



GUIDE TO THE STUDY OF INTELLIGENCE

From Axis Surprises to Allied Victories**The Impact of Intelligence in World War II**

By Peter C. Oleson

As governments declassify old files and scholars examine the details of World War II, it is apparent that intelligence had an important impact on many battles and the length and cost of this catastrophic conflict. As Nigel West noted, “[c]hanges in American, British, and even Soviet official attitudes to declassification in the 1980s allowed thousands of secret documents to be made available for public examination, and the result was extensive revisionism of the conventional histories of the conflict.”¹ More so than any time in history, intelligence played a central role in World War II. Historians F. H. Hinsley and David Kahn have suggested that the Allies’ success at breaking the German codes shortened the war in Europe by years and helped turn the tide in the Pacific.² The Allies did not enter World War II with good intelligence; rather, initial Allied losses and failures were often the result of poor or unconvincing intelligence or no intelligence at all. A war that started with Axis military successes in its early phases (1939 – 1942), based partially on their intelligence preparations, was brought to a conclusion aided by Allied intelligence successes (1942 – 1945).

1. Nigel West, *Historical Dictionary of World War II Intelligence*, series Historical Dictionaries of Intelligence and Counterintelligence No. 7, Lanham, MD: The Scarecrow Press, Inc., 2008, xx.

2. F. H. Hinsley, “The Influence of ULTRA in the Second World War,” lecture to the Security Group seminar at Babbage Lecture Theatre, Cambridge University Computer Laboratory, October 19, 1993. <http://www.cix.co.uk/~klockstone/hinsley.htm>. See also David Kahn, *Hitler’s Spies: German Military Intelligence in World War II* (New York: Macmillan Publishing Company, 1978).

The Bleak Years: 1939 – Mid-1942

The Axis powers repeatedly surprised Poland, Britain, France, and others, who were often blinded by preconceptions and biases, in both a strategic and tactical sense. When war broke out on September 1, 1939, the Polish leadership, ignoring their own intelligence, lacked an appreciation of German military capabilities: their cavalry horses were no match for German Panzers. British Prime Minister Neville Chamberlain misread Hitler’s intentions, unwilling to accept the evidence at hand. This was the consequence of the low priority given to British intelligence in the period between wars.³

Near the end of the “Phony War” (September 3, 1939 – May 10, 1940) in the West, the Germans engineered strategic, tactical, and technological surprises. The first came in Scandinavia in early April 1940.

Norway

The April 9 German invasion of Norway (and Denmark) was a strategic surprise for the Norwegians and British. The Norwegians had concerns about British intervention interrupting its ore trade with Germany. Not wanting the British to box them in, as occurred in World War I, the Germans wanted naval and air bases in Norway. German Grand Admiral (Großadmiral) Erich Raeder planned an unconventional move depending on surprise. According to him, the planned Operation Weserübung “goes against all rules of naval warfare. According to those rules the operation could only be carried out if we had superiority at sea. This we did not have: On the contrary, we shall be carrying out the operations in the face of the clearly superior British fleet.”⁴ The British mindset was that the superior Royal Navy would deter any such German move. The Norwegians had little intelligence capability, British intelligence had few tested and believed human sources inside Germany, and Enigma decrypts were nonexistent at the time. Dutch intelligence warnings were received skeptically. Britain’s signals intelligence (SIGINT) organization, the Government Communications and Cipher School (GC&CS) alerted the Admiralty to a revealing decrypted German naval hand cipher, which the Admiralty ignored. Bad weather limited aerial reconnaissance. Aerial photos of the German port of

3. Basil Collier, *Hidden Weapons: Allied Secret or Undercover Services in World War II* (Barnsley: Pen & Sword Books Ltd., 1982), xiii.

4. Olav Riste, “Intelligence and the ‘Mindset’: The German Invasion of Norway in 1940.” *Intelligence and National Security* 22 (4) (August 2007), 534, footnote 34.

The Enigma Machine

Enigma was a German developed enciphering machine introduced in the late 1920s. It was an electro-mechanical device using both a plug board and multiple 26-position rotors. Early versions used three rotors, later versions, five. "The greatest selling point was even if the machine fell into enemy hands it would still be useless. The secret of the machine lay in its rotors.... [U]nless one knew which rotor went where, and what position each rotor started in, the Enigma machine was useless.... At the time of its use it was the epitome of ciphering machines" for Morse transmissions.* The German armed forces, paramilitary Protection Squadron (Schutzstaffel, SS), police, railroads, and others used more than 200 versions of Enigma codes. Each had to be decrypted separately.

* Charles Cooper, "The Enigma Machine," notes for Probabilities and Statistics (US Naval Academy, April 16, 2002), retrieved from http://www.usna.edu/Users/math/wdj/sm230_cooper_enigma.html.

Bremen had shown many assembled ships, but their significance was not understood as aerial reconnaissance was not routine.⁵ Lacking intelligence sources, ignoring some warnings, and with tight German security, the invasion succeeded at little cost.

Disaster was a teacher for Britain. On June 3, the Admiralty again ignored a SIGINT warning of unusual naval activity, and the German battle cruiser SMS Gneisenau sank the British carrier HMS *Glorious* with 1,500 hands. After this, newly installed Prime Minister Winston Churchill asked to see all new Enigma decrypts,⁶ prompting senior officers to request Enigma briefings in response.⁷ GC&CS had begun to break German Enigma codes in March-April 1940, and, by June, was starting to extract useful intelligence from this new source.

Attack in the West

The Norwegian surprise was followed by another a month later. Without declaring war to alert its neutral neighbors, Germany invaded Luxembourg, Holland, and Belgium. The initial seizure of the crucial Belgian fort at Eben Emael on May 10-11, 1940, entailed both tactical and technological surprise. The use of only 85 glider-borne troops, who landed on top of the fort's 750 defenders, bypassed the extensive Belgian defense network intended to prevent the Germans from crossing the strategic Albert Canal bridges. Prior to the operation, the Germans employed extensive denial, deception, and security measures to hide the training of paratroops and glider assault forces. The preciseness of their attack demonstrated excellent foreknowledge of the objective. The silent

5. Riste, *ibid.*; F. H. Hinsley, *British Intelligence in the Second World War*, Abridged Edition (London: HMSO, 1993), 12; Stephen Budiansky, *Battle of Wits: The Complete Story of Codebreaking in World War II* (New York: The Free Press, 2000), 140; and R.V. Jones, *Most Secret War: British Scientific Intelligence, 1939-1945* (London: Penguin Books, 1979, 2009).

6. Hinsley, *British Intelligence*, 18-26.

7. Budiansky, *Battle of Wits*, 149.

gliders defeated the Belgian's warning system based on aircraft engine sound detectors. As British author James Lucas observed, a technological "military revolution occurred with the adding of a vertical flank to battlefield dispositions."⁸ The use of airlifted troops, paratroops, and glider-borne soldiers was a surprising innovation first demonstrated in the Norwegian invasion that caught Dutch and Belgian defenders unprepared. German paratroops leapt over the Dutch strongholds and unexpectedly seized Dutch bridges and the airfield near Rotterdam into which reinforcements were flown. Seaplanes flew in other reinforcements on the River Maas. The last Dutch resistance ended on May 14, and Belgium surrendered on May 28.⁹

Initially, the Poles broke early pre-war versions of Enigma and shared their success with the French and British. With the fall of Poland and France, the effort against Enigma fell to the British. On May 22, 1940, GC&CS broke the German *Luftwaffe* Enigma code, which it read more or less without interruption for the rest of the war. *Luftwaffe* messages provided a lot of intelligence on ground and naval operations and plans, as well as its own activities.¹⁰ But this was too late to affect the German offensive.

From a well-placed American Nazi sympathizer, Tyler Kent, the Germans knew the Allies were unprepared for operations on the Western Front in the winter of 1939-1940, and used the time to prepare a western campaign.¹¹ Despite reports from Belgian, French, and Swiss intelligence, the timing and direction of the June 5, 1940 German attack into France again achieved tactical surprise. "For the French it was axiomatic that the Ardennes were impassable. The British deferred to this conviction."¹² The British ignored the warnings from Paul Thümmel, a high-ranking *Abwehr* (German military intelligence) officer¹³ that the attack would

8. James Lucas, *Storming Eagles: German Airborne Forces in World War II* (London: Cassell & Co., 1988), 43.

9. *Ibid.*, 40-3, 48, 51.

10. Collier, *Hidden Weapons*, 92.

11. Kent was a disaffected code clerk in the American Embassy in London. Peter Rand, *Conspiracy of One: Tyler Kent's Secret Plot Against FDR, Churchill, and the Allied War Effort* (Guilford, CT: Lyons Press, 2013).

12. Robert J. Young, "French Military Intelligence and Nazi Germany, 1938-1939," in Ernest R. May (Ed.), *Knowing One's Enemies: Intelligence Assessment Before the Two World Wars* (Princeton: Princeton University Press, 1984).

13. Thümmel, known as A-54, was an asset of Czech intelligence, which, after Germany seized Czechoslovakia, moved to London. The Czechs provided A-54's reports to both the British and Soviets. Hinsley, *British Intelligence*, 12, 26-30.

come through the Ardennes. German intelligence on the Allies was good.¹⁴ From British documents captured in Norway, photoreconnaissance, and reading some high-grade French ciphers, the Germans knew of the plans, dispositions, and quality of French and British forces facing theirs. The Maginot Line fortresses were flanked and attacked from the rear. The French Army, much of the best of which was decimated in Belgium and around Dunkirk, was again surprised by the combined arms tactics of the German Blitzkrieg.¹⁵ France surrendered on June 22, 1940. With the fall of France, the focus of the war in Europe shifted to Britain, the Mediterranean, and the Atlantic.

Battle of Britain and the Blitz

The following month marked the beginning of the Battle of Britain. Radar became an important British source of intelligence, although from the end of 1939, tactical SIGINT from the Royal Air Force's (RAF) Y-Service helped Britain's Fighter Command detect takeoffs and direction of Luftwaffe planes before their detection by radar. The outnumbered Fighter Command, thus guided, inflicted heavy losses on the Luftwaffe, causing it in mid-November to revert to nighttime raids. The RAF Y-Service focused on tactical SIGINT and low-level codes and was not privy to the highly sensitive Enigma decrypts at this time.¹⁶

Battle of the Beams. In June 1940, an Enigma decrypt revealed the Luftwaffe was using a navigational beam called Knickebein to guide its bombers over Britain. Confirmed by prisoner-of-war interrogations and captured documents from downed German aircraft, the British developed masking beacons ("meacons"), which by September were having an effect. "The early detection and partial frustration of Knickebein – a feat then known to only a few – was

14. Ibid, 26.

15. Luftwaffe close air support of the Wehrmacht was a tactical surprise. Collier, *Hidden Weapons*, 88.

16. Hinsley, *British Intelligence*, 17, 38-40.

Anti-Nazi Spies Who Helped the Allies

The Allies were aided by several anti-Nazi sources within Germany who knowingly leaked information. In November 1939, Hans Ferdinand Mayer, an anti-Nazi mathematician and physicist, wrote a seven-page report on German weapons advances, many of which were unknown to the British. Given anonymously to the British naval attaché in Oslo, the "Oslo report" revealed how the Junker 88 was to be used as a dive bomber; that the German Navy had a radio-controlled anti-ship rocket-driven glider (HS-293)* that was being tested at the Peenemünde weapons research site; British bombers could be detected by radar at 120 kilometers, and Germany had another parabolic dish radar, the Würzburg, operating at 50-centimeters wavelength; the Luftwaffe could detect its own bombers via a system operating at 6-meters wavelength; and the Navy had two new torpedoes that were radio and acoustic controlled and were magnetically fused. British ministries largely ignored this intelligence until R.V. Jones became the head of scientific intelligence for both the Air Ministry and MI6.** Paul Thümmel, "a high ranking officer in the Abwehr, ... had originally offered his services to the Czechs, who referred to him as A-54. He supplied not only good information about the equipment, the order of battle and the mobilization plans of the German Army and Air Force, but also advance notice of the German plans for action against Czechoslovakia from the spring of 1938, for the seizure of Prague in the spring of 1939 and, from that spring, for the attack on Poland."***

"The Poles had achieved this success [in breaking Enigma] with brilliant mathematical ingenuity, by methods they would have been unable to devise but for the fact that the French Secret Service had supplied them with material obtained from Hans-Thilo Schmidt, a German employee of the cipher branch of the German Army..."#

Fritz Kolbe was an anti-Nazi courier for the German Foreign Ministry. From 1943, he provided more than 2,600 documents with significant intelligence to Allen Dulles, Office of Strategic Services (OSS) chief in Switzerland, including on morale in Berlin, German expectations for the Allied invasion, the V-1 and V-2 rocket programs, and advanced jet aircraft, and exposed the German spy "Cicero" in the British Embassy in Istanbul.##

* One sunk the troopship HMT *Rohna* on November 26, 1942 in the Mediterranean with the loss of 1,138 killed, mostly US troops. James G. Bennett. *The Rohna Disaster* (Xlibris, 1999).

** Collier, *Hidden Weapons*, 60; R.V. Jones, *Most Secret War*, 67-71.

*** Hinsley, *British Intelligence*, 12.

Ibid, 14.

Tony Patterson, "Germany finally honours the 'traitor' spy who gave Nazi secrets to America," *The Independent*, 25 September 2004; Anthony Quibble, "Alias George Wood." *Studies in Intelligence* 10, No. 1 (Winter 1966).

an early and major British victory in the Battle of Britain."¹⁷ When the Germans introduced improved bombing beams, the British rapidly countered them. The improved Y-Gerät navigational beam was introduced in January 1941; the British had operational countermeasures by February that significantly lowered German bombing accuracy.¹⁸ "By February 1941 the Battle of the Beams was as good as won."¹⁹ The last large Luftwaffe raid on London occurred on May 10-11. In May, most German bombers redeployed to the Eastern Front.

War at Sea

"[I]t was quickly realized by strategists on both sides that the war would be won or lost on the question of whichever side successfully dominated the Atlantic Ocean."²⁰ In August 1940, Germany began

17. Brigadier General Telford Taylor, Columbia University law professor, assigned to Bletchley in WW II, in *The Breaking Wave: The Second World War in the Summer of 1940* (New York: Simon and Schuster, 1967), cited in R. V. Jones, *Most Secret War*, 110.

18. Hinsley, *British Intelligence*, 47-48.

19. R. V. Jones, *Most Secret War*, 179.

20. Peter Scott Roberts, review of John R. Bruning, *Battle for the North Atlantic: The Strategic Naval Campaign that Won World War II in Europe* (London: Zenith Press, 2013) in *Intelligence and National Security* 29 (6), 2014, at <http://dx.doi.org/10.1080/02684527.2013.858517>.

unrestricted submarine warfare with the goal of isolating Britain and starving it into submission. "The Battle of the Atlantic was the dominating factor all through the war," according to Churchill.²¹ Except for agents reporting the departure of U-boats from their base at Brest, France, and direction finding (DF) on radio transmissions, there was no intelligence on U-boats. By the end of 1938, the Germans were reading one of the Royal Navy's codes. By late 1941, the naval cryptanalytic service, the B-Dienst, was also reading British Naval Ciphers #2 and #3 used for Anglo-Canadian-American convoys and directing U-boats to intercept the convoys.

