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FM 17-60

WAR DEPARTMENT

ARMORED FORCE FIELD MANUAL

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ARMORED DIVISION ARTILLERY

August 1, 1942

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FM 17–60

ARMORED FORCE FIELD MANUAL

ARMORED DIVISION ARTILLERY

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(For explanation of symbols see FM 21–6.)

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ARMORED FORCE FIELD MANUAL

ARMORED DIVISION ARTILLERY

SECTION I

GENERAL

■ 1. PURPOSE.—The purpose of this manual is to standardize training methods, to set forth standards of proficiency, and to emphasize tactical action peculiar to armored field artillery.

■ 2. GENERAL CONSIDERATIONS.—Tactical success in armored force action depends on cooperative and coordinated effort among tanks, the supporting armored ground troops, and aviation. The armored artillery supports the armored division in the execution of its offensive role in mobile warfare. In executing its general mission the artillery must be prepared to put down an effective preparation preliminary to an attack, when such is desired. It must follow through with the attack and give timely support during critical phases. It must be prepared to execute direct fire on hostile tanks that have penetrated our position. Finally, it must be able to deliver, rapidly and accurately, the necessary defensive fires to protect objectives already taken, or to guard organizations at rallying points.

■ 3. ORGANIZATION.—The organic artillery of an armored division consists of a headquarters division artillery command and three battalions of armored artillery. Each battalion is organized to include a battalion headquarters and headquarters battery, three batteries of six 105-mm self-propelled howitzers, and a service battery.

■ 4. METHOD OF EMPLOYMENT.—Artillery has no independent role in combat. It is employed in conformity with the plan of the commander of troops who uses its fire power to destroy the enemy and his defenses, to disorganize his command, and to neutralize his fire power. The battalion is the basic tactical

unit of field artillery. Based on the organic facilities for directing and coordinating its volume of fire, artillery should normally function as a battalion. The fundamentals which govern the employment of artillery in defensive combat, retrograde movements, and in special operations, as prescribed in FM 6–20, apply equally to armored artillery under the same conditions. Armored artillery is not a new and separate branch of service.

■ 5. PLAN OF EMPLOYMENT.—Normally the division commander will retain control of all or a part of his artillery by placing battalions in direct support of combat commands, as, for example, when the advancing elements of the division are such that mutual artillery support is possible. If the distances are so great as to preclude effective control by the division commander, a portion of the artillery may be attached to a combat command and the remainder placed in support of the division as a whole. The division artillery commander is the tactical and technical advisor to the division commander in artillery matters. Prior to an engagement, plans for the employment of the artillery are prepared and definite missions are assigned each unit in as great detail as time and the known factors permit. Plans must provide for possible eventualities such as pursuit after a successful attack, a stalemate during the attack, fires to stop an enemy counterattack, or a withdrawal.

■ 6. DIVISION ARTILLERY COMMANDER.—The principal duties of the division artillery commander are—

a. Commander of artillery with the division.

b. Tactical and technical advisor to the division commander on artillery matters.

c. Responsibility for training of the organic division artillery.

d. Preparation of plans for the allotment and use of artillery.

e. Supervision of observation, signal communication, and liaison within the division artillery.

f. Coordination of the survey system within the division artillery.

g. Allocation of artillery ammunition and general supervision of its distribution.

h. Coordination of fires of the division artillery.

i. Preparation of plans for employment of air observation for the division artillery and for cooperation of the division artillery with tanks and with Army Air Forces units assigned attack or bombardment missions within the division area.

j. Preparation of the artillery subparagraph of the division order and of the artillery annex (when required).

k. Collection and dissemination of artillery information through artillery intelligence agencies.

■ 7. USE OF ILLUSTRATIONS.—This manual contains a large number of idea sketches. It has been said that a picture represents 1,000 words. To understand a picture completely will require the same amount of time as it takes to read 1,000 words. DON'T LOOK AT THE PICTURES. STUDY THEM!

SECTION II

TRAINING

■ 8. TRAINING.—The basic elements of all field artillery training, namely, *fire power, mobility,* and *signal communication,* remain the basic elements of training for armored artillery. It is mainly the increased tempo at which these actions are performed that differentiates the action of armored artillery from that of other types of field artillery. Armored forces should normally be given offensive missions; therefore, those procedures peculiar to rapidly moving situations should be emphasized in armored artillery training.

■ 9. MISSION.—The primary battle mission of armored division artillery is to deliver close supporting fires for tanks and armored infantry. When reinforcing artillery is not available, the division artillery may be called on to execute other types of fires.

■ 10. TROOP SCHOOLS.—Schools to perfect the technical skill of officers and to develop competent, resourceful leaders in the noncommissioned officer grades will be conducted. Ordinarily, the daylight hours will be devoted to basic drills and training. Troop schools will be held in the evenings. Enlisted specialist training will be accomplished through the medium of unit specialist schools and special courses at the Field Artillery School and the Armored Force School.

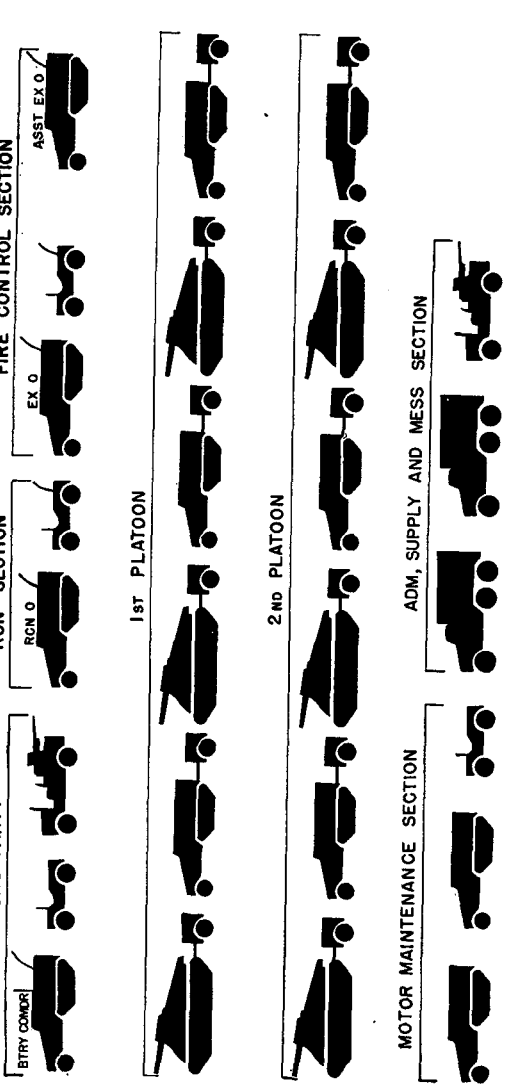


FIGURE 1.—Howitzer battery.

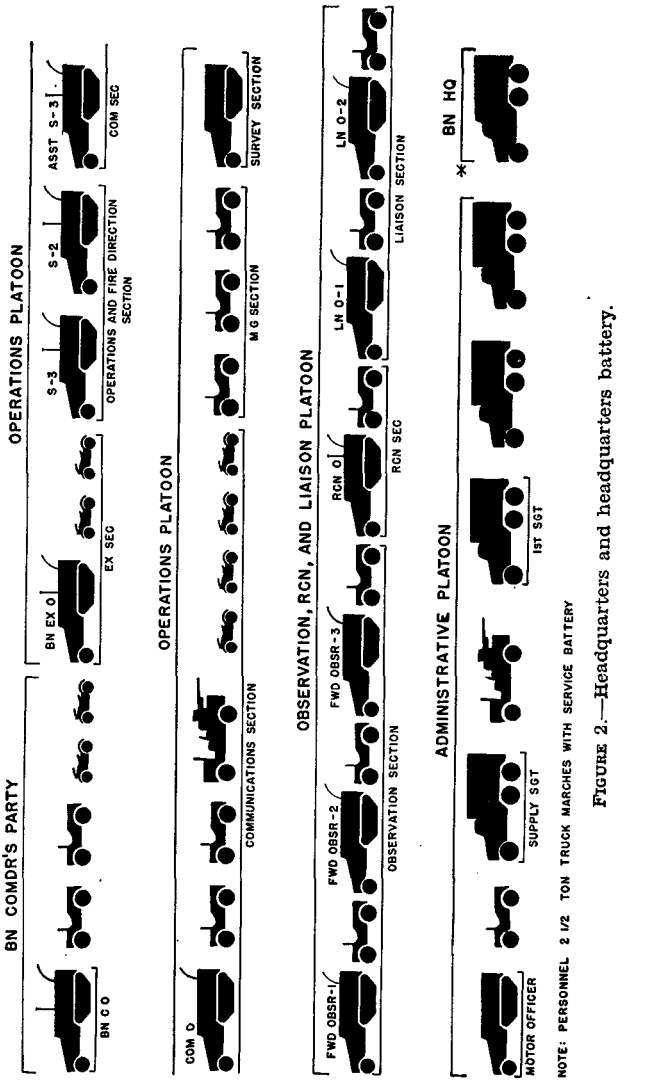


FIGURE 2.—Headquarters and headquarters battery.

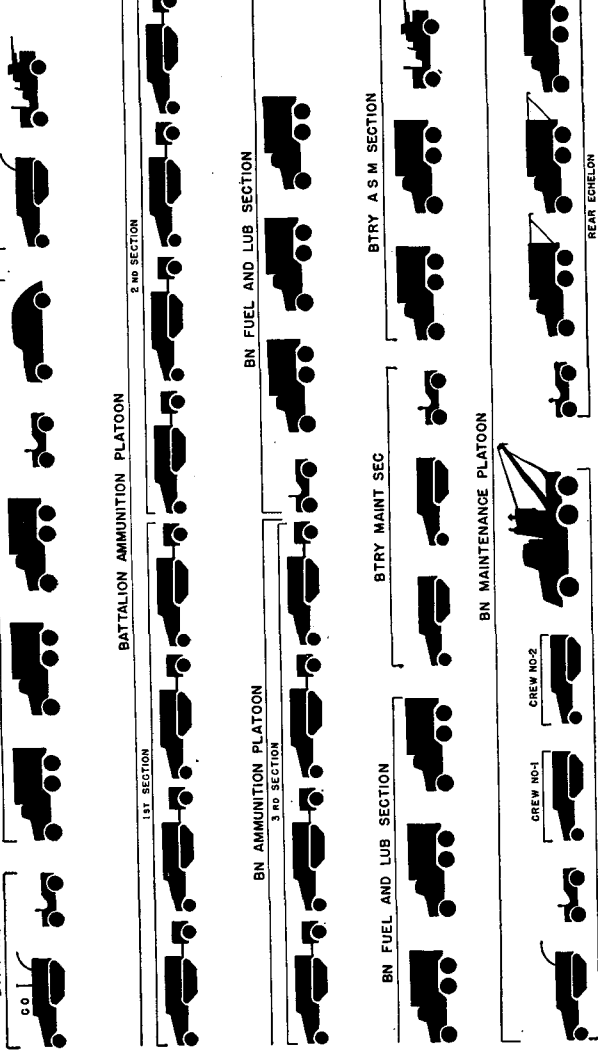


FIGURE 3.—Service battery.

