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APPLIED TACTICS  
JAPANESE ARMY

TRANSLATION  
OF  
JAPANESE MANUAL

REVISED 1938

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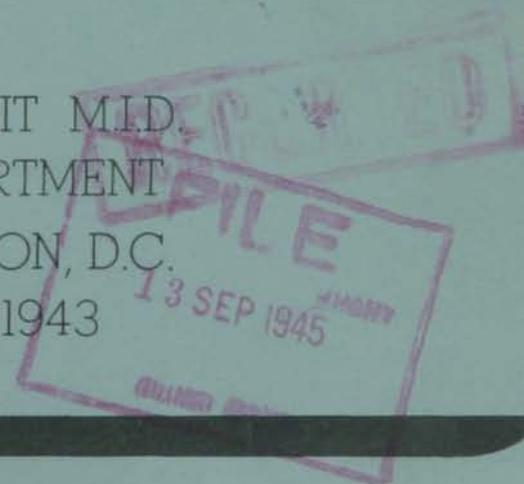
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## APPLIED TACTICS

Translation of "Oyo Senjutsu No Sanko", Revised 1938,  
a Reference Manual on Applied Tactics adopted for use in  
the Japanese Military Academy.

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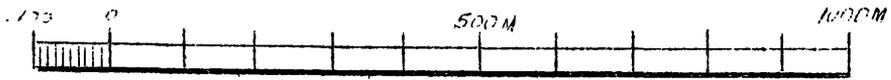
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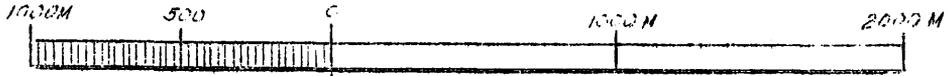
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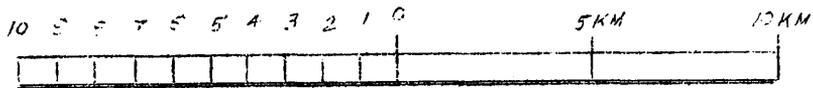
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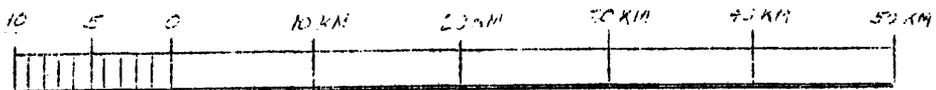
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APPLIED TACTICS  
JAPANESE ARMY ;

CHAPTER 1

COMPOSITION AND EXAMPLES OF ESTIMATES AND DECISIONS

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SECTION I

COMPOSITION

1. Although there are no specially prescribed methods in the writing of decisions and the various types of estimates, the forms commonly used in the study of military tactics and some of the precautions to be taken in writing them will be stated and explained in the following paragraphs:

a. In stating a decision the expression to be used is, "The division will do so and so," but in stating the requirements in an estimate, the expression to be used is, "The division must do so and so," accompanied in both instances by reasons and lines of action. In an estimate of the enemy situation, use the expression, "The enemy will probably do so and so," giving the reasons. In this case it is unnecessary to specify the lines of action.

b. Decisions and requirements must be simple, clear, and concise. This is especially true when the decision is indicated in orders as the commander's plan of action. However, when the lines of action which accompany the decision or requirement are not called for, but are still necessary for indicating the objective of the decision or requirement, it is pertinent to annex a summary like the following: "The division with XX as its objective will advance toward XX line; an element consisting of XX Infantry Battalion and the battery commander's party of XX Artillery Battery will proceed along XX road; and the rest of the main force will proceed along XX road".

c. The reasons for the decision must be written concisely and with logical consistency. When the decisions and estimates are made in the light of the mission, the enemy situation, the terrain, and the condition of our forces, if we are to make clear the reasoning behind the lines of action, it is to a certain extent pertinent for this purpose to compare the decisions or estimates with other possible plans. However, when other plans are rejected, emphasis must be placed upon the reasons for this rejection, and the explanation of factors giving rise to the decision or to the requirement in an estimate should not be ignored.

The simplest form of writing decisions or estimates is a

single paragraph. To facilitate the reading and comprehension of lengthy material, divide the paragraph. For this purpose the enemy situation, the mission, and the terrain may be put in separate paragraphs, or they may be combined and then separated into paragraphs according to some logical plan.

d. In the lines of action which accompany a decision, units must be clearly designated and the movements of all units recorded. In the possible lines of action which accompany the various types of estimates, it is best to indicate the order of battle of units in a meeting engagement, pursuit, or withdrawal and to designate the units whenever the sector has a great influence upon the outcome of the engagement. In all other cases, however, the disposition of troops will be shown by the number of units. (The Infantry will be shown by battalions, other branches by companies, batteries or troops.) In the estimates it is also a common practice to indicate only the movement of the main force of the combat unit, omitting all instructions relative to communication, supply and sanitation.

e. In indicating decisions and various types of estimates of the situation on military sketches, utmost effort should be made to include all matters which can be drawn on the map. Matters which cannot be shown on the map should be explained in separate notes. Decisions and requirements are ordinarily written distinctly in indigo color on the right side of the map. Usually reasons are not stated unless specifically requested.

## SECTION II

### EXAMPLES

The following are merely examples; therefore, they should not be taken to fit all situations.

#### 2. Estimate of the Situation.

##### ESTIMATE OF THE SITUATION OF COMMANDER, 1st DIVISION AS OF 1430.

- A. Requirement: The pursuit element of the division must continue to pursue the enemy to our front, while the main force changes its direction of movement to the sector of the left column and engages the fresh enemy troops that appear from that direction.
- B. Reason:
1. Fresh enemy forces are coming to attack our left column, while the enemy main strength to our front will reorganize and strike back at any opportune time.
  2. The enemy main strength to our direct front has escaped

to the right bank of the Gempei River, and although it is desirable, from the standpoint of fulfilling our mission, to strike him again in order to disable and prevent him from fighting further, it is questionable whether or not the left column can secure the rear of the division against fresh enemy troops while that action is being carried out. Therefore, the division out of necessity must first of all annihilate the fresh enemy troops and, after securing its flanks and rear, will oppose the hostile elements on the right bank of the Gempei River.

3. The division in order to fulfill its mission, must maintain a firm footing on the right bank of the Gempei River, and at the same time the plans of the division main strength to halt the pursuit must be concealed. Therefore, a pursuit detachment must continue the pursuit to the right bank of the Gempei River. Because the enemy has retreated, it is possible to crush him with the resolute attack of a single element. Moreover, even if the enemy counterattacks, the rugged terrain of the right bank of the Gempei River will enable the pursuit force to hold the enemy while the main elements are destroying the fresh hostile forces.

C. Lines of Action:

1. The pursuit force will continue to pursue the enemy which is on its front and thus protect the flanks and rear of the division.
2. The units of the left column will continue the attack.
3. The 2nd Infantry will move rapidly toward Doi under the command of the left column commander.
4. The 4th Infantry will advance rapidly toward Otako.
5. The Field Artillery will quickly occupy positions in the vicinity of Mt. Bogsho, and support the main elements of the division in the attack.
6. The division commander will rapidly proceed toward Otako.

3. Estimate of Enemy Situation.

ESTIMATE OF THE ENEMY SITUATION OF THE COMMANDER,  
1st DIVISION, AS OF 1600.

A. Requirement: The enemy will probably defend stubbornly his present position and will await the arrival of reinforcements from the rear.

B. Reason:

1. The enemy is now forced to relinquish a strategic sector of his position to our forces. However, he is expected to rely on his established position at the rear and offer stiff resistance. Therefore, he will await the arrival of reserves which are rapidly approaching from nearby, and will plan to recover his losses.
2. If the enemy retreats at this point from his present position, it will be practically impossible for him to

make a stand again in the Yamagata area. Eventually, he is apt to be annihilated, along with his reserves in the defiles of the Mt. Ueno area. Not only is this true, but also because of the fact that the left flank of the main force will become exposed, even if he should withdraw, he must strive to the utmost to maintain his present position during the day and to withdraw under cover of darkness.

4. Terrain Estimate for a Meeting Engagement.

TERRAIN ESTIMATE FOR A MEETING ENGAGEMENT OF THE 1st DIVISION,  
IN THE VICINITY OF XX.

A. Requirement: The division must engage in decisive combat in the area of XX, east of XX, attacking the enemy in such a way as to force him into the swampy area west of XX.

B. Reason:

1. As yet there is no information to determine whether the unit equipped with cannon which is moving in the vicinity of XX is the point of the advance guard of the main enemy force or an advance detached unit. However, it is definitely known that the main enemy force has crossed the XX River Valley and is moving steadily on the plateau south of the river. No matter where the forward element of the main hostile force is, the enemy, after having first made XX Hill secure and obtained a firm footing in the area on the south bank of XX River, will probably attack in the direction of our left wing.

2. In its plan to engage in decisive combat in the area of XX Hill, our main force, after occupying the hill, is in a position to take advantage of the main enemy force's crossing of the XX River Valley. But because our main force must make a frontal attack while its left wing is being restricted by the swampy area, the success of the engagement will be slight. Moreover, if the unit which is moving in the vicinity of XX is the point of the advance guard of the main hostile force, we must bear in mind that our advantage over the enemy by reason of his delay in crossing the river valley has been reduced, and consequently we must revise our estimate of this advantage.

Therefore, it is of advantage for the division to engage in decisive combat in the area of XX, east of XX, to drive the main hostile force into the swampy area west of XX, and to annihilate him with a single attack. In order to carry this out and thus aid the execution of our main plan, a powerful element must attack in the direction of the XX Hill sector and drive the main hostile force into the western sector.

C. Possible Lines of Action:

1. The right column will immediately attack the enemy in

the direction of XX and move in the direction of XX.

2. The advance guard of the left column will attack the enemy in the direction of XX hills and attempt to check the main hostile force in the west in order to give our main force an advantage. The main elements of the Engineer Battalion will from now on be under the direct command of the division commander.

3. The Artillery of the main body will immediately move to XX, in the vicinity of XX. It will support the right column and at the same time will hamper the enemy deployment. Two airplanes will cooperate.

4. The Engineer Battalion will be located at XX after having assisted in the occupation of artillery positions.

5. The main elements of the left column will diverge as follows:

2nd Infantry .....XX, in vicinity of XX  
4th Infantry & main elements  
of Medical Detachment ....XX, in vicinity of XX

6. The attached air unit, besides continuing its former mission, will reconnoiter all movements of the main hostile force. Two planes will cooperate with the Artillery.

7. The Cavalry will shift towards XX and envelop the enemy left flank.

8. The field train will halt with the head of the column at XX.

9. The advance transport (XXXX) will move towards XX, and the remaining transport elements will halt south of XX.

10. The division commander will proceed to XX.

5. Terrain Estimate for an Attack.(see Figure 1)

6. Terrain Estimate for Defense,(see Figure 2)

7. Written Decision,

DECISION OF THE COMMANDER, 1st DIVISION, AS OF 2100.

A. Decision: The division will leave the billeting area early tomorrow morning, the 3rd, and move toward the line connecting Kawayoke, Midaregawa-mura, and Michiman with the object of attacking the enemy in the Yamagata area.

TERRAIN ESTIMATE FOR AN ATTACK

Figure 1, Page 6a, is a Sketch Showing Terrain Estimate For The  
1st Division Attack On The Enemy Position in The Yokkaichi  
Area.

Requirements: The division will deploy in the sector extending  
from the Tada area through Yamamoto and Yokota to the  
Tagawa area. The main effort will be directed towards  
Kobara from the Yoshitomi area in such a way to cut off the  
enemy routes or retreat.

Note: Our advance cavalry will harass the enemy left flank  
from the lower reaches of the Minagawa.

Scale

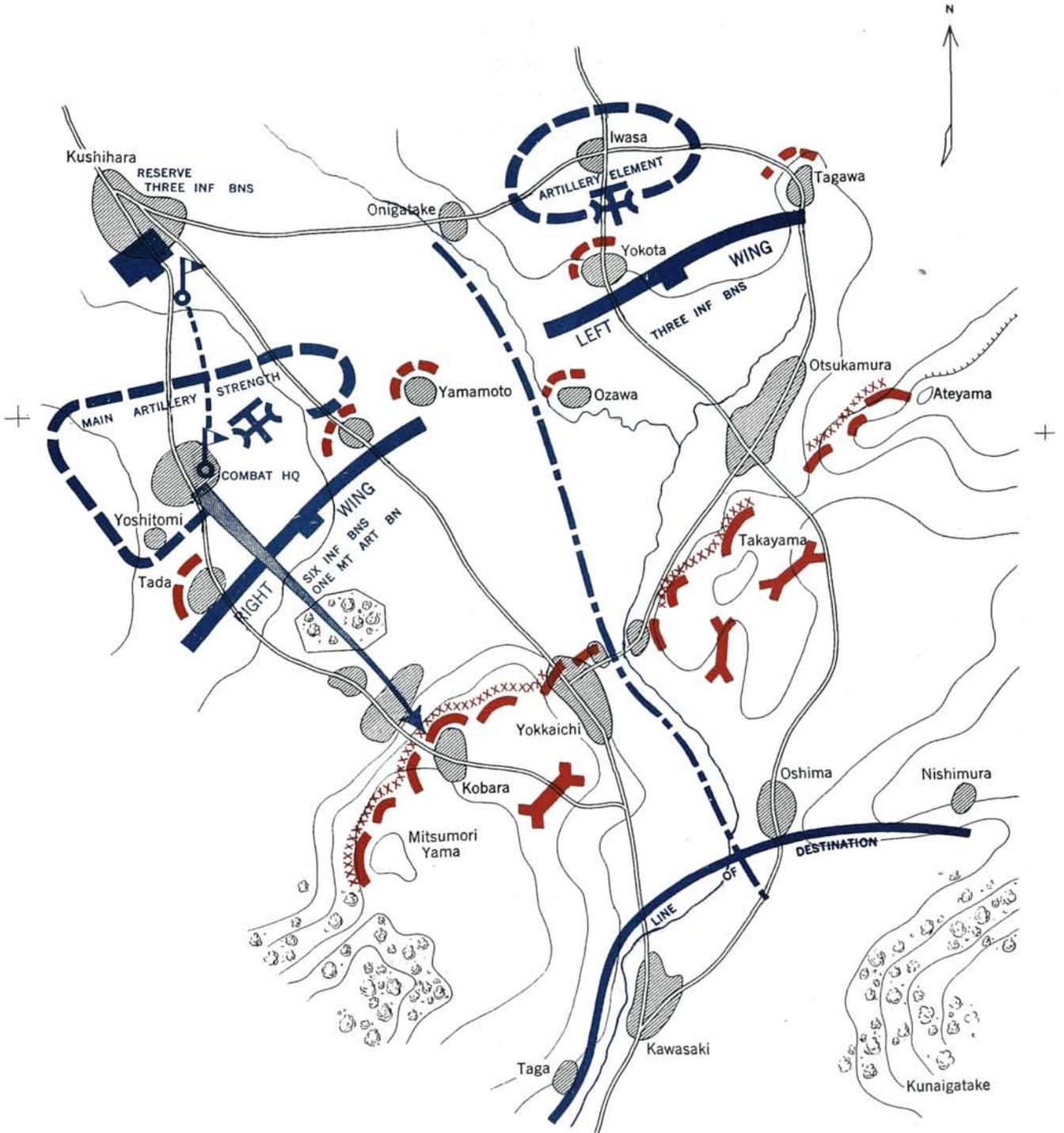
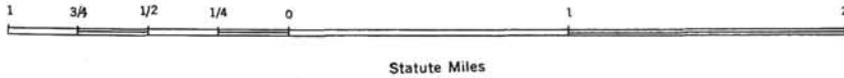


Fig. 1

Drawn in Cartographic Section, Dissemination Unit M. I. S.

TERRAIN ESTIMATE FOR DEFENSE

FIGURE II



Fig. 2 Sketch Showing Terrain Estimate for Defense of the Yamada Area by the 1st Division.

Requirement: The division will occupy the positions indicated on the sketch. After neutralizing the hostile offensive fire power, it will shift to the offensive from its left wing area in such a way as to envelop the enemy right wing.

B. Reason:

1. The enemy, having occupied the area in the vicinity of Yamagata, is awaiting the arrival of reserves and will probably launch an attack. The main enemy position is not clear, but, judging by the relation between the enemy strength and the terrain of the Yamagata area as well as the sectors occupied by both main forces, it is likely to be in the area south of Tendo and north of Yamagata, while a strong element will probably occupy the Tendo area.

2. In view of its mission, the division must quickly crush the enemy in the Yamagata area before he can be reinforced. Therefore, taking into account the condition of its elements and the distance to its objective, the division must leave the billeting area early tomorrow morning.

3. Since the enemy situation is not yet clear, it is best for the division, in order to facilitate subsequent operations, to take as its immediate objective a line connecting Kawayoke, Midaregawa-mura, and Michiman. There are three roads which can be used for this operation: the Kawashima-Nagatoro-Hanyu-Narifu road, the Koshu Highway, and the Tateoka-Higashine-Harazaki road. In the event of combat it would be advantageous to secure a foothold on the hill to the east. Therefore, a strong force must be moved on the last named road; the main strength of the division, to keep its movement unhampered, must move on the Koshu Highway, which is a good road; and a small element must move along the first named road to protect our right flank.

C. Lines of Action:

1. The attached air unit will use the advance airfield at Obanazawa from early tomorrow morning. The main force will reconnoiter the enemy position in the area northeast of Yamagata. An element will reconnoiter the hostile rear echelon and maintain liaison between columns. Two planes will be assigned to cooperate with the artillery after 0600.

2. The advance guard of the division (1st Cavalry Squadron less four squads of the 2nd Troop; 1st Battalion, 4th Infantry) will maintain its present position and cover the movement of the division. Its main force will reconnoiter the enemy condition in the area northeast of Yamagata and the terrain, especially that of Kuratsukawa, Sugawa, and Shirakawa. An element will reconnoiter the hostile rear echelon.

3. The right column (1st Battalion, 2nd Infantry; one cavalry squad; 1st Battery, 1st Mountain Artillery; one platoon of 2nd Engineer Company) will leave the south end of Kawashima at 0330 and move on the Kawashima-Nagatoro-Hanyu-Narifu road towards Kawayoke.

4. The advance guard of the center column (1st Infantry Brigade less 2nd Infantry; one cavalry platoon less two sections; 1st Battalion, 1st Field Artillery; 1st Engineer Battalion less three platoons; one-third of the Medical Detachment) will leave the south end of Tateoka at 0400 and move on the Koshu road towards Midaregawa-mura.
  
5. The main body of the center column will move approximately 1500 meters behind the advance guard. Its forward elements will consist of the Division Communication Unit, the Radio Platoon, and the 1st Battery of the 1st Independent Heavy Field Artillery. Its remaining elements will follow in the order listed: Division Headquarters, 2nd Infantry less 1st Battalion; one platoon of 1st Engineer Company; 1st Field Artillery less 1st Battalion and all elements of 2nd Battalion except 6th Battery; 1st Battalion, 1st Mountain Artillery less 1st Battery; 1st Battalion, 1st Heavy Field Artillery; 4th Infantry less 1st Battalion; Field Artillery Regimental Ammunition Train; one platoon of Mountain Artillery Regimental Ammunition Train; two platoons of Heavy Field Artillery Regimental Ammunition Train; one-third of Medical Detachment; 1st Independent Balloon Company.
  
6. The left column (2nd Infantry Brigade less 4th Infantry; one cavalry squad; 2nd Battalion, 1st Field Artillery, less 6th Battery; one platoon of 2nd Engineer Company; one-third of Medical Detachment) will depart at 0400 from the three-road junction located 1000 meters southeast of Tateoka and move on the Tateoka-Higashine-Harazaki road towards Michiman.
  
7. The Mobile Anti-Aircraft will take the following positions at 0500 and cover the division's assembly and departure:
  - 1st Mobile Anti-Aircraft Unit - Natori
  - 2nd Mobile Anti-Aircraft Unit - Southeastern end of Nagatoro.
 Thereafter, they will provide air protection to the column by moving from one position to another along the Koshu Highway.
  
8. The field train under its commander will follow two kilometers behind the advance transport.
  
9. The Advance Transport, consisting of one infantry ammunition train, one artillery ammunition train, and two field hospitals, will move in the rear of the center column. The remaining elements of the Transport Unit will leave Nagizawa at 0700 and move towards Kanaya.
  
10. A summary of decisions and lines of action as well as the enemy situation will be reported to the Army commander.

5. PLAN FOR DIVISION ROUTE MARCH

PLAN OF MARCH, 1ST DIVISION, APRIL 1 - 3

DISTRIBUTION	1st Column		2nd Column	3rd Column	4th Column
	1st Echelon	2nd Echelon			
UNIT	Major General X, Comdr. X 1st Inf. Brig (less 2nd Inf) 1 pl. Cav. (less 1 squad) 1st Bn. 1st F. A. 2nd Eng. Co. 1/5 Med. Detch. X Supply element (s)	Colonel XX Inf., Comdr. Div. Hdqrs. 2nd Inf. Comm. Unit Cav. Regt. Field Tr. X Supply element (s)	Major General XX, Comdr. 2nd Inf. Brig.  1 squad of Cav.  X Supply element (s)	Colonel XX, Comdr. 1st F.A. (less 1st Bn) F.A. Regt Ass. Tr. 1st Eng. Bn (less 2nd Co.) Med Detch. (less 1/3) X Supply element (s)	Col. XX, Trans., XX, Comdr.  Transport (less Med Detch.)  X Supply element (s)
ROUTE	Kofu- Sukizawa- Torosuzawa- Nakashuku- Shizuoka Road		Toyosumi-Inazumi-Ichikawa- Omon-Iwana-Nagamuki- Iwabuchi-Urahara-Shizuoka Rd.	Kofu-Usaguchi-Oomiya- Yoshihara-Shizuoka Rd.	Kofu-Yoshida-Gotenba- Numatsu-Hara Road
April 1st					
Point of Departure	Vicinity of southwestern extremity of Kofu		Vicinity of southern extremity of Toyosumi	Vicinity of southern extremity of Kofu	Vicinity of eastern extremity of east Kofu
Time of Departure	0530	0730			
Long resting place	South of Sukizawa	North of Aoyagi			
Billeting Area	Between Shimoyama & Kirishihi	Between Nishijima & Sukizawa	Between Ichinose & Ochi	Between Shojin & Usaguchi	Between Funatsu & Fujinoki
Length of March	9 Ri (22.0 miles)	6 1/2 Ri (15.9 miles)	8 Ri (19.5 miles)	6 Ri (14.7 miles)	8 Ri (19.5 miles)
April 2nd					
Point of Departure	Billeting area for each echelon		Vicinity of southern extremity of Shiro		
Time of Departure	0630	0730			
Long resting place	South of Hakano	North of Koshisawa			
Billeting Area	Between Kousane & Torosuzawa	Between Nambu & Hikarigawa	Between Nagamuki & Uchibune	Between Oomiya & Kitayama	Between Gotenba & Subashiri
Length of March	7 1/2 Ri (18.3 miles)	7 Ri (17.1 miles)	8 1/2 Ri (20.7 miles)	9 1/2 Ri (23.1 miles)	8 1/2 Ri (20.7 miles)
April 3rd					
Point of Departure	Billeting Area for each echelon		Vicinity of southern extremity of Shiro		
Time: Departure Arrival	0530 1700	0630			
Long Resting place	South of Ogochi	North of Shishihara			
Billeting Area	Between Irie & Mine	Between Yokosuna & Nakayado	Between Doyu & Kita	Between Kamizawa & Susukihara	Between Ipponmatsu & Funatsu
Length of March	8 Ri (18.5 miles)	9 Ri (22 miles)	8 Ri (19.5 miles)	7 Ri (17.1 miles)	10 Ri (26.4 miles)
Remarks	The supply platoons assigned to the 1st and 2nd echelons will stay between Tagi and Kojima during the march on April 3 and billet there.		End of column will complete passing through Iwabuchi before 1200, April 3rd. However after 1000 have the supply platoon pass through Onakasato via Oomiya to Yoshihara and billet there.	March so as to pass through Fujigawa after 1200 on April 3rd. However have the Provision and Forage platoon remain at Yoshihara and billet there.	

**Cavalry:** The 1st Cavalry (less one platoon) will leave Kofu early on the morning of April 1 and by night of April 3 move with its main force to the area west of Abegawa, establish liaison with the Cavalry Brigade, and reconnoiter the enemy situation in the Hamanatsu area, depending for supplies on the local resources.

**General remarks:** (1) Quartering of troops will be by billeting. For supply the division will depend upon field rations, but will utilize local resources as much as possible. The use of local resources for the 1st column will be supervised by the personnel of the Division Intendance Department, and for the other columns by the respective column commanders.

(2) Replenishment of field train will be at night, except on April 3 the supply companies (except that of the 4th column) will move with empty wagons.

(3) The Division Intendance Department will assemble local resources in the vicinity of Ejiri and Shizuoka.

CHAPTER 2

EXAMPLES OF PLANS

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SECTION I

PLAN FOR A DIVISION ROUTE MARCH

8. Plan for the 1st Division Route March (see Chart, p. 10)

SECTION II

DIVISION PLAN OF ATTACK

9. The Plan of Attack of the 1st Division.

A. Decision: At daybreak tomorrow, (date), the division will launch an attack against the hostile main position, break rapidly through, drive the enemy toward the XX River, directing the main attack toward XX.

B. Instructions:

1. Before daybreak tomorrow, (date), the front line units will move to XX, followed by an artillery preparation of approximately XX hours to destroy important sections of the hostile main position, especially the obstacles, and neutralize the enemy artillery.

2. At (time), the infantry will open the attack and advance to XX line. A major part of the artillery fire will be placed on XX sector.

3. If the hostile position is penetrated, drive the enemy at once toward XX River. At this time, the main strength of the artillery will change its position towards XX sector.

C. Troops.

1. Composition of Tactical Components.

Air Unit

1st Squadron

Right Wing

Commander: Major General XX

1st Infantry Brigade (less 2nd Inf.)

1 squad of Cavalry

1 platoon of Engineers

Left Wing

Commander: Major General XX

2nd Infantry Brigade

2 squads of Cavalry

5th Battery Mountain Artillery

2 platoons of Engineers

Cavalry

1st Cavalry (less 1 platoon)

Artillery

Commander: Colonel XX

1st Field Artillery

2nd Mountain Artillery Battalion (less 1 battery)  
and one platoon of Regimental Ammunition Train

1st Heavy Field Artillery Battalion and 1 platoon  
of Regimental Ammunition Train

1st Balloon Company

Engineers

1st Engineers Battalion (less 3 platoons)

Antiaircraft

1st and 2nd Mobile Antiaircraft

Reserves

2nd Infantry

2. Tactical Missions of Subordinate Units.

Air Unit: Tomorrow, (date), an element will carry out liaison missions while the main force will support the artillery.

Both Wings:

a. Today, (date), before sunset, an element will occupy XX line, where tonight it will cover the movement of the main force of both wings to that area. Movement will commence at (time), and advance made to the line. By (time) preparations for the attack will be completed. Following the artillery preparation the attack will be opened along the whole front and advance made to XX line.

b. The boundary between the zones of action for both wings will be XX line. (The area along this line will be the responsibility of the Right Wing.)

Artillery:

a. One artillery element and the main strength of XX will take position in XX area tonight, (date), and at daybreak tomorrow, (date), will begin preparatory fire. Artillery preparation will be continued until approximately (time) according to the following schedule:

X battalion(s) of Field Artillery to destroy obstacles in the front of the right wing and important targets in XX area.

X battalion(s) Field Artillery and X battery(ies) of Mountain Artillery to destroy the obstacles in front of the left wing and important targets on hill on north side of XX.

X battalion(s) of 15 cm howitzers and X battalion(s) of Field Artillery for counterbattery and destruction of other important targets in the hostile position.

b. After the infantry attack begins, fire will be massed as follows:

Direct support of right wing

X battalion(s) of Field Artillery

X battery(ies) of 15 cm howitzers

Direct support of left wing

X battalion(s) of Field (Mountain) Artillery

X battalion(s) of 15 cm howitzers

Counterbattery

X battalion(s) of Field Artillery

X battalion(s) of 15 cm howitzers

However, if necessity arises, be prepared to increase the mass of fire by X battalion(s) in front of the right wing and to increase the fire power by X battalion(s) in the zone of action of the 2nd Division east of XX line and in the zone of action of the 3rd Division west of XX line.

c. As soon as both wings have moved to the vicinity of XX line, the Field Artillery will shift position at once, one element to the vicinity of XX, the main body to the vicinity of XX.

d. The zones of action of the Corps Artillery and the Division Artillery will be the area bounded by the lines X-X-X-X.

e. The amount of ammunition to be expended in attacking the main defensive zone will be approximately five units of fire.

Engineers: The unit will mainly cooperate with the artillery in the occupation of positions and in changing positions with the progress of the attack.

Anti-aircraft: The unit will occupy positions in the vicinity of XX and XX before dawn tomorrow, (date).

and furnish air protection.

Reserves: The unit will take position in the area XX before 0400 tomorrow (date) and thereafter move towards XX in the rear of the center of the left wing in accordance with the progress of attack.

Division Headquarters: Will be at XX at 0400, tomorrow (date). Thereafter it will move to the vicinity of XX in accordance with changes in the battle situation.

3. Communication: The communication net will be established as shown in the annex (not attached).

4. Administrative Matters.

Medical:

a. The Medical Detachment will leave XX line at (time) tomorrow, (date). By 0430 it will set up dressing stations, one by an element of the detachment in XX area and one by the main strength in XX area.

b. The XX Field Hospital will leave XX point at (time) tomorrow, (date) and will be set up at XX before dawn.

Supply:

a. The ammunition supply point will be moved forward tomorrow, (date) to the following places:

Infantry ammunition distribution points at XX and XX

Artillery ammunition distribution points at XX

b. The Field Train will -----

c. The Transport will -----

### SECTION III

#### DIVISION PLAN OF ATTACK (with Battle Map)

10. Plan of Attack of 1st Division in the Vicinity of Uenoyama-machi, August 11.

(This plan is written, following Japanese army practice, in indigo ink on the right of the battle map shown in Fig. 3).

A. Decision: Tonight under cover of darkness, the division will approach the enemy and deploy along the crest line of the highland which roughly extends from the eastern hills of Sugarida through Kubote and Kanagame to the vicinity of Minami.

Tomorrow, at daybreak, on the 11th, after the preparatory fire of the artillery the infantry will launch an attack. The main point of attack will be directed toward the hills north of Uenoyama in such a way as to drive the enemy in the direction of Kanayama Pass, southeast of Uonbyama.



B. Outline for Attack:

1. 1st Phase: (up to the opening of infantry attack on the 11th).

a. On midnight of the 10th, the infantry will start from the present front line and by 0200 of the 11th will assemble along the line indicated on the battle map, where it will prepare for the attack that is to follow.

b. By 0300 of the 11th the artillery will occupy positions, prepare for action, and open fire at daybreak. By 0600 it will complete preparation for effective fire and carry out preparatory fire for attack. Its chief mission will be to destroy the obstacles directly in front of the center and right wing and to neutralize the enemy artillery. One element will endeavor especially to destroy the defense installations of the hostile flank in the area of the positions southwest of Kubote.

2. 2nd Phase: (from the opening of infantry attack to the preparation for the assault).

a. Although the time for launching the attack by the front line infantry unit will be determined by the increase in artillery fire, it is expected to be roughly 0600. However the detached force on the right flank will attack at an opportune time.

b. When the infantry launches its attack the artillery will give direct support with approximately two battalions to the center and with approximately one battalion to the left wing. The fire of approximately two battalions will be directed especially against the enemy moving out from the direction of hill 459.0

3. 3rd Phase (the time for preparation of assault).

a. The fire of one additional battalion will give direct support to the center infantry. If necessary it will neutralize the enemy flank defenses in front of our center.

4. 4th Phase: (from the time of assault to the exploitation of advantages gained).

a. When the assault begins, the artillery will shift its fire to the rear of the enemy position and make special effort to check hostile counter-attacks in the northern sector of Uenoyama-machi.

b. When the infantry penetrates the enemy position, the artillery will at a suitable time move forward and cooperate in exploiting the advantages gained.

C. Notes:

1. The Cavalry will be in the Mogamigawa River Valley and will continue former missions.

2. The 1st Independent Air Squadron will attach three planes to the artillery unit, and the remainder will

serve as liaison between the division commander and subordinate units.

3. The Mobile Anti-aircraft Unit will occupy positions in the vicinity of Matsubara and will provide air cover for the main force of the division.

#### SECTION IV

##### DIVISION PLAN FOR DEFENSE

#### 11. Defense Plan of the 1st Division.

- A. Decision: The division will occupy a position between XX area and XX area. After having overpowered the enemy in front of the positions, chiefly with fire power, the division will shift to the offensive from the right sector. If the enemy should make a turning movement from the mountain sector with a strong force the division is expected to shift to a decisive offensive by taking advantage of the separation of enemy strength.
- B. Instructions:
1. The XX forward element will be sent to XX area to delay the enemy advance. It will act as a covering force while the main body of the division occupies a defensive position.
  2. In the XX sector, the division flanks will be covered by the XX detachment.
  3. The main hostile attack is expected to be in the XX sector. At this time the enemy in front of the position may be overwhelmed by fire power. After this is done, the division will shift to the offensive from the right sector, push the main hostile force into the obstacle of the XX River and there annihilate them.
  4. If the enemy should make a turning movement from the mountain sector with a strong force, the XX detachment will block him. Our main effort, taking advantage of the separation of the hostile forces, will shift to a decisive offensive and destroy both groups.
- C. Location of the Main Defensive Zone, Disposition of Troops in the Occupation of Defensive Positions, and Assignment of Observation Posts. As shown on attached sketch. (omitted here)
- D. Reconnaissance and Security Measures:
1. The attached air unit will, at the outset, be assigned

to reconnoiter the enemy situation, especially as to indications of a turning movement. Thereafter, one element will be assigned to the artillery and the others to establish liaison between the commander and other units.

2. The cavalry unit will move towards XX, reconnoiter the enemy situation, keep in touch with the forward element, and delay the hostile advance. If it is pressed hard by the enemy it will withdraw to XX sector and secure the X flank of the division.

3. The XX Detachment will occupy the area between XX and XX, and will cover the X flank of the division.

E. Counterattack and Counter Offensive:

1. The counterattack which is carried out to maintain our position will mainly be entrusted to the front line commander, and if necessity arises the artillery will support it. And when the front line units carry out a local counterattack at a favorable opportunity, the division will shift to the attack in an effort to utilize their success.

2. Counter Offensive.

a. If the hostile main attack arrives in the XX area, the units in the left sector will become the left wing. It will deal a severe blow against the enemy from its present position and thereby support the division offensive. At the first opportunity it will join the right wing, and both wings will hold the strong points on the right and shift to the offensive.

Units in the right sector will become the right wing, maintain the strong points in its sector and drive the enemy to the southwest. Most of the division reserves will be added to the right wing.

The artillery will at first mass destructive fire in front of the division main point of attack. After destroying the enemy offensive power, it will support the attack of the left wing.

b. If the enemy should make a turning movement from the mountain sector with a strong force, the XX detachment will stubbornly block the enemy and protect the X flank of the division.

The main strength of the division will shift to the offensive from XX area and, after first repulsing the enemy to its front, will attack the rear and flank of the detachment that is making the turning movement.

F. Communication and Liaison: (omitted).

G. Construction of Positions:

1. Essentials )
2. Disposition of troops and )  
distribution of materials )
3. Amount of labor required ) (details omitted)
4. Method of work and order )  
of procedure )
5. Miscellaneous )

H. Supplying of Ammunition: (omitted)

## SECTION V

### DIVISION PLAN FOR RIVER CROSSING

#### 12. 1st Division Plan for River Crossing.

- A. Decision: At night on January 4th, the cavalry will move from the Kyobo area to harass the hostile flank, while the division forces the river crossing, one element moving from the Tokaido Railway line, and the main body from Yasaku and points along the tributaries of the Furukawa (river). By dawn, both groups will advance, at least to the line connecting the Ikebata area, Ogawa, and Meiji Reservoir, and annihilate the enemy on that front before the arrival of reserves.
- B. Instructions:
1. The division will move into the zones of action designated in the new disposition of troops on the night of the 3rd and prepare for river crossing. All units will do their utmost to guard the secrecy of their activities from enemy land and air reconnaissance. Preparation for river crossing will be completed before 2300 of the 4th.
  2. A large detachment of the dismounted troops will execute the initial crossing by boat and then construct a bridge in the Shikino area. The simultaneous crossings will commence at midnight. The Cavalry, however, will start crossing the river at an opportune time on the night of the 4th. The time to begin the bridge construction will be tentatively set at 0200.
  3. After the simultaneous crossings have been initiated, the Artillery will, at opportune times, support the river crossing and the operations that follow.
  4. Before daybreak of the 5th, the division will move to the line connecting the Ikebata area, Ogawa, and Meiji Reservoir, and attack hostile forces in that area.
- C. Troops:
- Air Squadron:
- I. Preparation for river crossing: On the 3rd and 4th,

the air squadron will reconnoiter the hostile disposition on the right bank of the Yasaku River, especially the disposition of the rear echelon. Also, an element will reconnoiter the situation of hostile reserves.

2. Execution of river crossing: The air squadron will continue its former mission. From daybreak of the 5th, (3) airplanes will be attached to the Artillery. Liaison will be maintained with the Cavalry.

Cavalry: 1st Cavalry (less one platoon and one squad)  
1st Battalion, 1st Infantry (less 3rd and 4th Companies)  
One battery of 1st Mountain Artillery (separate)  
One squad of Engineers

1. Preparation for river crossing: River crossing will start at sunset of the 3rd and by dawn of the 4th will move to the bank opposite Kyobo. On the 4th, preparation for river crossing will be made.

2. Execution of river crossing: River crossing will be initiated at an opportune time on the night of the 4th and hostile forces to the front annihilated. Harassing movements will be made on the hostile rear to render assistance to the main attack.

Right Wing: 1st Infantry Brigade (less all of 1st Battalion except 3rd and 4th Companies of 1st Infantry, and less all of 2nd Infantry except 1st Company)  
One cavalry squad  
1st Battalion and 1/3 of the Regimental Ammunition Train of the 1st Field Artillery  
One platoon of Bridging Material Company  
22 local boats

1. Boundary between the zones of action of the right wing and the left wing: Line connecting south end of Wakamatsu, north end of Zaika, north end of Kamiaono, and south end of Anjo.

2. Preparation for river crossing will be made in present area on the 3rd and 4th, and reconnaissance of the enemy situation and the terrain within the zone of action will be carried out. After sunset of the 4th, this unit will move to the Tempaku area and complete the preparation for the river crossing by 2300.

3. Execution of river crossing: At midnight, the crossing will be initiated after hostile resistance has been reduced. Hostile forces in the Suwa area will be driven out, and thereafter, as our troops increase in number, the encounter will be more and more expanded. By daybreak, this unit will advance to Yasaku and Ikebata and attack the hostile forces in that area, rendering assistance to

the main attack.

Left Wing: 2nd Infantry Brigade

One cavalry platoon

1st Battalion (less one company) of the Regimental Ammunition Train belonging to an element of the 1st Mountain Artillery (separate)

One platoon of 2nd Company of 1st Engineers

1. Sector boundary: Same as that of right wing.
2. Preparation for river crossing will generally be made in present area on the 3rd and 4th, and enemy situation and terrain of the zone of action will be reconnoitered. After sunset of the 4th, this unit will move to the Koraku area and complete the preparation for the river crossing by 2300
3. Execution of river crossing: At midnight, the crossing will be initiated after hostile resistance has been reduced. The unit will dislodge the hostile elements in front of it and by daybreak will advance at least to the line connecting Ogawa and Meiji Reservoir, where it will attack the enemy along that front.

Artillery: 1st Field Artillery (less 1st Battalion and a fraction of the Regimental Ammunition Train)  
1st Battalion, 1st Heavy Field Artillery and an element of the Regimental Ammunition Train.

1. Preparation for river crossing: Strictly guarding the secrecy of its activities, the Artillery will, during the night of the 3rd and on the 4th, carry out all arrangements for occupation of positions and for firing. At sunset of the 4th, operations will begin, and by 2300 positions in the Ukaku and Umbosan areas will be occupied. There the preparations to support the river crossing and attack of the Left Wing will be made.
2. Execution of river crossing: The Artillery will commence firing at an opportune time to cooperate with the Left Wing in the crossing and in the encounter that follows the crossing. After daybreak of the 5th, (3) airplanes will be attached. The employment of fire during the course of the engagement is as follows:
  - a. In the initial phase of the river crossing, the main strength will eliminate the hostile infantry which directly obstructs our river crossing, and an element will neutralize the hostile artillery in the Ogawa area.
  - b. Thereafter, the artillery will support the occupation of key points of the enemy, and then prepare to place interdiction fire on the front of the occupied area.
  - c. After the left wing has crossed the river, the Artillery will echelon its units forward to the right bank.

#### River Crossing Detachment:

1st Engineers (less 1st Company and six squads of  
2nd Company)  
1st Battalion, 1st PO  
1st Bridging Material Company (less one platoon)  
2nd Bridging Material Company  
10 local boats

1. Preparation for river crossing: Leaving at sunset of the 3rd, the main force will advance to the Kojima area on the Sanada-Nakajima-Kojima road to reconnoiter, survey, and arrange bridging materials along the river. The 1st Bridging Material Company, however, will leave at 1600 of the 3rd, and move to Makami where one platoon will be attached to the Right Wing, while the remaining force will, after sunset, move on to Nakajima on the Takajikara-Nakajima road and come under the command of the River Crossing Detachment. The 2nd Bridging Material Company will move after sunset along the route of the main force to Shikagoya. The commander of the Left Wing will be consulted about guarding of bridging materials.

2. Execution of the river crossing: The detachment will be assigned to assist in the river crossing of the Left Wing and the division Reserve Artillery.

Furthermore, the unit will construct a bridge in the vicinity of Shikiya. Although the time to begin the construction is tentatively set at 0200, the exact time will be given on a separate order. During the crossing operation of the Left Wing, the unit will be under the Left Wing command.

#### Antiaircraft Artillery

1. Preparation for river crossing: Previous missions will be continued.

2. Execution of river crossing: At dawn of the 5th, the 1st Mobile Antiaircraft Artillery will occupy a position in the Yonano area and the 2nd Mobile Antiaircraft Artillery in the Shimoaono area, to provide air defense.

#### Reserve: 2nd Infantry (less 1st Battalion)

1. Preparation for river crossing: The Reserve will remain in the present area on the 3rd, but after sunset of the 4th, will leave Sanada and advance to Kojima area.

2. Execution of river crossing: Approaching the river bank at an opportune time the Reserve will cross the river following the Left Wing and advance to Fujii.

#### Division Headquarters

1. Preparation for river crossing: Position of the headquarters on the 3rd and 4th will be at the eastern end of Fukuoka.

2. Execution of river crossing: At 2200 on the 4th, the

headquarters will advance to Kojima.

- D. Communications: With Fukuoka as the center, the Communications Unit will maintain communications between both Wings, Artillery, Reserve, and the River Crossing Detachment. One radio squad will be attached to the Cavalry. The message center at Fukuoka will be moved to the Kojima area on the 4th at 2200. The unit will advance to the right bank of the river together with main strength of the Left Wing.
- E. Supply:
1. Ammunition: The infantry will carry an additional supply of combat ammunition. After replenishment, the Combat Train will follow the unit. Before daybreak on the 5th, one infantry ammunition battery will take position at XX and one artillery ammunition company will take position at XX.
  2. Ration: Each individual will carry one day's additional iron ration. After the 5th, the field train will replenish at XX.
- F. Medical Detachment: By noon on the 4th, the Medical Detachment will establish dressing stations at Uewada with 1/3 of its strength, and at Shikagoya with its remaining strength. The 1st Field Hospital will be established at Okazaki-mura and the 4th Field Hospital at Nakajima. The 3rd Field Hospital at Okazaki-mura and the 2nd Field Hospital at Kojima will prepare for departure after midnight on the 4th. Others will be informed.

Note: Relief of the front line units in the new combat zone will begin after sunset on the 3rd, and will be completed at approximately midnight.

## SECTION VI

### CAVALRY BRIGADE RECONNAISSANCE PLAN

#### 13. 1st Cavalry Brigade Reconnaissance Plan.

- A. Decision:
1. One element of the brigade will reconnoiter the enemy situation in the Mito area, and the main body, in the Utsunomiya area. For this purpose the main body will move on the Fuchu-Omiya Road to the Tonegawa line, where it will seek out the main body of the hostile cavalry and destroy it.
  2. Even though pressure from a superior hostile force is

encountered, an element will continue to reconnoiter. At the same time, the main body, utilizing the obstacles of the Tonogawa and the Arakawa (rivers) and obstructing the movements and the reconnaissance of the enemy, will withdraw to the area of the right bank of the Tamagawa and support the advance of the 5th Division to the mountains.

B. Reasons:

1. The enemy is now concentrating in two areas, and from observation of the terrain and other general conditions, indications are that the unit in Utsunomiya is the main force. The most urgent information we are after is the activities of this main force, especially the disposition of troops for crossing the Tonogawa (river). This reconnaissance must be immediately carried out, since it has great importance for the operations of the Army, which is expecting an engagement in the Musashi Plain. Therefore, the brigade must move towards the bank of the Tonogawa on the Fuchu-Omiya Road.

The enemy force in the Mito Area is inferior to that in the Utsunomiya area, but since the Okazaki Beach Highway and Joban railway line are vital routes leading to the enemy, we must recognize the fact that he will move a fairly strong force to that area. However, since the hostile forces in both areas will probably maintain close collaboration with each other, it is important to reconnoiter the situation of the Mito area at once in order to make it possible for our army in the north to determine the disposition of troops. Consequently, instead of mere patrols a fairly strong element must be dispatched into that area.

2. If the main strength of the brigade, during its advance, encounters the enemy cavalry and does not destroy it, the movements of the brigade will be greatly restricted, and reconnaissance will be unsuccessful. Therefore, first of all, the main strength of the enemy cavalry must be destroyed.

3. Even if pressed by a superior enemy force, the brigade must endeavor to check its advance and cover our main force. In order to move to the Musashi Plain our army must travel a long distance through the mountains as well as cross such terrain obstacles as the Sagami-gawa and the Tamagawa (rivers). Furthermore, in order to check the hostile advance, we must take into consideration the possibility of utilizing the terrain obstacles of the Tonogawa and the Arakawa (rivers) and the terrain features of the Tokorozawa area. If the brigade, because of the situation, is pressed still further and cannot prevent being forced back, it must at least occupy the hill north of

Hino on the right bank of Tamagawa and endeavor to hold this position in order to support the advance through mountainous terrain of the 5th Division, which is moving on the Koshu Highway.

C. Distribution of Reconnaissance Troops: (chart, p. 26)

D. Plan of Advance: (chart, p. 27)

E. Communications:

1. With Matsuda Soryo as the center, a telephone line will be set up, following the route of advance of the main body of the brigade and utilizing as much as possible the existing lines of communication. For liaison with the Army Headquarters and the attached air unit, radio will also be used.

2. Liaison between reconnaissance and patrol elements within the brigade will be by radio, heliograph, telephone (using the existing lines), mounted messenger, and bicycle messenger. If conditions permit, an advance message center will be set up at a key position. Liaison with airplanes will be by radio, signal panels, and drop and pick-up messages.

3. Liaison between the brigade and the 5th Division will be by radio, existing telephone lines, heliograph, runners, and bicycle messengers.

4. For communication between the brigade and the supporting infantry battalion, existing telephone lines, bicycle messengers, mounted messengers, and motorcycles will be used.

F. Supply:

1. As much ammunition as possible will be taken along at the time of departure. Replenishments will be sent to the reconnaissance elements from the main body of the Brigade. The main body of the Brigade will be supplied by the Brigade Transport Unit and if necessary by the motorized Unit from the advance supply depot.

2. Supplies for reconnaissance and patrol elements will come chiefly from local sources. Although the main body of the brigade will also endeavor to utilize local material, still the shipments of supplies will be made, depending upon the transportation facilities of the Brigade Transport and Motorized Units (from Hachioji Advance Supply Depot).

C. Distribution of Reconnaissance Troops

Disposition	Patrol of Officer A	1st Recon. Party	2nd Recon. Party	Patrol of Officer B
Organization	Commander, 1st Lt. A 1 platoon 1 radio 1 heliograph Telephone equipment	1 Company (less 2 platoons) (1 officer patrol added) 1 radio Telephone equipment 5 bicycle messengers	1 Company (1 officer patrol added) 1 machine gun platoon 1 radio Telephone equipment 6 bicycle messengers	Commander, 1st Lt. B 1 NCO, 2 Superior Privates, 12 Pvts. Telephone equipment 1 heliograph
Parent Unit	13th Cavalry		14th Cavalry	
Time of departure	March 1 at 1400	March 1 at 1500	March 1 at 1500	March 1 at 1400
Mission	To reconnoiter enemy situation in the direction of Mito on the Rikuzen beach highway from the western sector of Tokyo.	To reconnoiter the enemy situation in the direction of Mito from the area east of a line connecting Tamura (5 miles south of Atsuki), Chofu, Urawa, Kasukabe, Toho, Shuka, Shitazawa, Shitadate, and Iawase; that is roughly, from the area of the Ichinomiya-Futako-Takaido-Iatogaya-Etsugaya-Noda-Suikaido-Doura road.	To reconnoiter the enemy situation in the direction of Utsunomiya from the area west of the line mentioned on the left; roughly from the Toba Highway area by way of the Atsuki-Fuchu-Omiya-Kuribashi road.	To reconnoiter in the direction of Utsunomiya from the Hachioji-Ogimachiya-Yukida-Kanbayashi-Sano road area.

Remarks: Employment of aircraft on the 3rd, while primarily dependent upon the situation, must include reconnaissance of the hostile cavalry on the Musashi plain south of Tonegawa.

D. Plan of Advance.

Troops	Billeting Area		Remarks
	March 1	March 2	
1st Rcn party	Yoda	Hatogaya	
2nd Rcn party	Atsugi	Omiya	
Message Center	Southern edge of Haragi	Owada	On the 2nd, an advance message center will be established between 0800 and 1100 at Haramachida, between 1100 and 1500 at Fuchu, and after 1500 at Owada.
Main body of brigade	Present area	Fuchu	Will leave Sono at 0600.
Field Train and transport	Present area	Field train- Fuchu Transport- Sekido	
Supporting Infantry Bn.	Present area	Fuchinobe	

Remarks: 1. Movement after March 3 will depend on the situation. 2. The message center will be composed of a commander, a fraction of the communications detail including 2 heliograph sets, one platoon of cavalry, 2 motorcycles with sidecars attached, and 6 bicycles.

## SECTION VII

## PLAN FOR EMPLOYMENT OF DIVISION ARTILLERY

## 14. Plan for Employment of 1st Division Artillery in an Attack on a Position.

Troops		Right wing elements	Left wing elements	XX Heavy Field Artillery
		Commander ..... Field Artillery .. Mountain Artillery .. Heavy Field Artillery .	Commander ..... Field Artillery .. Mountain Artillery .. Heavy Field Artillery ..	Commander ..... Field Artillery ... Heavy Field Artillery ...
Main Mission		Direct support of the right wing	Direct support of the left wing	Disruption of the formation of strong points, counterbattery, destruction of key points & cooperation with the left sector supporting artillery as the occasion demands.
Zone of Action (prepared fires)		Zone of action of the right wing (east or railroad line, within the 2nd Division zone of action)	Zone of action of left wing (west of line connecting XX & XX within the 3rd Division zone of action)	Division zone of operation
Occupation of Position	Position	Area between XXX & XXX	Area between XXX and XXX	Area between XXX, XXX, & XXX; observation posts at XXXXX.
	Time of occupation of positions	All units will complete arrangements by sunset and at 2000 commence movement, occupying the new positions by approximately 2400; however, a fraction of both left and right artillery groups will be prepared at all times to furnish direct support.		
Preparation of Fire	Topographical preparations	Based on the plan for survey operations prescribed in a separate regulation, the groups will carry out their preparatory survey in such a way as to tie it in with the general army survey. The various surveys will be completed by sunset of the 3rd, and all calculations and preparations by dawn of the 4th.		
	Preparation of data	<ol style="list-style-type: none"> <li>In the preparation of fire for effect, fire for adjustment aimed at direct targets and bracketing fire will be used jointly. Generally, one battery of each battalion will carry out fire for adjustment and all necessary inspection fire for the battalion.</li> <li>Preparation for effective firing will be completed by 0600.</li> <li>Zones selected for fire for adjustment are as follows: (a) Both left and right artillery groups will use their own zones of action; (b) The Heavy Field Artillery will execute fire for adjustment, first against the enemy artillery, and then against XX and XX Hills. Time and place will be determined by consultation with the left and right artillery groups.</li> </ol>		
Reconnaissance and Observation		<ol style="list-style-type: none"> <li>Generally, ground reconnaissance and observation will be carried out according to the plan for the 3rd.</li> <li>Air reconnaissance will be used to verify information as to the condition of hostile artillery and of Hills XX, XX, and XX.</li> </ol>		
Execution of Preparations during the various phases of infantry attack	1st Phase Preparatory fire for attack, until approximately 0830	Main force to carry out demolition of obstacles at XX, an element the demolition of critical points in XX area. The XX Mountain Artillery unit attached to the right wing will fire under the command of the direct support artillery	Main force to carry out demolition of obstacles at XX. The XX Mountain Artillery unit attached to the left wing will fire under the command of the direct support artillery.	Main force to neutralize enemy artillery and an element to destroy XX.
	2nd Phase (From the Infantry advance in attack until the assault)	<ol style="list-style-type: none"> <li>To directly support the right wing.</li> <li>To stop the enemy counterattack from XX area</li> </ol>	<ol style="list-style-type: none"> <li>To directly support the left wing.</li> <li>To stop the enemy counterattack from XX area.</li> </ol>	<ol style="list-style-type: none"> <li>Counterbattery with at least X Field Artillery Battalions.</li> <li>Neutralize XX, XX with X 155 Howitzer battalions.</li> <li>Executes accompanying fire with X 155 Howitzer battalions for support of the right wing in the assault.</li> </ol>
	3rd Phase Exploitation of advantage gained	An element to remain in the present position and stop the enemy counterattack. The main strength to shift position to the XX area & generally support the right wing in the exploitation of its gains.	An element to remain in the present position and stop the enemy counterattack. The main strength to shift position to the XX, XX area and generally support the left wing in the exploitation of its gains	To shift position to the vicinity of XX and XX and generally support the right wing in the exploitation of its gains.
Ammunition (units of fire)	Through 1st Phase	Artillery 155 Howitzer (Artillery Brig)	Artillery 155 Howitzer Mountain Artillery	Artillery 155 Howitzer
		3 3	3 3	3 3
	2nd Phase	3 3	3 3	3 3
	3rd Phase	1 1	1 1	1 1
By dawn, concentrate as much ammunition as possible in the vicinity of the positions.				
Communication		(Omitted)		

- Remarks: 1. Two planes, or as the occasion demands one plane, will cooperate with the Heavy Field Artillery during the attack.
2. Generally, the demolition of obstacles is carried to its fullest extent.

SECTION VIII

PLAN FOR EMPLOYMENT OF ARTILLERY FIRE

15. Plan for Employment of Artillery Fire.

A. Registration Fire.

1. Firing will commence at daybreak of the 9th and will be continued for approximately 40 minutes.

2. Zones for ranging fire:

a. 1st Mountain Artillery Battalion (separate).....  
The combat zone of the Right Wing to give direct support to the Right Wing.

b. Antiaircraft Artillery.....The combat zone of the right Regiment of the Right Wing to give direct support to the right Regiment.

c. 1st Battalion, 1st Field Artillery and 2nd Battalion, 1st Field Artillery....The combat zone of the left Regiment of the Left Wing to give direct support to the left Regiment.

d. 3rd Battalion, 1st Field Artillery....Within the line connecting XX, XX, and XX for counterbattery fire. Also in the combat zone of the left Regiment of the Left Wing to give direct support to the left Regiment.

e. 1st Battalion, 1st Heavy Field Artillery....The combat zones of the Right and Center Wings for counterbattery fire, also the combat zone of the left Regiment of the Left Wing to give direct support to the left Regiment.

f. Units giving direct support to the left Regiment of the Left Wing will use the adjusted data obtained by the 2nd Battalion, 1st Field Artillery when opening fire.

B. Preparatory Fire

1. Following registration, preparatory fire will be carried out for approximately one hour.

2. Counterbattery prior to destruction of obstacles:

a. 1st Mountain Artillery Battalion (separate) - within the combat zone of the Right Wing.

b. 1st Battalion, 1st Field Artillery and 1st Battery, 1st Battalion, 1st Heavy Field Artillery - within the combat zone of the right Regiment of the Left Wing.

c. 2nd Battalion, 1st Field Artillery and 2nd Battery, 1st Battalion, 1st Heavy Field Artillery - within the combat zone of the left Regiment of the Left Wing.

d. 3rd Battalion, 1st Field Artillery - within its combat zone.

3. Neutralization of hostile artillery during the destruction of obstacles:

a. Within the combat zone of the Right Wing - 3rd Battalion, 1st Field Artillery.

b. Within the combat zone of the Left Wing - 1st Battalion, 1st Heavy Field Artillery.

4. Destruction of obstacles:

a. Direct front of the Right Wing - 1st Mountain Artillery Battalion (separate).

b. Within the combat zone of the Left Wing - 1st Battalion, 1st Field Artillery.

c. Direct front of the left Regiment of the Left Wing - 2nd Battalion, 1st Field Artillery.

C. Direct Support of the Attack

a. Right Wing - 1st Mountain Artillery Battalion (separate).

b. Right Regiment of the Left Wing - 1st Battalion, 1st Field Artillery.

c. Left Regiment of the Left Wing - 2nd Battalion, 1st Field Artillery.

d. Counterbattery - same as in the destruction of obstacles.

D. Preparation for Assault

a. Direct support of the Right Wing - 1st Mountain Artillery Battalion (separate).

b. Direct support of the right Regiment of the Left Wing - 1st Battalion, 1st Field Artillery.

c. Direct support of the left Regiment of the Left Wing - 2nd Battalion, 1st Field Artillery (in charge of plans), 3rd Battalion, 1st Field Artillery and 1st Field Artillery Battalion (separate)

d. Counterbattery - same units as those taking charge of counterbattery prior to the destruction of obstacles.

E. Counterpreparation

a. XX, XX sector - 1st Mountain Artillery Battalion (separate) and 1st Battalion, 1st Field Artillery (the former in charge of plans).

b. XX, XX sector - 1st Battalion, 1st Field Artillery (in charge of plans) and 3rd Battalion, 1st Field Artillery.

SECTION IX

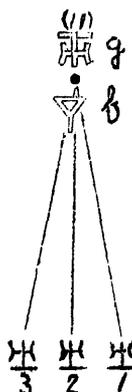
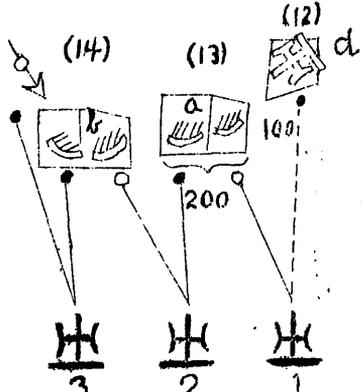
PLAN FOR EMPLOYMENT OF FIRE BY FIELD ARTILLERY BATTALION

16. Plan for Employment of Fire by Field Artillery Battalion  
(See chart, pp. 31-33)

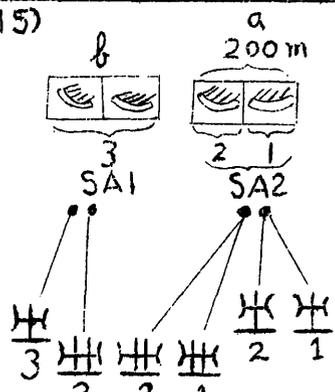
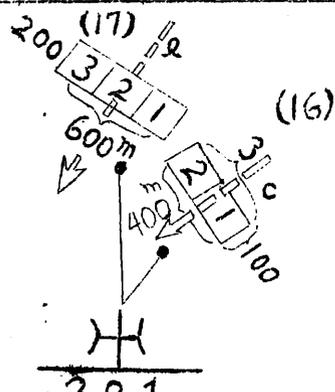
16. Plan for Employment of Fire of a Field Artillery Battalion

Phase	Preparation of Fire
Order of Fire	<p>The diagram illustrates the preparation of fire for three batteries, labeled 3, 2, and 1 from left to right. Each battery has a battery symbol (a cross with a horizontal bar) and a number below it. Battery 3 is positioned on the left, battery 2 in the center, and battery 1 on the right. Various targets are marked with letters: 'h' (a machine gun), 'g' (a tank), 'e' (a tank), 'd' (a tank), 'c' (a tank), 'a' (a tank), 'b' (a tank), and 'f' (a tank). Observation points are marked with Roman numerals: I, II, and III. Arrows indicate the direction of fire from the batteries to the targets. The diagram also shows the positions of the batteries relative to the targets and observation points.</p>
Mission	<p>Demolition of obstacles at a and b;          Disrupting counterattack at c and e;          Neutralization of flank defense at d and h;          Counterbattery at f and g.</p>
Type of shell and fuze	<p>Time shrapnel to disrupt counterattacks; HE shell with instantaneous fuze for other missions.</p>
Number of rounds	<p>About 20 rounds per target</p>
Duration of fire	<p>40 minutes</p>
Observation	<p>Aerial observation for d and g. For other, ground observation</p>
Liaison with infantry	<p>The Infantry regimental command post is at XX. Liaison detachment: commander, 1st Lt. XX, 1 MCC, 10 privates. Equipment: general-XX; telephone-X; radio-X; visual signalling-XX.</p>
Remarks	<p></p>

16. Plan for Employment of Fire of a Field Artillery Battalion (cont'd)

Preparatory Fire for Attack	Attack behind rolling barrage	
<p>Relative to a and b</p>		
Demolition of wire entanglement	Neutralization	Neutralization
HE shell with instantaneous fuze	HE shell with instantaneous fuze	HE shell with instantaneous fuze
100 rounds for each breach	50 rounds per target for each battery	50 rounds for each battery
50 minutes (25 minutes for one)	2 minutes	3 minutes and if necessary, repeat.
Ground	Air observation: 1st and 3rd batteries Ground: 2nd battery	Ground
		The regimental command post will move forward behind center of right Battalion
<ol style="list-style-type: none"> <li>1. 50 rounds for each gun</li> <li>2. 50 additional rounds for each gun</li> <li>3. Approx. width of breach is 10 meters</li> </ol>	<p>If necessity arises during the initial phase of the attack repeat this fire.</p>	<ol style="list-style-type: none"> <li>1. This can be repeated 8 times.</li> <li>2. Time for repetition of fire and designation of targets of opportunity will be by battalion order</li> <li>3. If necessary, shells with delayed action fuze will be used.</li> </ol>

16. Plan for Employment of Fire of a Field Artillery Battalion (cont'd)

After the Assault	Stopping the Counterattack
<p>(15)</p> <p>Depth of zone 150 meters</p>  <p>SA1 SA2</p> <p>3. 2. 1.</p>	 <p>3.2.1.</p>
Annihilation	Stopping the counterattack (Degree or extent of neutralization)
HE shell with instantaneous fuze	Time chrapnel
<p>One period of fire:</p> <p>120 rounds for each FA battery</p> <p>50 rounds for each heavy FA battery</p> <p>Depth of zone to be covered as shown above</p>	120 rounds for each battery
2 periods (1 period of 3 minutes and an interval of 4 minutes). Repeat if necessary	4 minutes (repeat if necessary)
Ground	Ground
<p>Fire will be opened on call from the front line battalion commander. Converging fire: black dragon rocket "Fu". Increase range: yellow dragon rocket "Wo". Repeat: green hanging star "Fu".</p>	Red hanging star "Ri"

Note: This chart is an example of a dawn attack. Topographical preparations will be consolidated within each battalion. Time of fire: Preparation fire - dawn. Preparatory fire for attack - about 1 1/2 hours. Converging fire - as required by infantry. Other firing as in battalion orders.

SECTION X

PLAN FOR EMPLOYMENT OF THE AIR UNITS OF AN ARMY

17. Plan for Employment of the Air Units of the 1st Army.

A. Decision:

1. During the concentration of our troops, the main air elements of the Army will destroy the enemy air power, while one element will reconnoiter the hostile concentration and cooperate with the 1st Cavalry Brigade, obstructing hostile concentration whenever possible.

2. With the opening of our operation, the air elements will one after another change the main point of action to the direct support of ground operations, and when the troops engage in decisive combat, they will support the action with full strength.

B. Instructions:

1. Destruction of hostile air power: The order of preference in destroying hostile aircraft will be (1) bombers, (2) fighters, and (3) reconnaissance planes.

2. Reconnaissance of hostile concentrations: The main effort will be placed on enemy railroad transportation especially on the XX line. In regard to hostile concentration any indications of activity will be observed.

3. Cooperation with the 1st Cavalry Brigade: One reconnaissance element will be assigned to this mission, and its strength will be increased if necessary.

4. Obstruction of enemy concentration: If the situation permits, the important points along XX line north of XX will be bombed to obstruct enemy concentration.

