FM
6-100
24 May 1944

Tactics and technique
of division
artillery and higher
artillery echelons.

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WAR DEPARTMENT FIELD MANUAL

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TACTICS AND TECHNIQUE OF DIVISION ARTILLERY AND HIGHER ARTILLERY ECHELONS

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WAR DEPARTMENT FIELD MANUAL

FM 6–100

This Manual, together with FM 6-20 and FM 6-101 (when published) supersedes FM 6-20, Tactics and Technique, 10 July 1940, including C 1, 2 January 1941

FIELD ARTILLERY

TACTICS AND TECHNIQUE OF DIVISION ARTILLERY AND HIGHER ARTILLERY ECHELONS

WAR DEPARTMENT • 24 MAY 1944

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BY ORDER OF THE SECRETARY OF WAR:

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OFFICIAL:

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Major General,
The Adjutant General.

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For explanation of symbols, see FM 21–6.

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CHAPTER 1

INFANTRY DIVISION ARTILLERY

Section 1. GENERAL

1. a. Field Artillery—*Infantry relationship. The reason for the existence of the Field Artillery is its ability to support the Infantry on the field of battle. Artillery acts by fire alone and is not capable of independent action as a self-sustaining arm.

b. Organization and employment. The direct-support battalion of divisional artillery is the foundation stone upon which the whole structure of field artillery organization, its employment and development of fire plans, is erected. Since artillery is not organized to act independently, the disposition and subsequent movement of direct-support battalions depend on the disposition and subsequent movement and maneuver of the supported infantry. The arrangement for and assignment of missions to other artillery are made to increase the fire power available to neutralize or destroy targets which threaten the success of the infantry.

Section II. MISSION AND ORGANIZATION

2. MISSION. The mission of division artillery is to furnish close and continuous fire support by neutralizing or destroying those targets which threaten the success of the supported infantry.

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*Throughout this manual, Infantry is used to indicate any supported arm, such as Cavalry or Armor.

Note: For definition of military terms not defined in this manual, see TM 20–205.

3. ORGANIZATION. Division artillery consists of a division artillery headquarters and headquarters battery, organic battalions, and such artillery units as are attached. The organic artillery provides the minimum artillery necessary to support the division against weak resistance. Against strong resistance the division artillery should be reinforced by attaching artillery or by assigning reinforcing missions to corps artillery.

Section III. PRINCIPLES OF EMPLOYMENT

4. CONTROL. a. Centralized control. When mutual support by artillery battalions in the division is possible and communications are adequate for control, massing of fires of several battalions can be directed from a central headquarters. Whenever the situation permits, division artillery is retained under centralized control so that the division commander can most effectively employ its massed fire power.

b. Decentralized control. When elements of the division are marching on separate routes or when unusual extensions of frontages, difficulties of terrain, or insufficient signal communication exist, artillery battalion (or group) commanders must accomplish their mission independently. When subordinate units of the division are operating independently, artillery should be attached. In such decentralized situations the division artillery commander maintains contact with battalions, prepares plans for reestablishing centralized control, and at the appropriate time recommends to the division commander that it be reestablished.

5. ORGANIZATION FOR COMBAT. a. General. (1) The permanent nature of the organic division artillery organization permits the employment of standing operating procedure, which should be flexible to permit incorporating and relinquishing attached artillery with ease. Preparations must be made for the reception, coordinated use, and release of such attached artillery.

(2) The division artillery is organized for combat by assigning missions to subordinate units according to the scheme of maneuver of the division. Organization for combat should provide for attaching artillery units to subordinate units where necessary, and for the assignment of general support, direct support, and reinforcing fire missions. To simplify control, battalions having the same mission may be formed into groups. See paragraph 28 for use of group headquarters.

(3) The medium battalion (or group) is normally in general support, and in addition is usually given a secondary mission of reinforcing the fire of a particular direct-support artillery battalion depending upon the operational plans of the division. As general-support artillery, it supports the division as a whole, and is held under the control of the division artillery commander. A general-support unit with a reinforcing mission maintains liaison with the unit whose fires it is to reinforce, and receives calls for fire directly from that unit. The reinforcing unit must be prepared to fire in the zone of the reinforced unit; it answers all calls for fire from the reinforced unit when the answering of such calls will not interfere with its primary mission.

(4) Direct-support battalions or groups support specific subordinate units of the division. Whenever practicable, a particular organic artillery battalion should be placed in direct support of the same infantry regiment. Should an infantry regiment not be committed, its corresponding light battalion should be used in general support until needed for direct support, provided time and space permit the battalion to be committed in its primary role. The organic direct support battalion, when engaged in general support, should maintain liaison sections with the battalions of its infantry regiment and sufficient staff at its infantry regimental command post to insure proper planning and liaison for the commitment of the infantry regiment. With the attachment of light artillery units to the division, direct-support groups may be formed by placing an additional light battalion with each direct-support battalion. The organic battalion commander should command any direct-

support group formed. Units in direct support remain under the control of the division artillery commander. The primary mission of an artillery unit in direct support is to furnish the maximum aid to the supported infantry. Generally, the artillery unit is free to maneuver in order to accomplish this mission unless limited road nets necessitate coordination. The fire of a unit in direct support may not be taken from the supported unit except with authority of the division commander.

(5) An attached artillery unit is under the direct tactical and administrative control of the unit to which it is attached.

6. ARTILLERY WITH RESERVE DIVISION. When a division is placed in reserve, its artillery may be employed in support of the corps if it can be foreseen that time will be available for the artillery to join its division when that unit is committed and sufficient artillery staff can be left with the division for proper planning and reconnaissance.

7. SOUND AND FLASH-RANGING UNITS. a. Organization. An observation battery or detachment may be attached to the division. The detachment may include survey and communication personnel and equipment to coordinate its activities, to lend survey assistance to division artillery, and to expedite establishing common survey control for the artillery with the corps.

b. Missions. The missions of attached sound and flash-ranging units include—

(1) Collecting combat information, including location of hostile artillery and other targets.

(2) Assisting in adjustment, observation, and massing of fires.

(3) Establishing survey control.

c. Employment. The sound and flash-ranging unit should be employed as a unit. Reconnaissance and survey elements march with the leading elements of the division. The division artillery commander's instructions to the unit should include—

(1) The situation and plan of operation.

(2) The units which they are to support.

(3) Instructions concerning coordination of survey, firing chart to be used, communication, and special reports desired.

8. COORDINATION OF OBSERVATION. Forward observers in the zone or sector of an infantry division are coordinated and controlled by the combat team or direct support artillery commander through his liaison officers with the infantry battalion commanders. Division artillery coordination of other observation may include the allocation of ground suitable for observation posts; the assignment of zones of observation responsibility; the employment of sound and flash-ranging units and of air observation; and the placing of observers from different artillery units at the same observation point for lateral coordination within the division and with adjacent divisions. When the ground does not provide suitable observation for all units, the following priority should govern: direct-support battalions (groups); flash sections of observation battalions; and general-support artillery. Division artillery in direct support requires the best observation into the immediate front of the supported infantry; general-support artillery can usually function with observation posts having a more distant and more general field of observation. Observation is not delimited in depth, but should be focused on those areas that normally contain targets appropriate to the mission of the artillery unit. The skillful maneuver of observation and the provision for constant surveillance of the action from the best available observation points are essential to success. Prompt advantage should be taken of the best available observation.

Section IV. COMMAND AND STAFF

9. DUTIES OF COMMANDER. The division artillery commander has a dual role. He commands all the artillery, both organic and attached, and he is the artillery officer on the special staff of the division commander, in which capacity he is the assistant and adviser to the division com-

mander on all artillery matters. His principal responsibilities are to—

a. Train the division artillery.

b. Direct the fire power of division artillery (see par. 13).

c. Maintain liaison with the division commander at all times either by personal contact or by a representative.

d. Make a continuous estimate of artillery capabilities; be prepared to submit to division commander, before that commander announces his decision, recommendations for the employment of the division artillery.

e. Formulate the artillery plan based on the approved recommendations (see par. 11).

f. Prepare the artillery subparagraph of the division order and, when required, the artillery annex (see par. 12).

g. Make recommendations to the division commander regarding personnel, matériel, and training.

h. Prepare plans for artillery air observation when required.

i. Estimate artillery requirements for a projected operation when required. (See ch. 4.)

10. STAFF ORGANIZATION AND DUTIES. a. General. The organization of the division artillery staff is prescribed by Tables of Organization (see fig. 1). The staff principles and functions appropriate to the size of the unit, stated in FM 101–5, apply to the division artillery staff. The administrative and supply functions of the staff are mostly supervisory and informative, subordinate units normally conducting all administrative and supply matters directly with the division. Duties of staff officers are prescribed below, but the division artillery commander may vary the organization and functions of his staff so as best to meet the demands of each particular situation.

b. Duties. (1) The *executive* is second in command. He is the principal assistant and adviser of the artillery commander. He coordinates the operations of the staff. For detailed description of his duties see FM 101–5.

(2) The *S–1* functions are usually restricted to the personnel and administrative matters pertaining to division

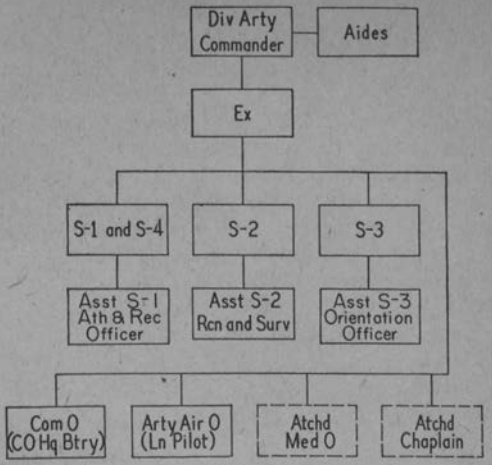


Figure 1. A type organization of the division artillery staff.

artillery headquarters, supervision of administration of subordinate units, and to the administration of quartering and of welfare activities of the division artillery.

(3) The *S–2* section has the primary function of locating enemy elements which are appropriate targets for the division artillery in its support of the infantry. It also secures information required by the division G–2. All information on targets appropriate for corps artillery is collected and transmitted promptly to the corps artillery S–2. When information agencies outside the division artillery are involved in obtaining desired information, the S–2 obtains the cooperation of division G–2 or corps artillery S–2. The principal duties of the S–2 are to—

(*a*) Initiate a systematic and coordinated search for required information by all available collecting agencies (see fig. 2).

(*b*) Collect, evaluate, interpret, and distribute information *in time for it to be of value.*

(*c*) Keep the artillery commander and staff informed of the enemy situation and capabilities.

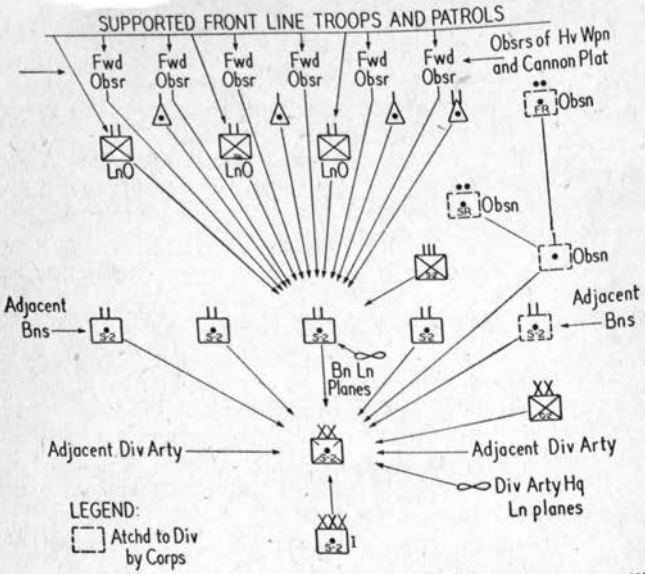


Figure 2. Sources of information available to division artillery S–2.

(*d*) Coordinate, through the normal chain of command, the work of intelligence personnel within subordinate units.

(*e*) Coordinate the establishment of any necessary special artillery intelligence observation posts.

(*f*) Keep in close touch with the intelligence sections of higher, lower, adjacent, and supported units for the purpose of exchanging information and predicting and finding targets.

(*g*) Work in close coordination with the S–3. He assists in the assembling of mosaics to be used as firing charts, in the preparation of combat orders, and massing of fires.

(*h*) Foresee the need for, obtain and distribute maps, photomaps, and air photographs.

(*i*) Study and interpret air photographs.

(*j*) Keep the S–2 situation map, and any other records pertaining to the S–2 section the situation may require.

(*k*) Furnish the executive with pertinent data for inclusion in the unit journal.

(*l*) Send pertinent information from the division G–2 reports and the corps S–2 bulletins to members of the staff and the S–2's of artillery battalions.

(*m*) Perform the duties of corps artillery S–2 in addition to other duties when the division is acting alone. This includes preparation of the S–2 bulletin for disseminating intelligence of importance to the artillery.

(4) The *assistant S–2* is the division artillery reconnaissance and survey officer. When not required for these duties, he is an assistant to the S–2. His principal duties are to—

(*a*) Assist his commander in reconnaissance.

(*b*) Recommend to his commander a plan of survey (see par. 22) coordinated with corps artillery survey plans and information if available.

(*c*) Perform survey (FM 6–40) in accordance with the approved plan.

(*d*) Secures existing topographic data (coordinates of geodetic points, bench marks etc.).

(*e*) Establish a division artillery survey information center where survey information determined by any unit of the division artillery will be made available to all units of the division artillery.

(*f*) Train the division artillery instrument and survey, and meteorological sections.

(*g*) Supervise and coordinate the training of the battalion instrument and survey sections when directed by the division artillery commander.

(5) The *S–3* section is charged in general with functions relating to organization, training, and operations. The S–3 keeps the artillery commander informed on all matters pertaining to the training, combat efficiency, and disposition of the units of the command. The S–3 assists the commander and the executive in formulating plans, and is responsible for the preparation and issue of combat orders. The S–3 must maintain the closest cooperation and collaboration with other staff sections and with subordinate com-

manders. In addition to the duties listed in FM 101–5, the S–3 performs the following:

(*a*) Assists the commander in fire direction (pars. 13 to 17, incl.).

(*b*) Coordinates the artillery fires of the division.

