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PART ONE: GERMANY

Section I. RECENT TRENDS IN THE USE OF MINES AND BOOBY TRAPS

1. INTRODUCTION

In earlier articles—"Minefields in Desert Terrain" (*Intelligence Bulletin* No. 5) and "Booby Traps" (*Intelligence Bulletin* No. 1)—this publication has discussed the Axis' use of mines in North Africa and the general subject of booby traps. However, when the Germans were increasingly forced to assume the defensive in the North African theater, they made certain variations in their methods of laying mines and preparing booby traps. The notes that follow deal with some recent trends observed in Tripolitania and Tunisia.

2. ANTITANK MINES

The Tellermine, model 35, is still the standard German antitank mine (see fig 1).¹ In addition, the

¹Recently two other models have appeared. They will be discussed in the *Intelligence Bulletin* as soon as complete details are available.

Germans occasionally make use of captured mines and Italian mines. Recent reports indicate an increased use of wooden box mines containing TNT, captured British guncotton, or German prepared charges. These wooden mines are difficult to locate with mine detectors, especially when bakelite igniters are used.

Not only are antitank mines frequently booby-trapped (by the addition of pull igniters), but anti-tank and antipersonnel mines are often laid in the same area.

The Germans, often retreating in haste, have found that a tar-bound macadam road, especially one which has a rock foundation, cannot be mined quickly. This has led them to do a great deal of mine laying in road shoulders, chiefly using Tellermines and burying them deep at irregular intervals along a road. The enemy

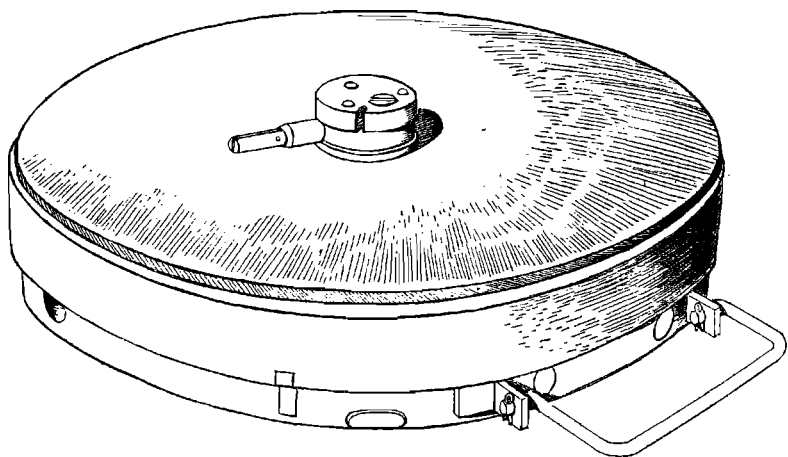


Figure 1.—Tellermine. Model 35 (standard German antitank mine).

carefully removes all evidence of excavated earth, and occasionally scatters small stones or fragments of wood or metal on the site as an aid to concealment. Axis troops usually collect all empty Tellermine crates, and throw them away farther along the line of retreat.² In some cases, once the existence of a mined area has been established, it is possible to locate the mines merely by inspection; even so, it has been found that the use of detectors over all such areas is the best procedure.

The Germans are especially likely to choose the following types of places when laying mines in road shoulders:

- a. At crossroads and junctions, and sometimes on an "island" not surfaced with tar-bound macadam.

- b. Near roadside houses or other obvious turn-outs, where vehicles are likely to pull off the road.

- c. In defiles, where passing vehicles sometimes go over the edge of the macadam.

- d. In entrances to detours.

- e. At sharp corners, where traffic is always likely to go over on the shoulder.

In sandy stretches, where the sand might be expected to blow across the road, the Germans sometimes place mines on the road surface and cover them with sand strewn in such a manner that it appears wind-blown.

² A recent German order states that for the purpose of economizing on steel, the present field packing for Tellermines, model 35, will be replaced immediately by wooden containers.

On hard-beaten tracks, holes are bored with earth augers. This makes the mines much harder to locate visually.

When time and the condition of a road or trail permit, the Germans often mine it according to a definite pattern. A variety of types may be encountered. For example, the Germans recently arranged 155 Tellermines across a road in staggered blocks of 20 and, in addition, laid a very dense belt of mines, with only 1 yard between mines, in a straight line across the road. If a trail leads through scrub, loose pieces of scrub are often placed on top of mines as camouflage, and the mines themselves sometimes laid close to well-worn ruts, as well as across the trail. In these instances the mines are likely to be detonated only after a number of vehicles have passed by.

The anti-vehicle mining of railroad crossings is common. Eight mines in a V pattern, 8 to 12 mines in a Z pattern, and 24 mines in a block are among the various arrangements which have been reported.

In villages mines are likely to be laid in open spaces, such as squares and courtyards, which might conceivably be used as parking areas.

No major changes in the German technique of laying patterned minefields in open country have been reported; however, it must be remembered that German minefield patterns are flexible and may be encountered in many combinations and variations, especially when

the enemy has had time to prepare other than hasty defenses.

NOTE.—It is reported that the method of pulling out Tellermines by means of 100 yards of signal cable is a valuable way to save time and reduce casualties.

3. BOOBY TRAPPING OF TELLERMINES

The German Tellermine contains two recesses, one in the side and one in the bottom, to receive standard German detonators. Axis troops usually booby-trap Tellermines by driving pegs into the ground, either below the mine or to one side of it, and connecting them with thin wire to pull-igniter devices screwed into the recesses. In some cases trip wires are erected; these are usually attached to small stakes about 6 inches high. Pressure devices are also employed.

In general, it may be said that whenever enough time is available the Germans fit a high percentage of their mines with antilifting devices.

The following instances of booby-trapped Tellermines have been reported recently:

a. Apparently unarmed Tellermines lying exposed, with the pin in and the arming wire still wrapped around the igniter, but with an antilifting device underneath.

b. One Tellermine directly on top of another, with the two connected by a pull-igniter and the bottom mine inverted so as to make disarming more difficult.

Also, Tellermines have been connected with British mines placed above and beside them.

c. Five barrels, filled with earth, blocking a road; one or two of the barrels containing Tellermines with pull-igniters pegged to the road, so that the mines exploded when the barrel was moved.

d. Barrels similarly arranged, packed with large charges—such as shells—and placed on a culvert so that when the barrels were moved, the explosion blew in the top of the culvert.

e. A truck partly obstructing a road, with a wire leading from an axle to a pull-igniter in the side recess of a Tellermine. This mine is laid on top of another, and connected to it by a pull-igniter. The second mine, in turn, has a pull-igniter underneath it, which is plugged into the ground by means of wire.

f. Tellermines buried under fecal matter sprinkled with dust.

g. Cord or trip wire connecting a pull-igniter in the side of a Tellermine with a nail or peg in the door of a building or derelict aircraft.

h. Wooden box mines connected to pull-igniters in Tellermines, which are buried underneath the box mines.

NOTE.—It has been discovered that a Tellermine should not be laid again until the main igniter has been tested—away from the mine—to make sure that the shear pin is neither broken nor distorted. Safety pins should be pulled out from a safe distance.

4. ANTIPERSONNEL MINES

The antipersonnel mines now most commonly used by the Germans are the German "S" mine and the Italian B4, both shrapnel types. The "S" mines are usually fitted with the standard three-pronged igniter buried flush with the surface or else protruding slightly. In soft earth and sand, the igniter is sometimes 1 or 2 inches below the surface. "S" mines, often called "jumping mines," may be fired either by pressure or by trip-wire friction, and are thrown about 5 feet above the ground before detonating. The bursting charge of TNT scatters some 350 steel balls (sometimes diamond-shaped pieces of steel are used, instead) with such force that they are dangerous at 200 yards. B4 mines, which can be concealed but not buried, are fired by trip-wire friction only. The primary purpose of the antipersonnel mine, when used in minefields and wire obstacles, is to give warning of an approaching enemy. When laid elsewhere, antipersonnel mines are intended to cause random casualties and to lower morale. Both pull- and pressure-type firing devices are used by the Germans.

Recently the Germans have also been using a new and ingenious type of improvised box mine. Standard charges are prepared in small wooden boxes. The charge is fitted with a pressure-type igniter, which protrudes just enough to keep the lid of the box open about $\frac{3}{4}$ inch. If the lid is stepped on, the box explodes.

Sometimes a wire is attached to the bottom of the lid, and is passed down through the charge and through a hole in the bottom of the box. This wire is then attached to a pull-igniter screwed into a prepared charge so that anyone opening the box fires the charge. In other cases the wire is attached to the bottom of the box so that the charge is fired when the box is lifted (see fig. 2).

The Germans know that clever, imaginative siting of antipersonnel mines is all-important. For example, a recent instance of shrewd antipersonnel mining was the burying of "S" mines around a kilometer post (like a mile post) on which the figures were so obscure that it was necessary to walk up close to the post to read them. Again, it is reported that the enemy has been known to lay "S" mines under patches of spilled tar near his dumps. A patch of tar, when fairly dry, is lifted up, and a hole large enough to accommodate an "S" mine is dug underneath it. The mine is buried, and the patch of tar is put back over it—providing very effective camouflage.

Taking advantage of road craters and destroyed culverts, the Germans often lay "S" mines very liberally in the spoil on the lips of the craters, and then lay Tellermines and additional "S" mines up to a radius of 50 yards on either side of the road, in the path of likely diversions.

The Germans always lay "S" mines and other antipersonnel types in front of localities they intend to defend—especially in strategic hillsides and defiles.

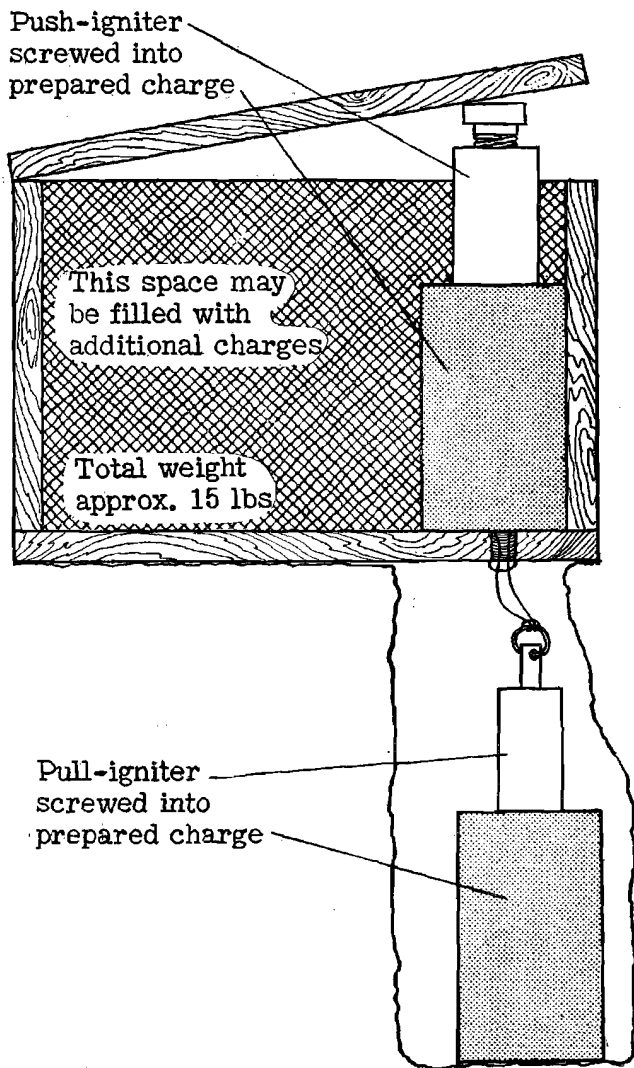


Figure 2.—New Type of Improved Wooden Box Mine.

5. BOOBY TRAPS (PREPARED CHARGES)

Although all mines fitted with pull-igniters and trip wires are sometimes lumped together under the general name of "booby traps," the expression in its exact sense refers to explosive charges or mines ignited by standard pressure-, pull-, release-, or combination-firing devices or by improvised means such as electrical connections. The igniter may be attached by fine binding wire to trip wires, marking stakes, low bushes, or loose bits of scrub used to camouflage mines. To date the Germans have booby-trapped almost every conceivable type of movable object—especially doors, windows, steps, floors, pictures, furniture (especially the drawers), cupboards, water taps, telephones, light switches, rugs, mats, documents, flashlights, cigarette cases, fountain pens, and even the bodies of their own dead. In fact, the list has included virtually everything that the perverted imagination of the enemy could encompass. Often the booby trap serves no tactical object whatever. The best precaution is to remember that everything movable in an area formerly occupied by the enemy must be treated with the greatest suspicion.

The following are recent notes by military observers on the subject of German booby traps:

a. Anything in the least out of the ordinary may indicate the presence of a booby trap—for example, German notice boards facing us instead of the enemy, loose strands of wire, stones with wire wrapped around

them, and so on. This observation, however, only supplements the basic rule regarding booby traps—*everything movable and seemingly harmless must be suspected and treated with caution.*

b. Stakes with booby traps under them are generally dug in, while others are knocked in.

c. Notice boards with skull and crossbones painted on them indicate the presence of booby traps in the immediate area.

d. Small heaps of stones, sometimes piled so as to support the base of a picket, are likely to be wired to prepared charges. This is also true of discarded gasoline, oil, and water cans and drums.

e. Obstacles on roads, tracks, and trails are almost invariably booby-trapped.

f. The standard German antipersonnel grenade is now booby-trapped.

(1) The German Army's small egg-shaped antipersonnel grenade can be identified by its gray body and blue primer cap. A 5-second delay fuze is fired when the blue cap is unscrewed and the enclosed string pulled.

(2) The same grenade with a red primer cap, instead of the blue, is a booby trap. When the red primer cap is removed and the enclosed string pulled, an instantaneous fuze is fired, killing the operator.

g. The Germans are likely to lay a new type of booby trap on landing strips or in any clearing that we may be expected to enlarge. On at least one occasion the Germans buried two "S" mines under a low

bush, and apparently connected a well-concealed trip wire to a lower branch of the bush. When the bush was dug up in the course of clearing operations, the "S" mines were detonated.

h. The Germans have been known to booby-trap an improvised device for cutting the tires of planes attempting to use an airfield. Using a type of wooden container manufactured to hold three "S" mines, they cut the metal rim-bands with a hacksaw and bend them upward to form spikes. The container is then sunk in the ground, with only the spikes protruding. A prepared charge with a pull-igniter is attached to the container, so that anyone who lifts it detonates the charge. "S" mines may also be buried close to the box.

