

THIS FILE IS MADE AVAILABLE THROUGH THE DECLASSIFICATION EFFORTS AND RESEARCH OF:

# THE BLACK VAULT

THE BLACK VAULT IS THE LARGEST ONLINE FREEDOM OF INFORMATION ACT / GOVERNMENT RECORD CLEARING HOUSE IN THE WORLD. THE RESEARCH EFFORTS HERE ARE RESPONSIBLE FOR THE DECLASSIFICATION OF THOUSANDS OF DOCUMENTS THROUGHOUT THE U.S. GOVERNMENT, AND ALL CAN BE DOWNLOADED BY VISITING:

[HTTP://WWW.BLACKVAULT.COM](http://www.blackvault.com)

YOU ARE ENCOURAGED TO FORWARD THIS DOCUMENT TO YOUR FRIENDS, BUT PLEASE KEEP THIS IDENTIFYING IMAGE AT THE TOP OF THE .PDF SO OTHERS CAN DOWNLOAD MORE!

**German Experiences  
in  
Desert Warfare  
During  
World War II**



**Volume II**

**U.S. Marine Corps**



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

7 November 1990

**FOREWORD**

**1. PURPOSE**

Fleet Marine Force Reference Publication (FMFRP) 12-96-II, German Experiences in Desert Warfare During World War II, Vol II, provides lessons learned by the Germans during World War II desert operations.

**2. SCOPE**

The author of this manual, Generalmajor Alfred Toppe, drew on German World War II veterans to record the lessons learned from operations in North Africa.

**3. 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. While these two factors have significant consequences, most of the doctrine, tactics, techniques, and procedures used in operations in other parts of the world apply to desert operations. The challenge of desert operations is to adapt to a new environment.

b. FMFRP 12-96-II was originally published by the Historical Division, European Command in the years immediately following World War II. This document is rich in the details so important for those who must live and fight in the desert. It supplements FMFRP 12-96-I, which has the same title.

**4. 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

**5. CERTIFICATION**

Reviewed and approved this date.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS



M. P. CAULFIELD  
Major General, U.S. Marine Corps  
Deputy Commander for Warfighting  
Marine Corps Combat Development Command  
Quantico, Virginia

DIST: 14012960200

GERMAN EXPERIENCES IN  
DESERT WARFARE  
DURING  
WORLD WAR II  
VOLUME II

SELECTED ANNEXES

HISTORICAL DIVISION  
HEADQUARTERS UNITED STATES ARMY, EUROPE  
Foreign Military Studies Branch



## TABLE OF CONTENTS

NOTE: This document consists of a series of annexes that resulted from interviews of German officers who fought in the German African Corps in WW II. These interviews were conducted by the Historical Division, United States Army, Europe at the end of WW II. The original documents were maintained by the US Army, Europe and copies are maintained at various United States Army libraries in CONUS. The quality of these documents has deteriorated considerably. Throughout this reproduction the reader will find notations where text is deleted due to poor copy or missing lines; however, the main context is provided for the readers benefit. Research by the Doctrine Branch, MAGTF Warfighting Center, Marine Corps Combat Development Command, Quantico, VA has determined that Volume II was originally developed as a series of nine annexes to Volume I. Seven of the nine annexes have been recovered. Unfortunately Annexes 2 and 3 are missing. Annex 1 is a series of WW II German battle maps. The sketches referred to in the text of Annexes five through nine were of such poor quality in the photocopy that they have not been reproduced in this FMFRP. Annex four is a series of German aerial photographs of the battle zone. Annexes one and four have been reproduced and will be retained for Marine Corps use by at the MAGTF Warfighting Center and Breckenridge libraries at Marine Corps Combat Development Command, Quantico, VA. Annexes five to nine are reproduced in this FMFRP.

- ANNEX 5    Medical equipment for Use in the Tropics
  
- ANNEX 6    Camouflage in the Desert
  
- ANNEX 7    Route March Plan
  
- ANNEX 8    Battle in the Marmarica, Winter 1941-1943
  
- ANNEX 9    The Actions from 2 to 6 June 1942





## ANNEX 5

### Medical equipment for Use in the Tropics

#### Development

The medical equipment used in the North African desert by the German Army has been available since the beginning of German colonization. Equipment developed during the first World War was the result of the experiences of German specialist in tropical diseases, army medical officers, missionaries and others. Later some firms, in part in collaboration with missionary societies, continued research on suitable equipment for various uses overseas: on plantations, for transportation by ship, for expeditions and small mission hospitals. In this connection, see the work by Professor Olpp, "Hervorragende Tropenaerzte" ("Outstanding Specialist in Tropical Diseases") and by Dr. A. Hauer, "Kumbuke - Erfahrung eines deutschen Militaerargtes in Ostafrike" ("Kumbuke - The Experience of a German Medical Officer in East Africa"). The layman will find a tropical medical kit developed by Dr. Hauer worthy of recommendation. This is produced by the pharmacist Mueller, in Kiel-Gaarden. The firms of Lautenschlaeger, Leitz and Zeiss have developed practical laboratory kits which contains microscopes and litters. In the manufacture of German medical equipment for use in warm and humid climates, durability of the equipment and medicines and transportability were of prime importance. Medical equipment for use in the tropics complemented the ordinary medical equipment of the field forces, which had proved extremely effective in the European theater of war. The German medical equipment for use in the tropics proved its usefulness during the North African Campaign from 1941 to 1943. What shortages there were, were mainly due to supply difficulties.

In Lybia the authorized strength of the medical personnel and vehicles was twice that allowed for Europe. Each company had two medical noncommissioned officers, each battalion two trucks for medical equipment. In addition to the motor ambulances in used in the German Army, armored regiments had an armored personnel carrier for the transport of wounded.

The equipment of the men was adopted to the warm climate and to life in the dessert: it consisted of a tropical uniform, a belly band, a tropical helmet (which, however, did not have to be worn), a mosquito net, a tropical gas mask, a first-aid packet, and a small gasoline stove. At the beginning of the African Campaign every soldier was issued a one man tent; subsequently, however, the troops were issued larger tents, with awnings to protect them from the sun. Officer gear was kept in a tin box protected from dust, humidity and insects by rubber weather stripping.

## Methods of Employment

In North Africa the transport of the wounded often had to be effected over great distances and under unfavorable road conditions. To a limited extent, Storch airplanes were available to carry head and stomach casualties from the advanced air stations to the medical installations in the rear. This is undoubtedly an ideal method of transportation because of its speed and the protection it gives the wounded. In addition, Ju 53 medical aircraft were available for transport of the sick and wounded. Medical officers with the combat units had an ambulance and a medical equipment truck. The medical officer had an infirmary tent and sometimes even an additional tent for lightly wounded and sick cases, either for the purpose of caring for them at the front or as a transit tent until they were evacuated. The auxiliary medical officer in the supply train had the same equipment at his disposal; in many instances dental treatment could also be given.

Special ration supplies so supplement the diet of the wounded were moved up to the field forces in large quantities. Instruction detachment regularly trained the army cooks in the special preparation required in warm climates for food and rations for the sick. Further training was given by means of a "field cook book" for warm countries issued on 30 June 1942 and based on experience gained in North Africa.

The medical officer had at his disposal the medical equipment uniformly introduced in the German Army. It was contained in five wooden chest and included all equipment and drugs needed for first aid. For every day use the contents of Chest No. 2 sufficed.

An additional medical chest for use in the tropics contained medical supplies for 150 to 200 men. Medical officers in North Africa had this chest in addition to the medical equipment ordinarily issued. This particular chest weighted about 45 kilograms. Weather stripping protected it from air, humidity, dust and insects. The method used to pack the chest and, especially, the arrangement of the supplies in the box, which made it easy to find things when they were needed, proved very useful. Breakage in transport was a minor factor. The arrangement of the equipment and the keeping of a list of what had been used made it possible at any moment to see what was available and to order new supplies in good time. The bottom of the chest was divided into three parts. Over this there were two superimposed trays which could be hung on the sides of the chest, when in use. Contents of the individual compartments were given on a list.

Quinine was hardly ever used in North Africa. The few cases of malaria were treated with atropine-plasma, as in customary.

In other cases, where quinine had been previously used, for instance in the case of inflammation of the lungs, sulfa drugs were used. The flasks of dysentery bacteria cultures contained in the tropical kit were soon discarded since from the standpoint both of prophylactics and therapeutics they did not prove effective. Instead the drugs most in use were increased. Immunization against dysentery was introduced only in 1942. It is advisable to include in the kit small quantities of serum for typhus, paratyphus, cholera and also spotted typhus, as well as anti-snake -bite serum.

### Application

Small units without their own medical officer had a medical noncommissioned officer. The latter had a tropical medical chest at his disposal. The chest weighed about 40 kilograms. It contained the drugs, bandages and equipment necessary for first aid. A list of the contents was attached to the chest. With this equipment the medical noncommissioned officer could administer first aid on the basis of his training.

### Employment

These chests, because of their weight, were not suitable for mountain warfare. In the desert, however, the equipment proved its worth in spite of the heat and the sand storms. The flasks or containers sealed off the drugs from the air and protected them against the effect of the sun. The tropical medical equipment was fully suited for transport by air, train, ship, or horse-drawn vehicles. Each truck and aircraft was equipped with a first aid box, which likewise proved its usefulness in North Africa.

### Conclusions

Ample equipment with hydrochloric acid pepsin tablets (salt tablets) would have been a help. During the decrease in the production of hydrochloric acid which takes place in the hot summer months, absorption of hydrochloric acid prevents or decreases bowel disorders. Hydrochloric acid was a valuable preventive for bowel disorders.

Ample means of fly control must be available for the sick tents, and also they must be protected as much as possible from the rays of the sun. This can be done, for example, by spreading a sun shield half a meter or a meter above the tent.

The weight of the heavy wooden chests could be considerable decreased if light metal boxes were used. For actual experience in the field the following study may be consulted: "Hygienische Erfahrungen ueber Klimaeinwirkung bei militaerischen Unternehmungen in heissen Zonen" ("Hygienic Experience in

Climatic Influence on Military Operations in Tropical Zones") in the book by Handloser-Hoffmann on "Wehrygiene" ("Military Hygiene"), published in 1944.

Bowel disorders were an important factor. The chief ailments were flexner dysentery and amoebic dysentery. Numerous soldiers were afflicted with exthyma of the legs. After the wearing of long trousers or high boots had been enforced and small skin wounds carefully tended the number of these cases diminished very quickly. Rest was the most important prerequisite for a quick cure of the skin diseases.

To kill flies contact poison--Cix--was used toward the end of the campaign.

## ANNEX 6

### Camouflage in the Desert

#### Camouflage of Personnel, Material and Positions

##### 1. General

In the vast space of the desert there were few natural camouflage possibilities because there is little or no vegetation and the terrain is so monotonous that any object seems larger than nature and is bound to be noticed. Camouflage possibilities are offered by the steep margins of ridges, the wadis (from ground and air observation), shallow depressions (from ground observation), moonless nights, which in Africa are particularly dark, sand storms, which take place frequently, and mirages, which occur from late in the morning until afternoon.

Artificial camouflage accordingly is as important as it is difficult.

Movements by large forces cannot be camouflaged because of the dust they unavoidable raise.

In the desert camouflage and deception go hand in hand. Deceptive measures in one place are used to conceal operations in another place.

##### 2. Technical Means of Camouflage

###### a. Personnel

The clothing of soldiers in the desert must approximate the coloring of the desert, that is to say, it must be a yellowish brown. The German uniform was unsuitable because it was olive-green and was fit only for the camel's-thorn areas near the coast. The British uniform was also too dark. The yellow-brown uniform of the German Luftwaffe was suitable. The sun and the dust, however, gradually adapted the uniform of the German army troops to the natural color of the desert. Since the desert is the same color summer and winter one color of uniform sufficed for all seasons. No special camouflage clothing is required in the desert, if the color of the ordinary uniform is similar to that of the desert. Only in camel's- thorn country is it advisable to have a camouflage suit of the type used in Europe. The base color would have to be yellow-brown, speckled with other colors. The camouflage color for men and material should be yellow-brown.

Camouflage of movements by use of smoke is hardly possible in the desert because the heat and the wind, blowing in varying strength almost always, makes it use almost impossible. Even the

English, who love to use smoke, seldom if ever used in the desert. The use of smoke is often replaced by natural sand storms produced by the wind and artificial storms occasioned by vehicles, fans, propellers (see below).

b. Weapons, Equipment, Vehicles

Camouflage of weapons, equipment and vehicles is possible; for example, tanks can be made to look like trucks. The British were very successful in this, placing dummy trucks specially made for the purpose, over their tanks. The tanks were able to fire through the dummies without difficulty or else they dropped them off during the attack and surprised the enemy. A low spiny shrub. In troop movements or marches to the front the armored forces could be disguised as a supply column to mislead the enemy air and ground observers. The only thing that revealed the deception was the caterpillar tracks in the sand. The same can be done with guns.

c. Color, Camouflage Nets, Blankets

Weapons, equipment of all sorts, trucks and tanks should be the color of the desert (yellow-brown). If they have not been given this color before arriving in the desert, they can be given a coating of oil and sprayed with sand. The sand sticks to the tanks. In this manner a temporary coating of camouflage is applied. But the application will have to be frequently repeated.

The German weapons, trucks and tanks arrived in Africa without a coating of desert camouflage. The above-described measure was used.

In contrast to the Germans who were sent into the desert without them, the British had excellent camouflage nets. However, the Germans soon caught up with captured British material. Camouflage nets are of great importance not only in the camel's thorn zone but especially in the barren sand desert. In order to give the weapon or the motor vehicle protective coloring it can, according to the color of the soil, be camouflaged with camel's thorn bushes or strips of yellow cloth. But every weapon, every vehicle and every tank should be equipped with camouflage nets, as was the case in the British Army.

Tents (naturally in the color of the desert) can be used to camouflage weapons and vehicles either alone or in conjunction with camouflage nets. Tarpaulins and blankets can also be used for camouflage, if they are the same color as the desert.

d. Cover, Concealment, Mimicry

In the desert, where there is excellent visibility, weapons, vehicles, tanks, occupied tents and even individual will in principle have to vanish into the ground; they will have to dig in so that no ground observer can see them. While this is difficult to do during short stays in an area; it is an absolute requirement if the troops remain anywhere for long, because of even the threat of an air attack. The foxholes should be covered with camouflage nets or shelter halves so that the men or equipment in them cannot be seen from the air. Experience has shown that it is not only the color of the net and the branches woven into it or the colored pieced of cloth attached to it but also the irregular form given to it which insured good camouflage. Branches, camel's-thorn shrubs or grass clumps used for camouflages were often, especially if the troops were tired, taken from the immediate neighborhood of the vehicles. This defeated the purpose of camouflage since the vehicles stood out as dark spots in light surrounding from which all the vegetation had been removed. The effect of shadows in the vast desert expanse, which exaggerates the size of things, makes it mandatory that the troops dig themselves in. The troops in Africa were used to doing so as soon as they had reached their destination, if only from the wish to survive. In the case of large and heavy vehicles or weapons it was often very difficult to dig the required holes quickly and also to get the vehicles out under their own power if the ground was unfavorable (loose sand) without the use of planking to provide traction.

In the desert it is hardly possible to conceal the muzzle flash of guns and the smoke. On the other hand the dust raised by each round fired can be decreased by laying shelter halves or blankets around the gun. According to the experience gained, however, this measure is not absolutely necessary, because in the desert dust is raised by all kinds of sources, so that it is impossible to tell whether it had been raised by a muzzle blast or by a vehicle.

The windshields of the motor vehicles glitter in the sun and can be seen from very far away. They must be covered with tarpaulins.

The tracks made by the movement may be quickly covered by the wind, providing it is strong enough and lasts long enough. Artificial camouflage is difficult. However, it is possible to deceive the enemy by putting down tracks running in another direction. This naturally camouflages the true tracks. This method was seldom used because the effort was out of all proportion to the benefits received.



It is possible to camouflage the easily identified caterpillar tracks of the tanks by having wheeled vehicles run over them.

Movements of troops can be camouflaged by artificially raising dust clouds, so that the enemy cannot tell the strength and direction of the movement.

It is especially important to camouflage all sources of light in the desert because light can be seen from much farther than in the European terrain. This is easily done with the usual black-out precautions. All motor vehicles must be equipped with black-out driving lights so that they can move through the dark moonless nights without light.

#### e. Positions/Camouflage of Various Positions

Stationary positions in the desert are dug in such a way that they do not show above the ground, that is to say they are built level with it, so as to be protected from ground observation. Positions can be detected only by the wire obstacles in front of them. It is impossible to camouflage the obstacles because in the barren terrain they can be seen both by ground and air observers. The positions (trenches, strong-points) are camouflaged by means of nets and shelter halves.

On the other hand, the quickly dug field positions of all arms including the individual rifleman cannot be made level with the ground. In stony desert terrain in fact, instead of digging in the positions, they will have to be constructed above the ground, in the form of stone walls. To camouflage such positions is extremely difficult and can only be carried out in an improvised fashion with the use of camouflage nets or shelter halves.

In defense, tanks are camouflaged by digging the vehicles in or else surrounding them with a wall of stones and then covering them with large camouflage nets.

### 3. Obstacles, Mines

Artificial obstacles on a large scale cannot be camouflaged in the desert unless they are built on a reverse slope and so concealed from the sight of a ground observer. Complete camouflage of antitank ditches from air observations can only be achieved by making extensive use of shelter halves and camouflage nets.

For safety, in the desert minefields are usually fenced in and can accordingly be detected from the ground. In order to deceive the enemy frequent use was made of dummy minefields or of mixed minefields. Dummy minefields were made by burying bits of

iron which the mine detectors picked up or else by digging small mounds of earth to simulate the placing of mines. In this way real minefields were camouflaged as dummy fields and dummy fields as real fields. Complete camouflage of a minefield in the desert is possible only if the field is not surrounded by a fence and if the places where mines are buried are made level with the surrounding ground by means of a broom. Very often the traces are effaced by the driving sand and dust. However, mines buried in loam or sand will soon be uncovered by the wind and will then be easily discernible. That is why frequent repetition of the camouflage is necessary.

Roads and beaten tracks, as well as vehicle tracks, within the system of positions can only be camouflaged by multiplying the tracks and preparing dummy tracks to divert enemy reconnaissance from the real tracks. Dummy positions should always be provided with dummy tracks. The sand carried by the wind will often camouflage any tracks of its own accord.