(6) The principal duties of S–4 are to formulate and to supervise the execution of a plan for the supply of ammunition to the division artillery, and to keep the commander and the staff informed of the ammunition in the division. The S–4 is concerned with supply other than that of ammunition, only to the extent that he keeps the commander and staff informed of any circumstances which may affect the efficiency of the division artillery. He keeps himself informed of all facts bearing on the ammunition situation to include the—

(*a*) Ammunition with the troops, including location, amounts, and whether it is dumped or mobile.

(*b*) Ammunition available to the unit at each ammunition supply point.

(*c*) Road net and transportation available.

(*d*) Practicability of distributing the estimated requirements in the time available.

(*e*) Amounts, by type and caliber, of ammunition required for various types of combat and for special fires.

(7) The *communication officer* functions in a dual capacity as a member of the special staff and as commander of headquarters battery. As a staff officer he assists and advises the artillery commander on all matters relating to signal communication. As headquarters battery commander he is responsible for the training and tactical employment of his organization. His principal duties are to—

(*a*) Plan and recommend to the division artillery commander the system of communication to be established.

(*b*) Establish the command post and provide communication facilities for the commander and staff.

(*c*) Install, operate, and maintain the communication system for which the artillery commander is responsible. (See pars. 18, 19, and 29.)

(*d*) Prepare prearranged message or other required codes.

(*e*) Maintain close contact with the staff, with communication officers of subordinate units, and with the division signal officer.

(*f*) When directed by the division artillery commander, inspect and coordinate the training of communication personnel of subordinate units.

(*g*) Assist subordinate units in the procurement of emergency signal supplies.

(*h*) Secure from the division signal officer early information as to the supply of signal equipment and of existing wire facilities available for all units of division artillery.

(*i*) Consolidate line route maps submitted by subordinate units, and after a thorough study of existing circuits, coordinate their use with the division signal officer as the situation changes.

(*j*) Consult and coordinate with division signal officer on the assignment of radio frequencies to artillery units of the division.

(*k*) Secure signal operations instructions from higher headquarters and distribute them to subordinate units.

(8) *Artillery air officer* duties are to—

(*a*) Assist and advise the artillery commander on all matters pertaining to air observation.

(*b*) Function as the artillery airplane engineer officer.

(*c*) Function as pilot and observer.

(*d*) Make frequent technical inspections of the airplanes and pertinent technical records within the division artillery.

(*e*) Supervise the performance of first and second echelon repairs within the division artillery.

(*f*) Keep on file pertinent technical orders pertaining to artillery air observation.

(*g*) Make recommendations as to training of pilots and maintenance of airplanes within the division artillery.

(*h*) Make reconnaissance for landing areas and recommendations to the artillery commander concerning allotment and assignment of landing areas.

(9) *Surgeon* of the division artillery is a member of the special staff, and commands the headquarters medical detachment. For detailed discussion of duties see FM 101–5 and 6–101 (when published).

(10) The duties of the *chaplain* (TM 16–205) as a member of the special staff are listed in FM 101–5.

(11) *Aides* perform such staff duties as are prescribed by the artillery commander.

Section V. PLANS AND ORDERS

11. PLANS. a. General. The division artillery commander, with his staff, must make a continuous estimate of the artillery capabilities and submit recommendations as to the employment of the artillery to the division commander prior to the announcement of the division commander's decision. Based on the division commander's decision, the division artillery commander recommends the plan for the employment of the artillery which will provide the maximum support to the action of the division. Upon approval of the artillery plan, the division artillery commander issues the orders to put the plan into effect and he directs its execution.

b. Estimate of artillery capabilities. In his continuous estimate of the situation, the artillery commander constantly seeks answers to the following questions:

(1) What lines of action are being considered by the division commander?

(2) How will the terrain affect the employment of the artillery?

(3) What is the enemy situation, including types of targets, and number of each?

(4) How can the artillery be best employed in support of each line of action?

(5) Can a particular line of action be supported? Are the artillery means at hand adequate? What reinforcements will be required?

c. Formulation of plan. Having received the decision as to the employment of the division, the division artillery commander forms his plan based on—

(1) Mission assigned to the infantry.

(2) Artillery available.

(3) Assistance which corps or adjacent artillery units will furnish or require.

(4) Availability of observation, survey data, maps, time,

position areas, cover and concealment, routes, landing fields, and ammunition.

d. Scope of plan. The artillery plan should cover—

(1) Organization of division artillery for combat.

(2) Mission for each battalion or group.

(3) Assignment of zones of fire, position areas and time of occupation, and routes.

(4) Coordination of observation and landing field facilities.

(5) Plan of survey; firing chart; meteorological data to battalions.

(6) Allocation and distribution of ammunition.

(7) Plan of fires; coordination of supporting fires. (See par. 15.)

(8) Restrictions, if any, on opening fire, or on fires laterally or in depth.

(9) Intelligence plan.

(10) Plan of communication.

(11) Special security measures.

12. ORDERS. a. Artillery subparagraph of division field order. The artillery subparagraph of the division field order gives the commander's decision on the employment of the division artillery. It includes only such details of the employment as are necessary for the general information of the commanders of major elements. An example of an artillery subparagraph of a division field order is as follows:

3d. (1) Div Arty will fire a preparation from H–60 to H–hour.

(2) It will be prepared to mass its fires vicinity SIDI ANID (19–64).

(3) (a) 1st Gp: CO 1st FA Bn comdg, 1st FA Bn, 101st FA Bn: Direct support 1st Inf.

(b) 2d Gp: CO 2d FA bn comdg, 2d FA Bn, 102d FA Bn: Direct support 2d Inf.

(c) 3d FA Bn: General support; prepared to support 3d Inf when committed.

(d) 101st FA Gp: 4th FA Bn, 203d FA Bn, 691st FA Bn: General support; reinforce fires 1st Gp.

b. Artillery annex to division field order. The artillery annex to the division field order is issued only when control is centralized and the plan of fires is highly organized and must be given to the supported units in considerable detail (see fig. 5②). The division artillery commander's field order is usually taken in its entirety, the annex caption being added thereto, authenticated by the division G–3, and attached to the division field order.

c. Artillery field order. The division artillery commander transmits his plan to units under his immediate command by means of field orders. Artillery orders are usually fragmentary, and may be oral, in written message, or overlay form. The amount of detail included in an order depends primarily upon the training of the unit. Artillery field orders, and numbered annexes attached to them, are authenticated by the S–3. (For general discussion of combat orders and annexes, see FM 101–5). An example of a division artillery field order in overlay form used in a mobile situation to confirm fragmentary orders is given in figure 3. When issuing orders commanders must not issue instructions regarding missions, position areas or areas for massing fire which conflict with the requirements of any one of these elements. A commander's responsibility does not end with the issue of an order. An initial order merely forms the basis for the issue of further orders throughout the action.

Section VI. FIRE DIRECTION

13. GENERAL. Fire direction is the tactical command of one or more artillery units, for the purpose of bringing their fire to bear upon the proper targets at the proper time with the maximum density and surprise. The division artillery commander directs the fire of the division artillery by organizing the artillery for combat; by assigning position areas; by assigning zones of fire; by designating specific important targets or areas to be covered by fire; by procuring and allocating ammunition; and by coordinating fires (including registrations) and displacements. Efficient fire direction depends on reconnaissance, survey, communication, liaison, observation, and intelligence.

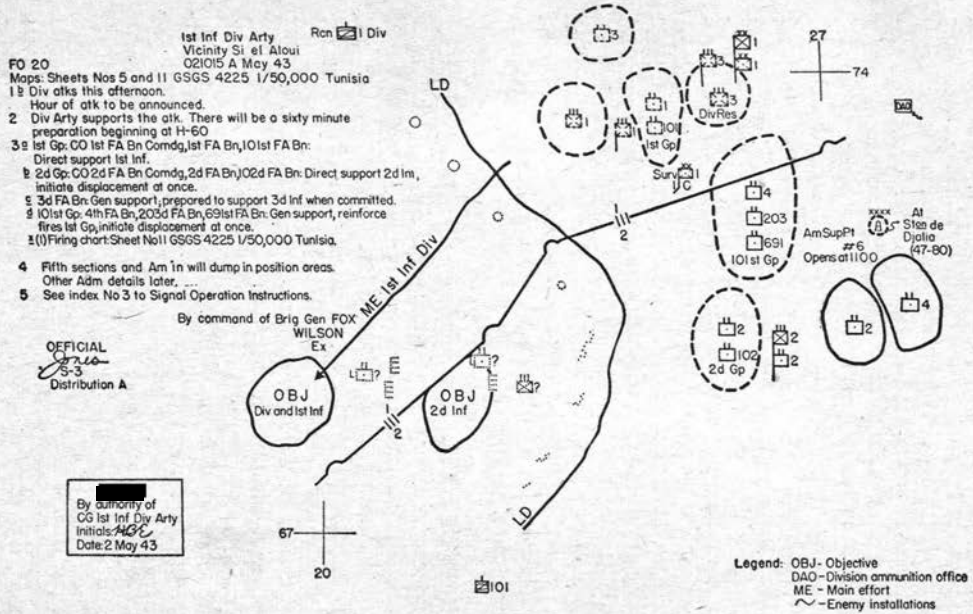


Figure 3. Example of a division artillery field order overlay form in a rapidly moving situation.

14. DIVISION ARTILLERY FIRE-DIRECTION CENTER. a. Location. The division artillery fire-direction center is normally part of the division artillery command post when the division command post is well forward. Otherwise, the division artillery fire-direction center is separated from the command post and located near the center of the division artillery position areas to facilitate control.

b. Organization. The fire-direction center consists of the necessary personnel, equipment, and communication facilities to assist the commander in the supervision and execution of his orders and in directing the coordination and massing of the fires of the battalions (see fig. 4). Direct telephone communication to all battalion fire-direction centers (either by simplexing existing trunk circuits or by installing direct circuits) is desirable. Radio communication is used when wire communication is impractical or inoperative.

c. Training. The division of duties in the fire-direction center must be thoroughly understood by all personnel. This personnel must be constantly drilled in the execution of these duties.

15. TYPES OF FIRES. The missions ordered by the division artillery commander are divided into the following two types according to degree of prearrangement.

a. Fires on targets of opportunity. These fires are delivered on targets that appear during an operation for which no prearranged fires have been planned. When the chart location of target is unknown, and common control has not been established, such targets must be attacked by observed fires.

b. Prearranged fires. When time is available and targets have been located, fires are prearranged and coordinated into a prearranged fire plan by the division artillery commander, when the need for these fires can be foreseen. (See figs. 5① and ②.) In the usual case, these fires are placed on located targets. However, they may be placed on areas strongly suspected of containing remunerative targets. Concentrations placed promiscuously on suspected areas seldom achieve worthwhile results.

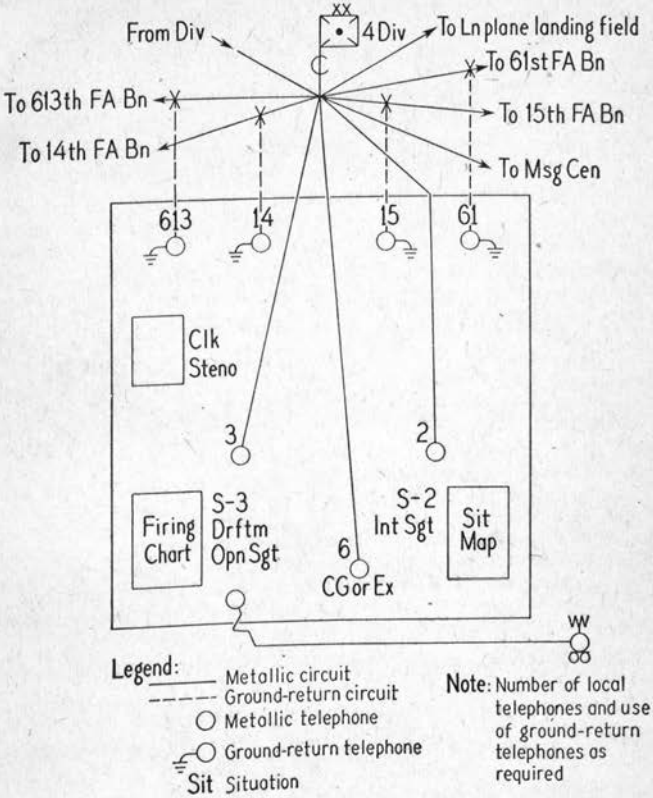


Figure 4. Division artillery fire-direction center (with four battalions).

(1) *Direct support battalion commander.* The direct support artillery battalion commander in conference with the infantry regimental commander formulates a tentative general plan of artillery support, including general location, time, duration, and priority of fires requested by the infantry commander.

Explanation of fire plan

Battalion. This may be battalion, group, brigade, or division. One sheet for each. (See note 1.)

Concentration number. This number should be assigned by division or corps artillery from their own block of numbers.

Time. Include here the limitations on time of firing. If it is an *on call* mission it should be so stated. Times may be given with respect to H-hour. (See note 3.)

Coordinates. Give the coordinates of the center of the concentration. (For assignment of area targets see note 2.)

Altitude. The altitude of the center of the concentration in yards.

Size. Give the size in yards. Concentrations number 43, 47, and 62 are appropriate for 155-mm battalions. Concentrations number 40, 51, 60, and 65 are appropriate for 105-mm howitzer battalions. (See note 2.)

Method of attack. Examples are *Center range,* 1–C *apart,* etc. The method of attack by a range spread is applicable for attacking targets in depth, the increase in range spread increases the size of the area covered in the direction of fire only. If the area to be covered is greater than that covered by a standard battalion concentration firing at center range or with range spread, the method of attack must be decided upon by the lower unit commander who breaks it down into separate standard size battalion (or battery) concentrations. (See note 2.)

Ammunition. The amount of ammunition to be expended on the mission.

Remarks. Any additional information pertinent to firing the mission, such as rate and type of fire, and any other unit firing on the target at the same time.

NOTE 1. Fire plan sheets are made in duplicate, one for the unit concerned and the other for file.