6. TACTICAL USE OF MINES AND BOOBY TRAPS

The Germans use antitank and antipersonnel mines as obstacles to reduce the mobility of enemy vehicles. Where possible, they are used in conjunction with natural or other artificial obstacles. Below are listed some of the most common tactical uses of mines.

a. To Strengthen the Defenses of a Strong Point

An order of German General Von Ravenstein, dealing with defensive measures in Libya, stated that mines should be used to cover small gaps within strong points. Where used for this purpose the mines are generally laid in narrow bands of a few

rows, and the antipersonnel mines are used in conjunction with barbed wire and tank ditch defenses.

b. To Cover Gaps between Strong Points

Von Ravenstein's order stated that the second use of mines is to cover areas between strong points. To accomplish this, the mines may be laid in extensive fields in order to cover large gaps with the intent to restrict enemy tanks to paths which enemy forces have previously prepared and in which they will be subjected to the maximum fire of defending guns.

c. To Form a Continuous Band of Obstacles

When a front becomes stabilized, both forces lay extensive minefields. In May 1942, the British laid a mined zone extending from Gazala to Bir Hacheim, some 50 miles, and doubling back in a V shape for another 25 miles. Such deeply mined areas do not consist of continuous fields of mines. Rather, they consist of successive bands of minefields laid in conjunction with defensive positions.

d. To Block Roads and Defiles

Such obstacles are of major importance to any army in retreat. Problems of supply require both retreating and pursuing armies to remain on the probably few good roads. The liberal use of mines laid in dense and irregular patterns, where every effort is made to render difficult their detection and removal, contributes materially to the successful withdrawal of a retreating force.

Section II. ARTILLERY TACTICS

1. IN NORTH AFRICA

a. Introduction

The following notes deal with German employment of artillery in North Africa. It is believed that they give general indications of the enemy's current artillery tactics.

b. Gun Positions

Ground conditions were apparently the deciding factor as to whether or not guns should be dug in. In principle, it would seem that guns always were dug in, except under the following circumstances:

(1) When the ground was so rocky and hard that it was considered more expedient to construct a breastwork of rocks and earth around a natural hollow than to dig in. Sometimes these positions were sandbagged.

(2) When it was foreseen that a position could be held only for a short time. In such instances, neither pits, breastworks, nor alternate positions were constructed.

When guns were staggered, the arrangement was like the letter "W," minus one stroke, and the guns were from 30 to 50 yards apart.

c. Alternate Positions

Although, under all normal circumstances, it seems to have been a rule to dig alternate positions, it has been reported that at least one battalion did not dig alternate positions because its guns were subjected principally to high-level bombing attacks—against which a change of position would not have offered increased protection.

Alternate positions were not used for night firing.

In certain instances, positions were camouflaged with garnished nets, tarpaulin, and even tentage. Evidence reveals that when camouflage was not attended to, it was always a case of laziness on someone's part. The implication is that instructions to camouflage guns had invariably been given.

d. Observation

At times observation was carried out in the following manner. There were two observation posts. One was 5,000 yards in front of the battery position, and was manned by an officer, a telephone operator, a radio operator with a walkie-talkie, and an antiaircraft gunner. The second observation post was from 2,000 to 3,000 yards forward of the first one. There was no direct intercommunication between the observation posts of

three batteries, but all targets had to be approved by each of the observation posts reporting. Communication by telephone and radio was always maintained between the observation posts and the command post. It is believed that there may also have been an additional radio link between the command post and division headquarters.

e. Counterbattery Fire

As a result of a shortage of ammunition, there was a decrease in the use of medium howitzers for counterbattery fire. However, 105-mm guns were reported as having stayed in action constantly to undertake counterbattery tasks, even when ammunition was short.

The practice of firing on British 6-pounder (57-mm) antitank guns was abandoned after it had been observed that British artillerymen were in the habit of occupying a position, firing, and then promptly moving to a different position.

It is reported that the Germans consider it necessary to expend from 100 to 200 rounds in order to destroy a battery of guns by artillery fire.

f. Training as Infantry

A certain German regiment apparently received intensive infantry training so that its personnel would be able to act as escorts for guns when necessary. (Our artillerymen of course receive this type of training, too.)

2. DEFENSIVE BARRAGES

The following extract from a German Army document on defensive barrages is also of interest. It is undoubtedly based on considerable battle-front experience.

As a rule, a battery should not be assigned more than one or two emergency barrage areas in addition to its normal barrage area.

The width allotted to each battery is 100 yards (150, if necessary) for 105-mm guns, and 150 yards for 150-mm howitzers. The barrage is fired in short bursts with the highest possible charge, and with the delayed-action fuze. The first concentration is fired automatically, or after a visual signal has been given. Such a concentration consists of 12 rounds fired in 2 minutes by the 105-mm pieces, and 8 rounds in 2 minutes by the 150-mm pieces. In case observation should prove impossible, or communications be destroyed, orders should always specify whether a new concentration is to follow a repetition of the signal. Apart from this precaution, the repetition of fire can vary according to circumstances.

The firing data for a barrage will be calculated and, whenever possible, verified with one gun. The corrections observed are then passed on to the other guns. The latest corrections can also be passed on to other batteries having the same equipment, provided that the difference between the line of fire and the direction of the wind is the same for the other batteries.

The area within which 50 percent of the rounds will fall must have been ascertained previously (and allowance made for an increase when the firing takes place on a downward slope). It is of course important to place the barrage in front of the forward line and in front of friendly wire, mine, or anti-tank defenses—generally by as much as 200 to 300 yards.

The shorter rounds must not be dropped nearer than 100 yards to the infantry in the case of the 105-mm's, and 200 yards in the case of the 150-mm's. Closer firing is to be undertaken only after agreement with the infantry. For this type of firing, calibers under 100 millimeters are the most suitable.

The results of the preparations made in the light of the latest corrections must be recorded separately. Each detachment commander will be handed a data sheet giving the orders for each different barrage. These are to be written up on a special board on each gun, or on the shield.

As soon as a metro message is received, the necessary calculations will be made and the barrage tables corrected accordingly.

During inactive periods the guns will be loaded (with projectiles only) and laid on the normal barrage. The number of rounds for the barrage will be held in readiness.

Section III. NEW GERMAN HEAVY TANK

In Tunisia the German Army sent into combat, apparently for the first time, its new heavy tank, the Pz. Kw. 6, which it calls the "Tiger" (see fig. 3). The new tank's most notable features are its 88-mm gun, 4-inch frontal armor, great weight, and lack of spaced armor. Although the Pz. Kw. 6 has probably been adopted as a standard German tank, future modifications may be expected.

The "Tiger" tank, which is larger and more powerful than the Pz. Kw. 4,¹ is about 20 feet long, 12 feet wide, and 9½ feet high. The barrel of the 88-mm gun overhangs the nose by almost 7 feet. The tank weighs 56 tons in action (or, with certain alterations, as much as 62 tons), and is reported to have a maximum speed of about 20 miles per hour. It normally has a crew of five.

The armament of the Pz. Kw. 6 consists of the 88-mm tank gun (Kw. K. 36), which fires fixed ammunition similar to, or identical with, ammunition for the usual 88-mm antiaircraft-antitank gun; a 7.92-

¹ To date there is no record of a Pz. Kw. 5 having been used in combat.

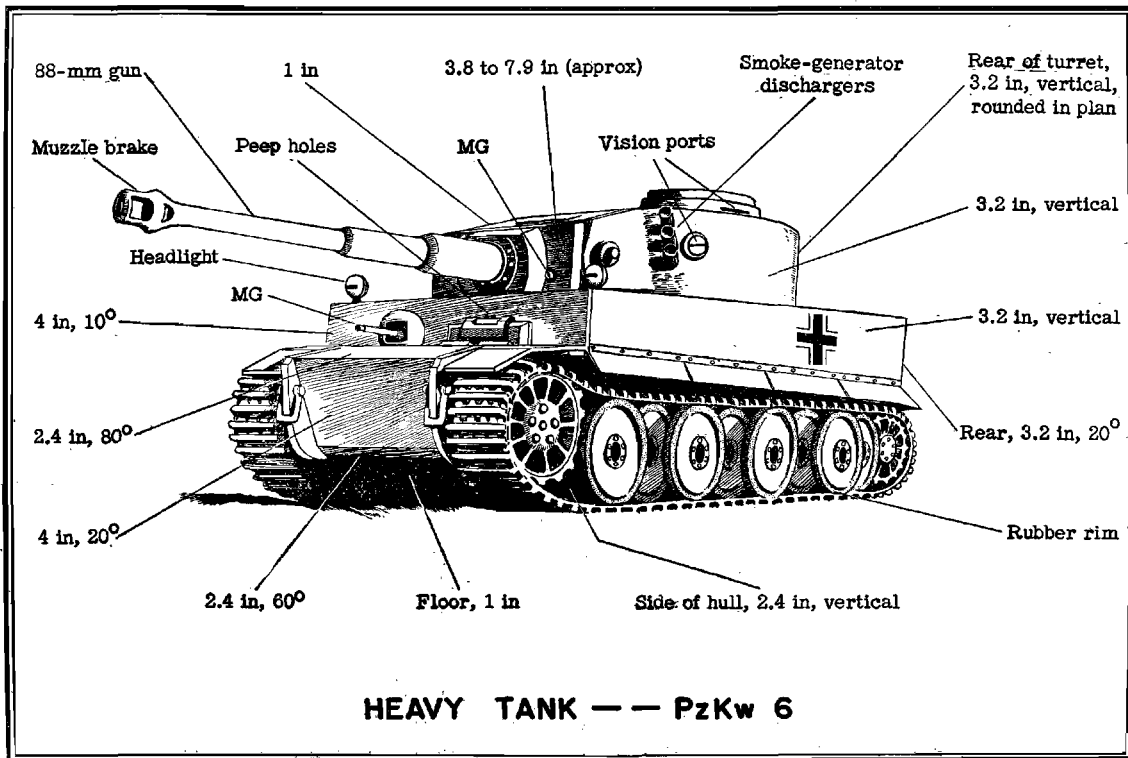


Figure 3.

mm machine gun (MG 34) which is mounted coaxially on the left side of the 88-mm; and a second 7.92-mm machine gun (MG 34) which is hull-mounted and fires forward. In addition, a set of three smoke-generator dischargers is carried on each side of the turret.

The turret rotates through 360 degrees, and the mounting for the gun and coaxial machine gun appears to be of the customary German type.

The suspension system, which is unusually interesting, is illustrated in figure 4. The track is made of metal. To the far right in figure 4 is the front-drive sprocket and to the far left the rear idler. There are no return rollers, since the track rides on top of the Christie-type wheels, which are rubber rimmed. It will be noted that there are eight axles, each with three wheels to a side, or each with one single and one double wheel to a side. There are thus 24 wheels—8 single wheels and 8 double wheels on each side of the tank. The

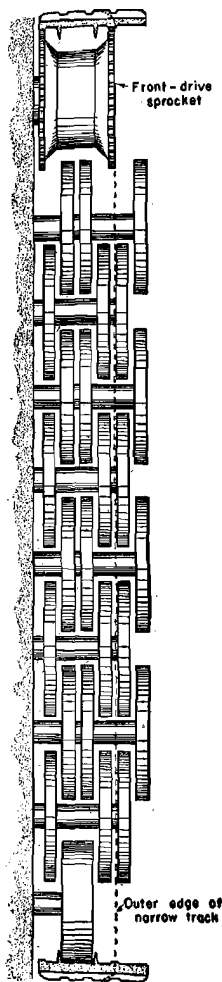


Figure 4.—Suspension System of the Pz. Kw. 6.

system of overlapping is similar to the suspension system used on German half-tracks.

The tank is provided with two tracks, a wide one (2 feet, 4.5 inches) and a narrow one (just under 2 feet). The wide track is the one used in battle, the narrow being for administrative marches and where maneuverability and economy of operation take precedence over ground pressure. The dotted line in figure 4 indicates the outer edge of the narrow track. When the narrow track is used, the eight wheels outside the dotted line can be removed.

The armor plating of the Pz. Kw. 6 has the following thicknesses and angles:

Lower nose plate.....	62 mm (2.4 in), 60° inwards.
Upper nose plate.....	102 mm (4 in), 20° inwards.
Front plate.....	62 mm (2.4 in), 80° outwards.
Driver plate.....	102 mm (4 in), 10° outwards.
Turret front and mantlet....	Possibly as much as 200 mm (8 in), rounded.
Turret sides and rear.....	82 mm (3.2 in), vertical.
Lower sides (behind bogies).	62 mm (2.4 in), vertical.
Upper sides.....	82 mm (3.2 in), vertical.
Rear.....	82 mm (3.2 in), 20° inwards.
Floor.....	26 mm (1 in).
Top.....	26 mm (1 in).

The angular (as opposed to rounded) arrangement of most of the armor is a bad design feature; reliance seems to be placed on the quality and thickness of the armor, with no effort having been made to present difficult angles of impact. In addition, none of the armor is face-hardened. The familiar German practice of increasing a tank's frontal armor at the expense of the

side armor is also apparent in the case of the Pz. Kw. 6.

Undoubtedly the Germans developed the "Tiger" tank to meet the need for a fully armored vehicle equipped with a heavy weapon capable of dealing with a variety of targets, including hostile tanks. Although the "Tiger" can perform these duties, its weight and size make it a logistical headache. It is entirely probable that the Germans, realizing this disadvantage, are continuing to develop tanks in the 30-ton class. Further, it is interesting to note that the Pz. Kw. 6 has proved vulnerable to the British 6-pounder (57-mm) antitank gun when fired at a range of about 500 yards.

