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No. 40

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SECTION I

ANTIAIRCRAFT

1. GERMAN PREDICTOR 40

The Kommandogerät or Kappagerät 40 is the standard German predictor used to control the fire of 88-mm, 105-mm and 128-mm antiaircraft guns.

It is used with the various guns by fitting it to the appropriate cams. In the operation of the Kommandogerät 40 allowances can be made for change of course as well as change of height. The height and range-finder used is a stereoscopic instrument.

a. Personnel

The number of men required to operate the Kommandogerät 40 is a commander and five men and their duties in action are:

Commander	Supervises work of the detachment
No. 1	Rangetaker
No. 2	Layer for line
No. 3	Layer for elevation
No. 4	Course-bearing plotter
No. 5	Feeds in corrections and operates switches.

It is the duty of Nos. 1, 2 and 3 to report all changes of height or course to No. 5. If a change of height is reported, No. 5 operates the switch marked "Höhenanderung" (target altering height); if a change of course is reported, No. 5 operates the switch marked "Zeil dreht" (target changing course).

b. Data

Traverse	360°
Elevation	0 to 90°
Slant range	1,308 to 19,620 yds
Ground range to present position	654 to 16,350 yds
Ground range to future position	654 to 16,350 yds
Height of target	0 to 39,360 ft
Horizontal speed of target	0 to 670 mph
Vertical speed of target	0 to 446 mph
Distance in azimuth travelled by target during time of flight of shell	0 to 6,540 yds
Lateral deflection	0 to 60°
Course bearing correction	0 to 90°
Height correction	0 to 9,840 ft
Displacement (horizontal)	0 to 1,640 ft
Displacement (vertical)	0 to 656 ft
Time of flight	0 to 30 sec
Drill time	0 to 10 sec

c. Weights

Computing mechanism	2,090 lbs
Mounting	990 lbs
Trailer	1,890 lbs
Weight of equipment in transport	2.2 ton*
Weight of equipment in action	1.6 ton*

d. Disadvantages

The disadvantages of the predictor appear to be that a very high standard of training and careful handling of the instrument are required from the crew, especially Nos. 4 and 5, and it is reported that the complex construction of the instrument (24 motors and 34 differentials are included) renders it unsuitable for use in mobile warfare.

2. AREA BURST OF GERMAN AA SHELLS

The following data on the area of burst of some of the standard German antiaircraft shells have been obtained from a reliable source:

Caliber of Shell	Burst Along Line of Flight	Burst Laterally
20-mm	33 to 43 feet	10 to 23 feet
37-mm	33 to 66 feet	36 feet
88-mm	39 feet	98 feet

ANTITANK

3. VULNERABILITY OF TIGER TANKS

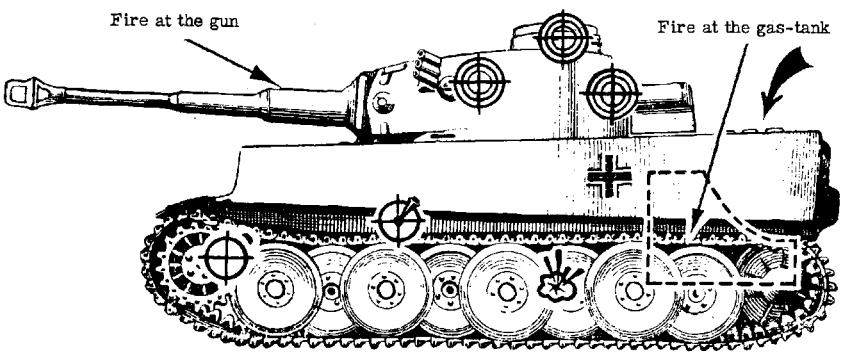
An article recently published in the Soviet Artillery Journal gave detailed instructions for the use of antitank weapons against the German Tiger tank. Vulnerability of various parts of the tank was cited in connection with directions for attack. The accompanying sketch shows vulnerable points and indicates weapons to be used against them. Material concerning the vulnerability of German tanks was published in Tactical and Technical Trends, No. 8, p. 46 and No. 11, p. 28. Detailed information about the Tiger tank was published in Tactical and Technical Trends, No. 34, p. 13.

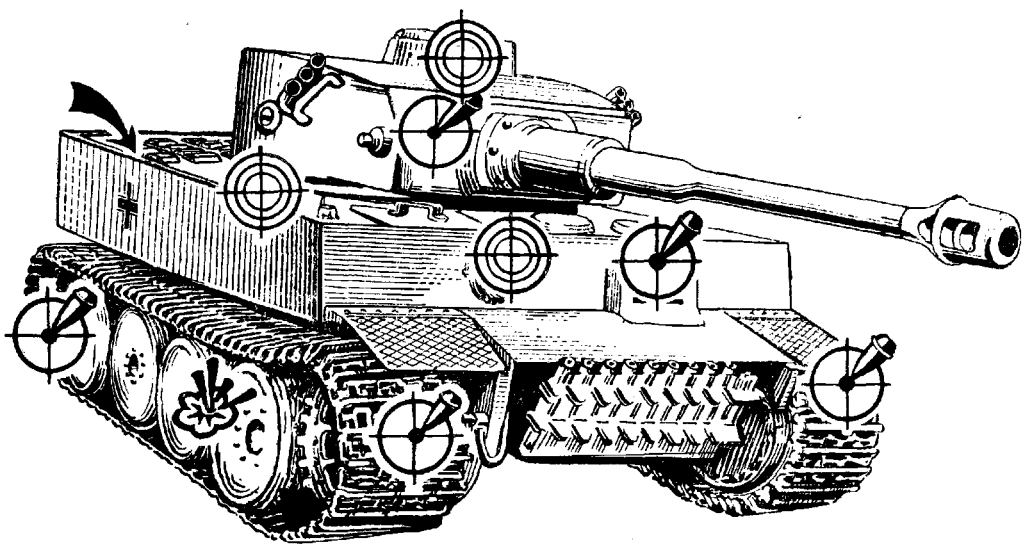
A translation of the Soviet Artillery Journal article follows:

"The mobility of tanks depends upon the proper functioning of the suspension

*British long ton

VULNERABILITY OF TIGER TANKS





Условные обозначения:

Стреляй из всех видов оружия.
Use all weapons

Стреляй из пушек всех калибров.
Use guns of all calibers

Забрасывай бутылками с горючей жидкостью.
Throw incendiary bottles

Бей противотанковой гранатой.
Use AT grenades

parts -- sprocket (small driving wheel), idler (small wheel in the rear), wheels and tracks. All of these parts are vulnerable to shells of all calibers. A particularly vulnerable part is the sprocket.

"Fire armor-piercing shells and HE shells at the sprocket, the idler and the tracks. This will stop the tank. Fire at the wheels with HE shells. Also, when attacking a tank, use AT grenades and mines. If movable mines are used, attach three or four of them to a board and draw the board, by means of a cord or cable, into the path of an advancing tank.

"There are two armor plates on each side of the tank. The lower plate is partly covered by the wheels. This plate protects the engine and the gasoline tanks which are located in the rear of the hull, directly beyond and over the two rear wheels.

"Fire at the lower plates with armor-piercing shells from 76-, 57- and 45-mm guns. When the gasoline tanks are hit, the vehicle will be set on fire. Another method of starting a fire within the tank is to pierce the upper plates on the sides of the tank, thus reaching the ammunition compartments and causing an explosion.

"The rear armor plate protects the engine as well as giving additional protection to the gasoline tanks. Shells from AT guns, penetrating this armor, will disable the tank.

"The turret has two vision ports and two openings through which the tank's crew fire their weapons. The commander's small turret has five observation slits. There are two sighting devices on the roof of the front of the tank, one for the driver, the other for the gunner. Also, in the front of the tank there is a port with a sliding cover.

"The turret is a particularly important and vulnerable target. Attack it with HE and armor-piercing shells of all calibers. When it is damaged, use AT grenades and incendiary bottles (Molotov cocktails).

"There is a 10-mm slit all around the base of the turret. AT gun and heavy machine-gun fire, effectively directed at this slit, will prevent the turret from revolving and thus seriously impair the tank's field of fire. Furthermore, hits by HE shell at the base of the turret may wreck the roof of the hull and put the tank out of action.

"The tank's air vents and ventilators are under the perforations in the roof of the hull, directly behind the turret. Another air vent is in the front part of the roof, between the two observation ports used by the radio operator and the driver. Use AT grenades and incendiary bottles against these vents.

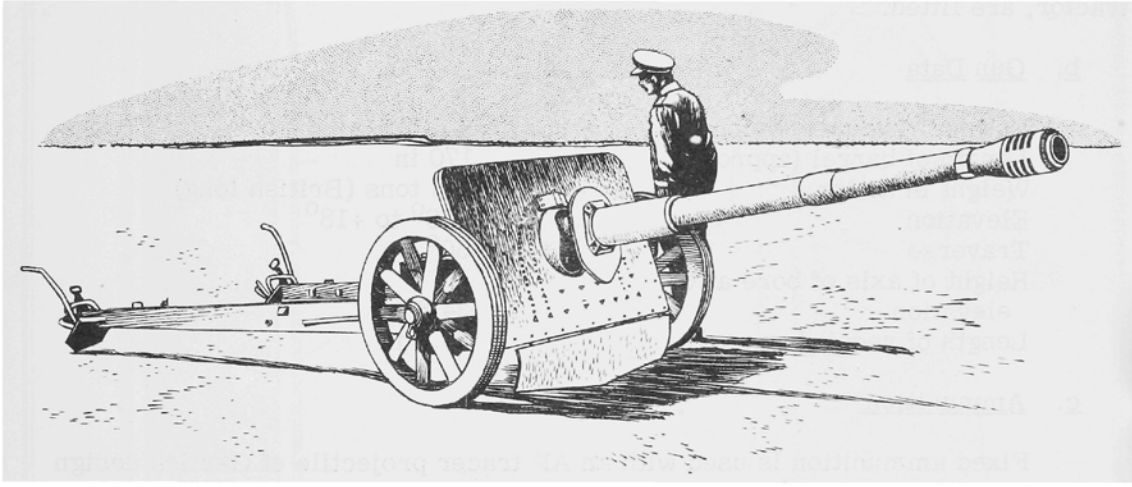
"Explode antitank mines under the tank to smash the floor and put the tank out of action."