SECTION III

MARCHES

■ 11. ORGANIZATION FOR MARCHES.—Figures 1, 2, and 3 show the normal order in the different battery columns for a march.

■ 12. CONDUCT OF MARCHES.—The artillery must be placed well forward in approach march formation, to permit it quickly to occupy firing positions from which it can deliver protective fires for the tanks or infantry as they move into assembly areas or break into battle formation. The artillery may with safety be placed so far forward as to follow the support of the advance guard. It should habitually be placed no farther to the rear of a column than the head of the main body. Armored artillery with its protective armor and automatic weapons has overcome the vulnerability of field artillery to enemy infantry small arms and automatic weapons. It disposes its armored vehicles with their powerful volume of fire to provide its own security while on the march and in position.

■ 13. MARCH DISCIPLINE.—March discipline must be stern. Vehicles must at all times avoid the fatal error of massing. In no situation will vehicles be moved or parked less than 50 yards apart. The best antiaircraft measure on the march is to maintain distance between vehicles. Antiaircraft and ground defense weapon crews must be constantly on the alert. Each individual vehicle driver must endeavor to maintain contact with the vehicle marching in front. The route of march must be explained to at least each car commander and driver. Route markers and guides must be provided at critical points along the route.

■ 14. HALTS.—Periodic halts will be made on marches. Unscheduled halts inevitably occur. At halts all vehicles must move off the road, get under the best available cover, and be parked in such a manner that they can move out and re-form on the road without delay. When contact with the enemy is imminent, guns will be placed in firing position at all halts. Halts in defiles must be avoided. When it is impossible to move vehicles off the road they should be halted at increased distances. *Drivers habitually perform roadside maintenance at every halt.*

WRONG

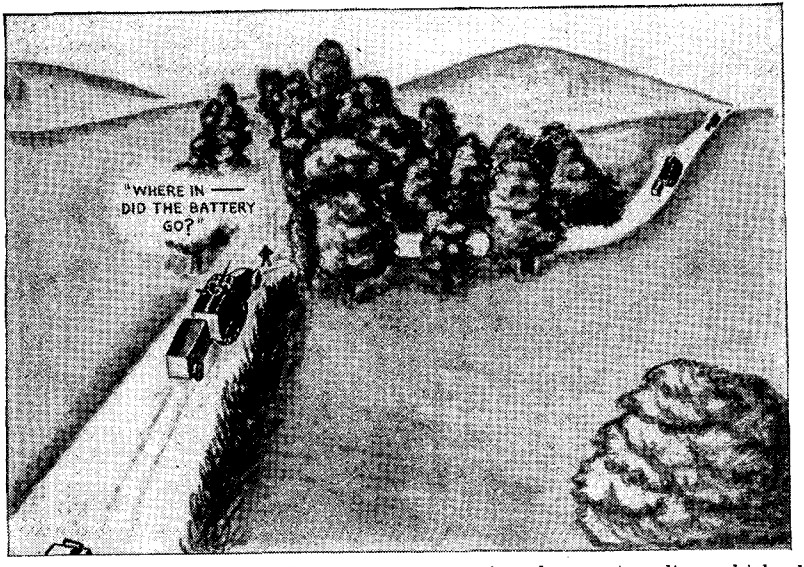


FIGURE 4.—If route markers are not provided, and gaps occur in column, straggling vehicles lead remainder of column on wrong road.

RIGHT

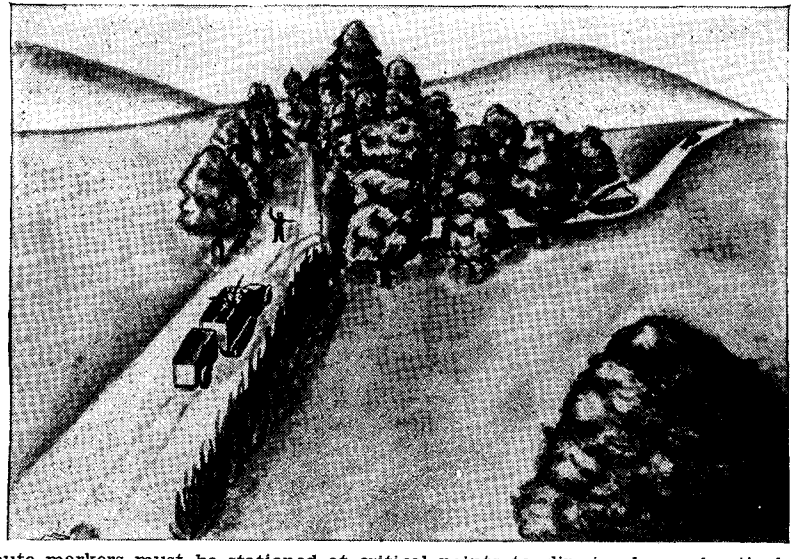


FIGURE 5.—Route markers must be stationed at critical points to direct column (particularly at night). Each vehicle must maintain contact with one in front. Route of march must be given to each car commander and driver. Every means must be employed to prevent parts of column from becoming lost.

WRONG



FIGURE 6.—Vehicles must not be halted and closed bumper to bumper. *Men must not* leave their anti-aircraft defensive weapons. The enemy is ever watchful for a target like this.

RIGHT



FIGURE 7.—When contact with the enemy is imminent, halts are made with all vehicles off road, dispersed and ready to resume march, and howitzers are placed in firing position. Advantage is taken of cover and concealment. All weapons are manned to protect against surprise air or ground attack.

WRONG

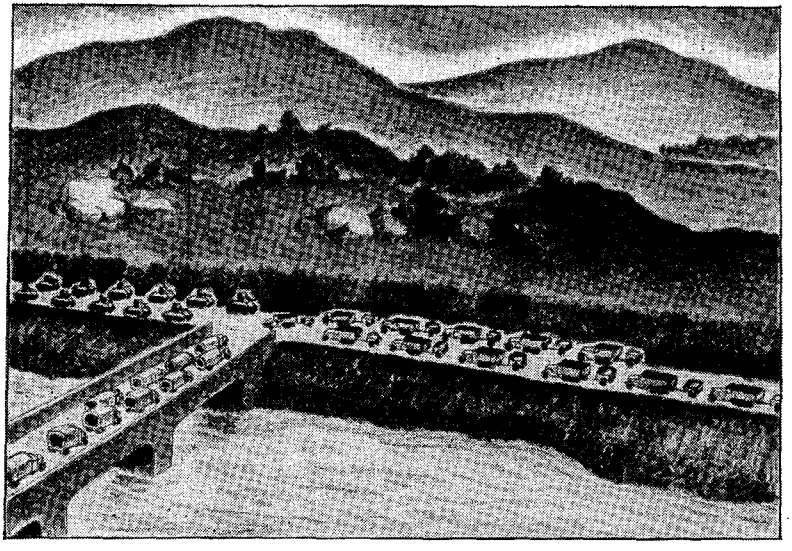


FIGURE 8.—Traffic jam—rear columns have attempted to pass halted columns without proper reconnaissance to see if road is open. Vehicles have blocked all roads and no column can move. Traffic control post should be provided.

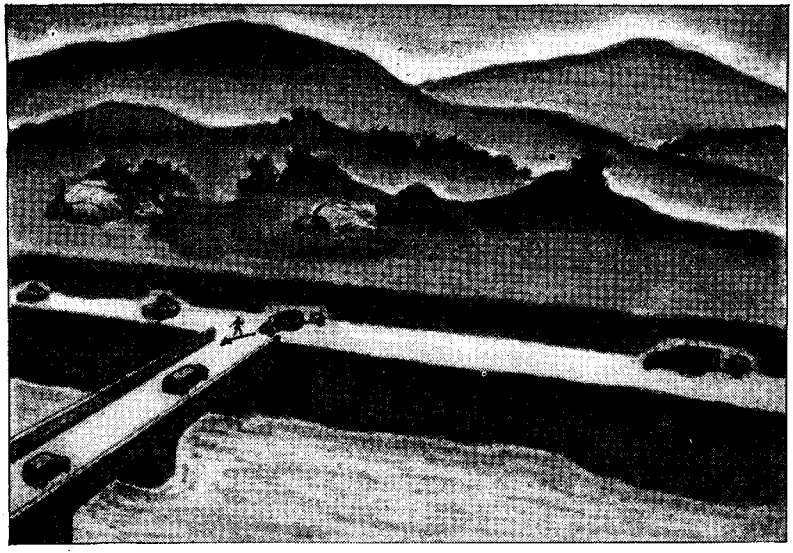


FIGURE 9.—When traffic routes cross, traffic control posts keep columns moving and prevent congestion. Each column moves on proper side of its road.

WRONG

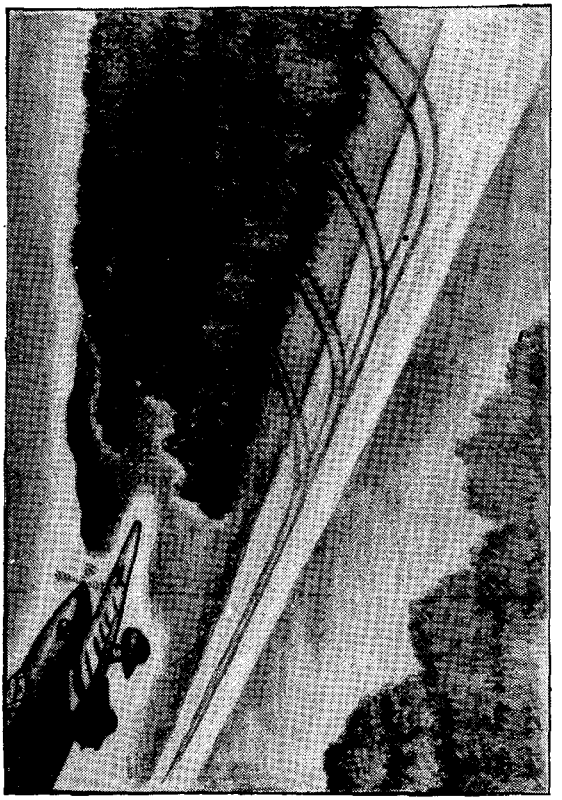


FIGURE 10.—Vehicle tracks of ammunition sections disclose position to enemy air observers.

RIGHT



FIGURE 11.—Vehicle track marks are either eradicated or continued beyond position.