Section IV. AIR FORCE

1. RECENT GROUND-ATTACK TACTICS

Recent reports indicate that German Air Force units in North Africa have developed new tactics, involving the use of Focke-Wulf 190's and Messerschmitt 109's (single-engine fighters) as dive bombers in raids on ports, airdromes, roads, and gun emplacements.

a. Attacks on Ports

(1) *By Day*.—Four types of daytime attacks on ports have been noted.

In the first type, FW 190's escorted by ME 109's make a weaving approach at about 20,000 feet and, when near the objective, glide down to between 10,000 and 12,000 feet. The 109's then veer off to attract the antiaircraft defenses, while the 190's maneuver into attack position and make a steep dive from the sun. They always dive in line astern.¹ The angle of dive is from 30 to 50 degrees, and the usual diving speed exceeds 400 miles per hour. At the end of the

¹ "In line astern"—one following another.

dive, the 190's are likely to bank to the right. After pulling out, they usually head straight for home, although sometimes they rejoin the 109's and both attack the target with machine guns. Occasionally the escort may dive with the bombing aircraft.

In the second type of attack, ME 109's approach at about 12,000 feet, make a shallow dive at full speed to 6,000 feet, and release their bombs at this altitude.

In the third type, FW 190's circle at 12,000 feet, and then peel off in a steep dive to about 6,000 feet; at this altitude the bombs are dropped.

The fourth type of attack involves Junkers 87's (the standard German dive bomber), which usually dive in formation, in line abreast, at a 60-degree angle from approximately 4,000 feet to drop their bombs at about 1,000 feet. Also, Ju 87's often approach at 10,000 feet, make a shallow dive to between 5,000 and 6,000 feet, and then release the bombs. They are immediately followed by FW 190's, which come over at 5,000 feet and dive steeply to 500 feet, disregarding anti-aircraft fire. At 500 feet they release their bombs and then make an almost vertical pull-out.

(2) *At Night*.—Several variations in night attacks on ports have been reported. In one type the aircraft, perhaps Ju 88's, approach singly at about 10,000 feet, make landfall² to the flank of the objective, and circle inland. The aircraft then head toward the

² "To make landfall"—to cross a coastline.

sea, usually shutting off their engines and gliding down to 2,000 or 3,000 feet to bomb port installations. However, they sometimes make a steep power-dive from 6,000 feet to about 2,000 feet. After attacking port installations, the Germans always head out over the sea.

Ju 88's also make a high, level approach, and drop flares before they separate to make diving attacks from different directions. They may even approach evasively—abruptly changing direction a number of times—at altitudes of 8,000 to 12,000 feet, from which they dive to 2,000 feet in order to bomb.

b. Attacks on Airdromes

It is reported that the Germans have used a variety of methods in attacking airdromes. For example, fighters escorting FW 190's and Ju 87's often try to engage the opposition's fighter patrols at high altitudes while the Ju 87's execute a deep dive, pulling out at 7,000 feet. The 190's go in simultaneously with the 87's in a shallow dive, the leading plane diving at a slightly steeper angle and about 1,000 feet below. The bombing by the FW 190's has been more accurate than that by the Ju 87's.

Another maneuver carried out by FW 190's and ME 109's is a low-level approach from the sun, at an altitude of about 50 feet, to attack with cannon and machine guns. These aircraft also engage in mock dogfights

over the airdrome, breaking off suddenly and diving to attack.

At altitudes of from 10,000 to 15,000 feet, 190's may approach and then divide into two sections, one of which dives to about 2,000 feet to bomb the target while the other maintains altitude. After the dive, the sections rejoin each other, and both immediately dive at right angles to the original line of dive, in order to bomb and machine gun for added effect.

Still another method of attack is for fighter-bombers to come in at about 2,000 or 3,000 feet, followed by fighters several thousand yards behind. The fighters fly at an altitude of about 30 feet in order to strafe airdrome personnel, who are so preoccupied with the bombers that they often are taken completely by surprise.

FW 190's and ME 109's frequently circle at 8,000 to 10,000 feet, diving singly or in formation to attack a target with cannon and machine-gun fire. In another type of airdrome attack, Ju 87's approach in formation at 8,000 feet, escorted by a high cover of ME 109's and FW 190's. The 87's dive and release their bombs at 2,000 feet while the fighter-bombers drop one large or two small bombs from 10,000 feet. Again, ME 109's and FW 190's may appear over an airdrome in formation at about 6,000 feet, and then suddenly break off and attack from all directions with bombs and machine-gun fire.

c. Attacks on Roads and Gun Emplacements

In order of priority, the favorite targets on roads appear to be water trucks, staff cars, artillery movers, and ambulances. Road attacks vary in method. First, FW 190's or ME 109's, in threes or fours, usually reconnoiter the targets from about 6,000 or 7,000 feet. When they have sighted the desired objectives, planes dive to 50 feet, and fly either parallel to a road or diagonally across it, often attacking while vehicles are on an "S" curve or in a wooded stretch. Sometimes the planes fly far down a road, strafing any target that they encounter.

Another method of attack that the Germans follow involves coming in low over a hill and diving on a road in the adjoining valley.

Both dive and fighter bombers have been used in a counterbattery role to attack forward gun emplacements from 5,000 feet or less, depending on the intensity of the antiaircraft fire encountered.

2. INTERROGATION OF PRISONERS

German interrogation of United Nations prisoners who belong to air force units is in many ways comparable to the interrogation of ground force personnel, according to statements made by captured Germans. However, it is believed that attention should be called to certain reported German methods of interrogating air force prisoners, so that the members of all arms may be better informed regarding the enemy's technique of securing information.

It is reported, for example, that when an air prisoner of war is taken to an interrogation center, he is likely to be placed first in a single room outside the main camp until his first interrogation, after which a decision is reached as to the type of treatment that he is to be given.

After the prisoner has refused to give more than his name, rank, and number, he is likely to be moved into a room with a companion, in the hope that he will divulge information which can be picked up by hidden microphones. Often the companion is a stool pigeon, who plays the role of a comrade in distress and who pretends to be hurt if the prisoner does not talk freely.

Captured Germans report that stool pigeons sometimes are air prisoners of war belonging to German-occupied countries, and that they have been coerced into this sort of work by threats of retaliation against their families. Other stool pigeons may be men with private grievances, which the Germans have encouraged and played upon.

Most often, it would seem, the companion assigned to a prisoner of war is simply a German who knows one of the United Nations very well, who speaks English perfectly, and who appears to be just another prisoner.

An alternative method is to give the prisoner a period of solitary confinement. The Germans hope that prisoners will no longer resist interrogation after having been kept alone for a considerable time, and that

when they are treated decently afterward, they will be glad to talk readily.

For certain prisoners, the method of "friendly" interrogation is used at the very beginning. The questioning takes place in a comfortably furnished room, and the interrogators take pains to keep the whole thing on the level of an informal chat. The serving of alcoholic drinks is intended to play an important part in this method.

Naturally, efforts are made to convince the prisoner that he need not fear to talk, inasmuch as everything about his unit is already known. It is reported that at certain German interrogation centers the prisoner is seated near a shelf of books purporting to give the history of each unit, together with names of personnel, details of losses, and so on. The interrogation officer may even start by reading aloud a few entirely correct statements, hoping that this will lead the prisoner to talk freely and, in so doing, to reveal other information, which is not yet known and which is badly needed.

German officers sometimes invite prisoners to parties, which last until four or five in the morning. There is always plenty to drink at these affairs. The Germans of course do everything they can to start friendly discussions with the prisoners, in the hope that eventually one man will grow talkative and that others will then follow suit. This method is dangerous, and no one should be so misguided as to think that it is safe for him to talk "just a little" on the grounds that he "knows when to stop."

Section V. MISCELLANEOUS

1. COUNTERATTACK TACTICS (MARETH FRONT)

The following notes deal with German counterattack tactics employed on the Mareth front in Tunisia from March 21 to 23.

a. Use of Tanks

In an attack against certain British positions, German tanks were not used in direct cooperation with the infantry. Instead, the tanks assembled—a maximum of 20 at a time were observed—and began to move in mass toward the British. After covering a short distance, they split into groups of three. Each group worked its way forward on its own, always attempting to reach the British flank. The groups advanced by bounds, moving from one hull-down position to another, and halting at each to shell and machine-gun the British positions.

b. Infantry

Detrucking under the concealment afforded by palm trees in the tank assembly area, the infantry

worked its way forward stealthily, making good use of ground. Snipers were very active, and protected the infantry's advance in an efficient manner. The mission of the infantry always appeared to be to gain possession of commanding ground, from which British positions could be observed and made untenable.

c. Fire

In preparing for the attack, the Germans made extensive use of mortars. The fire was intense and accurate, and gave evidence of extremely good observing.

The Germans often fired tracer ammunition to indicate, to heavier guns sited further back, which targets were especially worth attacking.

In one instance, when the British had captured a position and had shown a success signal, the Germans sent up a white Very light. German artillery at once placed fire on the lost position.

d. Panzer Grenadiers

It is reported that at least one attack in which Panzer Grenadiers took part was completely broken up as a result of British medium (U. S. heavy) machine-gun and 75-mm mortar fire, and that casualties were numerous.

At Zaret Sudest a German position, which apparently was held by a company of Panzer Grenadiers, was the scene of heavy hand-to-hand fighting in the

communication trenches, of which the Germans made full use, throwing hand grenades and sniping at close range.

2. ENGAGING A BRITISH OBSERVATION POST

On one occasion in North Africa a British observation post was engaged by seven enemy tanks, of which only six fired. The seventh, the commander's tank, was at the halt about half a mile away. After one of the six tanks had got the observation post's range, all began to fire for effect. They were employed rather like a 6-gun battery, with the commander's tank apparently controlling the others. The range was 7,000 yards.

British 25-pounders (88-mm gun-howitzers) responded with heavy fire. The enemy then attacked the observation post with 15 tanks and two 75-mm guns. As soon as the enemy fire was effective, one of the tanks placed its fire behind the observation post while the remaining tanks carried out a flanking movement.

3. TANK-BORNE INFANTRY

The Germans have been known to follow a wave of tanks with a second wave carrying infantrymen, 15 to a tank. The general rule has been for the infantrymen to jump off as close to their objective as the

nature of the terrain and hostile fire permit. It is reported that under favorable circumstances, they may ride on the tank until it is within 30 to 10 feet of the blind side of a pillbox, for example.

4. REACTION TO BRITISH USE OF SMOKE

A message from a German army to a corps indicates German response to the use of smoke—in this instance, by the British.

In case the enemy makes use of smoke, units must immediately open fire with machine guns and artillery on the area where the smoke is. We have found from experience that the enemy moves his infantry forward and carries out concentrations, movements, and replacements under the concealment afforded by the smoke. In such cases intense machine-gun fire obtains excellent results.

As far as our resources permit, our own troops must use smoke to conceal their own movements.

5. FLAK IN THE FIELD

Although a Flak (German antiaircraft artillery) unit in the field remains subordinate to the German Air Force in all matters of administration, it is operationally subordinate to the commander of the army unit to which it is attached. The use of Flak in cooperation with the army is highly flexible, and the scale and method of employment vary, often on short notice, according to the tactical situation. When Flak units

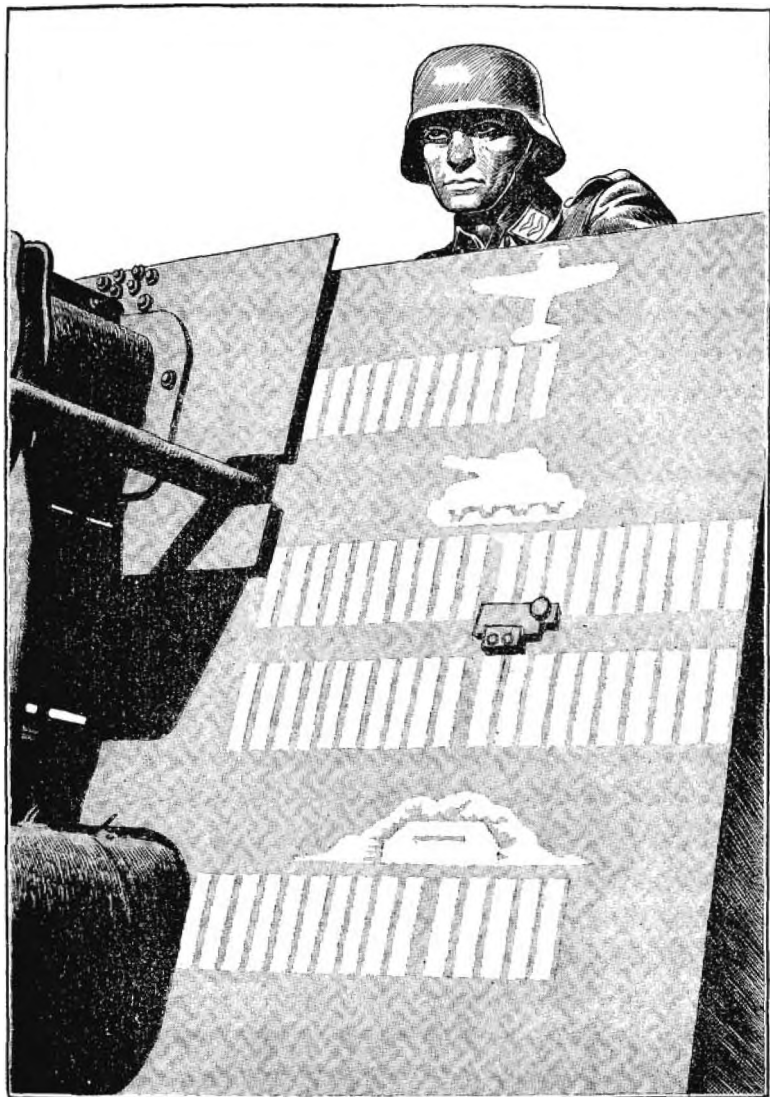


Figure 5.—Combat Score on German Flak Gun Shield

are assigned to divisions, first consideration is usually given to armored and motorized components.

All Flak guns up to and including the 88-mm are dual-purpose, and when units are attached to the field army, they carry armor-piercing and percussion-fuze as well as time-fuze ammunition.