At GC&CS in early 1941, cryptanalytic efforts against the naval versions of Enigma were aided by the captures of a German armed trawler, two weather ships, and U-110, which provided an Enigma machine, additional rotors, and settings tables. GC&CS was able to break the German Navy's home waters and dockyards codes and began to read other naval traffic. Through Enigma decrypts, the Royal Navy was able to eliminate eight clandestine German Navy support ships in the Atlantic,²² and by June had reduced the U-boats' successes against convoys.²³

When the German battleship DKM *Bismarck* forayed from Norway into the north Atlantic in May 1941, British DF and traffic analysis proved decisive in tracking her after she sank HMS *Hood*, damaged *Prince of Wales*, and escaped.²⁴ A decrypted Luftwaffe message revealed her destination was Brest, and, on May 26, *Bismarck* was intercepted and sunk.

When the US entered the war, U-boat commander Admiral Raeder turned his attention to the US East Coast. In the first six months of 1942, almost 500 ships were sunk off the North American coast.²⁵ U-boat sinkings of merchant vessels far exceeded Britain's shipbuilding capacity.²⁶

In 1942, the Germans came to realize the scope of supplies reaching the USSR²⁷ and turned to intercepting convoys bound for Murmansk. A low point for the Allies came in three days in July 1942, when Convoy PQ-17 lost 23 out of 36 ships to U-boats and Luftwaffe aircraft from northern Norway.²⁸ Fearing

that the German battleship KMS *Tirpitz* was at sea, despite a lack of SIGINT, First Sea Lord Sir Dudley Pound ordered PQ-17 to scatter. "... [N]ot for the first nor the last time, [SIGINT] was unable to provide that last and vital clue to the intentions of the enemy..."²⁹

Southeast Europe, the Mediterranean, and North Africa

On June 11, 1940, Italy entered the war. Its invasion of Albania was a surprise.³⁰ However, GC&CS decrypts gave a month's warning of Italy's September attack from Libya on Egypt. Counterattacking in early December, the 30,000-man British force captured half of Italy's 250,000-man invasion force.³¹ Geographically, Italian East Africa posed a threat to the Suez Canal and Egypt's security. Britain's Combined Bureau Middle East (CBME), a GC&CS outpost, was deciphering 90% of Italian radio messages in East Africa, which was a major aid in defeating Italy's forces there; unfortunately, the Secret Intelligence Service (MIG) had a lack of human sources in the Italian territories.³²

North Africa. Despite Enigma decrypts (now identified by the codeword "ULTRA") and Y-Service intercepts of the introduction of Luftwaffe units into North Africa in December 1940, the British were reluctant to believe German Army forces were in North Africa until Field Marshall Erwin Rommel's initial offensive on February 22, 1941.³³ The Germans used ground and air reconnaissance well, and its field SIGINT unit exploited the poor British communications security. Rommel's signals battalion warned of Britain's May and June counterattacks, which stalled when they ran into superior German armor and anti-tank guns for which there was no forewarning. British field intelligence was weak.³⁴

From 1941 through mid-1942, Rommel enjoyed a significant SIGINT advantage over the British in North Africa.³⁵ In January 1942, the Germans began to read the cipher of the US Army attaché in Cairo, Colonel Frank Fellers, who reported in detail on British Army conditions and plans. Feller's messages were a great

21. David Kahn, "Intelligence in World War II," *Journal of Intelligence History* 1 (1), (Summer 2001), 12.

22. Hinsley, *British Intelligence*, 50-58.

23. Hinsley, Cambridge address.

24. Budiansky, *Battle of Wits*, 189.

25. Roberts, review, 2.

26. Hinsley, *British Intelligence*, 308.

27. *Ibid*, 154.

28. Patrick Beesly, "Convoy PQ 17: A Study of Intelligence and Decision-making," *Intelligence and National Security* 5 (2), (1990), 292-322.

29. *Ibid*, 319.

30. Collier, *Hidden Weapons*, 114.

31. Budiansky, *Battle of Wits*, 182.

32. Thaddeus Holt, *The Deceivers: Allied Military Deception in the Second World War* (New York: Scribner, 2004); also Collier, *Hidden Weapons*, 134.

33. Hinsley, *British Intelligence*, 66.

34. *Ibid*, 77-79.

35. Wil Deac, "Intercepted Communications for Field Marshall Erwin Rommel," originally published in *World War II Magazine*, at <http://www.historynet.com/intercepted-communications-for-field-marshal-erwin-rommel.htm/1>.

advantage to the Germans. He inadvertently tipped off the Germans to convoys planning to relieve the British-held island of Malta between Italy and Libya in June 1942, and to the precursor commando raids against nine Axis airfields in Libya and Crete. British and Free French commandos were slaughtered. Only two out of the six ships of the Gibraltar convoy reached Malta; the Alexandria 11-ship convoy turned back under heavy air attack with serious losses.³⁶ The timing and direction of Rommel's May 1942 assault was based on what he learned from SIGINT. By the end of June, Rommel had driven the British out of Libya and advanced to within 90 miles of Alexandria, Egypt.³⁷

Yugoslavia, Greece, and Crete. On April 6, 1941, after a British-encouraged coup d'état, the German Army invaded Yugoslavia and, along with Italian forces, entered Greece. Alerted by a human intelligence (HUMINT) source, the British pulled troops from North Africa and sent them to Greece. However, with no photoreconnaissance capability and poor field intelligence, British forces were no match for the Wehrmacht and, by late April, were evacuated. SIGINT, however, helped reduce the scale of the calamity.³⁸

On May 20, German airborne forces invaded Crete. GC&CS had "deciphered the complete German invasion plans for Crete at least three weeks in advance of their intended date of operations."³⁹ But the Allied commander, Lieutenant General Sir Bernard Freyberg, was convinced it would be a seaborne invasion and had poorly positioned the island's defenders. Some historians point to Freyberg's bias as paralyzing his actions in light of the intelligence he received.⁴⁰ The British also overestimated the size of the attacking force. By the end of the month, the Allies abandoned the island. It was a Pyrrhic victory as the Germans badly underestimated the size of the defending force. German casualties were considerable and "left them with a crippled airborne arm" that was not used again in the west for the remainder of the war.⁴¹

Elsewhere in the region, Axis intelligence and propaganda fueled anti-British sentiment in the Middle East, prompting the British to divert troops to Syria and Iraq from North Africa.⁴²

36. Hinsley, *British Intelligence*, 198, and Deac, "Intercepted Communications."

37. *Ibid.*

38. Hinsley, *British Intelligence*, 73.

39. R.V. Jones, *Most Secret War*, 204.

40. See Saul David, *Military Blunders: The How and Why of Military Failure* (New York: Carroll & Graf Publishers, Inc., 1997), 333-48.

41. Hinsley, *British Intelligence*, 84.

42. See Commander Youssef H. Aboul-Enein & Basil H. Aboul-Enein, *The Secret War for the Middle East: The Influence of Axis and Allied Intelligence Operations During World War II* (Annapolis, MD: US Naval

Barbarossa

On June 22, 1941, Germany invaded the Soviet Union. Despite many intelligence indicators and warnings, Stalin and Soviet forces were caught by surprise.⁴³

"Richard Sorge [a Soviet military intelligence (GRU) asset in Tokyo] ... receive[d] solid information about a planned Nazi surprise attack against the Soviet Union. Joseph Stalin, who had signed a non-aggression pact with Hitler two years before, refused to believe the Nazi ruler would have the audacity to violate the treaty."⁴⁴ The Soviet's Alexander Rado GRU espionage ring in Switzerland provided warnings, as did the Soviet military attaché's agents in Berlin, the Yugoslav military attaché, and Swedish sources. It became known that the Abwehr (military intelligence) was recruiting specialists on the Ukraine, Crimea, and the Caucasus.⁴⁵ In preparation, the Germans entered Romania in October 1940. Reports of German plans from agent Thümmel were ignored.⁴⁶ After breaking the Japanese diplomatic code (Purple) in late 1940, the US provided GC&CS with the results of its cryptanalysis and copies of the decryption machines. On June 4, 1941, the decryption of a Japanese diplomatic message from Berlin to Tokyo revealed that Hitler had decided Communist Russia must be eliminated.⁴⁷ A week later, the British foreign secretary gave the Russian ambassador full details of British intelligence on the German build-up.⁴⁸ In March 1941, GC&CS broke the German railroad Enigma codes, which revealed the widespread movement of German forces to oppose Russia.⁴⁹

Two weeks after the German invasion, London started to provide the Soviets regular intelligence summaries about the Eastern Front via the British Military Mission in Moscow. However, not everything was shared. As Stalin severely limited intelligence

Institute Press, 2013).

43. See David E. Murphy, *What Stalin Knew: The Enigma of Barbarossa* (New Haven, CT: Yale University Press, 2005). Murphy "presents a mosaic of Soviet intelligence reporting found in no other work of Western scholarship." Some of the information provided "is truly enlightening, and changes scholarly understanding of German disinformation and how it influenced Soviet policy." Review by Robert Pringle, *International Journal of Intelligence & Counterintelligence* 19 (4), (Winter 2006-2007). In his book, *Operation Barbarossa* (Cambridge, MA: MIT Press, 1974), Barton Whaley details 84 warnings the USSR received of German attack plans. See also John Erickson, "Threat Identification and Strategic Appraisal by the Soviet Union, 1930-1941" in Ernest R. May (Ed.), *Knowing One's Enemies*, 375-423.

44. Sulick, *Spying in America*, 35. Sorge's major source was Hotsumi Ozaki, an advisor to Japanese Prime Minister Kono. Ken Kotani, *Japanese Intelligence in World War II* (Oxford: Osprey Publishing, 2009), 68.

45. Collier, *Hidden Weapons*, 186-190.

46. Hinsley, *British Intelligence*, 90-91.

47. *Ibid.*, 115.

48. *Ibid.*, 109.

49. Budiansky, *Battle of Wits*, 186.

sharing with Allies, British knowledge of Soviet order of battle (OB) was based on German assessments revealed through ULTRA. ULTRA also indicated that the Germans were reading Soviet ciphers, But this intelligence was not passed to the USSR.⁵⁰

Of great strategic significance, “[w]ithin a few weeks of the German invasion of Russia, [Sorge] was able to tell Moscow, on the highest authority, that the Japanese government had no immediate intention of attacking the Soviet Union and that its eyes were fixed on Indo-China and the Netherlands East Indies.... On the strength of [Sorge’s information] the Soviet High Command further reduced its forces in the Far East by moving to European Russia substantial formations which arrived in time to take part in the defence of Moscow and the Soviet counter-offensive in the winter of 1941-42.”⁵¹ The October 1941 – January 1942 Battle of Moscow frustrated Hitler’s priority objective.

Beginning in the spring of 1942, GC&CS could read both German police ciphers and the SS’s Enigma key. ULTRA revealed SS treatment of people in the captured territories and the exterminations of Jews.⁵²

In September 1941, the Deutsche Reichspost, the German telephone and telegraph organization, broke the American A-3 voice encoder (vocoder). Through a site on the Dutch coast, it had “become adept at intercepting and breaking A-3 [telephone] calls between President Franklin Roosevelt and other prominent political and military leaders, including Prime Minister Winston Churchill.”⁵³ US Army Chief of Staff George Marshall never trusted the A-3. In July 1943, SIGSALY (X System, Project X, Ciphony I, Green Hornet) replaced the A-3.⁵⁴

Surprises in the Pacific

As a member of the World War I Entente Powers, Japan was given the League of Nations mandate over former German territories in the Pacific and the German concession in Shandong Province, China.⁵⁵ In 1931, Japan invaded Manchuria, a resource-rich area of China, and created the puppet state of Manchukuo in 1932. In the face of Western criticism of its actions and atrocities, Japan withdrew from the

League of Nations. By 1934, Japan had instituted an aggressive espionage campaign against the US.⁵⁶ By 1941, through various spies, it compiled a 200-page encyclopedia on US Navy capabilities.⁵⁷ A spy ring in Honolulu reported on Pearl Harbor, and DF from Japanese-controlled Kwajalein Island tracked air patrols out of Hawai’i. This DF intelligence was valuable in planning the Japanese fleet’s approach to Hawai’i in December 1941. The spy ring’s reports on the depth of Pearl Harbor prompted the Japanese to modify shallow water torpedoes (Koku Gyorai Type 91, modification 2) that were used with devastating effect on December 7, 1941.⁵⁸ The Japanese apparently also had broken US and British diplomatic codes.⁵⁹

Pearl Harbor. “Prior to Pearl Harbor ... US policymakers held assumptions and expectations – that it would be impossible for Japan to attack a well defended and distant naval base – that contributed to the lack of warning and preparedness.”⁶⁰ From the Japanese perspective, a preemptive strike against the US fleet in Hawai’i was a necessary prelude to any move in force into Southeast Asia and its needed natural resources. In 1941, before the US imposed an oil embargo, Japan received 85% of its petroleum from US sources.⁶¹

The US had little insight into Japanese military moves at the time of the attack. US intelligence was fragmented, “disorganized and under-resourced.”⁶² President “Roosevelt had already set up his own private network of spies because the traditional intelligence system left him so much in the dark on what was happening overseas...” “The primitive and parochial intelligence units in the Army, Navy, and State Department were underfunded and undermanned dumping

50. Hinsley, *British Intelligence*, 115.

51. Collier, *Hidden Weapons*, 206.

52. Budiansky, *Battle of Wits*, 198.

53. Patrick D. Weadon, *Sigsaly Story*, 2000. https://www.nsa.gov/about/cryptologic_heritage/center_crypt_history/publications/wwii.shtml.

54. Ibid, and David Kahn, *The Codebreakers*, Second Edition (Scribner, New York, 1996), 555-556.

55. Mark R. Peattie, *Nanyo: the Rise and Fall of the Japanese in Micronesia, 1885-1945*, Pacific Islands Monograph Series, No. 4. (Honolulu: University of Hawaii Press, 1988), 43.

56. Tony Matthews, *Shadows Dancing: Japanese Espionage Against the West, 1939-1945* (London: Hale, 1993; New York: St. Martin’s, 1994). Matthews tells of the Japanese using Spanish diplomatic missions for its intelligence work.

57. Budiansky, *Battle of Wits*, 167. For details on Japanese espionage, see David Major & Peter Oleson, “Espionage Against America” *Guide to the Study of Intelligence*, http://www.afio.com/40_guide.htm.

58. Kotani, *Japanese Intelligence*.

59. Valerie Reitman. “Japan Broke U.S. Code Before Pearl Harbor, Researcher Finds,” *Los Angeles Times*, December 7, 2001. <http://articles.latimes.com/2001/dec/07/news/mn-12562>.

60. Kent Center, *Occasional Papers: Making Sense of Transnational Threats*, 3, No. 1 (Central Intelligence Agency, Center for the Study of Intelligence, October 2004), 5.

61. Pearl Harbor Review – International Agreements. http://www.nsa.gov/about/cryptologic_heritage/center_cryptologic_history. Charles Meachling, “Pearl Harbor: The First Energy War,” *History Today*, 50, December 2000.

62. Christopher Andrew. *For the President’s Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush* (New York: Harper, 1996), 75. Michael Warner, *The Office of Strategic Services: America’s First Intelligence Agency* (Monograph), (Central Intelligence Agency: Center for the Study of Intelligence, 2000), 2, at <https://www.cia.gov/library/publications/intelligence-history/oss/>.

grounds for poor performers.”⁶³ Most of Roosevelt’s focus, however, was on Europe.