WRONG

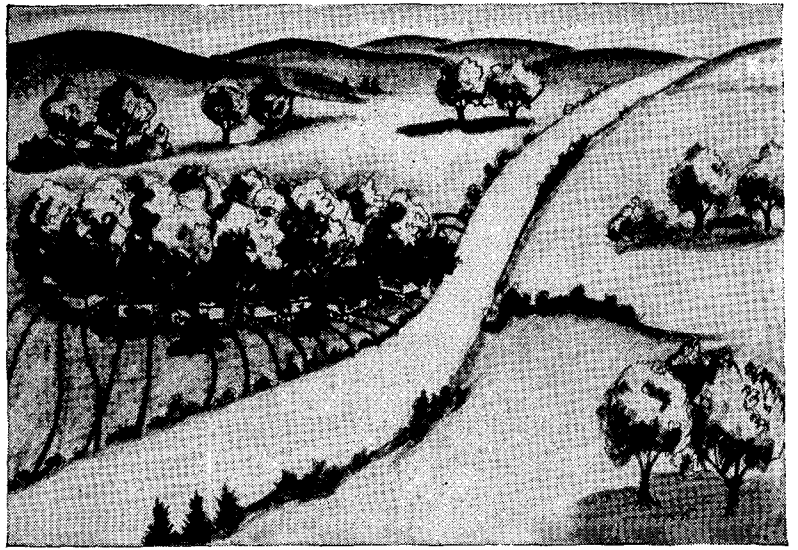


FIGURE 12.—Too many vehicles are crowded into small woods. Numerous tracks disclose location to enemy air observers. This position will certainly attract enemy artillery or bomber attack.

RIGHT

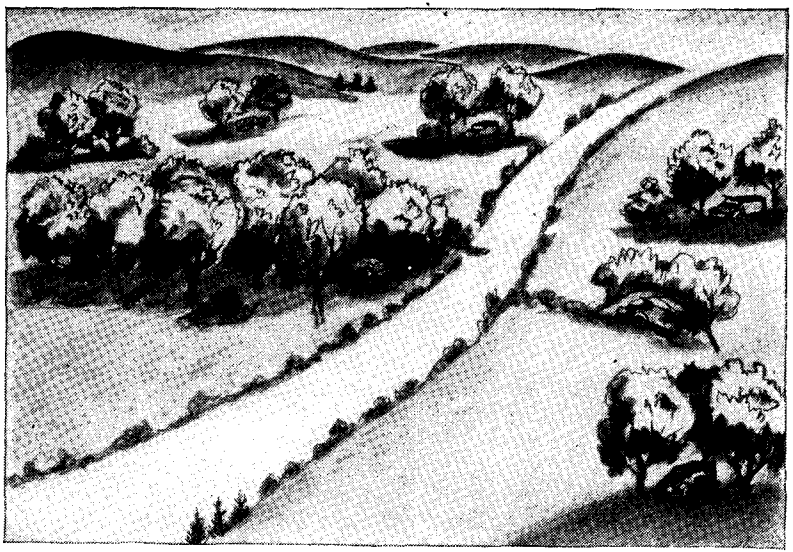


FIGURE 13.—Vehicles are concealed and dispersed. They seek shaded side. They do not offer profitable target to enemy. Halted vehicles not concealed must be defiladed and camouflaged if time and materials permit.

WRONG

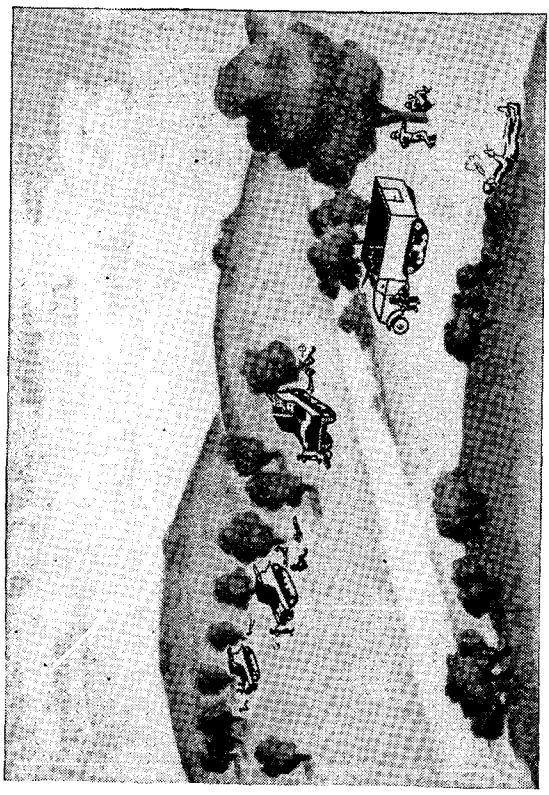


FIGURE 14.—Drivers are not looking after their vehicles at a halt. Some are eating sandwiches, smoking, and lying on ground.

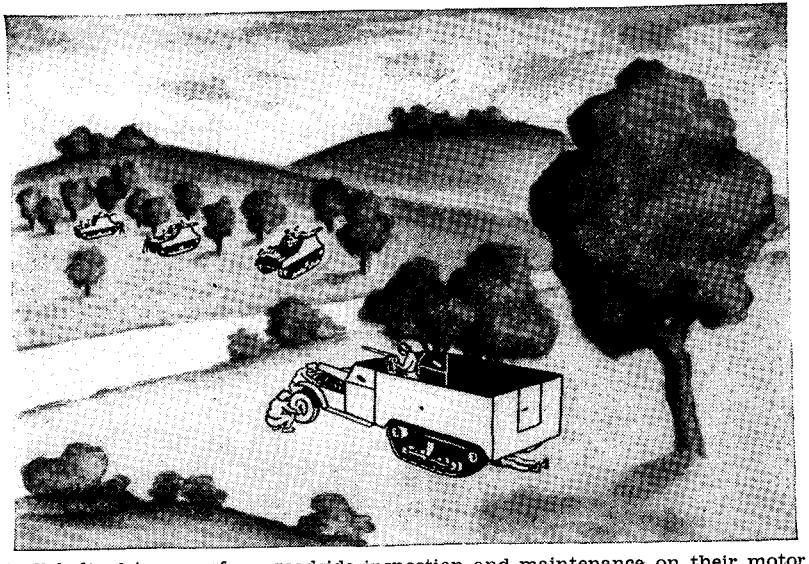


FIGURE 15.—At all halts drivers perform roadside inspection and maintenance on their motor vehicles and weapons.

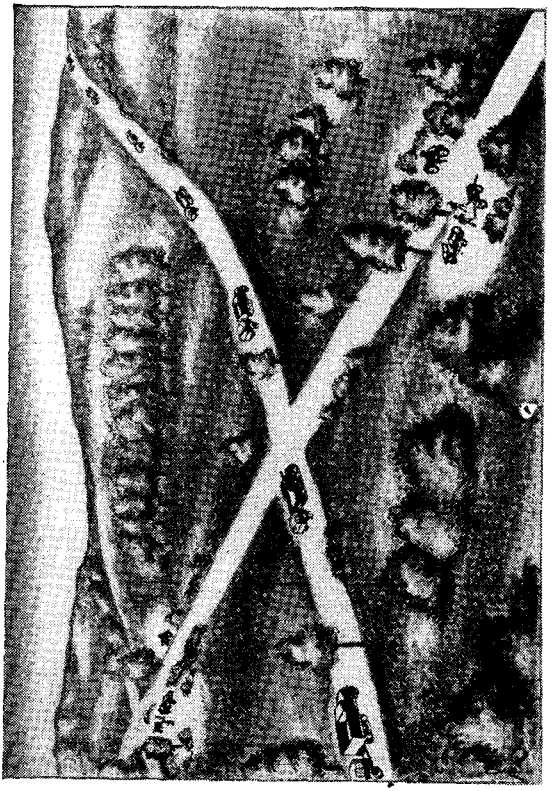


FIGURE 16.—March security—as the battery passes a cross road, defile, or other places where a flank attack might be launched, precautions are taken to guard passage.

SECTION IV

FIRING POSITIONS

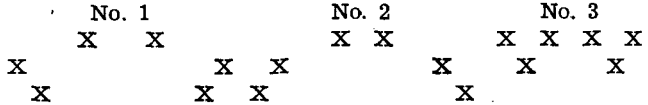
■ 15. SELECTION OF POSITION.—Battalion and battery reconnaissance officers on the approach march and in battle, in addition to seeking observation, must be employed on continuous reconnaissance missions to select the best routes for advance and possible positions for guns, other vehicles, and installations. Ideal firing positions are unnecessary for self-propelled howitzer mounts; of first importance is to get into position and open fire. Locations should be determined before occupation and not left to chance. Ability to reach probable targets, defilade, and cover will be the controlling factors in the selection of a position.

■ 16. OCCUPATION OF POSITION.—*a.* From their position in march column, howitzer batteries must move into selected firing positions and promptly cover with fire the movement of the tanks of infantry into assembly areas or battle formation. In a rapidly moving situation, the artillery will occupy many firing positions. There will be situations where poor cover and unfavorable terrain will require that batteries be "stripped" for action—the firing battery consisting of the cars of the battery commander, reconnaissance officer, and executive officer together with the six howitzers will form the combat group. The ammunition sections with the maintenance vehicles will be consolidated into battery trains which will follow the gun batteries by bounds. Guides must be provided to insure that vehicles move rapidly off the road and into position without confusion. Each driver and car commander must be trained to avoid the error of massing and of breaking defilade. If cover is sparse, it is better to scatter vehicles in an open but defiladed position than to overcrowd a small cover.

b. In a moving action, the batteries will be moved quickly to positions near the route of march and open fire as rapidly as possible. For the time being, at least, protection from air and artillery attack will have to depend on irregular formation with ample distances between vehicles. Overhead concealment will be secondary to speed in delivering fire. Therefore, it must be habitual to select at once, near at hand,

an alternate firing position, better from all points of view, to which the battery can move either during a lull when everything is ready or when brought under fire.

c. A straight linear formation, six guns abreast, makes control by one man practically impossible. To assure control, and for the defense of guns, a formation in depth is desirable. Suggested formations are shown:



d. When taking a new position, the assistant executive should give his attention to laying and adjusting fire of the first gun which can be fired, while the executive gets the rest of the battery into position and indicates defensive dispositions and general organization of the position. In a well-trained organization much of the latter will be mechanical.

e. Motors of vehicles "in position" must not be kept running. The Armored Force slogan is "SAVE FUEL." To make large shifts (S. P. M.), where it is necessary to move the vehicle, training must be such that motors can be started *immediately*.

■ 17. SECURITY OF POSITION.—Local security must be established for each position. This will normally be coordinated in the battalion by the battalion executive officer. Batteries operating away from the battalion will make the necessary provisions for their own protection. The firing battery itself provides protection to the front. Flank howitzers in a firing position must be prepared to change direction quickly and execute direct fire on enemy attacks from the flanks. The 37-mm antitank guns and half-track vehicles will be disposed to insure perimeter defense. One-quarter-ton reconnaissance trucks will be used to establish outposts to give timely warning of an impending attack.