In all the campaigns of the present war, Flak units have been active in the front lines, where the heavy guns, in particular, have been used increasingly against armored vehicles, artillery positions, and fortifications.

Flak gun crews are permitted to paint a record of their successes on the shields of their guns (see fig. 5). The Germans feel that this encourages a competitive spirit which not only strengthens morale, but which leads directly to greater efficiency on the part of the crews.

6. DEFENSE OF VILLAGES

As a rule, if the Germans believe that a town or village in their possession is likely to be attacked, they prepare it for all-around defense. In the outskirts of the populated area, they generally construct a belt of field defenses around the town, with ditches, minefields, and other antitank obstacles protecting all approaches, and with every obstacle covered by fire according to a well coordinated plan.

Within the populated center itself, the German defense plan is based on the theory that in all street fight-

ing, the element of surprise is important. Certain buildings are transformed into fortified strongholds, and several such buildings, capable of mutual fire support, become a center of resistance. Streets and houses which are outside these zones are covered by small-arms fire.

The ground floor of a fortified point is usually reserved for such heavy weapons as guns, antitank guns, and mortars. Artillery and mortars are also emplaced in parks, gardens, and courtyards, where the Germans believe that they can be especially effective in repelling tanks. Tanks may be placed in ambush inside barns or other buildings; also, they may be cleverly dug-in around the outskirts of the town to cover possible avenues of tank approach.

Heavy and light automatic weapons, snipers, and grenade throwers are dispersed throughout the upper floors of buildings and on roofs.

If one or two buildings of a fortified zone are lost, the Germans try to counterattack vigorously before the opposition has had time to consolidate its gains.

7. DEMOLITION PRECAUTIONS

The Germans now include as part of their normal equipment means of destroying anything which should not be allowed to fall into our hands. In addition to their regular ammunition, guns are allotted charges to be placed in the barrels so that the equipment may be

thoroughly demolished. Drivers are equipped with grenades to destroy their own vehicles. Company headquarters keep on hand a bottle of gasoline to pour over all classified documents. They also have another incendiary bottle, not unlike the phosphorous bomb used in close combat against tanks. Just in case this does not function, a box of matches is kept in reserve. The German theory is that if they allow us to capture anything intact, their loss is double—we gain a tank, for example, while they must call for a replacement.

PART TWO: JAPAN

Section I. JAPANESE USE OF SMOKE

1. INTRODUCTION

Although the Japanese have gained considerable experience in the use of smoke in China, they have used it very little to date against United Nations forces in the Southwest Pacific.

The Japanese are known to possess several types of smoke-producing equipment and to have personnel trained for smoke operations. Temporary smoke companies (infantry regimental smoke units) are formed from infantry regimental personnel (5 to 10 men from each company) who have been trained in chemical warfare duties. These men perform ordinary company duties except when detached for chemical warfare services. The enemy also has field gas companies (each about 220 strong), which are allotted to divisions for specific operations. Each of these companies carries 3,240 smoke candles. (Whether they are toxic, the ordinary type, or include both, has not been reported.) When the use of smoke is planned on a large scale, these smoke companies may be formed into temporary

smoke battalions—probably three companies to the battalion.

Various types of Japanese smoke-producing equipment—including smoke candles, a rifle smoke grenade, and grenade-discharger smoke grenades—have been reported by the Intelligence Branch of the U. S. Chemical Warfare Service. Reports on these items of equipment constitute the major part of this section.

2. TYPE 99 SELF-PROPELLED SMOKE CANDLE

This candle consists of three main parts: an outer cylinder 8 inches long and 2 inches in diameter, an inner container (which is the candle proper), and a propelling charge.

One report states that the candle is painted light gray, with a white sighting line along the side, whereas another report states that it is olive drab in color. Both reports give the total weight as 2.8 pounds, including the smoke mixture, which weighs 1.41 pounds. The mixture consists of hexachlorethane, 56.5 percent; zinc dust, 30 percent; zinc chloride, 2.8 percent. and zinc oxide, 10.7 percent.

To operate the candle, the top and bottom slip-on covers (sealed with adhesive tape) are removed, and the candle is placed in an inclined position by means of an attached spike (see No. 4 of fig. 6), which is slid to the bottom of the cylinder and then pushed into the ground. The fuze (10) is ignited from the match head (3), which, in turn, ignites the propelling charge. The explosion shoots the inner container a distance

of 131 to 306 yards, according to the angle at which the spike is driven into the ground. The smoke mixture is ignited by means of a fuze after a delay of 4 to 5 seconds.

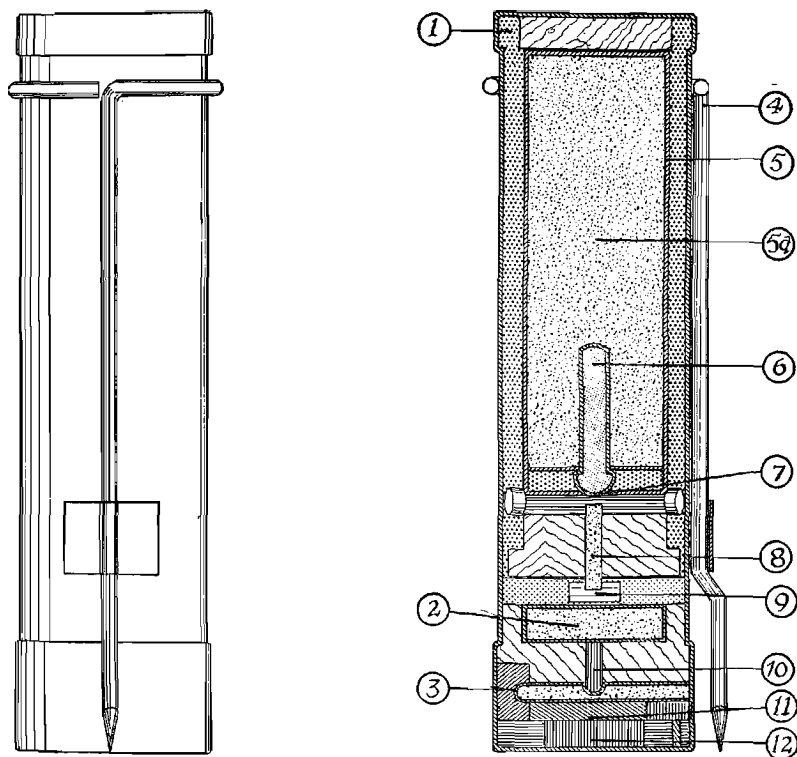


Figure 6.—Type 99 Self-propelled Smoke Candle.

KEY TO DIAGRAM

- | | | |
|--------------------|--------------------|-----------------------|
| 1. Felt packing. | 5a. Smoke mixture. | 10. Fuze. |
| 2. Propellant. | 6. Fuze. | 11. Abrasive surface. |
| 3. Match head. | 7. Fuze cap. | 12. Igniting block. |
| 4. Spike. | 8. Fuze. | |
| 5. Cardboard tube. | 9. Paper wads. | |

3. SMOKE GRENADE (for grenade discharger)

This smoke grenade, about 6 inches long and 2 inches in diameter, is fired from the 50-mm Type 89 heavy grenade discharger.¹ It can be projected a dis-

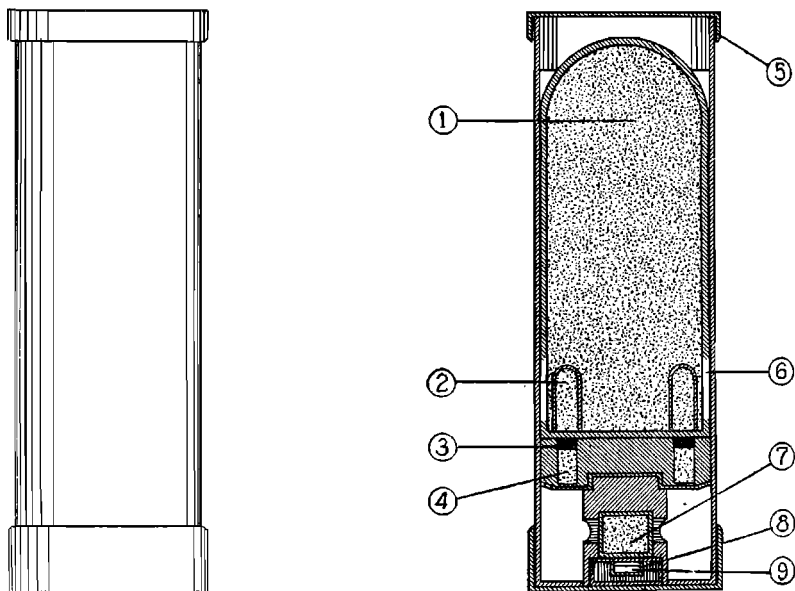


Figure 7.—Smoke Grenade (for grenade discharger).

KEY TO DIAGRAM

- | | |
|-----------------------------|--------------------|
| 1. Smoke-producing mixture. | 6. Smoke vent. |
| 2. Powder charge. | 7. Propellant. |
| 3. Flash vent. | 8. Detonator. |
| 4. Delayed-action fuze. | 9. Percussion cap. |
| 5. Soldered top. | |

¹ A detailed report, based on U. S. Ordnance findings, was given on Japanese grenade dischargers in the May, 1943, issue of the *Intelligence Bulletin*, page 15.

tance of 45 to 206 yards, according to the adjustment of the discharger.

The propellant weighs 4.24 ounces and the detonator .25 ounce—no other weights are given.

Before being used, the grenade is removed from its outer cover. The delayed-action fuze (see No. 4 of fig. 7) becomes ignited from the explosion of the propellant (7), and passes to the powder charge (2), which ignites the smoke mixture (1).

4. TYPE 94 SMOKE CANDLE (Small)

The container of this candle is 7.25 inches long and 2.1 inches in diameter, and is painted green. The markings (see No. 15 of fig. 8) show the usual details of the date and place of manufacture. The total weight of the candle is 2.17 pounds, including the smoke-producing (Berger-type) mixture. The mixture itself weighs 1.87 pounds, and consists mainly of carbon tetrachloride, zinc dust, and zinc oxide.

In operation, the sheet-iron cup (6) burns off with the igniter, and consequently starts the burning of the smoke-producing mixture.

5. TYPE 94 SMOKE CANDLE (Large)

This candle is a larger model of the Type 94 described in paragraph 4. It differs mainly in the method of ignition, which apparently is done by means of a cord attached to the igniting apparatus. (See fig. 9.)

The length of this candle is 31.5 inches and the di-

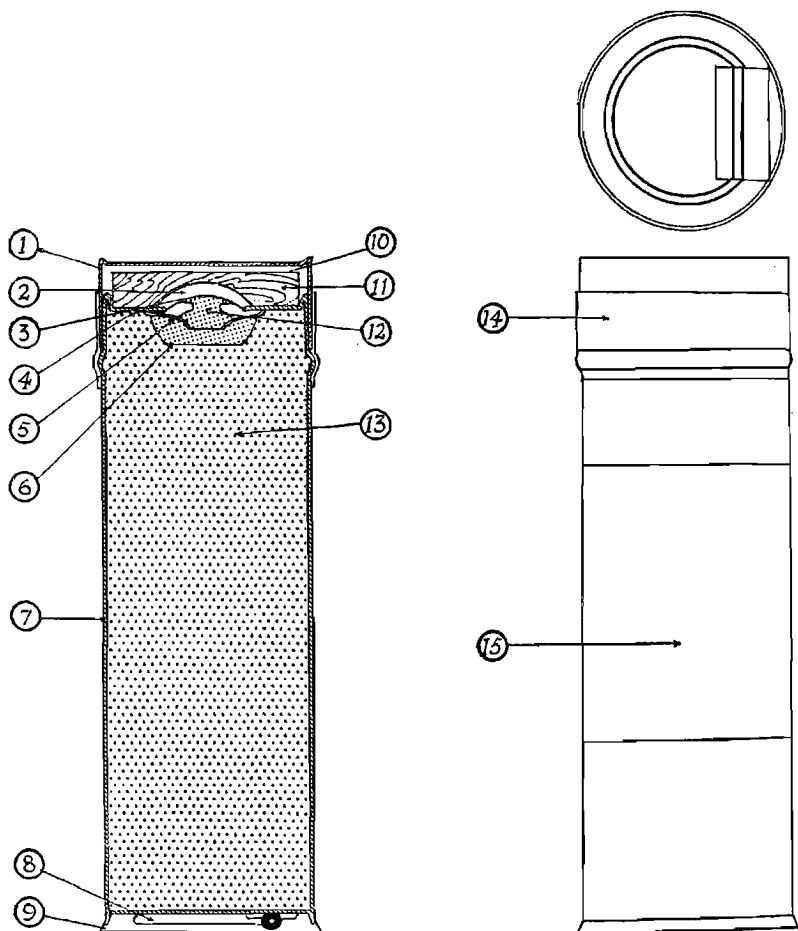


Figure 8.—Type 94 Smoke Candle (small).

KEY TO DIAGRAM

- | | |
|----------------------------|------------------------------|
| 1. Top cover. | 9. Base. |
| 2. Cotton wad. | 10. Abrasive surface. |
| 3. Tin-foil cover. | 11. Igniting block. |
| 4. Inner lid (sheet iron). | 12. Igniter. |
| 5. Lead seal. | 13. Smoke-producing mixture. |
| 6. Sheet-iron cup. | 14. Adhesive band. |
| 7. Body. | 15. Markings, etc. |
| 8. Handle. | |

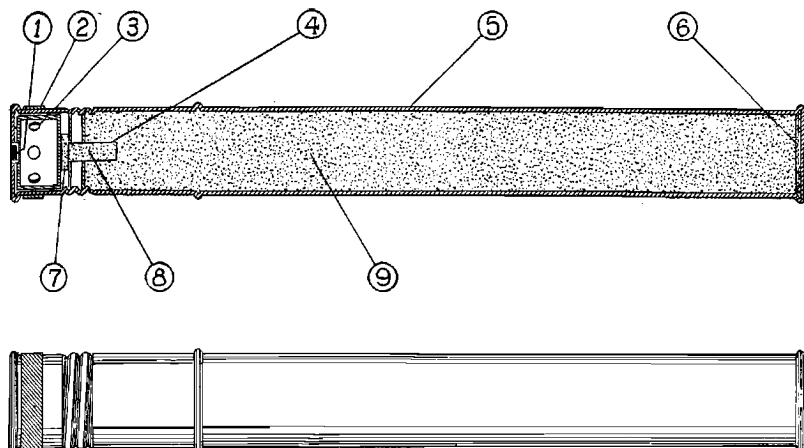


Figure 9.—Type 94 Smoke Candle (large).

