

12167.5
.N5465
pt. 1

JAPANESE NIGHT COMBAT

PART I OF 3 PARTS

PRINCIPLES OF NIGHT COMBAT

LIBRARY
ARMED FORCES STAFF COLLEGE

HEADQUARTERS
UNITED STATES ARMY FORCES, FAR EAST
AND
EIGHTH UNITED STATES ARMY
MILITARY HISTORY SECTION
JAPANESE RESEARCH DIVISION

20090410 006

U.S. Army. Forces in the Far East.
"

JAPANESE NIGHT COMBAT

Part 1 of 3 Parts

PRINCIPLES OF NIGHT COMBAT

HEADQUARTERS
UNITED STATES ARMY FORCES, FAR EAST
and
EIGHTH UNITED STATES ARMY
MILITARY HISTORY SECTION
Japanese Research Division

FOREWORD

Japanese Night Combat, compiled by a number of former officers of the Imperial Japanese Army, is presented in three parts. Part 1 is a general discussion of the principles and accumulated experiences of the Japanese in night combat; Part 2, an appendix consisting of appropriate excerpts from Japanese Army training manuals; and Part 3, a supplement containing a series of twelve examples of night combat engagements of the Japanese Army.

It will be noted that there is some variation in the style and composition of the several parts of the study. The different styles employed by the writers, the type of material, and the fact that the translated manuscripts were delivered to the Editor piecemeal, all combined to make standardization a virtual impossibility if undue delay in completion was to be avoided.

Because of the time limitation and the mass of material this study was not intensively edited, although redundancy was eliminated wherever possible and efforts were made to make the text understandable. Part 2, in particular, was handled with a minimum of re-writing in order to retain the spirit and style of the Japanese Field Manuals as completely as possible.

Information contained in this study indicates that Japanese training in night combat was basically sound. Employed by thoroughly trained Japanese soldiers against Chinese forces, often of vastly

superior numerical strength, the prescribed methods were highly successful. The same tactics were equally effective against the British and American troops in the early days of World War II.

Later in the war the Japanese night combat tactics, in which surprise played a vital part, were less successful as the microphones and mechanical warning devices of the Americans were encountered. The established night combat tactics broke down entirely when well-trained Japanese troops were replaced by hastily trained recruits.

One of the most important lessons learned by Japanese students of military affairs, if not by the field commanders, was that night attacks must employ a diversity of methods. Neither the Japanese soldier nor his officers were, apparently, trained to be versatile and were almost invariably inclined to repeat the same time-worn tactics in each attack.

For their invaluable assistance in the preparation of Japanese Night Combat the Editor is indebted to Lt. Col. Kengoro Tanaka, formerly a consultant with the Japanese Research Division and now a member of the Japanese Self Defense Force, and Mr. Masataka Ida, a former lieutenant colonel in the Imperial Japanese Army and presently a consultant with the Japanese Research Division of the Military History Section, Headquarters United States Army Forces, Far East and Eighth United States Army.

10 May 1955

TABLE OF CONTENTS

	Page
CHART I Introduction	
Section A. Basic Effect of Night on Combat	1
Section B. Origin of Night Combat in Japan	5
CHAPTER II Changes in Concept of Night Combat 1904 to 1938	
Section A. Night Attacks in the Russo-Japanese War	9
Section B. Indecision After World War I	11
Section C. Re-adoption of Night Attack Tactics and Employment in the Manchurian Incident	13
Section D. Conception of Night Tactics Suitable Against Characteristic Soviet Positions	17
Section E. Night Attack Conducted During the China Incident and Establishment of the Principles of Night Combat	38
CHAPTER III Basic Concept of the Principles of Night Combat in the Field Service Regulations for Operations and the Infantry Manual	
Section A. General	49
Section B. General Concept of Night Attack	49
Section C. Night Attack of the Infantry	54
Section D. Attack at Early Dawn and Dusk	70
Section E. Night Defense	71
Section F. Other Night Operations	73
CHAPTER IV Training in Night Combat	
Section A. General Training	79
Section B. Training in Hearing and Noise Prevention	112
Section C. Distance Estimation and Utilization of Terrain Features and Objects	114
Section D. Orientation and Maintenance of Direction	115
Section E. Movement Training	117
Section F. Assault Training	121
Section G. Training in Night Firing	122
Section H. Night Training Mottoes	123
Section I. Unit Training	125
Section J. Special Training	151
Section K. Attacking Pillboxes	158
Section L. Team Tactics	163

		Page
CHAPTER V	Experience in Night Operations During World War II	165

Figures

No 1	General Concept of Soviet Defense	19
No.2	Defensive Disposition of a Soviet Division	21
No 3	Defensive Disposition of a Soviet Sniper Battalion	23
No 4	Defensive Disposition of the 1st Sniper Battalion	25
No 5	Soviet Division's Defense in Depth	29
No 6	Construction of a Tochka with Machine Guns	39
No 7	Organization of Special Type of Defensive Position of Sniper Battalion	41
No 8A	Infantry Battalion in Night Attack	57
No 8B	Infantry Battalion in Night Attack	59
No 9	Company Approach Formation	63
No 10	Company Assault Procedure	67
No 11	Night Attack Training Problem	129-134
No 12	Early Dawn Attack Problem	135-142
No 13	Dusk Attack Training Problem	143-150

Charts

No 1	Program for Night Combat Training (First Period)	83-87
No 2	Program for Night Combat Training (Second Period)	88-94
No 3	Program for Night Combat Training (Third Period)	95-100
No 4	Visibility at Night	103-104
No 5	Visibility on Moonlight Nights	105-106
No 6	Organization and Equipment of the Pillbox Assault Team	160-162

CHAPTER I

Introduction

Section A. Basic Effects of Night on Combat

1. Basic Mental and Physical Effects of the Night

Although there may be a slight difference in the degree of darkness which may be tempered by the light of the moon and the stars, night darkness obviously limits man's visual acuity. On the battlefield at night soldiers with their visibility restricted by darkness cannot learn accurately the movements of friendly troops nor determine conditions of terrain and terrain features, let alone the enemy situation. Sometimes friend is confused with foe and distance is difficult to estimate. A wood or a grove is often mistaken for high ground, and the darkness makes it exceedingly difficult to preserve control, execute movement, firing, maintenance of direction, reconnaissance, security, or mutual support.

The sensitivity of the ear is greater at night than in the daytime, which may be attributed to the relative quietness of night and the natural tendency of man to offset limited visibility with audibility. However, this tendency toward increased sensibility sometimes adversely affects man's reaction to fire, light, or flashes observed at night. There are many instances in which a force closing in with the enemy at night lost the direction of advance under the effect of the report of guns, the flash of firing, or searchlight

beams from enemy flank positions. An example is recorded in the history of Japan when about 1180 a force of the Heike confronting a force of the Genji across the Fuji river (Shizuoka Prefecture) beat a hasty retreat one night due to mistaking the noise made by water fowl for sounds of the attacking Genji force.

Limited visibility and increased sensibility to sounds inevitably cause uneasiness in the human mind. Soldiers are never certain when or where they might encounter the enemy. When fired upon by the enemy it is very difficult to ascertain the origin of fire and to devise appropriate countermeasures. Constant vigilance must also be exercised for high and low ground as well as obstacles on the terrain the soldiers traverse. Thus in darkness man is seized with "fear of the unknown", a condition aptly described by the ancients as, "the doubtful mind pictures devils in the dark". Such a mental condition is frequently accompanied by a feeling of loneliness and helplessness and may be responsible for the development of tendencies to overestimate enemy power or to be excessively pessimistic of the combat situation.

Man has long regarded night as the time for rest. At night troops generally are prone to lack alertness except those on special duties such as sentry and patrol duties. Even those performing special duty have to combat the formidable foe called sleepiness. Combat activities conducted at night are against the natural habit of men to rest at night - and under the unfavorable conditions of limited

visibility and mental uneasiness, the physical and mental fatigue of troops will inevitably increase. This tendency may be further aggravated by other factors such as hunger and cold.

2. Basic Effects of Night on Attacks and Defense

The night affects soldiers mentally and physically whether they are on defense or offense, making night combat more difficult than daylight combat. However, a knowledge of the extent and nature of difficulties and disadvantages encountered by combatants at night may make it possible for one side to profit by the difficulties and disadvantages of its opponent.

The greatest advantage to the defense is the deadly effect of well-planned fire. Naturally, the limited visibility of defenders hampers the maximum application of fire power unless some special measures are taken to overcome the handicap. Restriction on effective employment of tanks and aircraft is another serious drawback for the defender. Moreover, the element of tenseness characteristic of the defender's psychology that exists even in daylight becomes accentuated at night and is likely to develop into extreme uneasiness. Even so, the defender can derive advantages from darkness. A defending force can utilize darkness to change dispositions, prepare for a shift to the offensive, or attack with a part of its strength to hinder enemy attack preparations.

The attackers are also handicapped by great difficulty in the maximum use of fire power. The ordinary procedure of attack -

destroying an enemy position by artillery fire, tanks, and aircraft in support of an infantry assault - is in most cases difficult to adopt. Also, since it is absolutely necessary for the attackers to approach the enemy before the assault, they are handicapped by many difficulties in movement and control, disadvantages which the defenders do not suffer. Moreover, because it is difficult at night to contact and destroy the enemy, the objective of the attack is in most cases limited to the occupation of a single point or position. These disadvantages will necessarily impose considerable restriction on both the objective and scope of night attacks. On the other hand the attackers have a great advantage in exploiting the disadvantages of the defenders. The attackers can move secretly by taking advantage of the reduced visibility of the defenders. It is also possible for the attackers to operate when the enemy is unable to make the maximum use of his ground fire, armor, and aircraft.

3. Comparison of Attack and Defense Advantages in Night Combat

Assuming an army skilled in close combat, well trained in night movement, and with high morale, the night will be decidedly to its advantage. Such an army is capable of surmounting disadvantages and enjoying the advantages of a night attack. It is able to approach secretly, taking advantage of the reduced visibility and suddenly force the enemy to close combat. To an army which is well trained and fully prepared, the night definitely affords opportunities of surprising the enemy. Considering these points it may be concluded

that while night combat is difficult for both the attackers and defenders, the attacking side has greater opportunity to utilize the advantages and disadvantages than does the defending side.

The Japanese Army concept concerning advantages and disadvantages of night combat is expressed most concisely in Article 146, Part II, Field Service Regulations, Operation (Sakusen Yomurei).

"The coordinated movement and control of units is difficult at night and errors are likely to be committed. On the other hand, it has advantages in that intentions can be concealed, loss can be minimized, obstruction from enemy air power can be minimized, and combat effectiveness can be displayed even with a shortage of ammunition. An army well trained in night movement can surmount the disadvantages and utilize advantages. Even if inferior in strength, such an army can expect success in an attack against a numerically superior enemy".

Section B. Origin of Night Combat in Japan

1. Night Attack. A time - honored tactic

The advantages and disadvantages of darkness discussed in the preceding section are applicable to warfare as conducted since firearms came into use. But as far as Japan is concerned, the tactics of night attack were employed in the days before firearms were introduced.

When the principal arms were swords, spears, bows, and arrows, the warrior's view of the basic effects of combat in darkness was virtually the same as that held after firearms were introduced. This was especially true because comparatively little technological progress had been made in those days, and the mental uneasiness of the defender at night was far greater than today. In

addition, backwardness in the technical phases of night defense afforded the attackers greater chance of success than today. A further advantage to the attacker was that in fighting in which swords, arrows and spears were used as principal weapons, daylight combat preparations were not especially necessary for night combat. In Japan the night attack has long been a preferred form of combat known as "Youchi" or "Asagake". In the year 1180, at Kurikara Pass (near the present boundary between Ishikawa and Toyama Prefectures), Kiso Yoshinaka, leader of the Genji forces taking advantage of inadequate security measures, carried out a night attack on the flank of the Heike forces and destroyed the bulk of the defending force. This historical attack is the most famous of many examples of night attacks recorded in the military annals of Japan. Centuries later, about the middle of the 16th century, the historic battle of Kawanakajima (in Nagano Prefecture) was opened with a night attack conducted by the forces of Uesugi Kenshin. Later in the period (circa 1590), when Toyotomi Hideyoshi sent an expedition to Korea, the night attack is said to have been the favorite tactic employed by Kato Kiyomasa, who carried his army as far north as Chientao Province after overrunning the northeastern part of Korea.

2. Adoption of Night Attack by the Japanese Army

When Japan abandoned 300 years of isolationist policy and adopted the open-door policy, under the influence of Commodore Perry and other foreigners, the Imperial Army was founded in 1873 (the sixth

year of Meiji). The newly created Army, based on the conscription system, originally took the French Army as its principal model, although later it adopted the pattern of the German Army. Firearms consisted mainly of rifles and mortars and accordingly stress was placed on combat utilizing the firepower of small arms.

Western type rifles and powder had been introduced to Japan in 1543, and firearms of this type were in use about the middle of the 16th century when the country was under the rule of Oda Nobunaga. However, the 300 years of peace and tranquillity during the Tokugawa period retarded the development of firearms with the result that swords, spears, bows and arrows still remained the principal arms. As the influence of the Tokugawa Shogunate waned toward the middle of the 19th century, feudal clans began importation of rifles, mortars, and other firearms from countries abroad and these firearms were distributed among clan troops in considerable numbers.

The superiority of firearms over swords was demonstrated in the civil war of 1877 (the so-called Southwestern Rebellions) which broke out only four years after the creation of the Imperial Army. In that war the Government forces composed of draftees armed mainly with rifles destroyed the Kagoshima Clan forces composed of Samurai using swords as their principal weapons. From then on Japan proceeded with the "firepower-first" principle, and organization, equipment and tactics of the Army were based on this principle. Nevertheless, Japanese respect for and attachment to swords and spears were

unshakable. The sword is one of the Three Sacred Treasures of the Imperial Household: The mirror symbolizes wisdom, the gem represents benevolence, and the sword is the symbol of valor. Wisdom, benevolence, and valor have long been regarded as the three major requisites for men of highly accomplished character in the Orient, and the sword and spear were the symbols of the warriors to whom valor was an indispensable moral requirement. The arts of fencing and spear exercise were recognized as the most noble martial arts, and training in these arts had reached high levels. In view of this attitude, it is not surprising that tactics of close combat with swords and bayonets were adopted by the Japanese Army created in the early days of the Meiji Era (circa 1873). These tactics called for assaults with swords wielded by the officers, and bayonets by the men. Close combat was considered the climax of infantry fighting and the art of fencing and bayonet exercise, together with marching and firing, were the three key subjects of infantry training.

The concept of hand-to-hand fighting held by the Japanese infantry called for continued employment of night attacks. Since swords and bayonets can be used most advantageously in darkness, the tactics of surprise attacks were adopted as a primary part of infantry training.

CHAPTER II

Changes in Concept of Night Combat 1904 to 1938

Section A. Night Attacks in the Russo-Japanese War

During the Russo-Japanese War of 1904-1905, several night attacks were carried out against the Imperial Russian Army by Japanese units of division or brigade size. A night attack was conducted by the 2d Division at Kung-Chang-Ling; by the 12th Division at Mt. Han-P'o-Ling; by the 10th Division at Mt. San-Ku'ai-Shih; by the 7th Division at Mt. Pei-Ling; by the 3d Division at Shou-Shan-Pu, and by the Shiroadasuki unit, led by Maj Gen Nakamura, at Port Arthur.

A characteristic common to those night attacks was that they were almost invariably a mass assault leading to a decisive battle. As a result only the 2d Division was entirely successful, the 7th, 10th and 12th Divisions barely succeeded, while the 3d Division and Maj Gen Nakamura's Shiroadasuki Unit failed.

The reason for the failure of the night assaults was twofold. One was the stubborn resistance of the Russian Army. The night attack on Shou-Shan-Pu was conducted by the units of the 3d Division including a battalion led by Lt Col Tachibana, who had the reputation of being the highest authority on night attacks in the Japanese Army. The attacking forces once seized the Shou-Shan-Pu height but the attack ended in failure owing to fierce counterattacks by the Russian forces. Similarly, the do-or-die night attack on the fortress of Port

Arthur conducted by Maj Gen Nakamura's Shirodasuki unit failed because of stubborn resistance by the Russian defenders. The second contributing factor was the difficulty of surprising the enemy when attacking with large units. The assault made on the Port Arthur fortress by the Shirodasuki unit lost the advantage of surprise in its early stages because a frontal attack method was used against the fortress.

A description of the successful night attack on Kung-Chang-Ling carried out by the 2d Division is given as Example 1 in the Supplement. This attack has since been considered a classic example of night attack, but the success is ascribed mainly to the fact that preparations were comparatively well made, that the attack was aided by moonlight, that there were a number of excellent officers, and that the enemy resistance was relatively weak. However, the fact that the moonlight was considered an important factor in the success of the 2d Division indicates that the Army units of those days were not highly trained for movement under cover of darkness. At any rate, after the conclusion of the Russo-Japanese War, greater stress was placed on courage and bayonet practice in training for night combat, while tactically orderly movement in darkness and careful attack preparations were emphasized.

It is strange that despite the stress placed on training for night combat immediately after the Russo-Japanese War, the value of night attack itself was rated less and less as the years passed.

During the Russo-Japanese War the night attack was invariably conducted with heavy loss of lives, notably those of officers and non-commissioned officers. This gravely affected the fighting power of units committed to night assault and made it difficult for them to continue the attack or to pursue the enemy. The 2d Division, which succeeded in the night attack, was ineffective on the following day, and it is said that the 10th Division which attacked San-Ku'ai-Shih-Shan had to spend the whole of the following day regrouping. These facts, together with the difficulty of achieving a surprise in a night attack conducted by a large unit, gave rise to skepticism regarding the advisability of conducting night attacks involving large units. The theory gained ground that it would be wiser to limit the size of a unit committed in the night attack to approximately an infantry battalion and to limit its objective to seizing a vital point of the enemy position so as to facilitate an attack by the main body in a subsequent daylight attack.

Section B. Indecision after World War I

The skeptical attitude toward night attacks which was manifested after the Russo-Japanese War became even more pronounced owing to the influence of World War I. During that conflict, with the exception of reducing the German fortress at Tsingtao, the Japanese Army did not conduct any large-scale operations. Because the tactics employed against the Tsingtao fortress were the orthodox method in which infantry troops advanced under the support of artillery fire, the Japanese Army

did not encounter any major problem which would prove the merits of night attacks. (A patrol unit, taking advantage of the enemy's lack of adequate security measures, seized the central position when it reconnoitered the fort at night, but this isolated instance did not serve as a major example for the study of night attack principles.)

On the contrary, the great lesson gained, from observation of the European battle ground, was that the vital factor in winning a victory in modern warfare was to excel the enemy in material strength such as artillery, automatic weapons, tanks, etc. This lesson had a profound effect on the Japanese Army. The need for an increase in automatic weapons and artillery was argued strongly and to some extent increases were made. Such a trend inevitably lessened the enthusiasm for infantry assault in close combat and increased the skepticism in connection with night attack tactics.

Although the army adopted the policy of increasing national combat strength with artillery, automatic weapons, tanks, and similar weapons, Japan's limited natural resources were not sufficient for full realization of the policy. Moreover, after World War I pacifism engulfed the world and a rapid succession of reductions in armaments was enforced by world powers. For these reasons it was impossible for the Japanese Army to possess modern arms in sufficient quantities. In spite of armament limitations, no decision was made to adopt a doctrine placing importance on close combat and the situation in the

Far East was not sufficiently tense to force such a decision. The Soviet Union was still preoccupied in domestic reconstruction following the revolution, while China was deeply absorbed in civil wars. The attitude of the Japanese Army toward armaments, tactics, and night attacks strategy remained undetermined until the late 1920's.

Section C. Re-adoption of Night Attack Tactics and Employment in the Manchurian Incident

1. Re-adoption of Night Attack Tactics in the Late 1920's

Under the conditions prevailing in the latter part of the 1920's, the Japanese Army had no hope or confidence of defeating the army of any major power. In the meantime, the Soviet Union had made substantial progress in internal construction, and the possibility of her eventually becoming Japan's potential enemy was realized. Therefore, those responsible for organization and training of the Army sought to devise tactics which would promise victory. However, the resources of Japan still were not adequate to permit satisfactory modernization of the Army.

In 1928 the Army began compilation of its new Infantry Manual (Hohei Soten) and centered its studies on infantry tactics. The Army General Staff believed that central Manchuria would be the probable battlefield in the event of war with the Soviet Union. The terrain of central Manchuria is characterized by vast undulating areas with the distance between crests averaging six kilometers. It was assumed that such rolling terrain would make it difficult for the Japanese artillery to give adequate support to ground forces and would make

daylight attacks hazardous and difficult. On the other hand, the Soviet army was inadequately trained in night combat. For these reasons, Col Obata Toshishiro (later Lt Gen), chief of the 2d Section (Operations) of the Army General Staff, and Capt Miyano Masatoshi (later Lt Gen), member of the Committee for Compilation of the Infantry Manual, stressed the need of adopting the night attack as one of the highly important infantry combat tactics, maintaining that the Japanese infantry would find the way to victory in the night attack.

Their opinion was accepted and the tactical doctrine was established that an attack should be carried out by an augmented company or battalion as a surprise involving no firing, with a limited objective relatively easy to approach. In view of the lessons learned in the Russo-Japanese War, restrictions were placed on night attacks to be conducted by a large unit, such as a division. The general provisions of the newly published Infantry Manual required that emphasis be placed on training for night combat. Gen Suzuki Soroku, then Chief of the Army General Staff, at a meeting of division commanders urged vigorous training in night combat as an operational requirement. Thus, training in night combat was launched by the entire Japanese Army, and became the most characteristic tactic of the Japanese infantry.

Of course, the army had no intention of depending solely upon the effectiveness of close combat in darkness if Japan could

surpass the potential enemy in material combat strength as represented by aircraft, tanks, artillery, and similar weapons. On the contrary, efforts were being made to place material combat strength on a par with that of the potential enemy and there had also been training in tactics in which material combat strength would be employed. Unfortunately there was no possibility that the material strength of Japan would be superior to that of the Soviet Union. Inferiority in material combat strength could be offset only by improved quality of equipment and weapons, adequate training, superior tactics and strategy, and the adoption of methods of combat which would utilize conditions which restricted the full use of the material combat strength of the foe. The restrictive effects of darkness, combined with such factors as the boldness, quickness, and diligence which are part of the traditional Japanese character, were thought to meet the necessary requirements.

Such a change in military thinking encouraged a tendency in some quarters of the Japanese Army to belittle material combat power, but the major motive leading to the adoption of the night attack was the realization on the part of the Japanese Army of the impossibility of attaining material superiority.

2. Night Attack in the Manchurian Incident

The Manchurian Incident broke out in 1931, soon after the Infantry Manual was issued. The numerical strength of the Japanese forces in Manchuria was estimated to be less than one-tenth that of

the Chinese forces in Manchuria, and Japan's artillery power was not adequate. Hence, the night attack was the favorite combat tactic employed throughout that incident. The size of the forces committed in a night attack was usually small, units of less than battalion strength, but all of them obtained excellent results. Among the reasons for the success were the excellent fighting spirit of the Japanese troops as opposed to the low fighting effectiveness of the Chinese forces, but at the same time, it was considered that success was largely due to skill in night assault, the result of intense training.

The usual objective of night attacks in those days was to capture a single objective such as a village, a town or a hill, but the night attack conducted by the 2d Battalion of the 17th Infantry Regiment in the vicinity of Nan-Tien-Men as recorded in Example 2 of the Supplement differs markedly from the rest. The objective of this night attack, selected before its execution, was similar to that of other night attacks, but actually the battalion broke through a strong enemy position of about two kilometers in depth. Moreover, the success attained by this battalion served as the immediate cause of greater success subsequently attained by a brigade attack. This battalion was the first to employ its companies in leapfrog fashion in night combat. These experiences later served as factors supporting adoption of the new method of night attacks to penetrate Soviet positions prepared in depth.

Section D. Conception of Night Tactics Suitable Against Characteristic Soviet Positions

1. As the Manchurian Incident progressed, the Japanese Army found itself confronted by the Soviet Army along the Soviet-Manchurian border. In the Soviet Union steady progress was being made and the build-up of the Red Army was especially conspicuous. Powerful elements of that Army were being disposed along the Soviet-Manchurian border, enveloping Manchuria.

2. The organization, strength, and equipment of the Soviet units, particularly their sniper force (infantry), excelled the Japanese Army especially in fire power.

3. After the conclusion of the Manchurian Incident the main duty of the Japanese Army was to defend Manchuria. However, the border was extensive (approximately 4,000 kilometers) and the border region was mainly vast plains which made defense, by purely defensive operations, very difficult. Consequently the Japanese Army conducted an exhaustive study of the offensive and defensive tactics of the Soviet Army and mapped out a general strategy calling for destruction, by offensive operations, of any invading Soviet force.

The basic tactical concept of the Soviet Army was based on the Basic Field Manual of the Red Army issued in 1929. The main features of their defensive tactics were as follows:

- a. Stress was placed on combat within the defensive position.

The main components of a force defending a position were

a stationary defense unit and a striking unit. The stationary defense unit was to strive to destroy the offensive power of the attacking enemy in front of the position and, should the enemy penetrate into the position, throw him into confusion by conducting limited counterattacks and raising fire barriers to facilitate a subsequent full-scale counterattack by the striking unit. The striking unit which was to be held separate from the reserve unit was to counterattack the enemy, breaking through the position to eject him from the penetrated area. Usually the striking unit was from two-thirds to one-third of the strength of the defense unit. The reserve unit was to be organized only when circumstances required and its strength was generally limited to less than one-ninth of the total.

The Soviet concept of defensive warfare was markedly different from that of the Japanese Army which considered that the sole object of the defending force was to destroy the attacking enemy in front of a position, holding the battle position to the last by means of fire power and counterattacks.

b. Defensive positions were generally disposed in depth.

The Soviet Army's general concept of the disposition of defensive positions is illustrated in Figures 1 to 5. The tendency to dispose defensive positions in depth was considered closely connected with the placing of stress on combat within the position area.