■ 18. FORWARD DISPLACEMENT.—When the artillery has occupied firing positions and the supported tanks have advanced to the attack it must deliver continuous fire support by displacing forward by bounds, keeping the maximum number

of guns firing at all times. As the tanks successively overrun enemy positions, islands of resistance will re-form behind them. The supporting artillery must not be cut off or isolated by this resistance. It is apparent that the artillery must follow the tanks so closely that the enemy does not have time or opportunity to reorganize. To insure that the artillery is not cut off and isolated, continuous reconnaissance must be made and liaison maintained with the progress of the tanks to prevent long distances or gaps from occurring. Since frequent displacements must be made, bounds will be for short distances. The battery moving forward should boldly occupy a new position close up on the tanks. The combat trains must be handled tactically similarly to the combat groups. They must be prepared to fight their way forward through small local resistance in order to keep up with the guns. This will be a particular problem of the ammunition platoon as it returns to the ammunition DP for resupply. In battle, vehicles will frequently displace forward in small groups or by infiltration.

WRONG



FIGURE 17.—Battery wastes precious time moving a long distance off road over unconcealed route to an excellent firing position.

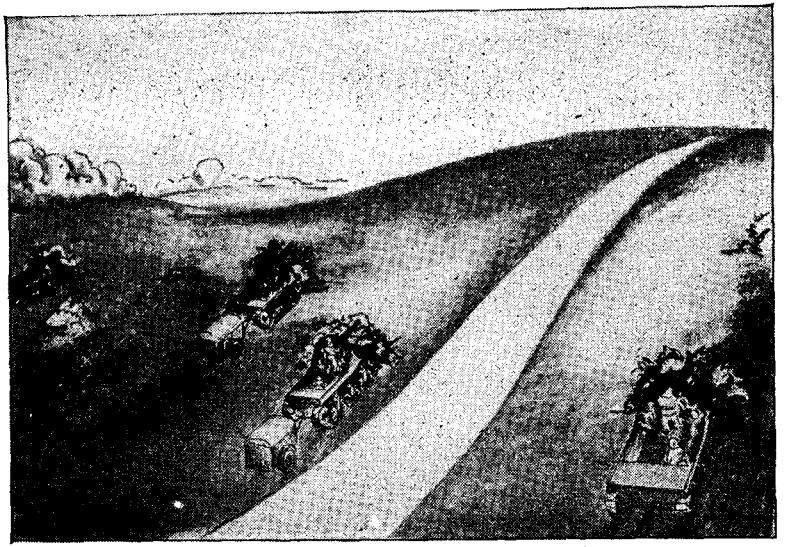


FIGURE 18.—Battery does not seek ideal firing position but quickly moves off road and rapidly prepares to support tanks.

WRONG

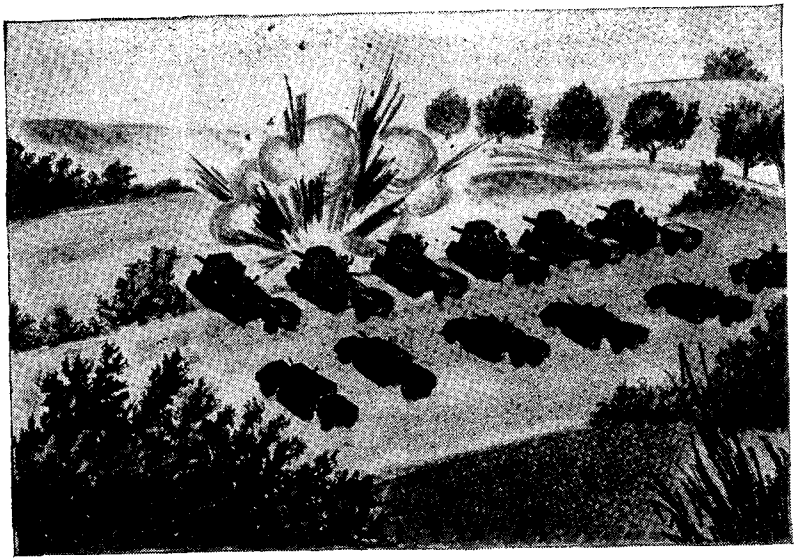


FIGURE 19.—Battery is lined up in parade ground formation. Advantage is not taken of concealment. Ammunition sections are unnecessarily close to gun position. Entire battery could be annihilated by enemy artillery or dive bombers.



FIGURE 20.—Guns are staggered and dispersed. Advantage is taken of concealment. Ammunition sections and vehicles which are not normally needed at gun position are placed under cover in a different location.

WRONG



FIGURE 21.—Adequate overhead concealment will not be found in all positions. To place guns close together at regular intervals will invite enemy attack.

RIGHT

FIGURE 22.—Where good concealment is not available, guns must be placed in staggered positions. Camouflage is used.

WRONG

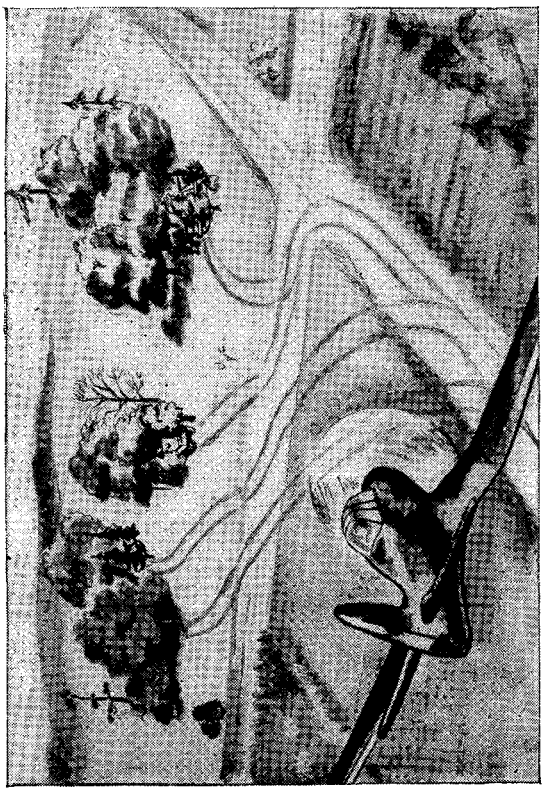


FIGURE 23.—Track marks disclose even well-camouflaged positions to enemy air observers.

RIGHT

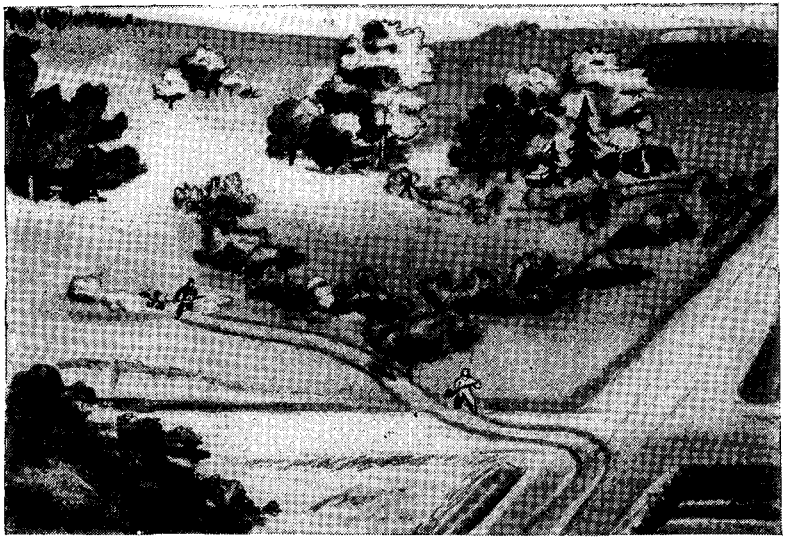


FIGURE 24.--Routes are carefully chosen from roads to firing positions. Track marks are eradicated.

WRONG

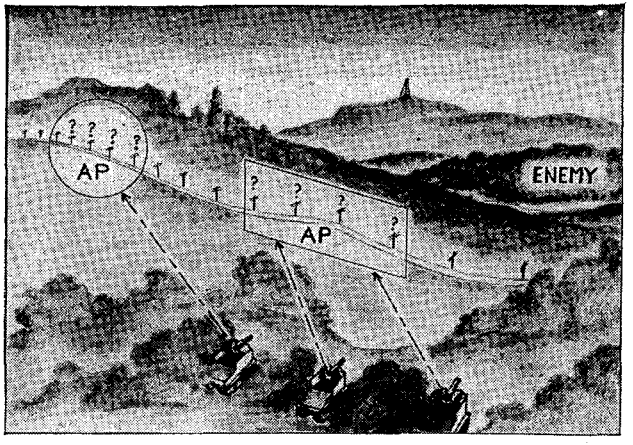


FIGURE 25.—Aiming points and reference points which can be mistaken should be avoided. In heat of battle wrong telephone pole might easily be used.

RIGHT

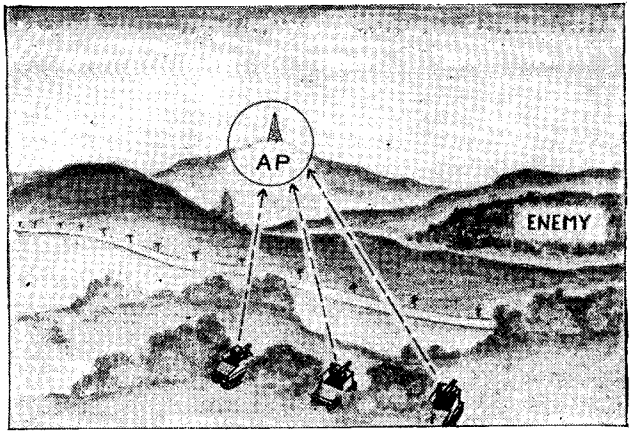


FIGURE 26.—To fix his base deflection correctly, each gunner immediately refers to his aiming stakes or to some prominent terrain feature which cannot be mistaken.

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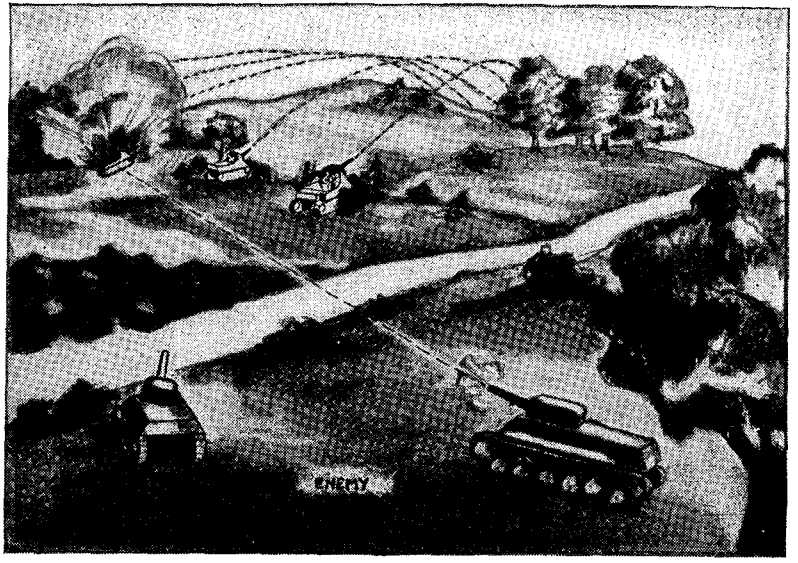


FIGURE 27.—Local security must not be neglected. Enemy tanks can surprise battery by flank attack.