5. Direct support of ground operations: After the opening of an operation by our main force, the main elements will, one after another, shift to direct support of ground operations, but in case the enemy has air superiority, they will continue to destroy the enemy air power. However, when our main force is engaged in decisive combat, the full air strength will be dispatched to the combat area for direct support.

C. Airfield: (As indicated on attached sketch). As the Cavalry Brigade moves forward, an advance field will be set up and utilized in the vicinity of XX and XX.

D. Distribution of forces:

1. (date) .

a. At dawn, XX Group and XX Group (less XXX) will attack XX airfield and XX Group and XX Squadron of XX Group will attack XX airfield. If the situation permits, the attack will be repeated during the same day.

b. XX Squadron of XX Group, will reconnoiter enemy concentrations in XX area and XX area.

2. (date) .

a. The main elements will continue the attack on the enemy airfield, and decisions on such matters as targets and time of attack will be determined by the situation.

b. XX Squadron of XX Group, in addition to continuing the missions of the previous day, will cooperate with the 1st Cavalry Brigade.

3. (date) .

a. The distribution will be determined by the situation.

b. XX advance airfield will be used.

E. Air Defense:

1. The air defense of the concentration point will be carried out by XXX and XXX. Their mission will be.....

2. The distribution of Mobile Antiaircraft Gun units will be as indicated on the attached military sketch.

3. Observation for aircraft.....

F. Communications: (omitted)

G. Supply: (omitted)

SECTION XI

PLAN OF EMPLOYMENT OF AIR GROUPS

18. Plan of Employment of Air Groups.

(Refer to section on types of orders used by air units).

## CHAPTER 3

### EXAMPLES OF VARIOUS ORDERS

SECTION		Paragraph
I.	General -----	19
II.	Reconnaissance -----	20 - 25
III.	March and Security -----	26 - 32
IV.	Meeting Engagements -----	33 - 44
V.	Attack of a Position -----	45 - 55
VI.	Defense of a Position -----	56 - 62
VII.	Pursuit -----	63 - 70
VIII.	Withdrawal -----	71 - 72
IX.	Billeting and Security -----	73 - 79
X.	Transportation -----	80 - 83
XI.	Routine Orders -----	84 - 85

#### SECTION I

##### GENERAL

19. The following orders are illustrative. The outlines of the orders and the summary of the items have been made merely as references for the beginner. The orders, furthermore, are of value only when they are adapted to the situation of the moment and to the mental capacity and the disposition of the receiver. Therefore, when giving orders the above elements must be taken into consideration. (Ordinarily in the study of tactics the receiver's mental capacity and disposition cannot be taken into consideration).

Emphasis on conventional forms with a subsequent disregard for the situation at hand is not the main purpose of these examples. Therefore, this will call for special attention.

#### SECTION II

##### RECONNAISSANCE

#### 20. Orders of the Cavalry Brigade

Headquarters, 1st Cavalry Brigade  
AT XX  
11 March, 19\_\_ , 1700

a. The enemy which has penetrated XX is the X division. The force advancing on XX is apparently a unit attached to the X division. It had advanced in a westward direction beyond the XX, YY line this morning. According to a reconnaissance report from our air unit, a large force of enemy cavalry had passed XX about noon today. At the same time the

advance party of a large enemy column had passed XX and was heading westward.

The rail traffic between XX area and XX area is becoming exceedingly heavier.

The Army Air force cooperating with our brigade will with its main strength reconnoiter to determine the enemy situation at XX area and XX area and will with a part of its unit reconnoiter the condition of the enemy railway transportation.

b. The brigade will advance on XX tomorrow, the 12th, to determine the enemy situation in the XX area. The following units will be under my command from now on:

1st and 3rd Cavalry (each less a platoon).

2nd Cavalry (less a troop - less a platoon).

3rd Bn. of the 4th Infantry.

A platoon of the Radio Unit.

c. 2nd Troop (less 2 platoons) of the 1st Cavalry is designated the 1st Scouting party and will depart at 0300 from the billeting area, advancing on XX town via the XX-XX-XX Road.

d. The 4th Troop, 5th Cavalry is designated the second Scouting party and will depart from the billeting area at 0300, advancing toward XX via XX Highway. One machine gun platoon and one radio set will be attached.

e. The 4th Troop (less 2 platoons), 6th Cavalry is designated the 3rd scouting party. It will depart from the billeting area at 0300 advancing on XX on the XX-XX-XX Road. One radio set will be attached.

f. The scouting parties on the left will be responsible for their respective boundaries. For each scouting party the boundary is as follows:

Between 1st and 2nd scouting parties the line connecting XX-XX-XX.

Between 2nd and 3rd scouting parties, the line connecting XX-XX-XX.

g. The following patrols will depart at midnight tonight and are assigned the following missions, details of which are indicated separately:

1. "Officer A" Patrol consisting of 1st Lieutenant "A" and 9 men will scout the enemy situation from the area of the XX Highway towards XX.

2. "Officer B" Patrol consisting of 1st Lieutenant "B" and 14 men will scout the enemy situation from the area of the XX Road towards XX.

3. "Officer C" Patrol consisting of 1st Lieutenant "C" and

19 men will scout the enemy situation from the area of the XX-XX-XX Road towards XX.

h. The 5th Cavalry (less 3rd and 4th troops) will form the advance guard and will depart at 0500 from the XX road marching on XX.

i. The 2nd Cavalry (less a troop, less a platoon) will depart from the billeting area tomorrow morning to march on XX via the X-X-X road and join the main force of the brigade. The main body (remaining cavalry units) will assemble on the road at 0500 in the following order with the head of the column at the eastern edge of the XX Village:

Brigade Headquarters

3rd Troop 5th Cavalry

6th Cavalry (less 4th Troop, (less 2 platoons))

3rd Cavalry (less one platoon 2nd Troop)

Machine Gun Unit (less one platoon)

Horse Artillery Battery

1st Cavalry (less 2nd Troop; (less one platoon))

Signal Section.

j. The supporting infantry battalion will depart from XX at 0500 tomorrow, the 12th, and advance on XX.

k. The Field Train and Transport under the command of the transport unit commander will depart at 0700 from XX and advance on XX.

l. I will be at the eastern edge of XX village at 0500. Thereafter, I will be at the head of the main body.

Major General XX  
Brigade Commander

Distribution:

Assemble the following recipients of orders and issue the printed forms. However, verbal orders will be given to patrol leaders and the essential contents will be telegraphed to the Commander of the 3rd Cavalry.  
Commanding officers, 1st, 5th, and 6th Regiments  
Representative of 3rd Cavalry  
Representative of the Infantry Battalion  
All Scouting Party Commander  
Various Patrol Leaders  
Horse Artillery Commander  
Machine Gun Commander  
Signal Section Commander  
Representatives of the Field Train and Transportation Units.

21. Various Air Force Orders (General Information): Our Army (3 divisions) for the purpose of annihilating the enemy which has landed in two areas will, with one division, protect our right flank against the enemy and with its main force will take the offensive against the hostile main strength. Should both our troops and the enemy troops advance, a meeting engagement between the main forces will occur about a day after tomorrow.

22. Orders of an Army Air Force.
- (1st Group - two reconnaissance squadrons
  - 2nd Group - two fighter squadrons
  - 3rd Group - 1st and 2nd squadrons (light bombers)
  - 3rd squadron (heavy bomber))

Headquarters, 1st Army Air Unit  
AT XX  
1 September, 19 . . , 1900

a. Enemy situation:

The Army will protect its right rear flank by dispatching the 3rd Division in the direction of XX tomorrow, the 2nd. It will move forward toward the XX, XX line with its main strength in order to destroy the enemy in the direction of XX.

The 1st Cavalry Brigade will reconnoiter the enemy condition in the direction of XX and should there arise the possibility of being hard pressed by the enemy, XX area will be occupied to facilitate the advance of the Army main force into the XX plains.

b. The Army Air Force will determine the enemy situation by reconnaissance tomorrow, the 2nd, harass the advance and concentration of enemy forces, and destroy his planes.

c. The 1st Group will reconnoiter the enemy situation in the XX and XX area particularly for signs of enemy advance. It will further reconnoiter the enemy rear in the XX area and cooperate with the Cavalry Brigade.

d. With its main force, the 3rd Group will attack the enemy airdrome in the district east of XX at dawn tomorrow while an element of the unit maintains close liaison with the reconnaissance unit and at an appropriate time, immede the enemy advance in the XX sector.

e. With its main force, the 2nd Group will attack the enemy airdrome in the district east of XX at dawn tomorrow, cooperating with the 3rd Group.

f. I will be at XX airdrome at 0800.

Major General XX  
Commanding 1st Air Unit

Distribution:

The essential contents will be telephoned and later distributed in printed form.

23. Form for the Air Reconnaissance Group Order.

Headquarters, 1st Air Group  
AT XX AIRDROME  
1 September, 19\_\_\_, 0830

a. Situation of friendly and enemy troops (omitted). Tomorrow, the 2nd, this Air Unit will reconnoiter the enemy situation in XX and XX areas and harass his advance in the direction of XX. It will further attack his airdrome in the district east of XX.

b. Tomorrow, the 2nd, this group will principally reconnoiter the enemy railway transport and his landing operations in XX area, and determine his situation in XX and XX areas.

c. The first squadron less one plane, will reconnoiter the enemy situation in the XX area particularly to determine whether or not there are signs of an enemy advance.

d. The mission of the second squadron will principally include the reconnaissance of the enemy situation in the XX plains north of XX, especially to determine whether or not there are signs of an enemy advance. It will furthermore cooperate with the Cavalry Brigade.

e. Captain "A" and Sergeant Major "B" (No. XX Plane equipped with wireless) will reconnoiter the enemy railroad transportation and situation in the vicinity. Detailed orders will be issued separately.

f. I will be at the airdrome after 0430.

Colonel XX  
Commanding 1st Group.

Distribution:

Printed forms will be distributed after verbal orders are issued.

SUPPLEMENTARY REPORT

Plans for First Flights of all Air Units on December 7

Units	No. of Planes	Time of Departure	Mission	Plans of action
1st Squadron 1st Group (attached to 2nd Division)	2	0600	To reconnoiter enemy situation in the Div.'s front.	(omitted)
2nd Squadron 1st Group (attached to 4th Div.)	2	0600	Same as above	(omitted)
4th Independent Air Squadron (attached to 1st Div.)	3	0600	Same as above	(omitted)
7th Air Squadron	(heavy) unknown	midnight of December 6	<ol style="list-style-type: none"> <li>1. To bombard enemy airdrome at XX &amp; XX</li> <li>2. To reconnoiter the situation of hostile rear echelon on YX road.</li> <li>3. To reconnoiter enemy situation in vicinity of XL.</li> </ol>	(omitted)
	(heavy) 3	0500	To bombard hostile ground units in area bounded by XX, XX, XX, and XX	(omitted)
3rd Air Group	Omitted	Omitted	Omitted	(omitted)

24. Form for the Bombardment Group Order.

Headquarters 3rd Air Group  
XX AIRDROME  
1 September, 19\_\_, 2130

a. Situations of the enemy, friendly forces, and the Army Air Unit (omitted).

b. The main strength of the 3rd Group will cooperate with the 2nd Group in the attack on the enemy air field at dawn tomorrow in the district east of XX in order to destroy his planes while one part of the group impede the enemy advance in the direction of XX area.

c. The 1st and 3rd Groups will attack the enemy airdrome located on the eastern side of XX according to the attached plans.

d. The main strength of the 2nd Squadron will be ready for flight at any time after 0600 tomorrow, the 2nd, to obstruct the enemy advance in the direction of XX area.

Fifty kilogram bombs (non-delay fuse) will be utilized.

e. I will take off aboard the commander's plane 3rd Squadron.

Colonel XX

Commanding 3rd Air Group

Distribution: After issuing verbal orders distribute printed forms

Note: Operation Plan of the 3rd Bomber Group (see chart, p. 43.)

25. Form for Fighter Group Order †

Headquarters, 2nd Air Group  
AT XX  
1 September, 19\_\_, 2130

a. Enemy situation and movements of our army air units and ground forces (omitted).

b. At dawn tomorrow, the 2nd, this group with its full strength will cooperate with the 3rd Group in the attack on the enemy airdrome in the district east of XX.

c. The 1st and 2nd Squadrons will destroy the enemy aircraft according to the attached plan.

OPERATION PLAN OF THE 3RD BOMBER GROUP (1st Movement - September 2)

PLAN: The main force of the 3rd Bomber Group will attack the enemy airdrome at dawn tomorrow, Sept. 2nd, under the protection of the 2nd Fighter Group.

Unit	1st Squadron	2nd Squadron	Remarks
Target	Enemy airdrome - east of XX		
Location of target	(omitted)		
Objective	Destruction of hostile aircrafts		
Strength	Full strength	Full Strength	
Kinds of bombs & fuzes	50 kilogram bombs (contact fuze)		
Time of departure	0500	0500	
Time of bombing	0545		
Flight and Formation	<ol style="list-style-type: none"> <li>1. Follow approx. 500 meters in rear of 3rd squadron maintaining an altitude between 700 and 800 meters.</li> <li>2. After passing XX at 0530, fly parallel to the base squadron (3rd squadron) &amp; in formation, &amp; follow coast line direct to XX.</li> <li>3. After bombing objective, turn left to take cover above XX &amp; return by direct route.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fly at an altitude of 900 to 1000 meters on the XX-XX-XX-XX route.</li> <li>2. Passing above XX at 0530, fly in formation directly to airdrome east of XX via XX.</li> <li>3. Movement after execution of bombing is same as that of the 1st squadron.</li> </ol>	
Route and Altitude	<ol style="list-style-type: none"> <li>1. Approach target from mouth of XX River.</li> <li>2. Altitude: 700-800 meters</li> </ol>	<ol style="list-style-type: none"> <li>1. Change into bombing formation enroute to the enemy airdrome on a direct route from XX.</li> <li>2. Altitude: 900-1000 meters</li> </ol>	
Methods of bombing	(omitted)		
Cooperation with Fighter Group	<ol style="list-style-type: none"> <li>1. Join the 2nd Fighter Group at 0500 above XX. Thereafter maintain contact with both fighter and bomber groups and proceed to enemy airdrome east of XX.</li> <li>2. The 2nd Fighter Group will generally be between the 1st and 3rd Squadrons at an altitude of 1200 meters.</li> <li>3. The 2nd Fighter Group and the 3rd Bomber Group will return on the same route.</li> </ol>		
Communication etc.	(omitted)		

d. I will be at the airdrome after 0430.

Colonel XX  
Commanding 2nd Air Group

Distribution: After verbal orders are issued printed forms will be distributed.

Note: Operation Plan of the 2nd Fighter Group (see chart, p. 45.)

### SECTION III

#### MARCH AND SECURITY

#### 26. Items to be Covered in a Division March Order

a. Summary of conditions of enemy and friendly forces. (Only information necessary for the recipient).

b. Plan of the commander. (mission, routes, objectives, etc.)

c. Matters pertaining to the aircraft. (time of initial movement, scouting zones, and other items).

d. Matters pertaining to the cavalry. (time and place of departure, areas to be scouted, etc.)

e. Matters pertaining to the right flank guards (detachment) and the right column. (time and place of departure, routes, objectives, zones or areas that must be especially scouted, places and their important points, and the time and place to receive information).

f. Matters pertaining to the Advance Guard of the left column (main force). (include information, same as above for right flank units).

g. Matters pertaining to the main body of the left column. (assembly areas, time of assembly, time and place of departure, and distance from the advance guard).

h. Matters pertaining to movements of signal units (the removal of signal communication systems in the billeting areas, and signal communications used during march, etc.).

i. Matters pertaining to field anti-aircraft gun units. (time and place of departure, routes, dispositions for air protection, etc.)

j. Matters pertaining to balloon units. (time and place of departure, routes, objectives, etc.)

Operation Plan of the 2nd Fighter Group  
(1st Movement on September 2)

Plan: The 2nd Fighter Group (full strength) will escort the 3rd Bomber Group to attack the enemy airdrome east of XX.

Unit	Strength	Mission	Formation	Departure	Course	Liaison between sqs	Cooperation with Bomber Group
1st Squadron	12 planes	Destruction of enemy aircraft	Group Comdr   T T   T T   T T   T T   T T	At 0510, the planes will take off successively in the following order: Gp Comdr 1st Sq 2nd Sq	O m i t e d	1. From XX, 1st sq will be base sq, & 2nd sq will take its position 600 meters above base sq. 2. In combat 2nd sq will cooperate to facilitate movements of 1st sq. 3. On return flight, maintain same liaison.	At 0530 follow 3rd Bomber Gp leaving XX, & proceed to enemy airdrome east of XX at altitude of 1400 meters midway between 1st & 2nd bomber sqs.
2nd Squadron	12 planes		T T   T T   T T   T T   T T				

k. Matters pertaining to allocated troop units. (Movements of units which have been allocated from the army for the march, etc.)

l. Matters pertaining to the field train. (assembly place, time, instructions to the commander, distance to follow behind the main force or the advance transport, etc.)

m. Matters pertaining to transportation. (time and place of departure, route, objectives, and if necessary matters pertaining to the advance transport).

n. Location of the commander during the march. If necessary, the method for liaison, and place, of dispatching messages, etc.

## 27. Example of a Division Route March Order

Headquarters, 1st Division  
AT XX  
1 (month) 19\_\_\_, 2400

### Operation Order A, No. X

a. The enemy is concentrating in the XX area with a strength approximately equal to one of our divisions.

b. Tomorrow, the 2nd, the main strength of the division will form 4 echelons and advance on the XX Route debouching into the area in the vicinity of XX on the 4th. Preparations will be made for coming operations.

c. The advance party will move out as soon as possible, occupy a position in the vicinity of XX and cover division movement into the area.

d. The left flank force will maintain contact with the advance party and occupy XX vicinity. It will protect the left flank of the division from the direction of XX.

e. The plan of march for the division main force will be as indicated on a separate chart.

f. Matters relevant to supply and replenishment will be as follows:

1. The main force of the division will use the field ration, while the advance force will make every effort to utilize local resources.

2. The transport will replenish supplies from the line of communication at the points listed below:

XX - May 3rd  
XX - May 4th

g. Wireless and existing telephone lines will be relied on to effect liaison between Division Headquarters and the Advance Party. Motorcycle messengers for liaison between Division Headquarters and the Left Flank Force will be used.

h. The wireless platoon will as soon as possible, establish a signal station at XX and maintain liaison with Army Headquarters.

i. Tomorrow, the 2nd, I will be with the 1st Echelon.

Lieutenant General XXX  
Division Commander

Distribution of orders: (omitted) Supplementary Chart (see p.48)

28. Orders, relating to the arrival and departure (several places) of the Division, when contact is expected the next day.

1st Division Operation Order "A"-No. 1  
(See 1st Army Operation Order "A").

Distribution of troops:

Air Unit

1st Air Squadron

Cavalry Unit

1st Cavalry (less one platoon)

Advance Guard of Right Column

Major General XX, Commanding 1st Infantry Brigade (less 2nd Infantry)  
(2) squads of cavalry  
1st Bn 1st Field Artillery  
1st Bn Engineers (less 2nd Co)  
(1/3) of Medical Unit

Main Body of Right Column

Communication Unit ) follow the rear of the  
Wireless Platoon ) Advance Guard  
Division Headquarters  
2nd Infantry  
2nd Co 1st Engineer Bn (less 1st Platoon)  
2nd Battalion 1st Pack Artillery (less 6th Battery)  
1st Field Artillery (less 1st Battalion)  
4th Infantry  
Ammunition Train 1st Field Artillery

SUPPLEMENTARY CHART

PLAN OF MARCH OF THE 1ST DIVISION (MAIN FORCE)						
May 2nd - 3rd						
Echelons		First	Second	Third	Fourth	
Composition		Div Hq Div Com Unit Radio Plat 2nd Mobile AA 1st Div 2nd Inf 1st Engr Bn (less 1st Co)	1st Bn, 3rd Inf 1st F A (less 1st Bn) 1/3 Regtl Amm Train	2nd Inf Brig (less 1st Bn, 3rd Inf and 2nd Bn, 4th Inf) 1st Bn, Hvy F A 1/3 Regtl Amm Train; Med Det (less 1/3)	Transport (less Med Det)	
Route		XX Highway				
M a y 2 n d	Point of Departure	South end of XX	North end of XX	North end of XX	South end of XX	
	Time of Departure	0600	0600	0630	0700	
	Resting Point	North of XX village	Between X & X villages	Between X & X villages	South of XX village	
	Billeting Area	Between XX & XX villages	Vicinity of XX town	Between XX village & XX town	South of XX village	
M a y 3 r d	Distance	9 Ri (22 mi)	9½ Ri (23 mi)	10 Ri (25mi)	11 Ri (27mi)	
	Point of Departure	(omitted)	(omitted)	(omitted)	(omitted)	
	Time of Departure	(omitted)	(omitted)	(omitted)	(omitted)	
	Resting Point	(omitted)	(omitted)	(omitted)	(omitted)	
	Billeting Area	Vicinity of XX				South of XX
	Distance	(omitted)	(omitted)	(omitted)	(omitted)	

Remarks:

- One platoon will be attached to each echelon to handle rations. Each platoon will replenish its supply of rations from the field train on the night of May 2nd, and will remain in the billeting area until the echelon moves out. Thereafter, it will come under the command of the Battalion Transport Commander.
- The movement of the 4th will be decided according to the situation.
- The billeting area for Division Headquarters on the night of the 2nd will be "R" village.

( $\frac{1}{2}$ ). Ammunition Train, 1st Pack Artillery  
Medical Unit (less main strength)

Left Column

Major General XX, Commanding  
2nd Infantry Brigade (less 4th Infantry)  
(1) platoon of Cavalry (less (2) squads)  
6th Battery, 1st Pack Artillery  
(1) platoon, 2nd Co - 1st Engineer Bn  
Medical Unit

Note: When recording the distribution of troops on a separate paper, it is best to have it in front of the written order so as to make it easier to understand. Number all essential orders in accordance with Article (62) Field Service Regulations (on others it is omitted.)

Headquarters, 1st Division  
AT XX  
18 September, 19\_\_, 2000

a. The leading elements of the enemy, about one division, entered XX today at 1300 and part of its infantry occupied XX and XX. Other elements arrived at XX this evening. An additional force which arrived at XX this evening, seems to have about 60 to 70 artillery pieces.

Our Cavalry Brigade is in the XX vicinity opposing the enemy cavalry of about the same strength. The supporting infantry battalion has occupied the XX vicinity and is opposing the enemy infantry and cavalry.

Tomorrow, the 19th, the Army will advance toward XX River line for the purpose of attacking.

b. Tomorrow, the 19th, this Division will attempt to advance toward XX River line for the purpose of attacking. The boundary line with the 3rd Division will be the line connecting X, X, X and X. (Areas on the line will be the responsibility of this Division).

c. The air unit will begin operations from early morning, mainly to reconnoiter the situation of the enemy advance into the zone of operations. During combat, with X number of planes, cooperate with the artillery and with the remaining planes be prepared for liaison and control missions.

The Reconnaissance boundary between the Army Air Unit and our Air Unit, will be the line connecting X, X, and X.

d. The cavalry will depart from the billeting area early tomorrow morning and with its main strength will reconnoiter the enemy situation in the direction of X, while an element will reconnoiter the area of X Y Road.

e. The Advance Guard of the Right Column will depart from the eastern edge of X at 0600 and advance toward the X River by way of X-Y-Z Road. It is essential that liaison be maintained with the Left Flank Unit of the 3rd Division.

f. The head of the Main Body of the Right Column will maintain a distance of approximately (1200) meters in rear of the Advance Guard, in the listed order of march, after assembling as follows:

The cavalry billeted in the vicinity of XX will assemble on the road by 0630 with the head of the column at XX.

The billeted units in the vicinity of X will assemble in the dry paddy field east of that place, at 0700, except the artillery, which will assemble on the road in the vicinity of its billeting area with the head of the column at XX, units being allotted positions by the artillery commander.

g. The Left Column Unit will depart from X at 0600 and will advance toward the XX River by way of X-Y-Z Road. It is essential that liaison be maintained with the Advance Guard of the Right Column. One wireless set will be attached.

h. Tomorrow, the 19th, the Communication Detail with its main strength will assemble at 0630 and follow the Advance Guard. An element of the Unit will maintain radio communication as follows, since the existing communication lines will be removed at 0600:

From 2400 - 18th to 0630 - 19th those between the Right Column at XX and Div. Hqrs.

At 0700 - 19th those between X and X Message Centers.

i. The Bridging Company will assemble on the eastern bank of XX River tomorrow morning and wait further orders.

j. The Field Train will assemble on the east bank of XX River at 0900 and prepare for departure under the supervision of the Division Train Commander, leaving the billeting areas as follows:

That part of the train attached to the Advanced Guard of the Right Column, from the western part of XX area at XX hour.

That part of the train attached to the main body of the Right Column, from the northern part of XX area at XX hour.

That part of the train attached to the Left Column, from the eastern part of XX area at XX hour.

k. The Transport Unit by 1000 will detail (2) ammunition platoons each, to the infantry and field artillery, (1) platoon to the pack artillery, and two field hospital units to XX. The remaining units will be held at the billeting area in readiness.

Note: This order is issued with the expectation of encountering the enemy soon after departure. However if otherwise, the order for the movement of the field train and transport should have previously been issued.

l. I will be at the eastern edge of XX at 0630 and will march at the head of the Right Column.

The various units will be able to use the XX message center (equipped with wire, wireless, air ground radio, and heliograph) which should be established by 0700 and in addition use the mounted relay posts which should be established between XX town and XX by that time.

Major General XX  
Division Commander

Distribution:

Assemble the representatives of X, Y, and Z units and issue printed orders, but to the Air Squadron Commander send an outline of the order by telephone through Army Headquarters, giving him the printed copy upon his arrival.

Note: Chart showing Quota of Distribution (see p. 52).

29. Example of an order relating to successive arrivals at and departures from a point on the route of march, in the presence of the enemy.

(Refer to Chapter (4) Section (11) Field Service Regulations).

30. Orders given to the Air Squadron.

Headquarters, 1st Division  
AT XX  
18 September, 19\_\_ . 2000

DIVISION FLIGHT ORDER, NO 2

a. Tomorrow, the 19th, this Division with the purpose of attacking the enemy will form two columns and advance toward the XX River line. The main force will advance via X-X highway and other elements via X-X highway.

b. The air unit will commence flying early tomorrow morning, the 19th. The main force will first of all reconnoiter the probable route of the enemy advance: XX highway or XX highway. Other elements will reconnoiter to determine

CHART SHOWING QUOTA OF DISTRIBUTION

Unit	No.	Total	Unit	No.	Total
Army Headquarters	4	4	Other Units		18
Division Headquarters		20	1st Cavalry	1	
Staff Section	10		1st F. A.	5	
Adj. Section	4		2nd Bn, 1st Mt. A.	1	
Intend. Section	1		1st Engineer Bn	3	
Baggage Master	1		Comm. Unit	1	
Intend. Dept.	2		Medical Unit	3	
Medical Dept.	1		Transport Unit	2	
Vet. Section	1		Air Squadron	1	
			Third Division Hdq.	1	
Infantry Brigades		22	Div. Total		60
1st Brigade	11		Grand Total		64
2nd Brigade	11				

- Note: 1. In all orders distribution quota will be shown. (Refer to Field Service Regulations, Article #25).
2. This chart will be made up in advance. It is best to make a notation of the number of copies for distribution to all units, including those to special organization.
3. This chart will be omitted in other orders.

the presence of enemy units in the vicinity of XX and will make immediate report. Later, the enemy advance and dispositions will be reconnoitered in detail. The reconnaissance boundary between the Army Air Unit and the 1st Division Air Unit will be the line joining XX and XX.

c. After 2000 be prepared to furnish on call (2) planes to cooperate with the artillery.

d. Drop stations for message tubes will be as follows:

Until 0700	---	North edge of X
0700 - 0800	---	South edge of Y
0800 - 0900	---	South edge of Z

e. I am at XX and tomorrow, the 19th, I will be at the head of the column.

Lieutenant General XX  
Division Commander

Distribution:

Summon the Squadron Commander and issue verbal instructions.

Note: This order is issued after assuming that conditions are difficult for contact between the Air Squadron and the Division. Predicting that difficulties will arise in communication, the missions assigned to the air unit should cover long periods of time.

31. Items to be recorded in Orders to the Advance Guard

a. Outline of the Enemy Situation (only matters requiring the attention of subordinates). The mission of this unit and matters pertaining to the Cavalry and the Flank Guard.

b. The plan of the Advance Guard.

c. Matters pertaining to the Cavalry of the Advance Guard (time of departure, place, and especially the direction in which to reconnoiter, etc.)

d. Matters pertaining to the withdrawal of outposts.

e. Matters pertaining to the support of the Advance Guard or the Flank Guard. (Indicate only when necessary. Generally given verbally at the assembly point).

f. Matters pertaining to the main body of the Advance Guard. (Same as above).

g. Matters pertaining to the Field Train.

h. The location of the Advance Guard Commander.

32. An Example of Orders to the Advance Guard.

1st Brigade Operation Order No. 1

(See 1st Div. Op. Order "A" - No 1)

Headquarters, 1st Brigade

AT XX

1 May, 19\_\_\_, 2100

a. No sign of enemy movement. The Army will advance towards the XX line tomorrow, the 2nd. This Division will advance towards the XX line for the purpose of attacking the enemy while the Cavalry Brigade will continue reconnaissance in the vicinity of XX.

b. The Advance Guard will march towards X tomorrow, the 2nd, by way of the XX-XX Road.

c. The Cavalry of the Advance Guard (2 squads 1st Cavalry) will depart from X at 0600 and will contact the Cavalry Brigade immediately after the reconnaissance of the enemy situation in the X direction is made.

d. The support of the Advance Guard (1st Battalion, 1st Infantry; ( $\frac{1}{2}$ ) Infantry Artillery, 1st Infantry; (1) Squadron, 1st Cavalry) will leave X at 0600 and march towards XX following the route of the Advance Guard.

e. The Left Flank Guard (9th Company, 1st Infantry and (2) mounted messengers) will leave XX at 0600 and march towards XX by way of the X-X Road.

f. The Outguard (2nd Battalion, 1st Infantry and (1) squad, 1st Squadron, 1st Cavalry) will be relieved at 0800 and assemble in the vicinity and upon the arrival of the Advance Guard Reserve, will join the column, in the order of march. The cavalry squad will revert to the control of its Regimental Commander after 0500.

g. The remaining units which are designated as the Advance Guard Reserve will assemble by 0700, as follows:

1st Infantry (less the 1st and 2nd Battalions, and ( $\frac{1}{2}$ ) Infantry Artillery) in the woods southwest of XX village.

1st Field Artillery on the road, with the head of the column at the XX village.

(1) Squad of Cavalry at XX.

(1) Squad of the Medical Unit on the road with the head of

the column at the east edge of XX village.

h. The field train will complete the preparation for departure at each bivouac area before 1000 and will await orders of the Division Train Commander.

i. I will be at XX from 0700 and later I will march at the head of the Advance Guard Reserves.

Major General XX  
Commanding

Distribution:

Assemble the recipients of each unit and have them take notes. Written instructions will be delivered to the outguard.

Note: The order of march of the Advance Guard Reserve will be designated at the assembly area tomorrow.

SECTION IV

MEETING ENGAGEMENTS

33. Items to be Covered in an Order Issued Prior to Deployment for a Meeting Engagement.

To the Advance Guard Commander:

1. The enemy situation.
2. The Commander's plan (indicating especially the area planned for the decisive battle), the routes of the units advancing separately, mission, and objectives.
3. Mission of the Advance Guard.
4. The Commander's movement or position.

To all Column Commanders:

1. The enemy situation and the movements of the Advance Guard and the Cavalry.
2. The Commander's plan (indicating especially the area planned for the decisive battle).
3. Direction of march to all columns.
4. The Commander's movement or position, and time and place where recipients of orders should be sent.

To the Various Unit Commanders of the Main Force and Those Commanders Who Order Separate Advances.

1. Enemy situation, movements of the advance guards, the cavalry and other columns.
2. The Commander's plan (indicating especially the direction planned for the decisive battle).
3. The routes by which the units should advance, their

mission and objectives. (If necessary, indicate the areas that should be especially protected.)

4. The location of the Commander, and if necessary the method of liaison, and the time and place where recipients of orders should be sent.

34. An Example of a Division Order Issued to the Advance Guard and Cavalry Commanders to Cover the Deployment of the Division (Single Column) Participating in a Coordinated Attack.

Headquarters, 1st Division  
CROSSROAD AT XX  
10 October, 19\_\_ , 1800

Operation Order A, No. 2, Part I.

1. The enemy has formed two columns and is advancing northward along the XX-XX and YY-YY roads, and at 0730 heads of both columns had passed the XX River line.

2. The Division will plan for a decisive battle in the XX area. The 4th Infantry and one battalion of Field Artillery will pass through XX and YY and march toward XX. The other main force will move toward XX on the XX-XX road.

3. The Advance Guard with its main strength will occupy the vicinity of XX and the line along its western hills, and with other elements will occupy the vicinity of XX, covering the deployment of the Division.

The Engineer Battalion, after assisting the Advance Guard artillery to occupy positions will come under my direct control in the vicinity of XX. The recipient of orders will be sent to XX at 0900.

4. The Cavalry will remain in its present position and delay the enemy advance. If enemy pressure is encountered, it will withdraw to the XX area to protect the Division left wing.

5. I will now proceed to XX.

Lieutenant General XX  
Commanding

Distribution:

To the Advance Guard Commander, the order will be given verbally by army staff officer, and to the cavalry a written order will be delivered by mounted messenger.

35. An Example of a Division Order Relative to Separate Advance, Issued to Subordinate Unit Commanders Prior to Deployment of the Division (Single Column) Participating in a Coordinated Attack.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_ , 0800

Operation Order A, No. 2, Part II.

1. The enemy has formed two columns and is advancing northward along XX-XX and XX-XX roads respectively. The heads of both columns have probably passed the XX River line at 0720.

The main strength of our Cavalry and one element of which are currently engaging enemy infantry and cavalry in the X and Y vicinities respectively, will later withdraw to the XX vicinity and protect the left flank of the Division.

2. The Division will plan for a decisive battle in the XX sector.

The main force of the Advance Guard will occupy the area in the vicinity of XX and the western line of hills, while another element will occupy the XX vicinity covering the deployment of the Division.

3. All units of the main force will move as indicated below:

Signal Unit	)	
Div. Hdqrs.	)	Advance toward X on the X-X Road from the sector of the 4th Infantry.
4th Infantry	)	
1st Bn - 1st F.A.	)	

Field Artillery (less (2) Bns)	)	Advance to XX from the sector of the 1st Inf. Brig. by way of X and X.
1st Inf. Brig. (less 2nd Inf)	)	

2nd Infantry	)	Advance toward XX through the X-X Road from the sector of the 2nd Inf Regt.
Med. Unit (less 1/3)	)	

4. From now on I will be at XX. Send a messenger to this point at 0900.

Lieutenant General XX  
Division Commander

Distribution:

Verbal orders will be given to all unit commanders or to messengers previously summoned.

36. An Example of a Division Order Issued to the Field Train and Transport Troops Prior to Deployment of the Division (Single Column) Participating in a Coordinated Attack.

Headquarters, 1st Division  
AT XX  
10 October, 19 \_\_, 0810

Operation Orders A, No. 2, Part III

1. The Division will plan for a decisive engagement in the

XX sector.

2. The Advance Transport will advance toward XX.
3. The Field Train will halt when the head reaches XX.
4. From now on I will be at XX.

Lieutenant General XX  
Division Commander

Distribution:

Written orders will be dispatched by messengers.

Note:

1. It will be assumed that the halting point for the Transport will have already been indicated by an order on the previous night. Essential points relevant to the situation will be indicated at this time.
2. This order is concerned with the carrying out of operations and not with the order of supply. Therefore, it is to be included in the operation order No. A .

37. An Example of a Division Order Issued to the Advance Guard of the Main Column, Artillery, Engineers, etc., Prior to Deployment of the Division (Two Columns) Participating Successively in an Engagement.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_, 1720

Operation Orders A, No. 2, Part I

1. Enemy situation (omitted).
2. The Division will plan a decisive engagement in the XX and XX highway areas.  
The Right Column will advance to the XX area after attacking the enemy in the XX vicinity.
3. The Advance Guard will move to the XX area after attacking the enemy in the XX vicinity. However the main strength of the Engineer Battalion will.....
4. The main strength of the artillery will deploy in the XX and XX vicinities and cooperate with the Advance Guard in the engagement to obstruct the enemy deployment. (2) airplanes will cooperate.
5. After assisting the Artillery of the main body in occupying positions, the strength of the Engineer Battalion will be located at XX.
6. I will now proceed to the X hill.

Lieutenant General XX  
Division Commander

Distribution:

Verbal orders will be given to the Commander of the Advance Guard and both the Artillery and Engineer Unit Commanders.

38. An Example of a Division Order Issued to the Cavalry Prior to Deployment of the Division (Two Columns) Participating Successively in an Engagement.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_, 0730

Operation Order A No. 2, Part II

1. Enemy situation (omitted).
2. The Division will plan a decisive engagement in the X and X directions.
3. The Cavalry Unit will turn toward the direction of X and will attack in rear of the enemy left flank.  
The Right Column after attacking the enemy in the vicinities of X and Y will advance toward XX while the Advance Guard of the Left Column after attacking the enemy in the vicinity of XX will advance toward XX.
4. I will now proceed to X hill.

Distribution:

Adjutant "B" will issue verbal instructions.

39. An Example of a Division Order Issued to the Right Column Prior to Deployment of the Division (Two Columns) Participating Successively in the Engagement.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_, 0735

Operation Order A, No. 2, Part III

1. Enemy situation (omitted).
2. The Division will plan a decisive engagement in the XX and XX areas.
3. The Right Column will advance toward XX direction after attacking the enemy in XX and XX vicinities.  
The Advance Guard of the Left Column will advance toward X direction after attacking the enemy in X vicinity.  
The Cavalry Unit will turn toward X direction and attack the rear of the enemy left flank.  
The main strength of the Artillery will cooperate in the engagement of the Advance Guard of the Left Column. After

occupying positions in X and X vicinities, it will obstruct the enemy deployment.

4. I will now proceed to X Hill.

Lieutenant General XX  
Commanding

Distribution:

"C" staff officer will give verbal instructions.

40 An Example of a Division Order Issued to the Subordinate Units Prior to Deployment of the Division (Two Columns) Participating Successively in an Engagement.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_, 0745

Operation Order A, No. 2, Part IV

1. Enemy situation (omitted).
2. The Division will plan a decisive engagement in X and X areas.

The Right Column after attacking the enemy in the vicinities of X and X will advance toward X while the Advance Guard of the Left Column after attacking the enemy in the vicinity of XX will advance toward XX.

The main strength of the Artillery will support the Advance Guard of the Left Column in the engagement after occupying positions in XX vicinity, obstructing the enemy deployment.

3. The 2nd Infantry will proceed to XX by way of XX and XX.

The 4th Inf and the Medical Unit (less 2/3) will advance to X via X and X roads.

4. The Division Signal Unit will maintain liaison with the Right Column, the Advance Guard of the Left Column and the Artillery of the Main Body, with the Division Command Post as its base.

5. The Mobile Anti-aircraft Gun Unit will engage in aerial defense after occupying positions in X and X vicinities.

6. I will now proceed to X hill.

Lieutenant General XX  
Commanding

Distribution:

Verbal orders will be issued recipients.

41. Items to be covered in Attack Orders for a Meeting Engagement.

1. Enemy situation . The situation of the Advance Guard,

and other advance units.

2. The plan of the Commander (especially those indicating clearly the plans for a decisive battle).
3. For the infantry on the front line: The direction of an advance in an attack and the objectives of the attack. (the enemy to be attacked, the direction of an advance in later attack if the necessity arises). Depending on the situation, the area of deployment and if possible the combat zone.
4. For the Artillery: A summary for the basis of directing fire.

The areas to be used for positions.

The strength of the artillery that is to be attached to the infantry if the necessity arises.

Matters pertaining to the air units cooperating or attached to the Artillery.

5. Matters pertaining to the Engineers.
6. Matters pertaining to the Cavalry.
7. Matters pertaining to the Reserve.
8. Matters pertaining to the Medical Unit.
9. Matters pertaining to the Field Hospitals.
10. Matters pertaining to the replenishment of infantry and artillery ammunition.
11. The location of the Commander and the liaison methods to be used for the movement.

Note:

Usually orders are issued separately at first concerning the above matters depending upon urgency. If the necessity arises for immediate deployment or movement in a desired direction for an attack, the movement of the whole force will be coordinated under a combined order.

42. An Example of an Attack Order for a Meeting Engagement of a Division (Single Column) Participating in a Coordinated Attack.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_ , 0920

Operation Order A No. 3

1. It appears that the enemy is deploying in the X and X vicinity.
2. The Division with its main strength will seek a decisive battle in the area along the XX road.
3. The 2nd Inf Brigade (less 4th Inf. and (1) squad of Cavalry attached) is designated the Right Wing Unit and will deploy in the vicinity of XX and the line of hills on the west. The Brigade will attack the enemy deploying at XX.
4. The 1st Inf. Brigade, with the 9th Field Artillery attached

- is designated the Left Wing Unit and will deploy along the X-X line. The Brigade will attack in the direction of XX Village so as to envelop the hostile right flank.
5. The boundary between the combat zones of both wings extends along a line joining the eastern extremity of X and the eastern extremity of XX.
  6. The 1st Field Artillery (less 9th Battery) from positions in the vicinity of XX with its main strength and positions in the vicinity of XX with other elements, will obstruct the deployment of the enemy and, cooperate in the attack of the Left Wing. From now on the Advance Guard Artillery will revert to control of the Artillery Commander.
  7. The Cavalry will harass the enemy right flank.
  8. The Air Unit will reconnoiter the enemy condition in the area east of XX road and cooperate with both Wing Units, especially the Left Wing. It will also cooperate with the Artillery.
  9. The Engineers after assisting the Artillery in the occupation of positions will remain in the vicinity of XX and later proceed to XX.
  10. The 4th Infantry as the Reserve will remain in the vicinity of XX. With the progress of the battle it will advance toward XX in the rear of the Left Wing.
  11. The Communication Unit with XX as its base will maintain liaison between Division Headquarters, both Wing Units, the Artillery, and the Reserve.
  12. The Medical Unit will establish a dressing station at X with a part of its unit, while the main strength will establish a dressing station at XX.
  13. The 1st Field Hospital will be established at X; the 2nd Field Hospital, at XX.
  14. The Infantry ammunition platoons will establish distributing points at XX and XX, while the Artillery ammunition platoons will establish distributing points at XX and XX.
  15. I will be at XX.

Lieutenant General XX  
Commanding.

Distribution:

The recipients of orders from the various units will be assembled and verbal instructions will be issued. However, the air force will be sent written orders after the essentials have been given by telephone.

43. An Example of an Attack Order for a Meeting Engagement of a Division (Two Columns) Participating Successively in an Engagement.

(Note: When the main force diverges, orders to attack will be given to the Advance Guard, the Right Column, the Artillery

of the Main Body, and the Cavalry).

Headquarters, 1st Division

AT XX

Date X, Time X

1. The enemy is apparently planning an attack in XX direction with certain elements and a decisive engagement in the area west of XX with its main force.

2. With its main strength, the Division will envelop the enemy left flank from the area east of XX road and attempt to crush and annihilate the enemy main force in the marshy area west of XX and XX.

The Cavalry will attack the rear of the enemy left flank from the XX and XX areas.

3. The 4th Infantry (less 3rd Bn) will form the Right Wing Unit and will attack the enemy left flank from the XX and XX areas.

4. The right column will form the Center Unit and attack the enemy in XX and XX vicinity so as to envelop the hostile left Wing and drive it towards the direction of XX.

Release the X Field Artillery Bn and one third of the Medical Unit, and attach the 2nd Infantry (less 3rd Bn) in its place.

5. Hereafter, the Advance Guard of the Left Column as the Left Wing Unit will continue on former missions. It will endeavor to divert as much strength as possible to the same area to assist the main force of the Division in the engagement. Release the X Field Artillery Bn, and one third of the Medical Unit.

6. The 1st Field Artillery (The X and X Battalions reattached) will continue on former missions and directly support the Right and Left Wing Units with a portion of the strength and at the same time support the Center Unit with its main strength.

Be prepared during the progress of the attack to shift approximately (1) Bn and from (1) to (2) batteries to the Center and Right Wing Units.

7. The Engineers during the progress of attack will remain with the Reserves after assisting the artillery in changing positions.

8. The 3rd Battalion 2nd Infantry and 3 Bn., 4th Infantry will comprise the Reserves, remain in XX vicinity and advance toward XX behind the right flank of the Center Unit with the progress of the engagement.

9. The Communication Unit will maintain liaison between the front line units, the Artillery, the Cavalry and Division Headquarters.

10. The Medical Unit will establish dressing stations at X and X with its main strength and an element of the unit respectively.

11. The 1st and the 4th Field Hospitals will be established at X and X respectively.

12. Each Infantry Ammunition Platoon and two Artillery Ammunition Platoons will establish distributing points at X and X, and at X vicinity respectively.

13. I am now at X.

Lieutenant General XX  
Commanding

Distribution:

Give verbal orders to the Artillery and Engineer Unit Commanders and the recipients from the remaining units will take notes of verbal orders.

44. An Example of a Division Artillery Attack Order to Support a Meeting Engagement.

Headquarters, 1st Division  
AT XX  
10 October, 19\_\_, 0950

1. The enemy is apparently deploying in the vicinity of X and X.

The main force of the division will attack so as to envelop the right flank of the enemy from the sector east of the XX road. To execute this, the Right Wing Unit (less 4th Infantry, plus (1) squad of Cavalry) will deploy from the vicinity of XX along the western line of heights and attack the enemy which is in the progress of deploying at XX. The Left Wing Unit (plus 9th Field Artillery and (1) squad of cavalry) will deploy from the line of X to that of X and will attack toward the direction of X village so as to envelop the right flank of the enemy.

The boundary line of both wing units in the combat zone will be the line connecting the eastern edge of XX and the eastern edge of XX.

2. One element of the Regiment (less the 9th Battery and the reattached 1st Battalion) will occupy positions in the vicinity of XX, the main strength in the vicinity of XX. The regiment will delay the enemy deployment and, later, the main strength will support the Left Wing in its attack.

3. The 1st Battalion will primarily delay the enemy deployment and neutralize enemy artillery from its present positions. It will directly support the Right Regiment of the Left Wing in its attack.

For the purpose of giving direct support to the Infantry it will be necessary to make preparations to direct the main mass of fire in the sector east of XX. (1) airplane will cooperate.

4. The 2nd Battalion will immediately deploy in the vicinity of XX. This Battalion will delay the enemy deployment and will neutralize enemy artillery. The Battalion will directly

support the attack of the Left Regiment of the Left Wing. One airplane will cooperate.

5. The 3rd Bn (less 9th Battery) will immediately take positions in the vicinity of XX and will delay the enemy deployment. It will principally give direct support to the Right Wing Unit in its attack.

6. The 1st Battalion and the 2nd Battalion will prepare to move forward without delay to positions in the vicinity of XX, and XX.

7. Each battalion will use the telephone to communicate from the Left Battalion to the Right Battalion.

8. The Regimental Observation Detail will use telephones to communicate with the Commander of the Left Wing, as well as establish telephone communications between X and X.

9. The Regimental Ammunition Train will be stationed at X. After supplying ammunition it will move to the Division Distribution Point at X and X and receive replenishment there.

10. I shall be at my present position and shall move in the rear of XX.

Colonel XX,  
Artillery Commanding

Distribution:

Assemble the Commanders of the 2nd and 3rd Battalions, the Messengers from the 1st Battalion and Regimental Ammunition Train and issue verbal instructions.

SECTION V

ATTACK OF AN ORGANIZED POSITION

45. Items to be Covered in Orders for the Development of the Division.

1. Summary of enemy situation and condition of friendly troops, etc.
2. Plans of the commander.
3. Matters concerning the movement of security detachments (occupied area, necessary instructions for the control of the movement according to the situation, matters pertaining to changes in organization and strength, and instructions concerning scouting and patrolling.)
4. Matters concerning each column. (Instructions relative to scouting and patrolling and the area that will be occupied by the main force). Details will be based upon the preceding paragraphs.
5. Matters concerning the main body of the main column. (Matters pertaining to the areas to be occupied by various

units, and if necessary, instructions pertaining to the support of the security detachments by the artillery of the main body.)

6. Matters relative to aerial defense and communications.
7. Matters relative to the halting of the Field Train.
8. Matters relative to the halting of the Transport and the movement forward of the Advance Transport.
9. Matters relative to the location of the Commander and dispatching recipients of orders.

46. An Example of a Division Order to Develop the Main Force in the Rear After Hostile Outpost Has Been Captured by the Advance Guard.

Headquarters, 1st Division  
AT XX  
Date X, Time X

Operation Order "A", No. X

1. Information of the enemy and friendly troops (omitted).
2. After seizing the hostile outpost position, this division will reconnoiter the enemy situation and terrain for the purpose of attack.
3. The Cavalry with its main strength will reconnoiter the enemy condition from the left bank of the XX River while an element will reconnoiter the hostile right flank.
4. The Right Column (One Infantry Regiment as the attack unit, commanded by the Brigade Commander) will deploy in the area extending from the vicinity of XX to the area in the vicinity of XX, **attack the enemy in the vicinity of XX, seize the area between X and Y, and reconnoiter the enemy situation and the terrain on our front.**
5. The Advance Guard of the Left Column will deploy in the area extending from the vicinity of XX to the area in the vicinity of XX, **attack the enemy in the vicinity of XX and XX, seize the area between X-X, and reconnoiter the enemy situation and the terrain on our front.**
6. The boundary between units is the line X-X (the area along the line is the responsibility of the right unit.) The time of the attack will be announced.
7. The Field Artillery Regiment (less (2) battalions) and the Heavy Field Artillery Battalion under the Field Artillery Regimental Commander from positions in the vicinity of XX will be prepared to support both units in the attack.
8. The main force of the division will develop as follows:

----- )  
----- )     - XX, XX vicinity  
----- )

----- )  
----- ) - XX, XX vicinity  
----- )

9. The 1st Mobile Antiaircraft Artillery will deploy at XX, and the 2nd Mobile Antiaircraft Artillery will deploy in the vicinity of XX. Both will engage in air defense.
10. The 1st Air Group will reconnoiter the positions in the vicinity of XX and determine the enemy situation in their rear.
11. The 1st Balloon Group will ascend from the vicinity south of XX and observe the enemy situation.
12. The Division Communication Unit being based at XX will establish liaison with the attached units.
13. The Wireless Unit will continue to carry out former missions.
14. The Field Train will halt at the southern edge of XX.
15. The Transport will halt with the head of the column at XX, while the Advance Transport will halt at XX.
16. I will be at XX. At X PM send a recipient for orders.

Lieutenant General XX  
Commanding

Distribution:

Assemble X, X, X, X, X recipients of orders and X and X Commanders for the issue of verbal orders.

The adjutant will deliver written orders to the X unit while a mounted orderly will deliver written orders to the X unit.

47. An Example of a Division Order to Execute its Development Without Seizing the Hostile Outpost Position.

Headquarters, 1st Division  
AT XX  
(Date, time)

Operation Order A, No. X

1. Since yesterday morning the enemy in the vicinity of XX is constructing positions from the area in the vicinity of XX to the area in the vicinity of XX as outlined on the attached sketch. The enemy rear echelon is at X.

The Army, with the purpose of annihilating the enemy at all points before he can receive reinforcements, will advance to the XXX line to prepare for the attack.

2. For the purpose of development and attack, in the vicinity of XX and XX this Division, with its main strength, will recon-

noiter the hostile situation and terrain, while other elements will seize the XX-XX line.

3. The advance guard of the right column will seize the area between XX and XX, and reconnoiter the enemy situation and terrain on that front. Immediately after contacting the 2nd Division, the main strength of the Cavalry will come under my control in the vicinity of XX while the main strength of the Engineer Bn. will come under my control in the vicinity of XX.

4. The Left Column, with an element will seize the area between XX-XX, while the main force will assemble in the vicinity of XX and reconnoiter the enemy situation and the terrain on his front. Clarify the enemy situation as soon as possible in the vicinity of XX mountain and if necessary cooperative with the 3rd Division in the occupation of the high ground in this area. Especially in the advance in the area north of the XXX River, maintain contact with the Advance Guard of the Right Column.

5. The reconnaissance and security zone boundary between units will be the line XX---XX---XX.

6. The various units of the Main Body of the Right Column will pass into assembly positions as follows:

In the area between XX---XX---XX

2nd Infantry

2nd Field Artillery

(less 1st and 2nd Bns, (1) element of the Regimental Combat Train)

1st Bn and elements of the Regimental Combat Train, 1st Heavy Field Artillery

1st Bn and elements of the Regimental Combat Train, 1st Independent Mt. Artillery

In the area between XX---XX

4th Infantry

Independent Units (less main strength)

The Engineer Platoon at its present position will revert to the control of its organization commander. The Field Artillery Regiment and the Heavy Field Artillery Battalion taking into consideration the possibility of debouchment by the enemy, will each reconnoiter for a battalion position in the vicinity of XX and XX.

The units, under the command of the Infantry Regimental Commanders will commence development upon reaching XX.

7. The 1st Antiaircraft Unit will occupy the position at XXX, while the 2nd Antiaircraft Unit will occupy the positions

at XXX, both being changed with air defense missions.

8. The Engineer Battalion taking into consideration the future deployment of the Division is charged with the establishment of communications in the zone of advance and if necessary, with certain elements, will assist the Artillery of the Right Column in the occupation of positions.

9. From XXX as a base, the Communication Unit will establish a communication net between the Advance Guard of the Right Column, main force of the Left Column, and the 4th Infantry.

10. The Advance Transport will halt with the head of the column at XX.

11. The Field Train will be at XXX

12. The Transport will be at XXX

13. I will be at XXX

Send recipients of the order at XX hours.

Lieutenant General X  
Commanding

Distributions: (omitted)

48. Items to be Covered in Orders to Attack an Organized Hostile Position

1. Friendly and enemy situations.
2. Plans of the Commander.
3. Instructions to the front line Infantry.
  - a. Zones of deployment.
  - b. Attack objectives (usually the hostile front line and the line of final advance)
  - c. Boundaries - zones of action.
  - d. Time to advance to the attack.
4. Instructions to Artillery.
  - a. Fire to be delivered in direct support of the infantry during each critical period.
  - b. Other desired fires and the purpose.
  - c. Areas to be utilized for positions.
  - d. Approximate amount of ammunition to be used.
  - e. Time to begin preparatory fire (scheduled fires) and fire for effect.
  - f. Items pertaining to change in positions.
  - g. Units which should be attached to infantry.

5. Instructions to the Engineers.
  - a. Work required at each stage of the battle and, if necessary, time for completion.
  - b. Methods of protecting labor detachments and their work, etc.
6. Instructions to the Air Force.  
The missions at each stage of the battle, and if necessary the time and number of planes to be used.
7. Cavalry missions.
8. Movements of the Reserve.
9. Duties of Communication Units.
10. Instructions to the Medical Unit.
11. Instructions to the Field Hospitals.
12. Matters pertaining to ammunition supply.
13. Location of Commander.

Note:

Time at which deployment is to be completed and items pertaining to preparations for attack, especially, those relating to the destruction of obstacles, etc.

49. An Example of a Division Order for a Daylight Attack on an Organized Hostile Position.

Headquarters, 1st Division  
AT XX  
(Date and Time)

Operation Order A, No. X

Distribution of troops

Right Wing Unit:

Commander - Major General XX  
1st Infantry Brigade  
XXXXX Units  
(2) Squads of cavalry  
XXXXX Units  
(2) platoons of Engineers

Left Wing Unit:

Commander - Major General XX  
2nd Infantry Brigade (less 4th Infantry)  
XXXXX Units  
(1) squad of cavalry  
(1) platoon of Engineers

Artillery

Commander - Artillery Col. XX  
1st Field Artillery  
1st Battalion Heavy Field Artillery  
1st Battalion Mountain Artillery

**Antiaircraft Units:**

1st and 2nd Mobile Antiaircraft Gun Units.

**Cavalry Troops:**

1st Cavalry (less 3 squads)

**Engineers:**

1st Engineer Battalion (less 3 platoons)

**Air Unit:**

1st Squadron

**Reserves:**

4th Infantry

1. The outline of the hostile position is as shown on separate sketch.
2. After seizing the hostile outpost position and making the necessary preparations, the division will penetrate the enemy main defensive position, advance to XX line directing the main effort against XX.
3. The Right Wing Units will deploy between XX and XX and after seizing the hostile outpost position, will advance to XX and XX line. After making the necessary preparations, they will attack the hostile main defensive position east of XX and advance to XX and XX line.
4. The Left Wing Units will deploy between XX and XX and after seizing the hostile outpost position will advance to XX and XX line. After making the necessary preparations, will attack the hostile main defensive position on the west side of XX and advance to XX and XX line.
5. The sector boundary between both Wing Units will be the line passing through the eastern edge of XX, XX and XX.
6. Although the time of attack of both Wing Units is expected to be at XX hour, the definite hour will be prescribed by special instructions. The advance from XX, XX, XX, YY lines will also be given by special instructions.
7. The Artillery will occupy position in the vicinity of XX-XX with its main strength and in the vicinity of XX with other elements, and as soon as possible, commencing fire for adjustment, will successively neutralize the hostile artillery. Following this the indicated missions will be carried out:
  - a. An element will assist in the attack on the hostile outpost zone and during seizure, will change positions successively to the areas in the vicinity of XX and XX.
  - b. (1) battalion of mountain artillery will be attached to the Right Wing Force for special missions.
  - c. During close combat against the hostile main line of resistance, attach approximately (2) battalions to the Right Wing and (1) battalion to the Left Wing for direct support, and in the event of attack (1) additional battalion for direct support to the Right Wing.
  - d. With the object of neutralizing hostile offensive action,

be prepared to place the fire of (2) battalions between XX and XX.

c. Ammunition to be used.....

The boundary of zones of action between the army artillery and the division artillery is line XXXX.

8. The Antiaircraft Gun Unit will occupy positions in the vicinity of XX and will engage in air defense missions.

9. Cavalry troops (omitted).

10. The Engineers will assist the Artillery in the occupation of positions and after the penetration of hostile lines will facilitate the passage of the Artillery.

11. The Air Unit will reconnoiter the enemy positions especially in the vicinity of XX and the situation north of XX. It will further cooperate with the Artillery with three planes.

12. The Reserve will occupy a position in the vicinity of XX, and as both Wings advance, will march on XX.

13. The Communications Unit will establish communications between Division Headquarters and both Wings, the Artillery and the Reserve.

14. The main strength of the Medical Unit will establish a dressing station at XX, while another element will establish a station at XX.

15. 1st Field Hospital will be established at XX and the 4th Field Hospital at YY.

16. The Advance Transport will establish a distributing point for infantry ammunition with (1) platoon each at XX and XX - and with (1) battery for artillery ammunition at XX.

17. I am now at XX and as the front line advances I will be at XX and XX. The message center will be established at XXXX.

Lieutenant General XX  
Division Commander.

Distribution:

Assemble the recipients of orders from XXXXX units and issue verbal instructions.

Note:

Condition of the enemy positions is indicated on the sketch.

50. An Example of a Division Right Wing Order for a Daylight Attack on an Organized Hostile Position.

Right Wing Unit  
AT XX  
2 July, 19\_\_ , 1050

Operation Orders No. X

1. Enemy condition (omitted). The Division will attack the

enemy on our front from now on, and will advance to line XX and XX.

2. The 1st Brigade (with XX Unit, XXX Unit, (1) platoon of cavalry, 1st Company, 1st Engineers, (less (2) platoons attached) designated the Right Wing Unit, will seize the hostile outpost position and main line of resistance in the area from XX-XX to XX-XX, and advance to the line of XX Village and XX Village, directing the main effort against XX. The 2nd Infantry Brigade (less 4th Infantry) is designated the Left Wing Unit and will attack the positions east of ZZ from the area east of the line passing through the shrine 1000 meters southeast of XX, eastern edge of XX, and the western edge of YY. The Left Flank Detachment will harass the enemy rear from the area west of WWW River. The direct supporting Artillery of the Right Wing, after occupying positions west of WWW and in the vicinity north of WW mountain, as the front lines advance, will push forward into the vicinity of XX and XX. After seizing the outpost position, one battalion of mountain artillery will be attached to the Right Wing.

3. The 2nd Infantry (less 3rd Battalion, plus one platoon of XX Engineers, and (4) mounted messengers) as the Right Front Unit will deploy in the area between the southern edge of XX and the river bridge across the X river at a point 300 meters north west of X mountain. From XX attack the hostile elements west of that point and advance to XX-XX line.

4. The 1st Infantry (1st Company - Engineers (less (3) platoons and (4) mounted messengers attached) on the left, generally keeping in contact with the left flank of the 2nd Infantry will deploy in the area in the vicinity of the shrine which is located 1000 meters south east of XX; attack the enemy in the vicinity of XX village and advance to line XX-XX.

5. The boundary of the zone of action between regiments is the line passing through the south eastern edge of XX, the western edge of XX and the eastern edge of XX. The definite time of attack will be at XX hour. After seizing the hostile outpost position advance will be made to the line XX-XX. Forward movement from this point will be directed separately.

6. The Cavalry Platoon (less (2) squads) will advance in the direction of XX, and directly protect the right flank of the brigade. It will further maintain liaison between the brigade and the unit on the left flank.

7. The 3rd Battalion, 2nd Infantry is designated the Reserve and as the action progresses will advance through the area

along the XX highway to the vicinity north of XX.

8. The Ammunition Distributing Point will later be established at the northeastern edge of XX, the Dressing Station XX, and the Field Hospital at XX.

9. I will advance along the XX highway.

Major General XX  
Right Wing Commander

Distribution:

Assemble the Regimental Commanders, Cavalry Platoon Commander, Engineer Company Commander, and issue verbal instructions.

Note:

If possible, include the 3rd Battalion Commander, 2nd Infantry for verbal instructions.

51. An Example of a Division Artillery Order to Support a Daylight Attack on an Organized Hostile Position.

1st Field Artillery  
AT XX  
X day, X time

Operation Order, No. X

1. Condition of the hostile position is as shown on sketch attached. (omitted).

The Division will direct the main attack towards XX, attacking so as to envelop the left flank of the hostile position, and advance to the line XX.

2. The Right Wing (1st Infantry Brigade, Hdqrs., 1st Infantry Brigade) will deploy between XX and XX and after seizing the hostile outpost position, will advance to the line XX-XX. After making the necessary preparations it will further attack the main hostile defensive zone east of XX and advance to the line XX-XX. The Left Wing Unit (2nd Infantry Brigade (less 4th Infantry) Hdqrs. 2nd Infantry Brigade) will deploy between XX and XX and after seizing the hostile outpost position, will attack the main hostile defensive zone west of XX, and advance to the line XX-XX. The boundary of the zone of action between both Wing Units is the line passing through the eastern edge of XX, XX and XX. The definite time of attack is XX hour. The advance from XX-XX-XX line will be directed by separate order.

3. The Artillery will occupy positions in the vicinity of YY and XX with its main strength and in the vicinity of XX-XX with other elements and as soon as possible, commencing fire for adjustment, will successively neutralize the hostile artillery. Thereafter, it will mainly furnish direct support to the Right Wing in the attack. Three aircraft will cooperate with the Artillery.
4. The 1st Battalion 1st Field Artillery will deploy between ZZ, and XX, and YY, furnish direct support to the right regiment of the Right Wing in the attack.
5. The 2nd Battalion 1st Field Artillery will occupy positions in the vicinity of XX and YY, and will neutralize the hostile artillery. Thereafter it will furnish direct support to the left regiment of the Right Wing in the attack, and will further be prepared to obstruct at the proper time enemy offensive action from the direction of XX village. Utilize the crest-line east of XX-XX for observation posts. The combat zone will be on the direct front of the Division. After seizure of the outpost position it is planned to immediately move forward an element to the vicinity of XX.
6. The 3rd Battalion 1st Field Artillery from positions in the area between XX and ZZ will neutralize the enemy artillery and furnish direct support to the Left Wing in the attack.
7. The 1st Mountain Artillery Battalion from positions in the vicinity of XX-XX will furnish support to the Right Wing in the attack and after seizure of the hostile outpost position will be attached to the Right Wing.
8. The 1st Heavy Field Artillery Battalion from positions in the area between XX and XX will neutralize the hostile artillery and after the assault on the hostile front line has begun, furnish direct support with the main strength to the Right Wing in the attack, and will further be prepared to obstruct at the proper time, enemy offensive action from the direction of XX. The area in the vicinity of XX may be used for the observation posts. The combat zone is all the area on the front of the Division. One airplane will cooperate.
9. Each battalion will independently execute an area survey and for the purposes of uniformity in future survey operations, the 2nd Battalion is designated the base organization. The commander of the Regimental Observation Party will furnish the details concerning the survey.
10. The Regimental Communications Officer will furnish details

concerning the communication net which will be established as follows:

a. Wire Communication: Each battalion is responsible for establishing communications with Regimental Headquarters. The Regiment is responsible for establishing communication between Regimental Headquarters and both Wings. The Battalion on the left will establish communication with the adjacent battalion.

