

Battle Analysis

Operation Crusader: Auchinleck's and Rommel's Great Gamble

Part 1 of 2

by retired U.S. Marine Corps LTC Robert W. Lamont

By November 1941, Britain and her Commonwealth stood alone against the advancing tide of European fascism. One glimmer of light would emerge from the bright desert landscape of North Africa as Operation Crusader – and the confused armor melee that was part of it – provided for the relief on an embattled seaport at Tobruk and the subsequent liberation of Cyrenaica in eastern Libya.

This two-part article reviews the conduct of this battle and highlights lessons-learned. The approach used here is to summarize the interaction between combat forces, explore the engagement defeat mechanisms and suggest operational ramifications for future battle doctrine and organization.

Battlespace

The area between Tobruk in the northwest and Buq Buq in the east would serve to frame the maneuver space for the approaching battle. Major military units could be sustained within 80 miles of the coast, and these boundaries defined the area of interest for each side. That's an area that would encompass all of the National Training Center plus a line connecting Barstow and Ridgecrest running through Death Valley out to the California-Nevada border.

An escarpment rising up from the coast could only be traversed by major military formations at the road junctions connecting the lower coastal areas with the upland desert. The major road through this region, known as the Via Balbia, tended to follow the coast running from Tobruk through Bardia to Sollum. Less-improved tracks ran both parallel to the coast and inland, providing keys to navigation and supporting wheeled-vehicle movement. The Trigh Capuzzo track ran above the escarpment from El Aden through Sidi Azeiz to Bardia. Finally, further inland, the Trigh El Abd ran from Bir Gubi through Bir Sheferzen to Halfaya Pass.

While microterrain would dominate the employment of direct-fire weapon systems, the high-desert plain was trafficable terrain and supported the operational maneuver of wheeled and track vehicles during the contest. Few built-up areas would impede the maneuver of mounted units as they struggled to gain advantages over their opponent.

Given the open nature of the terrain, tanks were destined to play a key role in the future offensive. Table 1 gives a quick review of the main vehicles engaged in this battle and provides some of the technical and material insights that influenced planning and tactical outcomes.

Tank Types							
Characteristic	Matilda	Cruiser	Stuart		M13 (Italian)	Panzer III	Panzer IV
Weight (tons)	25	19	16		13.5	23	25
Height	8 ft 3 in	7 ft 4 in	7 ft 6 in		7 ft 10 in	8 ft 2 in	8 ft 10 in
Armor	78mm	40mm	51mm		42mm	70mm	88mm
Gun	40mm	40mm	37mm		47mm	37mm	75mm
Power/weight	6.5	18	18		8.9	12	12
Range	160	200	74		120	96	120
Road speed	16	26	36		20	25	26

Table 1. Crusader tank characteristics.¹ Allied tanks are to the left of the red bar; Axis tanks are to the right of it.

The power-to-weight ratio in the table is horsepower per ton. *Range* is the expected distance in miles the vehicle can cover on a single tank of fuel. *Speed* is listed in miles per hour while moving on a paved roadway.

What is striking in this armor comparison is not how different key operational characteristics were between vehicles but rather how similar the technical parameters were given the unique national designs. The German vehicles had an edge in armor protection, and the uniformity of their speed would allow for tighter tactical employment. Vehicle operational range would allow the British increased options, but the underpowered nature of the Matilda would complicate tactical employment and coordination. What is clear from the table is that no side commanded a dominating technological edge that would translate to unchallenged battlefield success.

Battle leadership

Leadership on the German side was dominated by the two personalities of GEN Erwin Rommel and GEN Ludwig Crüwell. Rommel commanded Panzer Group Africa, which included the German Afrika Corps and the Italian XXI Corps. He arrived at this position as somewhat of an outsider with the German General Staff. Independent, driven and offensive-oriented, he led 7th Panzer across France in 1940 and reversed the Italian collapse in the desert by securing all of Cyrenaica except Tobruk. His attention at the start of Operation Crusader was consumed in the capture of this last remaining British outpost and key port facility.