Supplies, stocks or material and fuel will in principle have to be stored under the ground. The dumps then must be camouflaged with nets and shelter halves. Dummy depots were often constructed in the vicinity of the real dumps in order to divert the enemy reconnaissance and the air bombardment following from the important targets. In the fall of the 1941 the British built up the supply dumps for their enveloping attack in the rear of the German Army and camouflaged them very effectively from ground and air reconnaissance. The material was dug in and provided with a great number of camouflage nets. Tracks leading to it were rubbed out.

At a few of these depots, it was later learned, wooden imitations (dummies) of the then greatly feared British Mark II tanks had been set up. German armored reconnaissance cars did not identify the depots as such but, hoodwinked by the British tanks, they retired.

#### 4. Permanent Fortifications

The permanent fortified positions in the desert, such as Tobruk, Bardia, Marsa Matruk and Alamein, were camouflaged against ground observation by extensive adaptation of the works (with the exception of the wire obstacles) to the surroundings.

Example: Tobruk as Fortified Defense System: Tobruk was protected on the east and the west by rocky and pathless terrain, on the south is spread into a sandy plain. The Italians had made great improvement to the fortifications. They had taken into account all means of combat available to storm fortifications. The numerous works surrounding Tobruk has been built into the earth in such a way and so skillfully camouflaged that an attacker could identify them only from the air. They consisted

of an underground system of galleries opening into antitank and machine gun positions. Each of the individual works was provided with up to ten machine guns and cast off their artificial camouflage only when the danger was greatest. Then they poured destructive fire on the attackers, the enemy artillery, because of the lack of any kind of superstructures and embrasures in the fortifications, was useless for direct fire. Each individual work was surrounded by an antitank ditch and multiple-bait entanglements. In additions, at places passable by tanks, there were deep antitank ditches, which were not camouflaged. Behind the fortification systems of the outer ring there was massed artillery in well camouflaged positions. Most installations were protected by minefields extending far in depth.

The wire obstacles could not be camouflaged, but the minefields could be identified only to the extent that they had been fenced in. Camouflage of antitank ditches requires large quantities of material (nets, tarpaulins). In view of the extent of the Tobruk fortifications it was impossible to camouflage them completely.

Camouflage of works and obstacles by means of vegetation is altogether impossible in the dessert.

## Camouflage Through Measures Taken by the Command

### 1. Marches

Since in the desert it is impossible to conceal movements under taken during the day because of the dust raised, marches can be concealed from sight only if the troops move at night. Neither during the day nor at night can noise be fully camouflaged, for instance, by artillery fire or by aircraft motors because the motor noises of columns on the march can be heard from very far away.

During moonlit nights it is almost impossible to prevent enemy air observation from detecting friendly forces. Using his constantly increasing air superiority to advantage, the enemy in North Africa illuminated vast areas of the desert with parachute flares, thereby making any attempt at concealment impossible.

During sand storms, or course, camouflaged movements could be carried out both by day and by night. Such marches, however, are very difficult to execute because of the lack of orientation, the need for halts to re-establish contact and the dust, which makes it hard for the drivers to find their way.

The march undertaken by the German Africa Corps on 26 and 27 May 1942 is an instructive example of the camouflage measures used in a large-scale enveloping march to attack an enemy on the flank and in the rear: Rommel conducted a frontal feint attack, using artillery in strength, in order to divert the attention of the enemy from the envelopment movement.

The envelopment march of the attackers was conducted over a distance of more than 100 km directly across the desert, with more than 10,000 motor vehicles of all types. The following camouflage measures were used:

- a. Radio silence. This made it very difficult to command and keep the forces together.
- b. Night march with complete black-out.
- c. Diverting the attention of the enemy at the main front by meant of a large-scale feint attack.
- d. Noise camouflage by means of powerful artillery fire and aircraft motors on the main front.
- e. The gigantic clouds of dust raised by the 10,000 motor vehicles and in part by artificial dust-producing devices cast a pail over large sections of the terrain, so that precise

direction of the movement and the strength of the enveloping force could not be estimated by the enemy.

The camouflage could be regarded as tactically successful to the extent that the enemy remained uncertain about these two points. But the fact that the attacker was marching on the enemy's flank could not be concealed from the operational point of view because of the size of the forces advancing and the noise which the 10,000 motor vehicles made in the night.

## 2. Attack

To camouflage an attack at any one place in the desert a feint attack must be prepared elsewhere by noticeable movement, adjustment of artillery, the noise of motor vehicles, putting down wheel and caterpillar tracks and raising dust clouds.

Camouflage of reconnaissance, disposition and the adjustment of artillery fire is camouflaged in the desert in the same way as in Europe. Camouflage of the movement into the assemble position is however far more difficult, because of the dust raised during the day and the noise of the motors at night.

For the attack from the Alamein position aiming at Egypt, which took place at the end of August 1942, Rommel used the following camouflage methods:

The attack was to be carried out at a weak place in the southern part of the position and was to envelop the flank and rear of the enemy. Since July the main part of the tanks and motor vehicles had been situated behind the northern part of the position, where they had been sheltered in camouflaged "compartments" (holes in the ground covered with camouflage nets). Several weeks before the attack Rommel had had about the same number of empty compartments dug in the southern part of the position. Gradually, during the night, the tanks were moved from the northern to the southern compartments. The number of the compartments was known to the enemy through the constant night air reconnaissance he carried out. The tanks tracks leading from the northern to the southern compartments were carefully effaced each time with brooms. By 29 August 1942, the day before the attack, nearly all tanks had been moved from the northern to the southern compartments. The enemy was unable to tell whether the tanks were in the northern or the southern compartments because the northern ones, covered with camouflage nets, had been kept intact. The other motor vehicles of the attack forces were moved into the southern areas only during the night before the attack, but even the compartments of these vehicles in the northern area were kept intact.

Large-scale camouflage measures such as these take a lot of work and are possible only in the desert, but there they are

necessary, because the vehicle parks of both sides are under constant observation by air reconnaissance. The strength of the enemy can be estimated on the basis of these parks and any changes in their disposition can be observed. These camouflage measures would have succeeded fully if spies had not informed the British about the plan to attack from the south.

In a great number of cases it was possible to mislead the enemy about the strength (or weakness) of the forces engaging in an attack by raising additional dust clouds.

Artificial raising of dust is effected in the following manner:

a. By the motor vehicles, which can raise considerable dust by driving in zigzags.

b. By appliances to raise dust such as ropes and wire rolls dragged behind motor vehicles.

c. By propellers mounted on motor vehicles. This produces a gigantic cloud of dust.

In camouflage by means of dust clouds the direction of the wind is of great importance. When there is little or no wind the dust clouds remain over the marching or resting troops for a very long time. If there is a cross wind the dust cloud, depending on the force of the wind, will slowly or quickly draw away from the unit producing the dust and remove their camouflage. In such cases the dust-raising vehicles will have to move further away from the side of the troops. The most favorable case is that in which the wind is behind the attacking or advancing forces and the dust cloud blows toward the enemy, blinding him. The most difficult camouflage is that in which the wind comes from the enemy's side and the dust is blown away from the attackers, so that they are revealed.

### 3. Defense

If the enemy has air superiority, enabling him to reconnoiter the friendly forces when and as he pleases, operational camouflage of defense measures and positions is impossible. However, tactical camouflage of individual defense positions against ground and air reconnaissance is easier. It can be achieved by means of the measures described in the section dealing with Stationary Positions.

Good reverse slope positions, concealing defensive works from ground observation, are not frequently found in the desert. However, the troops should be schooled to recognize such positions and to exploit them.

Use of alternate positions and dummy positions in order to deceive the enemy is easier in the desert, but it is also more necessary than in Europe.

Use of such positions was successfully made on several occasions in the fighting for Alamein positions in November 1942.

Example: In the night of 3 November the German position at Tel el Aquaquir was evacuated, but it was kept intact as a dummy. The new defensive position was organized about 5 kilometers further to the west at Tel el Kepsra. When the enemy attacked on the morning of 4 November, the artillery preparation covered the dummy position. It was midday before the enemy identified the new position and attacked it.

#### 4. Withdrawal

Because of the dust raised withdrawal movements cannot be camouflaged in the daytime. However the enemy can be deceived tactically regarding strength and composition of friendly forces by dust clouds. There are many possibilities of simulating attacks against the flank of the advancing or pursuing enemy by the use of dust clouds and in this manner to camouflage the weakness of one's forces.

During the withdrawal of the German Africa forces from Tobruk to the Bay of Sidra in December 1941 these measures were used separately. On the other side, south of Cyrenaica, the British simulated a large-scale enveloping movement through the open desert from the Bir Hacheim area and on the overland connection of Agedabia by means of extensive dust clouds. In this way they concealed their limited strength and made Rommel withdraw all his forces quickly to Agedabia and, as a result, give up Cyrenaica.

#### 5. Evaluation

In spite of the lack of vegetation there are enough opportunities for camouflage in the desert. Resourceful troops and their commanders can exploit these opportunities.

The tactical use of dust clouds as a means of camouflage in part replaces the employment of smoke, although dust clouds are substantially influenced by the force and direction of the wind.

Troops in the desert must be amply equipped with camouflage nets, since they are the alpha and omega of camouflage in the desert. Every single motor vehicle and every single tank, every gun must have one or more large-size camouflage nets and tarpaulins and every unit, as far as there is space available on its vehicles, should have large numbers of nets to camouflage its foxholes, bunkers and positions. Camouflage in the desert

demands a great deal of physical labor, but it must be done if casualties are to be avoided.

Camouflage of strategic measures is not possible in the desert, but tactical measures can be camouflaged, although, as has been said, a lot of work is involved.

It is impossible to camouflage movements during the day because of the dust unavoidable raised. If camouflage is necessary, the marches will have to take place at night.

The side that has superiority and thus has the enemy under constant observation, can of course carry out its camouflage measures in the desert better than the other side.

The expense and labor required for camouflage in the conduct of operations in the desert is in direct proportion to the benefits derived by the troops. Camouflage always pays. That is the primary lesson learned by the Africa Corps in its two years of fighting in the desert.





## ANNEX 7

### ROUTE MARCH PLAN

The organization, width and depth in the route march plan used in the desert depended on whether there was contact with the enemy or not.

When no contact with the enemy was expected, for instance, moving into the assembly area east of Bir Hacheim on 26 June 1942, the width required for the division was about 500 meters.

In the sector of 500 meters, for instance, the eight companies of an armored regiment were brought forward next to each other in files with intervals of 50 meters and the three headquarters in advance of the rest.

The depth in the case of 20 tanks in a company, and with 50 meters distance between them to avoid the dust, was 1000 meters for an armored regiment, exclusive of combat vehicles and supply vehicles.

The depth for the whole division was 8-10 kilometers.

During night marches or in difficult stretches of terrain which the wheeled vehicles were unable to cross as quickly as the armor and prime movers, the intervals were substantially increased, that is to say they were doubled or tripled. This happened during a march in a pitch-dark night in the summer of 1942 between Tobruk and El Alamein, in which the column had been broken up as a result of the difficult terrain the individual units -- even though march tables had been issued -- had gone so far from each other, that the next morning the division had to be reassembled.

In the case when contact with the enemy was expected, the attack sector of the armored division was from 2.5 to 3 kilometers wide.

In commitment of the armored regiment in width the two battalion could each put in the first line two companies, each with two platoons, that is to say a total of four companies or eight platoons, each with five tanks, making a total of forty tanks. As a result there were company combat sectors 750 meters wide for ten tanks in the first line with 75-100 meters intervals from tank to tank in the first line, echeloned to a depth of 75 meters.

The reserve platoons which had not yet been employed were brought up with an interval of 350-500 meters. As a result the armored company in the first line had a combat sector 750 meters wide with a depth of 750 meters, including the reserve platoons

and the security vehicles sent on ahead. The reserve companies were brought up at intervals of 500-750 meters. The combat sector of an armored battalion was 1500 meters, with a depth of 1300-1500 meters; an armored regiment had a front of 3000 meters, the same as the armored division, and a depth of 1500 meters. Up to the moment of contact with the enemy the intervals of the remaining units of the armored division were the same, or if necessary, double the distance.

Because of the much wider combat sectors when contact with enemy was anticipated looser formations were possible even without increased intervals.

Depth of the division was 10-15 kilometers.

When contact with the enemy was made the artillery went into position and the units without armor stopped, so that shifts could be made out of range of enemy observers.

## Annex 8

### BATTLE IN THE MARMARICA, WINTER 1941-1943

#### Background

Ever since October 1941, Rommel had reckoned with the possibility of a British offensive against Tobruk. The English had sent great quantities of war material and large reinforcements to Egypt in early autumn. The dispatch of the South African division and the New Zealand division from the delta of the Nile to Marsa Matruk had been discovered in September by radio reconnaissance and had later been confirmed through the interrogation of prisoners. Nevertheless, the 21st Panzer Division's reconnaissance in force into Egypt in the area south of Sidi el Barani in mid-September did not give evidence upon which to base suspicion of an impending attack. Aerial observation in the border area was not able to establish the presence of enemy supply dumps capable of sustaining a large-scale attack. Although, as it later developed, the enemy in preparation for the advance had built up and excellently camouflaged over a long period of time many such dumps, not only in the border area but also far behind the German-Italian line of defense.

The assembly of the enemy troops for the offensive was not discovered by the German reconnaissance. The concealment of British preparations was excellent, especially since in the desert this is an exceptionally difficult feat. Since radio silence had been imposed, warning of the advance of the troops into assembly position could not be intercepted by radio reconnaissance. The British locations were probably not noticed as a result of the fact that their troops marched at night and utilized an excellent system of camouflage by day. In the desert clouds of dust betray even, the movements of small units. For this reason the British only advanced on moonless nights. In the daytime they camouflaged themselves by entrenching personnel, material and vehicles and by making abundant use of camouflage nets.

An increase in the tracks of vehicles, which might have pointed to large movements of troops, could not be discovered by the German aerial observation, since tens of thousands of such tracks were visible in the assembly area and it was impossible to determine whether these tracks were fresh or old.

In contrast to conditions in Europe, the assembly area in a desert can be far removed from the point of departure, since the lack of terrain obstacles permit vast areas to be covered in very short periods of time. As a result the troops can arrive at the point of departure very shortly before the beginning of the attack. In each of their offensives, the British, by holding the

attack forces back until the last moment, have been successful in properly camouflaging the moment for the start of the attack.

An additional reason lies in the fact that no German aerial reconnaissance could be completed on 17 November, as a cloudburst made the airfields useless for operations. It often happened in the rainy period in the desert (October, November) that sudden rain squalls cause floods. The German airfields had been built directly on the sand without any other auxiliary means; the British, on the other hand, successfully utilized steel landing mats to make the runways firm and thus kept their fields usable in the worst weather.

Not until the afternoon of 18 November after the enemy movements had already commenced did the German command realize that a major attack was in the making. The German reconnaissance forces were pushed back by superior enemy units from a security line running between Bir el Gobi and Sidi Omar. The statement of a captured British soldier belonging to the staff of the 4th Indian Division gave the German command detailed information on the enemy troops and their plans as follows:

The XXX Corps was to thrust toward Tobruk from the area around Maddelena. The 7th Panzer Division, composed of the 4th, 7th and 22nd Panzer Brigades, would act as a main attack group, the 1st South African Division as flank protection and the Guards Brigade as a reserve.

The XIII Corps was employed from the area northwest of Hebata, in order to attack the Sollum front with the 4th Indian Division and then, circumventing the Sollum front, to thrust into the area between Bardia and Tobruk with the New Zealand division.

The German and Italian forces were organized as follows on 18 November:

The Sollum front was held by non-motorized mixed Italo-German troops, who had been charged with drawing the enemy forces in their direction and thus split up the attack.

The Fortress of Tobruk was besieged by Italian divisions and the German 90th Light Division in order to prevent a breakout on the part of the enemy and a union of the garrison with the advancing offensive forces.

As for the mobile German and Italian forces, the "Trieste" Division was in the vicinity of Bir Hakeim and the "Ariete" Armored division in the vicinity of Bir el Gobi. They had been ordered first to prevent enemy envelopment movements in the area west of Tobruk and then, if occasion arose, they were to be employed for mobile defense together with the German armored divisions.

The German Africa Corps was located in the area between Bardia and Tobruk. The 21st Panzer Division southeast of Gambut and the 15th Panzer Division north of the town were ready to be employed for mobile defense against the enemy forces.

For the organization and armament of the 15th and 21st Panzer Divisions see appendix at the end of this annex.

For the assembly of the Italo-German forces see Sketch 1.

Operations of the German Africa Corps Between 18 and 21 November  
(See Sketches II, III and XI)

By noon on 18 November, the whole area between Maddalena, Sidi Omar and Gabr Saleh was covered by thick clouds of dust. The Africa Corps armored reconnaissance established an advance by armored forces in undeterminable strength from this area in the direction of Sidi Rezegh. Rommel decided to use the 21st Panzer Division, which was available south east of Gambut, to push into the enemy line of march in the direction of Gabr Saleh and thus disorganize the enemy forces and divert them from their goal at Tobruk.

The 15th Panzer Division was not ready to march until evening, because the heavy rainfall of the previous night had so wrecked havoc with units camping in the wadis north of Gambut by flooding the dumps and washing away weapons and equipment that a state of march readiness was not secured until the morning of 19 November.

The 21st Panzer Division advanced southward through the plain. The armored regiment served as advance force with about sixty tanks, Types III and IV, both battalions being committed in waves. The artillery and several 88mm gun batteries followed immediately behind the tank waves in order to give the tanks fire protection in the event of contact with the enemy. Antitank units secured the flanks of the attacking Kampfgruppe.

The terrain along the route of advance was a completely flat plateau overgrown with camel's-thorn bushes. Hardly any possibilities for cover existed. As a result shortly after the division reached the Sigh Capuzzo in the area of Bir Bu Maliha, a strong enemy armored unit was sighted, which was slowly advancing in the direction of Sidi Rezegh. The division artillery immediately took up position and secured the advance of the armored regiment, which was organized in depth. A favorable opportunity to hit the enemy tanks in the flank seemed to have arisen. Speeding up the armored regiment began to attack, supported by the 88mm batteries and the 2nd Armored Battalion. Violent battle developed with the surprised enemy, which had presumably not expected an attack from this direction. The enemy

advance was halted and during the time the British tanks were turning from their previous direction to the northeast the armored group was attacked in an envelopment movement from the east and southeast by the 2nd Battalion of the German armored regiment. This attack was a decisive success. Forty tanks were destroyed and the enemy thrown back to Gabr Saleh by evening. By sunset the armored regiment had reached the area of Bir Uaar, where it took up an all around defense position. The other elements of the division were distributed in depth through the entire area as far back as Trigh Capuzzo and also took up all around defense positions as Kampfgruppen.