The Heavy Field Artillery Battalion will establish communication with the 1st and the 3rd Battalions, 1st Field Artillery.

b. Radio Communication: Establish an air-ground communication station at Regimental and Battalion Headquarters.

c. 1st Battalion 1st Field Artillery with the right Regiment of the Right Wing Unit.

2nd Battalion, 1st Field Artillery with the left Regiment of the Right Wing Unit.

3rd Battalion, 1st Field Artillery with the front line Regiment of the Left Wing Unit.

11. Ammunition allotted in this engagement will be five units of fire.

12. The Ammunition Trains will take positions as follows:  
Regimental Field Artillery Ammunition Train at XX.  
Regimental Mountain Artillery Ammunition Train at XX.  
Regimental Heavy Field Artillery Ammunition Train at XX.

13. Division Artillery Ammunition distributing points will be established at XXX for part of the Field Artillery and at ZZ for others.

14. The battalion ammunition train of the 3rd Battalion 1st Field Artillery will receive replenishment directly from the X distributing point.

15. I will be at XXX.

Colonel XX  
1st Field Artillery Commander

Distribution:

Assemble recipients of orders for each battalion and issue verbal instructions.

Note:

A sketch of installations, indicating on a map the situation, will be printed and distributed later down to and including batteries. The target numbers will be listed.

52. An Example of an Infantry Battalion Order to Deploy for Attack on an Organized Hostile Position.

( At XX line after capturing outpost position)

1st Battalion, X Infantry  
AT: HAGIDAI  
26 December, 19\_\_, 0930

Operation Order No. X

1. The hostile position is at XXXXX. There is an enemy sentry post established on the north bank of a large depression south of Tsukamigaoka. Unless one uses the road running through the paddy field in the depression, it seems that the area will be difficult to cross. The Regiment is at XXXXXX.

2. This Battalion will deploy in the sector extending from the model house to the western edge of the Daikyoba-zutsumi which is north of Tsukamigaoka, and attack the enemy between XX and XX. It will then advance to the sector north of Sakura. The direction of the main attack will be towards XX. The sector boundaries between the battalion and adjacent units on both flanks will be as follows:

Right: A line passing the east side of Gongenoka and the model house southeast of Dainichizan (2-74) northeast of Hagidai.

Left: A line passing through the eastern security sign at Naganuma (26-4) approximately 400 meters north of the old fort, Naganuma pond, the western edge of the Daikyoba-zutsumi north of Gongenoka and (27-1) north of Unagayoroka. The 1st Battalion, 1st Field Artillery which is to support the attack in the Roppeya area is occupying a position in the vicinity of Hagidai with its main strength. The 3rd Battery from a position in the vicinity of the old fort, is expected to furnish direct support to this battalion in the attack.

3. The Companies will take positions in line from right to left in the order 1st Company, 2nd Company, 3rd Company, and make preparations for the attack.

The 1st Company will deploy in the depression area northeast of Hagidai. XXX is the attack objective.

2nd Company will deploy in the present area of the 1st Company. XXX is the attack objective.

3rd Company will deploy in the vicinity of the old Naganuma kanteki. XXX is the attack objective.

4. The Machine Gun Company and the Infantry Gun Unit will follow in the rear of the 3rd Company under the supervision of the Machine Gun Company Commander.

5. The Rapid Fire Gun X Unit will follow in the rear of the 2nd Company.
6. The time of attack of the front line units will be designated later.
7. The Reserve, 4th Company, will be located in the depression east of the old fort, and following the advance of the front line in the rear of the 2nd Company, will become the antiaircraft unit for air security. Completing the distribution of ammunition, the Combat Train will proceed to the ammunition distributing point at Hagidai, and after replenishment, will be located in the vicinity of the security sign north of the old fort.
9. I will be in my present position and as the front line advances, I will follow the 2nd Company through the plateau on the eastern side of Eigonchi (27-7) to the vicinity west of Hachigobayashi.

Major XX  
Battalion Commander

Distribution:

Assemble all Company Commanders, Infantry Gun Unit Commander, Combat Train Commander and issue verbal instructions.

53. An Example of a Field Artillery Battalion Order to Deploy to Support the Attack on an Organized Hostile Position.

1st Battalion, 1st Field Artillery  
AT: "A" HILL  
10 March, 19\_\_, 1100

Operation Order No. X

1. It appears that the enemy has deployed in area in the vicinity of "D" "B" and "C" since this morning with his artillery in the vicinity of XZ. The Division will from now on attack the enemy in the vicinity of "C" with its main strength and advance to the "N" River line. The Right Wing Unit (1st Infantry Brigade) will deploy on the "EF" line and attack the enemy east of "G" while the Left Wing (2nd Infantry Brigade less 4th Infantry (less 3rd Battalion)) will deploy on the "HJ" line and attack the enemy west of "G". The sector boundary is the line M-N. The Field Artillery from positions in the vicinity of "L" with other elements will generally furnish direct support to the Right Wing in the attack.

2. This Battalion will occupy positions in the vicinity of "L" with its main strength and in the vicinity of "M" with an element so as to be able to fire in the sector west of the line K-C-P, and in the sector north of the line X-Y-Z. It will mainly furnish direct support to the Left Wing.

3. Batteries will occupy positions as follows:

4th Battery - in woods right of the mound.

5th Battery - in woods left of the mound.

6th Battery - in woods south of "M". As the action develops, the position will be changed to the vicinity of "S".

4. Observation posts of all Batteries and the Battalion will be on plateau "A" in the order from the right to the left, 4th Battery, Battalion Headquarters, 5th Battery, and 6th Battery. As the action develops it is planned to move forward the observation posts of the Battalion Headquarters, and those of the 4th and 5th Batteries to the vicinity of "R".

5. Reconnaissance zones will be as follows:

4th Battery - right of reference point No. 1.

5th Battery - between 1st and 3rd reference points.

6th Battery - left of reference point No. 2.

6. Route of advance:

R-L route for the 4th and 5th Batteries, R-Q-M route for the 6th Battery. After completing the reconnaissance for positions move out in order of sequence.

7. The Battalion Ammunition Train will be in the pine woods south of "Q". It will dispatch two ammunition carts to the 6th Battery.

8. The Regimental Ammunition Train will be located in the vicinity of "R".

9. Ammunition Consuming Rate:

XX number of rounds of HE shell per gun.

XX number of rounds of shrapnel per gun.

10. The Battalion Headquarters will be at this place. To assist the Battalion Observation Party (1) officer, (1) non-commissioned officer, and (2) privates and one B.C. telescope will be sent to "T" Hill from the 4th Battery.

Major XX; Artillery  
Battalion Commander

Distribution:

Assemble Battery Commanders and the Commander of the Battalion Ammunition Train at Hill "A" and issue verbal instructions, pointing out on the ground the various terrain features.

Note:

Prior to issuing of orders, the reference point of the battalion will be pointed out, and orders will be issued indicating actual positions.

54. An Example of a Division Order for Dawn Attack on an Organized Hostile Position.

Headquarters, 1st Division  
AT XX  
13 June, 19\_\_, 1500

Operation Order A No. 1

1. The situation of the enemy positions on our front is as shown on sketch on separate sheet. (omitted)
2. This Division will attack the main position of the enemy extending from east to west on XX Mountain at dawn tomorrow, the 14th, and will attempt to advance to the line extending from XX Mountain to OO Mountain. The main attack will be directed towards XX Mountain.
3. The Right Wing will commence movement at sundown and immediately seize the enemy positions established on the right bank of the ZZ River in the vicinity of the plateau east of ZZZZ. From positions on this line preparations will be made for attack on the following dawn.
4. At sundown, a part of the Left Wing Force will occupy the line of ZZZ and XXX and prepare for the debouchment of the enemy. It will cooperate in the attack of the Right Wing. Upon seizure by the Right Wing Force, of the area in the vicinity of the plateau east of ZZZZ, the main strength will make contact with the Right Wing, deploy in the sector west of ZZZ by 0400 and prepare for the following dawn attack.
5. The boundary of the zone of action of both Wing Units is the line extending from the eastern edge of XXX through the eastern foothills of XX Mountain to the Western edge of ZZ. The boundary line will be included in the sector of the Right Wing Force.

6. The time for both Wing Units to attack is scheduled at approximately 0700 and will be by separate order.
7. The Artillery after cooperating in the seizure of the hostile outpost position on the right bank of the ZZ River at dusk today, with an effective part of its strength will begin movement at 2300. An element will occupy positions in the vicinity of OO while the main force will occupy positions in the area between YY and XX. Firing will commence at day-break with approximately a (40) minute preparation. After neutralizing the enemy artillery, it will cooperate directly with both wing units as follows:  
Right Wing - approximately (2) battalions (approx. (3) battalions during the assault).  
Left Wing - approximately (1) battalion.  
During the attack by both Wing Units detail for support (1) battalion Mountain Artillery (less (1) battery ) to the Right Wing and (1) Battery (left over from above Battalion) to the Left Wing. Make preparations so as to be able to place the fire of approximately (2) Battalions in the XX sector with the purpose of obstructing an enemy attack. During the attack on the hostile position (80%) of the ammunition carried may be expended. By dawn tomorrow, smoke shells will be supplied as follows: 100 rounds to each gun of mountain and field artillery, 50 rounds to each 155 mm howitzer.
8. The Cavalry Unit will advance towards the direction of ZZ and harass the hostile flanks.
9. The Engineers after assisting the Artillery in the occupation of positions will be in the XX vicinity and as the action progresses, will assist the Artillery in crossing the XX River.
10. Upon the advance of the Right Wing the Reserve will move to XXX and follow in rear of the Right Wing.
11. The Antiaircraft Unit will occupy positions in the vicinity of XX by 0400 and engage in air defense missions.
12. The Air Unit will commence operations early tomorrow morning; (3) planes will cooperate with the Artillery while the remainder will reconnoiter the enemy situation and the condition of the rear echelons.
13. The Balloon Unit will ascend from XX early tomorrow morning and cooperate with the Artillery during the action.
14. The Communication Unit will establish a communication net between the Division Headquarters and both Wing Forces

by 1700 today. It will further establish a communication net between the Division Headquarters and the Artillery, the Balloon Unit, and the Reserve tomorrow, the 14th, at 0400.

15. The Medical Unit with its main strength will establish a dressing station in the XX area and with other elements establish a station in YY area.

16. A field hospital will be established at YY and XX,

17. Tomorrow the 14th after replenishing rations and forage, the Field Train under its Commander will prepare to move to the area north of ZZZ.

18. By dawn tomorrow, the 14th, the Transport will establish ammunition depots as follows:

One infantry ammunition platoon at XX and one at WW. One artillery ammunition platoon at ZZ and one at YY.

19. At 0500 on the 14th, I will be at the plateau south of XX, and will later move to ZZ through XX.

Lieutenant General XX  
Division Commander

(The distribution orders and disposition of troops is omitted).

55. An Example of a Regimental Order for Night Attack of an Organized Hostile Position.

1st Infantry  
AT XX  
(Date and time)

Operation Order No. X

1. The Division will penetrate the hostile position in the vicinity X<sup>A</sup> and XX at 2100 tonight, and will further exploit its success towards XX from these areas at daybreak, annihilating the enemy in the Shinkawa River gulch. The Left Wing will penetrate the hostile position in vicinity of ZZ and YY tonight and advance to the XX-XX line.

2. This Regiment will form the Right Unit of the Left Wing. The XX positions will be seized by an element of the unit while the main strength will seize the XX and XX positions. The time of assault is 2100. The sector boundary will be the same as that during the day.

3. The 1st Battalion on the right of the line, with an element

of its strength, will cover the right flank of the regiment against the enemy in the XX vicinity, and with the main strength, will seize and hold the hostile positions at XX.

4. The 2nd Battalion on the left of the line, will penetrate the XX position, capture and hold the hostile positions in the XX vicinity.

5. The 3rd Battalion will assemble its main strength in the depressed area east of XX after sundown, and will become the Reserve. An element will remain at the present location and cover the movement of the Regiment. Withdrawal time will be given by separate order. During the progress of the attack, advance in the direction of XX in the rear of the 2nd Battalion.

6. The regimental guns will destroy enemy searchlights that appear at XX, XX, and XX, while preparations for the night attack are being made in the vicinity of the present position. Movement to XX will be made after the hostile lines have been penetrated. Time of the movement will be announced later. Attach a rifle squad from the 12th Company for covering purposes. As progress in the night attack of the Regiment is made the rapid-fire guns will move to XX. The time for movement will be announced later. Attach a rifle squad from the 4th Company for covering purposes.

7. Destruction of obstacles by stealth will be completed by 2000

8. The pass words for tonight will be XX and XX

9. I will be at my present location until sun-down and thereafter, I will proceed to the position of the line of departure of the 2nd Battalion.

Colonel XX  
Regimental Commander.

Distribution:

Assemble all unit commanders if possible, or the adjutants when this is impracticable and issue verbal orders. Notify the direct support artillery through the liaison officer.

Note:

Depending upon the situation, items after the 3rd may be stated as follows: "Each unit will maneuver according to the night attack plan as indicated on separate sheet." The night attack plan may be attached.

## SECTION VI

### DEFENSE OF A POSITION

56. Items to be Covered in Orders for Defense of a Position.
1. Situation of enemy and friendly troops.
  2. Plan of the Commander.
  3. For Units, (which are) occupying areas.
    - a. Front line of the zone of resistance.
    - b. Zone of action: so as to clarify the position boundaries, disposition of the foreground, assignments of areas for reconnaissance and security, demarcations in the zone of action will be made from the rear edge of the zone of resistance to the front of the security zone.
    - c. Items pertaining to the Security Units. (indicate the approximate location, withdrawal positions, and if necessary the movements and strength).
    - d. If necessary, list matters concerning flank defense.
  4. For the Artillery:
    - a. Distribution of the mass of fire in the desired direction and location during each period of support, and the purpose.
    - b. Areas to be occupied.
    - c. Approximate number of rounds of ammunition to be used.
    - d. Time to commence preparation fire.
    - e. Items pertaining to cooperation with the infantry.
    - f. If necessary, duties at the initial phase of the engagement.
  5. For the Engineers: Type, degree, time of completion, etc., of work to be carried out.
  6. Duties of Cavalry Units.
  7. Duties of Air Units.
  8. Duties of Antiaircraft Units.
  9. Duties of Balloon Units.
  10. Positions and movements of Reserve Unit.
  11. Duties of Signal Unit.
  12. If necessary, special dispositions and time of starting and completing construction, as well as matters relating to the posting of observation parties.

13. Matters pertaining to Medical Units.
  14. Matters pertaining to Field Hospitals.
  15. Matters pertaining to replenishment of ammunition.  
(Types of ammunition and location of distributing points.  
If necessary, the time to begin replenishment.)
  16. Location of the Commander, and if necessary method of communication.
57. An Example of a Division Order for Occupying a Position.

Distribution of troops.

Air Unit:

1st Air Squadron

Cavalry:

1st Cavalry (less one platoon)

Right Sector Unit:

Commander - Major X - 1st Battalion Commander, 1st Infantry

The 1st Battalion 1st Infantry (less 3rd and 4th Companies)

(1) Infantry Artillery platoon 1st Infantry

(1) Mountain Artillery Battery

(1) Engineer Platoon.

Center Sector Unit:

Commander - Major General X, 2nd Infantry Brigade  
Commander

The 1st Infantry (less 1st Battalion, less 3rd and 4th Companies)

2nd Infantry

(1) Cavalry Squad

(1) Engineer Platoon.

Left Sector Unit:

Commander - Major General X, 2nd Infantry Brigade  
Commander

3rd Battalion 3rd Infantry

4th Infantry

(1) Cavalry Squad

(1) Engineer Platoon.

Artillery :

Commander - Colonel X, 1st Field Artillery, Commander.

1st Field Artillery (less 3rd Battalion).

1st Battalion, 1st Pack Artillery (less (1) Battery).

1st Battalion 1st Heavy Field Artillery.

Antiaircraft Unit:

1st and the 2nd Mobile-Antiaircraft Units.

Engineer Unit:

1st Engineer Battalion (less (3) platoons).

The Reserve:

3rd Infantry (less 3rd Battalion and one-half Infantry Gun Unit)

(1) Cavalry Squad.

Headquarters 1st Division

AT: PLATEAU NORTH OF XX

10 May, 19\_\_, 1100

Operation Order A No. X

1. The enemy with approximately a division is advancing on XX, YY, ZZ Road while a force with a strength of at least (6) or (7) infantry battalions with about (20) guns is advancing on the road X village X town X village. At 1000 today the 10th hostile elements had passed XX and YY with the infantry leading. At present time the main strength of our Cavalry in the vicinity of XX and other elements in the vicinity of XX village are encountering slightly superior hostile cavalry units.

2. The Division will occupy positions in the area from the vicinity of XX mountain to the vicinity of XX and at the opportune time, from the left flank, will shift to the counter offensive. The 1st Battalion 3rd Infantry with (1) battery of field artillery, will occupy the plateau on the north side of XX village and assist the Division in the occupation of position.

3. The Air Unit will continue on former missions and will especially reconnoiter the movements of the enemy after advance into the vicinity of XX Village.

4. If the Cavalry is pressed by the enemy it will withdraw to the vicinity of XX Village and protect the Division right flank.

5. The Right Sector Unit will strongly occupy the area in the vicinity of XX and the plateau southeast of XX. It will especially protect the area in front of the Center Sector Unit with artillery (will designate if necessary).

6. The Center Sector Unit will occupy the area extending from XX to YY through the northern edge of OO and ZZ.

7. The Left Sector Unit will maintain contact with the left flank of the Center Sector Unit and will occupy the area extending from the northern edge of XX to Hill No. 205 and along the crest line to the plateau west of XX Village. It will especially defend the depressions to the front of the left flank of the Center Sector Unit. (Designate if necessary).

8. Each Sector Unit will distribute security detachments along the line of the XX River. Time of withdrawal will be given in a later order.

9. Sector boundaries will be as follows:

Between the Right and Center Sector Units: A line passing through the eastern edge of XX, western edge of YY and eastern edge of ZZ. The areas along the line will be included in the responsibility of the Right Sector Unit.

Between the Left and Center Sector Units: A line passing through eastern edge of XX and YY.

10. An element of the Artillery will occupy positions in the vicinity of XX and YY so as to furnish support to the Left Sector Unit while the main strength of the Artillery will occupy positions in YY and ZZ areas, so as to furnish support to the Center Sector. Fire support will be rendered as follows:

a. By sunset, the Field Artillery will detail (2) batteries to XX vicinity and (1) battery to YY vicinity to cover our advancing units and interrupt the enemy approach.

b. The enemy will be checked in front of the outpost positions with the fire of (4) batteries. The main strength will use every opportunity to neutralize the hostile artillery.

c. The preparations for an attack by the enemy will be hindered. In the event enemy movements indicate imminent attack, mass fire upon XX, YY, and ZZ areas and interrupt hostile plans to the maximum.

d. The Artillery will check the enemy in front of the main battle position. For this purpose the fire of (3) battalions will be massed in front of the Center Sector, while the fire of (1) battalion will be massed in front of the Left Sector. Depending upon the situation, be prepared to mass the fire of an additional battalion on the front of the Left Sector.

e. The Artillery will check the enemy penetrating the main battle position. The fire of approximately (2) battalions will be massed on the front of the Center Sector, while the fire of approximately (1) battalion will be placed on the front of the Left Sector.

f. Furnish direct support in order to shift to the offensive. To the Center Sector furnish the fire of approximately (1) battalion, while to the Left Sector furnish the fire of approximately (3) battalions.

g. By sunset an element of the field artillery will be assigned to flank defense of the Center and Left Sector Units while (1) battery of Mountain Artillery will be prepared for attachment to the Center Sector for the purpose of anti-tank defense. The time for attachment will be given in a later order.

- h. Preparations will be fired on YY today, between the hours XX and XX.
- i. For the purpose of this engagement the ammunition allotted will be (6) units of fire.
11. The Engineer Unit will assist the Artillery in the occupation of positions and will take steps to repair the road from XX to YY. The 3rd Battalion, 2nd Infantry will assist the Center Sector in construction work.
12. The Reserve will take positions in the XX vicinity.
13. The Antiaircraft Unit will occupy positions in the area XX and YY and engage in air defense missions.
14. The Communication Detachment will establish communications between the Division Command Post at XX, each Sector Unit Commander, Artillery Commander, and the Reserve.
15. The Medical Unit will establish dressing stations at XX with an element and at XX with the main strength.
16. A Field Hospital will be established at XX and YY.
17. By 1300 the Advance Transport will establish ammunition distributing points as indicated below:
- Infantry ammunition -----XX and YY
  - Artillery ammunition -----XX Village
18. I will be at XX Village

Lieutenant General XX  
Division Commander.

Distribution: (Omitted).

58. An Example of a Division Order for Occupying a Position.

Center Sector Unit  
AT: XX  
10 May, 19\_\_, 1230

1. Enemy situation (omitted)

The Main Strength of our Cavalry is at the present time engaging slightly superior enemy forces in the vicinity of XX while other elements are engaging slightly superior enemy forces at XX Village. In case the enemy exerts pressure (at both points) the Cavalry will withdraw to the vicinity of XXX Village and protect the right flank of the Division. The Division will seize the positions extending from the vicinity of XX

hill (mountain) through XX, YY, and ZZ to the vicinity of SS, await an opportunity, and attack from the direction of the Right Wing.

2. The XX Brigade will form the Center Sector Unit and will attempt to seize the positions in the area extending from XX through the northern edge of XX and XX to XX.

The Right Sector Unit (2nd Bn (less (2) Companies) 1st Infantry; (1) platoon Mountain Artillery) will seize the area in the vicinity of XX and the plateau southeast of XX. The artillery platoon will especially cover this sector front from the flank.

The Left Sector Unit (XX - XX Units) will maintain contact with the left flank of this Sector and will seize the area extending from northern edge of XX through the crest line of the plateau west of XX Village to hill 205. It will especially cover the depression area on the left flank of this Sector.

The main strength of the Division Artillery will occupy positions in the area to our rear and will chiefly support this Sector in the action.

3. 1st Infantry (less 3rd Battalion) will deploy in the area extending from XX through the cemetery southwest of XX to the vicinity of the northern edge of the woods northeast of XX. With an element it will cover the area on the left front of the Right Sector Unit as well as the area on the right front of the 2nd Infantry.

4. The 2nd Infantry will cooperate with the 1st Infantry in seizing the positions extending through XX and ZZ and XX and especially, with certain elements, seize the area in the vicinity of XX, and cover the front of the 1st Infantry.

5. The boundaries between the Right and Left Sector Units of the Division and both Regiments and the boundary between Regiments are as follows:

Right Sector Unit                      The line connecting the east edge of XX,  
and 1st Infantry:                      west edge XX, and the east edge of XX

1st Infantry and                        The line connecting the west edges of  
2nd Infantry:                        XX, ZZ and YY.

2nd Infantry and                        The line connecting the eastern edge of  
Left Sector Unit:                      XX and OO. The area along the line is  
the responsibility of the unit on the  
right.

6. Both front line regiments will establish outguards as follows:

1st Infantry with approximately (1) Company of Infantry and (1) machine gun platoon along the left bank of XX river with its main strength located at XX.

2nd Infantry with approximately (1) Battalion (less (2) companies) along the left bank of XX river. A detachment located in the vicinity of the right bank of XX river will reconnoiter the XX area.

The Division Artillery with an element will occupy positions in the vicinity of XX during the initial stages of the action to interrupt the hostile communications and with approximately (1) battalion of the zone of defense artillery will support the outpost in its action. A definite hour for withdrawal of outguards will be announced later.

7. Each unit will conceal its positions with the utmost care and all construction will take place after sundown. The construction material for positions will be distributed at XX at 1700.

8. The 3rd battalion 1st Infantry and a platoon of Engineers will form the Sector Reserve and will be located at XX. However, the Infantry and Engineers will proceed to XX after constructing positions in the direction of XX, in the areas of XX and XX, before dawn, tomorrow.

9. Communications Detachments of both regiments will construct the following net:

The 1st Infantry communication detail will establish communications between Brigade Headquarters and the Reserve in the vicinity of XX before dawn, tomorrow.

The 2nd Infantry communication detail will establish communications between Brigade Headquarters and the Commander of the Outpost, 2nd Infantry, in the XX vicinity.

10. I will now go to ZZ through XXXX and YY. At 2100 send a messenger to the above location.

Major General XX,  
Center Sector Commander

Distribution:

Assemble the recipients of orders of all units and issue verbal instructions.

59. An Example of a Division Artillery Order to Support the Occupation of a Position.

XX Artillery  
AT: XX  
10 May, 19 \_\_; 1200

1. Approximately one division of the enemy is advancing on the XX-YY-ZZ roads, while an additional force of at least (6) or (7) infantry battalions with approximately (20) guns are advancing on X village, X town, and XX village roads. At 1000 today, the 10th, the leading elements consisting of an infantry unit passed XX and YY.

At present the main strength of our cavalry is located in the vicinity of XX, while other elements of the unit are located in the vicinity of XX village. Slightly superior enemy forces have been encountered. If pressed by the enemy the cavalry will withdraw to the vicinity of XXX village and protect the right flank of the Division.

2. The Division will occupy positions in the area extending from the vicinity of XX mountain, through ZZ, YY, and XX, seizing the opportunity, it will take the offensive from the direction of the Left Wing Sector.

a. The Right Sector (1st Battalion, 1st Infantry (less 3rd and 4th Companies), (1) platoon Mountain Artillery) will strongly occupy the area in the vicinity of XX and the plateau southeast of XX.

b. The Center Sector (1st Infantry (less the 1st Battalion (less 3rd and 4th Companies)), 2nd Infantry) will occupy the area extending from XX to XX through the northern edge of YY and ZZ.

c. The Left Sector (3rd Battalion 3rd Infantry, 4th Infantry) will cooperate with the left flank of the Center Sector and occupy the area extending from the north edge of XX to Hill 205 through the crest line along the plateau west of XX village.

d. Each Sector will post security detachments along the XX River.

e. The boundaries between Sectors are as follows:

Right and Center Sectors: Line connecting the eastern edge of XX, western edge of XX, and the eastern edge of XX.

Left and Center Sectors: Line connecting the eastern edge of YY and XX.

3. The Artillery will occupy positions with an element in the vicinity of XX and XX, and with its main strength in the ZZ and YY areas. It will cover the Advance Body and harass the hostile approach. As the enemy approaches, the main strength will support the Center Sector while other elements support the Left Sector in the action.

4. The 1st Battalion will revert to the control of the Regiment after occupying and withdrawing from covering positions and will occupy the area between YY, ZZ, and TT, to carry out the following missions:

a. One battery will be immediately dispatched to the XX

vicinity to cover the Advance Party and harass the hostile approach.

b. To delay the enemy in front of the outpost position of the Center Sector.

c. To furnish direct support to the Center Sector as the enemy attacks the main defensive zone.

d. At the time of the shift from the defensive to the offensive, the main strength will furnish direct support to the Center Sector while one element will neutralize the hostile artillery.

5. The 2nd Battalion will occupy positions in the area between XX, YY and ZZ and carry out the following missions:

a. Two batteries will be dispatched immediately to the XX vicinity to cover the Advance Party and harass the hostile approach.

b. Obstruct the enemy preparations for attack in the vicinity of YY, ZZ and TT and neutralize his artillery.

c. During the enemy attack on our main defensive zone, furnish direct support to the Center Sector, and at the appropriate time furnish direct support to the Left Sector.

d. During the shift from the defensive to offensive, the main strength will furnish direct support to the Left Sector.

6. The 1st Mountain Artillery Battalion (less one platoon) will occupy positions in the vicinity of XX and carry out the following missions:

a. One battery will check the enemy in front of the outpost positions of the Left Sector.

b. Furnish direct support to the Center Sector during the hostile attack on our main defensive zone.

c. Furnish direct support to the Left Sector during the shift from the defensive to the offensive.

7. The 1st Heavy Field Artillery Battalion will occupy positions in the area between ZZ, YY and TT and carry out the following missions:

a. Obstruct the hostile preparations for attack in the vicinity of TT, YY, and ZZ and neutralize the enemy artillery.

b. Neutralize the hostile artillery and successively furnish direct support to the Center Sector during the enemy attack on our main defensive zone.

c. At the time of shift from defensive to offensive action the main strength will furnish direct support to the Left Sector while an element will neutralize the enemy artillery.

8. The details concerning the massing and execution of fire by each battalion during each phase of action will be indicated later.

9. The zone of action of each battalion will be as follows:  
1st Battalion - Zone of action of the Center and Left Sectors.  
2nd Battalion - Entire zone of action.  
1st Mountain Artillery Battalion - Zone of action of the Center and Left Sectors.  
1st Heavy Field Artillery Battalion - Entire zone of action.

10. The reconnaissance zone of each battalion will be the same as the zones of action but the 2nd Battalion and the 1st Heavy Field Artillery Battalion will pay particular attention to location of hostile artillery.

11. Each battalion will conceal its preparations for establishment of positions as much as possible during daylight and at sundown the main strength will move to positions, completing occupation by 2000. The 2nd Battalion and the 1st Mountain Artillery Battalion will prepare to place harassing fire on the billeting area and interdiction fire on the hostile communications in the areas ZZ, TT, XX and PP, simultaneously. For this purpose it is permissible to move into positions before sunset if it is necessary.

12. Survey operations will be coordinated and executed by all units.

The officer in charge of the Regimental Observation Detail will take charge of the Regimental Observation Party and such parts of the details of each battalion as are necessary to carry out the survey operations, so as to enable the Artillery to execute transition fires by dawn tomorrow. Successive operations will be carried out during the time available so as to increase the accuracy of the survey as much as possible. The essential area for survey is that area west of the ZZ-TT road, between the outpost positions and the main defensive zone. Captain X, the Commander of the Regimental Observation Detail will furnish the information concerning the orientation and work to be performed.

13. The Communications Net will be completed by 1700 in accordance with the following plan:

a. Wire Communication: Lines between Regimental Headquarters and various battalions to be installed by each battalion.

Lines between Regimental Headquarters and sectors to be installed by Regiment.

Lines between battalions will be installed by the unit on the left.

Lines between the Heavy Field Artillery Battalion and the 1st Field Artillery and the 1st Mountain Artillery Battalion

will be installed by the Heavy Field Artillery Battalion.

Lines between the 1st Battalion and the Heavy Field Artillery Battalion will be installed by the 1st Battalion.

b. Wireless Communication: Air-ground liaison will be established by the Regiment and each Battalion Headquarters by 1500. Communications will be established between Regiment and Battalions by 1700.

c. Liaison:

1st Battalion will establish liaison with the Left Regiment, Center Sector.

1st Mountain Artillery Battalion will establish liaison with both regiments of the Left Sector. The Regimental Communications Officer will furnish the necessary details.

14. A (30) minute preparation will be carried out commencing at XX hour, today, the (date) and details will be indicated separately.

15. The ammunition to be expended in this engagement will be approximately (6) units of fire.

16. The Ammunition Trains of the Field Artillery Regiment, Mountain Artillery Regiment, and the Heavy Field Artillery Regiment will be located at XX, YY, and ZZ respectively. The ammunition distributing points for the Division will be at XX and YY.

17. I am at YY. Send a recipient for orders at 1700.

Colonel XX  
Commander, Field Artillery Unit

Distribution:

Unit Commanders will be assembled and verbal instructions issued.

60. An Example of an Infantry Battalion Order for Occupying a Position.

HQ 2nd Battalion 1st Inf.  
Plateau south of MAEHARA  
1 February, 19\_\_ , 0930

1. The enemy directly on our front began a westward movement at about 0700.

The Division will occupy positions in the area extending from the plateau southwest of Shoshiga Pond to Ebigasaki through (plateau south of Mashara), Takidai, and Shichirin and upon the arrival of all units will shift to the offensive.

The Cavalry is opposing the enemy cavalry at the line Usui - Noborito.

One Infantry Brigade will form the Right Sector Unit of the Division with the 1st Infantry on the right front.

2. This battalion on the left front of the regiment will attempt to occupy the position between Fudaba and the eastern edge of Maehara. The front of the barrage will be along the line XXXXX.

The Infantry Gun Unit (less (1) Platoon) and (1) platoon of Engineers will be attached.

The 1st Battalion will occupy the plateau southwest of Shoshiga Pond and part of its machine gun unit will defend the right flank of this battalion.

The unit on the left will occupy positions extending from XX to XXX and with an element of its strength will cover the front of this Battalion.

The boundary between the 1st and 2nd Battalions will be the line joining the western edge of Fudaba, southern edge of the Railroad Regiment, Kukuda Shrine which is located on the northern edge of Kukuda, and the northern edges of Nakanogi, Maehara, and Fujisaki.

The 3rd and the 4th Companies will be posted as out guards in the vicinity of the plateau west of Fujisaki.

The 2nd Battalion XX Field Artillery will occupy positions in the XX and XXX vicinity, and will cover the area on the direct front of this Battalion. Besides covering the area of the depression directly in front of the position and the western edges of the depressions in the vicinity of Fujisaki and Kukuda, the fire of (2) batteries will be placed on the front of the 5th and 6th Companies, while the fire of (3) batteries will be placed on the front of the 7th Company. In case of necessity the fire of (6) batteries will be placed in the area south of the line connecting Shojigaike (on the Map) and the northern edge of Fujisaki plateau. The observation posts for the artillery units may be established on the line of the front line units. In anticipation of an attack by hostile tank units a position for one gun will be selected in the vicinity of the northern edge of Maehara.

3. The front line will be occupied by the 5th, 6th, and the 7th Companies.

The 5th Company will occupy positions extending from the southern edge of Fudaba to the eastern edge of Bosa (a fruit orchard on the SW edge of Maehara). The field of fire will be the area inclosed by the line connecting the western edge of Fudaba with the eastern edge of Tanizu and the line connecting the edge of that village (in the vicinity of the gendarme station) with Bosa. An element will protect the front of the

6th Company against a flank attack. A squad of Engineers will be attached.

The 6th Company will occupy the center of the sector on the left of the 5th Company with positions extending from the flank of that Company to the main road east of the plateau. The field of fire will be the area extending from the shed used as a look-out, 100 meters right of the station to the line connecting the left flank of this Company position with the northern edge of the village. (south of Fujisaki plateau.)

The flank of the 5th Company will be covered by an element of the unit to furnish protection from a hostile attack.

The 7th Company on the left will occupy positions extending from the vicinity of the plateau beyond the eastern side of the main road to the northeastern edge of Maehara. (The plateau approximately 150 meters high is south of the T shaped road junction on the Nijo Road, on the eastern edge of Maehara). The field of fire will be the area between the line connecting the left flank of the position to the northern edge of Fujisaki Plateau and the line along the main road on the right flank of the company position.

Each front line company will establish listening posts on the XX and YY line and keep under observation the area between this line and the line XX-YY. Separate instructions will be issued covering the withdrawal.

4. One platoon of the Machine Gun Company will occupy a position in the vicinity of the southern edge of Fudaba and deliver sweeping fire in the area, south of the railroad line, on the right front of this battalion, while the lowlands directly in front of the position will also be covered.

The remainder of the Machine Gun Company will occupy positions in the vicinity south of the grammar school (right flank position of the 5th Company) and bring under fire hostile elements advancing towards the right flank of the battalion, while the lowlands directly in front of the position will also be covered.

5. The Infantry Gun Unit will occupy positions as follows;

- a. The 2nd Platoon will occupy a position in the vicinity of the T shaped road junction at Nijo, southeast of Maehara, so as to fire against enemy machine guns appearing on the left front of the battalion in the area east of the Tsudanuma Village.
- b. The 1st Platoon will occupy a position in the vicinity of the southern edge of Fudaba so as to fire against enemy machine guns appearing in front of the right flank of the battalion in the area south of the Higashi-Gane Road.

6. During the construction of positions the possibility of enemy tank attacks will be carefully considered. As soon as possible a wire entanglement supply detail will be sent to the railroad crossing (300) meters north of Daishuku. The amount of material allotted is (300) meters for the 5th Company (350) meters for 6th Company, and (350) meters for 7th Company. This material is sufficient for the installation of (3) lines.

7. The 8th Company is designated the Reserve and will be located at Nakanogi.

8. The Battalion Headquarters will be located at Nakanogi.

I will be at Nakanogi after inspecting the positions.

Major XX

Commander 2nd Bn, 1st Inf.

**Distribution:**

I will assemble the unit Commanders and issue verbal instructions making the necessary changes after inspecting the position.

61. An Example of a Field Artillery Battalion Order for Occupying a Position.

Hq 1st Field Artillery Bn

"J" PLATEAU

10 March 19\_\_\_, 0900

1. The head of the enemy column which is advancing on the "A" road will reach XXX at 1100.  
The detached force will occupy a position along the line C, G, D, and E. After the enemy is overwhelmed by fire power the offensive will be assumed in the direction of D and F. The Right Sector Unit (1st Infantry less (1) Battalion) will occupy positions in the area between C and G; the Left Sector Unit (2nd Infantry) will occupy positions in the area between H and E.
2. This Battalion will occupy positions with the main strength in the vicinity of Q, and with other elements in the vicinity of R, so as to concentrate its entire fire power in the area between M Road and N River and especially cover the area in the vicinity of E.
3. Each Battery will occupy positions as follows:  
1st Battery In woods east of Q with the Observation Post in the vicinity of the eastern edge of "J" Plateau.  
2nd Battery - In the pine grove west of Q with the Observation Post in the vicinity of the western edge of "J" Plateau.  
3rd Battery - In the depression area southeast of G.  
Make preparations to cover the front of the positions in the vicinity of D.

As the enemy approaches, the 1st and 2nd Batteries will be prepared to change positions successively to the area in the vicinity of Q and G.

4. The route of approach to be followed by the 1st and 2nd Batteries is the VQ Road. As soon as the reconnaissance has been completed, the occupation of positions will be made.

5. The Reconnaissance Officer will indicate the areas to be reconnoitered and the preparations to be made for opening fire.

6. The Battalion Ammunition Train will be located in the area on the south side of X Village.

7. Allotment of ammunition: For each gun, X rounds (Shrapnel, X rounds, Shell, X rounds).

8. The Battalion Command Post will be established in the center of "J" Plateau.

The 1st Battery will detail (1) officer, (1) non-commissioned officer, and (2) privates with (1) B. C. Telescope as an observation party at T Plateau.

The telephone lines between the Battalion Command Post and the Observation Party at T Plateau will be installed by the Battalion Detail. All Batteries will lay telephone lines to the Battalion Command Post.

Major X,  
Commanding

Distribution: Assemble all Battery Commanders and the Battalion Ammunition Train Commander on the "J" Plateau and issue verbal instructions.

62. An Example of a Division Order Relative to a Counter Offensive.

HQ: 1st Division  
Place XX  
Day, month, 19\_\_, 0900

Operation Order No. 2

1. The enemy situation (omitted)

2. At dawn tomorrow the Division will assume the offensive from the area of the Right Wing, forcing the enemy main strength into XX and annihilating him. The main direction of attack will be from YY to XX.

3. The 1st Infantry Brigade Commander will command the Right Wing composed of the former Right Sector Unit and the former Center Sector Units. At the present positions preparations will be made for the attack tomorrow morning. The 1st Battery, Mountain Artillery in the XX vicinity, will be attached.
4. The 4th Infantry Regimental Commander will command the Left Wing composed of the former Left Sector Units. Preparations for the attack on the following morning at the present positions, will be made, with special emphasis placed on the right flank.
5. The definite time of the attack of both Wing Units will be indicated in separate orders.
6. The boundary of the zones of action between both Wing Units will be the line passing through the eastern edge of XX, eastern edge of YY and the western edge of ZZ.
7. Tonight, elements of the Artillery (less the 1st Battery Mountain Artillery) will move positions to the vicinity of XX to commence firing at dawn tomorrow. After neutralizing the enemy artillery the fire of approximately (3) battalions will be placed in direct support of the Right Wing and approximately (1) battalion will furnish direct support to the Left Wing. If both Wing Units advance to the XX vicinity, the Artillery will advance successively to that vicinity. It will support the subsequent attack and will especially be prepared to attach approximately (1) battalion of Mountain Artillery to the Right wing and approximately (1) battery to the Left wing.
8. The Engineer Unit will be located in the vicinity of XX and at the opportune time will assist in the movement of the Artillery.
9. A squadron of the Air Unit will reconnoiter the enemy situation in the YY area at dawn, tomorrow. Two planes will cooperate with the Artillery.
10. The Reserve will move to the vicinity of YY by dawn, tomorrow. Prepare to move to the right flank of the Right Wing.
11. The Cavalry will harass the hostile left flank from the direction of XX.
12. The Communications Unit will make preparations to extend a single circuit from XX to XX.
13. The Medical Unit located in the rear of the Left Sector will complete the evacuation of casualties as soon as possible and by dawn, will be established at XXXX.

14. I will be at my present location and will move to the XX plateau by dawn tomorrow.

Lt. General XX,  
Commanding

Distribution: Assemble recipients of orders of all units and issue verbal instructions.

## SECTION VII

### PURSUIT

63. An Example of a Division Order to Designate the Zones of Action for Pursuit.

Hq 1st Division  
At XX  
16 May 19\_\_, 1630

Operation Order No. X

1. The enemy on our front has begun to retreat.
2. This Division will seize and annihilate the enemy in the area east of the plateau, north of Village A.
3. The Cavalry will immediately move to the vicinity of Village B and cut the enemy route of retreat.
4. The 4th Infantry (less 3rd Battalion) will form the Right Pursuit force and will pursue the enemy so as to cut off immediately his route of retreat from the area Village G - Village D Road. (1) squad of Cavalry, (2) Batteries of Field Artillery, one platoon of Engineers and one wireless set will be attached to the 4th Infantry at X hour in X area.
5. The Right wing Unit will rapidly pursue the enemy towards Village A.
6. The Left wing Unit will rapidly pursue the enemy towards the line E-F.
7. The boundary between the zones of action of both Wing Units will be extended from XX to XX.
8. The Artillery, as the front line units continue the pursuit, will make displacements forward in the area along the XX highway and support them in the action. Fire will be

particularly placed in the vicinity of XX bridge in order to intercept the hostile retreat. Two Batteries of Field Artillery will immediately be attached at XX place to the Pursuit Unit.

9. The Engineer Unit (less (2) platoons) will as soon as possible remove the obstacles from the route of advance and will facilitate the movement of the Artillery in particular.

10. The 3rd Battalion 4th Infantry comprising the Reserve will advance in the rear of the Left Wing in the direction of XX.

11. I will for the time being remain at my present location, and will later proceed to the northern edge of Village A via the XX Road.

Lt. General XX,  
Commanding

Distribution: An outline will be sent by telephone and simultaneously, a staff officer will be dispatched to each Wing Unit and the adjutant to the Artillery and Engineer Units to issue verbal instructions. Written orders will be furnished the Cavalry. Instructions to the 4th Infantry (Right Pursuit Force) will be issued through the Liaison Officer of that Unit.

64. Items to be Covered in a Division Order to Organize a Pursuit Unit.

1. Enemy situation

2. Commander's Plan.

When necessary items pertaining to the pursuit of adjacent units.

3. Organization and mission of the Pursuit Unit. (The composition, the location where the Artillery and other units come under control of the Pursuit Commander, routes, pursuit objectives, and boundaries etc., if necessary).

4. Location of Division Commander and if necessary, the movements, the methods of liaison, the place to which messages are to be delivered, etc.

Essential factors to be indicated in the order to all units at the time of pursuit.

1. Enemy situation

2. Commander's Plan

Items pertaining to the movement of the Pursuit Unit and its subordinate units.

3. Movement of all (regiments) units. (designation of the pursuit sector and indication of the objectives, instructions concerning the assembly, and the place where the Cavalry and Artillery come under the control of the Pursuit Commander.)

4. Location of the Commander, (If necessary his movements, the method of communication and place to which messages are to be sent.)

65. An Example of a Division Order Issued to the Cavalry Commander (Who Has Been Assigned to Harass the Hostile Right Flank and Rear)

HQ 1st Division  
North Edge of A Village  
16 May 19\_\_, 1200

Operation Order No - Part I

1. The enemy is withdrawing in the direction of N town, passing through the area along the X<sup>a</sup> road, J, M, N, village roads and K, M, N, village roads and K, M, N, town roads.

2. The Division is preparing to pursue the enemy toward the line of the X river. The Right Pursuit Unit will pursue so as to close in on the left rear flank of the enemy from the direction of C-D Village road while the Center and Left Pursuit Units pursue in the area parallel to the K, M, N town road and the XX Highway.

3. The Cavalry will immediately pursue the enemy in the area extending from the right bank of the S River in the direction of "Z" town and cut off his route of retreat.

The 3rd Battalion, 4th Infantry (light pack) one battery of Field Artillery, and one platoon of Engineers will overtake and come under the control of the Cavalry in the direction of Village B.

4. I will be in rear of the Center Pursuit Unit and will advance on the XX road.

Lt. General XX,  
Commanding

Distribution: Verbal orders by the adjutant.

66. An Example of a Division Order Issued to the Commander, 4th Infantry (Reserve) Commanding The Right Pursuit Unit.

HQ 1st División  
Northern edge of Village A  
16 May 19\_\_, 1200

Operation Order A

1. Enemy situation (Same as above)
2. The Division will prepare to pursue the enemy toward X River.  
The Cavalry will pursue the hostile force from the area along the right bank of the S River in the direction of Z town and cut off his route of retreat.  
The Center and Left Pursuit Parties will pursue the enemy in the area along the XX Road and K, M, N town roads, toward the X River line.
3. The 4th Infantry (less 3rd Battalion) is designated the Right Pursuit Unit, and will pursue the enemy toward E town so as to cut off his route of retreat from the area C village D Village Road.  
Two batteries of the field artillery and one Platoon of the Engineers will come under the command of the Infantry Commander at XX.
4. I will be in rear of the Center Pursuit Unit and will proceed on XX Highway.

Lt. General XX,  
Commanding

Distribution: Verbal instructions will be issued to the Regimental Adjutants after telephoning an outline of the subject matter.

67. An Example of a Division Order Issued to the Commander, 1st Infantry Brigade (Right Wing) Commanding the Center Pursuit Unit.

HQ 1st Division  
North edge of Village A  
16 May 19\_\_, 1220

Operation Order No. 2A Part III

1. Enemy situation (same as above)
2. The division is preparing to pursue the enemy, toward the line of the X river.  
The Right Pursuit force will follow the road from C Village to D Village, while the Left Pursuit force will follow the road from K-M Towns, both moving in the direction of the high ground east of N town.

3. The 2nd Infantry Brigade Commander will command the 4th Infantry, one squad of Cavalry, one battalion of Field Artillery, one Battalion of Engineers (less one company) and as the Center Pursuit Force, will follow the XX Highway toward the high ground east of N Town.

4. I will proceed on XX Highway at the rear of the Center Pursuit Force.

Lt. General XX,  
Commanding

Distribution: Staff officer X will issue verbal instructions.

68. An Example of a Division Order Issued to the Commander, 2nd Infantry Brigade (Left Wing) Commanding the Left Pursuit Unit; and other Unit Commanders.

HQ 1st Division  
North edge of Village A  
16 May 19\_\_, 1220

Operation Order No. 2A, Part IV

1. Enemy situation (same as above)

2. The Division is preparing to force the enemy to retreat in the direction of the line of X River.

The Center Pursuit force will proceed on the XX Highway, towards the high ground east of N Town.

3. The 2nd Infantry Brigade Commander will command the 4th Infantry, one squad of Cavalry, one battalion of Field Artillery (less one battery), and one platoon of Engineers, as the Center Pursuit Force. This force will proceed on the road K-M-N towns toward the high ground east of N Town.

4. The Artillery will allocate a part of its strength for attachment to this Pursuit Force while the remainder will proceed to H Village and await further orders.

5. The remaining units will assemble in the vicinity of Village P and await further instructions.

6. I will proceed on the XX Highway at the rear of the Center Pursuit Force.

Lt. General XX,  
Commanding

Distribution: A staff officer will issue instructions verbally to the 2nd Infantry Brigade Commander. The Adjutant

and a Liaison Officer will transmit the orders to the Artillery, Engineers, Communication Unit, and the Reserve.

Note: It is understood that all units are already familiar with the above pursuit force.

69. An Example of a Division Order Issued to the Medical Troops and Field Hospitals.

HQ 1st Division  
North edge of A Village  
16 May 19\_\_, 1230

Operation Order D - No. 2 - Part I

1. The "N" enemy has retreated in the direction of N Town.
2. This Division will attempt to pursue the hostile elements along the X River with its main strength on the XX Highway and with other elements on the K-M-N town road and C-D Village road.
3. The Medical unit will as soon as possible complete the treatment of patients and follow in the rear of the Division main strength by way of the XX Highway through Village A.
4. The 1st and 2nd Field Hospitals, will assume the duties of the Medical Unit upon its departure and remain at present locations.
5. I will proceed on the XX Highway at the rear of the Center Pursuit Force.

Lt. General XX,  
Commanding

Distribution: Written order will be distributed by a messenger.

70. An Example of a Division Order Issued to the Field Train and Transport Troops.

HQ 1st Division  
North edge of A Village  
6 May 19\_\_, 1230

Operation Order D, No. 2 - Part 2

1. Enemy situation (omitted)
2. Same as in above order (omitted)

3. The Field Train will proceed toward Village A.
4. The Advance Transport will move forward to Village C for replenishment of ammunition.
5. The Transport will move out at once and proceed on the XX Highway while one Field Hospital will rapidly move forward.
6. I will proceed along XX road at the rear of the Center Pursuit Force.

Lt. General XX,  
Commanding

Distribution: Forward through liaison personnel.

## SECTION VIII

### WITHDRAWAL

71. Items to be Covered in an Order Relative to Withdrawal
  - A. Essential matters which must be stressed in the orders given to the Commander of the Covering Force in the event of withdrawal.
    1. General situation.
    2. Commander's plan, march objective of each column, withdrawal zone (or the road, and if necessary, the starting time of withdrawal, and order of withdrawal etc.)
    3. The mission and the positions of the Covering Force (composition and place where the Artillery and other units come under the control of the Commander of the Covering Force.)
    4. Location of the Commander (especially his present location time of departure and movement will be clearly indicated) and methods of liaison.
  - B. Essential matters which must be stressed in the orders given to each unit in the event of withdrawal:
    1. If necessary, the general situation.
    2. Commander's plan, covering troops, and their locations.
    3. Movement of each unit (each column) (march objective, withdrawal zone, or road, starting time of withdrawal, order of withdrawal, etc.)

4. Commander's location. (Indicate the time of departure, present location, and his movements.)  
Method of Liaison. (The time and place to send the recipient to receive orders, as well as the location of the message center.)

C. Essential matters which must be recorded in Joint Orders for withdrawal.

1. Situation of enemy and friendly troops.
2. Commander's plan.
3. Items concerning the Transport.
4. Items concerning the Field Train.
5. Items concerning the Medical Troops.
6. Items concerning the Covering Force (when established.)
7. Items concerning each Unit (each column.)  
Matters to be indicated to units other than the Covering Force. (march objective, zone of withdrawal or the road, departure time for withdrawal, order of withdrawal, etc.)
8. In the event of a withdrawal of front line units, the units which must remain and their movements.
9. Items concerning Signal Units (time of removal of communications net.)
10. Commander's location or movements, (time of departure, present location, withdrawal route) and methods of liaison.

Note: Joint orders are usually issued in situations which call for independent withdrawal at night. Before issuing this order, if it is necessary, a gist of it will be furnished the proper commander in advance.

72. An Example of a Complete Division Order for a Night Withdrawal

HQ 1st Division  
At XX  
19 Sept 19   , 1700

Operation Order 'A' No. 2

1. The enemy strength on our front is composed of approximately two divisions and is generally increasing in strength

- on our Right Wing. The Army will temporarily withdraw to the vicinity of the line X, X, and X, await the arrival of rear elements, and formulate plans for future action.
2. This Division will avoid a decisive engagement with the enemy, withdraw toward the vicinity of XX town, and protect the flank of the Main Body of the Army.
  3. The Transport will await sunset before commencing its movement, and will withdraw toward the area west of XX via the valley of the XX River. It will cooperate with the Field Hospital in evacuating patients to the rear.
  4. The Field Train will await sunset before starting its movement, follow the Transport, and withdraw toward the XX vicinity.
  5. The Medical Unit and Field Hospital will, as soon as possible, complete treatment of patients, and withdraw respectively towards the elementary school in XX town and the XX village via the XX highway and XX-XX road. The Transport Battalion Commander will be consulted pertaining to the evacuation of patients.
  6. Immediately after sunset, the Antiaircraft Unit will commence movement, engage in aerial defense in the vicinity of XX bridge and cover the passage of the various units.
  7. The Artillery will move at 2200 from positions, withdrawing toward XX to the south edge of XX town via XX town. One platoon of Engineers will be attached.
  8. The Cavalry will withdraw at 2200 from its present positions to the vicinity of XX via XX, and protect the Division right flank. During withdrawal it will maintain contact with the Right Sector Unit.
  9. The Right Sector Unit will leave the front line at 2200 and withdraw to XX and XX, one kilometer south of XX town, through area west of XX-XX road. An element will withdraw to XX via the area north of XX highway and contact the Cavalry.
  10. The Left Sector Unit will move from the front line at 2200 and withdraw to XX through the area east of XX, XX, and XX roads (inclusive.)
  11. Upon the withdrawal of each unit from the front line, units will leave a small force in important points in the vicinity of present positions to cover the withdrawal movement. These units will withdraw at daylight.

12. The Engineers will demolish the bridges in the vicinity of XX and XX, intercept the enemy advance and at the same time, will be especially assigned for the security of the withdrawal route, the XX highway.

13. The Signal Unit will remove the communication net, upon the withdrawal of various units.

The 2nd Radio Platoon will, after sending deceptive messages, withdraw at 2300 to XX.

14. I will remain at my present position and depart at 2230 for XXX.

Dispatch recipients to XX at 1600 to receive orders.

Lt. General XX,  
Commanding

Distribution: A summary will first be delivered by telephone and verbal instructions will be issued to recipients of various units.

## SECTION IX

### BILLETING AND SECURITY

73. Items to be Covered in an Order Relative to Billeting and Security.

1. Summary of enemy and friendly situations.
2. Plans of the Commander.
3. The approximate positions of the Security Units (if necessary separate into cavalry, advance guard, outpost guards, flank guards, etc.) and duties (security zones, direction and areas to be especially scouted, and areas to be occupied, etc.)
4. Indicate the methods of billeting of various units, billeting areas and their sub-divisions, the degree of military preparation necessary, Commander of the billeting area, and assembly point in case of emergency, etc.
5. If necessary matters pertaining to communications and air defense.
6. Matters pertaining to the types of supplies and the replenishment of provisions and forage.
7. Matters pertaining to the billeting area of the Transport, the supply of rations, and forage, and if necessary, the billeting area for the Field Trains.

## 8. Location of the Commander.

Essential matters to be recorded in Advance Guard Orders which are issued for the purpose of billeting.

To the Outpost Commanders:

1. General situation (enemy situation, the location of our forces, condition of cavalry, etc., unit with which contact is to be maintained, and the locations of its outguards)
2. The plans of the Advance Guard Commander and the location of the Main Body of the Advance Guard
3. Composition, duties, and movements of the Outpost. (especially indicate matters pertaining to reconnaissance, security and air defense, and precautionary actions to be taken in case of hostile assault, etc.)
4. If a separate security detachment is dispatched directly from the rear echelon (such as the Main Body of the Advance Guard) the number of this unit and mission will be indicated.
5. Items concerning communications.
6. Items concerning supply.
7. Location of the Advance Guard Commander.

Note: If there are to be two or more outpost areas designated, the boundaries must be shown. Important items concerning liaison will also be indicated.

For the unit not used as an outguard

1. General Situation (matters pertaining to outpost units; enemy situation, and location of friendly main force.)
2. Plan of the Advance Guard Commander
3. The billeting area and the billeting orders of the Main Body of the Advance Guard. If necessary include the appointment of a billeting officer. The degree or extent of military precautions.
4. The steps which should be taken by the Main Body of the Advance Guard in case of emergency.
5. Supply methods; if necessary include items pertaining to air and gas defense.

6. The time at which the recipients of the order should be sent out and the location of the Advance Guard Commander etc.

Essential items to be recorded in the Outpost Order.

1. General situation (the enemy situation, the positions of the friendly Main Force, the Main Body of the Advance Guard and the situation of the Cavalry and other units on the front and the location of the adjacent outposts.)
2. Plan of the Advance Guard Commander.
3. Mission of the Cavalry.
4. The composition, duties, and movements of the security detachments dispatched from an Outpost Company and those dispatched from the Outpost Reserve. (The items include the location, security zones and the steps to be taken in case of enemy assaults, if necessary the outpost line of resistance, and in some cases the outguard line, especially the key positions to be reconnoitered, and the dispositions for air and gas defense.)
5. Location of the Outpost Reserve.
6. The facilities for communication.
7. The location of the Outpost Commander

The following orders are given immediately at the actual position or simultaneously with the issuing of the above orders:

- a. If a unit is dispatched to assist the Outpost Company, order its movement.
- b. Order those matters which concern the action of machine guns, infantry guns, artillery, engineers, etc., which have relation to the Outpost Company and Pickets.
- c. Order essential matters concerning the degree and extent of security.
- d. Order special actions pertaining to barricading of roads, constructing obstacles, and establishing communications, etc.

Essential items to be recorded in Billeting Orders.

1. The designation of billeting and bivouac areas of each unit.
2. The appointment of billeting and billeting area patrol officers (and NCO's).

3. **Strength and** distribution of the billeting and bivouac guards and, if necessary that of air guard sentries for Antiaircraft Units. Also the special actions to be taken by various Unit Commanders concerning these items.

4. Special action to be taken by personnel with reference to the various types of warning signals; if necessary, the special movements to be taken by mounted, wagon, and train units.

5. The degree or extent of security preparations.

6. The location of the message center and the quarters of the senior Commander of troops and the Billeting area Commander.

7. If necessary indicate the alarm post and the roads leading to it. Indicate the essential items pertaining to alarms, liaison, sanitation, fire and gas defenses, and the general public.

74. An Example of a Division Order Issued to Various Units.

HQ 1st Division  
At XX  
11 March 19\_\_, 1500

Operation Order A No. X

1. Although the enemy columns arrived at XX at about 1400 and a unit of its infantry arrived at XX and XX at about the same time, there are no indications of later movements. Our Cavalry was attacked by hostile infantry and cavalry units in the XX vicinity at 1300 and has withdrawn to XX.

2. This Division will be billeted at XX town and in its vicinity tonight.

3. The 1st Cavalry (less two platoons) will change direction and advance towards the vicinity of XX and will patrol the XX highway area.

4. The Advance Guard of the Right Column will billet in the XX vicinity and will patrol the area from XX vicinity to the XX vicinity (exclusive).

5. The Left Column will billet in the vicinity of XX, make contact with the Advance Guard of the Right Column and patrol the area, covering to XX.

6. The security and scouting boundary between the Right and Left Column units is the line passing through XX, YY,

and ZZ. The area along the line will be under the responsibility of the Left Column. When encountering hostile attack, hold the ZZ XX line.

7. The remaining units will billet as follows:

2nd Infantry - in the vicinity of XX  
4th Infantry - in the vicinity of XX  
The regiments will arrange for bivouacking their respective battalions.

In the vicinity of XX town and in the vicinity of XX village:

Division Headquarters  
Communications Unit  
Wireless Platoon  
Field Telegraph Unit  
4th Field Artillery (less 1st & 3rd battalions)  
3rd Battalion, Mountain Artillery  
Antiaircraft Unit  
2nd Company, Engineers (less one platoon)  
Medical Unit (less one third)

Colonel XX, Field Artillery is designated the Billeting Area Commander.

8. The Antiaircraft Unit will billet at XXX.

9. The Field Train will billet at XX. It will distribute rations and forage to each organization, and replenishment will be made at XX with the Transport Unit after 2100.

10. The Transport Unit will bivouac in the area between XX and YY. A company will be dispatched to XX with the ordinary rations and forage by 2030 and will billet at XX after delivery to the Division Intendence Personnel.

11. I am at XX. Send out written orders at 2100.

Lt. General XX,  
Commanding

Distribution: A staff officer and the adjutant will first be dispatched to the Advance Guard of the Right Column, the Left Column and to the Artillery, communicating a summary of the orders, after which assemble all unit recipients and issue verbal instructions. Written orders will be sent to the Field Train and Transport Unit.

75. An Example of a Division Order Issued to the Field Train.

HQ 1st Division  
At XX  
11 March 19\_\_, 1330

1. Summary of enemy situation (omitted)
2. This Division will billet in XX town and its vicinity tonight. The Cavalry will engage the enemy in the XX vicinity.
3. Outline for the billeting of various units is as follows:

Advance Guard	XX vicinity
2nd Infantry	XX vicinity
4th Infantry	XX vicinity
Left Column Units	XXYY village vicinity
Division Headquarters	XX town & XX village vicinity
Communications Unit	XX town & vicinity of XX village
Wireless Platoon	XX town & vicinity of XX village
Field Telegraph Unit	XX town & vicinity of XX village
4th Field Artillery (less 1st & 3rd Bns)	XX town & vicinity of XX village
3rd Bn Mt. Artillery	XX town & vicinity of XX village
2nd Co Engineers (less one platoon)	XX town & vicinity of XX village
One element Medical Unit	XX town & vicinity of XX village

4. The Field Train will billet in the vicinity of XX. It will distribute provisions and forage to each unit, and at 2100 will receive replenishment at XXXX.

5. I will be at XX.

Lt. General XX,  
Commanding

Distribution: The written order will be delivered by liaison personnel.

76. An Example of an Advance Guard Commander's Order Issued to the Outpost.

HQ Advance Guard Right Column  
At XX  
11 March 19\_\_\_, 1530

1. Enemy conditions and the situation of friendly Cavalry (same as in the Division Order).

This Division will billet tonight in the vicinity of XX village and XX town.

2. The Advance Guard will billet tonight in the vicinity of XX village and will cover the area from XX vicinity to XX vicinity (exclusive).

The Left Column will billet in XX vicinity, cooperate with this Advance Guard and cover the area extending to XX vicinity.

The 1st Cavalry is later expected to change its position to the XX vicinity and guard the area of the XX road.

3. The 1st Battalion, XX Infantry is designated the Outpost and from positions in the vicinity of XX will cover the area extending from the vicinity of XX to XX village. It will reconnoiter the enemy situation in the area between XX town and XX village.

The boundary of the reconnaissance and security zone with the Left Column will be the line connecting the eastern edge of the XX, YY, and ZZ.

In case of enemy assault, strongly defend the line extending from the left bank of the XX River, to plateau(45.2) west of X village.

4. One platoon of the 5th Company will be detailed as a picket, and take position in the XX vicinity. It will cover the X village - X village road.

5. Only the Outpost Reserve will be permitted to use tents and charcoal fires.

6. The 1st Infantry Communications Detachment will establish communications with the Outpost Reserve.

7. Supply will be dependent upon the rations and forage carried by the Field Train. The Train after distributing the rations and forage will march to XX for billeting.

8. After arriving at XX, I will inspect the installations and will then proceed to ZZ.

Major General XX,  
Commanding

Distribution: The Adjutant will successively forward the order to the Outpost Commander and the Picket Commander.

77. An Example of an Advance Guard Commander's Order Issued to the Advance Guard Reserve.

HQ Advance Guard Right Column  
At XX  
11 March 19\_\_ , 1550

1. Elements of an enemy column have entered XX about 1400.

One element of hostile infantry entered XX and XX at about the same time, but since then, there has been no indication of forward movement. This Division will billet tonight in the vicinity of XX town and XX village.

2. The Advance Guard will billet tonight in the vicinity of XX village and will cover the area from XX vicinity to XX vicinity. (exclusive)

The 1st Battalion XX Infantry is designated the Outpost and will take positions in the vicinity of XX and cover the area from XX vicinity to the vicinity of XX village. In case of enemy assault, it will strongly defend the line extending from the left bank of the SS River to plateau (45.2) west of X village.

X platoon of the 5th Company will form the picket and take position in the vicinity of XX, and cover X village-YY village road.

The Left Column will billet in XX vicinity and will cooperate with this Advance Guard, covering the area extending to the vicinity of XX.

3. The remainder of the Advance Guard will billet in the village of XX as follows:

1st Infantry (less 1st and 3rd Battalions)  
will bivouac in XX vicinity.

The 3rd Battalion will billet in XX vicinity.

The 5th Company (less one platoon) will be held on the 'alert'.

Other units - billet in XX village.

The 1st Infantry Commander, Colonel XX, is designated the Bivouac Area Commander.

4. The 1st Infantry Communications Detail with one element will establish communications between Brigade Headquarters, Billoting Area Commander, and the Outpost Commander.

5. Supply will be dependent upon the Field Train for rations and forage, but the Train after delivering the rations and forage will march to XX to billet.

6. I will be at III. At 2100 recipients for orders will be dispatched to XX.

Major General XX,  
Commanding

Distribution: Assemble the Infantry Regimental Commander, Artillery Battalion Commander, and the recipients of orders for the Medical Unit and the Regimental Communications Detail and issue verbal instructions.