In contrast, Crüwell, commander of Afrika Corps, had risen through the more traditional route within the Wehrmacht. He would command two panzer divisions and one infantry division during the battle. While he reported directly to Rommel, the two would have strong differences over strategy and tactical approach throughout the campaign.²

As Commander-in-Chief Middle East, Field Marshal Sir Claude Auchinleck would sit atop the British order of battle. Having arrived from the Indian theater, his depth of experience would focus in the Western Desert during Operation Crusader. His command presence was to prove key in the turbulence to follow.

GEN Sir Alan Cunningham took command of the newly formed British Eighth Army fresh off stunning victories over Italian forces in Somaliland and Ethiopia. He had three months to stand up a new army headquarters, plan a major offensive to relieve the siege of Tobruk and provide for the logistical demands of a large mobile force operating under the most austere conditions.³

Battle plans

Following Operation Battleaxe, both sides made plans to resume the offensive and seize the initiative in the campaign. On the German side, Rommel was focused on securing the port city of Tobruk. Taking this transportation hub would allow supplies to avoid more than 1,000 miles of roads in supporting the forward elements of Afrika Corps. Given his limited combat strength, this effort consumed his operational intensity as he looked to develop a scheme of maneuver to secure this stronghold.

His counterpart would beat him to the punch as preparations to secure Tobruk matured. The British were pushing forward their rail line from Cairo to simplify their supply arrangements. Progressive shipments of tanks, some from the United States, allowed Eighth Army to build its mobile striking power. For their part, the British were eager to pre-empt the German attack and take control of the situation in North Africa. They envisioned an end-run around the German screening forces and a breakout from Tobruk to turn the tide.

This set the backdrop against which each antagonist would formulate his courses of action.

Rommel's plans were oriented on a local offensive to recapture Tobruk. Most of his combat power was concentrated for this effort. He maintained a screen along the Libyan frontier and had less-mobile Italian formations occupy strongpoints along the coast road. He kept an Italian armor division and a panzer division as a mobile reserve to counter any pre-emptive moves emanating from Egypt.

The British planned to launch an attack around the southern flank of Afrika Corps in an attempt to secure both Tobruk and Bardia. XIII Corps with the New Zealand Division, 4th Indian Division and 1st Army Tank Brigade would strike toward the Italian garrison at Bardia. XXX Corps – led by 7th Armoured Division, 4th Armoured Brigade, 1st South Africa Division and 22nd Guards Brigade – would attack Tobruk. The 7th Armoured Division would head directly for Tobruk, and 22nd Guards would move on the southern flank toward Bir el Gubi, with the South Africans to their left flank. The 4th Armoured Brigade would act to tie the two corps together and strike more due north than rest of the corps.

