

OPERATION MARKET-GARDEN: ULTRA
INTELLIGENCE IGNORED

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
Military History

by

Joel J. Jeffson, MAJ, USA
M.S., Joint Military Intelligence College, Bolling Air Force Base,
Washington, D.C., 1998

Fort Leavenworth, Kansas
2002

Approved for public release; distribution is unlimited.

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: MAJ Joel J. Jeffson

Thesis Title: Operation Market-Garden: Ultra Intelligence Ignored

Approved by:

_____, Thesis Committee Chairman
Jerold E. Brown, Ph.D.

_____, Member
Maj Joe Dague, M.S.

_____, Member
LTC Michael J. Berry, B.S.

Accepted this 31st day of May 2002 by:

_____, Director, Graduate Degree Programs
Philip J. Brookes, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

OPERATION MARKET-GARDEN: ULTRA INTELLIGENCE IGNORED, by Major Joel Jeffson, 94 pages.

Authors and historians have made the words Market-Garden and intelligence failure virtually synonymous. Is this really the case? Operation Market-Garden, the plan envisioned by Field Marshal Montgomery, would open the gate into Germany and simultaneously force General Eisenhower to abandon his broad-front strategy in favor of his narrow-front strategy. Executed on 17 September 1944, this operation became one of the greatest defeats suffered by the Allies during the Second World War. Until 1974, when the British Government declassified Ultra, no one beyond the producers and consumers of Ultra intelligence knew of its existence. With the program now declassified, it was learned that Ultra allowed Allied commanders an unprecedented capability to read high-level German messages that were thought to be unbreakable. The release of these documents now showed that senior Allied commanders knew that the 9th and 10th SS Panzer Divisions were located on the corridor that the Allies planned to make their narrow-front thrust on. Despite this new information, numerous authors still continue to describe Market-Garden as an intelligence failure. While intelligence was not perfect in supporting this operation, it is not justifiable to say that Operation Market-Garden failed due to the intelligence system's failure to warn commanders of the threat to the operation.

ACKNOWLEDGMENTS

I would like thank my Thesis Committee for the advice and input they provided to me as I endeavored to complete this thesis. Without their contributions, it is doubtful if this thesis would have been completed on time.

I want to especially thank my wife, Christine, and children, Mallory and Nathan, who had to endure the many lost weekends that we would have otherwise spent together while I spent them in the library.

TABLE OF CONTENTS

	Page
THESIS APPROVAL PAGE	ii
ABSTRACT	iii
ACKNOWLEDGMENTS	iv
ACRONYMS	vi
ILLUSTRATIONS	vii
CHAPTER	
1. INTRODUCTION	1
2. ULTRA AND ENIGMA	17
3. PRELUDE TO MARKET-GARDEN	45
4. ROAD TO ARNHEM	60
5. CONCLUSION	80
BIBLIOGRAPHY	89
INITIAL DISTRIBUTION LIST	94
CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT.....	95

ACRONYMS

FAAA	First Allied Airborne Army
GAF	German Air Force
GCCS	Government Code and Cipher School
GIR	Glider Infantry Regiment
OIC	Officer in Charge
PIR	Parachute Infantry Regiment
RAF	Royal Air Force
SHAEF	Supreme Headquarters Allied Expeditionary Force
SLU	Special Liaison Unit

ILLUSTRATIONS

Figure	Page
1. Operation Market-Garden Plan.....	9
2. Enigma Keyboard	22
3. Enigma Machine with Open Box.....	23
4. Pursuit to West Wall	48

CHAPTER 1

INTRODUCTION

This thesis examines if adequate intelligence was available to Allied commanders in the first half of September 1944, that should have warned them of the risks involved in executing Operation Market-Garden. While there were numerous sources of intelligence available to the commanders upon which to base their decision upon, this thesis will only focus on the information provided by the Ultra intelligence program. Strategic and operational leaders throughout the war used Ultra intelligence and this product's accuracy was rarely questioned.

Numerous authors have stated that Operation Market-Garden failed because the intelligence community did not adequately warn the commanders of the threat the Germans posed to this operation. In the decades following the war, using the documents and personal testimonies available, this theory appeared to be correct. In 1974 the British government began to declassify the Ultra program and the Ultra messages that were transmitted to the field. Not only did historians begin to have access to the reports, but also the producers and consumers of Ultra intelligence could now, for the first time, begin to discuss Ultra's impact on the war. Despite the declassification of Ultra intelligence, the perception remains that the intelligence community failed to warn commanders of the inherent risks of executing Operation Market-Garden.

An example of this continued perception is Lyman Kirkpatrick's book *Captains Without Eyes*, initially published in 1969 with the first American edition published in 1987, that states, "What happened at Arnhem was the result of a major intelligence error:

a gross underestimation of the enemy and a serious misjudgment of the terrain.”¹

Kirkpatrick later goes on to attempt to explain the intelligence failure by saying, “In the one week between the decision to mount the operation and the attack there was not time to collect additional information on the enemy forces in the area.”² This last statement of his is clearly incorrect based on the Ultra messages, and brings his first statement into question. After the fall of Antwerp to the British Second Army on 4 September 1944, Ultra began to provide a very clear picture of the German forces moving into Holland, the reorganization within their command structure, the repositioning of panzer divisions to Holland, and the fact that the Germans anticipated an Allied attack, possibly with airborne forces, towards either Arnhem or Aachen. The intelligence information was available; whether commanders were adequately warned of the risks to the operation is really the question, as well as whether intelligence failed during this operation.

A later book by Michael Lee Manning, *Senseless Secrets*, published in 1996 states, “The most significant intelligence failure of Market Garden was the gross underestimation of enemy strength.”³ The criticism leveled by Manning is almost verbatim that of Kirkpatrick’s criticism, but the difference between the two is that Manning does reference the Ultra reports that indicated German armor in the vicinity of Arnhem. He places the failure to heed these reports on Montgomery and his staff, but does not address how Montgomery’s staff attempted to warn him of the perils in continuing with this operation.

Numerous other authors have continued to perpetuate the theory that Market-Garden failed due to either a lack of intelligence or a failure of the intelligence personnel to adequately interpret the available information. While the intelligence community was

certainly slow to change its overly optimistic assessments following the pursuit in late August, it did in fact change their assessments, and this information was presented to commanders at various levels of command. Each commander responded differently to this new information, but in the end the operation was executed as planned.

There were two main sources of intelligence to support the planning for the operation: signals intelligence (SIGINT) in the form of Ultra and human intelligence (HUMINT) that was mainly based on reporting from the Dutch resistance. Of the two, Ultra provided the most in terms of volume, but was also the most readily accepted as fact since it was not subject to disinformation or penetration by the Gestapo. While the Dutch resistance reports were confirmed by Ultra, or vice versa, their reporting was often discounted and not accepted to be true.

Ultra was a proven performer during World War II and was relied on considerably by the Allied commanders. It not only provided them with an unprecedented ability to know what their enemy was planning to do, but also allowed them to estimate the current state of the German forces through their logistical and casualty reports. Ultra was a new and unproved asset at the beginning of the war, but quickly gained the acceptance of the commanders in the field.

This asset was closely controlled at the highest military and governmental levels. The reason the reports were only disseminated to army level and higher was the fear that the Germans would realize that the Allies were reading their mail and would alter their codes or change their communication system altogether, which would dry up this most valuable source. Surprisingly, the Germans never knew that their communications were being intercepted and decrypted during the war. There were some suspicions, but they

believed that their system was infallible and that any compromises of information came from spies.

Limiting Ultra to army level and higher echelons made sense at the time and does so in hindsight as well. Ultra's main focus of support was at the operational and strategic echelons of command and was never intended to support tactical users. That is why the focus of this thesis is limited to the planning stages of the operation and does not address the actual operation itself. Ultra's timeliness, anywhere from four hours to days, was not reliable enough to support the soldier in the direct battle. Its real strength was providing higher-level commanders with insight into upcoming enemy operations and the status of his forces. This is why analyzing the Ultra messages in the weeks leading up to the operation are so crucial, because it was here that the plan for Market-Garden was developed, approved, and ultimately executed.

Ultra was a reliable source of information for commanders throughout the Western European campaign. It provided indications of Hitler's Mortain counterattack, casualty reports following the Falaise pocket, and the state of chaos in the German command as they retreated towards the west wall during the pursuit. While reporting on the German collapse in late August, Ultra certainly fueled the victory euphoria that was creeping into the Allied ranks. Ultra, though, was not tainted by this euphoria and only reported on the German communications that it was able to intercept.

It is beyond the scope of this thesis to address in detail the command and personal relationship between Montgomery and Eisenhower and how it influenced their decision making prior to Operation Market-Garden. Both officers maintained a different philosophy on how to prosecute the war in the European theater and their respective

governments, national public opinions, subordinates, and their backgrounds exasperated these differences. All of these factors weighed heavily on each man as the operation was developed, approved, and executed.⁴

The Road to Arnhem

By August 1944 Operation Overlord was complete. The mission of securing a lodgment on the European continent was accomplished, and the Allies could now focus on their drive into Germany. Up until this point, the commander of Supreme Headquarters Allied Expeditionary Force (SHAEF), General Dwight D. Eisenhower's, broad-front strategy was a success. This strategy was designed to pressure the Germans across their entire front so they could not regroup or strengthen their positions elsewhere.

Logistically, this strategy could no longer be supported. The Allies possessed only one functioning port, Cherbourg, and were required to bring the majority of their supplies over the beach. Supplies were being sent directly to front-line units and not to supply depots as originally planned. This situation was exacerbated by the fact that the Allies were racing away from the beaches faster than supplies could be brought forward. Though the enemy was in disarray, the Allies could not continue to execute Eisenhower's broad-front strategy, at least for the time being.

By the first week of September, the pursuit was over. Not only did the rapid advance exhaust the troops, but also their equipment and supplies were depleted. Due to the extended length of the supply lines and wear and tear on the equipment, the transportation system was unable to keep up with the demand. Even though supplies were reaching the continent, they were unable to move sufficient quantities to the front. Of the 10,000 tons of supplies needed per day, General Bernard Montgomery,

commander British 21st Army Group, received 7,500 tons; General Courtney Hodges, commander U.S. First Army, received 5,000; and General George S. Patton, commander U.S. Third Army, received an unsustainable 2,000 tons.⁵

Though the Allies were crippled by logistics, there was no shortage of the victory euphoria that was sweeping the command. The rapid advance across France was in sharp contrast to the slow and difficult fighting coming out of the beachhead. It was now believed that the German Army was shattered and incapable of conducting coordinated defensive operations. The SHAEF G-2 summed up the feelings at the time when he said, “The August battles have done it and the enemy in the west has had it. . . . Two and a half months of bitter fighting have brought the end of the war in Europe in sight, almost within reach”⁶

The Decision

Eisenhower’s decision to approve Operation Market-Garden was not solely a tactical decision; many other factors influenced it. At the national level, politics influenced his decision. The British press was criticizing the attention being lavished on U.S. Generals Bradley and Patton at the expense of Montgomery. Prime Minister Churchill discussed this with President Roosevelt and requested that Montgomery’s sector be given more attention.⁷

Another factor in his decision was the pressure he was receiving from the U.S. War Department to employ airborne forces in an operational role. The First Allied Airborne Army (FAAA), commanded by U.S. Army Air Force Lieutenant General Lewis H. Brereton, was created in August to execute just such a mission. It was believed that airborne forces could play a major role in pursuit warfare. Up until this point, seventeen

operations had been planned, and none executed. The rapid advances of the ground forces quickly overran the planned airborne objectives.⁸

Logistically, the broad-front strategy was no longer feasible. If Eisenhower desired to continue the advance, it would have to be on a narrow front. Montgomery was pushing just such a plan. He disagreed with Eisenhower's strategy since the summer and wanted to become the main effort. His plan was to lead the drive to Berlin through the northern plains and he believed Eisenhower's strategy would unnecessarily prolong the war.

Beyond the external pressure and causes of concern, three distinct advantages of Montgomery's plan initially existed: (1) it allowed the massing of forces on a narrow front to secure a strategic advantage; (2) the German Army seemed to be in total confusion; and (3) the plan was extremely bold and would be unexpected by the Germans.⁹ Ultra though would certainly call into question the second and third apparent advantages.

It was these factors, and many more, which Eisenhower considered when he gave Montgomery the go ahead to finalize plans for Operation Market-Garden on 10 September. Two days later, the FAAA was placed under the control of Montgomery's 21st Army Group. He became the theater main effort and was given priority of logistics, which brought the other Army groups to a halt.¹⁰

The Plan

Operation Market was a more robust version of Operation Comet. Comet was an operation in which one and one-half airborne divisions would be used to secure crossing sites over the Lower Rhine at Arnhem. These crossing sites would then be used by the

Second British Army to enter Germany. Comet was cancelled on 10 September because of insufficient combat power and repackaged by Montgomery and approved by Eisenhower on the same day as Market (figure 1).

Market consisted of three and one-half airborne divisions, which would be used to secure a corridor that the British XXX Corps would pass through to their final objective of the Zuider Zee. The U.S. 101st Airborne Division would be inserted north of Eindhoven and secure the crossing sites between Eindhoven and Veghel. The U.S. 82nd Airborne Division would be inserted south of Nijmegen and secure the crossing sites between the Maas and Waal Rivers and control the Groesbeek Heights.¹¹ The British 1st Airborne Division, with the 1st Polish Independent Parachute Brigade attached, was to be inserted west of Arnhem and move over eight kilometers through the city to secure the bridge over the Lower Rhine.

The Second British Army comprised the ground component of the plan, Operation Garden. The XXX Corps was to spearhead the assault after the parachute units landed and the VIII and XII Corps were to conduct supporting attacks to protect the XXX Corps' flanks. The XXX Corps had the daunting mission of travelling sixty-five miles by D+3 to link up with the 1st Airborne Division in Arnhem. Its final objective was the Zuider Zee, over ninety-nine miles away, and was to be reached by D+6. What made this difficult, if not impossible, was that they had to push 20,000 vehicles up a single road. The surrounding terrain consisted of dense woods, marshes, and dykes, which severely limited the off-road movement of vehicles.¹²



Figure 1. Operation Market-Garden Plan. Source: Stephen Badsey, *Arnhem 1944: Operation 'Market Garden.'* (Oxford: Osprey Publishing Ltd., 1999), 26-27.

The Operation

In the early afternoon of 17 September, the skies over Holland were filled with transports and gliders that were part of the largest airborne operation ever conducted. Dutch citizens and German soldiers alike watched as the formations passed overhead. Generaloberst Kurt Student, commander of the First Parachute Army, observed the spectacle unfold from the balcony of his headquarters and remarked, “Oh, how I wish that I had ever such a powerful force at my disposal.”¹³

The insertion on D-Day of the airborne units resembled more of a training exercise than a combat mission. German air defenses were unprepared even though the weather was perfect. For the 101st Airborne Division, 422 of 424 transports were able to release their loads over the drop zones. The 82nd Airborne Division enjoyed similar successes and the 1st Airborne Division had a remarkable 100 percent success rate. Unfortunately, that success would quickly evaporate as the Germans reacted and the friction of war settled over the Allied units.¹⁴

The 101st Airborne Division was the first unit to hit the ground at 1300. Two separate drop zones were utilized to facilitate the securing of the unit's objectives. The division was able to secure all of its initial objectives except for one bridge that would be taken the following morning. They were forced to secure bridgeheads in places where there were no bridges. The Germans destroyed three bridges over the Wilhelmina Canal before they were captured. Loss of these bridges would cost the XXX Corps over twelve hours as they were forced to construct a new bridge.¹⁵

At 1330, the 1st Airborne Division was the second division to hit the ground. It was unable to secure its objectives due to stiff enemy resistance. The 1st Airborne Reconnaissance Squadron, which was supposed to secure the Arnhem bridge, was stopped by a collection of German supply and depot soldiers as it attempted to infiltrate by way of a railroad line. Lieutenant Colonel J. D. Frost, commander of the 2nd Parachute Battalion, 1st Parachute Brigade, set out for the Arnhem bridge on foot. Enroute, he ran into heavy concentrations of enemy and was forced to fight his way to the bridge. He made it there by 2030 with only one-half of his battalion. It was here that Lieutenant Colonel Frost and his men would remain and withstand numerous German attacks and heavy shelling until they were eventually forced to surrender. At 1400, the 82nd Airborne Division landed in the vicinity of Nijmegen. The division was able to seize the bridges over the Maas-Waal Canal and the Groesbeek Heights.

At 1435, the XXX Corps began its breakout operations at the Meuse-Escaut Canal bridgehead and faced fierce resistance. Armored units were restricted to the roads and were subjected to frequent ambushes. The Germans concentrated their antitank weapons on the road in depth, so that the British had to fight from one ambush to the next and could not bypass them due to the terrain. By nightfall, they were at their initial objective of Valkenswaard, seven miles from their starting point.