According to the Japanese concept of defense, the defending force was to hold the battle position which was in effect a line

FIGURE NO. 1

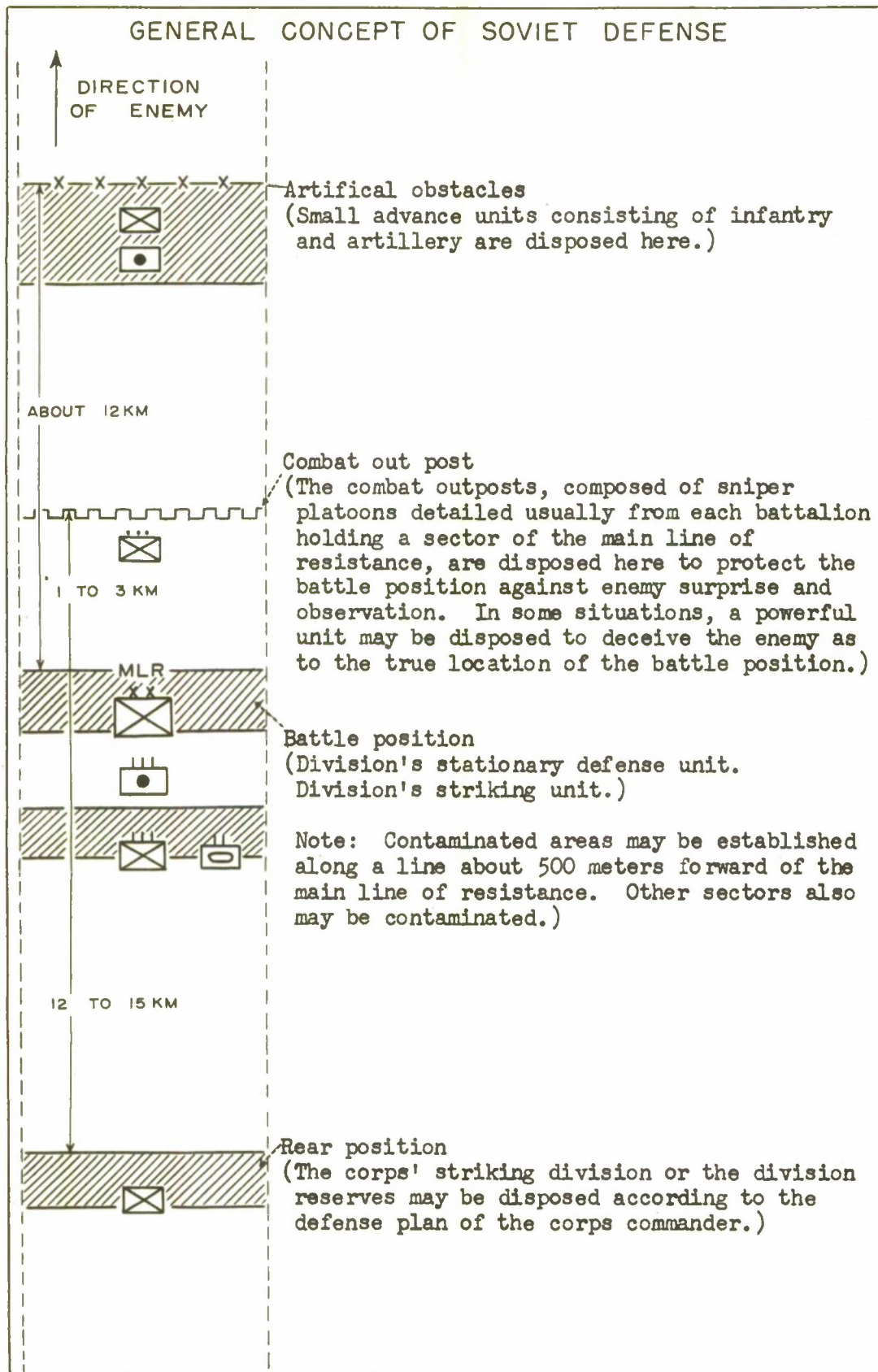


FIGURE NO. 2

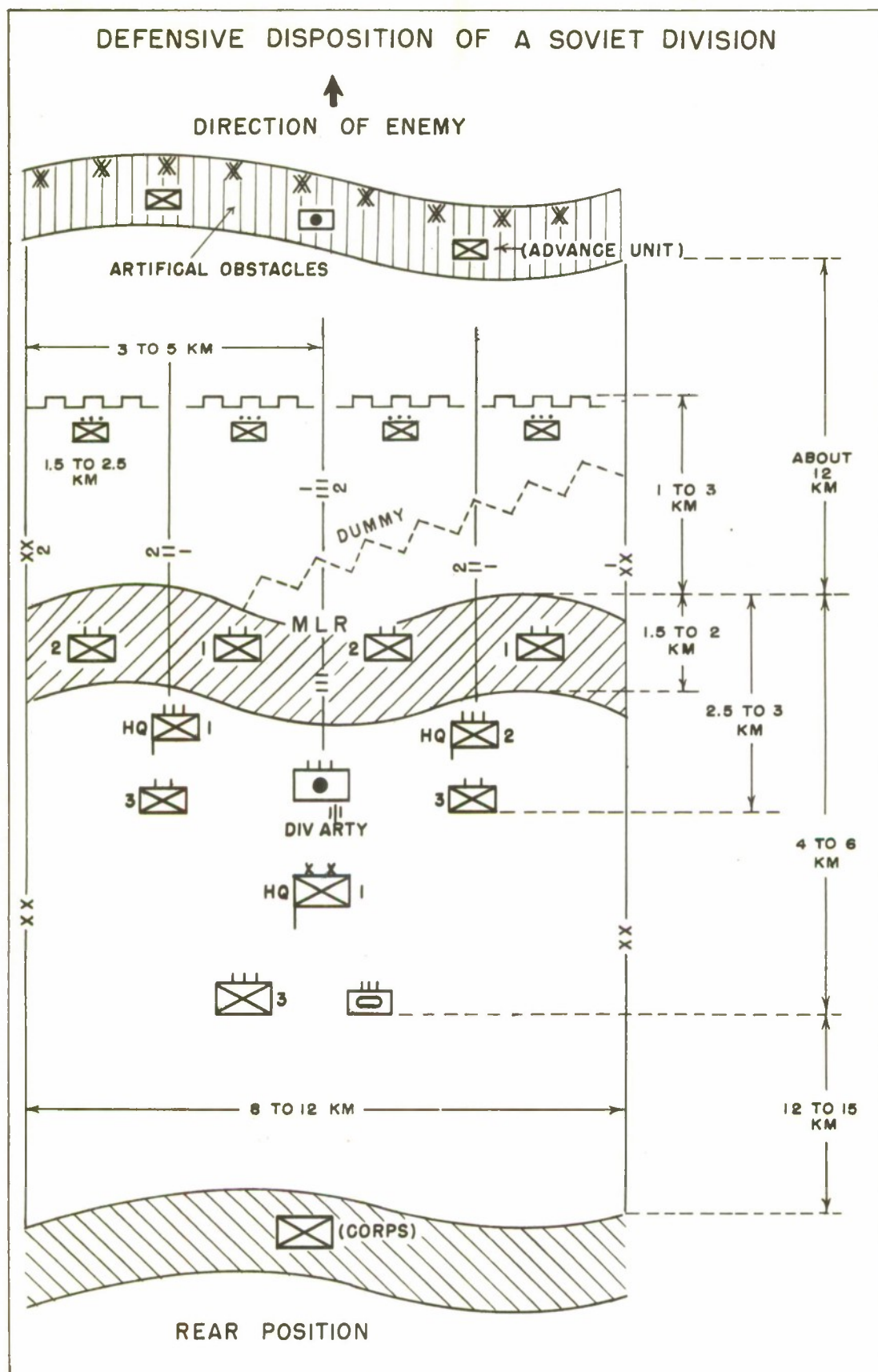


FIGURE NO. 3

DEFENSIVE DISPOSITION OF A SOVIET SNIPER BATTALION

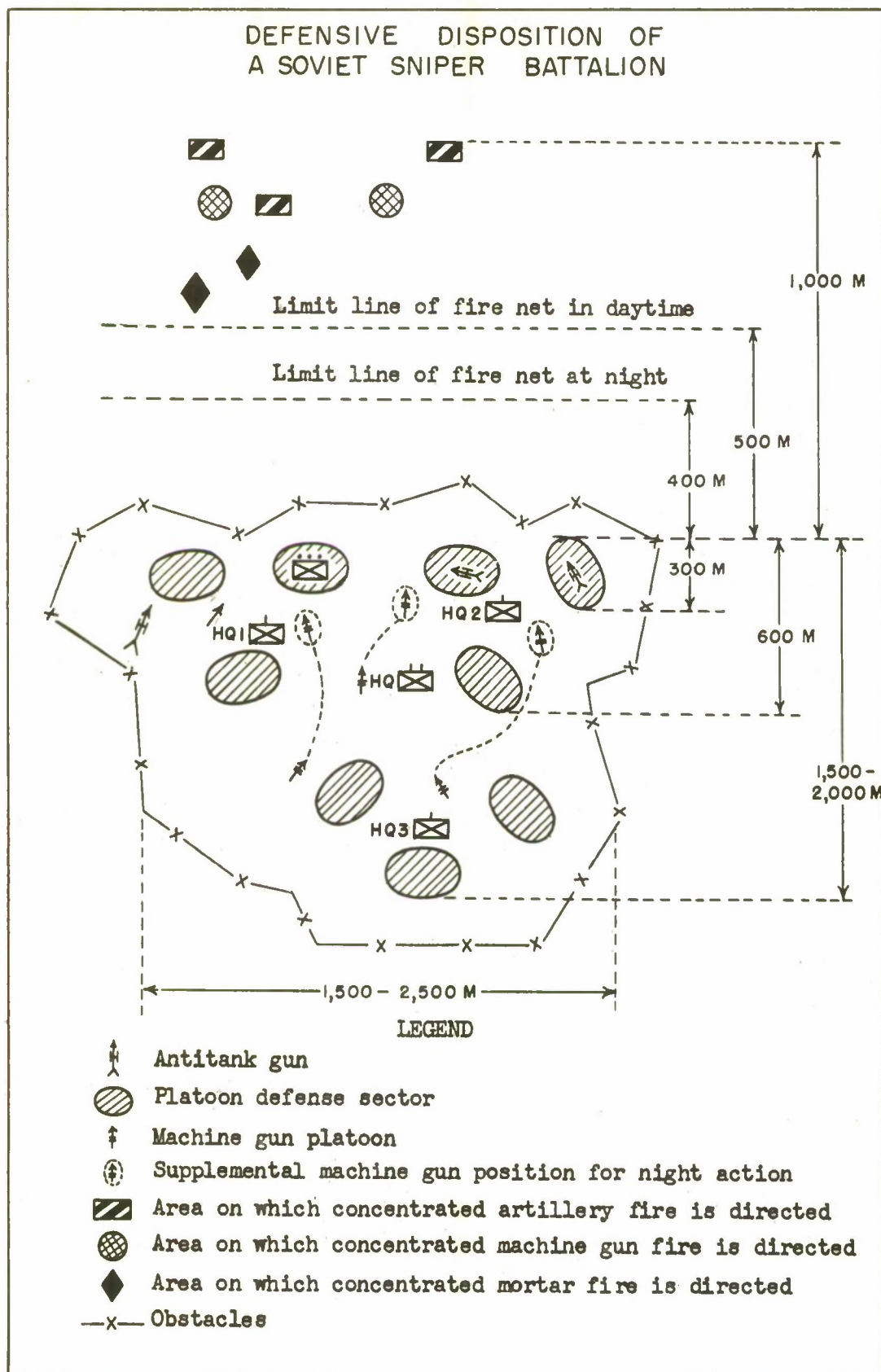
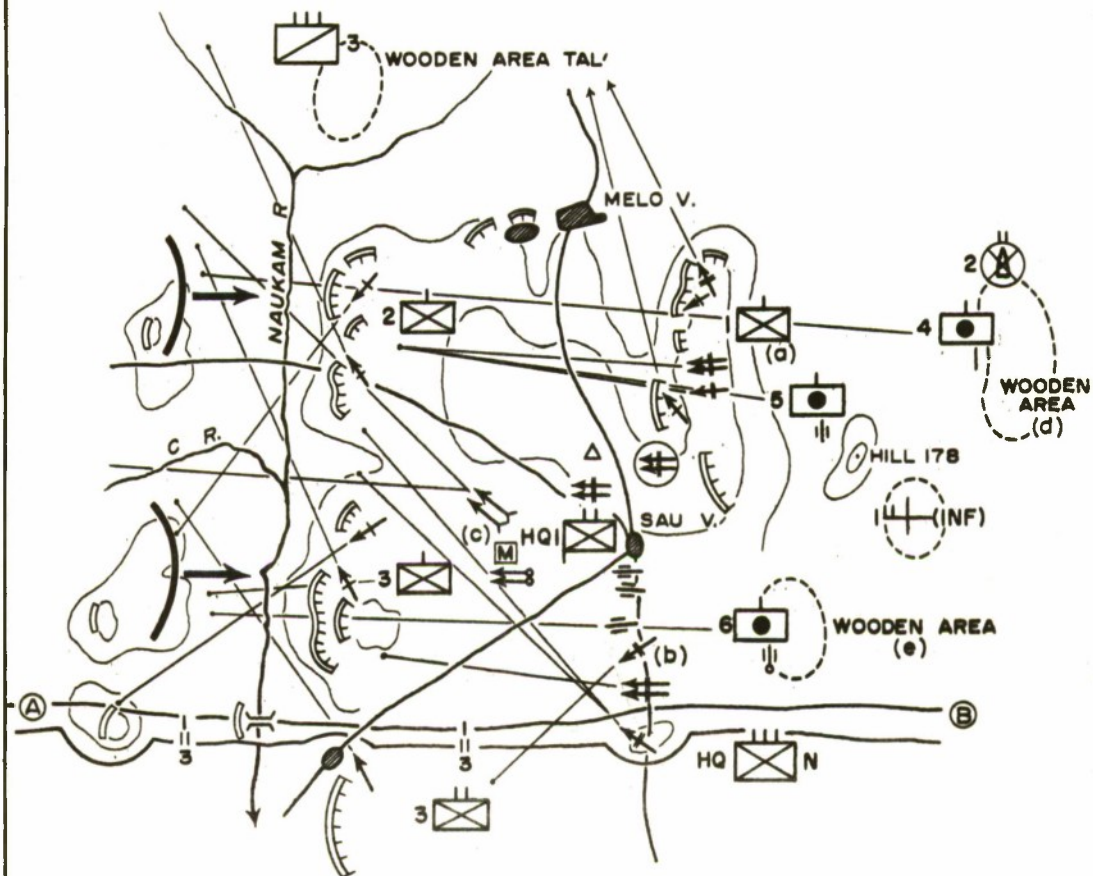


FIGURE NO. 4

Defensive Disposition of the 1st Sniper Battalion
Along the Left Bank of the Naukam River
19 August



LEGEND:

- ↑ Machine gun of MG Company
- ↑ Machine gun of sniper company
- ⊕ Antiaircraft machine gun
- ⊗ Battalion ammunition supply point
- ⊥ Battalion medical aid station
- △ Battalion commander's observation post
- Ⓜ Message center

Defensive Disposition of a Sniper Battalion

Situation

1. The Sniper Regiment occupies a defensive position in the area south of Melo village along the left bank of the Naukam river on 19 August to check and delay the enemy advance eastwards from area (A).

2. The 1st Sniper Battalion is disposed in the area extending from the vicinity of Melo village to the (A) - (B) road.

Four regimental guns and the 2d Battalion of the Division's Artillery Regiment support the 1st Sniper Battalion directly.

The 3d Cavalry Regiment is disposed in the wooded area Tal to cover the right flank of the 1st Sniper Battalion. The 3d Sniper Battalion is disposed on the left abreast of the 1st Sniper Battalion.

Defensive Disposition of the 1st Sniper Battalion

1. The 2d and 3d Companies are disposed on the main line of resistance and the 1st Company is support as shown in the sketch.

2. Machine gun company:

The 1st Machine Gun Platoon is with the 1st Company (a). One machine gun of the platoon directs flanking fire to the area north of Melo village.

The 2d Machine Gun Platoon is disposed in rear of the 3d Company (b). One machine gun of the platoon is located to cover its flanking fire the gap between the 2d Infantry Company and the 3d Infantry Company.

Half of the 3d Machine Gun Platoon is disposed at a point 500 meters northeast of Sau village to fire at hostile aircraft. The other half is disposed on the hill northwest of Sau village.

3. Antitank guns are disposed in rear of the 3d Company (c), to direct their fire at the area north of the junction of the Naukam river and the C river. (The area south of the junction is not suitable for tank movement.)

4. The regimental guns are disposed in the area south of Sau village as shown in the sketch.

5. Artillery battalion:

The 4th Artillery Battery is disposed in the wooded area (d) to support the 1st Infantry Company.

The 5th Artillery Battery is disposed in the valley northwest of Hill 178 to support the 2d Infantry Company.

The 6th Artillery Battery is disposed in the wooded area (e) to support the 3d Infantry Company.

6. The battalion headquarters is located in Sau village, the battalion commander's observation post on the hill northwest of Sau Village, and the message center at "c".

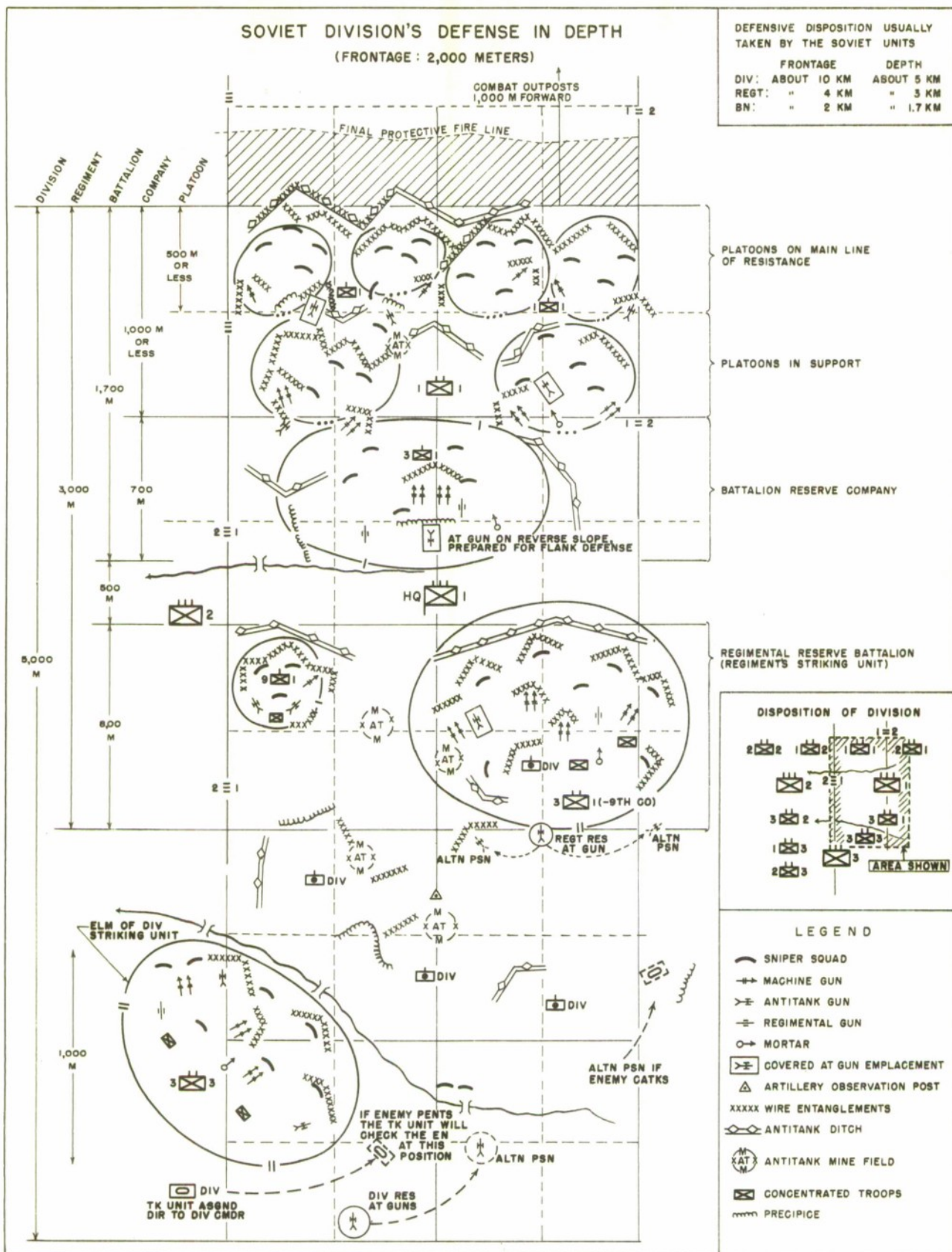
7. The 1st Sniper Battalion's ammunition train and the 2d Artillery Battalion's ammunition platoon are located in Oranui (about four kilometers east of Melo).

Notes:

1. One machine gun of each sniper company and an element of the machine gun company are employed in short range firing.

2. Most of the machine gun company is committed to long and medium range firing.

3. The 1st Sniper Battalion is supported by four regimental guns and one artillery battalion. (Supporting guns are not attached to the 1st Sniper Battalion.) Each artillery battery is assigned to directly support one infantry company.



with a depth of from 100 to 200 meters connecting strong points composed of front line infantry platoons. This was in striking contrast to the Soviet battle position with a zone from 1,500 to 2,000 meters in depth formed by battalions disposed side by side.

- c. Cross fire and flanking fire were basic principles in the fire plan.

Both the Soviet and Japanese armies considered the combination of fire power and counterattack basic to the effective defense of a position. But while the Japanese Army used frontal, oblique, and flanking fires in daytime defense and concentrated on frontal fire at night as the basic fire plan, the Soviets used oblique and flanking fires in both day and night defense.

- d. Other features of the defensive tactics of the Red Army.

- (1) Special stress was placed on anti-tank defense.

The defending force was required to establish anti-tank defense sectors by organizing the defense with guns, mines, obstacles, etc.

- (2) Stress was placed on means of concealing defensive positions. The defending force was required to avoid concentration of defensive positions and was required to use dummy positions and camouflage.

- (3) Each battalion sector was to be independent and to continue defensive combat independently even if the neighboring sector fell to the enemy. The enemy penetrating to the rear of a position after breaking through a battalion sector was to be dealt with by the striking unit.

(4) In addition to artillery, tanks and aircraft were to be employed mainly in defensive warfare as a striking force.

4. As stated before, the Soviet Army of the 1930's had not emphasized training in night defense. Following are the main points of night defense as shown in their field manual of 1929:

a. At night the defending force dispatches infantry reconnaissance units, concealed security units, and observation parties (provided with war dogs) to the foreground of the defensive position.

b. At night it is advantageous to shift machine gun positions so as to avoid hostile artillery fire prepared during the day. In case the distance between firing positions (squad positions) is more than 300 meters, machine guns are disposed between the intervals close to the front line.

c. In preparing for night firing, the artillery makes preparations during the daytime by dividing the foreground of the position into smaller sectors (TN Grid reference system). The artillery opens fire on a pyrotechnic signal from the front line infantry unit facing the area being subjected to attack by enemy infantry. The type of pyrotechnic signal is decided by the division commander.

d. The rocket, flare, and searchlight are used for illumination, to facilitate the firing of machine guns and other weapons. When effecting illumination, care must be taken not to expose friendly defensive dispositions. When using searchlights, cross and direct beams of light are projected jointly.

e. The striking unit counterattacks the enemy penetrating the friendly position before he consolidates the sector. For this purpose the striking unit is located comparatively close to the front line.

5. After studying the defensive dispositions of the Soviet Army, the Japanese Army formed the following conclusions:

a. Defensive positions of the Soviet Army are composed of firing positions (Usually a sniper squad position. When a firing position contains a heavy machine gun it is specifically called a machine gun position) which are dispersed and disposed in depth and width in a checkerboard pattern. Such a position lacks a key or vital point.

b. The distance between the firing positions is usually about 300 meters.

c. A penetration of a Soviet position to the depth of 1,000 meters has no decisive effect. It is obvious that a penetration executed to such an extent will merely result in playing into the hands of the enemy striking unit and the attempt will end in failure. It is necessary for an attacking force penetrating a Soviet position to reach the rear of the battalion area.

d. Should an infantry battalion with a frontage of 200 meters penetrate a Soviet battalion defense area at night, to a depth of about 2,000 meters, the enemy positions the battalion will directly encounter number only about five. (Three firing and two machine gun

positions.) The number of enemy firing positions encountered would, of course, be less should the attacking battalion penetrate through a gap in the enemy position or shorten its frontage.

e. The night attack would be advantageous in nullifying the effect of the superior number of Soviet tanks and aircraft.

6. As a result of studies of Soviet offensive and defensive tactics the Japanese Army issued a series of manuals on methods of combat against the Red Army. (These manuals were commonly called "Red Books" as they were classified and bound in red paper.) The Red Books, compiled mainly on the basis of studies conducted by the Infantry School, contained information on a wide variety of combat methods to be employed against the Soviet Army, including engagements, attack on positions, defense and combat on special terrain. New methods of night attack were emphatically emphasized and intensive training conducted.

The night attack as treated in the Red Books was designed for the infantry battalion as the attack unit, and is described in the Red Books as follows:

a. The battalion conducting a night attack on the enemy position chooses a distant point within the enemy position (usually the rear limit of the battalion position) as the vital attack objective. This objective is not an enemy force but a vital point within the enemy position.

b. The frontage of the attacking battalion is very narrow (usually a two company front with units advancing in parallel columns). Attacking troops advance boldly, proceeding normally at a speed of six kilometers an hour. The bold or daring advance method (KANI ZENSHIN) is a special rapid walk utilized to approach the desired objective in spite of difficult terrain and

hostile fire. This manner of walking requires troops to lower their hips and lift their feet high so as not to stumble over low obstacles on the ground and at the same time increase their walking speed.

c. During the advance enemy resistance which may be expected from firing positions and counterattack units is repulsed by several firing position attack units (KATEN KOGEKI BUTAI), each composed of one or two squads, and counterattack repulsing units (GYAKUSHU HAIGEKI BUTAI) also composed of one or two squads, both units will be designated and organized before the attack. These units are under the immediate control of the battalion commander whose position, during the attack, is at the head of the battalion. As the occasion requires he employs these units to liquidate enemy resistance.

d. Ordinarily no serious consideration is given to enemy fire from the front and flank. Of course, at a temporary halt, employment of the firing position attack unit and the use of a smoke screen is permitted, but as a rule, losses from enemy fire are to be minimized by an increase in the pace of advance.

e. Protection of both flanks of the advancing battalion or exploitation of successes in areas along the flank is conducted by other units assigned by the regimental commander.

While the adoption of such a bold method of night attack was primarily the result of studies of Soviet positions, reference was made to the night attack at Nan-Tien-Men in 1933 (Example 2) as an example proving the feasibility of the new method of night attacks.

7. The Red Books also laid stress on special attack methods utilizing meteorological characteristics of high latitude districts (about 50 degrees north latitude) in northern Manchuria. These attack methods were known as early dawn attacks (REIMEI KOGEKI) and dusk attacks (HAKUBO KOGEKI).

A type of dawn attack (FUTSUGYO KOGEKI) was a method of attack which had been favored by the Japanese Army since the Russo-

Japanese War. It called for an infantry attack immediately following a preparatory bombardment by the artillery, commencing at day-break and continuing for one or more hours. In northern Manchuria the Japanese Army discovered that the half-light of the early morning continued for a comparatively long period. The early morning light normally permitted visibility up to several hundred meters but did not afford that of several thousand meters, the distance required to permit the artillery to open fire. To the infantry of both sides the morning light was practically daytime, but as far as the artillery was concerned, night conditions prevailed. The Japanese Army called this period, "early dawn" (REIMEI). How long this early dawn would last depended on the latitude, the season, and weather conditions. It usually lasted from 30 to 60 minutes, although it frequently lasted more than an hour.

The old concept of a dawn attack as applied to northern Manchuria had an obvious disadvantage: If the infantry attack was to be preceded by artillery preparation, the period during which the infantry stands by under enemy infantry fire would have to be extended until the end of the early dawn period. On the other hand, the earliest period of early dawn, a brief period of about ten minutes when visibility is limited to forty or fifty meters, was recognized to be a time of greatest advantage to the attacking infantry. This period meant night time visibility for distances over 100 meters for the defense, but it was possible for attacking infantry troops to

advance, since they required a shorter range of visibility. Thus it was considered possible for infantry to advantageously employ night combat tactics in the early dawn. Accordingly, a new concept of early dawn attack was initiated: An early dawn infantry attack to be followed by the combined action of infantry, tanks, and artillery with the coming of full daylight.

8. In northern Manchuria the period of dusk is also comparatively long, and a dusk attack was another application of night combat tactics. The infantry committed in a dusk attack starts action after sunset as visibility becomes progressively less, and penetrates the enemy position under the concealment of full dusk. It was considered possible for attacking infantry troops to approach enemy defense positions without observation.

The dusk attack method could be used advantageously in continuing an attack to exploit successes gained in daylight attacks or in assaulting enemy outposts. It could also be utilized as the initial phase of a night attack which would require most of the night to complete.

9. Importance was also attached to studying the possible effect of the superior air power of the Soviet Army. While studies were made in air strategy aimed at gaining air superiority over the Soviet air force, training of ground forces was so conducted as to minimize the Soviet advantage of stronger air power. Emphasis was placed on the fullest possible use of the night, not only in combat but in all

military activities including movement of troops and transportation of supplies, as offering the greatest advantage for minimizing losses and concealment of intentions.

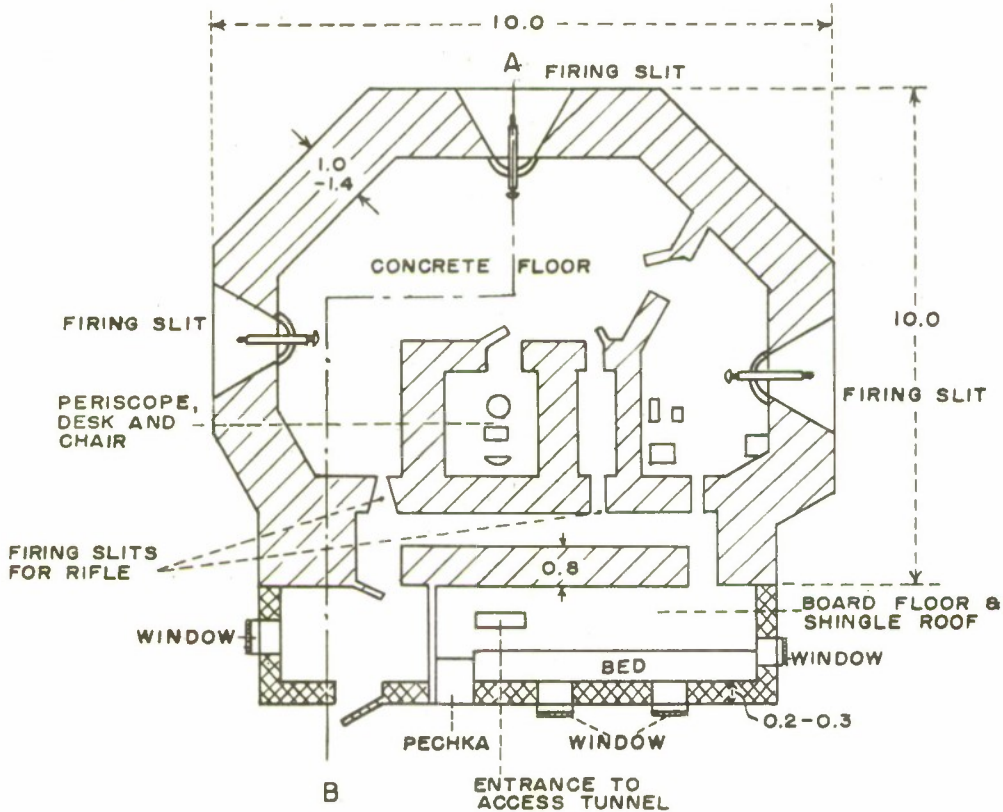
10. One of the characteristic features of the Soviet defensive system were the tochkas, special pillboxes disposed in the fortified zone along the Soviet-Manchurian border, which constituted the backbone of the frontier fortifications of the Red Army. The ground plan of a typical tochka is shown in Figures 6 and 7. (From the manual, "Soviet Army"). These pillboxes were constructed of concrete and were designated as machine gun tochka or gun tochka according to the principal weapons they contained. Much time was devoted by the Japanese Army to studies on how to neutralize or seize these pillboxes in order to break through the frontier defensive positions of the Red Army.