The bold attack of the division had halted the advance of the enemy and had driven a wedge into the enemy offense group. If the 15th Panzer Division could also have participated in this attack, a really decisive success would have been gained.

While this fighting was taking place, British forces in the strength of an armored brigade had pushed forward to a line Sidi Rezegh - Bir Sciafsciuf and had engaged the weak Italo-German security forces in heavy combat. The latter defended themselves valiantly at the edge of the djebel southeast of Tobruk. These forces had completely inadequate equipment and only a few tanks, but they were able to prevent the enemy from pushing on to Tobruk. These forces had completely inadequate equipment and only a few tanks, but they were able to prevent the enemy from pushing on to Tobruk by way of the cross-country highway and uniting with the besieged garrison.

In the meanwhile the Sollum Position was surrounded from the east and south by the Indian 4th Division and by elements of the New Zealand division from the west. The strong points were involved in heavy defensive fighting. Rommel decided to strike the New Zealanders, who had been reported to be advancing with a brigade reinforced by an armored battalion, from the area west of Sidi Omar toward Sidi Azeiz. He, therefore, employed both armored division against this enemy force on 20 November. The 21st Panzer Division headed toward Sidi Omar from the area of Bir Uaar in the early hours of the morning, secured to the west and south. The 15th Panzer Division, which had recovered from the consequences of the catastrophe occasioned by the flood, advanced south of the Trigh Capuzzo toward Gabr Lachem. In view of these superior forces, the reinforced New Zealand brigade fell back by way of Sidi Omar to the south, without suffering losses of any great size. This brought both armored divisions of the German Africa Corps into the area west of Sidi Omar by the evening of 20 November. On the following morning they were to attack the flank and rear of the main enemy attack group located between Gabr Saleh and Sidi Resegh.

The mission was begun in the early morning (Sketch 3). Both armored division advanced side by side on a broad front and

echeloned in depth. At Gabr Sredi they met a strong armored group composed of about 100 tanks, which were attacked immediately. While the 15th Panzer Division was occupied with this enemy, the 21st Panzer Division, advancing to the left, pushed forward energetically to Sidi Muftan and there encountered the rear elements of the British 4th Armored Brigade which was attacking the German defenders at the djebel edge near Sidi Rezegh. The division attacked the enemy in the late afternoon and was able to destroy about twenty tanks, whereupon the enemy fell back to the southwest toward Bir el Gobi. Approaching darkness prevented pursuit.

The 21st Panzer Division built up an all-around defense position in the area north of Sidi Muftan for the night of 21 November. The reconnaissance forces of new enemy tanks, approaching from the southeast, were already trying to feel out the division.

After successful combat in the vicinity of Bir Bu Meliha, the 15th Panzer Division had reached the ridge near Bir Sciafsciuf and had built up an all around defense position. Here too, there were new enemy feelers.

#### Tank Battle near Bir Sciafsciuf (Sketch 4)

The newly arrived enemy forces and the unfavorable battle terrain -- the steep rim of the plateau restricted mobile operations to the north diminished the operation possibilities which existed for the German Africa Corps. Therefore, the 15th Panzer Division was transferred eastward by way of the Trigh Capuzzo during the night of 21 November and assembled in the area south of Gasr el Arid. It was intended to attack the flank and rear of the newly arrived enemy group, which was obviously also heading in the direction of Tobruk.

The 21st Panzer Division was employed for the defense at Sidi Resegh - Belhamed, in order to prevent an enemy breakthrough to Tobruk and a subsequent union with the garrison in the fortress.

By noon of 22 November, the new enemy group had reached the area south of Bir Sciafsciuf by way of Bir Bu Meliha. The 15th Panzer Division arrived from the area of Gabr el Arid and one column (one armored battalion, one artillery battalion and one 88mm battery) attacked the enemy's flank near Hagfet Hauna. The second column (one armored battalion, two artillery battalions, one 88mm battery and a rifle regiment) lunged through Bir Bu Meliha and hit the rear of the enemy group. Violent tank combat developed, in the course of which about eighty enemy tanks were put out of action. By evening the enemy group (the British 4th Armored Brigade, reinforced by artillery) was surrounded on three



sides and its commander offered to capitulate. Nevertheless, elements of the brigade managed to escape westward, since the pocket could not be closed on that side.

While this was going on, a strong attack, supported by fifty infantry tanks, was made from the southeast section of the fortress of Tobruk. The enemy broke through the encirclement front, penetrated across the main highway and destroyed a good part of the Italian "Bologna" Division. A counterattack by elements of the 21st Panzer Division succeeded in restoring the situation, thus shattering the enemy aim of uniting the garrison at Tobruk with the attacking group from Egypt.

The Italian garrison at Bir el Gobi succeeded in repulsing strong enemy attacks and thus preventing an enemy advance into the area west of Tobruk.

#### Remarks

The British Offensive was based on the idea of thrusting with superior forces from the Egyptian border to Tobruk, of relieving the fortress and destroying the German forces in the Marmarica. The English armored forces which were employed were about four times as strong as their German opponents. The Italian tanks did not count for much because of their limited capacity. Despite this numerical superiority enjoyed by the enemy, Rommel, by utilizing the mobility of his forces and the lack of barriers in the terrain, managed in four days of battle to nullify the British plan. While the British were throwing one after another of their tank brigades into the combat and thus draining their strength, Rommel concentrated his armored forces at the most favorable spot and dealt one British brigade after the other considerable damage. He was moreover thus able to prevent a union of the offense group with the fortress. If the British had not stubbornly followed the orders prepared so long in advance, that is to thrust toward Tobruk, and if they had instead attacked the German armored forces wherever they found them and according to the situation at the moment and then destroyed them by a concentration of their own forces, they would certainly have achieved their second objective, the elimination of the German armored units. The above-cited fighting is an example of how one can conduct mobile operations in the desert. It is necessary to grasp the situation quickly and promptly take the proper measures. Desert terrain with its lack of barriers is ideal for a rapid concentration of forces at decisive points.

The Tank Battle on Memorial Sunday, 23 November 1941  
(Sketches 5 and XI)

The Italo-German forces south of Tobruk on the morning of 23 November were organized as follows:

The 15th Panzer Division, after its victory over the British 4th Armored Brigade, was prepared for the decisive battle in the area south of Bir Sciafsciuf.

The 21st Panzer Division was organized for defense in an all-around defense position in the area of Sidi Rezegh and was capable of being employed if necessary for mobile warfare to the south. The Italian Armored Division "Ariete", which had successfully repulsed all enemy attacks up to this time, was still in the area of Bir el Gobi, and the Italian Motorized Division "Trieste" occupied the area Bir el Hacheim - Bir Harmat in order to prevent the enemy from penetrating into the area west of Tobruk.

The enemy armored forces with corresponding strong artillery support, antitank units and motorized infantry were collected in the area around Sidi Muftan - Bir el Haiad and had intended to begin the decisive attack on Tobruk on 22 November. The following British units were established: the three brigades of the 7th Armored Division which had been attacked previously, that is the 7th and 22nd Armored Brigades and the 7th Rifle Brigade, and also the South African 1st Division.

Rommel intended to destroy these forces in one concentric attack on 23 November.

The following measures were planned:

The 21st Panzer Division was to defend the edge of the djebel on both sides of Sidi Rezegh and, if necessary, to pass over to a counterattack with both wing elements.

In the west, more or less along the route Tobruk - el Adem - Bir el Gobi, the Italian "Pavia" Division and elements of the "Ariete" Armored Division were to close off the combat area and prevent an advance or a possible evasion of the enemy to the northwest and west.

The 15th Panzer Division, together with the "Ariete" Division was to lead the main attack, enveloping the enemy and throwing him against the front of the 21st Panzer Division.

The operations of the 15th Panzer Division and the "Ariete" Division are of special interest in the execution of this large-scale battle of encirclement and they are described below.

At about 0730 the 15th Panzer Army began the advance. It was divided into two Kampfgruppen, each containing one armored battalion, one artillery battalion, one 88mm battery and one antitank company. The rifle units, the heavy artillery and antitank units were held in reserve for the time being in the area east of Bir Sciafsciuf.

During the advance southward strong enemy tanks (about sixty) were discovered in the area of Sidi Muftan. The western Kampfgruppe of the division received the order to make an enveloping attack on this enemy force and to block the area east of Sidi Muftan.

The eastern Kampfgruppe continued its advance southward, in order to establish contact with the "Ariete" Division, which was advancing from Bir el Gobi northeastward, and then in a joint operation to attack the enemy's rear from the south.

Numerous enemy combat units with vast vehicle parks, many tanks and guns were established to be in the area Bir el Haiad - Hagfet Nadira. For this reason the Commander of the Africa Corps, who was leading the envelopment group, launched an even more comprehensive envelopment movement.

In the meanwhile, the front of the 21st Panzer Division had been attacked by superior forces and was engaged in a serious defense against enemy tanks charging Sidi Rezegh and Zafraan. After a sudden artillery concentration the garrison of Fortress Tobruk, supported by sixty tanks, made an attack on the direction of Bel Hamid at noon, intending at long last to unite with the main offense group. The Italian siege front around the fortress tried to offer a defense in the confusion but was forced to relinquish numerous strong points in the encirclement front about Bir Bu Assaten to superior enemy forces. The Italian "Pavia" Division was committed for a counterattack and managed to seal off the enemy breakthrough.

By early afternoon General Gruswell under continuous heavy fighting had reached the area around Hagfet el Nadira deep in the rear of the enemy. The spearheads of the "Ariete" Division arrived with about 100 Italian tanks and General Gruewell sent the combined Italo-German armored forces north against the enemy rear in order to complete the encirclement and to force the enemy northward against the front of the 21st Panzer Division.

The attack began well but soon the divisions struck a broad front of artillery and antitank guns, which had been hurriedly constructed by the enemy between Bir el Haiad and Bir el Chelb. The western Kampfgruppe of the 15th Panzer Division attacked the pocket from the east and, after enemy guns had inflicted considerable casualties, reached the area of Sidi Muftan in the late afternoon, where the attack petered out.

General Gruewell's group was engaged in heavy fighting with the enemy artillery and antitank positions in the late afternoon. The entire artillery had to be committed and at places used direct fire at the enemy gun positions. Every single gun had to be silenced by the joint activity of tanks, antitank guns and artillery. By evening several breaches had been made in the enemy front. The armored attack could now continue, and tank duels developed in the midst of the battlefield, in which both sides suffered considerable losses. The enemy attack group was soon compressed into a narrow area as result of the concentric attack in which the 21st Panzer Division and its wing elements now also participated. Since even the thrust from Tobruk had not relieved the pressure on the enemy, only a breakout from the pocket seemed to offer a safeguard against annihilation.

The broad area south of Sidi Rezegh had been transformed into a sea of dust and steam and smoke. Visibility was limited and no one could distinguish friend or foe. Considerable British forces thus managed to breakout of the pocket to the south in the direction of Bir el Gobi. A large part of the troops were not able to escape, however, and were captured or destroyed during the course of the night.

Not until the morning of 24 Nov could any clear impression be gained of the preceding events, nor could the forces be reassembled and the casualties established. German fighting power was struck such a bad blow that the whole Africa Corps only had forty tanks to commit on 24 Nov.

This battle resulted in the removal of the danger to the encirclement ring about Toburk, the destruction of a large part of the enemy armored strength and the morale effect on the enemy of being forced by a considerably weaker opponent to renounce temporarily offensive plans.

**Special tactics involving the employment of mobile forces developed in this fighting:** rapid evaluation of the situation by personal observation, making a quick decision and acting promptly by moving the forces to the decisive position. Likewise the concentration of forces in order to be able to attack the enemy with local superiority at any time is highly important in desert operations.

The Assault on Egypt  
(Sketch 6)

In the morning of 24 Nov General Gruewell reported to General Rommel, who had not yet been informed of all the details of the tank battle south of Tobruk, that in his opinion the enemy had been destroyed at Sidi Rezegh and only a few elements had been able to escape the encirclement. This fact reinforced Rommel's determination to thrust into the southeast deep into the enemy hinterland in order to assail the latter's east front and destroy the Indians and New Zealanders before they could unite with the remnants of the defeated offensive group and then make a combined advance on Tobruk. At the same time he wanted to seize Habata and Maddalena in order to cut off enemy supply lines. By making use of the disorganization and confusion which doubtlessly existed within enemy ranks, he desired to make a bold thrust into the area south of Sollum front and thus completely unnerve the enemy and perhaps even occasion a withdrawal to Egypt. All mobile troops would have to participate in such an operation. South of Tobruk a weak defense force, created from various elements, would remain, in order to be able to ward off any possible new moves on the part of the enemy. The defense of Bir el Gobi and of the encirclement front around Tobruk would retain the forces previously assigned.

In spite of exhaustion of the men and the heavy casualties suffered in the fighting of the last days, about noon of 24 Nov the German Africa Corps and the "Ariete" Division began to march across the plain in the direction of Sidi Omar. The village was reached that evening in a lightning advance that paid no attention to any possible threat to the flanks from British elements. Rommel, himself, was at the head of this pursuit column and led the 21 Panzer Division right through the Indian 4th Division into the area by Sidi Suleiman in order to seal off the Halfaya front from the east. The 15th Panzer Division was to attack the enemy at Sidi Omar. A combined-arms Kampfgruppe was assembled to seize the supply center of Maddelena and another force was to destroy the dumps around Habata at the terminus of the British desert railroad.

The briefing for this operation took place at Bir Sheferzen late in the afternoon of 24 Nov. Thereafter Rommel drove over to the 21st Panzer Division and launched it in the direction of the Halfaya Pass. During that night, the division, in opposition to its original instruction but in consequence of an incorrectly transmitted order from the army's rear echelon, cut through the Halfaya Position to Capuzzo, where it had to engage in stiff fighting with the New Zealanders and suffered many casualties.

The attack of the 15th Panzer Division proved a failure, and it became clear that the enemy was still everywhere a good deal stronger than the German victory would have led one to believe.

The enemy quickly recovered from the shock occasioned by the defeat, and, as was later learned, it was General Auchinleck, the Commander in Chief of the Middle East, himself, who, hastening over from Egypt, personally intervened to save the situation at the last moment by opposing the decision of the Commander of the Eighth Army to evacuate the Marmarica and fall back to Egypt.

Although the British 7th Armored Division and the South Africans had been badly shaken up, the New Zealanders, the Indians, the Guards Brigade, and the garrison of Tobruk were all still fully intact. In view of this situation Rommel unfortunately had to refrain from carrying out the operations against the supply centers of Naddelena and Habata. Such time-consuming, extensive raids would no longer have come as a surprise and would have signified an irresponsible dissipation of heavily decimated forces. Rommel instead concentrated all his mobile forces against the New Zealanders.

On 25 Nov the heavy fighting at Tobruk again grew in intensity. The covering force became the objective of a simultaneous pincer movement frontally from the southeast and in the rear from Tobruk. By utilizing all available forces the attack could be partially beaten off and a deep enemy breach halted by an Italian counterthrust.

This critical situation (Sketch 7) caused Rommel to break off the fighting on the Sollum front and transfer all elements as rapidly as possible for commitment at the point of main effort at Tobruk. Meanwhile the 15th Panzer Division had surrounded and captured a New Zealand brigade and many tanks near Sidi Azeiz. The 15th and 21st Panzer Divisions, accompanied by the "Ariete" Division, then advanced along a broad front westward, where the defense group was having difficulty defending itself from attacks on all sides.

While the 21st Panzer Division hurried to Gambut on 28 Nov along both sides of the coastal highway and gained the area south of Zafraan, the 15th Panzer Division, constantly threatened on its flank by mobile enemy forces, utilized the Trigh Capuzzo. It had to fight its way in heavy fighting up the outer slope of the djebel and finally in the evening reattained the old battlefields south of Tobruk.

In the meanwhile the enemy had burst the encirclement ring and had occupied the dominating hills of El Dude, Bel Hamid and Zafraan.

Rommel intended to encircle the New Zealand division, which had united with the Tobruk garrison, and thus to close the ring around the city again. He concentrated all available forces for this operation and laid the point of main effort of the attack at the west wing in order to prevent a withdrawal of the New

Zealanders into the fortress area. The 21st Panzer Division sealed the pocket from the east, simultaneously being forced to defend itself against relief attacks from the south. The 15th Panzer Division, advancing northward by way of Bir Bu Creimisa, captured the important ridge of El Duda in the evening. The 90th Light Division thrust south of its positions as far as Magen Belhamid, without being able to join the 15th. The ceaseless British attacks from the south against the battle front could be repulsed. The "Ariete" Division was moved forward to reinforce the encirclement ring. El Duda was lost again during the night. On the morning of 30 Nov the enemy armored and infantry forces made a thrust against the southern covering line Creimisa - Rezegh - Zafraan. Since the attacks were not directly uniformly, however, they could all be repulsed. On the other hand the 15th Panzer Division was not able to take Bel Hamed despite repeated attempts to storm the hill, nor was it able to restore contact with the 90th Light Division or seal off the pocket from the fortress. Not until the next day could the sealing be completed after heavy fighting, after which a concentric attack ended by wiping out the bulk of the encircled New Zealanders, all attempts at relief from the south and east having failed.

With this the garrison of Tobruk was shut in again, and the enemy had suffered such heavy losses that the fighting had to cease for the time being - as was learned from an intercepted British radio message.

Rommel still could not spare his troops, which so badly needed rest and rehabilitation. The Sollum front was engaged in stiff defensive battle with the Indians and the fortress of Bardia was seriously threatened. For this reason Rommel sent two combined-arms Kampfgruppen across the Trigh Capuzzo and the coastal highway to the Sollum front in order to free the lines of communication. He prepared the bulk of his German and Italian mobile forces southeast of Tobruk in such a way that while they were resting they could still at any time be committed southward against the main British forces.

The enemy forces carried out their reorganization and regrouping in an area on both sides of the Trigh el Abd and secured themselves by means of a veil of armored reconnaissance units along the line Sidi Muftan - Capuzzo.