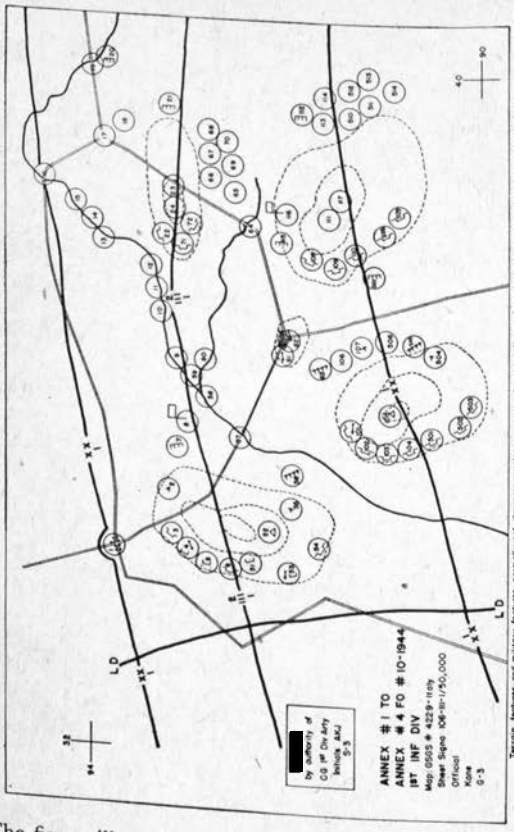
2. The assignment of prearranged fires may be made by *overlay* with graphical time schedule. This method is particularly applicable when area targets are being assigned. The use of an overlay will eliminate the coordinates, altitude, and size columns from the fire plan sheet.

3. A graphical time schedule is useful as a work sheet in planning fires, and as a quick reference for commanders to determine units which are firing.

DIVISION (or GROUP, CORPS) ASSIGNMENT OF PREARRANGED FIRES

Battalion, group, division	Concentration No.	Time		Coordination	Altitude	Size		Method of attack	Ammunition	Remarks
		From	To			Width	Depth			
	43	H–50	H–45	55.730–68.915	425	300	300	Center Range..	120	2 RGM Time fire
	47	On call		54.675–70.210	470	300	400	½–C Apart....	60	Maximum rate Time fire
	40	H–40	H–35	53.945–69.020	410	200	200	Center Range..	120	2 RGM Percussion fire 7th Bn also firing
	51	H–30	H–25	54.720–67.520	505	200	400	1–C Apart.....	168	2 RGM for 3 minutes 4 RGM for 2 minutes Time fire
5	60	H–20	.....	55.620–69.050	437	200	200	Center Range..	60	Maximum rate Smoke 7th Bn also firing
	62	H–15	H	53.970–68.850	476	300	.....	.....	348	1 RGM for 5 minutes 2 RGM for 8 minutes 4 RGM for 2 minutes Time fire
	65	H–60	H–30	53.790–69.210	482	100	.....	.....	140	One battery: 2 RGM for 5 minutes 1 RGM for 25 minutes Time fire

Figure 5.① Assignment of prearranged fires in tabular form.



(*Upper*)

The figure illustrates a division artillery fire plan issued in overlay form as an annex to the division artillery order which in turn is an annex to the division field order. Fires planned, but not covering enemy weapons or installations, cover areas strongly suspected of containing remunerative targets or are planned for "On call missions." The graphical assignment of prearranged fires may be shown directly on the overlay or as a separate annex.

(Lower)

Figure 5. Graphical assignment prearranged fires

The graphical schedule is especially valuable to indicate what battalions are immediately available for fire on targets of opportunity. Figures above horizontal lines indicate concentration numbers assigned; figures below lines indicate ammunition allotted.

(2) *Liaison officers of direct support battalion.* Direct support artillery liaison officers in conference with infantry battalion commanders formulate tentative detailed plans for the close support fires desired by the infantry battalions. Their conferences are usually preceded by a joint reconnaissance. These plans include location, time, duration, density, and priority of fires requested. Certain fires may be planned as on call missions. Prompt lifting, suspending, or ceasing of fire may become necessary. Plans for these contingencies, including signals to be used, must be made.

(3) The several battalion plans are then coordinated with the general plan of fire support agreed upon by the infantry regimental commander and the direct support artillery commander. In the event of conflict between the desires of infantry battalion commanders, the direct support battalion commander requests the decision of the infantry regimental commander (FM 6–101 (when published)).

(4) *Division artillery commander.* The division artillery commander consolidates and coordinates the fire plans of the direct support battalions and those fires ordered by higher headquarters, and then assigns missions to the appropriate battalions of the division. If insufficient artillery is present in the division to fire all missions, the division artillery commander requests additional fires from the corps artillery (see par. 38). The commanders concerned must be informed of the final plan.

16. MASSING FIRES. The ability of the division artillery commander to mass the fires of his battalions is dependent on four considerations:

a. Common control. A common control must be established by survey or firing. When maps or map substitutes are not available, and time is limited, common control is established by firing. Survey will always be initiated and whether used initially will depend upon the time available for completion.

(1) *Survey.* Fire direction is most efficient when common control is established by survey (see pars. 21 to 24, incl.). Registration improves survey.

(2) *Firing.* (*a*) *General.* It may be necessary to mass the fires of the division artillery before survey is completed. The common control is established by firing. This requires the coordination of the battalion observed fire charts.

(*b*) *Procedure.* The coordination is obtained by an additional registration on a common point (division artillery check point). The division artillery commander selects the division artillery check point and assigns it arbitrary coordinates and altitude. The division artillery check point is identified to the battalions on the ground. Each battalion coordinates its observed fire chart with the division artillery arbitrary horizontal and vertical control by registering one battery on the division artillery check point. When the battalion observed fire chart has been replotted, coordinating it with the division artillery control, the old battalion observed fire chart should be destroyed and the chart with division artillery control used for all subsequent missions. It is not necessary, although desirable, for battalions of like caliber to use the same charge for registrations on the division artillery check point. The highest practicable charge should be used for this registration. Within any one battalion there is a limitation on the charge which may be used in massed fires of several battalions using the observed fire chart. The charge for these massed fires is limited to that one used in the registration on the division artillery check point.

b. Fire capabilities of battalions. The fire capabilities of the several battalions (see FM 6–101 (when published)) determine the areas into which more than one battalion can fire (see fig. 6). The field of fire of each battalion, latest data on registrations, and the up-to-date detailed location of our leading elements are plotted on the division artillery firing chart, so that it is immediately apparent what fire can be delivered in a given area and whether such fire will endanger our own troops. Overlays and color schemes may be used.

c. Communication. Reliable communication between division artillery and battalion fire-direction centers must be maintained. Wire is preferable; radio must be available as an alternate means. (See sec. VII and fig. 4.)

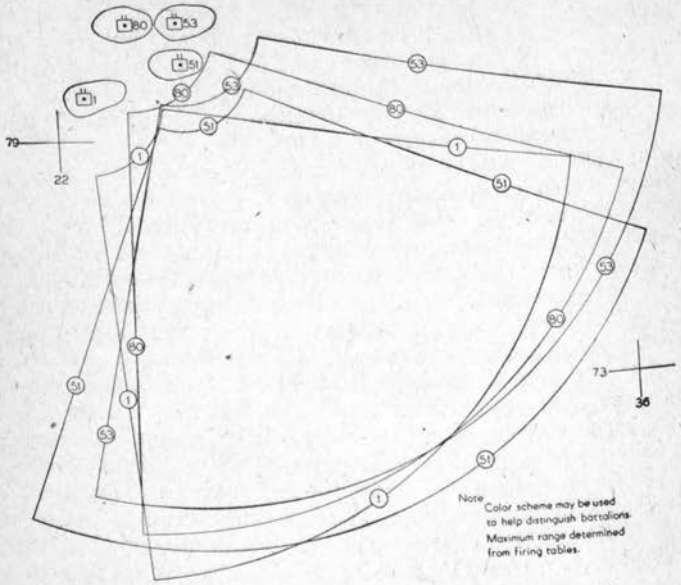


Figure 6. Fire capabilities of battalions (on overlay).

d. Battalion fire-direction technique. Centralized control within battalions must be established, and the battalions must be thoroughly trained in battalion fire-direction technique (FM 6–40).

17. TECHNIQUE OF MASSING FIRES. a. Origin of missions. Missions originate with the unit whose intelligence agencies fix the location of a target.

b. Battalions to fire. The battalions capable of firing on a target are determined from the division artillery firing chart. In order to avoid diverting direct support artillery from its primary mission, artillery units in general support of the division are normally used to the maximum to reinforce the fires of artillery units in direct support when additional fire is necessary. When a unit within the division requests additional fire, the division artillery commander or

his authorized representative at the fire-direction center must decide the following: Whether to grant the request; the number of battalions to fire; and the amount of ammunition to be expended. The source of the request for fire is informed of the decision.

c. Assignment of missions. (1) *Chart location of target known.* The chart location of the target may be determined by survey by restitution from air photographs or from a study of the ground by commanders, ground observers, or air observers. In assigning missions to battalions the division artillery fire-direction center includes in its order the following: the coordinates and altitude of the target; the nature of the target; the amount and type of ammunition; and the time of opening and/or lifting fire. Fire on these targets should be delivered with surprise whenever practicable.

(2) *Chart location of target is unknown initially.* A battalion adjusting on an important target may make a request to the division artillery fire-direction center for additional fire. When the battalion makes this request it gives the approximate coordinates, description of the target, and states that correct coordinates and altitude will be reported later. The division artillery commander, or his representative, decides which battalions are to be placed on the target, sends them warning orders, and informs the requesting battalion what additional fire it will get. Communication lines are kept open. As soon as the battalion requesting the fire has determined the correct coordinates and altitude in yards, these data are sent to division artillery fire-direction center, and from there sent to the battalions designated to fire the mission. (See FM 6–40.)

d. Method of attack. (1) *Size and nature of target.* The distribution of the fire of battalions will be governed by the size and nature of the target. The following two methods of fire are appropriate:

(*a*) *At center range.* When firing with sheaf, appropriate for maximum lateral coverage (FM 6–40), at center range, the areas covered are as follows: by a 105-mm howitzer battalion, approximately 200 by 200 yards; by two battalions of 105-mm howitzers or one battalion of 155-mm

howitzers, approximately 300 by 300 yards; and by three battalions or more (one or more of them a 155-mm howitzer battalion) approximately 400 by 400 yards. When the area to be covered and the number of battalions available agree with the figures above, the method of attack should be with sheaf appropriate for maximum lateral coverage and at center range.

(*b*) *Distributed fire.* When the area is too large to be covered by the above method, each battalion is assigned a part of the target. If a battalion's part of the target is so large it cannot be covered as described in (*a*) above, the battalion may use a range spread or attack the parts successively.

(2) *Type and amount of ammunition.* The type of ammunition that will give the maximum effect on the target is the type to be used. The amount of ammunition to be fired is determined by a consideration of the following: The ammunition supply situation; the amount necessary to cover the area; and the mission.

(3) *Rates of fire.* Reinforcing missions ordered by the division artillery commander on targets of opportunity will usually be fired at maximum rate. The rate on prearranged fire missions will vary from maximum rate to the slow rates of prolonged fires in preparations.

e. Precautions. (1) *Massing fires in close support of troops.* When massing fires in close support of infantry the greatest caution must be exercised. There are inherent inaccuracies in all types of firing charts. Registration near the target or the firing of check rounds on the target must be made to eliminate unnecessary casualties to our troops.

(2) *Firing of units other than direct support artillery.* Targets located by observers of general support and reinforcing artillery must be checked with division artillery or the direct support battalion concerned before they are fired upon.

Section VII. SIGNAL COMMUNICATION

18. GENERAL. a. Scope. The general subject of communication is covered in FM 24–5. Details regarding items of communication equipment and technique of operation

are found in appropriate manuals and instruction books. FM 6–101 (when published) includes the principles and procedures of communication applicable to field artillery units; this section deals only with the variations from those procedures which apply to division artillery.

b. Establishing communication. Communication personnel of division artillery headquarters battery install, operate, and maintain communication as follows:

(1) To the command posts of subordinate units.

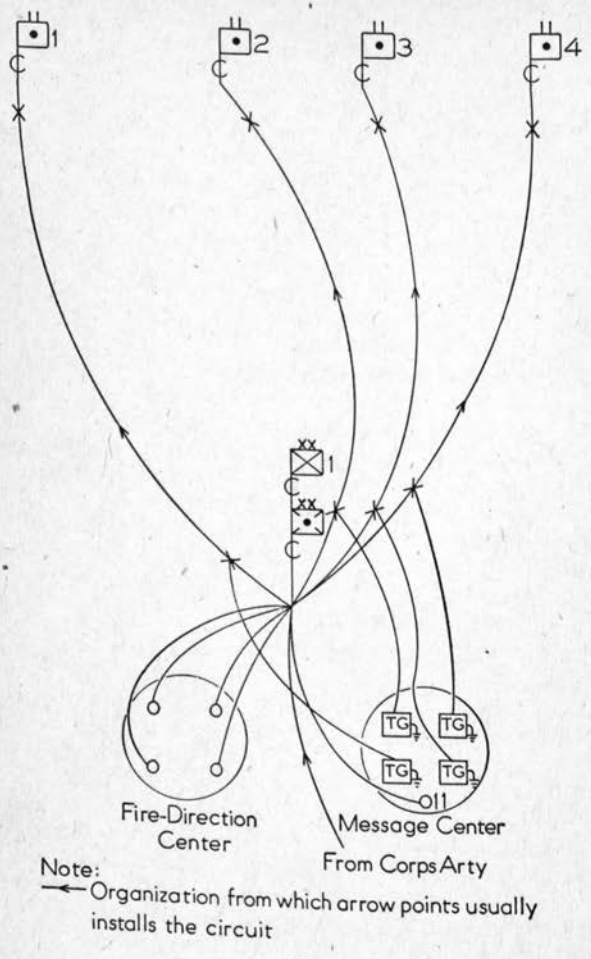
(2) To the command posts of reinforcing units not equipped to establish communication.

(3) To own local installations.

(4) To adjacent units when prescribed by higher authority. (See AR 105–15.)