78. An Example of an Outpost Order

HQ XX

At XX

11 March 19\_\_\_, 1550

1. The situation of the enemy and friendly Cavalry (same as above).
2. The Main Body of the Division will billet near XX town and XX village. The Main Body of the Advance Guard will billet in the vicinity of XX and the Left Column Unit will billet in the vicinity of XX. The main force of the Cavalry will at a later time change direction to the vicinity of XX and will cover the area along XX road.
3. This battalion (with  $\frac{1}{2}$  of a cavalry platoon attached) will become the Outpost, and occupying positions in the vicinity of XX, will cover the area from Z to the vicinity of Y (exclusively).  
The Outpost of the Left Column will maintain contact with this Outpost and cover the area extending to XX. The boundary of the reconnaissance and security zones between Outposts is the line that passes through the eastern edges of XX, YY, and ZZ.  
One platoon of the 5th Company will form an independent picket in the vicinity of XX and cover Y and Z village roads.
4. The Cavalry Platoon (less one half) will occupy a position in the vicinity of its present location before sunset. The Platoon will return to XX after a continued reconnaissance of the enemy situation.
5. The 1st Company, designated an Outpost Company will occupy positions in the vicinity of XXX, and cover the area east of the line passing through the eastern edges of XX, YY, and ZZ. It will especially reconnoiter the enemy situation in the direction of XX town. One machine gun will be attached to this company.
6. The 2nd Company designated an Outpost Company will occupy positions in the XX vicinity. It will cover the area west of the line allotted to the 1st Company and cooperate particularly with the Left Column Outpost, reconnoitering in the direction of XX village. One machine gun will be attached.
7. In case of an enemy attack both Companies will firmly hold the left bank of XX River.
8. The Outpost Companies will not use tents and charcoal fires.
9. The remaining troops will be under the command of the 3rd Company Commander and will be at XXX. Dispatch to me

from the 4th Company an officer and X men.

10. After inspecting the present area, I will be at the location of the Outpost Reserve.

Major XX,  
Commanding

Distribution: Verbal orders will be issued to the 1st and 2nd Company Commanders. A written message will be sent by mounted messenger to the Cavalry Platoon Commander. Verbal orders will be issued to the Machine Gun Unit by the Adjutant.

Note:

- a. In order to facilitate the execution of emergency actions in the disposition of outposts all necessary instructions have been ordered.
- b. After the units selected for the Outpost Reserve have taken their proper station, instructions concerning antiaircraft defense, gas defense, security measures and supply will be given in order to facilitate their actions.

79. An Example of a Billeting Order.

HQ XX  
At XX  
11 March 19\_\_, 1700

1. Units will billet as follows, (Indicate with sketch) (omitted)
2. The Officer of the Day at the billeting area will be Captain XX Infantry.
3. The Infantry Battalion and the Field Artillery Battalion will each send a 1st Lieutenant (or 2nd Lieutenant) by 2000 to report as patrol officers.
4. Battalion personnel to act as billeting guards from each infantry battalion will report at 1900 to the Billeting Officer of the Day at the crossroads as follows:
  - 1st Battalion - 1 Non-commissioned Officer
    - 3 Superior Privates
    - 13 Privates ((1) bugler)
  - 2nd Battalion - 1 Superior Private
    - 6 Privates
  - 3rd Battalion - 1 Superior Private
    - 6 Privates
5. The 2nd Battalion will send a machine gun detachment to the eastern edge of the billeting area. Its duty will

be air defense until sunset.

6. Antiaircraft observation sentries from the infantry battalions will take orders from the Billeting Officer of the Day, after being posted out as follows:

1st Battalion - 1 Non-commissioned Officer  
1 Superior Private  
4 Privates

At the northeast edge of the road junction  
2nd Battalion - 1 Non-commissioned Officer  
1 Superior Private  
7 Privates

At the eastern side of the Ryotan Hashi (bridge)  
3rd Battalion - 1 Non-commissioned Officer  
1 Superior Private  
4 Privates

At the southwest edge of nameless shrine.

Include one bugler among the privates from each battalion.

7. All men below non-commissioned officer grade will be restricted to the billeting area because of an outbreak of typhoid at XXX.

8. Division Headquarters will be at the Central Grammar School at XX town. The message center will be at XX. I will be at XX village office.

Colonel XX,  
Commanding

Distribution: Assemble recipients of orders and issue verbal instructions.

## SECTION X

### TRANSPORTATION

80. An Example of a Detachment Embarkation Order.

HQ Detachment A  
At XX  
15 January 19\_\_, 1000

1. This detachment will embark at XX harbor tomorrow, the 16th.
2. Assignment of various units to ships will be as per attached list (omitted).
3. The various units will embark according to the attached

embarkation orders from the First Embarkation Headquarters.

4. The assembly area before embarkation will be as indicated on the attached chart. (omitted).

Instructions for the assembly are as follows:

a. The 1st Battalion, 1st Field Artillery will depart from the billeting area and move to the south of XXX at 0500.

b. At 0500 the head of the 1st Cavalry will pass the south edge of XX.

5. By 1800 today, the 15th the detachment will dispatch personnel to report to the district coast office as guards to be assigned to posts by personnel of the Embarkation Headquarters as shown in the following:

First Embarkation Area -- XX, Infantry Regiment, non-commissioned officer - (1), superior privates - (2), Privates - (9).

Second Embarkation Area -- XX, Infantry Regiment XXXX  
(omitted)

The morning and noon rations for tomorrow, the 16th, will be provided by the Embarkation Headquarters.

6. I will remain here for the present and tomorrow, the 16th, at XX time, I will embark on YX Maru.

Major General XX,  
Commanding

Distribution: Assemble recipients of orders from various units and distribute printed forms.

Attached Embarkation Regulations:

1. Embarkation will commence at 0600 on the 16th at XX and will be completed by XXXX time.

2. For the purpose of embarkation, the Army Assembly Center, the anchorages of each transport, and the pier will be as indicated on attached chart (omitted).

3. Officers in charge of loading are as follows:

Loading Area No. 1 - Captain A from Embarkation HQ

Loading Area No. 2 - Captain B, XX Coast Office

Loading Area No. 3 - Captain C, XX Coast Office

Loading Area No. 4 - Captain D, XX Coast Office

The above officers will be at their respective places on the 15th at 1500.

4. At 1500 each Transport Commander will dispatch necessary personnel as follows to report to the above officers,

to confer on details and to inspect the interior of the ships:

- X Maru, X Maru - to XX Embarkation Headquarters
- XX Maru, XX Maru - to Coast Office
- XX Maru, XX Maru - to Coast Office
- XX Maru, XX Maru - to Coast Office

5. Each unit will make a detailed list, showing the numbers of men, horses, and types of materiel to be transported and immediately dispatch it to the Transport Commander.

6. On the ship, the ship owner will provide the rations, while the government will provide the forage, from supper time tomorrow evening, the 16th.

7. The assignment of the guard for the Loading Areas will be as shown in the appended chart and their disposition will be designated at each Loading Area.

8. Liaison between transports and land will depend upon local communications. Messenger boats will be dispatched as follows:

- Number 1 Loading Area - (2) boats
- Number 2 Loading Area - (2) boats
- Number 3 Loading Area - (1) boat
- Number 4 Loading Area - (1) boat

9. Messenger boats, (with Red Cross Flag) to be used as life boats are assigned as follows:

- Number 1 Loading Area - (2) boats
- Number 2 Loading Area - (2) boats
- Number 3 Loading Area - (1) boat
- Number 4 Loading Area - (1) boat

The rescue duty in the vicinity of each transport will be carried out personally under the command of the Transport Commander concerned. For this purpose one small boat, flying a white flag, will be attached to each transport before embarkation. Horses that fall overboard will be taken to XX and XI beaches which will be indicated by red flags.

10. The distinguishing mark or sign (brassard) of each man on duty is as follows:

- a. At Embarkation Headquarters -- red cloth
- b. On Army Duty -- white cloth.

Colonel XX,  
1st Embarkation Commander

81. An Example of an Embarkation Order of 1st Infantry.

HQ 1st Infantry  
At XX  
15 January 19\_\_, 1530

1. Tomorrow, the 16th, the Regiment will embark from ZZ harbor. The chart showing ships assigned to each unit is attached hereto. (omitted)

2. Each unit will embark as directed by its respective Transportation Commander.

3. The guards for the 2nd Loading Area composed of (1) non-commissioned officer and (15) privates ((2) superior privates, (1) bugler) from the 2nd Battalion will report to Captain B at XX office in ZZ Anchorage Headquarters by 1800 today, the 15th.

The Anchorage Headquarters will be responsible for the morning and noon meals on the 16th.

4. The rations on board ship for the personnel will be provided by the ship owner, while the forage will be provided by the government, starting with the evening meal tomorrow, the 16th. When embarking, individual noon meals will be carried by each individual.

5. I will remain here and will embark on XX Maru tomorrow morning at X hour.

Colonel XX,  
Commanding

Distribution: Assemble XX recipients from each unit and distribute printed forms.

82. An Example of a Transport Commander's Order Relative to Embarkation.

Headquarters ZZ Maru  
At XX  
15 January 19\_\_, 1600

1. The Embarkation Unit for the ZZ Maru will embark tomorrow, the 16th. Distribution of troops for embarkation will be as per attached chart. (omitted)

2. Various units will assemble as follows, and details will be given at the respective places:

Field & Combat train of	) Equipment will be assembled at the head of Pier #15 by 0530. Animals will be held at the assembly point at western side of Pier #15
the 3rd Battalion 2nd	
Infantry Machine Gun	
Company 2nd Infantry,	
2nd Battery 1st Field	
Artillery.	)

Combat Personnel of the 3rd ) To be at the assembly  
Battalion 2nd Infantry. ) point on the western side  
of Pier # 15, by 1030.

3. Men on duty will serve according to the attached chart No. 1 (omitted).
4. The various units will embark according to the embarkation outline on the attached chart No. 2.
5. The units, upon their arrival at the assembly point, will immediately prepare for embarkation.
6. Supply for units from the evening of the 16th on will be as follows:

Personnel: Provided for by the ship owner.  
Animals: From forage on hand.

7. I will be in the vicinity of Pier # 15 at 0600. Units will send their recipients for orders to me at that time.

Major YX,  
Transport Commander, ZZ Maru

Distribution: Assemble recipients from various units and issue verbal orders.

#### XX Maru Embarkation Outline

##### General:

This outline indicates in detail the order of moving horses, materials, provisions and forage, and personnel, from land to the transport and the distribution of loads on each barge in the order of departure from the pier.

##### Example: (Usually shown by chart)

The first two barges departing will each carry (40) men. The following three barges will each carry (6) animals of the Infantry Battalion Field and Combat Train.

(Attached Sheet)

#### Loading Regulations for XX Maru

1. Place of loading will be on Pier No. 5 .
2. This Unit will be lined up in columns parallel to the embarkation units of other transports with the head of the column at the far end of the pier, in the order; equipment, horses, and personnel.

3. The personnel and equipment will be loaded on (1) small steamer and (18) horse barges (Each with a loading capacity of (40) men, (6) horses, (1) gun carriage, (80) sets of horse equipment, (50) pieces of baggage or the equivalent of (25) carts and (15) transport carts).

4. Regarding barge movement, it is satisfactory to tow barges as follows per trip: (4) barges with personnel; (3) barges with horses; (2) barges with equipment. Generally there will be (40) minute intervals between departures.

5. On board, the Look-out N.C.O. will be Master Sergeant XX and the Pilot N.C.O. Sergeant XX.

6. Place and time for detail to report:

Equipment detail	(land	
	(bargo	0530
	(ship	
Animal detail	(land	0730
	(bargo	0730
	(ship	0730
Personnel detail	(land	1030
	(ship	0530
Animal emergency attendant		0730
First Aid personnel		0530

7. Loading will be in order; equipment, animals, forage, and personnel.

8. Loading preparations will begin at 0530.

Captain B,  
2nd Loading Area Commander

83. An Example of an Order Relative to Railroad Transportation.

XX Transport Command  
At XX  
X day, X month, X hour

1. XXX will be transported from XX station to XX station on X train tomorrow, X day. I will be Transport Commander.

2. Entraining Officers are detailed to duties as follows:

For Personnel	XXX (Name of officer)
For Animals	XXX (Name of officer)
For Equipment	XXX (Name of officer)

3. Each entraining officer will allocate personnel to report as follows for a loading detail:

Personnel:

- a. Assistant in charge XX
- b. Individuals XX, XX, XX, XX.

Assembly Time XX

Assembly Place XX

4. The Machine Gun Company, Infantry Gun Unit, and the Infantry Signal Detail will be under the jurisdiction of the Infantry Gun Unit Commander. It will assemble in front of the loading platform by XX o'clock. The equipment will be loaded on freight cars under the direction of the equipment entraining officer. Following this, animals will be led to the horse depot by XX o'clock and instructions will be issued by the animal entraining officer.

5. The remaining troops will be under the command of XXX and will assemble at the locations shown on the following chart by XXX hour. (omitted).

After the saddle horses arrive at the station, instructions concerning them will be issued by the animal entraining officer.

6. The X Company Commander will detail a railroad station guard composed of (1) N.C.C., (6) privates, and a bugler to X place.

7. I will be at the station master's office at X PM. Each unit will send a recipient to receive orders at X o'clock.

Colonel XX,  
Transportation Commander.

## SECTION XI

### ROUTINE ORDERS

84. An Example of a Routine Order of the 8th Infantry

HQ 8th Infantry  
At SAKURA-MACHI  
9 March 19 \_\_, 1300

1. Released from 1st Company and assigned to X Company; 1st Lieutenant X, Infantry.
2. Promoted to 2nd Class pay: Warrant Officer XX Infantry by order dated March 5th, Hdqrs, 4th Division.
3. The following schedule will be in effect during this period:

Reveille & Morning Roll Call                      0600

Medical Examination	0900
Routine Meeting	1400
Evening Roll Call and Taps	2100

85. An Example of a Routine Order of the 2nd Division

HQ 2nd Division  
At XX  
1 March 19\_\_ , 1400

1. Colonel X, Infantry, appointed Major General and assigned to the XX Infantry Brigade.
2. From tomorrow, the 2nd, each unit will police the battlefield in the X area for X days and report its results.
3. A citation, copy attached hereto, was awarded this Division by the Army Commander for distinguished service in the battle of X area. Each Unit Commander will bring this to the attention of all Personnel.
4. Each individual will receive as extra, (1) gō (approximately 1/3 pint) of refined sake and (10) cigarettes in addition to the regular supply. These items will be issued tomorrow, the 2nd, at 1000 at X place.
5. Tomorrow, the 2nd at 0800 at X place the men and animals arriving today as replacements will be allotted as follows: (omitted). Send recipients to X place.

Lt. General XX,  
Commanding

(attached sheets omitted)

## CHAPTER 4

### FIELD SERVICE

	Paragraphs
SECTION I. Marches -----	86 - 93
II. Computations Pertaining to Messengers--	94 - 96
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#### SECTION I

##### MARCHES

86. Example of an Order Relative to Successive Arrivals at and Departures from a Point on the Route of March (with Calculations for Assembly.)

HQ 1st Division  
SAKURAMACHI  
1 March 19\_\_, 1800

Operation Order A No. X

##### TROOPS

Cavalry: -1st Cavalry (less 1 platoon)

Advance Guard (Major General X, Commanding):

1st Infantry Brigade (less 2nd Infantry)  
1 platoon of Cavalry  
1st Battalion, 1st Field Artillery  
1st Battalion, **Engineers** (less one platoon)  
1/3 of Medical Detachment

Main Body:

Communications Unit (follows the last unit of the advance guard)  
Division Headquarters  
2nd Infantry  
2nd **Company, Engineers**  
1st Field Artillery (less 1st Battalion)  
2nd Infantry Brigade  
Field Artillery Regimental Ammunition Train  
Medical Detachment (less 1/3)

---

1. Enemy situation .....

Tomorrow, the 2nd, the Army will move toward XX line; the 2nd Division will move on the Komyo Highway toward XX.

2. Tomorrow, the 2nd, the Division will move on the Chuo Highway toward Asahimachi for the purpose of carrying out an attack. The boundary between the zones of action of the 1st and 2nd Divisions will be the Amaniya-Ausunoki-Motoyama line. (The 1st Division will be responsible for the area along this line.)

3. At 0600 the Cavalry will depart from the Yoshitsunobashi (bridge) and reconnoiter the enemy situation in the direction of Asahimachi.

4. At 0630 the Advance Guard will leave the Yoshitsunobashi (bridge) on the Chuo Highway and move toward Asahimachi with the Infantry at the head of the column. It will maintain close contact with the 2nd Division.

5. The elements of the Main Body will assemble successively at the western end of Sakuramachi and move off according to the following schedules, the head of the column keeping an interval of approximately 1500 meters behind the Advance Guard:

At 0700:

Division Headquarters

2nd Infantry

2nd Battalion, Engineers

1st Field Artillery (less 1st Battalion)

At 0800:

2nd Infantry Brigade

At 0850:

Field Artillery Regimental Ammunition Train

Medical Detachment (less 1/3)

The Communications Unit, however, will be at the eastern end of Tsubakida by 0720 and will move behind the last unit of the Advance Guard.

6. The Field Train will leave its billeting area according to the following schedule, and will assemble by 0920 in the western end of Sakuramachi, and move off under the command of the Division Field Train Commander at a distance of approximately 2000 meters behind:

X billeting area field train at (time)

XXXXXXXXXX at (time)

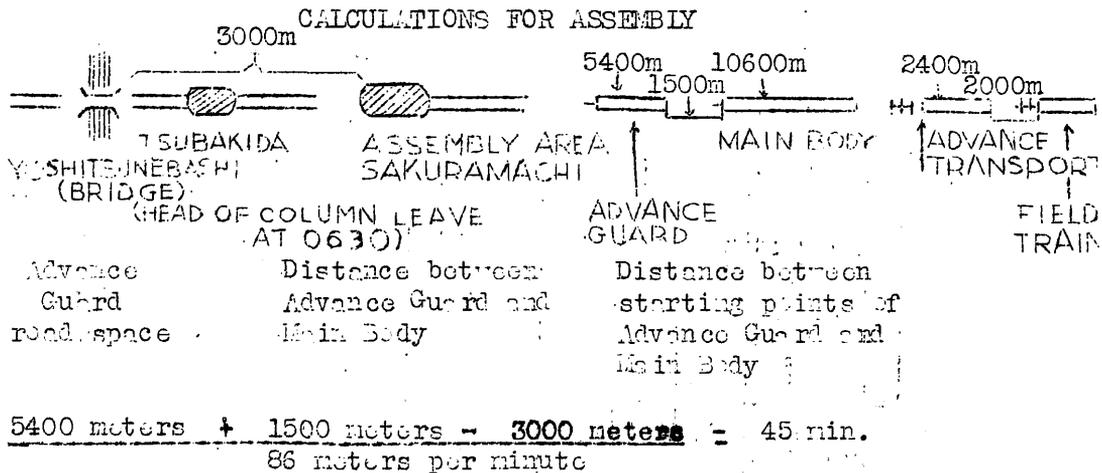
The Field Train elements attached to the troops in the Tsubakidamura billeting area, however, will assemble at the western end of that village under the command of the Division Field Train Commander. (Note: Where the name of the Field Train Commander is well known, it need not be recorded.)

7. Transport ....

8. I will be at the assembly area on the western side of Sakuramachi at 0700, and thereafter at the head of the Main Body.

Lt. General XI,  
Commanding

Distribution: (omitted)



Since the Main Body is to leave the assembly area at 0630 + 45 minutes = 0715, it must complete its assembly a little before then, that is, by 0700.

Because of the fact that the main body on the march extends on the road for a distance of 10,600 meters, whenever all the troops are to assemble simultaneously, the rear units must not without reason cause any long delay, once the leading units have moved off. Therefore, the troops will be divided in such a way as to enable them to assemble and depart in orderly succession.

The first group (Division Headquarters, 2nd Infantry, 1st Field Artillery less 1st Battalion, one platoon of Engineers) should be ordered to move to the assembly area at 0700. Since its road space will be about 5300 meters, the time required for departure will be  $\frac{5300}{86} = 62$  minutes. Therefore since the 2nd Infan-

try Brigade should depart at 0715 + 1.02 = 0817, the second group (2nd Infantry Brigade) should be ordered to assemble a little before, that is, at 0800.

2nd Inf. Brigade road space = 4200m.  $\frac{4200m}{86} = 49$  min.

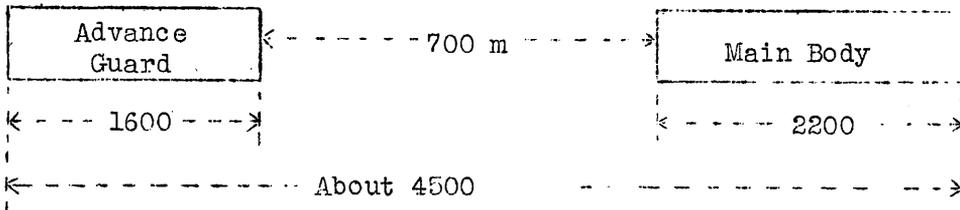
0817 + 49 = 0906. Therefore, the Field Artillery Regimental Ammunition Train and the Medical Detachment should be ordered to assemble at 0850. 1000 meters (road space for this group) + 2000 meters (interval) =  $\frac{3000m}{86} =$  about 35 minutes. Therefore, the Field Train should assemble by 0920, and the time for departure from each billeting area should be designated in order not to interrupt the movement of the other units.



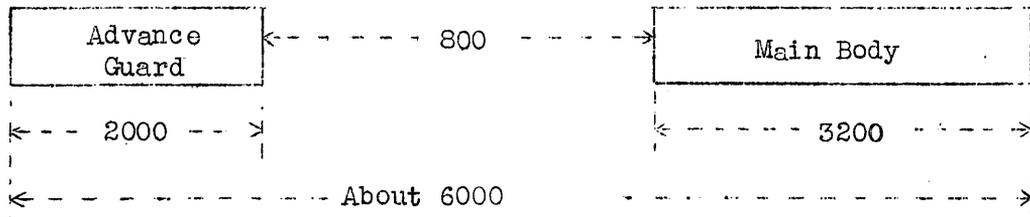
88. Approximate Road Space in a March Column

(Meters)

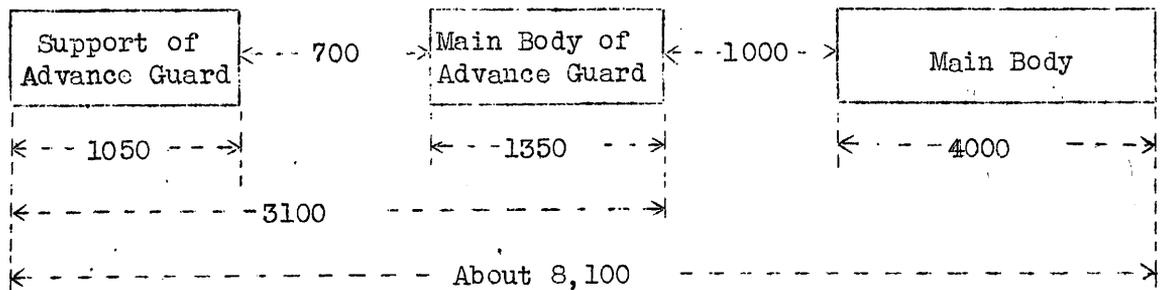
- (1) One infantry regiment and one field artillery battery as the nucleus.



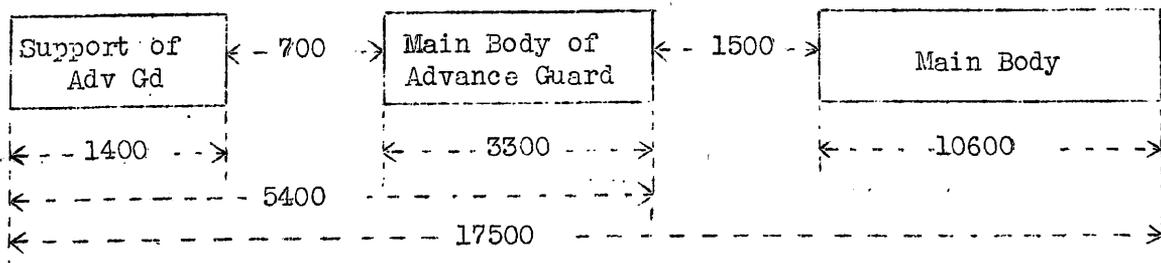
- (2) Four infantry battalions and one field artillery battalion (less one battery) as the nucleus.



- (3) One infantry brigade and one artillery battalion as the nucleus.



- (4) Division Combat Team



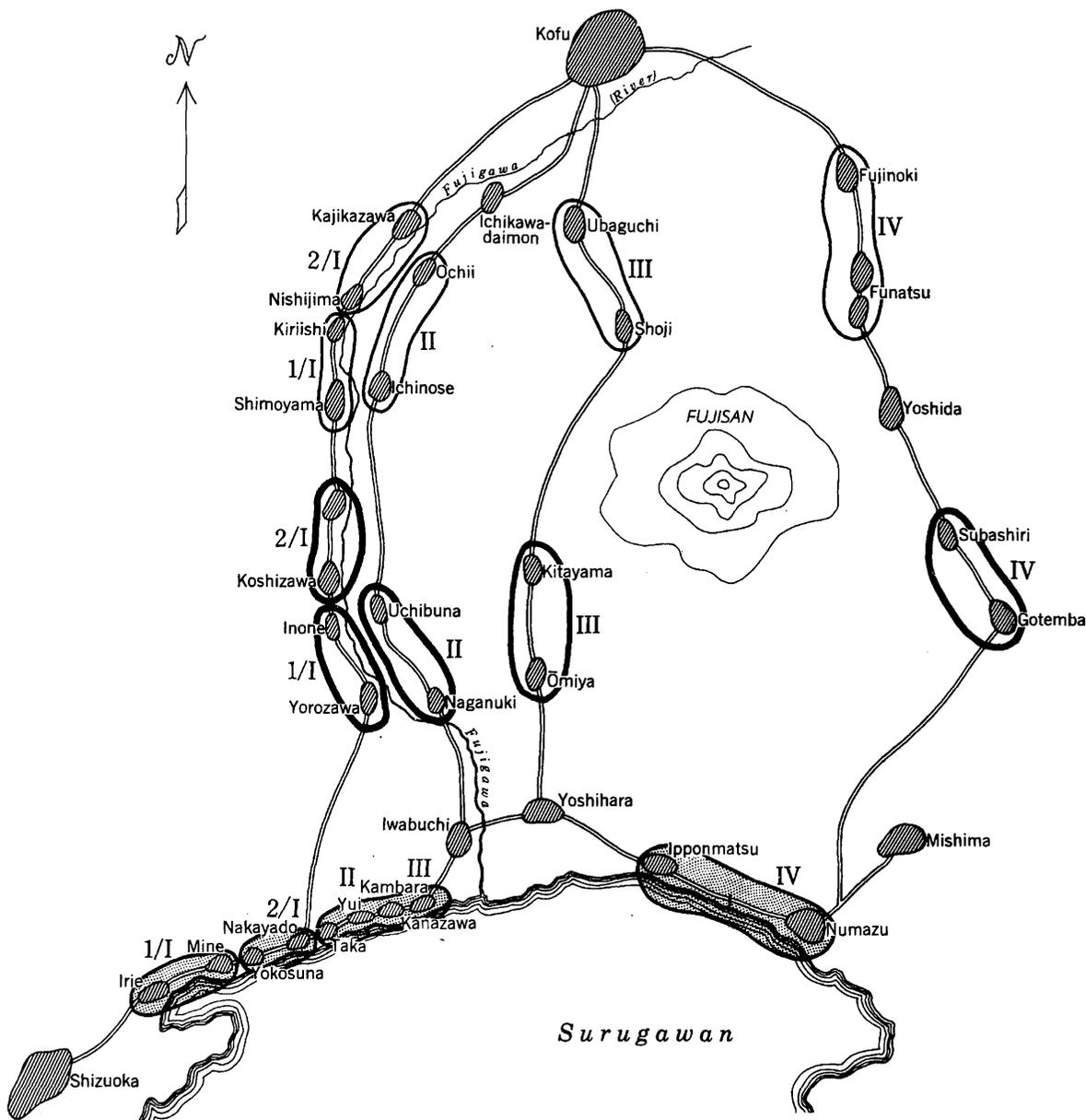
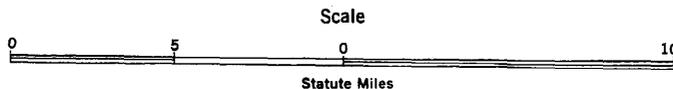
89. Rate of March (meters per minute)

	Route Step	Ordinary Walking Speed	Quick Time or Trot	Double Time or Gallop
Dismounted Troops	36			145
Mounted Troops		100	200	300
Artillery Soldier Mounted on limber		86	200	300
Combined Arms	1. Based on the speed of a slow unit, one kilometer will be covered in 13 minutes, or 15 minutes if the break is included.			
Automobile Corps and related units	2. Ordinarily the speed is approximately 12 kilometers per hour, but this speed cannot be maintained long by mounted or dismounted troops.			
Remarks	<p>1. This chart is based on Field Service Regulations, 260.</p> <p>2. The rate of march during the night differs according to the situation. When approaching the enemy, a rate of one kilometer per hour is sometimes necessary.</p>			

90. The Pace of Mounted Troops.

Pace (rate of march)	1/4	1/3	1/2	2/3	3/4
Distance	7 kilometers per hour	8	9	10	11
Use	In Ordinary March			When it is urgent for short distances	

SKETCH OF FIRST DIVISION ROUTE MARCH, APRIL 1-3

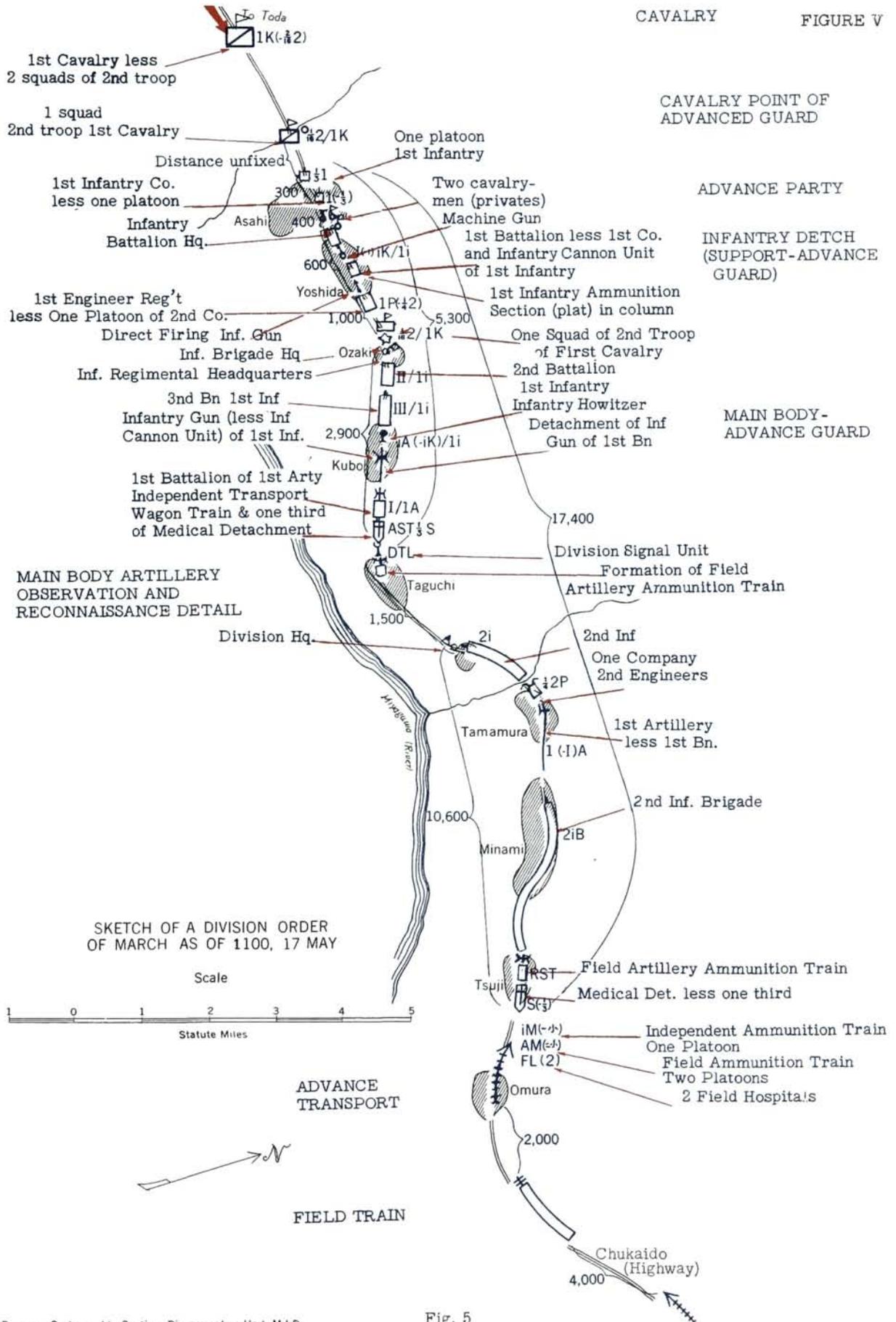


NOTES

- |           |                               |   |                                |
|-----------|-------------------------------|---|--------------------------------|
| 1/I ..... | 1st Echelon of the 1st Column |  | Position on night of April 1st |
| 2/I ..... | 2nd Echelon of the 1st Column |  | Position on night of April 2nd |
| II .....  | 2nd Column                    |  | Position on night of April 3rd |

The field warehouse is being established in Numazu, and in the future the Division's rear communication line will be the Tokaido (highway).

Fig. 4



Drawn in Cartographic Section, Dissemination Unit M.I.D.

Fig. 5

93. Speed of Tanks

Types \ Speed	Light Tank	Light Armored Car	Tanks will operate at cruising speed unless otherwise specified. However, speed can be regulated according to the terrain and other factors. Full speed will be used for a short time when necessitated by special circumstances.
Low Speed	6 kilometers per hour 100 meters per minute		
Cruising Speed	12 kilometers per hour 200 meters per minute		
High Speed	18 kilometers per hour 300 meters per minute		
Full Speed	Maximum speed allowed by terrain		

Precautions:

- a. Light tanks must move at low speed until the motor is sufficiently warmed up. (at least 5 minutes after starting the motor.)
- b. Tanks with a speed of 50 kilometers per hour have made their appearance in Europe and America.

## 94. Speed of Messengers

SECTION II  
COMPUTATIONS PERTAINING TO MESSENGERS

Classification Speed	Mounted	Dismounted
Routine	About 8 km. per hour. Roughly at 1/3 pace; that is, in the proportion of two walking and one trotting.	About 5 km. per hour, generally in quick time.
Priority	About 10 km. per hour. Roughly at 2/3 pace; that is, in the proportion of one walking and two trotting.	About 6 km. per hour in a combination of quick and double time.
Urgent	Highest speed attainable with respect to the horse's endurance. (Use only for distances of not more than 20 kilometers.)	Double time within limits of human endurance (use only for short distances)

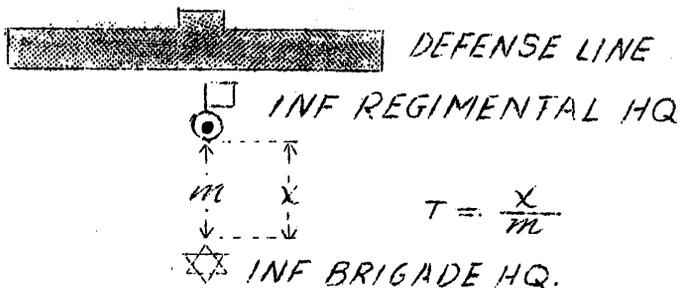
Bicycle: Under good conditions 12 km. per hour is the standard speed.

Motorcycle: 40 km. per hour. 180 km. per day.

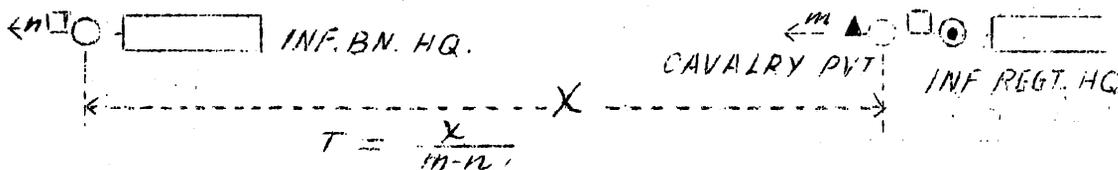
Automobile: 50 km. per hour. 250 km. per day.

95. Method of Computing the Time Required for Message Transmission by Courier

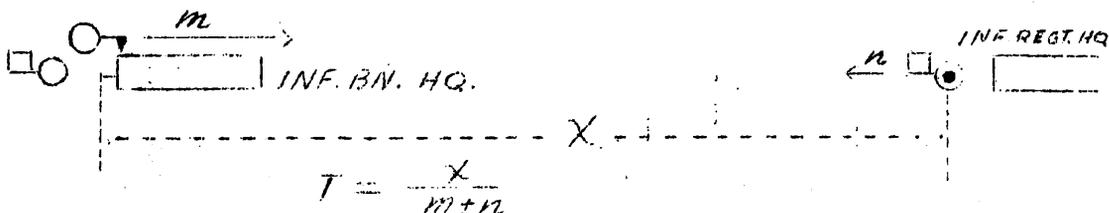
(a) The recipient at a halt



(b) Recipient being overtaken



(c) Messenger and recipient moving towards each other



T - Transmission time

x - Distance

m - Speed of messenger per minute

n - Speed of recipient per minute

96. Time Required for Message Transmission by Courier

Distance in 100 m	Speed (min)														
	5	10	15	20	30	40	50	60	70	80	90	100			
Recipient at a halt	Runner	Routine	6	12	18	23	35	45	56	71	83	94	100	118	
		Priority	5	10	15	20	30	42	54	64	75	85			
		Urgent	3	6	9	12	18	24	32	38	45	56			
	Mounted Messenger	Routine	4	8	11	15	23	31	39	46	54	62	70	77	
		Priority	3	7	9	13	19	25	32	37	43	50	57	67	
		Urgent		3	5	5	8	12	17	21	25	30			
	Messenger and recipient moving toward each other	Runner	Routine	3	6	9	12	18	23	29	36	42	47	53	59
			Priority	3	6	8	11	16	22	27	33	38	43	49	55
			Urgent	2	4	6	7	12	16	20	24	28	32	36	40
Mounted Messenger		Routine	2	5	7	10	14	19	25	30	34	42	47	52	
		Priority	2	4	6	8	13	16	21	24	29	33	37	41	
		Urgent	1	2	4	5	7	10	13	15	18	20	23	26	
Recipient being overtaken		Runner	Routine												
			Priority	33	67	100									
			Urgent	5	10	16	25	33	57						
	Mounted Messenger	Routine	11	22	34	44	67	89	111	133	155	177	200	222	
		Priority	7	13	20	27	41	57	71	92	117	133	156	167	
		Urgent	2	4	6	7	12	17	21	27	35	40	56	63	

REMARKS

1. The approximate speed per minute used in the above calculation is as follows:

Dismounted	{	Routine	85 m.	}	Mounted	{	Routine	130 m.
		Priority	100 m.				Priority	160 m.
		Urgent	180 m.				Urgent	350 m.

2. The speed of priority and urgent message transmissions diminishes as time elapses.

## SECTION III

## FRAMING AND ISSUING ORDERS

97. Average Time Required to Frame and Issue Orders (Part 1)

Types of Orders \ Unit	Division	Brigade	Regimental	Battalion	Company	Total
	Headquarters	Headquarters	Headquarters	Headquarters		
(1) Average Complexity	1:40	0:30	0:30	0:20	0:10	3:10
(2) Complicated	2:40	0:48	0:48	0:32	0:16	5:00 (Approx.)
(3) Simple	1:00	0:18	0:18	0:12	0:06	2:00 (Approx.)

REMARKS: This table shows the time required (in hours and minutes) for framing and issuing orders in the various headquarters and units, but it does not include the time required in the movement of adjutants, messengers, etc.

EXPLANATION: In this chart, the figures for orders of "average complexity" represent the average of several types of operations orders, which are considered to be comparatively accurate, issued during past grand maneuvers and maneuvers within divisions. This average was taken by picking orders that were neither very complicated nor very simple. The index numbers for column (2) and (3) are obtained from the most complicated and the most simple orders issued during the above mentioned maneuvers. The values for columns (2) and (3) are increased and decreased values of the index number of (1); that is (2) is increased by .6 of (1), and (3) is decreased by 0.4 of (1).

98. Average Time Required to Frame and Issue Orders (Part 2)  
(under favorable conditions)

Unit Types of Orders	Army Hq	Division Hq	Brigade Hq	Regimental Hq	Battalion Hq	Company	Total
Average Complexity	0:25	0:25	0:15	0:10	0:10	0:05	1:30
Complicated	0:40	0:40	0:15	0:15	0:10	0:07	2:07
Simple	0:15	0:15	0:08	0:08	0:05	0:02	0:53

- 140 -

- REMARKS:
1. This chart is applicable only when orders are framed and issued by experienced personnel working under favorable conditions.
  2. This chart shows the time required for framing and issuing orders in various headquarters and units, but it does not include the time required in the movement of adjutants, messengers, etc.
  3. Taking these conditions into consideration, the time required from the issuing of an order until the front line goes into action is approximately  $3\frac{1}{2}$  hours for an army and  $2\frac{1}{2}$  hours for a division.

## SECTION IV BIVOUACS

## 99. Area Required for Bivouacs

ORGANIZATION	UNIT	NECESSARY AREA		
		FRONTAGE (PACES)	DEPTH (PACES)	
Infantry	Battalion	210	240	
Cavalry	Regiment (2 Trs)	220	370	
ARTILLERY	Field Artillery	Battalion	230	300
		Regtl Am Tn	100	330
	Mountain Artillery	Battalion	230	300
		Regtl Am Tn	110	260
	Heavy Field Artillery	Battalion	230	460
		Regtl Am Tn	190	360
	Independent Heavy Field Artillery	Bn within Regt	240	270
		Regtl Am Tn	120	210
		Transport Company	100	600
		Mtr T Co for the LC	160	260

NOTE: The machine gun company is not included in the calculations for the infantry battalion.

SECTION V MEANS OF COMMUNICATION

100. General Data for Wire Communication.

Types of Apparatus		Time Required to Establish a Station	Speed	Maximum Range (km.)	Summary
Telegraph		Approximately 20 minutes	60-70 units (kana or Japanese syllables) one day { Two stations--180 -200 msgs A circuit of three stations--150 msg (100 units or less per message)	Semi-permanent wire 400 km. Uninsulated wire 200 km.	
Telephone	Heavily Insulated Wire	Several minutes		100(clear) 40(rain)	1. In all these cases a single direct communication wire is laid on the ground. 2. [ ] indicates buzzer telephone.
	Medium Insulated Wire			40(clear) 20(rain) [40(clear)]	
	Lightly Insulated Wire			[40(clear) 30(rain)]	
Rate of Laying Telephone Wires (in kilometers)			<ol style="list-style-type: none"> <li>The rate of laying wire is that of one linesman detail for the semi-permanent wire, and that of one labor detail for each of the others.</li> <li>The rate of laying wire during the night is approximately half of that shown in this chart.</li> <li>The removal rate of uninsulated wire and heavily insulated wire is approximately the same as the rate of laying. Removal rate of medium and lightly insulated wire is approx. three to four kilometers per hour.</li> </ol>		
Semi-permanent Wire	4 per day (approx.)				
Uninsulated Wire	2 per day (approx.)				
Heavily Insulated Wire	3 per day				
Medium Insulated Wire	4 per day				
Lightly Insulated Wire	5 per day				

101. General Data for Visual Communication, etc.

Types		Speed of Communication	Range of Communication
Semaphore Signalling		15 units a minute	700 meters (1,300 meters)*
Semaphore (Morse) Signalling		Same as above	500 meters (1,000 meters)
Wig-wag Signalling		15 units a minute	1,200 meters (3,000 meters)
10-cm. heliograph	Sun	15-17 units a minute. Three messages of about 100 units an hour	30-40 kilometers
	Fire		Night 12 kilometers (Day 2 kilometers; Night 20 kilometers)
Carrier Pigeons**	Loft Pigeons	Flying speed approximately 1 kilometer per minute	200-300 kilometers
	Pigeons trained for mobile lofts		50 kilometers
	Night loft Pigeons		Same as above
	Round Trip Pigeons		Same as above
Dogs		200-300 meters per minute	2 kilometers (approx.)

\* ( ) shows range when binoculars are used.

\*\* The pigeons which are trained for mobile lofts upon arrival in the new position can be utilized for a communication distance of 5 kilometers after only one day training.

SECTION VI

SUPPLY

102. Channels for Replenishing Rations and Forage.

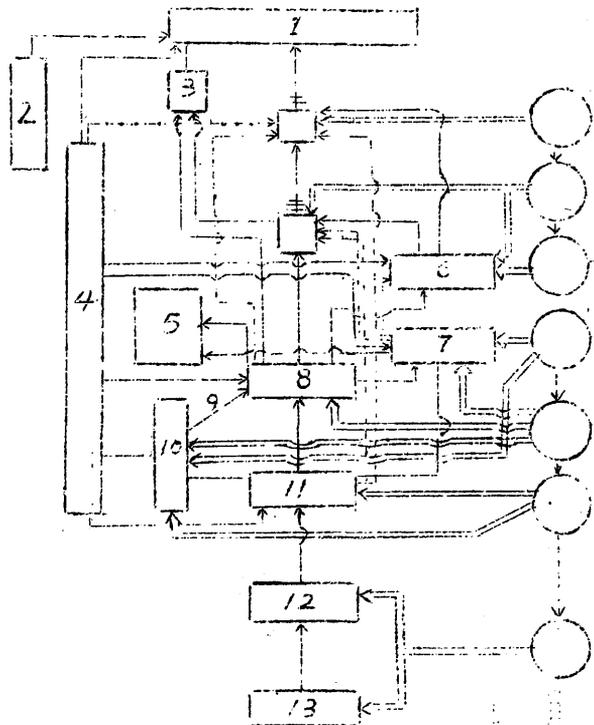


Fig. 6

LEGEND

-  Field Train
-  Assembly of Transports

-  Replenishment of Food
-  Replenishment
-  Orders
-  Requisitions

- 1. Units
- 2. Supplied by householders
- 3. Portable
- 4. Purchase or Confiscation

- 5. Line of Communication Unit, Line of Communication Relay Point, and Transient Men and Horses.
- 6. Field Warehouse.
- 7. Line of Communication Hqs.
- 8. Field Victualling Depot.
- 9. On occasions.
- 10. Material Collecting Depot.
- 11. Field General Depot.
- 12. General Provision Depot.
- 13. Provision Depot.

103. Fixed Quantity of Rations and Forage for Men and Horses in the Field.

Ordinary rations and fodder (one day)

I T E M S	M E N						H O R S E S					
	Rice	Barley	Canned meat	Salt	Soy sauce extract	Vegeta- bles, pickles, season- ings, etc.	Riding horses Draft horses (except those attach- ed to trains or transports)			Draft horses of trains and trans- ports		
							Barley	Hay	Rice straw	Barley	Hay	Rice straw
Full Ration	640 (.882 litre)	200 (.342 litre)	130 (5.3 oz.)	12 (0.39 oz.)	20 (0.66 oz.)	some	5250 (9.0 litres)	3750 (132.88 oz.)	3750 (132.88 oz.)	4200 (7.2 litres)	3750 (132.88 oz.)	3750 (132.88 oz.)
Limit to be car- ried in the field	same as above	same as above	same as above	/	same as above	/	same as above	/	/	same as above	/	/

REMARKS: a. Numbers are shown in approximate gram measures.

b. The full ration of barley for transport draft horses is 1050 (1 sho - 1.8 litres) less than that for riding and other draft horses.

104. Time Required for Cooking.

A. Cooking by means of the kitchen equipment of the field train.

When five sets (one set consisting of three iron pots, two iron stoves and accessories) of regulation type cooking equipment (inside pot) are used, the feeding of 1000 men requires approximately  $4\frac{1}{2}$  hours.

The details are as follows:

Number of men to be fed ..... 1000  
 Amount of rice and barley ..... 30 Bushels  
 (Rice ..... 6 stoves  
 Use of stoves - (  
 (Miscellaneous ..... 4 stoves  
 Volume of one pot ..... 4 gals.  
 Number of cooking times ..... 9 (approximately)

(To set up equipment ..... 20 minutes  
 (To build fire ..... 10 minutes  
 Time (To bring water to a boil ..... 20 minutes  
 Required (To Cook (20 min each cooking) ..... 3 hours  
 (To change water (15 min each time) ..... 30 minutes

Total ... 4 hours, 20 minutes

When the apparatus to prevent scorching (nakazoko) is used instead of the inside pot, and one oven is added to each set of cooking equipment, the result is as follows:

1. Amount of rice per pot ..... 7 gallons
2. Amount of time required in cooking  
     rice per pot ..... 40 minutes

With the above, it is possible to economize approximately one-third on the cooking equipment and time. (By experiments of the Central Provision Depot).

B. Cooking with mess kit equipment.

It takes approximately 40 minutes to cook two meals with mess kit equipment roughly as follows:

Preparation time (distributing and washing  
     rice and barley ..... 15 minutes  
 Cooking time of rice ..... 18 minutes  
 Steaming time of rice ..... 7 minutes  
 Total ..... 40 minutes

105.) --see page 147.

106.)

107. The Effect of Cold Upon the Human Body.

Temperature (in degrees Centigrado)	Effect
About 15° and above	When there is no wind, cold is not noticeable.
-20° and below	Breath freezes on the mustache, and a freezing sensation is particularly noticeable on the hands and feet

(continued on Page 148)

105. Normal Requirements of Water for Men and Horses

	Emergency situations	Bivouac	Long Halt
M E N	1.06 gal.	For cooking, drinking, and washing hands:  2.89 gal.	For cooking and tea: 6.5 gal. For washing and laundry: 4 gal. For bathing and other uses: 3.7gal.
Horses	5.31 gal.	5.78 gal.	14.5 gal.
R E M A R K S	Based on war-time supply regulations.	1. Based on the Bivouac Manual. 2. Water horses twice daily each time for about 5 minutes with 2.9 gal. 3. During bivouac it is best to distribute one appropriate-size trough to each company.	According to tests conducted during the Chinese Incident of 1928, it was found that a man uses an average of 13.5 gal. per day and that horses use maximum of 19.3 gal. and a minimum of 8.2 gal. per day.

1. When cooking with mess kit, 1.45 gal. of water is required for three meals.
2. The (1-sho--1.8 litres) measure is 5.88 inches square and 3.24 inches high, with a volume of 111.6 cubic inches.

106. Standard Capacities of the Transport Cart, Ordinary Cart, and Pack Horses in Use at the Present Time.

Model 39 Transport Cart A (regular type):

Weight	157.7 kgs.
Length	3.21 m.(with horse, 4.20 m.)
Gauge	1.30 m.
Loading limit	190 kgs.(420 lbs.)

Ordinary cart: 413.4 lbs. maximum load limit

Pack horse: 206.7 lbs. maximum load limit

107. (continued)

Temp.	Effect
about - 27° and below	Eyebrows and hair within the nostrils freeze. Not only does one have a queer sensation in the opening and closing of the eyes and in breathing, but the tongue cannot be used freely and speech becomes difficult.
About -35° and below	In addition to the above effects, the intense cold severely attacks the body, causing a sensation of strong pressure being applied on the top of the head. Unconsciously the body shakes continuously. It is, of course, difficult to sleep or to stand still even for a short time.
Remarks	For protection against cold, wear hood, gloves, socks, and underwear.

108. The Relation of Extreme Cold to the Wearing of Special Clothing.

Special Clothing	Relation to Extreme Cold
Hood	By nature the head and face are greatly resistant to cold, therefore, a simple woolen hood is sufficient protection even at -18°, if the wind is not strong.
Underwear	If special protective underwear is worn underneath the uniform, it is possible to withstand temperatures as low as -5°.
Winter overcoat and jacket	If the wind is not strong, the use of overcoats and jackets is hardly necessary at temperatures between -12° and -18°, but they should be worn at lower temperatures or in a strong wind.
Shoes and socks	It is necessary to use winter shoes and socks at temperatures under 18° below zero. But when they are worn, caution must be used to change socks from time to time. This is because the feet, warm at first, perspire, causing the socks to become moist, then cool, and finally to freeze.

(continued on next page)

108. (continued)

Clothing	Relation to Cold
Ordinary winter gloves and large overgloves	Even when there is no strong wind, it is difficult to withstand temperatures below $-20^{\circ}$ with ordinary winter gloves as long as 30 minutes. At temperatures below $-30^{\circ}$ , it is essential that large gloves be worn over the other gloves. It must be remembered, however, that this will make loading and firing difficult.

109. The Relation of Extreme Cold to the Wearing of Special Clothing While on Stationary Duty.

Temperature	Winter Clothing	Summary
$0^{\circ}$ to $-10^{\circ}$	Winter gloves and underwear	One is able to withstand the cold for 40 minutes, but thereafter one begins to feel cold below the hips and pain in the face and finger tips. At temperatures below $-25^{\circ}$ , it is difficult to stand outdoors for more than 30 minutes without moving around.
$0^{\circ}$ to $-10^{\circ}$	Winter underwear, overcoat, cap, socks, shoes, and gloves	No feeling of extreme pain from the cold as long as 2 hours.
$-15^{\circ}$ to $-20^{\circ}$	Add a winter jacket (sleeveless) to above list.	Although the feet become painful after 2 hours, exercise will relieve the condition.
$-18^{\circ}$	Winter gloves, underwear, and hood	It is possible to withstand the cold for 2 continual hours while on stationary duty. For longer periods it is necessary to add winter shoes and jacket.

(continued on next page)

Temperature	Winter Clothing	Summary
-25° to -30°	Add long-sleeve winter jacket to the clothing designated above for -15° to -20° and wear large over-gloves and 2 or three pairs of winter socks.	Ordinary winter gloves when worn at temperatures of about -23° make it possible for firing to be continued for approximately 20 minutes.
-30° to -35°	Add to the above list a woolen overcoat, 3 pairs of socks and fur-lined boots.	At a temperature of -35° pain will be felt in the feet after approximately one hour and gradually the feet will lose their feeling.
Below -35°	In addition to the above, put hay or cotton in the fur-lined boots, or wear leggings.	In temperatures below -40° the pain which occurs after approximately 30 minutes renders difficult the performance of duties lasting more than an hour. In a strong wind thirty minutes is the maximum time of duty.

## REMARKS:

1. This table is a synthesis of reports on experiments made while wearing Japanese style clothing.
2. It is preferable for mounted men to wear all types of special winter clothing at temperatures below -10°.

## 110. Field Cooking Equipment Carried by Troops.

NOTE: In all discussion of Japanese food, it must be remembered that the main dish is rice or rice and barley mixed, and that the secondary or side dish includes all other food such as vegetables, fish, eggs, meat, etc. Kitchen equipment used in the field consists of that carried by troops and that obtained from local resources.

Articles (in sets)	Remarks
Hemispherical iron pot Inside pot and lids	Used for cooking rice and other food and for boiling water.
Iron stove	Collapsible model (5 parts)
Rice washing tubs, large and small	Used for washing rice, barley, and ingredients for side dishes, and also as a water container.
Hot water tubs, large, medium & small	
Whetstone	
Pail stand	
Tripod	
Steel dipper	For serving side dishes
Handles for large ladles	
A hemp palm brush	For rinsing or washing pots & other equipment
Bag	For storing miscellaneous utensils
Rice cloth	A hemp cloth, approximately 5'6" by 2' used in serving rice after emptying from pot.
Large dipper	Used as container for hot water, soy sauce, etc.
Small wollen bag	Used to filter water
Lanterns	
Scales	Used to weigh rice for apportioning the amount per meal.
Rice sieve	Used for washing rice and barley
Sickle	

Articles (in sets)	Remarks
Rain cover	A waterproof cloth 7' 3" sq.
Large ladle	
Food conveying sack	Used to convey rice and other food in packages.
Rice wrapping cloth	Used in wrapping rice for distribution to troops.
Vegetable wrapping cloth	Used in wrapping vegetables for distribution to troops.
Rope	For use as wellrope and also for tying purposes.
Axe	

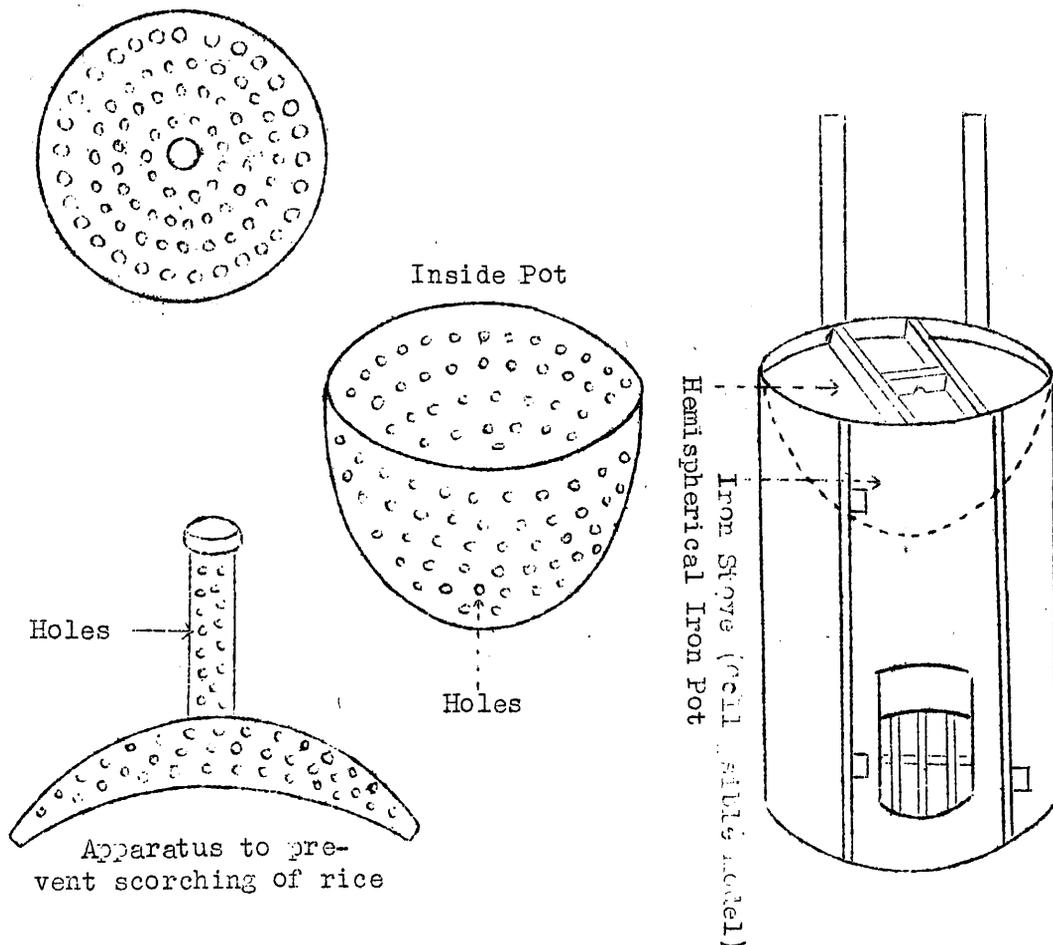


Fig. 7

111. Mess Kits Carried by Troops. (See Fig. 8)

The 2-meal mess kit, being in common use at the present time, is too well known for description. Therefore, the 3-meal kit will be described below.

A. Merits of the 3-meal mess kit.

1. With this mess kit, it is possible to cook a whole day's ration at one cooking.
2. It is a double type with inner and outer parts. Because of the fact that it has a space between the two parts, it offers protection for the contents against freezing in the winter and spoiling in the summer.
3. Graduations on the mess kit: On the inner side of both the outer and inner mess kits, the following is indicated: Water for two meals -- upper mark; water for one meal -- lower mark. The graduation on the inner side of the outer mess kit shows the capacity for one day's full ration of rice and barley in wartime. Capacity of the inner tray is 0.63 litres (.17 gallon); and the combined capacity of the inner and outer parts of the mess kit is 1.8 litres (.5 gallon).

B. Packing and carrying method.

1. The method of packing and carrying this mess kit is the same as for others. However, when it is required to pack and carry rations for meals in both outer and inner mess kits, cover the outer mess kit with the inner tray. On top of this put the inner mess kit with the cover on. Place the complete mess kit in the leather case and strap it to the pack.
2. When placing the mess kit in a pack or a carryall bag, lock the handle over the outer cover.

112. Kitchen Wagons, Electric Field Kitchen Mounted on Motor Cars, Etc.

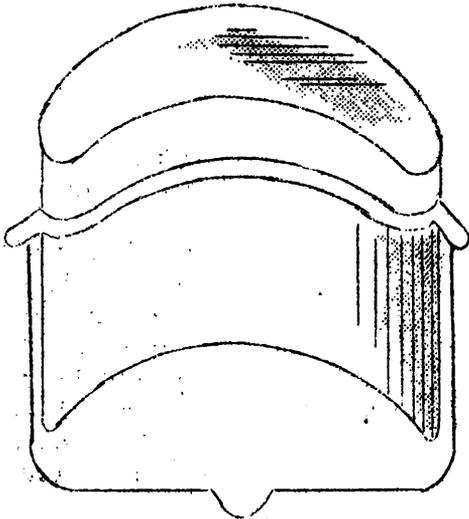
Besides the equipment described above, there are also kitchen wagons, electric field kitchens mounted on motor cars and others, which will be described later.

113. Menus.

Suitable menus should include the following:

1. Foods that are easy and simple to cook.
2. Foods that are easy to serve and convenient to carry.

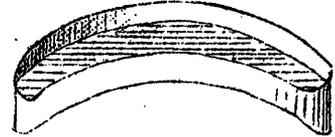
Two Meal Mess Kit



Complete

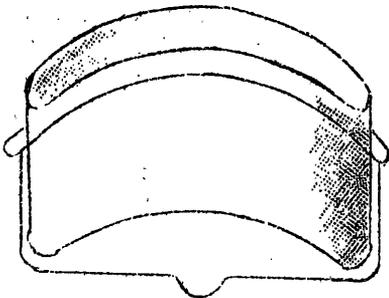


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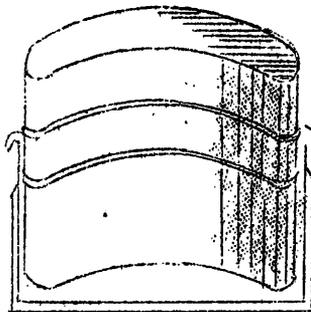


Inner Tray

Three Meal Mess Kit (Double Type)



Main



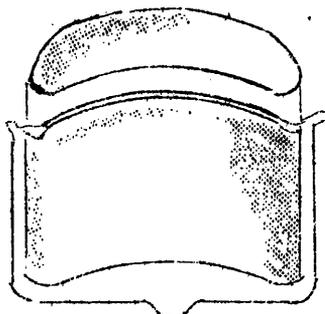
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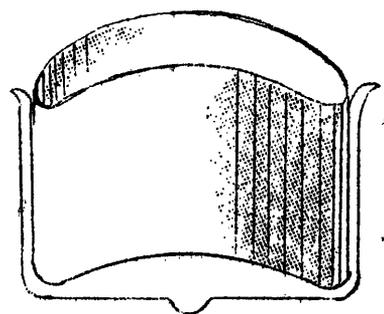
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Inner Tray



Inner Mess Kit



Outer Mess Kit

Fig. 8. Sketch of Mess Kits (Two Types)

3. Foods that will not spoil easily.

4. Easily obtainable local resources as well as regular supplies.

Note: Conforming to the above instructions, the principal menus used up to now include the following:

Gomokumeshi (rice mixed with eggs or vegetables) -- In summer add a small amount of vinegar to the mixture.  
Fukujinzukemeshi (sliced vegetables preserved in soy sauce and mixed with rice) Cook the rice longer than usual; sprinkle fukujinzuke over the rice and mix.  
Kannikumeshi (canned meat mixed with rice) -- Follow the above procedure.  
Mushihan (steamed rice) -- If a bamboo basket is placed over the hemispherical pot, the rice may be easily steamed.

These may be	( Nimamo (boiled beans)
easily prepared	( Tsukudani (food boiled in soy
with field kitchen	(       sauce
equipment	( Misoni (food cooked in soy bean
	(       paste)
	( Tokkamiso (food cooked in tekka
	(       bean paste)
	( Shio-kombu (salted sea weed)
	( Kanroni (various kinds of food
	(       cooked with sirup)
	( Misoyaki (food baked in soy bean
	(       paste)

Agemono (fried food) -- select such food as pork which can be fried plain.

Daikon-hayazuke (Radish pickled for a short time.) The radishes which are cut thick can be eaten immediately after soaking them in a vinegar & sugar solution (a small amount of spice may be added if available.)

#### 114. Setting Up of Field Kitchen.

a. The field kitchen is ordinarily divided into a place to prepare food for cooking and a place to cook it.

b. Particular attention is given to drainage where the kitchen is set up, and if necessary, ground should be covered with boards or matting to protect against mud.