[redacted]

Accompanying sketch shows vulnerable points and indicates weapons to be used against them.

4. THE 75/55-MM AT GUN, PAK 41

An account of a new and powerful tapered-bore 75-mm AT gun made by the Rheinmetall factory, the 75/55-mm (2.95-in/2.17-in) Pak 41, has recently become available through Allied sources. The gun has a curious bore; the rear part is cylindrical and rifled; the central part, tapered and unrifled, and the muzzle section -- 27.6 inches -- cylindrical and unrifled. The weight of the powder charge fired is 95 per cent of the weight of the projectile. With an estimated velocity of approximately 4,000 f/s, and a penetration of 5.94 inches of homogeneous armor at 1,000 yards, the gun is most formidable.



THE 75/55-MM AT GUN

a. General

The 75-mm Pak 41, one of the latest German antitank guns to be brought into service, is the third* of the Gerlich or tapered-bore weapons introduced. In issue No. 7, p. 3 of Tactical and Technical Trends, reference is made to the use of this principle in the 42-mm Pak 41. A 75-mm tank gun, the 7.5-cm Kw.K 41, is also known to exist, and it is very probable that this weapon too is of the tapered-bore variety. The caliber of the 7.5-cm Pak 41 at the breech is 75 millimeters (2.95 in), while at the muzzle it is reduced to 55 millimeters (2.17 in). The reinforced breech is of the vertical wedge type, and is semiautomatic. There is a muzzle brake. The weapon is very long, low and sturdy in appearance. The carriage

*The other two are: the 2.8-cm (1.10 in) heavy antitank rifle and the 4.2-cm (1.65 in) light antitank gun.

which has a split trail, is unusual but extremely simple. The cradle is attached to the shield, which forms the basis of the carriage, by what is, in effect, a spherical universal joint. The cradle itself is cylindrical, and covers the whole of the rear half of the barrel. The gun is sighted up to 1,500 meters (1,635 yards), and the sight has four scales for use according to the actual muzzle velocity of the gun, which drops considerably owing to wear. The life of the barrel is provisionally estimated as 500 to 600 rounds.

The shield is composed of 2 1/4-inch plates bolted together with the barrel installed in a ball mount.

The elevating mechanism, of the sector type, is on the right-hand side of the cradle. The traversing mechanism is of the screw type and is on the left. There is no equilibrator. The buffer is hydraulic, and the recuperator is spring type. The wheels are metal with solid rubber tires. Traction is motorized. The axle is under-slung with torsion-bar suspension, which is automatically cut out when the trails are opened. Pneumatic brakes, controlled by the driver of the tractor, are fitted.

b. Gun Data

Estimated muzzle velocity	4,123 f/s
Length of barrel (approx)	170 in
Weight in action	1.4 tons (British long)
Elevation	-10° to $+18^{\circ}$
Traverse	60°
Height of axis of bore at 0° elevation	34.6 in
Length of recoil (approx)	27.6 in

c. Ammunition

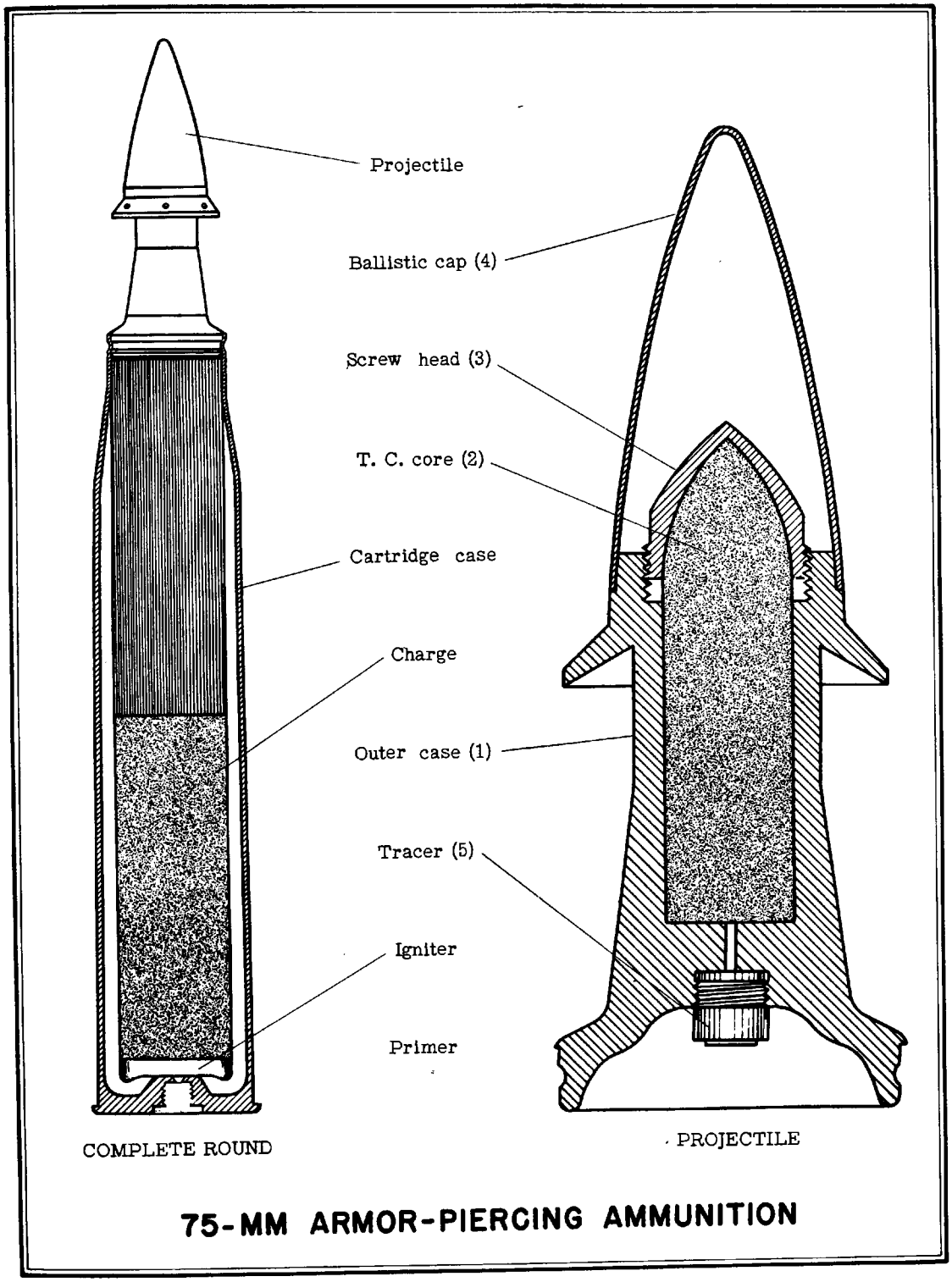
Fixed ammunition is used with an AP tracer projectile of Gerlich design (see accompanying sketch). The AP round is known as 7.5-cm Pzgr. Patr. 41 Pak 41 (Armor-piercing shell Model 41 for Pak 41).

The projectile consists of the outer case (1), the tungsten carbide core (2), the screw-head (3), the ballistic cap (4), and the tracer (5). The outer case has a forward and a rear skirt. Only the forward skirt is perforated. The screw-head is made of mild steel.

The propellant charge is diglycol tubular powder, while the igniter is of pyroxylin porous powder.

There is also an HE round (7.5-cm Sprgr. Patr)(HE shell Model 41 for Pak 41) as in the cases of the 2.8-mm s.Pz.B (antitank gun) 41 and the 4.2-cm Pak 41, but no details of this ammunition are known.

The following are brief specifications of the AP ammunition:-



75-MM ARMOR-PIERCING AMMUNITION

[redacted]

Total weight of round	16.65 lb
Total length of round	29.8 in
Weight of projectile	5.68 lb
Weight of tungsten carbide core	2.01 lb
Diameter of core	1.16 in
Weight of propellant charge	5.4 lb

d. Penetration

The following figures for penetration of homogeneous armor by this weapon firing the AP projectile have been estimated:

Range (yards)	Thickness of armor in inches Normal	30^{o}
500	(6.67 in)	(5.75 in)
1,000	(5.94 in)	(5.12 in)
1,500	(5.28 in)	(4.49 in)
2,000	(4.63 in)	(3.94 in)

ARMORED

5. GERMAN PZ KW 5--ADDITIONAL INFORMATION

The receipt of more recent information supplementing the data on the German PzKw 5 (Panther) tank as described in Tactical and Technical Trends No. 37, p. 5, makes it possible to furnish additional details.