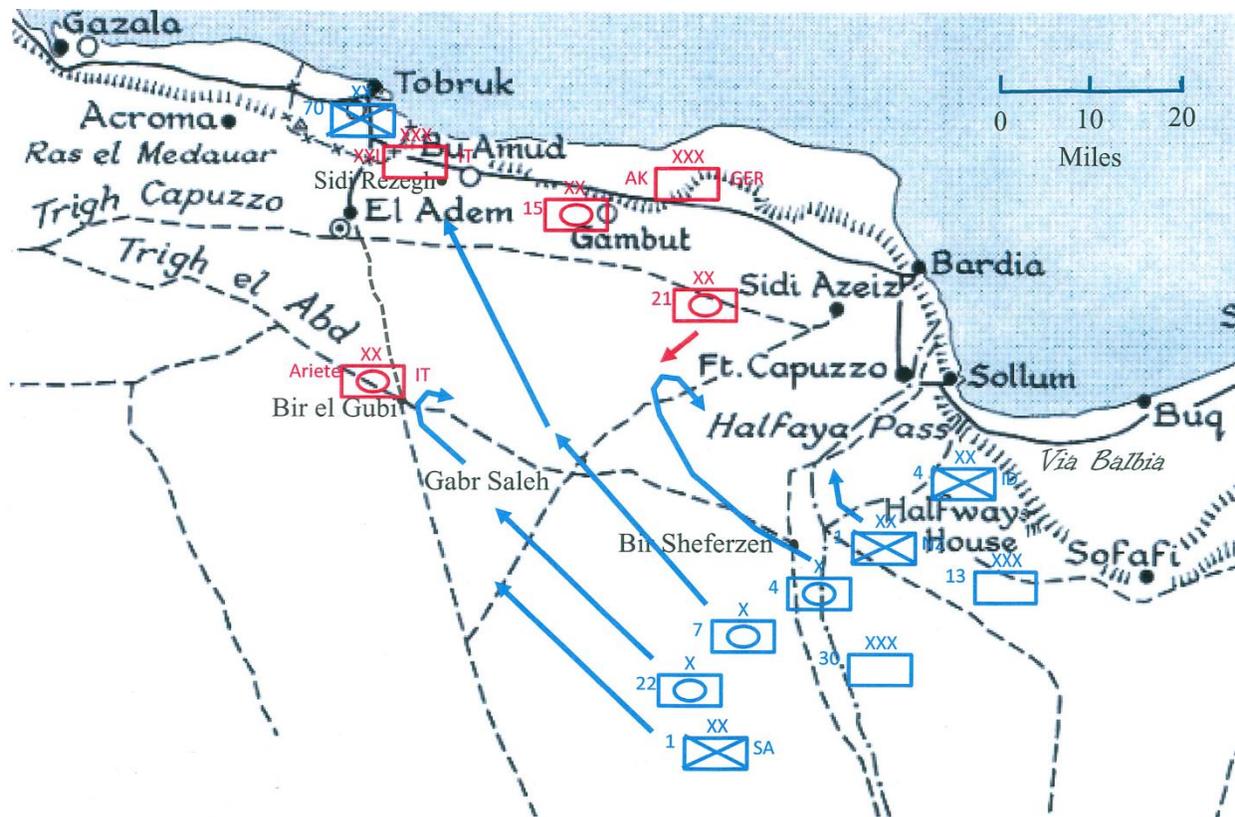


Figure 1. Disposition of units at the opening of Operation Crusader Nov. 18-19, 1941. (Map by author)

British and Commonwealth Forces		
Unit		Strength
Eighth Army		738 tanks (including many of the new Crusader Cruiser tanks, after which the operation was named, and new American M3 Stuart light tanks)
XXX Corps		477 tanks
	7 th Armoured Division	
	South African 1 st Infantry Division	
	Sudan Defence Force	
	22 nd Guards Brigade (independent)	
XII Corps		135 tanks
	4 th Indian Infantry Division	
	2 nd New Zealand Division	
	1 st Army Tank Brigade	
Tobruk garrison		126 tanks
	32 nd Army Tank Brigade	
	Australian 9 th Division (replaced by British 70 th Infantry Division and Polish Carpathian Brigade in late 1941)	
	Australian 20 th Brigade	

German and Italian Forces		
Unit		Strength
Panzergruppe Afrika		406 tanks
	Deutsches Afrika Korps (15 th Panzer Division and 21 st Panzer Division)	260 tanks (15 Panzer I, 40 Panzer II, 150 Panzer III, 55 Panzer IV L/24, 154 Italian tanks)
	Special Purpose Division Afrika (renamed 90 th Light Africa Division)	
	Italian 55 th Infantry Division "Savona"	
Italian XX Motorised Corps		146 Fiat M13/40 medium tanks
	132 nd Armoured Division "Ariete"	
	101 st Motorised Division "Trieste"	
XXI Corps		
	17 th Infantry Division "Pavia"	
	102 nd Motorised Division "Trento"	
	27 th Infantry Division "Brescia"	
	25 th Infantry Division "Bologna"	

Table 2. Units involved in Operation Crusader. As Axis forces built a defensive line of strongpoints along the escarpment running from near the sea at Bardia and Sollum to Fort Capuzzo, elements of 21st Panzer and the "Savona" divisions manned these defenses. Rommel kept the rest of his forces grouped near or around the Tobruk perimeter.