RIGHT

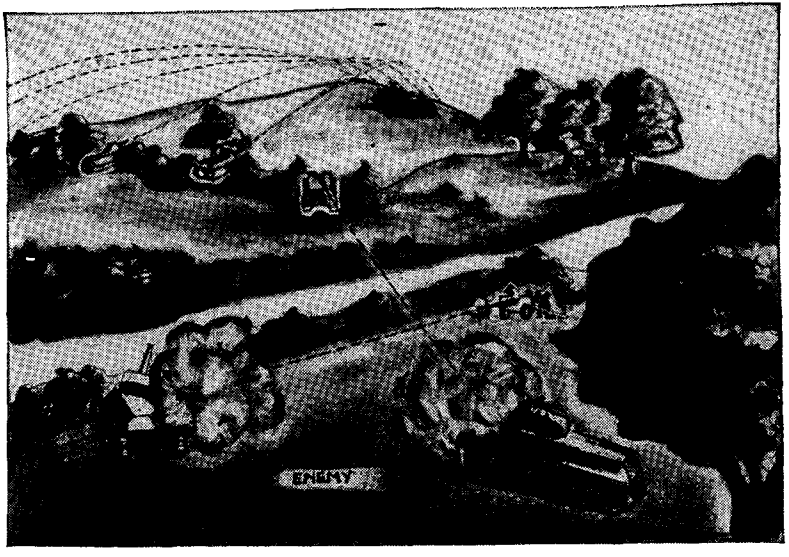


FIGURE 28.—Local security has been provided. Note that right flank howitzer has changed direction to meet enemy attack.

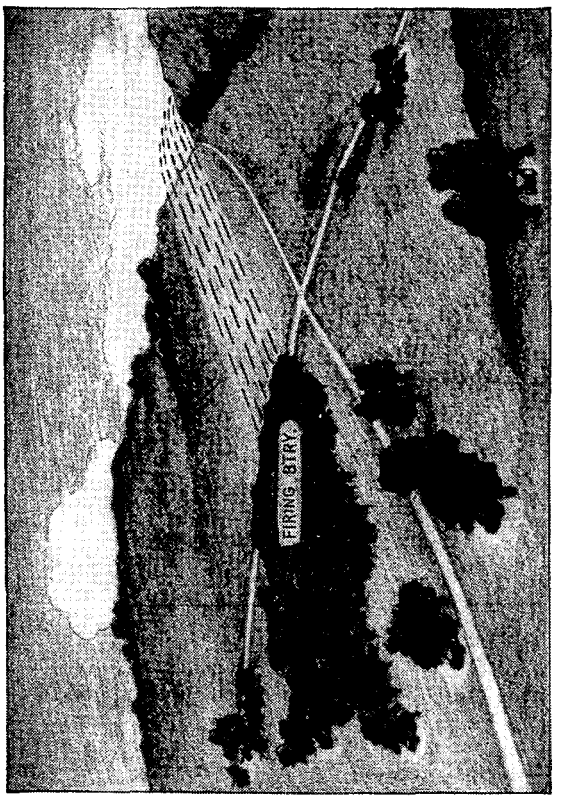


FIGURE 29.—Local security—firing battery concealed in woods; 37-mm AT guns are placed down side roads to protect flanks and rear; half-tracks are disposed to furnish all-round protection with their automatic weapons.

SECTION V

COMMUNICATION

■ 19. COMMUNICATION AGENCIES.—Voice radio will be the primary means of communication. Short wire lines and visual signals (air-ground panels and semaphore) will be alternate means. Messengers will be used.

■ 20. TABLE OF ALLOWANCES AND CHARACTERISTICS.—Table of Basic Allowances and characteristics of radio sets for armored artillery battalions:

Type No.	SCR No.	Function	Allowance		Range (miles)	Communicates with SCR	Use
			No.	Organization			
CW	506	Medium range set mounted in scout car and half-tracks.	6	Hq Battery	Voice 10, code 50-70	193	Bn command net. Air-ground net. Div Arty Officer. Combat command. Div administrative.
			1	A Battery.		197.	
			1	B Battery.		209.	
			1	C Battery.		245.	
			1	Ser Battery.		299.	
						274N	
FM	508	1 transmitter, 2 receivers mounted in half-tracks.	3	Hq Battery	Voice only 5-7	293A	Bn fire control net.
						294A.	
						509.	
						510.	
						528.	
						538.	
FM	510	Portable set operates from dry or vehicular batteries mounted in ¼-ton RCN car.	4	Hq Battery	Voice only 5	Same as 508	Replaces present SCR-194. Used for scouting and patrolling. Local security installations, etc.
			2	A Battery.			
			2	B Battery.			
			2	C Battery.			
FM	528	1 transmitter, 1 receiver mounted in half-track.	4	Hq Battery	Voice only 5-7	Same as 508	Btry fire control net. LN net Bn administrative.
			4	A Battery.			
			4	B Battery.			
			4	C Battery.			
			3	Ser Battery.			

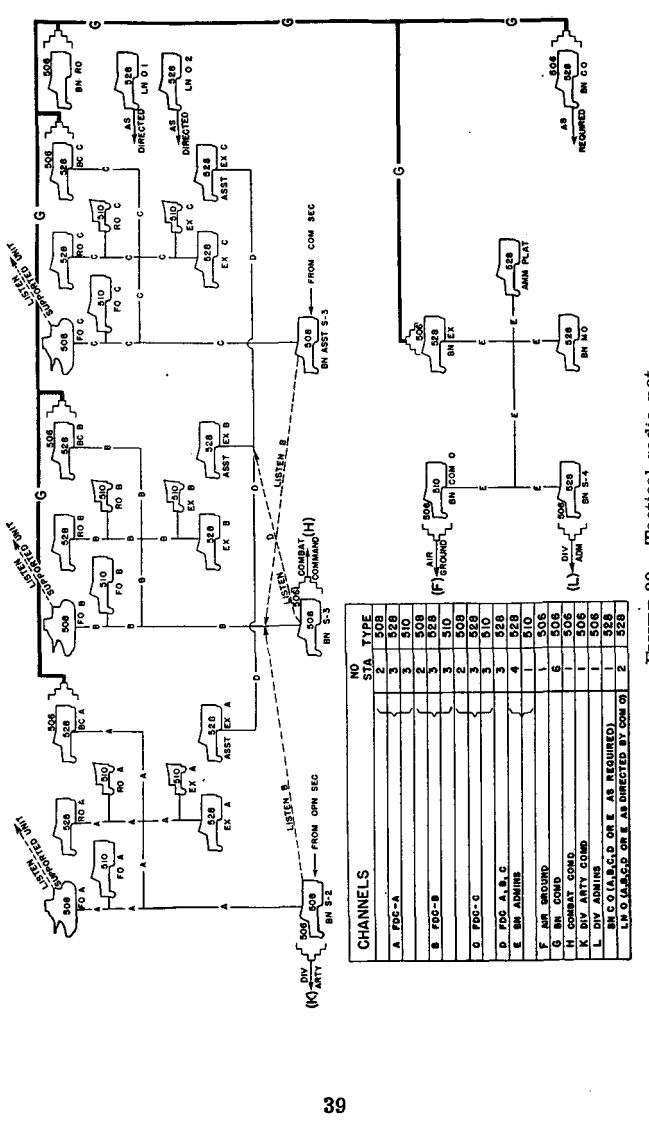


FIGURE 30.—Tactical radio net.

■ 21. TACTICAL RADIO NET.—The diagram (fig. 30) outlines a tactical radio net for an armored field artillery battalion. This set-up is flexible and permits various combinations of station nets. With voice sets, net control will require strict discipline. Orders and messages must be concise and as few in number as is consistent with accomplishing the mission. Unnecessary conversation must be rigorously eliminated. Routine reports should be sent by messenger.

■ 22. RADIO PROCEDURE.—*a. General.*—(1) Officers must use the microphones. Messages will be classified as follows:

Urgent—Reports of imminent danger and fire missions.
Routine—Reports, etc.

(2) Abbreviated procedure will be used. (See TM 6–210 and 11–454.) Success will depend on intensive training. The radio must not be blamed for failures that are caused by faulty operation. Errors will occur until the personnel has been properly trained.

b. Nets.—(1) It is necessary to distinguish between two types of nets: fire control nets; and command, intelligence, or liaison nets. We must also consider two types of messages: calls for fire or sensings of the forward observer; and orders and "straight" traffic. The messages of the forward observers in fire control nets are always urgent. For other messages and other nets, more time is available for excution.

(2) There are four fire direction nets. Nets A, B, and C are assigned to batteries A, B, and C, respectively, each having a forward observer set, an S–3 or S–2 fire direction set, and a battery set. The S–3 and S–2 sets may be listening stations only. Other stations in the net may be used to augment the batteries' fire power by providing additional forward observers and channels. Each observer must have a free channel if he is to adjust fire. If two observers are on the same channel, only one can adjust fire at one time. There is a fourth fire direction net D that includes the assistant battery executive of each battery and is used by the fire direction center to bring the fire of the entire battalion to bear upon targets calling for massed fire.

c. Procedure.—(1) The procedure of establishing a net is prescribed in FM 24–6 and TM 11–454. Call letters must be used so that stations can be identified. Sets should be

checked if operation is faulty and in the case of SCR–506 brought to correct frequency.

(2) *The procedure of changing a set from one net to another* is also prescribed in these manuals.

(3) For all nets other than for fire control, procedure as prescribed in these manuals should be retained. For the fire control net an abbreviated procedure of TM 6–210 is employed. Example:

(*a*) The net has been established and regulations covering check of communications have been carried out, with a resultant assurance that the net is operating.

(*b*) The forward observer has received a target and sends the following message:

Fire mission, fire mission
Base point
400 left 500 short
Tanks
Will adjust
Go ahead.

(*c*) This message is copied by both the S–3 and by the battery executive's car. The S–3 car announces "Bn 7, affirm." This serves to receipt for the message and authorizes a battery to fire. The A battery executive reports "Roger." This assures the forward observer that the message is received at the battery.

(*d*) Procedure from that point is prescribed in TM 6–210. Such data as the S–3 section requires are copied at the fire direction center by listening in.

(4) When the forward observer has a target requiring the battalion, the message would take this form:

Fire mission, fire mission
Base point
300 right 400 short
Bn of tanks
Request bn
Will adjust
Go ahead.

S–3 answers with "Bn 10, battalion will fire, affirm."

(5) If the observer normally works with one battery only, the battery to fire need not be announced.

(6) In this case fire direction center net D will be used and the adjusting battery will have to be designated by the fire direction center. The last command above will designate A, B, or C as the battery to fire by merely adding the phonetic words of the letters A, B, or C. The forward observer will, therefore, know which battery is being adjusted.