Night attack by infantry and engineers was seriously studied as was a variation that employed night attack principles. This latter attack method was characterized by the use of smoke to create night conditions for the enemy manning the tochka and to create conditions similar to dusk or dawn for the attacking force. Methods adopted for the use of smoke were shooting by artillery, projecting by hand projectors, and spreading by wind. The smoke candle, to be discharged by the grenade thrower, was invented as a simple agent for producing screening smokes available to the infantry.

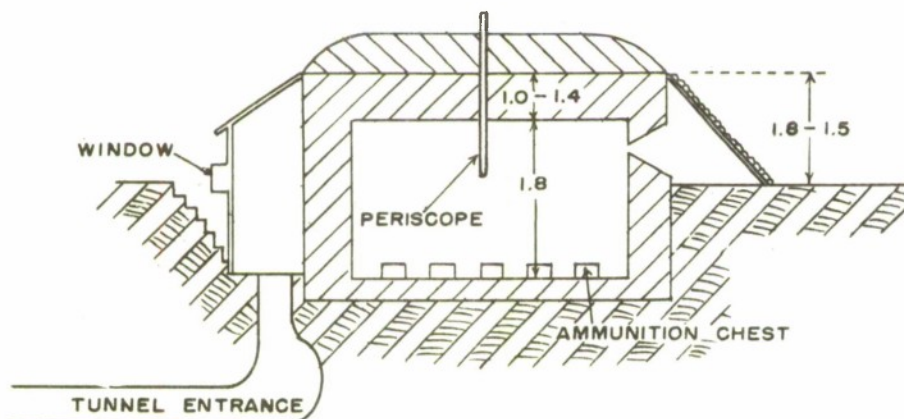
Section E. Night Attack Conducted During the China Incident and Establishment of the Principles of Night Combat

CONSTRUCTION OF A TOCHKA WITH MACHINE GUNS

PLAN VIEW



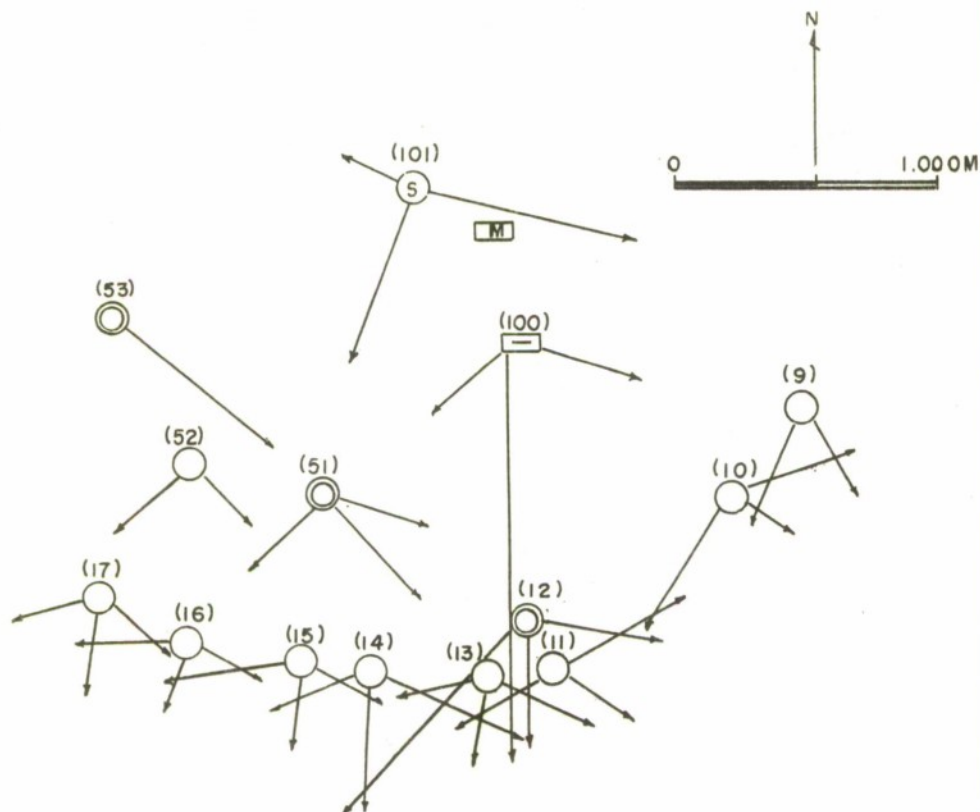
ELEVATION ALONG THE LINE A—B



NOTE:

1. AMMUNITION CHESTS ARE ON THE FLOOR.
2. A MACHINE GUN IS MOUNTED IN EACH FIRING SLIT AT ALL TIMES.
3. UNIT OF MEASUREMENT: METERS

ORGANIZATION OF SPECIAL TYPE OF DEFENSIVE POSITION OF SNIPER BATTALION



Density of final protective fire:

1. About 3 rounds per minute per meter of frontage west of the Tochka No. 11.
2. About 2 rounds per minute per meter of frontage east of the Tochka No. 11.

Legend:

- : Tochka with machine guns
- ⊙ : Tochka with guns
- Ⓢ : Sot (Tochka with disappearing machine guns)
- ▬ : Tochka with guns, in which the commander is located.
- ▭ : Covered ammunition dump.

1. Some Army tacticians, particularly students of war history, were very skeptical of the possibility of the success of the bold tactics advocated in the Red Books. According to the Infantry Manual, the objective of a night attack was limited and contemplated relatively shallow penetration (400 to 500 meters). In view of this skepticism, the Infantry School began to study a new method of night attack to be conducted by infantry deployed in two successive assault echelons - a method which was a slight modification of that described in the Red Books. This method, like that mentioned in the Red Books, was aimed at penetrating deeply into the enemy defense area. According to the new method, however, the depth to be penetrated by the first echelon (a company or battalion) was limited, and the second assault echelon was to leapfrog the first and penetrate to the desired depth. While this method was considered more sound than that of the Red Books, in that it set a limit to the distance to be covered by one assault echelon, it created the difficulty of executing a leapfrog movement at night.

2. Meanwhile, studies were commenced on the problem of firing during a night attack.

Heretofore the loading and firing of weapons had been prohibited in night attacks for fear that firing might cause confusion among the attackers. This was justifiable in the days of the Russo-Japanese War where the enemy defensive positions were shallow in depth and the final issue of an attack was often decided by the

initial surprise. However, in breaking through the Soviet positions constructed in great depth, the initial surprise assault, even if successfully delivered, would disclose the attackers' intention, and subsequent assault efforts would be met by enemy fire.

Thus the advantage of firing during the second or later assaults and for holding the occupied ground came to be realized, and studies were made along this line.

On the other hand, the modern armies of the world were tending toward systematic security measures and defense reconnaissance, with great strides being made in organizing defensive fires for night combat. Consequently, it was generally agreed that a night attack depending solely on the element of surprise without first neutralizing or destroying the enemy defensive fire network might prove too hazardous. To reduce such risks, studies were begun on assault with the combined initial employment of infantry, artillery, heavy weapons, tanks, and engineers. In connection with the use of supporting fires, some quarters expressed views favoring the adoption of the extended formation in addition to the mass formation in assaulting an enemy defensive position.

3. In July 1937 when the China Incident broke out, the new concepts of night attack, utilizing two assault echelons and attack by the use of supporting fires, were being developed in addition to the basic principles laid out in the old Combat Regulations, the old Infantry Manual, and the Red Books. Consequently, various methods of

night attacks were employed during the China Incident. Commanders of Japanese units made frequent use of night attacks, adopting tactics to suit their preference and the situation.

The Japanese infantry usually resorted to night attack whenever it was difficult to obtain artillery support, and most of those night attacks were highly successful. This was due in great measure to the thorough training of the Japanese troops and the inferiority of the Chinese troops.

The night attack, as shown in Example 3, which was made by the 14th Division in the area north of Pao-Ting was an example of a night attack made by a large unit with the objective of achieving a decisive battle. The night break-through in depth, as illustrated in Example 4, which was conducted by the main body of the First Army in the initial phase (May 1941) of the Battle of Chung-Yuan was conducted after the new Field Service Regulations and the new Infantry Manual were issued, but many of the concepts of the Red Books were employed.

4. The Japanese Army employed a night attack against Soviet positions for the first time during the series of disputes that took place near the Soviet-Manchuria border in 1938.

The first, a night attack made by the 1st Battalion of the 75th Infantry Regiment in Chang-Ku-Feng in the latter part of July 1938, is described in detail in Example 5. The 1st Battalion carried out the attack generally according to the Infantry Manual of that

time and succeeded in capturing firing positions arranged in several lines. The Soviet positions were only about 300 meters in depth, but the fact that several lines of firing positions were captured was highly significant. Furthermore, it became clear that the Soviet positions, terrain permitting, were composed of an organized network of positions. It is important to note that the Soviet Army began to stress night combat training after that time.

The second of the night attacks was made during the Nomonhan Incident in 1939. During that border incident which lasted from May to September, night attacks were made to compensate for the Japanese weakness in artillery. The terrain in the Nomonhan area was flat and barren, the typical Soviet positions were deep, broad, and widely spaced and, since the strength of Japanese infantry battalions was depleted (200 to 300 men), the maximum capability of a battalion in a night attack was the capturing of one firing position on the front line of the Soviet positions. Moreover, in almost all cases, battalions that succeeded in capturing a firing position were forced to abandon it on the following morning in face of heavy counterattacks by enemy artillery and tanks. While such an outcome might have been expected from the study of the Soviet positions, the Nomonhan Incident provided the proof.

5. After the outbreak of the China Incident, serious studies were continued to improve the tactics of night attack. About that time, the Soviets showed a strong tendency to intensify night combat

training and to change from extremely deep and broad defense positions to a defense with an organized network of positions (collection method).

After the outbreak of the Russo-German War in 1941, the Soviet Army switched completely to the system of organized defense positions.

Experiences in the early stage of the China Incident proved that the strict adherence to the tactical doctrine of the Red Books was not practical even against Chinese positions. These battle experiences demonstrated the advisability of the night attack by two assault echelons. The general principles of night attack contained in the new Field Service Regulations for Operations, issued in September 1938, embodied the concept of the Red Books, the lessons gained in the early stages of the China Incident as well as experiences acquired since the Russo-Japanese War. Shortly thereafter, in February 1940, the Infantry Manual was revised and the general principles of night attack contained in the new Field Service Regulations, were given in detail in that manual.

The Red Books were abolished after the new Field Service Regulations and the new Infantry Manual were issued.

CHAPTER III

Basic Concept of the Principles of Night Combat in the Field Service Regulations for Operations and the Infantry Manual

Section A. General

The Field Service Regulations for Operations, published in 1938, and the Infantry Manual, published in 1940, were the last field manuals on tactics issued by the Japanese Army and maintained their positions as the final authority of the Japanese Army, being neither amended nor modified during the Pacific War. Both publications contained details of night movement and other types of maneuvers in addition to combat, but they placed special emphasis upon positive utilization of the advantages inherent in offensive combat at night. The text of the tactical doctrine of night combat given in the Field Service Regulations for Operations and the Infantry Manual, are given in Appendices I and II.

Section B. General Concept of Night Attack (From the Field Service Regulations and the Infantry Manual)

1. The following conclusions are drawn concerning night attacks and the size of units.

a. Small units will endeavor to take the enemy by surprise under cover of darkness.

b. Large units will execute ~~a~~ night attack under the following circumstances: 1) in case an attack is to be continued in order to exploit and complete gains obtained during a daylight attack, 2)

if the situation requires it, or 3) when it is advantageous to take strong points of the enemy position to facilitate the attack of a larger unit on the following day. The foregoing, 1) and 3) are self-explanatory. The phrase "the situation requires it" in 2) was provided chiefly for cases when time was limited. It is also possible that the phrase was chosen to permit the application of the tactics stressed in the Red Books (i.e. deep penetration of the enemy position on a narrow frontage).

Night attacks by small units were encouraged without reservation, but limited encouragement was given to the night attack by large units. Infantry units of regimental-size or larger did conduct night attacks in actual battle after the Field Service Regulations were issued, but generally speaking the Japanese Army considered the infantry battalion the unit of the most suitable size to conduct a night attack.

2. Seizure of key positions, capturing hills or hamlets within the enemy defense area or other specific tactical positions where hostile strong points are situated, as well as penetration in depth were recognized as the objects of a night attack. While the Red Books had placed the primary objective of night attack upon penetration in depth rather than on seizure of key positions, in view of the characteristics of Soviet positions, the Field Service Regulations approved both the capture of key positions and penetration in depth as objectives of night attacks.

3. The changes in the types of Soviet positions and the lessons learned during the early phase of the China Incident made it advisable to adopt a two-echelon system as being less hazardous for penetration in depth by night attack. After the first assault echelon occupied the preliminary objective, the second echelon would leapfrog the first and become the front line unit, penetrating deep into the enemy position.

4. Preference was shown for surprise attack without supporting fire rather than sudden attack with artillery support, although the latter was also approved. While it was recognized that supporting fires might warn the enemy of an impending attack in actual practice, support for an infantry assault with artillery and infantry weapon fire was often provided, even in cases in which surprise was intended.

The employment of tanks was also approved for the purpose of destroying enemy wire or neutralizing heavy weapons, especially flank defense weapons, providing that there were no other suitable means available and that the maintenance of secrecy was not essential.

In all concepts of night attack methods, the infantry companies remained the primary components of night attacks, although participation by machine guns, artillery, tanks, and other weapons was approved under certain circumstances.

5. Preference was given to a concentrated attack formation as opposed to an extended formation, since a concentrated formation was decidedly advantageous from the standpoint of control and movement

in darkness. Also, the infantry assault is more effective in applying pressure against the enemy and maintaining the morale of attacking troops when conducted in concentrated formation. It is impossible to ignore the adverse effects the extended assault formation may produce in the minds of individual soldiers. When an extended formation is used at night each officer and man is freed from the eyes of his commanders, subordinates, and fellow-soldiers, and because his deeds, whether merited or otherwise, are not observed by others, troops tend to become less aggressive in action. However, minimization of losses must also be an important consideration in selecting an assault formation and for this reason the employment of extended formation was not precluded entirely in the Infantry Manual.

6. The need for completely familiarizing the assault unit with the terrain and hostile positions and the need for making thorough attack preparations were stressed as factors essential to a successful night attack.

7. Taking advantage of the enemy's lack of security was emphasized in choosing the time of attack.

Also recognized was the greater possibility of gaining the initiative when the attack against the enemy was launched just after dark as well as the advantage of early dawn attack in which gains could be exploited in the subsequent daylight attack.

8. In selecting the assault point, preference was given to the location offering ease of attack maneuver, but directing the assault

against a soft spot in the enemy position was also approved.

9. The importance of adopting the simplest dispositions in the night attack and avoiding intricate dispositions was emphasized.

However, night attacks in modern warfare generally require complex organization. Consequently, the Field Service Regulations. required the commander to formulate detailed plans for night attacks and to thoroughly familiarize his subordinate units with his plans. The manual also stressed the necessity for support units to make adequate attack preparations during daylight, if the attack is to be supported by fire.

10. The infantry taking part in the night attack was required to seek decisive combat by suddenly closing with the enemy and fighting hand to hand. For this purpose, the infantry approaching the enemy position was required to place in the first assault echelon strength sufficient for decisive combat and then rush the attack objective rapidly and resolutely with an assault formation as compact as practicable. Company commanders as well as platoon leaders were especially enjoined to maintain firm control of subordinates and to lead their units in the final assault.

Since it has been proven that the success of an attack by the infantry is dependent largely on the valor of the company commanders and platoon leaders, platoon leaders were required to be at the head of their men even in daylight assault, although company commanders were required to lead only in night attacks.

11. Emphasis was placed on measures for holding occupied ground after a night attack had succeeded.

The need for holding measures was emphasized on the basis of the lessons gained from the unsuccessful night attacks against Shou-Shan-Pu during the Russo-Japanese War and from the studies conducted after the failure of the night attacks against Soviet positions in the Nomonhan Incident.

12. Provision was made in the Field Service Regulations for the allotment of targets between the artillery and infantry heavy weapons in night attacks executed under supporting fire.

As a general rule, the artillery fired on pre-determined objectives, whereas the infantry weapons fired on targets of opportunity.

The Infantry Manual prohibited the firing of rifles and light machine guns even when the night attack was conducted under supporting fire, presumably because the unaimed fire of small arms is seldom effective at night and to avoid confusion resulting from wild firing under the psychological influences of darkness.

Section C. Night Attack of the Infantry (From the Infantry Training Manual)

1. Since units of battalion or company size were most commonly used in night attacks by the infantry, the Infantry Manual was devoted mainly to battalion and company training.

At the beginning of the section on Company Tactics in Night Combat, the Infantry Manual stressed the need for thorough preparation

and resolute execution of the assault with the company commander and all his men firmly convinced of victory, and taught that a high offensive spirit and a firm unity among officers and men were of the utmost necessity in the conduct of night attacks.

Likewise, at the beginning of the section on battalion tactics in night combat, the Infantry Manual stressed the fact that the night attack provided an opportunity for the infantry to display its special characteristics to the utmost, that the battalion size infantry unit was best suited for executing an independent night attack, and that the battalion commander must always be willing to plan night attacks and have the courage to execute them resolutely.

2. When the decision to carry out a night attack was made, the battalion commander was required to immediately inform the subordinate company commanders of his intentions, specifying the time of attack, objectives, and other necessary information, so that the assault units would have sufficient time to prepare for the attack.

3. Commanders were required to assemble their subordinate commanders during daylight near the scene of the scheduled attack and issue detailed orders based on the night attack plan.

Normally, in a night attack, a company had no reserve, but a battalion was divided into a front line echelon and a reserve. If deep penetration of the enemy position was desired, the battalion was divided into two assault echelons and a reserve. The machine gun and infantry gun units moved with the reserve. The formation of a batta-

lion in a night attack is shown in Figure 8.

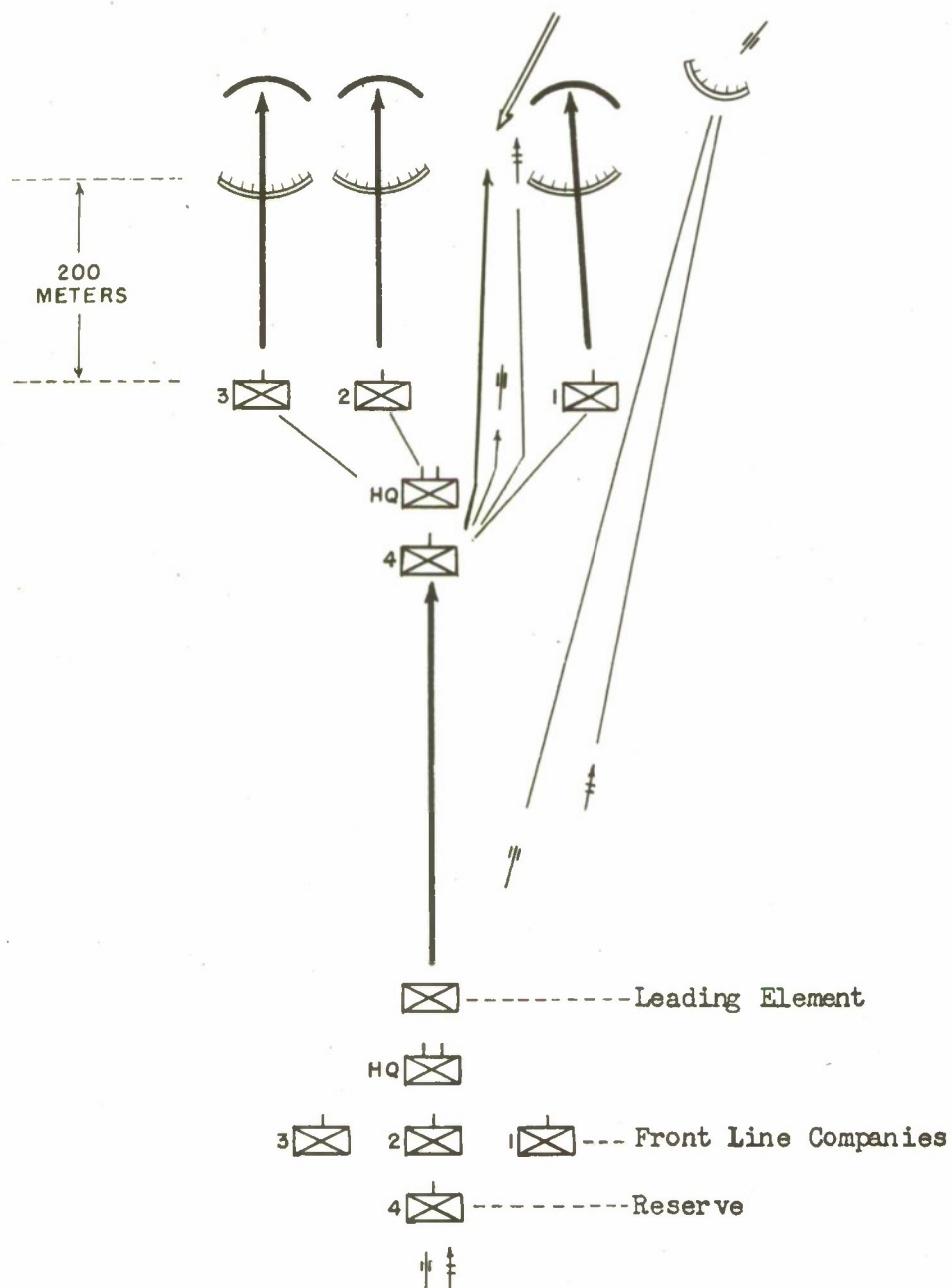
4. Prior to the advance of the main body in a night attack, the battalion commander normally dispatched minor elements to occupy key points along the route of advance or in the foreground of the hostile position in order to cover the advance of the main body and facilitate attack preparations. In the normal situation, the main body of the battalion approached up to a certain designated point in a closed formation, and from there front line companies moved forward in column to their respective attack positions.

5. Maintenance of direction at night is a matter of great importance. To maintain direction in darkness, the battalion was not only required to depend on a compass, as well as the moon and stars, but also to: 1) establish natural objects as reference points; 2) install markers; 3) place men at intervals; 4) use picked patrols as guides and 5) employ star shells. The manual also stressed the necessity of individual soldiers knowing their own location in relation to the enemy position by measuring the distance of advance by rope or pace.

6. During the approach march for a night attack, each company advanced in a formation that offered ease of maneuver. The company commander directed the troops at the head of his company with baton, marking flag, white cloth, or similar means, with the direction of advance maintained by keeping contact with the battalion commander. When subjected to hostile searchlights or effective fire, short halts

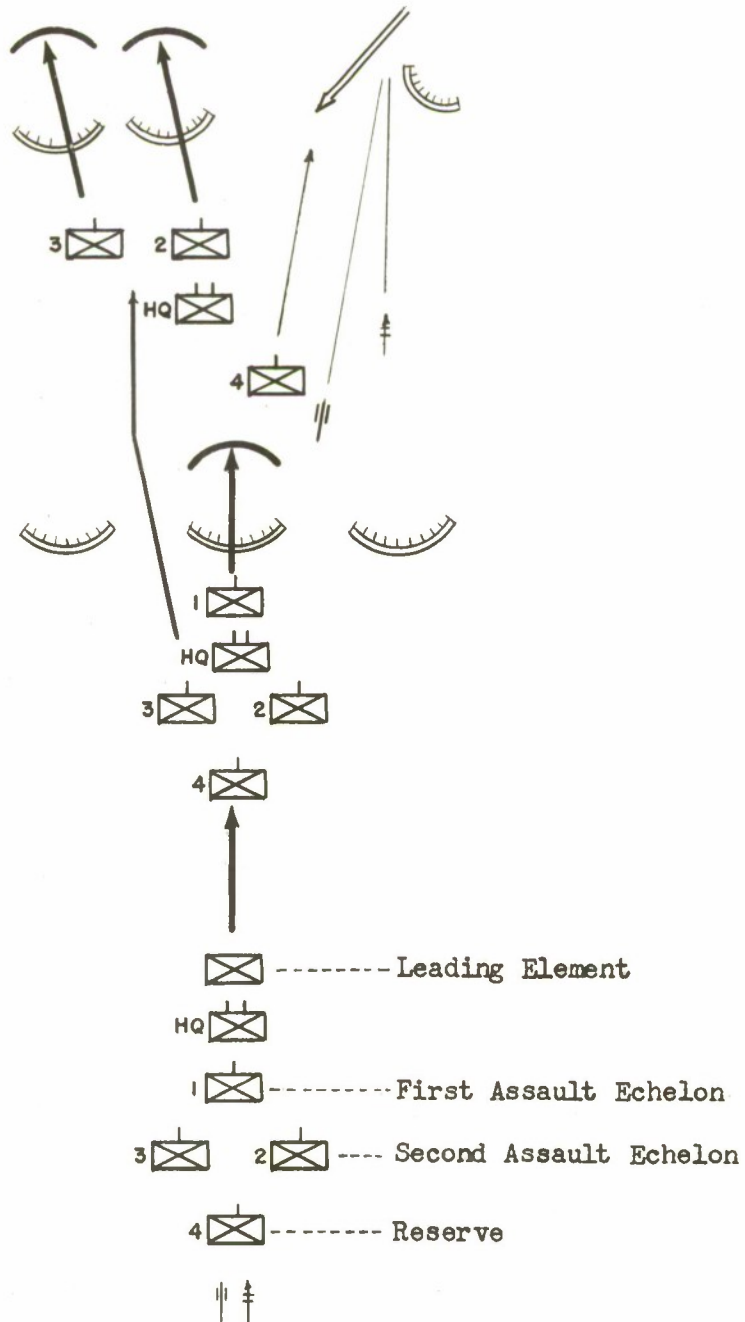
INFANTRY BATTALION IN NIGHT ATTACK

When the capture of a front line enemy position is desired.



INFANTRY BATTALION IN NIGHT ATTACK

When a deep penetration of the enemy position is desired.



were authorized. Even when small enemy elements, sentries or dogs, were encountered the main body of the company continued the approach march. Ordinarily such enemy obstructions were eliminated beforehand by the security patrols but, if necessary, the company commander might employ an element under his command to eliminate them. The company approach formation is shown in Figure 9.

7. Clearing away obstacles in the foreground of the enemy position was planned to be completed well before front line companies reached their assault position.

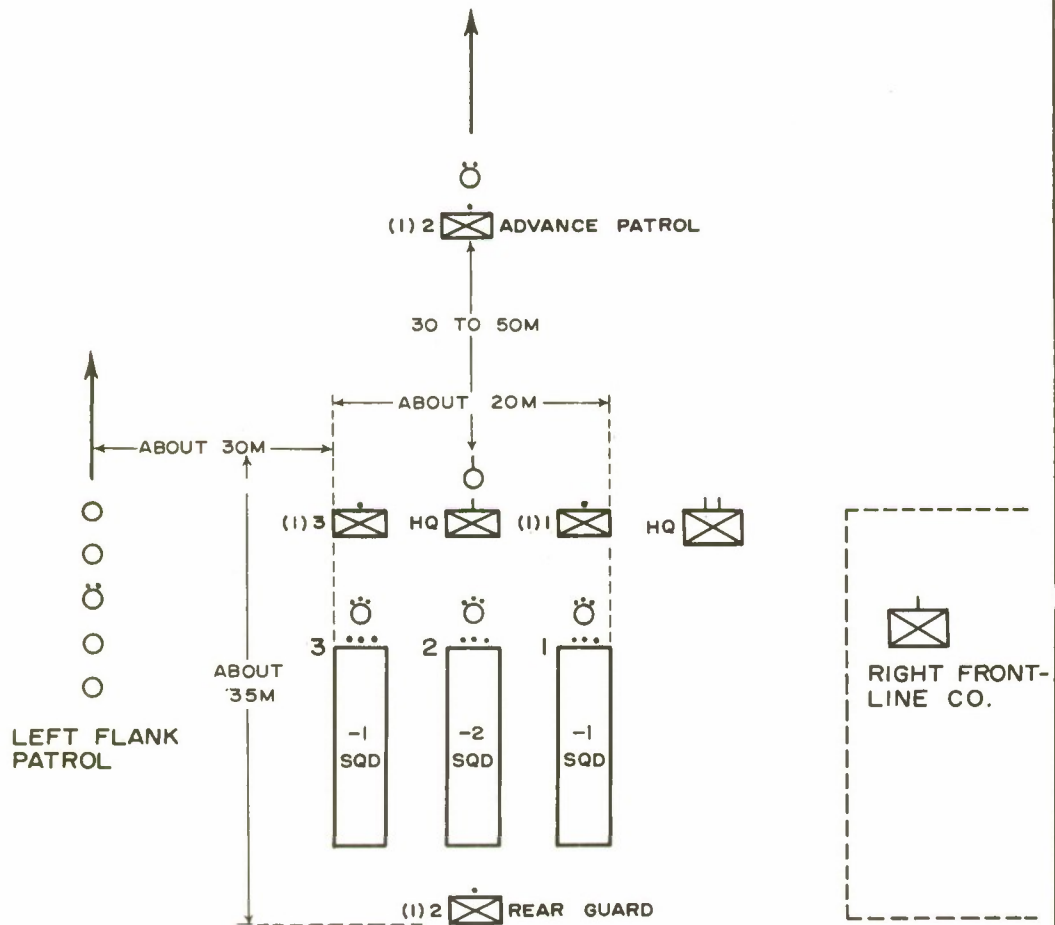
Obstacles were cleared either by the battalion or by each front line company acting independently. In the latter case, the battalion commander designated the time of dispatching obstacle clearing parties, methods of protection, points and method of clearing, time of completion, and other pertinent matters.