Battle of Bir el Gobi  
(Sketch 8)

During 4 Dec the army finally gained a clear picture of the enemy dispositions. A new force had been assembled at Bir el Gobi, whose mission obviously was to thrust in an enveloping movement into the area west of Tobruk and to dislodge the siege front. Rommel decided to immediately attack this not yet completely prepared enemy force with all the mobile elements available to him.

Since forces encircling Tobruk were too weak, he made preparations to give up the eastern portion of the front. During the night of 4 Dec the German Africa Corps rolled westward through the corridor between el Duda and Sidi Rezegh, now only three kilometers wide, to its assembly position west of El Adem. Its mission was an attack on Gobi, which was to be carried out jointly with the Italian motorized corps ("Ariete" and "Trieste" Divisions) coming from the northeast. Since the Italians were neither assembled or ready for attack, the Africa Corps had to attack alone at noon on 5 Dec. Both of the armored divisions advanced organized in depth and on a broad front along the route from el Adem to Bir el Gobi. Northwest of Gobi they united with the Young Fascist Division, which had fought there for a long time and very bravely. The Corps first met the British Guards Brigade and then the newly reequipped brigades of the British 7th Armored Division. In spite of this they reached the area eighteen km northwest of Gobi by nightfall. At the same time the British 70th Infantry Division, supported by tanks, broke out of Tobruk and seized the ridge line el Duda - Bel Hamed. As result of this move, the siege of the east front of Tobruk had to be relinquished for good.

On 6 Dec the German Africa Corps again had to continue the attack on Gobi without the assistance of the Italian corps. The Italians reported that their troops were worn out and no longer capable of waging battle. Although the enemy gradually withdrew toward Bir el Gobi, a destruction of strong elements or even an encirclement was no longer possible.

The attack was nonetheless continued on 7 Dec, but it led to no success and resulted in heavy German casualties. Having considered the strong enemy superiority and the conditions of his own troops, Rommel decided to give up Tobruk entirely and to fall back to the Ain el Gazala Position for the time being. To have remained at Tobruk any longer would have led to gradual attrition of his own very weak forces and thus to the loss of Libya in the long run.



Withdrawal to Sirts  
(Sketch 9)

While the defense on the west front at Tobruk was continued, the German Africa Corps and the Italian Motorized Corps disengaged from the enemy in the night of 7 Dec. Elements of the Italian non-motorized XXI Corps and the 90th Light Division had already attained the Gazala position. The major danger during the withdrawal movement was located on the southern flank, which could have been enveloped by the enemy without any trouble. The Africa Corps was therefore entrusted with the mission of assuring flank protection to the entire armed forces. The enemy did not attempt such a large-scale operation, however, but limited his attacks to frontal thrusts all of which could be repulsed. Falling back by stages and engaged in part in stiff individual combat, all the forces had reached the Gazala position by 12 December without the enemy having succeeded in cutting off any sizeable elements or having caused them any particularly high casualties.

On 13 Dec the reinforced British Guards Brigade broke through the position of the Italian XX Motorized Corps, and its reconnaissance forces reached Bir Temrad twenty miles behind the front. At the same time, enemy armored forces enveloped or circumvented the German Africa Corps' position on the flank of the defense front. (Sketch 9). The danger was obvious that the British might be able to gain the trail junction at El Mechili and thereby cut off the supply line and force a shifting of the withdrawal route through Cyrenaica. By exerting all its energy and committing its last man and weapon the Africa Corps was able to attack the enemy, who had broken through, and destroy a large portion of the Guards Brigade. Eight hundred prisoners including the brigade commander were taken and many guns and twenty tanks destroyed. A thrust by about 150 British tanks against the rear of the Africa Corps was successfully repulsed by the employment of a few antitank guns and artillery.

In spite of these apparently favorable circumstances, one should not forget that the strength of the Axis soldiers was at its end.

The German Africa Corps and the motorized corps, both under General Gruewell, fell back in the evening of 17 Dec across the southern edge of the Cyrenaica Mountains to El Abiar, while the Italian infantrymen marched through Cyrenaica.

The withdrawal into the area of Agedabia was completed on 25 Dec. The enemy had not utilized the many opportunities which offered themselves to envelop the German forces. The non-motorized Italian-German forces occupied a defense position built for the emergency on both sides of the town. The Africa Corps

and the Italian motorized corps prepared for mobile defense in the Agedabia area.

It will always remain a mystery why the English did not advance through the easily passable desert and catch up with the German troops. They could have stopped the withdrawal once and for all at this critical spot. Such fears, which always hung over Rommel, fortunately did not materialize. Yet even after the arrival at the Agedabia position, which was tactically unfavorable, the danger of a broad envelopment did not subside. The condition of the troops, particularly the Italians, and the scanty supplies did not seem to make it advisable to remain long in the position but rather to fight a delaying action and to withdraw the bulk of the troops into the far more advantageous Marsa el Brega line as soon as conditions seemed favorable.

Since the Agedabia position, itself, could not have withstood a strong enemy attack, the defense had to be secured by means of mobile counterattacks. In the meantime the British had pushed forward very close to the front, so that both a frontal as well as an enveloping attack could be expected. On 27 Dec the rehabilitated British 22nd Armored Brigade, once again fully capable of giving battle, thrust across El Haseiat at the same time as other forces attacked along the Agedabia front. It was possible in a three day tank battle to envelop the enemy force to give him battle with reversed front, push him against the antitank positions and finally encircle him. The defeat cost the British 146 tanks and 300 prisoners. The brigade's remaining thirty tanks were able to escape to the east, but only lack of fuel on the part of the Germans saved them from destruction. As result of this defeat, elements of the Guards Brigade and the 7th Armored Division, which had been attacking frontally, fell back to the northeast. This removed any immediate danger to the Agedabia position. Rommel utilized this favorable situation, evacuated the Agedabia position and withdrew by stages into the Mersa el Brega line without the exertion of enemy pressure. The movement began on 2 Jan with the departure of the Italian infantry. Last to follow were the mobile forces, and on 12 Jan all units were ready for employment in the Brega position.

The course of this winter campaign clearly indicates that the decisive role on desert warfare falls to the tank, chiefly because there are no barriers and the tank's possibilities are unrestricted. The dimensions of victory or defeat are, therefore, apparent from the number of tanks which is important; even more essential are the technical capabilities -- mobility, maximum range, and the caliber of their guns. For it is important in the open desert to take the enemy under effective fire earlier and hit him earlier than he, himself, is in a position to do. To be "further from the enemy than he from you" is a cardinal principle in the desert. The English Mark II tank was feared because it had such heavy armament that it was

difficult to destroy. At the same time it was slow and had a short, small-caliber gun. The German tanks, Types III and IV were still superior to their counterparts in range, caliber and also partially in maneuverability in the winter battle, but in May 1943 the British evened the gap with the Grant and the Lee and later the Sherman tanks. A great share of the German success in the winter battle can thus be attributed to the superiority of the tanks.

The same principles were true for gun capabilities too. Here the English had the superiority. It was highly unpleasant when they directed fire from great distance with their 37.6 mm guns and the Germans could muster no effective counterfire. On the other hand the Germans had a weapon in the 88mm antitank/antiaircraft gun greatly envied by their opponents because of its great flexibility. It played a decisive part in the German successes, although the British called it "unfair" for tank combat because of its large caliber. The infantry was of lesser importance on both sides, and it was only in the position warfare at Sollum that it played a more important role.

The German operations were governed by the effort to concentrate their inferior forces for attack at decisive points. The difficulties which are part of fighting in which allies are also concerned and the supply situation, which was always strained, set certain limits to these objectives. Nonetheless, Rommel always maintained that only offensive tactics could bring success. That was the reason that, even when he had to go over to the defense, he waged a mobile defense. His aim always was to envelop, encircle and destroy enemy elements. It was due to his skill that his inferior forces could almost invariably be grouped and concentrated in accord with the new situation with whirlwind speed so that the enemy could then be defeated before other forces could intervene. That is the way he defeated the 7th Armored Brigade on 21 Nov after having regrouped the two German armored divisions at the former's flanks and rear the previous night. The next day he succeeded in encircling the 4th Armored Brigade in similar fashion. During the battle on Memorial Sunday it was not until just before noon during the fighting itself that a German armored division was brought up under constant fighting to the rear of the enemy, where it forced the enemy forces to fight with reversed front against the Italian division moved up from the other direction. The result was that it was caught in a pocket. Since the Axis forces were not sufficient to completely seal off the ring, considerable elements of the exceedingly strong enemy forces succeeded in breaking out and a total destruction could not be achieved. The encirclement of the New Zealand brigade south of Tobruk on 1 Dec after Rommel managed to concentrate his forces in spite of the most difficult conditions was a complete success for the Africa Corps.

The defeat of the Guards Brigade near Temrad was due to the quick action of General Gruewell in the defensive fighting during the withdrawel. The three day tank battle at Agedabia at the end of 1941 is a model of mobile warfare and cooperation between tanks and antitank guns. Rommel's combined forces were able to completely destroy the enemy.

The winter battle in the Narmarica is, therefore, of very special importance, because there the tactical principles of desert warfare were born, solidified and tested. All later desert successes were built upon these experiences and are the basis for Rommel's success in the summer battles of 1942, where he succeeded by mobile warfare in gradually defeating an enemy with decided material superiority.

#### Organization of the 15th and 21st Panzer Divisions

The 21st Panzer Division (then still known as the 5th Light Division ) was only organized on an improvised basis and consisted of the following troops:

- Armored regiment with two battalions
- Two light artillery battalions with three batteries each
- Three machine gun battalions with four companies each
- One antitank battalion with three companies each
- One engineer battalion with two companies
- One signal communications battalion with a radio and a telephone communications company
- Supply units

The 15th Panzer Division was organized as follows:

- Armored regiment with two battalions
- One artillery regiment with two light and one heavy battalion
- One infantry brigade with two regiments, each of which had two battalions and one motorcycle battalion
- One antitank battalion with three companies
- One engineer Battalion with three companies
- One signal communications battalion with a radio and a telephone communications company
- Supply units

The two otherwise completely different divisions were equipped exactly the same as far as tanks were concerned.

- Regimental staff with a signal communication platoon
- Each regiment with two battalion staffs with signal communication platoon

Each battalion with three companies with Type II and Type III tanks and one company with type IV tank

The divisions were also assigned one or two 88 mm gun batteries.

Pages 230-236 are missing from this manuscript.

### THE BATTLE OF GAZALA

#### Plan of Attack (Sketch I)

The opening note of the offensive was to be sounded by a frontal attack by the Italian divisions (A) stationed in the Gazala position against the 50th British Division and the 1st South African Division. Strong artillery units were designated to support this attack. During the day and night of 27 May tank concentrations were supposed to be simulated behind the sector of the local attack belt. For this purpose tank and motor vehicles were driven around in circles.

By means of this deception maneuver Rommel intended to lead the British to expect the main German thrust in the north and central part of the Gazala position, so that they would bring up the armored unit which were stationed in the rear areas as a mobile reserve to this sector. In case he was unable to induce the British command to transfer their entire armored units to that place, he nevertheless hoped that some of the armored units would be dispatched to this area, thus splitting the British offensive forces.

At dawn on 26 May the motorized troops were also supposed to move in the direction of the attack front of the Italian infantry. After dark the motorized group was then supposed to move into its assembly area (B) -- see Sketch II -- at Segnali-Bir es Sferi. This group consisted of the German Africa Corps with the 15th and 21st Panzer Division, the XX Italian Motorized Corps with the "Trieste" and "Ariete" divisions and the 90th Light Division, to which were attached three reconnaissance battalions (3rd, 33rd, and 580th).

The beginning of the advance for the enveloping attack on Bir Hacheim was set for 2200 hours. From here the German Africa Corps and the XX Italian Corps were to advance past Acroma to the coast in order to cut off the British divisions in the Gazala position from the lines of communication and destroy them.

The reinforced 90th Light Division was supposed to gain the area of El Adem-Belhamed in order to prevent the withdrawal of

the Tobruk garrison as well as the movement of reinforcements into the Acroma area and to cut off the enemy from his extensive supply depots in the area around Tobruk. The division was equipped with numerous dust making machines (airplane engines and propellers mounted on trucks), which were supposed to simulate the approach of strong armored units by creating a gigantic dust cloud. By this measure Rommel intended to prevent the British reserves in the area south of Tobruk from entering the battle of Acroma as long as his panzer units were still seeking a decision there.

Following the destruction of the enemy, it was planned to capture the fortress of Tobruk.

### Execution

#### Concentration, Advance and Tactical Assembly (Sketch II)

At 1400 on 26 May, after strong artillery concentrations, the Italian infantry (A) launched a frontal attack against the Gazala position. In order to deceive the British, one armored battalion each from the German Africa Corps and the XX Italian Corps were attached to those assault units, but they were supposed to push back their units again in the evening. The British reconnaissance groups in the outpost area of the Gazala position offered only slight resistance and withdrew from their main positions.

In the meantime the offensive group (the 90th and 1st Divisions of the German Africa Corps and the XX Italian Motorized Corps) assembled in the areas assigned to them (B). In order to deceive the enemy, elements of these units continued to march toward the attack point of the Italians on the evening of 26 May and, as had been planned, they could not help being recognized during this movement by the British night air reconnaissance units. Then these units also returned in great haste to their assemble area. At 2020 hours the 10,000 motor vehicles of the offensive troops began to move. The divisions advanced across the gravely desert by bright moonlight in a cross-country march without interruption. The terrain was easily traversed by vehicle and contained hardly any obstacles. In the tremendous dust clouds, which reduced visibility almost to zero, the drivers had a great deal of trouble maintaining contact with the vehicle ahead of them.

#### Comments:

1. The numerous deception measures carried out by Rommel were only possible with respect to timing in the unobstructed desert. Under European conditions, where the troops are confined to roads, it is impossible to carry them out.

2. The area of advance was already familiar to a large number of this unit commanders from the fighting of the preceding year and presented no obstacles whatsoever, except for a few wadis at Trigh el Abd, east of Segneli which however -- rest of line missing/poor photocopy -- would have required considerably more time

3. A "cross-country" march by such strong motorized units is only possible in the desert. The formation selected (see Annex 7) was the result of the experienced gained in the previous fighting and proved to be very efficient. The tanks were in the lead (deployed in wings or waves) with attached engineer units, behind them the light artillery, so that they could take part in any engagements which might develop, even at great distances. There were antitank units in the flanks as security troops. The divisional operations staff with signal facilities was directly behind the tank wave, behind them the signal battalion and combat columns. There was one armored infantry battalion as a rear covering force. The order of march did not follow any set form, but could be changed at will at any time without difficulty, if the situation so required. Under European conditions, on the other hand, it is very difficult to change an order of march once it has been established, since this is prevented by the terrain (roads, obstacles).

4. Dust. The 90th Light Division was equipped with special dust creating devices for the purpose of deception in order to simulate a main attack on El Adem.

The dust thrown up during the advance of the 10,000 vehicles in the offense group was tremendous and greatly hampered driving. The commander of the panzer regiment writes concerning this:

"This night march of 100 km made heavy demands on the officers and drivers, since for reasons of secrecy we had to march without radio, i.e. without any signal communications, and since in spite of the full moon the hugh clouds of dust made it almost impossible for the drivers to see anything."

-- line missing/poor photocopy -- both in depth and in the flanks. The division had a total march depth of approximately ten kilometers and a width of 500 to 1000 meters.

5. Orientation. All the men were given compass bearings, so that it was possible to follow the general direction of the march. In spite of this the columns frequently became separated and some of them diverged from the main direction. A night march of this kind requires great practice and experience on the part of the troops; otherwise it cannot be done on time.

The average marching speed was fifteen to twenty km, which in view of the difficulties can be described as good. Smaller units marching alone can naturally make considerably greater speeds.

6. Mine fields. At Bir Hacheim the columns ran into extensive mine fields, which were fenced in, but some of them proved to be dummy mine fields. They created a considerable feeling on insecurity among the troops. In the Gazala position the British had made a large-scale use of mine fields for the first time in the desert warfare, and had strewn the unobstructed desert terrain with a mass of artificial obstacles which were more unpleasant than the natural obstacles (bodies of water, forests, buildings) of a European theater of war. Rommel writes the following about this in his diary:

"A strongly mined defense area from eight to ten km wide extended from the coast at Bazala toward the south. The 50th British and 1st South African Divisions had established themselves in it at numerous strong points. From the southern part of these of these positions a mine field about twenty km wide led to Bir Hacheim. This village was the southern anchor of the British Gazala front. Its works were situated within broad mine fields. The position was fortified with great skill. This was the first time that an attempt had been made to establish a fortified area so deep in the desert. There were about one million mines within the area of these fortifications alone. Several km east of the central part of the Gazala position -- line missing/poor photocopy -- surrounded by mine fields and was manned by the 201st British Guards Brigade. To protect the outpost area of Tobruk toward the south the British had strongly fortified and mined this area around El Hatain and Batruna."

The fortress of Tobruk was the supply base and permanent support point for the Gazala position. The British had energetically carried on the completion of the fortification since 1941. In particular, extensive mine fields had been laid within the area of the fortress. All fortified points in the entire defense system possessed strong infantry, artillery and armored reconnaissance units. Extensive supply depots had been established. All the fortifications were characterized by the extraordinary engineering skill of the British. Tremendous quantities of mines -- over one and one half million in all the fields -- were laid by the engineers.

Besides their completely motorized units in the fortified areas, the British also had strong armored and mechanized units (1st and 7th Armored Divisions, as well as several independent



motorized brigades and battalions), which were organized as mobile reserves behind the fortifications.

The Tank Battle of Bir el Harmat  
(Sketch II)

Shortly before daybreak on 26 May there was an hour's pause in the area about fifteen to twenty km southeast of Bir Hacheim. Then the great mass of vehicles sprang into movement again and in swirling clouds of dust and sand the units drove northward into the British rear area. British mine fields and dummy mine fields caused trouble in places, but by 0600 all units of the army were advancing steadily toward the objective.

The 90th Light Division reached the area of El Adem as early as 1000. Large supply depots of the XXX British Corps, which had its supply base here, fell into its hands. The British command did not react until about noon, and then there was brisk fighting there.