The overall appearance of the Panther closely resembles that of the Soviet T-34, particularly as to inclined armor plate, cone-shaped turret and Christie-type suspension wheels. It should be emphasized that the type and arrangement of driving sprockets and bogie wheels is one of the most important aids to prompt identification and destruction of enemy tanks (see reference p11, armor skirting on German tanks).

By American standards, the Panther should be classed as a heavy tank, not a medium.

a. Dimensions

(1) Lengths

Overall length, including gun	29 ft 1 in
Overall length, excluding gun	22 ft 7 1/2 in

[redacted]

Length of hull	22 ft

(2) Widths

Overall width	11 ft 3 in
Width over tracks	10 ft 9 in
Width of superstructure	9 ft 9 1/2 in
Width of hull	6 ft

(3) Heights

Overall height	9 ft 6 1/2 in
Ground clearance	1 ft 7 in

(4) Diameters

Inside diameter of turret ring	5 ft 5 in

b. Armor

Position of Plate	Thickness	Angle to Verticle in Degrees
(1) Turret		
Front (including gun mantlet)	3.93 in	0
Sides and rear	1.77 in	25
Roof	.66 in	90
(2) Hull and Superstructure		
Front nose plate	2.95 in	53
Driver's front plate	3.34 in	57
Superstructure sides	1.77 in	42
Hull sides	1.77 in	0
Tail plate	1.77 in	30
Belly plate	.66 in	90
Skirting plates	.19 in	0

The armor appears to consist of rolled plate except for the gun mantlet which is a casting. The skirting plates extend down to about 30 inches above ground level.

c. Armament

The armament consists of one 75-mm tank gun Kw.K 43, turret mounted, one 7.92-mm machine gun, coaxially mounted; and six electrically-fired smoke projectors in two sets of three on either side of the turret. The 75-mm tank gun

[redacted]

is a straight-bore weapon having a muzzle brake with an overall length of 18 feet 2 inches.

d. Suspension

Front sprocket drive, large, disk-type interleaved, rubber-tired bogie wheels on eight load-carrying axles each side of the tank. Independent torsion bar springing. All units are fitted with shock absorbers.

e. Track

Track width	2 ft 2 in
Pitch of track	6 in
Diameter of track pin	0.9 in
Links per track	86
Ground contact, front to rear bogie wheel centers	12 ft 9 1/2 in
Ground contact by measurement on ground	13 ft 5 1/2 in
Width of track between centers of track plates	8 ft 6 in
Width of track between edges of track plates	10 ft 8 in
Track pressure (Russian report)	11.7 lb (per sq in)

f. Miscellaneous data

Ammunition carried	75 rounds of 75-mm (2.95 in) shells, 2500 rounds of 7.92 mm (MG)
Sighting arrangement	Binocular sighting telescope on left of 75-mm gun
Gasoline (2 tanks) capacity	165 gals
Ventilation	An electric fan in the turret roof above the coaxial machine gun.
Pistol ports	One in each side and one in rear of turret.

It has been reliably reported that due to the angle at which the armor is placed (practically none of the armor is vertical) the Panther is the most formidable of German tanks.

6. ARMOR SKIRTING ON GERMAN TANKS

From both Allied and German sources, reports have come in of additional armored skirting applied to the sides of German tanks and self-moving guns to protect the tracks, bogies and turret. Photographs show such plating on the PzKw 3 and 4, where the plates are hung from a bar resembling a hand-rail running above the upper track guard and from rather light brackets extending outward about

18 inches from the turret. What appeared to be a 75-mm self-moving gun was partially protected by similar side plates over the bogies. This armor is reported to be light -- 4 to 6 millimeters (.16 to .24 in) -- and is said to give protection against hollow-charge shells, 7.92-mm tungsten carbide core AT ammunition, and 20-mm tungsten carbide core ammunition. This armor might cause a high-velocity AP shot or shell to deflect and strike the main armor sideways or at an angle, but covering the bogies or Christie wheels would make the identification of a tank more difficult, except at short ranges.

[redacted]

ARTILLERY

7. GERMAN 12-CM MORTAR BATTALIONS

Translation of an incomplete German document, which was obtained from a reliable source, gives the following information about the motorized German 12-cm German Heavy Mortar Battalion.

These battalions appear to be G.H.Q. troops which may be attached as desired. They combine great fire power with considerable maneuverability. When it is necessary to operate off roads, the mortars can be carried for short distances in three loads, therefore they can support the infantry everywhere. As only high angle fire is possible, the mortars must always be placed in positions from which they can take advantage of cover afforded by defilade.

The fire unit is the platoon, the tactical unit may be either the company or the battalion. To build up an especially effective fire concentration, the battalion can be employed complete, fire being coordinated by the battalion commander. In this way it is possible to produce great intensity of fire so that, for the tasks of breaking through fixed positions or overcoming particularly obstinate defense, the battalion is especially suitable. Breaking up the battalion into units smaller than company, diffuses and lessens the effectiveness of the fire.

The battalion is organized as follows:

Battalion headquarters, with signal sections
Ammunition platoon and train
Three heavy mortar companies.

Each company is equipped with 12 mortars and 3 light machine guns for local defense and antiaircraft fire. Battalion headquarters has 6 radio sections with which the companies and also the forward observation posts can be linked. In addition there is a telephone section which can connect 5 separate points.

For communication with their platoons, companies have 3 radio sections and 2 telephone sections so that when 1 platoon is within calling distance of the company command post, the 2 other platoons can each have both radio and telephone communication, and a radio section remains available for a forward observation officer. For communication between observation point and fire position, each platoon has a telephone line and a field radio set. Or alternatively, if double communication is not required, a forward observation officer can be supplied with radio or telephone.

The battalion is equipped with trucks which have only a moderate cross-country performance. For this reason the routes of approach to the position, and particularly to the actual firing positions, must be carefully reconnoitered and sign-posted.

The best range for the 12-cm mortar is between 2,200 and 3,800 yards. Maximum range is 6,500 yards.

When fitted with percussion fuzes, the mortar shells have a good splinter effect. Splinters fly almost horizontally over a large area.

The almost silent flight, the dull thud of the impact, and the air compression when the shell bursts, produces considerable adverse effect on the morale of troops. Naturally, the effect is heightened when the mortars are mass fired. In view of these effects and the destructive power of the shells, the heavy mortar battalion is especially suited for attacking dug-in positions, objectives in hollows, villages and wooded areas.

Generally 12-cm mortar battalions are attached, as army troops, to large units on the march, or else they are ordered to proceed independently to a unit which they are to support in a particular action. When in support of an infantry division, the battalion moves by bounds, either with the motorized elements of the division or alone. When action with an advance guard is necessary, the principles for employment of motorized artillery apply. When in support of a motorized division, the battalion can be allocated to the advance guard.

In the preparation of an attack, the battalion is to be used as a complete unit at tactically important points. In such cases, the battalion is subordinated to an infantry regiment.

Employment of the battalion depends on the distance from the enemy. If the assembly takes place at a great distance from the enemy, the battalion takes position right forward. It advances, whenever possible, on the heels of the leading infantry. Company and platoon commands maintain contact with the unit in front and report back on the possibilities of action.

8. STORAGE OF AMMUNITION DURING RAINY SEASONS

It is important that special attention be given to the storage of ammunition during rainy seasons. If the necessary material for stacking and covering the ammunition is not available, it must be buried. However as there is danger of the pits being flooded, the following precautions are recommended in a translated enemy document.

* * *

(1) The pits must be dug deeper than required and filled to the required level with rubble.

(2) The ammunition should not come into contact with the sides of the pit.

(3) The top should be covered in as far as possible with old tarpaulins, etc.

[redacted]

(4) If there is danger of the pit flooding, the ammunition should be taken out, even if it is still raining. Separate charges must be given first preference.

(5) The ammunition should be examined when the rain has stopped, but air-tight containers which are intact must not be opened. Damp ammunition should be treated according to instructions, but it should not be exposed to the sun directly as it will become moist again when it is put back into a cool pit.

CHEMICAL WARFARE

9. USE OF SMOKE BY GERMAN AIR FORCE

Various German documents which have become available for examination reveal much information concerning the tactics, and apparatus employed by the German Air Force in the use of smoke. It will be noted that German and American smoke tactics are similar in many respects.

The following information obtained from German documents, was compiled in the Office of the Chief of Chemical Warfare,

* * *

a. Weapons and Objectives

Aerial smoke apparatus can be used to establish smoke screens (a curtain of smoke extending down to the ground) and area screens (a smoke cloud extending close to the ground and covering a given area). At present, smoke does not appear to be a suitable weapon for aerial combat.

Ordinary screens are established by a single aircraft or by several aircraft following each other. Area screens, on the other hand, are produced by a number of aircraft flying in close proximity. Two means of dissemination from aircraft are available.

(1) Spray Apparatus -- Under air pressure, smoke acid, which is either sulfurtrioxide or chlorsulfonic acid or a mixture of the two, is sprayed from tanks attached to the plane. By experiments it has been found that planes spraying smoke should fly at altitudes of 130 to 165 feet or less. Another German source states that the minimum altitude for smoke cloud emission is 100 feet.

(2) Smoke Bombs -- Smoke bombs are used for establishing screens from high altitudes. Usually the filling is either smoke acid or a Berger mixture consisting of powdered aluminum and hexachlorethane. Release by aircraft is the same as for HE bombs.