In 1936, the US Army Signal Intelligence Service (SIS) cracked the main Japanese diplomatic code, “Red.” In March 1939, the code was changed and named “Purple.” Purple was finally broken on September 20, 1940. The codename “Magic” stuck after SIS analysts were deemed “magicians” for breaking Purple. The Army’s success in breaking the Japanese diplomatic code⁶⁴ led to competitive friction with the US Navy over responsibilities for decryption and reporting.⁶⁵ The “success ... in breaking the Japanese diplomatic code ... had the ironic effect of distracting attention” from the more important naval operational code, JN-25.⁶⁶ Some success was made against JN-25 in 1940, but a variant, JN-25b, was introduced in December 1940. “A detailed study by the ... NSA, later concluded that the failure to break JN25b was due solely to a shortage of resources.” “... [I]t was only the lack of manpower – and machine power – that prevented the Navy from reading JN-25 in the critical months before Pearl Harbor.” From 1939, usually only two people worked on the problem, sometimes five. By late 1941, the number increased to eight. When later broken, JN-25b had many indicators of a surprise attack by six carriers on a fleet in the “north Pacific.” This reflected Navy Department “myopia” of the significance of SIGINT.⁶⁷

US Navy SIGINT personnel were following Japanese naval movements by traffic analysis. The Pacific DF net consisted of stations at Corregidor, Guam, Pearl Harbor, Dutch Harbor in the Aleutians, Samoa, and Midway Island. However, in November and December 1941, traffic analysis reports were sent to Washington by mail and were running two, sometimes three weeks behind.⁶⁸ Realizing that the Americans were monitoring their communications, the Japanese had radio operators generating dummy traffic to mislead the eavesdroppers into thinking that some of the

ships sailing through the north Pacific to attack Pearl Harbor were still in home waters.⁶⁹

US decision-makers underestimated the Japanese Navy’s abilities. The shallow water torpedoes were one example. The Japanese had studied the November 1940 British attack on the Italian fleet in Taranto that used such torpedoes. Ironically, in early 1941, senior US Navy officers had envisioned an aerial torpedo attack on Pearl Harbor launched from aircraft carriers, but they had no impact on increasing readiness. The Pearl Harbor attack represented a strategic, tactical, and technological surprise⁷⁰ for the US.

Philippines and Southeast Asia. Little is published in English from Japanese sources on Japan’s intelligence successes in World War II.⁷¹ Japan’s turn toward Southeast Asia was predicated by the need for resources. It attacked the Philippines and Malaya on December 8. Despite several hours of warning that the Japanese had attacked Pearl Harbor, confusion hampered American actions in the Philippines. “MacArthur was convinced that Japan would not attack until April 1942. He claimed that by then the Army’s defensive preparations in the Philippines would be complete....”⁷² “MacArthur’s irresponsible optimism” contrasted sharply with US Asiatic Fleet commander Admiral Thomas “Hart’s stark realism.”⁷³ Half of the Army Air Force’s aircraft were destroyed in the initial Japanese air raids.

Japanese forces invaded British Malaya at the same time. The Japanese War Ministry’s espionage Unit 82 had discovered that all of Singapore’s defenses faced the sea and the “impregnable fortress” was largely unguarded toward the land. The British had badly assessed Japanese capabilities and, blinded by their biases, ignored what intelligence provided.⁷⁴ Britain’s strategic plan for Singapore’s defense depended upon strategic warning in time to allow the Royal Navy to reinforce the Far East from Europe. On December 10, 1941, Japanese aircraft sank HMS *Prince of Wales* and HMS *Repulse* off Malaya. Admiral Sir Tom Phillips adhered to the Admiralty view that capital ships could not be sunk by aircraft, despite contrary evidence from

63. Douglas Waller, *Wild Bill Donovan: The Spymaster Who Created the OSS and Modern American Espionage* (New York: Free Press, 2011), 70.

64. Andrew, *President’s Eyes Only*, 105. In the late 1930s, the Soviets broke Japan’s diplomatic codes. Kōzō Izumi, a Japanese diplomat whose Russian wife was an NKVD [Soviet secret service] asset, provided Japan’s codebooks and keys to the Soviets. Hiroaki Juromiya & Andrej Peplonski. “Kōzō Izumi and the Soviet Break of Imperial Japanese Diplomatic Codes.” *Intelligence and National Security*, 28 (6), 2013, 769-84.

65. Budiansky, *Battle of Wits*, 167.

66. *Ibid.*, 5-6.

67. *Ibid.*, 217. Andrew, *President’s Eyes Only*, 120-122.

68. Pearl Harbor Review, http://www.nsa.gov/about/cryptologic_heritage/center_cryptologic_history.

69. *Ibid.*

70. Frans B. Bax. “Intelligence Lessons from Pearl Harbor.” *Studies in Intelligence* (November 2002), 1-9, cited in the Kent Center Occasional Papers: *Making Sense of Transnational Threats*, 3, No. 1. (Central Intelligence Agency: Center for the Study of Intelligence, October 2004).

71. See Kotani, *Japanese Intelligence*.

72. John Gordon. *Fighting for MacArthur: The Navy and Marine Corps’ Desperate Defense of the Philippines* (Annapolis, MD: Naval Institute Press, 2011), 21.

73. *Ibid.*, 23.

74. David, *Military Blunders*, 65. There was also a racist element in viewing the Japanese and their abilities. Collier, *Hidden Weapons*, 247.

US Brigadier General Billy Mitchell's controversial 1921 tests. Singapore fell by February 15 and the Dutch East Indies fell by March 9.

South Pacific. In January 1942, the Japanese moved on the Australian-administered South Pacific islands beginning with an assault on Rabaul, New Britain. From here, the Japanese advanced on northern New Guinea and into the Solomon Islands to cut the supply lines from the US to Australia and New Zealand.

Turning of the Tide: 1942 – 1943

In January 1942, faced with multiple fronts in the war, the US and Britain agreed on a complete exchange of military intelligence at all levels. By that autumn, a division of labor was agreed concerning SIGINT: Britain would take the lead against Germany and Italy, the US against Japan. Canada joined the Atlantic intelligence effort against the U-boats; and by June, GC&CS was sharing decrypts of U-boat messages. In the Pacific, Australia and the US joined forces in a combined SIGINT effort.⁷⁵

Mediterranean and North Africa

Despite the multiple defeats suffered in 1941, British forces dealt significant blows to the Axis that year. Intelligence contributed to all of them.

Battle of Cape Matapan. In late March, tipped by SIGINT, the Royal Navy intercepted the Italian fleet south of Crete and sank three cruisers and two destroyers and damaged a battleship. Directing airborne reconnaissance to disguise the true source as sensitive ULTRA intelligence, "...it was the first naval battle in which carrier-based aircraft played a decisive role, and the first battle of any kind in the Second World War in which the timely use of signals intelligence played the decisive role."⁷⁶ The Italian fleet withdrew and the battle "consolidated British naval control of the eastern Mediterranean."⁷⁷

Malta. British-held Malta was a constant thorn in the side of the Axis sitting astride the supply lines to North Africa. By June 1941, GC&CS had broken many of the Italian codes; Italian codes based on the Hagelin C38 machine were "a baby compared to Enigma" and were easily broken.⁷⁸ A single intercept allowed British destroyers from Malta on April 16, 1941 to sink an entire convoy (five merchant ships and

three destroyers) carrying elements of the 15th Panzer Division.⁷⁹ Decrypts provided advance notice of every supply convoy from Italy to Libya and allowed British destroyers and aircraft in late 1941 to sink 48 ships resupplying North Africa, stopping reinforcements, and starving the Afrika Korps of fuel.⁸⁰

El Alamein. Rommel's advance deep into Egypt, slowed by British defensive actions, stalled in early July 1942 due to supply shortages and exhaustion. On July 10, he suffered several intelligence-related strategic losses. One was when Australian troops overran his field SIGINT unit, Radio Intercept Company 621. Its capture revealed how successful German SIGINT had been.⁸¹ That same month, the British broke the Wehrmacht's medium-grade field cipher used in North Africa.⁸² GC&CS already could read almost daily the Luftwaffe's Enigma for North Africa.⁸³ The British also informed the US that its diplomatic code used by Colonel Fellers in Cairo was compromised, ending Rommel's "gute Quelle" (good source).⁸⁴

Coupled with the loss of intelligence sources, planted British disinformation as to the Eighth Army's readiness deceived Rommel.⁸⁵ Via doubled Axis agents, a special deception unit fed false OB information to German intelligence. The October 23 British attack on El Alamein surprised the Germans. Rommel was away in Germany. Montgomery was well informed of German reactions via aerial reconnaissance, Enigma decrypts, and the Army Y-Service's tactical SIGINT, which had improved greatly. During battle, Y-Service intercepts and DF were more valuable than Enigma in reflecting unit movements and conditions.⁸⁶ RAF reconnaissance and Y-Service intercepts frustrated Rommel's October 28 attempt to counterattack. This "defeat was the turning point of the battle."⁸⁷ "The deception operation for Montgomery's offensive [at El Alamein] was one of the great success stories of the war."⁸⁸ From then on, Rommel was on the defensive, retreating across Egypt, Libya, and Tunisia.

Operation Torch and Allied Victory in North Africa. On November 8, 1942, Allied forces landed at Casablanca, Oran, and Algiers, in French North Africa, creating a second front for the Afrika Korps.

79. Hinsley, *British Intelligence*, 80.

80. *Ibid*, 182, 194, 237.

81. *Ibid*, 229 footnote.

82. *Ibid*, 184.

83. *Ibid*, 180.

84. Deac, "Intercepted Communications."

85. The British cut their teeth on deception operations in the Middle East. Holt, *The Deceivers*, 240, 244.

86. Hinsley, *British Intelligence*, 248.

87. *Ibid*, 243.

88. Holt, *The Deceivers*, 240, 244.

75. Hinsley, *British Intelligence*, 115-116.

76. Budiansky, *Battle of Wits*, 186.

77. Hinsley, *British Intelligence*, 73.

78. Hinsley, Cambridge address.

Human and diplomatic sources had helped prepare for Torch.⁸⁹ Coordinator of Information William Donovan "... sent a dozen officers to work as 'vice consuls' in several North African ports, where they established networks and acquired information to guide the Allied landings..." Topographical intelligence was good,⁹⁰ and the British could read French Air Force codes.⁹¹ Despite the fact that German naval intelligence had broken Allied convoy codes⁹² and the Luftwaffe had sighted the Torch convoys entering the Mediterranean five times, 340 ships passed through Gibraltar without loss.⁹³ Increasingly bold British deception operations were employed as well as deceptive tactical communications. British employed deceptive radio transmissions similar to those of previous Malta relief convoys. German U-boats were ordered to withdraw eastward in reaction and were out of position for the landings.⁹⁴ Using doubled Abwehr agents, the British suggested there would be simultaneous attacks against Norway and northern France and a major relief operation for Malta.⁹⁵

Despite the initial success of the Torch landings, once the seasoned Wehrmacht directly opposed the untested US Army, the poor state of US tactical intelligence and command and control was exposed. Poor maps, which led to units getting mixed up, contributed to the February 1943 disaster at Kasserine Pass. Despite intelligence warnings, US II Corps Commander Major General Lloyd Fredendall failed to prepare adequate defenses. US forces were also surprised by the new German Tiger tanks, against which American 37-mm guns had little effect.⁹⁶

With sea lanes from Italy largely cut, German forces relied on Luftwaffe air transport for reinforcements and critical supplies. In April 1943, SIGINT prompted Allied air attacks on concentrated Luftwaffe transports in Tunisia, destroying over 100 transport aircraft, representing almost 25% of the Luftwaffe's transport capacity.⁹⁷ These losses, coupled with the transport losses at Stalingrad, crippled Luftwaffe air

transport for the rest of the war. On May 8, 1943, the North African campaign ended with the surrender of remaining Axis forces in Tunisia.

Eastern Front

Battle of Stalingrad. From July 1942 to February 1943, the Wehrmacht and the Red Army were locked in the most monumental strategic battle of World War II.⁹⁸ Hitler underestimated the capabilities of Russian troops and armor. The Soviet T-34 tank proved to be the equal or superior to German armor until the introduction of the heavier Panther and Tiger tanks later in the war.⁹⁹ The mid-November Soviet counteroffensive annihilated the German Sixth Army. By the time of the Casablanca Conference at the end of January 1943, the Allies' strategic situation had changed.

The British Joint Intelligence Committee assessed that the Wehrmacht had lost 40 divisions, 14 at Stalingrad alone.¹⁰⁰ British assessments were aided by a further SIGINT success: the breaking of the German "Fish" radio-teleprinter ciphers, which tied the German High Command (OKW) to major German headquarters. Codenamed "Tunny," Fish intercepts "[t]hough less voluminous than Enigma, and more difficult to decrypt ... made a valuable contribution to Whitehall's knowledge of the strategic situation on the Russian front: it revealed the planning, the [German assessments of the situation] and the supply difficulties of the German commands."¹⁰¹

Little is published in English on Soviet intelligence successes in World War II and understanding of Soviet SIGINT is poor. In Stalin's purges of the late 1930s, the "GRU [military intelligence] was smashed to pieces." "... [I]ntelligence officers and undercover agents were recalled in the hundreds and put to death." Consequently, the impact of "the purges makes any rational accounting of the [Soviet] assessment process almost impossible."¹⁰² Distrustful of Britain, after a honeymoon period in 1941, Anglo-Soviet intelligence exchanges diminished.¹⁰³

89. Collier, *Hidden Weapons*, 266; Warner, *Office of Strategic Services*, 8.

90. Hinsley, *British Intelligence*, 260.

91. *Ibid.*, 261.

92. The B-Dienst did not discover the Torch convoys bound for North Africa. "Only twenty-three of the more than one thousand transits to North Africa were intercepted and sunk by U-boats." http://world-war2database.com/html/atlantic43_45.htm. The Germans did not believe the US could carry troops directly from America to North Africa. Collier, *Hidden Weapons*, 266.

93. Hinsley, *British Intelligence*, 260.

94. *Ibid.*, 260.

95. Ben Macintyre, *Double Cross: The True Story of the D-Day Spies* (New York: Crown Publishers, 2012), 126-127.

96. David, *Military Blunders*, 348-364.

97. Hinsley, *British Intelligence*, 290.

98. *Ibid.*, 125.

99. David, *Military Blunders*, 197-208.

100. Hinsley, *British Intelligence*, 323.

101. Hinsley, Cambridge address; and Hinsley, *British Intelligence*, 323.

102. John Erickson, "Soviet Union, 1930-1941," 402-403.

103. Ryan E. Bock, "Anglo-Soviet Intelligence Cooperation, 1941-45: Normative Insights from the Dyadic Democratic Peace Literature," *Intelligence and National Security* 30 (6), 2015, published online (May 21, 2014) <http://dx.doi.org/10.1080/02684527.2014.900267>. Also Robert W. Stephan has written about Soviet military counterintelligence and deceptions operations against the Nazis. See *Stalin's Secret War: Soviet Counterintelligence Against the Nazis, 1941-1945* (Lawrence, KS: University of Kansas Press, 2004).

Battle of Kursk. The British tipped Moscow to the upcoming German offensive, which started on July 4, 1943, although Soviet intelligence probably already had a good idea of the planned German offensive from its own sources. Soviet intelligence had improved significantly by the time of the battle. Aerial reconnaissance of German forces was good, which added to Enigma-based reports from the British Military Mission, reports from the Lucy spy ring,¹⁰⁴ and probably also from Soviet SIGINT. Unknown to London at this time, a “Cambridge Five” Soviet agent within GC&CS, John Cairncross, provided the Soviets verbatim transcripts of Tunny decrypts, thereby confirming that the British had broken German codes.¹⁰⁵ The Soviet counterattack eight days later resulted in the largest tank battle ever fought. Losses at Kursk on both sides were enormous but more significant for Germany. This was the last German strategic offensive on the Eastern Front, and the Soviets had the initiative for the rest of the war.