After the initial shock of the airborne landing, the Germans were able to regroup and launch counterattacks before the airborne soldiers could be reinforced. The intentions of the Allies were also clear. Since the Germans knew that Arnhem was the gateway into Germany, they would bring all forces to bear in this area. German commanders also realized that if they could control the bridges and interdict XXX Corps' line of communications (LOC), they would stop the Allies from reaching Arnhem. The Germans were also fortunate to capture the complete operations order on D-Day. Even without this document, though, it was obvious to the Germans what the Allies were after.

On the morning of the eighteenth, D+1, the 101st found themselves defending Veghel against a German counterattack. The attack was soon repulsed and the town remained in U.S. possession. At 1530, 428 gliders brought in the 3/327 Glider Infantry Regiment (GIR) and divisional support troops. These assets would shortly be pressed into service as the Germans increased their efforts to dislodge the Americans. At 1915, the lead elements of the Guards Armoured Division of XXX Corps linked up with the 101st at Eindhoven. The Guards Armoured Division was able to push as far as Zon that evening, but had to stop to construct a Bailey bridge to replace one that was blown by the Germans.¹⁶

At 0630, the 82nd was attacked by a brigade-sized element of German infantry in the vicinity of Groesbeek Heights. As mentioned earlier, the Groesbeek Heights controlled the area around Nijmegen, and the 82nd had to control this piece of terrain

before they could begin operations to secure the bridge in Nijmegen. The 505th Parachute Infantry Regiment (PIR) was able to repulse the attack, but the Germans controlled the drop zones that the second lift was soon to come in on. The 505th counterattacked to clear the Germans off the drop zones and were still fighting when the second lift arrived at 1300.¹⁷

The British 1st Airborne Division was having a difficult time in Arnhem. Division von Tettau attacked the 1st Airlanding Brigade from the west as it was defending the drop zones.¹⁸ From the east, the 9th SS Panzer Division bypassed Frost's battalion at the bridge and attempted to link up with Division von Tettau. Enroute to the linkup, the division ran into two battalions from the 1st Parachute Brigade attempting to reach Frost. Fierce fighting occurred and the British began to take heavy casualties. At 1500, the 4th Parachute Infantry Brigade arrived. Major General Urquhart kept one battalion in reserve and sent two battalions to reinforce the foothold Frost held in Arnhem. Moreover, by this time the Germans were able to establish a cordon around the bridge, and the units were unable to break through.¹⁹

On the evening of 18 September the situation was not in favor of the Allies. German resistance was stiffer than had been expected. Instead of fighting a conglomeration of disorganized and composite units, the Allies were fighting a mix of highly motivated frontline and composite units. Although the 101st had secured its objectives, it was having a difficult time keeping open its fifteen-mile stretch of "Hell's Highway." Arrival of the XXX Corps would provide the mobility necessary to repel the German attacks. The 82nd controlled the high ground of Groesbeek and all of the bridges except for one. Nijmegen Bridge was the only one capable of supporting tanks in the area, and it was in German hands.

The 1st Airborne Division was no longer attempting to secure a bridgehead for the drive into Germany, but was fighting for its life. The four battalions sent to reinforce

Frost were not able to penetrate the German cordon, and the divisional support area was under constant attack. To make matters worse, the division was unable to contact the corps commander, Lieutenant General Browning, by radio and apprise him of the situation.

On 19 September, D+2, the majority of the action was in the 82nd Airborne Division's sector. Up until this point, the 82nd had been unable to secure the bridge in Nijmegen. Now it became the division's main effort, because it was the only bridge within twenty miles that the XXX Corps could use to cross the Waal River. A plan was developed that called for a coordinated attack by the 82nd and XXX Corps. The operation began the following day at sunrise and consisted of three phases: (1) a combined attack to clear the town, (2) an assault river crossing by the 504th PIR to secure the northern end of the bridge, and (3) a simultaneous assault on both ends of the bridge to secure it.²⁰

On the morning of the twentieth the attack began as planned, but quickly encountered stiff resistance. Attacking elements of the 82nd and the XXX Corps eventually were able to push through the city. The 3/504th PIR began its 400-yard river crossing at 1500. The first lift took heavy casualties, but was able to secure a lodgment on the far bank. Two more lifts crossed the river, and the 3/504th fought its way to the north end of the bridge. At 1700 the bridge was attacked from both ends. The Germans initially put up a strong fight, but they were quickly overwhelmed. Once the momentum shifted to the attackers, more than 500 Germans were killed in a matter of minutes.²¹

During the day, the 1st Airborne Division was finally able to contact the I Airborne Corps located outside of Nijmegen. At 1505 Major General Urquhart reported his situation, "Enemy attacking main bridge in strength. Situation serious for 1 Para Brigade. Enemy also attacking position east from Heelsum and west from Arnhem. Situation serious. . . . Relief essential both area earliest possible."²² That afternoon

Frost's battalion was forced to surrender because of the heavy casualties and lack of supplies. The British lost what little control of the bridge they had and would not regain it.

By the afternoon of the twentieth, Lieutenant General Browning realized for the first time how serious the situation was for the 1st Airborne Division. Although the Allies now controlled the Nijmegen Bridge, the XXX Corps could not continue its advance to Arnhem. The lead elements had fought all day to get through the city and were critically low on supplies. Since the corps was still tied to one road to bring up reinforcements and supplies and the Germans continued to pressure this tenuous supply line, it was becoming increasingly difficult to logistically support the advance. By 21 September, the situation in Arnhem was critical. The previous day they had lost the bridgehead, and their supplies were falling into the hands of the Germans who controlled their DZs. At 1700 that afternoon the Polish brigade was inserted south of the river (the British were to the north). More than forty-one aircraft (one battalion) had to turn back because of the weather. Only 750 men actually landed, and these soldiers were attacked before they reached the ground. For the rest of the night and next day they fought for their lives. On the nights of the 22nd and 23rd, the Poles were ferried across the river to the 1st Airborne Division perimeter. Only 200 made it there when the extraction was complete.²³

At this point it was clear that the 1st Airborne Division was in jeopardy of being decimated or captured and that the German resistance was too strong for the XXX Corps to break through to them. The order to withdraw from Arnhem was given. Before sunrise on the morning of 25 September, elements of the airborne division began crossing the Lower Rhine and stopped at daylight. At 2200 that evening, the remaining soldiers who could make the journey began their exfiltration. The soldiers who were too seriously wounded stayed behind and provided cover for the departing soldiers. They did

this by firing weapons and sending radio transmission that replicated a division headquarters. By 0550 on 26 September 2,398 soldiers had been evacuated. When the Germans attacked that morning they found nothing but corpses and wounded soldiers. By the end of the battle, the British and Poles lost 7, 212 men killed, wounded, missing, or captured.²⁴

¹Lyman B. Kirkpatrick Jr., *Captains Without Eyes* (Boulder, CO: Westview Press, 1987), 223.

²Ibid., 226.

³Michael Lee Manning, *Senseless Secrets: The Failures of U.S. Military Intelligence* (New York: Carol Publishing Group, 1996), 215.

⁴For a more detailed account of this relationship see Norman Gelb, *Ike and Monty: Generals at War* (New York: William Morrow and Company, 1994).

⁵Paul S. Burdett, "To Hell With Monty," *Command*, August 1997, 44.

⁶SHAEF Weekly Intelligence Summary 23, 26 August 1994, in SHAEF G-2 files.

⁷Burdett, 44.

⁸Charles B. MacDonald, "The Decision to Launch Operation MARKET-GARDEN," in *Command Decisions*, ed. Kent Greenfield (Washington DC: GPO, 1960), 435-436.

⁹Burdett, 43.

¹⁰F. H. Hinsley, *British Intelligence in the Second World War: Its Influence on Strategy and Operations*, vol. 3, part II (New York: Cambridge University Press, 1988), 380.

¹¹The Groesbeek Heights was a key terrain feature, which dominates the adjacent terrain.

¹²Charles B. MacDonald, *The Siegfried Line Campaign, The European Theater of Operations of the United States Army in World War II*, (Washington, DC: GPO, 1963), 120.

¹³Peter Harclerode, *Arnhem: A Tragedy of Errors* (London: Arms and Armour Press, 1994), 66.

- ¹⁴Ibid., 97, 101.
- ¹⁵Ibid., 97, 98.
- ¹⁶Ibid., 99.
- ¹⁷Ibid., 103.
- ¹⁸This was a composite division made up of rear echelon troops.
- ¹⁹MacDonald, *European Theater of Operations: The Siegfried Line Campaign*, 171.
- ²⁰Harclerode, 111.
- ²¹Ibid., 114, 115.
- ²²Ibid., 119.
- ²³Ibid., 120.
- ²⁴Ibid., 153.

CHAPTER 2

ULTRA AND ENIGMA

The German cipher machine, which would eventually be called Enigma, began its existence as a commercial product following World War I. Initially, large companies that required secure communications in the execution of their business operations were the target market for this product. This would change though as the German military began to redevelop its armed forces in violation of the terms outlined in the Treaty of Versailles. In order to continue its modernization plan in secrecy, it required a secure means of communications, and the Enigma machine provided a preexisting capability that could easily be incorporated into its communications architecture.

The first service to take notice of the machine and its capabilities was the Navy, and shortly thereafter the Army. Before World War II concluded, this cipher machine would proliferate to all branches of the armed services and numerous nonmilitary portions of the German government.

Germany's future adversaries, initially Poland and France and later Great Britain, began to attempt to "break" the Enigma code before hostilities broke out against their respective countries. This task was a daunting one, considering the complex code that the machine was able to produce. It took much trial and error and a few lucky breaks that allowed the Allies to eventually read the messages before the intended recipient was able to read it.

Codename Ultra was the name given to the program of deciphering Enigma messages. Before the war ended, Ultra would provide Allied commanders with an

unprecedented capability never before seen in warfare: the ability to read the enemy's transmissions in near real time. While this program alone did not bring the end to the Third Reich, it certainly did aid the Allies in the planning and execution of their operations to reduce the number of Allied casualties and possibly the time required for the ultimate defeat of the Germans.

It is difficult to produce a definitive history on the evolution of Enigma, because of the nonlinear development of the system. The machine went through a continuous series of upgrades designed to make the messages harder to decipher from its inception to the end of the war. To compound the problem, each service made various changes to the machine without regard to what the other services were doing; therefore, at the same time numerous versions of the Enigma machine existed throughout the German military and governmental agencies.

For example, the Navy went beyond the standard three-wheel configuration and introduced a fourth wheel in 1943 and later added a fifth wheel. These additions greatly increased the difficulty decrypting naval signals. Compared to the other branches of the service, the Navy used fewer machines; therefore, it was easier for them to field upgrades to the fleet.¹

In addition to the various models of the machines, different organizations used their own operating procedures. While virtually all Enigma users simply typed in the plain text message into the machine, the Party security service (*Sicherheitsdienst*) used the additional step of manually enciphering the message before entering it into Enigma.² This caused additional challenges to the analysts since they had to decipher the Enigma code, as well as the manual code.

Attempting to determine the origins and subsequent success of the programs endeavoring to decipher the Enigma codes is just as daunting as tracing the evolution of the Enigma machine. Each author who writes on this subject approaches it from his own viewpoint and gives weight to one nation's efforts over that of another. The secrecy that shrouded these programs also limits the historical records available for an accurate assessment of the development of these programs.

The Poles were the first group to seriously attempt to decipher the code, with some French assistance. Ultimately though, it was the British who were able to resource a large-scale effort to decipher the messages and would be able to effectively exploit the intelligence derived from the process. The Ultra endeavor is recognized today as one of the most successful intelligence programs in history.

This chapter will attempt to give a basic understanding of how the Enigma machine worked without discussing in detail the various modifications that occurred throughout its existence. Likewise, a brief history of the efforts to decipher the Enigma messages will be provided, so the subsequent discussion of Ultra traffic can be put in the proper context.

Enigma

The Enigma cipher machine began as a concept by the Dutchman Hugo Alexander Koch, who eventually patented his idea as a secret writing machine. A German engineer, Arthur Scherbius, who was also an inventor and had an interest in cryptography, later purchased Koch's patent. In 1923 Scherbius started a small company with the goal of marketing his machine to large corporations for their secure

communications. No company purchased sufficient quantities of the machine to make it a commercial success.³

Scherbius' machine would go virtually unnoticed until 1926, when the German Navy decided to incorporate the machine into its communication architecture. It was only natural that the Navy would be the first service to realize the potential of this capability, since all of its ship-to-shore and ship-to-ship communications were dependent on wireless transmissions. Scherbius' version of the Enigma would remain unchanged until it was upgraded in 1934.⁴

Scherbius' company continued to pursue its commercial endeavors even after the German Navy began to field the machine to the fleet. On 11 August 1927 the company registered a patent with the British Patent Office complete with a description of how the machine worked and accompanying figures. This patent went unnoticed by the British government, and up to the start of the war, it was still trying to understand how the machine worked.⁵

The Army, Air Force, and other governmental organizations would later follow suit and incorporate the Enigma into Germany's communications architecture. By the end of the war, this machine would be used in all branches of the armed services and virtually all nonmilitary organizations within the government as well. Throughout the entire war the Germans had no suspicion that their communications had been compromised and continued to believe their communications were secure.

Enigma Operations

At first glance the Enigma machine looked like a ruggedized field typewriter, but upon closer inspection numerous differences existed. The letters on the keyboard were

laid out the same as a standard German typewriter except there were no numbers or punctuation keys, just the twenty-six letters of the alphabet. Above the keys was a duplicate of the keyboard, but this was actually a lighted display which would be used in coding and decoding the messages (figure 2). The final main difference between the Enigma and a typewriter was that there was no place to input paper. The deciphered message was handwritten by the operator and did not automatically come out of the machine. The common misconception with the Enigma was that it was similar to a teleprinter that automatically sent the message and then decoded it on the receiving end, this was not the case. A human was in the operating loop and human error would prove critical in providing clues in the attack on the Enigma code. With the lid of the box open and the front panel lowered it becomes apparent that this is not a typewriter at all. Above the lighted lamp display are three wheels, which are commonly referred to as the scrambler unit. Below the keyboard is a set of twenty-six plugs, *steckers*, with each plug corresponding to a position on the keyboard (figure 3).



Figure 2. Enigma Keyboard. Source: University of Arizona website, available from <http://www.math.arizona.edu/~dsl/enigma19.htm>; Internet; accessed on 15 January 2002.

The operating instructions would tell all of the operators working on that particular network how to configure their machine for a specific time period, generally twenty-four hours. Only Enigma machines with the exact configuration would be able to decipher the sent message. As mentioned earlier, each service had its own version of the Enigma and likewise its own operating settings. The challenge for the Allies was that just



(c) 1995, Morton Swimmer

Figure 3. Enigma Machine with Open Box. Source: University of Arizona Website, available from <http://www.math.arizona.edu/~dsl/enigma11.htm>; Internet; accessed on 15 January 2002.

because one code was broken did not mean that all Enigma traffic for that time period could be decoded.

The heart of the Enigma was the scrambler unit, which consisted of three wheels. Each day the operator would place three wheels into the Enigma from a box of five in the order stated in the operating instructions. Each wheel had its own unique wiring pattern and had twenty-six contact points on its outer edge. When the operator depressed a key the right wheel would rotate one position. Once the right wheel made one complete revolution, the center wheel would turn one position, and when this wheel made a complete revolution, the left wheel would turn one position forward. This process would continue until the message was completed and the wheels were reconfigured.⁶

The *steckers* were a later addition to the Enigma and created even more variations for each letter. When the electrical current left the keyboard and returned from the wheels it would go into the plug board, which were set in pairs, and exit the plug board as a different letter than which it entered.⁷

What follows is an example that one letter would follow along its path of encryption. When the operator struck a key, T for example, the current would enter the plug board and exit as J. It then traveled to the wheels, the scrambler unit, where it entered as J, traveled through the right and center wheel and reflected off the left wheel and back through the previous two wheels and exited as F. A wire would then take it back to the plug board as F and it would exit as Q, where it would then travel to the lamp board and be displayed as Q. If the operator continued to hit T, a different letter would appear based on the permutations caused by the machine, but T would never be encrypted and become T.⁸

The reason that the Germans thought their codes were unbreakable was the number of variations produced by the machines. The original Enigma machine, without the plug board, could produce over one million variations. The introduction of the plug board exponentially increased the number of variations to approximately 150 million million variations.⁹

Before preparing a message for encryption, the operator would ensure that the machine was configured for that day's operational settings. This consisted of the positions of the wheel, for example I-IV-III, and the pairing of letters on the plug board, A-F, C-T. While a maximum of thirteen pairings were possible, the usual amount of pairings were between five and ten.¹⁰ He would then randomly set the three wheels and record the starting position for the wheels. Working with an assistant, he would begin to enter the plain text message one letter at a time. After each strike of the key the assistant would annotate on a piece of paper which light was illuminated on the lamp board. This process would continue until the entire message was entered into the machine and the results were recorded. The message was now ready for transmission.

