance of contact, immediate protection, and close reconnaissance.

The motorized infantry brigade (following in vehicles) and other parts of the division should be accompanied on their flanks by antitank troops. Until the division is equipped with antitank guns on self-propelled mounts, this task will be carried out by tanks. These will protect the motorized infantry against a surprise tank attack and sudden lifting of the fog or smoke.

164. Against an enemy organized for defense, the attacks will be led by the motorized infantry brigade on foot. Tanks and anti-tank troops are allotted to motorized infantry on company or platoon strength to deal with enemy defense areas.

165. It will often be desirable to employ task forces in fighting in fog and smoke.

Chapter 13

REST

166. Protection at rest is carried out according to principles in Field Service Regulations. Sectors giving cover are of special importance for the armored division. Wide dispersion simplifies camouflage, especially of the numerous vehicles. Mutual support must be provided for in event of an enemy attack.

Protection of rest areas is normally taken over by motorized infantry. For this purpose the infantry can be reinforced with other troops (antitank units, single guns, and machine-gun units attached). Employment of tanks for protection of rest areas will be exceptional.

Protection by mine fields laid by the engineers may be desirable. They must be covered, and must be removed some time before the march is resumed.

Protection against air reconnaissance and attack is the responsibility of the division anti-aircraft machine-gun units. They can be supplemented by machine guns.

167. If possible, rest areas should be chosen in which the work of the repair services can be simplified and accelerated by assistance from existing workshops. The division will therefore seek out sites, especially for its full-track or half-track vehicles, in or near large villages or towns.

168. Division of troops for purposes of quartering into groups which fit into the composition of march groups accelerates preparation for resumption of the march and reduces movement orders.

Chapter 14

SERVICES

169. Dependence for fighting strength upon the condition of vehicles, high gasoline consumption, and the rapidity with which supply bases are left behind are factors which have a decisive bearing upon employment of the division.

170. Supply services must anticipate tactical and strategical demands made upon the division. Elasticity and ability to improvise are required in order to meet the demands of a constantly changing situation.

Close cooperation between the tactical and supply sections of the division staff is indispensable. It is of primary importance that there should be reliable communications—usually by radio—from supply services to the tactical group, to supply services of the superior formation, and if possible, to the rear services.

171. Every endeavor should be made to insure that the division goes into action fully supplied. On the march, when contact with the enemy is not expected and road conditions permit, it is desirable to send forward strong parties from the rear services—at the very least, fuel supply columns and repair and ration units. By this means, time necessary for transition from route order to battle order is appreciably reduced.

172. If the situation does not permit service detachments to be sent forward, parts of the fuel supply columns, ammunition columns, medical services, and recovery platoons of workshop companies should be temporarily incorporated into march columns during long moves. Personnel of the services will not move from the rest area until the fighting troops are all clear of the area. They will then usually move behind in bounds.

173. During combat the rear services require a strong and forceful leadership. As far as the situation allows, they must maintain close contact with the fighting troops in order to spare the latter

long marches for replenishment of supplies. This also relieves the problem of protection and prevents dislocation arising from the movements of other troops.

The division will frequently present long exposed flanks, and in a critical situation may be compelled to employ fighting troops to protect or even to bring up supplies. In addition, all unit transport and the services must be able to protect themselves against air and ground attacks.

174. In order to simplify command of the numerous services, it will be normal practice to group several units under energetic commanders. Composition of these groups will vary with the situation. The greater part of the smaller motor transport columns and the supply company will usually be under command of the division G-4, while the larger motor transport columns for fuel supplies will frequently be employed singly.

175. Not later than the beginning of the battle, motor transport columns will be formed, consisting primarily of ammunition columns. They may, however, also include parts of the larger motor transport columns. Columns with cross-country vehicles are particularly suited to this purpose.

176. If shortage of gasoline occurs during an attack with strategic objectives, or during pursuit, it may be advisable to allot all of the fuel available to those units which are to play a decisive role in the battle, even at the expense of other units of the division.