Turnaround in the Pacific

Battles of the Coral Sea and Midway. A major intelligence breakthrough for the US took place in February 1942 when Navy cryptanalysts began to read Japanese messages sent in the JN-25b naval general-purpose code.¹⁰⁶ In mid-April, SIGINT intercepts revealed that a large Japanese convoy was to enter the Coral Sea in early May. The May 8-9 Battle of the Coral Sea revealed that US tactical intelligence was lacking. Japanese air reconnaissance found the US fleet first, but aerial counterattacks stopped the invasion force headed for Port Moresby on New Guinea’s southern coast.¹⁰⁷

Less than a month later, SIGINT would contribute to a strategic defeat of the Imperial Navy. Admiral Isoroku Yamamoto’s decision to attack Midway Island was partially based on the erroneous belief that Doolittle’s April 18 raid on Tokyo came from Hawai’i via Midway, not from the carrier *Hornet*. Doolittle’s B-25 bombers were Army Air Corps land-based aircraft and not perceived as capable of taking off from Navy carriers. “The Americans had no inkling of the effect the Doolittle raid had had on the Japanese sense of honour.” This led the Japanese to conclude it had to take Hawai’i and Midway was the first step.¹⁰⁸ In July 1940, Congress had passed the “Two Ocean Navy” bill and the US Navy was building 15 battleships, 11 carriers, 54 cruisers, 191 destroyers, and 73 submarines.¹⁰⁹ This led to the Japanese belief it had to destroy the US Pacific fleet early in 1942 before the US’ industrial might could become a factor. Yamamoto, therefore, sought a decisive battle against the US Navy.¹¹⁰

On May 14, 1942, Fleet Radio Unit Pacific (FRUPAC, Station Hypo), the US naval cryptographic unit in Hawai’i, decrypted a message about an “invasion force” for “AF.” “AF” was unknown and within the Navy there were arguments over the Japanese designation “AF” and the Japanese objective. Using a ruse about a water shortage on Midway, subsequent decrypts confirmed that “AF” was Midway Island and gave the timing of attack – June 3 or 4.¹¹¹ Due to SIGINT, the US, although outnumbered, was “able to concentrate its forces for a slight advantage where it counted the most, at the scene of the battle.” US Admiral Chester Nimitz knew the Japanese objectives, OB, organization, timetable, and direction of attack. “This situation was in sharp contrast to the Battle of the Coral Sea only a few weeks before, when CINCPAC was virtually blind to unfolding events.”¹¹² The result was a stunning victory for the US, four of the first-line Japanese carriers were sunk, their pilots lost. After Midway, the Imperial Navy remained on the defensive for the rest of the war.

“Midway moved code breaking and signals intelligence from an arcane, little understood, and usually unappreciated specialty to the very center of military operations.”¹¹³ “Midway, Nimitz said later, ‘was essentially a victory of intelligence.’”¹¹⁴

Despite the SIGINT revelations, there were intelligence failures that were costly for the Allies in the

104. Collier, *Hidden Weapons*, 208-209. The Lucy spy ring had several high-ranking German sources, including Major General Hans Oster, chief of staff to Admiral Wilhelm Canaris, head of the Abwehr. See *The Rote Kapelle* (Central Intelligence Agency, 1984) and Anthony Read and David Fisher. *Operation Lucy: Most Secret Spy Ring of the Second World War* (New York: Coward, McCann, 1981). *Rote Kapelle* (“Red Orchestra”) was the German name for the Lucy spy ring. By November 1942, the Soviets also had broken Enigma. Zdzislaw J. Kapera. “Summary Report of the State of the Soviet Military Sigint in November 1942 Noticing ‘Enigma,’” *Cryptologia* 35 (3), July 2001, 247-56.

105. Cairncross was uncovered as a spy in 1951.

106. Frederick D. Parker, “A Priceless Advantage: US Navy Communications Intelligence and the Battles of Coral Sea, Midway, and the Aleutians,” *United States Cryptologic History*, Series IV, World War II, Volume 5 (National Security Agency: Center for Cryptologic History, CH-E32-93-01, 1993), 20.

107. Collier, *Hidden Weapons*, 303-304.

108. Budiansky, *Battle of Wits*, 2.

109. PL 757, Chapter 644, 76th Congress, July 19, 1940.

110. Parker, “Priceless Advantage,” 37; Patrick D. Weadon, *The Battle of Midway: How Cryptology enabled the United States to turn the tide in the Pacific War* (National Security Agency brochure), http://www.nsa.gov/about/cryptologic_heritage/center_crypt_history/publications/battle_midway.shtml.

111. Budiansky, *Battle of Wits*, 19.

112. Parker, “Priceless Advantage,” 61.

113. Budiansky, *Battle of Wits*, 21.

114. Andrew, *President’s Eyes Only*, 125.

Pacific. The August 7, 1942 Guadalcanal landings by US Marines caught the Japanese by surprise, but Imperial forces reacted quickly. In the Battle of Savo Island on the night of August 8-9, 1942, a Japanese surface fleet attacked, and poor Allied tactical intelligence and command and control contributed to the loss of one Australian and three US cruisers. Coastwatchers had provided 80 minutes of warning of Japanese air attacks on Guadalcanal during the day but were ineffective at night when the Japanese fleet attacked.¹¹⁵

The Counterintelligence War

When war broke out in 1939, Britain was consumed with fear of fifth columnists. The British Security Service (MI5) “managed to neutralize an extensive network of Nazi sympathizers in the United Kingdom by pretending to represent the German government...” John Bingham, aka Jack King, “the British agent was handling six senior-level pro-Nazi operatives – five of them British subjects – who were regularly supplying him with British state secrets believing he was passing them on to the Gestapo. The archives show that, between 1942 and 1945, ‘King’ helped MI5 identify “scores ... and probably ... hundreds” of devoted Nazi sympathizers in the UK.”¹¹⁶

SIGINT played an important role in counterintelligence operations. The British Radio Security Service (also known as MI8, which ran the Y-Service) decrypted hasty Abwehr preparations to introduce agents into Britain. With this advanced knowledge, all but one of the 25 sent to England between September and November 1940 were captured. Of the 24 captured, one committed suicide, five were executed, 15 imprisoned, and four became double agents for the British.¹¹⁷

Of concern, in early 1940, GC&CS intercepted “Nazi traffic indicating the German ambassador in Italy was receiving messages from the US Embassy in London, including Roosevelt-Churchill correspondence.”¹¹⁸ On May 18, MI5 arrested Tyler Kent, a US Embassy code clerk, for spying. Kent was a “virulent isolationist and a Nazi sympathizer.”^{119, 120}

By December 1940, GC&CS had broken the codes used between Abwehr headquarters and its stations.

By the second half of 1941, the British had so complete a knowledge of the Abwehr’s organization and operations throughout Europe, Latin America, and the Middle East that it posed little threat from then on.¹²¹

Using captured Abwehr agents who had been doubled, and recruiting others, the British began to feed the Abwehr false intelligence. An original purpose was to demonstrate that the agents sent were productive and it was unnecessary to send more. However, reading Abwehr Enigma traffic, the British began to see the value of turned agents for strategic deceptions.¹²² In January 1941, the British established the Twenty Committee – better known by its Roman numeral designation: XX, or double-cross, to coordinate controlled double agents worldwide. Almost all Axis agents in the Middle East and in the India Theater feeding the Germans in Kabul were under British control.¹²³ “MI5 ran a double-cross system of labyrinthine complexity...”¹²⁴ Before the war, 70 German agents infiltrated into Britain. There were another 220 during the war hidden in the 7,000-9,000 refugees that entered Britain each year. Only three are known to have evaded detection.¹²⁵ About the XX system, Churchill wrote: “Tangle within tangle, plot and counter-plot, ruse and treachery, cross and double-cross, true agent, false agent, double agent, gold and steel, the bomb, the dagger and the firing party, were interwoven in many a texture so intricate as to be incredible and yet true.”¹²⁶

One of the more interesting double agents was Juan Pujol, who arrived in England in the summer of 1942. A fabricator recruited by MI5 as Agent GARBO, by 1943, Pujol had established a network of 27 mythical sub-agents and sources of information for the Abwehr. He had a “remarkable talent for duplicity” and got the Abwehr to pay for his mythical subagents. He made the XX system self-financing. Project MIDAS “would prove to be one of the most profitable and least known operations of the war.” GARBO later would become an important deception vehicle for the Allies.¹²⁷

The British used every means possible in its counterintelligence operations. For example, TRIPLEX was material the British surreptitiously took from foreign diplomatic pouches, often using an attractive woman as a “honey pot.” Ironically, the effort was run

115. Collier, *Hidden Weapons*, 312-313.

116. “British spies infiltrated Nazi sympathizer groups, wartime files show,” *IntelNews.org*, February 28, 2014, <http://intelnews.org/2014/02/28/01-1427/> and BBC News, February 27, 2014, <http://www.bbc.com/news/uk-26365085>.

117. Macintyre, *Double Cross*, 36.

118. Sulick, *Spying in America*, 151.

119. *ibid*, 149.

120. Peter Rand, *Kent’s Secret Plot Against FDR, Churchill, and the Allied War Effort* (Lyons Press, Guilford, CT, 2013), 113, 218.

121. Hinsley, *British Intelligence*, 118-119.

122. Hinsley, *British Intelligence*, 119.

123. Holt, *The Deceivers*, 308.

124. Nigel West, *Historical Dictionary of World War II Intelligence*, xxv.

125. Keegan, *Intelligence in War*, 289.

126. Winston S. Churchill, *Thoughts and Adventures* (London, 1991), 55.

127. Macintyre, *Double Cross*, 89, 116.

by Anthony Blunt, a homosexual MI5 officer who was also an NKVD spy.¹²⁸ As the war progressed, the British brought the US into its fold. The Office of Strategic Services (OSS) Counterintelligence Branch (X-2), set up at the urging of British officials, was privy to ULTRA materials that the US Army and Navy denied OSS, and developed a close relationship with MI5. In 1943, X-2 was included in the Double Cross System.¹²⁹ The end result was that German intelligence, largely dependent upon human agents, was emasculated.

German counterespionage severely hampered Britain's Secret Intelligence Service (MI6).¹³⁰ Britain's first attempt to insert spies into France failed. "A high proportion of the Special Operations Executive (SOE) agents in France ... were discovered by German radio counter-intelligence...." All agents dropped into Holland were captured.¹³¹ "Despite its weaknesses, the Abwehr's counterintelligence performed well [early in the war]. Working with the Gestapo it broke the Soviet 'Rote Kapelle' spy ring, penetrated major resistance networks in France, seriously damaged British clandestine operations in Belgium, and controlled and doubled back those in Holland."¹³²

In 1939, President Roosevelt assigned to the FBI the principal counterespionage investigative responsibility, with the Army and Navy keeping responsibility for counterintelligence within their services and industrial contractors. In 1937, the Abwehr had acquired the revolutionary Norden bombsight from a German immigrant and sympathizer. It also got the proprietary data for synthetic rubber.¹³³ Through a double-agent operation (the Sebold case) at the end of July 1941, the FBI rolled up all 33 Nazi agents in one night. Historian G. J. A. O'Toole credited the Sebold case and British information on German operations in the Western Hemisphere with helping convince President Roosevelt to cooperate with British Security Coordination.¹³⁴

128. Nigel West & Oleg Tsarev, eds. *TRIPLEX: Secrets from the Cambridge Spies* (New Haven: Yale University Press, 2009).

129. Andrew, *President's Eyes Only*, 139-40. Denial of cryptographic intelligence to OSS poisoned later relationships between the newly established CIA and NSA. See [Author's name redacted], "A Fixation on Moles: James J. Angleton, Anatoliy Golitsyn, and the 'Monster Plot': Their Impact on CIA Personnel and Operations." *Studies in Intelligence*, 55, No. 4, December 2011, declassified April 2013.

130. Hinsley, *British Intelligence*, 118.

131. Keegan, *Intelligence in War*, 24.

132. Holt, *The Deceivers*, 108.

133. Major & Oleson, "Espionage Against America," footnote 12.

134. Peter Duffy, *Double Agent* (New York, Scribner, 2014) and G. J. A. O'Toole, *Honorable Treachery: A History of US Intelligence, Espionage, and Covert Action from the American Revolution to the CIA* (New York: The Atlantic Monthly Press, 1991 – reissued in 2015 as paperback), 351.

The FBI was active throughout Latin America. The German spy ring in Brazil was quickly rounded up after Brazil's August 1942 declaration of war on Germany. However, Axis spies in Argentina "flourished for much of the war," but did not help the German war effort.¹³⁵

In June 1942, the Abwehr landed a sabotage team on Long Island, New York, that a Coast Guard beach patrol discovered; and four more near Vero Beach, Florida. All were caught within weeks. The last spy attempt occurred in November 1944 when a U-boat put ashore two spies in Maine.¹³⁶ The British torpedoed the U-boat that landed them and alerted the FBI. Named Operation Pastorius, the saboteurs were sent by the Sicherheitsdienst (SD), the intelligence arm of the SS and Nazi Party, not by the Abwehr. Two of the poorly trained team, George Dasch and Edward Kerling, "defected" and told the FBI about the operation.

Intelligence Contributions to Allied Victories

By mid-1943, the tide of battle had turned in the Allies' favor in both Europe and the Pacific. Intelligence was playing an increasingly important role in the air war over Germany, the Battle of the Atlantic, Allied invasions in southern Europe, on the Eastern Front, and in the Pacific. Strategic and tactical SIGINT became the backbone of intelligence.

Air War Against Germany

By early 1943, British intercepts of Enigma messages, aircraft radio-telephony, navigational beams, and low-level codes provided a good understanding of Luftwaffe operations and defensive systems as well as providing several hours warning of most air attacks and probable targets. Enigma revealed intelligence on German radars. The February 27-28, 1942 Brunelval Raid obtained key pieces of the Würzburg flak control radar from the French coast and captured a radar technician. Analysis of German radar led to the development of "Window" or chaff, although it was not used for many months for fear of reciprocal action by the Luftwaffe negating Allied air defenses.¹³⁷

Long neglected before the war, the British greatly increased their photoreconnaissance capabilities and established a Central Interpretation Unit (CIU). Intelligence, however, had little impact on British

135. Kahn, "Intelligence in World War II," 15-16.

136. Sulick, *Spying in America*, 144-146.

137. Hinsley, *British Intelligence*, 141, 164-165, 170, and R. V. Jones, 40-1, 239-249.

GC&CS SUCCESSES AGAINST ENIGMA AND ITALIAN CIPHERS*

Spring 1940	Initial Luftwaffe Enigma Morse code ciphers decrypted (Red key).
September 1940	Additional Luftwaffe Enigma key broken (Brown).
Winter 1940-41	Enigma decrypts grow from 50 to 250 per day.
February 1941	Luftwaffe Light Blue Enigma key broken (Luftwaffe operations in North Africa).
June 1941	German Navy home waters Enigma broken (Dolphin key).
June 1941	Wehrmacht Enigma key used on the Eastern Front broken (Vulture).
June 1941	Luftwaffe's SIGINT service's Enigma key broken.
June 1941	Enigma decrypts grow to 1,300 per day.
June 1941	Italian C-38m code broken revealing port activity and convoy movements in the Mediterranean to North Africa.
Mid-September to November 1941	Afrika Korps operational Enigma keys broken.
December 1941	Abwehr (German military intelligence) Enigma broken.
January 1942	All new Luftwaffe Enigma keys broken as soon as introduced.
Summer 1942	GC&CS was solving 30 Enigma keys out of 50 in use.
December 1942	GC&CS began to read the new, four-rotor, naval Enigma key (Shark) after a blackout beginning in February 1942.
Early 1943	GC&CS broke "Fish" radio-teleprinter transmissions linking German high command with subordinate armies and army groups.
Mid-1943	Enigma decrypts grow to between 3,000 and 4,000 per day. Italian C-38 and Japanese PURPLE (diplomatic) codes in addition. GC&CS eventually identified over 200 different Enigma keys.
March 1944	The "Fish" link from Berlin to Field Marshal von Rundstedt, commander of forces in France, broken, three months before the Normandy landings.