A message consisted of a combination of plain text and encrypted text. The initial part of the message sent in plain text consisted of the call sign, time, total number of letters and the randomly selected setting of the three wheels as addressed above.¹¹ The remainder of the message was the encrypted text. Once the message was sent, the receiving operator, whose machine was set using the same operating instructions, would key in the plain text wheel setting and set his wheels based on the encrypted results. He would then be able to decipher the remainder of the message.¹²

Since the encrypted message was simply written on a piece of paper it could be transmitted using any communications path available. The common method of transmission was Morse code. The operator could transmit it using voice if that was all he had available, and it could be sent via a wireless transmission or landline. If the message was sent over landline, a telephone for example, the Allies would not be able to intercept the message. This becomes a key factor, because if the Germans had reliable landline communications, a fixed command post in a city, they would not transmit their messages over wireless; therefore, the message was not susceptible to interception. While there are examples of resistance agents working in telephone exchanges and intercepting German communications, it was not realistic that they could have assisted Ultra. The threat to the program being compromised did not justify having the agents intercept Enigma messages.

Ultra

The lineage of the British Ultra program can be traced directly to the Polish *Wicher* program. Without the prior thirteen years of work that the Poles had amassed reading German communications, it is debatable if Ultra would have become the success story that it is today. When the Poles turned over their work on the eve of World War II to the French and British, the British only had a rudimentary understanding of how the machine operated. Unfortunately the Poles' work has often been overlooked by historians, since theirs was a much smaller effort, in size but not effectiveness, and occurred during the interwar years. Their efforts though are no less important and are probably more important than the later work carried out by the British.

Another popular misconception is that Ultra's sole mission was to break the Enigma code. While this is partially correct, the Ultra program was much larger than a group of mathematicians endeavoring to find the daily key. Ultra was actually a complete program that included all of the steps involved from the actual interception of a German message, to breaking the daily key, to making the message readable, to analyzing the message for intelligence information, to transmitting the message to the field, and then to putting it into the hands of the commander for action.

During the years following World War I, many of the nations that participated in the war continued to maintain their cryptological programs, but at different levels of effectiveness. The Poles probably had the most active program, because they realized that the Treaty of Versailles would not end war, but just provided a respite before the next war. Their immediate concern was how Germany would react towards Poland because of the territory it ceded to them under the treaty. With this threat in mind, the Poles began intercepting Germany's radio communications shortly after the war and would continue until they were invaded in 1939.

The other Allied countries were not even close to the Poles when it came to understanding this new potential threat caused by Enigma. Room 40 was the name of the British cryptological program during World War I. Following the war it was given the name of the Government Code and Cipher School (GCCS) and was transferred from the Admiralty to the Foreign Office. While this was an active program in the interwar period, it was not adequately resourced to solve the Enigma code and was found to be unprepared to attack the German communications system on the eve of the next war.

The French found themselves in a similar position as the British. Captain Gustave Bertrand, who was responsible for radio intelligence in the Second Bureau of the French General Staff, was one of the key figures in the French efforts to penetrate German signals. In 1930 he became the head of Section D of French Intelligence and continued his efforts on the German signals.¹³ While the French were unsuccessful in breaking the Enigma code, they were key players in assisting the Poles by providing them with intelligence provided through contacts in Germany on the Enigma program. Bertrand would become a key conduit for the Poles in assisting them, not through technical means but by passing them stolen documents, in deciphering the German's communications and ultimately assisting the Polish cryptanalysts in escaping to Paris at the onset of the war.

The U.S. had an active program as well, but its main focus was not on German communications, but Japanese instead. American analysts were curious though about German capabilities and had their military attaché in Berlin purchase a copy of the Enigma machine in 1927. Little came of this in regards to the Enigma program since the focus at the time was on Japanese diplomatic traffic. The overall American cryptological effort faced a setback when in 1929 Secretary of State Henry Stimson stated, "Gentlemen do not read each others mail."¹⁴ The U.S. cryptological efforts did not come to an end at that point, but simply changed names and became more discreet about their activities. America took the least amount of interest in the early stages of breaking the Enigma but would eventually become one of its greatest consumers.

The Early Years

Following World War I the Poles maintained a limited capability to decipher German secure communications. They established communication collection sites at

Starogard, Poznan, and Krzeslawice for the interception of German communications, and the General Staff's Cipher Bureau in Warsaw was responsible for deciphering these messages. The problem the Poles faced was that they possessed a limited number of trained cryptanalysts who were up to the task of breaking the German's codes. This problem was exasperated when the German Navy began using the Enigma machine in 1926.¹⁵

To counter this growing threat, the Poles began a cryptology program at a university in the city of Poznan. This university was selected not only for the strength of its mathematics department, but also because students from that area grew up speaking German. The goal of the program was to select the students with the best aptitude for cryptography to expand their program. In 1931 this program came to an end, and Marian Rejewski, Jerzy Rozycki, and Henryk Zygalski were selected to become members of the Cipher Bureau and would lead the Polish efforts in breaking the Enigma code.¹⁶

The Poles continued to toil on the new Enigma code with little success, but this changed when they received key documents from Captain Bertrand. Hans-Thilo Schmidt contacted French Intelligence; he was a German who worked in the *Reichswehr* cipher department and who stated that he had some information he would like to pass on to the French. After a series of interviews, in which he was thoroughly vetted, he was given the code name of *Asche*. To prove his authenticity, the French asked him to provide them with as much documentation as he could on the Enigma machine.¹⁷ These documents would end up in Polish hands and provide the point of entry that the cryptanalysts had so far not been able to determine.

Bertrand turned over the documents to the Poles in Warsaw on 7 December 1932. Included in these documents were keys to manual ciphers, operating instructions for the Enigma, and a set of old keys, which the Poles then used to recreate the operations of the machine. Armed with this new knowledge, the Poles were able to make rapid advances on reading Enigma messages by the end of December. During the first half of January 1933, the Poles were able to begin reading a limited amount of Enigma traffic.¹⁸

The initial success of reading an Enigma-produced message laid the groundwork for the Poles to continue their attack on Enigma. A series of setbacks and failures characterized the 1930s for the Poles. Just when they succeeded in breaking a new cipher, the Germans would make a modification to the machine, and the procedure would start all over again. The difference from here on out was that the Poles understood how the system worked and that they would only have to focus in on the modification the Germans made before they were once again reading the messages. This greatly reduced the time required to compensate for the changes that the Germans made. During this time, the Poles were still the only nation that had success with the Enigma, and they were not sharing their results.

As the Poles became more adept at deciphering the Enigma code, they began work on a series of systems, both automatic and manual, that would assist them in more rapidly deciphering the codes. The bomba was one of the key aids that they produced to rapidly determine the settings for the Enigma machine.¹⁹ This machine, a precursor to the computer, would allow the analysts to rapidly determine the settings of the machine. Without these aids it would be virtually impossible for a human to identify the settings in time for the intelligence to be of any value.

If a message could not be rapidly worked out by an analyst, they would process that message through the bomba to determine that day's operational settings. The bomba consisted of the parts of six Enigma machines and would rapidly work through, within hours, the possible rotor settings of the Enigma machine until it found a match. This worked well for the Poles, until the Germans made available two more rotors and turned the six possible wheel settings, hence six Enigma machines as part of the bomba, into sixty.²⁰ The Poles did not have the ability to make a bomba that could cope with sixty possible wheel settings.

In addition to the Germans adding the fourth and fifth wheels in late 1938, there were other strains being placed on the already limited Polish resources. As Germany increased its war footing more communications nets became active, and, thus, more Enigma traffic was produced. This created a strain on the communications intercept sites, and the Poles could not expand this capability as fast as the Germans activated radio nets. They were now being inundated with more traffic than they had the capability to decipher. The Poles were quickly able to theoretically determine how to attack the two new rotors, but did not have the resources available to build a bomba required to put the theory to use.²¹

By 1938 it was becoming apparent that war with Germany was inevitable. Many of the European countries began posturing for war and this highlighted the need to have a capability to read Germany's communications. The GCCS began an all-out recruitment campaign to fill the ranks in an attempt to decipher the Germans yet uncipherable codes. Poland, on the other hand, was having success deciphering the codes, but now realized

that it could not go it alone and eventually had to bring the Allies in on its secret. Up until this time, no one was aware of the successes that the Poles had had.

The lack of the Allies' awareness of the extent of the Polish program is highlighted by the fact that Bertrand went so far as to suggest to Colonel Gwido Langer, chief of Poland's Cipher Bureau, that the French should let slip to the Germans that the Enigma code was compromised. Based on his belief that they could not decipher the German's communications anyway, this would cause the Germans to change their entire communications system on the eve of war. While it is pure conjecture to determine what the German response would have been, it is obvious that the Ultra program would have ceased before it ever began. Luckily for the Allies, Langer disagreed with Bertrand, and the scheme did not go further than their discussion.²²

The now Major Bertrand was intent on deciphering Enigma and arranged a meeting in Paris in January 1939, in which representatives from France, Britain, and Poland would meet to share information on Enigma. Overall, the meeting was not a success. The British, who by now were diligently working on Enigma, did not think anyone else had been successful either. Bertrand had not produced anything productive since the *Asche* documents, and the Poles were under orders not to release any information on Enigma unless another country produced better information than what they had first.²³

Following the January meeting the situation in Europe continued to deteriorate. In March German forces occupied Prague, moved into Slovakia, and occupied Klaipeda in Lithuania. The Germans were beginning to envelope Poland, and the Poles ordered a partial mobilization to deal with the now very real German threat. When it was apparent

that war with Germany was inevitable, the Polish General Staff agreed to let the Allies in on its secret.²⁴

The meeting took place in Poland, and a delegation from France and England arrived on 24 July. This time the Brits sent their more experienced members of the GCCS in anticipation of what the Poles had to offer, and the ever-present Bertrand was a member of the French team. They were not disappointed.

On the twenty-fifth a group of ten people traveled to the small town of Pyry about ten kilometers south of Warsaw. In the woods outside of Pyry, the Poles had built a transmitting and cipher station. It was here that their secret work was disclosed to the French and British delegations. After a tour of the station, Colonel Langer showed them the copy of the Enigma and bomba that they had created. Both the British and French delegations were duly impressed by the Poles achievements.²⁵ This was the first time that they learned of the extent of the Polish program and realized what this meant to their own fledgling programs.

The information that they received in Poland was sure to advance both of their programs, and the psychological boost in knowing that the Enigma could be broken surely lifted their spirits, but beyond the information they garnered, they were not to leave empty handed either. At the conclusion of the conference, Langer said that the French and British would each receive a copy of one of their Enigma machines. By August their copies had arrived, and a new chapter had begun on the attack on Enigma.

The invasion of Poland began on 1 September 1939 by the Germans, and the Soviet Union followed suit on the seventeenth and effectively brought the Polish cryptological effort, as a stand-alone project, to an end. Many members, including

Langer, Rejewski, Rozycki, and Zygalski, were able to escape Poland through various modes of transit. They fled south and ended up in Rumania, where the French were able to secure transportation and documents to allow them to go to France.²⁶ The Polish cryptological team would become members of Bertrand's team until they were once again forced to flee from German forces.

British Ultra

Prior to hostilities on the European continent, the British cryptological program was woefully underfunded and undermanned. Luckily for the Allies, the British had an extensive reservoir of talent to draw upon when they began to develop a full-up cryptological program. This experienced cadre would form the nucleus of the new program and would be rounded out with some of the finest minds available within the academic community. This combination of old hands, eccentric geniuses, and the drove of new hires would quickly become a well-functioning organization that would be another asset for the Allies as they started on their endeavor to topple Nazi Germany.

The old hands of the Ultra program gained their experience during World War One. The MI1b, a program under the War Office, was the first cryptological program within the British government. As a fledgling organization, MI1b was able to decipher many of the German codes. Although the codes during this period were relatively simple compared to World War II standards, so was the ability of the cryptanalysts of the time. The MI1b's first big break came during Christmas of 1916. A German commander in the Middle East sent out a Christmas message to his troops, and this message was rebroadcast to his subordinate commands. Prior to this message being sent, MI1b was only able to decipher a limited number of German codes. This holiday greeting appeared

in six different codes that the Brits had been unable to decipher. The message was easily discernible due to the low volume of traffic during the holiday season, and they were able to break the six new codes.²⁷

Under First Lord of the Admiralty Winston Churchill, the Admiralty established its own cryptological program. Room 40 was the name given to this program, because that was the room it occupied in the Admiralty Old Buildings. Room 40's most notable success was the decryption of the Zimmerman Telegraph, which was sent by the Germans to the Mexicans in an attempt to have them enter the war against the U.S. While the War Office and Admiralty were having success against the Germans, they were not successful in coordinating between themselves. The organizations shared the results of their work but not the technical methods of how they obtained their results. This would not change until after the war.²⁸

In 1919 the Cabinet created the GCCS by combining MI1b and Room 40 with an authorized strength of twenty-five people recruited from these two organizations. Initially this organization was under the control of the Admiralty, but in 1922 it was assigned to the Foreign Office.²⁹ This arrangement created numerous problems during the interwar years. Since the organization was funded and controlled by the Foreign Office, its focus was more on diplomatic messages and codes than on military communications. This is one of the reasons why the British were so far behind the Poles when it came to deciphering Enigma traffic prior to World War II. When the British began a concerted effort in the late 1930s to attack German communications, many of the old members of MI1b and Room 40 were called out of retirement to provide the nucleus of the reenergized GCCS.

Bletchley Park

When it was apparent that war with Germany was inevitable, the British government began to move many of its organizations, especially defense-related organizations, out of London. Bletchley Park was just one of the many locations purchased by the government to accommodate these exiled organizations and became the new home for the GCCS. The official cover name of Bletchley Park was Station X. It was not called this because of the top-secret work conducted there but because it was the tenth site purchased by MI6 to house its operations and they used a Roman numeral system to designate their sites.³⁰

Bletchley Park was an ideal location for the GCCS. It was approximately seventy kilometers northwest of London and was between its two major recruiting sources, Oxford and Cambridge. While it was isolated in the English countryside, a road and rail line existed that allowed for easy access back to London when required. The initial complex was adequate, given the limited size of the GCCS in 1939, but it quickly became apparent that major additions would be required to house the ever-growing GCCS. Before the war would end, 10,000 people would work in the Bletchley Park compound or in the numerous facilities that supported it in the outlying area.³¹

During the summer of 1939 work began to transform Bletchley Park from a country mansion into the Allies key cryptography center. Initial work consisted of upgrades to the infrastructure of the site, such as the power, water, roads, and other improvements. After a short time though it was obvious that they required more workspace than was currently available. A series of “huts” were built on the Bletchley grounds to accommodate the growing space requirements as the Ultra program began to

expand from a handful of cryptographers to a full-fledged cryptography center. These huts were numbered and each hut performed a different function in the production of Ultra intelligence. The hut numbers not only described the physical location where the work took place, but also describes what type of work occurred in each hut.

Before any work could begin on decrypting messages, they first had to be intercepted, and this was the responsibility of the Y Service. The Y Service's main responsibility was to intercept the enemy's transmissions and then forward the intercepts on to Bletchley for exploitation. Initially the intercept sites were located in England, but expanded throughout the world as the Ultra program grew. The Y Service was not only responsible for intercepting the messages, but also developed an extensive base of knowledge over time on the enemy's radio networks and their operating procedures. This became a major enhancement to the Ultra program when the Germans began changing frequencies and call signs every twenty-four hours. It was imperative that the operators quickly located the new operating frequencies, so that intercepted messages could be passed to Bletchley and exploited. If the Y Service was unable to reestablish contact with a key frequency, it delayed the entire process.³²

The entry point of the intercepted messages into Bletchley and the heart of the decryption effort was Hut 6. It was here that the assembled mathematicians worked around the clock to find the Enigma settings for that day and to render the messages readable for the analysts who worked in Hut 3. Hut 6 did not conduct any analysis on the messages and did not even translate the messages into English, their job was only to make the message readable in German and then it was passed on. Peter Twinn, who worked in Hut 6, said, "When the codebreakers had broken the code they wouldn't sit

down themselves and painstakingly decode 500 messages. . . . By the time you've done the first twenty letters and it was obviously speaking perfectly sensible German, for people like me that was the end of our interests."³³

The Control section within Hut 6 received the messages from Y Service and was in constant communications with them to ensure that the appropriate frequencies were being monitored and that the messages received from the Y Service were exploitable. They received the intercepts via a combination of teleprinter and motorcycle courier. Over the teleprinter, Control received the preamble and the initial groups of the message, which they used to determine cipher settings and any other information of intelligence value before the code breakers began to work on the messages. A motorcycle courier would then bring the complete messages later.³⁴

The function of Control was similar to the collection management and dissemination sections that are in use today. They were the conduit between the collectors and analysts and ensured that the collectors were focusing on the key frequencies and not collecting on frequencies that had little or no intelligence value. Faced with limited resources within the collection and analytical sections, it was imperative that only the most exploitable frequencies were collected.