[redacted]

b. Atmospheric Conditions

Proper evaluation of weather conditions determines the effectiveness of smoke screens produced by planes. The following data have been ascertained by experiment:

(1) Very Favorable Weather--No wind or light wind, high humidity, atmospheric conditions of early morning and dusk, also night time.

(2) Favorable Weather--Wind velocity from 4 to 16 mph for spray dissemination, 7 to 13 mph for smoke bomb, temperature not below 23° F, overcast sky.

(3) Unfavorable Weather--Wind and sunlight cause convection currents ("noon weather"). Very strong wind and squally weather cause drifting and scattering of smoke. Following a dry cool night, sunlight, and medium strong wind will cause rapid dispersion of cloud ("Forenoon weather"). Heavy frost and low atmospheric humidity result in poor smoke cloud formation. Smoke dissemination may be made effective under unsatisfactory weather conditions by an adequate increase in expenditure of smoke agents.

c. Tactics

Surprise is an important factor in the use of smoke. Consequently in defense, enemy smoke on one's own positions is an imperative signal for the dispatch of one's own aerial reconnaissance. Situations which permit the use of smoke by aircraft are:

(1) Attack on Ground Targets--In HE bombing or in strafing attacks, smoke-disseminating planes can be used to blind or neutralize the aimed fire of enemy antiaircraft batteries and thus reduce the danger to the attacking planes. However, premature employment of smoke in such cases may enable enemy planes to intercept and thus jeopardize the effectiveness of the smoke on the antiaircraft positions. The further danger exists that smoke may conceal the actual objective of the friendly planes which are attacking.

During night bombing, the use of smoke may decrease the effectiveness of enemy searchlights as well as their antiaircraft fire. Diversion screens may deceive the enemy as to the true objective of the attack.

(2) Antiaircraft Defense--For screening of important installations, including airfields, aircraft factories, arsenals, business and industrial centers. This use requires an adequate service to warn of approaching enemy planes and a system to enable rapid response.

Area screens laid by aircraft can hamper the orientation of enemy aircraft with respect to their objective by covering an area considerably larger than the specific target. Dense masking screens may be established by mass employment of smoke. (However, in practice, the Germans seem to depend on ground means of dissemination for area smoke screens.) Even light smoke screens may suffice to

render orientation difficult, but they possess the disadvantage of being rapidly dissipated. Thorough preparations are required to co-ordinate use of area smoke with antiaircraft defenses.

(3) In Support of Ground Forces--Thorough preparation and perfect co-ordination with the ground forces, including a reliable communications system, are necessary. Consideration must be given to the necessity of not interfering with one's own aerial combat reconnaissance. These are some of the tasks that may be undertaken:

Observation posts of enemy artillery and machine gun emplacements may be blinded by smoke bombs. Flanking fire from sectors outside the main line of attack may be neutralized by smoke sprayed from low-flying aircraft. This can be particularly valuable in facilitating movement of units within the area under enemy observation either in attack or defense.

Similarly, to break off combat, and during withdrawal, smoke may be placed on the enemy to delay his movements and enable one's own ground troops to withdraw with a minimum danger from effective enemy fire. Consideration must be given to the possibility that smoke may limit or neutralize one's own aerial defenses and may interfere with operations in adjacent sectors as a result of drift.

d. German Aircraft Smoke Bombs

The following table identifies and describes two of the smoke bombs used by the German air force. It is probable that other bombs are available and that they may be encountered. For a detailed description of the NC 50 bomb, see Tactical and Technical Trends, No. 29, p. 27.

Bombs

Type of Bomb	NC50	NC250-S
Employment	On land	On land and at sea
Weight	110 lbs	418 lbs
Dimensions	2'2-1/2" x 8" diam	------
Markings, color	Nose-white; body-aluminum color with 4 white bands, 1 in wide	------
Ballistics and suspension	Same as for SC50*	Same as for SC250
Fuze	Mechanical tail fuze	Electric contact fuze (Zd. 26)
Duration of smoke cloud	30 to 40 mins	2 to 3 mins

*See Tactical and Technical Trends, No. 37, P. 27.

[redacted]

e. Comments

Doctrines set forth by the Germans in the documents under review are for the most part standard practice. It is questionable, however, whether the use of smoke-spraying aircraft to produce large area screens is anywhere nearly as effective as ground installations for this purpose. Actual German practice seems to confirm this.

Direct spraying of smoke on enemy ground units by low-flying aircraft to prevent flank fire during an attack would seem to be questionable tactics. The smoke-laying aircraft would be extremely vulnerable in such an operation. However, it may be intended to lay smoke in an adjoining area which will drift over the units which it is desired to blanket.

During the Grecian campaign smoke was at times used by the Germans to indicate targets. Reconnaissance planes would lay down a streamer of smoke to indicate the direction of the targets. In one case a German aircraft circled a camouflaged airfield and laid down a smoke trail. In another, a winding road was outlined for several kilometers by smoke placed over it by two reconnaissance bombers. Following shortly, 20 bombers flew over the smoke trail, 10 on each side, and dropped their bombs.

10. SMOKE GENERATORS -- GERMAN 8-WHEELED ARMORED CAR

A German eight-wheeled armored car (see Tactical and Technical Trends No. 32, p. 8) recently examined was equipped with two smoke generators. The discharger cups were fitted to either side of the turret on brackets, pointing forward, upwards and outward. In the bottom of each cup was fixed the bolt of a standard German carbine, controlled by a cable and trigger mechanism from inside the car. A blank cartridge projected the smoke generator, which, from the dimensions of the cup -- 6 inches in length and 3.61 inches internal diameter -- was the standard German Nb.K. (Nebel Kerze--smoke candle) 39.

ENGINEERS

11. NOTES ON APPLIED CAMOUFLAGE

a. Report From Attu

In camouflage, as in all other matters, there is a wide difference between theory and practice. To the question, "What camouflage technique proved most

[redacted]

effective as used by you?" four Attu casualties, all enlisted men, replied, "We were too busy fighting to have any time to worry about camouflage." However, further inquiry disclosed that moss was put on the helmet-nets and mud on their faces. A white sheet was effective on a snow background--when not used to clean rifles--and a reversible parka, brown on one side, white on the other, was effective among rocks with patches of bare snow among them -- a hospital tent camouflaged with the combination of chicken feathers on wire netting was practically invisible a few feet away.

Soldiers reported that the use of tracer bullets served only to give away a position. The Japanese did not use them. The Japanese, particularly when they held the higher ground, hid their trenches and fox-holes by covering the mound of excavated dirt very carefully with tundra. From a lower elevation, it was practically impossible to see such a foxhole. They too, used the white-sheet camouflage in the snow. Grass was used to camouflage buildings.

b. German Practice in Africa

(1) General

In Tunisia, the Germans sited positions for concealment even when it meant overcoming considerable natural difficulties. While they used no special camouflage tactics with which we are not familiar, nor possessed any equipment superior to our own, their camouflage discipline was excellent. Tracks and litter were kept well under control. The use of alternative positions for mobile equipment was general. The nets used to cover their vehicles were lightly garnished, and employed for the most part to support brush or other local material threaded in.

(2) Artillery

Artillery camouflage was unusually good, with brush-wood hedges as the principal material. Guns so protected were hard to spot, as the German powder, while it produces a flash, is quite smokeless. In settled communities, guns would be placed in gardens or private houses; carefully covered with shrubbery, they defied anything but almost point-blank observation from both air and ground. At Bizerte, bamboos, iron-shod at both ends were found upon which netting was stretched and used to cover emplacements. These frames were of different sizes and worked on simple hinges around the emplacements so that they could be quickly pushed off the guns or swung back into position. Local foliage supplied the garnishment. No camouflage was wasted on targets located on conspicious landmarks such as those in Bizerte harbor.

c. German Airfield Camouflage

(1) Runways

There is no stereotyped layout for German advanced landing fields. Of those inspected, as little as possible had been done in order not to disturb the ground surface. In only one had attempt been made to level the site and here, light

scraping and harrowing had been done through the various crops. No runways had been cut or tracks laid--the crops had not been destroyed -- only their growth was retarded. An air reconnaissance proved that the runway so prepared was very difficult to spot.

(2) Dispersals and Blast Pens

Dispersal was over a large area and blast pens were almost always used. Two or three were usually placed adjacent to the landing strip within easy access. Located in banks or on a hillside, or among olive groves according to the country, the rest were dispersed over a wide area. On one airfield, the dispersal was carefully concealed around a large grove with the airplanes pushed in between the trees around the edge. Air reconnaissance showed that well located blast pens were not easy to distinguish.

d. Decoys

The use of dummies and decoys is as old as warfare. In Tunisia, there is evidence that German dummy positions successfully drew our fire. In Attu the hoary trick of holding up a helmet to draw fire produced no results and the only successful decoys were our junior officers who exposed themselves to draw fire. The Japanese did the same, to focus attention on one position or foxhole while others were moving to some other location.

12. ENEMY BOOBY TRAPS RECENTLY ENCOUNTERED

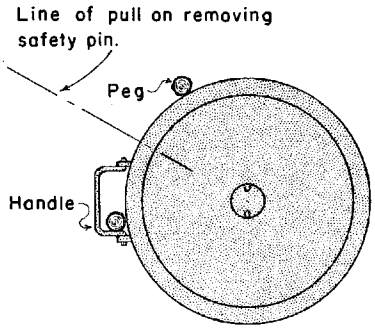
A war correspondent who covered the campaigns in Tunisia and Sicily recently warned those who expect a spectacular Allied march on Berlin, that the road will be literally paved with land mines and booby traps. The following samples of unusual Axis booby traps have been recently encountered.

