FMFRP 12-99

The Development of German Defensive Tactics in Cyrenaica--1941

U.S. Marine Corps

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DEPARTMENT OF THE NAVY
Headquarters United States Marine Corps
Washington, D.C. 20380-0001

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FOREWORD

1. PURPOSE

Fleet Marine Force Reference Publication (FMFRP) 12-99, The Development of German Defensive Tactics in Cyrenaica--1941, discusses the principles the German Army learned about desert operations during their first months in North Africa.

2. BACKGROUND

a. Desert operations have much in common with operations in the other parts of the world. The unique aspects of desert operations stem primarily from heat and lack of moisture. These two factors have significant consequences, but most of the doctrine, tactics, techniques, and procedures used in operations in other parts of the world applies to desert operations. The challenge of desert operations is to adapt to a new environment, particularly the greater visibility and mobility afforded in the desert. Weapons of greater range can be emplaced outside the range of enemy weapons and deliver fires on an enemy who cannot return

fire. This leads to a search for ways to stand off from the enemy and destroy him by fire or to close with him before he destroys us, depending on whose weapons have the greater range. Because of the desert's good mobility, flanks are of great concern.

b. This manual should be particularly valuable to company-grade officers.

c. The German experiences in North Africa illustrate the need to adjust to new conditions. The German units sent to Africa in 1941 were trained for operations in European terrain with its vegetation, rainfall, and cooler temperatures. However, the Germans quickly adapted to the deserts of North Africa. Another characteristic displayed by the Germans was their ability to identify, analyze and counter the tactical innovations of their enemy. The fruits of this ability to think and adapt are well known.

d. FMFRP 12-99 was originally published by the U.S. Army's Military Intelligence Service in 1942 to alert soldiers to the Germans' flexibility in meeting the demands of new situations.

e. Readers of this manual may also want to read Leavenworth Paper No. 4,

The Dynamics of Doctrine: Changes in German Tactical Doctrine during the First World War, which complements this FMFRP. This paper describes the Germans' ability to adjust to new circumstances during World War I. Leavenworth Paper No. 4 is stocked in the Marine Corps supply system with prefix control number (PCN) 50100296400.

f. FMFRP 12-99 provides very specific statements on distances between weapons and formations of troops. The principles which led to these statements are as true today in desert warfare as they were in 1941. Weapons' ranges and effects, however, have changed. Readers of this manual, therefore, are cautioned to approach desert operations as the Germans did: figure out the principles; develop new tactics, techniques, and procedures based on such things as weapons' ranges to supplement those tactics, techniques, and procedures already in the doctrinal manuals; be alert for what works and what doesn't work; and adjust to changes in the situation.

3. RECOMMENDATIONS

This manual will not be modified. However, comments on the manual are welcomed and will be used in revising

other manuals on desert warfare. Submit comments to --

Commanding General
Marine Corps Combat Development Command
(WF12)
Quantico, VA 22134-5001

4. CERTIFICATION

Reviewed and approved this date.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

M. P. CAULFIELD
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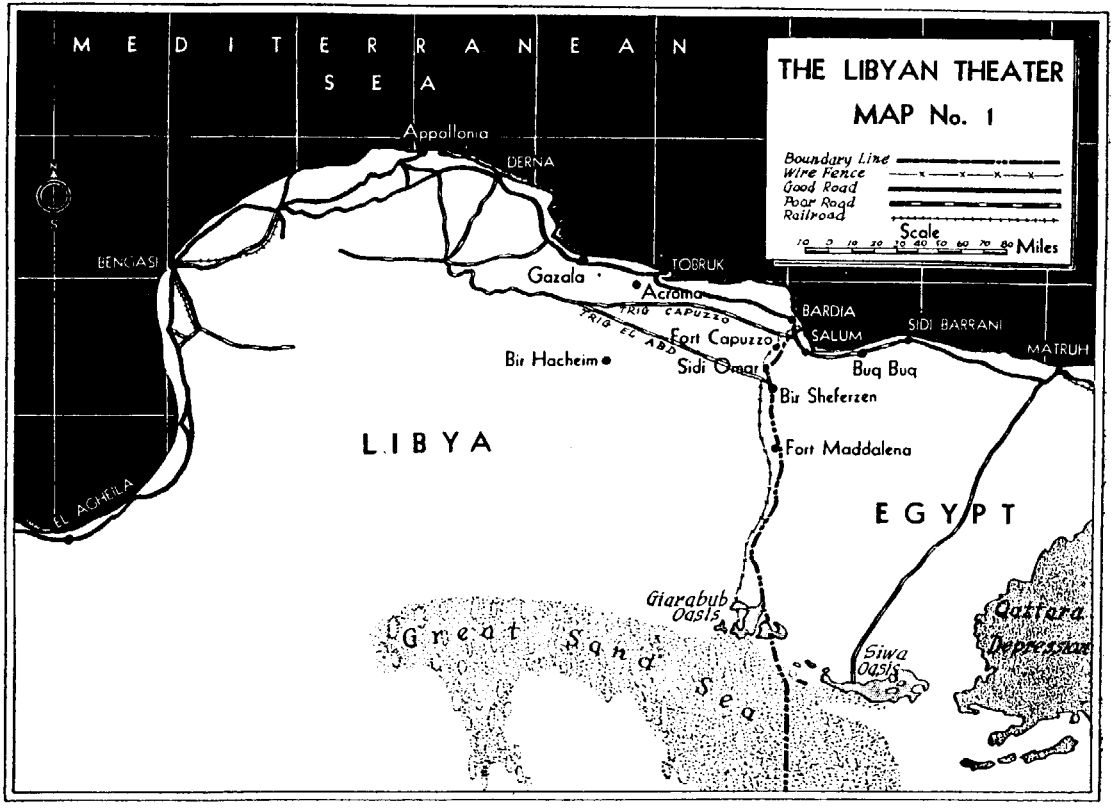
FOREWORD

German military doctrine has stressed the offense, and the ability of the German Army in attack is well known. However, it should not be assumed that when the Germans are thrown on the defensive, they will not know what to do; the Libyan campaigns are evidence to the contrary.

At certain periods in this campaign, the Germans had to take a defensive role and develop defensive techniques in a terrain and type of warfare entirely different from those in other theaters. They showed ability to adapt the old principles of defense to these conditions, and this resourcefulness may be expected in the future. It will take imagination, thorough preparation, and careful reconnaissance to deal with the defensive tactics that may be expected from the Germany Army.


MEDITERRANEAN SEA
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Section I. INTRODUCTION

The German force that was concentrated in Libya during February and March 1941 was indoctrinated with a zeal for the offensive. This spirit was founded both on an aggressive national philosophy and on a body of tactical doctrine that emphasized the importance of achieving and maintaining the initiative. Officers had been taught that attack and its exploitation were the keys to success in battle. In their service schools they had solved ten offensive problems for every defensive one. While one German training manual did set forth in detail the organization of the defense, this lesson had not been mastered.

But the Germans were to face a new problem in North Africa, where supply by sea and desert logistics largely condition tactics. When they failed to take Tobruk in early April 1941 and were again repulsed on May 1, Marshal Rommel's *Afrika Korps*[1] found itself for the first time seriously on the defensive.

[1] The German *Afrika Korps* comprised the 15th and 21st Armored Divisions and the 90th Light Motorized Division. They were made up approximately as follows:

15th Armored Division—8th Tank Regiment, 115th Motorized Infantry Regiment (?), 33d Artillery Regiment, 15th Motorcycle Battalion, 33d Motorized AA/AT Battalion, and services.

21st Armored Division—5th Tank Regiment, 104th Motorized Infantry Regiment, 115th Artillery Regiment, 3d Motorized Reconnaissance Battalion, 39th AT Battalion, 200th Engineer Battalion, and services.

90th Light Motorized Division—155th Infantry Regiment, 361st Infantry Regiment, 361st Artillery Battalion, 190th Engineer Battalion, 190th AT Battalion, and services.

With characteristic German adaptability, commanders devoted themselves to learning the technique of position warfare. While doing this, however, they did not forget their maxim that "The object of the defense is to wear down an attack before launching a counterattack." Led by Rommel and his staff, many lower commanders made important contributions during this experimental period.

The story of the development of German defensive tactics, with its new theories, successes, and failures, has been pieced together from captured German documents. This account is valuable both because it gives an inside view of the enemy defensive system and because it demonstrates the ability of the German Army to learn from experience.

The three maps included in this bulletin were drawn by the Military Intelligence Service, and defensive positions indicated on them are of necessity only approximate. Map No. 1 is included for the purpose of orienting the reader in the North African theater; map No. 2 shows the German front line defenses on the frontier as of November 1941; map No. 3 is included to allow the reader to follow developments in the Gazala—Tobruk sector. Figures are schematic representations of German defensive positions.

Section II. NEW DEFENSE PLANS, MAY 7-JUNE 15, 1941

1. ORIGINAL DOCTRINE

A sound defensive system existed in the German Army prior to the Libyan campaign, but it had to be expanded and altered to meet special conditions existing in the desert. The German doctrine of defense, which formed the basis of the system developed in Libya, may be summarized as follows:

(1) Effective fire is more important than cover.

(2) The object of the defense is to wear down an attack before launching a counterattack, generally with armored troops.

(3) Reconnaissance must be made to discover enemy intentions and to screen one's own positions, which are organized in depth.

(4) A linked fire plan must cover the entire front.

(5) Most of the fire should be concentrated to cover the *stützpunkt* [2] which is the key to the position and the

[2] *Militärisches Wörterbuch*, a German dictionary of military terms, defines *Stützpunkt* as "A strongly constructed and armed point in a defensive position which is capable of being defended when the enemy has forced his way into the defensive position and is able to attack the position from the flanks of the break-through. One must be careful that the *stützpunkt* is well camouflaged in order that it may not be prematurely recognized and neutralized by fire."

Because of the difficulty of giving an exact and concise translation of *Stützpunkt* in U.S. tactical language, the German word is used throughout this bulletin.

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objective toward which the enemy is likely to put forth his main effort.

(6) A series of mutually supporting centers, each capable of all-around defense, must be organized in depth.

For the defense, troops are disposed in three main positions:

(1) *Vorgeschobene Stellungen*, or advanced positions.

(2) *Gefechtsvorposten*, or battle outposts.

(3) *Hauptkampflinie*, or chief battle line, corresponding to the U.S. main line of resistance.. This main defensive position is designed to be held until the counterattack.

In a paper written in early June 1941, a German major lamented the fact that "Our people know next to nothing about the construction of defenses. We have scarcely any exercise in this phase of warfare in our peacetime training. The junior commander does not realize that positional infantry warfare is 60 percent with the spade, 30 percent with the field glasses, and only 10 percent with the gun." In the same paper the major indicates his belief in the superiority of British camouflage and deception.

This criticism was apparently well founded, for the plans for defenses in the spring of 1941 indicated the inadequacy of German defensive training at that time.