* Hinsley, *British Intelligence*, 14, 116-7, 439.

strategic bombing policy before 1943, largely due to the personal predilection of the chief of Bomber Command, Air Chief Marshal Sir Arthur Harris, for nighttime strategic bombing of German cities. The US Eighth Air Force, however, developed a target intelligence organization at High Wycombe to support its daytime operations. The OSS Research & Analysis Branch (R&A) "made one of its biggest contributions in its support to the Allied bombing campaign in Europe." Its Enemy Objectives Unit identified German fighter aircraft factories and synthetic oil production facilities. "When American bombers began hitting synthetic fuel plants, ULTRA intercepts quickly confirmed that the strikes had nearly panicked the German high command." "[S]carcity of aviation fuel all but grounded Hitler's Luftwaffe and, by the end of [1944], diesel and gasoline production had also plummeted, immobilizing thousands of German tanks and trucks."¹³⁸ OSS R&A special studies on the German ball bearing industry and synthetic oil

138. Ibid, 171, 412. See also Richard Overy, *The Bombers and the Bombed: Allied Air War over Europe, 1940-1945* (New York: Viking Penguin, 2013). Warner, *Office of Strategic Services*, 12.

production industries aided strategic target priorities.¹³⁹

Battle of the Atlantic

"...[T]he battle ... in the Atlantic between December 1942 and May 1943 was the most prolonged and complex battle in the history of naval warfare.... "[T]he very fact that the struggle was so prolonged and so finely balanced suggests that the ability to read [German] communications must have been an asset of crucial importance to the Allies." "Early warning of U-boat sailings was usually obtained from Home Waters Enigma."¹⁴⁰ "From characteristics such as length, call signs and format, the Allies could on many occasions tell if a radio message from a U-boat was a passage, sinking, sighting, weather, contact, or position report."¹⁴¹

But by June 1941, GC&CS began to read the U-boat Enigma, which eventually "transformed the situation."¹⁴² Allied convoys were rerouted around U-boat wolf pack concentrations. Furthermore, the centralized command and control of U-boats resulted in frequent radio communication that was vulnerable to radio direction finding. "...[O]n many occasions D/F was the only timely communications intelligence available to the Allies on the activities of U-boats." As there were periods when the Naval Enigma was unreadable, there were always delays in decrypting messages – in August 1941, for example, of six to seven days.¹⁴³ On February 1, 1942, the German Navy added a fourth wheel to its Enigma machines, greatly complicating it. GC&CS could not solve it for 11 months.¹⁴⁴

139. O'Toole, *Honorable Treachery*, 414-415.

140. Hinsley, *British Intelligence*, 307, 381.

141. David Syrett, "The Infrastructure of Communications Intelligence: the Allied D/F Network and the Battle of the Atlantic." *Intelligence and National Security* 17 (3), Autumn 2002, 169.

142. Hinsley, *British Intelligence*, 129.

143. Syrett, "D/F Network," 163, 165.

144. Hinsley, *British Intelligence*, 134.

In early 1943, the British learned that the B-Dienst was reading its ciphers and providing U-boats accurate intelligence on convoy movements. March 1943 marked the high point for U-boat sinkings of Allied ships. In mid-March 1943, convoys SC112 and HX229 ran into U-boat wolf packs. "The battle around SC112 and HX229 ... was the costliest of the war." Of 90 merchant ships and 20 warships, 22 were sunk with loss of only two U-boats.¹⁴⁵ In June 1943, Royal Naval Cipher #3 was replaced, which the Germans never broke.¹⁴⁶

Also by early 1943, GC&CS was reading the naval Enigma key. "Shark" was the designator for the four-rotor naval Enigma machine. "Not only was it believed by the Germans that their codes were so complex that the Allies could never decrypt an encoded radio message in time to be of operational use, but it was also a firmly-held conviction by the [German navy U-boat headquarters] that it would be nearly impossible for the Allies to D/F, systematically and accurately, extremely short high-frequency radio transmission."¹⁴⁷ This was a major German intelligence failure.

At the same time, the British introduced a new anti-surface vessel radar for patrol aircraft. Up until the end of 1942, the British "original [anti-surface vessel] radar had worked ... [but] it was now becoming useless because the Germans equipped their U-boats with receivers to detect it, and thus the approach of our aircraft long before they themselves could detect the U-boat." The new radar operated on a different frequency that U-boats could not detect.¹⁴⁸

The Royal and US Navies carried out a unified anti-submarine warfare program. "They operated virtually as a single organization." On May 20, 1943, the US Tenth Fleet was established to be a centralized clearing house for all aspects of anti-submarine warfare (ASW), including ULTRA, SIGINT, HFDF, Operations Research, convoy routing, and R&D. Prior to the Tenth Fleet's establishment, the Allies sank an average of four U-boats per month. In the month after its establishment, the Allies sank 41 and an average of 23 per month thereafter. This outstripped the rate of U-boat production for which air reconnaissance provided an accurate estimate.¹⁴⁹ "Germany had a total of 842 U-boats that saw battle. Of these, the Allies sank

781 and captured two..., "¹⁵⁰ with U-boat crews suffering a 70% mortality rate.¹⁵¹ In late May, U-boats were withdrawn from the mid-Atlantic. In July, a decrypted Japanese diplomatic message (Purple) confirmed the withdrawal and Hitler's hopes for new types of U-boats equipped with better flak, search receivers, and acoustic torpedoes.¹⁵² The U-boat attack on two convoys on September 20, 1943 marked "... their last substantial success in the Battle of the Atlantic."¹⁵³

The Battle of the Atlantic was the longest battle of World War II: 2,073 days. "Without success in the battle of the Atlantic ... there would have been no epic victories at El Alamein or in Burma – and there would have been no 'Crusade in Europe,' launched via the Normandy landings of June 1944."¹⁵⁴

Invasions of Sicily and Italy

Sicily. Allied deceptions played a major role in Operation Husky, the invasion of Sicily. Field Marshal Wilhelm Keitel, chief of the German Supreme Command of the Armed Forces (Oberkommando der Wehrmacht, OKW), believed the Allied OB was twice its actual from false information fed through British-controlled agents.¹⁵⁵ On April 30, 1943, in Operation Mincemeat, a British submarine set a body ashore off Spain, purported to be Royal Marines Major William Martin. He was carrying dispatches and high-level correspondence suggesting the Allies' targets were Sardinia and the Balkans. Mincemeat played to a known Hitler fear of a Balkans invasion. ULTRA of May 12 indicated that the Germans bought the deception.¹⁵⁶ Additionally, Operation Solo was a deception threatening an attack against Norway. Solo played to Hitler's obsession with Norway known through ULTRA. "Throughout 1943, the Germans kept twelve divisions idle in Norway that would have been far more useful in Italy or the Ukraine."¹⁵⁷ "At Husky D-Day [July 9-10] there were only two German divisions in Sicily in addition to the Italian forces there."¹⁵⁸ SIGINT and photoreconnaissance were used to plan pre-landing attacks on Luftwaffe bases that disrupted its ability to react.¹⁵⁹

145. Keegan, *Intelligence in War*, 240.

146. Hinsley, *British Intelligence*, 308-10; Budiansky, *Battle of Wits*, 293.

147. Syrett, "D/F Network," 164.

148. R.V. Jones, *Most Secret War*, 319.

149. Andrew, *President's Eyes Only*, 136; US Navy, United States Tenth Fleet: From Anti-submarine Warfare to Cyberspace, <http://www.public.navy.mil/fcc-c10f/Pages/ustenthfleethistory.aspx>. Kahn, "Intelligence in World War II," 8.

150. US Navy, Tenth Fleet.

151. Roberts, review, 2.

152. Hinsley, *British Intelligence*, 319, 379.

153. Ibid, 383-384.

154. US Navy, Tenth Fleet.

155. Holt, *The Deceivers*, 379.

156. Hinsley, *British Intelligence*, 341.

157. Holt, *The Deceivers*, 493.

158. Ibid, 379.

159. Hinsley, *British Intelligence*, 339-347.

Italy. SIGINT and photoreconnaissance provided good intelligence on German OB and defenses before the September 9, 1943 American landing at Salerno, a week after the British Eighth Army landed, largely uncontested, on the boot of Italy at Calabria. Faced with stiff German resistance that stalled the Allied advance, the Allies outflanked the Germans by landing up the coast at Anzio, south of Rome, on January 22, 1944. Battlefield intelligence and an ULTRA intercept revealed Field Marshal Albert Kesselring's plan to attack the US Army struggling to expand the Anzio beachhead, which was frustrated by superior Allied firepower. The February 19, 1944 Allied counterattack caught Kesselring by surprise. On June 4, the Allies entered Rome. ULTRA showed Hitler was reluctant to give up Italian territory despite his generals' recommendations.¹⁶⁰ However, in "the day-to-day fighting the Army Y-Service [tactical intercepts] yielded even more intelligence than high-grade SIGINT, and it was no doubt more valuable to the operational authorities."¹⁶¹

The Pacific

"By early 1943 ... naval cryptanalysts had mastered the JN25 system so thoroughly that they were able to decrypt all of its variants almost without interruption for the remainder of the war."¹⁶²

US Submarine Warfare. "Regular reading of the Japanese convoy codes gave American submarines an almost total mastery over the Japanese supply lines...."¹⁶³ In June 1943, the US broke the codes of the Japanese Army water transport organization – the Army's navy.¹⁶⁴ The Office of Naval Intelligence apparently stole codes from Japanese Consulates in New York City and San Francisco. The record of this is fragmentary, largely based on a June 8, 1942 memorandum from Commander Alvin Kramer. Before the war, the Navy was admonished not to undertake clandestine operations against Japanese diplomatic facilities by the Army, which was fearful of compromising its success against the Purple code. NSA historian Robert Benson concludes the Japanese merchant shipping and attaché codes were obtained through these means.¹⁶⁵

As Army Chief of Staff Marshall reported: "Operations in the Pacific are largely guided by the information we obtain of Japanese deployments. We know their strength in various garrisons, the rations and other stores continuing [sic] available to them, and what is of vast importance, we check their fleet movements and the movements of their convoys. The heavy losses reported from time to time which they sustain by reason of our submarine action largely results from the fact that we have the sailing dates and routes of their convoys and can notify our submarines to lay in wait at the proper point."¹⁶⁶

Pacific Campaigns. At the end of January 1942, the Navy's SIGINT site at Cavite ("Cast") in the Philippines was evacuated to Java and then to Australia, where it was reconstituted as Fleet Radio Unit – Melbourne (FRUMEL), a joint US-Australian effort. On August 7, 1942, US Marines landed on Guadalcanal and found a buried copy of the newly instituted JN-25c9 code and cipher books. It was finally read in November 1942. On April 14, 1943, a decrypt revealed Imperial Navy Commander Yamamoto planned to visit Bougainville, Solomon Islands. Four days later, 18 long-range US P-38 fighters shot down his plane.¹⁶⁷

By mid-1943, American naval and air power had forced the Japanese largely onto the defensive. In May, the Alaskan islands were recaptured, as was Tarawa in the Gilbert Islands in the central Pacific. By November, US forces had invaded Bougainville, part of the Japanese defensive perimeter for its major base at Rabaul, New Britain. SIGINT tipped off the Navy to a planned Japanese reinforcement of New Guinea. The subsequent March 2-4 Battle of the Bismarck Sea, in which Allied air forces and PT boats sank all eight transports and five escorts, ended Japanese attempts to reinforce Lae, a major New Guinea port, by sea.

"No cryptologic continuity on Japanese [Army] communications had been built up before Pearl Harbor, principally because of the impossibility of intercepting the existing Japanese military nets either in the home islands or on the mainland of East Asia. It was not until April 1943 that an initial entry was made into one of the principal Japanese Army systems."¹⁶⁸

160. Ibid, 526.

161. Ibid, 378.

162. Andrew, *President's Eyes Only*, 125.

163. Budiansky, *Battle of Wits*, 319.

164. Ibid, 325.

165. Robert Louis Benson, *A History of US Communications Intelligence during World War II: Policy and Administration, Volume 8, World War II, Series IV, United States Cryptologic History* (National Security Agency: Center for Cryptologic History, 1997), 46. "The Flag Officers Code was never solved by the Americans." NSA, Pearl Harbor Review – JN25.

https://www.nsa.gov/about/cryptologic_heritage/center_crypt_history/pearl_harbor_review/jn25.shtml.

166. Marshall to Dewey, September 25, 1944, SRH-043, cited in Andrew, *President's Eyes Only*, 142-143.

167. Budiansky, *Battle of Wits*, 325.

168. John Patrick Finnegan & Romana Danysh, *Military Intelligence, Army Lineage Series, Center of Military History*, (Washington, DC: United States Army, 1998), 78, http://www.history.army.mil/html/books/060/60-13-1/cmhPub_60-13-1.pdf.

General Douglas MacArthur, commander of the Southwest Pacific, however, did not embrace SIGINT or the OSS. “General Douglas MacArthur in the South Pacific and Admiral Chester Nimitz in the Central Pacific saw little use for OSS.”¹⁶⁹ MacArthur’s preference was clearly slanted toward visual reconnaissance, including both aerial and coast watcher sources; he seldom passed on SIGINT-related intelligence received from FRUMEL.¹⁷⁰ Nonetheless, SIGINT played an important role in his campaigns. A watershed occurred when the Australians captured the Japanese Twentieth Division’s entire cryptologic library in January 1944 at Sio, New Guinea. “From the time of the capture of the Sio material until the end of the war, the Allies read approximately 2,000 messages a day.”¹⁷¹ SIGINT’s greatest contribution to the New Guinea campaign was the discovery of a Japanese convoy carrying reinforcements. In late April and early May 1944, US submarines sank the convoy, causing the Japanese to lose all of the equipment and 4,000 troops, frustrating the Japanese plan to reinforce western New Guinea and allowing MacArthur to speed up his western New Guinea offensive.¹⁷²

Geography of the Pacific helped Allied SIGINT. Isolated on islands, the Japanese had to communicate over the air code change instructions in the old code, which gave Allied cryptographers the instructions at the same time.¹⁷³

China. “At least a dozen American intelligence units operated in China over the course of the war, all of them competing for sources, access, and resources....”¹⁷⁴ The US Navy enjoyed a better relationship with the Chinese than did either the British, who the Chinese suspected of having further colonial ambitions, or the OSS. US naval intelligence placed personnel in China to provide essential weather information to the Pacific fleet. Under the Sino-American Cooperative Organization (SACO), coast watchers also provided information on Japanese movements and conducted sabotage in conjunction with Nationalist Chinese guerillas.¹⁷⁵ “Tai Li [head of the Nationalist Chinese

intelligence service] demanded that American intelligence operations in China be run – wherever possible – by the office of Capt. Milton E. Miles, the commander of [SACO].” “Gen. Claire L. Chennault, creator of the famous ‘Flying Tigers’ and chief of US air power in China, needed accurate target intelligence. OSS filled his need through an ‘Air and Ground Forces Resources Technical Staff.’”¹⁷⁶

Japanese intelligence was “uncoordinated, unsophisticated, and inept.” The Imperial General Staff had no intelligence organization. Strategic decisions were made by a committee unaffected by intelligence. There were separate Army and Navy intelligence offices, plus other intelligence related organizations in the Foreign Ministry and Greater East Asia Ministry, which disseminated their reports separately. The Japanese relied heavily on espionage and fifth column reports, although it enjoyed extensive SIGINT success against Chinese codes and limited success against British and US codes. Japanese HUMINT collapsed in the US with the FBI arrests after Pearl Harbor, and the FBI’s efforts limited Japanese collection activities in Latin America. The geography of the Pacific with American control of the sea and air “meant in the later stages of the war the Japanese ... were forced to rely on intelligence reports from Berlin and neutral capitals, plus radio traffic analysis and inferences from American sea and air activity.”¹⁷⁷

The Great Deception: “Fortitude” and the Normandy Landings – 1944

The Normandy landings (“Overlord”) were a daring and risky Allied undertaking the Nazi defenders fully expected. The invasion’s success can be attributed to good Allied intelligence and intelligence-enabled deception. “Most secret sources” (i.e., ULTRA intercepts) and “special means” (i.e., controlled enemy agents) were the two most powerful tools of the trade and were the keys to Allied success with deception. There had been extensive Allied deception operations in all theaters of the war. In 1942-1943, the strategic aim was to keep as many Axis forces as possible away from the Eastern and Mediterranean Fronts. In 1944, the aim was to encourage the Nazis to hold back as many forces as possible to repel a future attack at the Pas de Calais.¹⁷⁸ In June 1943, Thomas “Tar” Robertson, operational chief of the XX program, reached the startling conclusion that every single German agent in

169. Warner, *Office of Strategic Services*, 8.

170. Parker, “Priceless Advantage,” footnote 42, 19.

171. Sharon A. Maneki, “The Quiet Heroes of the Southwest Pacific Theater: An Oral History of the Men and Women of CBB and FRUMEL,” *United States Cryptologic History*, Series IV, World War II, Volume 7 (National Security Agency: Center for Cryptologic History, reprinted 2007), 23, 28.