KEY TO DIAGRAM

- | | |
|--|-----------------------------|
| 1. Connection for cord to ignite fuze. | 6. Cardboard. |
| 2. Adhesive band. | 7. Ignition cap. |
| 3. Smoke vents (8 in number). | 8. Igniting powder. |
| 4. Fuze tube. | 9. Smoke-producing mixture. |
| 5. Body. | |

ameter is approximately $3\frac{1}{3}$ inches. The total weight is given as 16.5 pounds, including the smoke-producing mixture (Berger-type) which weighs 15 pounds.

6. TYPE 94 FLOATING SMOKE CANDLE (Model B)

This type of smoke candle floats on water by means of an inflated rubber tube. The candle has a supporting ring with two lugs, to which the tube is fastened. (See fig. 10.)



Figure 10.—Type 94 Floating Smoke Candle (Model B).

The candle, painted a dark gray, is 31.18 inches long (792 mm) and 3.11 inches in diameter (79 mm). The total weight of the candle is approximately 12.47 pounds (5,660 grams), and the smoke-producing mixture weighs approximately 10.8 pounds (4,910 grams).

The fuze used is known as the "10th-year pattern hand-grenade time fuze," according to a label on the box in which a fuze was packed. The fuze is removable. It is taken out and carried separately when the candle is transported. The candle itself is sealed by use of the "wing-nut" plug.

The candle may also be supplied with a delayed-action igniter. This igniter is constructed in a manner similar to the "10th-year pattern hand-grenade time fuze," except that the striker and detonator are replaced with a length of ordinary time fuze, one end of which is sealed into the igniter itself. The igniter screws into the candle; it is used when a delay greater than the 4 to 7 seconds delay of the hand-grenade type is required. To ignite the fuze, the Japanese provide a match head in a thin metal tube attached to the other end of the length of fuze.

The smoke-producing mixture is composed of hexachlorethane, 50 percent; metallic zinc, 23.5 percent, and zinc oxide, 26.5 percent.

Details on how to operate the candle are given in a label on the outside of the weapon. A translation of the instructions reads as follows:

- a. Make sure the cover plate is satisfactorily fixed.
- b. Examine the floating belt to see whether it is sufficiently inflated.
- c. Do not remove the waterproof strip on the tube [candle].
- d. When using the candle [equipped with the 10th-year pattern hand grenade time fuze], hold the candle with the left hand, very carefully remove the safety pin from the fuze, and hit the head of the fuze firmly with a wooden billet. Then it is necessary to point the tube in a direction where the smoke emitted will not be dangerous.
- e. When using the delayed-action igniter, cut the length of the fuze so it will burn the required time. After attaching the special ignition point, strike the match head of the ignition point with a scratch block.
- f. When ignited, throw the candle into the water immediately by grasping the upper and lower parts so that the candle will be at right angles to the surface of the water.
- g. Because a faulty smoke action might cause an explosion, move at least 10 yards away at the first sign of smoke, and do not approach until the smoking has finished.

7. 10-KG NAVAL SMOKE CANDLE

This candle, painted gray, is approximately 9.5 inches long and 6 inches in diameter. The total weight is 20.5 pounds. A paper name card on top of a captured candle bore the following: "10-kg smoke candle, made . . . 1941."

The candle container, made of iron, is cylindrical in shape and is closed at either end by tin-plate disks.

It is made airtight by the soldering of all seams. A single hinged carrying handle (see fig. 11) is riveted and soldered to the container near the top. The ig-

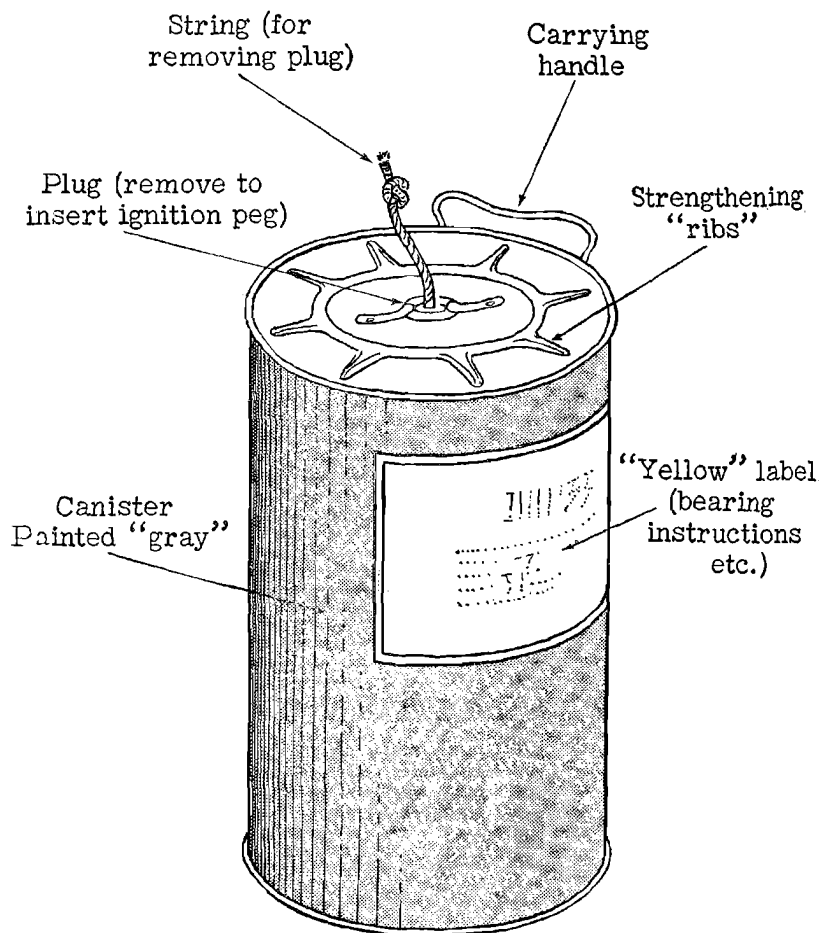


Figure 11.—10-Kg Naval Smoke Candle.

niter apparatus fits into a hole in the center of the top. A wooden plug is provided to fill the hole while the candle is being transported.

This smoke candle is believed to have been designed for use on the rear of a boat or ship, as well as on land. An instruction label on a captured candle stated that it "may be used aboard ship if placed on a sheet of iron."

According to the instruction label, the candle is filled with Berger-type smoke mixture, which, when ignited, gives off an ash-colored smoke for 3 to 4 minutes.

The label also stated that "an ignition apparatus is supplied separately, and is kept in the container. It consists of an ignition peg and a striking plate."

Other instructions given include the following:

a. Methods of Operation

- (1) Remove the paper name card and plug from the top.
- (2) Insert the ignition peg firmly into the ignition-peg chamber.
- (3) Rub the match head of the ignition peg with the striking board.

b. Points on Using

- (1) Sparks are given off during ignition, so wear working gloves and turn your face away when striking.
- (2) Immediately before use, drill some small holes in the upper plate to relieve excess pressure from expansion—which usually occurs during storage or when exposed on decks, and so forth. If the candle is not used after the holes are drilled, the gas will escape unless you fill the holes with solder.

(3) If the contents are severely shaken in transport and there is doubt whether part of the smoke-producing content has leaked out, do not use the candle.

(4) Burning particles are liable to fall within a radius of 3 yards when the candle is burning, so the candle must not be used near inflammable materials.

c. Instructions for Storage

- (1) Do not pile candles on top of each other.
- (2) Avoid handling them roughly.
- (3) Keep them in a cool place.

8. RIFLE SMOKE GRENADE

The rifle smoke grenade is used with a special adapter, which fits over the end of the standard Japanese 6.5-mm rifle barrel. The force to propel the grenade and the primary means of ignition are furnished by the .256-caliber Japanese cartridge (6.5 mm), which is loaded with 1.927 grams of powder and fitted with a wooden pellet. This cartridge is wrapped in paper and stored in the grenade tube.

The grenade, weighing 1.29 pounds and having an over-all length of 8½ inches, is painted a silver color and thoroughly waterproofed with coats of heavy lacquer and paraffin. The nose and body proper, 2 inches in diameter, are made of tin plate. The base, stamped from sheet steel, is screwed onto the body by means of rolled threads. Four smoke vents are placed at 90-degree intervals around the base, and are covered with light sheet metal disks, which are held in place by waterproof cement covered with paraffin. The

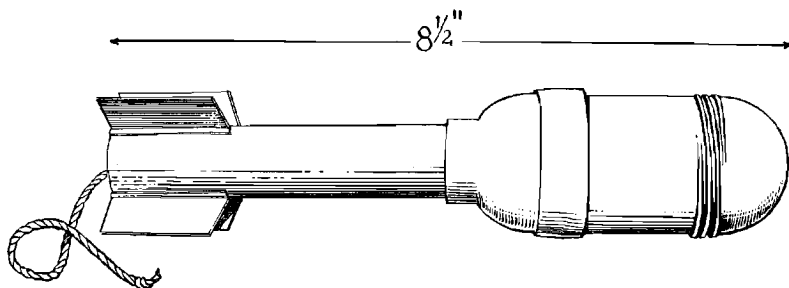


Figure 12.—Rifle Smoke Grenade.

grenade has three flash ports, spaced at 120-degree intervals in the bottom of the base. (See fig. 12.)

Four fins, made of tin plate, are soldered to, and equally spaced around, the grenade tube. The fins are $2\frac{3}{8}$ inches long and $1\frac{1}{16}$ of an inch wide; the tube is $1\frac{3}{16}$ inches in diameter.

The smoke-producing mixture, which weighs .6 pound, is composed of the following:

	<i>Percent</i>
Hexachlorethane.....	56.2
Zinc dust	27.6
Zinc Chloride.....	2.9
Zinc Oxide.....	13.4

9. SMOKE-SCREEN OPERATIONS

Japanese plans for the use of smoke to screen the unloading of troops and supplies at and near Lae, New Guinea, are revealed in an enemy document, which is paraphrased below. Three *han* (at normal strength a *han* is roughly equivalent to our squad) were selected for the operations, under direction of a first lieutenant.

Each *han* was given the responsibility for screening a separate area (see fig. 13).

a. Personnel and Equipment

(1) *No. 1 Han*.—This unit was composed of a sergeant major as leader, another noncommissioned officer, and 20 privates. It was allotted six collapsible boats. If needed, an armored boat or high-speed boat also would be allotted. This *han* was to use 200 smoke candles of the floating type, 10 of the Type 94 (large), and 160 of Type 94 (small).

(2) *Nos. 2 and 3 Han*.—Each of these units was allotted a noncommissioned officer as leader, 15 privates, and the following equipment: 100 candles of the floating type, 7 of Type 94 (large), 120 of Type 94 (small), and three collapsible boats.

In addition to the equipment allotted to the above *han*, the Japanese document stated that 400 of the floating-type candles “are to be kept in readiness” [probably as a reserve].

b. Laying the Screen

Regarding the actual operation, the document included the following:

Regulations for the formation of smoke screens are to be based upon orders from Debarkation Unit Headquarters.

When operations begin, all smoke candles are to be lighted at the same time—when the signal shots (red dragon parachute flares) are fired.

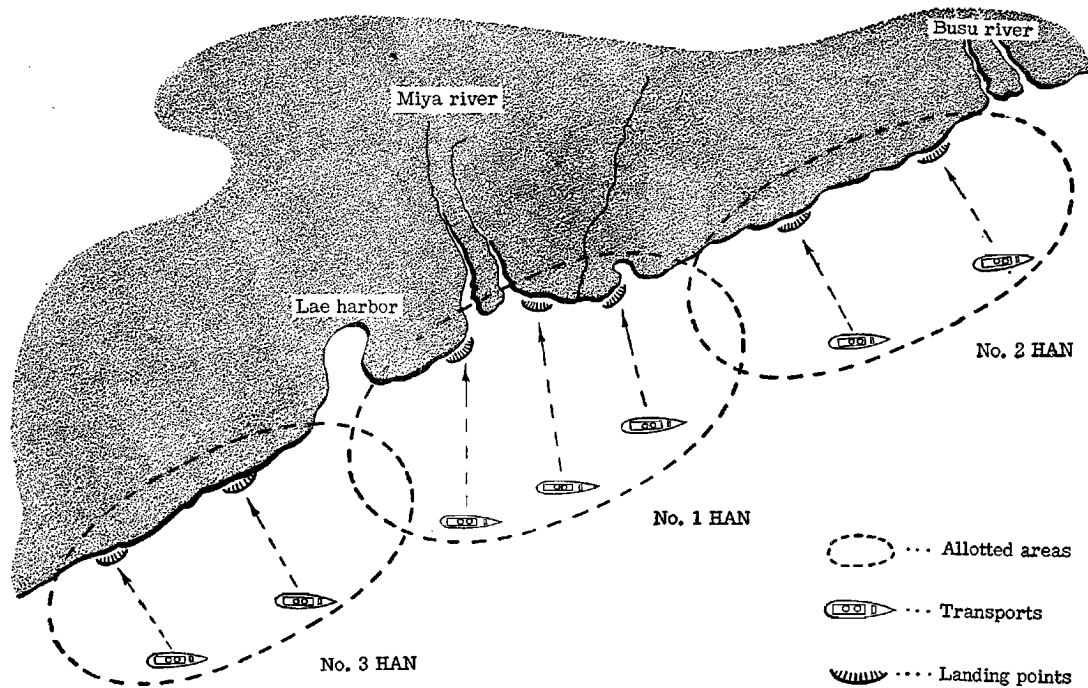


Figure 13.—Japanese Smoke-screen Plans.