First of all, select the site for the kitchen, and then construct the cookstove. After the allotted supplies (any shortage of materials will be met from the supplies of the individual outfits) and fuel have been received, proceed with the operation of the kitchen.

115. Construction of Cookstove (on Ground)  
 Cookstoves are constructed as sketched below:

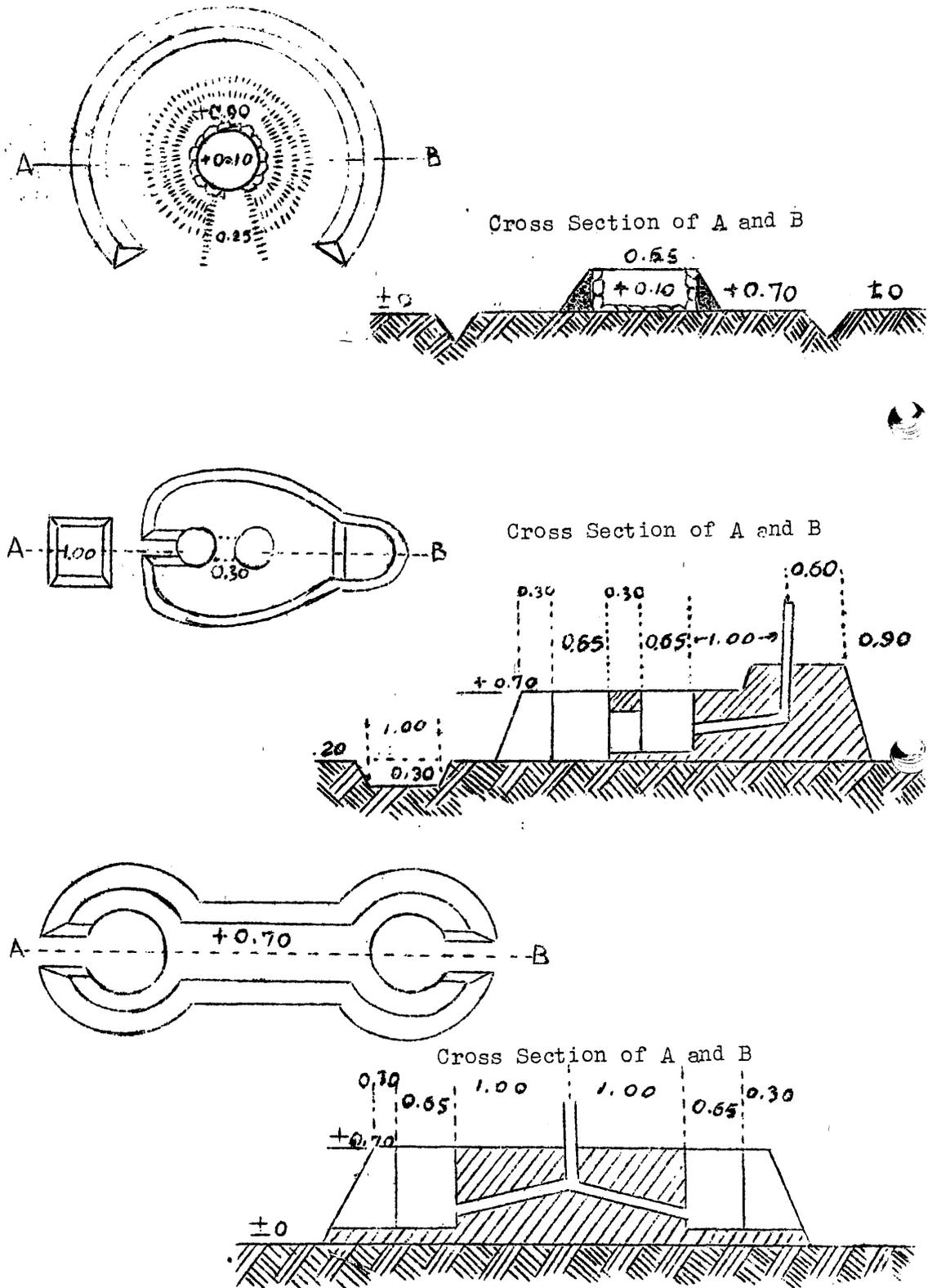


Fig. 9

116. Kitchen Detail for Field Cooking with Stove.

The personnel required to cook for 1000 men is generally as follows:

1 NCO is in charge of all kitchen personnel, incoming and outgoing rations, and meals.

1 Superior Private in charge of side-dishes and fuel.

16 men on duty.

The number of men required will depend upon the situation, especially upon the variation in menus and the convenience in obtaining water.

The duties of the 16 men, which follow the usual procedure of first serving supper and later preparing and distributing breakfast and dinner (food to be carried along) for the following day, are divided as follows.

1st step: before beginning to cook	
Cookstove construction detail	3 men
Rice and barley washing detail	5 men
Detail to prepare other food	5 men
Fatigue detail (water and wood)	3 men
2nd step: after beginning to cook	
Detail to handle main dish (rice)	7 men
Detail to handle side dishes (other food)	5 men
Fatigue detail	4 men
3rd step: Details for the distribution of breakfast and dinner after supper has been served.	
To distribute rice	8 men
To distribute other food	5 men
To clean up	3 men

117. Setting Up of Stove (Portable-old type) for Cooking in Field.

When assembling the cookstove, first of all remove the plates from the package and then assemble them in a spot selected by the person in charge of supplies.

Place the steel plate which forms the front of the stove so that it faces the wind. Then, on the opposite side, place the two steel plates to which the chimney is attached. First start with figure (1) as illustrated on the sketch and then assemble the other parts consecutively in order (1,2,3,4,5).

In case of a strong wind it is better not to face the mouth of the stove at right angles with the direction from which the wind blows.

The fire will burn more satisfactorily if the foundation of the stove is dug in an X shape about  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches in depth before assembling the parts of the stove.

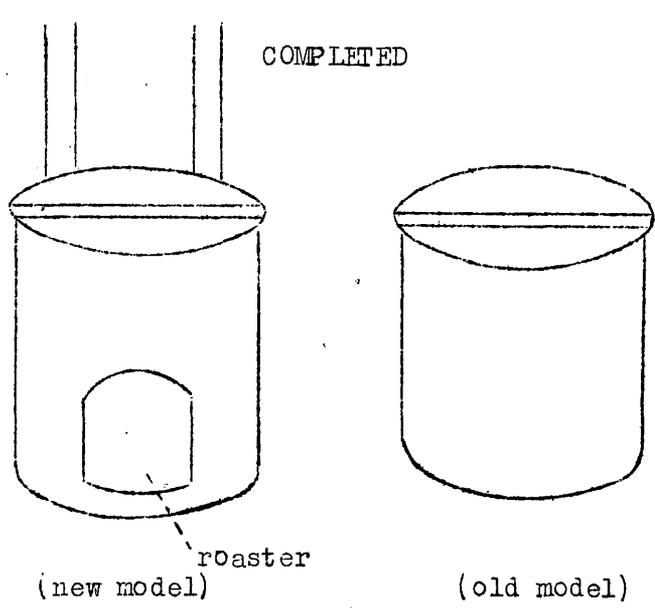
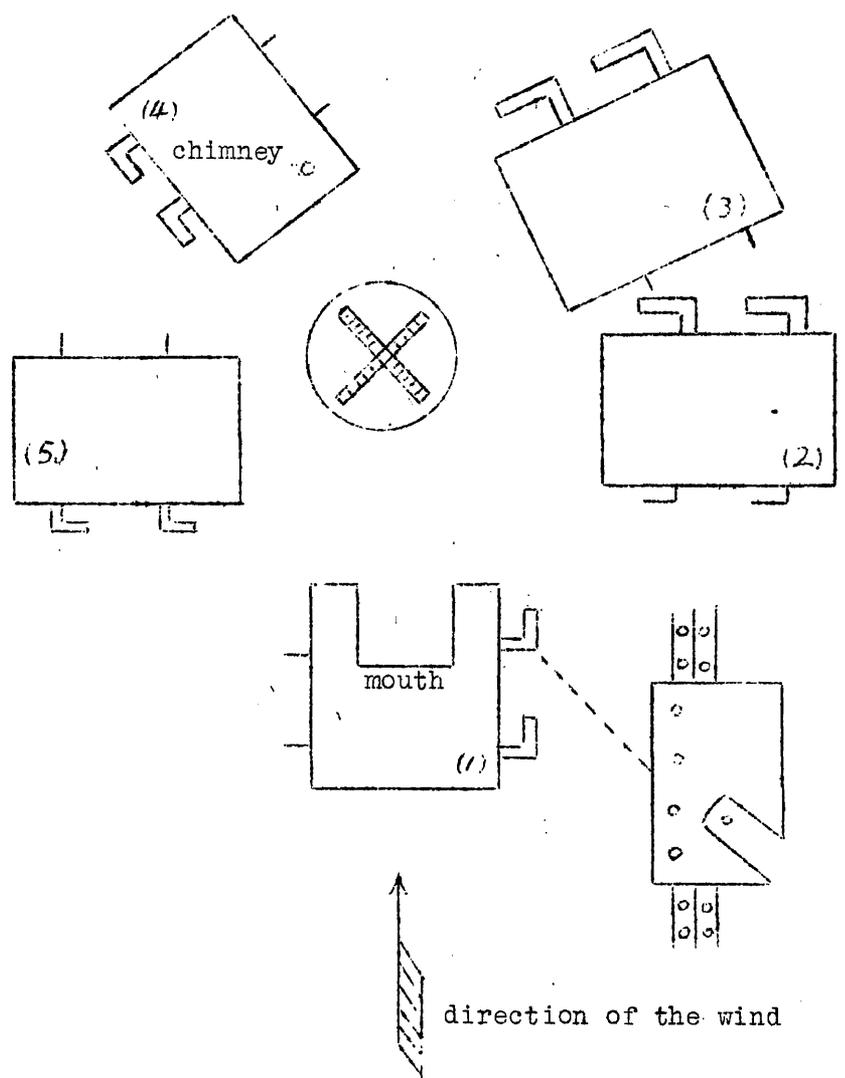
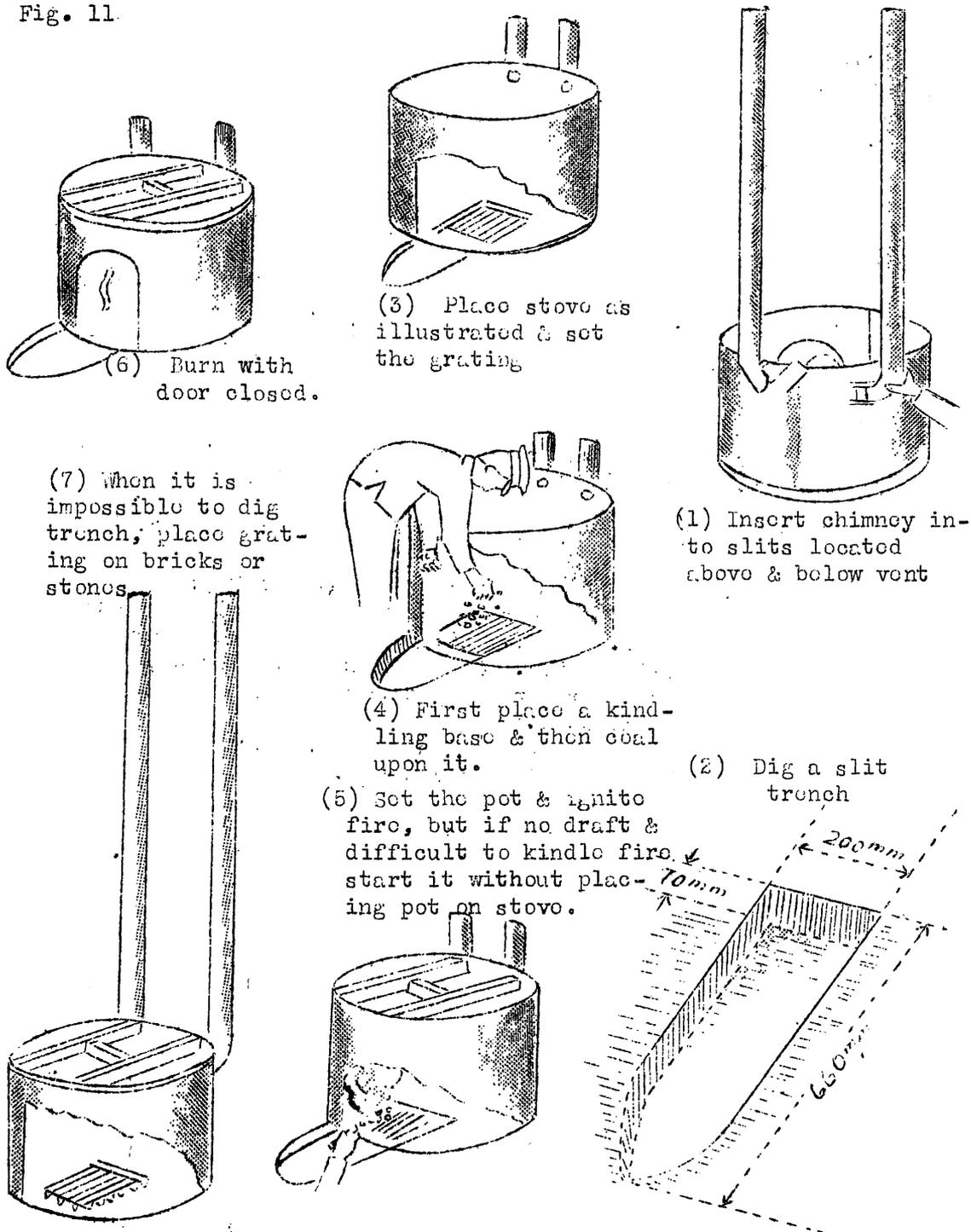


Fig. 10.

118. Setting Up of Stove (Portable-new type) for Cooking in Field.  
 The following chart illustrates the assembling of a coal-burning new model stove and the essentials of building the fire.

Fig. 11.



(3) Place stove as illustrated & set the grating

(6) Burn with door closed.

(7) When it is impossible to dig trench, place grating on bricks or stones.

(1) Insert chimney into slits located above & below vent

(4) First place a kindling base & then coal upon it.

(2) Dig a slit trench

(5) Set the pot & ignite fire, but if no draft & difficult to kindle fire, start it without placing pot on stove.

**Precautions:**

(1) In order to prevent damage to stool sections from heat, bank as much dirt as possible around inner walls of the stove. (2) Any kind of kindling wood such as kaoliang, dead wood, & twigs may be used to start fire. (3) When throwing coal on kindling wood, be sure to leave space for air circulation (draft).

119. Procedure in Cooking Rice with Stove.

In all cases, a common method of cooking side dishes is used; since this process is very complicated however, only the methods of cooking the main dish (rice) will be described.

Select the more suitable of the following methods of cooking the main dish (rice) in a hemispherical iron pot, taking into account the skill of the men and the equipment on hand.

When using an inside pot:

Put 45 litres (25 sho) of water in the pot and boil. Put 10 kilograms (8 sho) of rice and barley in the inside pot and place it in the boiling water for approximately 10 minutes. Remove the inside pot and place it on a stand to let the excess moisture evaporate. Add 18 litres (10 sho) of water in the hemispherical iron pot and place the next inside pot on for a second cooking.

Precaution:

It is easy for even an inexperienced person to cook rice with an inside pot. However, if possible it is best not to have an inexperienced person do the cooking because if the rice is extremely unpalatable the nutritive value will be lost.

When using the apparatus to prevent scorching (nakazoko):

Put 36 litres (20 sho) of water in the hemispherical iron pot and bring it to a boil. Put 1.5 kilograms of rice and barley (17 sho) in the boiling water. Cook for about 5 minutes; then either remove the fire or the pot from the stove and steam for about five minutes.

N.B. Just as in the use of the inside pot, there is no fear of scorching when this equipment is used.

When only the iron pot is being used:

Put 36 litres of water into the pot and bring it to a boil. Put 2.15 kilograms (17 sho) of rice and barley into the hot water to cook. As soon as the rice begins to boil over, immediately remove the pot and place it aside or set an asbestos pad under the pot and let it steam.

Precaution:

1. By this method, the rice will scorch if the fire is not withdrawn within five minutes after the rice has begun to boil. Therefore, as mentioned above, it is best to complete the cooking by removing the pot from the fire and letting the rice absorb the moisture of the steam.

2. If the essential points of the procedure are thoroughly understood and practiced, rice can be cooked fast, economically and without scorching.

120. Construction of Trench for Cooking with Mess Kits.

a. Trenches, embankments or supports are used when cooking with mess kits in the field. Cooking by this method is simple; when firewood is used as fuel, however, it is advisable to use supports or embankments. When using fuel that is brought along, use supports if there is no wind, but if there is a wind, it is advisable to dig a simple trench. In place of a trench, stones can be used. (Construction Manual No.73)

b. The kitchen will be arranged as much as possible in a single row of trenches set approximately 2 meters apart. However, if the terrain does not permit this, dig 2 rows of trenches.

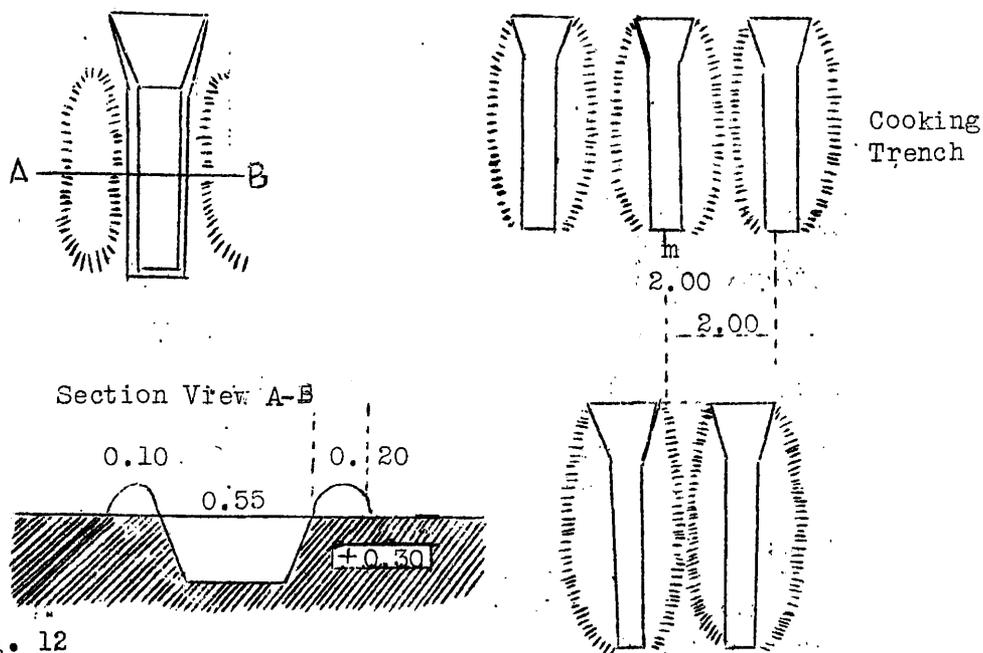


Fig. 12

The width of the trench will vary with the number of mess kits to be hung on the crosspiece. For example, when four or five are used, the width will be 50 to 60 centimeters. The length will be 20 centimeters to each crosspiece; thus, the entire length will be determined by the number of crosspieces to be used. However, for the convenience of cooking, it will be limited to two meters.

The depth of the trench measured from the top of the embankment to the bottom of the trench should be as follows:

When using charcoal as fuel ----- about 40 cm.

When using wood as fuel ----- about 50 cm.

When using fuel that is brought along, the distance between mess kit and fuel should be about 3 cm.

If necessary arrange the support so as to protect the crosspiece. The embankment should be so constructed as to follow the course of the trench.

Supports for crosspieces will consist of either simple tripods constructed of bamboo or twigs, about 50 cm. in length, or of

forked branches and such, which are to be driven into the ground..

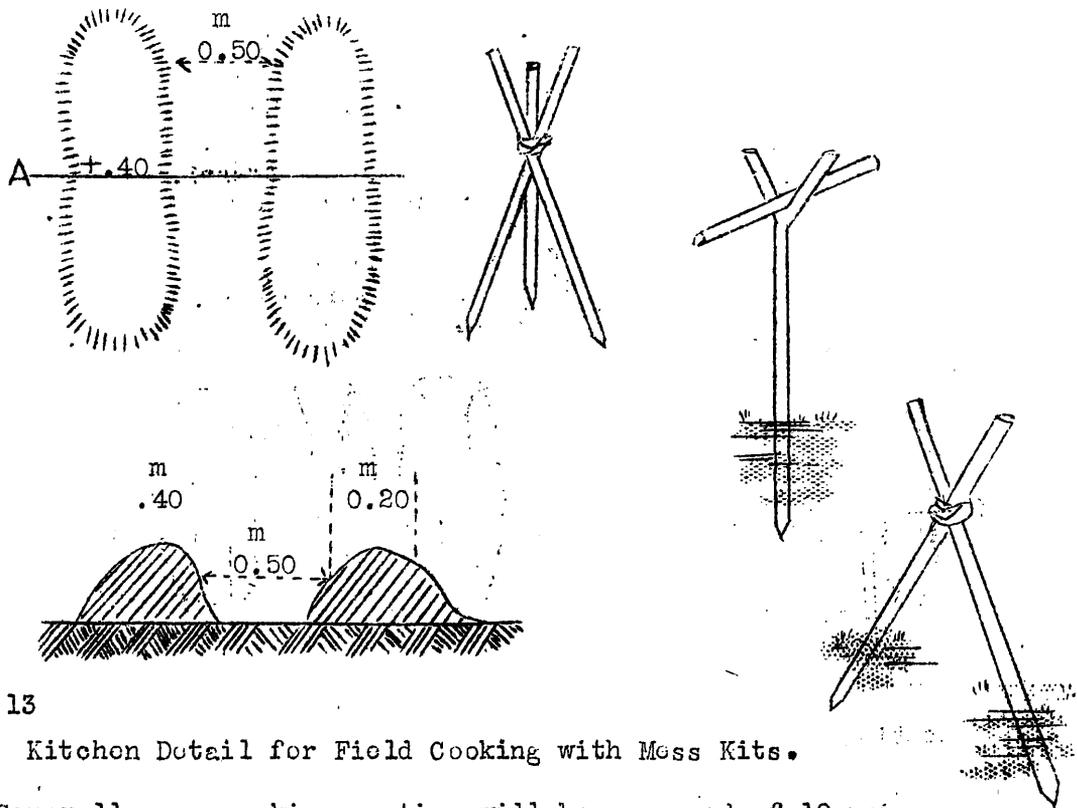


Fig. 13

121. Kitchen Detail for Field Cooking with Mess Kits.

Generally one cooking section will be composed of 10 men (cooking for 60 men) selected each day in turns..

Special duties:

One officer (or warrant officer) in general command.

One NCO to assist the officer and take charge of cooking..

First Step (until preparation for cooking begins)

- Ration and fuel detail ----- 6 men
- Mess kits and canteens collecting detail ----- 2 men
- Detail to prepare cooking place ----- 2 men

Second step (cooking preparations)

- Rice and barley distribution detail----- 3 men
- Side dishes distribution detail ----- 3 men
- Fuel distribution detail ----- 1 man
- Fire kindling and miscellaneous detail ----- 3 men

Third step (cooking)

- Main dish detail ----- 6 men
- Side dishes detail ----- 3 men
- Fireman for trenches and boiling water ----- 1 man

Fourth step (distribution)

- Main dish detail ----- 6 men
- Side dishes detail ----- 3 men
- Clean up detail ----- 1 man

## 122. Procedure in Cooking with Mess Kits.

When cooking side dishes with the mess kit, it is best to select those kinds of food which do not have to be cooked thoroughly. It is not always possible, however, to follow this in regard to such items of food as the ingredients for mixed rice (rice mixed with meat and vegetables) and raw food obtained from local resources. The following statements are based on the methods used in such conditions:

- a. Cook the main dish and the side dishes at the same time.
- b. Collect several mess kits and use some of them to cook the main dish and the others to cook the side dishes.
- c. In all probability the amount of heat absorbed by the main part of the mess kit will differ from that reaching the inner tray placed over it. If both dishes are cooked at the same time, unless the food for the side dish is such as can be cooked within the time required for cooking rice, they will not get done together. Therefore, the former method (a.) must in principle be based upon the latter method (b.). However, there are two exceptions to this principle:
  1. Cooking mixed rice (mazomoshi)
  2. Cooking those side dishes which only require warming before they are eaten.

In all cases hang the mess kit at a height where the flames barely touch the bottom of the kit; and after it has boiled for approximately five minutes remove it from the fire. If it is plain rice that is being cooked, turn the kit over and let it steam for approximately 10 minutes. Moreover, after removal from the fire, do not lay the kit directly on the cold ground, but lay it on something such as pieces of wood or straw to keep the food from getting cold.

## 123. Utilization of Kitchen Equipment and Fuel obtained from Local Resources.

Equipment obtained from local resources refers to cooking utensils used by the inhabitants of the battle area. In Manchuria many homes use large pots, and as a result it is possible to make extensive use of them in group cooking.

### Pots used by the Chinese.

The two kinds of pots usually used by the Chinese are hemispherical pots with cooking capacity of approximately 2 4/5 gallons and 5 3/4 gallons respectively. These two are generally found in each household. However, in those establishments, such as inns, which house many people, four of the

larger pots (or of a still larger type with a capacity of about 7 3/5 gallons) are usually found.

#### Decolorizing of Chinese pots.

Chinese pots have a certain offensive smell and an oily film. The easiest method of removing this is to wash it with laundry soap before it is used. Another method is to boil water in it once before it is used. Still another method is to rub salt on the inside of the pot.

These pots may be well used during the winter to cook side dishes. Moreover, it is important to boil a large quantity of hot water prior to cooking. When washing the rice, add some of this hot water to the rice washing water until lukewarm. This will facilitate the process of washing the rice.

#### Peculiarities of cooking rice (with the Chinese pots).

It will take less time to cook rice in a Chinese pot than in a Japanese pot. Since the pot cannot be removed from the cooking stove, the fire must be carefully watched (use a strong fire until the pot boils over). Furthermore, when cooking rice in the Chinese pot, because the pot is shallow and has no fixed capacity, do not measure the amount of water by the depth of the water above the rice; but always measure it out in proportion to the amount of rice. Since Chinese measuring cups vary greatly from place to place, use the mess kit as a measuring cup.

#### Provisions for buckets, pails, etc.

Chinese households have few utensils such as buckets or pails, and it is very inconvenient when one wants to use warm water. Therefore, have the field train carry 2 buckets and 2 dippers for each platoon and it will be most convenient to have them issued at the time the materials are distributed to each platoon. However, households in Manchuria generally have 1 or 2 large basins (1 1/2--2 gallons) and a large dipper (called suihyo) made of gourds.

### 124. Miscellaneous

#### Use of kaoliang stalks as fuel.

In burning kaoliang stalks, it is best not to throw them in large quantities into a fire. It would be better to first build up the fire by stirring the ashes well and then to feed the fire with only a few stalks at a time. In case natives are present in the vicinity it would be convenient to get their help.

Compared with charcoal, the kaoliang stalks burn faster, and heat given out varies more greatly. If the kaoliang stalks are moist or if there is insufficient combustion

because of the direction of the wind, the smoke may make cooking difficult.

Facts on local cooking;

a. The kaoliang, millet and other staple foods of the locality have fine sand mixed in the grain. Therefore, use a suitable vessel (a very good one will be a cone shaped vessel) to wash the grain. Pour the contents while being shaken into another container, and throw away the sediment. After repeating this process a number of times and removing all the sand, cook the grain.

b. In Manchuria and Mongolia water is very scarce, and so it is especially necessary to economize on water when cooking. For this reason, if possible, use clean white rice (polished rice) which does not require washing.

c. Generally the grain becomes extremely dry (except for the rainy season of July and August, it becomes increasingly drier after the harvest season); therefore, there are occasions when it is best to use a little more water in cooking than is used in Japan proper.

d. When relying on local staple foods, employ Chinese to do the cooking if possible. Show them the menu and have them cook according to their customary methods. This will give the military personnel sufficient rest. Furthermore, Chinese cooking with its many kinds of food rich in nutrition will suit everyone's taste.

TIME REQUIRED FOR COOKING WITH FIELD TRAIN  
KITCHEN EQUIPMENT

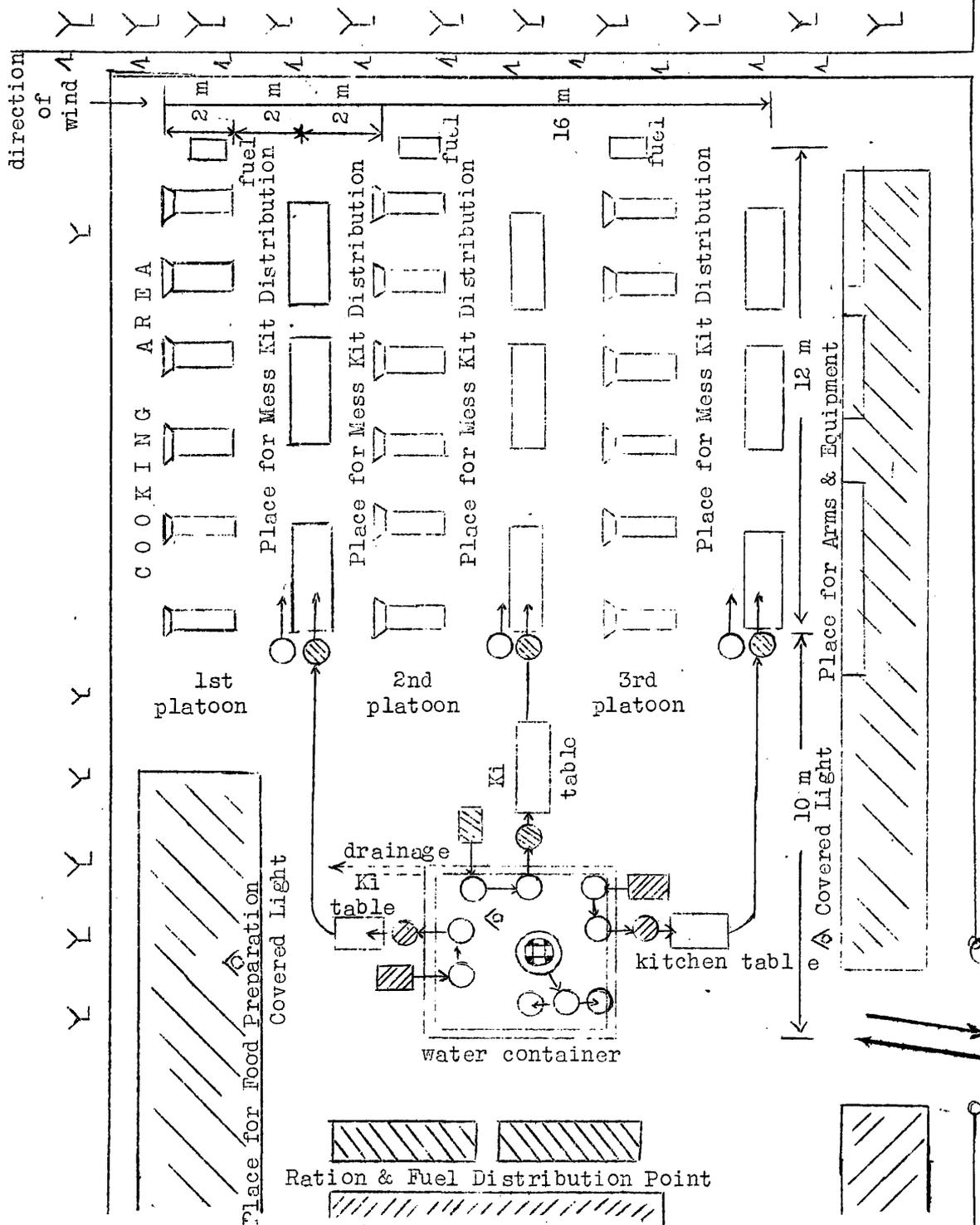
CLASSIFICATION	TIME FOR PREPARATION	NECESSARY COOKING TIME	
		Per Round	For one Inf. Bn. (including time for preparation)
When using inside pots. (9 pots, 6 cookstoves)	50 min.	20 min.	4 hrs. 30 min.
When not using inside pots ( 9 pots, 9 cookstoves)	50 min.	40 min.	3 hrs. 30 min.

TIME REQUIRED FOR COOKING WITH MESS KIT

Proceduro		Time Required in Minutes
Preparation		15 min.
Cooking	Two meals with inner mess kit	22 min.
	One meal with outer mess kit	17 min.
Steaming		7 min.
Total	Two meals with inner mess kit	44 min.
	One meal with outer messkit	39 min.



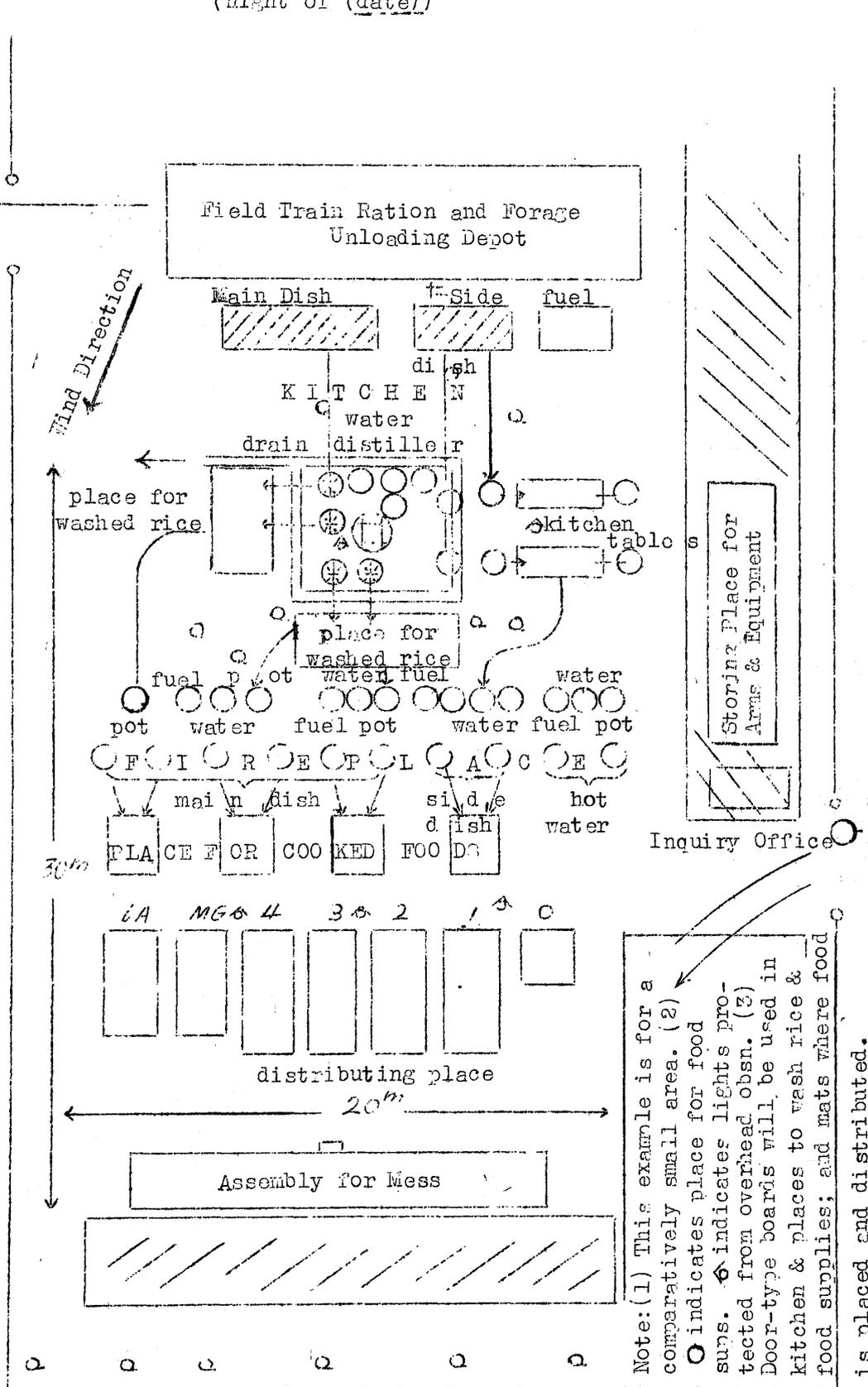
126. Kitchen Layout for Cooking with Mess Kits of Company X in the Vicinity of XX. (night of (date) )



Remarks: (1) This example is for a comparatively narrow area (2)  place where food is kept in bamboo baskets, tubs, and barrels. (3)  indicates where water is kept in tubs and barrels. (4)  indicates the place of shaded lights that cannot be observed from the air. (5) Use door-type boards for kitchen tables. (6) Lay door-type boards and mats where mess kits are to be arranged.

127. Kitchen Layout of XX Infantry Battalion in the Vicinity of XX  
(night of (date))

Field Train Sanitary Inspection Area



Note: (1) This example is for a comparatively small area. (2) indicates lights protected from overhead obsn. (3) Door-type boards will be used in kitchen & places to wash rice & food supplies; and mats where food is placed and distributed.

CHAPTER 5

FIRING

SECTION I	Infantry-----	Paragraphs
	II Artillery-----	128-132
		133-157

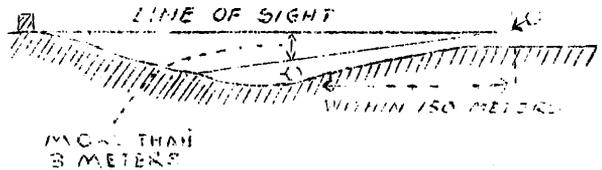
SECTION I

INFANTRY

128. Rifles and Light Machine Guns

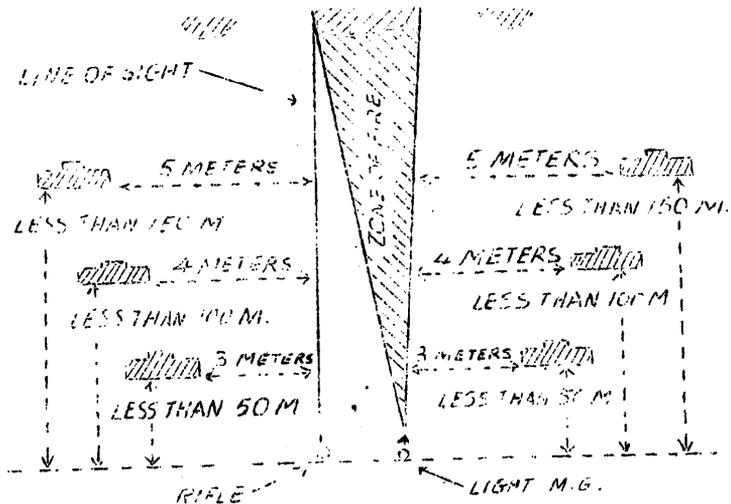
1. Overhead fire

It is possible to execute overhead fire when friendly troops are within a range of 150 meters and when the line of sight passes more than 3 meters above their heads.



2. Gap fire

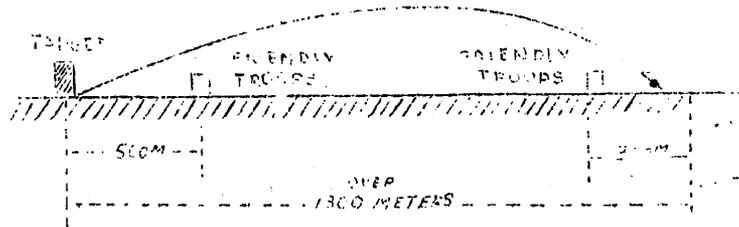
It will be necessary to leave an interval between the line of sight and the flanks of friendly troops as shown in the diagram below.



129. Machine Guns and Flat Trajectory Infantry Guns

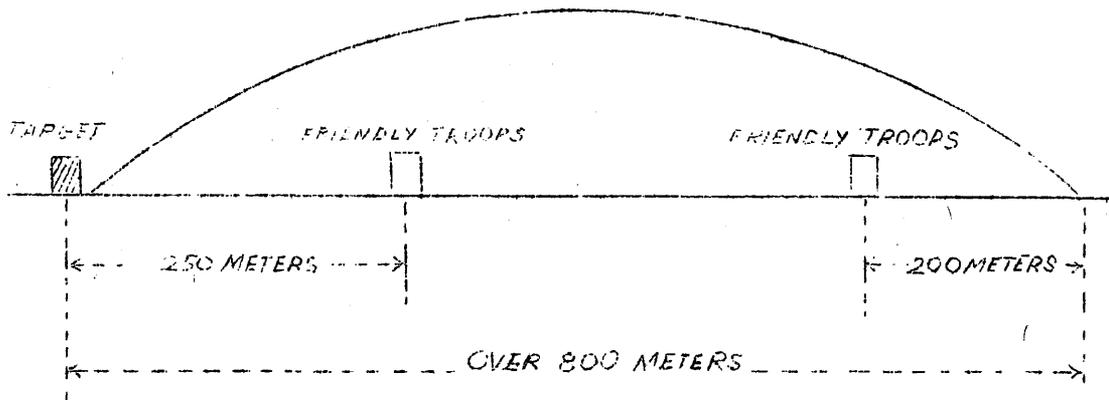
1. Overhead fire on level terrain

When the distance to the target on level terrain is less than 1300 meters in the case of machine guns and less than 800 meters in the case of flat trajectory infantry guns, overhead fire should ordinarily be avoided as friendly troops may be endangered.



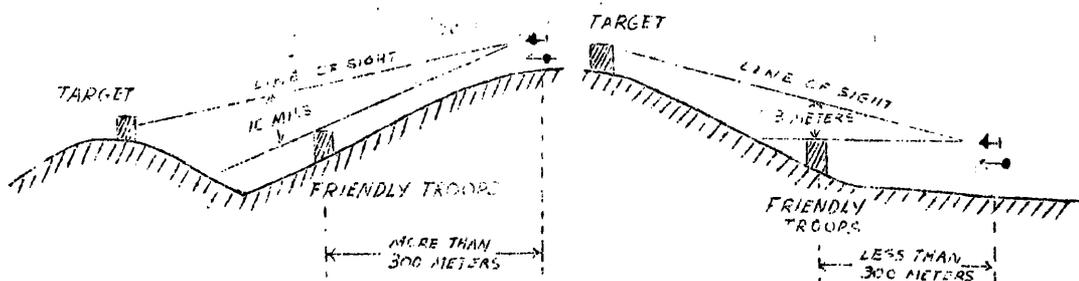
When the machine gun is firing at distant objects of more than 1300 meters, the limits of the safety zone will be as shown in the diagram above.

When the infantry gun is firing at distant objects of more than 800 meters, the limits of the safety zone will be as indicated in the diagram below.

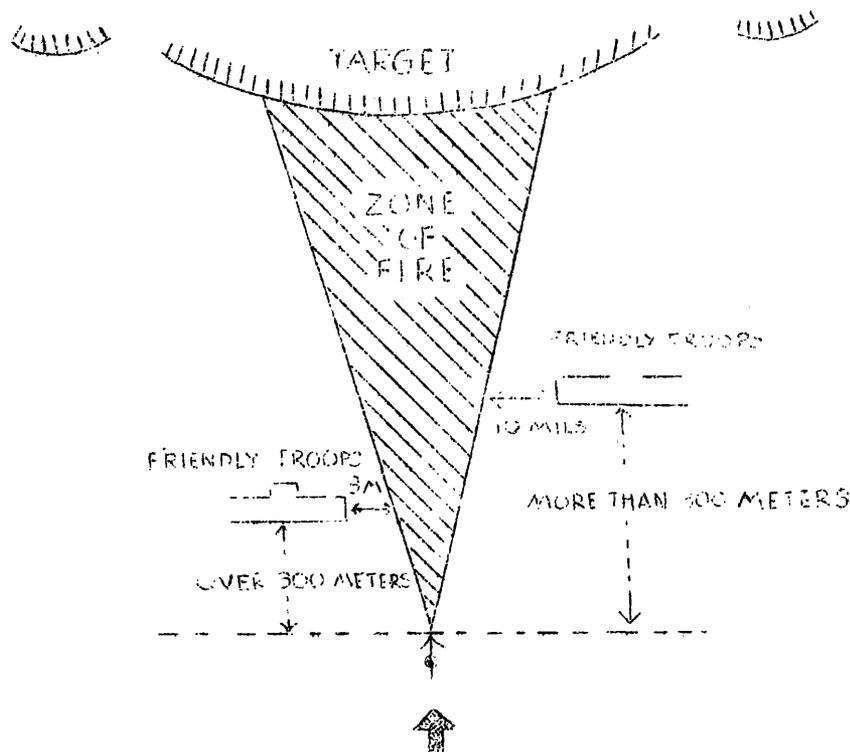


2. Overhead firing on sloping terrain (machine gun and flat trajectory infantry gun)

When the target is above the line connecting the gun position and the height of friendly troops, overhead firing must be executed within the limits of the safety zone as shown in the following diagram to avoid inflicting casualties to friendly troops.

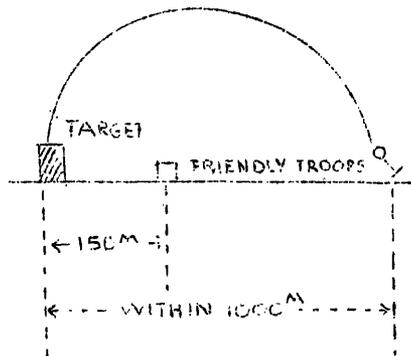


3. Gap firing (machine gun and flat trajectory infantry gun)  
 To avoid danger to friendly troops in gap firing, the limits of the safety zone are indicated in the following diagram.



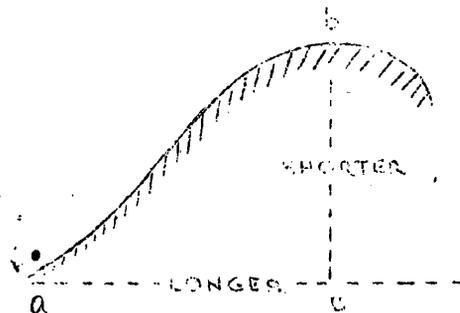
130. Overhead Fire of High Angle Infantry Guns over Friendly Troops and Obstacles.

1. Firing over friendly troops  
 To avoid endangering friendly troops when the range is less than 1000 meters, the standard distance between the target and friendly troops is 150 meters.



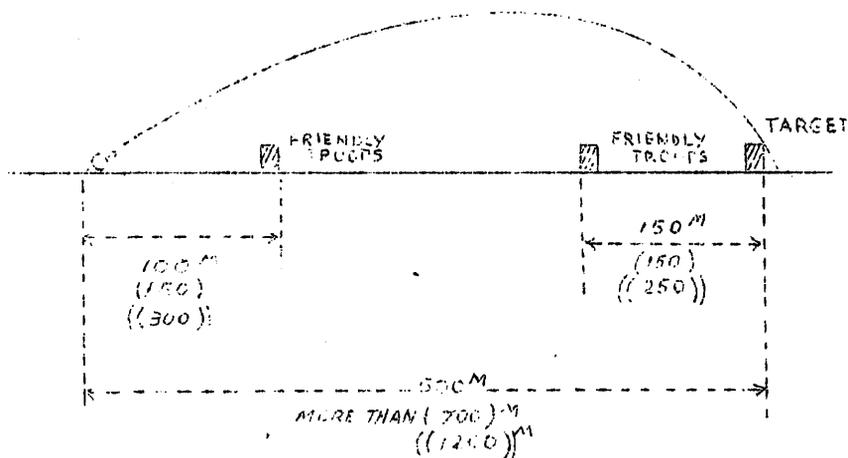
2. Firing over a mask

It is usually necessary that the horizontal distance (a-c), from the gun position (a) to the grazing point (b) be greater than the height of mask (b-c).



131. Overhead and Gap Firing of the Battalion, the Regimental, and the Rapid Firing Gun

1. Overhead firing



Note:

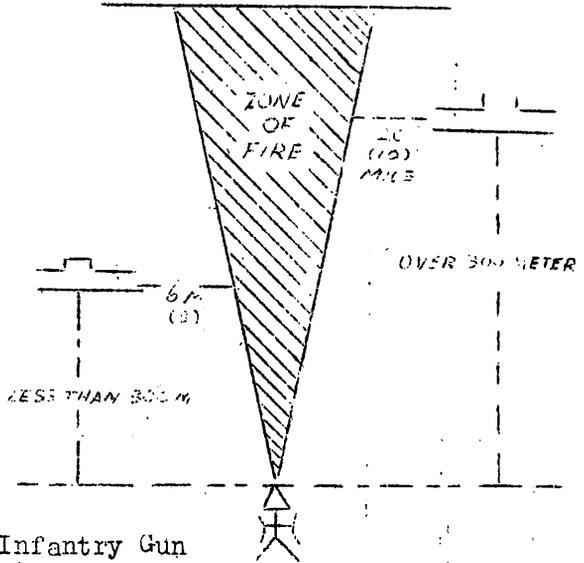
- (1) The height of a man is the standard for friendly troops.
- (2) This diagram is for level terrain.
- (3) ( ) refers to Regimental Gun.  
(( )) refers to Rapid Firing Gun.

2. Gap firing

Note:

(1) The figures within parenthesis ( ) indicate Regimental Guns.

(2) Gap firing of the Rapid Firing Gun is the same as that of the machine gun.



3. Length of defilade of the Infantry Gun

a. Battalion Gun Note:

- |                 |                                    |
|-----------------|------------------------------------|
| I.....D = 10 a  | D..... Length of defilade (meters) |
| II.....D = 5 a  | a..... Angle of defilade (mils)    |
| III.....D = 3 a | I. II..... Powder charges          |
| IV.....D = 2 a  |                                    |

b. Regimental Gun

D = 20 a

4. Minimum permissible ranges with instantaneous fuzes and delayed action fuzes are:

a. Battalion gun

<u>Instantaneous fuze</u>	<u>Delayed action fuze</u>
I.....1000 meters	.....600 meters
II..... 600	.....300
III..... 200	.....consideration unnecessary.
IV..... 100	

b. Regimental gun

<u>Instantaneous fuze</u>	<u>Delayed action fuze</u>
Effective over approximately 1000 meters.	Effective within 2500 meters, but projectile may ricochet.

Note:

- (1) Above computation is made for level ground of medium hardness.
- (2) Computation for Battalion Gun is for executing low angle fire.

132. Firing Data for Aerial Targets

Armaments	Effective range	Rear sight (elev.)	Aiming point	The visible distance of airplanes under normal conditions		
				1000 m	600 m	200 m
Rifles and light machine guns	Ordinarily within 600 meters	300	When a plane is beyond the effective range, the target length lead should be generally 1/100 of its estimated range.	Though the outline of the plane can be seen, each part is indistinguishable.	It is possible to distinguish the insignias and wing struts, and identify the various parts of the plane.	It is possible to count the crew members and to distinguish their headgear.
		500				
Heavy machine gun	Ordinarily within 1000 meters	300	The coinciding point of the antiaircraft sight and the target in respect to the speed of aircraft (Outer piece 300 kilometers per hour, middle piece 200 kilometers per hour, inside piece 100 kilometers per hour)			
		600				
		800				
		1000				

SECTION II

ARTILLERY

133. Time Required for Surveying

1. Estimate of time necessary for the regiment to make a survey

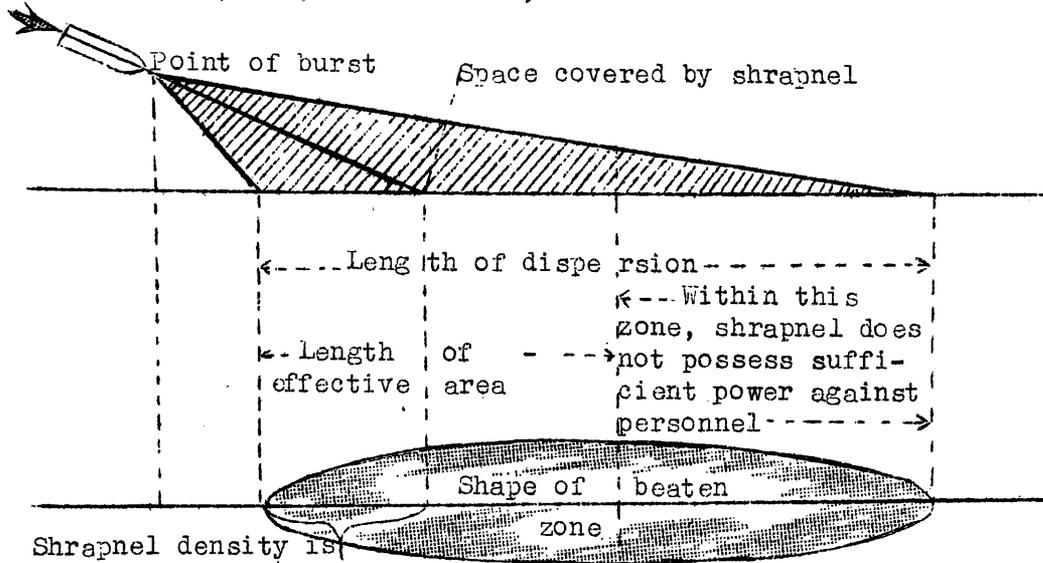
- These are the totals for both general and detailed reconnaissance. The former does not require much time; however, the time necessary in accomplishing the latter varies according to the terrain, and usually will be carried on with the field work.
- a. Reconnaissance -- about 3 hours
  - b. Field work -- about 6 hours
  - c. Calculations -- about 11 hours after the beginning of the field work.  
(With (4) survey details locate about (10) base points. Readings of horizontal angles are taken once. In base line surveys fore sight and back sight readings will be taken twice.)

2. Estimate of time necessary for the battalion to make a survey

- These are the total number of hours for both general and detailed reconnaissance. The former does not require much time; however, the necessary time in accomplishing the latter varies according to the terrain, and usually will be carried on with the field work.
- a. Reconnaissance -- about 2 hours
  - b. Field work -- about 4 hours
  - c. Adjustment, graphic representation, and calculation:  
When essential matters are calculated and others of lesser importance are graphically illustrated, the time required is approximately 6 hours after the beginning of field work. When nearly everything is dependent upon calculations.....10 hours after the beginning of field work.  
(With (2) survey details locate (6) or (7) base points in the vicinity of the positions and (2) or (3) more in the forward area. Readings of horizontal angles are taken once. In base line surveys fore sight and back sight readings will be taken twice.)

134. **Effects Accompanying the Burst of Time Shrapnel**

This varies according to type of gun, range, powder charge, height of burst, slope of the land, etc.



135. **Effective Area of Time Shrapnel**

Kind of guns	Range (meters) Powder (large)	Depth (meters)			Width (meters)
		3000	5000	7000	
Field Artillery		200	100		20
Mountain Artillery		150	50		15
155 mm Howitzer	II	200	100	50	25
	III	100	50		20
	IV	50			20
105 mm Gun		500	200	100	25
155 mm Gun		400	350	300	35

- Note:
1. This chart indicates the effective area of one shell against personnel when its bursting height corresponds to that which is shown in the Table of Height of Burst.
  2. Generally, the depth of the effective area against animals should be one-half of the figures shown in this chart.
  3. The width indicates the area at the point of impact of a shell.

136. Effective Beaten Zone of Common Shell Fragments

Type of guns	Field and Mountain Artillery	105 mm gun	155 mm how	155 mm gun
Effective radius in direction of flight	20 meters	30	50	100
Note:	The fragments in the lateral radii are less effective than those in the forward radius.			

137. Effectiveness of Smoke Shells and Flares

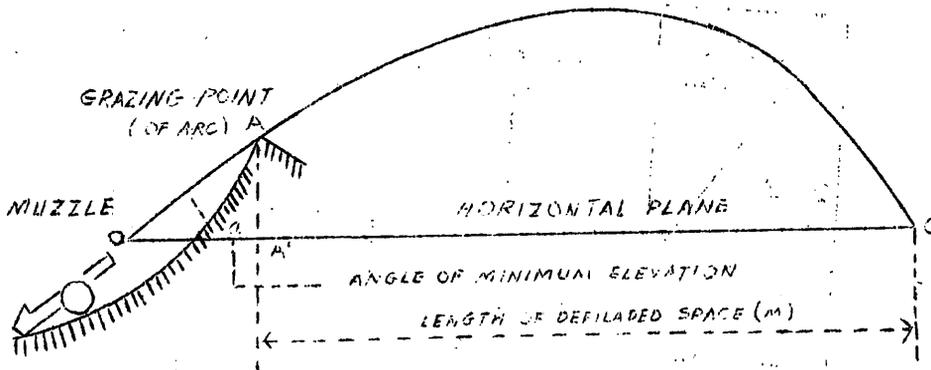
TYPE OF SHELL TYPE OF GUNS	SMOKE SHELL		FLARE		
	Width of Smoke Screen	Persis-tency	Persistency of Illumina-tion	Speed of Descent	Area of Illumina-tion
Field and mountain artillery guns	30 m	1 min	20 sec	1-15 m per sec	Approx. 100 m
155 mm how	100	2 min 30 sec			
105 mm gun	50	1 min 30 sec			
NOTE:	This is applica-ble when the wind velocity is either 3 or 4 meters per second (approx. 7 miles per hour)		The area of illumination sur-rounds the point of burst when the height of burst is 150 meters.		

138. Size of Shell Craters

Kind of shell	Nature of ground	Shell crater		Penetrating power	Maximum depth of possible destructive effect of a shell
		Diameter	Depth		
Shell (common)	Ordinary soil	20 D 25 D	5 D 6 D		
Armor piercing shell	Concrete structure			2 D 3 D	4 D 6 D

Note: 1. "D" is the caliber of the gun.  
 2. The penetrative power increases as the angle of fire increases. It also varies with the range.

139. Calculation Relative to Length of Defiladed Spaces

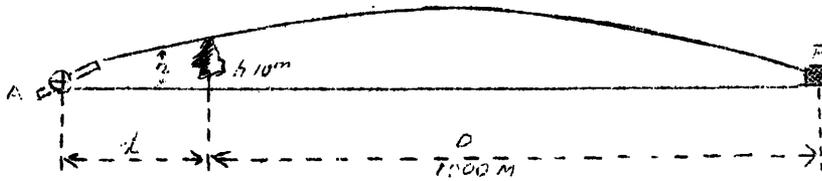


D = 40 a (Field artillery, horse artillery, 105 mm gun)

D = 20 a (Mountain artillery gun)

D = { 30 a No. 1 powder charge  
 25 a no. 2 " " (155 mm howitzer) In high trajectory  
 15 a No. 3 " " fire, it is not necessary to consider  
 12 a no. 4 " " the minimum elevation.  
 9 a no. 5 " "

(1) Method of determining (A) gun position (field artillery) when the length of defilade space (d) is known

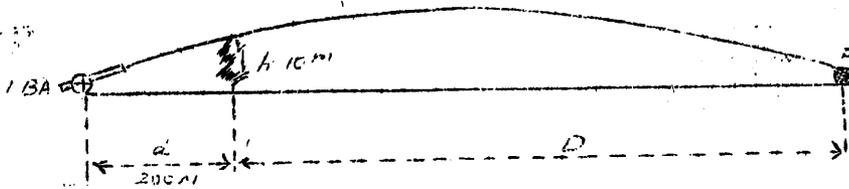


$D = 1000\text{m}$ , when  $a = \frac{D}{40}$  Therefore:  $a = \frac{1000}{40} = 25 \text{ m}$

$a = 25 \text{ m} = h/d \times 1000$  But;  $h = 10$  Therefore,  $d = \frac{10 \times 1000}{25} = 400\text{m}$ .

Therefore the gun position will be 400 meters in the rear of the obstacle.

(2) Method of calculating the length of defiladed space (mountain artillery)



Determine "a" first. (This can readily be measured on the actual terrain.)

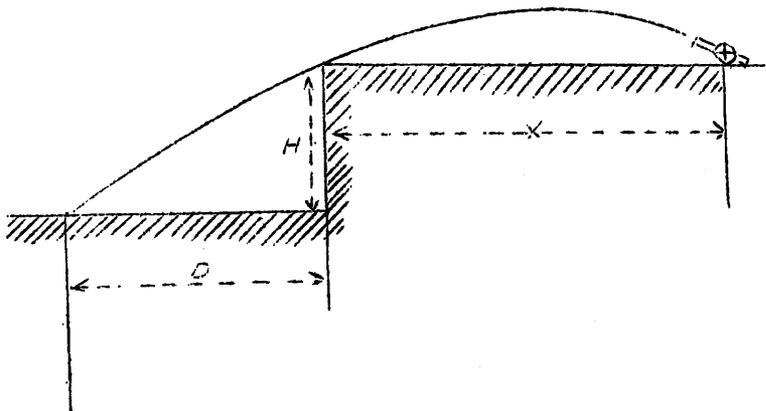
with  $d = 200 \text{ m}$

$a = h/d \times 1000 = 10/200 \times 1000 = 50 \text{ m}$

By using formula  $D = 20 a$

$D = 20 \times 50 = 1000 \text{ m} \dots \dots \dots$  the length of the defiladed space.

140. The Length of Defiladed Space When the Line of Guns is in the Rear of a Cliff.





Assume a horizontal line ABC through A and B to C so as to obtain D' by the formula in paragraph 139. Let  $d + D' = X$ , then D'' is obtained from the chart in paragraph 140.

But,  $D' + D'' = D$   
 and D is the required length of defiladed space.

An example (field gun):

Hypothesis:  $a =$  minimum elevation  
 $d = 1000m$   
 $h' = 10m$   
 $h = 20 m$   
 $d + D' = X$   
 $D' + D'' = D$

Then, by mil formula,  $a = h'/d \times 1000 = 10/1000 \times 1000 = 10m$   
 by formula in par. 139,  $D' = 40a = 40 \times 10 = 400m$   
 by hypothesis,  $X = d + D' = 1000 + 400 = 1400$   
 by chart in par. 140,  $D'' = 320$   
 then,  $D = D' + D'' = 400 + 320 = 720m$

#### 142. Method of Determining the Minimum Elevation, the Length of the Defiladed Space, and Gun Positions

1. To measure the angle of a minimum elevation, determine the mils from a kneeling position (corresponds to the height of a gun) with an arm extended forward in the direction of the obstacle. (Width of one finger equals approximately (30) mils.) In this case, it is necessary that lower finger be on the horizontal line of sighting.
2. In calculating the length (horizontal) of defiladed space (D), the formula,  $D = 40a$  is used, "a" being measured as above.
3. To find a gun position which corresponds to a certain length of defiladed space, calculate "a" by the formula  $a = D/40$  (field gun.) Then, the gun position will be determined by taking "a" as the minimum elevation.

#### 143. Height of Defilade Required to Conceal Flash of Guns

The minimum height of defilade required to conceal the flash of guns is the distance between the artillery piece and the line of sighting from the enemy. It varies according to the types of guns as follows:

Field, Horse, and Mountain Artillery piece....4m  
 155mm Howitzer.....6m  
 105mm Gun.....5m

144. Simplified Formula for Determining Angle of Elevation and Fall of the Field and Mountain Artillery Guns

	Field Artillery	Mountain Artillery
Angle of Elevation	$5X(X + 4)$	$7X(X + 5)$
Angle of Fall	$10X(X + 2)$	$13X(X + 3)$

Note: X is the range in kilometers and the angle is in mils.

Example:

Hypothesis, Range = 2.5km

Field Artillery

Then to find the angle of elevation

$$\angle a = 5X(X + 4) \dots \text{by the formula}$$

$$\text{But } X = 2.5\text{km}$$

$$\therefore \angle a = 5 \times 2.5(2.5 + 4) = 81 \text{ mils (answer)}$$

Mountain Artillery

Then to find the angle of fall

$$\angle a = 13X(X + 3) \dots \text{by the formula}$$

$$\text{But } X = 2.5\text{km}$$

$$\therefore \angle a = 13 \times 2.5(2.5 + 3) = 179 \text{ mils (answer)}$$

145. Formula to Calculate the Time of Flight of a Projectile  
(X = Range in kilometers)

Time of flight:  $T(\text{sec}) = \frac{X(X + 10)}{2} \dots \text{Heavy Artillery}$

$$T(\text{sec}) = 4X - 3 \dots \text{Field Artillery}$$

$$T(\text{sec}) = 4X - 1 \dots \text{Mountain Artillery}$$

146. Overhead Firing of Field and Mountain Artillery Pieces..

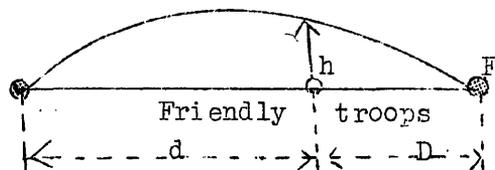
1. Method of determining the height of trajectory

$$h = \frac{1}{4} \times \frac{d}{100} \times \frac{D}{100} \text{ FA}$$

$$h = \frac{1}{2} \times \frac{d}{100} \times \frac{D}{100} \text{ MtA}$$

d = distance between artillery and friendly troops.

D = distance between friendly and enemy troops.



Example:

The distance (D) between the artillery and the enemy is 2000 m.