In the meantime the panzer units of the Africa Corps had also come into collision with the 4th British Armored Brigade and the 3d Indian Motorized Brigade about 10 km east of Bir el Harmat. A tank battle ensued. The German panzer units entered the engagement without adequate artillery support. To their great surprise the German tanks were met by well aimed tank fire even at great distances and soon many of our tanks were in flames. This far-reaching tank fire caused astonishment, for in previous desert engagements the British had not been able to score good hits even at medium distances. However, in spite of heavy losses, the Germans finally succeeded, by committing all their forces, in driving the British back past Trigh el Abd. From there, however, they immediately returned in a counterattack.

The commander of the 5th Panzer regiments (21st Panzer Division) gives the following description of these engagements (Sketch VIII)

"After issuing new orders and supplying the troops and vehicles, we resumed our advance about 0600 on about 27 May in the combat formation of the cross-country march (Flaechenmerch). In place of the 1st Battalion or the panzer regiment, which had not yet been able to return to its position from the deception maneuver on the Gazala front, the antitank battalion was stationed in the foremost line in order to increase the number of our armor-piercing guns. It was obvious that this was only a makeshift, for in an attack against tanks the antitank battalion, which was only motorized (wheeled vehicles only, no track-laying vehicles) could not give

the same performance as a tank battalion. Radio silence was ordered until contact had been established with the enemy. This considerably hampered the command and the cohesion of the division.

"After a march of about 10 km the tank wave made its first contact with individual enemy tanks. In the area east of Bir el Harmat a furious battle then developed with enemy tanks, which had already opened fire at a great distance, as well as with enemy batteries. For several hours the battle raged here and there and caused us heavy losses in tanks and men. The battle was finally decided in our favor when our panzer battalion arrived at the right time and several batteries, but we too had lost forty to fifty tanks. To be sure, they were not all complete losses, but in view of the fact that the total strength of the regiment was 170 tanks they represented a considerable percentage.

"In the afternoon the regiment again attacked toward the north and slowly gained ground. The enemy launched an armored counter-attack from the west into the deep flank of the division which cut off considerable elements from our combat troops. In particular, these elements included the supply train, which contained the motor fuel columns of the panzer regiment. The absence of the motor fuel supply units was felt most severely by the panzer regiment, for this regiment was not only our biggest gasoline consumer, but also because in contrast to other motor vehicles one of our tanks could only carry enough fuel for 100 km even under very favorable conditions.

"With the arrival of darkness the fighting came to an end and the regiment took up a hedgehog position (a strong point having an all-around defense) north of Knightsbridge in order to rest."

The following had occurred among the other elements of the offensive group in the afternoon of 27 May:

Around noon, when Rommel and his staff attempted to reach the 90th Light Division at El Adem, his column was attacked by British tanks and had to turn back. Contact between the 90th Light Division and the Africa Corps was broken. When attempting to fight its way back to the Africa Corps, it suddenly found itself confronted by a British battery, which was advancing from the area of Bir Hacheim in the direction of Tobruk. Although the staff did not have any forces to speak of at its disposal, they attacked the British from their march movement and captured them.

-- Line missing/poor photocopy -- el Harmat. The 1st British Armored Division was brought up from the area south of Tobruk and entered the battle. Its strong armored units attacked chiefly from the northeast. While the British artillery furnished strong fire protection, they fired into the columns and tank units of the Africa Corps, which were visible at a great distance. Black smoke poured from the burning vehicles and tanks. The attack came to a halt. The divisions again suffered exceptionally high tank losses. A sudden sandstorm which prevented both sides from seeing and firing accurately, came at a very opportune time for the Africa Corps.

Numerous German columns became disorganized and withdrew in a southwesterly direction from the fire of the British artillery. While defending itself on the east, the Africa Corps fought its way step by step toward the north. Until darkness the battle continued to rage over the level country, which was covered with camel's-thorn. The greater part of the Africa Corps advanced as far as the area 12 km south and southwest of Acroma. During this movement a large part of the column unfortunately became separated from the panzer divisions and the majority of the armored infantry could not follow them.

Comments:

1. Tactics: Rommel's attack with comparatively weak forces into the heart of the enemy Gazala position after a long enveloping march of about 200 km was an enterprise of unprecedented daring and only possible in the desert. In Europe it is impossible to move such large numbers of troops in such a short time, since they have to follow -- line missing/poor photocopy -- in favor of the British. However, the latter committed their superior tank forces on piecemeal fashion and in this way helped the German forces to win a victory - although at a heavy price. Rommel's papers contain the following comments about this:

" In spite of this situation on the evening of 27 May, which confronted us with serious problems, my attitude toward the subsequent course of the battle was very hopeful. For General Ritchie had thrown his armored forces into the battle separately and at different times and had thus enabled us on each occasion to confront them with a more or less adequate number of our own tanks. This splitting up of the British armored brigades was incomprehensible. In my opinion there was no strategic or tactical purpose whatsoever behind the sacrificing of the 7th British Armored Division south and southeast of Bir el Harmat, for it would have been all the same whether my panzer divisions had been placed here or at Trigh el Abd, where the other British armored units finally entered

the battle. What the British should have done was to commit all their available armored units at the same time. They should never have allowed themselves to be deceived into splitting up their forces before the battle or during our feint attack on the Gazala position. The fact that their units were completely motorized and that the unobstructed desert terrain was easily passable would have enabled them to collect their forces and cross the battlefield in very quick time. The battle of movement in the open desert was often correctly compared with a naval battle. Even at sea it is a mistake to attack with divided forces by leaving some of your ships in harbor during the battle.

## 2. The "Hedgehog Position:"

After the fighting and during every rest period in enemy territory the practice of taking up a "hedgehog" position proved very useful. In this operation the troops were assembled in a specific area had the outer boundary of this little area was guarded in the form of a circle by infantry and antitank guns, and possibly also by tanks. As a matter of principle the resting troops dug themselves in, in order to have protection in their fox-holes from any possible air attacks.

3. Tanks: The American "Grant" tank, which was then used in combat for the first time, furnished the German troops with an unwelcome surprise. It had a relatively long 75 mm gun of superior range. Because of their ignorance of this fact, numerous German tanks were knocked out by the enemy just as they entered the engagement and before they could get the enemy in range with their shorter guns. Both of the German panzer regiments were committed there had between them forty-eight Mark IV tanks armed with 75 mm guns, which, however, had only a short barrel with a correspondingly short range. Only four Mark IV tanks in each of these two panzer regiments were equipped with the long 75 mm guns and their supply of ammunition was low. Thus, on the first day of the attack these two panzer regiments lost a total of about 150 tanks out of the 380 with which they had entered the battle. To be sure, not all of these were totally destroyed, but they represented very serious losses. During the next few days the situation improved somewhat, since the German tanks quickly adjusted themselves to the superior range of the majority of the enemy tanks.

In open desert country, where it is often possible to see for great distances, the range of the guns is of decisive importance.

4. Staffs: All combat command staffs are almost always stationed on the foremost line. Thus, they are just as much exposed to the enemy as the combat troops and are often

unexpectedly involved in unforeseen fighting. The staffs, therefore, should be escorted and protected by combat units armed with antitank guns and tanks. Mixed combat groups of approximately company strength proved useful for this purpose. In the enemy tank attack against the deep flank of the Africa Corps on the -- line missing/poor photocopy -- exclusively for defensive purposes and they succeeded in halting the attack. To be sure, the effect of the dust and sunlight also contributed to this.

5. Effects of Dust and Sunlight: The sandstorms which arose in the afternoon of 27 May can concealed the front with dust (easterly winds) saved the Africa Corps during the enemy attack on its deep flank, where only weak forces could be committed for a defense.

Another great disadvantage for the enemy was that the early hours of the afternoon they had to fight against the sun and because of the increased agitation of the air this made aiming extremely difficult. In the evening, on the other hand, the enemy had a good chance to aim at the Germans, who had the sun at their backs and so were silhouetted against the sky.

6. Supply: It was very difficult or even impossible to supply the combat troops, since the supply columns had been attacked and scattered by the enemy. In operations which are carried out deep into the territory of a superior enemy, columns moving in the open desert are in danger and must be protected (scout cars, antitank guns, self-propelled guns). Supplies can be moved only by the convoy system. However, it is best to give the troops such an abundance of all supplies, especially motor fuel, which in mobile desert warfare is of the highest importance, that they will have a wide radius of action.

It would have been impossible for several days to supply the troops with water if they had not captured a fairly large fresh-water well at Bir el Harmat, which had been dug by the British shortly before that time. Otherwise it would have been necessary to transport drinking water -- line missing/poor photo copy -- have been placed in jeopardy. Here the importance of water points in the desert becomes clearly evident.

Engagements on 28-29 May  
(Sketches II and III)

On the following day our forces were supposed to be concentrated for the purpose of continuing the attack toward the north. For this purpose the 90th Light Division was to disengage itself from the enemy in the area around El Adem, where they were being hard pressed, and attach itself to the Africa Corps in the

west in order to increase the latter's striking power. At daybreak on 28 May British units were sighted advancing toward the northwest. We still did not have any contact with the individual elements of the panzer army. Shortly after daybreak British tanks fired on the army's headquarters. The XX Italian Motorized Corps was ordered to follow behind the Africa Corps and to advance to the north.

The 90th Light Division was unable to comply with the order to attach itself to the Africa Corps in the east and increased the latter's striking power, for it was constantly under attack by strong British forces. About 100 British tanks were engaged in action there. Many airplanes of the RAF dropped bombs on the division, and several units were soon scattered from the main body. They had to take up a hedgehog position 10 km east of Bir el Harmat in order to ward off further attacks by the enemy. Fortunately, in the course of the morning we succeeded in establishing a defense front with at least some elements of the Africa Corps in order to protect our columns northeast of Bir el Harmat. -- line missing/poor photocopy -- the enemy had assembled almost all available armor north of the Trigh Capuzzo and were repeatedly attacking the Africa Corps.

Rommel now ordered the Italians to make a frontal attack from the Gazala position against the main enemy front in order to pin down the British forces committed there and to prevent them from joining in the action against the German envelopment forces. The Italian attack, which jumped off at noon on 28 May, made good progress forward at Eluet el Tamar against the resistance of weak British forces.

In the afternoon it became evident in the Africa Corps that there was a considerable lack of ammunition as the result of the failure of the supply system, so that some elements of the tank and artillery forces were no longer fit for action. It was, therefore, exceptionally important to bring up the supply columns quickly.

Rommel describes the subsequent course of the engagement:

"Late in the afternoon of 28 May we, that is the combat staff, succeeded in advancing to a hill about 15 km north of Bir el Harmat with a few vehicles and antitank guns and from there we were able to see the German Africa Corps. A typical picture of desert warfare was revealed. Black clouds billowed up to the sky and gave the landscape a peculiarly somber charm. I proposed to send up the supply columns to the Africa Corps along this route in the early hours of the following morning.

"On our way back to the combat post we established further contact with one British and one Italian

column. Even the latter took us for the enemy and opened a wild fire, from which we escaped by a speedy withdrawel. After dark, when we succeeded in reaching the area southwest of Bir el Harmat through one of the mine lanes cleared by the Italians and met some of our own troops, we learned that the British had overrun my staff headquarters during our absence. To be sure, numerous British tanks had been knocked out on this occasion by the Kiehl combat echelon (Kampfstaffle Kiehl). Other British columns had pushed forward as far as the supply units of the Africa Corps, had created great confusion there and had shot up a large number of vehicles carrying gasoline and ammunition. During the night we succeeded in restoring order and in occupying our old positions.-- line missing/poor photocopy -- purpose of sending them to the Africa Corps the following morning. In view of the slight cover which was available for protection, it would have been fairly risky for the columns to march through an area controlled by the enemy. Fortunately the 90th Light Division was able to disengage itself from the British during the night and establish itself around Bir el Harmat. The "Ariete" Division was sent into the gap between the 90th Light Division and the Africa Corps. This plan of organization made the route of the supply units a great deal safer. At daybreak I sent them to the Africa Corps. Everything went off smoothly. As we entered the combat area, the Africa Corps was just being attacked from the north and east by British tanks. Because of its lack of gasoline and ammunition the operations of the corps had been severely limited. Now for the first time it was possible to relieve this situation to a certain extent. I established my command post here on the same afternoon.

"After full contact had been re-established with all elements of the army, I was able to gain an over-all picture of the situation.

"We had now succeeded in uniting our forces on both sides of the Trigh el Abd and in forming a strong defense front here. Nevertheless, the German and Italian units had suffered badly. The supply route of the offensive units south of Bir el Hacheim had been practically cut off by British motorized battalions. The attack of the Italian infantry divisions against the Gazala position had run into the main British position and had stuck fast there in front of well prepared fortifications."

The commander of the 5th Panzer Regiment (21st Panzer Division) describes the engagements of his regiment as follows (Sketch VIII):

"During the night the division took up a hedgehog position due north of the Trigh Capuzzo. The rest area was covered by enemy artillery fire from the northeast, east and south. Although the supply train had not yet arrived on 28 May, the attack was continued in a northerly direction on the next day in the forward part of the division front, just as the panzer regiment had attacked on the day before. Enemy tanks tried to harass the assembly; consequently the regiment had to issue orders in advance for an attack with limited objective. The enemy was quickly repulsed and lost ten tanks and two batteries.

"The division moved up and about noon reached the area ten kilo-meters southwest of Acroma and El Cuscia. The division opened up somewhat to the west toward the corps headquarters and took up a hedgehog position. -- line missing/poor photocopy -- not known whether the motor fuel columns had been destroyed in the enemy tank attack.

"The 15th Panzer Division--which as far as I know was located southeast of the 21st Panzer Division --  
\_suffered even more from the supply situation.

"The regimental engineer arrived in the evening and a few more supply columns during the night, so that the troops could be supplied and the fuel tanks refilled. It was not yet possible to remove the men who had been wounded in the morning of 27 May and so they were taken along with the combat echelons (Kampfstaffel) in captured trucks and empty supply vehicles.

"29 May (Sketch VIII): Enemy tanks had made an attack from the east against the 15th Panzer Division, which was located farther to the south; upon orders from the Africa Corps the 1st Battalion of the 5th Panzer Regiment was placed at the disposal of this division and entered the heavy tank battle.

"The 2d Battalion of the 5th Panzer Regiment, which had been reinforced with one battery, one company of armored infantry and several engineers, had the mission of advancing to the north and harassing supply traffic on the Via Balbia with their 105-mm battery. This mission was accomplished, and when the reconnaissance detachment which had been sent out by the battalion commander reported that the ridge of hills east of Sidi Mgherreb was occupied by the enemy, the battalion commander (1st Lieutenant Rocholl) attacked at



Point 201 ran into an excellently fortified British strong point, which they captured although they suffered some casualties. Over one hundred prisoners were taken here.

"Another company of the panzergrenadier regiment and the regimental staff of the panzer grenadier regiment were sent after the battalion in the afternoon with orders to hold the strong point.

"On the same evening, however, the regiment received orders to close up toward the division with its detached elements. There it was learned that in order to improve supply system the British Corps had been ordered to return through the British mine field along mine lanes which were said to exist along the Trigh Capuzzo and the Trigh el Abd. One battalion of the 104th Panzergrenadier Regiment with an attached company of the 5th Panzer Regiment was supposed to remain behind as a rear guard.

"The march movements were carried out smoothly; the rear guard which was pursued by enemy reconnaissance forces and tanks did not arrive at the area assigned to it until the morning of 30 May."

Supply: The supply situation of the offensive group was gradually becoming catastrophic, because the supplies had to be moved over great distances in enemy-dominated territory and because due to the lack of men, the supply columns had to drive without any escort. Some of the columns, therefore, became scattered, others were shot up, so that only an extremely small part of them or none at all ever reached the troops. Conclusion: Strong convoy guards should be assigned to columns in the desert. However, this is only possible if sufficient forces are available and at the time this was not the case.

Staffs: The danger to which combat command staffs were exposed in desert warfare was again made clearly evident. Therefore, the staffs attached "combat echelons" to them, which consisted of tanks, antitank guns and antiaircraft guns and which were frequently able to take a successful part in an engagement.

## The Actions from 30 May to 2 June

### Penetration of the Mine Fields (Sketch III)

In the evening of 29 May the British had concentrated their entire armored forces in front of the German-Italian offensive group. By the evening of 29 May the supply situation had become so critical that it was no longer possible to consider continuing the attack successfully toward the north. Rommel drew the right conclusions from this state of affairs and attempted to secure a guarded supply route for the army which would by pass the wide bend around Bir el Hacheim, which was dominated by line missing/poor photocopy Gazala front by an attack from the east and to open a gateway to the west. For this purpose units of the 90th Light Division and elements of the Africa Corps were supposed to move against the minefields from the east. In order to safeguard this operation, the other units were to organize themselves for defense along a shortened front. Following the penetration of the Gazala fortifications, the souther anchor of the British front, the fortress of Bir el Hacheim, was to be subdued.

30 May: In the gray light of dawn all the trucks which could be spared were assembled as supply vehicles in a convoy, to which tanks were attached. This measure appeared necessary because in the preceding days some supply columns of the Africa Corps had been attacked by British scouting vehicles west of the Gazala-Bir el Hacheim position. Those with minor and serious wounds who could not be accommodated in the medical trucks were now sent to the rear of the empty supply vehicles. Unfortunately, the column did not start upon its trip to the rear until after dawn and was fired at by enemy artillery and aircraft. By driving at top speed the truck drivers attempted to evade the artillery fire, but were blinded by enormous clouds of dust thrown up by the vehicles in front of them, so that they got off the mine lanes, most of which were only a single track wide, and drove over mines, resulting in heavy losses in vehicles and men. It was obvious that these mine lanes were not sufficient for supplying several armored and motorized divisions. First of all, however, it was necessary to repel the enemy, who was pressing hard on their heels from the north and northeast.

At daybreak the individual divisions arrived at the areas assigned to them and there established themselves for defense. During these movements we ascertained that there were strong British units accompanied by tanks in the area of Got el Ualeb. This was the 150th Brigade, which was attached to the 50th British Division. In the meantime elements of the X Italian Corps had succeeded in getting through the British minefields and forming a bridgehead on the eastern side of them. The lanes which the Italians had already cleared through the British mine

fields were, to be sure, exposed to heavy fire from the British artillery, which had an extremely disturbing effect on the column traffic. Nevertheless, by 1200 hours contact had been established between the offensive group and the X Italian Corps and a direct supply route opened to the west. In the course of the day the British brigade was surrounded at Got el Ualeb.