The code breakers themselves worked on what was called the Watch. It was here that they received either the complete or partial messages and began their work on trying to determine the key setting for that day. Rarely did they break a cipher by hand; instead they worked out the "menus" that would be fed into the bombes. Using their experience and knowledge of the operating procedures used by the Germans, they eliminated numerous possible settings for the machine and reduced the possible settings to a

manageable number that could be attacked by the bombe. For example, one of the operating restrictions imposed by the Germans was that no wheel order would be used twice in the same month. If the wheel setting for a day was I-II-III, the cryptanalysts knew that the next day's setting could not be I-II-III and this reduced the possible wheel configuration from sixty to thirty.³⁵

Once a daily key was successfully identified, the decrypted messages, in German, would be sent to Hut 3 for analysis. Hut 3 was responsible for all of the German Air Force (GAF) and Army messages and was staffed with members who were knowledgeable in army and air force matters and all of them were fluent in German.³⁶ Any relevant information was extracted from the message and filed in an index system that was maintained in Hut 3 for future reference. Once the message was translated and assessed, it was passed to the head of the watch who determined to whom the message would be sent from the list of authorized Ultra recipients and what priority it would be sent out as. The priority system was based on a scale of five Zs, where least urgent messages were given a priority of Z and the most urgent messages were rated ZZZZZ. The messages sent from Hut 3 were not an assessment of a single message or group of messages, but the exact translation of the message itself. It was decided early on that Bletchley would not become an all-source intelligence production center, but would be a single-source cryptographic section instead.³⁷ Analysts sometimes did make comments within the messages though, but this was only to clarify a specific part of the message. The only subjective input for a message coming out of Bletchley was the priority that the chief of the watch assigned to it.

Initially, the dissemination of Ultra intelligence was limited to the ministries on the isles via courier or landline transmission, but as headquarters began to deploy the means of sending the results of Ultra via wireless, transmissions became necessary. There was a danger though in sending an exact replica of a German message by wireless, because the Germans could just as easily have broken the British cipher and would quickly realize that their communications were compromised. A solution was developed that allowed the Allies to transmit Ultra intelligence to distance command posts throughout the war without the Germans able to decipher these messages.

Special Liaison Units (SLU) were created to solve the Allies' communications problems. The Ultra program leadership had two distinct challenges that it needed to address to maintain the operational security of the Ultra program. The first was the transmission of the material to the field commanders without it being intercepted by the Germans. This was accomplished by recruiting select members from the Royal Air Force (RAF) Signal Corps to man the SLU stations. These airmen were specifically trained in the use of the one-time pad. While this is not the preferred technique for sending messages, it is a virtually unbreakable system. It is based on the fact that only the sender and receiver have the key for that transmission, and it is used only one time and then destroyed. Repetition and operator error are critical for breaking a cipher, and since these airmen were highly trained and used a key only one time, the Germans were never able to break into SLU transmissions.³⁸

The second concern and the more likely way Ultra could be compromised was that the receiving unit would disseminate Ultra traffic in its reports without disguising the source. If the Germans captured this information and if they determined that the only

source possible for that information was from their Enigma, it would compromise the Ultra program. The officer in charge (OIC) of the SLU was given the thankless job of ensuring that this did not happen. Several control measures were used to limit the dissemination of Ultra intelligence within the headquarters. When the SLU decrypted an Ultra message, they personally walked it into the headquarters and showed it to the personnel on the Ultra access list and then brought the message back to the SLU truck and destroyed it.³⁹ This ensured that no Ultra messages were left lying around inside the headquarters. Another task for the OIC was to ensure that Ultra traffic was not going directly into intelligence summaries or field orders. The commands could use the information, but had to be able to adequately disguise it or it could not go into their reports.

One of the truly remarkable aspects of the Ultra program was not the technical ingenuity required to decipher the Enigma code, but was the fact that it remained a secret for over thirty years after the war, and it was not until the British government declassified it in the 1970s that the program became known to the world. This is extraordinary considering that over 10,000 people worked on the program in the remote countryside north of London and that numerous commands from multiple countries were recipients of Ultra intelligence.

Part of this secrecy is attributable to the thousands of people who were sworn to secrecy and did their duty by maintaining their oath long after the war was over. The other reason that the secret remained for so long was the compartmentalization of the entire Ultra program. Very few people knew the full extent of the operation, and most only understood their narrow role in the production of this intelligence. While these

measures were necessary to maintain the operational security of the program, in some ways it limited Ultra's ability to support the commanders in the field.

The people working in Bletchley Park were not apprised of upcoming operations in the field. One of the reasons was to avoid the possible tainting of their analysis by looking for something that may or may not be present. On the other hand though, items of critical importance to a command in the field may have been viewed as unimportant at Bletchley. An example of this is an Ultra report from 15 September 1944, two days prior to the launching of Operation Market-Garden, that stated that Army Group B had moved its headquarters to Oosterbeek, Holland, which was only a couple of miles from the drop zones used by the British 1st Airborne Division. Since the analysts at Bletchley were unaware of the upcoming operation, the message went out as a priority ZZ.⁴⁰ It is doubtful that the operation would have succeeded if this information was in the hands of the division commander, but it is something that he would probably have wanted to know.

¹Peter Calvocoressi, *Top Secret Ultra* (New York: Pantheon Books, 1980), 26.

²Jozef Garlinski, *The Enigma War* (New York: Charles Scribner's Sons, 1980), 32.

³*Ibid.*, 6.

⁴Ronald Lewin, *Ultra Goes to War* (New York: McGraw-Hill Book Co., 1978), 26.

⁵*Ibid.*, 45-47.

⁶Alan Stripp, "The Enigma Machine: Its Mechanism and Use," in *Codebreakers*, ed. F. H. Hinsley and Alan Stripp (New York: Oxford University Press, 1993), 84-85.

⁷Ralph Bennet, *Ultra in the West: The Normandy Campaign 1944-45* (New York: Charles Scribner's Sons, 1975), 4.

⁸Stripp, 85,86.

⁹Bennet, 4.

¹⁰Calvocoressi, 26, 30.

¹¹Before enciphering a message the operator would randomly rotate the three wheels and annotate this as the starting position.

¹²Stripp, 87.

¹³Garlinski, 13-14.

¹⁴Lewin, 28.

¹⁵Wladyslaw Kozaczuk, *Enigma: How the German Machine Cipher Was Broken, and How it Was Read by the Allies in World War Two* (Unknown: University Publications of America, 1984), 2.

¹⁶Garlinski, 18-19.

¹⁷*Ibid.*, 14-16.

¹⁸*Ibid.*, 17-21.

¹⁹Some authors refer to the Polish version as the bomba or bombe. Since the British versions were later called bombe, bomba will be used to assist in the differentiation between the Polish and British versions.

²⁰This was not a new five-rotor *Enigma*, but was still the standard three-rotor machine with two additional wheels that could be placed in the three available positions.

²¹Kozaczuk, 55.

²²Lewin, 40-41.

²³Garlinski, 38-39.

²⁴Kozaczuk, 57-59.

²⁵Garlinski, 41-44.

- ²⁶Kozaczuk, 69-75.
22. ²⁷ Michael Smith, *Station X Decoding Nazi Secrets* (New York: TV Books, 1999), 22.
- ²⁸ *Ibid.*, 23.
- ²⁹Hinsley, 21-22.
- ³⁰Smith, 34.
- ³¹Garlinski, 50.
- ³²Lewin, 115.
- ³³Smith, 50.
- ³⁴ *Ibid.*, 49.
- ³⁵Derek Taunt, "Hut 6: 1941-1945," in *Codebreakers*, ed. F. H. Hinsley and Alan Stripp (New York: Oxford University Press, 1993), 108.
- ³⁶Hut 4 was the Navy's counterpart to Hut 3.
- ³⁷Lewin, 122-124.
- ³⁸ *Ibid.*, 55.
- ³⁹ *Ibid.*, 55.
- ⁴⁰Ultra Message HP 220, dated 15 September 1944.

CHAPTER 3

PRELUDE TO MARKET-GARDEN

At the outset of the war, Ultra was a small program both in the organization's size and stature. No one could really foresee how critical this program would be in the future prosecution of the war, and in the beginning many were skeptical and relied on the more common sources of low-grade ciphers, imagery intelligence, and the traditional use of spies. This attitude would eventually change as Ultra established its credibility and began to provide commanders with an ever-increasing amount of intelligence.

The invasion of Norway in April 1940 was Ultra's first success in providing operational intelligence. The *Oberkommando der Wehrmacht* (OKW) Yellow key, specifically produced for the invasion force, was broken within a week and would ultimately produce 1,000 messages. This initial limited success was quickly followed by Germany's invasion of Western Europe on 10 May. While Ultra intelligence did not forestall the signing of the armistice on 22 June, it did prove that it had the potential to provide valuable intelligence to the commanders in the field.¹

All of the intelligence in the world though could not stop the Germans at the beginning of the war. The Allies simply did not have the capability to defeat the Germans. David Kahn, in describing the defeat of the Poles in 1939, could have been describing the defeat of the Allies in 1940 when he said,

The defeat demonstrated an elemental point about intelligence: unlike guns or morale, it is a secondary factor in war. All the Polish codebreaking, all the heartrending efforts and the heroic successes, had helped the Polish military not at all. Intelligence can only work through strength.²

This position of weakness though changed to one of strength as the war progressed and as the Allies were able to take advantage of the intelligence provided by Ultra.

By 1942 the Allies were on the offensive and Ultra was providing actionable intelligence to commanders in the field. British general Bernard Montgomery began using Ultra intelligence to his advantage shortly after he assumed command of the Eighth Army in August 1942. His first use of Ultra was during the defense of Alam Halfa against Field Marshal Erwin Rommel on 31 August. Montgomery prepared his defense based on Ultra reports that provided Rommel's main axis of attack and when the attack would occur. Rommel's Afrika Corps was defeated at Alam Halfa and the Allies were now able to press the attack.³

It is important to note here that the architect of Market-Garden began using Ultra intelligence as early as 1942 and would use it throughout the war. One of his former intelligence officers, Bill Williams, described the events in August 1942 and Montgomery's use of the intelligence he received:

He wanted to know when Rommel would attack, where and what with. . . . He won his first battle, the model defensive belt at Alam Halfa, by accepting the intelligence with which he was furnished. . . . It meant, too, that because the intelligence had proved adequate then, he believed it afterwards.⁴

It would be to Montgomery's detriment that he did not continue to utilize Ultra intelligence in the weeks leading up to the execution of Operation Market-Garden

The Ultra program continued to expand as the war progressed. It was a key component in the defeat of the German Navy during the Battle of the Atlantic, the campaign in Italy, and the strategic bomber offensive against Germany. By the time the Allies launched Operation Overlord, Ultra was a main source of intelligence for echelons

at army level and higher. Security precautions precluded the use of Ultra at corps level and below though. While the tactical units were indirect recipients of Ultra through intelligence summaries and reports, they were not aware of its existence. The First Allied Airborne Army (FAAA), created in the summer of 1944 and serving as the planning headquarters for Market-Garden, was not even on the distribution list for Ultra intelligence.

Pursuit Beyond the Seine

By the middle of August 1944 the Allies had successfully secured a lodgment on the European continent and could now realistically begin to make preparations for the invasion of Germany. By this stage of the campaign the original plan called for the Allies to develop an adequate logistical base that would support their drive into Germany. The tactical situation, mainly the retreat of the Wehrmacht across France, instead called for the pursuit of the enemy, so that he would not have time to reconsolidate his forces and make a defensive stand elsewhere.⁵ The buildup of an adequate logistical infrastructure would be delayed in order to take advantage of the fleeting opportunity to destroy the broken enemy.

On 19 August the first Allied units began to cross the Seine River for their advance towards the German frontier. Eisenhower made the decision that the main effort would be directed north of the Ardennes and consisted of the First Canadian, Second British, and First U.S. Armies. Patton's Third U.S. Army, a supporting effort, would move south of the Ardennes. The ultimate goal of this drive was the Ruhr industrial complex in Germany, but the Allies faced numerous challenges.⁶ The major obstacles

confronting them consisted of their tenuous supply situation and the Rhine River, while the German forces were becoming less of an obstacle as time went on (figure 4).

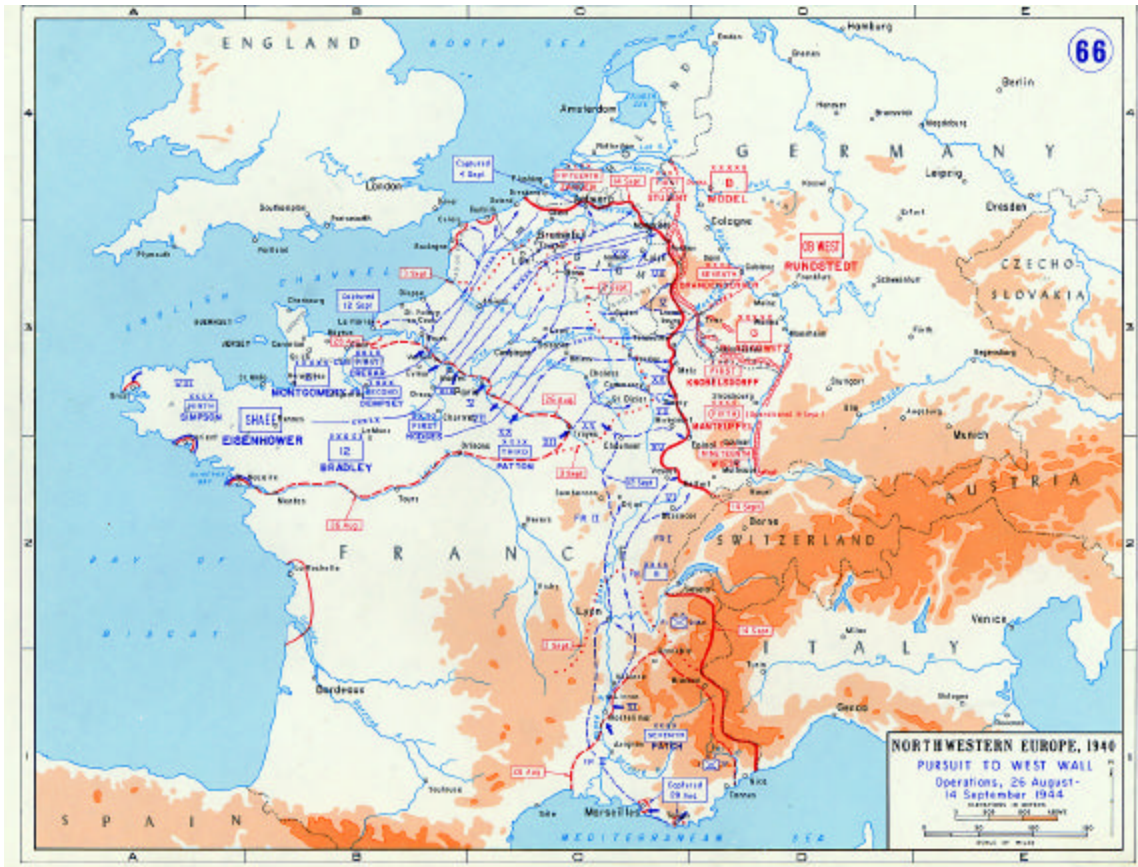


Figure 4. Pursuit to West Wall. Source: United States Military Academy Website, available from <http://www.dean.usma.edu/history/dhistorymaps/WWIIPages/WWIIEurope/ww2es66.htm>.; Internet; accessed on 23 February 2002.

The situation confronting the Wehrmacht was not one of defeating or delaying the Allies, but that of survival. All across the front they were being driven by the Allied offensive and had no other options but to retreat. Hitler's ill-advised counterattack at Mortain on 7 August hastened the destruction of the German forces in the west, but the

real death knell came with the destruction of the German Seventh Army in the Falaise pocket.

As fortune would have it for the Allies, the First Canadian Army launched a planned attack toward Falaise, east of Mortain, the day after the Germans launched their counterattack. During the next two weeks elements of three Allied armies would begin to encircle the German Seventh Army and Fifth Panzer Army with their escape route to the east being slowly tightened. Within a two-week period the Germans would lose approximately 50,000 men as prisoners, 10,000 men killed, and the loss of a staggering amount of vehicles, guns, and supplies.⁷

In addition to the loss of men and equipment, whole units were shattered with individual men fleeing from the pocket. This loss dealt a serious blow to the morale of the Wehrmacht that it would not recover from until it reached its own frontier. The destruction and confusion inside the Falaise pocket is described in a Supreme Headquarters Allied Expeditionary Force Weekly Intelligence Summary published on 19 August. It states that at “RANES [town in southern part of pocket] the enemy’s order of battle was so confused that out of 100 prisoners taken there eighteen divisions were represented.”⁸ It was becoming rapidly apparent that the Wehrmacht was losing control of its formations and was having difficulty conducting coordinated operations to stop the Allied advance.