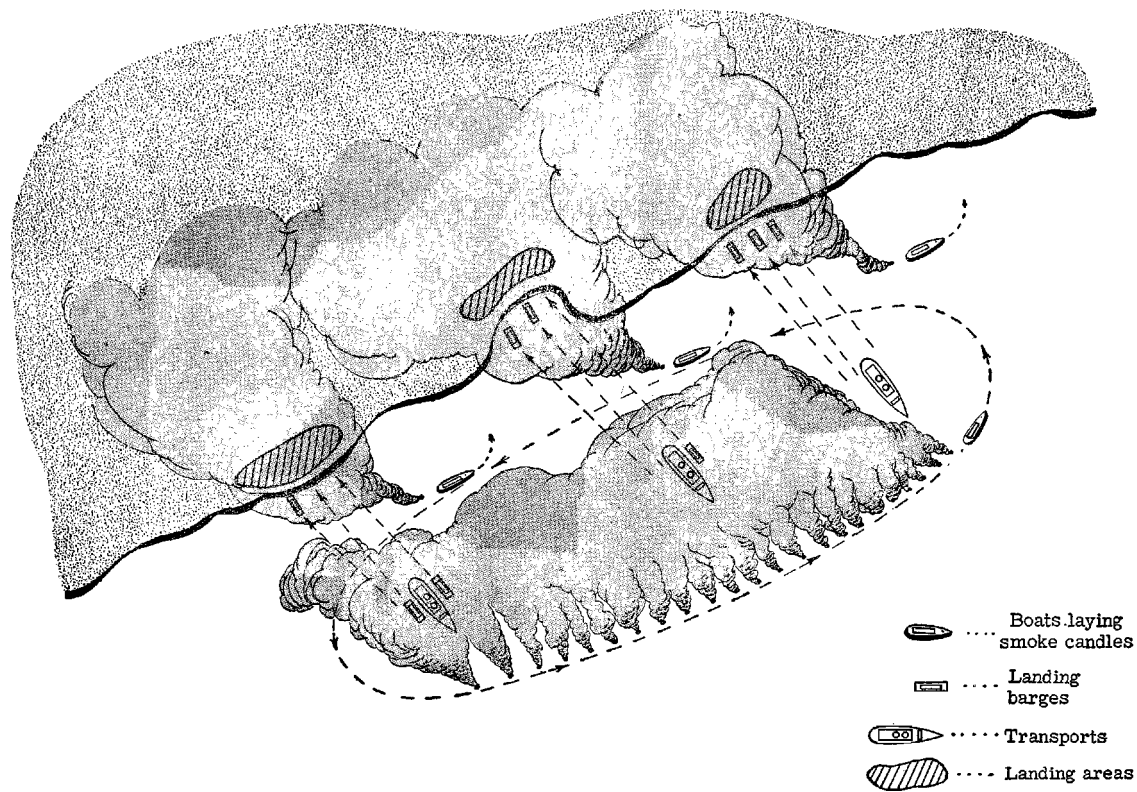


Figure 14.—Japanese Smoke Laying

The main smoke operations are to be carried out by boats over the designated water area. Smoke operations also will be conducted over land, according to circumstances.

[A study of the Japanese diagrams (figs. 13 and 14) indicates that, in this operation, the enemy planned to lay a smoke screen over the designated area by placing the floating-type candles at certain intervals in the water, and, if necessary, to operate the Type 94 candles on adjoining land areas.]

c. Care of Candles

In connection with the candles, the following steps will be taken:

- (1) The candles must be exposed to the sun to keep them dry.
- (2) Candles, torch lamps, and so forth are to be used for lighting purposes.
- (3) Smoke candles are to be lighted from smoke candles which already have been lighted.
- (4) In order to avoid the danger of explosion, all personnel will keep away from the candles after they have been lighted.

Section II. NOTES ON BOATS AND SHIPS IN AMPHIBIOUS OPERATIONS

1. INTRODUCTION

The Japanese are showing an increasing tendency to use motor landing barges instead of ships for transportation within range of United Nations aircraft in the Southwest Pacific. This change of policy is probably due to heavy Japanese losses in transports and destroyers as a result of air attacks.

The substitution of motor landing barges for transports would complicate Japanese shipping problems, but it would lessen the dangers from air attacks, because: the barges are comparatively small, they can be concealed during the day beneath overhanging trees or even camouflaged on an open beach, and they can operate at night in shallow, reef-infested waters where they are comparatively safe from destroyers and PT boats.

The 4,000-ton (gross) Japanese transport, commonly used for amphibious operations, can load 4,500 long tons, transport it 300 miles, and unload it in about 4 days.

In contrast, the large-type Japanese landing barge (*daihatsu*) can load a maximum of 15 long tons, transport it 300 miles, and unload it in 5 days.

Therefore, for a distance of 300 miles, 375 large landing barges would be required to do the work of a 4,000-ton transport.¹ These figures, derived from a mathematical formula, should not be applied at shorter or longer distances because the relative capacity of motor landing barges decreases with distance.

The Japanese are known to have experimented extensively with the use of small boats (mostly landing barges) for the transportation of personnel and matériel, both during and after landing operations. A Japanese experiment with both large and small types of landing barges was conducted comparatively recently in tropical waters of the Southwest Pacific. Their conclusions regarding such matters as boat capacities, use of various types of weapons on the boats, methods of unloading, and the provision of food and water are contained in documents, which are paraphrased below.

2. BOAT CAPACITIES

Japanese conclusions with regard to the capacity and efficiency of landing barges for transporting various

¹ According to a Japanese document, the large-type landing barge is 49 feet long, 11 feet wide, and has a capacity for 10 horses, or a tank and an automobile. The speed of the boat is about 8 knots. The crew numbers seven.

types of troop units and equipment across large bodies of water are summarized below. The conclusions are based on experiments conducted over a distance of approximately 50 nautical miles. Using both their large- and small-type landing craft, the Japanese made the trip in 7 hours.

a. For Large Landing Barge (*Daihatsu*)

<i>Unit</i>	<i>Personnel</i>	<i>Equipment</i>
Rifle Co -----	50	None.
MG Co -----	40	3 HvMG.
Inf Bn gun unit -----	40	2 70-mm How (1 in bow ready for firing; 1 dismantled in stern).
Inf Regt Arty unit -----	35	1 75-mm gun.
Mt Arty unit -----	35	1 75-mm gun.
Rapid-fire gun unit -----	28	2 37-mm guns.
L Armd-c unit -----	15	1 L Armd-c.

[Comment: In the loadings shown above, consideration was given to the comfort of occupants, facilities for cooking, and defensive use of weapons. For landing operations where distances are fairly short, these barges could carry considerably more tonnage—probably twice as much in the case of rifle and machine-gun companies. When the large barge is used as a command boat, the Japanese recommend that 25 to 30 men make up the load.]

b. For Small Landing Barge (*Shohatsu*)

<i>Unit</i>	<i>Personnel</i>	<i>Guns</i>
Rifle Co -----	25	None.
Rifle Co -----	20	1 HvMG.

[Comment: Capacities for units equipped with heavy weapons are not given, indicating that the small barge is not considered

suitable for carrying troops and heavy equipment on a run of a full day.

For landing from troop transports, the above capacity figures for the small landing barge probably should be about doubled.]

3. CONVENIENCES FOR PERSONNEL

a. Except in the case of tank and armored-car units, benches for the men to sit on are absolutely necessary on long voyages. They must be thrown overboard before landing because it would be inconvenient to unload them.

b. Rifles should be placed in an arms rack. The best positions for the racks are in the stern or in both sides of the boat.

c. Lowering of the floor boards when there are no waves will provide better ventilation and lessen fatigue.

d. The bow operator gets tired quicker than others because he has no shelter; therefore, it is advisable to relieve him often.

e. Personnel in the small barges should stand up for 10- to 15-minute intervals from time to time.

f. Tents are absolutely necessary. Shelter tents are thin and very hot.

g. If possible, provide a utensil in each boat for boiling water.

h. A half canteen of water [per day] is necessary for drinking, in addition to the amount consumed with meals.

i. Coconut milk is very good for drinking.

j. The best method for carrying and preserving rice is to put it in a rice basket and add 3 or 4 pickled plums. [The plums are preserved by a salt solution.] Rice kept in this manner will not spoil for 17 hours or more. If it is carried in a rice box, without pickles, it is liable to spoil after 11 hours. In any case, rice must be cooked hard and its container must be dried thoroughly.

Rice carried in a mess kit, without pickles, will keep for 13 hours.

4. ARRANGEMENT OF WEAPONS

a. Rifle

The rifle should be rested on sandbags, which are to be prepared and placed on the sides of the boat for this purpose.

b. Light Machine Gun

Rather than have it handled by two men, the light machine gun should be rested on the sides of the boat for firing. It occupies too much space when handled by two persons, and the firing of rifles is interrupted.

c. Machine Guns

When using a rest for antiaircraft fire, the firing will be the same as under ordinary circumstances. In circumstances under which the rest is not used for antiaircraft firing, arrange the weapons as follows:

(1) When the left (or right) side of the boat and sandbags are used, remove the cotter pin of the cog and lower the cog sufficiently. Remove the barrel cover pin, swing the barrel in the opposite direction, and replace the pin. Essentials for aiming correspond to those for the light machine gun.

(2) When manpower is used [to hold the gun while firing], take down the gunshield and rest the front and rear legs of the weapon on the two sides of the boat. To fire, remove the barrel from the legs, tie ropes around the barrel, and hang it a suitable height.

d. Antitank Gun

To operate an antitank gun from a large boat, the No. 3 and No. 4 gunners will fire from a standing position. When adjusting the range sights, make no change in elevation, but change the direction slightly. Contact the boat captain beforehand and have the boat proceed toward the target. Depending upon the action

of a moving target; set the sights at the bottom or top center, and pull the trigger when the boat is at the crest of a wave.

e. Mountain Gun

In making arrangements for firing this gun from a large boat, pile three square pieces of timber at the 10th rib to make a brace for the legs and the trail spades; put two sandbags on each of the trail spades, one bag under each wheel, and two bags on each wheel in order to prevent the gun from jumping up. At the same time, tie the wheels to the rings on the sides of the boat with ropes.

In operating the mountain gun from the boat, show the target clearly to the boat captain and have the boat advance straight toward the target. In other particulars, operate according to the essentials of direct fire. However, when the waves have a disturbing effect, fire when at the crest of a wave.

5. NOTES ON UNLOADING

Japanese instructions dealing with the unloading of troops and matériel from ships at a New Guinea port and on Guadalcanal are contained in enemy documents which are paraphrased below.

a. New Guinea

The order of unloading is mainly as follows:

(1) Land duty personnel [including unloading detail], and their necessary equipment;

(2) Antiaircraft guns (with ammunition), motor vehicles, heavy matériel (including artillery), and the personnel who operate them;

(3) Supplies, including medical stores, important articles for all units, and the necessary handling personnel;

- (4) Matériel of units and the necessary handling personnel;
- (5) Personnel assigned to ship duties during the unloading.

In regard to munitions ships, fuel should be removed from them first, and as fast as possible, in order to lessen the danger of fire.

Endeavor to keep intact the organization of small units, and progressively increase the unloading and transport details (particularly the latter) as the troops land.

In the past, personnel in a number of instances have hurriedly disembarked from transports to evade aerial bombing. This seriously reduced the number of duty personnel on board the ships—in some extreme cases, no one was left on board to direct operations. The result has been not only a serious delay in unloading but actually a failure in some cases to unload anything. Such occurrences must be avoided in the future and every effort put forward to unload everything down to the last articles, in spite of all difficulties.

The following paragraph on “Supplies” was included in the Japanese document:

During the unloading operations, the number of evening meals and snacks will be increased in accordance with the progress of operations. The water supply will be on the same basis. This will have a beneficial effect upon the progress of the work.

b. Guadalcanal

The order of unloading was practically the same as that given for the New Guinea port. Infantry units were unloaded ahead of the land duty personnel.

The “commander of the Guadalcanal Island unloading unit” was responsible for regulations governing the beach where the unloading took place.

(1) *Use of Lights.*—"Dangerous spots near the landing beach and dangerous reefs in the sea will be marked . . . with faint red lights just before the convoy comes in to anchor," the document stated. Other references to use of lights were as follows:

Strict control of lights will be enforced at night. Dim lights, utilized in such a way that they cannot be seen from the air or from the sea, may be used for the following purposes:

- (a) For loading or unloading ships' holds;
- (b) For the inspection or repair of engines on the boats; and
- (c) For indicating danger or distress (use a red signal with a circular motion).

(2) *Rescue and Medical Care.*—Each company will prepare one rescue boat, and will be responsible for rescue work between the anchorage and the shore.

During the daytime, the rescue boats will be identified by displaying a Red Cross flag.

Those requiring rescue will make circular motions with their red light at night, and will wave their red flag horizontally in the daytime.

6. HOW TO DODGE PLANES

Of particular interest to air forces are two Japanese documents which describe evasive tactics of their ships during air attacks. These documents are paraphrased below.

In cases where the planes are sighted at least 4 sea miles away, turn toward the oncoming enemy immediately and increase your speed. When the planes are about to drop their bombs, change course at a large angle (full helm). When the

wind is fairly strong, change your course so as to receive a full cross wind.

When attacking planes are sighted close at hand (less than 4 sea miles), or when attacks are continuous, immediately carry out a large dodging movement. Subsequently, make continued large turns individually, without maintaining a set course. Strive to gain the benefits of cross winds as outlined above.

If you are in formation, break it and scatter according to circumstances.

Section III. SOME JAPANESE TACTICS OBSERVED IN BURMA

1. INTRODUCTION

The British-Indian drive on the Arakan front in Burma early in 1943 afforded an opportunity for studying some of the Japanese defensive tactics. In this campaign, the Japanese used most of their old ruses plus a few new ones.

This section is devoted to a discussion of the Japanese defenses and of those ruses or deceptive tactics which have not been reported previously.