In the first German defenses in Libya there was a purely linear fire plan—that is, with units bivouacked within a thin ring of weapons, and weapons, if grouped at all, bunched without variety. This was natural; probably for the first time since they were formed as units, the Germans found themselves seriously on the defensive

after their first failure at Tobruk. They regarded this defensive phase as purely temporary; units were to be covered by an artillery barrage of two batteries over the defiladed tanks of one regiment, part of one machine-gun battalion, and two engineer companies.

A captured document dated May 15 shows a plan of defense for Fort Capuzzo. The antitank guns are strung out in a straight line on the road front. Defense is all-around, however, and there is an advanced position. The only specific roles in defense are assigned to artillery and antitank guns. Counterattack is the master thought in all these documents and infantry defense is a role left (in one paragraph) to an unpopular Italian battalion.

2. THE PLAN UNFOLDS

On May 7 the commander of the 15th Armored Division reiterated previous defensive instructions which had been disregarded. Because of the width of the African front, he discarded the theoretical subdivision into advanced positions, battle outposts, and chief battle line, and divided defended areas into battle outposts, a main defense line, and reserves. The battle outposts, because of the huge front, were to be placed only where the enemy could approach unawares; their role was reduced to that of observation posts by day and listening posts at night. The main defense line (U. S. main line of resistance) must be completely covered by fire. It is pointed out that this line must not be thin for two reasons: because in a thin line a penetration rapidly develops into a breakthrough, and because casualties are heavy when the artillery has registered on a line. During the day only a part

of the machine guns are moved up. This 15th Armored Division directive indicates that at least one-quarter of each company, battalion, and regiment must be kept in reserve for counterattack.

Following these principles, the commanding general of the 15th Armored Division gave his orders. The building of new defenses was to begin the next night. Half of the available force was to work in a zone 550 yards behind the front line; reserves and rear pickets were stationed farther back. Heavy weapons were to be sited the same night, the heavy machine guns on the flanks, the antitank guns echeloned in depth, with antitank rifles and some antitank guns in front of the positions. Sector reserves were to be formed—one or two sections to each company, one company to each battalion. Emphasis was placed on constructing dummy positions, removing and shuffling landmarks, and cutting radio masts to 1 or 2 yards in order to conceal headquarters.

Groups varying from 20 to 80 men, supported by antitank and antiaircraft guns, were pushed forward to operate as battle outposts. By May 10, 2 nights after the order, some 560 positions were being planned, including rifle positions in depth 1,000 yards from the wire. Work started immediately on some of them.

In the pivotal Ras Meduaaur salient (map No. 3), positions were laid out in depth and heavy weapons were sited on the night of May 8/9. There was a company front to every 550 yards and an antitank gun to every 200 yards. The salient was held by one battalion, with two companies in reserve.

The Meduaaur defenses were tested on May 17, when

the British attacked a *stützpunkt* on the German left flank. The defense proved sound. Two German companies fought on in their antitank trenches after the position had been penetrated by tanks, finally repulsing the British. A second attack was driven off by a reserve of one tank company.

A separate group from the 15th Armored Division was located in the frontier area. On May 14 construction was ordered of a scarp sector [3] and of two sectors of advanced positions at Point 191, just south of Salum coastal sector. Prior to this, advanced positions had been outlawed. On the coast there were to be an antitank ditch, wired on either side and covered by fire; field positions for light and heavy weapons, connected by crawl trenches; and antitank emplacements with wire and mines in front of the positions and within them. Low sandbag fortifications had to be used on the scarp, where digging was impossible. Here nests were to be built around antitank weapons placed in groups, wire was to be laid around both nests and groups of nests, and the area between groups was to be strewn with mines and wire. The work was to be done at night and camouflaged by day against air observation.

Upon further orders from the corps to build positions on the frontier for "a long period of defense," the commanding officer of the Frontier Group appointed a reconnaissance headquarters of four officers to start work immediately at Fort Capuzzo. The principles laid down in the directive were: these *stützpunkte* must be held by weak forces until the mobile reserve could counterat-

[3] A sector located on the plateau above the escarpment.

tack; they must have all-around defense; they must be laid in areas where there is natural security against tanks, natural cover for infantry, obstacles, and OP's; and there must be dummy positions.

The front (to be plotted on May 19) was to be made up of four positions: Sidi Omar, Point 206, Point 191, and a coastal position in contact with Point 191 (map No. 2). The rear (to be plotted on May 20) was to contain another group of four positions—Point 208, Fort Capuzzo, Musaid, and Upper Salum. About 500 men daily were needed for the work.

It can hardly be said that a free hand was given to the reconnaissance headquarters, for on May 19 there was an order to start construction of two *stützpunkte* on May 20, one at Point 206 and another at Point 196. The former is 5 miles south of Fort Capuzzo, while the latter includes Qalala. Each of these *stützpunkte* was to have an advanced point. Work was to be done day and night in two shifts—0200 to 0900 hours, and 1500 to 2000 hours. Two German engineer platoons and 160 men from the Italian battalion were to be used on each position, and they were to be heavily screened by tanks, armored cars, artillery, antiaircraft guns, and motorcycle troops. The garrisons considered necessary to hold the *stützpunkte* were—

Point 206:
- 2 infantry companies.
- 1 heavy machine-gun platoon.
- 1 heavy mortar section.
- 3 37-mm and 1 50-mm antitank guns.

3 20-mm and 1 88-mm antiaircraft guns.
1 artillery OP and an alternative OP.

Point 196:

1 infantry company.
1 heavy machine-gun platoon.
1 heavy mortar section.
1 light infantry gun battery.
13 37-mm and 1 50-mm antitank guns.
3 20-mm antiaircraft guns.
Several artillery OP's.
Gun positions for 1 or 2 artillery batteries.

Advanced point:

1 reconnaissance section in foxholes.

Meanwhile, however, the main defense works of the German *Afrika Korps* were being constructed at Gazala (map No. 3) by a labor force of nearly 2,000 men. Great pains were taken; reconnaissance lasted from May 9 to 13. Marking out began on May 14, and the whole advanced position at Bir el Heial (Point 209), 6 miles to the east, was finished by May 23. Work on the antitank defenses and at Alam Hamza began the next day.

The work was governed by three principles: all-around defense; the theory of the *stützpunkt*, or main defensive position; and a model circular platoon position planned by Rommel himself, 270 by 270 yards and laid out in an interdependent series.

The view was that the Wadi Embarech was the key to the Gazala position, and it was therefore planned that it should be covered by a defensive area 2½ miles south of Km 110 on the Via Balbia, between Points 179 and 181. The position was divided into five sectors as follows:

(1) *Bir el Heial.*—At this advanced position were 11 platoon defense areas between Point 209 and the escarpment. This fits into no known conception of advanced positions or battle outposts, but, as it was finished first, this position was probably meant simply to cover the rest of the work in case of an accident at Tobruk. The Germans felt that the situation on the frontier was "tense" at this period.

(2) *Coast.*—Between the forward position on the escarpment at El Azragh and the sea at Point 22 (dune) were nine platoon areas.

(3) *Desert.*—Between the main position, Points 179–181, and Alam Hamza were 15 to 20 platoon areas.

(4) *Rocks.*—Between Points 179–181 and the Via Balbia were 11 platoon areas.

(5) *Block.*—An antitank trench was placed at Km 107 on the Via Balbia, covered by antitank guns from caves in the scarp face.

Thus, at the main defensive position, including the outpost of Alam Hamza, there were to be 26 to 30 platoons out of a total of 46 to 51 platoons—that is, a total of about two regiments of infantry.

The alternative of defense on an arc was rejected because the front would then be too long. Positions were organized in depth with self-contained infantry squads as the basic units. Three of these squads formed a platoon area and three platoon areas made up a company defense area.

It was proposed that the Gazala position should be held either by two Italian divisions or by two Italian regiments, according to their strength, of which Rommel was ignor-

ant. These were to be stiffened by German "corset-stays." It was noted in particular that, as visibility south of the scarp is 5 to 7 miles, the advantage is with the position that has its back to heavily intersected country. The Wadi Embarech thus gives good battery positions, while Wadi Balban and Wadi el Aasi give protection against tanks.

At last a German theory of defense in the desert was emerging—a discontinuous line of big *stützpunkte,* each crystallized out of model "triplices" (see figs. 1 and 2): three sections in the platoon, three platoons in the company, each of these small units capable of all-around defense. As yet, however, there had been no statement on the siting of the heavy weapons within the infantry group.

The frontier defenses then consisted of—

A Salum group as the main "defense-front," with one "positional battalion"—actually a battalion of the 104th Motorized Infantry Regiment had to support this position battalion; the 33d Reconnaissance Unit and a Bardia group on the right flank and in the rear; and a tank group and the divisional reserve ready for mobile intervention.

Salum and Musaid were finally ordered built into independent *stützpunkte* on the principles outlined on May 18 and 19, and Qalala also was ordered built by the Italians into a *stützpunkt* after the operation of May 26 and 27. A fourth important position had been laid down on May 18, but the order apparently had been countermanded the next day.

The tank group was to stand ready 4½ miles north of

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Capuzzo, with forward troops at Alam Abu Dihak and Qalala.

Although the main work was done at Gazala, the main proving ground was felt even now to be the frontier. On May 23 the commander of the *Panzergruppe Ost,* which now included most of the whole of the 15th Armored Division, warned that "The British may at any time try to relieve Tobruk, either by a thrust to the north against the 15th Armored Division, then encircling us from the west, or by a drive northwest from south of Sidi Omar while containing our positions at Salum and Capuzzo." On the strength of this estimate he ordered positions to be held at Point 208, Salum, Point 206, and Qalala.

More heavy weapons were promised—88-mm dual-purpose guns, Italian heavy artillery, and an antitank battalion. An entire antiaircraft battery was brought up. Artillery was to concentrate particularly on the area west of Capuzzo, and the tank patrol contact at Point 206 and Qalala, and was to move with the 8th Tank Regiment, being prepared to lay a general barrage on the area west of the *stützpunkt.*

In short, the development looks large on the map, but contains no new ideas on the details of defense.

On May 26 and 27 the Germans captured Halfaya Pass from the British and were able to make further plans. Musaid and Salum ceased to be important positions; they became *Rückhalten*—in baseball terminology, backstops. The center of the defense became Halfaya, with Qalala only a second *stützpunkt,* and Point 206 again an important position.

Forces were redistributed, and orders given for defense as follows:

(1) *Halfaya.*—A Salum—Halfaya Pass Group was formed, consisting of one infantry battalion, two antiaircraft batteries, and one Italian mobile artillery regiment. Both routes up the scarp to the plateau were to be held; the bulk of the antitank weapons were to be put on the right wing, above the scarp; an Italian company was to be located in the center; the left wing on the coast was to be weak, but well mined; an outpost was to be put at Bir el Siweiyat; Qalala was to be held by a reinforced company; and one or two Italian platoons were to be the backstop.