Crusader begins

This scheme of maneuver had the effect of spreading three lines of approach that were separating as they departed the attack positions along the frontier. Instead of striking at Tobruk with a mailed fist, the British were extending an opening hand. This had the effect of partitioning the effort into three columns of about 150 tanks each, allowing Afrika Corps to concentrate on each in turn.⁴

On Nov. 18, 1941, the British plan was unfolding with three strong columns fanning out across the desert, screened by armored cars and active reconnaissance. This activity brought Crüwell to Rommel's headquarters. He was pushing to move 21st Panzer to attack east toward Sidi Azeiz to counter the advance of the British armored-car screen. Rommel was reluctant to let go his attack on Tobruk, commenting, "We must not lose our nerves." As the situation continued to unfold, Crüwell would revisit the issue the next day and obtain permission to move 21st Panzer toward Sidi Azeiz and get 15th Panzer to an assembly area within supporting distance.



Figure 2. British Matilda tanks on the move outside the perimeter of Tobruk, Libya, Nov. 18, 1941. (*United Kingdom government photo by CPT G. Keating, No. 1 Army Film and Photographic Unit; public domain*)

By the evening, Rommel had given his counterpart a free hand in dealing with the attack.⁵ While 21st Panzer would strike and try to turn the British effort south, a faulty read on the strength, composition and location of the threat developing along the frontier limited the influence of this action. However, it would serve to position both panzer divisions within a mutually supporting distance and align them to counterattack from a direction not expected in initial British planning.

Change of plans

By the evening of Nov. 20, Crüwell had realized his efforts toward Sidi Azeiz were ineffective. Coordinating with Rommel, Crüwell broke contact with the British 4th Armoured Brigade and turned in the direction of the airfield at Sidi Rezegh and 7th Armoured Brigade.