2. DEFENSES

The Japanese apparently make a practice of using various types of defensive positions, according to the terrain, the time available for construction, and the strength of the enemy. On Guadalcanal and parts of New Guinea, they frequently established their defenses on low, jungle-covered ground, in preference to high ground. In Burma, where less jungle is encountered,

the Japanese usually established their positions on terrain heights and near the crests of heights.

An observer in Burma described Japanese defenses in one area as being of two types, temporary and permanent. The temporary types were small, self-contained, cleverly concealed squad posts, 30 feet in diameter and situated some 300 yards apart. They usually contained 10 men. These posts, designed for all-around defense, served as hideouts from which Japanese patrols operated at night.

The so-called permanent-type defenses, or main positions, were sited on natural obstacles. They contained mortars, for which the temporary squad positions probably served as observation posts.

Several of the enemy positions were situated along the edges of woods, and others were located from 30 to 40 yards inside the woods.

The Japanese had cut fire lanes for most of their positions. The lanes, extending out from the positions in different directions, usually were 15 to 30 feet long and never more than 2 feet wide.

An observer in another area reported that the enemy depended largely upon foxholes and individual weapon pits for defense positions in his forward area. Most of the positions were well camouflaged with natural foliage, and some of the foxholes were covered with lids resembling trap doors. Japanese soldiers would keep these lids down except for short periods of observation. Some of these positions were 4 feet deep.

Around the top of each position was a bundle of brushwood, about 2 feet high and tied together with wire. One of these posts contained three grenades, a rifle, an individual cooker, and an ammunition box full of rice and various papers—evidence of the self-contained nature of Japanese individual defense positions.

Other observers noted that many of the deeper Japanese defense trenches on the Arakan front were T-shaped or L-shaped.

A large number of trenches were not occupied. These “extras” were dug to allow the Japanese to shift from one position to another, for reasons of security. Observers believed that the enemy soldiers must have spent most of their time digging.

Usually the defending Japanese would hold their fire until the attacking forces launched an assault—sometimes from a distance as close as 50 yards. In accordance with previously reported enemy defense doctrine, the Japanese, if driven from their positions, will soon launch a counterattack. This attack starts with a shower of grenade-discharger shells and is followed immediately by a charge with automatic-weapon support.

Japanese foxholes in one area of the front were 2½ feet deep, and did not contain well-developed machine-gun positions. The foxholes were in two rings around the top of a hill, one just below the crest and the other spaced around the top of the hill. Additional

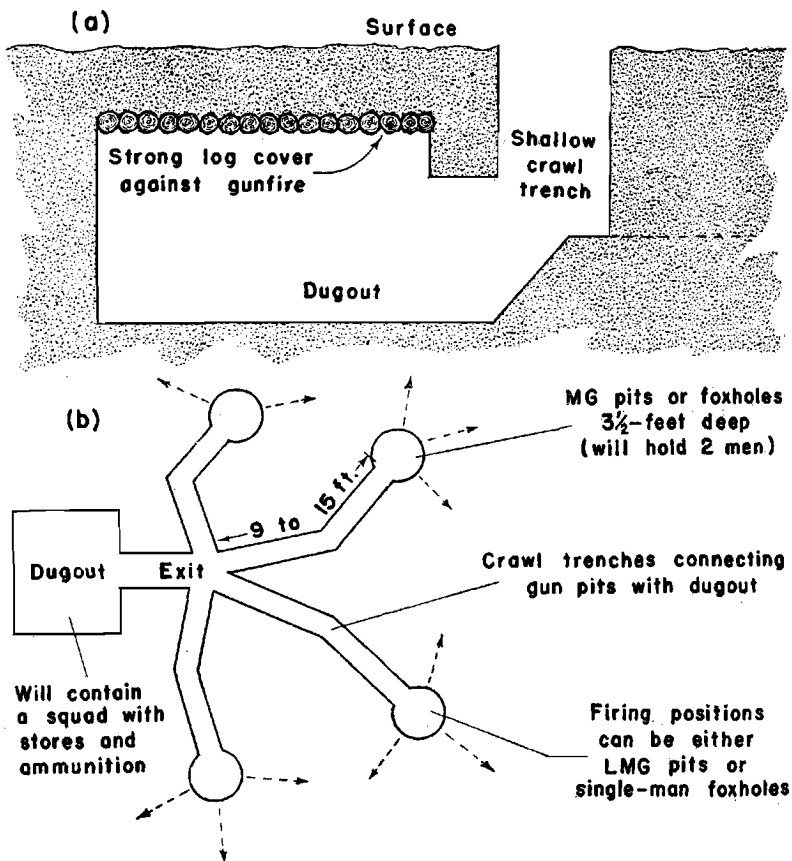


Figure 15.—Japanese Defense Post.

foxholes, of a different construction, were found at the bottom of the hill.

The Japanese have been reluctant to disrupt interlocking cross fire plans for their light machine guns when the guns were attacked from the front by infantry.

Almost invariably the Japanese will sacrifice a good light machine-gun target if firing would give away the location of a strategic observation post.

Figure 15 is a sketch of a Japanese defense post. While being shelled or bombed, the enemy probably fled to the dugout—realizing that he could abandon his light machine-gun posts without being assaulted while the shelling was actually in progress. In a tree which affords a view of all approaches to the position, the enemy built a combination sniper's nest and sentry post. One man could have kept watch during the daytime while the others slept or relaxed. Part (a) of the diagram shows how the dugout is constructed. Part (b) shows how crawl trenches are connected to outlying firing positions.

3. RUSES

Observers on the Arakan front described several Japanese ruses or tricks that had not previously been reported. These included the following:

a. Use of Cattle

Cattle left behind by Burmese fleeing the combat zone were driven by the Japanese into places where they

could be conveniently watched from under concealment. When natives bent on looting—usually two to four men travel together—tried to steal the groups of cattle, the Japanese would pop out and arrest them. The captives then were taken before a Japanese officer and questioned about the opposing forces (British). If the natives could not supply sufficient information (generally they couldn't), one of them was released to go back into the British lines and find out more, while his friends were held as hostages. If the released native did not return by a given date, the remainder of his group were shot for stealing. Since the native released would often be separated from his family by the Japanese if he failed to return, he generally came back with some information because it was the easiest way out, both for himself and his fellow looters.

b. Use of Patrols

Japanese patrols could always be counted upon to do the unexpected. They often withdrew from Japanese-held areas while these were being scouted by patrols of opposing forces. When the latter patrols reported back with the information that the enemy had fled, the Japanese would reoccupy the area with a strong force. When the opposition moved a considerable force into the area, the Japanese opened up with a murderous fire at close range.

c. Use of Exposed Men

The Japanese are particularly keen about using all sorts of ruses to draw mortar and automatic fire. On at least one occasion, an individual soldier, waving a flag, ran out into open spaces for this purpose.

When automatic fire was opened on him, he dropped to the ground while other Japanese, under cover, observed the location of the automatic weapon or weapons doing the firing, so they could open up on it a short time later.

d. Use of Tommy Gun

At night the Japanese have been known to send a man toward our lines with a Tommy gun and tracer ammunition. This gunner would fire in short bursts at places believed to be occupied by the opposing forces. When he was fired upon, he ducked to the ground while his pals in the rear tried to locate the positions of automatic weapons firing at the Tommy gunner.

If this gunner failed to receive fire from a position he moved on to another—all the time closing in on opposing positions until someone eventually fired at him with an automatic weapon.

e. Miscellaneous

(1) *Mortars*.—To escape detection, the Japanese mortars often began firing either immediately after our guns had fired or just after impact of our mortar bombs.

(2) *Dummy Men*.—In one area on the Burma front, the Japanese put up dummy men in an effort to fool the opposing forces. These dummies may have been corpses.

(3) *Imitating Signals*.—On at least one occasion, the Japanese fired red signals immediately after similar signals had been fired by the opposition.

Section IV. JAPANESE TACTICS AT MILNE BAY

1. INTRODUCTION

The information in this section summarizes the tactics used by the Japanese in and around Milne Bay, New Guinea. The terrain over which most of the operations took place consists, generally speaking, of a narrow coastal strip, varying from $\frac{1}{4}$ mile or less to 1 mile in width. It is composed mainly of thick jungle and waist-deep sago-palm swamps, with occasional coconut plantations scattered about near the villages. This narrow strip is bounded on the inland side with a chain of hills and mountains, some of which rise to a height of 3,500 feet. Deep gorges cut this range at several points.

The Japanese attack was carefully planned to take advantage of the terrain, and of extremely heavy rains which were falling at the time.

2. SUMMARY BY OBSERVERS

In summing up the Japanese tactics, United Nations observers stated that the meeting engagement is the

basis of Japanese combat training—their official regulations give more space to it than to any other form of combat. The Japanese believe that the meeting engagement provides for the best development of swift and decisive offensive action, and they deliberately seek it.

The meeting engagement offers the Japanese the added advantage of minimizing deficiencies in matériel—especially artillery—and in the support by combined arms. In addition, the Japanese feel that the meeting engagement will enable them: to seize and hold the initiative, to allow subordinate commanders to take bold and independent action, and to occupy important terrain features quickly.

Nearly all the Japanese tactics in the Milne Bay fighting were centered on attack. All defense positions were covered by a screen of snipers, who were difficult to dislodge.

No Japanese maneuver is ever attempted without including some ruse to deceive the opposition and to conceal the true intentions of the commander.

3. PATROLS

The size of Japanese night patrols encountered by our forces varied from 18 upwards, while day patrols averaged from 6 to 10 men.

As a rule, these patrols moved as a body and kept on or close to roads or trails. For reconnaissance, the Japanese did not employ fighting patrols, but used

scouts, who worked singly or in pairs. These scouts utilized the thick jungle to approach our defended localities or were left in hidden positions when the enemy withdrew from a night attack. The scouts lay very still while close to our troops and allowed our patrols and working parties to pass unmolested.

4. NIGHT OPERATIONS

The Japanese relied almost entirely upon night operations for which they appeared to be well trained.

a. Approach March

During the approach march, the Japanese moved rapidly, in groups of 20 to 30 and with little regard for flank protection. The main line of advance was the road or beach, and no organized groups or units appeared to have moved more than 300 yards from the road. If the Japanese had tried to secure their flanks, their speed of movement would have been cut down considerably. They talked a great deal during the approach, but were careful about lights. While assembling, and just before the attack, they maintained absolute silence. However, they had a tendency to bunch up while assembling.

b. The Attack

Once the attack began, the Japanese made a great deal of noise, by firing mortars, grenades, and fire-crackers, and by calling and whistling. These noises were made to draw our fire and demoralize our

troops—and to boost their own morale at the same time.

The night attacks were made on a small frontage, but their mortars were fired well forward and to the flanks to give the impression of a large force advancing on a wide front. The rear elements appeared to be more widely deployed, for a probable flank envelopment.

When our troops opened fire, the Japanese tried to infiltrate around our flanks and to our rear. After assembling and taking up positions, these enemy troops attempted to rush our posts under the cover of mortar and grenade fire.

c. Withdrawals

The night attacks were suddenly broken off before daybreak. Chattering as they went, the Japanese withdrew along the road except for snipers and observers, who were left in trees close to our forward defense lines and along trails. A great deal of equipment was abandoned, but no wounded were left.

d. Use of Tanks

The Japanese used at least two light tanks, which had strong headlights. Some machine gunners rode on top of the tanks or followed close behind. Other infantry parties preceded the tanks in defiles, such as ravines or gullies, for the purpose of attacking our antitank guns.

Section V. NOTES ON THE JAPANESE— FROM THEIR DOCUMENTS

1. INTRODUCTION

Notes on Japanese warfare, as revealed by their documents, are given in this section. The documents have been edited and paraphrased to eliminate repetition and unimportant parts. The reader must keep in mind throughout that the information presented is from enemy sources, and he must not confuse it with U. S. methods of warfare.

2. TACTICS

a. Offense

(1) *Artillery*.—Artillery support is essential for any successful attack against the enemy [U. S. troops]. They react quickly to our artillery fire; therefore, we should establish numerous artillery positions (real and dummy). By fixing fake positions, using smoke, and so forth, we confuse the opposing forces and make them waste their shells.

. . . We [Japanese] have often received effective shelling in front of the U. S. positions. And there have been instances where this shelling disorganized our ranks and finally made it impossible for use to charge.

(2) *Fire Support*.—In many cases our attacks on positions are ineffective without organized fire support. Even a night attack must have a thorough artillery preparation, and we should not hesitate to use fire-power support forces. [These “fire-power support forces” probably consist of battalion and regimental guns, quick-firing guns, mortars, and machine guns—in other words, the infantry heavy weapons. The Japanese have had a tendency to neglect the proper use of these, and to depend mainly on maneuver and “cold steel.”]

(3) *Antitank*.—In regard to attacking tanks, you will jump on the tank and throw a hand grenade inside, or stab the occupants with your bayonet.

b. Defense

(1) *Against Aircraft*.—The direction from which U. S. planes approach should be watched carefully, and no one should be exposed to aerial view. If the troops carelessly bunch up, they will be bombed and strafed at every opportunity.

In woods, take advantage of shadows while moving.

Your equipment should include camouflage nets and camouflage matériel. The latter should be fastened to your uniform with string.

Opposing planes seek to locate our headquarters in order to bomb and strafe it. Therefore, its concealment is very important. Runners and orderlies must be careful lest their activities betray the position of headquarters and cause strafing by planes. Headquarters will detail an officer to direct and control all special duties.

Shortly after our landing, fierce air attacks are expected . . .

The moment the attacks are over, you will construct slit trenches big enough to accommodate about five men. Until these are completed, remain under cover during daylight hours.

To afford protection against strafing as well as bombing, use the slopes of high ground and dig lateral tunnels.

Since incendiary bombs probably will be dropped, military supplies must be dispersed and important documents placed in safe places.

(2) *Against U. S. Warships.*—There will be practically no friendly warships on the sea [in this area], and opposing ships may appear in considerable force with scouting planes. Since there is great danger of a naval bombardment, those units fronting the ocean must dig strong entrenchments.