As the Allies raced across France towards Belgium, the Wehrmacht was stretched to the limit, attempting to delay the inevitable. Without adequate men and tanks they could do little but to try to slow the Allied advance while the remainder of the army attempted to reach the German frontier in hopes of occupying the long-neglected West

Wall, also referred to as the Siegfried Line, in hopes of stopping the Allies before they could drive into Germany. The fact that the Germans were capable of resisting at all is truly impressive and is a tribute to the soldiers and small-unit leaders who fought the delaying actions that allowed a large part of the army to extricate itself from the front and would ultimately resist the Allied advance into Germany.

From an intelligence standpoint, the pursuit of German forces across France provided a wealth of intercepts and intelligence. According to Ralph Bennet, author of *Ultra in the West* and veteran of Hut 3, “The great retreat that late August was one of Hut 3’s busiest periods.”⁹ The amount of Ultra traffic exploded as the Germans conducted their headlong retreat back towards their frontier. Two reasons exist for this upsurge in traffic. The first was that virtually the entire army was mobile and no longer operated from fixed command facilities that allowed it to use landline communications. Wireless transmission became the main mode of communications, and for Bletchley this created an inordinate amount of traffic. The second reason was the disintegration of the Wehrmacht. German commanders were having difficulty in coordinating their chaotic retreat because this was not a planned retrograde operation, but a broken army attempting to withdraw itself, and as much equipment as possible, from the Allied juggernaut. Radio transmissions were the only way to determine the location of subordinate units and to attempt to coordinate their activities.

The communications situation was so bad for the Germans that General Westphal, Rundstedt’s Chief of Staff of *Oberbefehlshaber West* (OB West), stated that it would often take over twenty-four hours for a subordinate headquarters to receive a message from OB West via the telephone system. General Guderian went further in his criticism

by saying that commanders had ceased to have an accurate understanding of what was transpiring on the battlefield.¹⁰ Westphal and Guderian's comments were backed up by Ultra intercepts that highlighted the lack of command and control that the Germans had at this time. An unidentified division reported that it was "without any instructions all day" and went on to say that it was coordinating with its adjacent unit to establish a defensive line.¹¹ Many units were not only fighting for their lives, but also were doing so without any guidance from their higher headquarters.

At the same time that the German High Command was trying to grasp the situation on its front, the analysts at Bletchley and in the field commands were having an even more difficult time trying to determine the current disposition and composition of the German forces. Prior to the Falaise pocket the Wehrmacht was still a coherent fighting force, and tracking the enemy's movements and intentions was not particularly difficult. Following the events in the Falaise pocket though, the enemy picture became very confused at best. Entire units were written off the books and merged into other units, and battle groups were formed in other situations. Battle groups were ad hoc groupings of units pulled together out of tactical necessity to attempt to delay the oncoming Allies. The confused and very optimistic intelligence picture after the crossing of the Seine River was one of the reasons that led to the "victory euphoria" that began to permeate all levels of the Allied command.

Based upon the Ultra intercepts alone, not to mention the carnage that the Allies passed as they drove on towards the German frontier, it is easy to see how the Allies began to think that the war was truly coming to an end. On 7 August, the same day that the Mortain counterattack was launched, the Germans transmitted a consolidated casualty

report for the period of 6 June to 6 August. Personnel losses consisted of 3,219 officers, and 131,046 noncommissioned officers and soldiers. In addition to gaining insight on the numbers of casualties, the report also showed how few troops were being sent to the front to replenish these losses. Only 19,904 replacements had been received to replace the 134,265 casualties (a rate of one replacement for every fifteen lost) with another 16,457 replacements expected to arrive.¹² These numbers do not include the 60,000 lost as prisoners or casualties in the Falaise pocket.

German assessments of their subordinate unit's combat effectiveness were also made available by Ultra. These assessments from the front are extremely candid and do not attempt to shine a positive light on their situation, but report the situation as it actually existed. Low morale was one of the myriad of problems confronting the Germans after their recent defeats, and one symptom of this was an increasing desertion rate. While the SS and paratroop units maintained their cohesion and discipline, regular line units did not show the same enthusiasm. An Ultra report intercepted on 25 August said that during the two-day period from 23 to 24 August fifty soldiers from the 179th Reserve Grenadier Battalion deserted, and the same report stated that 60 percent of the 217th Reserve Grenadier Battalion deserted as well.¹³

While the SS did not have the morale problems faced by units in the regular Army, the effects of the past month were beginning to show. The II SS Panzer Corps, which held open the east end of the Falaise pocket to allow as many German units to escape as possible, reported "people were very exhausted."¹⁴ It is important to note though that the SS units maintained their discipline and cohesion throughout the retreat and, although badly attrited, continued to fight as an effective force. The II SS Panzer

Corps, battered and exhausted as it was in August, would be the key unit that denied the Allies the capture of the bridge at Arnhem.

Ultra also provided insight on the state of German material resources required to continue to oppose the Allied advance. The Germans provided very detailed reports on the status of their equipment that allowed order of battle analysts to accurately estimate the combat power of the German units that maintained unit integrity during the retreat. For example, the I SS Panzer Corps reported the status of two of its tank battalions: SS Panzer Abteilung (battalion) 101 had eighteen total tanks, seven serviceable, two short repair, nine long repair and SS Panzer Abteilung 503 had seventeen total tanks, three serviceable, six short repair and eight long repair.¹⁵ In addition to the material reports provided by Ultra, logistic reports also showed how short the Germans were on critical supplies. The Fifth Panzer Army reported on 29 August “that all fuel without exception had been issued.”¹⁶ Not only were the Germans losing tanks at an alarming rate, but also they were approaching the point where they could not refuel the limited number of tanks they had on hand.

The amount of weapons and supplies that were left in the Falaise pocket, combined with the German armaments industry inability to meet current demand, also showed itself in Ultra reports. An unidentified division reported on 27 August that “Infantry had scarcely anything but carbines. Two batterien (batteries) all but exhausted their ammunition, supplies sent off but not arrived.”¹⁷ A lack of supplies, both consumables and durables, is a consistent theme in the Ultra reports in the end of August. This problem would decrease though as the German’s lines of communication grew shorter as they retreated closer to their bases of supply in Germany.

While the field commanders were having difficulties communicating with their units in the field, there was not a lack of messages from Hitler and the OKW (High Command of the German Armed Forces) providing directives on how to prosecute the war in the west. The vast majority of these messages was transmitted via landline and Ultra was, therefore, unable to read these messages. What inevitably would occur though, is that the Hitler or OKW message, in whole or part, was sent down to the field commands over wireless, and Ultra would be able to intercept these messages. By piecing together the various messages, Bletchley would be able to recreate to a large extent the complete message from Hitler or the OKW.

An example of this is a commander in chief west message intercepted on 26 August that quoted a Hitler message sent on the twenty-fifth. This message showed how severely the battles in August had attrited the Wehrmacht and the steps that the German High Command was taking to provide manpower to the units in the field.

Charlie in Charlie [Commander in Chief] West on twentysixth quoted following Hitler order of twentyfifth colon Firstly, all staffs, authorities and units released as result of the course of the fighting in the west and which are not required for re-employment further back are immediately to be disbanded. Secondly, elements of the Army thus released, in so far as suitable, to be at direct disposal Charlie in Charlie West to reinforce the battle front. . . . Thirdly, released elements of the Navy and GAF [German Air Force] to be at disposal Charlie in Charlie West and sent by shortest route for employment with fighting forces of the field army (including parachute divisions). . . . Fourthly, authorities of OKW in this area to be disbanded, personnel and equipment released to be in first instance at disposal Charlie in Charlie West.¹⁸

While this message highlighted the lack of manpower confronting the Germans, it also showed that the High Command was still in charge and coordinating activities on the front to attempt to counter the Allied advance.

The results of the Allied successes in the field and the intelligence provided by Ultra began to resonate in the intelligence summaries of the various commands. SHAEF produced weekly intelligence reports that recapped the week's activities on mainly the western front, but also included key events in the other theaters of war. While Ultra is never addressed specifically in these summaries, due to the security restrictions, it certainly had an impact on the final product. Subordinate commands, prisoner reports, captured documents, resistance groups, and other sources provided the bulk of the intelligence that went into the SHAEF summaries.

Following the defeat of the German Seventh Army in the Falaise pocket, the SHAEF weekly intelligence summaries began to portray a very optimistic picture of the situation confronting the Allies. This is not surprising considering that the Allies had partially destroyed a German army and had the rest in full retreat back to its borders.

The first intelligence summary following the battle in the Falaise pocket was published on 19 August. Unguarded optimism is the best way to describe this weekly summary. Lack of reinforcements, orders given to retreat to positions that had already been occupied by the Allies, and a general sense of confusion within the Wehrmacht were the key topics in this report. An example of the overly optimistic nature of this report is found in the section describing the enemy's capabilities where it says, "It is difficult to see how the Germans can stand it much longer. Two things are certain. The enemy has lost the war and the defeat of Seven Army and Panzer Gruppe West will hasten the end."¹⁹

The next summary, published on 26 August, is the high-water mark for Allied optimism and contains the now-famous quote describing the August battles.

The August battles have done it: the German Army in the WEST has had it. Crippled, in the NW by appalling losses, in the SW by sheer futility, and in the SOUTH by totally inadequate reserves, the armies of RUNDSTEDT, of KLUGE, . . . are committed willy-nilly to what must shortly be the total surrender of more than two-thirds of FRANCE. It is an achievement of which the Allied Armies may well feel enormously proud, and of which the enemy is frankly envious. Two and a half months of bitter fighting, culminating for the Germans in a blood-bath big enough even for their extravagant tastes, have brought the end of the war in EUROPE within sight, almost within reach. The strength of the German Army in the WEST has been shattered, PARIS belongs to FRANCE again, and the Allied Armies are streaming towards the frontiers of the Reich.²⁰

Virtually every book or article suggesting that the failure of Market-Garden was caused by an intelligence failure cites this report, and rightfully so, but then they fail to address subsequent intelligence summaries that do not show the same enthusiasm and become more pessimistic as the collapse of the Wehrmacht does not materialize. These latter summaries, laced with Ultra intelligence, show a very different enemy in mid-September than the one from August.

Not everyone agreed with SHAEF's overly optimistic assessment. In fact, the closer an analyst was to the front, the less optimistic his reports tended to be. Colonel Koch, the U.S. Third Army G2, stated in his G2 Estimate number 9 on 28 August that,

Despite crippling factors of shattered communications, disorganization and tremendous losses in personnel and equipment, the enemy nevertheless has been able to maintain a sufficiently cohesive front to exercise an overall control of his tactical situation. His withdrawal, though continuing, has not been a rout or mass collapse. . . . It must be constantly kept in mind that fundamentally the enemy is playing for time. Weather will soon be one of his most potent Allies as well as terrain, as we move east to narrowing corridors. . . . But barring internal upheaval in the homeland and the remoter possibility of insurrection within the Wehrmacht, it can be expected that the German armies will continue to fight until destroyed or captured.²¹

Antwerp

Antwerp was the culmination point of the Allied pursuit of the Wehrmacht, and the failure to press the attack gave the Germans the one thing they needed to organize their defense, and that was time. Alistair Horne in his biography of Montgomery stated, “The failure to seize Antwerp and its approaches at the beginning of September 1944 comes down through the years as one of the greatest errors of the Second World War, greater even than Arnhem--though the two were closely linked.”²² Sir Brian Horrocks, commander of the British XXX Corps, echoed this sentiment when he said, “To my mind 4th September was the key date in the battle for the Rhine. Had we been able to advance that day we could have smashed through this screen and advanced northwards with little or nothing to stop us.”²³

Horrocks’ lead division, the 11th Armoured Division, entered Antwerp on 4 September and seized the ports intact. The rapid advance of the XXX Corps in the preceding days did not allow the Germans time to destroy the port facilities. In addition to taking Antwerp, the British had cut off the land escape route of the German Fifteenth Army, commanded by General von Zangen. The Fifteenth Army, with a strength around 80,000 soldiers, was trapped between the British Second Army and the Scheldt Estuary.

Cornelius Ryan described the failure of the British to advance north of Antwerp to cut off the alternate escape route of the Fifteenth Army as “The Great Mistake.” Ryan states that Von Rundstedt, Commander in Chief West, quickly developed the situation and devised a plan to extract the Fifteenth Army while denying the Allies the use of the port at Antwerp. Von Rundstedt ordered Von Zangen to ferry his troops across the Scheldt Estuary to Walcheren Island, where they would then be able to march across the

South Beveland peninsula to where it connected to the mainland, fifteen miles north of Antwerp.²⁴

According to Horrocks, “With the capture of Brussels and Antwerp 30 Corps was ordered to halt. The reason given was that we had out-run our administrative resources.”²⁵ The failure of the British to cut off the South Beveland peninsula allowed the majority of the Fifteenth Army to escape into Holland, where they would later be utilized to oppose Operation Market-Garden. In addition to forces being made available to counter Market-Garden, the Germans maintained control of the north side of the Scheldt Estuary, which denied the Allies the use of the port at Antwerp. With guns located on Walcheren Island and the South Beveland peninsula, Allied shipping could not transit the estuary until these areas were cleared, and the first Allied ship would not enter the port until 9 November 1944.

The first Ultra reports indicating how the Germans planned to deny the Allies the use of the Antwerp port began on 5 September. In a retransmission of a Hitler order, Army Group B was told of the importance attached to holding Walcheren Island and Flushing Harbor.²⁶ Both of these sites sit at the mouth of the Scheldt Estuary, which, at its widest point, is no more than two miles across. An Ultra report on 6 September stated that, “Walcheren Island to receive same powers as fortress commandants.”²⁷ In previous reporting fortresses were ordered told to hold until the last man. On the seventh another Ultra report stated that, “Naval Chief Command North by late sixth pointed out defence of Walcheren was becoming decisively important as key of defence of Scheldt.”²⁸ A Hitler order on the morning of 7 September to Fifteenth Army stated, “Accordingly mouth of Schelde to be barred by adequate occupation, including infantry, and by

obstinate defence of islands Walcheren and Schouwen and of batterian round and west of Breskens.”²⁹ It was by now apparent that the Germans placed a high importance on denying the use of the Antwerp to the Allies.

Summary

While the Allies were celebrating their most recent successes, the Germans were busily preparing themselves for the defense of the Fatherland. Field Marshall Gerd von Rundstedt, who was relieved of command of OB West by Hitler on 2 July 1944, was now preparing to leave the Fuhrer’s command post on 4 September to assume his old position. On the same day that Von Rundstedt was departing Gorlitz, Colonel General Kurt Student was busy preparing his newly created command, the First Parachute Army, for deployment to Holland. Just four years prior, Student dropped into Holland to secure the key bridges that the Wehrmacht would use to race through Holland, and now he was going to defend against a force attempting a very similar feat.³⁰

Germany gained the vital time it required to organize a coherent defense in Holland and Belgium by the failure of the Allies to exploit their success at Antwerp. While the situation for the Germans was still dire, they now had three things going their way. The first was that the terrain they now occupied was much more defensible than that in France. The Low Countries of Belgium and Holland consisted of flat, often marshy land that did not lend itself to mounted operations and contained numerous canals and dikes created to make the land suitable for farming. Secondly, they were now on their own frontier and defending the homeland. Analysts and commanders alike surprisingly discounted this fact. The most prominent dissenter was Prime Minister Winston Churchill, who was also one of Ultra’s earliest and greatest supporters. He clearly did not believe the Germans would collapse that easily, and on 8 September said, “It is as least as likely that Hitler will be fighting on 1 January as it is that he will collapse before then. If he does collapse before then the reasons will be political rather than military.” His reasoning was that the “fortifying and consolidating effect of a stand on the frontier of her soil should not be underestimated.”³¹ Lastly, the Germans had some of their finest senior leadership now orchestrating the defense of the Reich.

CHAPTER 4

Road to Arnhem

While the Germans were contending with the collapse and subsequent reorganization of their army, the Allies were debating over how to end the war. General Eisenhower was a proponent of the broad-front strategy designed to pressure the Germans across the entire front, while Field Marshal Montgomery proposed a single “full-blooded thrust” towards Berlin to end the war. Naturally, Montgomery’s planned thrust was to occur in his sector, and this would force the other army groups to a halt for want of supplies.

The differences in opinion between the leaders are highlighted by communiqués sent between them on 4 September. Eisenhower, in a message to his commanders, stated, “further movement in large parts of the front even against very weak opposition is almost impossible.” His concern was that the Allies had outrun their supply lines and could not move further into enemy territory, even against light resistance. He concluded by reiterating his position on the broad-front strategy by saying, “It is obvious from an overall viewpoint we must now as never before keep the enemy stretched everywhere.”³² On the same day Montgomery sent Eisenhower a message stating that, “I consider we have now reached a stage where one really powerful and full-blooded thrust towards Berlin is likely to get there and thus end the German war.”³³ The ever-widening gap between the two commanders would continue to grow and the end of the war would not resolve the dispute over strategy.