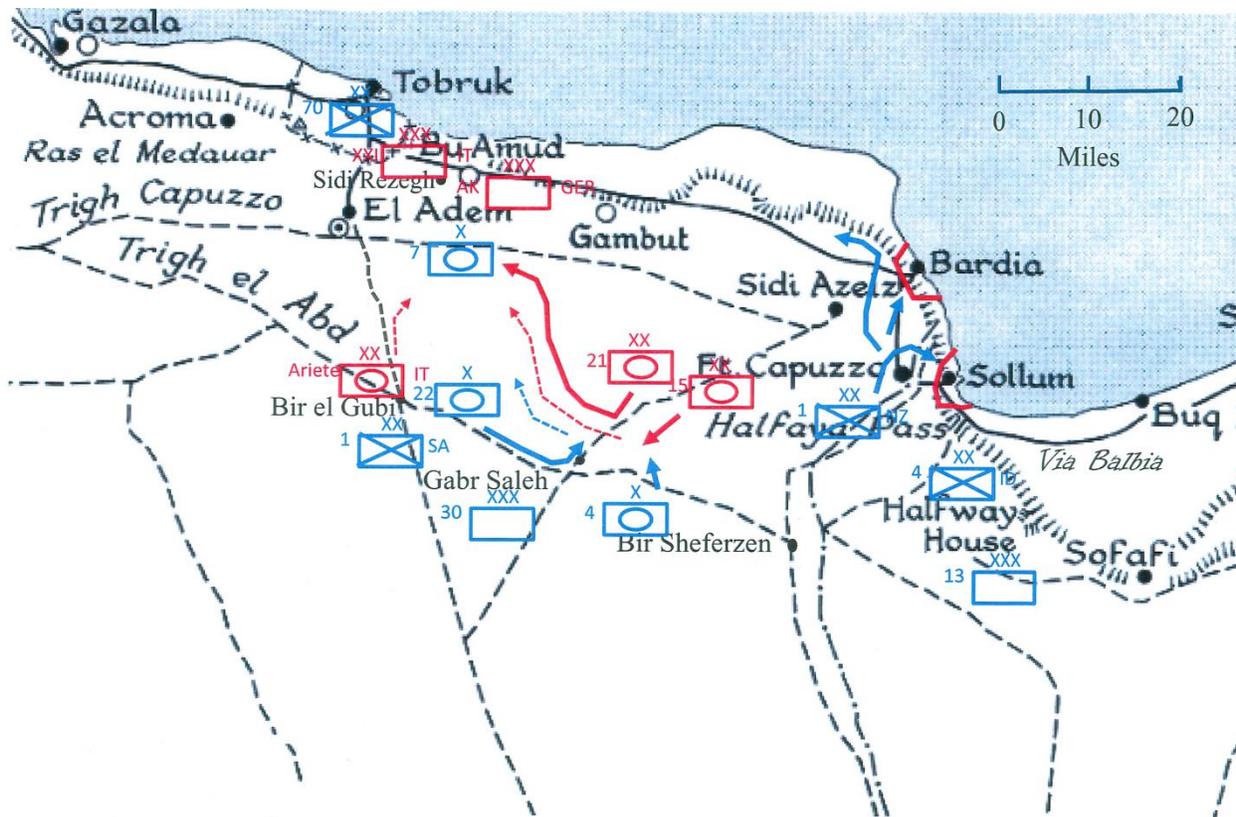


Figure 3. Unit positions Nov. 20-23, 1941. (Map by author)

The next two days would witness a full engagement of this brigade by Afrika Corps. As the panzers closed on his position, the commander of the British 7th Armoured Brigade left 6th Royal Tanks to defend the airfield and turned to meet his attackers with 2nd Royal Tanks and 7th Hussars, partitioning yet again his forces for little tactical advantage.⁶ In the freeform battle that followed, 7th Armoured Brigade would lose 113 of the 141 tanks with which it started.

As these losses were being inflicted, both 22nd Guards Brigade and 4th Armoured Brigade were moving to support the beleaguered 7th Armoured Brigade.⁷

Nov. 21 would break with a new threat to Afrika Corps as the garrison at Tobruk attacked to link up with 7th Armoured Brigade at Sidi Rezegh. This attempt was turned back with Rommel's personal intervention by reinforcing the Italian "Bologna" Division with his reconnaissance units and 88mm anti-tank guns. The battle in and around the airfield remained undecided, but by the evening, the German mobile forces were in a solid central position between Sidi Rezegh and the closing 4th and 22nd Brigades, allowing them the opportunity to attack each separately.⁸



Figure 4. GEN Erwin Rommel consults with COL Paul Diesener and Italian GEN Enea Navarini near the start of Operation Crusader Nov. 21, 1941. (Deutsches Bundesarchiv photo by Moosmüller)

The following 48 hours were to prove both decisive and bloody for both sides. Afrika Corps was able to concentrate its divisions against British brigades and inflict enough loss to render them less than operationally effective. This result was due in part to the converging nature of the German maneuver, coupled with the tendency of 4th Armoured Brigade to hang back from the initial stage of the fighting. In sharp contrast, Crüwell advanced on his own initiative, overrunning the headquarters of 4th Armoured Brigade and disrupting the formation of 8th Hussars. This action around Sidi Rezegh blunted the offensive action of the British 7th Armoured Brigade and placed the battle's initiative squarely on the German side.⁹

In just four days in November, Eighth Army lost more than 500 tanks, while the Axis lost about 100.¹⁰ The ability of Afrika Corps to exploit operational speed in maneuvering its forces successively against the disjointed efforts of its British opponents ensured that it was able to retain the full advantage afforded it by partitioning its adversary on the battlefield.

Lanchester Square Law

In reviewing Table 1, we noted that the German side may have had some advantages in armor protection and uniform speed, while the British maintained lower silhouettes and some mobility advantages. Given this relative parity of opposing weapons capabilities, how then do we account for Afrika Corps' ability to readdress numerical inferiority in the opening rounds of Operation Crusader? We'll consider the Lanchester Square Law.