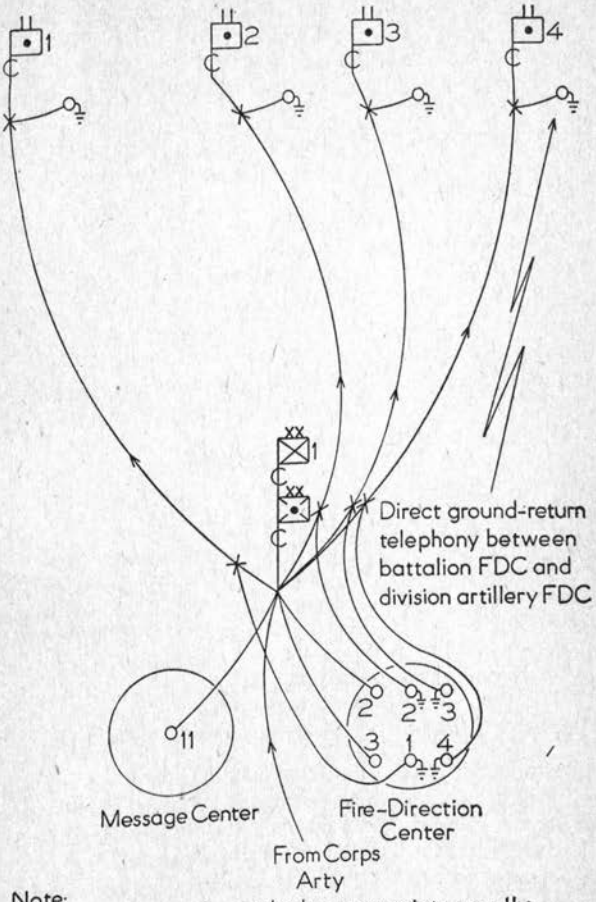
c. Command post. The command post of division artillery is in the immediate vicinity of the division command post. The command post installations of division artillery follow the pattern of the battalion. When the fire-direction center must be detached from the division artillery command post in order to facilitate control of fire, reliable communication must be maintained between the two installations. The meteorological station is located well away from other command post installations in order to avoid disclosing their location.

19. WIRE COMMUNICATION. a. Wire systems. Examples of division artillery wire systems are shown in figures 7① and ②. In figure 7, trunk circuits to battalions are simplexed to provide telegraph communication between message centers of division artillery and battalions. When fire direction is of primary importance, simplexed circuits to battalions may be used for ground-return telephone communication between fire-direction centers as indicated in figure 8. Ground-return telephone communication is subject to interception and must be used only for conduct of fire. Ground-return circuits should be replaced by metallic circuits as soon as practicable. Figures 7 ① and ② show the minimum requirements. Local telephone circuits within the command post are installed to the message center, fire-direction center, and to the commander. Circuits to landing field and observation post may be installed. The divi-



①

Figure 7. A division artillery wire system (simplexed for telegraphy).



②

Figure 7. Continued.

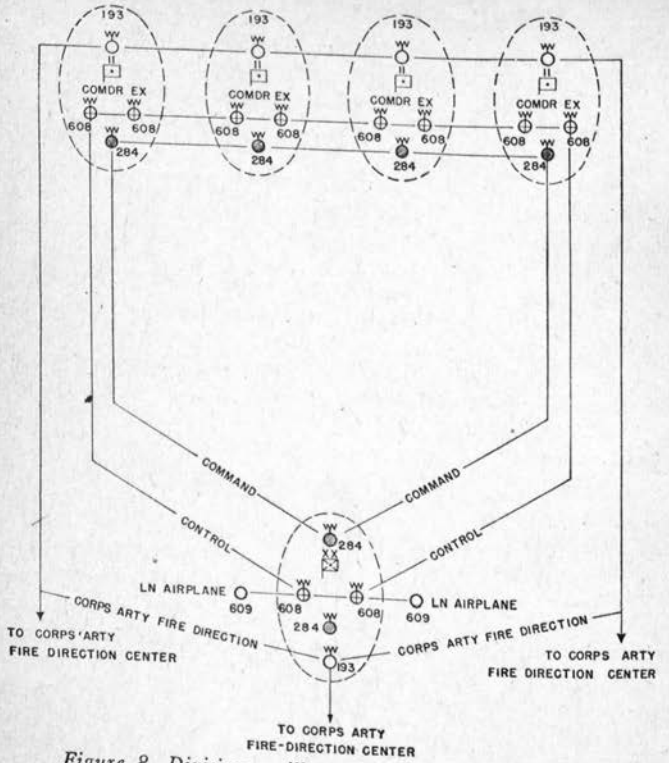


Figure 8. Division artillery (or group) radio system.

sion installs two circuits to division artillery, one of which is simplexed for telegraph communication if the switching centrals are widely separated. Corps artillery installs a circuit from its switching central to division artillery.

b. Displacement. The fire-direction center of division artillery displaces when necessary to maintain control of and communication with subordinate units.

20. RADIO COMMUNICATION. a. General. Radio communication is covered generally in FM 24–5, and radio procedure is prescribed in FM 24–6, 24–9, and 24–10.

b. Radio nets. The radio system provides the commander with adequate communication facilities for control, observation, fire direction, survey, and administration, within the division artillery, and provides communication to division and to corps artillery. The division artillery maintains—

(1) A radio set in the division command net unless the two headquarters are together.

(2) Communication with corps artillery when required for fire direction.

(3) A command net in which each immediately subordinate artillery headquarters is represented. An alternate frequency must be provided.

(4) A control net. The net includes commanders and fire-direction centers of immediately subordinate units, and may include special purpose sets for survey and observation within division artillery headquarters.

Section VIII. SURVEY

21. GENERAL. a. Purpose. The purpose of division artillery survey is to facilitate the accurate massing of observed or unobserved fires by all battalions of the division artillery. The division artillery survey officer, as instructed by the division artillery commander, is charged with furnishing common control.

b. Time required. Commanders must allow for the time required for survey if support by *accurate unobserved fires* is expected. Some survey work may be accomplished at night but certain reconnaissance and topographic operations have to be performed during daylight hours. The time required to complete survey operations in a division artillery survey is so dependent on the type of chart available and the terrain involved that average figures cannot be stated. However, as a guide, the minimum time allowed for survey in planning an operation should be 6 hours of daylight. Artillery commanders when they have thorough knowledge of the type of terrain and charts involved will be able to make a better estimate of the time needed.

22. PLAN. a. Information required from commander. The division artillery commander or his representative gives

the division artillery survey officer the following information:

(1) Firing chart(s) to be used. (See b below.)

(2) Situation, including the zone of action, time available for survey, and the time battalion survey elements will arrive.

(3) The ground location of the division artillery check points, reference points, and critical terrain features.

(4) Location of battalion position areas.

(5) Limitations on registration.

(6) Control available from higher headquarters.

b. Reference to plan in orders. Based on reconnaissance and on the above information, the survey officer recommends a survey plan. The division artillery commander prescribes the plan of survey to be followed by including in his orders to the battalions—

(1) Charts to be used.

(2) Assistance in survey to be given battalions by division artillery or to division artillery by battalions.

(3) Limitations on registration.

(4) Location of the division artillery survey information center.

23. FIRING CHARTS. Based on the above information, the survey officer initiates survey. In order to furnish common control, the survey officer must determine the following information for the types of charts listed:

a. Observed fire chart. Arbitrary coordinates and altitudes for the division artillery check point (see par. 16a(2)).

b. Grid sheet. (1) Coordinates, altitudes and ground location of two intervisable points for each battalion; or the coordinates, altitude, and ground location of one of these points with the *Y*-azimuth to the other point. (In either case one of these points should be in the target area.)

(2) Coordinates, altitude, and ground location of a division artillery check point.

(3) Coordinates of points for restitution from air photographs.

c. Battle map. Common control is furnished by the geodetic control on which the map is constructed. This

control is usually expanded for use of battalions as in a grid sheet survey. Coordinates and altitudes of geodetic control points should be secured from higher headquarters and distributed to battalions if such data are not printed on maps. The designation of a division artillery check point(s) by coordinates, altitude, and ground location for registration will facilitate the massing of fires in an area.

d. Small scale maps (less than 1/50,000). Such maps are unsatisfactory for firing charts but provide valuable information to be used in conjunction with a grid sheet firing chart. The basic geodetic control of a small scale map may be used as the origin of control for a grid sheet survey if lists of coordinates of the basic geodetic control points are available.

e. Photomap. When a photomap is used as a firing chart, the following must be determined:

(1) Coordinates, altitude, and ground location of a point to be used for vertical control (preferably in target area).

(2) Coordinates, altitude, and ground location of division artillery check point(s).

(3) Ground distance between two points identifiable on the ground and on the photomap. (One of these points must be in the position area and the other should be in the target area.)

(4) Direction expressed as Y-azimuth of a grid line or the Y-azimuth of a line between two points identifiable on the ground and on the photomap. (The same two points may be used for distance and direction.)

(*a*) The photomap is used as a firing chart initially. It should not be used for unobserved fires without survey or registration. (If used over wide areas, several registrations may be necessary.)

(*b*) If the grid sheet survey proves the photomap to be accurate in the entire division zone or sector, then the protomap continues to be the firing chart. If the photomap is found to be in error, it is replaced by a grid sheet firing chart.

24. PROCEDURE. Detailed methods and procedure for performing survey operations are covered in FM 6–40, 6–101 (when published) and 6–120.

CHAPTER 2

CORPS ARTILLERY

Section I. MISSION AND ORGANIZATION

25. MISSION. The mission of corps artillery is to contribute effective support to the action of the corps by reinforcing the fire of division artillery, by neutralizing or destroying hostile artillery, by fire on hostile reserves, by restricting movement in hostile rear areas, and by disrupting hostile command agencies.

26. ORGANIZATION. Corps artillery consists of the organic corps artillery headquarters and headquarters battery, the organic observation battalion or similar organization provided by Tables of Organization, and such War Department Reserve Artillery as may be attached to and retained under control of the corps. Attached artillery varies in type, caliber, and quantity according to the task confronting the corps, but usually includes light, medium, and heavy artillery battalions, and sufficient group or brigade headquarters for control.

Section II. PRINCIPLES OF EMPLOYMENT

27. CONTROL. In general, the organic division artillery must be reinforced either by the attachment of additional artillery to the division or by the reinforcement of the fire of the division with that of additional units under corps artillery control, or both. The degree to which control of corps artillery is centralized is based on the same principles enunciated for division artillery in paragraph 4. When attachments have been made to divisions in decentralized

situations, the commander must anticipate centralization of control by placing limitations on these attachments.

28. ORGANIZATION FOR COMBAT. **a.** After attachments have been made to division artillery, the artillery remaining under the control of the corps artillery commander is organized to give maximum support to the infantry. This is done by the assignment of general support and the reinforcement of fire missions to subordinate units. This organization should provide artillery for reinforcing the fires of division artillery, for executing counterbattery fire, and for long-range fire missions. *The assignment of special fire missions to corps artillery units does not limit the employment of these units to such special fire missions only.* When corps artillery units are given the mission of reinforcing division artillery, the reinforcing unit establishes direct communication and liaison with the reinforced unit. Reinforcing battalion(s) establishes direct communication with reinforced divisional battalions to expedite delivery of reinforcing fires.

b. Battalions having a common mission, regardless of caliber or other characteristics, should be grouped under one commander. One battalion headquarters can control the fires of a second battalion through the latter's headquarters. Group and brigade headquarters are employed for control in accordance with the principle that a headquarters can efficiently control up to four subordinate units. Improvised headquarters should be formed only as a last resort.

29. SOUND AND FLASH-RANGING UNITS. The observation battalion provides a means for locating hostile batteries; collecting other combat information, adjusting artillery fire (FM 6–40), and providing common survey control for corps and division artillery (see par. 56). When corps artillery action is centralized, control of the observation battalion is also centralized. Information secured by the observation battalion is then transmitted to the corps artillery fire-direction center. (See figs. 12 and 13.) For detailed discussion of employment of sound and flash-ranging units see FM 6–120.

Section III. COMMAND AND STAFF

30. DUTIES OF COMMANDER. The corps artillery commander has a dual role; he commands the corps artillery and he is also the artillery officer on the special staff of the corps commander. There is no direct chain of artillery command from corps to divisions. The corps artillery commander issues instructions to divisions in the name of the corps commander. His principal duties are to—

a. Make a continuous estimate of the situation from the artillery viewpoint and submit recommendations for the employment of the artillery with the corps.

b. Based on the approved recommendations, prepare the plan for employment of the artillery with the corps, covering particularly:

(1) Attachment of War Department Reserve Artillery units to divisions.

(2) Movement of units to position areas.

(3) Allocation of artillery ammunition to division and corps artillery.

(4) Temporary control to be exercised over division artillery during certain preparatory phases of combat and in reinforcing the counterbattery fire of the corps artillery.

(5) Assignment of missions to artillery.

(6) Coordination of artillery with naval or air force units assigned attack or bombardment missions within the corps zone or sector.

(7) Coordination between artillery units.

(8) Survey control for the artillery.

(9) Determination of need for and arrangement for procurement and distribution of maps, photomaps, and intelligence photographs.

c. Prepare the artillery annex to the corps field order when necessary (see par. 35).

d. Organize the corps artillery for combat.

e. Arrange with artillery of adjacent corps and with army artillery, if present, for mutual reinforcement and coordination of fires.

f. Coordinate the work of the S–2 section and corps sound and flash-ranging units with other information agen-

cies in the corps for prompt exploitation of artillery information.

g. Coordinate observation, signal communication, and liaison within the corps artillery throughout the engagement.

h. Make necessary recommendations to the corps commander pertaining to personnel, matériel, and training of the artillery with the corps.

i. Train the corps artillery and supervise the training of artillery with the corps as directed.

j. Estimate artillery requirements for a projected operation, when required.

31. STAFF ORGANIZATION. The organization of the corps artillery staff is prescribed by Tables of Organization (see fig. 9). The staff principles and functions stated in FM 101–5 apply to the corps artillery staff. Administrative and supply functions of the staff are mostly supervisory and informative. The corps artillery commander must vary the organization and functions of his staff so as best to meet the demands of each particular situation.

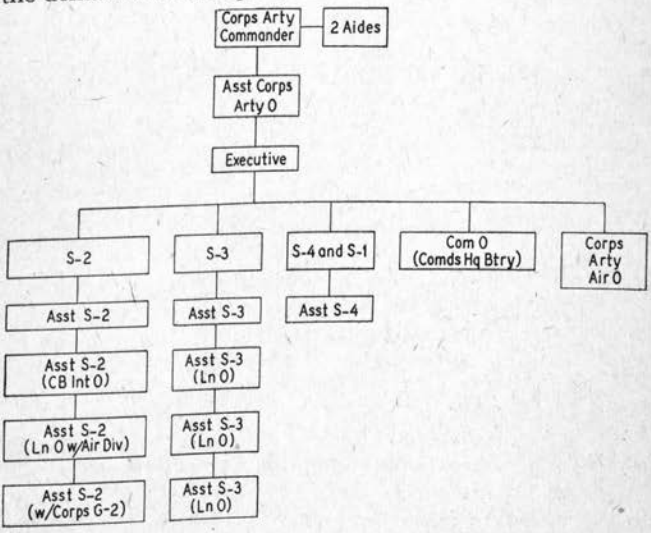


Figure 9. A type organization of the corps artillery staff.