8. The attack position of the front line company was ordinarily selected about 200 to 300 meters in front of the enemy position. Upon arrival at this point, the front line company immediately contacted its obstacle clearing parties and advance guards in the forward areas. These groups provided information on the enemy situation, the terrain and the condition of cleared lanes through obstacles. The company commander then determined the company assault dispositions, familiarized his subordinates with those dispositions, and completed preparations for attack.

9. The battalion commander ordered the assault as soon as the

FIGURE NO. 9

COMPANY APPROACH FORMATION



LEGEND :

- CO CMDR
- PLAT LEADER
- NCO

front line company had completed attack preparations.

The assault formation of the company depended on the situation but was invariably one which assured the maximum degree of control with a minimum of loss.

Company assault procedure is illustrated in Figure 10.

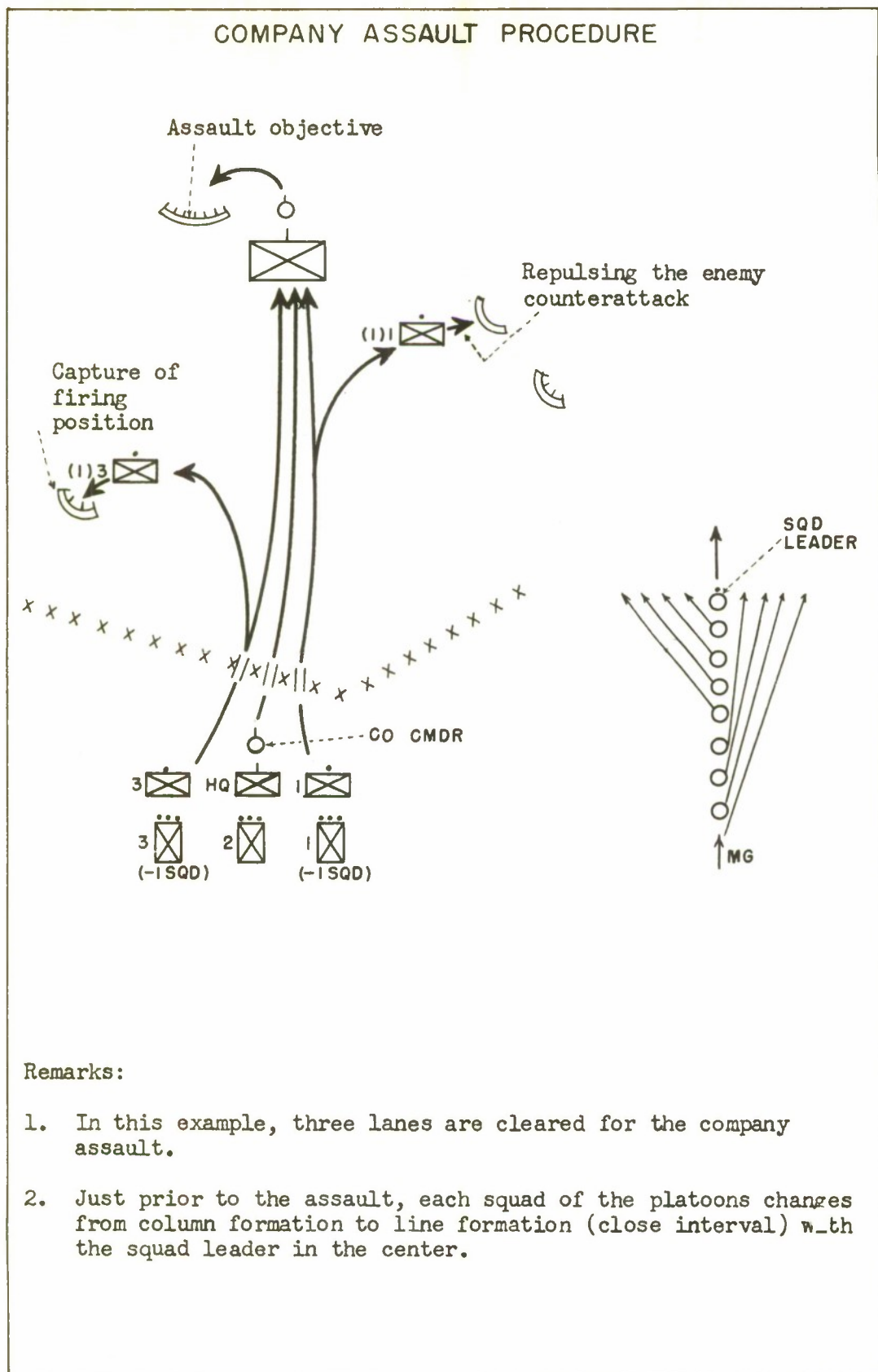
10. The company commander, immediately upon taking the assigned objective, regrouped the company, dispatched elements to reconnoiter the enemy situation and terrain, established contact with the battalion commander and adjacent units, prepared close-range fires, ordered construction of necessary defenses, enforced strict security measures against enemy counterattack, and prepared the company for the next action. The battalion commander, likewise disposed the battalion to meet possible enemy counterattack and prepared for the subsequent action.

11. When a battalion conducted a night attack in two assault echelons, the strength of each echelon was determined in consideration of the depth and condition of the enemy position to be attacked.

The battalion commander committed the first assault echelon to seize the enemy front line position prior to penetration by the battalion's main body. The width of the enemy position to be captured by the first echelon was determined by the terrain and the manner in which the enemy fire was organized.

The battalion commander, after determining the degree of success of the first assault echelon, personally commanded the second

FIGURE NO. 10



echelon and the reserve. After placing the obstacle clearing squads and other necessary elements at the head, he executed a leapfrog movement to pass the first assault echelon in order to continue to assault the enemy position and capture their key points. The leapfrog movement was made as soon as possible after the initial assault to avoid giving the enemy time to rally.

12. Normally the second assault echelon adopted attack dispositions from the outset and advanced in a formation suitable for the attack. However, to avoid confusion during the leapfrog, the second assault echelon closed its formation and returned to the attack formation after the first assault echelon had been passed.

13. When tanks joined the infantry in a night attack, they were employed chiefly for destroying wire entanglements of the enemy front line positions, his known heavy weapons and flanking fires. In tank-infantry employment, the battalion commander usually distributed tanks to each front line company and regulated the time of their joining the attack.

14. The company was required to take every possible measure for concealment in order to make the night attack successful. The company commander was required to exercise the strictest security measures, enforce thoroughgoing sound and light control, prohibit loading of firearms and refrain from using verbal orders except when ordering the final rush.

15. Maintenance of contact during the night attack was stressed

as being of vital importance.

The battalion commander was required to make his position known with markers or some special means of identification, and to keep his subordinates always under his control.

Section D. Attack at Early Dawn and Dusk (From the Infantry Training Manual Published by the Infantry School and the Field Service Regulations for Operations)

1. The "early dawn attack", previously described as a combination of the ordinary dawn attack and a night attack, is infantry assault conducted during the period shortly before dawn. Combat organization for an attack of this type can be obtained by proper modification of dawn and night attacks, with a rapid switching over to the coordinated attack of the infantry, tank and artillery after day-break.

2. In order to take advantage of the night to approach the enemy, to reach the attack position and to make the assault at dawn, reconnaissance and other attack preparations should be made during the daylight hours whenever possible.

3. In the battalion advance to the assault position for an early dawn attack procedures for the night attack are followed.

4. As in the case of the night attack, the company sometimes assaults a single objective with its entire strength concentrated in a close formation, but usually in the early dawn attack the company assigns attack objectives to its front line platoons and allows them

to assault individually using methods similar to the daylight attack procedures. In the latter case, the intervals between platoons are kept greater than in a night attack and the company usually holds some reserve strength.

5. In the early dawn attack, tanks are usually committed to the action after the front line infantry has penetrated the enemy position. However, depending on the conditions of enemy obstacles, it is sometimes advantageous to employ a part or the whole of the tank strength from the start.

6. The artillery is, in principle, required to render the fullest possible support to the infantry, particularly at daybreak. However, when it is possible to complete preparations for action in advance, the artillery opens fire at early dawn and supports the infantry assault, although it is advisable for the artillery to delay opening fire until after the first infantry assault in order to conceal the attack.

Section E. Night Defense (From the Infantry Training Manual published by the Infantry School and the Field Service Regulation for Operations)

1. The defensive doctrine of the Japanese Army required that the front line infantry positions, be defended to the last and the enemy attack stopped before the line.

The requirements of night defense took into consideration both the Japanese Army's defensive doctrine and the fundamental effect which night has upon combat. Consideration was given to the

fact that redistribution of troops under hostile fire at night results in confusion and that, in view of the difficulties of cooperation by adjacent units or reinforcement from troops in the rear at night, simplicity was required in defense assignments.

2. Generally speaking, at night patrols and more stringent security measures were used to detect the enemy approach, contact between security detachments was strengthened and a sentry line organized in front of each platoon position. Also, if available, searchlights were prepared to illuminate the ground in front of the defensive position.

3. If necessary for defense at night, the battalion commander disposed elements where the gaps between companies were great or where terrain conditions made it necessary, and dispatched elements to reinforce companies in critical areas. He also moved the reserve close up to the front line.

4. The company commander usually increased the strength at his strong points dispatched reserve elements to occupy other points and to organize new strong points.

5. In night defense, the infantry company organized its fires to deliver frontal fire at a close range. Machine guns attached to the companies and those under direct control of the battalion commander were employed for frontal fire to cover important sectors in the immediate foreground of the defensive position.

6. If the enemy succeeded in closing with the defensive position, defenders of each strong point subjected them to heavy fire or engaged in hand-to-hand fighting. As soon as the enemy was thrown into confusion, or if he had penetrated the company position, the company commander led the reserve in a counterattack. The battalion commander likewise counterattacked with his reserve. However, the performance of the original mission of defending the assigned position was not be jeopardized by counterattacking too hastily.

Section F. Other Night Operations

1. The Japanese Army, regarded the pursuit as the means to complete the victory and required commanders of all echelons to carry out pursuit actions. Because an enemy attempting to withdraw usually takes advantage of darkness, the necessity of combat units carrying out the pursuit at night was particularly stressed.

2. Before executing a night withdrawal, preparations must be made so as to facilitate the retrograde movement by secretly sending to the rear, during daytime, the sick and wounded as well as excess ammunition.

The common procedure in the daylight withdrawal is to post a covering force (SHUYO BUTAI) in a suitable position behind the front line in order to cover the assembly and withdrawal of the front line force. No covering force is used in the night withdrawal, although it

is commonly protected by small screening detachments (ZANCHI BUTAI) left at key points along the front line. Detachments are disposed so as not to arouse in the enemy any suspicion of withdrawal intentions. It may be advisable to deceive the enemy by making a night attack with elements of the screening force.

3. Darkness should be utilized in amphibious landing and river crossing operations, as secrecy and surprise are vital elements in such operations. Having the invasion convoy approach the landing beach under cover of darkness will often have the advantage of taking the defending force by surprise and since the approach to the landing point will be concealed, may permit the debarkation of the entire main body without detection by the enemy.

In river crossing operations all efforts must be made not to betray the time and place of crossing. Darkness can be used to excellent advantage to conceal the progress of operational preparations from enemy air and ground observation. Actual crossing by the combat elements gains advantages similar to those of night attack. In order not to betray the crossing attempt by the sound of engine powered pontons, the normal procedure is to take the first wave across by rowing, unless the width of the river renders such a method impractical. However, the element of surprise is seldom attained along the entire crossing sector in river crossing operations. In most cases prior preparations for forced crossing under support of artillery and heavy infantry weapons must be made, as it may be necessary

to change from a surprise crossing to a forced crossing. The combination of surprise attack and all-out assault was called sudden attack (KYUSHU) by the Japanese Army.

In both river crossing and amphibious operations, carrying across or putting ashore the bulk of the combat force before daybreak is highly desirable. Moonlight nights should be avoided in amphibious operations.

4. There are numerous other cases in which utilization of darkness is recommended by the Japanese Army. To outflank the enemy position secretly during the night and attack the flank or rear at daybreak or to carry out supply transport and troop movements in rear areas in order to avoid enemy observation and hostile air attack are typical examples of the utilization of darkness. The movement of a large force over a long distance, including the assembly, march, and deployment with the operation extended over several nights has been used to good advantage in some instances. The strategic surprise achieved by the First Army in the battle of Chung-Yuan described in Example No. 4 was accomplished mainly through application of this method. The night was also utilized in assaulting pillboxes and in clearing artificial barriers by infantry and engineers.

Author's Note:

The fundamental rules for assaulting pillboxes were described in Part 4 of the Field Service Regulations for Operations. Unfortunately, this document is not available, as it was destroyed at the time of the surrender.¹ The methods described, although seemingly elementary, were actually very effective. As an illustration of their effectiveness, the following story is told about Part 4 and its author, ex-Major General Miyano:

"The substance of Part 4, including the section on assaulting pillboxes, was originally conceived by Major General Miyano in 1933, but the methods advocated were not accepted by the General Staff on the grounds that they were too elementary. When Major General Miyano visited Germany, later in 1933, he was asked by the German General Staff for suggestions on how to penetrate the Maginot Line. At that time he recommended the assault tactics he had conceived earlier. The German General Staff adopted his recommendations and succeeded in breaking through the Maginot Line in 1940. When this news reached Japan, the Japanese General Staff adopted the assault methods conceived by Major General Miyano and made them Part 4 of the Field Service Regulations for Operations."

1. Editor's Note:

Although reported to have been destroyed, a copy of Part 4 of the Field Service Regulations was located by research consultants employed by the Japanese Research Division. Translation is included as Appendix V.

The methods advocated in Part 4 called for a dawn or dusk surprise attack, with penetration in depth, by a battalion. Tochkas were by-passed and the attacking and neutralizing of those pillboxes were accomplished by specially trained and equipped Tochka Attack Units, composed of 30 to 40 infantrymen and engineers.

The assault tactics of the Tochka Attack Units and its component groups were divided into four phases:

- a. Neutralization firing directed against pillbox firing slits by the Support Group (snipers and light machine guns) and light artillery.
- b. Demolition of obstacles by Obstacle Demolition Group (wire cutters and clearers as well as demolition teams). Heavy artillery was also employed to clear obstacles and soften up tochkas.
- c. Placement of demolition charges on and in tochkas by Assault Group.
- d. Mop-up of personnel inside tochkas by Assault or Reserve Group.

Flame throwing tanks ("SO") operated by special engineer groups ("KI") were also employed against tochkas. The use of regular assault tanks in lieu of light artillery in firing on slits was contemplated, although normal employment called for their use in support of the break-through of the main body.

CHAPTER IV

Training in Night Combat

Section A. General Training

1. Reference materials used for writing this chapter are:

Infantry Manual

Night Movement Training Manual
(Yakan Kodo Kyoiku no Sanko)
(Published in May 1936 by the Infantry School)

Infantry Training Manual (Volume IV)
(Hohei Kyoren no Sanko)
(Published in June 1941 by the Infantry School)

Individual Combat Training Manual
(Sento Kakko Kyoren no Sanko)
(Published in December 1937 by the Infantry School)

Night Attack Manual
(Yakan Kogeki no Sanko)
(Published in September 1944 by the Inspectorate General
of Military Training)

Maneuver Guide
(Enshu Binran)
(Published in February 1944 by the Military Academy)

Night Observation Training Manual
(Yakan Shiriyoku Zoshin Kunren no Sanko)
(Published in March 1944 by the Inspectorate General of
Military Training)

Infantry Position Construction Manual (Volumes I & II)
(Hohei Chikujo)
(Published in August 1941 by the Infantry School)

Field Fortification Manual (Volumes I & II)
(Yasen Chikujo Kyohan)
(Published in March 1944 by the Inspectorate General of
Military Training)

Field Fortification Manual (Volume I, Supplement)
(Yasen Chikujo Kyohan)
(Published in October 1944 by the Inspectorate General
of Military Training)

2. That training in night combat in the Japanese Army occupied a very important part of the training program is evident from the emphasis placed on it in the Infantry Manual. The manual stressed that "The infantrymen must be especially proficient in night combat. For this reason the infantrymen must attain a degree of proficiency equal to daylight combat through repeated training and exercises. Mastery of taking advantage of the dawn and dusk is also vital." The phrase "especially proficient" is the strongest of all expressions of this sort, and the phrase "the proficiency equal to the daylight combat" means to attach to night combat training equal importance with daylight combat training. In other branches, too, considerable stress was placed on training for night action, although not so much as in the infantry.

3. In the night combat training of infantry, the emphasis was laid on offensive action, with the surprise attack being stressed. The reason for the emphasis probably stemmed from the fact that the basic concept of night attacks invariably contemplated a surprise attack followed by close combat, fire power being considered of secondary significance - although both the Field Service Regulations for Operations and the Infantry Manual approved the night attack with use of fire power.

Therefore, in combat training much effort was exerted in how to attack the enemy by surprise under concealment of darkness. Such measures as sound prevention, blackouts, silent marches, silent

orders, and silent assault are all designed to take the enemy by surprise, concealing our intention and movements.

Great efforts were put into the basic training to overcome the disadvantages of the night. Training eyes and ears, finding bearings and maintaining direction in darkness, movement in various terrain at night, assault firing, and maintaining control at night were included in the training program.

Mental conditioning for the night attack was centered on an undaunted fighting spirit, firm unity, boldness and a strong sense of responsibility.

4. Night combat training by the Japanese Army in peacetime was conducted parallel to the daylight combat training. The progress attained in the daylight training was utilized in the night combat training, sometimes conducted intensively by designating a "night combat training week." Generally, however, it was conducted progressively with daylight training during the training year.

The training year of the Japanese Army began in December and ended in November of the following year. This training year was divided into three periods: The first period (December to March), the second period (April to July), and the third period (August to November). (The training year system was formulated by taking into consideration the mobilization plan, which began from April of each year. The recruits who completed the training of the first period in March were listed in the mobilization plan as combat ready soldiers.)

The company commander in charge of the training of recruits prepared the training program for each period based on the Military Training Guide. The examples of night combat training during each period of a typical training year for the rifle company of an infantry regiment is given in Chart Nos. 1, 2 and 3.

The number of hours allotted to the night combat training of the infantry throughout the training year was approximately one-fourth of the total hours for training, although training for daylight combat was applicable to night combat to a considerable extent.

5. Special equipment used by the infantry in training and actual combat at night were as follows:

a. For maintenance of direction and course marking: Luminous compass, route marker, lime, tape, rope, and marker light.

b. For control, contact, and sign: Small white flag, luminous watch, whistle, contact rope, luminous marker (used by commander), white sash, white belt, white cloth, position marker light, blinder light, flashlight, and signal cartridge.

c. For reading maps and documents: Dim light, flashlight, and luminous mirror.

d. For sound prevention: Cloth, straw, or other material for wrapping the metal parts of the bayonet, canteen, mess kit, saber, shovel, pick, and hobnail of shoes.

e. For use in attack: Smoke candle, self projecting smoke candle, wire cutter, sandbag, movable barrier, and individual camouflage net.

Program for Night Combat Training During the First Period of the Training Year for a Rifle Company of an Infantry Regiment							
Policy	To instruct and train the individual in the subjects essential to night action according to the progress of daylight training, thus completing the preliminary training and developing the ability of each individual to act as a member of the unit.						
Sub- jects for Training	Weeks	8th Week (18-25 Jan)	Hrs	9th Week (26 Jan-1 Feb)	Hrs	10th Week (2-8 Feb)	Hrs
Combat Training		Vision training: 1. Visibility under various conditions of darkness. 2. Utilization of terrain features and objects at night	4	Vision training: Identification of the enemy. Camouflage, and identification of objects.	2 2	Training in hearing Estimate of enemy situation. Noise prevention 1. Noise prevention in handling individual arms and equipment. 2. Silent movement.	3 6
March Security and Reconnaissance							
Bayonet Training							
Training Hours			4		4		9

Sub- jects for Training	Weeks	11th Week (9-15 Feb)			12th Week (16-22 Feb)			13th Week (23 Feb-1 Mar)		
		Hrs	Hrs	Hrs	Hrs	Hrs	Hrs			
Combat Training		Distance estimation 1. By pace 2. By eye 3. By sound	6	Orientation Maintenance of direction 1. By celestial bodies 2. By compass 3. By terrain objects and features	3 6	Route marking 1. Road markers 2. Other markers Silent march 1. Movement by signal. 2. Action to be taken when exposed to light. 3. Action to be taken when exposed to fire.	2 3			
March Security and Reconnaissance						March Runners and connecting files	3			
Bayonet Training										
Training Hours			6		9		8			

Sub- jects for Training	Weeks	14th Week (2-8 Mar)			15th Week (9-15 Mar)			16th Week (16-22 Mar)		
		Hrs			Hrs			Hrs		
Combat Training		Crawling and double march			Squad training			Squad training		
		Advance and hand grenade throwing			Silent march over various terrains.			1. Assault by surprise		
		Assault			Squad combat training Advance over various terrains and advance through lanes cut through wire.			2. Forced rushing		
March Security and Reconnaissance		Sentry Watch and challenge			Sentry Actions to be taken against enemy attack Visiting patrol			Patrol at halt and sentry duty		
		2			3			5		
Bayonet Training		Dummy thrusting Dummy thrusting from the ready position			2			Dummy thrusting Dummy thrusting after advancing over level ground		
		2			2			2		
Training Hours		11			10			13		

Sub- jects for Training	Weeks	17th Week (23-29 Mar)		18th Week (30 Mar-5 Apr)		Remarks
		Hrs		Hrs		
Combat Training		Squad training Securing a captured position and preparing for night firing	6	Platoon movement at night	3	The squad training in the night combat will be complet- ed, and the outline of platoon training will be given.
	March Security and Reconnaissance	Patrols during movement	4			The training in night sentry duties will be completed, and the training in night recon- naissance and others will be conducted to the extent that will enable the soldier to serve as a unit member.
Bayonet Training		Advanced bayonet drill	3			The soldiers will be trained in the method of hand-to-hand fighting at night.
	Training Hours		13		3	

Notes:

1. Special attention will be given to the following matters to obtain better results in the training for night combat.
 - a. Accomplishments in daylight training will be utilized in night training to the fullest extent.
 - b. Proficiency in training for night combat will be improved through simulated night conditions.
 - c. In general, no training will be scheduled for the afternoon preceding and the morning following night training in order to achieve a high degree of proficiency in the night training.
2. The mental state essential for night training will be developed along with combat training. Bayonet exercise will be encouraged during off duty hours to improve skill and develop a strong fighting spirit.
3. In order to further improve the combat efficiency of individual soldiers, each squad will repeat night training during unscheduled time*.
4. The Period 1 Inspection will be conducted in the early part of April.

* Periods allotted on MTG for review and extra training.

N. B.

Charts were prepared by the following ex-officers who were training officers in the 15th Infantry Regiment about 1935.

Ex-Lt Col Tokunaga, Hachiro

Ex-Lt Col Maruyama, Yoshiharu

Ex-Lt Col Matsushita, Sansei

Program for Night Combat Training During the Second Period of the Training Year for the Rifle Company of an Infantry Regiment					
Policy	To conduct advanced training with emphasis on unit training so as to make it possible to carry out night combat by a company or battalion and accomplish security and reconnaissance missions at night. To conduct supplementary training in the parts found to be unsatisfactory in the Period 1 Inspection.				
Sub- jects for Training	Weeks	2d Week (6-12 Apr)	Hrs	3d Week (13-19 Apr)	Hrs
Combat Training		Platoon attack Approach, preparations for assault and assault	6		6
March Security and Reconnaissance				Sentry duty	4
Bayonet Training					3
Training Hours			6		4
					9

Sub- jects for Training	Weeks	5th Week (27 Apr-3 May)	Hrs	6th Week (4-16 May)	Hrs	7th Week (11-17 May)	Hrs
Combat Training		Platoon attack Assault after clearing obstacles (switching over to forced clear- ing from clearing in secrecy)	8			Occupation of defensive position and defensive combat by a platoon	4
March Security and Reconnaissance		Outguards Training in sentry duties	4	Outguards Training in patrol & visiting patrol duties	8		
Bayonet Training							
Training Hours			12		8		4

Sub- jects for Training	Weeks	8th Week (18-24 May)	Hrs	9th Week (25-31 May)	Hrs	10th Week (1-7 Jun)	Hrs
Combat Training		Company night attack Approach and preparations for assault Company night attack Assault and holding a captured position	8 8	Company night attack Assault after clearing	8	Occupation of a position and defensive combat by a company	4
March Security and Reconnaissance		Outpost support Training in outguard and sentry duties	8	Outpost support Training in security by the main body of the company	8	March and bivouac	12
Bayonet Training							
Training Hours		(Field maneuver)		(Field maneuver and inspection)			
			24		16		16

Sub- jects for Training	Weeks	11th Week (8-14 Jun)	Hrs	12th Week (15-21 Jun)	Hrs	13th Week (22-28 Jun)	Hrs
Combat Training		Battalion night attack Attack against weak position	8				
March Security and Reconnaissance		Outpost reserve Training in conversion from the advance guard to the outpost reserve	8			Outpost training Measures to be taken when attacked with gas	4
Bayonet Training				Dummy thrusting Thrusting several dummies successively	4		
		(Field maneuver and inspection)					
Training Hours			16		4		4

Sub- jects for Training	Weeks	14th Week (29 Jun-5 Jul.)	Hrs	15th Week (6-12 Jul.)	Hrs	16th Week (13-19 Jul.)	Hrs
Combat Training		Attack after passing through a contaminated area	6				
March Security and Reconnaissance							
Bayonet Training				Advanced bayonet drill	3	Advanced bayonet drill	3
Training Hours			6		3		3

Sub- jects for Training	Weeks	17th Week (20-26 Jul)	Hrs	18th Week (27 Jul-2 Aug)	Remarks
Combat Training					1. The recruit will be trained in unit combat and in independent action under various conditions at night by training together with the second-year men in the joint company training. 2. From the beginning of the Period 2, the efficient recruits will be trained for as first class privates or non-commissioned officers (squad leader, NCO of the guard, and others) through general and special training.
March Security and Reconnaissance		Patrols, visiting patrol and messengers	8		
Bayonet Training					Soldiers will be trained in hand-to-hand fighting at night.
		(Field firing at the maneuver ground)			
Training Hours			8		

Notes:

1. Special emphasis will be placed on the following points to obtain better results in the training for night.
 - a. The accomplishments of daylight training will be utilized in night training as much as possible.
 - b. Night training will be facilitated by preliminary training in the daylight.
 - c. Depending on the nature of the night training, no training should be scheduled on the afternoon preceding and the morning following night training in order to achieve a high degree of proficiency in the night.
2. The mental state essential for the efficient soldiers in night combat will be developed along with combat training. Bayonet exercise will be encouraged during off duty hours to improve skill and develop a strong fighting spirit.
3. Efforts will be made to schedule the training so that the night training can be conducted on the company drill day (normally every Tuesday and Friday).
4. The Period 2 Inspection will be conducted at the maneuver ground; the company exercise (security, reconnaissance and others included) in the latter part of May and the battalion exercise (security, reconnaissance and others included) around middle of June.