Before World War I, Fredrick Lanchester observed that changes in technology were altering the fundamental conditions of combat. He coupled differential equations to capture the essence of the attrition process on the evolving battlefield. His well-known Square Law combat model states that the squared starting strength of the opposing sides, minus the squared ending strength of the opposing sides, times unique combat-force attrition coefficients, equals the casualties one force will inflict over a period of time relative to those inflicted by the opposing side.¹¹

Defining these coefficients generated much debate when the model was used to predict battle outcomes or fit historical data. However, this dialogue does not distract from the model's descriptive powers to explore combat interactions when these limitations are accounted for in the discussion's underlying assumptions and the resulting operational points are so illuminated.

For the purpose of this discussion, we will assume the threat of interest is a true peer-competitor. The competitor is able to muster equal technology in terms of weapons systems, doctrine and command, control,

communications, computers and intelligence. Also, the competitor's units of combat power are equivalent as a result of training or organization to those arrayed against them.

In one sense, this case represents an upper-boundary condition. In such a fight, if one side is able to muster a combat strength of 1,200 against an opposing force of 800, that side will eliminate its opponent while retaining a strength of 894 for follow-on operations. However, if the opposing force is able to partition its larger opponent into three battles and fight each partition in turn, the opposing force will eliminate its larger opponent and still have half its force at the end of the engagement.¹²

Under modern conditions, partitioning as a defeat mechanism allows an outnumbered opponent to gain the upper hand against a force with technological parity.

So, while the theory appears to hold potential, how does it hold up in reviewing the outcomes from North Africa in November 1941? Using tanks as the unit of combat power in the desert, and accepting the limitations that such an approach implies, the Germans were able to fight three battles against the 4th, 7th and 22nd Guards Armoured Brigades. Further, 22nd Guards reached the field behind the other two brigades in terms of strength, having lost 40 tanks to the Italians at Bir el Gubi.

If each engagement was fought to conclusion, we would expect the British to lose 410 tanks, while the Germans would retain the field with just over 100 vehicles remaining operational. Historically, tank losses were reported as 530 for the British and 100 for the Germans. The larger volume of British losses reflect tank losses in XIII Corps, which are not included in the model, coupled with the superior influence of the 88mm cannon used as an anti-tank weapon.

The point here is the consistency of the influence of partitioning between both the model and historical outcome, and the resulting potential it represents as a defeat mechanism for conducting high-tempo mounted operations when outnumbered.

Operational ramifications

On the morning of Nov. 24, Rommel and Crüwell met to discuss the outcome of the action in and around Sidi Rezegh. Crüwell stressed that the enemy had been smashed but enough force remained for Afrika Corps to stay in the area and destroy the survivors. Intelligence was reporting that the New Zealand Division, moving west from Bardia, posed a potential threat to the Tobruk area if left uncovered.¹³ MG Friedrich von Mellenthin, in his post-war account, indicated that since the New Zealand Division was advancing piecemeal, holding tight and defeating them as they approached offered a solid chance to win the battle.¹⁴

As Rommel was taking this information in, he was balancing it against a plan of his own. Rommel had cast his eyes east with the potential to strike a decisive blow against Eighth Army. He felt by attacking across XXX Corps' line of communication, he could inflict enough fear in the British of being surrounded and could strike at their command structure's cohesion. In short, by exploiting maneuver as a defeat mechanism, he could unbalance Eighth Army and throw them from the field. As supreme on-scene commander, he had to weigh the reality of incremental attrition vs. a decisive campaign-winning blow.¹⁵

This sort of operational flair was certainly reflected in his historical tendencies. During the Battle of France, he led 7th Panzer Division following the breakthrough at Sedan across the plains of the French countryside, exploiting rapidity of advance as a weapon. The inability of the French command to respond to these actions had resulted in their collapse of will to continue the contest on the battlefield.