172. *Ibid.*, vii.

173. *Ibid.*, 38.

174. Warner, *Office of Strategic Services*, 37.

175. Linda Kush, *The Rice Paddy Navy: US Sailors Undercover in China; Espionage and Sabotage Behind Japanese Lines During World War II* (Oxford: Osprey Publishing, 2013, Kindle edition); Warner, *Office of Strategic Services*, 37.

176. Warner, *Office of Strategic Services*, 37.

177. Holt, *The Deceivers*, 61, 109-112.

178. *Ibid.*, 98.

Britain was actually under his control. The XX system was, in fact, a weapon.¹⁷⁹

In November 1943, the Japanese military attaché in Berlin sent a 32-part report to Tokyo on the Western Wall defenses, which "... gave a detailed account of the numbers and sites of every element in the coastal defense system, from the heaviest coastal battery down to grenade throwers...."¹⁸⁰ In the second half of the war, the Japanese Embassies in Europe were to prove of immense intelligence value because they were repeating back to Tokyo their versions of German assessments and their knowledge of German intentions. The MAGIC intercepts were almost as valuable on some subjects (such as the Normandy landings) as were the direct ULTRA intercepts from the German horse's mouth.¹⁸¹ Little did the Japanese know they were sharing this detailed intelligence with the Allied invasion planners.

"Fortitude South" was the deception plan for the Normandy landings. Its strategic aim was to disguise the date of attack, exact location, and its nature – to raise in the Germans' minds whether it was the "real" invasion or a preliminary feint. "Fortitude North" was related to a potential invasion of Norway from northern Britain, playing to a known fear of Hitler. Operation Copperhead used a look-alike actor to imitate Field Marshal Bernard Montgomery who was paraded before a known German agent in Gibraltar just before D-Day, suggesting an invasion was not imminent. Operation Ironside threatened an attack in the Bordeaux region of southwestern France from southern Britain and the US.¹⁸²

SIGINT revealed that the "Germans greatly exaggerated Allied strength in Britain in 1943."¹⁸³ Allied deception planning played to this misperception. Deception planners created the First US Army Group (FUSAG) under then Lieutenant General George Patton, believed by the Germans to be one of the Allies best combat generals, with 150,000 men in southeastern England. A "[h]uge effort went into physical deception, camouflage, and signals traffic, but the Germans were not really paying attention. And why would they? They had numerous spies on the ground providing copious evidence of exactly what was going on." Principal among the deception agents were Roman Garby-Czerniawski (Brutus), a Polish captive, recruited by the Abwehr and sent to Britain who then

volunteered to the British; and Pujol (Garbo), who ran a fictional network of sub-agents.¹⁸⁴ German aerial reconnaissance over Britain was very limited. Thus much of the visual and SIGINT deception efforts were wasted.

In March 1944, GC&CS broke the Fish radio-teletype link between Field Marshal Karl von Rundstedt, commander of German forces in the west, and Berlin.¹⁸⁵ This new SIGINT source provided high-level German plans and intentions and estimates of the invasion threat. "The Allied deception plan that would prove crucial in the success of D-Day owes a great debt to Bletchley Park's breaking of the German teletype machine."¹⁸⁶

On April 20, 1944, a Japanese naval attaché message reported that the Germans expected the invasion would be centered on Boulogne and revealed Rommel's strategy to defeat the landings on the beach.¹⁸⁷ On May 27, nine days before D-Day, Japanese Ambassador Baron Hiroshi Ōshima lunched with Hitler. On June 1, Ōshima's intercepted message to Tokyo confirmed that Allied deceptions had led the Germans to overestimate Allied strength and that Hitler believed the major assault would be at the Pas de Calais.¹⁸⁸ Enigma decrypts revealed that "... the Germans did not believe in the few days before D-Day that the landings were imminent, and they remained uncertain of their destination." Meanwhile Allied SIGINT, photoreconnaissance, and resistance reports "enabled the Allies to make an all but totally accurate assessment of the German order of battle in the Overlord area on D-Day ..."¹⁸⁹ and to cripple heavy defenses. Photoreconnaissance was used extensively to target German batteries. On D-day, only four batteries were active in the assault area; 21 had been damaged or destroyed.¹⁹⁰

Appreciating the importance of intelligence, on D-Day, the Allies bombed the German's jammers and knocked out the headquarters of the Luftwaffe's SIGINT service and large portions of their radar network.¹⁹¹ Bombing and jamming reduced German radar coverage to 5%.¹⁹² Knocking out the Luftwaffe's SIGINT capabilities contributed to the lack of air attacks against the D-Day forces. As the Germans had lost their meteorological ships, they did not expect

179. Macintyre, *Double Cross*, 1, 4.

180. Hinsley, *British Intelligence*, 436-437.

181. Hinsley, Cambridge address.

182. Macintyre, *Double Cross*, 235.

183. Holt, *The Deceivers*, 481

184. Macintyre, *Double Cross*, 227.

185. Hinsley, *British Intelligence*, 439.

186. Budiansky, *Battle of Wits*, 315.

187. Hinsley, *British Intelligence*, 448, 460.

188. Macintyre, *Double Cross*: 309; Hinsley, *British Intelligence*, 449.

189. *Ibid.*, 450-453.

190. *Ibid.*, 466.

191. R.V. Jones, *Most Secret War*, 411-412.

192. Hinsley, *British Intelligence*, 467.

landings in such bad weather as there was on June 4/5.¹⁹³ Enigma decrypts and intercepted ship-to-ship tactical communications allowed the Allies to map the German minefields off the beaches “which proved to be of crucial importance for the success of the landings.” Air attacks crippled German mine-laying boats.¹⁹⁴

While Overlord was a tactical success, the German forces positioned near the Pas de Calais posed an existential threat to the Allied armies in Normandy. Allied deception efforts continued after the Normandy landings emphasizing the mythical threat from Patton’s FUSAG. “German troops could be redeployed from Calais to Normandy in a matter of days: every hour the deception held firm would be measured in thousands of lives saved; if it failed, the butcher’s bill would soar.” “Allied casualty rates averaged 6,674 a day for the seventy-seven days of the Normandy campaign. Those numbers would have been far higher, had it not been for...” the XX operators.¹⁹⁵

In early July, Japanese diplomatic messages revealed that the Germans still believed Patton’s FUSAG would land at the Pas de Calais with 23 divisions. A July 7 Japanese naval mission message reported there were 30 divisions in England waiting to land. And a July 10 Japanese ambassadorial message to Tokyo reaffirmed that belief.¹⁹⁶ The continued deception delayed a massive German reaction for over a month allowing the Allies to greatly build their strength.

Post mortem studies of the D-Day landings “attributed [its] remarkable success ... at so little cost in large measure to the excellence of the intelligence on the defences and the topography of the invasion area.”¹⁹⁷ This was in sharp contrast to the intelligence of the August 1942 Dieppe raid. The Naval commander ignored warnings based on SIGINT of German ships in the area and many landing craft were caught offshore and the Dieppe defenders were alerted to the landing. Poor topographical intelligence resulted in the Allied tanks being unable to scale the rocky beach. Of the 5,000 raiders involved, 70% were killed, wounded, or captured in the debacle.¹⁹⁸ One failing in Normandy, however, was not foreseeing the challenge of the countryside’s hedgerows. The Allies’ advance

was stalled several days until tanks could be outfitted with plows to break through these obstacles.¹⁹⁹

Six weeks after the Normandy landings, on August 15, 1944, the Allied landings (“Dragoon”) in southern France achieved total surprise. OSS agents provided detailed intelligence on troop dispositions, defense, fortifications, and minefields. The 7th Army G-2, Colonel William Quinn, later said, “We knew everything ... and where every German was. And we clobbered them.”²⁰⁰ The Germans were concerned about a landing at Genoa, Italy, another Allied deception story.²⁰¹

The Drive Across France

Trapped between the advancing Allied armies and hounded by the French resistance, aided by joint British SOE-Free French-American OSS Jedburgh teams, the deterioration of the German position in Normandy resulted in much increased Enigma traffic and intercepted tactical communications.²⁰² By the time of the Third Army’s breakout (Operation Cobra) Patton (no longer the “commander” of the mythical FUSAG in Britain) had become an astute consumer of SIGINT. ULTRA provided extremely accurate OB information, often having exact figures down to the man and the gun for German units facing the Third Army. “An army has never moved as fast and as far as the Third Army in its drive across France, and ULTRA was invaluable every mile of the way.” It is unclear whether Patton had much knowledge of communications intelligence (COMINT) or exposure to it during the North African or Sicilian campaigns, but he learned its worth in the drive across Western Europe after the D-Day landings.²⁰³ Tactical SIGINT was welcomed when it disclosed specific enemy intentions (e.g. a maneuver or attack) in time for commanders to prepare an effective response. It was highly valued if it revealed specific vulnerabilities (e.g., shortages in either fuel or certain ammunition) of enemy units within reach that a commander could then exploit. But by far, the bulk of SIGINT that mattered to ground forces consisted of enemy unit identifications and DF fixes.²⁰⁴ The Jed-

193. Ibid, 468.

194. Ibid, 461-2.

195. Macintyre, *Double Cross*, 6.

196. Hinsley, *British Intelligence*, 496, 500.

197. Ibid, 471. Not to be overlooked were the contributions in Normandy of the French Resistance and the 93 Jedburgh teams operated by the OSS and SOE. Warner, *Office of Strategic Services*, 16.

198. David, *Military Blunders*, 103, 115.

199. Observation of General James A. Van Fleet, then a colonel commanding the 8th Infantry Regiment on D-Day, as told to Joseph Goulden. Private e-mail in author’s library.

200. Waller, *Wild Bill Donovan*, 265.

201. Holt, *The Deceivers*, 619-620.

202. Hinsley, *British Intelligence*, 506.

203. Based upon a contemporary report written by Major Warrack Wallace, “General Patton and COMINT” http://www.nsa.gov/about/cryptologic_heritage/center_crypt_history/almanac/index.shtml#article3.

204. George F. Howe, “American Signal Intelligence in Northwest Africa and Western Europe,” *United States Cryptologic History*, Series IV, Volume I (Center for Cryptologic History, National Security Agency,

burgh teams often provided vital topographical and OB intelligence to rapidly advancing Allied forces that outran their map and intelligence support.²⁰⁵

From SIGINT, the Allies learned that German ground troops were abandoning southern and southwestern France and were returning to defend the Fatherland.²⁰⁶ ULTRA also revealed German stay-behind agents. OSS X-2 and Allied agents captured most and some turned into additional “special means.”²⁰⁷ But with the collapsing German Army, strategic deception opportunities dwindled.

Eastern Front

Two weeks after the Normandy landings, the Red Army opened a coordinated major offensive in the center of the Eastern Front, taking Minsk, and giving the Germans a defeat on the scale of Stalingrad. By mid-July, the Soviets launched two more major attacks. By mid-August, the Germans abandoned Estonia and Latvia on the Baltic coast. The southern offensive resulted in the collapse of Germany’s allies, Romania and Bulgaria; and, by the end of September, the Soviets entered Yugoslavia. Budapest was captured in mid-February. Soviet intelligence had improved greatly during the war – the Soviet Air Force had expanded its photoreconnaissance capabilities and Moscow was reading German communications – and contributed to effective deception operations against the Wehrmacht.²⁰⁸

The Soviets had a large number of GRU and NKVD agents inserted with Tito’s Yugoslav partisans and other teams in Hungary. Tito’s partisans fought both the Germans and their Chetnik collaborators. GC&CS SIGINT and reports from the SOE teams in Yugoslavia provided the British with details of the partisan infighting.²⁰⁹ Hungarian counterintelligence left the SOE operations largely alone and cooperated with MI6 against the USSR in the conflict’s later stages.²¹⁰

Final Surprises and Allied Victory in Europe: 1944 – 1945

Despite Allied successes, German military resistance remained formidable. Hitler hoped for new weapons to reverse the tide of war. And despite overwhelming material resources and insight into German plans and intentions, intelligence failures contributed to costly Allied reverses.

V-Weapons: British intelligence received hints of new long-range Nazi weapons from the initial Oslo report in 1939. In December 1942, a Danish chemical engineer reported to MI6 that rockets with a 200-kilometer range were being developed at Peenemünde, Usedom Island, on the Baltic coast. Bugging of two German general officer POWs mention a 200-kilometer rocket program.²¹¹ In April 1943, the first photoreconnaissance of Peenemünde in almost a year revealed a “torpedo-line” object. A June Enigma decrypt referred to winged rockets and London as a target. One of Allen Dulles’ covert agents in the Abwehr provided confirmation of the V-1 and V-2 programs.²¹² The accumulating intelligence prompted a heavy bomber raid on Peenemünde on the night of August 17/18 that delayed the rocket program up to six months.²¹³ Days later, a V-1 winged drone crashed on Sweden’s Bornholm Island, and the Swedes provided intelligence about the wreckage to the British. In September 1943, R. V. Jones, the chief of scientific intelligence for the Air Ministry and MI6, warned of the construction of rocket launch sites in Belgium and northern France, on which the French Resistance provided much of the intelligence.²¹⁴ The first V-1 attacks began a week after the Normandy landings.

Tactical SIGINT gave British air defenses advanced notice of most of the V-1 launches, often 70 minutes before acquisition by radar. The XX Committee employed doubled agents’ reports to deceive the Germans as to the accuracy of the V-1s. From January 1941 to September 10, 1944, there was no Luftwaffe aerial reconnaissance of London, so the Germans were reliant on the false agent reports. From September to December 1944, of the 1,300 V-1s launched, only 66 reached London. Air defenses, tipped off by SIGINT and aided by radar, destroyed 60% of those crossing the English Channel.²¹⁵

2010, completed in 1980, declassified in 2010), 170.

205. Will Irwin, *The Jedburghs: The Secret History of the Allied Special Forces, France 1944* (New York: Public Affairs, 2005).