The distance (d) between the artillery and friendly troops is about 1800 meters.

The height of the trajectory over the friendly troops is:

$$h = \frac{1}{4} \times \frac{1800}{100} \times \frac{200}{100} = 9 \text{ m} \quad (\text{answer})$$

2. Notes concerning overhead firing

a. Overhead firing over friendly troops who are within 300 meters of the gun and not protected from our fire by terrain or construction works should be avoided as much as possible.

b. When friendly troops are about 150 meters from the target at a firing range of 2000 to 3000 meters, shrapnel fire at the standard height of burst may be carried out without losses if it is accurate and the tangent sights are set properly.

c. Field or mountain artillery shells passing more than one meter over the heads of friendly troops will not cause any physical damage.

d. When obtaining "h" (height in meters) by the above formula, it is necessary to fix the height above the heads of the friendly troops in positions to the arc line connecting the muzzle and the point of impact.

3. Minimum distance from target that may be approached by friendly infantry during artillery fire

Type of Gun	Field or Mountain Gun	105mm Gun	155mm Howitzer
Minimum Approachable Distance (meters)	150 (Shell and Shrapnel)	200 (Shell) 250 (Shrapnel)	250 (Shell) 300 (Shrapnel)

Note:

1. This chart applies in the case of a target within an average range distance.

2. This distance must be increased when the target is not within the average range distance.

## 147. Ammunition Required for Fire Against Personnel

(continued on next page)

Target Situation and Purpose of Firing	Exposed						Covered	
	When planning for annihilation			Neutralization			Against personnel firing from behind fortifications	
							Annihilation	Neutralization
Guns	Field and Mta	155mm How	155mm Gun	Field and Mta	105mm How	105mm Gun	Guns suitable to inflict casualties on personnel and guns responsive to varying strengths of constructions.	
Ammunition and Fuzes	Shell with instantaneous or delayed action fuze or armor-piercing shell.						Ammunition and fuzes will be in accordance with the target situation and will be selected in conformity with firing objectives.	
Number of Rounds Required (per hectare = 2.5 acres)	100-150	40-60	80-120	Less than 16 per min	Less than 6 per min	Less than 12 per min	Practically same as the number required to annihilate exposed personnel.	Practically same as the number required to neutralize exposed personnel.
Remarks	When enemy fails to withdraw from sector, it is usually necessary to fire rapidly, for it is possible to inflict casualties upon enemy to such an extent that he will not escape completely from our fire power.			In order to neutralize the enemy so that our infantry will not suffer heavy losses, it is usually necessary to fire for approximately three (3) minutes, the maximum values given above.				

Target Situation and Purpose of Firing	Interdiction Fire		Standing Barrage Fire	To impede enemy reconstruction work	Interruption of Communication		Harassing fire
	Movement of concentrated fire		Annihilation		To cut off an element of unit passing through a certain point	To cut off, absolutely, traffic at a certain point	
	Temporary check	Absolute check (annihilation)					
Guns	155mm Howitzer 105mm Gun Field & MtA Gun		Field & MtA Guns 155mm Howitzer	Field and MtA Guns	Field and MtA Guns 105mm Gun		F & MtA Guns 155mm How
Ammunition and Fuzes	Instantaneous and delayed action fuzes  armor-piercing and common shell		Corresponds to the left column	Usually, with less than one battery, repeat rapid fire with less than 3 rounds per gun per hectare at appropriate intervals. During dense fog at night, fire 150 rds. per hour.	Approx. 100 rds. FA shells per hr per hectare for every point that should be checked.	Approx. 200 rds. FA shells per hr per hectare for every point that should be checked.	Usually based upon the neutralization fire against exposed personnel.
Number of Rounds Required (per hectare = 2.5 acres)	Continuous neutralization fire for 3 min	Same as the number required to annihilate exposed personnel.	When one battery is charged with frontage of 200m, F and MtA will fire more than 4 rds/min per gun.				
Remarks			Fire several times having each period last over 2 min, repeating fire if necessary.	1. During a dense fog, fire in irregular intervals for one hour as described above.	1. Fire will be based upon that fire to hinder the enemy reconstruction work. 2. 105mm guns are approx. 80% of field and mountain artillery guns.		

148. Shells Required to Make Uniform the Density of Effective Fire with Time Shrapnel

Type of Gun and Powder Charge Range (meters)	Field Artillery, Horse, or Mountain Gun	155 Howitzer (low)				105 mm Gun				155 mm Gun								
		II	III	IV	V													
Effective Fire	1000-5000	3000	4500	3000	4500	3000	4500	3000	1500	3000	5000	7000	9000	3000	5000	7000	9000	10000
At several ranges	Equivalent to the range in kilometers	1	1	1	2	1	3	2	1	1	2	4	8	1	1	1	2	3
At a single range	15 times the range in kilometers	1	2	1	2	1	4	2	1	2	2	6	13	1	1	2	3	4

Note:

1. This chart is based on the table of average height of burst. The chart indicates the number of rounds required for one (lateral) direction, when the width of distribution of fire is 25 meters for field, horse, and mountain artillery guns and 30 meters for other guns.
2. When firing for effect at several ranges (range graduated to 100 meters) the number of rounds required at each range is found by calculating the average density between each limit of the bracket.
3. When firing for effect at one range, calculate the average density fifty meters in front and in rear of the average point of impact of all projectiles.

149. Ammunition Required to Make Uniform the Density of Effective Fragments in Firing Field Artillery and Armor Piercing Shells

Fire for Effect	Type of Gun		Field, Horse, Mountain Art. Firing (within 5000m)	155mm Howitzer (within 5000m)	105mm Gun (within 6000m)
	Type of Shell	Fuze			
Several Ranges	Common shell	Instantaneous	7	4	6
	Armor Piercing shell		Delayed Action (ricochet)	4	2.5 low angular fire
		2.0 high angular fire			
Single Range	About 1.5 times more than that of several ranges.				
<p>Note:</p> <ol style="list-style-type: none"> <li>1. When firing for effect at several ranges when the difference in range and the width of distribution is 3 times the deviation in calculating the fragmentation distribution, the number of rounds necessary for each target in one direction will then be calculated by taking the average density between each limit of the bracket.</li> <li>2. When firing for effect at a single range, calculate by taking the deviation of each fragmentation distribution in front and in rear of the point of impact of all projectiles from the average density of the rest of the area.</li> </ol>					

150. Area of Beaten Zone of Various Moving Targets

T a r g e t	Mounted Troops	Dismounted Troops				Shielded Artillery Personnel	
		S t a n d i n g	K n e e l i n g	P r o n e	Personnel Firing from behind Emplace- ments	When Firing from Flank	When Firing from Direct Front
Area of Time Shrapnel (Square meters)	1	1/2	1/3	1/5	1/10	1/8	1/10
Area of Shell (Square meters)	1		1/3			1/4	

151. Table of Average Number of Direct Hits and Casualties

	Shrapnel	Shell		Shrapnel	Shell		Shrapnel	Shell
n	Z%	Z%	n	Z%	Z%	n	Z%	Z%
0.1	8	5	1.2	57	42	2.3	84	67
0.2	14	10	1.3	60	45	2.4	86	69
0.3	20	14	1.4	62	47	2.5	87	71
0.4	25	18	1.5	66	50	2.6	88	73
0.5	30	22	1.6	69	52	2.7	89	75
0.6	34	25	1.7	72	55	2.8	90	76
0.7	38	28	1.8	74	57	2.9	91	77
0.8	42	32	1.9	76	58	3.0	92	78
0.9	46	34	2.0	78	61	3.5	95	84
1.0	50	37	2.1	80	63	4.0	96	89
1.1	54	40	2.2	82	66			

Note: n = The average number of direct hits on each target.  
 z = The percentage of the beaten zone of the target.  
 To inflict a 50% casualty, the average number of direct hits necessary would be one per person with shrapnel and 1.5 per person with shell.

An example of computing the required rounds of ammunition.  
 (Using paragraphs 147, 148, 149, and 150)

Example: To determine the number of rounds required by one battery of field artillery to inflict 50% casualty upon hostile infantry in prone position directly in front at 100 meters  
 Providing that: The firing range = approx. 300 meters  
 Number of ranges to fire = 2  
 Width of distribution (of fire) = 25 meters  
 Kinds of projectiles = shrapnel (shell)  
 Calculation: (numerals in parenthesis indicate the number of shells)

In order to make the average density uniform at a range of 3000 meters when firing at several ranges, one gun requires 3 (7) rounds for one range in one direction (paragraph 148 and 149.) Therefore, two ranges requires 6 (14) rounds. Now, in order to inflict 50% casualties, it is necessary to have an average hit of 1 (1.5) shrapnel (fragment) per man. (paragraph 151)

Again, since the target area of the infantry in the prone position is 1/5 (1/3) square meters (paragraph 150), to average one hit per target necessitates firing with an average density of 5 (3). Therefore, the necessary number of rounds per gun is

$$6 \times 5 \times 1 (14 \times 3 \times 1.5) = 30 (63) \text{ rounds}$$

For a battery of 4 guns 120 (252) rounds are necessary.

152. Ammunition Required to Demolish Wire Entanglements

Classification	Range (meter)	Type of Gun	155 mm How	105 mm Gun
		Type of Shell	Armor Piercing Shell	Armor Piercing Shell
Width of Breach (meter)		FA or (MkA) Gun	Ordinary Shell	Armor Piercing Shell
		10	15	15
Spider Wire (10m in depth)	2000	100 (100)		
	3000	200 (200)	100	
	4000	300 (300)	150	200
	5000	400	200	250
	6000	550	300	300
Double-apron Fence (8m in depth)		Same as spider wire	Approximately 1/3 of spider wire	
Concertina Spiral (8m in depth)		Approx. 1/2 of spider wire		

Note:

1. This chart shows the ammunition required for continuous fire concentration on an average range by a battery.
2. To enlarge any breach, the number of rounds of ammunition are increased proportionately.
3. The number of rounds of ammunition required for the depth remains the same up to twice the possible deviation of the range.
4. For general demolition, approximately half the number of shells of this chart will be sufficient.
5. The standard number of shells for general demolition is approximately 10 and for complete demolition approximately 20.

153. Direct Hits Necessary for the Demolition of Field Fortifications

Type of Fortifications	Covered Machine Gun Emplacement	S h e l t e r			
Outline of Fortifications	Cover composed of 4 layers of logs 25cm in diameter and embankment 65cm thick	Light Shelter	Shelter composed of a gravel layer 1m in width, a dirt layer 55cm in width, and two layers of logs each 25 cm in diameter. Shelter may also be of concrete 1m in thickness.		Concrete cover less than 1m thick
Type of Gun	FA or MTA Gun	FA or MTA Gun	155mm Howitzer		240mm How
Type of Shell	Combination fuze attached to shell	Delayed action fuze attached to shell	Delayed action fuze attached to shell.		Armor piercing shell
Number of Rounds	25	1	1	several rounds	1
Effect	Complete destruction	Complete destruction	Complete destruction	Creates large cracks	Pierces through roofs and walls

Note: Hits directed toward corners cause greater destruction than those falling on any other area of concrete field fortifications.

154. Ammunition for Smoke Shell Fire

Type of Gun	Frontage assigned to one battery	Rounds to be fired by one gun to lay a smoke screen	Rounds per minute fired by one gun to maintain a smoke screen	Approx. number for practical use
FA and Mt A Gun	100m (During emergencies 400m)	6 (12)	2 (6)	1. 100 rounds for a battery of field or mountain artillery to cover a front of 100m for 10 minutes.  2. Add 100 rounds for each 100m added to the frontage.
155mm How	200m	2	2/3	
105mm Gun	150m	4	1 1/2	

Note:

This chart is computed on a 3 meter per second wind from 3 o'clock or 9 o'clock.

155. Flares

Type of Gun	Maximum number of rounds to be fired for illumination	Number of rounds required to continue illumination
Field and Mountain Artillery Gun	2	one round per ten seconds
Note	Flares are ineffective in 7m per second wind or more.	

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156. Average Number of Antiaircraft Ammunition Required to Shoot Down an Enemy Plane.

Altitude (Kilometer)	Number of rounds	Number of Guns
2	24	4
3	50	9
4	80	14

## 157. Gas Shells Fired by Foreign Armies

### A. Destruction Fire

#### 1. Purpose

To take advantage of an unguarded moment against a minor moving objective and to destroy it swiftly by a cover of dense gas clouds.

#### 2. Targets

- a. Artillery position
- b. Observation posts
- c. Machine gun positions
- d. Skirmisher trenches or intersections of communication trenches, etc.

#### 3. Required rounds of ammunition

When the wind velocity is below 3m per second, quick acting, non-persistent shells are used for each "hectare" as follows:

Field and Mountain Artillery-----	100
105mm Gun-----	50
155mm Howitzer-----	25

#### 4. Remarks

It is necessary to make a thorough preparation by the employment of all observation techniques to swiftly open a concentrated fire so that fire may cease usually within a minute.

### B. Neutralization Fire

#### 1. Purpose

To cover a desired area with gas clouds and to compel the use of gas masks for several hours, hindering enemy maneuverability.

#### 2. Targets

##### Minor Targets

- a. Observation posts
- b. Artillery positions
- c. Vital points of communication trenches and skirmisher trenches
- d. The passage through deep ravines or forests, etc.

##### Major Targets

- a. Fair concentration of hostile infantry troops
- b. Bivouac areas, etc.

3. Required rounds of ammunition

To place neutralization fire on an area of 1 hectare for one hour with non-persistent shells (lachrymatory and sternutatory) in a wind less than 3m per second, the ammunition requirement is approximately as follows:

Field and Mountain Artillery----	100
105mm Gun-----	50
155mm Howitzer-----	25

4. Remarks

Surprise fire concentration with approximately half the number listed above will be executed. Thereafter, repeat fire on the same target with the remainder of the shells. The time and the number of shells required for this repeated firing should be irregular. In case a target covers a wide area, it should be divided into one or more hectares and fire should be in succession from the windward side.

C. Use of Poison Gas Shells

1. Purpose

To compel the enemy to retreat from his position, to make it impossible for him to utilize a key position for any length of time and to disrupt communications.

2. Target

Areas desirable for contamination by gas--forests, bridges, entrances to villages, intersections of roads and narrow paths.

3. Required rounds of ammunition

When wind velocity is below 5m per second, use persistent shells for an hour per hectare.

Field and Mountain Artillery----	100
105mm Gun-----	50
155mm Howitzer-----	25

4. Remarks

In order to gas a desired area, it is necessary to drop a series of shells uniformly within that area. Fire should be continued to maintain a gas concentration.

CHAPTER 6

AIRCRAFT, GAS, TANKS, SEARCHLIGHT

	Paragraphs
SECTION I. Aircraft -----	158-166
II. Gas -----	167
III. Tanks -----	168-170
IV. Searchlight -----	171

SECTION I

AIRCRAFT

158. Important Data on Military Aircraft

Type of plane Speci- fication	Fighter	Reconnaissance	Light Bomber	Heavy Bomber
Ceiling	10,000 m	8,000 m	7,800 m	5,000 m
Rate of climb	5,000 m in 8 min	5,000 m in 20 min	5,000 m in 15 min	4,000 m in 30 min
Maximum speed (Km/hr)	350	240	300	200
Duration of flight (hrs)	2½	6	4	8
Remarks		Carry bombs occasionally	Bomb load about 500 kg	Bomb load about 1,500 kg

159. Visual Identification From a Plane at a 45° Angle of Depres-  
sion Under Clear Weather Conditions.

400	Guards in trenches
800-1,000	Group of mounted and dismounted troops
800	Deployed troops and skirmishers
1,000	Guns and vehicles
2,500	Column on road of infantry or cavalry smaller than a company or troop
2,500	Type and number of cars in a train (column of cars)
1,500	Line of each independent trench
3,000	Large column of Army transports

160. Data on Captive Balloons

Specifications	Amount	Remarks
Envelope: Overall length Maximum diameter	27 mtrs 8 "	A crew of two with 100 kilograms of sand bags
Buoyancy	1100 km(approx)	
Ascension power	250 km(approx)	
Wind velocity within which a balloon can be raised	20 mtrs per. sec.	Maximum - 25 mtrs
Ascension Altitude	1200 mtrs	
Favorable obser- vation area	Within radius of 15 km	Equivalent to 10 times the altitude; varies considerably depending on weather conditions
Gas cylinders necessary for in- flation	180	15 min are required for the inflating, but this may vary accord- ing to atmospheric pressure and tempera- ture
Time required for replenishment	40 min(appr)	
Gas cylinders necessary for re- plenishment after ascending to 1500 m	20	
Operating crew	1 Officer; 4 N.C.O.'s; 7 Superior Privates; 50 privates Total: 62	

161. Classification of Various Types of Aerial Photographs

( Chart on following page)

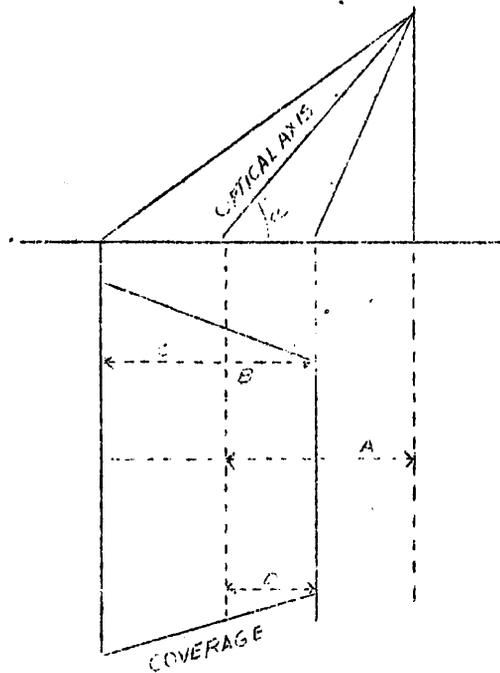
Aerial Photography	Vertical	Single	
		Stereoscopic	
		Successive overlapping	Single
			Composite
	Oblique	Single	
		Stereoscopic	Crosswise
			High and low
	Successive oblique	Lengthwise	
		Crosswise	
		Composite	
Circumferential oblique			

162. Usage of Aerial Photographs

Purpose	Situation	Type mainly used
Estimate of the terrain	<ol style="list-style-type: none"> <li>1. Landing point (selection of river crossing point)</li> <li>2. Estimate of line of advance and the terrain along both sides</li> <li>3. General estimate of the terrain for conducting a major engagement</li> <li>4. Detailed estimate of the terrain for conducting a battle</li> </ol>	<ol style="list-style-type: none"> <li>1. Crosswise successive Lengthwise successive</li> <li>2. Circumferential oblique Mosaics</li> <li>3. Crosswise successive Vertical and oblique reduced mosaics</li> </ol>
Estimate of enemy situation	<ol style="list-style-type: none"> <li>1. Estimate of vessels</li> <li>2. Estimate of troops</li> <li>3. Estimate of positions</li> <li>4. Estimate of works or other construction</li> </ol>	Vertical or oblique photographs taken to the necessary scale
Preparation of topographical map	<ol style="list-style-type: none"> <li>1. Accurate surveying</li> <li>2. Correcting maps</li> <li>3. Surveying combat zone</li> </ol>	Corrected and revised vertical mosaics of required scale
Substitute for map	<p>The following types of uncorrected and unrevised photographs are used as substitutes for maps:</p> <ol style="list-style-type: none"> <li>1. Composite or single vertical</li> <li>2. Reduced composite vertical</li> <li>3. Lengthwise successive oblique</li> <li>4. Photo maps (for this purpose, correct and revise oblique photographs)</li> </ol>	

163. Data for use in Aerial Photography

Vertical	F.0.25	Interval between courses $H/2$		<p>H is the photographing altitude.</p> <p>Both vertically &amp; horizontally the successive photographs should overlap by <math>\frac{1}{2}</math> to form a mosaic.</p> <p>For a F.0.50 camera the values to the left must be divided by (2). The maximum error by this chart is <math>\frac{1}{25}</math>.</p>	
	18 x 24	Interval between exposures $H/3$			
	F.0.25	Interval between courses $H/3$			
	13 x 18	Interval between exposures $H/4$			
Oblique	Angle a	Central width B	Depth C	Nearer side depth D	Photographing horizontal distance A
	45°	H	H	0.35H	H
	35°	1.5H	2.5H	0.7H	1.7H
	20°	2H	8H	1.4H	1.8H



164. Important Matters Regarding Photographs

1. When observation aviation is ordered to take aerial photographs, particulars to be pointed out are the purpose of its use, the area to be photographed, the relative importance of objects within that area, the date for submitting photographs, and the number of prints to be submitted. When necessary, further items to be included are the scale and type of photographs, and for oblique photographs the altitude and the direction from which the photographs are to be taken.
2. The time required by observation aviation for photographs is about one dozen per hour up to ten dozen.
3. Method of and time required for receiving aerial photographs from observation aviation.

165. Items Relative to Bombing

Methods of Bombing	General		Horizontal bombing with instruments by heading toward the objective from the desired direction at the necessary altitude.
	Low Altitude	Horizontal	Approach from desired direction and bomb by relying on instruments or estimation by eye
		Dive	Approach from desired direction and bomb by relying on estimation by eye
Methods of Dropping Bombs	Single	Adjust bomb sight for each bomb to be released	Desired pattern bombing can be executed by these methods with the use of single planes or formations of planes
	Simultaneous	Drop required number of bombs simultaneously	
	Successive	Drop bombs successively at fixed intervals	

166. Items Relative to Bombs

Type	Target
Fragmentation	Exposed personnel and animals, gun carriages, field vehicles, planes, wire entanglements, light installations under construction.
Light Demolition	Field fortifications, wooden installations, adobes, airfields, railroad stations, rolling stocks, railroad tracks, objectives moving under protection of armored vehicles
Medium Demolition	Strong field fortifications, light masonry structures, lightly armored ships, steel bridging material
Heavy Demolition	Heavy masonry construction and ships
Armor Piercing	Against strong and solid objects, to penetrate and destroy the target.

Effect of Bombing:

1. Upon impact the fragmentation bomb will burst with a tremendous report, inflicting casualties to personnel and animals and at the same time producing a violent concussion. Within an effective diameter of 60 to 70 meters, all inflammable objects will burst into flames because of the bomb's intense heat.
2. Upon bursting after penetration, a demolition bomb creates a shell crater and demolishes the objects that are hit. When there is slight penetration, the bomb produces concussion and causes great damage to installations.
3. Besides the above, the bombs have great psychological effect, produce burns, and emit poisonous fumes.

Note:

1. The probable error in bombing is about 30 meters. (The errors in range and direction of projectiles are approximately the same.)
2. Other types of bombs are chemical, incendiary, and bacterial bombs.
3. The effect of the bombs, especially the fragmentation type, will vary according to the altitude and the terrain of the target.

167. Characteristics of Principal Chemical Warfare Agents.

SECTION II - GAS

Classification	Agents	State & color	Characteristic odor	SOL IN H <sub>2</sub> O	Persis-tency	Physiological Effects	
Vesicant	Yperite	Liquid colorless	Mustard	In-sol	Persis-tent	Blisters skin, ir-ritates eyes and respir-atory or-gans	Besides blistering the skin and inflicting injury, it also attacks the eyes and the respiratory and di-gestive organs. Latent development of symptoms.
	Lewis-ite	Liquid colorless	Geran-ium	Sol	Persis-tent		Attacks the skin and respiratory organs immediately and brings about further reactions characteristic of arsenic poisoning.
Lung Irritant	Phosgene	Gas colorless	Rotting Compost	Sol	Non persis-tent	Irritates the respira-tory system & attacks the lungs causing death by suffocation	Affects the respiratory organs violently and causes hyperhaemia of the lungs, hydropsy, air blisters, bronchitis, or pneumonia.
	Diphos-gene	Liquid colorless	Same as above	Sol	Non persis-tent		Approximately same as above
Lachry-matory	Chloro-picrin	Liquid colorless	Acrid like pepper	In-sol	Semi-persis-tent	Irritates ophthal-mological membrane, causing eyes to water, temporarily obstructing vision	Besides being lachrymatory, has considerable suffo-cating and emetic effect.
	Chloro-aceto-phenone	Solid colorless	Pungent	In-sol	Non persis-tent		Causes irritation and burning of the eyes and ob-structs vision. It also affects the mucous membrane and the skin and causes acute pain.
	Benzyl bromide	Liquid colorless	Same as above	In-sol	Non persis-tent		Irritates the eyes and respiratory organs considerably causing profuse flowing of tears and running of the nose. It often brings on sneezing and violent head-aches.
Sternu-tatory	Diphenyl chloro-arsine	Solid colorless	odor-less	In-sol	Non persis-tent	Irritates the nose & throat & causes sneezing and vomiting	Burning irritation of the membranes of the respira-tory organs, causing sneezing and vomiting.
	Adam-site	Solid light yellow	odor-less	Sol	Non persis-tent		Irritation is less than above with somewhat delayed symptoms of violent headaches and at times blistered skin.
Toxicant	Prussic acid	Liquid colorless	Strong almond oil	Sol	Non persis-tent	Affects the blood & nervous system; poisons and kills the victim	Affects the nervous and respiratory system; fatal.

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## 168. Tanks of Various Nations

SECTION III  
TANKS

Nation	Model	HP	Speed (km / hr)	Operating Distance (km)	Gross Wt. (metric ton)	Len- gth (m)	Width (m)	Ht. (m)	Armament	Crew	Width of Track(m)	Armor (mm)
Great Britain	V-type (compound)		8		29				1-37 mm gun 5 - MG	8		12
	C-type		11.5	110	20	7.8	2.7	2.8	3-MG	3	.5	15
	New Hv Tank				70	11.0			1 med size gun			
France	Cadalus Lunar	41	12		Type A-6.7 Type B-6.5	5 (less tail)	1.8	2.1	1-37mm gun 1- MG	2	.35	
	Comb. Tank & Armored Car (Sanshomon)	15	20(whl) 5(trk)		3	3.6	1.85	1.75	1-MG	2	<i>4-Track Whl. - pneu- matic tire</i>	16
United States	Christie Type Comb. whl & track (amphibian)	90	<i>5.9-42 (whl) 4.8-32 (trk) 13 (water)</i>		5 - body .54-track	5.0	2.3	1.7	can carry 1-75mm gun		<i>Caterpillar TRA Steel Whl. - rubber</i>	
	Christie Type Amphibian (Naval Use)		<i>25 (road) 18 (X-Country) 6 (water)</i>		70 4	5.1	2.4	2.0	1-37mm gun	2-3	.21	6
	2-C	2x30	8-9 12(max)	10(hrs)	70	10.4	3.0	4.0	1-75mm gun or 1-155mm gun, 12- sub MG	14- 16	.85	15-22
	Medium Tank (M24. ?)		20-25		18				1-35mm gun 2-sub MG			22-36(?)
	Snyder, NC	60	1.8- 18.5	10(hrs) 120	72		1.8	2.2	1-37mm gun 1- MG	2		20-30
	Type No. 3	400(12 cyl. Liberty)	10	150	40	10	3.7	2.7	2-37mm gun 5-MG	11-1 17-11	<i>Steel Plates lengthened by pressure .67</i>	16
Medium Tank 1921 Model	200(6 cyl. Liberty)	19		2				1-37mm gun 2- MG	1		13	
Italy	Fiat 2000	240 (6cyl. Fiat)	75	75	40	7.4	3.1	3.8	1-65mm How 7-MG	10		20
	Fiat 3000	54(6 cyl. Fiat)	2-15 22(max)	180	5	4.8	1.6	2.2	2-M1923 Fiat MG	2		16-17
Russia	Hv Tank		40 ?		40				2-75mm gun 4-MG	15		

168. (continued)

Nation	Suspension	Max. Climb	Width of trench (m) negotiated	Ammunition (rds)	Fuel (l/hr)	Ground clearance (m)	Remarks
Great Britain							Though a World War I model, it is widely used at present.
		35°	3.5		682	.5	Though built in latter part of World War I, not used in World War I.
France		45			90		Cadulus type rubber track applied to Lunar tank.
	no spring on track				20		Method of steering depends on differential gear.
United States	Spring	35°			200		When maneuvering on track, method of steering depends upon clutch. Amphibian tank is built in same manner except for boat-shaped body equipped with 2 propellers.
		40°			2.40		Improved model of above, top hatch closed to prevent water from coming in. Track taken apart and stored inside.
		45°	4.3	120 - shells 4000 - MG		.6	
							Equipped with stroboscope.
			1.5	200 - shells 1000 - MG			
	no spring	45°	4.5	200 - shells 1500 - MG	1100	.53	Equipped with stroboscope.
	Spring						Turret and gun turret rotate independently of each other.
Italy	Spring	35° 40°	3.5		600	.54	Five made in 1917, ten in 1918.
		51°	1.8	3640	(illegible)	(illegible)	100 made since August, 1922.
Russia							Equipped with oxygen generator.

169. Armored Cars of Various Nations

Nations	Model	HP	Speed (km / hr)	Operating Distance (km)	Gross wt. (metric tons)	Len- gth (m)	Width (m)	Ht. (m)	Armament	Armor (mm)	Ammu- nition (rds)	Type of wheel drive	Fuel liters	Grnd. Clear- ance (m)	Re- marks
Germany	Earhardt	85	61	150	8	5.3	2	2.9	2 MG 1 MG(reserve)	Nickel 4-9		4 wheel drive (Compound Type)	175	.32	
	Daimler	100	36	150			2.1	3.1	2 MG (revolving turret)	4-9		4 wheel drive	200	.40	
France	Austin	40	40	150-250	6				1 Hv MG 1 LMG 1 37mm rapid firing gun	7	500 MG 200- shells				
	Skoda	80	4 speeds 3 forward 1 reverse			6	2.16	2.4	2 MG (?)	3- 5.5		Covered wheel	150	.27	
Russia	Eucheroe	Large model equipped with a light gun in rear of body													
	Minerva	Small model													
United States	Packard	Armored cars of original Packard and Pierce Arrow models													
	Pierce Arrow														
	Christie	90	48-64(wheel) 32-48(track) 13(water)			5.4 less arma- ment	5	2.3	1.7	Various types to 75mm gun	1-5		Differ- ential & brake		
Great Britain	XXXXX	35	Max. 52		5				2 MG Each has se- parate turret	8					Used for recon- nais- sance

170. Efficiency of Military Motor Trucks (4-Ton Motor Truck)

Net weight	2500kg
Loading capacity	personnel: 18-22 (1500 - 2000kg)
Length of loading space	5.3m
Wheel base	1.6m
Maximum slope which truck can climb with load	1/6 (9°)
Operating time without refill	3 hours
Maximum speed on level ground	24 km per hour
Minimum radius for turning	7m
Depth of water through which truck can pass	.4m

- NOTES: 1. This chart shows only standard specifications for reference.
2. For a three-ton (metric) trucks, the net weight is 2 tons (metric) and the loading capacity is 1 ton (metric.)

SECTION IV

SEARCHLIGHTS

171. Illuminating Distance of Searchlights

Although there may be variations because of weather conditions and terrain, the approximate illuminating distances of various searchlights under favorable conditions are as follows:

60cm field searchlight-----	3km
75cm field searchlight-----	4km
150cm open type searchlight-----	6km
30cm gas searchlight-----	400m

CHAPTER 7

TRAFFIC ROUTES

SECTION I Temporary Military Roads-----	Paragraphs
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SECTION I

TEMPORARY MILITARY ROADS

172. Data on Temporary Military Roads

UNIT	WIDTH OF ROAD	GRADIENT	RADIUS OF CURVATURE
Dismounted trs in clm of fours. Cav in clm of twos.	2.5m		
Field Artillery	2.5m	1/8 (short straight sections 1/4)	On flat ground 8m On sloping ground 20m
Mt. Artillery: limbered up on pack horse	1.5m 1 m	1/6 (short straight sections 1/4) 1/4 (short straight sections 1/2)	6m
Hv FA	3 m	1/20 (short straight sections 1/8)	On flat ground 10m On sloping ground 25m
Transport: vehicle pack horse	2 m 1 m	Based on FA Based on MtA	Based on MtA
Motor Vehicle	3.5m	Based on Hv FA	On flat ground 15m On sloping ground 25m
Track-laying Mtr Vehicle	4 m	1/10 (short straight sections 1/6)	On flat ground 10m 15m

When the passing unit is small and when the situation demands speed, it is permissible in case of emergency to lower these requirements slightly.

SECTION II

FORDING

173. Fording Area

(Depth of river at which fording is allowed if the river bottom is firm and the rate of flow is less than (1) meter (rough estimate)

	Meters
Infantry.....	.80

	Meters
Cavalry.....	1.00
Field Artillery.....	.50
Field Artillery (when considering the humidity of gun- powder).....	(.80)
Mountain Artillery--limbered up.....	.40
Mountain Artillery--on pack horse.....	.80
Heavy Field Artillery.....	.50
Heavy Field Artillery (when not considering the humidity of gunpowder).....	.70
Pack Horses.....	.80
Transport Vehicles.....	.50
Model 36 and Model 38 Transport Carts.....	.40
Motor Vehicles.....	.40

### SECTION III

#### MOVEMENT ON ICE

174. Thickness of Ice Required for Passage	Meters
Dismounted troops deployed or with extended intervals...	.10
Infantry unit in column of fours or Cavalry unit in column of twos.....	.15
Field Artillery.....	.20
Mountain Artillery.....	.17
Heavy Field Artillery.....	.30
Pack horses in one column.....(below horses' knees)	.12
Army Transport vehicles in one column.....(1/3 of wheel)	.06
Three-ton truck.....(.50)	.30
Four-ton truck.....(.50)	.40

Depth of snow is indicated by ( ); if the snow is deeper than specified and special precautions are not taken, passage will be difficult. Caution is required in determining whether or not the ice is thawing.

## SECTION IV

## RIVER CROSSING

## 175. Normal Time and Personnel Required in Bridge Building

1. Size of assembly area and assembly point for one bridging material company.

Assembly area	200m x 230m
Assembly point	150m x 150m

2. Bridge building preparations

Arrangement of material: (2) hours in daytime, and approximately (3) hours at night, especially when it is necessary to work secretly in unfamiliar territory.

Approach (medium bridge) Its width will be (3) meters, and for a distance of (5) meters from its starting point it will be horizontal and straight. For field artillery, the average radius of curvature will be (4) meters and the gradient below 1/10. Construction of abutment (1) hour.

Personnel required in raft construction:

Pontons	1 NCO	12-18 privates
Bays	1 NCO	12 privates

3. Personnel required for the construction section

Classification Section		Officers	Non-coms	Privates	Total
Medium Bridge	Trestles	1	7	53	61
	Pontons	1	7	53	61
	Bays	1	5	49	55
Heavy Bridge	Trestles	1	8	61	70
	Pontons	1	7	47	55

4. Speed of construction varies according to conditions (enemy situation, season, amount of light and darkness, condition of river, etc.) but the norm is roughly as follows:

CLASSIFICATION		Trestle Bridge	PONTON BRIDGE			Adaptable Ponton Bridge	SUMMARY
			Successive Construction	Successive Construction of Ponton Rafts	Simultaneous Construction from both shores		
Time to erect one section of bridge	Daytime	6 min	4-6 min	Successive Construction 8-10 min	Construction of whole bridge 30 min	12 min	<p>(1) The rate of construction per hour is figured roughly as:-</p> <p style="text-align: right;">Trestle Bridge      30m Ponton Bridge        40m</p> <p>(2) The construction speed during the night varies according to the situation, especially the amount of light, but it requires roughly <math>1\frac{1}{2}</math> to 2 times that required in day operations.</p>
	Night	9 min	6-8 min	10-15 min	40 min	17 min	
REMARKS	<ol style="list-style-type: none"> <li>1. Numerical values of this chart are based on the actual operations of slightly skilled personnel working on a river with a rate of flow of approximately (1) meter.</li> <li>2. The speed for simultaneous construction of the bridge from both shores is computed upon the time after departure of the raft from the shore of a river about (100) meters wide with an average rate of flow.</li> <li>3. The dismantling speed is <math>1\frac{1}{2}</math> to 2 times less than the construction speed.</li> </ol>						

5. Number of men required to handle a bay raft: 1 NCO, 12 men.
176. Average Time and Personnel Required in Crossing by Rowing  
The following will illustrate important items in this connection:

1. Chart showing the loading capacity of individual pontons and ponton rafts constructed with bridging materials carried by vehicles. (Refer to chart in the Transportation Manual, Vol.I.)

2. Rate of rowing:

The average of the rowing speed on outbound trips, return trips, and movement with the current when the rate of flow is (1) meter, will be (1) meter per second. However, with a raft the outbound speed will be ( $\frac{1}{2}$ ) meter per second and the return speed (1) meter per second.

3. Method of computing drift

According to experiments, the drift in a medium current is equivalent to the rate of flow (in meters) multiplied by one-fifth ( $\frac{1}{5}$ ) of the width of the river.

4. Space along river bank to allow for drift

Twice the drift plus the interval between crossing points.

5. Total length of a triangular route

Although it is equivalent to doubling the sum of the width of the river and the drift, ordinarily there will not be much difference if it is considered as approximately ( $2\frac{1}{2}$ ) times the width of the river.

6. Number of pontons distributed to a ferry station

It is equivalent to the ferrying time required in one round trip divided by the time required to load.

7. The time required to row across is equivalent to the time required to load and land plus the time obtained by dividing the total length of the triangular route by the speed of rowing.

8. Time required in loading and landing

Branch of Service	Infantry		Cavalry	Artillery
	Iron Ponton	Raft		
Loading	2 min	2 min	3-4 min	4-6 min
Landing	1-1 $\frac{1}{2}$ min	1-1 $\frac{1}{2}$ min	1 $\frac{1}{2}$ -2 min	2-3 min

9. Number of crossing points

Divide the total number of the pontons used by the number of pontons distributed to one ferry station.

10. Front of the crossing

The number of crossing points multiplied by the space along the river bank required for one crossing point plus the interval between sections.

11. Interval between sections

It is standard procedure to leave an interval equal to one crossing point between each section. A section is composed of (2) or (3) crossing points.

12. Time required in crossing the river

Divide the personnel crossing the river by the total capacity of the pontons used, multiply this by the time required for making the round trip and add the time necessary for preparations.

13. The time required in delivering and arranging materials is as follows:

- a. For delivering and arranging of bridging materials--approximately (2) hours in daylight and (3) hours at night.
- b. Preparations for river crossing with individual pontons--about (2) hours.
- c. Construction of raft--about (1) hour more.

177. Loading Capacity of Ponton Rafts Constructed with Bridge Building Materials Carried by Vehicles: Method of Loading and Landing

Classification	Loading Capacity		Loading Method
	Ponton	Raft	
Foot Troops	22 men If a ponton is equipped with more than two sculls, deduct two men per each additional scull.	40 men If railings are set up and personnel caused to stand, it is possible to carry 50-60 men.	1. For embarking on a ponton, men will board from the bow in order and will sit holding rifles pointed upward. 2. To board a raft with 40 men to the raft, personnel will board in the formation of a column of fives and will be seated close together. With 50 or 60 men to a raft, personnel will board by formation of columns of fives or sixes and will stand closely together.

Classification	Loading Capacity		Loading Method
	Ponton	Raft	
Cavalry		5 or 6 men and 5 or 6 horses	Horses will be led slowly, one by one, on to the platform of the raft, and lined up with bodies parrallel to the side of the raft, heads of horses facing up-stream. Each rider will face his horse and hold the animal's for-age.
Artillery FA HA Hv FA		One gun (or one ammunition cart or store wagon) (6) men, (2) horses	1. With the limber and the gun carriage coupled, place the shaft 50cm from the center of the raft, pointed downstream. Place blocks under the wheels to prevent rolling. Then the (2) horses will be taken to the upstream side of the raft singly, with heads faced toward the opposite bank. Gunners will occupy suitable places, and drivers will hold the animals. 2. Ammunition and store wagons will be loaded in the same manner.
MtA	(1) gun (12) men (10) boxes of ammunition (2) tool boxes	(1) gun, (15) men, (4) horses (10) boxes of ammunition (2) tool boxes	In loading the limbered mountain artillery piece, first unhitch the horses from the pole. Place the trail-toe on the edge of the raft toward the water, with the gun facing toward either the bow or the stern. Use blocks as in the case of field guns, to prevent rolling. Next, lead (4)

Classification	Loading Capacity		Loading Method
	Pontoon	Raft	
Branch of Serv			horses behind the guns, and line them up facing the stern. The gunners will be at both the front and rear of the gun. Drivers will hold the horses. In cases where the guns and caissons are carried on pack horses, the loading must be done in the same manner as in the cavalry.
Transport Wagons		(2) wagons (2) men (2) horses	Although it is difficult to prescribe a method because of the variety of loads, ordinarily wagons will be loaded from both the water side and the land side of the raft, according to the method used in loading limbered mountain artillery, while the horses will be loaded between the wagons in the same manner as in the cavalry.
Pack Horses		(4) horses (4) men	Same as for cavalry
(4) Ton Truck		(1) truck with driver	Load truck about 15 cm from the center of the platform on the downstream side, and place blocks under all wheels to prevent rolling.

**Landing Methods:**

Unloading will be undertaken in about the same order as in loading; if it is possible, however, horses should be unloaded before vehicles.

- Noté: 1. In the case of strong winds, high waves, or swift current, loads will be reduced according to the situation.  
2. All the pontoons and rafts considered in this table are in four sections.

**178. Rough Estimates of Time Required in Bridge Building and Ferrying**

Although the time required in bridge building and ferrying varies considerably according to different situations, the following are rough estimates of crossing times in situations where the various conditions are generally considered favorable.

Chart No. 1 is a summary of time required in the construction of a medium bridge.

Example No. 1. The head of the Bridging Material Company arrived at the bridging point at 1900 and will construct a bridge from the shore of a river which is 140 meters in width. What time will the bridging be completed? (The boundary between day and night will be assumed as 0600 and 1800, and all the following will conform to this.)

	Hours	Minutes
For delivering and arranging bridging material	3	00
Bridge building preparations	2	00
Construction time	5	50

(Compare the time at the point of intersection of the night construction line and the river width 140-meter line in the first list.) Since the total is 10 hours 50 minutes, the bridge will be completed at 0550.

Example No. 2. Bridging preparations will be completed by midnight and bridging of the river (500 meters wide) will be undertaken immediately, constructing 300 meters out from the near bank and 200 meters out from the far bank. At what time will the bridging from the near bank be completed?

According to Chart No. 1 a bridge of approximately 140 meters will be constructed by 0600 and a bridge of 150 meters requires 4 hours and 23 minutes during daytime.

To construct the remaining 8 meters it requires 14 minutes during daytime; therefore, the time required will be 6 hours + 4 hours, 23 minutes + 14 minutes = 10 hours, 37 minutes, or construction will be completed by 1030.

Example No. 3. If the bridge in Example No. 2 is a strong medium bridge, at what time will it be completed?

$$\begin{array}{rcccl} \text{Hours} & & \text{Minutes} & & \text{Hours} \\ 10 & : & 37 & \times 4/3 = & 14:09 \end{array}$$

The bridge will be completed at 1409. ( $4/3$  will be the coefficient.)

Chart No. 2 shows the time required in ferrying by various branches of the service.

Chart No. 3 shows the theoretical crossing time when the ferrying is performed by a bridging material company with the continuous use of material.

The basis for the figures in Chart No. 2 is as follow:

1. If a ponton bridge is to be formed by a single bridging material company, it will take approximately 20 complete ponton spans (each with a carrying capacity of 20 men) and 4 rafts. Therefore, if metallic pontoons are used, it will be necessary to divert materials or occasionally employ improvised materials.
2. The average speed of rowing upstream and on outbound and inbound trips is one meter per second.
3. The rate of flow is approximately one meter, and the distance covered on each round trip will be 2.5 times the width of the river.
4. The time required for loading and landing is determined as follows:

<u>Branch of Service</u>	<u>Loading</u>	<u>Landing</u>
Infantry	2 minutes	2 minutes
Cavalry	5 minutes	2 minutes
Artillery	6 minutes	3 minutes

Example No. 4. The bridging material company arrived at the crossing point at 1900, and will ferry one battalion of infantry (less the combat train) over a river 100 meters wide. At what time will the crossing be completed?

For the first crossing the ponton ferries go simultaneously, but after this they are distributed to various crossing points so that continuous crossings are carried out.

According to Chart No. 3, the theoretical crossing time will be 15 minutes. But since a continuous crossing are carried out the difference in time between the first and the last boat to leave from the crossing point is approximately the theoretical time for one round trip (15 min), plus the additional time required for dismounted troops on a round trip over a river 100 meters wide (7 min as shown in Chart No. 2): 15 minutes + 7 minutes = 22 minutes. Adding the four hours required to deliver the material and to prepare for ferrying, the time the crossing is completed will be 2320.

Example No. 5. What is the time required in ferrying one infantry battalion (less the combat train) over a river 500 meters wide? (The method of crossing is the same as in Example No. 4.)

According to Chart No. 3, the time required for one infantry battalion (excluding combat train) to ferry a river 100 meters wide is 15 minutes. Subtracting 7 minutes (the required time for loading and landing) the remaining 8 minutes

will be the time required for the boats to go the 100 meters and back. Therefore, in the case of a river 500 meters wide, it will require 15 minutes + (8 min x 4) or 47 minutes. Now find out the time required to make one round trip over a river 500 meters wide (= 7 min according to Chart No. 2). Computing on the same principle used in Example No. 4: 7 minutes + (4 min x 4) = 23 minutes. 47 minutes + 23 minutes = 70 minutes (1 hour, 10 minutes.)

However, in a situation where the number of pontoons to be distributed to the various crossing points is not at a maximum, even though, instead of the figure 23 minutes, it is proper to compute by taking the difference between the times of the first and the last ponton to leave in one complete cycle of continuous crossing, it is well to compute as we have mentioned above in order to avoid complicated calculations.

Example No. 6. At what time will one bridging material company be able to complete the construction of a medium bridge over a river 150 meters wide, after having completed the ferrying of nine battalions of infantry, three infantry machine gun companies, one troop of divisional cavalry, and one battalion of field artillery across the river?

The crossing will start at 1800, and initially it will utilize all pontoons available and ferry the infantry and machine guns at one time. Then, the river crossing points will be assigned, and the ferrying will be carried on continuously. Thereafter, construct ponton rafts and ferry across horses and artillery. During this time construct abutments (of bridge), arrange bridging material and complete all preparations for bridge building, and one hour after the completion of the crossing, start the bridge construction. It is assumed that it is possible to bridge 50 meters from the far bank while bridging 100 meters from the near bank.

According to Chart No. 3:

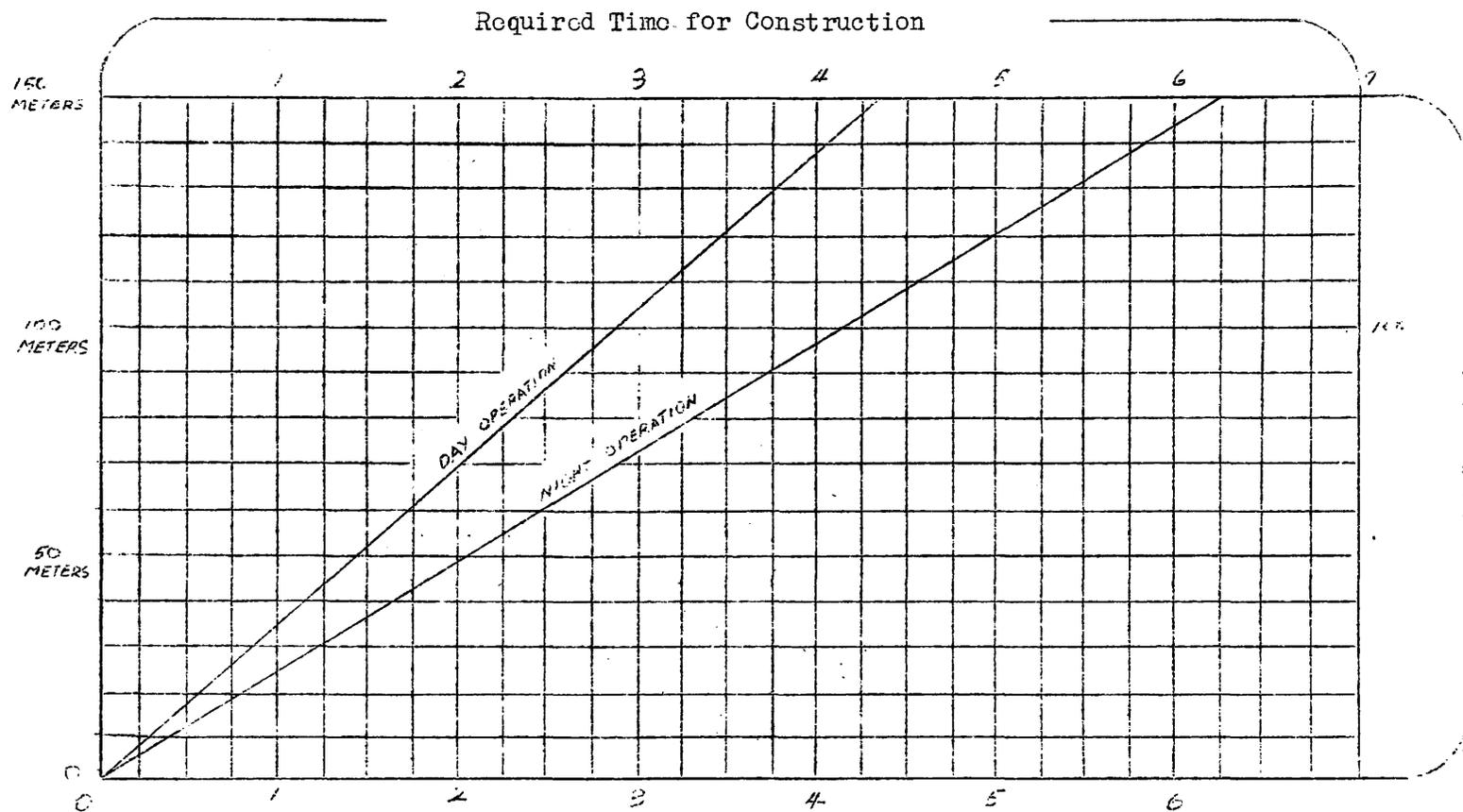
For nine Infantry battalions, (20 min + 4 min for the combat train) x 9	= 216 minutes
For three machine gun companies, (4 min + 4 min) x 3	= 24 minutes
One troop of divisional cavalry	= 21 minutes
For one battalion of field artillery 25 x 3	= 75 minutes
For changing from a simultaneous crossing to a continuous crossing, according to Chart No. 2 (refer to Example No. 4)	9 minutes
Time required in the construction of rafts	60 minutes
Time for preparation for bridging	60 minutes
Time required to bridge 100 meters (according to Chart No. 1)	250 minutes

TOTAL

715 minutes

715 minutes = 11 hours 55 minutes. Time of completion 0555.

CHART NO. 1 (BRIDGING TIME CHART)



Notes: 1. For delivering and arranging bridging material, approximately two hours in daylight and three hours at night.

2. Preparation for bridge construction will be approximately two hours.

CHART NO. 2 (TIME CHART OF SINGLE RIVER CROSSING BY FERRY OF THE VARIOUS BRANCHES OF SERVICE)

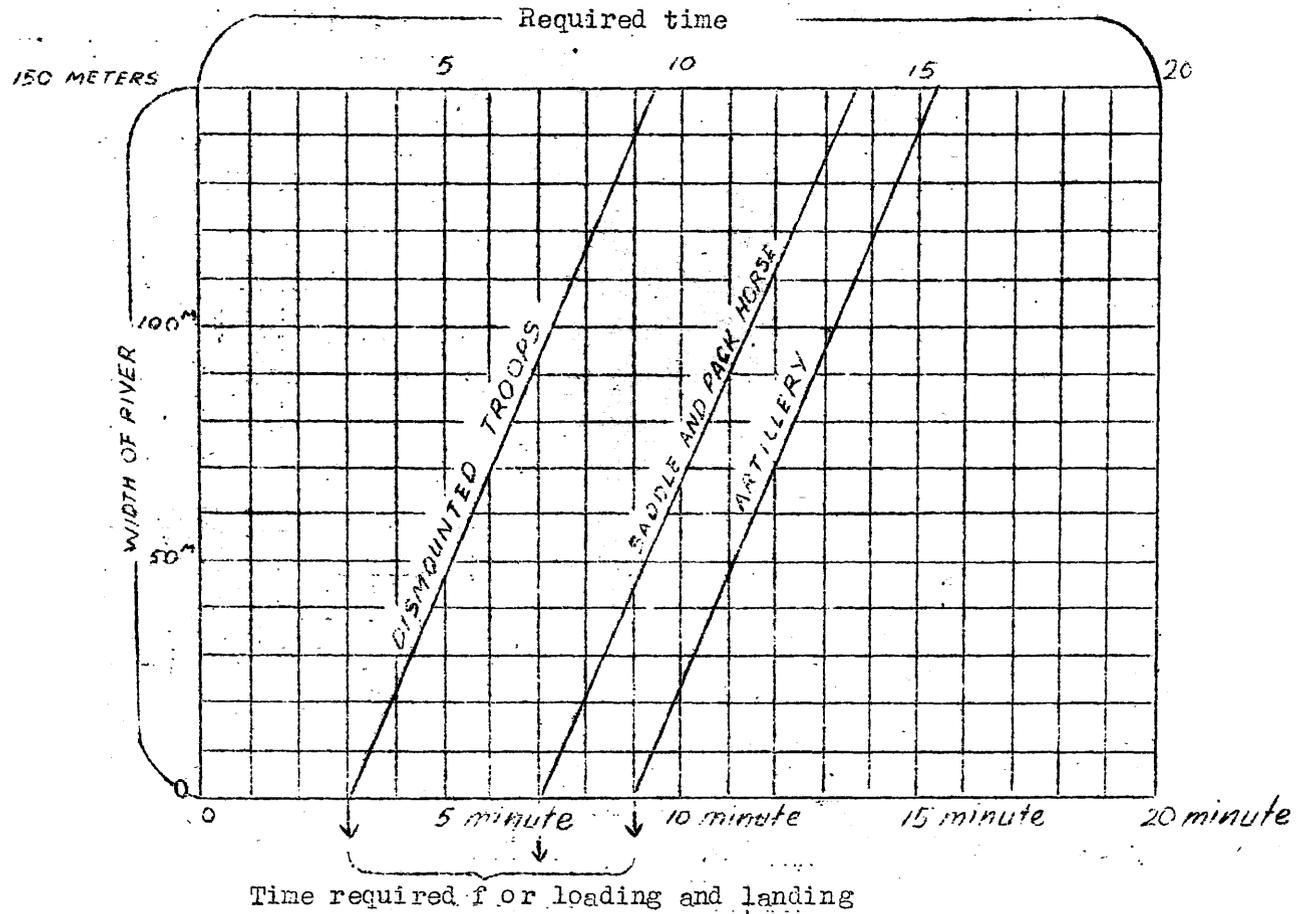
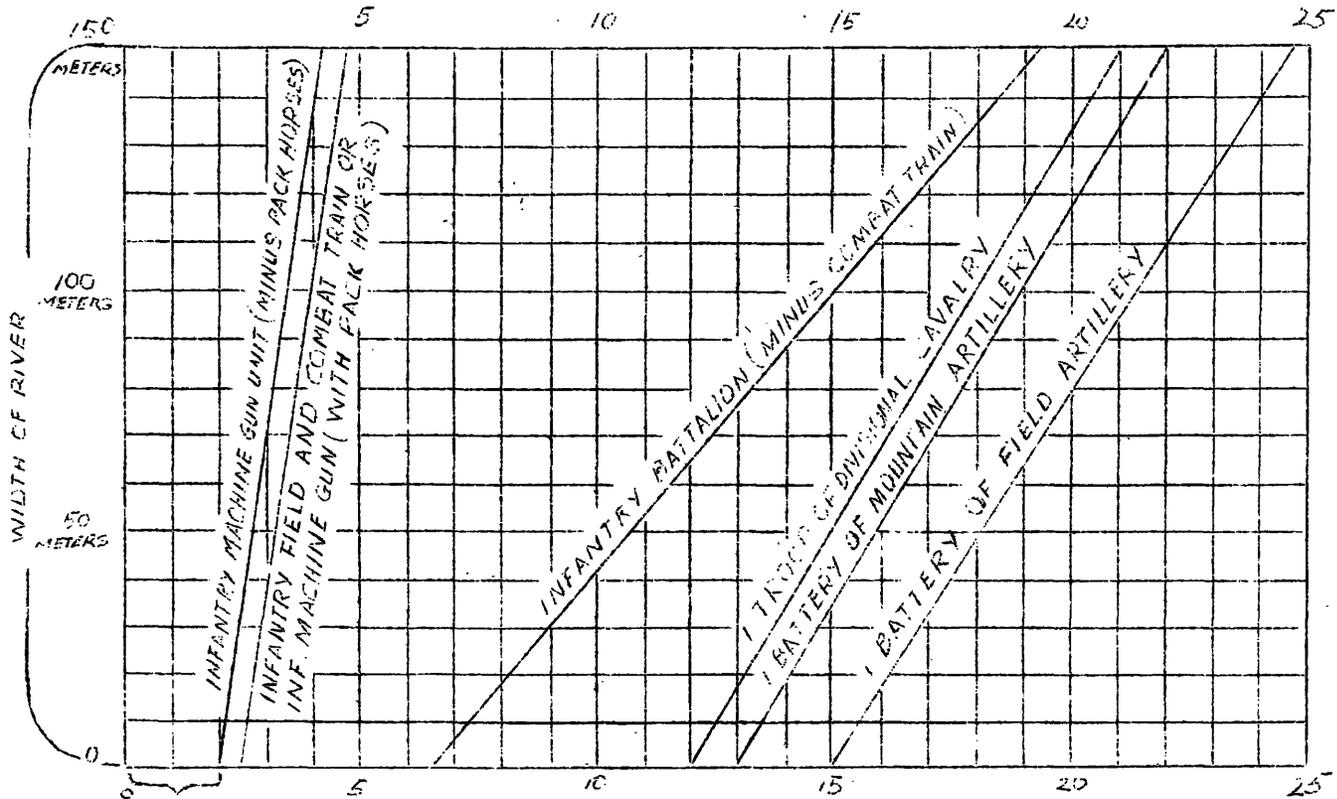


CHART NO. 3 (TIME TABLE FOR RIVER CROSSING OF THE VARIOUS UNITS BY ROWING)



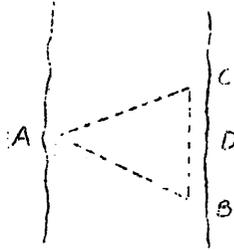
Time for loading and landing of Infantry machine gun unit (minus pack horses). For other units, time is indicated in the same way.

Notes:

1. The approximate time required for delivering and arranging bridging material: daylight - two hours; night - three hours.
2. Approximately one hour is required for preparations for ponton ferry crossing and an additional hour for construction of rafts.

Example of calculations for river crossing by ferry (see sketch)

The width of the river (AD) is 199 meters; the rate of flow is (1) meter; A is the loading point; B is the landing point; and BC is the distance between two landing points on the opposite shore. Determine the number of pontoons to be distributed at A.



First of all, find the total length of the triangular water route and calculate the time necessary to cover this distance.  $AB = CA > DA = 200$  meters. Since BC (the distance that has to be rowed against the current on the other side of the bank) = 2 x drift.  $DB = \text{drift} = \frac{\text{width of the river}}{5} \times$

rate of flow in meters (equation proved by experiment.)  
 Therefore  $BC = 2 \times 200/5 \times 1 = 80$  meters.  $200 + 200 + 80 = 480$  meters (triangular water route) If the rowing speed is one meter per second, it requires 480 seconds to make a round trip. Allowing one minute for landing, the time required for a boat to return to the starting point will be  $480 + 60 = 540$  seconds. Since there must be a boat being constantly loaded during this time at the loading point, the number of boats that have to be assigned at A is  $\frac{540 + 120}{120} = 5.5$ .

(120 seconds represent the two minutes required for loading.)

#### 179. Approximate Capacity of Ferries for River Crossing

Branch of Service	Type of Boat	Number necessary for (1) company	Number of companies that can cross in one trip by using the pontoons of one bridging material company
Infantry	Ponton	13	2
	Raft	7	2
Cavalry	Raft	46	0.3
Field Artillery (including Ammunition Train)	Raft	31	0.4
155 Howitzer (including Ammunition Train)	Raft	48	0.3

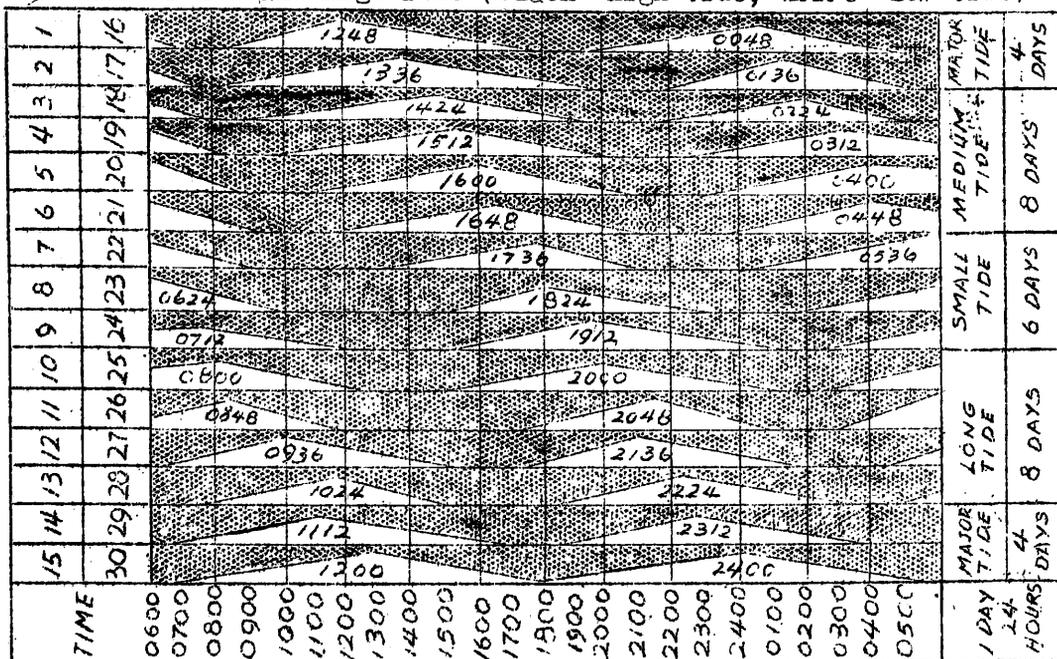
180. Light Materials Used in River Crossings

		Model 92 Light Raft	Model 91 Pneumatic Float (Large)	Model 91 Pneumatic Float (Medium)	Model 91 Pneumatic Float (Small)	
Uses		To carry horse and mountain artillery including attached personnel and material	For infantry river crossing—either as ferry or supports for foot bridges	To carry cavalry personnel and saddles and as support for foot bridges	For use by infantry, cavalry, or engineer patrols	
Construction		In all these floats, the main body consists of a buoyancy bag made of rubberized cotton-fabric, floor boards, and bracing. They are inflated into a boat shape. They can be used in water where the rate of flow is less than 2.5 meters. They should be handled by personnel of the unit using them.				
		Construct platform on two boats using poles as oars.	Use poles as oars.	Use poles as oars.	Use a small spade or other improvised materials for oars.	
Method of Carrying		Vehicle or pack horses	Vehicle or pack horses	Vehicle or pack horses	Vehicle or pack horses or personnel	
Weight (kg)			74.5	46.8	15.8	
Capacity	Personnel equipped troops (inc. oarsmen)	30	12	10 (cavalry)	2 (equipped soldiers)	
	Horse Artillery Mountain Artillery		Possible to load one MG on two boats			
	Saddles	60	12	10		
Time	Assembly	8 men: 25 min	4 men: 5 min	4 men: 4 min	2 men : 5 min	
	Disassembly	15 min	4 min	3 min	1 min	
Ferry Data	Oarsmen (oars)	5 (5)	4 (4)	4 (4)	2 (2)	
	Speed in still water	.85m per second	1.20m per second	1.20m per second	.90m per second	
	CUTBACK TIME	RIVER WIDTH 100M Rt. of flow 2m/sec.	2 min 15 sec	1 min 45 sec	1 min 37 sec	1 min
		RIVER WIDTH 130M Rt. of flow 2.2m/sec	2 min	1 min 40 sec	1 min 45 sec	1 min 45 sec
	Rate of drift percentage of river width	1.1	1.0	1.1	1.1	

CHAPTER 8

CALENDAR DAYS AND ATMOSPHERIC PHENOMENA

181. Chart of Low and High Tide (black--high tide, white--low tide)



NOTE:

1. The intervals between high tide and low tide depend upon the locality and are not definite. In an open sea a low tide occurs halfway between two high tides, but in a bay it takes a longer time to change from high tide to low tide than from low tide to high tide. The time for high and low tide changes 48 minutes every day.
2. The calendar dates are from the lunar calendar.
3. The numbers in the sketch are in hours and minutes.
4. This chart was made by using Reigan Island in Tokyo as a standard; therefore, when using this at other places, the proper corrections, as shown below, must be applied:

Table of Correction for High and Low Tides

Kuwana	0 hr 37 min	}	+	Yokohama	0 hr 01 min	}
Hyogo	1 hr 34 min		Ishimaki	1 hr 16 min		
Osaka	2 hr 01 min		Hakodate	1 hr 02 min		
Shimonoseki	3 hr 06 min		Niigata	3 hr 01 min		
Nagasaki	1 hr 56 min		Fushigi	2 hr 75 min		

182. Time Table of Sunrise and Sunset in Japan

Cities	Sun	January	February	March	April	May	June	July	August
Tokyo	Rises	0651-0647	0639-0618	0607-0539	0523-0509	0446-0430	0425-0426	0430-0442	0451-0507
	Sets	1641-1700	1711-1731	1739-1756	1805-1814	1830-1846	1853-1900	1900-1851	1842-1819
Dairen	Rises	0812-0806	0757-0734	0720-0649	0632-0604	0552-0534	0530-0529	0533-0548	0555-0614
	Sets	1745-1806	1818-1840	1851-1911	1920-1940	1945-2007	2014-2022	2022-2012	2003-1938
Taihoku	Rises	0840-0739	0735-0722	0713-0653	0642-0624	0616-0606	0603-0606	0608-0617	0622-0621
	Sets	1818-1833	1840-1853	1858-1908	1912-1921	1925-1936	1941-1947	1948-1943	1938-1922
Keijo	Rises	0747-0741	0734-0712	0658-0627	0613-0545	0534-0516	0512-0512	0515-0529	0537-0554
	Sets	1723-1747	1759-1820	1830-1849	1858-1917	1925-1942	1950-1957	1957-1947	1939-1915
Kumamoto	Rises	0720-0717	0711-0751	0640-0615	0601-0538	0528-0513	0510-0510	0513-0525	0532-0545
	Sets	1725-1743	1753-1810	1818-1833	1840-1854	1902-1916	1922-1928	1929-1912	1914-1854
Osaka	Rises	0705-0702	0655-0634	0622-0555	0541-0516	0505-0450	0455-0455	0550-0501	0509-0523
	Sets	1702-1720	1730-1750	1758-1814	1822-1838	1846-1900	1907-1914	1915-1907	1858-1837
Sendai	Rises	0653-0647	0640-0616	0602-0532	0517-0449	0537-0419	0415-0415	0418-0532	0439-0457
	Sets	1641-1650	1702-1724	1734-1854	1803-1822	1831-1848	1856-1603	1904-1854	1845-1820
Sapporo	Rises	0706-0657	0648-0620	0603-0529	0511-0438	0424-0403	0357-0357	0400-0516	0427-0449
	Sets	1614-1687	1650-1716	1729-1753	1804-1828	1840-1900	1907-1917	1917-1905	1849-1805

## 182. (continued)

Cities	Sun	September	October	November	December
Tokyo	Rises	0515-0530	0538-0556	0606-0636	0635-0648
	Sets	1804-1735	1720-1654	1643-1630	1628-1634
Dairen	Rises	0623-0640	0654-0714	0724-0747	0757-0810
	Sets	1923-1852	1828-1800	1748-1734	1731-1737
Taihoku	Rises	0635-0642	0648-0658	0704-0718	0725-0737
	Sets	1912-1851	1835-1817	1811-1804	1804-1812
Keijo	Rises	0603-0619	0632-0651	0702-0723	0732-0745
	Sets	1900-1830	1808-1741	1730-1716	1714-1720
Kumamoto	Rises	0555-0509	0615-0630	0639-0657	0705-0718
	Sets	1835-1808	1755-1732	1723-1712	1711-1718
Osaka	Rises	0535-0549	0557-0613	0623-0642	0651-0704
	Sets	1817-1749	1735-1710	1701-1649	1647-1654
Sendai	Rises	0510-0528	0535-0556	0607-0629	0639-0652
	Sets	1758-1728	1712-1644	1633-1619	1616-1622
Sapporo	Rises	0505-0527	0538-0602	0615-0640	0651-0705
	Sets	1800-1725	1707-1635	1622-1604	1600-1605

## Note:

1. The time is central standard time, the time of the Meridian Line, 135° East longitude.

2. Sunrise and sunset time for the Tokyo Region is taken when the upper edge of the sun appears on the horizon as seen from the Tokyo Astronomical Observatory. The time for the other regions depends upon the calculation of the longitude and latitude.