The enemy followed our disengaging movements only slowly. The withdrawal of the German-Italian units had apparently come to him as a surprise. Besides, the British command never reacted very quickly. In the morning of 30 May we detected concentrations of 280 British tanks in the east and 150 tanks in the north of our front. We were now constantly waiting for the British to deliver their major blow. In the morning, however, there were only a few British attacks against the "Ariete" division which the Italians repulsed, and relatively weak thrusts at the rest of our front. Fifty-seven British tanks were knocked out on this day.

In the afternoon Rommel himself reconnoitered the possibilities of an attack against Got el Ualeb and ordered an attack to be made on the next morning against the British fortifications there by elements of the Africa Corps, the 90th Light Division and the Italian "Trieste" Division. The attack of these units began on the morning of 31 May. Step by step the German-Italian units fought their way forward against extremely stubborn British resistance. The British defense was conducted with considerable skill. As usual, the British fought to the last cartridge. In spite of all, by the evening of 31 May we had driven a considerable breach into the British positions. On the following day the British garrison was to be finished off. After vigorous Stuka attacks, our infantry again flung themselves against the British field fortifications. The attack went on. Position after position of this system of fortifications, which had been built like a fortress was in our hands. The last British resistance had been extinguished. We captured a total of 3000 prisoners here and destroyed or captured 101 tanks and armored reconnaissance cars, as well as twenty-four artillery pieces of all types.

After the fall of Got El Ualeb, the British made an attack with reinforced reconnaissance units in late afternoon on 1 June against our defense front to the east and southeast. Brisk concentrations of fire were suddenly directed, especially against our command post. Rommel's most important assistants were wounded that day.

Then the major base of Bir el Hacheim was to be surrounded and attacked on 2 June. British and French assault teams had repeatedly attacked our lines of communication from that base. This now had to come to an end.

Comments:

1. With the successful attack from the east against the minefields of Got el Ualeb and the subsequent reduction of that fortress, the Gazala front was split in two and a safe supply route was opened up. If this had not been accomplished, the German-Italian offensive group would have been destroyed by the superior enemy forces and as a result of their lack of supplies. The importance of a secure supply route in the desert is clearly apparent.

2. The fact that we ascertained the number of enemy tanks (180) in action on 30 May is something which is only possible in the desert, where one has almost unrestricted visibility.

3. Dust in Connection with Mine Warfare: During the withdrawal of the columns of the 21st Panzer Division on 30 May the dust thrown up by the rapidly moving motor vehicles reduced the driver's visibility to zero, so that they got off the track in the mine lanes and drove into the mine fields, thus sustaining heavy losses.

4. Removal of Wounded: Because of the constant attacks by the British against our rear communications it was impossible to ship the numerous wounded to the field hospitals in the rear and have them cared for. For four days they had to remain with the field units, where they could only be given scanty treatment, since the proper facilities were lacking. For many seriously wounded men this had disastrous consequences.

It is necessary to equip field units with facilities which will enable them to provide suitable treatment for seriously wounded cases for a fairly long time. In the German divisions this was not the case.



## ANNEX 9

### The Actions from 2 to 6 June 1942 (Sketch V)

#### The First Battle of Knightsbridge

During the night of 1-2 June the 90th Light Division and the "Trieste" Division advanced against Bir el Hacheim. After these units had traversed the mine fields without heavy casualties the fortress was enveloped from the east. The demand for surrender which we forwarded under a flag of truce was rejected and the attack began about noon. The "Trieste" Division advanced against the fortifications, field positions and mine fields of the French from the northeast, while the 90th Light Division attacked from the southeast. Our artillery preparation opened a battle of unusual severity, which was to last for ten days. The French defended themselves in field positions which were built very cleverly on a level with the ground and in combat positions such as fox-holes, small bunkers, machine guns and antitank gun positions, all of which had been surrounded with strong mine belts and built according to the proper rules for desert warfare. Fortifications of this kind are hard to recognize and extraordinarily insensitive to artillery fire and air raids, for a direct hit can wipe out only a fox-hole at the most. Therefore, it is necessary to use a great deal of ammunition if one wishes to inflict actual damage on the enemy in such a position.

It was especially difficult to clear lanes in the mine fields under the French fire. Here the army engineers, who suffered heavy casualties, turned out a superhuman performance. Under smoke screens and the covering fire of their own artillery, they had, in some places, to dig their way directly up to the mines. The victory was to a large extent due to them. -- line missing/poor photocopy -- Air Force attacked in waves, assault detachments made up of men from all the service arms of several different units attacked from the north and south. Our attacks repeatedly bogged down in the excellent French fortifications. During the first ten days of our attack against the French the British had remained amazingly calm. The "Ariete" Division alone was attacked by them on 2 June, but it defended itself stubbornly. After a counterattack by the 21st Panzer Division the situation there again became quiet.

### Actions of the 5th Panzer Regiment on 2 June 1942 (Sketch VIII)

On the morning of 2 June about twenty tanks of the 5th Panzer Regiment advanced in a scouting raid around Knightsbridge and returned with useful reconnaissance information.

Toward noon the 21st Panzer Division was supposed to make ready for the attack toward the north. Orientation was extremely difficult because of a violent sandstorm, and the assembly lasted longer than usual. As always, the beginning of the attack was supposed to be ordered after the units had reported themselves in readiness.

In the afternoon, when the sandstorm suddenly abated, some enemy tanks which had apparently been alarmed by the scouting raid of our tanks and had pursued them, appeared in front of the 5th Panzer Regiment, which was assembled for the attack, and opened fire.

Since haste was called for, the order to advance was given and the attack carried out immediately; the artillery attached itself to the regiment and in a free-moving attack the enemy was hurled back and pursued for a distance of fifteen kilometers until it became dark. Two batteries and about twenty-five tanks were destroyed during this operations, while our own losses were slight.

The regiment was ordered back during the night by the division commander and remained in front of the position, a battalion of the panzer grenadier regiment being brought forward as a covering force.

Since the division was not supposed to advance to the north again during the next few days, the panzer regiment was again withdrawn behind the main line of resistance.

Even during these days the regiment maintained telephone communication with the division and also with neighboring units whenever possible in order to make as little use as possible of radio messages, which might be intercepted.

### The first Battle of Knightsbridge (Sketch IV)

The British were repeatedly harassing our supply columns with combat teams sent out from the area south of Bir el Hacheim. They laid mines in our supply paths and attacked out supply units. We had to use scout cars and self propelled guns as a convoy guard.

The Africa Corps took advantage of these days of quiet in order to make up for its heavy losses of material by repairs, but on 2 June the corps still only had 130 tanks left out of the 320 it possessed at the beginning of the battle. Now the number slowly increased again.

We sensed that there was something in the air. It was clear to us that the British would soon make another attack, either against the front of our panzer divisions in the north or against our siege group in the south. Therefore, in the night of 4-5 June we prepared the 15th Panzer --line missing/poor photo copy -- ground during this stubborn tank battle. A combat group blocked the Trigh Capuzzo to the east and thereby forced the British units into the fire of the German-Italian panzer divisions, which were attacking concentrically. The combat team was soon exposed to vigorous attacks from the east. When it became enveloped by the enemy in the south, it had to withdraw during the night to Bir el Harmat.

Since we were able to press the British hard from three sides, they suffered considerable losses. Thus, 4000 British troops were taken prisoner on 5 and 6 June.

Actions of the 5th Panzer Regiment During the British Tank Attack  
Against Axis Positions of 5 June 1942  
(Sketch IX)

During the night, at about 0200, there was suddenly a considerable sound of fighting in the right wing of our position where the Italian "Ariete" Armored Division was stationed. Thereupon the 21st Panzer Division ordered a state of combat readiness, which was immediately carried out. As a result of this all the tanks had to switch over to radio reception, which was otherwise forbidden in order to spare the batteries. When the strong artillery fire suddenly ceased about 0330, orders were given to suspend the state of combat readiness, although it was still dark. The order had hardly been given when tremendous artillery and machine-gun fire was directed at the left wing of our position against the 90th Light Division, which was removed from there to Bir el Hacheim -- its sector was taken over by the 21st Panzer Division and the Italian divisions stationed in the mine lanes.

At dark the enemy surrounded -- line missing/poor photocopy -- division sector, and especially at the mine lane. A company of the 1st Battalion, the 4th Company of the 5th Panzer Regiment, which was sent forward to the northwest at this time independently launched a counterattack and was soon supported by the 1st Battalion. By 0700 the 1st Battalion had knocked out twenty enemy tanks. After consulting by radio with the division,



which had already received reports from other units, the regimental staff and the Battalion were sent in to support the 1st Battalion.

The regiment launched a counterattack with a limited objective and in the course of the morning knocked out a total of about fifty tanks, captured several trucks and took about 150 prisoners, while sustaining relatively few casualties of its own.

The British attempt to cut off the Axis forces from the mine lane with this attack was thereby frustrated.

The enemy withdrew to the north with their tanks; thereupon the 5th Panzer Regiment was placed in a state of readiness at the right wing of the division, approximately in the area west of Bir el Aslagh, where, apart from minor movements it remained for several days.

#### Tank Actions in the Area Around Knightsbridge from 6 June to 10 June (Sketch IX)

Radiating from this point, tank actions were fought almost daily in the afternoon hours in the form of attacks with limited objective against the British armored units stationed around Knightsbridge, mostly with the 8th Panzer Regiment of the 15th Panzer Division. These attacks were generally not broken off until dusk, when it was no longer possible to distinguish between friend and foe, which frequently led to the most remarkable situations until the elements of the regiment could be withdrawn to their assembly area.

Especially notable was an operation presumably carried out on 6 June, in which the staff of the 5th Panzer Regiment together with the 2d Battalion of the 5th Panzer Regiment, the 2d Battalion of the 104th Panzer Grenadier Regiment, the 1st Battalion of the 155th Panzer Artillery Regiment and a heavy anti-aircraft battalion were ordered to advance past Bir el Aslagh to a ridge of hills along a permanent telephone line, presumably passing through Point 171 to Triangulation Point 169. They were to hold this line for the purpose of sealing off to the north an enemy group stationed farther to the south, which was supposed to be subjected to an enveloping attack by the 15th Panzer Division and the Italian "Ariete" Armored Division.

The combat group advanced from the sector of the 15th Panzer Division without encountering any resistance forward, but after reaching its objective it was under heavy enemy artillery fire from the north and south until the afternoon and was repeatedly attacked by enemy bombers.

Then in the afternoon the enemy group was encircled and the 1st Battalion of the 5th Panzer Regiment, which had to be committed by the division in order to extend the barrier to the west, broke into the pocket with elements of the 2d Battalion of the 5th Panzer Regiment.

Several thousand prisoners were taken. Many artillery pieces, antitank guns and motor vehicles were captured, so that the losses of our own unarmored units, which were not light, appeared slight in comparison.

#### Attack on Bir el Hachiem from 6 to 10 June (Sketch IV)

Combat activity in front of the French fortification of Bir el Hachiem had temporarily subsided. On 6 June the 90th Light Division resumed the attack. Their spearheads were able to advance to within 800 meters of the redoubt (small fort) of Bir el Hacheim. Then the attack bogged down again. The French poured a furious defensive fire into our ranks across the stony and completely open terrain. Toward evening the attack had to be broken off. The fortress was enveloped even more closely. In the night of 6-7 June the 90th Light Division cleared several mine lanes in its sector. In the darkness the assault teams advanced to within attacking distance. The fortress was taken under artillery fire and strongly attacked by the Luftwaffe. Then in the morning of 7 June the infantry flung themselves against the French positions. In spite of their gallantry, this assault also collapsed under the fire of all the enemy guns. In the north alone the combat group was able to effect several breaches. This defense was a remarkable achievement on the part of the defenders, who in the meantime were completely cut off from the outside world. We continued our attacks on 8 June also. Flares were sent up throughout the night and the defensive positions were covered with machine-gun fire in order to tire out the French. Nevertheless, when the assault troops attacked their positions the next morning, the French fire struck them with undiminished strength. The enemy remained stubbornly in their holes and were not to be seen.

On 9 June the Africa Corps sent up another combat group to support the attack on Bir el Hacheim. In the early hours of the morning waves of our infantry again rolled toward the French works. Toward noon the 90th Light Division, which had also supported from the south with its heavy weapons, the attack of the combat groups in the north, also attacked. With painful losses and under constant exposure to the hostile fire of the French, who defended themselves to the last, their assault troops worked their way to within about 200 meters of the redoubt of Bir el Hachiem. On 10 June the combat group of the Africa Corps finally succeeded in breaking deep into the main defensive area

of the enemy north of Bir el Hachiem. The French defended every pocket of resistance with desperation and sustained exceptionally high casualties. After this penetration, however, they were unable to hold Bir el Hacheim any longer. We expected that the enemy would then send up relief troops in order to enable the French garrison to break their way out. Elements of the 7th British Brigade, which, as already mentioned, had hitherto occupied themselves with harassing our supply lines, had already been sighted by our reconnaissance patrols marching toward Bir el Hacheim. In order to be prepared for every situation, the 125th Panzer Division was also dispatched to Bir el Hacheim. The French garrison was to be finished off on the following day. Unfortunately, the French did not do us this favor, for in spite of our security measures they succeeded in effecting a breakthrough with a considerable number of their garrison under the leadership of their commander, General Koenig. They disappeared toward the west under the cover of darkness, where they joined up with the 7th British Motorized Brigade. It was later to become evident that the point where they had broken out of the encircling ring had not been sufficiently closed. It had again been proved that a resolute commander who does not -- line missing/poor photocopy --, can achieve a great deal, even in situations in the desert which appear desperate. The 90th Light Division was able to occupy Bir el Hacheim early in the morning of 11 June. Five hundred Frenchmen fell into our hands there, but most of them were wounded. Our units were not free. Although these actions had cost the troops considerable casualties, the latter were in no proportion to the losses of the British, since thousand of British soldiers had to surrender in the bases besieged by us because of the lack of water and ammunition. For psychological reasons in particular it is generally a mistake to sacrifice units to the enemy.

#### Comments

Tactics: Movements as rapid as those carried out by the German troops in the first battle of Knightsbridge are only possible in the desert. This battle is a typical example of how decisions have to be made and quickly converted into actions in the desert in order to achieve a decisive success. The envelopment of the British forces was thereby assured.

Fortress Bir el Hacheim: This was a typical desert fortification with the combat positions level with the ground, without superstructures, so that it could not be seen from ground level, surrounded by mine fields. This effective positions withstood the attack of strong German forces for ten days. Tanks could not be used for the attack. The eight German tanks which were committed were considerably limited in their movements by the mine fields and were quickly destroyed by antitank shells which came from directions which could not be determined.

Break-out from Bir el Hacheim: This is a typical example showing that it is only in the rarest cases that complete encirclement is possible in the desert, and then only if such strong forces are available that it is possible to seal the position off completely.

A bold, energetic defender can easily collect all his forces at any point in the pocket and break out of it there. The unobstructed desert terrain is suitable for a break-out. The defenders of Bir el Hacheim solved the problem in an exemplary way.

The Second Battle Knightsbridge on 11-12 June (Sketch V)

In the afternoon of 11 June the units committed at Bir el Hacheim were sent to the northeast for the purpose of seeking a final decision.

In the evening of 11 June the 15th Panzer Division, the 90th Light Division and the 3rd and 33rd Reconnaissance Battalions reached the area ten to fifteen kilometers south and southwest of El Adem. In order to circumvent this danger, the enemy moved the 2d British Armored Brigade into the area east of Knightsbridge. In the morning of 12 June, after stubborn fighting against the concentrated British armored forces, which had strong artillery support, the area around El Adem and south of the Trigh Capuzzo was captured. El Adem itself was occupied by the 90th Light Division. The British suffered considerable tank losses in this area and left 400 prisoners in our hands. The 29th Indian Brigade offered stubborn resistance in the El Adem box.

In the morning of 12 June another combat group of the 21st Panzer Division set out to the east. In this way the British armored units were driven closer and closer together and squeezed between the two German panzer divisions. During 12 June the enemy also moved up the 32rd GHQ Armored Brigade from the Gazala position into this area, which was already extremely congested. It therefore appeared likely that a continuation of the attack by the 15th Panzer Division in a northwesterly direction would be attended by great success.

In the morning of 12 June a brisk engagement ensued between the 90th Light Division and the Indians. Moreover, British bombing units attacked without interruption and gave the division a hard time. When Rommel attempted to get through to the 15th Panzer Division, his vehicles were subjected to heavy fire from the north and south and held up for several hours in the open country.

On the following day the 15th Panzer Division mopped up the foothills at El Adem, while to the Italian "Trieste" and Ariete" divisions forced the British into the area north of Trigh Capuzzo. During the violent sandstorm, which at times reduced visibility to zero, the 21st Panzer Division also arrived in the evening hours and attacked toward the east. The big tank massacre among the British units went on. Of the 150 tanks which the British still had left, one after the other was shot up. From several sides a murderous fire was poured into the closely compressed formations of the enemy, whose strength became weaker and weaker. Their counterattacks showed less and less vigor.

Unfortunately, on this day the 90th Light Division for several hours was unable to comply with the order to move up from the east to the 15th Panzer Division for the purpose of closing off the pocket entirely. It was close pressed by the British from all sides and had to fight hard for its life. It could not disengage itself from the enemy until the afternoon, when it moved into its new area after bypassing.

On this day the Guards Brigade evacuated the base of Knightsbridge, after this place had been bombarded with all the available artillery there for the whole morning. This elite unit was almost a perfect embodiment of both the good and bad military qualities of the British Army. Extraordinary bravery and stubbornness were coupled with a rigid immobility. The greater part of the armored units which were attached to the British Guards were destroyed during the day, or else during their retreat during the night.

#### Breakthrough to the Sea (Sketches VI and IX)

On 13 June all the forces of the German-Italian motorized troops were to be assembled for the purpose of forcing a breakthrough to the sea. The British divisions which had hitherto occupied the Gazala position and some elements of which were now withdrawing to the east along the coastal road were now to be thrown back to the west and annihilated. It was clear that we would have to fight hard during the next few days, for it began to be obvious that the British intended to hold the Acroma position under any circumstances in order to enable the units in the Gazala position to make their retreat. It seemed as if the enemy would sacrifice his last tanks for this purpose.

During the night before 14 June the two divisions of the Africa Corps west of the Trigh Hacheim trail were organized for an attack to the north. The Italian "Ariete" and Trieste" divisions were supposed to cover their east flank. The 90th Light Division started off to the east in order to make the

necessary preparations for a rapid occupation of the outpost area of the fortress of Tobruk.