The two leaders met on 10 September in Brussels where Eisenhower, despite his reservations over Montgomery's plans, authorized an airborne operation to seize a crossing across the Rhine River. It was not Eisenhower's intent for this to be the start of a drive to Berlin, but "Market-Garden would be merely an incident and extension of our eastward rush to the line we needed for temporary security."³⁴ He still believed in the broad-front strategy, but was willing to back Montgomery if he could obtain a bridgehead over the Rhine River.

German Situation

Following the fall of Antwerp the German high command began to issue orders to stop the Allied advance further into Holland. On the afternoon of 4 September, Colonel General Kurt Student, who commanded the German airborne forces earlier in the war, received a call from Colonel General Alfred Jodl ordering him to take command of the newly-created First Parachute Army. Student's army was to defend a seventy-five mile gap east of Antwerp created by the recent Allied penetrations.³⁵ The area assigned to Student would eventually become the main axis of advance of Operation Market-Garden. The man who led the airborne assault into Holland in 1940 would now be responsible for defending against an Allied airborne assault against the same area.

While the German High Command was reorganizing its defense in the west, local commanders also saw how dire the situation was and took steps to stop the Allied advance. Generalleutnant Kurt Chill, commander of the 85th Infantry Division, was under orders to take his division back to the Rhineland. Upon seeing the situation along the Albert Canal on 4 September, he took it upon himself to stop his withdrawal to the Rhineland and began to establish a defensive position along the canal. By that evening

he was able to augment his own division with remnants from every branch of the service that he picked up trying to cross the canal back into Germany.³⁶ Chill's actions, along with those of other local commanders, firmed up the defense along the Albert Canal and provided the time necessary for the Germans to begin to establish a coherent defense. The momentum of the Allied advance had stalled under its own weight, and the Germans were using the time to their advantage.

While local commanders were stabilizing the front and reinforcements were being rushed from Germany, General von Zangen's Fifteenth Army began its withdrawal from the area west of Antwerp to the South Beveland peninsula via the Scheldt Estuary. Montgomery had isolated the Fifteenth Army west of Antwerp and had cut off its land escape route, but failed to advance beyond Antwerp to completely isolate the army. Von Zangen used this respite to ferry his units across the Scheldt Estuary to the South Beveland peninsula, where they were then able to escape into Holland. Some of these units would later be assigned to First Parachute Army and fight the Allies during Market-Garden.³⁷

Ultra

Ultra intelligence continued to flow into Allied headquarters following the capture of Antwerp. The nature of the reporting changed from that of controlling a retreat to one of establishing a coherent defense designed to halt the Allied advance, and the quantity of Ultra traffic began to taper off as the Germans began their reorganization in Holland. German units were now basically static and could rely on the preexisting landline communications infrastructure in Holland. While the amount of Ultra traffic diminished,

it still was capable of providing commanders with the disposition and intent of some of the major German forces.

An Army Group B order on 4 September ordered panzer units currently not in operation to withdraw to designated areas to rest and refit. The 2nd and 116th Panzer Divisions and the 9th and 10th SS Panzer Divisions were ordered to withdraw to the Venloo-Arnhem-s'Hertogenbosch area to conduct their refit. This area forms a triangle with Arnhem at the apex and the XXX Corps route of advance going directly through the base of the triangle towards the apex. The 1st, 2nd, and 12th SS Panzer Divisions were ordered to return to the Reich to conduct their refit.³⁸ On the following day the II SS Panzer Corps was directed to transfer to Eindhoven to direct the rest and refit of the four panzer divisions ordered to the Venloo-Arnhem-s'Hertogenbosch area.³⁹

Army Group B was also taking other measures to shore up its defense on the now vulnerable Albert Canal. An Ultra message on 6 September disclosed that the newly fielded First Parachute Army was to be responsible for the defense of the Albert Canal from Antwerp to Maastricht and would have under its control the 3rd, 5th, and 6th Parachute Divisions.⁴⁰ A later message on the same day expanded the forces at the disposal of the First Parachute Army. The three parachute divisions were to be brought up to authorized strength from a GAF training division: the First Parachute Army was to have subordinate to it LXXXIII Corps with two divisions, all battle groups currently under control of CIC Armed Forces Netherlands, ten battalions from Wehrkriess VI that were to be equipped with antitank guns and close-range antitank weapons, thirty heavy and ten light flak batteries, and enough heavy weapons to refit the parachute army.⁴¹

The Germans were preparing their first defensive belt along the Albert Canal. The troops that were manning it were a mixture of first-line soldiers and former rear-area troops now thrust to the front. These formations were lightly armed and under strength, but were already putting up stiff resistance to Allied probing attacks. It was becoming clear that the Germans would not leave the doors to Germany open for the Allies to drive through. The importance that the German High Command placed on this area and the steps it was taking to protect it are highlighted by an order from Heinrich Himmler, head of the security services, on 8 September that stated “crossing of the Rhine eastwards by elements of armed forces without express orders to be prevented. Rhine crossings to be blocked by standing patrols of officers.”⁴²

While four armor divisions were ordered to relocate to areas around the future Allied drop zones and the First Parachute Army was occupying the Albert Canal, the Fifteenth Army was executing its withdrawal virtually under the noses of the British in Antwerp. As mentioned in the previous chapter, the British advance stopped short of the South Beveland peninsula and failed to cut off the escape route of the Fifteenth Army, which became a busy place as the Fifteenth Army began to extricate its forces over the Scheldt Estuary. On 4 September Army Group B ordered the Fifteenth Army’s units that could not escape over land--the British had already sealed their land escape route--to withdraw via Flushing and Breda across the Scheldt. By that evening units were already being ferried across to the peninsula.⁴³

This ferrying activity continued throughout September, and Ultra provided continuous coverage of the German activities while the British failed to seal off their escape route. On 6 September an Ultra message stated that a GAF division and other

miscellaneous units had already been ferried across and that they were preparing to increase their activities. An intercept on 8 September “estimated that so far 25,000 men, 350 vehicles and 50 tons of equipment had been ferried across.”⁴⁴ Ultra continued to provide almost daily situation reports that detailed the evacuation of the Fifteenth Army. On the day that Market-Garden commenced, it was estimated that 70,000 men had been ferried across the Scheldt Estuary and escaped into Holland.⁴⁵ By the end of the evacuation on 23 September, a summary stated that 82,000 men, 530 guns, 46,000 vehicles, and 4,000 horses were ferried out of the pocket.⁴⁶ These numbers are low compared to those provided by the 21st Army Group G2 Brigadier Bill Williams. In his intelligence summary on 18 September, he stated that, “probably over 100,000 men had crossed into the Scheldt Peninsula since Antwerp was captured.”⁴⁷

Based upon the numbers of Germans who escaped the pocket, it is easy to see how the failure to cut off the South Beveland peninsula has been described as an even greater failure than that of Market-Garden. The reason that this failure is a mere footnote in history is simply because it was one of inaction. There was neither an operational name nor high casualty list to accompany the failure, just an opportunity that slipped away and would become a factor in the famous defeat that occurred two weeks later.

Allied Intelligence

An underlying theme in the intelligence reports of late-August and early September is the impending collapse of the Wehrmacht. Many Allied intelligence officers and their commanders as well took the events of the past month and predicted that those events would continue into the future. What they failed to do was to predict their enemy’s ability to quickly reorganize his shattered formations and to develop an

adequate defense with the meager resources he had available. This was by no means a universal belief throughout the Allied ranks, but is one that some headquarters would cling to until they were forced by defeat to reevaluate their opinions.

The SHAEF weekly intelligence summary for the week ending 9 September starts out by saying that Germany itself is now being threatened and that “the encirclement battle for the REICH is beginning as collapses are reported from every part of the fighting front.”⁴⁸ The summary does not comment on signs that the enemy is beginning to stiffen in the north. While Ultra provided indications that the Germans were reorganizing their defenses, the British had stopped their advance in the north. Since the front in the British sector was basically static, there would be no reason for them to alter their summaries or assumptions about the German capabilities.

Even though Ultra reported on the 6th that the First Parachute Army was to assume the sector east of Antwerp, there is no mention of this in the text of the summary. On the enemy order of battle map provided with the summary, the First Parachute Army is written on the margin of the map as unlocated. The same is true for the II SS Panzer Corps and the previously mentioned panzer divisions. All of these units are reported to be unlocated despite the Ultra reports.⁴⁹ One could assume that the reason for this could be the security requirements regarding the use of Ultra in reports. If no other source could verify the report of these units, then the analysts would be forced to report them as unlocated for fear of compromising Ultra.

The SHAEF summary also addressed the situation confronting the Fifteenth Army. It stated that, “The captured ANTWERP meant that the remains of the Fifteenth Army in the PAS DE CALIS lost their land escape-route.” The summary goes on to say

“some may well escape by ferry or by sea.”⁵⁰ This is somewhat of an understatement, since Ultra had already reported that 25,000 men had escaped. This situation is clearly an example of intelligence not acted upon. If the British 21st Army Group’s focus was on preparing Antwerp for port operations, that included clearing the Scheldt Estuary, the Fifteenth Army would have been isolated and either captured or destroyed. Instead, it was looking toward the Rhine and disregarded what was going on around it.

While SHAEF was producing its optimistic intelligence summaries, the *British Intelligence in the Second World War* volume that deals with this time period simply states that, “21st Army Group issued no intelligence summary between 28 August and 12 September.”⁵¹ No reason is provided on why it did not produce a summary during this period.

Not everyone in the intelligence community though was as optimistic as those at SHAEF or 21st Army Group. The G2 of Third U.S. Army, Colonel Koch’s, lack of optimism is highlighted in his intelligence estimate dated 28 August. He stated that, despite the severe losses suffered by the Wehrmacht, the “enemy nevertheless has been able to maintain a sufficiently cohesive front to exercise an overall control of his tactical situation.” He describes the advantages that the enemy will have in regards to the terrain and weather as he moves closer to his border and the autumn weather patterns begin. He concludes by saying, “Barring internal upheaval in the homeland and the remoter possibility of insurrection within the Wehrmacht, it can be expected that the German armies will continue to fight until destroyed or captured.”⁵² Koch’s estimate highlights the divergent viewpoints within the intelligence community on the situation confronting the Germans on the eve of Market-Garden.

The Decision is Made

After receiving authorization from Eisenhower, Montgomery briefed the I British Airborne Corps commander Lieutenant General Frederick Browning on the plan. During the discussion Montgomery stated that the armored forces would be at Arnhem in two days, and Browning replied that they could hold out for four. Browning immediately left for England, where the FAAA and participating airborne divisions were located, to begin planning for the operation. When Browning briefed his American commander, Lieutenant General Lewis Brereton, Brereton was hearing about the operation for the first time.⁵³

Since the FAAA was a combined organization, Montgomery obviously did not want the Americans to find out about his plans until he received the go ahead from Eisenhower. It is highly suspect to assume that Browning just happened to be sitting in Montgomery's headquarters the day that Montgomery met with Eisenhower for approval of the plan. The FAAA now only had seven days to prepare for the largest airborne operation in the history of warfare. Unlike the seventeen previously planned but not executed airborne operations since D-Day, the only thing that could stop this operation was the weather or Montgomery.

The planning for the operation though did not start from scratch. Operation Comet was the last airborne operation that was currently being planned and consisted of one and one-half airborne divisions dropping on Arnhem to seize the bridge. The cancellation of Comet, and the addition of two airborne divisions, was due to the recent increase of German forces in the objective area. General Miles Dempsey, commander of the Second British Army, in a diary entry on 10 September discussed the increase in

airborne divisions and said it was “because of increasing German strength . . . in the Arnhem-Nijmegen area.”⁵⁴

Ultra

Ultra reports continued to feed information to the analysts, but none of it went directly to the fighters. The actual fighting units were not on the dissemination list for Ultra intelligence, since Ultra was restricted to army level and higher. One exception to this rule was the FAAA, which was an army level unit, but was not on the list. Since the operation was under the supervision of 21st Army Group and command of the Second Army, all of the official intelligence support would come from these headquarters.

As mentioned in chapter 2, the analysts at Bletchley Park were not informed of upcoming operations to avoid the possibility of tainting their analysis. Their mission was to still decipher, translate, and send messages to the headquarters in the field for their use. Ultra was never designed to directly support on-going tactical operations, and it would not during Market-Garden. This does not mean though that Ultra became irrelevant at this point. Many of the messages intercepted by the Y Service were still decrypted and sent to the field within twelve to twenty-four hours from original transmission. If the headquarters could verify the information by another source the message could then be disguised and sent to the field. If the Ultra message was the sole source for the information, then the intelligence could only be used within that headquarters.

Ultra continued to report on the progress of the Fifteenth Army and its escape into Holland. By this point in time, the intelligence was only useful for order of battle purposes and determining how many Germans escaped to Holland, since there were no plans to attempt to stop their withdrawal.

The overall volume of reporting in the objective area continued to taper off as the units were now in position and utilizing landline communications. There were some reports of units repositioning within sector, but these units had been previously identified. This lack of reporting, compared to the past weeks, should have been an indicator that the front was now beginning to stabilize and was not as chaotic as before.

The Germans continued to develop their defenses and were preparing for an armored breakthrough. A commander in chief west order on 11 September instructed every army to establish antitank blocking positions ten to twelve kilometers behind its main defense line. This order provided detailed instructions on how to utilize rear-area personnel to prepare antitank obstacles and ambushes to stop armored breakthroughs.⁵⁵ A CIC West message that same week stated the importance of the West Wall in the defense of Germany and that it was to be defended “until annihilation.”⁵⁶

Ultra continued to provide more clarity on the German command and control structure prior to the operation. On 15 September Ultra reported that the new headquarters for Army Group B was established at Oosterbeek.⁵⁷ Oosterbeek is a suburb of Arnhem and located only four kilometers west of Arnhem and approximately five kilometers east of the drop zones utilized by the 1st British Airborne Division. Elements of the 1st Parachute Brigade would pass the Army Group B headquarters on the seventeenth enroute to Arnhem. The headquarters of the First Parachute Army was identified the following day at s’Hertogenbosch.⁵⁸

Ultra provided commanders with reports that showed that the Germans were expecting an Allied attack towards either Arnhem or Aachen and that this attack would probably utilize airborne troops. A message intercepted on 13 September reported that

Army Group B had requested air reconnaissance to determine if the Allies were preparing “for a thrust to Aachen or against One Para Army for thrust towards Arnheim (*sic*).”⁵⁹

An intercept from 9 September, transmitted to the field on 15 September, stated that the British XXX Corps’ mission is to “thrust mainly on Wilhelmina Canal on both sides Eindhoven into Arnhem.”⁶⁰ Based on this last message, the Germans had identified the Allied plan before it was even approved by Eisenhower.

Field Orders and Intelligence Summaries

The second most maligned SHAEF weekly intelligence summary, by critics of the intelligence support to the operation, is Number 26 published on 16 September. This summary is criticized not for the content of the report, but for the time that it was released: one day prior to the operation commencing.

One must keep in mind a couple of thoughts before criticizing this summary on the grounds that it came out too late for the information to be acted upon. A weekly summary is exactly what the name implies, a summary of the past week’s activities. Operational planners and commanders have access to this information on a daily basis through briefings, reports, or in planning sessions with intelligence personnel. The first time that they see this information is not when the weekly summary is published.

The second thing to consider is that SHAEF and 21st Army Group had virtually the same sources of intelligence information, and 21st Army Group should have been more aware of what was occurring on its own front than SHAEF. In addition, SHAEF, 21st Army Group, and the Second British Army were all recipients of Ultra traffic for messages impacting the northern portion of the western front. To conclude that SHAEF

was the only organization that possessed the information found in the 16 September summary is simply wrong.

The most important piece of information found in the 16 September summary was the location of the 9th and 10th SS Panzer Divisions. The report stated that, “9 SS Panzer Division, and with it presumably 10, has been reported as withdrawing altogether to the ARNHEM area of HOLLAND: there they will probably both collect some new tanks from the depot reported in the area of CLEVES.”⁶¹ This information was originally reported by Ultra during the first week of September and subsequently corroborated by the Dutch resistance.

The First Parachute Army, in conjunction with the Fifteenth Army, is given credit for stopping the Allied advance into Holland. The summary states that

The increased resistance NORTH and EAST of ANTWERP, which was offered later in the week, was doubtless due to the arrival of the Fifteenth Army elements from over the SCHELDT Estuary and of course the arrival of First Parachute Army with its heterogeneous collection of forces.⁶²

This summary still exhibits at times an overly optimistic picture of the German situation, but its tone is much different than previous summaries.

Shortly after the decision on 10 September to execute Market-Garden, the participating units began to produce their field orders to support the operation.⁶³ The intelligence annexes to the orders were based primarily on the information that they received from their higher headquarters. All of the airborne units were located in England and did not have any collection assets on the continent and were not recipients of Ultra intelligence. They were thus dependent upon their higher headquarters for information, but would surely use any type of information that was available. According

to Brigadier Gordon Walch, British I Airborne Corps chief of staff, “21st Army Group headquarters was the principal source of our intelligence, and we took what they gave us to be true.”⁶⁴ Certain examples exist where subordinate headquarters differed with their higher on exactly what type of threat was anticipated.

