World War I - Technology
Industrial War

France and Germany had Standing Armies prepared for a European war.
Britain had a small standing army with a larger colonial force designed for quick policing actions supported by a powerful navy. Its last major action was the South African War against the Boer Commandos.

(left0 telephone exchange operators. (centre) Line carried forward. (right) Air Line being erected

Telegraph Wire connected the strategic headquarters
Telephone lines were laid in the trenches.

Visual Signals were flags, lamps and shutter boards. Dispatches were carried by runners, dogs and pigeons

Visual Signals using heliographs, signal lamps, shutter-boards; and signal flags were the principal tactical means of sending Morse Code messages.
Messages were also sent by pigeons, runners or dogs.
Technology was quickly adopted to supplement the **Telegraph** connecting headquarters.
Wireless was heavy, fragile, short range and very new. The Navy and were firm proponents for this new technology as the heavy radios could be carried in a ship. The Germans were quick to see its value, particularly since the British had destroyed their international Telegraph cables.

In 1912 Marconi had a close working relationship with the Royal Navy. He had established a factory in Chelmsford. England where nne of his engineers, Maurice Wright was working. Maurice was picking up German language naval messages. Marconi got the intercepts to Blinker Hall of Room 40 the Intelligence section of the Admiralty. Blinker had Maurice develop a chain of intercept stations including a secret listening station at Norddeich in Norway. It was this listening station that provided critical information on the German Fleet that lead to the British victory in the Battle of Dogger Bank.

Both sides Intercepted messages

Both sides Intercepted the telephone and telegraph networks.
Telegraph lines and telephone lines were intercepted. The German's intercept equipment known as the "**Moritz"** was copied by the French and British who called it **ITOC**. The Moritz had a range of 500 yards. On the Somme an attack was expected by the German Command due to the intensity of the British bombardment. The Specialist Interception teams were expert in the languages and even some dialects of the allied soldiers. On **1 July 1914** a German intercept team picked up a message from British HQ offering encouragement to forward troops waiting to advance. Surprise had been lost.

The British command were slow to accept opinions that communications were being intercepted. However, on 23 July the British Staff issued a memo that "clear evidence that a German system of over hearing was being used extensively and that is must be assumed that the enemy has listening apparatus."

Later in July, the German strongpoint at Ovillers la Boisselle was attacked and the Scottish troops found a complete **copy of the operational orders** of the attacking British Corps in the German trenches.

In October 1914 Haig published his order on "**The Indiscreet Use of the Telephone".** This was to end unnecessary gossip and introduced silent hours and warned of severe punishment if contravened. ITOC was used to monitor the British networks.

Visual Signals brought back

Major General Nadler said “step by step the countermeasures were tightened. But the main obstacle throughout the process was the frequent disregard by the telephone users of the orders relating to forbidden subjects, the worst offenders often being the more senior officers who had most to give away. It is no exaggeration to say that thousands of casualties resulted from these indiscretions during the course of 1915 and 1916, and it was not until 1917 that the countermeasures became reasonably effective. “

Telephones were monitored using ITOC and Visual signaling between the trenches was re-introduced. Heliographs and Shutter-boards were used for signals back to higher headquarters.

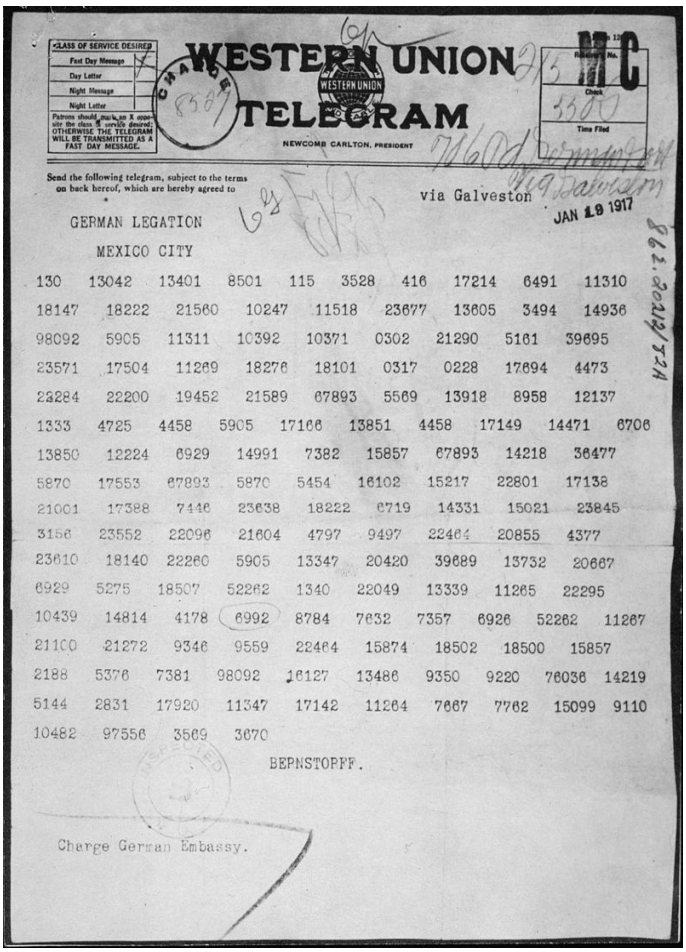
A Secret War

Jan 1917 Zimmerman telegram

The secret diplomatic telegram from the German Foreign Office proposing an alliance between Germany and Mexico.