In the morning the German panzer divisions began to move toward the north. The greatest haste was now called for, since the British were pouring eastward in thousands of vehicles. Suddenly they ran into a mine field. Here the enemy had attempted to form a new defensive front and for this purpose had committed all the tanks and artillery which he still had left. Our advance bogged down. Our vehicles were covered by a hail of British projectiles. The reconnaissance battalion was immediately given orders to clear lanes through the mine fields. The violent sandstorm which blew up toward noon proved an advantage for this work. Rommel ordered the 170mm guns to direct harassing fire against the Via Balboa. The thunder of the guns mingled with the sound of demolitions. The enemy was blowing up his ammunition dumps in the Gazala positions.

Late in the afternoon the 15th Panzer Division launched an attack against Hill 187 southwest of Acroma. In spite of vigorous defensive fire from the British tanks, artillery and antitank guns, our attack gained more and more ground. Around 1700 the British fire slowly died down. Resistance crumpled. More and more British troops surrendered. By evening the British barrier had been broken through. After hard fighting, the success of which was indicated by the wrecks of forty five British tanks lying on the battlefield, the German panzer divisions gained the area West of Acroma. The way to the Via Balbia was practically open. The 1st British Armored Division was no longer fit for action, and its remnants left the battlefield during the night.

During the darkness, elements of the British division succeeded in breaking out of the main front of the Gazala position to the southwest through the Italian troops of the X Corps. Although we knocked out 400 British vehicles there and captured several hundred prisoners, British troops with the strength of a brigade still managed to escape. After the successful breakthrough, the British commander led his troops in small columns through our supple area and caused considerable damage there.

In the early hours of the morning of 15 June elements of the 15th Panzer division advanced past the Via Balbia to the sea. Unfortunately, the group which was supposed to block the Via Balbia was only seven tanks strong. British and South Africans were able to knock out these few tanks, break through the barrier and escape with additional elements, some of them in wild flight. Shortly afterwards, however, the gap was definitely closed. In the meantime the Italian divisions and the German brigade had moved after the British from the Gazala position. In the morning of 15 June the 21st Panzer Division had already withdrawn from

the area around Acroma and had advanced in an easterly direction with the 90th Light Division and a reconnaissance group past El Adem for the purpose of eliminating the El Adem "box" with the strong points of Batruna and El Haitian. A brisk fire broke out between our tanks and the Indians, who had dug themselves in. On the same evening the strong point of Batruma was stormed and 800 prisoners captured, as well as a number of artillery pieces and other war material. The division reached Sidi Rezegh by the evening after being subject to violent British bombing raids, where its advance at first came to a halt in the face of strong British defensive fire. In spite of several attacks the 90th Light Division did not succeed in taking the main fortification of the El Adem box, El Haitian, that day.

Line missing/poor photocopy -- had withdrawn to the area of the Libyan-Egyptian border. Apparently the fortresses of Tobruk and El Haitian had the task of pinning down our units until the British had established a defensive position at the Libyan-Egyptian border. It was now necessary to attack and take Tobruk while confusion and depression still prevailed among the garrison of the fortress and while the spirit of resistance of the British troops was still weakened by our victory in the desert. Speed was again the paramount necessity.

As before, the Indians continued to defend themselves in El Haitian. On 16 June, in spite of all its gallantry, the 90th Light Division was unable to enlarge the breach in the fortification which its assault teams had made on the preceding evening. Like all the British fortifications in Marmarica, this position had been constructed with great engineering skill and with the most modern methods. Here too, just as at Bir el Hacheim, elements of the garrison, which consisted of the 29th Indian Brigade, broke out during the night and withdrew toward the south. One advantage of the complete motorization of the British infantry! The Indians easily managed to form a point of main effort during the night, concentrate their firepower there and effect a breakthrough. Another proof of how difficult it is to effectively encircle a completely motorized opponent whose command apparatus is still in order. The rest of the Indians in El Haitian surrendered in the morning of 17 June. Five hundred prisoners and considerable war material fell into our hands here. (Sketch X)

In the morning the Africa Corps with the 21st Panzer Division had already taken the strong southern forts of Tobruk, El Duda and Belhamed. Line missing/poor photocopy -- the command immediately committed the 90th Light Division against several British strong points which were still holding out in this area. They were surrounded and attacked. The entire Africa Corps and the "Ariete" Division were ordered to march to Gambut and the area south of it. This move was intended to divert the attention of the British from Tobruk and at the same time clear the area in

our rear for the attack on Tobruk. Above all, however, this advance was supposed to drive the British air force, which, thanks to its short approach flights, and made itself extremely disagreeable, away from its bases at Gambut and so eliminate it during the assault on Tobruk.

In the evening the 21st Panzer Division was ordered to the north. There was again a minor engagement south of Gambut. After we had considerable difficulty with the extensive British mine fields, our spearhead reached Gambut around 2200. Of course, most of our troops halted in front of the mine fields during the night.

At dawn on 18 June British airplanes were again sighted over the 21st Panzer Division, which was continuing to move northward. Toward 0430 we reached the rail line and the road. The British had laid this rail line from Mersa Matruh to the outer zone of Tobruk during the last few months. While crossing it we tore up parts of the track. During the night of the 4th Infantry Regiment had already taken 500 prisoners on the road. This number now rose steadily. On the airfields, which the British had evacuated at the last minute, we captured fifteen airplanes which were just ready to take off and considerable quantities of oil and gasoline.

In the course of 18 June we finished mopping up the area between Tobruk and Gambut. The necessary movements for encircling the fortress had been carried out. The supply measures for the attack on the British in Tobruk had been prepared with excellent administrative work. In some places we had found large artillery depots and ammunition dumps dating from 1942 which we had to evacuate during the Cunningham offensive. They were now to prove useful.

In the afternoon of 19 June the Africa Corps moved into its assembly area southeast of Tobruk (Sketches VII, X), while the 90th Light Division started off to the east in order to occupy the British supply base between Bardia and Tobruk. These movements were especially important in order to increase the uncertainty of the enemy concerning our intentions. Besides the 90th Light Division, the "Pavia" Division and the "Littorio" Armored Division, elements of which had been sent up again during the last few days, were supposed to screen the attack on Tobruk to the east and south.

#### Comments:

Tactics: In particular these engagements showed how important it is to grasp the situation quickly, as well as the importance of having both the unit commanders and troops react quickly to it. At the end of these actions Rommel wrote the following about this point:



One of the first things I realized in motorized desert warfare was that here the speed of operations and the ability of the command to react quickly is a decisive factor. The troops must be able to operate in great haste and in perfect unity. Here one cannot be satisfied with any particular standard, but must always demand maximum performance, for the one who makes the greater effort is faster, and it is the faster side which wins battles in the desert."

Line missing/poor photocopy -- available forces can be quickly concentrated at the decisive point in a given situation, for the desert terrain offers no obstacles to rapid movements. However, they also show how piecemeal commitment leads to disaster.

Battle of Encirclement: The 50th British Brigade, which was encircled in the west by the Italians and in the east by Germans, concentrated its forces at one point in the pocket and broke its way through to the open desert, where it was received by another British combat group, furnished with supplies and went on to the east. The encircled garrison of El Hatain broke its way out to the east after it had concentrated the bulk of its forces at the breakthrough point while fighting on its interior line. An example of how complete encirclement in the desert is hardly possible.

Deception: Rommel effected a masterpiece of deception by having his troops attack to the east in order to give the enemy the impression that he did not intend to attack Tobruk. The greater part of these troops, however, were led back to the assembly areas southeast of Tobruk in the night before the attack. Zigzag movements of this kind within such a short time are only possible in free and unobstructed desert country. (Sketch VI, VII)

Supply: Immediately after the capture of Marmarica in the winter of 1941-1942, the British built a railroad line straight across the desert from Mersa Matruh to Tobruk and thus provided themselves with a rapid, cheap and fairly safe supply route almost as far as the foremost line of battle. Railroads of this kind can be built very easily in the desert, since there are no obstacles and the subsurface of the desert soil does not require any special railroad embankments. Unfortunately, the Italians and Germans neglected to construct a railroad of this kind from Tripolis or Bengasi to the combat zone, although it would have greatly relieved their always critical supply situation, which was actually only a question of transportation.

The British also erected dummy railroad stations (south of Tobruk for example), with dummy freight cars, ramps, sheds and tracks, with the result that the dummy installations were bombed while the real railroad stations remained untouched.

## Attack on Tobruk (Sketches VII, X)

On the evening of 19 June we had the impression that the enemy had only partially and inaccurately recognized our rear movements toward Tobruk. In all probability, therefore, our attack came as a surprise. There were no longer any appreciable British armored forces in the "Western Desert" outside of the fortress of Tobruk. We could, therefore, feel very hopeful about our impending blow at Tobruk. In spite of the hard days that lay behind us, the army was full of energy and confident of victory. The garrison of Tobruk was organized for defense within the works of the fortress as follows: the reinforced 2d South African Infantry Division, the 11th Indian Brigade, two battalions of the Guards Brigade, several British armored infantry battalions under the staff of the 32nd GHQ Armored Brigade, and artillery reinforcements in the form of several additional artillery regiments.

Although in a purely numerical sense these units were strong, they could not be expected to offer stubborn and well organized resistance, for large parts of the garrison had already confronted us in battle and were depressed and weary. Moreover, the British, whose army organization always proceeded at a very slow pace, had no time to develop their defense system. Besides these troops, the enemy also had five infantry divisions, of which three had been badly mauled. The other two had been brought up fresh by the British command. The two armored divisions of the British had been practically wiped out in the preceding fighting, but reinforcements and replacements were sent to them from the Nile delta.

## Tobruk as a Desert Fortress

Framed in the east and west by rocky, impassable terrain, the system of fortifications extended to the south along a flat, sandy plain. The Italians under Balbo had fortified it splendidly. Excellent consideration had been given to modern weapons of the type available at the present day for attacking fortresses. The numerous works which surrounded Tobruk like a belt had been built into the earth and camouflaged in such a way that they could only be properly recognized by an attacker from the air. They consisted of a system of underground trenches which opened into antitank or machine gun positions. The latter, of which each work had up to ten, did not unmask themselves until the moment of maximum danger and then overwhelmed the attacker with a destructive fire, to which he was unable to reply with direct fire because of the lack of embrasures. Every single work was surrounded by an antitank ditch and by -- line missing/poor photo- copy -- be traversed by tanks the entire fortified area

was surrounded by a deep moat. Behind the fortified system of the outer belt, which was generally organized into several lines, were strong artillery concentration, field positions and several forts. Most of the works were guarded by deep mine fields.

The XXI Italian Corps, which was given several tanks as support, was assigned to make the feint attack in the southwest of the fortification front. The group which was to make the decisive attack on the fortress was composed of the German Africa Corps and the XX Italian Corps. The point of penetration in the southeast was to be bombed by all the German-Italian air forces then available in Africa. When the infantry had subdued the fortified lines, the Africa Corps was to thrust past the crossroad to the harbor and open the Via Balbia to the west. In conjunction with the Africa Corps the XX Italian Corps was to capture the British defense positions and drive through to Ras el Madauer in the rear of the South Africans.

During the night preceding 20 June the attack units moved into their assembly areas. Around 0520 several hundred Stukas pounded the point of penetration in the southeastern part of the fortress. It was possible to observe the considerable effect achieved by this attack. Tremendous mountains of dust rose high above the fortifications of the Indians whirling obstacles and weapons through the air. Impact after impact tore up the multiple-belt entanglement. Immediately after the attack by the air force, the infantry of the Africa Corps and the XX Italian Corps advanced. Lanes had already been cleared through the outer mine fields during the night. After only two hours the German assault troops succeeded in breaking into the British positions. One work after another was attacked and taken in extremely stubborn hand-to-hand fighting. By 0800 the engineers had bridged over the antitank ditch. One can hardly imagine what it means to carry out work of this kind under very heavy British fire. The way was now clear and the panzer units were unleashed.

Immediately afterwards Rommel and his combat staff drove into the sector of the 15th Panzer Division. Here, riding in an armored personnel carrier, he managed to get as far as the mine lanes, which were under violent British artillery fire. Consequently, there was considerable congestion. In the meantime the Africa Corps was exposed to British tank attacks from the interior of the fortress. A violent tank battle developed, in which the artillery of both sides joined. Around 1100 the "Ariete" and "Trieste" Divisions, whose attack had bogged down within the British positions after crossing the antitank ditch, received orders to move up into the penetration area of the Africa Corps. The German attack made more and more progress. Around noon the Africa Corps reached the crossroad of Sidi Mahmud after knocking out fifty British tanks in hard fighting. From then on the key point of the fortress was in our hands.

Rommel accompanied the attack of the Africa Corps beyond the crossroad. Our assault troops were struck by a withering fire from the area of Fort Pilastrino and several emplacements on the descent of the djebel. British ships were now trying to leave the harbor of Tobruk. Apparently the British intended to carry away the crews. Our anti-aircraft guns and artillery immediately went into action and sank six ships.

The attack went on. Soon we reached the descent to the city. Here a British strong point defended itself with exceptional stubbornness. Rommel called on the garrison to surrender, but the British answered with a murderous fire at the vehicles of his combat staff.

On the same evening Fort Pilastrino offered to surrender. Fort Solaro was stormed. Another gunboat was sunk in the harbor. When darkness fell two-thirds of the combat zone of the fortress was in our hands. The city and harbor had already been captured by the Africa Corps during the afternoon. At 0500 on 2 June Rommel drove into the city of Tobruk. Nearly all the buildings of this miserable hole had been leveled with the ground or were only ruins, most of them the marks of our siege in 1941. Then Rommel drove along the Via Balboa to the west. The headquarters of the 32nd British GHQ Armored Brigade offered to surrender. Thirty British tanks in good operating condition were then surrendered to us. Numerous vehicles were burning left and right of the Via Balboa. Everywhere were seen pictures of destruction and chaos.

General Klopper, the commander of the 2d South African Infantry Division and commandant of the fortress, offered to surrender the fortress of Tobruk at 0900. He had no longer been able to avert defeat, although he had done everything to keep his troops in hand. However, it looked as if he no longer had the necessary communications to organize a break out by his troops. Everything had simply gone too quickly. Incomprehensibly enough, the British outside the fortress had done nothing to interfere with the attack on Tobruk.

The victory in Tobruk --line missing/poor photocopy -- our very last forces, since weeks of heavy fighting against an enemy who was superior with respect to both personnel and material had not failed to leave their mark on the German troops too. However, thanks to the tremendous amount of ammunition, gasoline, food and material of all kinds which we had just captured, it was now possible to stock up for another offensive operation.

#### Comments:

1. Attack Against Fortresses: Attacks against fortresses in the desert are no different form those in European territory. The assault by the infantry is preceded by the concentrated

commitment of artillery and bombers. The attack against mine fields, obstacles and strong points is carried out by the infantry and engineers, who have to force a breach through the mine fields, strong points and trenches before armored forces can be sent into the interior of the fortress.

Permanent fortifications in the desert are difficult to attack from the ground, since all the works are constructed level with the earth and cannot be recognized by a ground observer. It is extremely difficult, therefore, to attack them. No results can be achieved by direct fire. The artillery can attack fortifications only by indirect fire or by using high burst projectiles.

The weapons of the defense are located in flanking fire positions, which are so well concealed and camouflaged in the front that the attacker cannot recognize them.

2. Deception: By sending forward partial forces to Bardia which gave the impression there of being strong forces by artificially creating large clouds or dust, and by sending back the Africa Corps -- which had advanced past Gamut to the east -- into the assembly areas for the attack on Tobruk, Rommel was able to deceive the enemy about his overall intentions and about the presumable sector of the attack. He then deliberately attacked in a sector of the fortified front which was defended by an Indian brigade. Of all the defense units in the fortress this brigade was the worst. Its resistance was overcome surprisingly soon.

With respect to time and place, these deception maneuvers are only possible in the desert, where it is possible to move freely, quickly and with difficulty, forward, backward and sideways.

3. Bombing Operations: The bombing of the fortifications of Tobruk had more of a psychological than an actual effect. Just as at Bir el Hacheim, the bombs could do little damage to the fortifications and the garrison. After a few bomb hits the amount of dust and smoke which was generated made it impossible to aim accurately any more. Therefore, most of the bombs had to be dropped unaimed into the immense clouds of dust.

In general, it can be said that bombs have a much slighter effect in the sandy or gravelly desert (Tobruk) than in a stony desert, such as Alamein, where the fragmentation effects are tremendous.

THE TANK BATTLE OF SIDI BOU ZID, TUNISIA  
(10th Panzer Division, 10-17 Feb 1943)

I. Background

Following the battles around Tabourba and in the area farther south, the situation had become somewhat stabilized in the northern and central sectors of Tunisia by Feb 1943. Defense positions had been developed along the hill ranges and there was no longer any immediate threat of a breakthrough to the coast in a surprise attack by Allied forces.

In the south, in contrast, all reconnaissance indicated that the American armored forces concentrated west of the Faid Pass would soon launch an attack to break through to the coast. This operation would have separated the Tunisia Army (Fifth Panzer Army) from Rommel's Panzer Armee Afrika, which was advancing from the south.

During the first days of Feb, the bulk of the 10th Panzer Division passed through Tunisia in a southerly direction to the Sbitha area southwest of Kairouan, from where it was to be employed in an attack toward the west.

II. Measures Taken and Activities in the Rest Area

The units of the division were able to find relatively good cover and camouflage in an extensive area covered with a growth of cacti. During this period the Allied air forces were not very active, so that it was possible to correct initial mistakes without any losses or serious damage being incurred. After a short while spent in the desert, one develops the ability to recognize the smallest possibility of taking cover. Plant growth of any type or the slightest irregularities in the terrain must be taken advantage of. However, the efforts to do so should not lead to any massing or concentration of troops, since this would invariably lead to heavy losses in the event of sudden bombing attacks or concentrations of artillery fire.