A tellermine was found balanced on one branch of a tree by means of a long stick. A pull igniter was attached to a second branch, the idea being that someone would remove the stick that balanced the tellermine, thereby allowing the mine to fall and explode in the air.

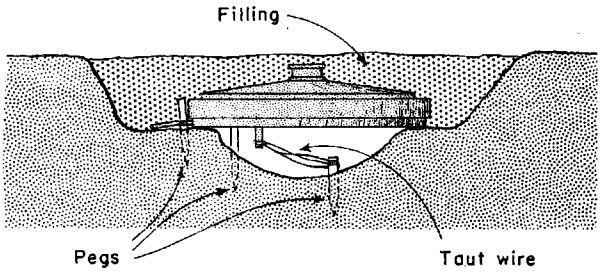
In another instance a hole was dug the required depth and size for a tellermine and a peg with a nail in it was driven into the bottom of the hole. A short loop of wire was fastened to the igniter in the bottom of the mine; the mine was then placed in the hole and the loop of wire fixed over the nail on the peg. The mine was then turned around the peg, thereby wrapping the slack in the wire around the peg until there was no play in the wire. A peg was driven through the handle of the tellermine to hold it in position. The safety pin was pulled out so that the pull came against the pegs (see sketch) and prevented any movement which might have detonated the mines.

Had the pegs at the side not been noticed, it might have been assumed that no trip mechanism had been fitted underneath.

A 3-kg (about 6 pounds) charge was found with a pull igniter attached to the carrying straps in such a way that anyone lifting the charge by the straps, would set off the mechanism.



PLAN



SECTION

Perhaps the most unusual instance was that of a cake of soap taken from a German gas mask case. An examination disclosed that while this soap bore the brand of "Bourjois" it did not have the characteristic perfume, but on the contrary resembled common washing soap. A concussion charge was fired 6 inches away from a can of water containing the soap. This resulted in a sympathetic detonation of extreme violence, blowing the bottom of the can away, but hardly damaging the side of the can between primer and soap. The odor of the fumes resembled those of polar Gelignite*.

13. GERMAN ARMORED PORTABLE PILL BOX

A new type pill box, called the "Armored Crab" by the Germans, is now in action on many sectors of the Eastern front. These pill-boxes are of steel construction, painted grey and are dome-shaped. They are mounted on wheels (see accompanying figures 1 and 2), in an inverted position, and may be quickly moved from one position to another, usually by tractor. They carry a crew of two men.

a. Construction

Overall height	6 ft
Height of upper part above ground	3 ft
Width	5.6 ft
Weight	3 tons

*A moderately fast-burning British explosive for bore-hole charging and blasting.

[redacted]

b. Thickness of Armor

Level with embrasure	5.46 in
Below embrasure	3.51 in
Sides, rear and top	1.56 in
Lower section and floor	.39 in

c. Embrasure

The pill box has a small embrasure with an observation peep hole above it. When necessary the embrasure may be covered by a large triangular armored slide which can be moved either to the right or left of the embrasure and is operated by a handle on the inside. On the top of the pill box are two collapsible periscopes also regulated from the inside. The entrance to the pill box is through a small trap door in the rear which has two levers for closing it from the inside.

d. Armament

The armament is an MG-42 or MG-34 machine gun mounted on a special type stand. The machine gun is elevated or depressed by an elevating hand wheel. It moves horizontally along a frame which is attached to the inside walls of the pill box - the field of fire through the embrasure being 60 degrees.

e. Emplacement

These pillboxes are usually situated in the second defense zone. It takes fifteen men to change one from traveling to firing position. When it is emplaced, the usual procedure is to dig a hole and sink in the entire lower section and part of the upper section (see figure 3). The upper part does not rotate so that only the machine gun aperture in front and the opening in the rear with the two periscopes and the pipe on top must be exposed.

f. Operation

Under combat conditions the observer looks through one of the periscopes to observe and direct the gunner's fire. The gunner observes through the forward slit. Protection from the front against rifle, grenade and artillery fire is by means of the iron slit cover which is manipulated to cover or open slit from the inside. Inside the pillbox there is sufficient room for both members of the crew to sit comfortably and move around to a limited extent. There is a small heating stove and a ventilating apparatus, operated by a foot pedal, which provides sufficient changes of air when all vents are closed. There is enough ammunition for 5 to 10 hours of fire.

g. Methods of Combatting

As only about one yard of this pill box shows above the ground, it is very difficult to detect. Thorough reconnaissance is imperative. It can best be detected by the outline of its embrasure, by its periscopes, flue pipe, and flash and powder

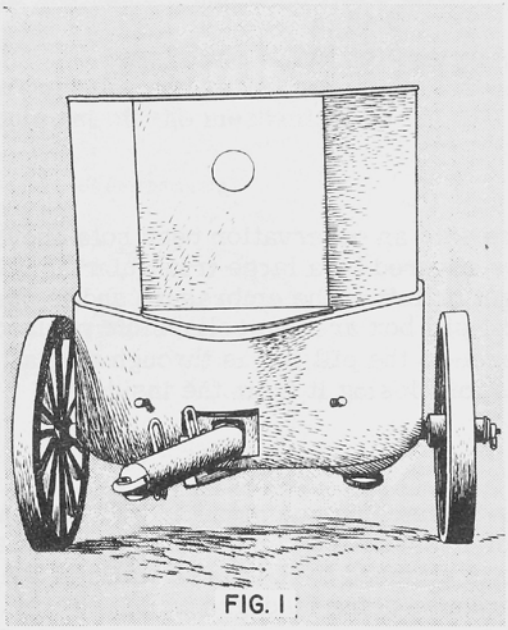


FIG. 1

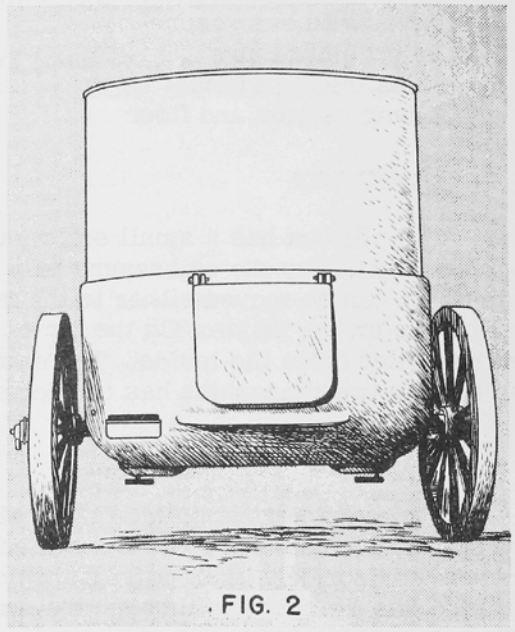


FIG. 2

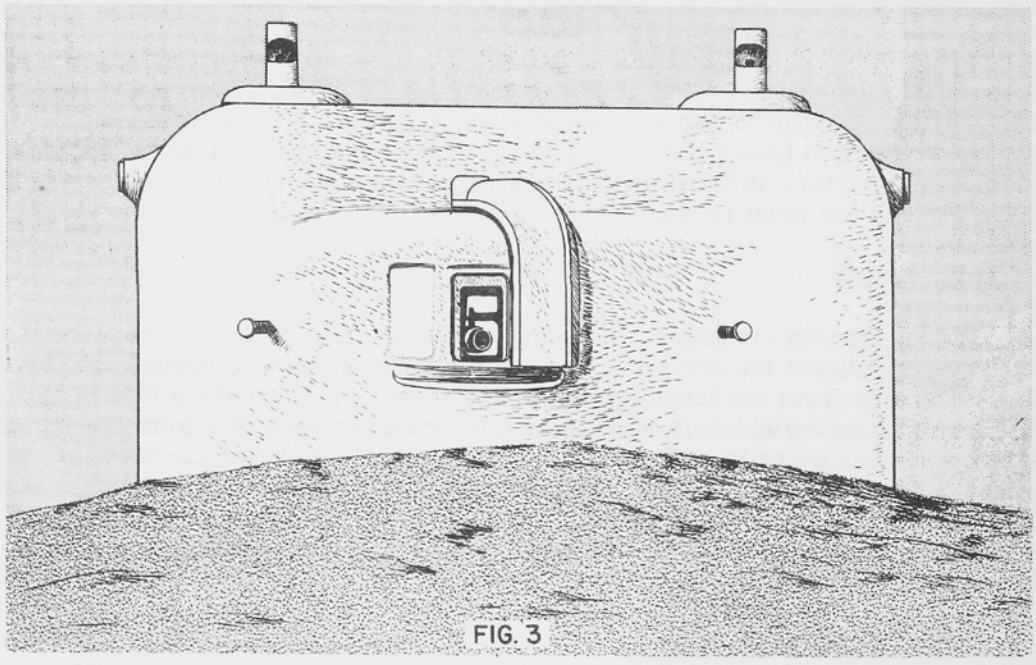


FIG. 3

GERMAN ARMORED PORTABLE PILL BOX

smoke from the machine gun when fired.

Riflemen or mortar squads should demolish the periscopes, thus leaving the crew without means of observation. Rifle shots should be aimed at the embrasure. In a number of captured pill boxes, armor-piercing rifle bullets had made holes in the lower part (the walls of the base). Such fire is effective only if this portion has been uncovered by artillery fire or if it was not completely covered with earth when the pill box was emplaced. Antitank guns should aim at the sides of the pill box about 20 to 24 inches from the top, since the thickness of the armor there is only one inch. The most practical method of destroying these pill boxes is point-blank fire by antitank or artillery guns.