(2) *Capuzzo.*—The defenses of Point 208 were to be started on May 27; Point 206 was to be held by a reinforced company.

There had been work in this defensive period, not only at Gazala, Meduaaur, and on the frontier, but also at the fourth German point of contact with British forces, on the Tobruk—el Adem road. Here, by May 23, two machine-gun battalions had created a regimental *stützpunkt* of enormous size. On a truncated ellipse of 9½ miles running out from the scarp they had built 76 groups, each of three positions placed checkerwise. The depth of the defended belt averaged 550 yards. Over the 5 miles of front accorded to one machine-gun battalion were 26 heavy machine guns, 13 light machine guns, and about 30 antitank guns, an average of just over 270 yards to every antitank gun. The principal development, however, is that here the trefoil principle of defense first finds its

place on a German map in North Africa. Also the battle outpost recurs, well-mined but ill-armed.

(3) *Security and reconnaissance.*—A reinforced tank company was to cover the guns at Qalala and a reinforced reconnaissance unit was to patrol the line Sidi Omar—Qaret Abu Faris—Sidi Suleiman—Bir el Siweiyat.

There were only slight modifications on May 31, when the main *stützpunkte* of the frontier finally crystallized into four—Halfaya, Qalala, Point 206, and Point 208.

At the same time new orders were given to the 15th Motorized Infantry Brigade, which held the Meduaaur salient, to prepare all-around defenses to meet a possible attack from either the north or the south. Holtzendorff, who had made a defensive reconnaissance at Gazala, was appointed infantry commander. Both battalions of the 115th Motorized Infantry Regiment, one battalion of the 104th Motorized Infantry Regiment, and two oasis companies [4] were placed under him. These were assigned to three sectors—the battalion of the 104th Motorized Infantry Regiment (left); one battalion of the 115th Motorized Infantry Regiment (center); one battalion of the 115th Motorized Infantry Regiment (right). The other companies were held in reserve, as was one battalion of the 5th Tank Regiment, which was south of brigade headquarters. The 39th Antitank Battalion, one company of the 33d Antitank Battalion, and one company of the 605th Antitank Battalion—a total of 50 antitank guns—were allotted to the salient, in addition to an artillery regiment and an engineer battalion. The whole

[4] The organization of an oasis company is not known.

position was at once reconstructed on Holtzendorff's arrival. The southeastern bulge or nose of the salient was given up after it had been thoroughly mined between June 2 and 6, and booby traps were planted in the dead ground.

Under the new plan each battalion had two rifle companies forward, the heavy weapons company halfway back to battalion headquarters, the heavy machine-gun company somewhat farther forward, and the third rifle company in battalion reserve. Sketches of the layout show the great bulk of the light machine guns up against the wire in pairs, with intervals of 40 to 80 yards. Half of the antitank guns were in the front line. Company frontages were about 830 yards, and positions were between 445 to 500 yards deep. The average front of a light machine gun was 55 yards. There was a total of six antitank guns for each company front, or two to every 280 yards. The siting of these antitank guns conformed with the laws of depth.

As usual, defense plans involved the preparation of a counterattack, this time on the right flank with two rifle companies, tanks, antitank guns, and the usual reserve company. The Italians on either flank were always a problem, and when the Ariete Division on the right was relieved by the Pavia on June 4, their extreme left *stützpunkt* was occupied and improved. This was done by the 10th Oasis Company, which turned it into three platoon positions, while the reserve company of the 2d Battalion, 115th Motorized Infantry, turned its rest area into a well-organized defense area with platoon *stütz-*

punkte. Barrage schedules were prepared for heavy machine guns and mortars. Under the new plan eight antitank guns, with infantry guns and heavy mortars, were concentrated on either side of the new mine field in the center. Much had been accomplished, but on June 7 still further improvement was made by bringing up the guns of one battery of the 18th Antiaircraft Regiment.

A few days later there was a weakening of antitank forces, to be explained by the threat of action on the frontier (on June 12, 3 days before the British offensive). Only nine of the antitank guns outside the battalions remained, and the 33d Engineer Battalion was also moved. Infantry reserves were reallotted.

The 33d Engineer Battalion left a record of its work in the Meduaaur salient. Besides taking part in several attacks with its special storm sections, it had removed 3,000 British and 800 Italian mines under fire by early May. On May 19 it began to straighten the salient, and finished by June 1. During this period it had built 33 *stützpunkte* and 10 special positions, each for two antitank guns and one machine gun. It had used 5,185 sandbags, constructed a 3,170-yard double fence, and planted an S-mine [5] ring and a T-mine [6] field, with 674 S-mines and

[5] The "S," or Shrapnel, antipersonnel mine is cylindrical, about 4 inches in diameter and 6 inches high. It weighs about 9 pounds and contains 1 pound of explosive studded with 250 steel balls. The mine is detonated by a push-or-pull igniter operated by contact boards, pull wires, etc. It is projected into the air by a secondary charge before its shrapnel charge explodes.

[6] The "T," or Teller, antitank mine weighs 22 pounds and contains 11 pounds of TNT; it is 15 inches in diameter and 4½ inches high, with a convex top and a flat bottom. It is usually buried about 2 inches below the surface of the earth.

1,674 T-mines. In the abandoned nose of the salient it had left another large field of 2,300 T-mines, 159 booby traps, 1,560 pressure mines, and 139 trip-wire mines.

The improvement in German defensive practice is exemplified by the layout of the weapons in the 2d Battalion of the 104th Motorized Infantry, which was in the left flank of the salient on June 20. There were groups of

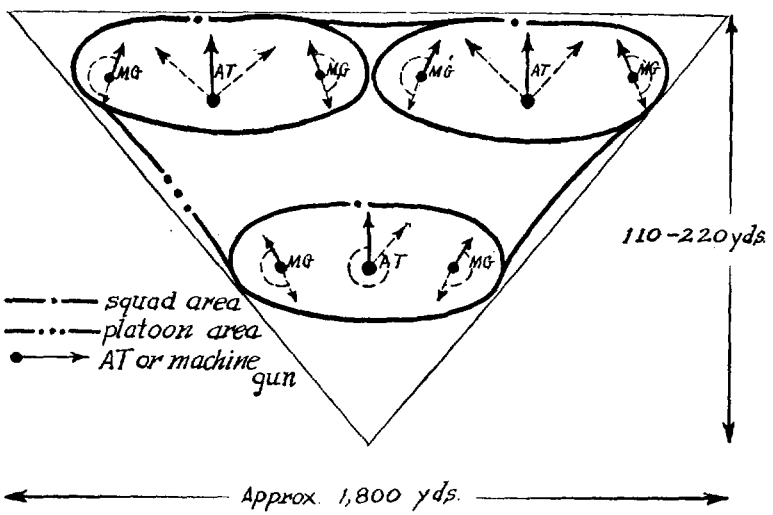

FIGURE 1.—Typical German trefoil (platoon illustrated).

weapons extending all the way back to battalion headquarters; the light machine guns were thinned out in the front line until there was only one each 110 yards; the antitank guns were placed at 330-yard intervals; company frontage was 990 yards; and company depth (to battalion headquarters) was 1,100 yards.

Major Halierstedt, a German officer who at this time wrote a report on positional infantry warfare in Africa, was not yet satisfied. He emphasized the difficulties of Africa, where the climate required that work be done at night and with limited control. It was difficult also to find sufficient fields of fire for the numerous light machine guns in mobile units. A battalion sector in the Meduaaur salient was about 1,780 yards, and on the basis of a two-company front, each company with 18 light machine guns, there were only 50 yards for each weapon.

The answer was the old one: disposition in depth. Heavy weapons too must be withdrawn to positions where they could fire over the forward lines and be controlled by one officer, the *Führer schwerer Waffen* (heavy weapons commander). It was easy to cover every point with fire, for there were 80 heavy and light weapons in a motorized infantry battalion. Indirect machine-gun barrages at 2,200 yards had failed, for the troops had forgotten accuracy and correction in France. Barrage fire from all weapons, he said, should be brief, only a quarter or a half minute; otherwise it would cost too much ammunition. Antitank guns should be hidden and should fire only when tanks attacked. Battalion antitank guns should remain hidden, also firing only when tanks attacked. Battalion antitank guns (three) should support the front line; other antitank guns (generally two platoons, or six guns of an antitank company) should remain somewhere near battalion headquarters. Any part of the battalion system which they do not control must be mined.

An officer named Ballerstedt made the first statement in writing on the trefoil (fig. 1) in defense, which was mapped

by the 8th Machine-Gun Battalion. All weapons must, he said, be placed in half-moon triplices, the heavy in the center and the two light machine guns on the sides. We shall see later how this developed under the instructions of Major General von Ravenstein.

The time approached when German theory was to be put to the test. Orders warning of the approaching tanks came on June 12. They indicated the attack, but not that it would be a general offensive.

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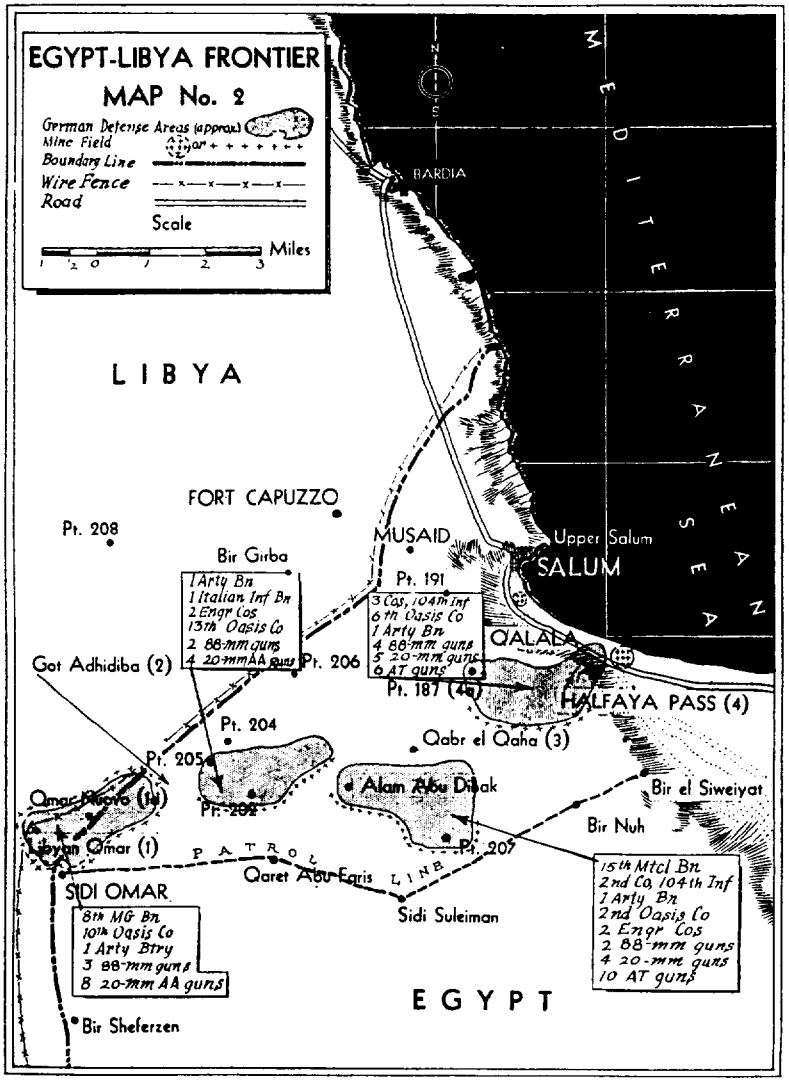
EGYPT-LIBYA FRONTIER
MAP No. 2
German Defense Areas (approx.)
Mine Field
Boundary Line
Wire Fence
Road
Scale
Miles
1 0 1 2 3
N
W E
S
MEDITERRANEAN SEA
BARDIA
LIBYA
FORT CAPUZZO
Pt. 208
Bir Girba
1 Arty Bn
1 Italian Inf Bn
2 Engr Cos
13th Oasis Co
2 88-mm guns
4 20-mm AA guns
MUSAID
Pt. 191
3 Cos, 104th Inf
6th Oasis Co
1 Arty Bn
4 88-mm guns
5 20-mm guns
6 AT guns
Upper Salum
SALUM
QALALA
Got Adhidiba (2)
Pt. 206
Pt. 187 (4)
HALFAYA PASS (4)
Pt. 204
Qabr el Qaha (3)
Pt. 205
Alam Abu Dihak
Bir el Siweiyat
Omar Nuovo (1)
Pt. 202
Bir Nuh
Libyan Omar (1)
PATROL
Pt. 207
Qaret Abu Faris
LINE
15th Mtcl Bn
2nd Co 104th Inf
1 Arty Bn
2nd Oasis Co
2 Engr Cos
2 88-mm guns
4 20-mm guns
10 AT guns
SIDI OMAR
8th MG Bn
10th Oasis Co
1 Arty Btry
3 88-mm guns
8 20-mm AA guns
Sidi Suleiman
EGYPT
Bir Sheferzen