(7) For example, if forward observer C were calling for the massed fires of the battalion he would normally adjust battery C when only one battery is to be adjusted. Should all three batteries require adjustment, forward observer C would be directed to change to channel D and all three batteries could then be adjusted simultaneously.

d. Identification of station.—Using the surname of the officer who is served by the set has two faults. First the name often is not a good radio word, which is important because the necessary band for frequency modulation has been reduced from 300 to 100 kilocycles. Second, the officer concerned may be a casualty or for some other reason may turn over the set to another. It is suggested that a code of good radio words be assigned in lieu of this system.

SECTION VI

OBSERVATION

■ 23. TERRESTRIAL OBSERVATION.—In a moving situation, terrestrial observation will rarely be adequate. The artillery forward observer, who rides in a tank and accompanies the tank commander in the leading wave, can handle only close supporting fire. Observation posts on high ground whenever available will be a dependable means of directing fire on targets beyond the view of forward observers.

■ 24. AIR OBSERVATION.—To place fires in the enemy rear areas will usually require air observation. Air observers must be trained to operate from slow, low-flying observation planes. These planes and operating personnel may be organically a part of the armored division. When the planes are not in the air or on air alert at landing fields, they will be towed, with wings folded, behind a vehicle on the march. Landing fields in small open fields or on roadways must be found for them.

■ 25. FIRE DIRECTION CENTER.—Armored field artillery will normally employ the fire direction center to control and direct the fire of the battalion. A high degree of training must be attained to accomplish this in rapidly moving situations. Short wire lines may be used between a fire direction center and gun batteries when time permits. Maps or map substitutes of a large enough scale to permit the computation of map data probably will not be available. Observed fire charts will be used.

■ 26. FORWARD OBSERVATION.—Close supporting fires will normally be conducted by forward observers. These observers must be resolute and aggressive young officers who are skilled in their duties. They will operate from tanks and will accompany the supported tank commander of the assault echelon. They must continually place themselves so that they can adjust supporting fires in front of the leading elements of the attack. Their duties will be strenuous. Trained replacements and relief for them must be provided from officer personnel of the battalion. Their enlisted assistants must be capable of performing these duties in case of emergency. When operating in wooded country where maps are not available and prominent terrain features cannot be seen, forward observers will be provided with pyrotechnic flares to be used in preparing initial firing data.

■ 27. LOCATION OF FORWARD OBSERVER AND COMPUTATION OF INITIAL DATA BY USE OF ROCKET.—*a. Case I.*—An instrument is set up near the guns with the scale at zero. The forward observer fires a double flare parachute rocket on call. These flares are tied together with a thin wire 24 yards long. The observer at the battery lays on the rocket with the lower motion and reads the angle between the flares with the reticle. The guns are laid reciprocally by the instrument for initial direction. The distance—guns to forward observer—is computed, using the mil formula. The forward observer selects a base point or target and adjusts the battery (batteries), for example, "Rocket, 600 Right, 1,200 Short, Base point, will adjust." A range factor of safety of 600 yards is included in initial range.

b. Case II.—(1) A base line of convenient length (100-200 yards) is measured near the guns. An instrument is set up at each end (*x* and *y*) of the base line. Each instrument scale is set at zero. The forward observer fires a rocket on call. Each observer, using the lower motion, lays on the rocket. *X* measures the angle *yxo*, and *y* measures the angle *xyo*. These angles are laid off on the base line plotted to a

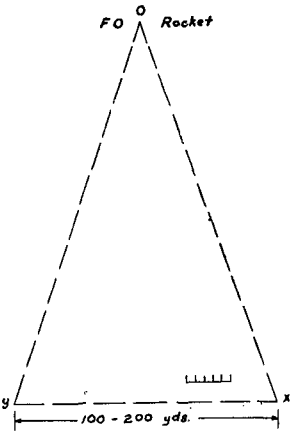


FIGURE 31.—Computation of initial data by use of rocket, case II.

convenient scale. The location of *o* is fixed by the intersection of *xo* and *yo*. The guns are laid reciprocally by either instrument for initial direction. The distance—guns to forward observer—is measured from the plotted position.

(2) The forward observer selects a base point or target and adjusts as in case I.

c. Case III.—In situations where one or more batteries are already in position, or when the forward observer moves to a new location and it is necessary to use a flare to locate him, the following is a simple and expeditious method. The guns are laid on a compass direction in the estimated direction of the forward observer. The forward observer then fires a flare on call. An aiming circle is laid on the flare and com-

pass measured. The guns are given a shift for direction and the distance—guns to forward observer—is determined as in case I or II, depending on the type of flare used.

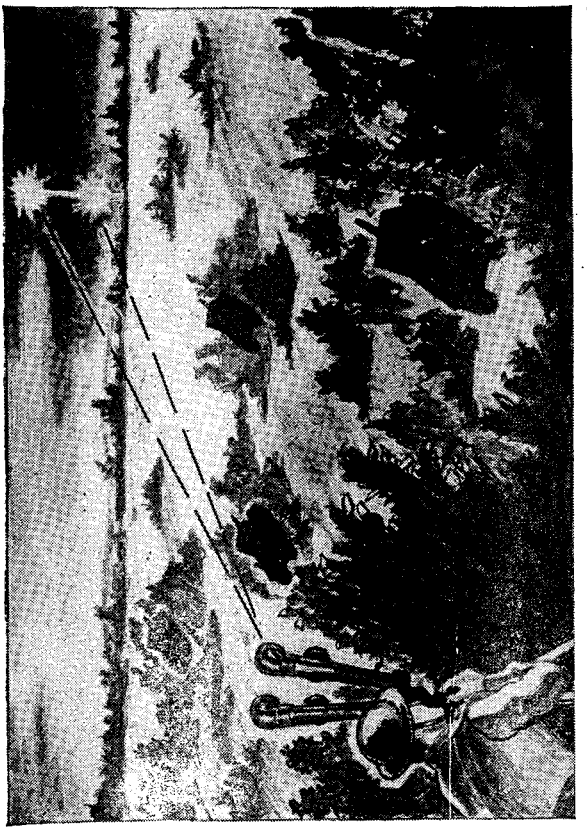


FIGURE 32.—Forward observer fires double flare parachute rocket. Flares are tied together with fine wire. Single observer lays on rocket, reads vertical angle between flares and computes initial data (case I).

d. Case IV.—The forward observer fires a rocket that gives off a colored smoke. A range finder is used to read on the column of smoke for range. An instrument is used to lay on the rocket or smoke column for direction.

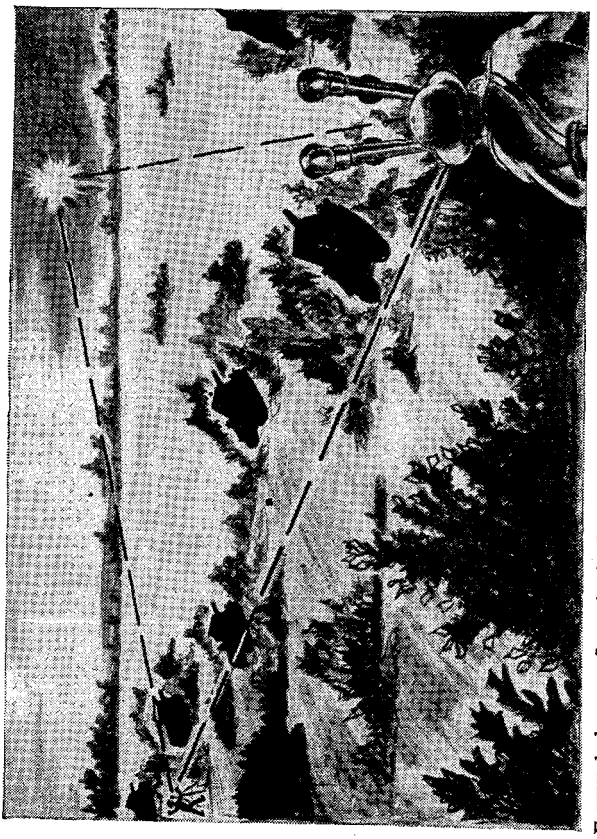


FIGURE 33.—Forward observer fires single flare on call. Observers at end of base line lay on rocket and initial data are computed (case II).

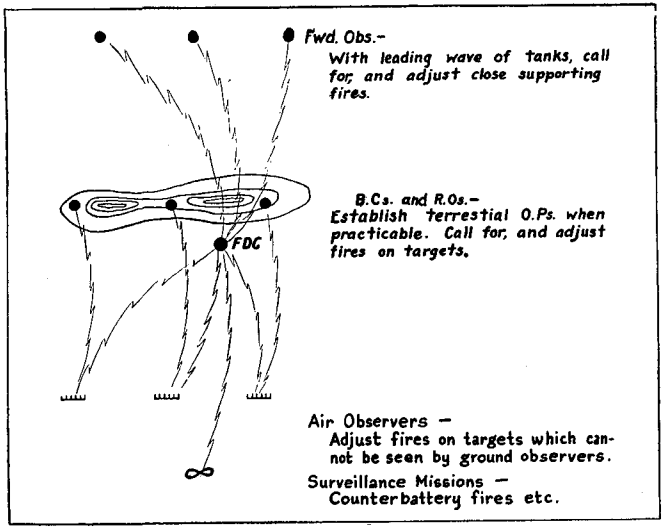


FIGURE 34.—Normally forward and air observers will be used. High ground on which observation posts can be established will not be overlooked. Voice radio will be normal, but short wire lines may be installed if time permits.

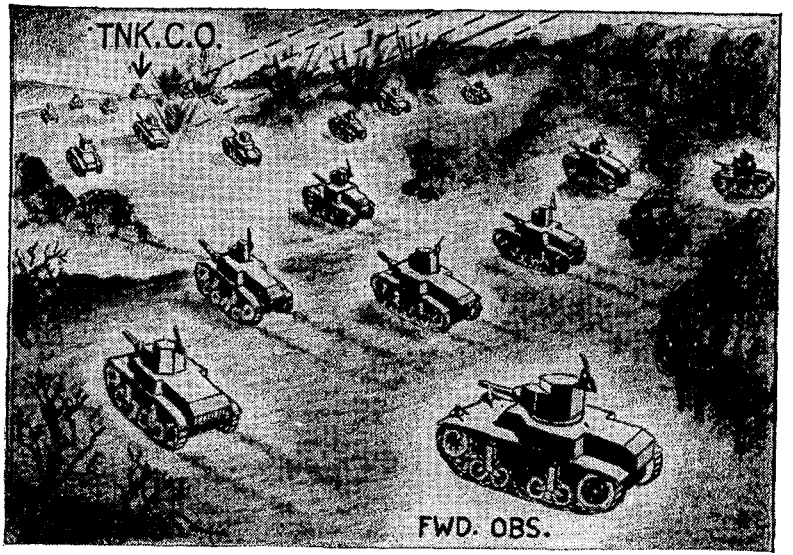


FIGURE 35.—Forward observer must not become separated from supported tank commander. He cannot see advance elements and cannot conduct supporting fires. He may call for fire that will fall on friendly troops or be ineffective on enemy.