32. STAFF OPERATION. The command post of the corps artillery is in the immediate vicinity of the corps command post. *The corps artillery fire-direction center is well forward.* Either the corps artillery commander or the assistant corps artillery officer remains at the corps command post. During the planning stage of an operation the bulk of the corps artillery staff works at the corps artillery command post; during the execution stage the bulk of the staff operates at the corps artillery fire-direction center. A possible distribution of the corps artillery staff in combat is shown below.

Installation	*Personnel*
Corps artillery command post at corps command post.	Corps artillery commander or assistant corps artillery officer.
	Assistant S–2 with corps G–2 section.
	S–4 or Assistant S–4.
	Corps artillery air officer.
Corps artillery fire-direction center.	Executive and corps artillery commander when not at corps artillery command post.
	S–3.
	Assistant S–3.
	S–2.
	Assistant S–2.
	Commander O.
	Assistant S–2 (CB Int O).
Division artillery command posts.	Assistant S–3 (liaison officer with each division artillery headquarters).
Tactical air division_____	Assistant S–2 (liaison officer) (located to facilitate coordination of supply of air photos and air photo intelligence).

33. STAFF DUTIES. **a.** *The assistant corps artillery officer* is the principal assistant to the corps artillery commander in the preparation of training schedules, tests, plans for employment, and preparation of orders. He represents the corps artillery commander at the corps command post during his absence.

b. *The executive* coordinates the staff, and supervises training and operational functions. See FM 101–5.

c. *The S–2 section* has as its principal function the location of targets. It prepares the S–2 bulletin for the daily distribution of enemy information to the army artillery

officer, to the artillery with the corps (to include battalions), and to artillery commanders of adjacent corps. The S–2 must foresee the need for maps and air photos. One officer of the S–2 section is usually employed in compiling, evaluating, and interpreting information on enemy artillery. See paragraph 32 for location of the various officers of this section.

d. *The S–3 section* is charged with artillery matters relating to organization, training, and operations. The principal functions of the section are to—

(1) Assist in the preparation of training schedules, tests, plans, and orders.

(2) Operate the corps artillery fire-direction center in conjunction with the S–2 section.

(3) Inform S–4 of ammunition requirements.

(4) Establish liaison with division artillery in the corps. The liaison officers, in communication with corps fire-direction center, transmit and receive battalion fire capabilities, requests for fires, enemy and friendly information, displacement plans, and available terrain and reconnaissance data.

e. *The S–4* performs both S–1 and S–4 functions. His S–1 functions usually are restricted to the personnel and administrative matters pertaining to corps artillery headquarters. His principal duty is to assist the corps artillery commander in ammunition matters. The S–4 is concerned with supply other than that of ammunition only to the extent that such supply may effect the efficiency of the artillery with the corps. See paragraph 10b (6) for duties of S–4 in connection with ammunition supply plans.

f. *The communication officer's* functions are similar to those of the division artillery communication officer as listed in paragraph 10b (7).

g. *The artillery air officer* performs duties similar to those of the division artillery air officer as listed in paragraph 10b (8).

Section IV. PLANS AND ORDERS

34. PLANS. a. General. The corps artillery commander makes a continuous estimate of the situation from an ar-

tillery viewpoint and submits recommendations as to the employment of the artillery with the corps to the corps commander prior to the latter's decision for the action of the corps. Based on the corps commander's decision, the corps artillery commander formulates the plan for the employment of the artillery with the corps to provide the maximum support of the action of the corps. Upon approval of the artillery plan, the corps artillery commander prepares the necessary orders to put the plan into effect.

b. Estimate of artillery situation. In his continuous estimate of the situation the corps artillery commander seeks answers to the following questions:

(1) What lines of action are being considered by the corps commander?

(2) What is the enemy situation?

(3) How will the terrain, especially in those areas of probable contact, affect the employment of artillery?

(4) How can the artillery be best employed in support of each line of action?

(5) What maps, photomaps, or aerial photographs are available?

(6) What is the status of the artillery ammunition supply?

(7) Is an artillery preparation desirable? Are restrictions on registration required?

(8) Is the time that is being considered for the development and for the action after the development sufficient to allow the artillery to occupy position and transport ammunition to support the action?

(9) What photographic and direct air observation are needed? How should they be employed? How should the field artillery observation battalion be employed?

(10) Does the situation indicate the desirability of supplementing artillery fire power by tank destroyer, tanks, antiaircraft artillery, naval, or air force units?

(11) Does the situation indicate the need for antiaircraft or tank destroyer units for protection of the artillery?

(12) Can a particular line of action be supported? Are the artillery means at hand adequate? What reinforcements will be required?

c. Formulation of plan. See paragraph 30b.

35. ORDERS. a. Artillery subparagraph of the corps order. The artillery subparagraph of the corps order furnishes directives to the artillery units with the corps, provides for the coordination of their fires, and gives information to other units as to what assistance or cooperation they may expect from the artillery. When these directives require such an amount of detail as to make the corps field order voluminous, an artillery annex is issued giving more detailed technical instructions. The subparagraph must be prepared to fit a situation and not a check list; all items listed in the following check list need not be included:

A CHECK LIST FOR THE FIELD ARTILLERY SUBPARAGRAPH OF A CORPS FIELD ORDER

3. *d.* (1) *Division artillery.*

(*a*) Attachment of artillery to divisions; time and place of attachment and relief.

(*b*) Special fire missions, as appropriate to the situation, such as:

ATTACK:
Prior to attack.
Preparation.
During attack.

DEFENSE:
Prior to enemy attack.
Counterpreparation.
During enemy attack.

(*c*) Instructions necessary to coordinate artillery of adjacent divisions.

(2) *Corps artillery.*

(*a*) Organization for combat (when appropriate include group designations, composition, and commanders); area in which mass of fire is to be placed.

(*b*) General location of position areas.

(*c*) Special fire missions (same as (1) (*b*) above).

(3) *Artillery with the corps.*

(*a*) Preparation (time and duration).

(*b*) Counterpreparation (general instructions, such as employment of general counterpreparation and authorization for local counterpreparations).

(*c*) Survey control.

(*d*) Observation.

(*e*) Ammunition.

(*f*) Use of chemicals.

(*g*) Counterbattery policy.

(*h*) Instructions necessary to insure coordination between division and corps artillery.

(*i*) Instructions or restrictions as to registration, movements, occupation of position, etc.

(4) Reference to artillery annex when issued.

b. Artillery annex to corps field order. (1) *Form.* The annex may consist only of an operations map; or it may be a combination of maps, overlays, and tables, which are attached as annexes to a written document.

(2) *Contents.* When a written document is used as an annex, it should furnish complete tactical instructions to the artillery with the corps. Administrative matters pertinent to the artillery, and not published in the field order, are included in the annex. Artillery commanders must receive both the corps order and the artillery annex. When a written document is found necessary, the following form may be used as a guide:

A FORM FOR A
CORPS FIELD ARTILLERY ANNEX

ANNEX ------ TO FO ------, ------ CORPS FIELD ARTILLERY

------ CORPS
(PLACE)
HOUR, DATE

MAPS:

1. Pertinent references to the corps field order, annexes, and appropriate summaries of intelligence; additional information of the enemy or supported troops, when necessary or desirable.

2. The general mission of the artillery with the corps.

3. *a. Division artillery.*

(1) Attachments to each division; time and place of attachment and time and place of relief if known.

(2) A separate numbered subparagraph for each division to which it may be necessary to give particular instructions, such as for contingent zones, coordination and limitation of fires laterally and in depth, special missions including general location of fires during the preparation or counterpreparation.

(3) A general subparagraph containing the miscellaneous provisions not covered elsewhere and applicable to more than one division, such as:

Time of opening fire.

Restrictions on fire.

Coordination with corps artillery units, including allocation of counterbattery missions to the division artillery.

Movement into position and changes of position.

Allotment of observation facilities (air and ground) and communication therewith.

Areas reserved for corps artillery.

b. Corps artillery.

(1) Organization for combat. If groups are formed, give designation, composition, and commander of each.

(2) For each of the above designated units, a separate numbered subparagraph giving instructions to include:

Zones of fire.

Contingent zones; lateral coordination.

Special missions, including general location of fires during the preparation or counterpreparation.

Postition areas, routes, movement into position, organization of the position, and priority of selection in reserved areas.

Changes of position during action, including time or priority, and routes to new position areas.

(3) A general subparagraph containing the miscellaneous provisions not covered elsewhere and applicable to more than one subdivision of the corps artillery such as:

Reconnaissance.

Use of special ammunition, including gas and smoke.
Liaison instructions.

c. Artillery with the corps. Miscellaneous provisions applicable to both the division and corps artillery not specifically covered elsewhere, such as:

General nature of the fires prior to the attack or counterpreparation.
General instructions covering schedule fires, including preparation or counterpreparation.
Measures to insure secrecy, including limitations on registration.
Use of special ammunition, including gas and smoke.
Limitations on ammunition expenditure.
Coordination of observation facilities, particularly air photographic facilities; lateral coordination of observation between divisions and adjacent corps artillery units (see par. 8).
Meteorological and survey data, to include information on issue of maps and photos.
Antiaircraft and antimechanized defense.

4. Reference to the corps administrative order; additional instructions when necessary or desirable.

5. Instructions covering signal communication and command posts.

By command of _____:

_____
Chief of Staff

OFFICIAL:

_____
G–3

ANNEXES:

DISTRIBUTION:

Section V. FIRE DIRECTION

36. GENERAL. The corps artillery commander controls the fire power of corps artillery by organizing the artillery for combat; by assigning position areas; by assigning and coordinating zones of fire to insure the massing of fire in support of the corps action; and by coordinating fires, regis-

trations, survey, communication, observation, and displacements. The degree to which fire direction is exercised depends primarily upon the degree to which operations are centralized. Centralized control, although necessary for massing fires, does not preclude decentralization of execution of fire missions.

37. CORPS ARTILLERY FIRE-DIRECTION CENTER. The corps artillery fire-direction center is well forward near the center of the corps artillery position areas. It consists of the necessary personnel, equipment, and communication facilities to assist the commander in the supervision and execution of the corps artillery missions (see fig. 10). Direct telephone circuits are established between the corps artillery fire-direction center and the corps observation battalion, the fire-direction center of corps artillery groups, and division artillery fire-direction centers. (See figs. 12 and 13.) Fire missions are expedited if direct communication is established between corps artillery fire-direction center and selected corps artillery battalions. Wire communication is maintained with the corps artillery command post. Radio communication parallels wire communication within limitations of equipment.

38. TYPES OF FIRES. **a. General.** The types of fire missions ordered by the corps artillery commander and the division artillery commander are the same (see par. 15).

b. Prearranged fires. The corps artillery commander receives, consolidates, and coordinates the division artillery fire plans. The division artillery fire plans are expanded from information obtained from other intelligence sources into the corps fire plan. The corps artillery commander then assigns fires to divisions, and corps brigades, groups, and battalions (see fig. 5).

39. MASSING FIRES. The ability of the corps artillery commander to mass the fire of the artillery with the corps is dependent on four considerations.

a. Common control. A common control must be established by firing or by survey.

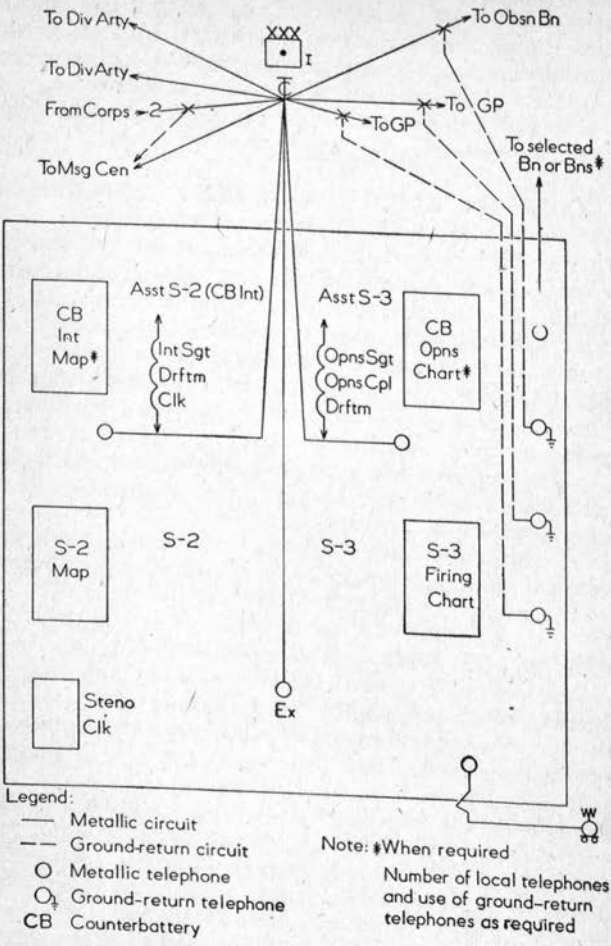


Figure 10. Corps artillery fire-direction center.

(1) *Firing.* It may be necessary to mass the fires of the artillery with the corps prior to the completion of survey. The common control is established by firing. This requires

the coordination of the observed fire charts of the battalions involved. The coordination is obtained by an additional registration on a common point (corps artillery check point). The corps artillery commander selects the corps artillery check point and assigns it arbitrary coordinates and altitude. The procedure of coordination is the same used in a division (see par. 16a(1)).

(2) *Survey.* Fire direction is most efficient when common control is established by survey (see sec. VIII).

b. Fire capabilities. The fire capabilities of the artillery with the corps determine the areas in which fires may be massed. The field of fire of the artillery of the divisions and the corps artillery battalions together with an up-to-date detailed location of our leading elements are plotted on the corps artillery firing chart. It is then immediately apparent what and how much fire can be delivered in a given area, and whether such fire will endanger our own troops.

c. Communication. See paragraph 37, section VII, and figures 12 and 13.

d. Centralized control. Centralized control within the artillery of the divisions, and corps artillery brigades, groups, and battalions must be established. Each of these units must be thoroughly trained in fire-direction technique (see par. 17). Corps artillery battalions employ the same technique as division artillery battalions (FM 6–40).