Since the field of fire is only 60 degrees, separate pill boxes may be destroyed by assault troops moving in on the vulnerable and unprotected sides and rear. As a rule these pill boxes are used in groups, but by neutralizing the supporting pill boxes it is possible to isolate any particular one.

When assault troops come up to these pill boxes, they should first cover the embrasure with earth and throw hand grenades at the trap door in rear. If the crew refuses to surrender, the pill box should be blown up. In attacking these pill boxes Molotov cocktails may be used against the periscope openings. If no explosives or gasoline bottles are available, in addition to covering the embrasures with earth, the trap door should be wedged with stones or logs to put the pill box out of action.

INFANTRY

14. THE JAPS AT BUNA

The following observations are quoted from an interview with an infantry officer who recently returned to the United States from the Southwest Pacific theater:

"The only enemy installations I saw were on the outskirts of Buna Village (between late November and 7 December 1942.) The Japs were comfortably quartered in semipermanent structures, made in the usual native design, with a pole frame, canvas roof and mosquito netting enclosing the interior. Board flooring further bug-proofed the houses and provided sleeping accomodations above the level of pools caused by rainfall. Dugouts, surrounding the structures, formed a defensive ring around the area of living quarters. These defenses were supplemented by installations extending to Buna village and Buna Mission.

"The Japanese defense installations were excavations, four to six feet in depth. They were covered with palm logs (generally more than 12 inches in diameter) and earth. The sides of the dugouts were usually reinforced with boards, sandbags or logs. Firing slits were provided for rifles and automatic weapons, fire lanes had been prepared, and the whole artfully camouflaged.

[redacted]

"These installations were practically impervious to the Australian 25-pounder artillery fire and our own 81-mm mortar fire. (See Tactical and Technical Trends, No. 31, p. 31 for additional information on these bunkers and dugouts.) However, I have been told that our 37-mm gun, firing the cannister shell, has been effective against the Jap emplacements. Also it was noted that these dugouts were open in the rear and thus were vulnerable to attack with hand grenades.

"The troops opposing us were Jap marines. They were disposed to defend Buna Village, Buna Mission and the nearby airstrips.

"The Jap has definite characteristics. He is not too willing to die for his Emperor when the odds are against him, and he will squeal like a pig when he is routed. He is crafty and takes full advantage of his surroundings to improve his position; he is a master of the art of camouflage; he will wait hours for a target; he will use decoys to draw and disclose fire; he takes delight in plaguing inexperienced troops with so-called "explosive bullets" which he fires into tree tops to the flank and rear of opposing positions; he also uses other noise-making tricks to bewilder his enemy. His attitude early in the Buna campaign was almost entirely defensive but he fought with dogged determination while he considered that he had a chance."

15. GERMAN CLOSE-QUARTER FIGHTING AND WITHDRAWAL

During the Sicilian campaign, perhaps the best example of German tactics in close-quarter fighting and withdrawal was furnished in the Battle of Primosole.

After the initial assault by Allied troops on the morning of 15 July 1943, which was brought to a standstill, the Germans made no attempt to defend the river line but concentrated on holding a position in the vineyards and ditches on each side of the road, north of the bridge. This position was based on a sunken track which afforded cover from view and in the banks of which shallow trenches were dug. The track ran west from the main road about 200 yards north of the river. The Germans also made much use of ditches running east and west from the main road. Pillboxes in the area were not used by the Germans as they had been engaged by .75-mm gun fire from Allied tanks.

The Germans were equipped with a very high proportion of automatic weapons, particularly light machine guns. During the night fighting, light machine guns fired on fixed lines very close to the ground, causing wounds to feet and legs and preventing crawling. The fire was coordinated with the firing of flares. Bursts of 10 to 15 rounds were fired at a rate of one burst about every minute.

In daylight, machine guns were well concealed in commanding positions in ditches and along the sunken track. Much use appeared to be made of alternate and supplementary positions, for each machine gun appeared to fire first from one location and then another. Never more than two or possibly three machine guns were firing at any one time, giving the impression of a very small force, whereas in the length of the sunken track alone (from 200 to 300 yards) the number of rifles and

other weapons counted and the number of prisoners taken showed that there were at least 50 to 60 men.

Individual snipers armed with light machine guns, sub-machine guns or rifles were concealed in the vineyards and trees forward of, and on the flanks of the Germans' main position. The mission of these snipers was probably to protect the German flanks and to serve as a nuisance against Allied troops.

During the first part of the battle the Germans had very few mortars. Only one is known to have fired, and its fire was inaccurate and did not appear to be observed, probably because of the closeness of the fighting.

Grenade throwing pistols and rifle grenade dischargers, both types of weapons throwing a high-explosive grenade approximately 20-mm in diameter, were used at close quarters to put down a heavy concentration of HE. Many stick and egg grenades were also used.

The Germans had four or five 88-mm guns and one or two antitank guns of small caliber, 20 mm or 37 mm. These guns were used principally to cover the main road. No attempt was made to conceal them, probably because they were brought up in great haste, when the Germans discovered the presence of Allied tanks and realized that bridge demolition work was impossible. But demolition charges and magnetic antitank grenades were used by individual Germans who concealed themselves in ditches by the side of the road and in culverts under the road and engaged our tanks at close quarters.

The German withdrawal from their defense position was at the rate of five to six miles daily, each movement being to a previously selected position. Such positions were chosen for their commanding nature, affording good fields of fire for machine guns and good observation posts for mortars. Sometimes they were based on natural antitank obstacles such as river beds. Towns and villages were not used as centers of resistance except where commanding positions over a bottleneck could be obtained by occupying houses on high ground. On one occasion the Germans occupied a line of houses built on a very high ridge. A sunken road behind the houses provided good lateral communications and a covered line of withdrawal.

Patrol reports and reports from civilians indicated that the Germans usually withdrew in the early morning, between 0200 and 0400 hours, the last elements to leave often being covered by a few tanks. The Germans gave no sign of their withdrawal, such as increased shelling and machine-gun fire at the end of day and intervals during the night. Such fire had marked their withdrawals in Africa.

FIG. 1

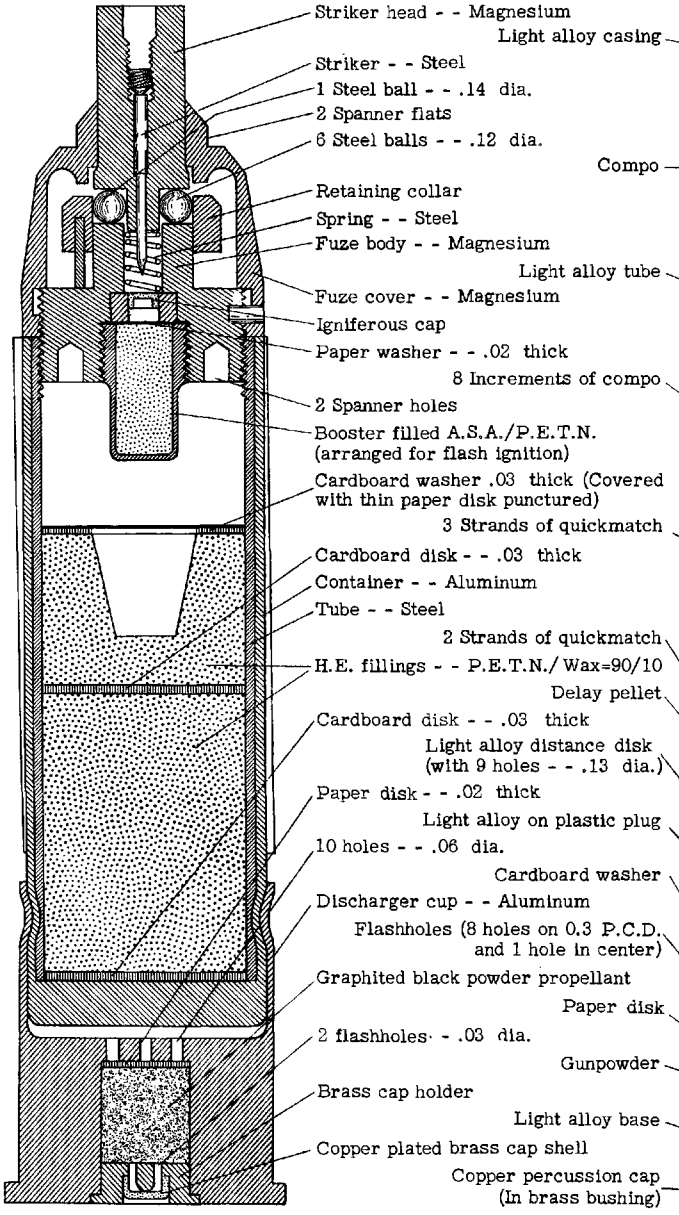
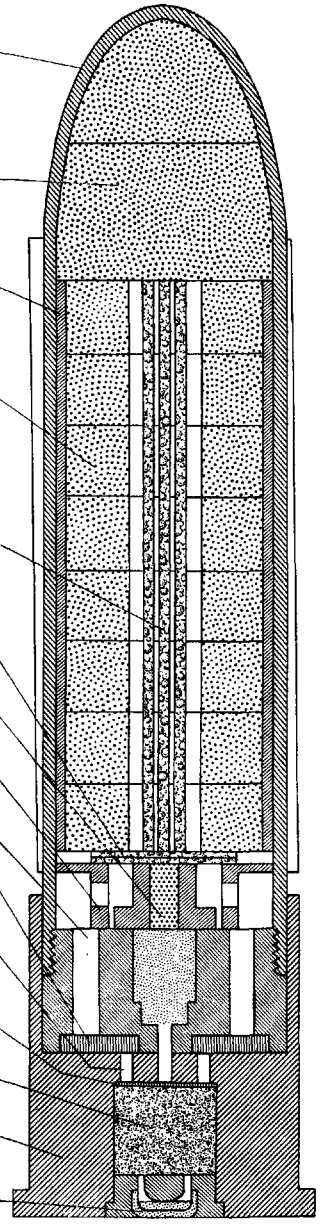


FIG. 2



GERMAN GRENADE PISTOL AMMUNITION

16. JAPANESE 81-MM MORTAR AMMUNITION

Test firing has demonstrated that Japanese 81-mm mortar ammunition is completely interchangeable with US ammunition when fired in the US 81-mm MI mortar. Slightly shorter ranges are obtained with the Japanese ammunition.