Were the British ripe for a repeat for such a bold maneuver? The balance of tank strength within Afrika Corps, when coupled with vehicles from the Italian "Ariete" Division, would have placed enough combat power on the field to challenge any likely combination the British could muster along the Libyan-Egyptian frontier.

So as the sun began to climb into desert sky Nov. 24, Rommel had to decide between two conflicting courses of action. His subordinate commanders were recommending that he retain the field of battle, exploit the uncoordinated advance of the New Zealand Division and defeat its brigades in turn as it attacked, and exploit his advantage in armor by keeping the body of his forces concentrated. In contrast, he could see a line of action that would place his combat power across the British line of communications and compel a positive resolution to the

campaign. This would require Panzer Army Africa to let go of the current field of battle, accept the logistical challenges of rapid forward displacement and strike his opponent before the New Zealand and Indian formations could link for a coordinated action against him.

One course was reactive to the efforts the British telegraphed. The other course allowed the German side to take the initiative and dictate the terms of the engagement while accepting increased operational risk. Which way would Rommel lean? Perhaps, more importantly, what would action would you take?

Retired U.S. Marine Corps LTC Robert Lamont is technical director of the Amphibious Vehicle Test Branch, Camp Pendleton, CA. Previous assignments include scientist, Naval Surface Warfare Center, Fallbrook, CA; exercise action officer, III Marine Expeditionary Force, Okinawa, Japan, planning Tandem Thrust in Australia and Cobra Gold in Thailand; instructor, U.S. Army Armor School, Fort Knox, KY; and company commander and assistant operations officer, 3rd Tank Battalion, Twentynine Palms, CA. Other assignments included operations analyst in the Studies and Analysis Division, Marine Corps Combat Development Command, completing analyses for anti-armor force structure, combat identification and the Advanced Amphibious Assault Vehicle. His service afloat includes executive officer, Marine Detachment, USS Constellation, and combat cargo officer, USS Cleveland. His military schooling includes the Armor Officer Basic Course and Armor Officer Advanced Course. He holds a bachelor's of science degree in management and technology from the U.S. Naval Academy and a master's of science in operations research from the Naval Postgraduate School. His awards and honors include Meritorious Service Medal with three gold stars, National Defense Medal with one bronze star and the Sea Service Deployment Ribbon with four bronze stars. He is a silver-level member of the Order of St. George.

Notes

¹ See http://en.wikipedia.org/wiki/operation_crusader. In short, Crusader (Nov. 18-Dec. 30, 1941) was a military operation during World War II by the British Eighth Army (with Allied contingents) against Axis forces in North Africa. The British intended to bypass Axis defenses on the Egyptian-Libyan frontier, defeat Axis armored forces and relieve the 1941 Siege of Tobruk.

² MG F.W. von Mellenthin, *Panzer Battles*, New York, NY: Ballantine Books, 1956.

³ Ibid.

⁴ LTG Sir Geoffrey Evans, *History of the Second World War* (Part 24), BPC Publishing Ltd., Marshall Cavendish, USA, 1973.

⁵ Mellenthin.

⁶ Ibid.

⁷ Evans.

⁸ Mellenthin.

⁹ Ibid.

¹⁰ http://en.wikipedia.org/wiki/operation_crusader.

¹¹ **Editor's note:** Lanchester's Linear Law (for ancient combat) and Lanchester's Square Law (for modern combat with long-range weapons) are mathematical formulae for calculating the relative strengths of military forces. Lanchester's differential equations in the "Square Law" demonstrate the power relationships between opposing forces: that the power of each force is proportional not to the number of units it has but to the *square* of the number of units. In its basic form, the law is only useful to predict outcomes and casualties by attrition. Lanchester's Square Law does not apply to technological force, only numerical force.

¹² For a more detailed discussion of Lanchester dynamics, see "An Operational Analysis of Operational Maneuvers from the Sea," *Phalanx* magazine, December 1994.

¹³ Evans.

¹⁴ Mellenthin.

¹⁵ Ibid.