Section III. THE THEORY TESTED ON THE FRONTIER[7]

1. GENERAL

The Germans (15th Armored Division) had established four main *stützpunkte:*

(1) Halfaya—one battalion (three companies of the 1st Battalion of the 104th Motorized Infantry, and one company from the Italian Battalion de Francesco).

(2) Qalala—one company (6th Oasis Company).

(3) Point 206 (5 miles south of Capuzzo)—one company (probably from the 15th Motorcycle Battalion).

(4) Point 208 (5 miles west of Capuzzo)—one company (machine-gun company from the 15th Motorcycle Battalion).

Each of these *stützpunkte* had its artillery. Halfaya had eight and Qalala four 105-mm gun-howitzers, but details of the other two *stützpunkte* are not known. All

[7] This section is based, like the foregoing, solely on German documents and thus gives only the German version of the campaign. These documents, however, are ordinary reports of units and are quite distinct from the version produced as propaganda in the German magazine "Signal."

See *The Battle of Salum*, WD MID Special Bulletin No. 36, November 17, 1941.

posts had antiaircraft guns, as shown below, and all of them were used principally against tanks.

The second element in the German defensive system was a mobile infantry reserve, consisting of 45 companies of infantry, some antitank guns, and some antiaircraft guns. This reserve played an unimpressive part in the battle.

The third element was a tank striking force, which was divided into two parts:

(1) The 8th Tank Regiment.

(2) The 5th Tank Regiment, followed by the two motorized machine-gun battalions, which "clinched" the Germany victory by its wide desert sweep of 55 miles.

"Clinched" is used advisedly, for this result was made possible only by the terrific antitank performance of the twelve 88-mm guns of the 1st Battalion of the 33d Antiaircraft Regiment, attached to the 15th Armored Division. This battalion was distributed as follows:

Halfaya—Four 88-mm and eight 20-mm guns (also covering Qalala).
Point 206—Four 20-mm guns.
Point 208—Four 88-mm and two 20-mm guns.
Infantry reserve—Nine 20-mm guns.
8th Tank Regiment—Four 88-mm and eight 20-mm guns.

The 88-mm gun, the 5th Tank Regiment, and the solid defenses of Halfaya and Point 208 won the battle for the Axis. Documents show that it was touch-and-go on the second day, when elements of the 15th Armored

Division very nearly let British tanks into Bardia, being saved only by their 88-mm guns with pick-up crews.

The Germans, whose theory was that the defensive positions should effect a temporary check pending a powerful armored counterattack, had stocked them with food and water for only 2 days. They took a great deal of punishment, but played an important part by gravely damaging the British tank force before the final attack.

An observation post was formed at Sidi Suleiman by the 33d Reconnaissance Unit and a motorcycle platoon, and there is mention of battle outposts, which appear to have been no more than listening posts.

Germany's side of the battle is best studied by reference to the reports of Major Bach and Lieutenant Paulewicz, who commanded, respectively, a battalion of the 104th Motorized Infantry and a machine-gun company of the 15th Motorcycle Battalion, in the two main positions. Four captured documents tell of the futile movements of the mobile infantry reserve, whose commander, Colonel Knabe, was at one time hidden in a hole beneath the main road within the area occupied by the British. The difficulties of the 8th Tank Regiment are also related in this document.

But the most illuminating picture is that of a battery of the 33d Antiaircraft Regiment, which chalked up 92 armored vehicles (including 82 tanks), which they claimed to have completely destroyed with 1,680 rounds of 88-mm shell and 13,500 rounds of 20-mm shell. As the 20-mm fire knocked out only three tanks, the 88-mm guns got a tank for every 20 shells fired in this action.

2. THE ACTION AT HALFAYA

The defending forces were as follows: one company on the coastal plain behind a mine field, one Italian company facing east on the edge of the plateau, and one company facing to the south and west of the Italian company. Four 88-mm antiaircraft guns were sited in the front line covering the open right flank. The eight Italian gun-howitzers were distributed between the front line and the interval between Halfaya and Qalala, and the battalion held a company in reserve.

The main attack by the British tanks on the open right flank was stopped by the 88-mm guns after fire had been taken up by the 20-mm guns and all other weapons at 440 yards. When the attack had been broken, a patrol was sent out to establish the position of the British infantry, which was then pinned down by Axis artillery. There was a counterattack by the battalion reserve in which 67 prisoners and important codes and maps were captured. A second attack by the British followed in which the Axis held fire until the infantry was within 440 yards, then opened with 20-mm antiaircraft guns. The British plan to attack by the coast was foreseen and one 88-mm gun was placed there.

Two more infantry attacks on the second day (June 16) were stopped short by an artillery barrage, accompanied by 20-mm and infantry fire. During the morning, German airplanes bombed their own artillery and antiaircraft positions, and in the afternoon the ammunition situation became critical—the artillery reporting that only 600 shells remained and that antiaircraft ammunition was running short. Bach was worried about food and water.

A message from the German *Afrika Korps* was dropped by air at 2000 hours: "All depends on holding Halfaya." He answered: "All depends on your sending us ammunition and food." As time had not permitted him to reconnoiter positions, he did not obey Knabe's order to clear the shore and concentrate on the pass. The next day aircraft dropped ammunition for small arms and 20-mm guns. The British retreat began, harassed by artillery, antiaircraft, and heavy machine-gun fire from Halfaya, and in the evening the position was relieved.

In the course of the action at Halfaya 20 British tanks and 8 armored cars were destroyed, and 98 prisoners were taken. Losses were small—8 killed and 32 wounded (excluding antiaircraft and antitank personnel). The Iron Cross, Class I, was awarded to Bach.

The report of the 1st Battalion of the 33d Antiaircraft Regiment indicated that this unit played an important role in the victory. Its guns opened up on the tanks at 2,200 yards at 0500, knocking out one cruiser tank; then they held fire until the opposing tank force approached to within 330 yards, where dust did not obscure the targets, and bagged nine infantry tanks. After this the entire battalion fired high-explosive shell into the infantry, forcing it to take cover. The 88-mm guns on the coast knocked out three infantry tanks. On the second day the 20-mm guns were pushed forward to eliminate machine-gun nests and an OP at 1,650 yards, while the coastal gun was used to scatter concentrations of motor transport and an infantry battalion. The antiaircraft guns thus eliminated 14 of the 20 attacking tanks, and doomed the British attack to failure.

3. THE ACTION AT POINT 208

When the attack alarm was given, two patrols from Point 208 were sent 2 miles to the south because of mist which blanketed the area. Fire was held for some time after tanks were first observed, because they were in the barrage area of Point 206. The 37-mm antitank guns opened fire first to drive off armored cars which were within 165 yards. Meanwhile the barrage from Point 206 had ceased, but Paulewicz gave orders to hold all antitank fire until vehicles approached to within close range in order not to give away antitank positions prematurely. This policy proved effective, for subsequent British artillery fire on Point 208 was inaccurate.

At 1015 on June 15, the British made a pincer attack on Point 208 with 45 tanks. The attacking force was soon reinforced to 70 tanks. Fire by all weapons was opened at close range. The left or easterly sector of the area was overrun, one 37-mm and one 20-mm antitank gun were knocked out, and one of the 88-mm guns was silenced. The commander of Point 208 immediately ordered the three 88-mm guns on the other flank to concentrate on the eastern sector, and this saved the situation for the Germans by enabling the silenced 88-mm to reopen fire. By 1130 hours 11 British tanks had been smashed and the rest driven away, and in the afternoon a new 14-tank attack was thrown back with 8 tanks knocked out. After that, Point 208 was secure and was used as a base for reforming the 8th Tank Regiment and the mobile infantry reserve.

The 1st Battalion of the 33d Antiaircraft Regiment had knocked out 19 tanks with its 88-mm guns. The

description of the battle given in the battalion report differs slightly from that of Paulewicz. The 88-mm guns opened up at 1,760 yards and drove back the first tank attack without inflicting any casualties. In the pincer attack, the gun on the left flank knocked out two cruiser tanks before it was overrun. The three other 88-mm guns on the right opened fire upon the other arm of the pincers at 1,550 yards without getting hits, but later knocked out seven cruiser tanks at close range. In the third attack the 88-mm guns opened at 880 yards, knocking out eight cruiser and later two infantry tanks.

4. THE ACTION AT POINT 206

Point 206 had no 88-mm guns, but five British tanks were knocked out by its antitank guns in the first attack. The 20-mm antiaircraft guns, however, proved useless. This *stützpunkt*, the only one captured by the British, was finally overrun after the last 50-mm gun had been knocked out.

5. THE MOBILE INFANTRY RESERVE

The 20-mm guns of the infantry reserve were ineffective against British tanks, even at close range. One battery engaged tanks at 110 yards in the area south of Capuzzo, but retired rapidly when its shells bounced harmlessly off the armor plates. Another 20-mm gun drove away an infantry tank without damaging it by firing 180 rounds in rapid succession at 110 yards. An 88-mm gun, detached from Halfaya and emplaced alone east of Capuzzo, opened fire at 2,200 yards and knocked out four infantry tanks.