40. TECHNIQUE OF MASSING FIRES. The technique of massing fires in corps artillery is the same used in division artillery (see par. 17).

41. COMMAND AND CONTROL. a. Assignment of fire missions to corps artillery. The corps artillery commander controls and directs the fire of corps artillery in accordance with the orders and plans of the corps commander.

b. Assignment of fire missions to division artillery by corps artillery. (1) *Ordered by corps commander.* When ordered by the corps commander, the fire power of the division artillery is used on any target.

(2) *Not ordered by corps commander.* When the corps artillery commander, through his knowledge of the flow of

battle, is cognizant of the fact that certain battalions of division artillery are not being employed, their fires can and should be utilized by him to reinforce the fire on portions of the front where reinforcements are indicated. This is a matter for thorough understanding and mutual cooperation.

42. ADJUSTMENT OF FIRE BY HIGH PERFORMANCE AIRCRAFT. The fire adjustment required by light artillery is accomplished from ground observation and from artillery liaison aircraft. Other calibers frequently require adjustment from high performance aircraft. These latter missions should be preplanned and will be coordinated by the corps artillery commander or the force commander if the corps artillery is inoperative. The adjustment of artillery fire from high performance aircraft is the responsibility of the Army Air Forces (FM 31–35) (see also par. 48).

Section VI. INTELLIGENCE

43. GENERAL. The S–2 section at the corps artillery fire-direction center is the principal link in artillery intelligence. Here all information of interest to the artillery is converged, transformed into intelligence, and disseminated to the artillery with the corps and to higher and adjacent units.

44. LOCATION OF TARGETS. Artillery is impotent unless targets can be observed or located with reasonable accuracy on firing charts.

a. Each fire-direction center from the direct support battalion to the corps artillery headquarters has increasing facilities for gathering information for fixing the location of targets.

b. In the direct support battalions, observers with the leading infantry elements locate the majority of the targets attacked. These targets are generally those enemy installations which can be seen and are an immediate threat to the success of the local action. Such targets are attacked immediately.

c. In the group or division artillery, the increased facilites for gathering information often fix target locations

which are only indicated by reports from battalions. These targets are generally installations deeper in the enemy position than the observed targets located by battalion observers. Except in the case of enemy artillery, these targets seldom offer an immediate threat, and their attack can be planned to obtain surprise.

d. The corps artillery S–2 section is the focal point for all artillery information in the corps. By careful evaluation and analysis of information, target locations beyond the capabilities of lower headquarters are possible. The locations made by the corps artillery S–2 section usually extend deep into the enemy position and cover targets which must be attacked with long range artillery. Such targets, with the exception of enemy artillery, are usually of no immediate interest to division artillery, but their neutralization at an opportune moment may affect the success of the corps.

e. The integration of target location as discussed above influences the missions assigned the various echelons of artillery. Each fire-direction center must report to the fire-direction center of the next higher unit the location of targets which they have attacked or plan to attack as well as targets which they do not plan to attack. Any indication of a target location must also be reported.

45. SOURCES. In addition to information received from division fire-direction centers, the following important sources of information are available to the corps artillery fire-direction center:

a. Air photographs. Vertical and oblique photographs, including stereo pairs, constitute a valuable source of information. Frequent rephotographing of areas is necessary to obtain and confirm intelligence and keep it up-to-date. Personnel of the S–2 section must be trained to interpret air photographs.

b. Artillery observation posts. S–2 should prearrange observation with units. Surveyed locations of a number of observation posts permit the use of reference azimuths on intelligence maps and charts.

c. Flash ranging. Operates day and night. Efficiency varies with terrain and visibility. Under favorable conditions is effective to limit of range of our weapons.

d. Sound ranging. Efficiency varies with weather, and general noise level. Adverse wind or battle noise reduces usefulness. In general, sound ranging is more efficient when weather conditions limit visibility.

e. Air observation. Observers in organic artillery airplanes can often locate enemy artillery and other important targets.

f. Shelling reports. All units in the corps must be trained to make prompt reports to the nearest artillery command post when they are shelled. Reports should include estimated direction of enemy battery (azimuth of shell trace on ground), duration, angle of fall of projectiles, number of rounds, caliber, and nature of the enemy mission. The *time* that shelling occurred is essential. Fragments of projectiles and fuzes which cannot be identified by lower units should be tagged with time and place found, and delivered to corps artillery fire-direction center.

g. Prisoners of war. Information from G–2 sections after interrogation of prisoners often gives excellent intelligence.

h. Captured maps, documents, etc. The corps artillery staff must be familiar with map symbols used by the enemy and with his tables of organization.

i. Figure 11 outlines other sources of information.

46. COUNTERBATTERY INTELLIGENCE. a. The location, surveillance, and attack of enemy artillery requires the combined intelligence agencies of all echelons of a force. Because of the great amount of information on enemy artillery which is transmitted to the corps fire-direction center, the corps artillery S–2 section is provided with an officer whose primary duty is the sifting out of accurate data, and determining the location, caliber, and capabilities of enemy artillery. It is often necessary for him to maintain separate charts and records (see app. I).

b. Special emphasis on counterbattery intelligence in the corps artillery headquarters does not mean that subordinate units have no responsibility for counterbattery intelligence and the neutralization of enemy artillery. All artillery must be trained to locate and neutralize or destroy enemy ar-

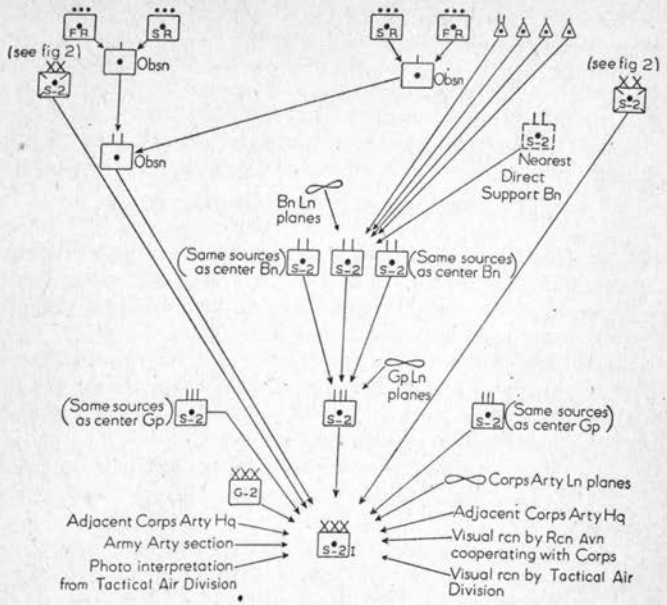


Figure 11. Sources of information available to corps artillery S–2.

tillery. In a centralized situation, the corps artillery will fire a majority of the counterbattery missions because the location of much of the enemy artillery will be determined in the corps artillery fire-direction center.

47. ATTACK OF TARGETS. The policy for attack of targets may be active or silent; the decision as to the policy is made by the force commander.

a. An *active* policy indicates that hostile installations will be neutralized as soon as located. An active policy has the advantage of inflicting damage on the enemy and increasing the morale of the supported troops; it has the disadvantage of disclosing our own artillery positions and of warning the enemy that his installations have been located. An active policy is desirable in a mobile situation.

b. A *silent* policy indicates that the location of enemy installations, artillery in particular, will be reported and recorded only; such targets are fired upon only by order of the force commander. Targets that are particularly annoying or effective may be neutralized after permission has been obtained. The bulk of our fires are delivered in mass with surprise effect during the preparation or counterpreparation.

Section VII. SIGNAL COMMUNICATION

48. GENERAL. a. Scope. The general subject of communication is covered in FM 24–5. Details regarding items of communication equipment and technique of operation are found in appropriate Technical Manuals.

b. Establishing communication. (1) Corps artillery is responsible for the installation and maintenance of communication to—

(*a*) Subordinate groups or battalions.

(*b*) Headquarters of division artillery with the corps.

(*c*) Local installations at the corps artillery fire-direction center.

(2) The field artillery is not charged with the ground end of the communication incident to adjustment of artillery fire by the Army Air Forces.

c. Command post. The command post of the corps artillery is in the immediate vicinity of the corps command post and is usually considered as a part of that command post. A corps artillery switching central and message center are established at the fire-direction center which is well forward along the corps axis of signal communication.

49. CORPS WIRE SYSTEM. The corps signal battalion establishes wire communication between corps headquarters and the corps artillery switching central, each division, and other corps units. The number of circuits installed to each will vary according to the needs, time available, and available signal supplies. These circuits provide one channel of wire communication between corps artillery and division artillery headquarters through corps and division switching centrals. These circuits must be shared with staff sections of corps and division and should be used infrequently. The corps signal battalion usually installs two circuits to the

switching central of corps artillery, and installs a local telephone to the corps artillery commander at the corps command post.

50. CORPS ARTILLERY WIRE SYSTEM. a. Wire systems. Examples of minimum corps artillery wire systems are shown in figures 12 and 13. Trunk circuits to subordinate groups,

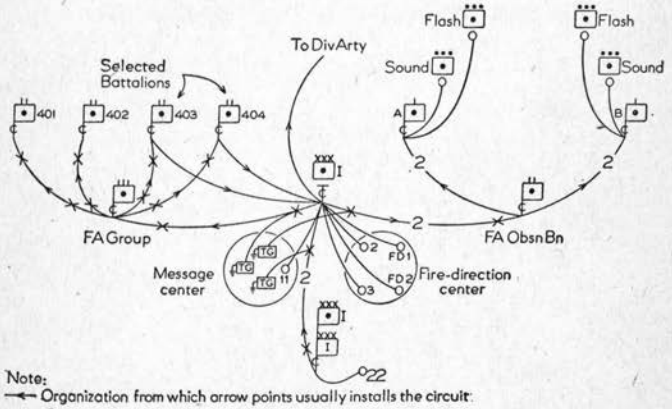


Figure 12. A corps artillery wire system (ground-return telegraph).

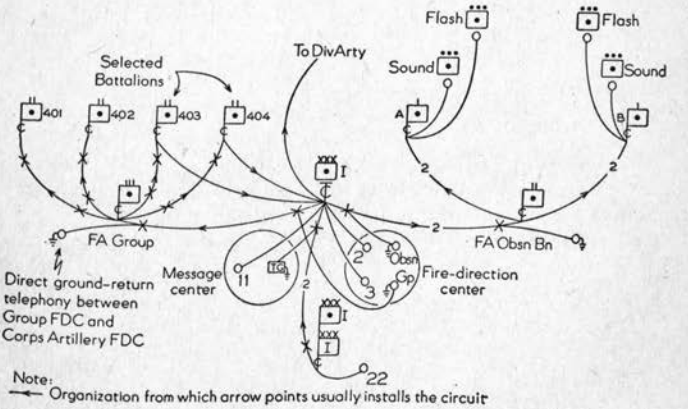


Figure 13. A corps artillery wire system (ground-return telephone).

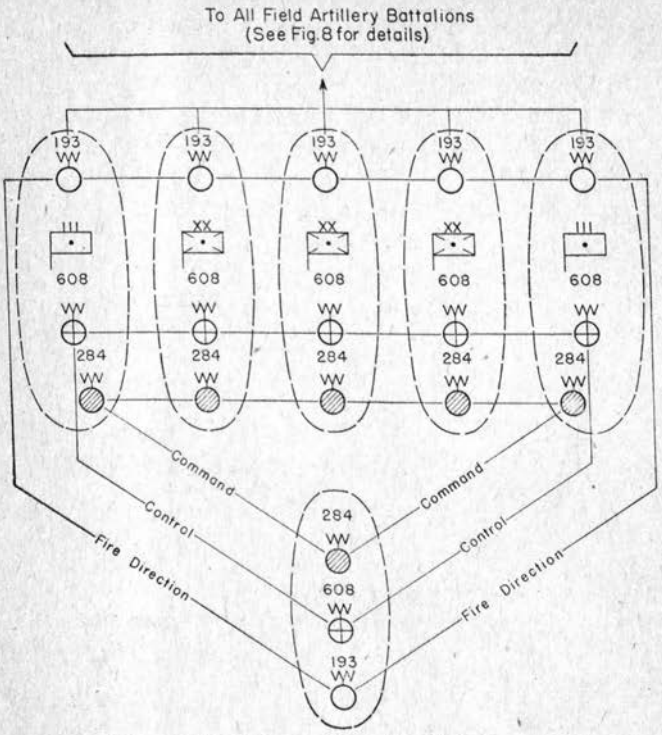


Figure 14. Corps artillery fire-direction center.

NOTES

1. SCR–608 radio sets may be used for fire direction.
2. Division artillery and group headquarters only receipt for corps artillery fire missions and verify compliance by battalions.
3. Command and control nets may be monitored at corps CP as required.

the observation battalion, and corps headquarters are simplexed to provide telegraph communication between message centers or to provide ground-return telephone communication between fire-direction centers. The systems indicated may be expanded as the situation dictates to in-

clude local circuits from the forward switching central to the commander, S–4, executive, landing field, or observation posts. Trunk circuits to division artillery are not usually simplexed, but may be when required. (See par. 19a for precautions on ground return circuits.)

b. Displacements. The fire-direction center of corps artillery displaces along the corps axis of signal communication when necessary to maintain communication with subordinate and associated artillery units. Corps wire circuits are extended to the new switching central.

51. RADIO COMMUNICATION. a. General. Radio communication is covered generally in FM 24–5, and radio procedure is prescribed in FM 24–6, 24–9, and 24–10.

b. Radio nets. Corps artillery radio nets provide for control of subordinate units, observation and reconnaissance, liaison, and fire direction of artillery with the corps. Corps artillery headquarters maintains the following:

(1) A command net in which the corps artillery command post, corps artillery fire-direction center, and the headquarters of all directly subordinate units are represented.

(2) A control net in which the corps artillery commander, corps artillery fire-direction center, and the commanders and fire-direction centers of all subordinate units are represented.

(3) Radio communication with the air force headquarters assigned to work with the corps.

(4) Radio communication with the fire-direction centers of all division artillery when required for fire direction.

c. Communication indicated in (3) and (4) above may be maintained through the corps artillery command or control nets, or by establishing special nets for those purposes.