206. Howe, “American Signal Intelligence,” 187.

207. Holt, *The Deceivers*, 648.

208. The. Zdzislaw J. Kapera, “Summary Report of the State of the Soviet Military Sigint in November 1942 Noticing ‘ENIGMA.’” *Cryptologia* 35, No. 3 (July 2011), 247-56. See also Robert W. Stephan’s *Stalin’s Secret War: Soviet Counterintelligence Against the Nazis, 1941-1945* (Lawrence, KS: University of Kansas Press, 2003). Reviews at http://intellit.muskingum.edu/russia_folder/russiawwii_folder/russiawwiiigenk-z.html.

209. Hinsley, *British Intelligence*, 357.

210. Author’s notes from lecture by Dr. Laszlo Ritter, Hungarian Academy of Sciences, at the Cryptologic History Symposium, Johns Hopkins Applied Physics Laboratory, 2013.

211. For insight into how the British tapped high-ranking German POWs see Sönke Neitzel (ed.), *Tapping Hitler’s Generals: Transcripts of Secret Conversations, 1942-45* (London: Frontline Books, 2013).

212. Kahn, “Intelligence in World War II,” 18.

213. R. V. Jones, *Most Secret War*, 360-361.

214. Ibid, 364.

215. Ibid, 421-2. Hinsley, *British Intelligence*, 567-570.

There was very little intelligence on the V-2.²¹⁶ An Enigma decrypt indicated one test flew over 160 miles (250 kilometers) and impacted in Sidlice, Poland. In June 1944, an errant V-2 fell on Sweden. The Swedes provided the British pieces in exchange for jammers and the results of British analysis. But there ensued a technical debate within the British establishment over the range, warhead, and accuracy of V-2s. Some did not believe such a weapon was possible. Certainly the British had never attempted such a weapon.²¹⁷ On September 8, 1944, the first V-2 landed on London. Their launch pads were hard to detect in aerial photos. Radar gave only a few minutes warning. Of the 1,190 V-2s launched against Britain, 1,054 landed in the country, half on London.²¹⁸

Market Garden: Despite its successes in France, Allied intelligence was fallible. A failure to heed intelligence warnings contributed to the disastrous September 1944 airborne invasion of the Netherlands. Enigma decrypts, Dutch underground reports, and aerial reconnaissance all indicated elements of four German divisions, including two Panzer, in the target area of Arnhem. One Enigma message indicated that the Germans believed Arnhem to be the Allies' objective.²¹⁹ Field Marshal Montgomery, the British commander, believing that the Germans would not put up a fight, dismissed the intelligence. Operation Market Garden, launched on September 17, was a failure. After heavy losses, the British and American airborne forces retreated on September 25. The Market Garden disaster is a case when bias reigned over evidence. The British corps intelligence officer was dismissed for insisting that the intelligence was accurate.²²⁰

Battle of the Bulge: On December 16, 1944, under heavy overcast, the Wehrmacht launched a massive counterattack against the thinly held Allied line in the Ardennes Forest of Belgium and Luxembourg. Preoccupied by its own offensive against the Siegfried Line,²²¹ the Allies were caught by surprise. Ignored intelligence indicators and mistaken judgments, coupled with good German security, contributed to the Allied surprise.

Decrypted Japanese diplomatic messages from Berlin forewarned of a planned German offensive as early as late August. By the end of September,

British intelligence was aware of a major German mobilization of up to 60 divisions. SIGINT revealed plans for a major Luftwaffe deployment to the west of close support aircraft. POW interrogations and civilian eyewitness reports indicated a forthcoming offensive.²²² In October, the Abwehr and SD changed cipher procedures; their messages were not recovered until December, too late for any warning.²²³ Also, the Germans practiced strict radio discipline in early December, often an indicator of a coming offensive. But British assessments underestimated German strengths and plans and did not imagine the risks Hitler would take.²²⁴ Recent revelations suggest that Hitler was a heavy user of drugs, including methamphetamines that give a feeling of euphoria but are mentally destructive. How this may have affected his risk-taking in the Battle of the Bulge is open to speculation. Evidence of this is contained in a US military intelligence dossier, but the source(s) of the intelligence are not public.²²⁵ Furthermore, Allied euphoria at the collapsing German Army reinforced old habits of ignoring intelligence.

By December 19, SIGINT revealed to the Allies that the Wehrmacht was headed for the Meuse River and the port of Antwerp. Allied ground and air counterattacks and German supply difficulties finally stalled the offensive. The battle, the biggest and bloodiest battle fought by the US during the war, lasted until the end of January 1945; 19,000 GIs were killed and 70,000 wounded.²²⁶ SIGINT was not decisive in the Battle of the Bulge, but did give the Allies an advantage.²²⁷ Allied attempts at deception, however, were "defeated by the [Allied Military Police] radio net, which ... handed the true information to the Germans 'on a silver platter.'" German tactical SIGINT was good.²²⁸

The results of Hitler's Ardennes offensive were even worse than his generals had feared. Although it had delayed Eisenhower's planned drive into Germany by about six weeks, it had resulted in well over 100,000 German casualties, over 600 ruined armored vehicles, and a loss of over 1,000 aircraft. German resources

216. Ibid, 571.

217. R.V. Jones, *Most Secret War*, 430-461.

218. Ibid, 459; Hinsley, *British Intelligence*, 571.

219. Ibid, 544.

220. David, *Military Blunders*, 117-132.

221. From mid-September, the US and Germany were locked in a struggle of attrition in the Hurtgen Forest area south of Aachen and north of the Ardennes.

222. Hinsley, *British Intelligence*, 550-66 and Collier, *Hidden Weapons*, 297-299.

223. Holt, *The Deceivers*, 126-127.

224. Hinsley, *British Intelligence*, 550-66.

225. The Independent, "Hitler was 'a regular user of crystal meth,' American Military Intelligence dossier reveals," October 25, 2014. For a physician's perspective see D. Doyle, "Adolf Hitler's Medical Care," *Journal of the Royal College of Physicians of Edinburgh* 35 (1), 75-82.

226. Stephen E. Ambrose, *Americans at War* (Oxford, MS: University Press of Mississippi, 1997), 52.

227. Hinsley, *British Intelligence*, 550-566.

228. Holt, *The Deceivers*, 658.

had been largely wasted, and that meant that when the Russians and the Western Allies renewed their attacks, both would be able to advance more rapidly. The tying-up of the German reserves in the Ardennes offensive proved a godsend for the Red Army, which opened its winter offensive on the Eastern Front on January 12, 1945, eventually enabling it to reach its principal objective, Berlin, before the Western Allies.²²⁹

In the final months of the war, OSS recruited “volunteer” agents from Axis POWs and inserted more than 200 into Germany. “[T]he data they collected on industrial and military targets significantly aided the final Allied air and ground assaults on Germany.²³⁰ In the spring of 1945, high-ranking German officials began to explore secret peace arrangements. OSS Switzerland chief Allen Dulles brokered the surrender of German forces in Italy in April, saving many lives.²³¹

In the final weeks of the war, “[t]he Allies had obtained good tactical intelligence during these advances from [photoreconnaissance], POW, and especially from Y [operational tactical SIGINT], the enemy’s VHF links supplying a steady flow of information in plain language.”²³² By late April, the speed of the Allied advance and overwhelming superiority made operational intelligence largely superfluous.²³³ Germany surrendered on May 8, 1945.

Post-Conflict Lingering Concerns. As the war drew to a close, two topics of great interest prompted formation of separate intelligence task forces. One was ALSOS, the other was TICOM.

The ALSOS (Greek for “grove”) mission focused on capturing German scientific and technical knowledge, especially information on German R&D on atomic weapons and biological research. Its ostensible medical mission was to camouflage and divert attention from the primary objective of atomic intelligence.²³⁴

The technological superiority of German tanks, jet aircraft, and rockets had caused the Allies great

concern.²³⁵ The Target Intelligence Committee (TICOM) mission also included capturing German cryptographic information and equipment. One revelation was the discovery of a hitherto unknown Nazi Party SIGINT unit separate from all others under the control of Hermann Göring. Another was a German machine for breaking Soviet codes.²³⁶

Victory in the Pacific

By late 1944, overwhelming American naval and air power forced the Japanese onto the defensive on most fronts. In June 1944, US Marines captured the islands of Saipan, Guam, and Tinian in the Marianas campaign, which became B-29 bases for the strategic bombing of the Japanese homeland islands. SIGINT allowed the Army Air Forces to exact a high price on Japanese ships and men going to Leyte Island, Philippines. The October 23-26 Battle of Leyte Gulf, the largest naval battle in history, broke the back of the remaining Japanese fleet, assuring Allied naval and air superiority in the Pacific. After this, the Japanese had to abandon large garrisons that they could no longer resupply.²³⁷

In the Philippines, guerillas controlled almost half of the country and provided MacArthur with much of his intelligence on the Japanese. In December, the main island of Luzon was invaded; fighting continued until the end of the war.

Intelligence proved fallible with the February 19, 1945 invasion of Iwo Jima when it did not discover a change in Japanese defense strategy. The extensive Japanese tunneling and defense in depth, not at the beach as previously encountered, belied the intelligence estimate that the island would fall within a week. It did so finally on March 26.²³⁸

On April 1, Okinawa was invaded. The ferocious fighting and kamikaze (“divine wind”) attacks, which took a heavy toll of an estimated 65,000 Allied killed and wounded, lasted until mid-June. The level of casualties was to have a significant influence on later Allied strategy toward Japan. The last major naval engagement took place on April 7, 1945, when tipped by SIGINT, US submarines on reconnaissance patrol

229. Franz Kurowski, “Dietrich and Manteuffel,” in Correlli Barnett (ed.), *Hitler's Generals* (New York: Grove Weidenfeld, 1989), 432.

230. Warner, *Office of Strategic Services*, 22.

231. *Ibid.*

232. VHF is very high frequency, referring to tactical radios. Hinsley, *British Intelligence*, 610.

233. *Ibid.*, 611.

234. From a captive “...we obtained the first substantial picture of German BW activities. It was a totally amateurish profile and allowed us pretty well to exclude any danger from the use of such weapons in the final phase of the conflict. This essentially coincided with the findings of our physicist colleagues concerning nuclear developments.” “An analysis of the assembled documents confirmed our earlier judgment that German interest in BW had been short-lived and amateurish.” Carlo Henze, M.D. “Recollections of a Medical Intelligence Officer in World War II.” *Bulletin of the New York Academy of Medicine* 49 (11), November 1973, 966, 970-971, 973.

235. TICOM Archive: *Secret Intelligence in Nazi Germany*. <http://www.ticomarchive.com/home/origin-of-ticom>.

236. https://www.nsa.gov/public_info/_files/european_axis_sigint/Volume_7_goerings_research_bureau.pdf. Review of James Bamford’s book *Body of Secrets*, *Cryptologia* XI (3), 129-141 (July 1987). See also <http://www.ticomarchive.com/iv-case-studies/russian-fish>.

237. Maneki, *Quiet Heroes*, 38.

238. Jeff M. Moore, “The High Cost of Faulty Intel,” *Naval History*, February 2005. http://www.military.com/NewContent/0,13190,NH_0205_Intel-P1,00.html.

spotted 10 Japanese warships, including the large battleship *Yamato*, sailing toward Okinawa. Navy aircraft sank the *Yamato*, one cruiser, and four destroyers.²³⁹

Allied intelligence²⁴⁰ enjoyed a significant advantage over Japanese intelligence. Japanese codebreakers were decentralized and fragmented. Although the Japanese could read Chinese military and diplomatic codes, some British weather and merchant codes, and American aircraft movement codes, especially in MacArthur's Southwest Pacific Theater, a post-war Japanese assessment stated:

Our [Japanese] navy was not able to break the American military's code(s); our intelligence appreciations and strategic estimates were primarily based on communications intelligence which was derived from enemy traffic analysis, call sign identification, direction-finding bearings, and interception of plain language transmissions (particularly those of aviators when airborne)... only a few of our many intelligence estimates based on communications intelligence really 'hit the mark,' and our navy's confidence in them was, therefore, relatively low.²⁴¹

B-29 operations became a priority target for Japanese SIGINT, which could exploit open air-to-air communications and do traffic analysis. Japanese SIGINT broke call signs for the B-29s in 1944 and would alert radar stations and interceptor aircraft. In early August 1945, a US intercept revealed that Japanese COMINT was following the unusual operations of the 509th Bomb Group, which was conducting trials for the atomic bomb.²⁴²

Invasion of Japan and the A-Bomb Decision

The Army and Navy disagreed over the strategy to defeat the Japanese in their home islands. The Navy preferred a strategy of blockade and bombardment to weaken the Japanese military. MacArthur, by this time the overall land and air forces commander in the Pacific, pushed for an amphibious invasion of Kyūshū ("Nine Provinces"), the southernmost home island, and later attacking Honshū ("Main Island") near

Tokyo.²⁴³ The debate was unsettled when President Roosevelt died on April 12, 1945.

Also being debated at political levels was the meaning of "unconditional surrender" contained in the July 26 Potsdam Declaration. Assistant Secretary of State Joseph C. Grew, the leading Japan expert in the State Department, proposed keeping the Emperor even with unconditional surrender.²⁴⁴ On July 13, while President Truman was en route to the European victors' conference at Potsdam, SIGINT revealed the Japanese had approached Russia to negotiate a peace. But SIGINT also revealed divided opinions of Japanese leaders.²⁴⁵

Previously, in May, while fighting still raged on Okinawa, the Joint Chiefs of Staff (JCS) agreed on Project "Downfall," the invasion of the Japanese home islands. However, SIGINT was providing indications of what invading forces would face. The original estimates were for 246,000 defenders on Kyūshū. Anticipated US casualties were projected at 193,000. As SIGINT accumulated, the estimate grew to over 1,100,000 defenders with many kamikaze forces. MacArthur and Army Chief of Staff Marshall differed on the estimates. "MacArthur's practice was to not allow intelligence to interfere with his aims, and his history of complaints about [his intelligence chief] Willoughby's reports resulted mainly from their contradiction of his own estimates and preferred courses of action."²⁴⁶ MacArthur challenged the accuracy of intelligence estimates. In a cable to Marshall, MacArthur stated:

Throughout the Southwest Pacific Area campaigns, as we have neared an operation, intelligence has invariably pointed to greatly increased enemy forces. Without exception, this buildup has been found to be erroneous.²⁴⁷

However, "[in] those instances during MacArthur's Pacific campaign when the ULTRA-derived

239. William H. Garzke & Robert O. Dulin, *Battleships: Axis and Neutral Battleships in World War II* (Annapolis, Maryland: Naval Institute Press, 1985), 60.

240. By this time in the war, the US and Australia enjoyed a close SIGINT partnership.

241. Edwin T. Layton (translator), "America Deciphered Our Code," *Proceedings*, June 1979, 98-100, derived from Volume 43 of the Japanese War History Series, Chapter 14, Section 3, 591-592.

242. Author's notes from the 2013 Cryptologic History Symposium.

243. Douglas J. MacEachin, *The Final Months of the War With Japan: Signals Intelligence, US Invasion Planning, and the A-Bomb Decision* (Central Intelligence Agency: Center for the Study of Intelligence). <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/the-final-months-of-the-war-with-japan-signals-intelligence-u-s-invasion-planning-and-the-a-bomb-decision/csi9810001.html>, 3-4.

244. Richard B. Frank, *Downfall: The End of the Imperial Japanese Empire*. (New York: Penguin, 1999), 214.

245. Andrew, *President's Eyes Only*, 152-3; and Frank, *Downfall*, 238.

246. Douglas J. MacEachin, *Final Months*, 223; and Thomas B. Allen & Norman Polmar, *Codename Downfall: The Secret Plan to Invade Japan – and Why Truman Dropped the Bomb*. (New York: Simon and Schuster, 1995), 224.