Program for Night Combat Training During the Third Period of the Training Year for the Rifle Company of an Infantry Regiment									
Policy	To further promote the soldiers's skill in individual action at night and to continue the unit training to make units proficient in all types of night attack. To conduct supplementary training in the parts found to be unsatisfactory in the Period 2 Inspection.								
Sub- jects for Training	Weeks	2d Week (3-9 Aug)	Hrs	3d Week (10-16 Aug)	Hrs	4th Week (17-23 Aug)	Hrs	5th Week (24-30 Aug)	Hrs
Combat Training		Company dusk attack Conversion from daylight attack to night attack	4					Battalion night attack Attack supported by fire	8
March Security & Reconnais- sance				Outpost support Sentry duties & measures to be taken when attacked by enemy	8				
Bayonet Training						Advanced bayonet	3		
Training Hours			4		8		3		8

Weeks Sub- jects for Training	6th Week (31 Aug-6 Sep)	Hrs	7th Week (7-13 Sep)	Hrs	8th Week (14-20 Sep)	Hrs	9th Week (21-27 Sep)	Hrs
Combat Training	Joint maneuver of infantry & artillery	8			Company early dawn attack Conversion from night attack to day- light attack	5	Joint maneuver of infantry and tanks	8
March Security and Reconnaissance								
Bayonet Training			Advanced bayonet drill with soldier and dummies	4				
Training Hours		8		4		5		8

Weeks Sub- jects for Training	10th Week (28 Sep-4 Oct)	Hrs	11th Week (5-11 Oct)	Hrs	12th Week (12-18 Oct)	Hrs	13th Week (19-25 Oct)	Hrs
Combat Training			Battalion night attack Attack by a unit disposed in assault echelons	8				
March Security and Reconnaissance	March with military precautions	6			Forced march and village bivouac	12		
Bayonet Training								
Training Hours		6		8				12

Weeks Sub- jects for Training	14th Week (26 Oct-1 Nov)	Hrs	15th Week (2-8 Nov)	Hrs	16th Week (9-15 Nov)	Hrs	17th Week (16-22 Nov)	Hrs
Combat Training					Assault against pillbox	4		
March Security and Reconnaissance								
Bayonet Training							Hand-to-hand fighting bayonet and sword	3
Training Hours								3

Weeks Sub- jects for Training	18th Week (23 Nov-29 Nov)	19th Week (30 Nov-6 Dec)	Remarks
Combat Training			1. The recruits will be trained in unit combat and in independent action under various conditions at night by training together with the second-year men in the joint company training. 2. The training of efficient recruits will be continued and be completed by the end of this period.
March Security and Reconnaissance			
Bayonet Training	Hand-to-hand fighting bayonet and sword	3	Advanced training will be conducted to improve the skill in hand-to-hand fighting at night.
Training Hours		3	

Notes:

1. Special emphasis will be placed on the following points to obtain better results in the training for night.
 - a. The accomplishments in the daylight training will be utilized in the night training as much as possible.
 - b. The night training will be facilitated by the preliminary training in the daylight for the night training.
 - c. Depending on the nature of the night training, the afternoon preceding and the morning following the night training should not be used for the daylight training in order to achieve a high degree of proficiency in the night training.
2. The mental state essential for the efficient soldiers in night combat will be developed along with the combat training. Especially the bayonet exercise will be encouraged during the off duty hours to improve the skill and a strong fighting spirit.
3. Efforts will be made to schedule the training so that the night training can be conducted on the company drill day (normally every Thesday and Friday).
4. The training during the division's autumn maneuver will be conducted according to the maneuver schedule of the division. Any part of the training found to be unsatisfactory during the maneuvers will be corrected in the supplementary training which will be conducted before the expiration of the current training period.

f. For use in defense: Searchlight, flare and movable barrier.

g. For elementary training: Dark eyeglasses.

Individual Training, General

The object of night training for the individual is to make the night combat training of units possible.

The Infantry Manual gives the following points as vital objectives of night training.

(1) To train soldiers in the ability to discover the enemy quickly and to estimate their strength, distance and movements.

(2) To develop soldiers in the ability to correctly identify terrain features and objects and to make the best possible use of them.

(3) To train soldiers in orientation and the ability to reach the desired point by maintaining direction through the aid of conspicuous landmarks or other terrain features and objects observed during the daytime.

(4) To train soldiers in the method of silent march, noise prevention, movement by signals, and the action to be taken when exposed to light.

(5) To train soldiers in movement in various situations and terrains, by crawling or rapid and daring advance.

(6) To train soldiers in bold and silent assault at night and in the throwing hand grenades.

(7) To train soldiers in preparing for night firing and in effective night firing even when there is no advance preparation.

1. Vision Training and Camouflage

In training eyesight at night, it is essential to adapt the eyes to darkness. Experiments indicated that the eyes adjust gradually to the darkness, with the maximum night sight of a person generally being reached in about 30 minutes to an hour. It was also determined that the maximum night sight of individuals can be developed to a considerable extent by constant training.

The next step is to adapt the eyes of the trainee to the appearance of various objects at night and to enable them to correctly identify the objects. Groves of small pine trees are often mistaken for enemy patrols and a low bank is sometimes taken for an enemy column. Small natural objects unnoticed during the daytime are sometimes mistaken for enemy soldiers.

2. The second phase of training vision at night was concerned with moonlight - the variations of visibility according to the age and slant of the moon, the relative position of the moon, the object and the observer, the weather, particularly the cloud conditions, the background and condition of the objects.

The results of experiments conducted on the Visibility Range by well trained soldiers at the Infantry School are shown in Chart Nos 4 and 5. Noteworthy in Chart No. 5 is that the visible range differs greatly according to whether the observer faces the moon or has the moon behind him.

Visibility at Night (in meters)

Moon Age Object	Starlit Night			12th Day from the Full Moon (Crescent)			7th Day from the Full Moon (Half)		
	Single Soldier	Patrol	Unit	Single Soldier	Patrol	Unit	Single Soldier	Patrol	Unit
Ground and Background									
Level, Grassy Ground	25	30	40	30	60	75	60	70	80
Level, Bare Ground	30	40	45	30	45	50	35	50	55
Dark Background	10	10	15	10	15	20	10	15	20
Silhouetted Against the Sky	35	55	80	130	140	180	140	170	230

1. Patrol is three or four men. Unit is a platoon in column.

The above figures show the visible range when the object is not in motion.

It is easier to identify an object in motion especially when it is moving crosswise.

Notes: 2. This experiment was conducted on clear nights during January and February.

It can be assumed that the brightness is practically equal for two or three nights before and after each age of the moon in the chart.

3. This chart applies for visibility after the full moon as well as before.

(Cont'd)

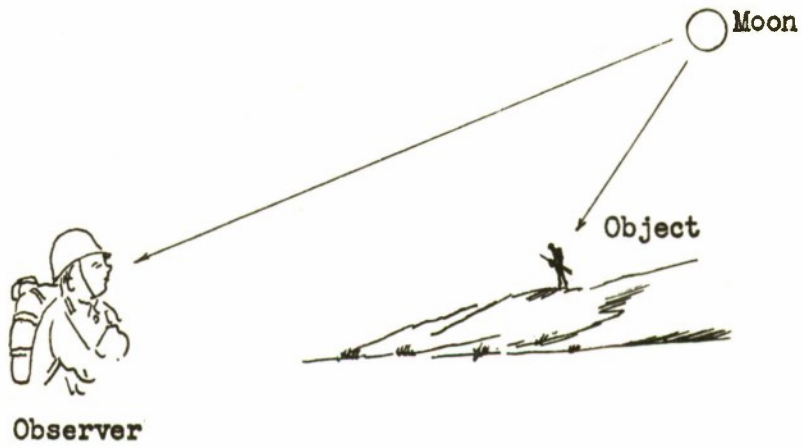
Moon Age Object	3d Day from the Full Moon (3/4)			15th Day of the Moon (Full)			Remarks
	Single Soldier	Patrol	Unit	Single Soldier	Patrol	Unit	
Ground and Background							
Level, Grassy Ground	70	75	120	75	100	150	When the object is not silhouetted against the sky.
Level, Bare Ground	40	50	70	50	30	100	Vary slightly with the amount of humidity in the air.
Dark Background	15	20	25	15	20	25	When the object is in the shadow of wood or grove and the background is dark, the light of the moon makes very little difference.
Silhouetted Against the Sky	160	220	280	180	250	300	
Findings: 1. On the terrain features where attackers will be silhouetted against the sky, the final protective line may be selected 200 to 300 meters ahead of the front of the position because it is possible to identify the attackers at that range at moonlight night. 2. On level ground, on the moonlit night, it is possible to fire at a column at a distance of about 100 meters, and on a starlit night at a distance of 50 meters.							

Visibility on Moonlight Nights				
Object			Single Solider	Unit
Standing Position	Halted	Facing moon	190 meters	264 meters
		With moon behind	115 "	113 "
	In motion	Facing moon	223 "	310 "
		With moon behind	121 "	151 "
Kneeling Position	Halted	Facing moon	128 "	171 "
		With moon behind	69 "	102 "
	In motion	Facing moon	150 "	184 "
		With moon behind	75 "	76 "
Prone Position	Halted	Facing moon	79 "	127 "
		With moon behind	41 "	56 "
	In motion	Facing moon	83 "	131 "
		With moon behind	45 "	59 "

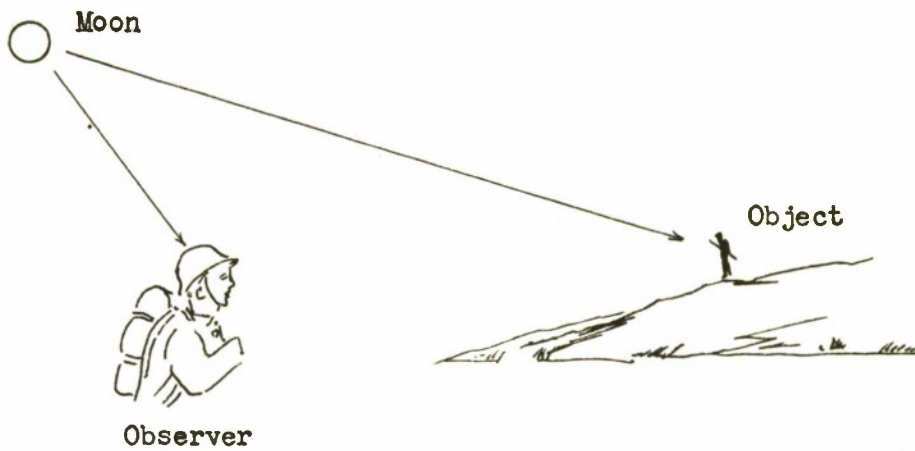
Notes:

- Soldiers employed in the experiment were equipped with full pack and camouflaged.
The unit was approximately a squad in extended order.
- 16th day of the moon (Full Moon), position 60 degrees from the ground, no background. Ground covered with grass 30 centimeters high. There was no haze, but a high percentage of humidity.
- Visibility when the observer faces the moon is half as great as when the observer has the moon behind him.
- It is almost impossible to determine colours even in bright moonlight. Recognition except at very close range is by silhouette or outline.

A. When the moon is faced by the observer



B. When the moon is behind the observer



3. The third phase of vision training at night is the application of training acquired in the first and second phases in approaching the enemy without being discovered, care to be exercised in the reconnaissance mission, and utilization of terrain features and objects and selection of direction in carrying out a successful assault.

In this phase of training the soldier learned that the use of lights and smoking at night are undesirable, not only for the concealment but for adaptation of eyesight. The importance of covering the metal parts of swords, steel helmets, rifles, and bayonets with cloth or other materials in order to prevent reflection in the moonlight or enemy illumination was also taught.

In scanning for enemy soldiers, it is advisable to look upward from a lower position in order to silhouette them against the sky. Men on patrol should occasionally lie down on the ground and scan all directions for suspicious objects.

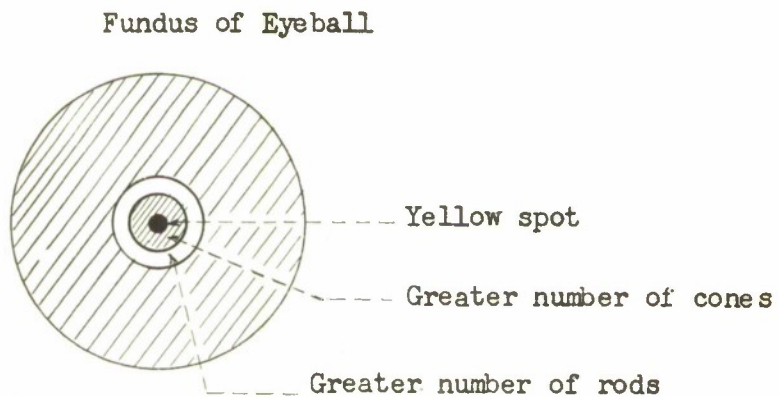
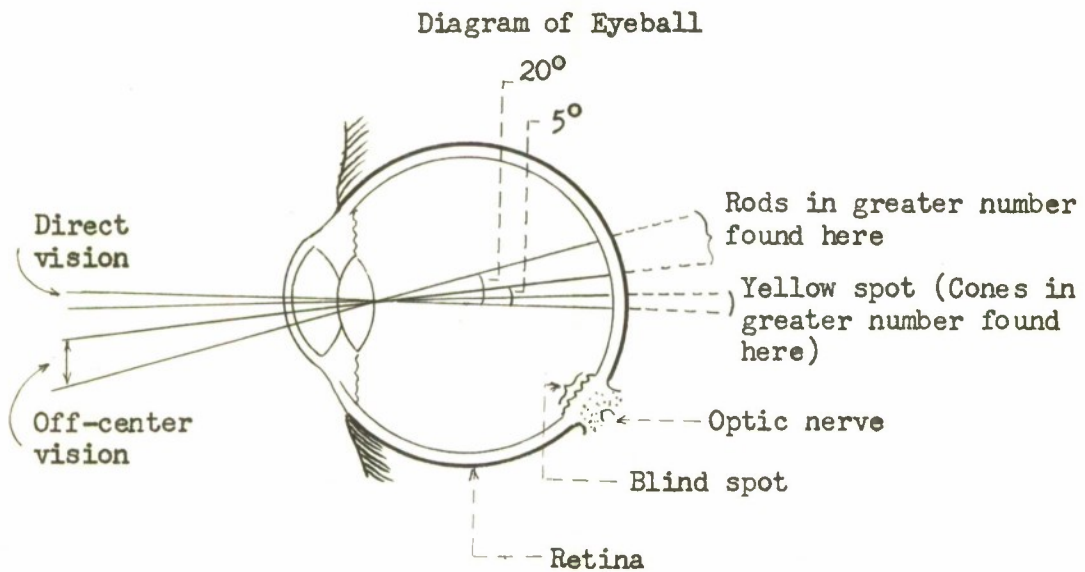
4. Camouflage is used at night to prevent reflection of moonlight and to disguise the silhouette of the figure to make identification more difficult.

5. The "Night Observation Training Manual" published in March 1944, was based on studies undertaken at the Army Medical School and experiments at the Toyama Army School. Although this manual was not widely used in the night training of Army units, it contained valuable data. The principal object of this manual was training in off-center vision. The manual admitted that the night vision can be improved by

The Japanese Research Division does not guarantee the medical accuracy of the following optical discussion.

training other than the off-center vision method, but it stressed that by following this method, night vision can be increased from two to six times.

Off-center vision is using that portion of the retina where the red cells (rods) which enable the eye to see objects in the dark are in the greatest number. In light, the central part of the fundus of the retina (where cones are in the largest number) performs the chief visual function, but in the dark the part surrounding the central part of the fundus of the retina performs the visual function. This is illustrated in the following diagram.



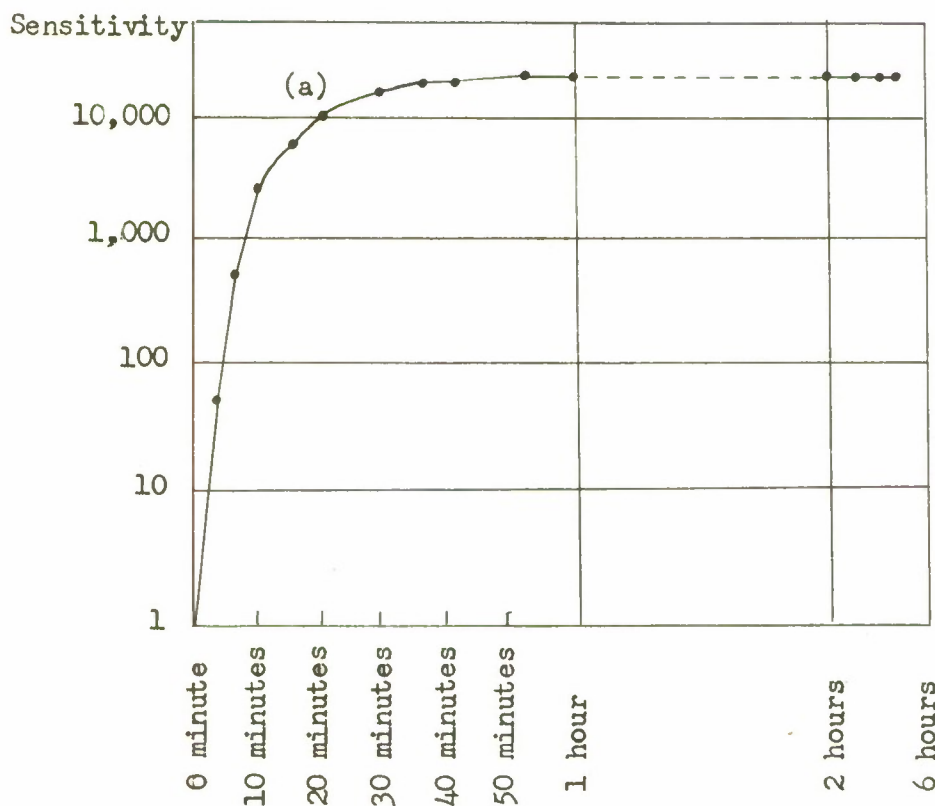
In order to achieve the maximum vision at night, one should not look directly at the object, fixing the center line of sight directly as in the daytime, but look at an angle to the object. This angle depends on the amount of light, in full moon the angle should be about 7.5 degrees whereas on a starlight night the angle should be about 10 degrees off center. Off-center vision is not effective when it is lighter than 0.02 lucas. The comparison between the visual power (the visual power of the central part of the fundus of the retina) in direct vision and the visual power (the visual power of the part surrounding central part of the fundus of the retina) in the off-center vision in various degrees of illumination, and the angles of proper off-center vision are shown in the following chart.

Illumination (lucas)		0.02	0.01	0.005	0.002 (Full Moon)	0.001	0.0002 (Star- lit Night)	0.0001	0.00002
Vision									
Visual Power of Direct Vision		0.11	0.048	0.03	0.017	0.009	0.0046	0.0032	0.0022
Off-center Vision	Off-center Angle (degrees)	3.5	5	6	7.5	9.0	10.0	12.0	13.0
	Visual Power	0.12	0.09	0.07	0.052	0.035	0.024	0.018	0.013
Ratio of the Visual Power of Off-center Vision to Direct Vision		1.1	1.9	2.3	3.05	3.9	5.0	5.8	6.0

In an experiment conducted at the Toyama Army School, several officers and non-commissioned officers underwent off-center vision training for two hours every night for one week, and it was found that their visual power on a starlit night had nearly doubled.

The manual also gives the following results of experiments on dark adaptation, and states that for practical purposes one hour is required to adapt the eyes to darkness.

Sensitivity of the Retina
to the Light in Dark Adaptation



Remarks: Point (a) indicates that the sensitivity to light is increased by 10,000 times after 20 minutes of dark adaptation.

The manual stresses the importance of taking into consideration the time required in dark adaptation in preparing schedules for sentry and patrol duties. It also points out that special caution must be exercised in using lights at night because eyes adapted to darkness would immediately return to their original condition when exposed to light, even for a short time, and would require about one hour to adapt to darkness again.

Section B. Training in Hearing and Noise Prevention

1. The main purpose of training in hearing is to familiarize soldiers with battlefield sounds so that they may correctly judge its cause, direction and distance. The footsteps of a single soldier or a group of soldiers, the sounds made by handling individual arms and equipment by soldiers on the march or starting the march must all be identified. The noises incident to constructing positions and obstacles, the sounds of voices in conversation, characteristic sounds of various weapons when fired, airplane, tank and truck noises, and the sounds of communication apparatus must be demonstrated and soldiers adequately trained to identify them correctly.

2. Sounds of footsteps and engines in the distance can easily be caught by placing the ear to the ground. Well-trained soldiers should be able to estimate the number of enemy soldiers by the sound of footsteps, although this method may often result in overestimation.

Attention must be paid also to the resulting of leaves, animal noises, and the sound of the wind. Barking dogs may indicate

troops passing through a village and the sudden stopping of insects' singing may indicate an approaching enemy.

When the wind is strong, it is especially difficult to hear sounds in forests or koaliang fields and sounds do not carry in dense fog. Men on guard duty must be particularly vigilant under these conditions.

3. Soldiers moving at night must take every care to prevent making noise. They must:

- a. Secure equipment firmly.
- b. Prevent rattling of articles in the pack by wrapping them with cloth and bind mess gear securely with cloth or straw around the handle.
- c. Put the mess gear in the holdall or haversack when the pack is not carried. Separate the wood and metal parts of the shovel and secure them under the belt separately.
- d. Completely fill the canteen to prevent noise.
- e. Stuff ammunition pouches and chests with paper in order to prevent rattling. Wrap the bayonet sheath with cloth or enclose the sheath in a cloth bag.
- f. Refrain from needless conversation and coughing; signs and gestures should be used at night. Orders, information, or reports which must be given orally should be in a whisper.
- g. When marching over a hard-surfaced road, step lightly in order to prevent noise. Walk on the soft shoulder of the road, if

possible and, if necessary, muffle noise by covering the shoes with straw rope or cloth.

Section C. Distance Estimation and Utilization of Terrain Features and Objects

1. Estimating distance is difficult at night, but is necessary on many occasions. For instance, in approaching the enemy position at night, one must know his position in relation to the enemy and for this purpose the direction and distance of advance from the starting point are often estimated and the position oriented on the map. The distance from the starting point is usually measured by pace, which is fairly accurate even at night, although the margin of error greatly increases when the terrain is rough or sloped and overestimation of distance may result.

2. Great distances cannot be estimated by the eye, at night, but the ability to accurately estimate a short distance is vital. For instance, the distance to weapons being fired, to the enemy or position to be assaulted, for throwing hand grenades and the distance to the counterattacking enemy force must often be determined at a glance.

Distance to or from flash and illumination is likely to be underestimated at night whereas the distance to or size of obstacles and terrain features are likely to be overestimated. Estimating distance or measuring at night also varies greatly according to the degree of darkness and the posture of the individual. Consequently

training must be conducted in various degrees of darkness and in different postures, especially the prone position.

3. Training must be given in estimating distance by sound as well as by vision. When a single shot is fired at a considerable distance, estimation may be made by measuring the time required for the sound of the shot to be heard after the flash is observed.

4. Proper appreciation of the differences between the night and daylight in the utilization of terrain features and objects is vital.

Movement over flat and open ground is restricted by enemy fire during daylight but becomes comparatively easy at night. High ground commanding an excellent view in daylight may become an unfavorable spot at night because movement may be silhouetted against the sky. In many cases, the objects conspicuous in the daytime, particularly if distinguished because of color, become inconspicuous at night and can no longer be utilized. Grass and bushes, utilized for concealment in the daytime, sometimes becomes a hindrance at night and impede maintenance of secrecy.

At night, a break in the ground or a river becomes a greater obstacle and movement through woods and some types of terrain, which offer excellent concealment during the daytime, becomes very difficult.

Section D. Orientation and Maintenance of Direction

1. All officers and men must acquire the ability to orient themselves and maintain direction. The heavenly bodies, compass, route

markers (Keiroki), and other aids are used in orientation training.

a. The principal heavenly bodies used in orientation are the moon, the North Star, and familiar constellations.

b. When a compass is used, particular stress must be placed on correcting the variation. The route marker is used for recording the direction and distance covered. (The route marker is used only by guide patrols and others having a specific mission as special training is required for its use.)

c. In the Northern Hemisphere, houses and trees generally face south and the ridges and furrows in the fields are usually made in the east-west direction. When there is a snowfall, north can be determined by observing the manner in which the snow melts. Direction can be also determined when the prevailing wind is known. However, all these vary considerably according to the theater of operations, and it is essential to give troops training in conditions peculiar to the theater before commencing operations.

2. Direction can be maintained at night by the methods described, but the following points are important.

a. Daytime preparation is vital. When the compass is used, the angle between the direction of advance and the magnetic north must be studied and memorized. It will be particularly advantageous to bear in mind the destination in relation to some easily recognizable terrain objects such as a mountain top, a single tree, or isolated house. Maintaining direction would be further facilitated by

memorizing the location and directions of roads, railroads, electric wires, streams, openings in the ground, and other objects which would be encountered en route to the destination.

b. Direction is likely to be lost when bypassing obstacles and, because of the psychological effect, when subjected to enemy fire or flares.

Section E. Movement Training

1. Since night movement is vital to a successful night assault, the training in silent marching, crawling, daring advance, movement through difficult ground, and actions to be taken when caught in flares is important.

2. The following points must be stressed in silent movement training.

a. The strict observance of noise prevention.

b. Control by signals.

Night movements are usually controlled by arm-and-hand signals and each soldier must be trained to make all movements on signal. Each man must constantly watch the commander and the man next to him for relayed signals.

3. At night, crawling is the most suitable method for advancing silently to reconnoiter the enemy or to clear enemy obstacles, and for advancing under enemy fire or flares. Soldiers must be trained in four methods of crawling.

a. Method 1:

A method of moving forward bearing the weight on the left leg, below the knee, and the palm of the left hand. While this is the fastest method, because the position of the body is high and because noise is more likely to be made, this method is used at a comparatively long distance from the enemy position.

b. Method 2:

In this method the body is moved forward carrying the weight on the left elbow and right toe, with the left hip touching the ground. The advantages of this method are virtually the same as in Method 1.

c. Method 3:

In this method the body is moved forward with the weight on the left elbow and right toe, with the stomach touching the ground. This method is quiet and is used when advancing close to the enemy.

d. Method 4:

In this method the body is moved forward on both elbows and both toes, with the body flat on the ground. The body may be propelled by using both elbows and both toes simultaneously or using the left elbow and toes and the right elbow and toes alternately. This is the slowest method and is used by obstacle clearing teams and others when silence is most vital.

In the first three methods, the rifle is held with the right hand but in the fourth method it is cradled in both arms or held horizontally with both hands.

4. "Daring Advance" is a rapid and resolute advance. This new method was originated especially for the rapid movement required in night attacks when shifting from a surprise attack to a forced attack, when advancing immediately before rushing, or when advancing within the enemy position.

The daring advance resembles the rapid walk in most respects. However, speed is increased by lowering the center of gravity of the body, by taking slightly longer steps, and by swinging the left arm harder. Pressure is applied to the lower abdomen and the hip is pulled forward. The eyes are fixed on the head gear of the soldier ahead and never at the ground.

The rifle is held with the right hand just forward of the balance with the wrist pressed lightly against the hip. Although the rate of advance varies with the ground, it should be 7 to 8 kilometers an hour. Developing the spirit to advance resolutely should be stressed in the daring advance training.

5. Generally speaking, double time is inadvisable at night because the soldiers are likely to stumble and break formation, making noise. However, double time for short distances is used in rushing the enemy. For this reason the training in double time at night is conducted in conjunction with night assault training.

In double time at night, the leg muscles should be relaxed, and the feet lifted a little higher and brought down on the ground toe first.

6. In night movement training, special emphasis should be placed on walking through difficult terrain.

a. In rough or rocky ground, the foot is brought down gently, heel first, and then the body weight is gradually placed on the outside of the foot in order to avoid stumbling and making any sound.

b. In a silent walk over grassy land, it is better to lift the forward foot higher, reduce the pace, and take longer steps.

c. In a silent walk through kaoliang fields or shrub-covered fields, the kaoliang or shrubs must be held aside to avoid noise.

However, the daring advance through a kaoliang field or a shrub-covered area must be made resolutely, ignoring obstacles.

d. Silent night movement across or over a ground opening, small streams, ditches, embankments, or other natural obstacles is comparatively easy, but the formation is likely to be broken. Consequently, cooperation between men is especially vital.

e. Gaps in enemy wire must be passed with the greatest possible speed. Training in passing over the enemy wire quickly by laying boards or other material over it is essential.

f. Training in ascending and descending mountains, fording rivers, and passing through forests is also necessary.

7. Actions of the individual caught in the light of a flare are also taught.

a. When caught in a flare, soldiers will halt and drop to

the ground only when the signal is given by the commander.

b. Dropping to the ground must be done silently. Soldiers must not move while lying prone, but must watch the commander and the direction of the enemy with the head to the ground while carefully protecting the eyes.

c. When caught in a strong flare, soldiers must not look at it directly because of the blinding effect. If possible, they should wear smoked glasses or cover their eyes.

d. When caught in a flare at a short distance from the enemy, the soldiers should assault without delay.

Section F. Assault Training

1. Assault training is particularly essential for developing confidence in night combat and is conducted in close conjunction with bayonet drill.

2. Two methods of rushing, silent or forced, may be used.

a. Silent rushing is conducted following a silent and cautious approach, with the rifle held in readiness and the enemy being rushed from close proximity.

The method of rushing is employed by a single soldier, a patrol, or other small body in surprising an enemy sentry or guard.

b. Force rushing is conducted following the daring advance, with the rifle held in readiness and the enemy being rushed on the double. This method is commonly used in assault by a unit of platoon or company size.

c. When assaulting searchlights, covered machine gun emplacements, or when counterattacking, it is often advantageous to rush the enemy after checking him by throwing hand grenades. In assault training of this type, emphasis is placed on the proper judgment of throwing distance and in rushing immediately after the explosion of the grenade.