Upon receiving notification of the operation, the assistant G-2 of FAAA flew to France to meet with the G-2s of 21st Army Group, Second Army, and XXX Corps. The purpose of his trip was to acquire whatever information he could on the enemy to support FAAA planning.⁶⁵

The results of his trip were published in a memorandum dated 15 September 1944. While it is doubtful that the airborne units used much of the information in his report in their planning, since all of their orders and intelligence annexes were published prior to 15 September, this report does provide insight into the attitudes found within the British headquarters on the continent.

Even though the report is dated 15 September, it reads as if it were written immediately after the fall of Antwerp. The 9th and 10th SS Panzer Divisions are not addressed in his report at all, and the total number of tanks confronting Second Army is estimated at thirty. In discussing the enemy he states, “The type of German soldier to be met will be mixed--badly demoralized groups, foreign SS troops, paratroop reinforcements, GAF personnel, fanatical youths.” The last sentence of the report sums up the prevalent attitude in the British headquarters on the continent when he says, “The maintenance of control will be particularly difficult [for the Germans], and large forces of airborne troops having the audacity to drop in daylight may well scare the enemy into a state of complete disorganization.”⁶⁶ Even after the Germans had checked further British

advances into Holland, the prevailing attitude was still that the Germans were a demoralized lot and would be easily defeated.

The I Airborne Corps had a less optimistic view of the enemy, as described in their Operation Instruction No. 1. This order, published on 13 September, states that the “enemy is fighting determinedly” on the Albert Canal and has “remnants of some good divisions, including parachute divisions.” Their estimate was that German tank strength be put at fifty to one-hundred and that the enemy was reinforcing the Arnhem and Nijmegen areas.⁶⁷

A clear trend is beginning to appear, and that is the closer one is to the fighting the more one is going to estimate the enemy is going to fight. This is evident in the field orders for the 82nd and 101st Airborne Divisions.

The 82nd Airborne Division published Field Order No. 11 on 11 September, one day after the operation had been approved and two days prior to their higher headquarters publishing an order. This division also has the distinction of being the first unit to state in an order the possibility of a panzer division in the vicinity of Arnhem.

The 82nd Airborne Division’s order on the eleventh is probably the most correct assessment of what was actually happening on the front than any other unit’s. The impressive thing about this is the limited amount of intelligence reporting sources they had compared to the units in the field. It is unknown what sources they used for their order, but they were supported by a Dutch liaison officer who may have been a conduit for Dutch Resistance reports that were discounted by the 21st Army Group. The 82nd also had the advantage of not being wedded to a plan and could, therefore, report what it thought was actually occurring at the front.

In the general enemy situation section, the annex states, “There is no doubt that the enemy has made a remarkable recovery within the last few days, at any rate in the 21 Army Group Area.”⁶⁸ In describing the German units in the area of operations, it is noted that a “broken” panzer division is reported in the vicinity of Arnhem and that it may yield up to fifty tanks. It also addresses 4,000 SS troops that are reportedly in Nijmegen after relocating from Amsterdam.⁶⁹

The 101st Airborne Division’s order also address German panzer units located in the objective area. Annex 1a to Field Order No. 1 is a situation template overlay of the enemy order of battle. On the overlay is depicted the four panzer divisions that were reported by Ultra to have withdrawn to the Arnhem- Venloo-s’Hertogenbosch area to refit.⁷⁰ Their overlay is certainly one of worst case, because all of these divisions are depicted as being south of Eindhoven (the 101st’s southernmost objectives). Even though this template is wrong--the 2nd and 116th Panzer Divisions were repositioned elsewhere on the front and the 9th and 10th SS Panzer Divisions were located further north in the vicinity of Arnhem--it shows that the G-2 of the 101st was not discounting the possibility of armor units in the area of operations as readily as the higher headquarters were.

Attempts to Warn

The victory euphoria that permeated Allied ranks at the end of August and first part of September began to wane as it became more obvious that the Wehrmacht was not going to be easily brushed aside. Numerous Allied officers, American and British, tried to warn Montgomery of the risks posed to the operation based on new intelligence and

the obvious strengthening of the German's defense. While many tried, none were able to convince Montgomery to cancel the operation.

These warnings did not just come from Americans or subordinate units echelons below Montgomery, but they also came from his primary staff officers. On the day that Eisenhower approved Montgomery's plan, Montgomery's senior intelligence officer, Brigadier Bill Williams, who had served with Montgomery since Africa, tried to get his commander to "change his mind."⁷¹ Williams' concerns were based on the reports of the German armor units now in the objective area and the introduction of the First Parachute Army under command of General Student.⁷² There can be no question that Williams based his concerns on the recent Ultra reports that showed the changing situation at the front.

Montgomery's chief of staff, General Freddie de Guingand, who was hospitalized in England, contacted Montgomery by phone to express his concerns. General de Guingand was concerned not only about the increases in the German strength but also the ability to logistically support the operation without an adequate logistical support base.⁷³

The most famous effort to warn and the least likely to influence anyone's decision was Major Brian Urquhart, G-2 of the I British Airborne Corps. Urquhart recalls that he saw a reference in the 21st Army Group's intelligence summary about the 9th and 10th SS Panzer Divisions refitting in Arnhem and was concerned when he saw a similar report from the Dutch Resistance. Urquhart states, "Even if these formidable fighting units had been badly mauled . . . they were a deadly threat to lightly armed airborne troops landing in their vicinity."⁷⁴

Urquhart informed his commander, General Browning, who did not appear overly concerned. He then ordered oblique photographs of the area in question and these images showed tanks and other armored vehicles close to the 1st Airborne Division's drop zones. Once again his concerns were not addressed, and he was placed on sick leave and did not participate in the operation. Before the operation was a week old, Urquhart was ordered to return to corps headquarters located outside of Nijmegen. After ten days at the headquarters he requested a transfer and was posted in the chemical warfare section of 21st Army Group.⁷⁵

Concern was also growing in SHAEF headquarters over the upcoming operation. British Major General Kenneth Strong, SHAEF G2, said, "Not long before the airborne drop on Arnhem, I told Bedell Smith (Eisenhower's chief of staff) that I had doubts about its success as there was some evidence that elements of German armour, probably with new tanks, were within striking distance of Arnhem."⁷⁶ Strong probably based this concern on the reports emanating from Ultra and the Dutch Resistance on the 9th and 10th SS Panzer Divisions that relocated to Arnhem. This is the same information that was previously described in SHAEF's intelligence summary of 16 September.

Based upon this information, Smith believed that an additional airborne division should be added to the operation and dropped in Arnhem or, if that was not feasible, one of the American divisions should be moved from the south to Arnhem. Smith received permission from Eisenhower to fly to Brussels and discuss this issue with Montgomery. Smith was unable to change Montgomery's mind and said, "Montgomery ridiculed the idea" and "waved my objections airily aside."⁷⁷

Summary

Despite the increased intelligence reporting, both from Ultra and the Dutch Resistance, that showed that the German situation had changed, the operation was not cancelled. Ultra clearly depicted an enemy that was no longer on the verge of a collapse, but was continually taking measures to improve its situation by reorganizing the command structure at the front, pulling units out of the line to refit, and preparing for an Allied thrust either towards Eindhoven or Aachen, possibly utilizing airborne forces. Despite these reports and the numerous senior members of Montgomery's staff and the SHAEF staff who counseled against conducting the operation as planned, Montgomery refused to consider changing or canceling Operation Market-Garden.

While it is beyond the scope of this thesis to address the command and personal relationship between Montgomery and Eisenhower and the powerful influences that each man was under from his own country in detail, still it must be mentioned. The rift between Montgomery and Eisenhower over the prosecution of the war surely played into Montgomery's refusal to alter his plans at this late date. He realized that this could be his last chance to obtain a crossing over the Rhine, and if he backed out now another opportunity like this one may not present itself before the war ended. To execute this operation was certainly a gamble, but one that he was obviously willing to take. If he failed to seize this opportunity, Eisenhower's broad-front strategy would have ensured that his army group would have to operate in conjunction with the other army groups advancing towards Germany.

The political pressure that both leaders felt from their own countries, and in Eisenhower's case the United Kingdom as well, factored into their decision-making process. One of Eisenhower's key tasks was to maintain cohesion within the coalition,

and this meant deferring to Montgomery more than he cared to. This deference to Montgomery virtually paralyzed him when he discussed the options available to him in regards to Market-Garden. If Eisenhower cancelled the operation, the relationship between himself and Montgomery would certainly lead to a dysfunctional command climate. Eisenhower told Smith, "I cannot tell Monty how to dispose of his troops," nor could he "call off the operation, since I have already given Monty the green light."⁷⁸ With Eisenhower unable to cancel the operation and Montgomery unwilling to cancel the operation, despite their staff officers advice to cancel it, the operation was allowed to continue as planned.

CHAPTER 5

Conclusion

Operation Market-Garden did not fail as the result of a major intelligence error, as stated by numerous authors. Information was available that clearly showed that the German situation in Holland changed dramatically from 4 September to 17 September. While the intelligence community, as a whole, was slow to respond to this change, it nevertheless did. Their warnings though came after the decision to execute the operation had already been made, and the senior commanders were unwilling to cancel the operation.

Ultra, the tool that helped Montgomery succeed in Africa, was regrettably set aside in Holland. The intercepts that told the Allies that panzer divisions were relocating to the vicinity of the planned drop zones and airborne objectives were discounted within Montgomery's 21st Army Group, and this information was not passed down to the combat units that were tasked to execute the operation. Even the commander of the British XXX Corps later said, "I had no idea whatever that the 9th and 10th Pazer Divisions were refitting just north-east of Arnhem."⁷⁹ The fact that the two American airborne divisions, the 82nd and 101st, addressed the possibility of armored units in their area of operations, while the British units did not, is an indication of command influence in the intelligence channels. Ralph Bennet, in discussing why this information was not passed down asks, "Was it because the likelihood that there were two SS divisions near Arnhem called the wisdom of the whole operation into question?"⁸⁰

Ultra also provided an almost daily rundown of the German Fifteenth Army's escape from its isolated position west of Antwerp across the Scheldt Estuary. The fact

that this information was known to commanders is unquestionable. The 21st Army Group's intelligence summary of 18 September reported the inflated number of 100,000 men escaping from Belgium into Holland.⁸¹ To discount a force of this size, especially one that remained relatively unblooded so far in the campaign, is hard to imagine.

Alistare Horne, in his biography of Montgomery, was correct in saying that, "What was perhaps more serious than the failure to secure Antwerp itself was the escape of General von Zangen's Fifteenth Army across the Scheldt Estuary, which was to have a serious effect on the next stage of the battle-Arnhem."⁸²

How and why all of this intelligence was discounted, in fact suppressed, by Montgomery's headquarters is still a matter of debate today. This difference between now and pre-1974 is the access to the Ultra documents, which clearly show that the Allies realized the threat that the Germans posed. While one cannot peer into the mind of Field Marshal Montgomery--his memoirs do not provide a clear answer either--it will never be completely known why he continued to proceed with Market-Garden, despite the intelligence reports available and the fact that his senior intelligence officer counseled him not to allow the operation to continue.

Nigel Hamilton, a biographer of Montgomery who has published numerous works on his career, probably provides the closest insight into Montgomery's thought process when he discusses why the operation failed:

The revised airborne landings between Zon and Arnhem, as ordered by Monty on 10 September 1944, did not fail because of the unrecognized presence of German Panzer divisions, or poor radio communications, or bad operational planning, or lack of zeal among the ground formations. It failed because, as in the case of resistance on Patton's front at Metz and Hodges' front at Aachen, it was too late. And, worst of all, in his heart of hearts, Monty knew it.⁸³

Lessons Learned

As is the case with all operations, especially those that fail, numerous lessons can be learned for today's military professionals. Ultra and Market-Garden provide lessons that apply solely to the intelligence community and also on the intelligence staff officer-commander relationship.

It is questionable if denying the intelligence analysts at Bletchley Park knowledge of future Allied operations was wise. While it was a noble attempt at keeping the intelligence "pure," it denied the analysts the ability to focus their efforts on supporting upcoming operations. Today, as in World War II, operations occur in a resource constrained environment that forces the intelligence community to focus directly on the commander, and a key component of this support is to future operations. The modern-day intelligence system does not operate "in the blind" in regards to future operations, nor should it.

That being said though, analysts must not allow themselves to become such a close part of the planning process that they begin to lose their objectivity. This is precisely what appears to have happened to the intelligence community on the continent at the end of August 1944. Analysts began to be swept away by the victory euphoria, along with everyone else, and the extremely optimistic intelligence summaries, produced by most headquarters, highlight this. Analysts must resist the temptation of being caught up in groupthink and remain objective.⁸⁴ If analysts at SHAEF would have maintained their objectivity and looked at the German military from a 360-degree perspective and not solely on what they saw on their front, they would have been aware that the German Army had an incredible ability to regroup after stunning defeats to provide formidable

resistance to follow on attacks. They needed to look no further than the Soviet experiences on the eastern front to realize this.

One of the most challenging lessons learned to put into action is how an intelligence officer responds to a commander when the commander refuses to consider the input that he receives. This is a very personal dilemma because of the nature of the relationship between the two officers. Additionally, while the intelligence officer is the supposed expert on matters dealing with the threat, the commander has a vast amount of experience and is often more knowledgeable of what the enemy is going to do than the intelligence officer is.

Market-Garden provides two different examples of this relationship and how the intelligence officers responded to it. Both Major Urquhart and Brigadier Williams had served with their commanders from the early stages of the war. Urquhart repeatedly voiced his concerns to his commander and was subsequently sent home on sick leave prior to the operation commencing, when he repeated to warn his commander of the dangers of German armor in the vicinity of the drop zone. He shortly rejoined the unit in Holland, but requested a transfer. He was then posted to the chemical warfare section in 21st Army Group Headquarters.⁸⁵

Brigadier Williams, on the other hand, was not as vociferous with his warning and continued to serve on Montgomery's staff. Williams, with more maturity and experience, probably knew that his commander's mind was already made up and continued arguments would probably have not done any good. This was a situation over which Williams was not willing to potentially end his career.

In either officer's case it did not really matter how loudly or persistently they made their views known, because the operation was not going to be cancelled. Regardless of the information presented to their commanders, it would not change their minds. Operation Market-Garden, the great gamble to hasten the war's end, was going to be executed.

¹Calvocoressi, 77-78.

²W. J. R. Gardner, *Decoding History: The Battle of the Atlantic and Ultra* (Annapolis, MD: Naval Institute Press, 1999), 145.

³Lewin, 264-265.

⁴Ibid., 265.

⁵Martin Blumenson, *The European Theater of Operations: Breakout and Pursuit*, (Washington: Center of Military History, 1984), 631.

⁶Ibid., 660.

⁷Ibid., 557.

⁸SHAEF Weekly Intelligence Summary 22, week ending 19 August 1944.

⁹Bennet, 140.

¹⁰Ibid., 133.

¹¹Ultra message XL 8384 dated 29 August 1944. Note: The date for all Ultra messages is the date provided by Bletchley and not the time of intercept. The time of intercept was placed in the text of the message.

¹²Ultra message XL 8908 dated 2 August 1944. Note: the date of this report probably contained a typographic error, since the report could not have been generated five days prior to receipt of the message.

¹³Ultra message XL 8072 dated 26 August 1944.

¹⁴Ultra message XL 8270 dated 28 August 1944.

- ¹⁵Ultra message XL 8543 dated 30 August 1944.
- ¹⁶Ultra message XL 8942 dated 2 September 1944.
- ¹⁷XL 8384.
- ¹⁸Ultra message XL 8280 dated 28 August 1944.
- ¹⁹SHAEF Weekly Intelligence Summary 22.
- ²⁰SHAEF Weekly Intelligence Summary 23, week ending 26 August 1944.
- ²¹Forrest C. Pogue, *European Theater of Operations: Supreme Command* (Washington: Office of the Chief of Military History, 1954), 245.
- ²²Alistair Horne and David Montgomery, *Monty: The Lonely Leader, 1944-1945* (New York: HarperCollins, 1994), 276-277.
- ²³Brian Horrocks, *Corps Commander* (New York: Charles Scribner's Sons, 1977), 205.
- ²⁴Ryan, 57-58.
- ²⁵Horrocks, 204.
- ²⁶Ultra message XL 9219 dated 5 September 1944.
- ²⁷Ultra message XL 9248 dated 6 September 1944.
- ²⁸Ultra message XL 9381 dated 7 September 1944.
- ²⁹Ultra message XL 9409 dated 9 September 1944.
- ³⁰Ryan, 30, 37-38.
- ³¹Hinsley, 369.
- ³²Pogue, 253.
- ³³Bernard L. Montgomery, *The Memoirs of Field-Marshal the Viscount Montgomery of Alamein* (London: Collins, 1958), 271-272.
- ³⁴Dwight D. Eisenhower, *Crusade in Europe* (New York: Da Capo Press, 1979), 307.
- ³⁵Ryan, 38.