It was therefore important to disperse the units as far apart as possible while at the same time maintaining integration and a constant state of preparedness for action. As a preparatory measure to this end, the reconnaissance platoon of the armored battalion had been sent on ahead. This platoon consisted of twenty men with Volkswagens (small passenger cars which served the same purpose in the German army as the jeep did in the American Army). As is obvious from the designation of the unit, the platoon had the mission of reconnoitering roads and terrain for the most widely varying purposes. Reconnaissance platoons had originally been equipped with motor bicycles, but in Africa these had proved unsuitable. The Volkswagens, which had

special broad tires were admirable for cross country travel, and could also carry weapons as well as water and gas for reconnaissance over long distances. From the volkswagen the air could be kept under observation in all directions and attacking low flying planes were made out in good time. During long marches the reconnaissance platoon served as an instrument for the battalion commander in transmitting his orders and in maintaining contact within his unit.

The units travelled by the shortest route to their bivouac areas. Camouflage nets were used. In checking over the camouflage measures taken, it was repeatedly necessary to point out that it is not the color camouflage, but the placing of the net in such a manner that irregular contours are formed. The tired troops were inclined to fetch everything necessary for camouflage, such as leaves, branches and bundles of grass, from the area immediately around the vehicles, which defeated the purpose of camouflaging, since the vehicles then stood out as dark spots in the lighter surroundings.

During the first days of Feb the weather was comparatively dry, so that the risk could be taken of placing even the vehicles and tents in the wadis which traversed the cactus covered terrain. Though these wadis provided very welcome cover, they are a grave danger when sudden rain turns them into raging torrents. It is therefore always necessary when camping in a wadis, to reconnoiter its course and to find or prepare as many exits as possible. For such purposes, the battalion had an engineer platoon, about twenty strong, mounted on two armored personnel carriers and on Volkswagens. They were employed to overcome terrain difficulties for the tanks, to construct positions and to lay remove mines. In desert warfare this platoon proved particularly valuable and it is a component no armored unit can dispense with.

While the camouflage work was proceeding, trenches were dug underneath and beside the tanks and other vehicles to provide protection against shell fragmentation. These trenches also had to be camouflaged, the edges sloped and the soil removed had to be placed so that it could not be seen at any point.

On the whole it can be said that the process of moving into and --- line missing/poor photocopy --- respects from the circumstances that had been encountered elsewhere, such as in Russia, for example, where there were extensive forests. If losses of men and material are to be avoided in warfare in desert and steppes, much work is necessary.

After the assembly area had been occupied, a conference was held early the next morning, and the following points were once again stressed:

1. The troops will not rest before camouflage work is completed and ample protection provided in the form of trenches.

2. For reasons of concealment and as protection against injury, full uniform will be worn during daylight. The wearing of shorts is prohibited.

3. At an early stage we had found that minor injuries, which would receive no attention in Europe, in North Africa often took a long time to heal and usually festered. Especially dangerous were the sharp spikes of the cacti, which even pierced the soles of shoes.

4. Gatherings of more than twelve men at any one spot are prohibited. All supplying will take place at night. Motor trips during the daytime must be only at the express orders of the commander.

5. Each company will place aircraft warning posts and anti-aircraft machine guns in appropriate positions. The aircraft warners will be placed in positions where they will have a clear range of vision; they must also be camouflaged and take care to remain concealed.

6. All tracks of arriving and departing vehicles, which were deep in the sand, must be removed immediately. Every man will be held individually responsible for doing so.

7. Every man is warned to be careful of scorpions and venomous snakes. The camping sites will be carefully searched.

The clothing worn during the daytime and during the cold nights was of particular importance. The difference between the daytime and night temperatures were enormous. The most important article of clothing for protection against the cold at night was the belly band. Tank personnel who, during the battle or while on the march often had to remain without moving for protracted periods in the confined of their tanks, had to be extremely careful in the choice of their clothing. Any clothing that impeded the flow of blood or that impeded movement, such as laced high boots, was useless. The materials used had to be soft to avoid injuring the skin by friction, as the skin became unusually sensitive anyhow owing to the exigencies of the African climate. The cloth had to have a smooth surface to prevent the adherence of dust. Tropical helmets were not used at any time during the campaign. A cap with a wide visor was of great importance as protection against the glaring sun.



The necessary supply bases were provided for nighttime supplying. Armored units require large amounts of supplies; their combat value in the desert where the capture of terrain is not the objective, is largely dependent upon its radius of action, which, in turn is dependent upon supplies. The farther the distance to the coast, the more supply bases had to be established so that the unit could receive provision at any one of these points as circumstances required.

To obtain as wide a range of action as possible, all disadvantages were willingly accepted --- missing line/poor photocopy --- as many as ten cans and additional containers of ammunition in the tanks. During marches, the empty cans were placed alongside the road for collection by a truck which followed. The bulk of the ammunition taken along was armor piercing. Whereas in Russia the ration of armor piercing to high-explosive shells was 1:1, a far higher ratio of armor piercing shells was taken along in Tunisia, since the tank is the weapon in desert warfare.

During rest periods, while in assembly areas and whenever possible while the unit was on the march, each company was accompanied by its organic maintenance team. This team, which consisted of ten specially trained tank repairman, was able to service the tanks and to carry out minor repairs. So far as the service company of the battalion was concerned, it had proved advisable to have it under the direct control of the battalion engineer officer. Two heavy platoons of the service company worked close to large-sized farms or to factories in the vicinity of the supply depots. The armored battalion was accompanied by a light workshop platoon, which was equipped with the more essential tools and so forth, and had everything for the recovery of damaged tanks, such as tank recovery trucks and prime movers.

No appreciable difficulties were encountered in Tunisia so far as water supplies were concerned. All that was necessary, was to caution the men again and again to be extremely careful about not mixing water and gas containers.

During every rest period and every halt, the important parts of the tanks had to be cleaned and protected against dust. The air filters for the motors require frequent cleaning. Originally, air for the -- line missing/poor photocopy -- As result, so much dust collected in the cylinders of the motors that they were soon worn out. Larger air filters were therefore attached and the air intakes placed inside the battle compartment, whereby the life span of the motors was increased. However, this measure had the disadvantage that a lot of dust entered the battle compartment, where it was only possible to keep the ammunition and the weapons useable through constant cleaning. The muzzles of the guns were protected by a cloth through which the shells could pass.

Messengers from the companies were always in attendance at the battalion command post to insure the rapid transmission of orders and other messages. During rest periods radio silence was observed. If it was necessary to coordinate the tuning in of the radios, special antennae were used, which had only a small range and could not be picked up at any distance.

Advantage was also taken of every halt to instruct the men in great detail on the health and hygienic regulations. All refuse had to be buried immediately; water had always to be boiled and was to be drunk only in the morning and evening - never during the daytime; the eating of raw meat was prohibited and all slaughtered carcasses had to be inspected by the medical officer. They were also informed that alcohol was very harmful in the climate in which they were living.

Another important point was to instruct the men on their behavior with the Arabs, since misunderstandings and blunders, in relations with these peoples in particular, can lead to fateful enmities, which can result in espionage and partisan activities. It was necessary to know and understand their peculiarities and to respect their way of life. --- line missing/poor photocopy --- a great role, this appears to be a point of decisive significance. In any future war, the numbers of partisans and irregular bands will be greater than ever before and it will be advisable to arrange all training accordingly.

### III. Movement Into the Assembly Area

On 10 Feb 1943, the units of the division moved southward in an overnight march into the area roughly forty kilometers east of Faïd. The tanks found good cover in the olive groves on either side of the east-west road.

Extensive olive groves were often encountered in Tunisia and they were eagerly sought as cover and for rest areas. Any attempt by tanks to enter an olive grove held by enemy force is sheer suicide. The trees are just high enough to prevent the tank commander from seeing anything and to make it impossible for the gunner to train his gun. At the same time the line of fire of the antitank gun in position is in no way obstructed.

During night marches the following points had to be observed: during moonlight, the nights in Africa are so bright that the moving unit can be seen from a great distance. Therefore it was necessary even at night to move in open column and to have anti-aircraft machine guns constantly on the alert. If, owing to mechanical trouble, one of the tanks could not maintain the speed of the marching column, it dropped out of the line and signaled the following vehicles to keep moving. Otherwise it would cause the column to become too extended.

#### IV. The Attack on Sidi Bou Zid

On 11 Feb 1943, preparations commenced for the westward attack through the Faid Pass. Reconnaissance results showed the following situation: Apart from occasional tanks and reconnaissance patrols, no signs of the enemy force were to be found west of the elevated terrain on either side of Faid. The hills held by the Italians north and south of Faid were high and rugged and therefore impassable for tanks. An olive grove roughly ten kilometers east of Faid was suitable as an assemble area. The tree-covered terrain immediately north of the road two kilometers east of Faid was suitable for a halt prior to the assembly. The pass itself was mined.

The 10th Panzer Division commenced moving at 1930 on 13 Feb, proceeded at a steady pace of fifteen kilometers per hour and reached the assembly area which had been reconnoitered. The attack order was issued during the night and was to be carried out by two groups. The first group consisting of:

- 86th Panzergrenadier (Armored Infantry) Regiment
- 1 Tiger tank company, with 5 tiger tanks
- 1 Engineer platoon of the 90th Engineer Battalion
- 1 Battery of four 105mm self-propelled assault guns
- 2 antitank platoons with self-propelled guns,

was to attack along the Faid-Sbeitla road with Post-de Lassouda as its first objective.

The second group consisting of:

- 1st BN, 7th Panzer Regt
- 2d Bn, 69th Panzergrenadier Regt
- 1 antitank platoon with self-propelled guns
- 1 light battery with 105mm guns,

and was to move through the Faid Pass and then, in sweeping around north of Djebel Lessouda was to obtain control of the Faid-Sbeitla road as its first objective.

Units of the German Africa Corps were to take the city of Sidi Bon Zid in an attack from the south.

During the night, engineers cleared the mines which the Italians had placed in the Faid Pass.

While the tanks were taking up the attack positions at about 0400, a severe sandstorm arose, which greatly restricted visibility, and it was only due to the experience of the tank crews that no accidents occurred. Using light signals, the engineers piloted the armored battalion as the first unit through the pass, the units of the second attack group following. On

emerging from the pass the battalion turned north, pushing as fast as possible in spite of the darkness and the sandstorm.

By daybreak the battalion reached a line as far as the Djebel Lessouda mountain pass. Suddenly heavy artillery fire was opened by guns in position on the opposite mountain slope, directed by observers on the summit. It was now of the utmost importance to skirt the northern tip of the mountain of the mountain as fast as possible in order to attack the enemy artillery. The battalion was organized in depth in order to be able to counterattack any surprise move by the enemy. The company in the lead was responsible for the direction and for the --- line missing/poor photocopy --- immediately behind the lead company with the light tank platoon. Had enemy tanks appeared on either flank, all tanks would have been able to take part in an attack on a broad front after making the proper turn either to the left or to the right.

Firing continued without a break from the Djebel Lessouda heights but had to be ignored by the tanks. To silence this fire was the responsibility of the armored infantry, who were following up and who could approach the hills in their armored personnel carriers to wipe out the pockets.

The battalion turned southwest just in time to prevent the American artillery, which was self-propelled, from carrying out their attempted displacement into new firing positions farther west. After a brief pursuit they were overtaken by the lead company and put out of action. Several of the guns bogged down in the swampy terrain west of Djebel Lessouda. The light platoon of the battalion kept guard over the guns to prevent their recapture by the enemy.

As a result of this pursuit, this battalion column had become widely extended and it was now necessary to reassemble, since a counterattack could be expected from any direction. The tanks now assembled in an enormous all-around defense position alongside the Faid-Sbeitla road, having achieved their first objective.

Meanwhile, the first attack group had also made good progress. Two Stuart tanks retreating before it appeared suddenly behind a slight rise in the ground. After a brief exchange of fire, they attempted to escape westward but were intercepted.

All eyes were turned to the south, but nothing was seen of the expected units of the German Africa Corps. The uncertainty was not to last for long. High explosive and armor-piercing shells poured into the antitank barrier and the continuous flash of firing guns was to be seen in the south. At first it was thought that the expected counterattack was coming, in which case

it would have been a mistake to extend the battalion column too far. However, since no change could be observed in the enemy disposition, two light tank companies were sent forward, one to the right and one to the left, in flanking attacks through a patch of cactus covered terrain northeast of Sidi Bou Zid, the medium company of the battalion providing fire cover with its 75 mm guns. Later, a additional light tank company was moving forward farther left in a turning attack directed toward the eastern fringe of the patch of cactus.

In the meantime the division had sent out a radio message reading:

"The 21st Panzer Division has been delayed in its advance from the south. The Panzer battalion will attack and take Sidi Bou Zid."

Enemy self-propelled and antitank guns in position in the cactus patch continued holding out tenaciously against the German tanks advancing from all sides and kept up their fire even after the tanks had reached the cactus patch and, in fact, even at a range of only ten meters. However, they were not able to hold out permanently. Some of the enemy tanks attempted to retire westward but bogged down in a swampy ditch.

While this battle was in progress, a number of planes suddenly appeared from an easterly direction, which were recognized as German planes. Identification flags were immediately spread out. The planes dropped a few bombs with delayed action fuzes on the well-developed positions along the outskirts of Sidi Bou Zid.

The situation in the late afternoon was as follows: There was no longer any sign of the enemy on the battlefield. The Panzer battalion has sent forward reconnaissance units toward Sidi Bou Zid, and the bulk of the battalion was standing off in an all-around defense formation northeast of the city. The armor infantry battalion was scouring and mopping up the cactus patch. The engineers had been set to work immediately at destroying the bogged-down enemy tanks. The other attacking units, after reaching their objective, had also drawn up in all-around defense formation, the Tiger tanks taking up a front facing south immediately beside the road.

During the night the battalion remained outside the city receiving supplies and overhauling the tanks as speedily as possible, since a counterattack by American forces was to be expected with certainty on the next day.

## V. Review

Quite a number of lessons could be learned from this attack: The Terrain must be very carefully reconnoitered prior to an attack which is to take place during dark. In issuing orders, the inclusion of directional gyro data is of the utmost importance. It is absolutely essential that tank crews receive training in the use of the directional gyro for desert combat. It is only by this means that it proved possible to overcome the disadvantages imposed by the sandstorm. However, at the --- line missing/ poor photocopy --- the approaching tanks.

The American forces should have advanced their outposts and so forth farther forward.

The choice of direction for the two attacking groups was correct. If the main thrust had been frontal one directed due west it would not have been possible to exploit the mobility of the tanks and the attack would have run up against the stiffest resistance. The enemy troops on the Djebel Lessouda mountain massif were very courageous, attempting again and again to stop the German tank attack in spit of the fact that they had little cover on the bare rocky surface. Initially, the self-propelled artillery placed very effective fire on some of the rearward elements of the attacking German groups in the vicinity of Faid Pass. However, they continued firing too long and attempted to change positions too late, so that they were cut off. The tanks and artillery in the cactus patches north of Sidi Bou Zed opened fire at a very long range. The guns of the Sherman tanks were far superior to the 50mm guns of the light German tanks, so that the enemy could have allowed the German tanks to approach much closer without any danger. Once they opened fire, the Sherman tanks should have exploited their speed and mobility to operate freely. Usually, it is a mistake to employ tanks as artillery or as antitank guns in the desert. The Battle of Sidi Bou Zid is a typical example bearing out the old tactical principle that the mobility of tanks must be exploited in order to bring as many weapons as possible to bear on the enemy within the shortest possible time. The truth of this principle was shown again in the American counterthrust on the next day.

## VI. Repelling the American Counterattack on Sidi Bou Zid

The situation on the morning of 15 Feb 1943 was as follows: The German tanks were in position around Sidi Bou Zid in all-around defense formation, units of the 10th Panzer Division in the north and units of the German Africa Corps, which had arrived during the night, in the south. From the early morning on, one company of the 1st Bn, 7th Panzer Regt, together with an armored infantry company, had been busy mopping up the terrain, including the hills, east of Sidi Bou Zid, where scattered elements of the American forces were still offering stubborn resistance.

Toward midday the tank companies were alerted because of a report that a German plane had observed an armored column in the vicinity of Sbietla moving eastward. The light platoon was ordered to go into position near a group of houses west of Sidi Bou Zid for observation purposes. A radio alert was ordered. Toward 1499 the light platoon reported dense clouds of dust in a northwesterly direction. The battalion commander received orders to prepare for a counter attack, supported by the tanks of the 15th Division. The light platoon was ordered to continue observation for the present and to report continuously.

The Battalion was disposed as follows: The 3d Company was to remain at the western outskirts of Sidi Bou Zid. The headquarters staff, with the 1st, 2d, and 4th Companies advanced first in a northerly direction in order not to meet the enemy tanks frontally. When the light platoon reported that the advance units of the enemy force was approaching Sidi Bou Zid, the American tanks were driving toward Sidi Bou Zid in a very deep formation so that they were exposed broadside to the tanks of the 15th Division on the south and to those of the 10th Panzer Division on the north. This sealed their fate, they were between the jaws of a pincer and were not even able to withdraw. By evening, the tank battle was over.

#### VII. Review

In the light of experience hitherto gathered in Tunisia it may be said that the counterattack by the American force was "in the air". Even if they had no precise information, the American command should at least have had some idea of what they were likely to meet.

The American attack was in battalion strength, as they had more tanks available than did the German Panzer force. Superiority could have been gained because of the better weapons with which they were equipped. However, the attack plan was wrong. If no prior reconnaissance is possible, and this seems to have been the case here, the advance must be methodical and by phases, supporting fire being provided by one group while the other moves forward. In deserts and steppes it is wrong to restrict preparations to one direction only, rather, it is essential to count on an attack from an entirely unsuspected direction.

A tank battle in the desert is very similar to a naval battle, the important elements being proper formation, rapid planning and un-restricted operation. --- line missing/poor photocopy --- advancing toward the road intersection twenty kilometers northwest of Sidi Bou Zid for reconnaissance. It moved in all-around defense formation, the various units providing cover for each other. During this advance, the following incident occurred.

Without having contacted the enemy, the advance elements were approaching the Faid-Sbeitla road, where they observed heavy dust clouds which could only be assumed to come from moving tanks. This assumption was confirmed by continued observation. As it was not possible to recognize the type of tanks under observation, the battalion staff and one company took up positions facing north. Hardly had they done so, when the tanks travelling along the road suddenly opened fire. From the type of tracer ammunition fired, it was possible to establish that the tanks were German and by firing light signals a calamity was avoided.

This minor episode was by no means an isolated case of such events. As has been emphasized repeatedly, the enemy must be expected from all directions, so that it is absolutely essential for all friendly units to be informed about each other's movements.

Later the battalion advanced to Sbeitla and on 22 Feb to Kasserine, from where it commenced the attack toward the north.