3. Training in hand-to-hand combat at night should be conducted in close conjunction with bayonet exercise and should be given on rough ground as well as flat terrain. It should also include hand-to-hand combat against several men, and bayoneting while advancing. It must be remembered that in close quarters combat at night the distance to the enemy soldier is likely to be underestimated and that stabs are likely to be made from too far a distance.

Section G. Training in Night Firing

Japanese infantrymen were trained in night firing mainly for general defense and for holding newly captured ground following a night assault. Although the Japanese Army believed that night firing was far less effective than daylight firing, it was aware of the great effectiveness of close range night firing when properly conducted.

Two methods were stressed in the infantry night firing. One was plotting the fire to cover a special target or a target area by fixing the rifle before dark. The other was to fire parallel to the ground when firing was necessary immediately after a night assault or in similar instances. These methods are not peculiar to the Japanese

Army, but are common to the modern armies of the world and will not be discussed in detail.

Although the general rule was that the infantry did not fire during a night assault, the Toyama Army School in Tokyo did experiment with firing in close combat and firing from the hip in daylight assault, but the method was not adopted for night assault.

Section H. Night Training Mottoes

The Japanese Army believed that the memorizing and frequent reference to mottoes, not only aided in teaching, but was also an important morale factor.

1. Mottoes for night combat:

"The night is one million reinforcements." (Emphasis on the advantage of night.)

"Firing in the dark is sure to miss." (Encouragement of boldness and calmness.)

"Suspicion will create a bugbear." (Caution against fear.)

"A dog bays the moon and a thousand curs follow suit."
(Caution against panic at night.)

"Don't hear the enemy in every leaf that rustles."
(Caution against panic at night.)

"Don't rely on your bullets, rely on your bayonet."
(Emphasis on the effectiveness of hand-to-hand combat.)

"Untrained comrades are more to be feared than the enemy."
(Emphasis on military training.)

2. Mottoes concerning mental attitudes of commanders and men:

"Lead at the van or from a prominent place." (Leadership encouragement.)

"When surprised by the enemy, pause for a smoke." (Caution against panic.)

"One man's carelessness is the whole army's loss." (Stress on sense of responsibility.)

3. Mottoes concerning night movement:

"Move onward regardless of fallen comrades." (Emphasis on boldness.)

"Heed the enemy flares, but ignore the enemy fire."
(Emphasis on secrecy and daring.)

"Lower your hip and bring your feet down vertically." (The method of moving through rough ground.)

"Don't glance aside during the daring advance." (Emphasis on boldness.)

"No sudden halt or sudden advance." (Prevention of confusion.)

"Time is a vital factor in movement." (Emphasis on importance of synchronizing timing.)

4. Others

"Be cautious of the direction in which no enemy can be seen."
(Stress on the importance of exercising caution in all directions.)

"Moving objects are often overestimated in number." (Caution against overestimating enemy strength.)

"Fire and light appear close at night." (Caution against underestimating distance at night.)

"When lost among the enemy, wait until dawn." (Caution against panic.)

"It is easy to get lost in a forest or village." (Stress the importance of selecting a proper route of advance.)

"Prepare for night before dark and prepare for daylight before dawn." (Emphasis on the importance of adequate preparations.)

"Hold on to your gun and equipment." (Caution against loss.)

"Don't leave articles, clean the place before leaving."
(Caution against the loss of articles and the betrayal of intentions to enemy intelligence.)

Section I. Unit Training

1. In general, the basic combat training of the Japanese infantry was completed at company level. Unit training on battalion level or above was conducted primarily in cooperation with infantry heavy weapons, or the units of other branches.

This general rule also applied to night combat and in the night assault when the company attacked independently or as an element of a battalion, it was believed that the success of the attack depended on how well the company was trained. Squad training was begun when individual training had progressed satisfactorily. The squad training then progressed through platoon training to company training.

2. The unit training on company level was based primarily on the Infantry Training Manual, but details of the training were also drawn from the manuals published by the Infantry School. The following excerpts from the section on company training in the Infantry Training Manual concerning reconnaissance of the enemy situation and terrain as a preparation for a night attack will illustrate to what detail the training was conducted.

a. Reconnaissance objectives: Enemy disposition, the location of the attack objective in relation to its surroundings, location and size and type of obstacles and flank defenses, the terrain in front of and within the enemy position, routes of approach, existence of contaminated areas.

b. Reconnaissance methods:

- (1) Personal observation by the company commander.
- (2) Continuous observation by the company command section.
- (3) Observation by subordinate platoons.
- (4) Dispatch of patrols.
- (5) Forward observation points.
- (6) Contact with the observation organization of other units, particularly heavy weapons and artillery.

c. The following points are important in reconnaissance.

- (1) The company commander must conduct coordinated reconnaissance.

(2) Frontal reconnaissance will be made whenever possible. However, observation of the target from several directions is also essential.

(3) Because the situation in the enemy position is often revealed when the enemy opens fire on observation patrols, such opportunities may be used to reconnoiter the enemy.

(4) When the location of the enemy has been reconnoitered, the distance and the angle from a clearly defined terrain features (reference points) must be measured as accurately as possible.

(5) Information obtained from various means of reconnaissance must be entered on maps, sketches, and photomaps as obtained.

(6) In long range observation, in undulating terrain, caution must be exercised since valleys, ravines, and openings in the foreground cannot be seen and distance is likely to be underestimated and frontage overestimated.

(7) Caution must be exercised not to betray intentions through careless movements and open use of glasses or range finding instruments.

3. The main objects of company night combat training were the control and the maintenance of direction and guidance by the company commander as well as the assault made under the company commander's leadership.

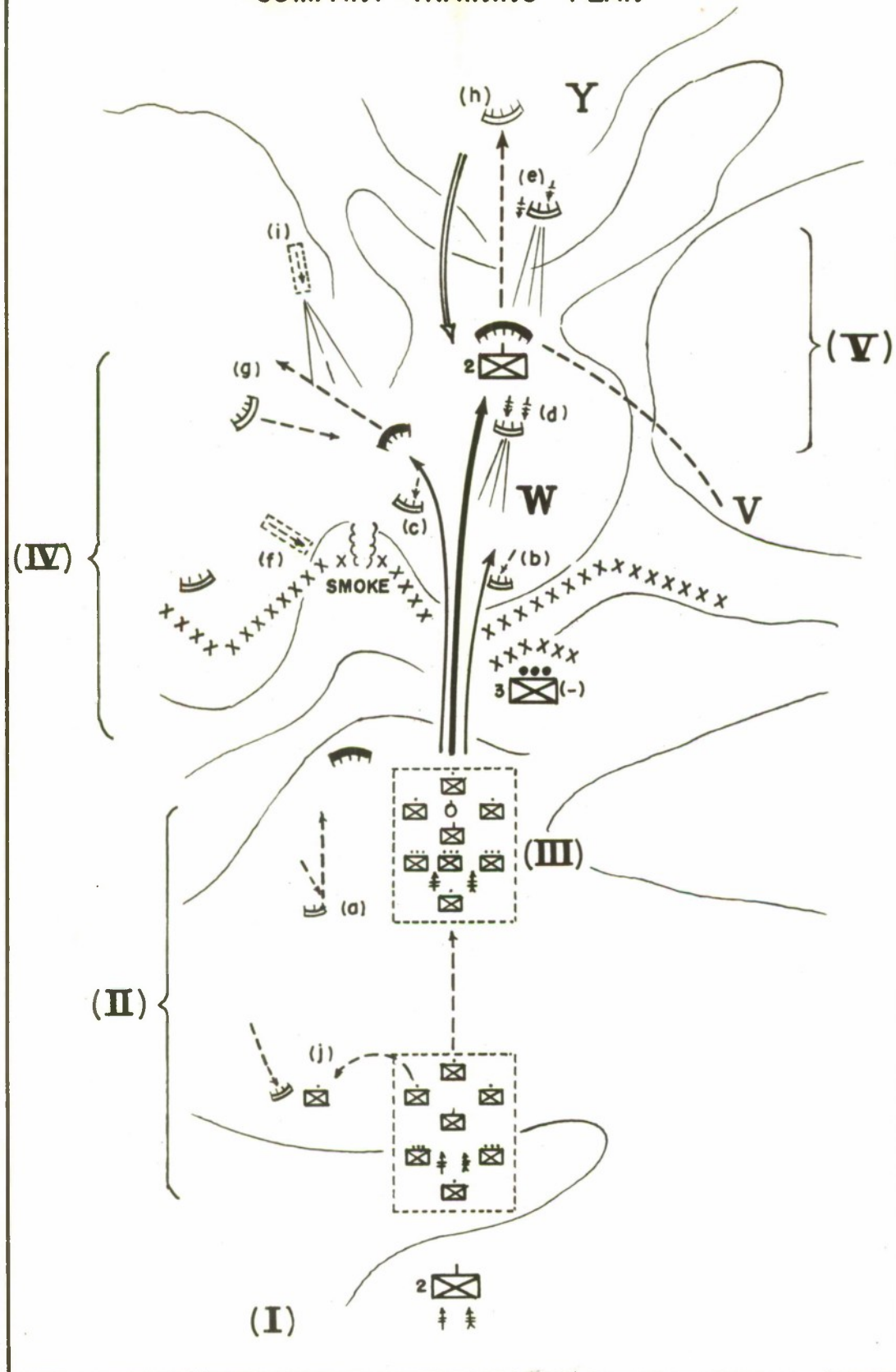
The Japanese stressed that the company was the basic spiritual unit and should be a family whose head is the company commander.

It was said that a glance at a company training in night attack was enough to see whether the unity in the company was firm.

4. In night attack, the battalion commander normally approached the enemy directly commanding the main body of his unit, but in training it was more convenient to train the company independently. Figure 11 indicates the manner in which a battalion commander directs the company training.

5. Figure 12 illustrates training conducted to push through an enemy position, taking advantage of the early dawn, and Figure 13 shows training in a dusk attack following a daylight attack.

COMPANY TRAINING PLAN



Night Attack Training Problem

(Attack by the First Assault Echelon of
a Battalion Planning Penetration in Depth)

1. Objects of Training

- a. Preparations for attack.
- b. Rapid advance to a given objective with attack intentions concealed from the enemy.
- c. Holding a captured position.

2. Situation

At 1500 hours, 23 December, the 2d Company of the 1st Battalion of the South Army is preparing for a night attack in the disposition shown in the sketch. The gist of the battalion order received by the company commander, at that time, is as follows:

- a. The 1st Battalion (plus one infantry engineer platoon) will attack the enemy position V, W and Y to capture Y Hill. The 2d Battalion is to occupy Z Hill.

- b. The 1st Company (plus one infantry engineer squad) on the right will capture V, and the 2d Company (plus one infantry engineer squad) on the left will capture W.

- c. The 3d Company (plus two infantry engineer squads) in the second assault echelon will prepare to capture Y Hill. The 4th Company will be the support.

- d. The 1st and 2d Companies are scheduled to launch the attack at 2200 hours, but the formal attack order will be issued separately. The 1st and 2d Companies will secretly open paths through wire by 2100 hours.

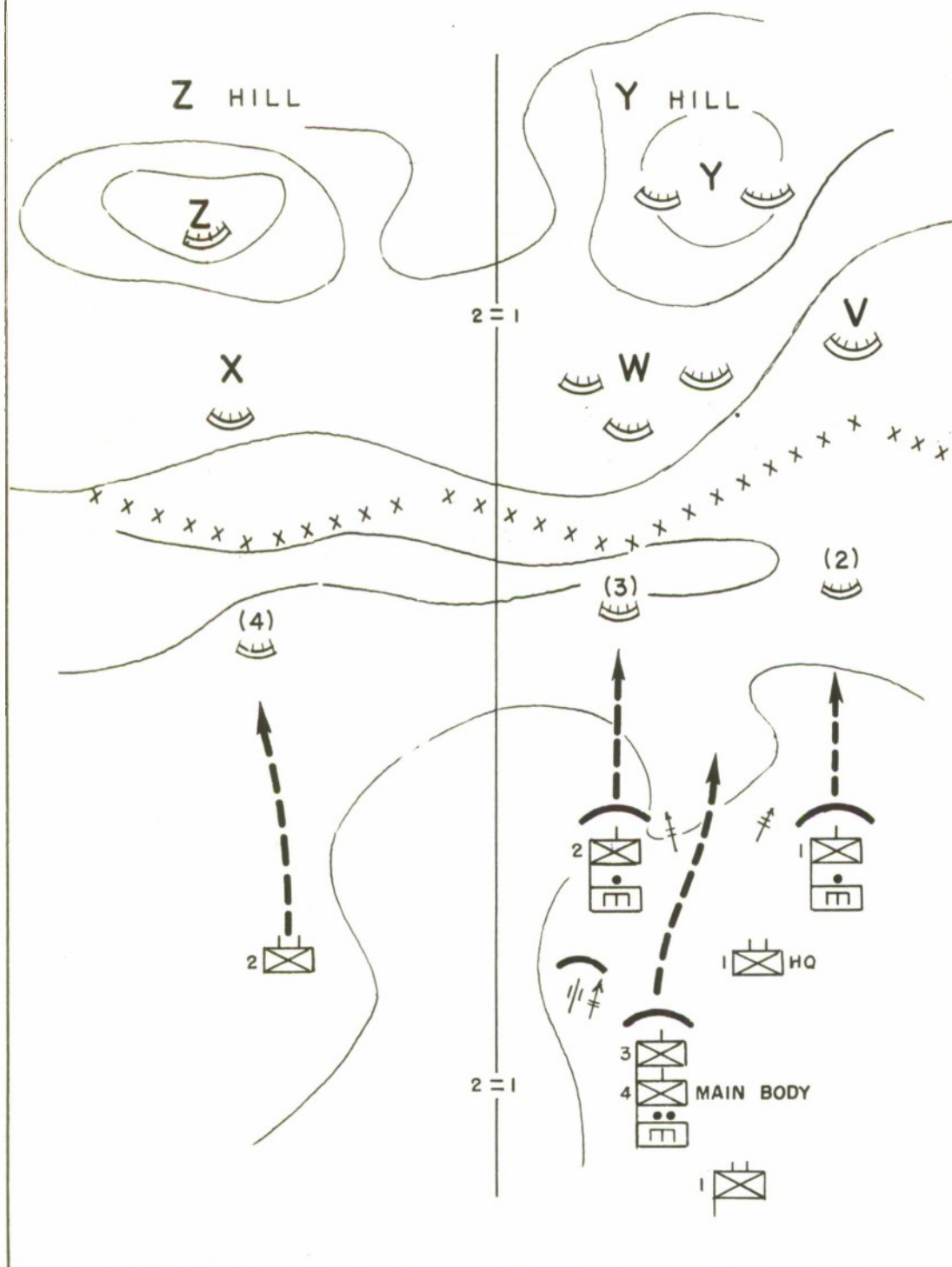
- e. At dusk the 1st Company will employ an element to drive out the enemy security element disposed at point (2), and the 2d Company will use an element to expel the enemy from point (3). The time of attack against the enemy security elements is scheduled at 1700 hours, but the formal order will be issued separately.

- f. Machine guns and battalion guns will remain in the position they presently occupy and prepare to support the attack against the enemy security elements.

- g. Each unit will assemble after sunset as follows.

(1) The 1st and 2d Companies will commence movement after 1800 hours and assemble in the proximity of their present position by 1900 hours.

(2). The main body of the battalion will commence movement after 1800 hours and will assemble in the area west of the place where the battalion headquarters is now located by 1900 hours.



3. Company Training Plan

(I) Attack Preparations:

1. Procedure

a. The company is disposed as ordered by 1430 hours. The oral battalion order is issued at a point from which the terrain can be pointed out. The exercise is then commenced.

b. The enemy disposed at points (a), (b) and (e) deliver sporadic fire.

c. Enemy artillery bursts are simulated by exploding practice charges.

d. The enemy at point (a) retire when the company begins advance.

2. Training objectives

a. Prompt and clear communication of the company commander's decision to his subordinates.

b. Reconnaissance of the enemy situation and the terrain.

c. Thorough knowledge of the terrain and the enemy disposition.

d. Issuance of orders.

e. Repulse of enemy security elements.

f. Disposition for cutting lanes through wire.

g. Maintenance of direction.

(II) Approach:

1. Procedure

a. Advance is ordered.

b. Flares are fired from time to time while the company is advancing.

c. Surprise enemy counterattack is made in the (j) area.

2. Training objectives

a. Approach disposition and approach march.

b. Action to be taken against enemy illumination and counterattack.

(III) Preparations for Assault:

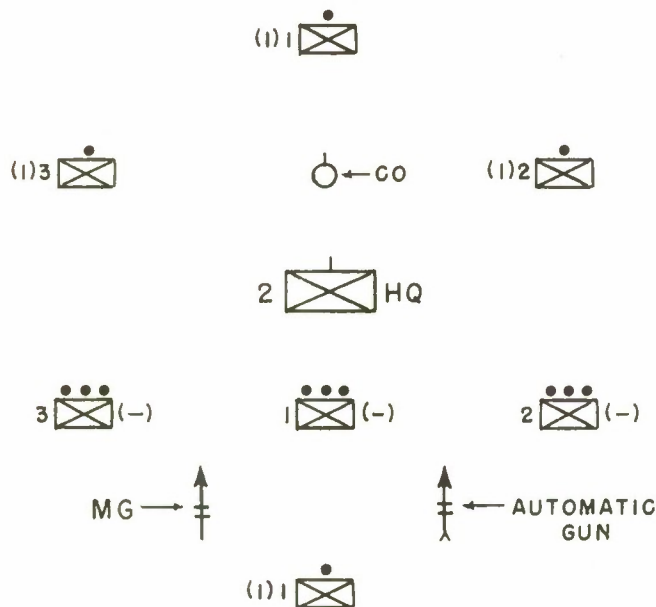
1. Procedure

a. Two lanes are considered to be successfully cut through wire by 2100 hours.

2. Training objectives

a. Contact with an advance element.

b. Assault disposition.



Notes:

(1) The 3d Platoon (less two squads), which was dispatched for cutting lanes through the enemy wire, return to the company when the company approaches the lanes.

(2) One squad each from the 1st and 3d Platoons, in advance security, are prepared to lay smoke screens to cover the company in passing through the lanes.

c. Measures to be taken to support the troops in passing through lanes.

(IV) Assault:

1. Procedure

a. The assault is ordered.

b. Enemy machine gun fire opens from positions (b), (c), (d) and (f).

c. When the assaulting unit captures position (c), the enemy machine gun at position (i) opens fire and counterattack is made from (g) area.

2. Training objectives

a. Passing through lanes in wire.

b. Assault.

c. Action to be taken against the enemy attempting to obstruct the penetration.

d. Maintenance of direction, and estimation of advanced distance.

(V) Holding a Captured Position:

1. Procedure

a. When the position (d) is captured, fire is opened from the position (e) and counterattack is made from (h) area.

b. The exercise is ended after the enemy counterattack from (h) area is repulsed and platoons are disposed in defensive positions.

2. Training objectives

a. Occupation of a given attack objective.

b. Holding a captured position.

c. Action to be taken against enemy counterattacks.

d. Contact with the battalion commander and other units.

e. Reconnaissance and mopping up of the area through which the 3d Company is to pass in a leapfrog movement.

Early Dawn Attack Problem

1. Objects of Training

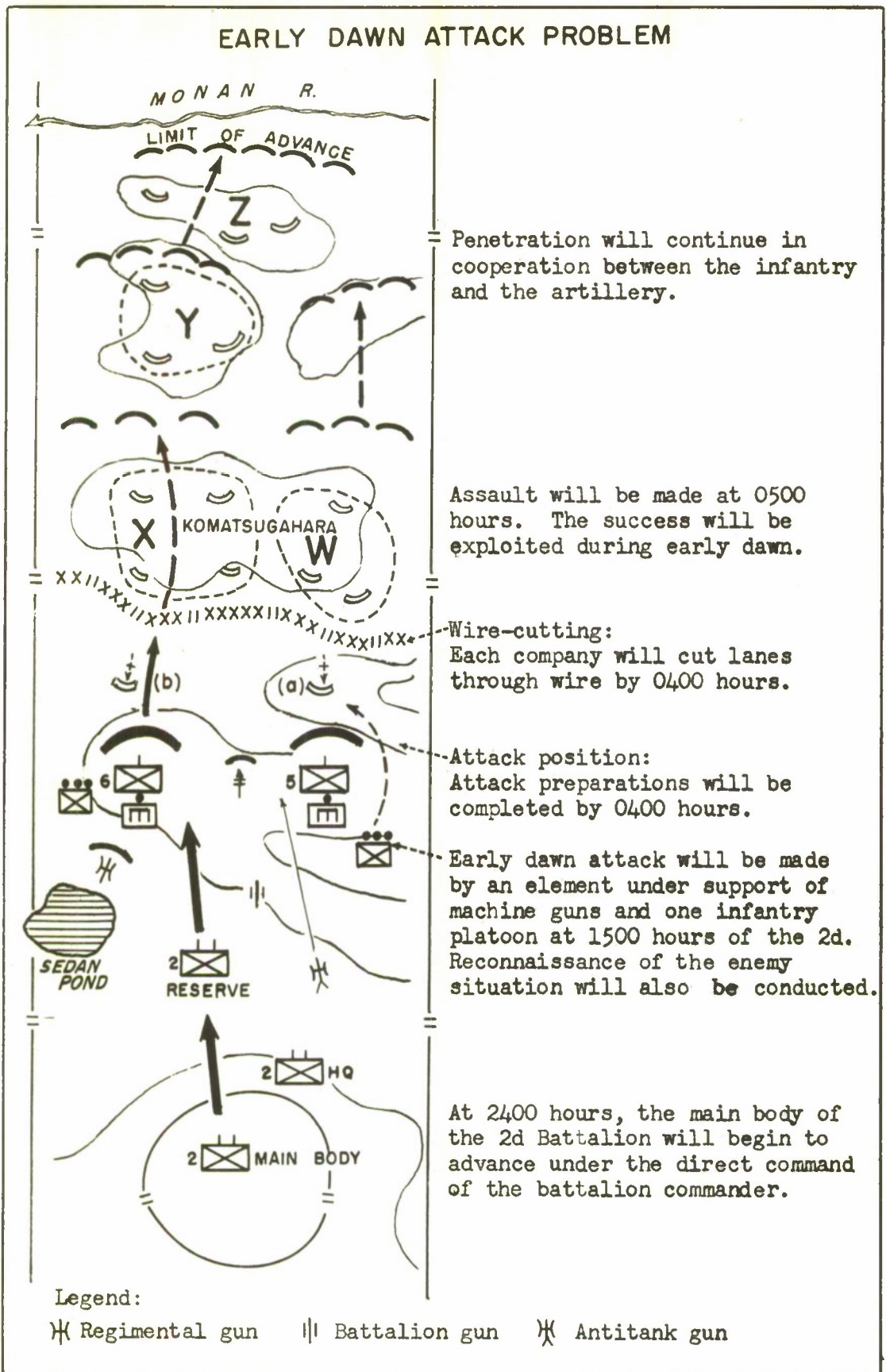
- a. Attack position.
- b. Assault preparations and assault.
- c. Cooperation between infantry and artillery immediately after daybreak.

2. Situation

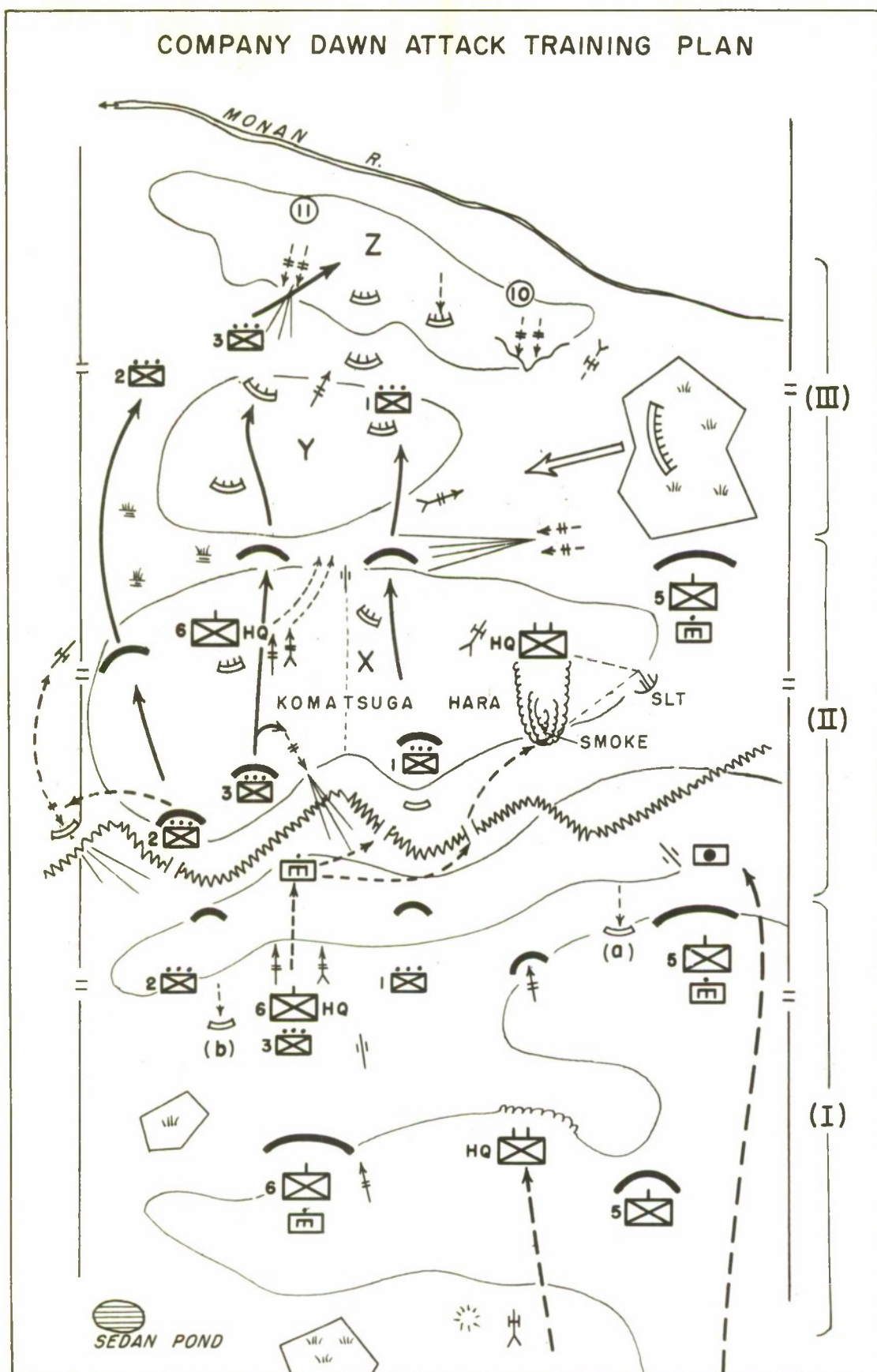
a. The 2d Battalion, assigned the mission to attack the enemy which occupied a position near Komatsugahara several days earlier, is preparing for an early dawn attack on the following morning, the 3d. The enemy situation around 1600 hours of the 2d, and the outline of the battalion's attack plan is as shown in sketch.

b. The commander of the 6th Company is assigned the mission to attack X and the company is making the attack preparations.

EARLY DAWN ATTACK PROBLEM



COMPANY DAWN ATTACK TRAINING PLAN



3. Company Dawn Attack Training Plan

(I) Attack Preparations:

1. Procedure

- a. Attack preparation is ordered.
- b. Fire is received from enemy artillery and security units.
- c. Information is received from the battalion commander.
- d. The assault is ordered.
- e. A counterattack is made by a small enemy unit.

2. Training objectives

- a. Formation and disposition of the raiding unit to be employed against hostile security unit.
- b. Reconnaissance of contaminated areas, and measures to be taken.
- c. Employment of the attached infantry engineer squad.
- d. Occupation of attack position, including reconnaissance for selection of position, markings for maintenance of direction, selection of platoon release point, and maintenance of contact.
- e. Constant observation of the enemy situation.
- f. Occupation of the obstacle clearing support point, and support measures.

(II) Assault and Early Dawn Combat

1. Procedure

- a. Caught in enemy searchlight beam.
- b. Exposed to sudden enemy flanking fire.

2. Training objectives

- a. Selection of assault formation.
- b. Assault by surprise.
- c. Contact with battalion commander and heavy weapons unit.

(III) Early Dawn Combat within Position

1. Procedure

a. Heavy fire received from enemy machine gun position on the right.

b. Counterattack by enemy.

c. Artillery support delivered against Y.

2. Training objectives

a. Change in assault formation as visibility increases.

b. Preparation to use smoke candles to prolong early dawn light conditions.

c. Measures taken against counterattack.

d. Use of heavy weapons after daybreak.