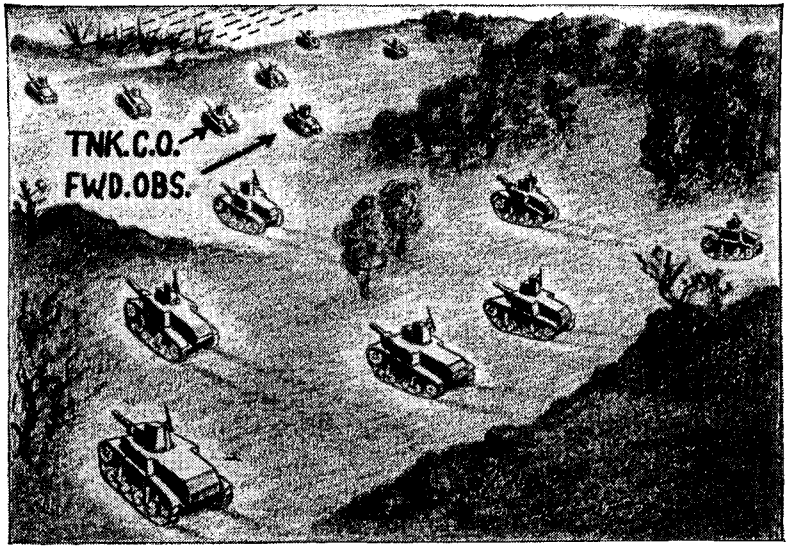


FIGURE 36.—Forward observer must stay with tank commander of leading wave. He is able to call for fire support where and when it is needed. He must keep artillery fire ahead of friendly troops. In starting initial adjustment, first rounds must surely be over. Fire is then brought back on target.

WRONG

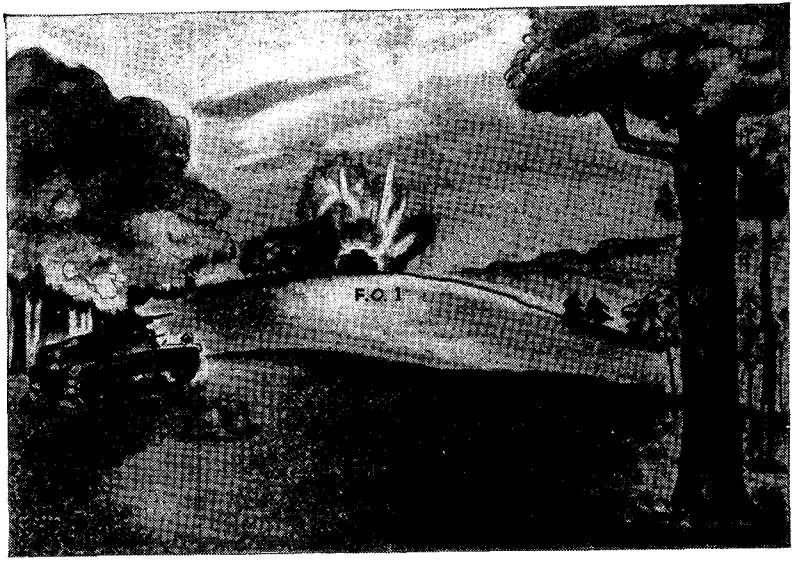


FIGURE 37.—Forward observers who carelessly expose their tanks in open and on crests will draw enemy fire and soon become casualties or their vehicle will be disabled.

RIGHT

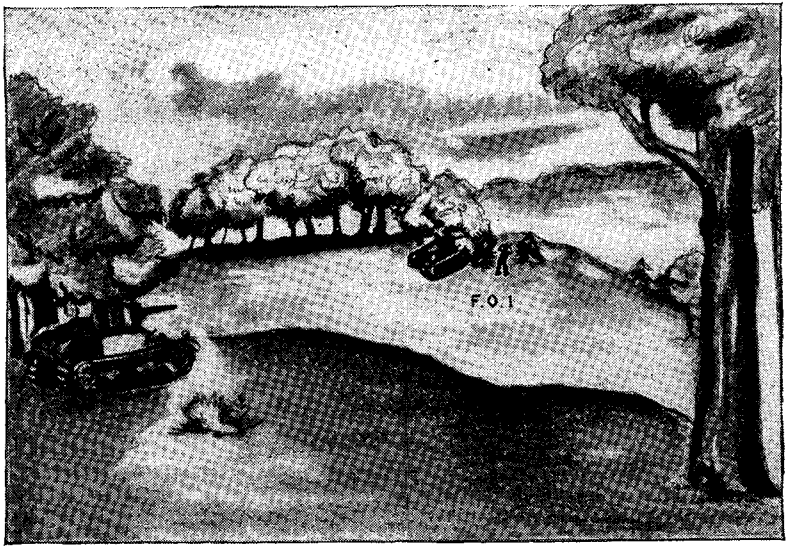


FIGURE 38.—Forward observers must conceal their tanks in defiladed positions. It may become necessary to leave tank on reverse slope and proceed to crest on foot.



FIGURE 39.—Tank commander has requested and forward observer has called for artillery fire on enemy motorcyclist. This is waste of artillery ammunition.

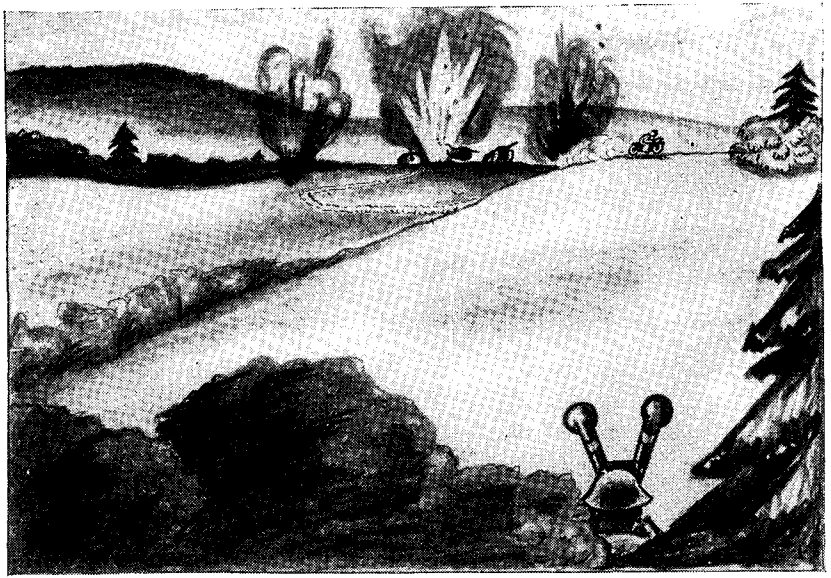


FIGURE 40.—Powerful and costly artillery ammunition should be used wisely against important targets. The ammunition carrying capacity is limited and resupply is a serious problem. Every round must count.

FIGURE 41.—Forward observer has sent message "Enemy fire coming from hill to the left front." It is too general to give exact location of target.

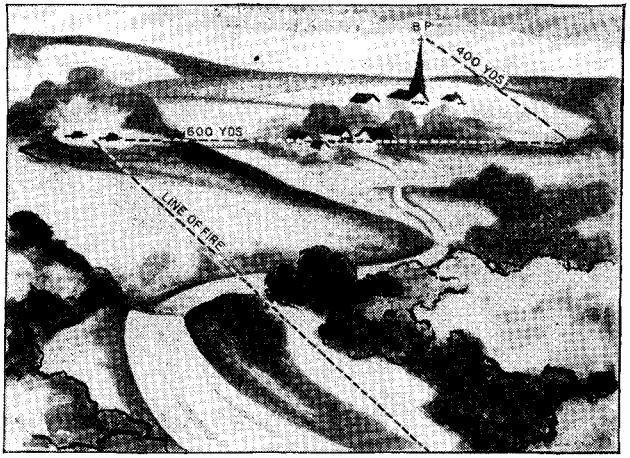


FIGURE 42.—Forward observer must give definite location with respect to base point or check point. He must also give nature of target, that is, "Base point is 600 right, 400 over, enemy antitank guns, will adjust."

WRONG

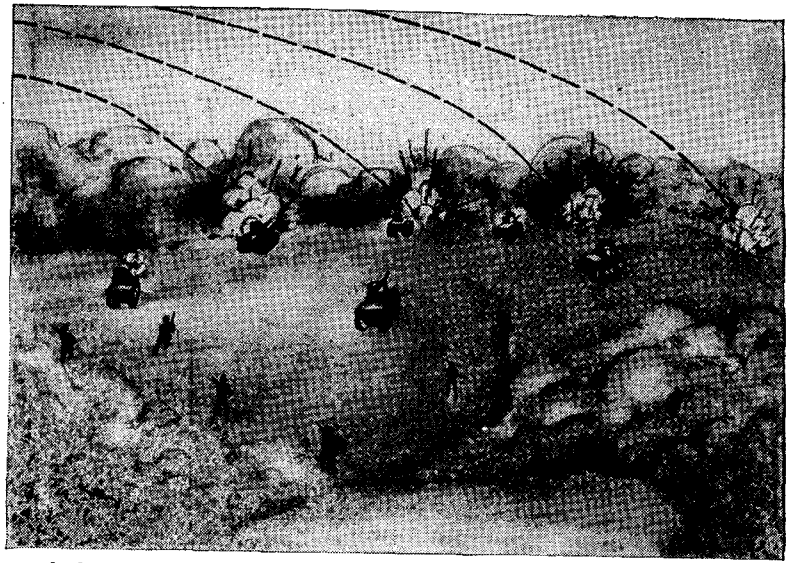


FIGURE 43 - Forward observer has called for artillery fire on targets too close to our leading tanks. Our own troops will be caught in dispersion area.

RIGHT



FIGURE 44.—Against targets close in front of our troops it is better to use infantry, mortars, assault guns, or tank weapons. Direct supporting artillery fires will be placed on targets not closer than 300 yards in front of our troops and those along flanks.

WRONG

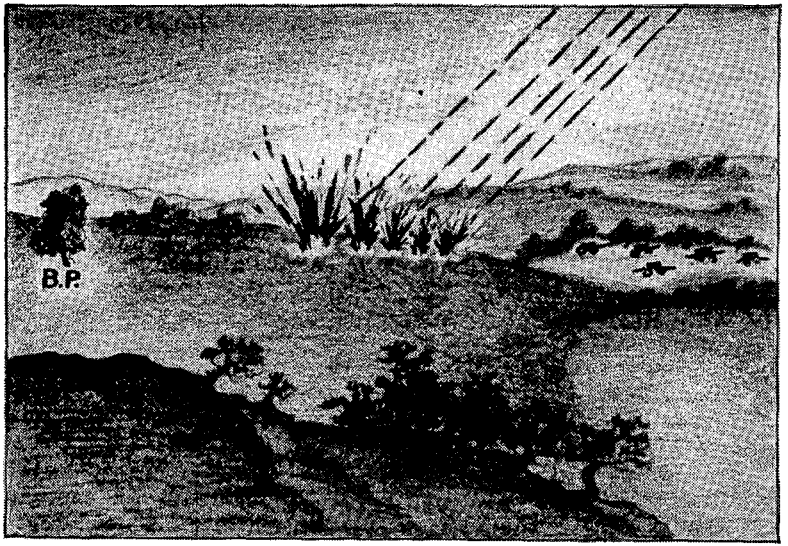


FIGURE 45.—If artillery registers on base point and "creeps" over to target, element of surprise is lost. Enemy is forewarned and could escape ensuing fire for effect.