177. Because of its complete mechanization and great distances covered by the division, motor transport makes the greatest demands upon the supply system. Fuel must be replenished as soon as it is expended. The G-4 must at all times have a clear picture of the fuel situation, the condition of vehicles, and demands made upon the workshop company.

The workshop companies form a special group. They must be employed with foresight and according to a strict plan. Repair of vehicles on the march and during battle is primarily the responsibility of unit repair columns and repair sections. More difficult repairs are carried out by the workshop companies. The latter can work effectively only under comparatively settled conditions, and arrangements should therefore be made for their employment for several days in the same place.

178. Supply of artillery and tank ammunition is the main task

of the ammunition supply services. Shortages of tank ammunition can, in extreme cases, be made good from tanks which have been put out of action. The loading of ammunition cranes must be adapted to the mission of the armored division and to the combat expected. Timely consideration is necessary.

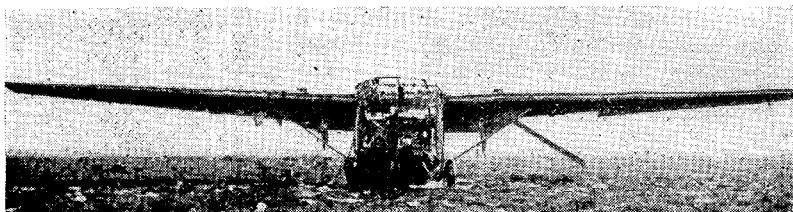
179. Rapid progress of operations requires special arrangements to be made for employment of the medical services. Sections of the medical services (surgical group, first-aid section, ambulances) must be well forward with the fighting troops, and medical companies must be kept in close attendance. Close liaison between the division medical units and higher units is especially necessary in order that the former may have ready information of medical arrangements set up by corps and army for rapid evacuation of the wounded.

180. The armored division is well supplied with iron rations and can therefore bridge gaps in the normal ration supply. Frequently it will be separated by long distances from its field bakery. If the supply of bread is thereby endangered, the armored division will make early arrangements for bread to be drawn from a higher unit.

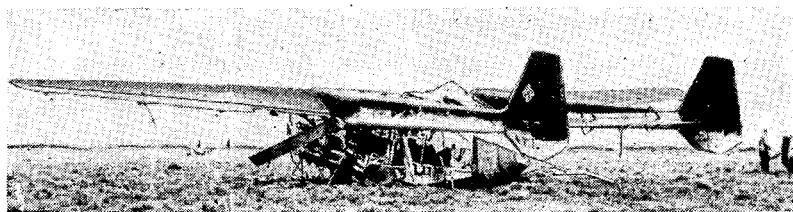
181. When particularly heavy strain is imposed upon the supply services and every inch of carrying space must be utilized, it will frequently be necessary to place the light columns of units either wholly or partly under divisional command, and to dispatch them directly to delivery points. They may be used also in conjunction with unit supply transport.

182. In view of the rigid organization of the armored division, detachment of men and vehicles to guard and evacuate prisoners is extremely inconvenient. As a general rule, therefore, the armored division will only collect prisoners, leaving troops following in rear to make arrangement for guarding and evacuating them.

183. In critical situations the armored division may temporarily be supplied by air.¹ It must be borne in mind, however, that the number of aircraft required is out of all proportion to the volume of supplies carried. Provision of supplies by air must, therefore, be confined to those parts of the armored division which must be supplied without delay in order to carry out their tasks. Air



transport requires very thorough preparation. Time and place at which supplies are to be dropped must be laid down accurately. Flat country which provides a clear view, open and easily identified



from the air, is most suitable. Terrain permitting, it is preferable for aircraft to land rather than to drop their supplies from the air. Wounded should be evacuated on the return flight.

¹ These photographs show a destroyed Gotha 242 glider of the type that has been used for air transport in Africa. It has the following characteristics: power, towed by JU 52's; capacity, 4,800 pounds plus pilots and equipment, or 23 men plus equipment; armament, positions for 8 machine guns but sometimes only 3 or 4 are carried; wing span, 79 feet; over-all length, 52 feet 6 inches; maximum towed speed, 144 miles per hour; approximate landing speed, 70 miles per hour.