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The difficulties of the mobile reserve during this day have been recounted in the reports of its unit commanders. The commander of a company of the 15th Motorcycle Battalion described the fear among his troops when infantry tanks approached, and told how they unsuccessfully attempted to recapture Capuzzo. On one occasion, a platoon ran a mile while the German antitank guns were taking refuge under cover of a solitary 88-mm gun.

British tanks occupied Capuzzo after the mobile reserve advanced through it to relieve Point 206. After two ill-organized attempts to recapture Capuzzo, which had previously been held by Italian troops, the reserve found that their most powerful antitank guns could do nothing against the infantry tanks at 550 yards. In a fierce counterattack, these infantry tanks rolled over that part of the road where Colonel Knabe was hidden, and the mobile infantry reserve retreated.

This situation was admitted by the Germans to have been the most serious in the whole battle. There was danger of a break-through to Bardia where their base installations were located, but they were saved by one 88-mm gun which had been lying derelict with a broken tractor north of Capuzzo. It was coupled to a truck and a pick-up crew was recruited from the transport column. The tanks of the German 8th Tank Regiment were being slowly driven back. For the moment the 88-mm gun stopped firing and withdrew to avoid encirclement. In a new position it knocked out two infantry tanks. The British tanks retired and formed for a new attack on the other flank. The 88-mm gun hurriedly took up a new position and knocked out two tanks. The rest

retired, believing that they were opposed by a number of 88-mm guns. The gun then followed up to counterattack on the right flank of a German tank advance, and knocked out five more infantry tanks in front of Capuzzo. The situation was saved and Knabe was released from his hiding place.

6. THE TANK STRIKING FORCE

German defensive theory emphasizes the role of the armored striking force, stating that defense is simply a temporary expedient. The 8th Tank Regiment meant it to be temporary indeed, for by 1030 on the first day of the action they were well up from their assembly area north of Capuzzo, and by 1130 one company was already engaged on the frontier. Reinforced by a second company, it nevertheless had to withdraw before superior numbers. In doing this it ran out of ammunition, allowing the British to take Capuzzo.

By this time two Mk. III tanks had been knocked out, and some others had fallen out with damage to their guns and engines. A third company was now called in to prevent the British from breaking through west of Capuzzo, but it also had to retire. Later in the day the 1st and 2d Battalions of the 8th Tank Regiment attacked Capuzzo in succession, but failed to get through and withdrew before dark to a position near the Bardia road. The 8th Tank Regiment had violated the rules of German tank doctrine by attacking in detail.

Next day, June 16, the regiment was ordered to attack Capuzzo once more, this time with both battalions combined. The 1st Battalion had now only 6, 4, and 9 of

the 8 Mk. IV, 18 Mk. III, and 13 Mk. II tanks, respectively, with which it started the battle. The British tanks struck out of the morning mist, and once more there were heavy casualties in the 3d Company. The commander of the 1st Battalion had his tank shot through twice by fire from infantry tanks at 330 yards, and the 1st Battalion had to withdraw with only three operative Mk. III tanks and one Mk. II. It is clear that if British tanks had been able to take Bardia, the 8th Tank Regiment would have been finished.

By the evening of the second day, two Mk. II, nine Mk. III, and two Mk. IV tanks had been repaired (the damage had been mostly to guns), and stood ready to defend Bardia.

The report of the 1st Battalion of the 33d Antiaircraft Regiment explains some of these moves. The four 88-mm guns attached to the regiment had participated in the first frontier action. After opening up at 2,000 yards, they had knocked out 12 tanks, 2 of them infantry tanks struck at 1,320 yards. British artillery then forced the 88-mm guns to withdraw (it will be noted increasingly that the chief fear of the Germans is British artillery). During these engagements a 20-mm gun knocked out an infantry tank with a lucky hit on the exhaust at 275 yards.

In the Capuzzo action of the second day 88-mm guns, firing through a mist, knocked out eight infantry tanks, including one hit in the turret at 550 yards. British artillery, however, forced the crews of the 88-mm guns to take cover and British tanks meanwhile approached to within 330 yards and damaged three of the four guns. The one intact 88-mm and two 20-mm guns knocked out

three more British tanks at ranges between 275 and 350 yards, but the German tanks were not in condition to follow up this advantage.

The 2d Battalion of the 8th Tank Regiment was now ordered to cross the frontier and join with the 5th Tank Regiment of the 5th Division. An infantry officer who observed the resulting action attributed the regiment's success in breaking through a British tank force on the frontier to the artillery and antiaircraft support. The 88-mm guns appear here in a new role. The tank battalion had picked up those which had saved Point 208, and had repaired at least two others damaged at Capuzzo. Some of these ran on the flank of the advance, others went 220 yards ahead of the leading tanks. The first group knocked out 2 infantry tanks and the second plunged straight ahead at the British formation of 20 infantry tanks, destroying seven of these before the German tanks had opened up. The way was clear to a rendezvous with the 5th Tank Regiment, as well as to Halfaya. The 1st Battalion of the 8th Tank Regiment suffered heavy losses from two British air attacks while en route to join the 3d Battalion. The first attack was by six strafing Hurricanes and the second by numerous bombers. Total losses were one Mk. IV (knocked out), one Mk. III (crew casualties), and one ammunition, one fuel, and one transport truck (rendered unserviceable). Five of the personnel were killed and 16 were wounded. The battalion turned back from this rendezvous.

The German defensive system had contributed heavily to a victory which might easily have been a defeat.

Future historians may say that the battle was won by the 88-mm gun and the 5th Tank Regiment's 50-mile drive through the desert to Sidi Suleiman, but it was the stubborn defense of *stützpunkte* that gave an opportunity for the employment of offensive tactics. The organization of these defensive positions in depth had allowed them to hold out until a typical German limited counteroffensive could be put in motion.

Without the 88-mm gun, however, none of the positions could have repulsed the British drive. It opened fire either at 2,200 to 1,760 yards or at 880 to 550 yards, but its most effective ranges were certainly in the lower bracket. British sources state that artillery is the most effective means of combating this gun, which is said to have destroyed 79 tanks as compared with the 64 claimed by the tanks of the 8th Tank Regiment.

Section IV. NEW THEORY FROM EXPERIENCE ON THE FRONTIER

The frontier warfare resulted in a flood of theory on defense, much of which originated with Rommel and his three major generals, Neumann-Silkow, Summermann, and Ravenstein.

1. NEUMANN-SILKOW

Neuman-Silkow emphasized the value of antitank trenches, as at Point 208, which remain tenable even when an enemy has penetrated a defense area. He ordered them to be dug at all positions. He declared the personality of the *stützpunkt* commander (undoubtedly thinking of the fine showmanship of Bach) to be one of the most important elements in *stützpunkt* defense.

For special emphasis, he singled out the camouflage of Point 208, where the British had not seen the position even after penetrating the defended area. He directed that stone walls be removed and used in future only on dummy positions, and that 88-mm guns should open fire before the 37- and 50-mm weapons, which should remain hidden and fire armor-piercing ammunition at short ranges.

The artillery in defense, he said, has three principal missions: to attack concentrations of tanks and motor transport; to disperse columns pushing past *stützpunkte;* and to lay a barrage on infantry attacks. It was not to fire upon individual tanks except at close range, when the position had been penetrated. All artillery (including antiaircraft) must be prepared to move rapidly out of the *stützpunkt* in an offensive role.

In the counterattack, artillery was to fire upon tank concentrations, infantry in trucks, enemy batteries, and retreating forces of all kinds. The 88-mm guns were to be used for opening a tank battle. German tanks were not to halt while under enemy fire, but were either to make a sudden dash in one direction or to disperse.

2. SUMMERMANN

Summermann worked out an elaborate timetable for individual weapons in the defense of a *stützpunkt.* By the time he wrote his report, the individual positions on the frontier had been vastly improved in the light of the recent battle, and he believed them to be impregnable (in the German sense, that is, tenable until the counterattack by tanks). The governing principle was all-around antitank defense with every weapon, including rifles, that can damage any part of a tank. Summarized, the system was this:

First phase.—Antiaircraft and antitank guns open fire on attacking tanks, the heaviest fire being directed on masses of tanks and tanks attacking gaps in the mine fields. The artillery fires on enemy artillery accompanying the tanks and on all active batteries; if there is no

artillery accompanying the tanks, the artillery fires on tank masses. The infantry defends with heavy machine guns, light machine guns, and rifles against low-altitude air attack, there being no other weapon then available against enemy aircraft.

Second phase.—Antiaircraft and antitank guns, then guns and antitank rifles, fire on the tanks, aiming now at the nearest, often firing very low over the heads of their own troops. The artillery fires on the enemy artillery covering the attack of the motorized infantry, and fires also on any masses concentrating behind the tanks. The infantry divides its attention between enemy aircraft and the tracks of tanks.

Third phase.—Antitank guns continue to fire on tanks, concentrating on those that have penetrated the positions. This fire naturally endangers the defending infantry, but is less dangerous to them than the enemy tanks. The artillery continues to fire counterbattery and on targets of opportunity. The infantry now finds its position eased by the arrival of friendly aviation over the *stütz-punkt,* and turns to fighting tanks with hand-to-hand weapons—bottles of gasoline, grenades, explosives—at the same time engaging the enemy infantry.

Enemy penetrations into subsectors are driven out by counterattacks of strong forces in pincer formation. Penetrations between subsectors are blocked by antitank guns supported by artillery and infantry.

3. RAVENSTEIN

Ravenstein's report was more specific than the other two. He felt that he still had to combat the idea of linear

defense. He expanded Ballerstedt's principle—one heavy weapon, two light machine guns connected by crawl trenches 33 yards away by applying it to isolated platoons. Varying with the width of front allotted, the minimum depth for a platoon was to be between 110 and 220 yards. In *stützpunkte*, the command posts of the infantry, field artillery, and 88-mm guns should be close together. Dummy positions should be built when time permits and camouflage technique should be improved. There should be no long communication trenches, as these tend to weaken a position's power of resistance by thinning out the defending troops and giving the enemy cover for penetration. Mine fields, carefully marked, should be laid inside and outside of positions.

Orders were given to build a new defensive line in accordance with the above principles. The 200th Regiment was the first in the field. The 2d and 8th Machine-Gun Battalions, the 2d Oasis Company, and the regimental reserve were assigned to build and occupy a series of southern defense areas extending to Sidi Omar. These positions were Bir Girba and Point 202 (headquarters of the 2d Machine-Gun Battalion); Points 205, 206, and 204 (on the frontier, headquarters of the 8th Machine-Gun Battalion); and two *stützpunkte* at Salum. As usual, all-around and subsector defenses were ordered, and each position was to have at least one heavy antitank gun and several 37-mm guns, antitank rifles, heavy machine guns, and light machine guns.