247. MacEachin, *Final Months*, 35, footnote 86, citing Message C31897, MacArthur to Marshall: CINCPAC to WARCOS, 9 August 1945. Naval Historical Center and MacArthur Bureau of Memorial Archives, WD1106.

assessments were not entirely accurate, the errors tended to be on the low side.”²⁴⁸

President Truman’s concern with casualties was conditioned by the bloody battle for Okinawa, in which Japanese civilians as well as the military fought US forces. Kamikaze attacks had taken a heavy toll of Navy ships, sinking approximately 50 US and Canadian ships.²⁴⁹ Marshall told the President that casualties would probably exceed the official number to be approximately 250,000. That and “[d]ecrypted messages from Tokyo [that] indicated that the Japanese would not surrender even if the Allies launched an all-out land invasion of the country ... played a role in ... Truman’s decision to drop the atomic bomb on the country.”²⁵⁰ On August 6, the first atomic bomb was dropped on Hiroshima. Three days later, the second destroyed Nagasaki. On August 14,²⁵¹ Japan agreed to unconditional surrender. The last hostilities ended a month later when Japanese forces in Burma surrendered.

Conclusions

Historian John Keegan has written “[w]ithout our knowledge of Ultra and Magic, it would be impossible to write the war’s history; and, indeed, all history of the war written before 1974, when the Ultra secret was revealed for the first time, is flawed by reason of that gap.”²⁵²

Intelligence played a far more prominent role in World War II than in any previous conflict. After a while, it became a strategic advantage for the Allies. In 1939, Allied intelligence was ill-prepared for the conflict. German and Japanese intelligence had been active for years preparing for war.

Before the war, US intelligence was fragmented between the War and Navy Departments and the FBI. All were underfunded and engaged in interagency bickering. The Army and Navy fought over the collection, production, and reporting of SIGINT. The FBI pushed for its own role and carved out Latin America as its own sphere. All opposed the creation of the OSS, and the Army, Navy, and JCS denied OSS access to SIGINT.²⁵³ Each had independent agreements

with the British regarding intelligence exchange and cooperation.

The British were the senior partners in Allied intelligence activities, especially their application to deception efforts against the Nazis. Suspicion of the Americans, especially concerning security, evaporated slowly. “London insisted that the Americans imitate British security practices to protect the vital ULTRA secret from unauthorized disclosures.” “This British caution kept the Americans in the awkward status of junior partners for much of the war, particularly during the planning for covert action in support of the D-Day landings in Normandy in 1944.”²⁵⁴

SIGINT was the most important source for strategic intelligence. Historian David Kahn notes “... codebreaking ... with its associated sorceries, such as direction-finding and traffic analysis, was by far the most important source of intelligence in World War II for both sides.”²⁵⁵ “[A]ll the intelligence the OSS produced never matched the value of the Ultra electronic intercepts in Europe and Magic in the Pacific.”²⁵⁶ In the early years, many Allied commanders were not knowledgeable or trusting of SIGINT, which led to many disasters, e.g., the fall of Crete, surprise in the Philippines even after learning of the attack on Pearl Harbor, and the destruction of convoy PQ-17. Bias often overruled intelligence as evidenced by the surprise over the invasion of Norway; the loss of Royal Navy capital ships to Japanese aircraft off Malaya; the unexpected German forces refitting at Arnhem, the Market Garden objective; and MacArthur’s persistent disagreements with intelligence assessments, especially regarding the invasion of the Japanese home islands.

ULTRA – Enigma and Fish – and JN-25 and MAGIC (the decryption of Japanese diplomatic and attaché codes) were “the best intelligence available to British and American commanders.” Then CIA historian Michael Warner wrote “[w]ithout ULTRA and MAGIC, the war might have been lost.”²⁵⁷ British historian F. H. Hinsley opined that “we wouldn’t in fact have been able to do the Normandy Landings ... until at the earliest 1946, probably a bit later. It would have then taken much longer to break through in France.... And altogether therefore the war would have been something like two years longer, perhaps

248. Ibid, footnote 87.

249. Denis and Peggy Warner, *The Sacred Warriors: Japan’s Suicide Legions* (Aarhus, DK: Van Nostrand Reinhold, 1982).

250. Sulick, *Spying in America*, 162.

251. August 15 in Japan.

252. Keegan, *Intelligence in War*, 322.

253. [Author’s name redacted], “CIA-NSA Partnership: A Brave New World [Redacted],” Declassified “Secret//X1,” *Studies in Intelligence* 48 (2), (Summer 2004).

254. Warner, *Office of Strategic Services*, 29, 8-9.

255. Kahn, “Intelligence in World War II,” 7.

256. Waller, *Wild Bill Donovan*, 389.

257. Warner, *Office of Strategic Services*, 29. Most historians would qualify this statement, preferring a judgment that the war would have lasted longer.

three years longer, possibly four years longer than it was.”²⁵⁸ SIGINT proved vital in specific battles for both the Axis, e.g., in North Africa and the Atlantic; and the Allies, e.g., the Atlantic U-boat campaign and at Midway.

Ironically, MAGIC intercepts were very important in understanding Nazi thinking as Ambassador Hiroshi Ōshima reported in detail to Tokyo on his discussions with Hitler and others. Chief of Staff Marshall stated that Japanese messages from Berlin were “our main basis of information regarding Hitler’s intentions in Europe.”²⁵⁹

As valuable as strategic SIGINT was, operational or tactical SIGINT was most important for combat commanders, who also relied on more traditional intelligence sources – reconnaissance patrols, POW interrogations, and captured documents and equipment, especially cryptologic materials. The capture of Rommel’s SIGINT unit in North Africa had strategic significance by thereafter denying him his advantage. Captured radar components from downed aircraft and the Bruneval raid helped the British scientists develop effective countermeasures to Luftwaffe bombing of Britain.

Born in World War I, photoreconnaissance became vital for the air war and identifying strategic targets, especially German war industries and oil production. By mid-war, it had become an intelligence discipline of its own. The British were the pioneers in knitting together the various elements of intelligence (SIGINT, HUMINT, POW interrogations, reconnaissance, radar, etc.) for the purpose of supporting operations.²⁶⁰

Counterintelligence and subsequent double agent operations proved critical for deceptions. Much of this also depended on ULTRA decrypts. The surprise of the Normandy landings is perhaps the greatest wartime deception in history. Certainly, it was one of the most complex deception operations ever.

“Germany lost the intelligence war,” historian David Kahn notes. “At every one of the strategic turning points of World War II, her intelligence failed. It underestimated Russia, it blacked out before the North African invasion, awaited the Sicily landing in the Balkans, and fell for thinking the Normandy landing a feint.”²⁶¹ German intelligence was “disorganized and unregimented” with various elements competing.

258. Hinsley, Cambridge address.

259. Kahn, “Intelligence in World War II,” 12.

260. Comments of Dr. Michael Warner, US Cyber Command historian at the AFIO Symposium, May 1-3, 2014. Author’s notes.

261. Kahn, *Hitler’s Spies*, 539.

Intelligence “... findings streamed together only in the mind of Adolf Hitler.”²⁶² The greatest failing may have been in strategic analysis, which should have illuminated to the Germans the fact that it alone could not compete against the combined economic and potential military strengths of the Allies.²⁶³

The Japanese were not heavily invested in intelligence, which played a subordinate role in strategic decisions. Japanese policymakers and war planners were not interested in intelligence. Operations planners thought their judgments were superior to the intelligence departments in the Navy and Army.²⁶⁴ Japanese intelligence, which was “overwhelmingly military,” focused almost exclusively on collecting short-term operational intelligence.²⁶⁵ Like Germany, Japanese strategic intelligence failed. Japanese leaders “engaged in ‘best case’ analysis” concerning their enemies, especially the recuperative powers and industrial might of the US.²⁶⁶ “Any intelligence findings which indicated that America would fight back could not be accepted by the policy-makers in Tokyo. Nor would they examine evidence that the economic disparity between the United States and the Japanese Empire was so great that their defeat was certain.”²⁶⁷

Historian Ernest May has noted that “... intelligence estimates are useful only if acceptable to the people who have to act on them.”²⁶⁸ In many cases, both Axis and Allied decision makers and commanders ignored or rejected intelligence. May also noted that “... widely accepted presumptions [before and during the war] were often quite wrong” and resistant to being even questioned, even in the face of intelligence.²⁶⁹

Allied success in World War II is often credited to American industrial might. At the 1943 Teheran conference, Stalin toasted, “To American production, without which this war would have been lost.”²⁷⁰ But the enormous manpower sacrifice of the USSR and British fortitude were other crucial factors. These were aided by extraordinary Allied intelligence. As historian Thaddeus Holt concludes, “The Western Allies in the Second World War beat their enemies by

262. *Ibid.*, 42.

263. *Ibid.*, 526.

264. Kotani, *Japanese Intelligence in World War II*, 160.

265. Michael A. Barnhart, “Japanese Intelligence Before the Second World War: ‘Best Case’ Analysis” in Ernest R. May (Ed.), *Knowing One’s Enemies*, 424-426.

266. *Ibid.*, 424.

267. *Ibid.*, 454.

268. Ernest R. May, “Capabilities and Proclivities,” in Ernest R. May (Ed.), *Knowing One’s Enemies*, 504.

269. *Ibid.*, 540.

270. Budiansky, *Battle of Wits*, 243.

valor in full measure. But that valor was aided by guile on a level never before seen; the most systematic and skillful deception ever practiced in warfare.”²⁷¹ And it was Allied intelligence that enabled that guile. “What effect did intelligence have on the war? It cannot be said to have won it. The war was won by the greater material and human forces of the Allies and by the bravery and spirit of the men and women in combat and in support. But intelligence shortened the war, thus contributing to victory. It saved lives – on both sides.”²⁷²

By the end of the war, Britain and the US had built an intelligence behemoth. SIGINT cooperation continued almost without interruption after hostilities. Cooperation in other intelligence disciplines was rapidly renewed after the descending of the Iron Curtain and the 1947 passage in the US of the National Security Act, but with a different focus – the Soviet Union, a former but temporary ally.

The major intelligence legacy of the war for the US was a commitment not to be so surprised by an adversary nation again, hence the establishment of a Central Intelligence Agency and creation of the “Five Eyes” SIGINT community of the US, the United Kingdom, Canada, Australia, and New Zealand.

READINGS FOR INSTRUCTORS

Much remains unknown about intelligence activities during World War II. While many of the wartime documents of the British and Americans have been declassified, those of the Soviet Union largely have not. Many Japanese records were destroyed at the end of the war before they could be secured and preserved. Many topics, even large theaters of operations (e.g., China-Burma-India and Latin America), have been omitted in this article due to space and time limitations. Instructors will profit greatly from the intelligence bibliography at <http://intellit.muskingum.edu/maintoc.html>. The footnotes contain many useful references. Recommended below are books that give a broad overview of intelligence during World War II.

Andrew, Christopher. *For the President's Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush* (New York: Harper, 1996). See Chapter 3 – Franklin D. Roosevelt: The Path to Pearl Harbor, Chapter 4 – Roosevelt at War (1941 – 1945), and Chapter 5 – Harry S. Truman (1945 – 1953).

Budiansky, Stephen. *Battle of Wits: The Complete Story of*

Codebreaking in World War II (New York: The Free Press), 2000. Budiansky provides a comprehensive explanation of what Axis and Allied codes and ciphers were broken. The layman can understand the technical explanations of the cryptanalytic processes. Most significantly, the author explains the consequences of the cryptanalytic efforts and how they affected battles and Allied strategies from Cape Matapan, Midway, El Alamein, the Atlantic, through and after the Normandy invasion.

Collier, Basil. *Hidden Weapons: Allied Secret or Undercover Services in World War II* (Barnsley: Pen & Sword Books Ltd., 1982). Collier is one of the officially accredited British World War II historians. Knowledgeable of ULTRA from his experience as an RAF Fighter Command headquarters intelligence officer, he offers a comprehensive view of the “use and misuse,”²⁷³ failings and successes of Allied intelligence in Europe and the Far East throughout World War II. While Collier does not go into great detail in all aspects of intelligence, his overview is a good introduction to the topics and guide for further readings.

Hinsley, F. H. *British Intelligence in the Second World War* (Abridged Edition) (London: HMSO, 1993). Hinsley was the official historian for MI6. The original official history is in six volumes, appropriate for research scholars, but overwhelming for others. The abridged edition at over 600 pages is still quite detailed.

Holt, Thaddeus. *The Deceivers: Allied Military Deception in the Second World War* (New York: Scribner, 2004). Holt details the expanding efforts at deception throughout the war. He provides excellent appendices and a list of relevant abbreviations.

Jones, R. V. *Most Secret War: British Scientific Intelligence, 1939-1945* (London: Penguin Books, 1979, 2009). This is a classic discussion of scientific intelligence and its contributions to the Allied war effort.

Kahn, David. *Hitler's Spies: German Military Intelligence in World War II* (New York: Macmillan Publishing Company, 1978). – “Intelligence in World War II,” *Journal of Intelligence History* 1 (1), Summer 2001.

Keegan, John. *Intelligence in War: Knowledge of the Enemy from Napoleon to Al-Qaeda* (New York: Alfred A. Knopf, 2003).

Kotani, Ken. *Japanese Intelligence in World War II* (Oxford, UK: Osprey Publishing, 2009). This is one of the few sources in English on this topic.

May, Ernest R. (ed.). *Knowing One's Enemies: Intelligence Assessment Before the Two World Wars* (Princeton: Princeton University Press, 1984). A very thought-provoking series of articles on intelligence and the failings on all sides.

MacEachin, Douglas J. *The Final Months of the War with Japan: Signals Intelligence, US Invasion Planning, and the A-Bomb Decision* (Central Intelligence Agency: Center for the Study of Intelligence, 1998). <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/the-final-months-of-the-war-with-japan-signals-intelligence-u-s-invasion-planning-and-the-a->

271. Holt, *The Deceivers*, xi.

272. Kahn, “Intelligence in World War II,” 20.

273. R. V. Jones in Foreword: vii.

[bomb-decision/jcsig810001.html#rtoc2](#). This is an excellent examination of the SIGINT that influenced the atom bomb decision.

Macintyre, Ben. *Double Cross: The True Story of the D-Day Spies* (New York: Crown Publishers, 2012).

– *Operation Mincemeat: How a Dead Man and a Bizarre Plan Fooled the Nazis and Assured an Allied Victory* (New York: Crown Publishers, 2011). A deception operation made famous by the 1956 movie *The Man Who Never Was*.

Masterman, J.C. *The Double-Cross System: The Incredible Story of How Nazi Spies Were Turned into Double Agents* (Guilford, CT: Lyons Press, 2012).

Sulick, Michael J. *Spying in America: Espionage from the Revolutionary War to the Dawn of the Cold War* (Washington, DC: Georgetown University Press, 2012). Sulick addresses most of the significant spy cases in American history.

Warner, Michael. *The Office of Strategic Services: America's First Intelligence Agency* (Monograph) (Central Intelligence Agency: Center for the Study of Intelligence, 2000). <https://www.cia.gov/library/publications/intelligence-history/loss>. This concise history of OSS covers its myriad missions and activities.

Wohlstetter, Roberta. *Pearl Harbor: Warning and Decision* (Stanford: Stanford University Press, 1962). This is a classic study of why the US was surprised at Pearl Harbor. However, other historians argue with her conclusions.

Many useful research materials are available over the Internet. CIA's Center for the Study of Intelligence (<https://www.cia.gov/library/publications>) contains many monographs, *Studies in Intelligence* articles, and declassified documents providing rich detail on many relevant aspects of World War II intelligence. NSA's Center for Cryptologic History (https://www.nsa.gov/about/cryptologic_heritage/center_crypt_history/index.shtml) also contains many useful articles and volumes related to World War II SIGINT.

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