17. GERMAN GRENADE PISTOL AMMUNITION

Recent reports show that four types of ammunition are furnished to German troops for use with the 27-mm (1-inch) Kampfpistole (grenade pistol). The four types of projectile are, respectively, HE, smoke, a so-called "indicator" grenade, and a grenade which, in flight, ejects an illuminating star attached to a parachute. For previously published reference to the German 1-inch grenade pistol, see Tactical and Technical Trends, No. 27, p. 31.

Detailed information concerning Kampfpistole ammunition follows:

a. HE (Sprengpatrone für Kampfpistole)

This is a small, nose-fuzed high-explosive round, relying on blast for its effect. However, since the effect is comparatively small it is believed that this round is essentially offensive ammunition, preferably for use in street fighting.

The small prismatic sight on the pistol is graduated to 100 meters (approximately 110 yards) and although tests have shown that longer ranges may be obtained, such shooting is inaccurate.

A general description of the grenade is shown in fig 1 (see accompanying sketches). Other details are:

Weight of complete round	Approx 5 oz
Weight of projectile	Approx 3 1/2 oz
Type of filling	PETN/Wax (pental erythritoltetranitrate)
Weight of filling (2 increments)	339 grains
Type of propellant	Graphited black powder
Weight of propellant	12 grains*
Markings	Base of cartridge case usually stencilled: "Spr. Z".

b. Smoke (Nebelpatrone für Kampfpistole)

Externally this is similar to the HE projectile; internally it contains a smoke generator. It is fitted with a nose fuze which is similar to that in the HE

*This propelling charge appears to be extremely small but the weight stated is correct according to the best available source information.

[redacted]

projectile, except that there is a charge of gun powder in place of the detonator below the flash cap. The projectile functions on impact. The gunpowder is ignited by the flash cap and blows off the smoke generator, at the same time igniting it. It has been ascertained that the smoke generator may be projected a considerable distance from the point of impact. The projectile may be recognized by the following stencilled marking on the base of the cartridge case: "NEBEL Z".

c. Indicator (Deutpatrone für Kampfpistole)

This grenade (see fig 2) emits a puff of reddish-brown smoke after it has been in flight for about two seconds. It is similar, externally, to the two grenades described above except for the head which is parabolic. There is no fuze, the smoke train being fired by the flash from the propellant.

Weight of complete round	Approx 4 1/2 oz
Weight of projectile	Approx 3 oz
Marking	Base of cartridge case stencilled "Deut. Z".

d. Illuminating Star on Parachute (Fallschirm Leuchtpatrone für Kampfpistole)

This grenade has the general external appearance of the other types. It has a black bakelite head which has a white spot in the center. "F. Leucht. Z" is stencilled on the base of the cartridge case. The base of the projectile has a screwed-on plug which is perforated to hold a gunpowder pellet. Above this is a star to which a parachute is attached. The parachute is towards the forward end of the projectile. The action is as follows: On firing, the flash from the propellant ignites the gunpowder pellet which, after a brief delay, ignites the star. The bakelite head is blown off and the star ejected. The star is of the illuminating type.

18. GERMAN MODIFIED SIGNAL PISTOL

The Germans have recently modified their signal pistol (see Tactical and Technical Trends, No. 22, p. 38 and No. 27, p. 31) in order that greater accuracy may be obtained.

A folding stock has been fitted to the butt of the pistol by a bracket which is recessed to allow the pistol to be cocked. It is secured by a quick release clamp immediately behind the trigger guard and by a small milled head screw which engages into the pistol butt itself. The securing bracket is connected by means of a hinged bracket to a hollow steel bar 10 inches long, at the end of which is an adjustable leather padded butt.

A loose rifled liner slides into the barrel and is held in position by a lug which fits into a slot in the extractor groove.

A sighting gear slides over the forward part of the barrel and is secured

by two screws. The sights consist of a combined folding front and rear sight, spring-actuated, and mounted on a cylindrical sleeve which slides onto the barrel.

GENERAL

19. GERMAN EVACUATION ORDER -- SICILY

The order below - a directive to the Herman Göering Division dealing with the evacuation of Sicily - is a typical example of German efficiency, even in defeat.

* * *

Enclosure to Herman Göering Div Order No. 31/43, 2 Aug 43

Directive for Future Moves and Battle Actions in Sicily

1. No demolition and no road blocks are to be manned by Italian personnel. Officers in charge of battle groups are responsible for the enforcement of this order.

2. Every German soldier who is forced to take to the mainland must be in possession of infantry weapons. Apart from revolver and bayonet he will carry a rifle, sub-machinegun, pistol or LMG, with ammunition. In the case of squads, one heavy MG or mortar. These weapons are tickets for the ferry. Without those mentioned, soldiers will ruthlessly be prevented from crossing.

3. No Italian, whether civilian or soldier, may interfere in any way with the movement of the German armed forces. All Italian motor vehicles and heavy weapons will be ruthlessly removed from the roads. This does not apply to units which, as part of the division, have proved their worth in battle, and carry on the fight.

4. Isolated remnants of formations, platoons, and squads of any description are to be put under the command of local units. They will be made to form part of the current movement. Out-of-date orders are no longer valid.

5. Any motor transport, weapons or equipment that cannot be transported across to the mainland are to be completely demolished. Destruction by fire is strictly forbidden, since fires and traces of burning are liable to attract the attention of enemy aircraft, both by day and by night. Blowing-up is the most effective method of destruction, and will be applied to weapons as a matter of principle. Motor transport will be destroyed so as to put them out of action for a long time at least. (They will be blown up, magnetos removed, tires slashed, the engine smashed, or the whole vehicle run over a cliff.)

[redacted]

6. The most rigid discipline is the main condition for the success of all future moves. Anyone not co-operating will be shot. Examples of individuals always work wonders.

7. All traffic control regulations come under direct orders of Div HQ. Whoever does not comply with regulations is subject to disciplinary action, vide paragraph 6.

8. Roads which because of enemy action have been blocked (bomb craters or demolished houses) must be made passable as quickly as possible, or diversions created and flagged (attention drawn to them) by drawing on the civil population and prisoners of war.

9. All personnel will carry haversack rations for 24 hours as well as iron rations.

SECTION II

FINNISH VIEWS ON SNIPING

[redacted]

FINNISH VIEWS ON SNIPING

The following excerpts from a translated German document give the views of the Finnish General Staff on Russian snipers, the general principles of sniping and the defense against sniping. The German translation of the original Finnish document was said to have been widely distributed by the German Training Command and can therefore, be considered as having been approved by the German High Command. A previous reference to German views on sniping will be found in Tactical and Technical Trends No. 29, p. 21.

* * *

a. Russian Training and Activity

This section is a Finnish summary of information derived from Russian sources pertaining to the training and activity of Russian snipers.

(1) General

As to moral and physical strength, the sniper must be a first-class fighter. Only a man utterly unafraid and imbued with the will to do his duty to the last, can measure up to such a task. During the attack his place is 10 to 15 yards behind the firing line; his task to lie in ambush for enemy officers and light and heavy machine gunners. In the defense his place is either on the ground or in a tree, preferably at the limiting points of the frontal sector or the open flanks. His task is the annihilation of enemy commanders and also soldiers about to execute special missions entrusted to them.

In patrol activity the sniper's place is in the center. When engaged, he withdraws slightly to the rear in order to be able to select his target better.

Snipers always work in pairs. One to observe with the binoculars and estimate distances, the other to fire. Their contact is either visual or by pre-arranged signals. They are supported by riflemen. Their alternative positions - there are several of them - are approximately 20 yards away from the firing positions. Of main importance in the selection of the positions are the field of fire and camouflage.

In order to be able to determine the location and nature of the enemy target by means of a few (very often barely noticeable indications) the sniper must possess a highly-developed sense of vigilance and faculty of observation.

It is claimed that in winter time a sniper discovered an adversary by his breath visible behind a stone or bush, and another behind a tree by some birds that picked up bread crumbs dropped by the soldier on the ground.

Especially in the defense, the sniper must possess patience and tenacity. He often has to watch hours on end for the appearance of an enemy observer in the slit of a pill box or a careless movement that betrays his presence in a trench.

[redacted]

The battle with the enemy is a continuous one decided by the one who makes the first careless move or fires the first premature shot.

The independent nature of his activity, the necessity of knowing how to take the best advantage of cover and concealment, and to fit himself into constantly (very often very swiftly) changing conditions make the sniper's thorough training in tactics a prerequisite.