RIGHT

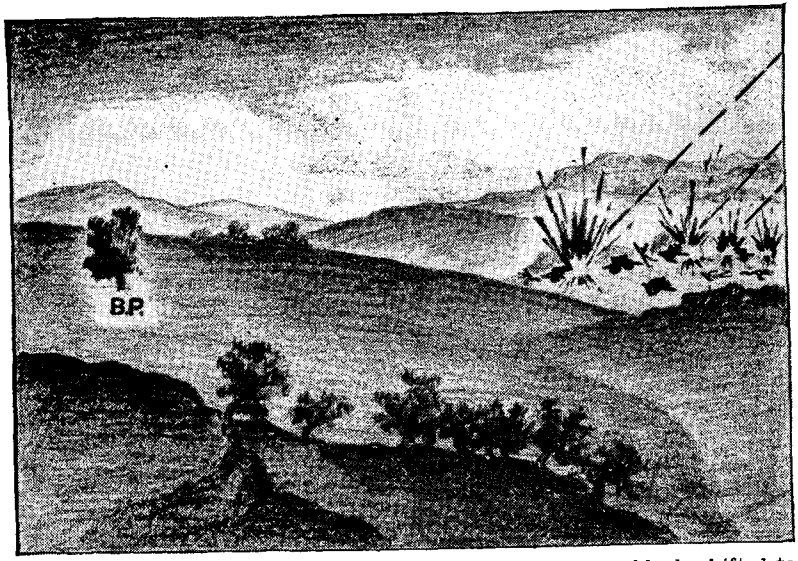


FIGURE 46.—Artillery fire adjusted on base point or check point must be suddenly shifted to real target to surprise enemy.

SECTION VII

LIAISON

■ 28. COMMAND LIAISON.—*a.* The artillery battalion commander must keep abreast of the situation at all times. This he can do most effectively by remaining with the combat command commander. However, he must maintain personal control of his battalion, and to do so requires his presence with it much of the time. During his absence from the battalion his staff must act for him; during his absences from combat command or regimental headquarters his representative, a liaison officer, must serve to keep him abreast of the situation.

b. On the march or when combat is imminent, the artillery battalion commander normally should be with the combat command commander to act as advisor on matters pertaining to employment of the artillery, to follow the situation, to assist in the formulation of plans, and to receive orders. During actual operations he must be with his battalion to supervise the performance of its mission. He must make decisions based on a thorough knowledge of the plan, its progress, and the location, condition, and functioning of his battalion. This he cannot do by staying in one place. He must circulate throughout the battalion area, visiting the CP, the fire direction center, the OP if one is established, and all battery positions. His frequent presence at combat command headquarters will be necessary.

c. Wherever he goes, his radio vehicle must go, so that he may be reached at any time by his own headquarters or by the commander of the combat command.

■ 29. LIAISON OFFICERS.—*a.* To assist the artillery battalion commander in maintaining liaison he is provided with two liaison officers, each of whom has a section consisting of one liaison sergeant, one liaison corporal, and four privates (half-track driver, chauffeur ¼-ton truck, machine gunner, and radio operator). The noncommissioned officers must assist the liaison officer in performing his duties and must act as relief for him. The privates provide the necessary com-

munication and protection. Each should know the duties of the other three. Each section has a half-track equipped with an SCR–528 radio. It also has a ¼-ton truck.

b. One liaison section remains at combat command headquarters. It determines or procures from the combat command commander, the S–2, or the S–3 all available information concerning enemy dispositions, location of friendly tanks and troops, location of the CP, the scheme of maneuver, time of attack, nature of resistance expected, fires desired, and administrative details concerning the battalion. The liaison section will deliver all this information and all orders promptly by messenger or radio to battalion CP. The ¼-ton truck should be used freely for message delivery, since much of the information is best transmitted by overlay and much of it might benefit the enemy if sent by radio. The liaison officer will keep the combat command commander informed as to the location of the battalion; where, when, and in what volume it can place fire, and the amount and types of ammunition available. *He should inform the battalion commander whenever his presence is desired by the combat command commander or whenever orders or a change in plan appears imminent.*

c. The other liaison officer and his section report to the commanding officer of the supported armored or infantry regiment, if that regimental commander retains a command function; in this case, the liaison officer will conduct himself much as does the one at the combat command headquarters. If the combat command commander deals directly with the battalion commanders and the regimental commander has no immediate combat assignment, one liaison officer and party will remain available for such liaison missions as may develop. A liaison officer is not a forward observer, although he must be prepared to act as forward observer on occasion.

■ 30. BATTALION COMMANDER.—The battalion commander must remain with his radio and in contact with his command post. He should rely largely on reports from his reconnaissance officer, his forward observers, and liaison officers, since he cannot be in all places at once. It is important that he

be available to evaluate information, make decisions, and control his battalion.

SECTION VIII

TECHNIQUE OF ADJUSTING FIRES

■ 31. METHODS.—Numerous tested methods of bringing down speedy and effective fire of single batteries and battalions, when controlled maps, mosaics, or wide angle air photos are available, are prescribed in FM 6–40. Maps or map substitutes may rarely be available. The problem for armored artillery resolves itself into, first, getting the initial round off and, second, massing the fires.

■ 32. INITIAL ROUND.—When forward observers are in position the methods already described for the use of rockets will normally be employed. If the approximate locations of the front lines, guns, and direction of fire are known an air burst may be used. Other factors such as prominent terrain features located in or near enemy territory may be used as reference points when they can be identified at the guns and by the forward observers. The airplane can give direction by flying the gun-target line or 180° opposite. Range must be estimated by the air observer.

■ 33. MASSING FIRES.—*a.* In the early stages of combat, forward observers may be assigned to work with individual batteries. Until enemy resistance becomes strong enough to cause the tank commander to make a coordinated attack, this may be the usual method of employment. However, when a coordinated attack is to be made, the supporting artillery commander must be prepared to mass the fires of all batteries. The quickest and simplest method is to register all batteries on a common target or base point and construct an observed-fire chart at the fire direction center. The fires of more than one battalion can be tied together, without survey, and massed by registering one battery of each battalion on a common base point.

b. There may be cases where action opens suddenly and each battery initiates fire on a separate target, each being adjusted by a separate observer, the batteries being so dis-

posed that survey cannot be completed for some time. No map being available, the following methods may be used to tie the fire of one of the batteries, or by description. This may concentrated on a single target or survey can be completed.

(1) A reference point is indicated to the forward observers in any manner applicable—a round of smoke, a high burst, the fire of one of the batteries, or by description. This may be done either before or after the fires of the batteries have been initiated. Each forward observer, having determined the direction of fire and an approximate ground, during the course of his adjustment, reports the relation of the initial target to the announced reference point in the form of a sensing. Each battery executive converts this sensing into a shift and elevation change. He applies it to the guns, records base deflection, and reports these data in compass and range to the fire direction center, where it is plotted on the observed-fire chart. This will give an approximate location of the batteries in relation to the base point and is a means of determining initial data for concentrating all batteries on a single target.

(2) A second method would be to have an observer fire a rocket, all three batteries laying on it, recording base deflection, and reporting compass and range to the fire direction center.

Both of these methods are rough and the plot would be corrected or abandoned when the fires of the battalion had been concentrated or a survey had been completed.

■ 34. GENERAL.—*a.* As a general rule one gun should be used in the initial stage of an adjustment to conserve ammunition. The gun firing must be announced to the forward observer to enable him to center the sheaf on the target. The battery should be fired at least once during adjustment to check the sheaf before fire for effect is started.

b. The sheaf should be approximately 40 yards per gun. Maximum sheaf, 6-gun battery, is 200 yards.

c. The normal bracket should be 200 yards.

d. The method of attacking targets may be zone fire by a single battery; zone fires of more than one battery superimposed; or when more than one battery is firing to have each

WRONG



FIGURE 47.—Fire direction center is not camouflaged. Vehicles are too close together and in open. They are soon located by enemy and neutralized.

RIGHT



FIGURE 48.—Fire direction center is under cover. The two S–3 and the S–2 cars are dispersed and under cover.

WRONG

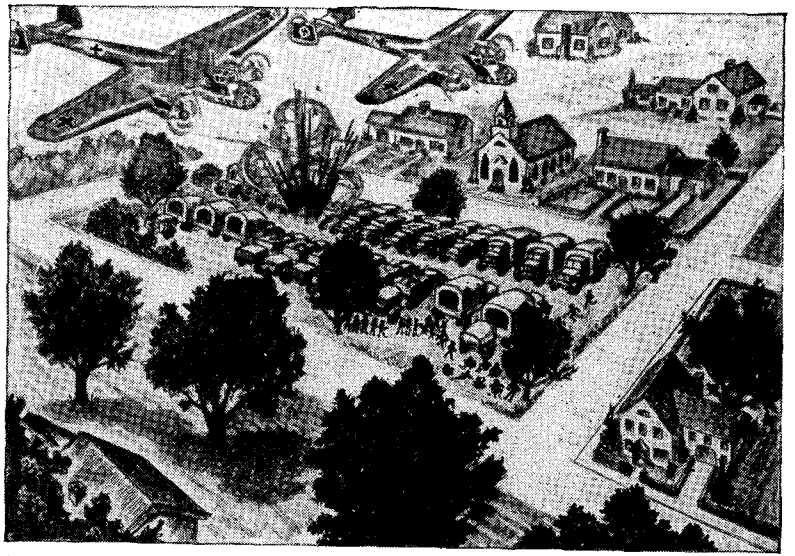


FIGURE 49.—Vehicles parked in open square of town are easily located by enemy planes and bombed.



RIGHT

FIGURE 50.—Towns must be avoided. Vehicles are scattered under cover on outskirts.

battery fire at a single range of its own with an announced range spread.

e. In a moving action, the first target will not usually be a selected "base point" of clear definition; it will be a combat target. The use of the term "registration on the base point" should not be allowed to obscure this fact.

f. While many targets will be wide and deep enough to require firing through a standard area, there will be many of small size, such as resistance located in a clump of buildings. Forward observers must be practiced in making the sheaf fit the target and in indicating the proper bracket and width of sheaf to the fire direction center or battery. For example, firing for effect at a small target, following an adjustment, sensing might be "50 right, 100 short, sheaf wide, fire for effect at single range."

g. Due to the time necessary to prepare ammunition and the fact that armored artillery action will usually be fast, it will be normal to use ammunition as it comes prepared in the containers.

h. Armored artillery must be expert at hasty methods of delivering observed fires; it must also be prepared to fire by precise methods and to deliver unobserved fires. The characteristic case would be a deliberately prepared attack. The use of the survey section of battalion headquarters battery must be stressed.

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