On June 10, however, the 5th Tank Regiment referred to the armament of each *stützpunkte* as "one machine-gun battalion, one battery of artillery, one antitank company,

and two or three 88-mm guns." This seems nearer to their eventual strength after the Italian battalions and the oasis companies had been added.

Antitank guns were to be fixed in their firing positions and well dug in against British artillery fire. Engineers were to do this for the 88-mm guns. Artillery was to be emplaced so as to fire over open sights, but protected against tank attack by being located well within the system. Every antitank gun was to be able to fire in all directions. Another document, dated June 2, 1941, shows that the 3d Reconnaissance Unit was covering this work, based on Sidi Suleiman, and that the 15th Armored Division was working from Capuzzo to the sea. Further protection was given by the 1st Battalion of the 75th Field Artillery and the 2d Battalion of the 33d Field Artillery. Counter-attack roles were assigned the 5th Tank Regiment and the 605th Antitank Battalion. Antitank weapons were to vary between 2 (both 88-mm) and 17 in the separate *stützpunkte*. The strongest positions were to be Point 206, with three 88-mm guns, and Bir Girba, with two 88-mm guns. Artillery orders show that there was to be concentration of direct fire against tanks, and that guns would be able to swing rapidly to other targets. One section of each battery was to be prepared for mobile work.

Halfaya, in spite of its already formidable defenses, was to be strengthened. One thousand mines were to be added to the mine field on the coast, and company positions were to be rebuilt. The frontage of two of these were 720 and 770 yards, and 1,980 yards of wire were laid

in front of them. Two thousand more mines were needed to cover the gap between Qalala and the artillery position on the right flank, through which the British tanks would have broken on June 15 had it not been for the 88-mm guns. Qalala, it was reported, could be completed in 10 days. Two 88-mm guns each were proposed for Qalala and Halfaya.

4. ROMMEL

On July 27, possibly dissatisfied with the standard of work done by the 5th Light Division, Rommel ordered the 15th Armored Division to take over the fortification of the frontier. A completely new plan was mapped which included reestablishing the frontier defenses as they existed when broken by the British offensive of November–December 1941. To help man the line, the 10th and 13th Oasis Companies were brought forward on June 22 (the 2d and 3d Oasis Companies were already there). These were placed for a few days at Capuzzo, and then, together with the 8th Machine-Gun Battalion, the 15th Motorcycle Battalion, and the 1st Battalion of the 104th Motorized Infantry, over the whole system.

The line ordered was: from Sidi Omar to Halfaya, inclusive, four *stützpunkte* of battalion strength and three intermediate *stützpunkte* of company strength, the whole divided into two building sectors, the West Sector in charge of the 104th Motorized Infantry Regiment (commanded by the experienced Colonel von Holtzendorff), and the East Sector in charge of the 15th Motorized Infantry Brigade. The East Sector was divided into two subsectors, Halfaya (battalion *stützpunkt* 4 at Halfaya

and company *stützpunkt* 4a at Point 187, to the southwest) and Qabr el Qaha (battalion *stützpunkt* 3 at Point 207 and company *stützpunkt* 3a, 2 miles northwest of Alam Abu Dihak). The west sector was divided into two subsectors, Got Adhidiba (battalion *stützpunkt* 2) and Sidi Omar (battalion *stützpunkt* 1 at Libyan Omar, and company *stützpunkt* 1a at Omar Nuovo). Great speed was enjoined; reconnaissance of all these positions was to be completed on June 26, and building was to begin the following day.

Libyan Omar and Omar Nuovo were allotted the 8th Machine-Gun Battalion, the 10th Oasis Company, a battery of artillery, three 88-mm and eight 20-mm antiaircraft guns, and some antitank guns of unspecified caliber.

Got Adhidiba was allotted an Italian battalion, the 13th Oasis Company, two 88-mm and four 20-mm antiaircraft guns, and a battalion of artillery, in addition to two engineer companies for constructing the position.

Point 207 and the nearby company position were allotted the 15th Motorcycle Battalion, the 2d Company of the 104th Motorized Infantry, the 2d Oasis Company, two 88-mm and four 20-mm antiaircraft guns, ten antitank guns, and a battalion of artillery, as well as two engineer companies for the construction of the position.

Point 187 and Halfaya were allotted three companies of the 1st Battalion of the 104th Motorized Infantry, the 6th Oasis Company, four 88-mm and five 20-mm antiaircraft guns, six antitank guns, and a battalion of artillery.

One earlier weakness in the *stützpunkt* system was mitigated by an order to stock each position with two full echelons of ammunition, 2,000 gallons of water, and rations for 6 days. Emergency concealment was stressed in orders which required all motor transport to be kept more than a mile from the positions, or, in the case of gun tractors, to be dug in at the gun emplacements. Holtzendorff ordered that Libyan Omar be built in a form more linear than the trefoil, "because we have no mines for the position." He admitted that the plan differed from Rommel's idea of the advanced position at Gazala (Bir el Heial), as the reinforced squad areas (antitank gun with two machine guns) lay 220 yards apart. At Got Adhidiba, where there were mines, he had carried out the trefoil in companies and platoons.

There were 22 antitank guns, mostly Italian 47-mm guns, with the infantry units Libyan Omar and 16 at Got Adhidiba.

The Omar Nuovo area was laid out as a battalion *stützpunkt* after an Italian battalion of three companies joined the defenses. The position was laid out in German trefoil and held by about 720 men with four 65/17 guns and eighteen 45-mm mortars. Initially there was no antiaircraft or antitank defense.

Security was systematically organized. Each subsector was to send forward once or twice at different times each day a motorized antitank patrol, and also to send another patrol to make contact with the adjoining positions on the left. During the daytime subsectors were to maintain OP's, and at night double listening posts were

to be established. These posts would be ⅝ mile forward and would have the special job of reporting any sound heard. Each was allotted a motorcycle messenger. They were to be withdrawn only at daybreak, or during mists or sandstorms. All patrols were to warn the *stützpunkte* of a surprise attack by long bursts of fire, and were to return to their *stützpunkt* from the rear. Platoons were organized to support each other with fire, and field artillery developed defensive barrage plans. A map of the 13th Oasis Company at Got Adhidiba shows its three platoons dispersed at 1,000-yard intervals.

Holtzendorff gave ranges for opening fire as follows: 88-mm guns, 1,650 yards; antitank guns, 440 yards; 20-mm antiaircraft guns (concentrated on infantry and heavy machine guns), 440 yards; all infantry weapons, 440 yards.

Rommel was displeased by the linear positions at Libyan Omar, where the 8th Machine-Gun Battalion had laid out trefoils of one heavy weapon and two light machine guns along the three sides of an empty triangle. Holtzendorff and Major Teetz, who commanded the new oasis battalions, went there to modify the defenses by new section sectors according to the principle of defense in depth. Defense groups were shifted so that machine guns were more than 40 yards from supported antitank weapons. An interesting note by Holtzendorff shows that German defense theory was becoming standardized in detail: The 8th Machine-Gun Battalion has the sketches for the laying of section *stützpunkte* at Ras el Meduaaur, but not the second sketches for the laying of platoon and

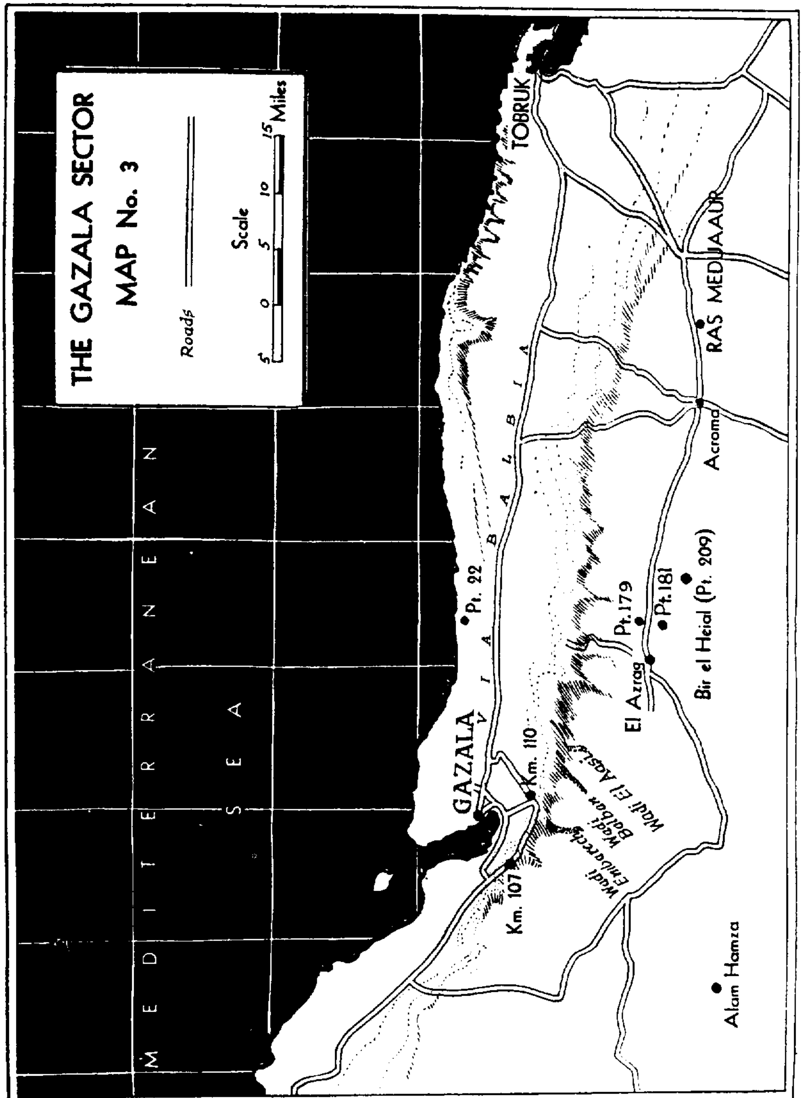
company *stützpunkte* at Gazala. This is apparently because these positions took a rather different form in the Meduaaur sector, owing to their combination with fixed fortifications. The Gazala sketches are being issued to all units.

Finally, on July 1, the 15th Armored Division started building a large mine field in front of the *stützpunkte*. Gaps were marked in various ways: some with red and yellow paint on stones, others by lines of gasoline cans.

Shortly after July 12 an order signed by Rommel shows that the 8th Machine-Gun Battalion and the 15th Motorcycle Battalion were to be replaced by Italian units, the Savona Division taking over the entire front except for Halfaya and Point 187. The only German troops to remain in the Italian sector were the 2d, 10th, and 13th Oasis Companies, and antiaircraft units. These were to stiffen the defenses of Alam Abu Dihak, Libyan Omar, and Got Adhidiba, respectively. German antitank guns were replaced by Italian, and the artillery in each *stützpunkt* was increased by one or two batteries.