LEGEND

~~~~~	Wire Entanglement
↑	Automatic Gun
↑	Light Machine Gun
↑	Heavy Machine Gun
☞	Searchlight
⌘	Regimental Gun
⌘	Battalion Gun
⌘	Antitank Gun

## Dusk Attack Training Problem

## 1. Objects of Training

- a. Attack disposition of the assault company.
- b. Approach and assault taking advantage of dusk.
- c. Holding the captured position.

## 2. Situation

a. For past few days the battalion has been attacking an enemy disposed in the area south of the Norm river. This evening the battalion, taking advantage of dusk, intends to advance rapidly to the left bank of the river. The disposition of the battalion at 1500 hours and the enemy situation are as shown in sketch.

b. The gist of the battalion order issued to the commander of the 2d Company at 1500 hours is as follows.

(1) The battalion will assault W, X and Y positions at dusk this evening and attack Z and penetrate to the left bank of the Norm River.

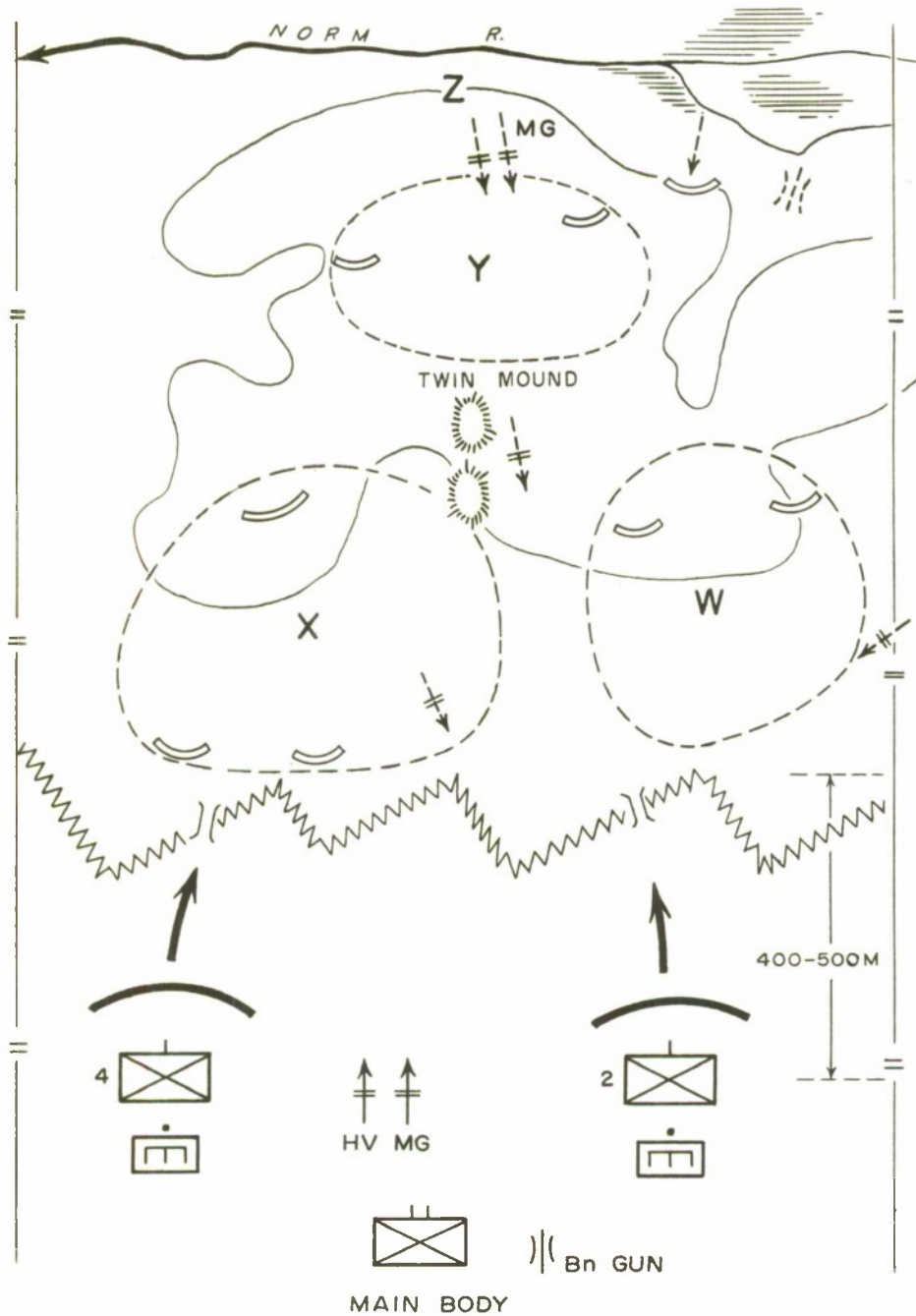
The first assault echelon companies, the 2d and 4th, will be employed to capture and hold W and X respectively, but the main attack emphasis will be placed on the left company.

The second assault echelon will be committed to attack Y and Z positions after leapfrogging the first assault echelon in the Twin Mound area.

(2) The 2d Company will have as its objectives W, and a machine gun position located near the Twin Mound.

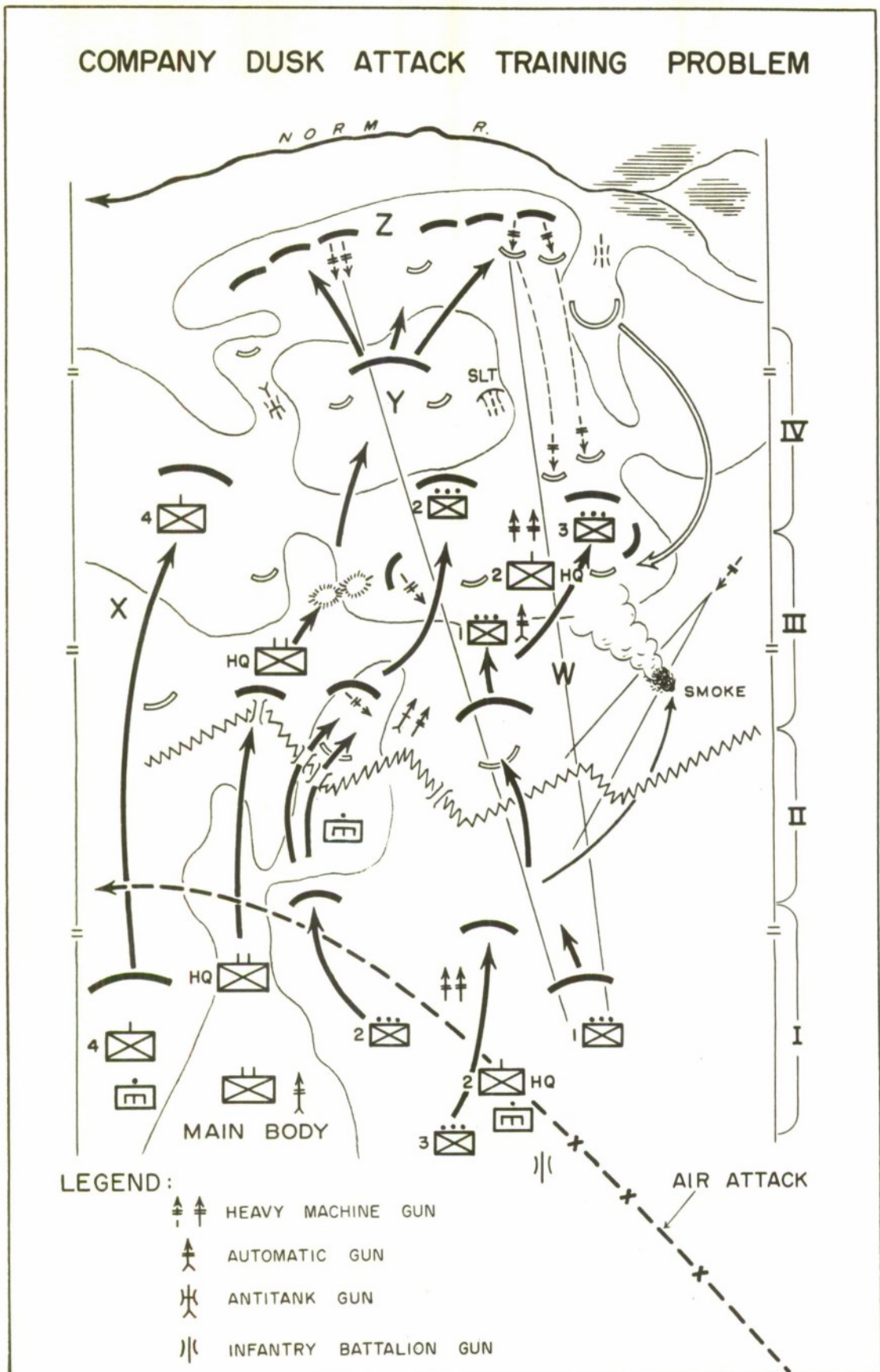
Limit of advance:	Rear limits of X position.
Time of attack:	The attack is scheduled to be launched at 1700 hours, but the formal order will be issued separately.
Passing obstacles:	Using lanes already made in wire, and clearing lanes by demolition.

## DUSK ATTACK TRAINING PROGRAM





## COMPANY DUSK ATTACK TRAINING PROBLEM



### 3. Company Dusk Attack Training Problem

#### (I) Attack Preparations

##### 1. Procedure

a. Issuance of the battalion attack order.

b. Situation

(1) Enemy air attack.

(2) Heavy enemy fire. The battalion has suffered 20 per cent casualties by this time.

##### 2. Training objectives

a. Issuance of the company order.

b. Concealment of intentions.

c. Measures to be taken against enemy aircraft.

d. Cooperation with heavy weapons.

#### (II) Approach

##### 1. Procedure

a. Change in the enemy disposition.

##### 2. Training objectives

a. Selection of pace and formation.

b. Maintenance of contact.

c. Advancing security elements to reconnoiter change in the enemy disposition.

#### (III) Assault

##### 1. Procedure

a. Obstruction by a small enemy unit.

b. Part of the enemy machine guns disposed in the rear are moved forward.

##### 2. Training objectives

a. Passing obstacles (demolition by infantry engineers unit).

b. Feint and surprise against the enemy.

c. Assault under enemy fire.

(IV) Holding a Captured Position

1. Procedure

a. Enemy counterattack from the right flank is made before assault company is reorganized.

b. Heavy firing by enemy machine guns accompanied by searchlight illumination.

2. Training objectives

a. Reorganization and reconnaissance.

b. Contact with the lower and higher echelons and adjacent units.

c. Disposition for holding the captured position.

d. Construction of defense works.

e. Employment of machine guns.



## Section J. Special Training

Maintenance of direction, (including instruction on the use of route and road markers, and the training of guide patrols), the firing of heavy weapons, methods of fighting in teams, the clearing of paths through obstacles, and attacks against pillboxes, were taught either as part of the general training for night attack or in close conjunction with it.

Clearing paths through obstacles requires careful planning combined with bold and quick action. Consequently, extra effort was exerted and training in this field was extensive. Methods of clearings differed according to the type of obstacles and also for varying general conditions at the time of clearing.

The smallest unit for clearing obstacles was usually called an obstacle clearing team (Hakai Gumi). This team was assigned to make one passageway through one obstacle. Organization and equipment of typical teams is shown in the following chart:

	Equipment for Clearing with Wire Cutter	Equipment for Clearing with Demolition Tube
Leader	Markers, contacting rope, and two smoke candles	Markers, contacting rope, and two smoke candles
Clearer (One or several men)	One wire cutter, one smoke candle, and a pair of leather gloves for each member	One wire cutter and one smoke candle for each member. One demolition tube per team
Reserve members (One or several men)	One wire cutter, one smoke candle, a pair of leather gloves for each member of the team, and a few markers	
Remarks:	Each team member will carry one or two hand grenades. When required, screen, sand bag, or shield will also be carried.	

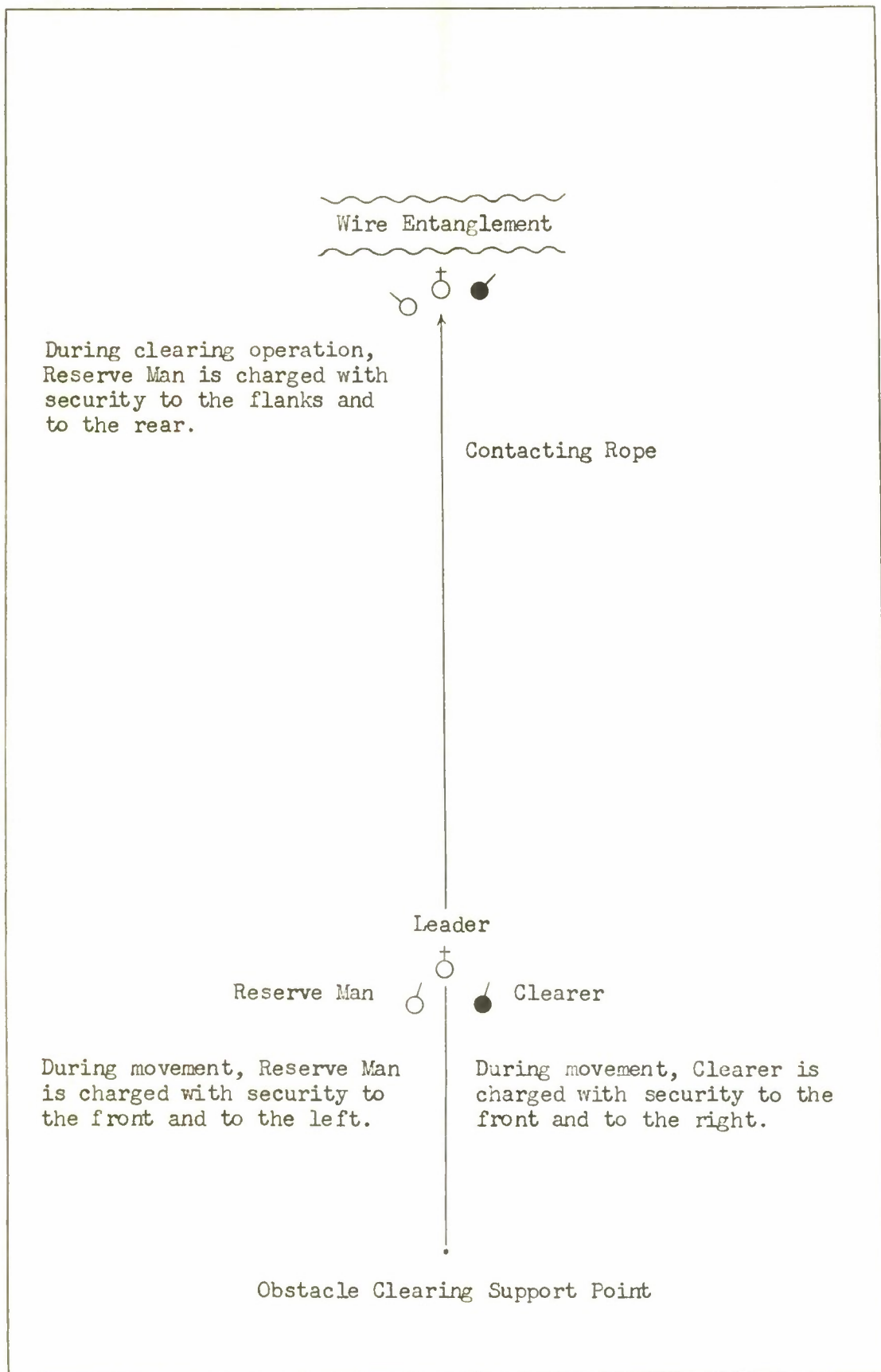
In the training a number of obstacle clearing teams were organized into an obstacle clearing party (Hakai Han), and an additional number into an obstacle clearing unit (Hakai Tai). Each party or unit usually had a necessary number of reserve or support teams and were equipped with defense equipment such as movable barriers.

The commander of the unit prescribed the number of paths to be cleared, their location and direction, the extent of clearing, the method to be employed, and the time of execution. The clearing in preparation for the night attack was usually conducted in secrecy.

Even in preparation for a supported night attack, it was advantageous to effect the clearing in secrecy, although forced clearings were sometimes used. In an attack to seize an enemy position after a penetration had been made, a forced clearing was generally employed, for speed was then the major consideration.

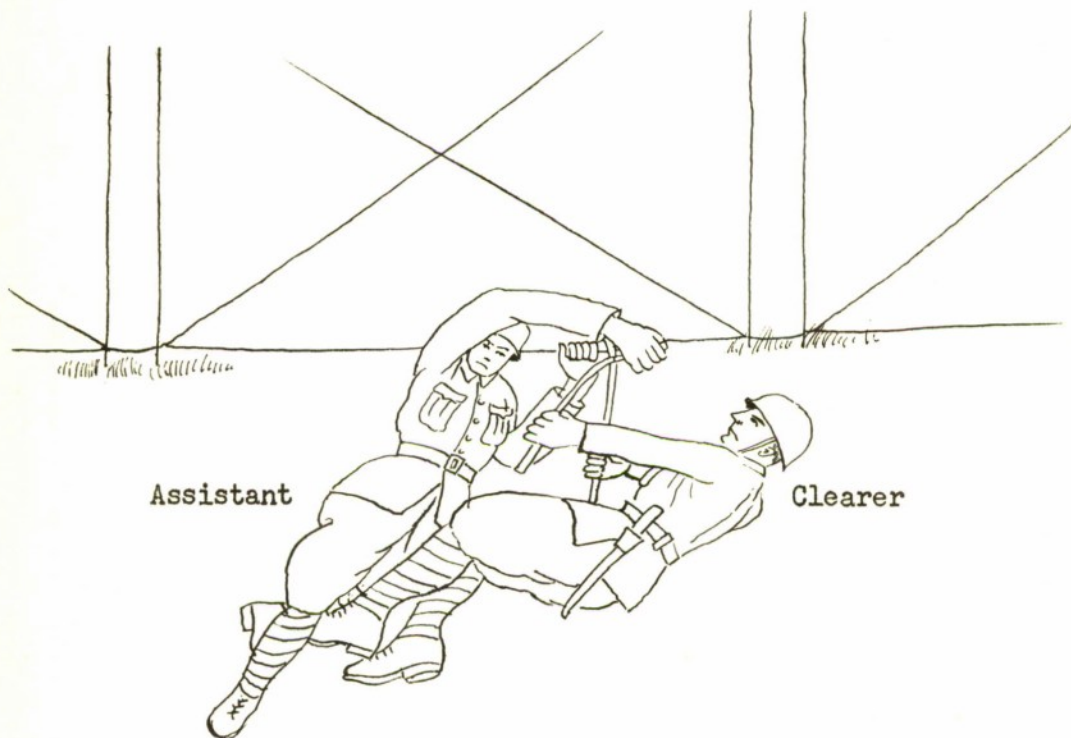
The clearing unit, after careful preparation, approached the enemy wire entanglement by night and set up a clearing support point (Hakai Kyoten). Clearing teams were released at the clearing support point. Under certain circumstances clearing teams set up their own clearing support point.

All movement was accomplished with strict concealment of intentions with the last stage of the approach usually made entirely by crawling. An example of the team's approach is shown in the following diagram.



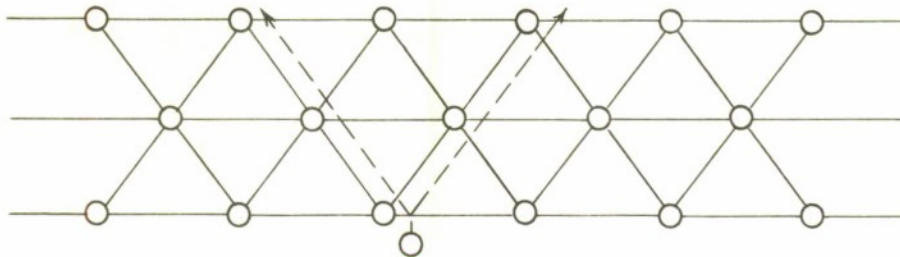


When one man is assigned to cut wire without an assistant, he first searches for an alarm wire and determines how it is connected, and after removing the alarm he begins cutting. Wire will be cut about 30 cm from posts and will not be done in one snipping. Wire will first be notched by the cutter, and then will be grasped by on both sides of the notch and the shorter portion bent quietly back and forth several times until the wire is broken. The loose ends of the broken wire will be thrust into the earth to prevent loose ends from making a noise by striking other wire. When the work is done by two men, the assistant will hold the wire at both sides of the cut as shown in the following sketch.

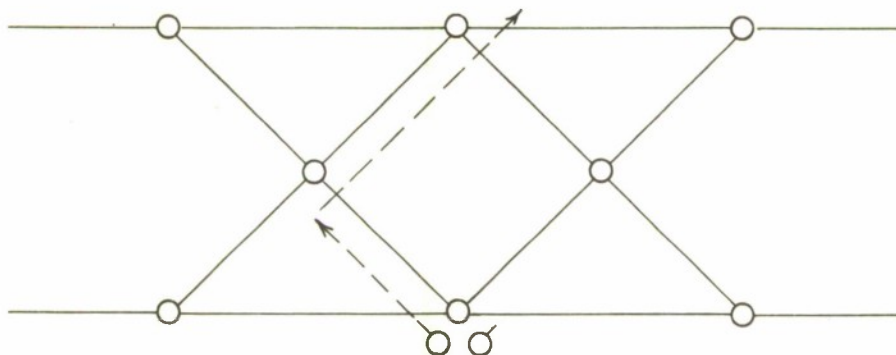


Wire is usually cut as indicated below.

a. Net-type wire



b. Double-apron type wire



For clearing a path in a short space of time only the lower wires of the net or double-apron type entanglements will be cut, a path being made for crawling under the wire. Wire three meters in width can be cleared in about three and a half minutes by one man, although much more time is generally allotted. Time required is shown on the following chart:

Time Required for Clearing in Secrecy			
		Technique	
Approach from the unit occupying key point to the clearing support point. (Assuming that the distance between the two points is 250 meters.)	First 150 meters	Quiet advance with body bent low	20 minutes
	Next 50 meters	Crawling, Method 3	20 minutes
	Next 50 meters	Crawling, Method 4	50 minutes
Approach from the clearing support point to the wire	Next 60 meters	Crawling, Method 4	60 minutes
To clear a path through a barbed wire entanglement about six meters in width	No alarm wire	Cutting wire by one man	2 hours
		Cutting wire with one assistant	1 hour & 30 minutes
	Alarm wire	Cutting wire by one man	3 hours
		Cutting wire with one assistant	2 hours & 40 minutes



In a forced clearing using a wire cutter, cutting will be done openly in the kneeling or standing position, ignoring the enemy fire, giving primary consideration to speed. Direction of cutting will be the same as in clearing in secrecy in the case of net-type wire, but with double-apron type wire, a right-angled clearing will be preferable to an oblique one. The work will be made very much easier if an assistant wearing white gloves is employed to grasp the wire. A skilled man can clear a path through a six meter net-type wire in about one minute.

Clearing with a demolition tube may be necessary in the event of a forced clearing. The standard demolition tube is an iron tube filled with explosive, about seven centimeters in diameter and about two and a half meters in length. It is threaded at each end so that tubes may be extended to the width of the obstacle. When the standard tube is not available, a bamboo or metal pipe may be used as an expedient.

As circumstances may necessitate changing over from a secret clearing to a forced clearing in the middle of path clearing operations, the demolition tube must be included in the equipment of the obstacle clearing team. It is also necessary for the obstacle clearing team to maintain contact with the party or unit commander by signaling with contacting rope or other suitable device. In the case of a forced clearing, the obstacle clearing team usually operates under supporting fire and uses smoke to conceal its operations.

When the path is cleared, the obstacle clearing team reports the fact together with the width and height of the clearing to the party or unit commander, and will attach markers to indicate the cleared path.

In training, the technique of secret clearing was emphasized, as well as the keeping of cleared paths open and the maintaining of contact with troops waiting to begin the attack.

At the completion of training each company had four or five trained obstacle clearing parties.

#### Section K. Attacking Pillboxes

Methods of close quarter assault against pillboxes by the infantry and engineers included throwing an exploding armor piercing charge, demolition tube, or hand grenade into a pillbox through its firing-slits, demolishing the entrance or overhead cover with an explosive charge, or attacking the firing-slit with a flame thrower. Since it was often necessary to make the assault in the teeth of strong enemy resistance, it was considered best to make a surprise assault at night. In all methods of assault, taking advantage of the vulnerable dead space of the pillbox was strongly urged.

The number of men to be employed in assaulting a pillbox varies according to circumstances, but for maneuverability and surprise it is advisable to make it as small a group as possible. Although care must be exercised to provide for possible casualties lest the death

of one man make the accomplishment of the assault mission impossible.

Examples of the organization and equipment of pillbox assault parties are shown in Chart No. 6.

Thorough preparatory reconnaissance is a very essential factor in successful pillbox assault.

Reconnaissance is conducted to ascertain: (1) Strength, shape, and the internal construction of pillboxes. (2) Number, direction and aboveground height of firing slits. (3) Kind and number of weapons housed in pillboxes. (4) Position and construction of entrances. (5) Ventilation, water supply, illumination, and periscope installation. (6) Communication trenches. (7) Mutually supporting fires between pillboxes and other fire positions. (8) Terrain features, location of natural cover and pillbox dead spaces. (9) Type and size of artificial obstacles, existence of mines and electrically charged wire.

Means of reconnaissance included continuous observation, sending out reconnaissance and combat patrols, taking prisoners, and other means coordinated with the application of military knowledge.

When artificial obstacles surround enemy pillboxes, a path is secretly cleared through the obstacles, the assault party stealthily approaches the pillbox and then begins the assault. The order for the charge is usually given at a point about 10 meters from the pillbox.

When firing slits are protected against hand grenades by wire



## Organization and Equipment of the Pillbox Assault Team

Team & No. of Members	Mission Assigned to Each Member		Equipment	Objective & Enemy Situation
Team A      Seven men including a leader	Leader (NCO)	Control of the team	One luminous compass, one flashlight, one wire cutter, a contacting rope, two hand grenades, two self-projecting smoke candles, a few armor-piercing mines, and explosive charges.	A concrete pillbox which forms the key point of enemy defense
		Clearing a path through wire	Two wire cutters, six hand grenades, one demolition tube, one flashlight, armor-piercing mines, explosive charges, and an instrument to detect wire entanglements charged with electricity.	
	No. 1	Mopping up inside the pillbox		
	No. 5	Assault against the firing slit and entrance	One wire cutter, eight hand grenades, one flashlight, one demolition tube, two armor-piercing mines, equipment to block a firing slit, smoke candles, and a ladder or plank	
	No. 6	Mopping up inside the pillbox		
	No. 2 No. 3	Support with machine gun	One wire cutter, two hand grenades, four self-projecting smoke candles, and light machine gun and ammunition	

(Cont'd)

Team & No. of Members	Mission Assigned to Each Member		Equipment	Objective & Enemy Situation
Team B	Leader (NCO)	Control of the team	One luminous compass, one armor-piercing mine, two hand grenades, one pistol, one flashlight, one shield, two explosive charges, one wire cutter, a contacting rope, two self-projecting smoke candles, one Type 89 binocular, and one rifle.	A concrete pill-box. (Wire is damaged in places by artillery fire.)  Communication trench is open type.
	No. 1	Clearing path through wire	One wire cutter, one cutting pliers, one demolition tube, one pistol, two armor-piercing mines, six hand grenades, two smoke candles, one shovel, one flashlight, two explosive charges, one contacting rope, one shield, and one rifle.	
	No. 2	Mopping up inside the pillbox	Four smoke candles, one pistol, two armor-piercing mines, one 5 kilogram charge, six hand grenades, one flashlight, one contacting rope, one small pick, one shield, and one ladder.	
	No. 3	Assault against the firing slit & entrance		
Five men including a leader	No. 4	Mopping up inside the pillbox		

(Cont'd) Organization and Equipment of the Pillbox Assault Team

Team & No. of Members	Mission Assigned to Each Member		Equipment	Objective & Enemy Situation
Team C  Three soldiers including a leader	Leader (NCO or lance corporal)	Control, and assault	One small pick in addition to equipment carried by the leader of Team B.	A concrete or wooden pillbox. (Path is already opened through wire.)
	No. 1	Clearing a path through wire	Equipment to be carried is the same as that carried by No. 1 man of Team B.	
	No. 2	Assault against firing slit Mopping up inside the pillbox	Equipment to be carried is the same as that carried by No. 3 man of Team B.	
Team D  Two soldiers including a leader	Leader (superior private)	Control, and assault	Equipment to be carried is the same as that carried by No. 1 man of Team B.	A wooden pillbox. (there is no wire.)
	No. 1	Assault against firing slit Mopping up inside the pillbox	Equipment to be carried is the same as that carried by No. 3 man of Team B.	



netting or canopies, it is necessary to destroy these protective nets and canopies with hand grenades or a demolition tube prior to attacking the firing slit.

When discovered by the enemy during the assault, soldiers must move to dead space at the side of the firing slit, taking advantage of intervals in enemy fire, terrain features, and natural cover before throwing in explosive charges. Smoke may be used to conceal movements.

Upon throwing in the explosive charge, the thrower must take shelter to avoid injury from the explosion. He should keep clear of the entrance or firing slits, and drop to a prone position, utilizing a natural cover or nearby trench, if available.

When an armor piercing charge is used, it is necessary to attach it to the object to be demolished. While a 400 gram charge would suffice to disable the enemy in the pillbox, for demolition purposes even a light wooden shelter would require a bundled charge of about five kilograms. Against a pillbox with unknown strength, an explosive charge of one or two kilograms is used first for the purpose of neutralizing the enemy within the pillbox. Under certain circumstances, explosive charge is attached to the end of a wooden pole to assist in handling or placing.

#### **Section L. Team Tactics**

The concept of fighting team formation was developed about 1936

when the new organization which equipped each infantry squad with a light machine gun was conceived and adopted. A team method, designed to seize enemy positions by infiltration, was developed by Lt. Gen. Ishihara, Kanji, commanding general of the 16th Division. As one of the principal features of this tactic an infantry squad was divided into a support team (two or three soldiers with a light machine gun), a sniper team (two or three good marksmen) and two assault teams (about three men to each team). Assault teams approached the enemy pillbox by crawling and attacked it from its side or rear, under the covering fire of the support and sniper teams. The basic consideration underlying this tactic was the belief that a Russian pillbox could be captured by an assault conducted by seven to nine men instead of requiring an entire infantry squad, previously considered necessary.

The system of close quarter combat in pairs was taught in all infantry regiments and was put into practice in many night engagements. Later, the method of fighting teams was adopted by the 16th Division and other units followed suit. Although attempts were made to have this tactic adopted by the Infantry Manual, it was not accepted until near the end of WWII. However, in the Night Attack Manual published in 1944, the 16th Division method was recommended as the most common attack formation of the infantry squad. The manual recommended also that the supporting and sniper teams be made into assault teams under certain circumstances.

## CHAPTER V

### Experience in Night Operations During World War II

When the Greater East Asia War started in December 1941, the Japanese Army successfully displayed in its initial operations the results of its night combat training.

In launching the War, special importance was attached to surprise attack and nearly all initial invasions commenced with night operations and landings. Among these were the landing operations in Malaya and at Lingayen Gulf, Lamon Bay and Davao in the Philippines. In accordance with the principle of tactical surprise, the attack on the British force on the Kowloon Peninsula started with a night attack, as did the operations against Hongkong, Singapore, Borneo, Java, Ambon, Guam, Wake and Rabaul. In Kowloon, Hongkong and Ambon, there were also night attacks against enemy pillboxes by infantry and engineer units.

All the initial night attacks were highly successful, except the first attack against Wake Island, which was carried out by a naval force, alone. While successes were attributed to the superior training and morale of the Japanese forces, the advantages gained by advance preparation and the achievement of tactical surprise cannot be discounted as they were vital factors in gaining and holding the initiative. In addition, the Japanese Air Force and Navy were generally superior to that of their enemies and not only



enabled the concentration and movement of troops to be concealed from the enemy but facilitated transportation and landing operations.

The initial combat successes did not long continue, as in less than a year from the outbreak of hostilities, the Japanese Army suffered serious setbacks. Significant among the reverses were the night attacks carried out by the Kawaguchi Detachment and the 2d Division against the American beachhead on Guadalcanal during September and October 1942. (See Examples 9 and 10 of Supplement.)

Great prestige was at stake in these attacks which, carried out with the purpose of recapturing Guadalcanal Island, employed the traditional night attack tactics in which the Japanese Army was proudly confident. The failure of the attacks not only dealt a severe blow to the confidence of the Japanese Army in the efficacy of its night attack tactics, but marked the turning point in the overall situation of the war between Japan and America. The causes of failure, were attributed to the fact that the Americans possessed air superiority over Guadalcanal Island and its vicinity. America also possessed superior surface strength most of the time, although it was occasionally regained by the Japanese. The Kawaguchi Detachment and the 2d Division had to be transported at night to Guadalcanal by Navy destroyers and as it was impossible to supply sufficient quantities of materiel essential for ground action, the equipment of both units was totally inadequate and even their food supplies were dangerously low.

The Guadalcanal Operation occurred at an unexpected time and at an unexpected place and operational preparations were generally inadequate. The Army was unfamiliar with the local topographical conditions and no accurate, detailed maps were available.

The difficulties presented by the jungles and rugged terrain of Guadalcanal also contributed to the Japanese defeat. Both the Kawaguchi Detachment and the 2d Division carried out night attacks after having moved great distances through jungles and over mountains. The movements, although chosen to avoid the enemy air force, were physically exhausting and adversely affected the night attacks. In addition, neither unit had been adequately trained for jungle fighting and the units lacked the perfection of the initial Japanese army operations insofar as preparation, disposition, and enforcement of attack are concerned.

As the strategical initiative was in American hands, the Japanese were required to change their plans frequently. Unlike the American troops who had fought in the Philippines in the initial phase of the war, those on Guadalcanal Island were well trained and equipped and geared for counterattack, while the Japanese lacked the high morale which they possessed during their advances in the earlier phase of the war.

Intense ground and air fire were important contributions to the defense, but the trip-wire warning system which the Japanese encountered for the first time, in these attacks, was also most effective.

Japanese attacking units sustained heavier losses than had been anticipated and were prevented from making a silent approach for a surprise attack. The attacks were doomed to failure when the troops of the Kawaguchi Detachment and the 2d Division started their operation by losing most of their equipment due to American air raids, then experienced difficulties in the jungles during the tropical nights, and finally became victims of the American defensive fire.