3. The figures on the left side of this table indicate the times for the fifth day of the month and those on the right side for the twenty-fifth day.

183. Time Table of Sunrise and Sunset in Manchukuo (Central Standard Time)

Cities	Sun	January	February	March	April	May	June
Hsinking	Rises	0813-0807	0753-0734	0709-0643	0614-0548	0526-0507	0457-0456
	Sets	1715-1733	1753-1812	1832-1851	1910-1928	1946-2003	2017-2024
Mukden	Rises	0814-0809	0756-0738	0715-0650	0623-0559	0538-0521	0512-0511
	Sets	1730-1746	1805-1823	1841-1858	1916-1932	1948-2005	2017-2024
Kirin	Rises	0808-0802	0748-0829	0704-0638	0609-0543	0521-0502	0453-0451
	Sets	1711-1728	1748-1807	1827-1846	1905-1923	1941-1959	2012-2019
Harbin	Rises	0815-0808	0752-0732	0706-0637	0607-0540	0516-0456	0445-0443
	Sets	1704-1722	1743-1804	1825-1846	1907-1926	1945-2005	2019-2027
Tsitsihar	Rises	0831-0824	0807-0745	0718-0648	0616-0547	0522-0501	0450-0447
	Sets	1708-1728	1750-1812	1835-1857	1919-1940	2000-2521	2036-2044
Heiho	Rises	0829-0820	0801-0736	0706-0634	0559-0527	0459-0436	0422-0419
	Sets	1642-1703	1728-1753	1818-1843	1908-1932	1955-2018	2035-2044
Hailar	Rises	0856-0847	0829-0805	0736-0705	0631-0601	0533-0511	0458-0455
	Sets	1718-1738	1802-1826	1850-1913	1938-2000	2023-2045	2101-2110
Changto	Rises	0834-0829	0817-0800	0737-0713	0646-0623	0602-0546	0537-0536
	Sets	1755-1810	1829-1846	1904-1920	1937-1953	2009-2025	2037-2044

## 183, (continued)

Cities	Sun	July	August	September	October	November	December
Hsinking	Rises	0503-0517	0533-0551	0608-0626	0644-0703	0722-0742	0759-0810
	Sets	2023-2012	1955-1931	1904-1835	1808-1743	1722-1707	1701-1704
Makdon	Rises	0518-0531	0546-0602	0618-0634	0650-0707	0725-0744	0800-1811
	Sets	2023-2014	1958-1935	1910-1842	1817-1753	1734-1721	1719-1719
Kirin	Rises	0458-0512	0528-0546	0603-0622	0639-0658	0717-0737	0754-0805
	Sets	2018-2007	1950-1926	1900-1830	1803-1738	1717-1703	1656-1700
Harbin	Rises	0451-0506	0523-0543	0601-0621	0640-0700	0722-0742	0800-0812
	Sets	2025-2013	1955-1929	1901-1830	1801-1735	1712-1656	1649-1652
Tsitsihar	Rises	0455-0511	0529-0551	0610-0632	0652-0714	0736-0758	0817-0829
	Sets	2042-2029	2010-1942	1913-1841	1811-1743	1719-1708	1654-1657
Hoiho	Rises	0428-0445	0506-0530	0553-0617	0640-1705	0730-1754	0815-0828
	Sets	2041-2027	2004-1934	1902-1827	1754-1723	1657-1638	1628-1630
Hailar	Rises	0504-0521	0541-0604	0625-0648	0711-0734	0738-0822	0842-0854
	Sets	2107-2053	2003-2003	1932-1858	1826-1756	1731-1712	1703-1705
Changte	Rises	0543-0556	0610-0626	0641-0657	0712-0729	0746-0804	0820-0831
	Sets	2043-2034	2018-1956	1932-1905	1840-1817	1758-1745	1741-1744

Note: On this time table, the number on the left indicates the 4 days from the 5th to the 8th of the month and that on the right the 4 days from the 21st to the 24th of the month.

184. Table of Comparison -- New and Old Way of Telling Time

NEW	0000	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200
OLD	NE (moose)	USHI (cow)	TORA (tiger)	U (rabbit)	TATSU (dragon)	MI (snake)	UMA (horse)	HI- TSUJI (sheep)	SARU (monkey)	TORI (bird)	INU (dog)	I (wild boar)
	9 AKA- TSUKI (day- break)	8	7	6 AKE (dawn)	5 ASA (morn)	4 HIRU (day)	3 HIRU (day)	2 HIRU (day)	1 YUBE (even- ing)	0 KURE (twi- light)	11 YORU (nite)	10 YORU (nite)

NOTE: Use halves to call an uneven hour. For example, 0500 is called "Tora and half" or  $7\frac{1}{2}$ .

185. Method of Computing the Phase of the Moon according to the Calendar Day

- (a) Subtract 1911 from the year of the Christian Era, multiply the difference by 11 and divide the answer by 30. We shall call this result "A."
- (b) Next, obtain the number from the following chart, which we shall call "B," given under the month of the year.

MONTH	January	February	March	April	May	June	July	August	September	October	November	December
B (No.)	0	2	0	2	2	4	4	6	7	8	9	10

(c) The date of the month shall be called "C."

The sum of "A," "B," and "C" is the phase of the moon for that day.

Note:

There may be an error of a day or so when calculating by this method, but it will not make a great difference in the result.

If the total of "A," "B," and "C" is over 30, the phase of the month can still be obtained by subtracting 30 from the total.

186. Periods of Thaw and Freeze in Northern Manchukuo

District	Period of Freeze	Period of Thaw
Harbin	Early part of November	Mid - April
Manchuria	Latter part of October	Mid - May
Kokkawa	Latter part of October	Early May
Hoei	Latter part of October	Early May

NOTE: (a) Although the flow of the rivers is generally great during the period of thaw, the volume of water increases and decreases according to the snow fall along the upper reaches of the river.

(b) During the rainy periods of July and August the flow which increases suddenly rises above the usual water level and inundates the area along the river banks.

(c) The water is at its lowest level in October.

CHAPTER 9

LABOR

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III.	Field Fortifications and Construction--	194-197
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SECTION I

DESTRUCTIVE POWER OF PROJECTILES

187. Penetrative Power of Various Types of Projectiles (Meters)

Type of Ammunition Materials		Rifle Bullet	Field Artillery		Field Howitzer		24 cm & 28 cm Howitzers
			Shrapnel & fragmentation	Whole shell	Shrapnel & fragmentation	Whole shell	Whole shell
Medium Hard Soil	NOT LOOSENED			1.0-2.0		2.5-3.0	4.5-7.0
	Fill	0.9-1.0	0.4-1.0		1.0		
Sand		0.6-0.8					
Sand Bag		0.5					
Mud or Sod Embankment		2.0					
Packed Snow		0.8-2.0		3.0			
Wood		0.5(oak) 1.1(pine)	0.02-0.08		0.16		
Brick Wall		0.3-0.4	0.25	1.00	0.25	2.0 FLAT TRAJECTORY 0.0 HIGH ANGLE TRAJECTORY	
Concrete						0.10-0.45	0.3-0.8
Reinforced Concrete						0.1-0.2	0.3-0.4
Steel Plate		0.0-0.02					

Remarks: Generally, the penetrative power of machine gun bullets is similar to that of rifle bullets, but it is necessary to increase the thickness of shelter by several times because the machine gun having a smaller beaten zone, will concentrate its fire on a single point.

188. Zones of Demolition and Concussion of Various Types of Shells

Classification	Radius of Demolition in Ordinary Soil	Radius of Concussion in Ordinary Soil
Field Artillery Gun	1-1.5m	2-2.6m
Howitzer of the FA	1.5-2 m	2.5-3 m
24cm and 28cm Howitzers	2-3 m	2.5-3 m
30cm Howitzer	2.7-3 m	3.8-4 m

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189. Beaten Zone of Time Shells

Type of Shells	Effective beaten zone	Maximum beaten zone
Field Artillery Gun	Depth = 5m                  Width = 15m	Radius = 150m
Howitzer of the FA	Depth = 8-15m              Width = 70m	Radius = 200-500m
<p>NOTE: In case the shell ricochets and explodes on the rebound, the effect will be roughly the same.</p>		

SECTION II  
FELLING TREES

190. Relative Handiness of Tools for Felling Trees

Diameter ORDER of tree OF HANDI- NESS OF TOOLS (cm)	Less than 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	More than 40
1st	Hatch- et	Crosscut saw Mt. saw (small)	Axe	Mountain Saw (medium)	Mt. saw (med.)	Mt. saw (med.)	Mt. saw (med.)	Mt. saw (med.)	Two-man saw
2nd	Hand axe	Axe	Mt. saw (med.)	Axe (medium)	Two-man saw	Two-man saw	Two-man saw	Two-man saw	Mt. saw (med.)
3rd	Crosscut saw	Hand axe	Crosscut saw Mt. saw (small)	Cross-cut saw Mt. saw (small)	Axe	Axe	Axe	Axe	Axe
4th	Hand saw	Hatch- et	Hand Axe	Two-man saw	Crosscut saw	Crosscut saw			
5th				Hand Axe					
Remarks				Often axes are not suitable for long periods of work					Med. Mt. saw limit is 90cm
<p>Since two men are required to operate the two-man saw, first of all, the actual felling time has been multiplied by two and then the relative merits of the saw have been compared with those of the other tools.</p>									

191. Time Required for Felling Trees...

Diameter (cm)	Time (one medium mountain saw per person)	One man operating a two-man saw
3.5	10 sec	
6.5	30-50 sec	
11	2-4 min	1 min
18	5-7 min	2 min
20	6-9 min	3-5 min
30	10-13 min	5 min
40	15-19 min	8 min

Results of tree felling experiments conducted on various maneuvers.

1. A company of engineers with moderate ability and various felling tools can cut down in an hour, an average of 3,000 pine trees 10 cm in diameter. Moreover, on level ground the company should be able to move the logs a distance of 150 meters in an hour and 12 minutes.
2. It requires approximately 8 hours for a company of engineers to fell a total of 10,634 pine trees 10 to 40cm in diameter. (An individual has more than one felling tool.)

192. Men, Equipment, and Time Required for Clearing Fields of Fire.

Classification	Number of men	Required Implements	Time	Remarks
Felling of trees (40cm-1m in diameter)	9	axe, saw, wooden wedge, 10m rope, 2m rope.	8-15 min	
Same as above	4	(2) axes 10m rope	25 min to 2½ hrs	Using axes only
Felling of trees (20-50cm in diameter)	4	two-man saw, 10m rope, (2) 2m ropes.	7-15 min	With only a two-man saw, it is difficult to saw objects over 50cm in diameter
Cutting dense undergrowth	2 men per 100 square meters	(3) hatchets hand axe	1-2 hrs	The time varies with the kind of undergrowth

193. Tree Felling Time Schedule

Diameter of Tree	Required Equipment	Calculating Method	Example
From 10-50cm	saw	$D^2 = \text{minutes required}$	30cm in diameter $3^2 = 9 \text{ min}$
Over 20cm	Saw and axe	$0.8 D^2 = \text{minutes required}$	40cm in diameter $0.8 \times 4^2 = 12.8 \text{ min}$
Over 50cm	Two-man saw and axe	$1.2 D^2 = \text{minutes required}$	50 cm in diameter $1.2 \times 5^2 = 30 \text{ min}$

194. Rate (amount) of Work for Field Fortification (engineers)

Fortification or Entanglement	Type of Work	Personnel	Time Required		Total man hrs required	Remarks	
	Cutting and sharpening pickets	2	0	20	.67	For ten pieces	
Spider Wire	Driving pickets and stretching wire in an area of 100 sq. meters				40.00		
Double Apron Fence	Driving pickets and stretching wire in a line of 100m				80.00		
Low Wire	Driving pickets and stretching wire in an area of 100 sq. meters				12.50		
Concertina Spiral Wire	A Construction	3	1	20	4.00	For length of 20m	
	B Construction	2	1	20	2.66	For length of 10m	
Riband Cylinder	Construction	10	0	15	2.50	For length of 3m	
	Construction of screw pickets	3	long	0	40	2.00	When constructing many
			medium	0	35	1.75	
			short	0	30	1.50	
Collapsible Barbed Wire	Construction	4	0	30	2.00	For length of 13m	
Single Line Steel Post (rail) Obstacle with 10m Frontage	Construction				40.00	Not including the rail cutting	
	Cutting one section of a 30 kg rail	4	0	20	1.30	Using rail cutters	

FIELD FORTIFICATIONS AND CONSTRUCTION

SECTION III

194. (continued)

Shelter or Emplacement		Type of Work	Person- nel	Time		Man hrs. REQUIRED (Total)	R e m a r k s
				Required	REQUIRED		
				Hr	Min		
6-man Light	Fig. 59 in manual	Construction	4	1	40	6.70	
	Fig. 60 in manual	"	4	3	20	13.30	
Medium Tunneler		"	20	125	00	2500.00	Length 6m; construct incline on each end of the shelter. The measurement of the cross section of the shelter--1.6m x 1.7m; inclined end--1.0m x 1.7m
Medium Excavated (Fig. 63 in Manual)		"	30	50	00	1500.00	Length = 6m; Entrance of both sides = 2m
Covered Machine Gun (Fig. 72 in manual)		"	30	30	00	900.00	
Concrete Covered Machine Gun (medium cover)		"				3000.00	Construct entrance in wall
Concrete Block Pill Box (Fig. 74 in manual)		"				1000.00	
		To dig 1 cubic meter of soil (medium hardness)	1	1	15	1.25	
Standing Trench with 25m Frontage		Construction	12	1	40	20.00	Use shovel only.
Enlarged Standing Trench with 25m frontage		Construction	12	2	40	32.00	
		To spread a camouflage net with dimensions between 15-20 meters square	20	3	30	7.00	Begin operation at sundown
		Rate of progress in the construction of a camouflage net	1	1	00		Tie 270 knots

Construction of a 100 Sq. Meter Spider Wire Entanglement

Classification	Preparations		Construction	
	Stake-making	Clamp-making	Staking	Wire-laying
Personnel	4 (incl. leader)	2 (incl. leader)	1 NCO 10 Pvts in two groups	1 NCO 12 Pvts in four groups
Equipment	(4) Axes (2) Saws	2 Wire-cutters	(2) Stake driver (2) Baled wire	(4) Hatchets or Claw hammers
Time	30 min	1 hour	1 hour	2 hours
Construction Method	2 groups of 2 men each. Prepare for wiring after completing job.	Prepare for wiring after completing job.	Stabilize wire brace after completing job.	First of all, wire bases of the stakes are planted parallel to the firing line, then the diagonal line, and finally the upper parallel line.
<p>Remarks: 1. Total Personnel: 1 Officer, 2 N.C.O., 28 Pvts.</p> <p>2. Use those materials previously accumulated nearby.</p>				

Construction of Abatis of Branches 10 Meters Wide(3 rows) (Material already assembled)

Classification	Preparing ground	Distributing material	Fixing	Remarks
Personnel	1 NCO 10 Pvts.	1 Superior Pvt 4 Pvts in two groups	1 NCO 5 Pvts in 1st. group 2 Pvts in 2nd group	Total Personnel 1 Officer 2 NCO 22 Pvts.
Equipment	10 shovels 5 picks	2 saws 2 bolo knives	2 sledge hammers 2 saws 5 wire cutters	
Time	1½ hours (approx)	1½ hours (approx)		
Method of Construction	Mark out the position on the ground and dig triangular trenches. After distributing and fixing the tree branches, dig the second row of trenches, and with the excess dirt bury the foundation of the first line of abatis. Carry this out for the remaining positions.	Distribute the branches to be used for the purpose of construction; cross them suitably, and distribute the necessary prong-shaped or hook-shaped stakes.	First group will fix the distributed branches by using prong-shaped or hook-shaped stakes. The Second group will tie the branches with wire or vines to increase the effectiveness of the obstacle.	

195. Labor Statistics on Field Fortification

Type	Subdivisions	Amount of work	For 50- mrie!	Time	Total (man hrs)	Work per man hour	Remarks	
F I R I N G	Average daily excavation	1248 cu m	150	hr. min. 16:00	2400	0.52 cu m	Those figures apply where the ground is pasture or grassland.	
	Enlarged standing trench (1 sqd)	<i>7.5 m. front, 1 m. embankment on one side</i>	12	3:30				
	Standing trench (1 squad)	<i>3.5 m. in front 1 m. embankment on one side</i>	12	2:10				
	<i>Reconstruction of a standing trench to an enlarged standing trench (1 sqd)</i>	30m	10	1:30				
	Light machine gun shelter (independent)	For one squad	8	1:00				
	Same (Reconstruction to fir- ing trench)		8	:10				
	Same (for prone firing)		3	:12				
	T R E N C H	Individual firing trench (standing position)	frontage 1m <i>lower width - 80cm</i>	1	:45			
		Same (kneeling position)	frontage 70cm <i>upper width - 1m. 20cm</i>	1	:45			
		Working under enemy fire. After digging individual standing po- sition firing shelters, (fox- holes), connect them with prone position communication trenches.	For one squad frontage of 25m	9	2:00			
Apply the same procedure to kneeling position trenches		Same	9	2:00				

195. (continued)

Type	Subdivision		Amount of work	Time	Total (man hr)	Work per man hour	Remarks			
Com Trench	Average daily excavation of outdoor single trench		1512 cu m	150	2400	0.63cu <sub>m</sub>	The section leader should understand the technique of construction and measurement, and the privates should have some experience in this work.			
Light Shelters	Fig. 59 in manual (for 6 persons)			6	1:30	about 10				
	Fig. 60 in manual (for 6 persons)			6	3:10	about 10				
	Fig. 61 in manual (for 3 persons)			3	3:10	about 10				
	Observation Post Fig. 80 in manual			6	3:05	about 20				
	Time required to advance from shelter to firing position		fully equipped		16 sec					
		without pack		7 sec						
Wire Entanglements	Construction	Sharpening of Stake		920 stakes	12	10:30	8	4 axes		
		Make U-shaped clamps		300 clamps	5	12:00	50	2 wire cutters		
		Spider Wire entanglements	Day	Staking	1440 sq m	40	5:30	220	2	4 stake drivers 2 clamps
				Wire Stretching		18	20:00	36	4 sq m	4 wire cutters
		Spider Wire entanglements	Night	Staking						In small operations night construction can be done almost as quickly as by day.
				Wire stretching						

195. (continued)

Type		Subdivision		Amount of Work	Personnel	Time	Total (man hrs)	Work per man hr	Remarks	
Wire Entanglements	Construction	Double apron fence entanglement	Day	Staking	2040 sq. m	40	4:20	170	3	4 stake drivers 3 hammers 3 wirecutters
				Wire + Stretching		12	21:40	260	8 sq m	
			Night	Staking						In small operations night construction can be done as quickly as by day.
				Wire Stretching						
			Concertina Entanglement	A		6	A 1:30			Time required to construct one section :
				B			B 2:30			
		Ribard Spiral Entanglement			10	4 per hr				
		Barbed Wire Entanglement			6	38 min			Time required for construction of section with prepared steel reel.	
		Crossing Wire Entanglements by means of mats, etc.	Double apron fence entanglement	Day	Using ladder		12	24 sec		Be fully equipped and take a prone position 30m in front of the entanglement and cross in one rush.
				Using board	12		20 sec			
			Night	Using ladder	(dark night)	12	32 sec			
				Using board		12	28 sec			
	Spider Wire Entanglement		Day	Using board	12	16 sec		As above		
			Night	Using board	12	35 sec				

Type	Subdivision			Amount of work	Per-sonnel	Time	Total (man hrs)	Work per man hr	Remarks		
Wire Entanglements	Destruction	Secret destruc- tion at night	Spider wire	4 meter deep	5	hr. min. 1:00 2:00*			* (with en- tangled wire)		
			Double apron fence		5	:32 1:00*					
		Enforcement	Spider wire	Day	4 meters deep		5	29 sec			Be fully equipped (excepting knap-sack) and take prone position 30 meters in front of the obstacle & then destroy it. It's difficult to cut through intricate ly entangled small wire.
					Entangled wire		5	39sec			
				Night	4 meters deep		5	31 sec. darknite 45 sec. 12 minite			
					Entangled wire		5	45 sec. darknite			
	Double Apron Fence		Day	4 meters deep	5	18 sec			As above		
				Entangled wire	5	24 sec					
	Night	4 meters deep	5	35 sec. darknite							
		Entangled wire									
	Sand Bag	Filling with soil			4 per min. (20 KG) Per bag	3	2 per min				
		Passing by hand in one column				12	8 min			By this method 1 squad will be able to move a sand bag a distance of 50 meters	
Passing by hand in two columns				12	6 min						
Passing in prone position				12	20 min						

Note: The above chart contains statistics compiled by troops of Infantry N.C.O School (with fairly good training in fortification). Of course, there may be variations from this chart, due to climatic conditions, the commander's efficiency, the degree of training, the equipment, etc.

196. Estimate of the Position of an Infantry Battalion (front of approximately 1000 meters) Based on the Number of Days Required for Construction

The strength of the position cannot be estimated merely by the period of its construction, but varies considerably with circumstances; misunderstanding will be avoided in this chart, however, by the use of approximate numbers.

- a. The soil is assumed to be of medium hardness.
- b. 600 Infantry men and 40 Engineers will comprise the construction personnel of the battalion.
- c. Although not under enemy fire, a gradual construction method will be adopted depending upon the situation.
- d. An individual work output per hour will be as follows:
  1. digging capacity - .04 cubic meters
  2. wire entanglement - 2.5 square meters
  3. construction of a light shelter for 6 persons - 30 man hours
  4. construction of a medium shelter - 1500 man hours
  5. construction of a heavy shelter - 2700 man hours
- e. Generally the material is already arranged in the vicinity of the position.
- f. Tools will be mainly portable and supplemented by those collected.

Construction Period	Summary of Project	Firing Trench	Communi- cation Trench	Obstacle	Shelter	Remarks
1st Day (6 hours)	Each skirmisher will dig a standing trench at his position. Neighboring skirmishers will be connected with each other by means of trenches which have the same cross section dimensions as the standing trenches. Thus, the squad position with a front 30m will be completed. However, the lack of time will not permit the construction of communication trenches, laterally and in depth, between the positions of squads, platoons, companies, and such.	1440m for the standing position (360m)				A detail will be assigned to clear the field of fire. About two hours is required in constructing the firing trench (about one meter wide alone.)
1st Day (10 hours in all)	Communication trenches, laterally and in depth, between squads and platoons within the company position will be constructed deep enough to allow crawling. $\frac{1}{4}$ of the minimum requirement (8000m) can be finished. (Sketch B)	1440 m for the standing position (360m)	2,000m for crawling (500m)			A detail will be assigned to clear the field of fire and to gather materials. (About 20 men from each company plus a platoon of engineers)

Construction Period	Summary of Project	Firing Trench	Communication Trench	Obstacle	Shelter	Remarks
2nd Day (20 hours in all)	Construct an additional communication trench, 2000m in length, which is deep enough to allow crawling. Construct a line of wire entanglements, 4m in depth, mainly in front of the key positions. Construct machine gun cover. (Sketch C)	1440m for the standing position (360m)	4000m for crawling (1000m)	1200m depth 4m	4 (for machine gun cover)	The communication trench which affords protection only when crawling will include the dummy positions and the battle positions which must necessarily be increased.
3rd Day (8 working hours per day from here on)	Construct an additional communication trench about 1500m in length, and a battle position of about 350m.	1300m for standing position (450m)	5500m for crawling (1400m)	Same	Same	
4th Day	Construct a light shelter for about half of the guards and lengthen the communication trench 500m. (Sketch D)	1300m for standing position (450m)	6000m for crawling (1500m)	1200m depth 4m	57 (light 6-man shelters), and light cover for MG	

Construction Period	Summary of Project	Firing Trench	Communi- cation Trench	Obstacles	Shelter	Remarks
First Week	<p>The battle position of the squad will consist of an enlarged standing trench connected with other units on all sides by means of crawling type communication trenches. A line of wire entanglements, 8m in depth, will be set up in the front line, and another line of wire entanglements, 4m in depth will be set up near the key positions. Only the machine gun shelters will furnish cover against 155mm shells.</p> <p>(Sketch E)</p>	1800m enlarged section (450m)	6000m for crawling (1500m)	1500m (8m deep) 800m (4m deep)	125 (for 6 persons) 4 (medium cover for machine gun)	
Second Week	<p>It is possible to construct the exterior of a position with such labyrinthically arranged trenches and wire entanglements as those which appeared during World War I. However, the width of the wire entanglements and a part of the communication trenches will not be wide enough.</p>	Same	5000m for single column	4000m (8m deep) 800m (4m deep)	Same	Start constructing the medium and the heavy shelters from the beginning of the second week.

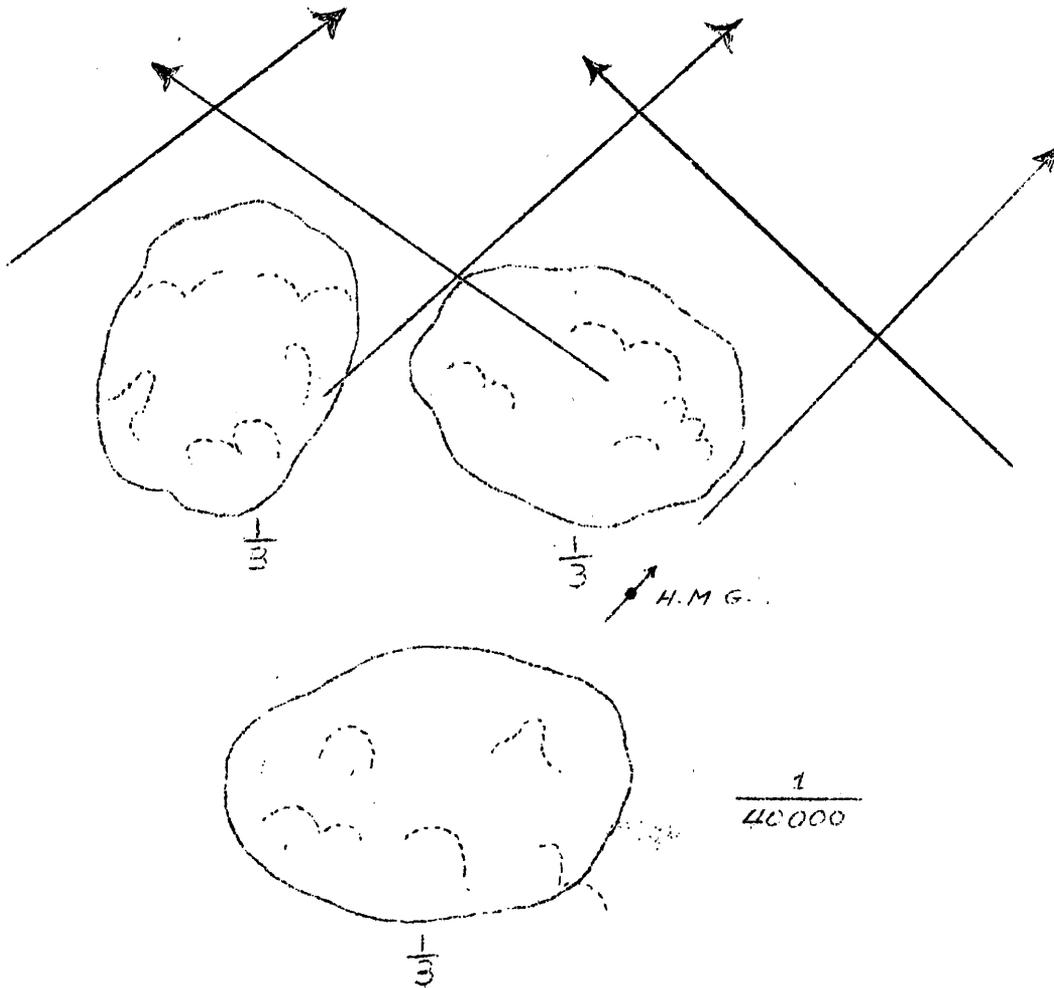
Construction Period	Summary of Project	Firing Trench	Communi- cation Trench	Obstacles	Shelter	Remarks
	Generally, the shelters will be of light construction and only the vital flank defensive positions and the command post will be made strong enough to withstand 155mm shells.					
Third Week	The trenches and wire entanglements should be practically completed. Construct medium or heavy shelters for companies, battalion, reserve, dressing station, and command post.	Same	5000m for single column 2000m for two columns	4000m (depth 8m) 4000m (depth 4m)	125 light 6-men shelters, 7 medium shelters for personnel 4 heavy shelters for personnel 4 medium shelters for machine guns	The medium personnel shelters will be constructed 2 each to a company and 1 for the battalion headquarters in the front line. The heavy shelters will be for the case of platoons, one for the dressing station and 3 for the reserve company.

Construction Period	Summary of Project	Firing Trench	Communication Trench	Obstacle	Shelter	Remarks
Fourth Week	The completion of the most firm position (Sketch F)	9000m enlarged sector	6500m for single column 3500 for 2 columns	Same	Same	

- Notes:
1. When it is expected that more than 5 or 6 weeks will be allowed for the construction of the position, it is possible to plan at the outset to use concrete in the construction of battle positions and shelters.
  2. This chart merely shows the construction period; however, if the preparation and transportation of the materials are taken into account, still more time (from one to four months) would be required to complete a position of such a wide frontage as shown on Sketch F.
  3. The numbers in parenthesis indicate the amount of construction to be performed by each company.
  4. The time of the commencing of construction may vary according to the situation; however, the work must be started not later than 2 hours after the development of the division, in other words, four to five hours after the arrival of the division at the front line position.

Sketch "A"

The company position after approximately two hours of work.



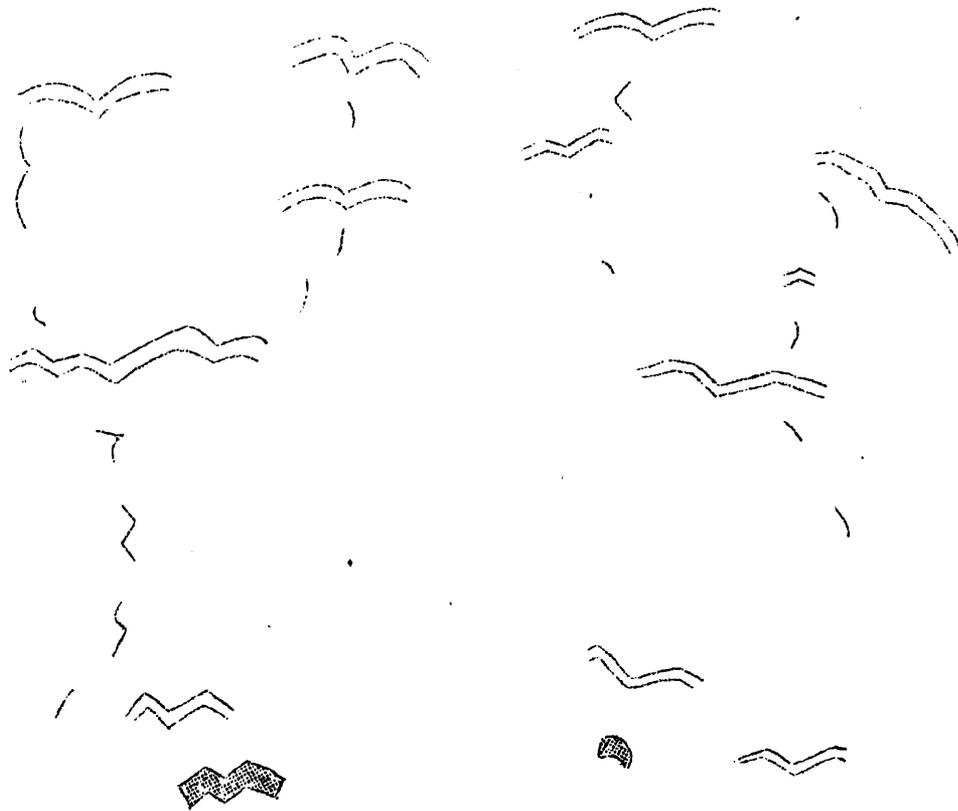
Note:

The work will take six hours.

The individual firing trenches within a squad position are connected, forming a single line.

Sketch "B"

The company position after approximately ten hours of work.

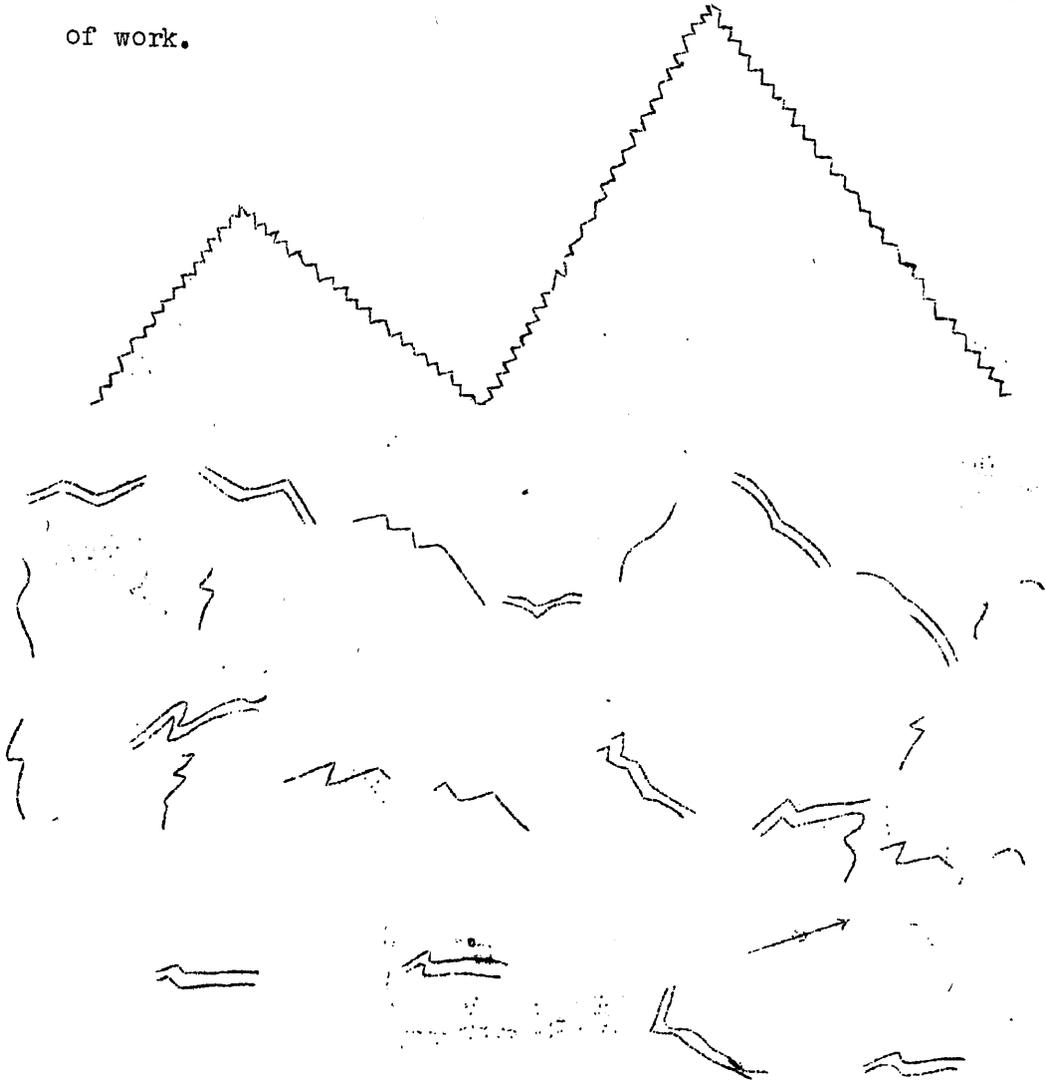


Note:

Connect the squad positions by means of crawling communication trenches and at the same time take measures to conceal the true squad positions.

Sketch "C"

The company position after approximately two days (20 hours) of work.

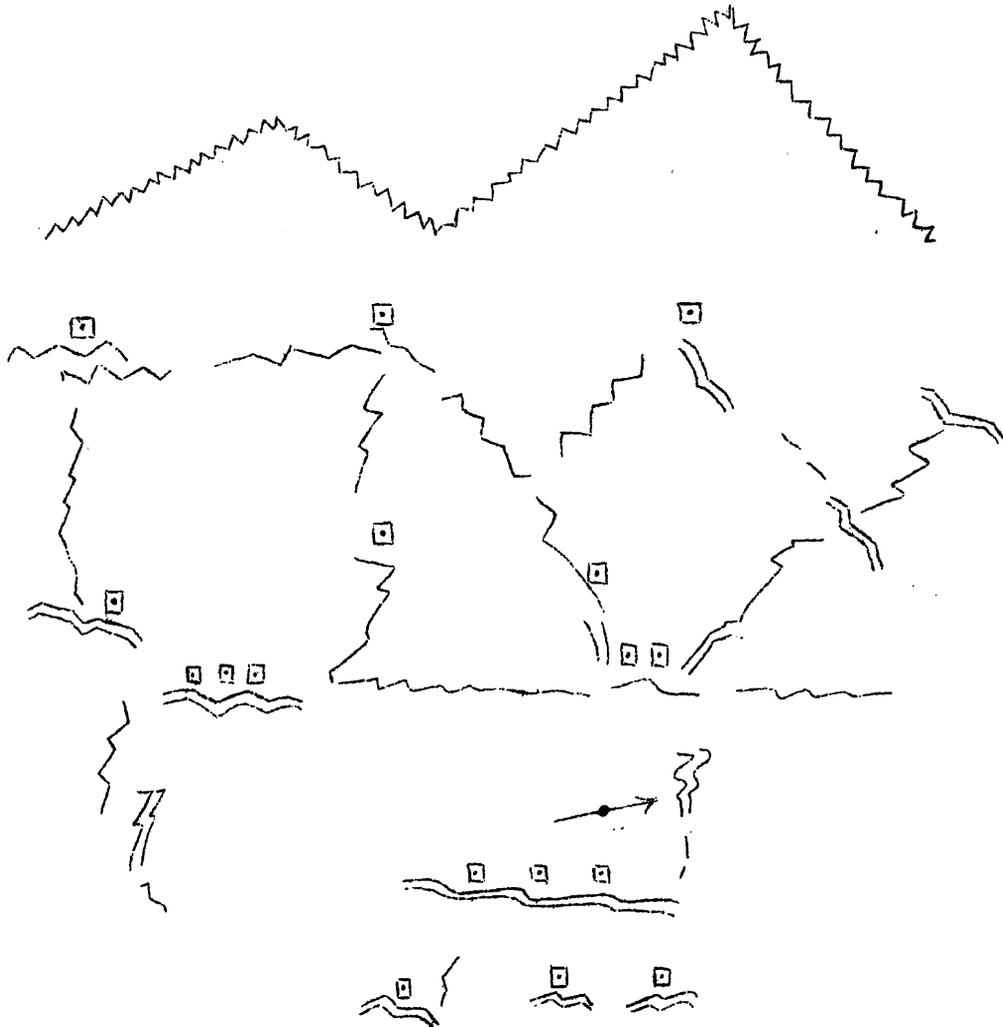


Note:

1. Wire entanglements will have a depth of four meters.
2. Light cover will be provided for machine guns.

Sketch "D"

The company position after approximately four days (32 hours) of work.

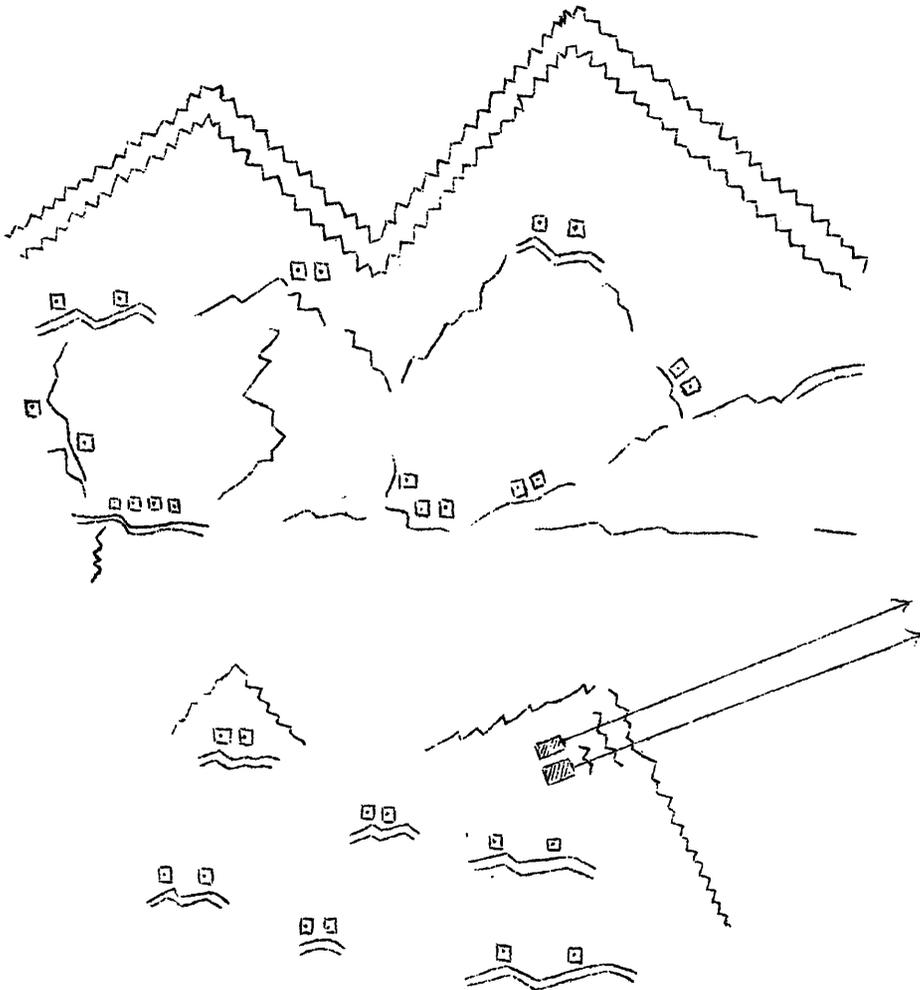


Note:

Construct (20) light 6-man shelters.

Sketch "E"

The company position after approximately a week's work (56 hours.)

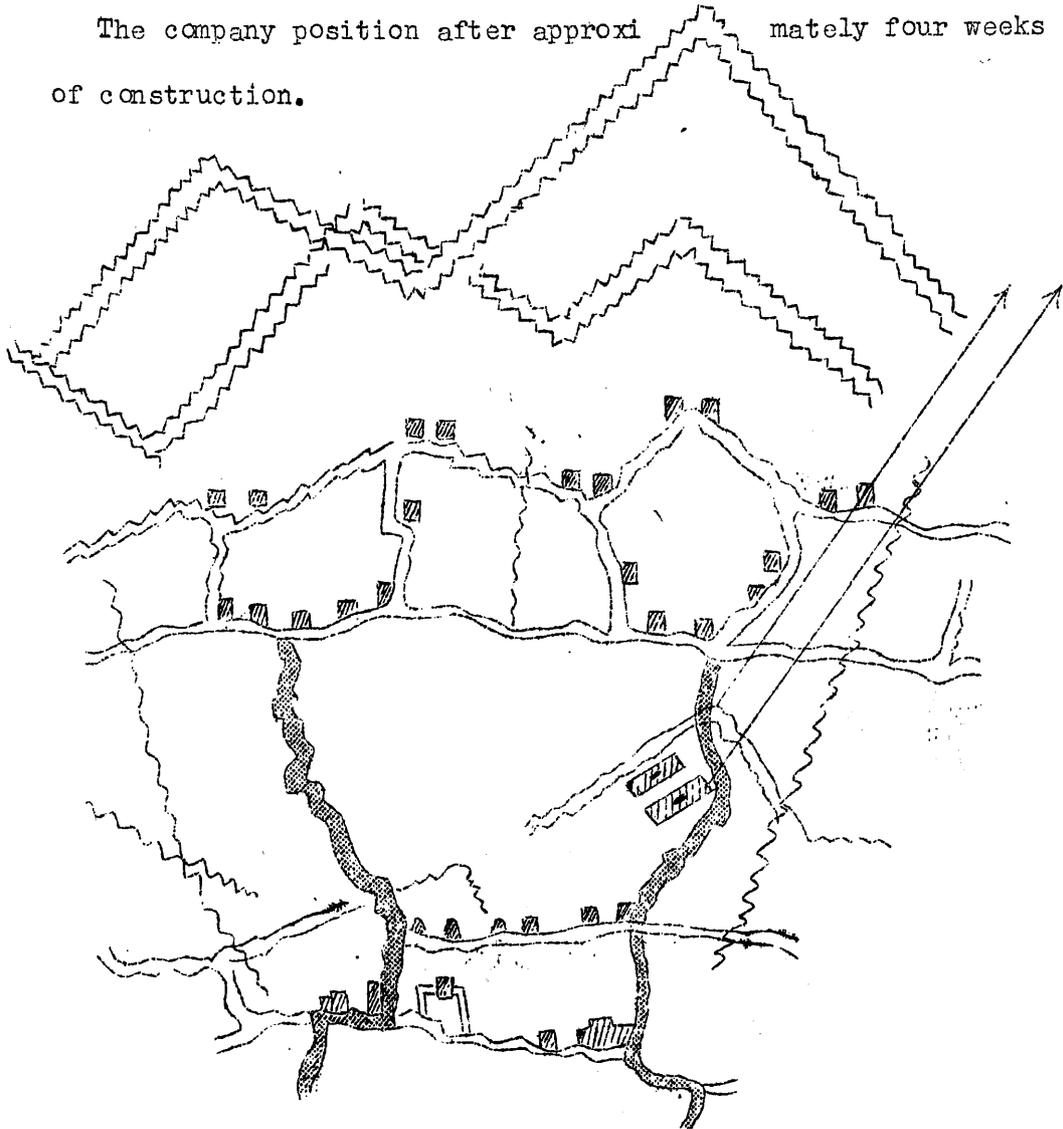


Note:

The squad positions will be in enlarged standing trenches. The communication trenches will be deep enough for crawling, and the shelters will be of light construction and accommodating six men. Only the machine gun shelters will resist 155mm howitzer fire. The wire entanglements in front of the first line will be 8 meters in depth.

Sketch "F"

The company position after approximately four weeks of construction.



Note:

 Communication trenches permitting the passage of two columns.

 Medium shelters.

197. Normal Work Required for Construction of Air Field

Phase of Construction	Condition of the land	no. of men	Necessary Equipment	Amount done in one day (8 hrs)	
Leveling the Ground	Level ground under cultivation	1	hoe or shovel	About 1000 sq. meters	
	Mulberry field after roots are dug	1	Same as above	2000 sq. meters	
	Grass land	1	hoe or shovel	1000 sq. meters	
	Grass land with mounds & embankments	1	Same as above	300 sq. meters	
Tamping	<i>Land under cultivation after mulberry, tea roots have been removed</i>	6	stake driver	1600 sq. meters	
		8	holt roller	3000 sq. meters	
	<i>Concreted land of sandy clay</i>	1	tamper	1000 sq. meters	
	<i>Mulberry field after the roots have been removed</i>		tractor	16000 sq. meters	
Clearing	Digging mulberry roots	1	Equipment, confiscated and carried	2-3 yrs growth 240 8-20 yrs growth 124	
		1	hoe and axe	2-3 yrs growth 600	
		1	Same as above	8-20 yrs growth 309	
	Digging Paulonia roots	1	Equipment, confiscated and carried	Large 36	
				Small 72	
	Pine	Digging roots	1	Hoe, mattock, saw, and rope	Large 4 Medium 6 Small 18
		Felling			10--30
	Cryptomeria	Digging roots	1	Same as above	10--15
		Felling	1		10--30
	Variety of trees	Digging roots	1	Same as above	18
		Felling	1		150
Tea	Digging roots	1	Mattock, sickle, and axe	5-20 yrs growth 84	
Excavation	<i>Soft soil (excavated amount)</i>	1	shovel	3.6 cu m	
	Medium soil	1	shovel and pick	3.6 cu m	
	Hard soil	1	Same as above	1.6 cu m	

Remark: This chart is taken from drill practice and field practice experiments conducted between the years 1921 and 1923.

## SECTION IV

## MATERIALS FOR FIELD FORTIFICATIONS

## 198. Materials for Fortification

Spider Wire Entanglement  
(100 meters long and 8 meters deep)

Type	Use	Class	Diameter	Length	Personnel	Weight	Remarks
Picket		Pole	.15	1.8- 2.5	200 (160)	1.7-2.4 Metric tons	Line space between pickets is 2.5 meters
Steel		No. 8				900 kg (678)	Including steel wire for the use of U-type clamp
Wire		No. 6				191 kg (42)	
Double Apron Wire Entanglement (100 meters long)							
Long Picket		Pole	.15	1.8- 2.5	40	650 kg	
Short Picket		Pole	Same	1.00	80	100 kg	
Steel  Wire	Oblique	No. 8				60 kg	Including steel wire for the use of U-type clamp
	Parallel	Barbed				100 kg	No. 14 spliced wire
	Fastening	No. 16				6 kg	Length of one fastening wire is 1.5 cm
Note: 72 kg of No. 8 wire is required in case it is used in place of barbed wire.							

198. (continued) Concertina Spiral Wire Entanglement (A) (100 meters long)

Name	Use	Type	Diameter	Length	Personnel	Weight (kg)	Remarks
Picket	To fix spiral wire	pole	.08	1.80	50	29 metric tons (green) 23 metric tons (dried)	Ratio of one picket to every 2 meters.
Screw Picket	Same	Long			50	138	Same
Steel Wire	Trunk Line	No. 6				200	Including pinning wire 30cm long.
	Same	No. 8				140	Same
	Same	Barbed				93	Spliced with (2) pieces wire No. 14.
	Feeder Line	No. 14				21.5	Including fixed spiral wire
	Same	No. 16				148	Same

Notes: 1. Use the same type of pickets for trunk line, foeder line, and fixed spiral wire.

2. When barbed wire is used for trunk line, approximately 12kg of No. 8 wire is necessary (to pin down and fasten the end of the spiral wire).

198. (continued) Concertina Spiral Wire Entanglements (B) (100m long)

Name	Use	Type	Diameter	Length	Men Required	Weight	Remarks
Picket	To fix spiral wire	pole.	0.08	1.80	50	0.29 Metric ton (green) 0.23 Metric ton (dried)	Ratio of 3 pickets to 2 meters
Screw type picket	Same	Long			Same	138 kg	Same
Steel Wire	Net	No. 8				350 kg	Includes wire for pinning
	Same	No. 10				110 kg	
	Same	Barbed wire				160 kg	Spliced with (2) pieces of No. 14 wires
	Splicing	No. 14				10 kg	Includes permanent spiral wire
	Same	No. 16				66 kg	Same

1. For spider wire, splicing wire, and permanent pickets, use only one type.

2. When No. 10 barbed wire is used for spider wire, approximately 13.5 kg of No. 8 wire is necessary (to pin down and fasten the end of spiral wire).

Ribard Spiral Wire Entanglements  
(10 Pieces of Wire Each 3 Meters Long)

Name	Use	Type	Diameter	Length	Personnel	Weight (kg)	Remarks
S t e e l  W i r e	trunk line	No. 6				56	Including wire for pinning
		No. 8				32	
	feeder line & diago- nal line	No. 12				16	
		No. 14				9.5	
	feeder line	barbed				18	For diagonal line it requires an additional 4.3 kg of No. 14
	perma- nent splic- ing	No. 16				1.32	
Wooden Picket	To fix ribard wire		.08	1.80	21	0.13 Metric ton 0.11 Metric ton	
Screw Picket		long				86.5	
Notes:	<p>1. One type of picket will be used for trunk line, for one oblique line, and for fixing ribard wires.</p> <p>2. Barbed wire will be spliced with two No. 14 wires.</p>						

198. (continued) Barbed Wire Entanglements (100 meters long)

Name	Use	Type	Diameter	Length	Personnel	Weight (kg)	Remarks	
Spider Wire	barbed wire	No. 6				84	Includes wire for pinning	
Steel Wire		same					80	Same
	Parallel & diagonal lines	No. 10				37		
		No. 12					28	
		Barbed					53	
	Binding & reinforcing	No. 16					2.9	

Notes:

1. One type of wire will be used for barbed wire, parallel, and diagonal wires.
2. Permanent pickets for wire entanglements are the same as concertina spiral wire entanglements.

Material Required for 10-Meter Abatis

T y p e	Number Required	R e m a r k s
Branches of Trees	35 - 50	To each meter of abatis 3.5 to 5 branches are required.
Steel Wire (No.14)	1.65 lb	
Sideboards	6	Length -- 1.5-2m Thickness -- about the size of one's arm
Hooked Pickets	12	

## 198. (continued) Machine Gun Emplacement Having a Medium Shelter Covering

Name	Use	Type	Metric Diameter (thickness)	Width (meter)	Length (meter)	Number	Weight	
							Green	Dried
Covering Material	(For entrance)	round	0.20		3.0 (2.6)	17 (2)	5.3 metric ton	4.3 metric ton
Supporting Material	Numbers in ( ) are for en- trance	round	0.20		1.4 (1.0)	2 (3)		
Pillar		square	0.20	0.20	1.44	4 (6)		
Foundation Material			0.20	0.20	1.8 (1.4)	2 (3)		
Connecting Material			0.04	0.08	1.6 (1.2)	2 (6)		
Frontal Covering		For covering		0.10-0.25	0.20	2.30		
Side Material	round		0.20		1.70	14		
Side Board	For entrance covering	square	0.03	0.20	1.20	56m long		
Sleepers		round, square	0.20	0.20	2.4-3.5	4		
Foundation Material	For loopholes	square	0.20	0.20	2.30	4		
Sleepers Used for Loop- holes					0.8-0.9	4		
Binding Materials: clamps, nails, wire, bolts						Few	Approx. 50	
Rail		60 lbs			2.00 5.50 4.00	14 70 170	32 metric ton	

198. (continued) Signal Station

Name	Use	Type	Thick- ness (meter)	Width (m)	Length (meter)	Number	Weight	
							Green	Dried
Covering Material		Round	0.15		2.30	8	0.51 metric ton	0.41 metric ton
Supporting Material					1.20	1		
Sleeper					1.20	2		
Pillar					2.00	4		
Rafter					0.10	2		
Revetment Board	benches	Board	0.03	0.20	1.20	4		
	sidewalls				1.20	16		
Shelf Board					0.90	1		
Desk Board					0.20	0.25		
Material for Desk leg		Square (round)	0.05	0.05	1.00	6		
Stake		Round	0.04		0.80	7		
Binding Materials: Clamps, nails, and wire						Few	Approx. 8	

## 198. (continued) Lightly Covered Observation Post

Name	Use	Type	Metric Diameter	Width (meters)	Length (meters)	Number	Weight (kg)	
							Green	Dried
Pillar		Round	0.10		2.00	4	0.67 metric ton	0.54 metric ton
Rafter					1.20	2		
Covering Material					2.00	18		
Supporting Material					0.80	1		
Sleeper					1.20	2		
Loophole Box		Board	0.03	0.20	0.80	10		
Loophole Box, Sleeper		Round	0.10		0.80	2		
Stake	seat				0.80	1		
Door Board		Board	0.05	0.20	1.30	5		
Frame	for door board	(round) Square	0.10	0.00	1.00	2		
Covering Purpose		(round) Square	0.03	0.10	1.00	12		
					2.00	5		
Support Pillar	for covering	Round	0.10		1.50	2		
Binding Materials -- Clamps, nails, and wire						Few	Approx. 7	

## 198. (continued) Weights and Measurements of Various Types of Wire

Type of Wire	Diameter (mm)	Weight per 100 m	
		Kan (3.75 kg)	Kilograms
No. 6 Galvanized wire	5.150	4.544	14.040
No. 8 " "	4.060	2.319	9.820
No. 11 " "	2.950	1.326	5.160
No. 12 " "	<u>2.760</u>	<u>1.248</u>	<u>4.680</u>
No. 14 " "	2.030	<u>0.720</u>	2.700
No. 15 Steel wire	<u>1.820</u>	<u>0.648</u>	<u>2.430</u>
No. 16 Galvanized wire	<u>1.630</u>	0.421	1.580
No. 16 Copper coated Steel wire	1.630	0.453	1.700
No. 19 Galvanized wire	<u>1.060</u>	<u>0.134</u>	<u>0.690</u>
No. 20 Copper wire	0.914	0.156	0.583
No. 30 Copper wire	0.315	0.012	0.070

Note: The underlined numbers are B.W.G. and others are S.G.W.

The unit of wire gauge is in millimeter.

198. (continued) Data on Field Sand Bag Revetment

Length \ Height	Length				Sketch
	0.25	0.50	0.75	1.00	
1.50	10	20	30	40	
1.35	9	18	27	36	
1.20	8	16	24	32	
1.05	7	14	21	28	
0.90	6	12	18	24	
0.75	5	10	15	20	
0.60	4	8	12	16	
0.45	3	6	9	12	
0.30	2	4	6	8	
0.15	1	2	3	4	

Height = height to be covered.  
 Length = length to be covered.  
 Both are in meters.

The figures in the last four columns denote the number of sand bags to be used.

## SECTION V

### EXPLOSIVES AND DEMOLITION

#### 199. Explosive Materials and Equipment

##### Explosives

###### Yellow Powder

Round shape - 100 grams

Cubic shape - 200 grams

Petard - 1000 grams

###### Trinitrotoluene (T.N.T.)

The shape and weight of this explosive is similar to that of the yellow powder.

###### Black Powder - Potassium Nitrate

Round shape - 95 grams

Cubic shape - 190 grams

##### Equipment

###### Slow burning fuze

combustion velocity - approximately 1 cm per sec

###### Rapid burning fuze

combustion velocity - approximately 100 m per sec

###### Primer

combustion velocity - approximately 5300 m per sec

###### Platinum wire electric cap

###### Electric Exploder

(Large size: Used by Engineers and generally capable of a 30-fuze simultaneous detonation.)

Small size: Used by the Cavalry and generally capable of a 10-fuze simultaneous detonation.)

#### 200. Calculation Relative to the Amount of Powder to be Used

1. Use of yellow powder. (T.N.T. will be used similarly to the yellow powder but its amount will be 1.1 times greater).

##### A. Timber

Formula to calculate the amount of powder required when wrapping the explosive on a timber.

$$L = C \times D^2$$

L = Weight of powder (grams)

C = Coefficient of lumber-resistance

D = Diameter of a log or width of a balk (cm)

When planting the explosive within a tree, the amount of powder required will be 1/7 of the above.

The value of "C" resistance coefficient, varies according to the kind and size of timber as shown on following page:

Kind of Timber	Diameter	"C"
New, hard, or knotty	Approx. 30cm or less	1.3
	Approx. 30cm or more	1.7
Ordinary	Approx. 30cm or less	1.0
	Approx. 30cm or more	1.3

The blasting of timber does not vary according to the kind and size, and the value of "C" is always 1.0. Experimental results show that timber with a diameter less than 40cm can be cut quicker with an axe and saw than with a blasting charge.

#### B. Iron

Formula to calculate the amount of powder charge necessary for demolition.

$$L = 25 F$$

$$L = \text{Weight of powder (grams)}$$

$$F = \text{Cross section area of iron material (square centimeter)}$$

Formula to calculate the number of cubic shape yellow powder to be used for demolition.

$$\text{Number Required} = \frac{25 F}{200} = \frac{F}{8}$$

Note: When demolition charges are placed in groups, the powder content calculated from the above formula will be increased by 1/3.