³⁶Charles B. McDonald, *European Theater of Operations: The Siegfried Line Campaign* (Washington: Center of Military History, 1984), 124.

³⁷McDonald, *The Siegfried Line Campaign*, 125.

³⁸Ultra Message XL 9188 dated 5 September 1944.

³⁹Ultra Message XL 9245 dated 6 September 1944.

⁴⁰Ultra Message XL 9247 dated 6 September 1944.

⁴¹Ultra Message XL 9248 dated 6 September 1944.

⁴²Ultra Message XL 9481 dated 8 September 1944.

⁴³Bennet, 156.

⁴⁴Hinsley, *British Intelligence in the Second World War*, vol. 3, part II, 379.

⁴⁵Hinsley, *British Intelligence in the Second World War*, vol. 3, part II, 383.

⁴⁶Ultra Message HP 1019 dated 24 September 1944.

⁴⁷Horne and David Montgomery, 279.

⁴⁸SHAEP Weekly Intelligence Summary 25, week ending 9 September 1944.

⁴⁹SHAEP Weekly Intelligence Summary 25.

⁵⁰SHAEP Weekly Intelligence Summary 25

⁵¹Hinsley, *British Intelligence in the Second World War*, vol. 3, part II, 374.

⁵²Pogue, 245.

⁵³Ryan, 89, 112.

⁵⁴Hinsley, 383.

⁵⁵Ultra Message XL 9762, dated 11 September 1944.

⁵⁶Ultra Message HP 188, dated 14 September 1944.

⁵⁷Ultra Message HP 220, dated 15 September 1944.

- ⁵⁸Ultra Message HP 294, dated 16 September 1944.
- ⁵⁹Ultra Message HP 9, dated 13 September 1944.
- ⁶⁰Ultra Message HP 242, dated 15 September 1944.
- ⁶¹SHAEF Weekly Intelligence Summary 26, week ending 16 September 1944.
- ⁶²SHAEF Weekly Intelligence Summary 26.
- ⁶³Field orders during World War II are basically the same as operation orders issued today.
- ⁶⁴Ryan, 163.
- ⁶⁵Memorandum. SUBJECT: Extracts from Observer's Report on Airborne Operation, ETO. TO: Commanding General, Army Ground Forces, Army War College, Washington 25, D.C. Date 6 December 1944, p. 2.
- ⁶⁶Memorandum. SUBJECT: Enemy Situation on Second Army Front. TO: GSI, HQ Airborne Troops, AC of S, G-2, XVIII Corps (Airborne), AC of S, A-2, IX Troop Carrier Command (Fwd). Date 15 September 1944, p. 2.
- ⁶⁷Operation "MARKET" Operation Instruction No. 1, Headquarters Airborne Corps, 13 September 1944, p. 1.
- ⁶⁸82nd Airborne Division, Annex 1c to Field Order No. 11, 11 September 1944.
- ⁶⁹82nd Airborne Division, Annex 1c to Field Order No. 11.
- ⁷⁰101st Airborne Division, Annex 1a to Field Order No. 1, 13 September 1944.
- ⁷¹Alistair Horne, *Monty: The Lonely Leader, 1944-1945* (New York: HarperCollins Publishers, 1994), 286.
- ⁷²Nigel Hamilton, *Monty: The Battles of Field Marshal Bernard Montgomery* (New York: Random House, 1994), 459.
- ⁷³Hamilton, 459.
- ⁷⁴Brian Urquhart, *A Life in Peace and War* (New York: W. W. Norton and Company, 1991), 72.
- ⁷⁵Urquhart, 74-75, 77.

⁷⁶Kenneth Strong, *Intelligence at the Top: the Recollections of an Intelligence Officer* (London: Cassell & Co. LTD, 1969), 149.

⁷⁷McDonald, *The Siegfried Line Campaign*, 122.

⁷⁸Ryan, 158.

⁷⁹Brian Horrocks, *Corps Commander*, 93.

⁸⁰Bennet, 151.

⁸¹Horne, 278.

⁸²*Ibid.*, 278.

⁸³Hamilton, 457.

⁸⁴For a detailed account of the reasons for intelligence failures see Richard K. Betts, "Analysis, War and Decision: Why Intelligence Failures are Inevitable," *World Politics* 31, no. 1 (October 1978): 35-54.

⁸⁵Urquhart, 72-77.

BIBLIOGRAPHY

Unpublished Documents

- Combined Arms Research Library Archives, Fort Leavenworth, KS. Memorandum.
SUBJECT: Extracts from Observer's Report on Airborne Operation, ETO. TO:
Commanding General, Army Ground Forces, Army War College, Washington
25, D.C. Date 6 December 1944, p. 2. Need to see how to cite this.
- Memorandum. SUBJECT: Enemy Situation on Second Army Front. TO: GSI, HQ
Airborne Troops, AC of S, G-2, XVIII Corps (Airborne), AC of S, A-2, IX Troop
Carrier Command (Fwd). Date 15 September 1944, p. 2.
- British I Airborne Corps, Headquarters. *Operation "MARKET" Operation Instruction
No. 1.* 13 September 1944.
- Supreme Headquarters Allied Expeditionary Force. *Weekly Intelligence Summary 22.* 19
August 1944.
- Supreme Headquarters Allied Expeditionary Force. *Weekly Intelligence Summary 23.* 26
August 1944.
- Supreme Headquarters Allied Expeditionary Force. *Weekly Intelligence Summary 25.* 9
September 1944.
- Supreme Headquarters Allied Expeditionary Force. *Weekly Intelligence Summary 26.* 16
September 1944.
- Ultra Message XL 8908. 2 August 1944.
- Ultra Message XL 8072. 26 August 1944.
- Ultra Message XL 8270. 28 August 1944.
- Ultra Message XL 8280. 28 August 1944.
- Ultra Message XL 8384. 29 August 1944.
- Ultra Message XL 8543. 30 August 1944.
- Ultra Message XL 8942. 2 September 1944.
- Ultra Message XL 9188. 5 September 1944.
- Ultra Message XL 9219. 5 September 1944.
- Ultra Message XL 9245. 6 September 1944.

Ultra Message XL 9247. 6 September 1944.
Ultra Message XL 9248. 6 September 1944.
Ultra Message XL 9381. 7 September 1944.
Ultra Message XL 9481. 8 September 1944.
Ultra Message XL 9409. 9 September 1944.
Ultra Message XL 9762. 11 September 1944.
Ultra Message HP 9. 13 September 1944.
Ultra Message HP 188. 14 September 1944.
Ultra Message HP 220. 15 September 1944.
Ultra Message HP 242. 15 September 1944.
Ultra Message HP 294. 16 September 1944.
HP 1019 dated 24 September 1944.
US 82nd Airborne Division, Headquarters. *Annex 1c to Field Order No. 11*. 11 September 1944.
US 101st Airborne Division, Headquarters. *Annex 1a to Field Order No. 1*. 13 September 1944.
US 101st Airborne Division, Headquarters. *Field Order No. 1 with Annexes, Operation MARKET*. 14 September 1944.

Periodicals

Betts, Richard K. "Analysis, War and Decision: Why Intelligence Failures are Inevitable." *World Politics* 31, no. 1 (October 1978): 35-54.
Burdett, Paul S. "To Hell with Monty." *Command*, August 1997, 42-48.

Books

Bando, Mark. *The 101st Airborne, From Holland to Hitler's Eagle Nest*. Osceola, WI: Motorbooks International, 1995.
Baynes, John. *Urquhart of Arnhem*. London: Brassey's, 1993.

- Bennet, Ralph. *Ultra in the West: The Normandy Campaign 1944-45*. New York: Charles Scribner's Sons, 1980.
- Betts, Richard K. "Analysis, War, and Decision: Why Intelligence Failures are Inevitable." In *Power, Strategy, and Security*. Edited by Klaus Knorr. Princeton: Princeton University Press, 1983.
- Blair, Clay. *Ridgway's Paratroopers: The American Airborne in World War II*. Garden City, NY: Doubleday and Company, 1985.
- Blumenson, Martin. *The European Theater of Operations: Breakout and Pursuit*. Washington: Center of Military History, 1984.
- _____. *Breakout and Pursuit, The European Theater of Operations in the United States Army in World War II*. Washington, DC: GPO, 1961.
- Bradley, Omar N. *A General's Life*. New York: Simon and Schuster, 1983,
- _____. *A Soldier's Story*. New York: Henry Holt and Company, 1951.
- Bradley, Philip G. "Market Garden: Was Intelligence Responsible for the Failure?" Research Report., Air War College, 2001.
- Calvocoressi, Peter. *Top Secret Ultra*. New York: Pantheon Books, 1980.
- Chandler, Alfred D. Jr., ed. *The Papers of Dwight David Eisenhower the War Years: IV*. Baltimore: The Johns Hopkins Press, 1970.
- Cornelius, Bauer. *The Battle of Arnhem*. New York: Stein and Day, 1996.
- Crosswell, D. K. R. *The Chief of Staff: The Military Career of General Walter Bedell Smith*. New York: Greenwood Press, 1991.
- Eisenhower, David. *Eisenhower: At War 1943-1945*. New York: Random House, 1986.
- Eisenhower, Dwight D. *Crusade in Europe*. Garden City, NY: Doubleday and Company, Inc., 1948.
- Gardner, W. J. R. *Decoding History: The Battle of the Atlantic and Ultra*. Annapolis, MD: Naval Institute Press, 1999.
- Garlinski, Jozef. *The Enigma War*. New York: Charles Scribner's Sons, 1980.
- Gelb, Norman. *Ike and Monty: Generals at War*. New York: William Morrow and Company, 1994.
- Hamilton, Nigel. *Monty*. New York: Random House, 1981.

- Harclerode, Peter. *Arnhem: A Tragedy of Errors*. London: Arms and Armour Press, 1994.
- Hinsley, F. H.. *British Intelligence in the Second World War: Its Influence on Strategy and Operations*. Vol. 2. New York: Cambridge University Press, 1988.
- _____. *British Intelligence in the Second World War: Its Influence on Strategy and Operations*. Vol. 3, Part II. New York: Cambridge University Press, 1988.
- Horne, Alistair, and David Montgomery. *Monty: The Lonely Leader, 1944-45*. New York: HarperCollins Publishers, Inc., 1994.
- Horrocks, Brian. *Corps Commander*. New York: Charles Scribner's Sons, 1977.
- Kershaw, Robert J. 'It Never Snows in September': The German View of MARKET-GARDEN and The Battle of Arnhem, September 1944. Shepperton, England: Ian Publishing, Ltd., 1994
- Kirkpatrick Jr., Lyman B. *Captains Without Eyes*. Boulder, CO: Westview Press, 1987.
- Kozaczuk, Wladyslaw. *Enigma: How the German Machine Cipher Was Broken, and How It Was Read by the Allies in World War Two*. Frederick, MD: University Publications of America, Inc., 1984.
- Lewin, Ronald. *Ultra Goes to War*. New York: McGraw-Hill Book Company. 1978.
- MacDonald, Charles B. "The Decision to Launch Operation MARKET-GARDEN" In *Command Decisions*. Edited by Kent Greenfield. Washington, DC: GPO, 1969.
- _____. *The Siegfried Line Campaign*. Washington DC: Office of the Chief of Military History, United States Army, 1963.
- Manning, Michael L. *Senseless Secrets: The Failures of U.S. Military Intelligence, From George Washington to the Present*. New York: Carol Publishing Group, 1996.
- McKee, Alexander. *The Race for the Rhine Bridges 1940, 1944, 1945*. New York: Dorsett Press, 1971.
- Middlebrook, Martin. *Arnhem 1944, The Airborne Battle*. Boulder, CO: Westview Press, 1994.
- Montgomery, Bernard L. *The Memoirs of Field Marshal the Viscount Montgomery of Alamein*. London: Collins, 1958.
- Piper, Maj. Arnold C. USA "Intelligence Planning for Airborne Operations: A Perspective from Operation Market-Garden." Fort Leavenworth, Kansas: School

- of Advanced Military Studies, United States Army Command and General Staff College, 1997.
- Pouge, Forrest C. *European Theater of Operations: Supreme Command*. Washington: Office of the Chief of Military History, 1954.
- Ryan, Cornelius. *A Bridge Too Far*. New York: Simon and Schuster, 1974.
- Schultz, James V. "A Framework for Military Decision Making Under Risks." Maxwell Air Force Base, Alabama: School of Advanced Airpower Studies, Air University, 1996.
- Smith, Michael. *Station X Decoding Nazi Secrets*. New York: TV Books, 1999.
- Stripp, Alan. "The Enigma Machine: Its Mechanism and Use." In *Codebreakers*. Edited by F. H. Hinsley and Alan Stripp. New York: Oxford University Press, 1993.
- Strong, Kenneth. *Intelligence at the Top: the Recollections of an Intelligence Officer*. London: Cassell & Co. LTD, 1969.
- Taunt, Derek. "Hut 6: 1941-1945." In *Codebreakers*. Edited by F. H. Hinsley and Alan Stripp. New York: Oxford University Press, 1993.
- Urquhart, Brian. *A Life in Peace and War*. New York: Harper and Row, 1987.
- Warner, Philip. *Horrocks: The General Who Led from the Front*. London: Hamis Hamilton Ltd., 1984.

INITIAL DISTRIBUTION LIST

1. Combined Arms Research Library
U.S. Army Command and General Staff College
250 Gibbon Ave.
Fort Leavenworth, KS 66027-2314
2. Defense Technical Information Center/OCA
825 John J. Kingman Rd., Suite 944
Fort Belvoir, VA 22060-6218
3. Dr. Jerold E. Brown
Combat Studies Institute
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352
4. Major Joe Dague
U.S. Air Force Element
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352
5. LTC Michael Berry
Center for Army Tactics
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352

CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT

- Certification Date: 2 June 2002
- Thesis Author: Major Joel J. Jeffson
- Thesis Title: Operation Market-Garden: Ultra Intelligence Ignored
- Thesis Committee Members
Signatures:

5. Distribution Statement: See distribution statements A-X on reverse, then circle appropriate distribution statement letter code below:

A B C D E F X

SEE EXPLANATION OF CODES ON REVERSE

If your thesis does not fit into any of the above categories or is classified, you must coordinate with the classified section at CARL.

6. Justification: Justification is required for any distribution other than described in Distribution Statement A. All or part of a thesis may justify distribution limitation. See limitation justification statements 1-10 on reverse, then list, below, the statement(s) that applies (apply) to your thesis and corresponding chapters/sections and pages. Follow sample format shown below:

EXAMPLE

<u>Limitation Justification Statement</u>	/	<u>Chapter/Section</u>	/	<u>Page(s)</u>
Direct Military Support (10)	/	Chapter 3	/	12
Critical Technology (3)	/	Section 4	/	31
Administrative Operational Use (7)	/	Chapter 2	/	13-32

Fill in limitation justification for your thesis below:

<u>Limitation Justification Statement</u>	/	<u>Chapter/Section</u>	/	<u>Page(s)</u>
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____

7. MMAS Thesis Author's Signature: _____

STATEMENT A: Approved for public release; distribution is unlimited. (Documents with this statement may be made available or sold to the general public and foreign nationals).

STATEMENT B: Distribution authorized to U.S. Government agencies only (insert reason and date ON REVERSE OF THIS FORM). Currently used reasons for imposing this statement include the following:

1. Foreign Government Information. Protection of foreign information.
2. Proprietary Information. Protection of proprietary information not owned by the U.S. Government.
3. Critical Technology. Protection and control of critical technology including technical data with potential military application.
4. Test and Evaluation. Protection of test and evaluation of commercial production or military hardware.
5. Contractor Performance Evaluation. Protection of information involving contractor performance evaluation.
6. Premature Dissemination. Protection of information involving systems or hardware from premature dissemination.
7. Administrative/Operational Use. Protection of information restricted to official use or for administrative or operational purposes.
8. Software Documentation. Protection of software documentation - release only in accordance with the provisions of DoD Instruction 7930.2.
9. Specific Authority. Protection of information required by a specific authority.
10. Direct Military Support. To protect export-controlled technical data of such military significance that release for purposes other than direct support of DoD-approved activities may jeopardize a U.S. military advantage.

STATEMENT C: Distribution authorized to U.S. Government agencies and their contractors: (REASON AND DATE). Currently most used reasons are 1, 3, 7, 8, and 9 above.

STATEMENT D: Distribution authorized to DoD and U.S. DoD contractors only; (REASON AND DATE). Currently most reasons are 1, 3, 7, 8, and 9 above.

STATEMENT E: Distribution authorized to DoD only; (REASON AND DATE). Currently most used reasons are 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

STATEMENT F: Further dissemination only as directed by (controlling DoD office and date), or higher DoD authority. Used when the DoD originator determines that information is subject to special dissemination limitation specified by paragraph 4-505, DoD 5200.1-R.

STATEMENT X: Distribution authorized to U.S. Government agencies and private individuals of enterprises eligible to obtain export-controlled technical data in accordance with DoD Directive 5230.25; (date). Controlling DoD office is (insert).