In December 1942 when the situation on Guadalcanal was becoming more and more unfavorable, the Japanese forces began to adopt a new method of night fighting, later referred to as "surprise raiding tactics" (Teishin Kishu Sempo). Earlier, the groups using this tactic were called "raiding parties" (Teishin Tai), "raiding attack parties" (Teishin Kogeki Tai), "infiltration raiding parties" (Teishin Sennyu Kogeki Tai), "close-quarter attack parties" (Nikuhaku Kogeki Tai), "marauding parties" (Kirikomi Tai) or "suicide parties" (Kesshi Tai).

Night raiding tactics were simultaneously adopted by units under the command of the Eighteenth Army in the Buna sector and the units on Guadalcanal. In both areas, raiding was carried out to offset inferior air and artillery strength and, at first, the attacks were directed against enemy aircraft and artillery positions. Later, the enemy headquarters, billets and warehouses were added to the list of attack targets. The raiding parties, each consisting of a maximum of 20 men, approached through the jungle under cover of darkness, in



many instances spending several nights in the approach. As this type of action was considered to be very hazardous, they were generally regarded as suicide parties.

Among the new ideas of night operations developed was "stepped-up debarkation" (Tansetsu Yoriku), in which various methods were adopted to improve debarkation efficiency under cover of darkness.

A second formula was the so-called "rat transportation" (Nezumi Yuso) which was night transportation by high-speed destroyers. In order to minimize the time for debarkation from the destroyers, a method was employed whereby materiel packed in oil drums was released at sea and floated ashore.

A third method was night transportation by large landing barges. In connection with the debarkation system, bases to conceal boats during the day were established about 60 to 100 kilometers apart -- the distance that the barges could travel in one night. This was nicknamed "ant transportation" (Ari Yuso).

The general practice of night movement, as a countermeasure to thwart the enemy air force, was widespread during this period. Virtually all large troop movements were undertaken at night. Cooking and transport in the rear was also carried out under cover of darkness.

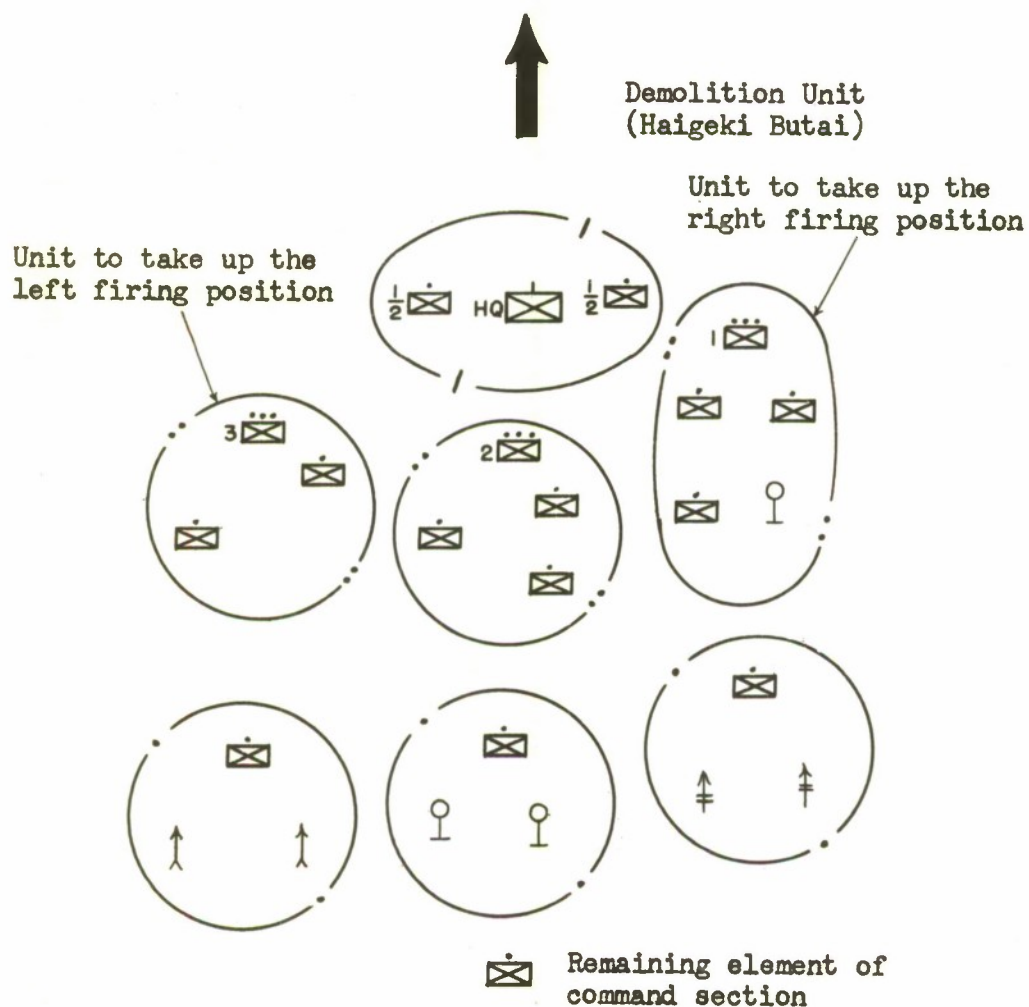
As a result of the failure of the night attacks on Guadalcanal, studies were hurriedly made to establish methods of coping with the superior enemy fire, securing and occupying a position after succeed-

ing in an attack and dealing with the enemy's trip-wire warning network. Part of the study made by the Army Infantry School in February 1943 concerning the first two of these problems is summarized from "A Study on Night Attack" which appeared in the June 1943 issue of the Monthly Report of the Infantry School Research Department:

a. There is no change in the basic principles of either attack by surprise or attack by force, but it is imperative that in both types the enemy fire power be neutralized. Therefore, even when attacking by surprise, prior preparations must be made to permit change to an attack which utilizes fire power to neutralize that of the enemy.

b. It is necessary for both battalions and companies to deploy in width when they attack. The drawbacks attending the adoption of such a formation must be eliminated by training. An example of the deployed attack formation of a company is shown in the following diagram:

# Formation of a Company in a Night Attack



## Legend:

- ⤴ Heavy machine gun
- ⊙ Grenade thrower
- ⤴ Automatic gun (light antitank gun)



Remarks:

(1) Squads advance in one or two columns with three paces between men.

(2) Distance between squads varies between 10 and 30 meters, according to the degree of darkness.

(3) The company commander keeps an element of the Command Section with him.

(4) The demolition unit (Haigeki Butai) is composed of men who are particularly courageous and reliable.

(5) Squads at the flank are responsible for security.

(6) It is advisable to have the third platoon commander follow in the rear of the company to pick up stragglers.

(7) This diagram gives only one example, formations may differ greatly according to the situation and the terrain.

c. In executing night attacks, utilizing the power of firearms, it must be recognized that illumination should be provided by the attacking unit to facilitate accurate firing.

d. In night attacks in which the element of surprise is paramount, it is advantageous to dispatch raiding parties into the enemy position for the prior neutralization and destruction of the enemy command post, positions of principal weapons, observation posts, etc.

e. Action to be taken when fired upon by the enemy while advancing should be based on the principles prescribed in the Infantry Manual, but consideration must be given to minimize losses. A reckless advance should be avoided.

f. The mass attack principle whereby a company assaults in one body with its commander in the lead should be adhered to, but, there may often be cases in which it will be more advantageous and will reduce losses, to have an element of a company seize the company's objective first and temporarily hold the position until the main body which follows closely can adequately secure the captured position.

g. Effective use of combat team tactics is to be recommended. Men to be assigned as members of a raiding party with such special duties as the destruction of enemy fire positions and the command

system should be trained, by organizing them into combat teams. In executing night attacks, combat teams are formed by temporarily combining courageous and cowardly soldiers. (Sic)

h. The attack of a battalion formed in two assault echelons can be carried out even against a position defended by American forces.

i. Measures to secure a captured position are extremely important. For this purpose, attention must be paid to the following points:

(1) In establishing the hour of attack sufficient time must be allotted for the construction of defenses within the occupied position so that the task may be completed before dawn.

(2) In deciding on the attack disposition consideration must be given to a formation which will enable units to move readily into defense positions after succeeding in the attack.

(3) On succeeding in the night attack a unit must immediately make preparations for daylight defense and construct positions. Attention must be given to defense, against heavy artillery and air bombardment and persistent counterattacks by enemy ground troops and tanks after daybreak. In establishing the defense disposition, flank support must be given to friendly troops and communication routes leading to the rear must be maintained.

(4) Defensive positions must be dispersed, and battalion and company commanders must personally direct the occupation of positions.

j. Preparations for a night attack on a position as strongly organized as an American beachhead require at least two days and a night.

k. The area of a strongly organized beachhead which an infantry battalion is capable of breaking through and securing is approximately 600 meters in frontage and 300 to 400 meters in depth.

In connection with the studies on the trip wire warning system of the American forces, the following items were extracted from the "Night Attack Manual" issued in September 1944, by the Inspectorate General of Military Training:



a. The Japanese Army has no information on the type of trip wire warning system employed by the Allied forces. However, the use of telephones by roving or stationary patrols for reporting to the rear was encountered on Guadalcanal Island. Information on the use of microphones indicates that one method calls for the strategic distribution of microphones alone, and the other uses microphones in connection with lookouts. From this, the Japanese Army concludes that the American forces will, in the future, adopt defense methods using radio, ultra short wave and infra-red rays, etc.

b. The method of destroying the trip wire warning system differs greatly according to the type of trip wire warning system in use. For example, the type using telephones as relays can be decommissioned by cutting the wires, but the type using radio must be destroyed or the signals jammed to render them ineffectual.

c. The destruction of the trip wire warning system must be executed prior to the demolition of ordinary obstacles. The demolition teams may be charged with the mission of searching and destroying trip wires prior to demolishing other obstacles.

d. Since the destruction of the trip wire warning system will eventually be discovered by the enemy it cannot be limited to a narrow front as in the demolition of obstacles. In order to conceal the exact location of attack, destruction extending over a wide front is necessary.

After the operations on Guadalcanal, defensive combat was fought more frequently than before and large-scale night attacks aimed at a decisive battle became rare. Although the night attack which was a traditional tactic of the Japanese Army was abandoned, there are many examples of night attacks executed as counterattacks, by units smaller than an infantry battalion, in each theater of operations. Some of these units achieved considerable success, particularly in the defense of Biak, from May to June 1944. There are also several examples of night attacks carried out by large units. Night counterattacks were executed by units of division size in



Saipan and Guam, but they all ended in failure due to the defensive fires of the American forces.

Combat Examples Nos. 11 and 12 illustrate night attacks executed by the units of the Eighteenth Army in eastern New Guinea during 1944. In No. 11 the Nakai Detachment achieved brilliant success against the Australian force in the sector south of Madang, while in No. 12, the main body of the Eighteenth Army barely succeeded in achieving success against an American force in a night river crossing operation on the Driniumor river. The success of the Nakai Detachment in its night attack was due mainly to the use of perfect surprise attack tactics, and the moderate success which the main body of the Eighteenth Army gained in the night attacks on the Driniumor river must be attributed to the fanatic offensive spirit of officers and men. At that stage of the war, the adoption of some new tactic or a fanatical display of offensive spirit was the only way to break the impasse; mere repetition of conventional night attacks invariably ended in failure.

After the operations of Guadalcanal Island the conception of night attacks underwent a change which had a bearing upon the original motive for adopting night attacks. Formerly, emphasis was placed on offsetting an inferiority in ground fire power by the advantages gained in a surprise attack under cover of darkness. After Guadalcanal, emphasis was shifted to executing attacks at night to offset the effects of enemy air power. While the effect of air

power had been considered in the training manuals and during the operations on Guadalcanal, it appeared that air power had not been given sufficient consideration, and in 1943, as the difference in air power between the Japanese and American forces became more marked, daylight attacks of ground troops became virtually impossible due to interference by the American air force.

Also in 1943, in the Burma area, the balance of air power began to turn against Japan, forcing the army to attach greater importance to night attacks by force as had been done in the Pacific area.

Against the Wingate airborne raiding force which landed in March 1944, near Mawlu in northern Burma, the Japanese forces carried out a series of night attacks with a unit composed of the 24th Independent Mixed Brigade, reinforced by troops absorbed from other units, but the attacks ended in failure. There is little doubt that the failures were attributable to the shortcomings of the Japanese force itself, since attack preparations were inadequate and units were composed of troops whose training was not up to par. The net of fire carefully and skilfully organized in the jungle by the Wingate force was a surprise to the attacking units, and as a result the brigade not only failed in its night attacks but also suffered heavy losses. From the failure the Japanese forces in the Burma area learned that the neutralization or destruction of enemy fire power is the prime requisite to successful night attacks on enemy positions defended with modern weapons and facilities.

In mid-May 1944, when the Imphal operation was under way, the necessity of neutralizing enemy fire power was further substantiated by the success of the night attack which was carried out by units of the Fifteenth Army in the vicinity of Torbung (south of Bishenpur). Japanese night attacks had failed repeatedly for the first few days, but finally succeeded on the night of May 19th when they resorted to the neutralizing of enemy fire by the use of artillery and tanks. Other night attacks were carried out by units of battalion strength, without fire support, but they were not successful.

At that time Allied forces had command of the air over the entire Imphal area and Japanese front line units were suffering from an acute shortage of weapons and ammunition as well as food, but in accordance with the desire of the Commander of the Fifteenth Army to continue offensive action, night attacks were attempted as a last resort. The attacks failed when the Japanese, seeking to engage in hand to hand combat, encountered the powerful defensive fire networks of the Allied forces.

Although the regular night attacks of the Japanese Army gained no satisfactory results either in the Pacific theater or the Burma area, the raiding combat tactics which were developed during the operations on Guadalcanal Island and in Buna were used throughout the entire army, during and after 1943, with many variations being added.

The Eighteenth Army, after suffering a serious setback in the



Buna operation, was the first major command to improvise and use raiding tactics, which they continued to utilize until the termination of the war. (See Combat Example No. 13)

The Kwantung Army, in Manchuria, had earlier planned to carry out raids on important targets in the Soviet territory surrounding Manchuria in the event of an outbreak of hostilities with the Soviet Union and had, since 1941, kept one mobile regiment under its command. In the summer of 1944 the 1st Mobile Brigade was organized with the mobile regiment as a nucleus. At the time of organization, the primary purpose of the brigade was to carry out attacks on targets in Soviet territory, but with the change in the operations policy of the Kwantung Army, in the Fall of 1944, the mission of the 1st Mobile Brigade was also changed. Under the new delaying action defense concept, the brigade would remain in the rear of Soviet forces invading Manchurian territory, throw the Soviet rear organization into confusion and facilitate the overall delaying action of the Kwantung Army. In 1945, one additional raiding battalion, with a mission similar to that of the brigade, was assigned to each of the divisions in Manchuria.

The central authorities of the Army acknowledged the advantage of raiding tactics and took measures to recommend their adoption. In 1944, they organized units which specialized in raiding tactics and disseminated information to all commands. A first step was the organization, in early 1944, of the 1st Raiding Unit Headquarters

and ten raiding companies which were dispatched to the Second Area Army (region north of Australia). Later, other similar units were dispatched to other southern areas, including Burma.

In July 1944, the Inspectorate General of Military Training issued a training manual titled: "Raiding Combat Manual" as a guide for the training and combat of units in general as well as specialized raiding units. Another manual titled "Night Combat Training" was published in May 1945.

The two training manuals acknowledge in principle the advantages of surprise attack in night combat and state that at least the initial action must be an attack by surprise even in instances where an attack in force is the eventual aim. Further, front line units must endeavor to carry out diversionary small scale surprise attacks even during a general attack in force.

However, both manuals stress the need for night attacks in force by admitting that night attacks by surprise had become more difficult to achieve due to the battlefield illumination, obstacles and trip wire warning systems increasingly employed by the American and British forces to forestall surprise attacks. One of the most important concepts underlying the two training manuals was that although a surprise attack was desirable, it was not permissible to depend entirely upon them. Training and planning were to be based on the principle of ensuring the success of night attacks by means of attacks in force and that the advantages of surprise attacks should be sought when the

situation permitted.

In relation to the concept of attaching primary importance to the attack by force in night attack, the two training manuals approved and encouraged use of day combat methods at night. For example, they emphasized that:

a. Infantry battalions and companies should attack in an open formation, practically the same as used in daytime attacks.

b. Firing of light machine guns and rifles by infantry, would be permitted under certain conditions.

c. As in day combat, the necessity of cooperation between infantry, tanks, artillery and engineers was stressed. The fire power of infantry and artillery should be used freely to prepare for and support attacks and assaults and in securing captured points.

The team combat method was adopted and close order assaults abolished in accordance with the following instructions in the manuals:

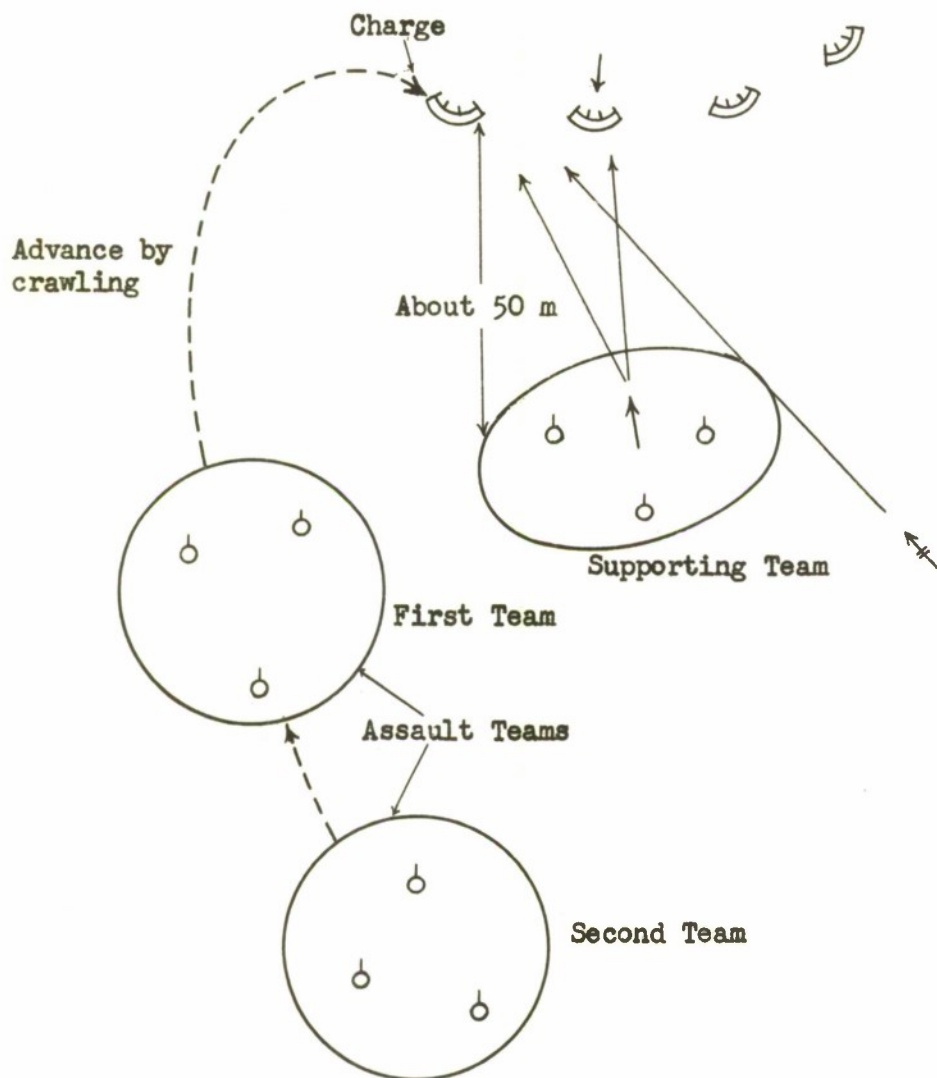
a. With the exception of special instances, the assault of an infantry company should be carried out by its elite platoon with the main body of the company following to secure the occupied area.

b. The infantry platoon or squad will not use its entire strength to carry out close order assault. Single enemy firing positions will be neutralized by the squad assault team. Other squads, grenade dischargers or the heavy machine guns assigned to the company may be used to neutralize the enemy force at points other than the penetration point.

c. An example of the procedure of the squad's assault on an ordinary pillbox is shown on the following sketch.



# Procedure of the Squad's Assault on a Pillbox



**Note:** Enemy machine guns and mortars will be neutralized by heavy weapons and artillery.

A characteristic common to both manuals was the stress placed on the importance of raiding. The mission of a raiding unit was described as facilitating the attack of the main body by destroying or neutralizing enemy tanks, artillery, command posts, important pillboxes and searchlights. The manuals laid down the following principles governing raiding units:

a. The time of action and the objectives of raiding units will be planned by a high echelon commander so that their activities will be coordinated with the general attack.

b. The front line forces (battalions or less) will dispatch raiding units against objectives in their zone of action, a higher echelon commander will dispatch raiding units under his direct control against important objectives located deeper in enemy territory.

c. If the situation warrants, an entire infantry battalion may be used as a raiding unit.

d. First line force will dispatch a raiding unit prior to the commencement of an attack or immediately after the capture of the enemy first line.

e. Raiding units not able to approach objectives by stealth, may at times be forced to break through the enemy's first line position and then take up duties as a raiding unit.

The two manuals considered it possible to effect penetration in depth of an enemy position by attacking in two echelons. However, they expressed the opinion that only an assault made by a company with a limited objective can be reasonably certain of success in a night attack. They proposed the following plan for the organization of an attack designed for the progressive occupation in depth, of an enemy defense position.

a. The enemy first line company position will be captured in a

night attack by the first echelon attacking company. Attack will be started as early in the night as possible.

b. The defense positions of the enemy battalion and regimental reserve will be captured by the second echelon company. This attack will be started at daybreak the following day or early the following night.

c. The defense positions of the enemy division reserve will be captured by the second echelon battalion. The time for this attack will be determined in accordance with the prevailing situation.

Importance was also attached to active and passive antibombardment and antitank measures, action to be taken when coming within close range of the enemy position and the conduct of warfare within the enemy position. In this connection, the manuals stressed the following points:

a. Assault positions will be prepared by digging cover trenches in open formation a short distance from the enemy.

b. Following the capture of the attack objective there will be a prompt shift to daytime defense disposition in order to secure the position.

c. Preparation for antitank defense by rapidly moving up anti-tank weapons and materials.

The manuals also stressed the necessity of careful preparation for attack and explained the essential points.

The new concept of night attack revolutionized the old theories of the Japanese Army in many respects. After the issuance of the new manuals, training was conducted in accordance with their principles but, after the Fall of 1944, there were no opportunities to carry out large-scale night attacks against American or British forces and the war ended before the new concepts could be evaluated by actual use in combat.



Some military authorities expressed doubt as to the practicability of the new concept and questions were raised concerning the difficulties of control of troops in extended formations as well as the possibility of confusion which might arise as a result of the employment of complicated tactics and fire plans in a night time operation. The only answers to these questions were that Allied air power had made night combat a necessity and that the manuals gave the only practical solution to the problem.

The operations of the Kwantung Army against Soviet Russia opened on 9 August 1945 and ended in about a week or ten days. Throughout this period the Japanese forces were engaged principally in defense actions and withdrawals and, as the Soviet forces seldom carried out any night attacks, the Japanese had few opportunities to conduct night attacks (sic). Of course, withdrawals and occupation of positions were often carried out at night and night counterattacks were conducted several times by small units, but there were no night attacks by large units.

Because the period of the operation was limited and because the battle fronts of both sides shifted too rapidly, the Mobile Brigade, organized within the Kwantung Army, and the raiding battalions in each division, did not achieve the expected results. Night raiding was carried out against the rear of the Soviet mechanized units on the eastern front, but it is not known to what extent the advance of the Soviet forces was delayed by those actions.