#### C. Masonry, rock, and soil

Formula to calculate the amount of powder required when demolition charges are placed in groups.

$$L = 3W \times c \times d$$

$$L = \text{Amount of powder (kg)}$$

$$W = \text{Radius of effective zone (m)}$$

$$c = \text{Resistance coefficient of material}$$

$$d = \text{Tamping coefficient}$$

Formula to calculate the amount of powder required when demolition charges are placed in alignment.

$$L = 2W \times c \times d$$

$$L = \text{The amount of powder for each meter (kg)}$$

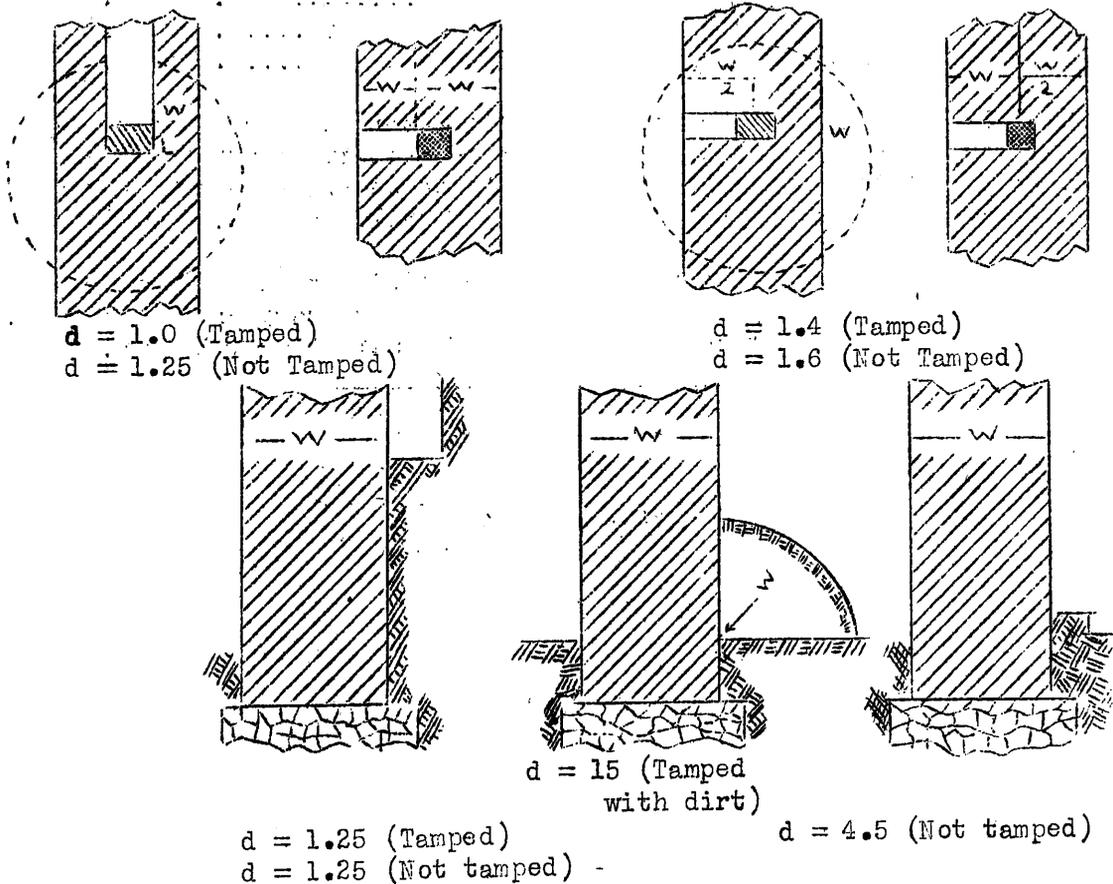
(As large amount of powder is necessary, this is used only in case of emergency.)

Resistance Coefficient of Materials

Material	W (m)	C	
		No Reinforcement	With Reinforcement
Firmly built masonry structures or rocks	2 or more	3.0	9.0
	1.5 to 2	3.5	10.5
	.9 to 1.5	4.0	12.0
	.9 or less	5.0	15.0
Ordinary masonry structures, brittle rocks, solid clay, and frozen soil		3.0	
Other types of soil		0.7	

For heavily loaded masonry structures (piers, arches, etc.) multiply the above figures by 1.3.

The following indicates the tamping coefficient,  $d$ , which is a number relative to the position of the powder charge and the condition of tamping.



## 2. Use of Potassium Nitrate

Potassium Nitrate is generally used in the same manner as yellow powder. However, to compute the amount of Potassium Nitrate, multiply the calculated amount of yellow powder by the following coefficients:

For soil and lumber.....	1.2
For iron.....	1.4
For concrete.....	1.8

## 3. Use of black powder

The formula to calculate the amount of powder required to blast masonry, rocks, and soil when placing the demolition charges in groups is as follows:

$$L = 3W \times c \times d$$

L --	Amount of powder (kg)
W --	Radius of the effective zone (m)
c --	Resistance coefficient of materials
d --	Tamping coefficient

The resistance coefficients of materials are as follows:

Soil in proportion to its hardness.....	1.5 to 2.5
Hard clay and revetment.....	3.0
Ordinary masonry construction.....	3.5 to 5.0
Heavy large masonry, arches, and etc....	5.0 to 6.0
Rocks in proportion to its hardness.....	4.0 to 7.0

The tamping coefficient, d, must be determined accurately because there is a great relationship between the length of tamping and the nature of the material to be destroyed by the use of black powder as compared to the use of yellow powder.

Chart "A" indicates the tamping coefficients under various types of soil and lengths of tamping when ordinary charge is used. However, this chart can also be used for slight overcharges.

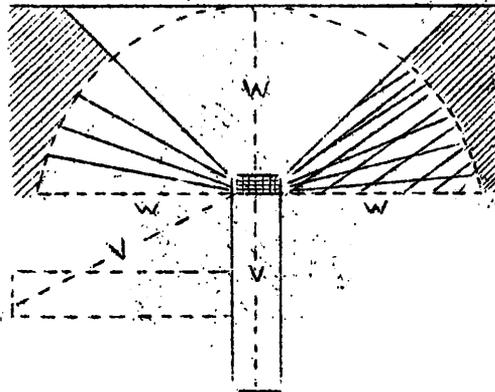


CHART A

Tamping Coefficient "d"	Length of Tamping		
	Rocks	Hard Soil	Sandy Soil
2.0	0.40 W	0.35 W	0.30 W
1.5	0.80 W	0.70 W	0.60 W
1.2	1.20 W	1.05 W	0.90 W
1.1	1.60 W	0.40 W	1.20 W
1.0	2.00 W	1.75 W	1.50 W

"A" in Chart "B" indicates the length of the minimum line of resistance.

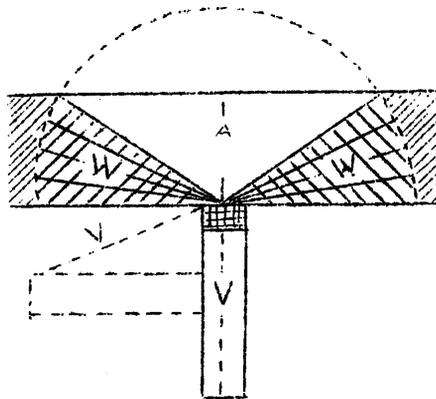


CHART B

Tamping Coefficient "d"	Length of Tamping		
	Rocks	Hard Soil	Sandy Soil
2.0	.50A	.40A	.40A
1.5	1.00A	.80A	.70A
1.2	1.50A	1.20A	1.00A
1.1	2.00A	1.60A	1.30A
1.0	2.50A	2.00A	1.60A

It is an exception that the minimum line of resistance is less than  $\frac{1}{2}$  of "W." Even though the amount of powder charge increases in proportion, "W" should not exceed more than three times A. The amount of powder required in the percussion type powder charge will be roughly 1/5 to 1/6 of the ordinary powder charge. The radius of the zone of concussion from a given amount of powder will be approximately 1.75 W. Fundamentally, tamping must be carried out in the setting of percussion type powder and the length of tamping should equal at least the radius of the zone of concussion.

## CHAPTER 10

### MILITARY MAPS, LANDSCAPE SKETCHES, MILITARY SYMBOLS

	Paragraphs
SECTION I. General Precautions to be taken in	
Drawing a Military Map-----	201
II. Detailed Precautions to be Taken in	
Drawing Various Types of Military Maps-	202-217
III. Landscape Sketches-----	218-220
IV. Military Symbols-----	221-225
V. Miscellaneous-----	226-228

#### SECTION I

##### GENERAL PRECAUTIONS TO BE TAKEN IN DRAWING A MILITARY MAP

201. In drawing a military map, Field Service Regulations No. 65 (Preparatory Topography) should be conformed with; the following are listed as references for beginners.

1. The main object of a military map is to indicate clearly the disposition of troops. Therefore, importance is placed upon military symbols and the accuracy of their usage. They should be colored heavily especially when they are small and significant. If by sketching terrain features, the military symbols are made indistinct, it is advisable to omit all terrain features except those that are important. However, symbols indicating the positions of troops must never be omitted, even in cases where it is necessary to record them in great detail. These precautions must be especially complied with when drawing maps of the area in which the unit is now located.
2. In sketching terrain features, it is advisable to use the symbols of the original sketch as much as possible; when the symbols are complicated, however, such as for railroads (-----), it is better to use the symbol (++++++) instead.
3. Streams, ponds, lakes, etc. are colored blue to make them conspicuous.
4. The location of the senior commander must definitely be shown on the map as it is vital to all troops. Besides this, it is a common practice to record the locations of immediate subordinate commanders only. The symbols used to designate the locations will be the various headquarters symbols.
5. When the artillery observation post is close to the gun positions, it is permissible to omit its location on the map, but when it is far from the gun positions, its location should be clearly indicated.

6. If the routes to be used in taking artillery positions (or the routes of advance) are recognized as essential, they should be indicated by dotted lines.
7. Notes and remarks should be minimized as much as possible by indicating them within the sketch itself.
8. The title of the military map will be written horizontally (from right to left) on the upper center of the map. The date and time will be written below the title in smaller print.
9. The position and situation of the troops indicated on the military map are those of a particular time. Therefore, when it is necessary to indicate the position of troops at a different time on the same map, it would be required to distinguish them by using the symbol (  ) to mean a certain time and the the symbol (  ) to mean some other time. Also, when it is necessary to indicate the future movements of a unit, the direction of that movement will be indicated by a dotted arrow with necessary notes.
10. To indicate clearly the direction of the main attack, an arrow will be drawn in the direction of the attack.
11. The enemy situation should be indicated on the map together with the estimate of the enemy situation to facilitate the comprehension of the map and to make clear the plan and the reasons that are recorded on the map.
12. Titles, directions, scales, and names are easily forgotten; therefore, these should be recorded first. This is especially true when drawing tactical maps of the area concerned.

## SECTION II

### DETAILED PRECAUTIONS TO BE TAKEN IN DRAWING VARIOUS TYPES OF MILITARY MAPS

#### 202. General

There are many types of military maps used in the study of tactics. To enumerate all of them together with the precautions to be taken in drawing them will be not only impossible but unnecessary.

If a given problem must be solved by the use of a military map, the situation must be studied and proved beyond all doubt and then recorded on the map. Special matters to be shown on the map will be indicated by the officer requesting the map. The following paragraphs illustrate cases where precautions need to be taken in drawing military maps in order to explain the essential matters which usually arise in the study of tactics.

### 203. Map Showing Order of March.

1. The route of advance of a marching column will be oriented to the original sketch, and will indicate briefly the terrain features along the road.
2. The head and rear positions of such important units as the advance guard reserves or the column must be clearly indicated, so as to be distinguishable at a glance.
3. The road space of all units in the column, and the intervals between the various echelons, the advance party, the advance guard reserve, and the main body should be indicated as much as possible to scale.
4. If necessity arises, the road space of the echelons and the intervals between them will be clearly and simply indicated.
5. Indicate clearly the distribution of units for march, and the order of march of the advance party, the advance guard reserve, the flank guards, and the main body of these units.
6. These items are to be recorded in case there is ample time. When time is limited as in the case of a hastily improvised map, it is permissible to omit the detailed positions and distributions of subordinate units.
7. The title of the map will be "Map showing Order of March of X Unit (1st Division, X Detachment, etc.)" It is vital that the time be clearly indicated.

### 204. Map Showing Billeting Disposition.

1. The map showing the disposition of billets of the X unit in vicinity of X ordinarily includes the disposition of the outposts.
2. In the map showing the disposition of billets for the main body of the X unit in vicinity of X, the outpost is ordinarily indicated merely by a line or entirely omitted.
3. In the map showing the disposition of the outposts of the X unit in vicinity of X, the disposition of only the outpost is indicated. The billeting disposition of the advance guard reserves and the main body are omitted except that they are indicated merely by a line bounding the area occupied and designating the unit in it or beside it, thereby clarifying their relation to the outpost.
4. The billeting (bivouac) area and the various zones in the area should be indicated clearly.

5. If two billeting (bivouac) areas are adjacent to each other, the boundary between the two should be clearly indicated.
6. The extent to which the interior zone of a billeting (bivouac) area should be indicated depends on the size and the purpose of the unit. At times only the units that are to be in the billeting (bivouac) area are indicated. There are occasions when the billeting zones are segregated and indicated according to the branch of service of the units. However, when indications are to be made in detail, the zones for the infantry and the engineers are ordinarily distributed by battalions and others by companies.
7. Emergency assembly areas, horse picket lines, wagon parks, and gun parks, are indicated if deemed necessary.
8. In case emergency assembly areas are established, they should be indicated. The units designated to assemble in this area should also be indicated.
9. The disposition of local security of the billeting area should ordinarily be indicated.
10. In the disposition of outposts, the positions, from that of the outpost reserve to the patrol and sentry must be indicated in detail. The outpost line of resistance must be indicated by a continuous line in blue and noted as "The Outpost Line of Resistance."

#### 205. Map Showing Development of Troops.

The map indicates the situation during the development of troops, that is, the assembly positions and conditions of the security detachment and the main force.

1. The quality of a map depends upon the instructions given, the amount of time available, and the purpose of its use.
2. It is generally sufficient to indicate on the map the items which should be contained in the orders for development.
3. The known enemy situation (the hostile position, the advance units, etc.) and the probable direction of the enemy attack should be indicated, the latter by a red arrow.
4. The map showing the situation of X Unit during its development should be titled "Map Showing Situation of X Unit during Development."
5. At times it is preferable to indicate the course leading to development.

## 206. Map Showing Deployment for Attack.

The map indicates the condition of deployment for an attack at a certain time. Whether that certain time should be shown or not is usually indicated.

1. The indication of the enemy situation during a meeting engagement should be based on actually acquired information of the enemy and on the manner he deploys for an attack.
2. In a meeting engagement, it is necessary to indicate clearly the line of battle and whether the attack will be piecemeal or coordinated.
3. To indicate the enemy situation when attacking an organized position, the probable and actual situation will be shown on the map. Therefore, it is well to indicate the probable enemy position on the map based upon estimate and to specify it as such.

## 207. Map Showing Distribution of Troops for Defense.

With the assumption that the enemy will attack, it is the usual practice to indicate the time of arrival of each unit at a prearranged position.

1. When a counter offensive is planned, its direction should be indicated by an arrow.
2. In a map showing the defensive position of a unit (such as a wing unit of a division, or a certain regiment) it is advisable to indicate the direction of an anticipated hostile attack and differentiate between the direction of the main hostile attack and a portion of that attack.
3. The expected direction of the main hostile attack and an outline of his artillery positions and infantry lines will be indicated. When the main hostile attack is expected in two directions, it is advisable to record both of them, but the more important should be clearly specified.
4. It is advisable to indicate clearly the division of sectors and the boundaries of the zones of action.

## 208. Map Showing Terrain Estimate.

The requirements and the lines of action for the terrain estimate for an attack or a defense should be indicated on the map.

1. For instructions relative to the requirements, reasons, and distribution of troops, refer to par. 1(d) and (2), Section I, Chapter 1, "Composition of Estimates and Decisions."

2. It is not necessary to indicate every disposition of troops in detail; however, if the terrain feature is such that the relocation of troops must be clarified, the disposition must be indicated clearly on the map.
3. The line of deployment must be indicated on the map showing the plan of attack.
4. On the map showing the plan of defense, the sectors, the strength, and the main line of resistance must be indicated; and if necessary, the combat instructions and the direction of the counter offensive should be included.
5. The strength and positions of the artillery and reserves must be indicated on both attack and defense plans.
6. It is not necessary to record the matters relating to communications, supply and sanitation.

#### 209. Map Showing Estimate of a Position.

Although there are slight basic differences between the terrain and position estimates, it is generally preferable to base our decision concerning employment of an organized position upon the terrain estimate. The position estimate must be recorded in greater detail than the terrain estimate, but such matters as the employment of units and the movements of companies, platoons, and squads will be recorded only in case of necessity. Matters relative to installations, distribution of troops (front line troops and local reserves) will be indicated, while those relative to the rear echelon and artillery will be recorded only if the situation requires them.

#### 210. Map Showing the Disposition for March, Attack, Etc.

On maps such as those showing the disposition of troops for a Division march or attack, the items to be recorded are mainly the division order of march, the disposition of troops for attack, and the missions of the various subordinate units.

#### 211. Map Showing Various Types of Plans.

On maps such as those showing a plan of attack or a plan for counter offensive, besides the symbols indicating the plan, the decision and instructions (if any) will be included.

#### 212. Map Showing the Distribution (Occupation of Positions) of Security Detachments (Advance Guard, Rear Guard, Covering Force, Covering Force of Bridging Material Company, etc.)

On maps of this type, it is imperative to indicate the liaison

with the main force by showing the position of the main force and the direction of advance. In case of the covering force of the Bridging Material Company, the location of bridge construction should be indicated.

#### 213. Map Showing Occupation of Artillery Positions.

On maps of this type, the enemy line and his probable artillery position, the direction of both friendly and hostile attack, and our front line will be shown. The main direction of fire and the zone of fire will be clarified; the positions of all unit commanders, observation posts, and ammunition trains, the routes leading to forward positions, the routes of advance, and if necessary, the means of concealment, the position of artillery patrol, and the communications net will be indicated. When a change of position is anticipated, the route to be taken to occupy that position and the time of the movement will be noted.

#### 214. Map Showing Artillery Preparation.

On maps of this type, the type of gun, the number of batteries indicated by such symbols as A3 (three batteries of Field Artillery) and BA2 (two batteries of Mountain Artillery), and the area to be **covered by** fire will ordinarily be indicated, together with the purpose of firing, such as neutralization fire or destruction fire.

Furthermore, the artillery preparation will be differentiated according to logical sequence (for example, the artillery preparation delivered during the phase prior to the advance of the Infantry from its line of departure to attack, or that delivered thereafter until the preparation for assault).

Note: Examples of three types of maps are illustrated in paragraphs 215, 216 and 217 on pages 282, 283 and 284 respectively

### SECTION III

#### LANDSCAPE SKETCHES

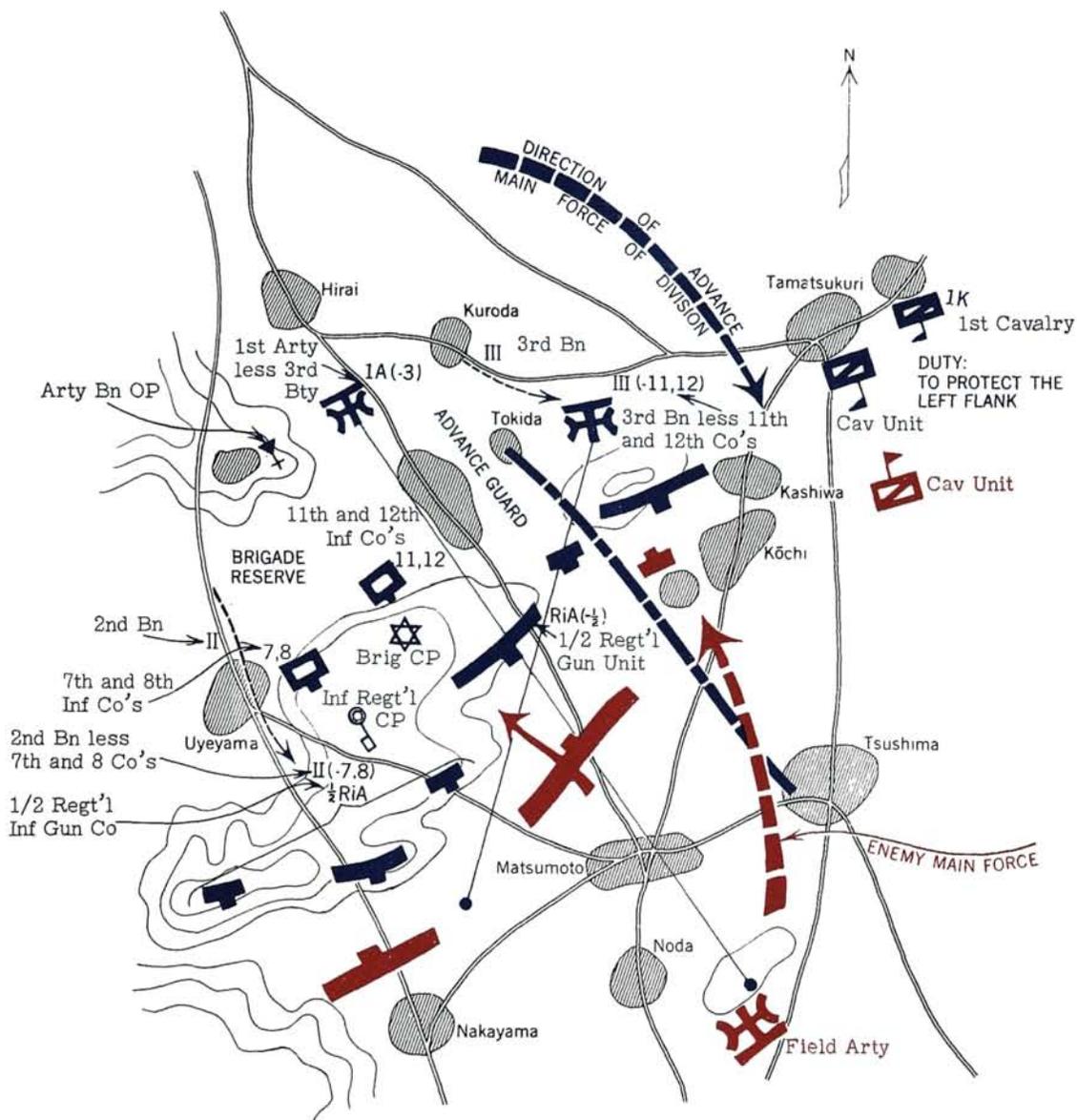
218. Landscape Sketch of the Line of Hills Northeast of Ikujima Fortifications, Looking from the Hill East of Goka-mura (Village).  
(See page 285)

219. Landscape Sketch of the Enemy Position in the Vicinity of Shiratori-mura (Village), Looking from the Hill East of Togen.  
(See page 286)

220. Landscape Sketch Showing the Field of Fire of the Field Artillery Battery.  
(See page 287)



MAP SHOWING DISTRIBUTION OF THE ADVANCE GUARD OF THE 1ST DIVISION  
IN THE VICINITY OF KOYAMA AS OF 0930, MAY 13



Mission:

The Advance Guard will occupy the area between the hill south of Uyeyama and the hill west of Kashiwa to cover the deployment of the division.

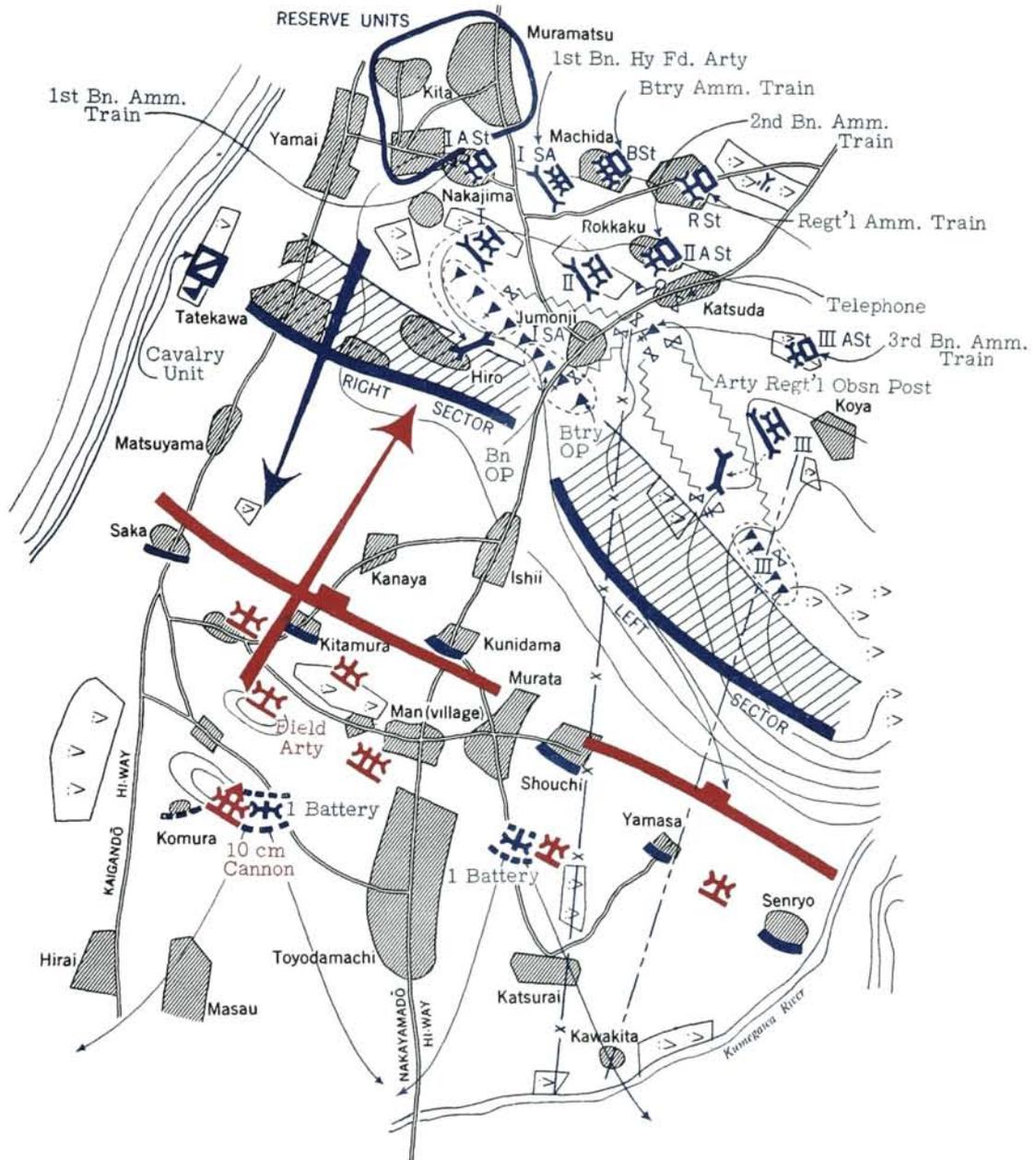
Note:

Front line troops will perform the necessary construction work within the time allotted.

Distribution shall vary according to the purpose of the work.

OCCUPIED POSITIONS AND DISTRIBUTION OF FIRE  
OF THE 1ST DIVISION FIELD ARTILLERY IN THE VICINITY OF TOYODA

FIGURE XVII



DISTRIBUTION OF ARTY. FIRE

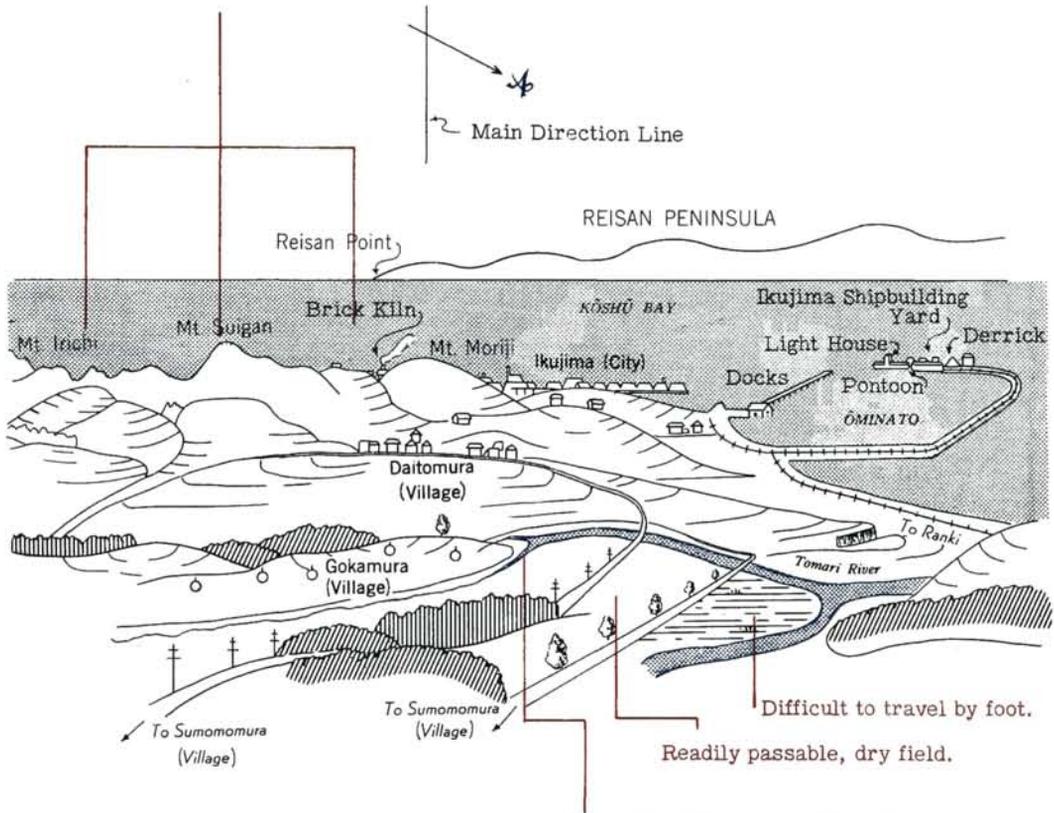
PURPOSE	ZONE	STRENGTH
Hinder Hostile Approach	No. of Nakayama Rds	1-F.A. Btry
	So. of " "	1-F.A. Btry
Hinder Hostile Attack Preparation	No. of " "	3-F.A. Btry
	So. of " "	5-F.A. Btry
Support of Security Position	No. of " "	2-F.A. Btry
	So. of " "	2-F.A. Btry
Check Hostile Advance	Right Sector	7-F.A. Btry, 1-H.F.A.
	Left Sector	2-F.A. Btry Btry
Support of Counter-offensive	Counter btry	3-F.A. Btry, 1-H.F.A.
	Right Sector	5-F.A. Btry Btry
	Left Sector	1-F.A. Btry

SECTORS:

3rd Bn.--So. of line connecting Koya, Yamasa & Kawakita.  
1st & 2nd Bn.--So. of line connecting southern Katsuda, northern Shouchi & northern Katsurai

LANDSCAPE SKETCH OF  
THE LINE OF HILLS NORTHEAST OF THE IKUJIMA FORTIFICATIONS

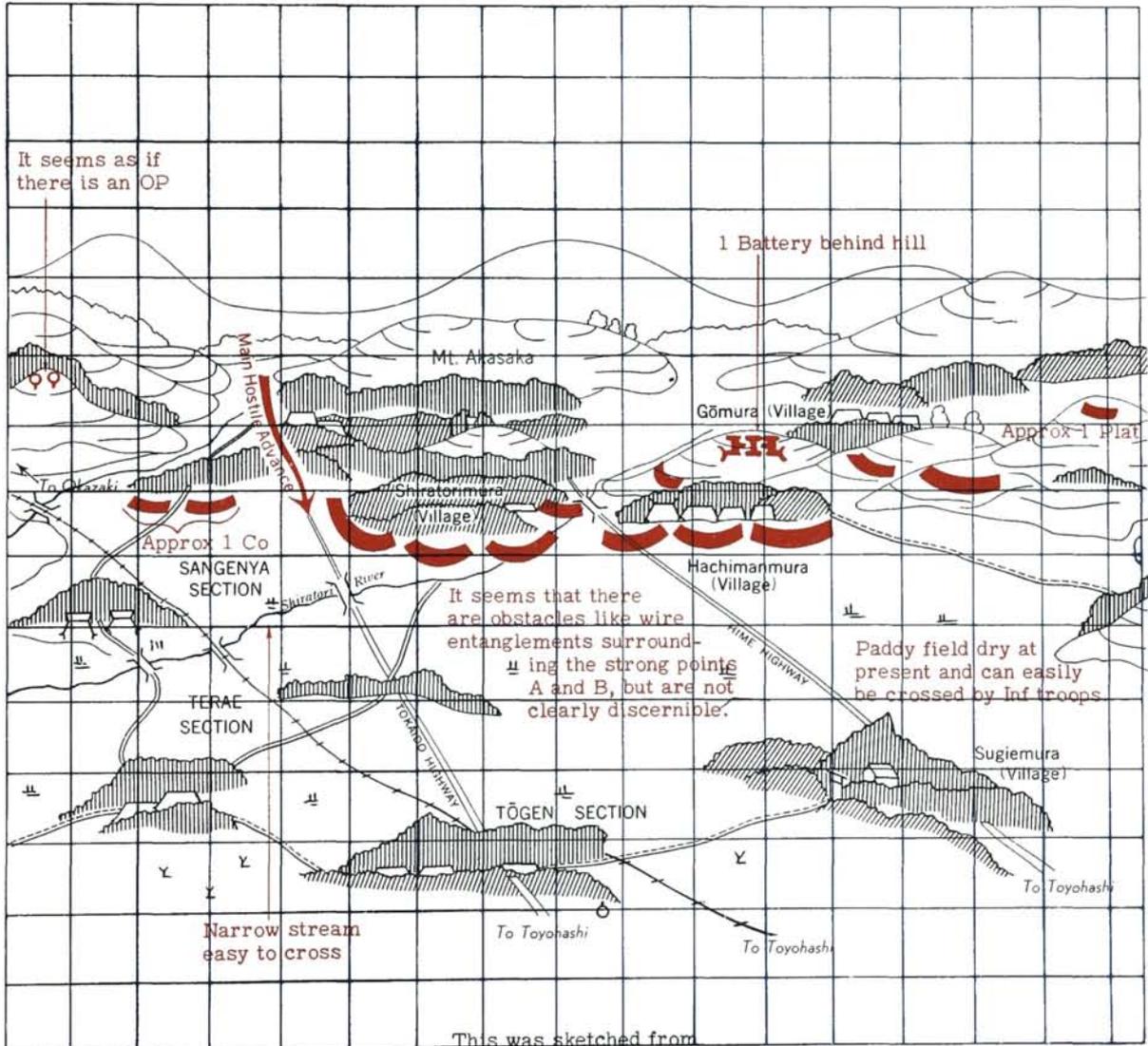
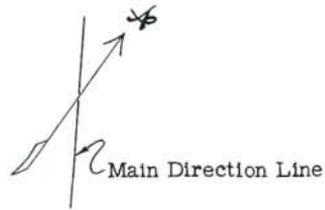
This line of hills in general is formed by granite with sharp inclines and has many cliffs. The hilltops are covered with pine trees approximately 2-3 meters tall.



Sketch drawn from a hill 230 meters high, east of Gakamura

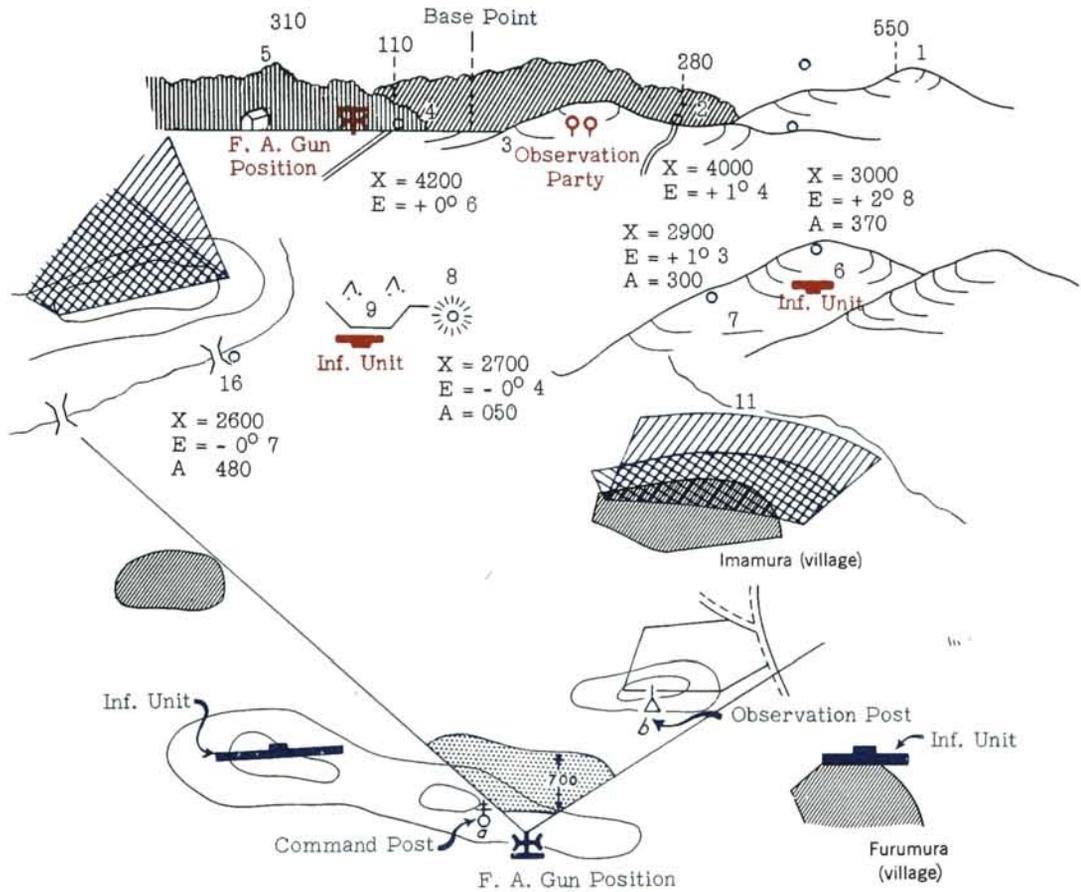
The width of the stream from this point down is about 30 meters; the depth approximately 20-30 centimeters; with sand bottom. Both banks are level and fording is possible.

LANDSCAPE SKETCH OF THE ENEMY POSITION IN THE VICINITY OF SHIRATORI-MURA (VILLAGE)



This was sketched from the Hachimanji (shrine) Hill, east of Tōgen (section).

LANDSCAPE SKETCH SHOWING  
THE FIELDS OF FIRE OF A FIELD ARTILLERY BATTERY



Note:

1. The fire control map for a Field Artillery Battery is drawn from a simple panoramic or military sketch and sometimes from a combination of both of them.

2. In this sketch the essential parts of the fields of fire are indicated by a military sketch, and the areas of expected enemy approach and terrain features in the vicinity of the enemy positions are shown by means of a panoramic sketch.

- 3. A - azimuth
- E - angle of site
- X - measured range

- dead space
- area invisible from a
- area invisible from b

## SECTION IV

### MILITARY SYMBOLS

Revised August 13, 1924  
Army Order No. 28

#### 221. General Rules

1. Conventional symbols to indicate opposing forces on maps are usually colored -- the enemy in red and Japanese forces in indigo.
2. The symbols in this book are to be selected to fit the circumstances, and they should be used to indicate concisely the intentions of the user. Thus, parts of symbols may be omitted or various symbols combined. Notations or special symbols may be added when necessary.
3. For the Imperial Guard Division, the letter "G" is attached in front of the symbol. For a separate unit, that is, an independent unit which is not organically a part of a larger unit, the letter "S" is attached at the end of the symbol. For the Second Reserve, a single line        is added below the symbol, and for the National Army a double line
4. To indicate the boundaries of an area or the limits of a specific sector, suitable lines are used. To indicate the field of fire, the main point of attack, and the direction of troop movements, symbols such as the arrow (  $\longrightarrow$  ) are used.
5. To indicate the unit number of an organization, Roman numerals are used for battalions of a regiment only. Arabic numerals are used for all other units; for example 2i.18P indicates the 2nd Infantry and the 18th Engineers together.
6. The number of units, rifles, artillery pieces, airplanes, etc. is indicated within parentheses. (Notations and abbreviated words are added if necessary.)

i	( 五 大 )	--	Five infantry battalions
K	( 四 中 )	--	Four cavalry troops
A	( 三 大 )	--	Three artillery battalions
P	( 一 小 )	--	One engineer platoon
↑	( 2 )	--	Two machine guns
⊕	( 2 )	--	Two field artillery pieces
✈	( 8 )	--	Eight airplanes

7. When it is necessary to indicate the unit numbers of higher (parent) units an oblique line is used to separate the lower from the higher unit. The former is placed to the left and the latter to the right of the line. For example, the third battalion of the second infantry regiment is III/2i.

8. Platoons and squads are usually shown as a fraction of a company. For example, one squad of the second troop of the 5th Cavalry (Regiment) is ~~XXXX~~

9. If one or more elements of a unit are missing, those missing may be written with a minus sign in parentheses. Thus, the 2nd Infantry (Regiment) less the 8th and 12th companies is written 2i(-8.12).

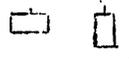
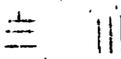
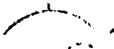
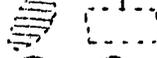
222. Symbols used for Field Operations

1. All arms and services.

Abbreviation	Symbol	Equivalent
		Grand Imperial Headquarters
		General Army Headquarters
		Army Group Headquarters
A		Army
		Army Headquarters
C		Corps
		Corps Headquarters
D		Division
		Division Headquarters
B		Brigade
R		Regiment
		Company (battery, troop) Commanding Officer
		Commissioned Officer
		Non-commissioned Officer
		Privates
		Mass Formation of Units
MG		Machine Gun Unit (Company)
		Machine Gun

		Light Machine Gun
LM		Light Trench Mortar
SM		Heavy Trench Mortar
		Grenade Thrower
TK		Tanks

## 2. Infantry

Abbreviation	Symbol	Equivalent
i.		Infantry
		Infantry Brigade Headquarters
		Infantry Regimental Headquarters
		Infantry Battalion Headquarters
		Infantry Units
		Assembly Formation of Infantry Battalion
		Assembly Formation of Infantry Company
		Deployed (during approach march) Infantry Company
		Example of a Platoon in deployment ( ⊥ indicate rifle squads
		Example of a Platoon building up a firing line ( ↑ indicate light machine gun squads
iA		Infantry Gun Unit
		Infantry Cannon
		Infantry Mortar
iTL		Infantry Communication Section
		Firing Line or Front Line
		Rear Echelons
		Occupied Area

### 3. Cavalry

Abbreviation	Symbol	Equivalent
K		Cavalry
k.k		Cavalry Group Cavalry Group Headquarters
KB		Cavalry Brigade Cavalry Brigade Headquarters Cavalry Regimental (Squadron) Hq.
		Mounted Deployment Formation
		Cavalry Unit
		Mass Formation of Cavalry Regiment
		Mass Formation of Cavalry Troop
		Dismounted Skirmishers, Dismounted Unit, and Horses (being held)
KTL		Cavalry Communication Section

### 4. Artillery

Abbreviation	Symbol	Equivalent
A		Field Artillery
Ka		Horse Artillery
BA		Mountain or Pack Artillery
SA		Heavy Field Artillery
ST		Ammunition Train
		Heavy Field Artillery Brigade Hq.
		Field Artillery Regimental Hq.
		Field Artillery Battalion Hq.

	Field Artillery Unit	
	Field Artillery Gun Line	
	Formation of Field Artillery Ammunition Train	
	Observation Detail (Platoon)	
	Brigade ) Regiment ) Battalion ) Battery )	Observation Posts  If necessary, line of guns and O.P. will be connected by dotted line. Line of guns will be indicated by dotted line. Auxiliary Observation Post will be indicated by an unshaded triangle.

Plotting Station

The Horse Artillery, Mountain Artillery and Heavy Field Artillery will be indicated by and respectively instead of . In special instances where types of guns must be distinguished, cannon and howitzer will be indicated by and respectively.

### 5. Engineers

Abbreviation	Symbol	Equivalent
P		Engineers
		Engineer Battalion Headquarters
		Engineer Unit

Infantry symbols will be used for other designations.

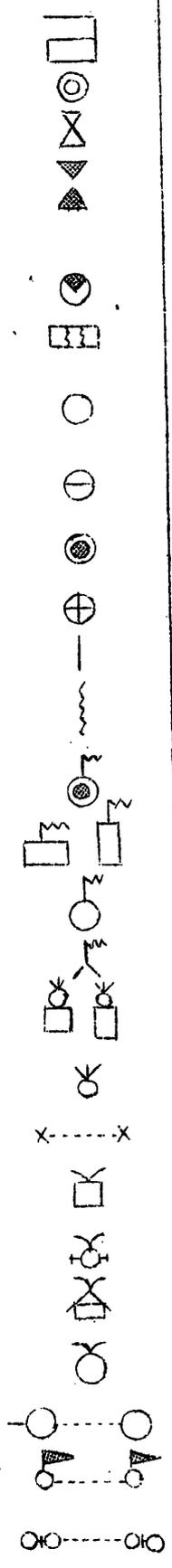
### 6. Communication, Searchlight.

Abbreviation	Symbol	Equivalent
		Field Telegraph Unit Headquarters
TL		Field Telegraph Unit
DTL		Communication Unit (Air Service Signal Unit will be indicated by the letters FTL.)

DTL

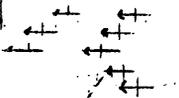
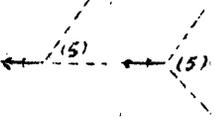
SW

PT



- Telegraph Station
- Telephone Station
- Telephono Instrument
- Bell System (whenever distinction is necessary)
- Telephone Switchboard
- Transformer
- Resonator (Tolographic instrument for printing a message on tape)
- Multiplex Resonator
- Automatic Resonator
- Undulator
- Wire line
- Insulated or submerged wire (whon distinction is necessary)
- Radio Unit Hq.
- Radio Unit
- Radio Station (mobile) } <sup>Add > to indicate</sup> air-ground radio communication
- Radio Station (fixed) } For Example:
- Field Searchlight Unit
- Searchlight Projector
- Visual Communication Post
- Carrier Pigeon Unit
- Pigeon Loft (mobile)
- Pigeon Loft (fixed)
- Pigeon Post
- Relay Post (Dismounted)
- Relay Post (Mounted)
- Relay Post (Motorized)

# 7. Aviation and Air Defense

Abbreviation	Symbol	Equivalent
		Staff Air Officer
		Air Regimental Commander
		Air Group Commander
FB		Air Unit
		Two-seated observation plane
		Observation, Fighter, Light Bomber, Heavy Bomber (respectively). Other types are indicated by similar signs.
		
		
		
		Formation of Aircraft (Formation of 6 heavy multi-seated bombers at an altitude of 3,000 meters) By leaving off the number of planes, single planes can be indicated.
		Aircraft (top view)  (Five single-seater fighters in formation)
		Aircraft (side view)  Used chiefly in maps pertaining to aerial combat; the above notes apply here.
		Airdrome Landing Field Possible Landing Area
		
		
		Airship
		Balloon Corps Headquarters
FB		Balloon Corps
		Balloon point of Ascension
		Antiaircraft Lookout Post

AA



Antiaircraft Machine Gun  
 Mobile Antiaircraft Unit  
 Fixed Antiaircraft Unit  
 Fixed Antiaircraft Headquarters  
 Aircraft Sound Detector  
 Searchlight

8. Supply and Transport

Abbrevi-  
 tion

Symbol

Equivalent

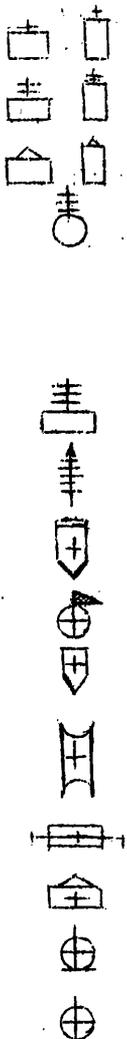
BK

T

FL

FD

S



Combat Train  
 Field Train  
 Bridging Material Company  
 Transport Battalion Headquarters  
 Transport ( To indicate the loading  
 classification: Pr is used  
 for Provisions and Forage,  
 and IM and AM for ammunition)  
 Transport in Assembly  
 Transport in March Formation  
 Field Hospital ( Use ^ over  
 the symbol  
 Division Veterinary Depot ( when indicat-  
 ing that it  
 Medical Corps ( has been es-  
 tablished.)  
 Medical Corps Litter Company  
 Medical Corps Ambulance Company  
 Dressing Station  
 Veterinary Depot  
 Veterinary First Aid Station

## 9. Security and Billeting

Abbreviation	Symbol	Equivalent
		Picket or outpost Company (Outpost Reserve)
		Sentry Group
		Single Sentry or Double Sentry
		Scout Patrol with NCO
		Lookout; Observation party
		(a) To indicate a billeting zone, draw heavy line around area and write serial number of unit inside or outside.
		(b) Draw the village bivouac as a rectangle or polygon, to include villages and fields. The serial number of the unit is indicated inside or outside the area marked.
		(c) To indicate a bivouac area, a suitable rectangle is drawn (the unit front is indicated by a thick line) and the serial number of a unit is written inside or outside of the rectangle.
		(d) The guard detachments of the billeting bivouac areas as well as unit observation groups, will be indicated in accordance with the relative importance of the outpost.
		Alarm Post
		Grand Alarm Post
		Provision and Forage Distributing Point
		Ammunition Distributing Point
		Horse Watering Place



Horse Hitching Lines



Wagon Park



Artillery Park



Machine Gun Park



Automobile Park

10. Labor

Abbreviation

Symbol

Equivalent



Firing Trench (Sectors having  
Communication, (emplacements will  
trench (be shown with a  
(heavy line.



Light Machine Gun Emplacement



Heavy Machine Gun Emplacement



Light Trench Mortar Emplacement



Heavy Trench Mortar Emplacement



Infantry Cannon Emplacement



Infantry Mortar Emplacement



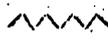
Field Artillery Emplacement  
(except heavy Field Artillery)



Flat trajectory (Heavy Field Artillery  
emplacements)



Steep trajectory (emplacements)



Low wire entanglement (Also used when there is  
(no need to differentiate  
(between high & low wire  
entanglements.



High wire entanglement



Abatis



Land Mine



Gap in artificial obstacles or cleared  
area in woods.



Road and bridge barrier

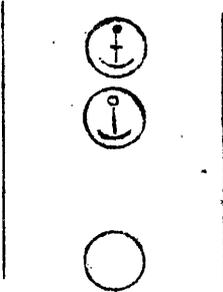


Defilade, dugout, shelter

A dummy trench will usually be drawn with a dotted line.

11. Railways, ships and related subjects.

Abbreviation	Symbol	Equivalent
E		Railway Unit
		Light Railway Handcar Unit
		Railway Inspection Department
		Headquarters of Railway Regt.
		Hq. of Railway Battalion
		Railway Materiel Park
		Railway
		Railway Control Office
		Railway Transport Office
		Hq. of Sea Transport
		Embarkation Office
		Army Transport (general)
		Troop Transport
		Munitions Transport
		Communication Ship
		Hospital Ship
		Patient Transport
		Repair Ship
		Ice Breaker
		Tanker
		Transport Fleet
		Sea Transport Base

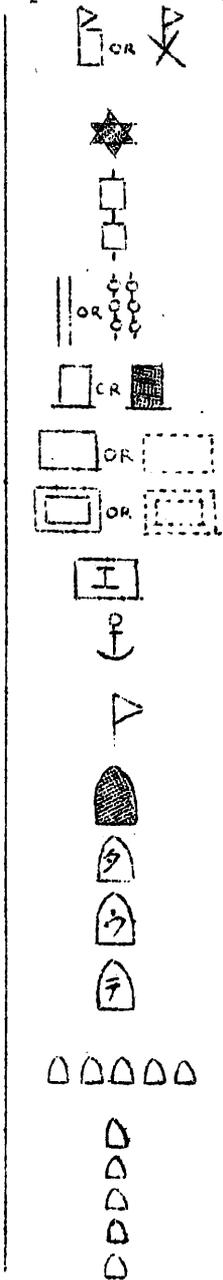


Secondary Sea Transport Base

Auxiliary Sea Transport Base

Transport Anchorage - The circle represents a diameter of approximately 400 meters, and the name of the vessel or the abbreviation for it will be written in the circle.

A rectangle or a polygon may be drawn to indicate the shape of a transport anchorage.



Buoy

Light Buoy (use color actually used as signal)

Boom or torpedo net

Mined area boundary line

Pier

Army Assembly Area

War Material Depot

Workshop for Embarkation Hq.

Ship Anchorage

Embarkation Hq. Signal (Signaling Station)

Small Steamboat

Flat Bottom Barge

Horse Barge

Messenger Boat

Small Barge Formation (Deployment)

Small Barge Formation (Single column)

12. Line of Communication and related subjects.

Abbreviation	Symbol	Equivalent
		Headquarters, Army Group Main Advance Depot (L of C)
		Hqs. Main Advance Depot
		Hqs. of a Post on L of C
		Unestablished L of C Hqs.
		Branch Hqs. of a Post on the Line of Communication
		Telegraph Unit Hqs. of L of C
		Telegraph Company of L of C
		Main Depot of Field Artillery
		Field Artillery Depot
		Field Artillery Branch Depot
		Field Engineers Main Depot
		Field Engineers Depot
		Field Engineers Branch Depot
		Main Field Air Depot
		Field Air Depot
		Field Air Branch Depot
		Hqs. of Motor Transport
		Motor Transport
		Tractor Transport
		Main Field Motor Transport Depot
		Field Motor Transport Depot
		Branch Motor Transport Depot



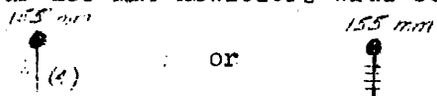
- Reserve Horse Depot (
- Veterinary Depot - L of C ( Use ^
- Hospital, L of C ( over the
- General Field Hospital ( symbol when
- Field Medical Supply Depot ( these are
- Casualty Clearing Station ( in opera-
- Infirmary ( tion
- Collecting Station
- General Field Warehouse
- Field Provision Depot
- Branch Field Provision Depot
- Field Warehouse
- Transport Company, L of C
- A Column of Local Transport carts
- Transport Escort
- Quartermaster Corps unit for land transport
- Horse Purchasing Section
- Field Construction Section
- Field Epidemic Prevention Section
- Material Collection Section
- Field Post Office
- Field Post Office Relay Station
- Field Post Office Direct Telephone Exchange

223. Symbols Used for Attack and Defense of a Fortification  
 (In addition to the following symbols shown above in the section on field operations should also be used.)

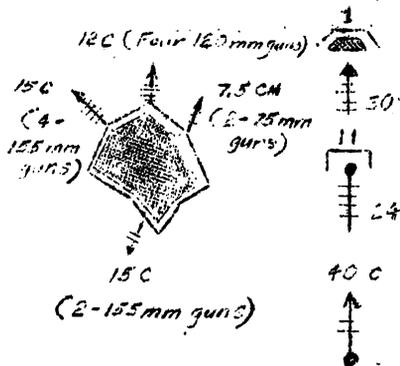
Abbreviation	Symbol	Equivalent
FA		Heavy Siege Artillery or Heavy Fortress Artillery
FA		Naval Gun
		Fortress Headquarters
		Siege Artillery Hq or Artillery Headquarters
		Sapper Headquarters
		Heavy Siege (Fortress) Artillery Regt. Hq or Sector. (Isolated Fortress) Art. Hq
		Heavy Siege (Fortress) Artillery Battalion Hq.
		Fortress Hospital
		Branch Fortress Hospital
		Submerged Listening Apparatus
		Permanent Defenses ( Symbols should be Semi-permanent Defenses ( shaped like the fort Temporary Defenses ( itself.
		Permanent Gun Emplacement
		Semi-permanent Gun Emplacement
		Permanent Mortar Emplacement
		Semi-permanent Mortar Emplacement
		Turret
		Permanent Pillbox
		Temporary Pillbox
		Barracks
		Barracks or Tent Camp
		Gallery or tunnel
		Siege approaches

		Siege Artillery Park
		Sapper Park
		Gun Depot
		Main Shell Magazine
		Branch Shell Magazine
		Main Powder Magazine
		Branch Powder Magazine
		Main Ammunition Depot
		Branch Ammunition Depot
		Engineer Materiel Distributing Point.
		Transport Supply Depot
		Ordnance Main Repair Shop
		Ordnance Repair Shop
		Cannon (Gun)
H		Howitzer
M		Mortar

The calibre is indicated by numerals and the number of guns is indicated by numerals or by drawing horizontal lines. For example four 155 mm. howitzers will be indicated by



The armaments of a fort battery are generally indicated as in the following examples:



Four 30 cm. guns in No. 1 permanent battery.

Four 24 cm. howitzers in the No. 2 temporary battery.

Two 40 cm. guns in a turret.

## 224. Navy Symbols

Abbreviation	Symbol	Equivalent
		Naval Vessel

To indicate the types of naval vessels, use the following equivalents:

B	Battleship
C	Cruiser
G	Gunboat
BC	Battle Cruiser
CD	Coast Defense Ship
RG	River Gunboat
AG	Auxiliary Gunboat
S	Submarine
W	Mine Sweeper
DW	Mine Sweeper Depot Ship
d	Destroyer
t	Torpedo Boat
Db	Torpedo Depot Ship; Destroyer Mother Ship
Df	Aircraft Carrier

 or    Fleet

Thick lines are used to indicate squadrons of capital ships; for all others thin lines are used.

Various types of ship formations are indicated as follows:

F	Fleet
S	Squadron
D	Division
GF	Combined Fleet

WG		Mine Sweeper Flotilla
CWG		Combined Mine Sweeper Group
Sd		Destroyer Squadron
Ss		Submarine Squadron
CdG		Combined Destroyer Group
GC		Gunboat Flotilla
dG		Destroyer Flotilla
SG		Submarine Flotilla
		Commander in Chief of Combined Fleet
		Fleet Commander
		Commander of a Division (Sqn)
		Ship Commander
		Airplane ( fw - seaplane ( fl - land-based plane
		Lookout Station (Signal Station)
		Captive Balloon
		Signalling Station (Coast)
		Submarine Base
		Air Base (auxiliary)

225. Special Military Symbols used only by the Military Academy for study purposes.

1. General

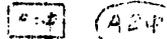
Abbreviation	Symbol	Equivalent
		Division Command Post
		Message Center
HW		Grenade Thrower

Lg

Light Machine Gun



Fire Net



An Example of Fire Preparation

Z

Headquarters of a Chemical Warfare Unit



Chemical Warfare Unit



Poison Gas Projector Unit



Chemical Neutralizing Unit



Gassed Area



Smoke Screen (gas smoke -  
poison smoke)



## 2. Infantry

Abbreviation	Symbol	Equivalent
RiA		Infantry Regimental Gun Unit
		Regimental Gun
biH		Infantry Battalion Gun Unit
		Battalion Gun
TA		Antitank Gun Unit
		Antitank Gun

## 3. Field Artillery and Aviation

Abbreviation	Symbol	Equivalent
RSt		Regimental Ammunition Train
ASt		Battalion Ammunition Train
Bst		Battery Ammunition Train
HA		105 mm Howitzer Unit
K		Cannon (Gun)

H		Howitzer Unit
		105 mm Howitzer
		105 mm Gun
		155 mm Howitzer
F1k		Air Fighter Unit
F1r		Air Reconnaissance Unit
F1b		Air Border Unit
		Artillery Battalion (Regiment) Liaison Detail

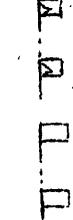
#### 4. Mechanized Units

Abbreviation	Symbol	Equivalent
TP		Mechanized Unit
		Battalion Commander's Tank or Battalion Tank Hqs.
		Tank of the Company Commander
		Platoon Leader's Tank
PW		Armored Car Unit
LPW		Light Armored Car Unit
TST		Tank Unit Ammunition Train
		Motorized Infantry (other branches may be indicated by changing the inserted letter)
		Motor Drawn Field Artillery Unit

#### 5. Labor (construction)

Abbreviation	Symbol	Equivalent
		Breach of obstacles (passage through gassed area)
		Antitank Defense

6. Communications.

Abbrevi- tion	Symbol	Equivalent
		Heliograph (Signal Station)
		Semaphore (Signal Station)
		Wig-wag (Signal Station)

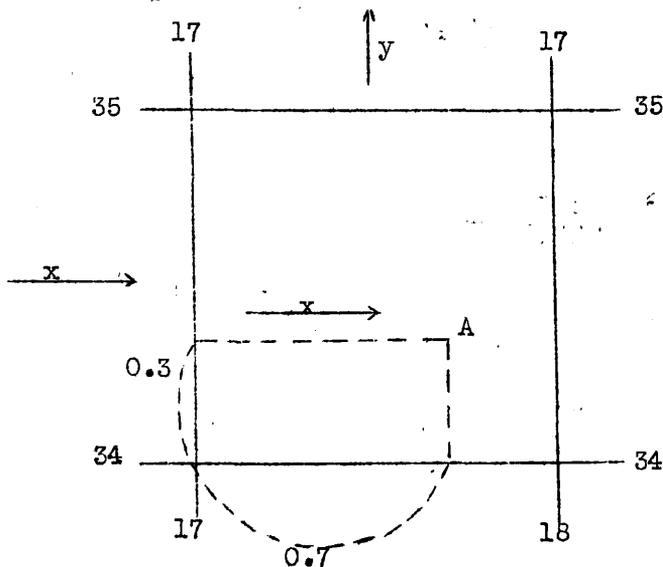
SECTION V  
MISCELLANEOUS

226. Comparative Chart of Weights and Measures of Various Nations.

Linear Measure			Land Measure		
Nation	Denomination	Japanese Equivalent	Nation	Denomination	Japanese Equivalent
England U.S.	Mile (1.609 km)	14 cho 45 ken	England U. S.	Acro	.408 chobu
Japan	Kairi	16 cho 58 ken 3 shaku	France Germany	Hectare	1.008 chobu
England U.S.	Chain	11 ken	Russia	Desyatin	1.102 chobu
"	Yard	.3 shaku	"	Sq. Vorst	0.07379 sq. ri.
"	Foot	.1 shaku	China	Ko (100 ko)	6.2 chobu
France	Kilometer	9 cho 1 ken	"	Sq. ri.	0.02151 sq. ri
Russia	Vorst	9 cho 46 ken 5 shaku			
China	Ri	5 cho 16 ken 4 shaku			
Capacity and Cubic Measures			Weight		
Nation	Denomination	Japanese Equivalent	Nation	Denomination	Japanese Equivalent
Japan	Sai	1 cubic shaku	England	Ton	270.946 kan
"	Ton (railway)	100 sai	U.S.	Ton	241.915 kan
"	Ton (ship)	40 sai	France	Ton	266.667 kan
"	Koku (small boat)	10 sai	England U. S.	Pound	.121 kan
England	Gallon	2.52 sho	France	Kilogram	.266 kan
U. S.	(liquid) Gallon	2.098 sho	Russia	Pood	4.360 kan
"	(dry) Gallon	2.44 sho	China	Kin	.8947 sho
France Germany	Liter	0.55 sho	Russia	Granets	1.82 sho
Russia	(liquid) Tarushoka	0.68 sho	China	Koku	5.7402 sho

Domestic railways use the English ton (long ton) while in Korea and Manchuria the American ton is used. Vehicles are weighed in French tons, 1000 kilogram (267 kan) per ton.

227. Reading of Grid Maps used in Maneuvers.



For large scale maps, which are over 1:50,000, the coordinate square will be (1) kilometer, and for maps with scale at 1:200,000, it will be (10) kilometers.

Method of Application

1. Numbers will be read from smaller print to larger print; if smaller print is not included, it has been either omitted or it means numbers over a hundred have not been used.
2. These grid numbers will be applied to maps of the nation as well as to maps of any one district.
3. To indicate a certain area omit figures over hundreds and use tens and unit digits.
4. Use round numbers calculating down to one decimal place (decimal fractions should be estimated) to indicate a certain point "A" on the map as: 17.7-34.3.
5. To find the distance between a certain point ( $X=17.7$ ,  $Y=34.3$ ) and another point ( $X'=5.3$ ,  $Y'=48.5$ ), it must be calculated by the formula

$$\sqrt{(X-X')^2 + (Y-Y')^2}. \text{ Thus,}$$

$$\sqrt{(17.7 - 5.3)^2 + (48.5 - 34.3)^2} =$$

$$\sqrt{12.4^2 + 14.2^2} = \sqrt{355.4} = 18.8 \text{ km.}$$

228. Method of Determining the True Azimuth of a Line AB  
Which Runs Between Point A ( $x_1 - y_1$ ) and point B ( $x_2 - y_2$ )

The grid azimuth of AB can be obtained from the following equation:

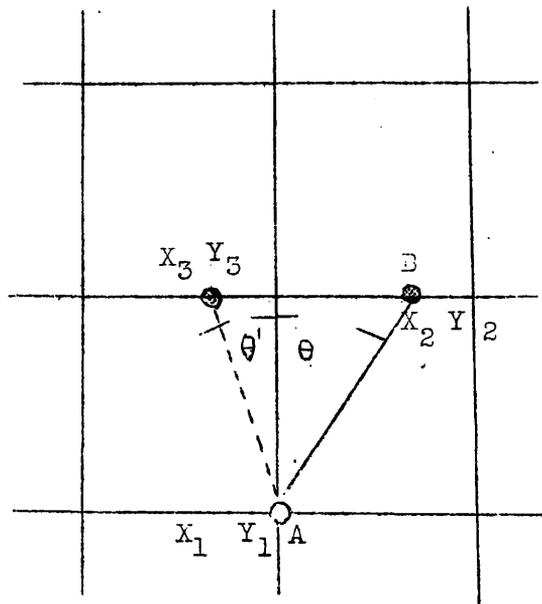
$$\tan \theta = \frac{x_1 - x_2}{y_1 - y_2}$$

The declination of the true north from the grid north (angle  $\theta'$ ) which is to be added to the angle  $\theta$  can be obtained as follows:

1. Select any point (A) on line AB
2. Locate on the map, any other point ( $x_3, y_3$ ) which is on the same longitude as point (A).
3. Then,

$$\frac{x_1 - x_3}{y_1 - y_3} = \tan \theta'$$

Therefore, the true azimuth of line AB is angle  $\theta$  plus angle  $\theta'$ .



THE END