52. CORPS ARTILLERY UNITS. a. Brigades and groups. Communication systems of brigades and groups are similar to those of division artillery (par. 19).

b. Battalions. Corps artillery battalions install a communication system as indicated in FM 6–101 (when published). Selected battalions may be directed to install trunk wire circuits to the corps artillery fire-direction center.

c. Observation battalion. The communication system used in the observation battalion is covered in FM 6–120.

Section VIII. SURVEY

53. GENERAL. a. Common control. In order to mass the fires of the artillery with the corps it is essential that all artillery with the corps have common control. Common control for the corps front is essentially the same in general concept as that for the division front. When stabilization follows or precedes a coordinated effort, common control is established.

b. Time required. Average time required to complete a corps artillery survey cannot be stated (see par. 21b). As a guide the minimum time allowed for survey in planning a corps operation should be 12 hours.

54. AGENCIES AVAILABLE. The corps artillery commander has the following survey agencies available:

a. Survey elements of the organic observation battalion.

b. Survey elements of attached brigades and battalions.

c. Survey elements of division artillery units.

d. Survey facilities of engineer topographic units of the corps and army. These facilities are secured through the cooperation of the corps engineer officer.

55. PLAN. The corps artillery survey plan must be progressive and provide for—

a. Extending control to points accessible to subordinate units having survey personnel capable of expanding this control.

b. The gathering and dissemination of survey data.

56. OBSERVATION BATTALION. a. General. The observation battalion executes three general missions: survey, intelligence, and conduct of fire. In planning the amount of survey to be executed by the observation battalion, the corps artillery commander must consider the urgency of the other general missions. If corps control is sought simultaneously with the other missions, survey parties from the letter

batteries must be left free to establish sound and flash installations.

b. Survey officer. The observation battalion commander is the corps artillery survey officer. Under the direction of the corps artillery commander, the survey officer—

(1) Plans the corps artillery survey.

(2) Coordinates the survey of the observation battalion with other artillery units with the corps.

(3) Maintains liaison with the topographic engineer unit operating with the corps.

(4) Secures and distributes control data from the topographic engineers.

(5) Establishes a survey information center for gathering and disseminating survey information.

c. Origin of control. The origin of common control for corps artillery survey is either arbitrary or true geodetic.

(1) *Arbitrary.* Arbitrary control should approximate true geodetic control in direction and altitudes to be used in connection with metro data.

(2) *True geodetic.* These data are procured from topographic engineers or existing maps.

57. TOPOGRAPHIC ENGINEERS. The army topographic battalion and topographic companies attached to the corps may be expected to assist corps artillery survey. The primary mission of these units is revision of maps and reproduction in quantity of photomaps, overlays, maps, and charts. Their secondary mission is the establishment and dissemination of survey control. These units have survey parties capable of establishing survey control sufficiently accurate for artillery needs. Survey parties from these may be attached to the observation battalion or are given the mission of establishing survey control accessible to the observation battalion (FM 5–6).

58. FIRING CHARTS. a. Grid sheet. Survey procedure with the grid sheet in corps artillery survey is the same as that used in division artillery. (See sec. VIII, ch. 2, and app. II.)

b. Photomap. Survey procedure with the photomap in corps artillery survey is the same as that used in division artillery (see par. 23c). When the photomap is superseded by a grid sheet firing chart, accuracy of restitution from the photomap to the grid sheet is improved by the use of corps surveyed control points for restituting in various sections of the photomap.

c. Battle maps. If good battle maps are available, common control is automatic. Corps reference points must be designated by coordinates and altitude. Poor or small scale maps should be used only for orientation, intelligence, and planning of fires.

59. VALUE OF REGISTRATION IN PROVING SURVEY. The greatest asset to accurate gunnery is registration. Regardless of the accuracy of survey, firing charts, and available metro data, registrations should be made to eliminate errors. (See also FM 6–20.)

CHAPTER 3

WAR DEPARTMENT RESERVE ARTILLERY

Section I. GENERAL

60. WAR DEPARTMENT RESERVE ARTILLERY. All artillery units which are not organic to divisions and corps are designated as War Department Reserve Artillery. These units are available as a pool for allotment to armies, groups of armies, or task forces according to their needs. War Department Reserve Artillery consists of separate battalions, groups, brigades, group headquarters, and brigade headquarters. War Department Reserve Artillery attached to an army is usually reattached to subordinate corps.

Section II. GROUPS

61. ORGANIZATION. The group consists of a group headquarters and such battalions as are attached, usually three or four. Attached battalions may be of the same or of different calibers and types. The composition of any group may be altered from time to time.

62. DUTIES OF COMMANDERS. The duties of the group commander are to—

a. Formulate plans, based on his assigned mission, for the tactical employment of the group.

b. Assign definite missions, position areas, and zones of fire to his subordinate units.

c. Exercise fire direction; supervise and coordinate reconnaissance, survey, communication, liaison, observation, intelligence, and displacement.

d. Foresee need for, procure, and insure distribution of maps, photomaps, and air photographs.

e. Supervise training.

63. DUTIES OF STAFF. The organization of the group staff is prescribed by Tables of Organization (see fig. 15). The duties of the staff are similar to those of the division artillery staff listed in paragraph 10.

Section III. BRIGADES

64. ORGANIZATION. The brigade consists of a brigade headquarters and such groups and separate battalions as are attached. Brigade headquarters may be used to assist in

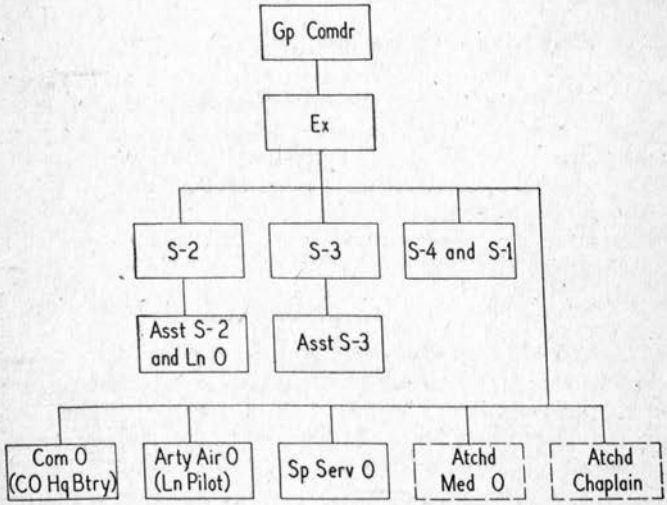


Figure 15. A type organization of the group staff.

the control of a number of groups or battalions. When army retains artillery units under its control, brigade headquarters are usually used to control these units and to supervise their training. The composition of any brigade may be altered as required.

65. DUTIES OF COMMANDER. The principal duties of the brigade commander are to—

a. Prepare plans for the employment of the brigade based on assigned mission.

b. Assign definite missions, position areas, and zones of fire to subordinate units.

c. Foresee need for, procure, and insure distribution of maps, photomaps, and air photographs.

d. Furnish meteorological data to subordinate units.

e. Direct the combat of his brigade; supervise and coordinate reconnaissance, survey, communication, liaison, observation, intelligence, displacement, and training.

66. BRIGADE STAFF. The composition, organization, and functions of the brigade staff are similar to those of a division artillery staff.

Section IV. ARMY ARTILLERY

67. GENERAL. There are no organic army artillery headquarters or units. The artillery allotted to army is habitually attached to the various corps. Army may in unusual situations retain heavy artillery for special long range missions.

68. ARMY ARTILLERY OFFICER. The army artillery officer is the senior officer in the field artillery section of army headquarters. He exercises no tactical command. There is no direct chain of artillery command from army to corps. The army artillery officer's instructions for the artillery with a corps are issued to the corps commander in the name of the army commander. The principal duties of the army artillery officer are to—

a. Make a continuous estimate of the situation from the artillery viewpoint; be prepared to submit to the army commander, before that commander formulates his plan, an estimate of artillery requirements and recommendations for the employment of the artillery with the army.

b. Formulate the artillery plan, based on the approved recommendations, for the employment of the artillery with the army, covering particularly—

(1) Allotment of War Department Reserve Artillery to the various corps in accordance with the army scheme of maneuver. Some considerations affecting the allotment of artillery to corps are—

(*a*) Mission of the army; progress expected; resistance to be overcome in reaching initial objectives; artillery available.

(*b*) Types best suited for the operation, considering speed of advance, character of resistance, character of terrain, roads, and road net.

(2) Assignment of such general missions and lateral limits to be reached by fire as are required for coordination between units of artillery with the army and with adjacent armies.

(3) Coordination of the movement of War Department Reserve Artillery allotted to the army with other essential movements, considering—

(*a*) Availability of routes and concealed positions.

(*b*) Time and place that control of movements is decentralized to lower unit commanders.

(*c*) Secrecy of movement; restrictions on occupation of positions.

(4) Coordination of artillery with the Navy or Air Forces.

(5) Collection and dissemination of general information pertaining to hostile artillery.

(6) Coordination of visual and photographic missions by high performance airplanes.

(7) Determination of the artillery needs for maps, photomaps, and engineer surveys; arrangement for their procurement in order of priority.

(8) Allocation of artillery ammunition to corps.

c. Supervise the training of artillery with the army as directed by the army commander.

69. STAFF OF ARMY ARTILLERY OFFICER (see fig. 16). The functions of the staff include—

a. S–2 section. Coordination of requests for and procurement of timely air photography, procurement of visual observation for the artillery by high performance planes; determination of needs for maps and engineer surveys; dissemination of general artillery intelligence.

b. S–3 section. Estimation, in conjunction with S–4 section, of artillery requirements; advanced planning for allocations to subordinate echelons; inspection of training.

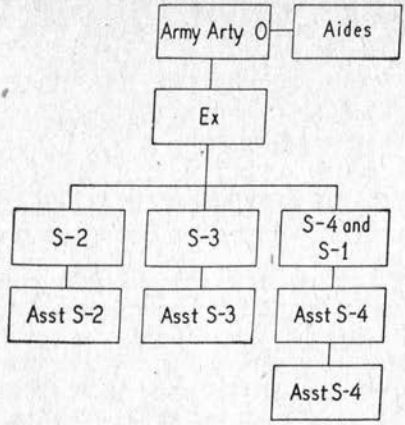


Figure 16. A type organization of the staff of army artillery officer.

c. S–4 section. Collaboration with S–3 section in estimating artillery requirements; advanced planning for allocation of ammunition to subordinate units; supervision of artillery supply. The assistant S–4's are normally used as "trouble shooters" for artillery supply.

CHAPTER 4

ESTIMATE OF ARTILLERY REQUIREMENTS

70. GENERAL. The artillery requirements, and the practicability of assembling the necessary artillery and ammunition at the time and place desired, must receive careful consideration when the plans for any operation are being prepared. Lack of sufficient artillery means may indicate postponement or abandonment of the operation. Artillery officers of armies, corps, and divisions are called upon by their commanders to estimate the artillery requirements for a contemplated operation. Such estimates are made for one or both of the following purposes:

a. To determine what artillery weapons (tanks and tank destroyers used as reinforcing artillery), headquarters, and ammunition are required to support the contemplated operation effectively.

b. To determine allocations to subordinate echelons.

71. RESPONSIBILITY FOR ESTIMATES. The artillery officer of the echelon ordering or conducting the operation is primarily responsible for making the estimate of artillery requirements. Since his immediate commander has the most complete conception of the plan of the operation as a whole, this artillery officer can best estimate the artillery means required to accomplish the desired result. He may require subordinate artillery officers to assist in this estimate or to check the results.

72. GENERAL FACTORS AFFECTING ESTIMATES. The amounts and types of artillery required for an offensive action depend mainly on the plan of the commander and the character of the enemy resistance expected. Generally, units

on the defensive will be allotted only limited amounts of artillery, in order to permit the massing of artillery means on other fronts where decisive action is contemplated. Before accepting the final estimate of the amount of artillery required, the artillery officer must determine whether the necessary ammunition can be supplied in the time available.

73. DETAILED FACTORS FOR ESTIMATE OF WEAPONS AND AMMUNITION. **a.** Artillery requirements vary so widely that no fixed data can be furnished. FM 101–10 contains tables showing prescribed loads, effects of projectiles, units of fire, and expenditures of ammunition in terms of units of fire for various types of operations; these are of assistance in making initial artillery estimates. As a campaign progresses, however, experience data applicable to the conditions will be accumulated to form a guide for the conduct of future operations. Among the factors that must be considered in estimating artillery requirements of weapons, headquarters, and ammunition are—

(1) Type of operation (attack, defense, delay, special operation, etc.).

(2) Terrain and weather.

(3) Comparative strength of our own and opposing forces, to include morale, training, supply.

(4) Form of maneuver.

(5) Assistance that may be expected from air forces, armored forces, etc.

(6) Strength, types, and ranges of opposing artillery.

(7) Time available.

(8) Front and depth of main and secondary attacks.

(9) Ammunition available, quantity and type.

(10) Allowance for losses during combat.

b. The following tables are based on World War (1914–1918) figures. They are applicable only to the degree that conditions of the prospective combat approach the combat conditions of that war.

Table I. Weapon requirements, attack against an organized position

	Batteries per 1,000 yards of front			
	Light	Medium or heavy	Total	RR or other long-range artillery
Maximum	18	18	36	1.5
Normal	14	13	27	1
Minimum	10	10	20	.....

Note 1. Maximum. The enemy is on the alert, is expecting an attack, and is disposed on several positions in depth, each of which is thoroughly organized, supplied, and equipped.

Note 2. Normal. The enemy is surprised to some extent, has not been reinforced, and is less well organized, supplied, and equipped than is indicated in note 1.

Note 3. Minimum. The enemy has fallen back during preliminary combat, and occupies a poorly organized position or is expected to fall back because of pressure elsewhere. The minimum requirement is usually applied to the front of a secondary attack.

Table II. Weapon requirements, attack in open warfare

	Batteries per 1,000 yards of front			
	Light	Medium or heavy	Total	Long-range artillery
Main attack	5	4	9	1/3
Secondary attack	3	3	6	.....

Table III. Weapon requirements, defensive combat

	Batteries per 1,000 yards of front			
	Stabilized defense		Open warfare	
	Light	Medium or heavy	Light	Medium or heavy
Maximum	6	6	2	1
Average	3	3	1	1
Minimum	2	2	1	1

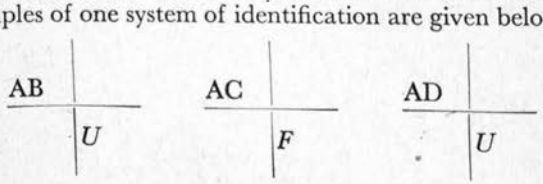
Note 1. Maximum. Protracted defense.
Note 2. Average. Defense against well-prepared attack.
Note 3. Minimum. Coordinated attack not anticipated.