3. INTELLIGENCE

a. Procuring Information

Get information [on U. S. forces], by means of air reconnaissance, enemy broadcasts, sentries with telescopes, prisoners of war, reconnoitering of outpost lines, and so forth. Information is needed on the following matters:

- (1) Enemy strength and tactics;
- (2) Location of main hostile positions, types of obstacles, and the strength of flank defenses;
- (3) The terrain, especially the situation of Lunga river [Guadalcanal];
- (4) Location of hostile hangars, fuel dumps, and communication centers.

However, procurement of information of the area in which the division is disposed will be given the greatest consideration.

b. Security Measures

Each first-line unit, as well as the command posts of the various commanders, will have its own secret name (code).

The disposition of our strength and the condition of our supply will be kept secret from the enemy [U. S.]. Adequate precautions must be taken regarding sketches of our troop dispositions. The scattering of secret paper scraps will be stopped, and papers used by soldiers, written orders, reports, and messages will be reduced to the minimum.

4. CONDUCT OF SOLDIERS

a. Discipline

That the discipline of Japanese soldiers in some New Guinea areas was far from perfect is borne out by the following extract from a Japanese pamphlet:

During these operations, many crimes which affect military discipline have been committed. They are based on a slackness of will power and a depression in spirit.

The crimes affecting military discipline are as follows:

Robbery and rape (most frequent); trespassing on another's premises (second most frequent); disorderly conduct (generally while drunk); destruction of military equipment; desertion; trespassing on places off limits; leaving the sentry post without permission; loss of secret military documents, especially the code book.

b. Personal Sacrifices

Every noncom and every private will cooperate by sacrificing his life for the Imperial Army.

Even though you are a patient, you should not hesitate to advance. There are cases where patients exerted their utmost

energy at the time of withdrawal. Therefore, it should be possible to exert your utmost energy at the time of advance.

Educate everyone so they would rather die on the battlefield in glory than withdraw.

5. DAILY SCHEDULE

The Japanese used the following daily schedule during their occupation of Tulagi Island in May, 1942:

<i>Daily schedule</i>	<i>Hours</i>	<i>Notes</i>
Reveille.....	0400	
Morning worship begins.....	0415	Respectful reading of Imperial Mandate.
End of worship.....	0440	
Exercise	0440	
Breakfast.....	0500	
Begin work	0630	
Rest	0730	
Resume previous tasks.....	0745	
Rest	0845	
Resume previous tasks.....	0900	
Stop work.....	1000	Sick call.
Begin daily care [of equipment].....	1015	
End daily care [of equipment].....	1100	
Lunch.....	1130	
Special course begins.....	1430	
Special course ends.....	1530	
Supper	1600	
Begin work	1700	
End work.....	1745	
All hands get sleeping gear ready.....	1900	
Prepare for tour of inspection.....	1915	
Tour of inspection.....	1930	

NOTES

1. It is expected that laundry work will be done after lunch and in time not allotted to tasks or lessons.
2. Special courses shall consist chiefly of sports designed to improve standards [of health], and, at the same time, to aid the nourishment of bright clear feelings.

Section VI. MISCELLANEOUS

1. INTRODUCTION

The following short reports by U. S. observers cover a number of unrelated topics and are grouped in this section for purposes of convenience.

2. EQUIPMENT

a. Bangalore Torpedo

The Japanese Bangalore torpedo (used at Milne Bay) consists of a split bamboo pole (with the parts held in place by several wrappings of cord) explosive charges, a primer cord, a fuze, and a detonator. Five to seven charges, depending on the length of the pole, are placed in the hollow spaces of the pole and connected by means of a primer cord. At one end of the cord is a short length of fuze, which is attached to a detonator. The use of the detonator causes the charges to explode almost instantaneously. The torpedo is operated by igniting a short length of safety fuze, which is attached to the detonator.

Each of the charges consists of a cylindrical cake, 6 inches long and 3 inches in diameter, and composed of Japanese Model 88 explosive wrapped in paper. The explosive has the appearance of finely ground thermite, and has an oily feeling. An analysis of a sample charge proved its composition to be as follows:

	<i>Percent</i>
(1) Ammonium perchlorate (NH_4ClO_4), a mild explosive with about the same sensitivity to detonation as picric acid-----	75.5
(2) Silicon carbide (<i>sic</i>), which is not commonly found in explosive; it was probably added as a gritty substance to increase sensitivity to detonation----	14.6
(3) Wood pulp-----	5.9
(4) Oil-binder -----	3.9

b. Antimosquito Cream

The Japanese soldier usually carries a glass tube of antimosquito cream in his first-aid kit. The tube is 3 inches long and $\frac{7}{8}$ inch in diameter, and has a cork stopper. The cream itself is in the form of a soft, green, and wax-like stick, which has an odor similar to oil of citronella.

A paper label on the tube gave the following directions for use:

"Mosquito cream—spread the preparation over the exposed skin, particularly when out of doors at night. After use, always put the cork back in the tube."

c. Blotting Paper

This paper, found on Japanese soldiers, is somewhat like an ordinary blotter, except that it is heavier and more absorbent. The paper, $4\frac{3}{4}$ inches long and $2\frac{3}{8}$ inches wide, is apparently used to remove liquid vesicants (chemicals that cause blistering) from the skin.

The reaction of the blotter to various tests gave no evidence that it might be an indicator paper. It was tested with various blister gases but gave no reaction or color change.

3. JUNGLE-CLEARING UNITS

On Guadalcanal, the Japanese employed well-equipped and organized units for cutting paths and removing obstacles so that routes could be established for troop movements. One such outfit, known as the Clearing Unit or Terrain Obstruction Unit, reconnoitered the terrain of proposed routes and planned the work.

This type of unit was a component part of the Guiding Unit, which included an 8-man Covering Squad, a 10-man Route Squad, a 10-man Course Squad, a 5-man Siting Detachment, a 10-man Reserve Squad, and a Command Unit (with a medical man attached).

The equipment of these units included the following: compasses, protractors, course instruments, whetstones, lighting apparatus, sickles, axes, hatchets, oil cans, pole-climbers, sketching board, and marking materials.

4. REGARDING SECURITY

a. Seeking Documents and Equipment

In searching for hidden Japanese documents and equipment, the following is a list of places where they may be found:

(1) In the thatching of hut roofs, and under dirt which has been thrown on roofs;

(2) Under floor boards of huts and dugouts, and in holes dug under the boards;

(3) In bedding, including grass and mat beds;

(4) In weapon pits, in false graves, and in real graves;

(5) Under logs (generally in holes dug and then filled before the logs are rolled back in place);

(6) In log roofs of dugouts, and in boxes used as cross-members of pillboxes (the documents often may be on the bottom of the boxes, which are completely full of dirt);

(7) Behind blankets tacked on walls of huts and dugouts;

(8) In the steel helmets of soldiers; and

(9) In garbage dumps.

b. Identification Disks

These are worn in a variety of places, for example:

On the wrist, around the neck or waist, attached to the outside or the inside of loin cloths, in hats, in haversacks, and in purses. Not all Japanese carry disks. Some of the disks observed were defaced and some were blank.

PART THREE: UNITED NATIONS

Section I. NOTES ON LIGHT AA (NEW ZEALAND)

1. INTRODUCTION

The following notes on light antiaircraft have been extracted from a New Zealand Army Training Memorandum, prepared by a field officer with a New Zealand Force operating against the Japanese in New Guinea. American forces fighting on similar terrain, and against the same enemy, will be especially interested in his suggestions.

2. THE LIGHT AA LAYOUT

a. Your layout will depend on the topography of the area to be defended. Don't decide on your layout until you have made your reconnaissance. If you neglect to follow this rule, you will always be disappointed in the results.

b. Don't try to make a symmetrical layout. Place all guns so that the volume of fire is where you want it.

c. In hilly country don't place all the guns above the target area. If you do, aircraft at low altitudes will be difficult to

engage, and your gun pits will be in constant danger from your own fire.

d. Hilly country gives ideal protection for director control, inasmuch as most guns are emplaced in hillsides, and protection of the guns' dead arc is insured. But the difficulty of sighting in time is a great disadvantage.

e. Never place guns too near the vulnerable point. Depth in layout is essential. If possible, place guns 800 yards from the vulnerable point. If this can be done, fast low-flying targets can be engaged effectively, and your equipment will be less vulnerable to pattern bombing.

f. When high-level pattern bombing and fast low-flying attacks are to be expected, it is believed that the conventional distance of 400 yards between guns is neither practical nor desirable.

g. Another reason why 800 yards has proved the ideal distance from the vulnerable point is that tracer does not show up for the first 400 yards. If the guns are too close, the layers can't observe the tracer.

h. If you are closer to the vulnerable point, low-flying attacks flash in at maximum speed. They are too fast to engage, because the layers cannot traverse fast enough. This can be countered by pushing the guns back and giving depth of layout.

i. Cover all avenues of approach. Once a plane comes in and commences to strafe, the enemy pilot is watching his own tracer and seldom veers off. But in every case in which our fire tackled him before he started his run, he didn't have the guts to come through. This was an important lesson and led us to alter our layout.

j. Don't believe that the Jap is a suicide merchant. He hasn't demonstrated it here.

k. If possible, establish the command post at a point from which all battery positions can be seen, but far enough from the vulnerable point to avoid unnecessary risk.

l. Telephone communication to every gun is absolutely essential.

m. A scheme of night barrage should be thought out. Flash will definitely blind the layer at the forward area sight. Director should be able to lay continuously on an illuminated target. However, a night barrage scheme to suit the layout is recommended.

3. CAMOUFLAGE AND CONCEALMENT

a. Although we have paid every possible attention to camouflage and have achieved excellent results, we have given first priority to protection whenever protection and camouflage have clashed.

b. To date, we have not found a quick-release net that we have liked well enough to adopt, and we have tried most varieties. Our chief objection to them is that during an alert the guns must be ready to open fire at an instant's notice. Also, the movement of a quick-release net betrays the gun position.

c. The rule that we have followed thus far has been to conceal the position entirely until the first engagement, and this has been successful. From then on speed and accuracy are everything. The enemy knows you are there, and will try to flash through, relying on his speed. Under these circumstances nets are a hindrance.

d. A track plan for vehicles and personnel must be controlled from the start. Study of aerial photographs here convinces us of this. High grass shows every track.

e. Dummy positions require constant attention. Look out for the lazy chap who is fond of borrowing sandbags from the dummy positions.

f. In the beginning, one of our pits was attacked and strafed from two directions simultaneously. Our men had made no attempt at concealment. But as soon as a single man had been

hit, they learned their lesson. They moved to a bomb crater, then to a gravel pit, and then to a group of cactus. In every one of these positions they were well concealed.

g. Men without shirts are more conspicuous than men with shirts.

h. The parapet of a bomb crater blends easily if each bag is smeared with mud. It may seem like a long job, but it's definitely worthwhile.

i. Keep the garnish on your nets in first-rate condition.

j. When your living quarters are nearby, they will always give away your gun position. The answer is dispersion. You have two guardian angels. Camouflage is one, dispersion is the other. It is hard to tell which is the greater saver of lives and equipment.

k. If you can possibly arrange to do so, go up and view your positions from the air.

4. IDENTIFICATION AND WARNING

a. Contrary to expectations, no difficulty has been experienced in identification.

b. On one occasion a Kittyhawk dived through thick oil smoke (just after a heavy bombing) with three Zeros on his tail, and was fired upon. He came to the gun later and apologized, explaining, "It was entirely my fault. Believe me, I was a lot more nervous about the tracer coming up to meet me than I was about those Zeros. But I was going too fast to get into reverse."

c. We can't always rely entirely on plane markings or types. In this particular area, the Japs have not yet resorted to their trick of coming in with landing lights on; nevertheless, we don't intend to be caught napping.

d. The secret of identification is in having an intelligent spotter on every gun. His tour of duty is only half an hour. He must be on the job all the time and must realize how terrific

his responsibility is. The only thing he can expect is the unexpected.

e. Planes at high altitudes are always suspect.

f. Don't expect warnings of a strafing raid. It may be all over before you receive them. The spotter should always play safe. Unless he is certain, "Take post" should be given.

g. Duty detachments should be within 5 seconds of the gun. Generally the warning is good. But we can't rely on it.

h. Watch out for the surprise fighter attack after the bombing raid, or after the "all clear." It amuses the Japanese; but an alert spotter spoils the joke.

Section II. BRITISH ARMY NOTES ON EMBARKATION SECURITY

The British have learned their embarkation security lessons from experience; consequently their opinions on this subject are not only informed, but should prove of immediate interest and value to American troops. The following is a condensation of a British Army training memorandum:

Troops under orders to proceed overseas must be made to understand why secrecy is essential, and that everyone of them possesses information which, in the hands of the enemy, might cost their own lives, the lives of thousands of their comrades, and the success of a major military operation.

Vital matters which must be kept secret from everyone whose official duty does not require the information are:

- a. Port of embarkation.
- b. Name of ship, or of other ships in the convoy.
- c. Date or time of sailing.
- d. Destination or route of convoy.
- e. Any particulars concerning His Majesty's Forces or the types and quantities of matériel embarked.

It is equally important not to talk to anyone about these subjects if your information is based only on guesswork. The guess may be right.

The fact that a unit is shortly to proceed overseas must necessarily be known to certain people during the preparatory period. Nevertheless, the fewer people who know, the better. And the less they know, the less the enemy is likely to find out.

Perhaps you suppose that the little you have to tell cannot be important. If you believe this, you are wrong. As a rule, the enemy discovers vital information only by piecing together several small items of intelligence, like a jigsaw puzzle. It may be that your little fact gives sorely needed verification. It may well be that the movement of your unit is part of a large-scale operational movement, which could fail entirely as a result of your breach of security.

Although everyone knows that classified information about the movements of troops and convoys must not be discussed in a public place (or even over the telephone), not everyone realizes that it is just as dangerous to pass this information along to relatives and lifelong friends. No doubt you are sure that they will not tell anyone, since you asked them not to. But YOU were instructed not to tell anyone, and you have already done so. They may follow your example. After all, they are not in as immediate physical danger as you are.

"Bowels open, mouth shut" is a very good motto to observe, not only in the Army, but throughout life.