Even so, Rommel was not satisfied with the all-around defense of Point 187, and strengthened it with another oasis company, presumably to hold the beach extending north to Salum. The antitank defense was augmented by the addition of some 75-mm antitank guns. Halfaya had become a company *stützpunkt*, and a string of immobilized tanks used as pill boxes were placed to strengthen the line Qabr El Gaha—Halfaya—Point 187. (This idea seems to have been Rommel's own.) Halfaya was to get one 88-mm gun and three 75-mm antiaircraft guns, while Point 187 was allotted one 75-mm antiaircraft gun.

The system was completed by the construction of battalion-strength positions at Point 187, Halfaya, Alam Abu Dihak, Qabr el Qaha, Got Adhidiba, Omar Nuovo, and Libyan Omar, with a line of *vorgeschobene stützpunkte* (advance posts) about 2 miles in front of them. Until November the only contact with British forces was by the German reconnaissance unit, whose job it was to discover changes in the British armored car outpost line and to defeat British reconnaissance. During this period an almost continuous mine field was laid along the defense line.


THE GAZALA SECTOR
MAP No. 3
Roads
Scale
5 0 5 10 15 Miles
MEDITERRANEAN
SEA
TOBRUK
VIA BALBIA
GAZALA
Pt. 22
Acroma
Pt.179
Pt.181
Bir el Heial (Pt. 209)
El Azrag
Km. 110
Km. 107
Alam Hamza

Section V. THE ACTION AT TOBRUK

On the night of August 2/3 the Meduaaur salient of Tobruk, from which the 115th Motorized Infantry Regiment and the 2d Battalion of the 104th Motorized Infantry Regiment had not yet moved, was attacked by the British. German documents give a fairly complete story of this assault.

The right and left flanks of the salient were attacked by three companies drawn from two Australian battalions. The extreme position on the left flank was taken, but was recaptured by the Germans on the following day, August 3. German losses were 30, British much higher.

The first defensive measure, at least of the 2d Battalion, 115th Motorized Infantry Regiment, was barrage fire. Just after the report that the enemy had broken in behind the position on the right flank, all telephone communication was destroyed. The battalion at once sent out two patrols to see if the next position was held, and heavy machine guns concentrated their fire around the flank position. It was found that the British had used one company and an engineer platoon in attempting to make routes through the mine field protecting the right flank, but had been stopped with many casualties by heavy

machine-gun and mortar fire and then had been driven back by small-arms fire. German casualties were 4 dead and 6 wounded.

The commander of the 115th Motorized Infantry Regiment reported that he observed 18 British field artillery batteries in action, delivering extremely heavy fire for 2 hours. He said that if the attack on the right had concentrated on silencing heavy machine guns in the supporting positions, the British thrust might have succeeded. The British company in the center was halted when it stumbled into the German mine field. On the left, which was defended by the 2d Battalion of the 104th Motorized Infantry Regiment, the British bypassed the mine field and crossed the gap between the 2d Battalion of the 104th Motorized Infantry Regiment and the Brescia Division without being observed. The report of the 2d Battalion of the 104th Motorized Infantry notes that they were wearing rubber-soled shoes and were heard neither by the forward listening posts nor by the sentinel to the west of the position.

Meanwhile, British field artillery had scored five direct hits on another position, and it was taken from the rear. The six wounded survivors of the garrison leaped into the antitank trench and tried to recapture the central position with grenades, but found that they were not strong enough. An immediate counterattack by part of the battalion reserve also failed because of British artillery and Italian machine-gun fire from the left. When British tanks were reported the Germans brought up their mobile antitank reserves, but the next day the position was recaptured. German losses were 18 killed and 32 wounded.

This encounter added little to German defensive doctrine—the value of intersecting antitank trenches had again been shown and once more British field artillery had proved to be effective against defensive positions. On the basis of its experience, the German command issued elementary instructions in defense to the 3d Battalion of the 268th Infantry Regiment, which arrived in Africa on August 16. Stress was laid on the early preparation of positions in an advance, and the newcomers were instructed to build positions for the covering party and OP's before establishing positions and headquarters for the main fighting force. They were next to build obstacles, then crawl trenches and shelters, and finally dummy positions. Antitank trenches were to be dug at 55-yard intervals across areas where enemy tanks were likely to penetrate. Alternate positions were to be constructed 55 to 65 yards from the original positions. Very vaguely, an ideal company position was suggested with light machine guns and antitank guns disposed along the front line. The directive also gave camouflage instructions.

An equally elementary document, coming from Tobruk on September 30, ordered rations to be stored for 2 days (prompted by the experience of Halfaya) against the danger of encirclement. A company order, this document shows that the total width of the left platoon sector was 330 yards and that it had only one antitank gun (these new units were notoriously weak in antitank defense by German standards). The left platoon was ordered to lay down a light machine-gun barrage if attacked in darkness, sandstorm, smoke, or fog. Each

forward section had a night listening post 500 yards from the enemy position. For an unexplained reason, the antitank gun crew was given rations for 8 days. Dummy positions behind platoon headquarters were being shot up by the British artillery. There is no data on the width of the right platoon sector, but there was an interval of 165 yards between headquarters and sections, 40 yards from sections to the wire, and 75 and 100 yards on the right and left flanks. Antitank rifles were distributed to the left and right sectors and to headquarters. There was a light machine-gun barrage, and snipers were ordered to concentrate on enemy commanders and forward machine guns. The mine field in front of the platoon was laid in four rows, checkerwise, with intervals of 4 yards between rows and 5 yards between the mines in each row. Behind it was a fence mined with concentric charges which could be exploded by pulling a wire in the position. (The British position was between 275 and 330 yards away.) In the center platoon area (the company had three platoons up) as in the right platoon area, there were three squads forward and two back, and each forward squad was equipped with two antitank rifles. Heavy mortars had firing positions 550 yards to the rear, near company headquarters. The antitank gun with the left platoon was to destroy British tanks at ranges of about 220 yards. Antitank guns were to stop the enemy attack before it reached the main line of resistance, and were to use high-explosive shells against infantry who broke the line. Fire was not to be opened against light tanks at ranges of over 330 yards; antitank guns were to hold their fire until the tanks approached to within 220 yards.

About mid-August the Meduaaur salient was taken over by the new and rather unsatisfactory troops of the 155th Motorized Infantry Regiment (including the 3d Battalion of the 268th Infantry Regiment, which on October 21 was relieved by the 7th Bersaglieri Regiment). The southeastern sector of Tobruk was not the important sector in view of the German preparations for the attack in November.

The 1st Battalion of the 104th Motorized Infantry Regiment had been resting, but on October 26 it again took over Halfaya from the 3d Battalion of the 347th Regiment.[8]

[8] It is interesting to note that though it was a motorized infantry battalion, it had not yet any motor transport of its own. Any estimate of the functions and capacities of the two motorized infantry regiments in Africa (the 104th and the 115th) should take into consideration that for months they had a purely static position role. It is from their experience that we get the most laborate German defensive practice.

Section VI. THE NOVEMBER OFFENSIVE [9]

By the beginning of November, as the long lull was drawing to a close, proposals of ideal *stützpunkte* were advanced by both the 1st Battalion of the 115th Motorized Infantry and the 2d Battalion of the 104th Motorized Infantry. Their dimensions were 1,760 yards front by 2,200 yards depth for the 1st Battalion of the 115th Motorized Infantry; 1,760 yards front by 1,320 yards depth for the 2d Battalion of the 104th Motorized Infantry. The difference was due to much stronger lateral protection provided in the second plan. It is interesting to compare these plans with those of Point 207 on the frontier, where 770 by 600 yards were given as the dimensions of a company position, and 400 by 175 yards as those of a platoon position.

All these systems met the requirements of the trefoil, both in organization and in weapons. The 1st Battalion

[9] See *The Battle of the Omars*, Information Bulletin No. 11, Military Intelligence Service, April 15, 1942; *The British Capture of Bardia*, Information Bulletin No. 21, Military Intelligence Service, July 25, 1942; and *The Libyan Campaign, November 1941 to January 1942*, Campaign Study No. 1, Military Intelligence Service, August 15, 1942.

of the 115th Motorized Infantry had a two-company front, each company being 880 yards wide. The heavy weapons in the rifle companies were well forward, with the heavy machine guns on the flanks, the light antitank guns in the center of the front line, and two heavier antitank guns immediately behind them. The bulk of the antitank guns, however, were in pairs in the front line of the rear company, in front of pairs of heavy mortars interspersed with pairs of heavy machine guns, all con-

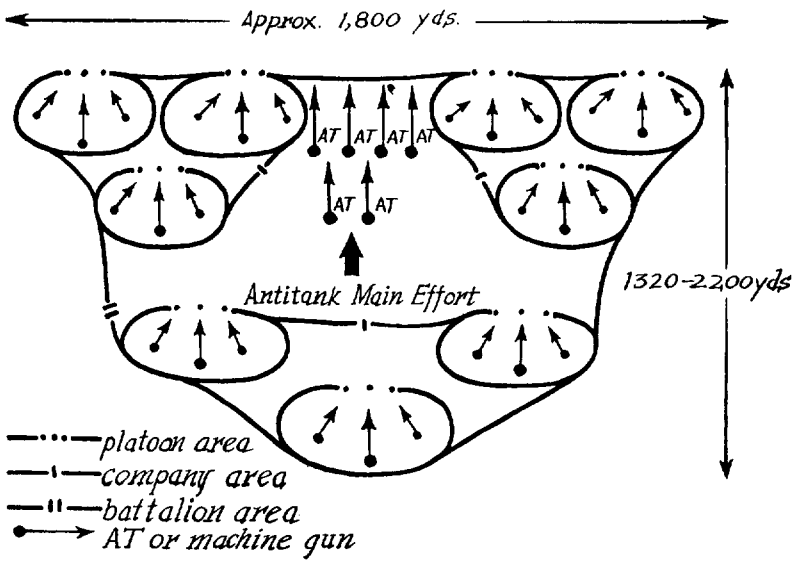


FIGURE 2.—The main antitank effort of a German position, placed to cover the most likely avenue of tank approach.

trolled by the *Führer schwerer Waffen* (the officer commanding the battalion of heavy weapons).

The 2d Battalion of the 104th Motorized Infantry Regiment had more support; it was reinforced by an antiaircraft battery of four heavy and two light guns, a light antiaircraft platoon of four guns, and an antitank company of six heavy and four light guns. Two rifle companies were placed on the flanks and strengthened by dividing the antitank weapons of the antitank company equally between them. Each forward position (four on each flank) had an antitank gun, and the remaining light guns were stationed well to the rear. As usual, light machine guns in pairs protected heavy weapons. The heavy weapons company of the battalion (less its two infantry guns, which protected the front of battalion headquarters) protected the rear. Once more antitank guns were in the front line. The heavy machine-gun company was divided between the center of the front, the rear, and the flanks; and a group of six heavy machine guns protected the rear of the heavy antiaircraft battery which formed a concentrated mass 440 yards broad in the center of the front (where it seems that it would present an excellent target for artillery). The exposure of the heavy antitank guns both contrasted with the methods of the 1st Battalion of the 115th Motorized Infantry and marked a change from the practice of the 2d Battalion of the 104th Motorized Infantry Regiment in May and June 1941.