APPENDIX I

COUNTERBATTERY INTELLIGENCE AIDS

1. IDENTIFICATION AND GRAPHIC LOCATION OF BATTERIES. **a.** Enemy batteries are assigned reference letters. Usually each battery as it is located is given a two-letter designation, AB, AC, AD, etc. This in effect names the battery, i. e., Able Baker, Able Charlie.

b. The location of an enemy battery is shown graphically. The graphical location may be indicated by a point in the center of a circle, by the intersection of two perpendicular lines, or by the standard military symbol with a single line at right angles to the center of the base of the symbol. Probable accuracy of location is denoted by the letters *F* and *U*. The letter *F* means that the location is fixed with sufficient accuracy for the position to be attacked by a standard battalion concentration of light artillery or larger caliber. The letter *U* means the location is unfixed and should not be attacked with unobserved fires until a more accurate location is obtained. Colors may be used to indicate caliber. Examples of one system of identification are given below:



2. RECORDS AND CHARTS. The following records and charts are usually maintained at the corps artillery fire-direction center. These records may be abbreviated or discontinued during mobile situations.

a. The *counterbattery journal* (fig. 17) is a chronological record of counterbattery operations. It includes entries of messages sent and received.

b. The *counterbattery register* (fig. 18) is divided into short time periods. Messages are entered in the register in the time space during which the activity reported by the message occurred. The register is a convenient means of linking together messages referring to the same activity but received at different times.

c. The *enemy battery file* (fig. 19) is a record of all data pertaining to each enemy battery. Each enemy battery is listed on an individual card whereon are entered the identifying battery letters, coordinates, caliber, periods of activity, objectives, and cross references to other records (such as the register or journal) containing remarks referring to that battery.

d. The *counterbattery intelligence map* shows the enemy situation, including hostile positions, zones of fire, and tactical organizations; our own observation posts, their fields of observation, and reference azimuths pertaining to each; and locations of enemy shelling. Overlays may be required.

e. *File—air photographs.* Air photographs are usually filed in envelopes on which are listed the identifying numbers of the photographs they contain. Enemy batteries located on each individual print are listed on the back of the photo.

f. The *photo key* (fig. 20) is a grid showing the areas covered by individual photos.

g. The *counterbattery operations* chart is essentially a fire-direction chart showing locations of our advanced elements, our battalions and their zones of fire, and a plot of targets and notation of fires delivered.

UNIT:
PERIOD:

Entry No.	How transmitted	Time received	Time signed	Source	Extract of message
1	Tp	0815	0802	AF	Enemy Btry in position.....
2	Tp	0817	0814	FR	AT gun in position.....
3	Tp	0829	0824	2d Div	6 rds 150-mm How landed on CR 1163 between 0818 and 0821. Fragments en-route to fire-direction center.
4	Tp	0829	0823	SR	150-mm How/1 gun firing 0820.
* *	* *	* *	* *	* *	* * * *
15	Rad	1220	1213	2d Div	50 rds 150-mm How on 2d Div reserves at (49.3–88.6) at 1210.
16	Msgr	1310	0855	2d Div	Fragments 150-mm How....
17	TP	1330	1330	402d FA Bn	Adjusted coordinates counter-battery mission (53.72–88.68).

Figure 17. Counterbattery journal.

EXPLANATION OF FIGURE 17

Note. The journal includes all messages received or transmitted, and all counterbattery missions executed.

Explanations of entries.

Message 1 As a result of study of photo V6. Information telephoned in by air liaison officer. Photo later by messenger. Observation battalion instructed to observe in this vicinity.

Location of enemy unit	Action taken		Remarks, including journal cross reference
	Time	Nature	
52.1–82.6.....	0817	Obsn Bn.....	In woods (photo V6)
50.15–79.30 (P)....	0819	To G–2.....	
.....	.....	.....	Direction of fire unknown (4) (16).
53.72–88.63 (Q)...	.....	.....	Registration (3).
* * * *	* *	* * * * *	* * * *
Vicinity woods at (54.0–88.0).	1223	Counterbattery assigned to 402d, 511th FA Bns.	
.....	.....	.....	(3).
.....	.....	.....	Observed by liaison plane.

Figure 17. Counterbattery journal—Continued.

Messages 2 and 4 Letters P and Q indicate accuracy assigned by observation battalion (see FM 6–120).

Message 16 Fragments tagged by 2d Division with time and place found, and forwarded by messenger. Original report (message 3) telephoned in to fire-direction center immediately.

Message 17 All battalions, upon completing *observed* counterbattery fires, report adjusted target coordinates as determined by firing.

6 May 1943

Time period	Messages	Source time received	Journal number
0800 to 0815.....	Enemy Battery in position/52.1–82.6/0802.....	AF photo/0815....	1
	AT gun in position/50.15–79.30/accuracy P/0814.....	FR/0817.....	2
0815 to 0830.....	6 rds/150 How/CR 1163/0818–0821—Fragments being sent to fire-direction center.	2d Div/0829.....	3
	150 How/1 gun firing/53.72–88.63/accuracy Q/0820...	SR/0829.....	4
0830 to 0845.....	Enemy Btry firing/51.0–90.1/accuracy Q/0840.....	SR/0843.....	8
0845 to 0900.....	.....	.....	

Figure 18. Counterbattery register (a 1-hour period is illustrated).

Enemy Btry: *AC*
Caliber: *150 How*
Z of fire: *Ca 3800–5000*
Unit: *15th Panzer?**
**

Journal reference	Caliber, No. of guns	Activity	Date, hour active	Coordinates
7	?	Arty in position	0930 5 May	54.0–88.6
13	150/?	20 rds	1100	estimated Ca 1600
25	150/4	Firing	1540	53.7–88.5
4	150 How/1	Firing	0820 6 May	53.72–88.63
***3	150 How/?	6 rds	0821	?
15	150 How/?	50 rds	1210	Vicinity woods (54–88)
17	****			Adjusted coordinates 53.72–88.68

*15th Panzer Division occupies area in which this battery is located (from G–2).

**Data above this line are entered in pencil, corrected as necessary.

***Message No. 3 was held in abeyance pending further informa-

Figure 19. Enemy battery file.

Coordinates: *53.72–88.68*
Accuracy: u F

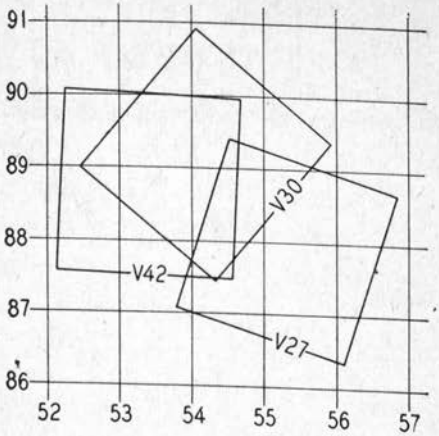
Counterbattery by *402d, 403d, 404th 511th FA Bns*

Accuracy	Target	Photo	Source	Remarks, including action taken
U		V13	AF	In woods
	Woods at (48.5–88.2)		2d Div	Time fire, no casualties
U	?		SR	
F	?		SR	1-gun registration?
	CR 1163		2d Div	150-mm fragments found
	2d Div Res (49.3–88.6)		2d Div	Counterbattery by 402d, 511th FA Bns
F			402d FA Bn	Counterbattery executed

tion, was entered after message No. 4 established identity of battery responsible.

****Battalions report adjusted target coordinates (stripped of corrections) when fire can be adjusted by observation.

Figure 19. Enemy battery file—Continued.

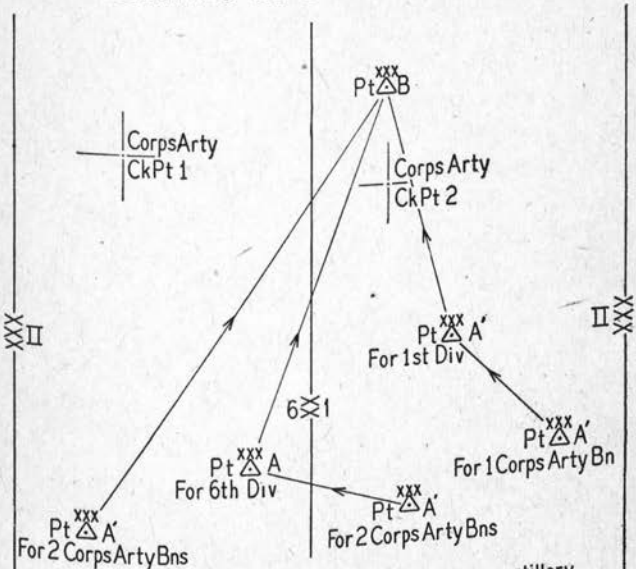


Note: Rectangles indicate area covered. Colors may be employed to distinguish between photographs.

Figure 20. Photo key.

APPENDIX II

EXAMPLES OF SURVEY CONTROL

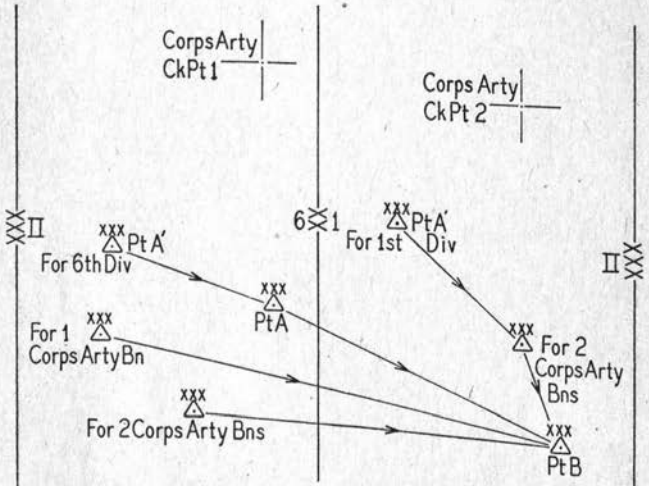


NOTES: 1. Point A with direction AB is the origin of corps artillery control. This control may be arbitrary, taken from a small scale map, or furnished by topographic engineers. Point A is in position area, Point B is in target area.

2. Each division and corps artillery battalion is furnished the coordinates, altitude, and ground location of a Point A' near their position area. In addition, they are furnished the coordinates and ground location of another Point B (or A'), or the Y-azimuth to Point B (or A'). The two points must be intervisible.

3. Corps artillery furnishes the coordinates, altitude, and ground location of check points and points for restitution.

Figure 21. Example of corps artillery survey control; grid sheet.

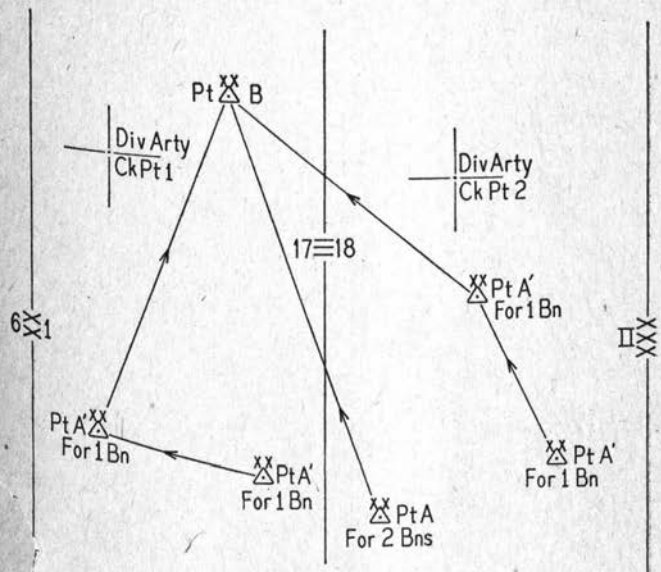


NOTES: 1. Point A with direction AB is the origin of corps artillery control. This control may be obtained by any one of the methods listed in Notes for Fig. 21.

2. The necessary information furnished divisions and corps artillery battalions is the same as shown in Notes for Fig. 21.

3. Points A and B are in the position area.

Figure 22. Example of corps artillery survey control; grid sheet.

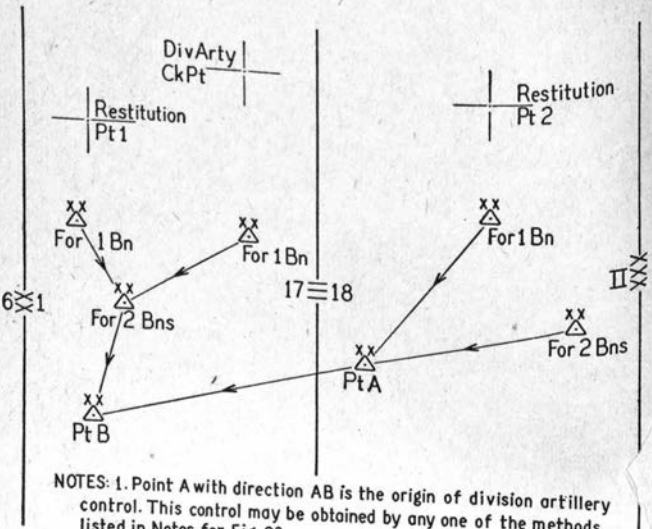


NOTES: 1. Point A with direction AB is the origin of division artillery control. This control may be arbitrary, taken from a small scale map, or furnished by corps artillery. Point A is in position area, Point B is in target area.

2. Each battalion is furnished the coordinates, altitude, and ground location of a point A' near their position area. In addition, they are furnished the coordinates and ground location of another point B (or A'), or the Y-azimuth to point B (or A'). The two points must be intervisible.

3. Division furnishes the coordinates, altitude, and ground location of check points and points for restitution.

Figure 23. Example of division artillery survey control; grid sheet.



NOTES: 1. Point A with direction AB is the origin of division artillery control. This control may be obtained by any one of the methods listed in Notes for Fig. 23.

2. The necessary information furnished battalions is the same as shown in Notes for Fig. 23.

3. Points A and B are in the position area.

Figure 24. Example of division artillery survey control; grid sheet.

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