He must be able in all situations to make a quick decision as to which of the enemy targets have to be eliminated first. Often he is entirely on his own and fights without contact with his command post.

The sniper must be thoroughly versed in the art of camouflage. Again, the use of firing tables, the calculation of errors, the making of map sketches, presuppose a sufficient amount of schooling and education.

(2) Replacements

Considering the fact that continual fighting often under severe conditions takes a high toll of both mental and physical energy and capacity, special attention must be paid to the proper clothing, feeding and rest of the snipers.

The training of new snipers should be in the hands of the experienced ones and should be conducted on the days when the latter are free from front duty.

(3) Reconnaissance Activity

For reconnaissance, snipers are to be employed solely for their own tasks. They are only to be attached to medium-sized reconnaissance parties and in pairs.

When the reconnaissance party advances, the two snipers follow the main body and observe distant targets. Sometimes it proves advantageous to use the snipers as a connecting link between patrols, committing them in the direction from which the enemy is expected to make his appearance. In this manner they help to support the points of the patrols and clear the way for them.

During combat the snipers take up positions from which they can actively further the development of the engagement. While the one selects moving targets, the other tries to put enemy gun nests out of action.

After having made a personal reconnaissance of the local terrain, the snipers continually change position, thus deceiving the enemy as to their whereabouts.

When breaking away from the enemy, the two snipers can be used together with automatic riflemen as security elements. Care has to be taken, however, in this case, to place the snipers somewhat apart, as automatic rifle fire will attract enemy fire.

[redacted]

(4) The Attack

For the attack, snipers are mainly employed to select such enemy targets as most impede the advance. Best results are obtained if they operate on the flank.

Snipers are not only to be given clear instructions as to their own positions and tasks when advancing, but also should be familiarized with the plan and object of the unit.

In the attack, snipers concentrate especially upon eliminating enemy officers, men directing enemy fire, automatic riflemen and antitank personnel. Should they not succeed in silencing these objects, they indicate by tracers their position to friendly MGs, mortars or antitank guns, and move without delay to alternate positions.

In case of counterattack by the enemy, the two snipers organize their activity as follows: one destroys enemy weapons, the other the man-power of the enemy, especially officers, automatic riflemen and sharpshooters.

The activity of friendly shock troops is to be supported by two to four snipers. Well-placed hits in enemy fire slits enable the shock troops to force their way into enemy emplacements.

(5) The Defense

The firing positions of the snipers vary with situation and distance from the enemy. During an engagement snipers are placed in the outpost line or even moved further ahead. If the fight is carried on over a short distance only, they may be moved even behind the M.L.R. provided there are commanding hills or elevations.

b. Finnish Observations

This section details Finnish combat experience with Russian snipers.

(1) Enemy Organization

The main factors contributing to the effectiveness of enemy sniper activity are first: a good weapon (rifle with telescopic sight) and secondly, the concentrated use of snipers in as large numbers as possible. It is true that the sniper contingent of a rifle company consists only of 3 to 5 men (formerly only 2) but to this have to be added the sharpshooters sent forward in support by the rear formations. As these reserves take part in the struggle and put up a good fight to make a name for themselves, a great deal of their own glory goes to the snipers of the units in the line.

As far as number and position of the snipers are concerned there have not been any hard and fast rules. Recently snipers have usually worked in small

groups (4 men); however, every man has his own post which he leaves within a given time to change over to another.

(2) Fixed Positions

The determining factors controlling sniper activity vary naturally from sector to sector, but generally it can be stated that the enemy very aptly takes advantage of local conditions and constantly keeps in mind that the secrecy of the sniper's hideout is of utmost importance.

Usually the sniper takes his stand in a well-camouflaged dugout or other covered position connected with the trench. However, there are also cases where snipers have been observed in open positions.

The covered positions and dugouts are provided with one or several small fire slits. The face of the sniper cannot be seen, and in winter only the appearance of a small whirl of snow in front of the fire-slit betrays the fact that a shot has been fired.

When operating from a dugout, the sniper aims sideways from the ordinary fire directions, probably to deceive the enemy or to provide cover for himself. In one instance snipers seem to have been posted in the background of the dugout or covered position firing through the openings of the front wall. This seems to be borne out by the fact that sometimes no sound of explosion was perceptible.

When posted in a trench the sniper observes through a very small, hard-to-find, fire-slit in the parapet. Once in a while they have been seen posted in front of or behind the trench, even on top of the roofs of dugouts probably to secure a sufficient field of fire in low terrain. On moonlit nights snipers have been observed in no man's land. Flares were then fired to illuminate the targets.

Houses and rubble furnish snipers with excellent hiding places, hatch openings in attics and cellars being used as fire apertures. Also by removing some bricks, slits for observation and firing have been created. Snipers have also hidden themselves in lumber-stacks and wood-piles. During the summer several snipers were shot out of trees. In winter, however, trees have been avoided by them.

The Russian snipers seem to execute their tasks with extraordinary patience and tenacity and seem to have excellent material at their disposal. This can be concluded from the fact that they were able to discern even the least movement at great distances and that they concentrated their efforts only upon well-selected, sure and visible targets. Generally speaking, they were interested only in sure targets. Also the cooperation between several snipers seems to be smooth and the allocation of the different phases of the work well-organized.

It seems that once in a while two snipers go after the same target, for it happened that two men walking side by side were hit almost at the same time. On another occasion, one of our [Finnish] snipers was taking aim at his opponent when another enemy sniper shot his rifle to pieces. The sniper's mate not only takes

care of the observation, but also the deception of the enemy. He tries by all conceivable means to lure lookouts and guards from their protective cover.

Enemy snipers have used "dum-dum" ammunition, which made it more difficult to locate the spot from which the shot was fired but easier for the enemy to observe a hit.

(3) Time of Activity

The activities of enemy snipers have been the liveliest on bright, sunny days, in winter after snowstorms when snowdrifts covered trenches and communication trenches. Also light snowfalls and dusk were selected by the enemy snipers to step up their activity, as then our men moved about somewhat more carelessly, but the enemy's telescopic sights still offered a clear enough view to secure a hit. Our mealtimes, too, when again our men dropped some of their watchfulness, were utilized. In daytime, snipers generally preferred the mornings and noon-time.

(4) Ranges and Performances

Depending upon the distance between the lines, the ranges run from 100 to 900 yards, but occasionally enemy snipers have tried shots up to 1,400 yards. The usual and most effective distance is 200 to 400 yards, but even at 600 to 700 yards the accuracy of fire has been fairly satisfactory.

The fire readiness and speed of fire have been good even on moving targets, a proof on the one hand of thorough training, and on the other of the indispensability of the telescopic sight.

The speed and accuracy of fire gave rise to the suspicion that snipers posted in buildings made use of special aids. The accuracy of the fire may be illustrated by the following examples:

At 200 to 400 yards several scissors telescopes and periscopes were smashed to pieces. One sniper shot down a small rock which had been placed in an observation slit three times in rapid succession.

When one of our MG platoon commanders lifted his hand just once above the snow-wall to repair the alarm wire a Russian sniper scored a hit on his hand at 100 yards. A sniper was hit several times through an observation slit fashioned into the snow-wall with a stick. Various objects lifted by our men above the parapet, as a trial, were generally hit. It also happened that Finnish observers behind periscopes, were shot at through the snow wall.

(5) Deception

Enemy snipers made use, among others, of the following methods of deception:

In order to induce our men to become lax in their watchfulness they leave

a position in our line alone for as many as 8 days.

The sniper's mate shovels snow from a pit for a while then raises a helmet above the parapet, or a sniper puts a helmet visibly into a fire slit and then opens fire from an alternate position. One sniper takes up position behind a rock, then the other moves a completely equipped dummy back and forth in the trench. By opening heavy fire in a certain sector the enemy tries to confuse our men and cause them to expose themselves. Long bursts of automatic weapon fire have been used for the same purpose.

c. Finnish Counter-Measures

Most of the losses from enemy sniper fire have been caused by carelessness, inept utilization of cover and concealment, use of dirty snow capes and caps, or by not wearing any suitable garment at all that would afford protection against detection in a given terrain.

These losses are a proven fact, and soldiers must be forced to do everything in their power to impede the activities of snipers.

The following counter-measures may be used among others:

(1) Careful movements and the taking of full advantage of the ground in the danger zone;
(2) The best of camouflage;
(3) Sufficient depth of trenches and appropriate danger signs in the trenches;
(4) Struts placed across the trenches to force the men to walk in a bent body position;
(5) Use of snow capes;
(6) Use of clean and complete snow suits in the front line;
(7) Careful selection of the fire positions and their thorough reinforcement (steel plates, sandbags) and camouflage;
(8) Frequent changing of observation points;
(9) Avoiding of unneccessary firing from observation posts and application of various proven methods of deception;
(10) Intensification of our own sniper activity by the use, for instance, of additional snipers from the reserve troops;
(11) Freeing snipers from other duties and continuing their training, especially with a view to improving their accuracy of fire;
(12) Organized use of other weapons against snipers who cannot be eliminated by our own snipers.

[redacted]

CORRECTIONS

No. 37, p. 6: The reference to the 75-mm gun as "probably the new Pak 41" was in error. The gun on this tank as stated on p. 9 of this issue is the 75-mm tank gun Kw.K 43.

SECTION III

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TACTICAL AND TECHNICAL TRENDS, ISSUES 31-40 (INCLUSIVE)

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