The defensive line on the frontier had been completed, or at least was as near completion as it would ever be. The principal features of this line were

(1) The main *stützpunkte* were Libyan Omar, Omar Nuovo, Got Adhidiba, Qabr el Qaha, Alam Abu Dihak, Halfaya, and Point 187.

(2) These *stützpunkte* were held by mixed troops.

(3) They were held in either company or battalion strength, and in the latter case they were to be subdivided into company positions, each with all-around defense down to include platoons.

(4) The distances between the main *stützpunkte* were 1¼, 2½, 3⅛, 2½, 1½, and 3⅛ miles—thus each could support its neighbors or cover the intervals with artillery.

(5) Distances between the company positions within the main *stützpunkte* varied between ¼ and ⅝ mile in general.

(6) A deep mine field with only nine openings covered the whole front between Halfaya and Sidi Omar.

(7) In front of the mine field were eight *vorgeschobene stützpunkte* (advance posts). Each depended on the main position in front of which it lay. Their distance from the mine field varied from 1½ to 2½ miles and from the main positions, 1½ to 3 miles.

(8) Immediately in front of these positions for a depth of 3½ miles was the artillery barrage zone of the main positions.

(9) In this there were three bands, each 1¼ miles wide, to allow patrols to maneuver.

(10) These patrols lay at three points (Qaret Abu Faris, Sidi Suleiman, and Bir Nun), respectively 4, 4, and 4¼ miles from the main *stützpunkte*, and were the most advanced OP's.

It should be noted that in a very strong battalion and company position like Alam Abu Dihak there were six or seven 88-mm guns.

There is only one complete report of how such a position resisted the offensive of November 18—the remarkable record of Lieutenant Schon, whose 12th Oasis Company held out at Libyan Omar until November 30, then retired to Got Adhidiba with 80 survivors from his original 150 men. His company and attached antiaircraft destroyed 17 infantry tanks and five armored cars. He had to withdraw because the food supply had run out and because all his antiaircraft and antitank guns had been knocked out by British artillery and tanks. From Schon's account the following principles can be deduced:

(1) The *vorgeschobener stützpunkt* (advance post) was commanded by a noncommissioned officer with 11 men, 1 antitank gun, 1 light mortar, 2 light machine guns, rations for 5 days, and emergency rations. Its mission was to observe, not to draw fire. There were three telephone wires running to the 12th Oasis Company, the Italian battalion, and the Italian artillery (attached to the oasis company for the defense of Libyan Omar). In fact, the post remained unspotted from November 18 to 23, and only withdrew on the main position a day after the main battle started. The post was able to observe behind British lines.

(2) The main *stützpunkt* was manned by the 12th Oasis Company, consisting of 4 officers, 24 noncommissioned officers, and 112 enlisted men, disposed in 10 positions—one for each section and one for headquarters. The supporting arms, some of which may have been

placed with the neighboring Italian battalion, were very strong: six 75-mm field guns; two or three 88-mm guns and two 75-mm antiaircraft guns; three 37-mm antitank guns; four heavy machine guns and ten light machine guns. There was ammunition for 3 days and food and water for 8 days. Radio communication also was established with the 300th Battalion and the 3d Reconnaissance Unit.

Schon's record shows that the reconnaissance unit was forced to withdraw in the first 2 days, and that the envelopment of Libyan Omar began on November 20. On that day the 88-mm gun destroyed a British OP at a range of 3½ miles, south of Libyan Omar; later it fired at vehicles at a distance of half a mile.

On November 22 the main attack began. Omar Nuovo had fallen very easily in the morning, and the British tanks then came over to Libyan Omar, where three of the four Italian companies surrendered with little resistance. The assault on the German positions began late in the afternoon, and the 88-mm guns knocked out 17 infantry tanks before dark. As usual, the 88-mm guns were vulnerable to British artillery, and a combination of artillery and tanks silenced them just before nightfall. At this range, the smaller antitank shells (presumably including 37-mm) were bouncing off the infantry tanks. Then night fell and the attack was called off.

During the night one 88-mm and two 75-mm guns were repaired, and the next morning the position was ready for battle again, with 100 German infantrymen, 38 antiaircraft crews, and 130 Italians.

These troops were continually cheered up by propa-

ganda. The Army News (*Wehrmachtbericht*) was taken regularly on the radio and the news given to the troops. The German successes in other areas were rapidly communicated to the Italians as well, and this tended to relieve the feeling of helplessness before British tanks which Schon noticed among Germans as well as Italians.

Nevertheless, the troops were always expecting to be relieved; there was no idea of holding out indefinitely. A counterattack by German tanks would settle the battle. It was therefore a great day on November 26 when German tanks appeared over the horizon, and the men were puzzled when the tanks did not relieve the position.

Libyan Omar was now plastered by British artillery, and on November 25 and 27 the last antiaircraft positions were knocked out. Schon then requested orders from the 300th Battalion to evacuate the position. He was told to hold out, and promised either speedy relief or supply by air, but neither of these was forthcoming. Between November 27 and 30 he repulsed an attack by Indian infantry.

Conditions were very unpleasant, as nobody could move outside of the position in the daytime because of the snipers, and the command had to be on guard all night, growing stiff with cold. Rations and water were very short. After the infantry attack the positions were attacked by a pair of infantry tanks, which eventually smashed every heavy weapon but were unable to hold their gains because (to the surprise of the Germans) they were not followed by infantry. Schon now asked for permission to retire, as further resistance would involve only an "unnecessary sacrifice of blood." He got the

permission, and reached Got Adhidiba (where there was another German company) after a forced night march.

Salum, the supply base of the 12th Oasis Company, had been cut off from the Omars since November 19, when the Italian supply transport broke down. Since that time the position had received no food. Twelve days, therefore, was probably the limit of any of the frontier positions without supply from base.

Here again, the total reliance of the enemy on 88-mm and 75-mm antiaircraft guns and the vulnerability of these guns to artillery fire, are apparent. There was an unusually long-range opening in this battle, but the concealed observational role of the advanced *stützpunkt* was probably characteristic of the seven positions along the frontier.

Unfortunately there are no records of the enemy's defensive methods at Tobruk and Gazala, and only a few sketches of units in the retreat, when they had lost much material and personnel. The 155th Motorized Infantry Regiment had a *vorgeschobene Beobachtungstellung*, or advanced OP, and boldly stuck its four 88-mm guns on high ground in the main body. A more detailed plan shows that in the hurry of retreat the unit forgot its doctrine on all-around defense. Antitank weapons were used well forward with the exception of the four 88-mm guns. Nineteen were in the front and on the flanks, and only three in the rear.

Section VII. COMMENTS AND LESSONS

1. GENERAL

Conditions existing in the North African Desert are very different from those in the training areas of Germany; therefore, German defensive practices have developed largely from actual combat experience in the desert. Commanders have kept in close touch with the situation and constantly striven to improve their tactical methods. They have never appeared to be satisfied with their defensive positions, and have continually put forth every effort to make them more impregnable.

German defensive theory emphasizes that *stützpunkte* are not simply positions from which an attack can be checked, but localities from which to launch a powerful armored counterattack. All supporting units are instructed to be prepared to move forward on short notice.

Dummy positions and other ruses are habitually used by the Germans to deceive the opposing army as to the location of their main line of resistance. Keeping the enemy guessing is an important part of their doctrine, both on the offensive and the defensive.

2. ANTIMECHANIZED OBSTACLES

Mine fields were extensively employed in front of defended localities. They were placed from a quarter to a half mile in front of these mine fields (fig. 3).

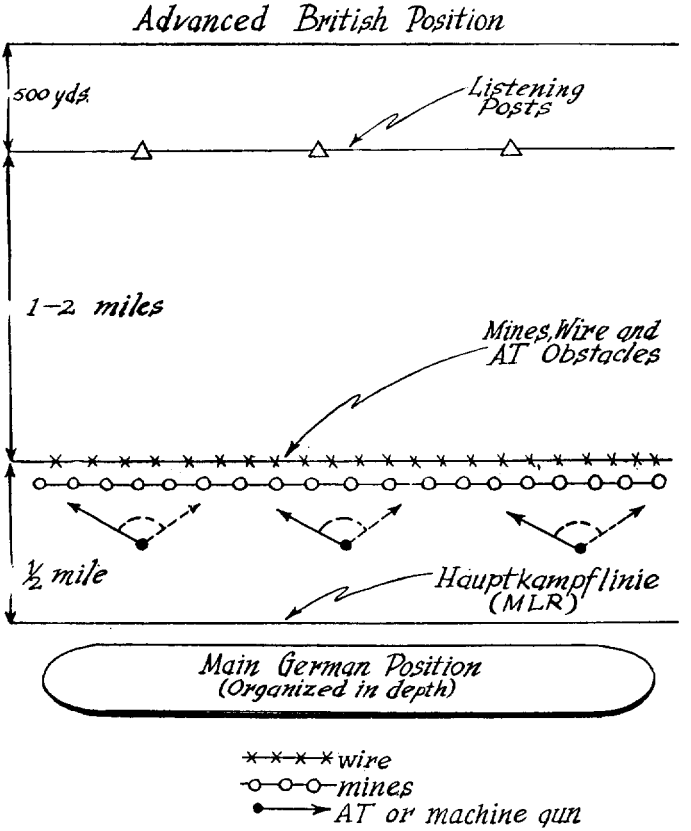


FIGURE 3.—Typical organization of the ground in front of a German *stützpunkt*.

Tank obstacles of all kinds were used liberally where possible. In the desert, this form of defense is handicapped to some extent by the hard, rocky nature of the soil.

3. ARTILLERY

Barrages were laid immediately in front of the most advanced defensive positions, thus furnishing them with a screen of fire that would protect them from attacking infantry and tanks. Lanes were left in these barrages to allow German patrols to operate during an attack.

All platoons were supplied as liberally as possible with supporting weapons, and these weapons were always employed in close coordination with the defending infantry.

Perhaps the most outstanding single element in German defenses was the 88-mm gun. It sometimes opened fire at ranges up to 2,000 yards, but was most effective at about 800 yards. The 50-mm and 37-mm antitank guns opened fire at between 400 and 800 yards.

4. RECONNAISSANCE

All new defensive positions were thoroughly examined before building began. This reconnaissance took into consideration enemy dispositions and capabilities. Thus the main centers of resistance were located at points of maximum effectiveness.

5. MORALE

The captured German documents used in the preparation of this bulletin again emphasized the great care that the enemy takes to keep morale at a high level in critical situations. One officer recognized the personality of the *stützpunkt* commander as the most important single factor in defense. All enemy officers agree that the will to resist is vital to success.