Germany would provide arms and support to Mexico helping in recovering Texas, Arizona and New Mexico and persuading Japan to invade the United States.

The message was intercepted by British intelligence and given to the Americans. Zimmerman admitted it was true. United States declared war on Germany.



WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT

Send the following telegram, subject to the terms on back hereof, which are hereby agreed to

via Galveston

JAN 19 1917

GERMAN LEGATION

MEXICO CITY

130 13042 13401 8501 115 3528 416 17214 6491 11310
18147 18222 21560 10247 11518 23677 13605 3494 14936
98092 5905 11311 10392 10371 0302 21290 5161 39695
23571 17504 11269 18276 18101 0317 0228 17694 4473
23284 22200 19452 21589 67893 5569 13918 8958 12137
1333 4725 4458 5905 17166 13851 4458 17149 14471 6706
13850 12224 6929 14991 7382 15857 67893 14218 36477
5870 17553 67893 5870 5454 16102 15217 22801 17138
21001 17388 7446 23638 18222 6719 14331 15021 23845
3156 23552 22096 21604 4797 9497 22464 20855 4377
23610 18140 22260 5905 13347 20420 39689 13732 20667
6929 5275 18507 52262 1340 22049 13339 11265 22295
10439 14814 4178 6992 8784 7632 7357 6926 52262 11267
21100 21272 9346 9559 22464 15874 18502 18500 15857
2188 5376 7381 98092 16127 13486 9350 9220 76036 14219
5144 2831 17920 11347 17142 11264 7667 7762 15099 9110
10482 97556 3569 3670

BERNSTORFF.

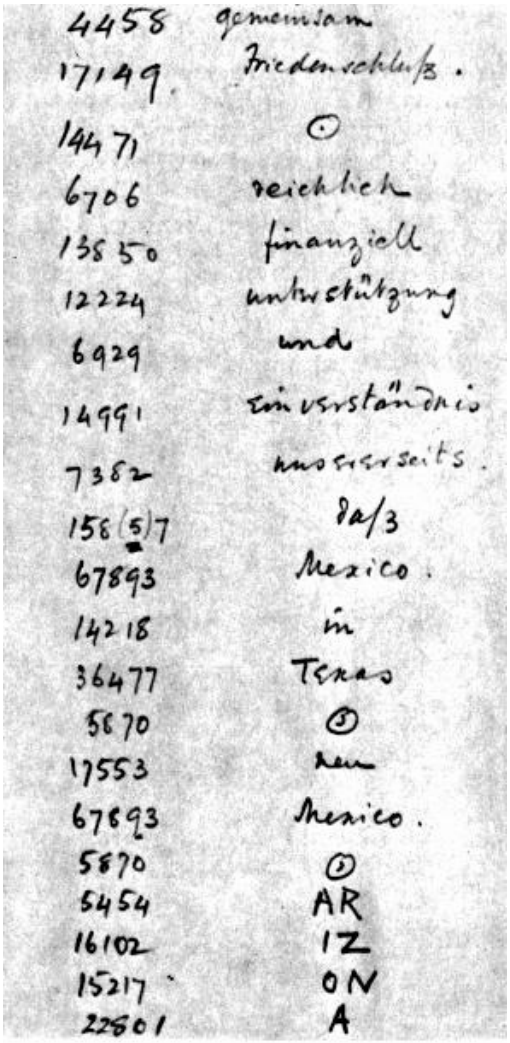
Charge German Embassy.

The British had to ensure the Americans did not discover that the message had been intercepted from the American Telegraph cable. Also, to ensure the Germans did not deduce the British could decipher the latest German Diplomatic cipher.

The main Telegraph cables from Europe including Denmark and Sweden passed through the Trans-Atlantic exchange in the United Kingdom. In the beginning of WWI, the Royal Navy had cut the German international Telegraph cables. In an effort to mediate an end to WWI President Woodrow Wilson had permitted the German Government to use the American Telegraph Cable to discuss a peace agreement.

Sending cipher messages was not in the agreement, Zimmerman, as the German Foreign Minister asked for special permission and the Americans agreed he could send the telegram.

In Room 40 of the Admiralty in London, Nigel de Grey who had been pulled out of the Naval Brigade in Antwerp just as the Germans captured it in 1914, deciphered Zimmerman's telegram using the old German Diplomatic code books seized in Mesopotamia and off the Magdeburg, a German ship captured by the Russians.



Zimmerman sent the telegram to his Ambassador in Washington using the new code. However, the Ambassador had to use the old code when sending the telegram to the Ambassador in Mexico as he had not received a new code book. The message was sent through the Mexican Commercial Telegraph Office. A British agent in Mexico bribed an employee in the Telegraph office and obtained a copy of the message which was sent to Room 40 in London.

"Blinker" Hall who ran the Admiralty Intercept office developed a plan for using the telegram. The telegram from the Agent was stamped as being received in Mexico. "Blinker", informally briefed his contact in the American Embassy in London and arranged for the Ambassador to receive the Mexican telegram from the British Foreign Minister in London.

Zimmerman admitted he had sent the telegram and on 1st February, Germany began unrestricted U Boat War sinking 2 American ships. By 6 April 1917, Congress voted for War against Germany.

WW1 1917 a year of change

Electronic Interception of messages

Creating military messages still followed the procedures and formats that speeded reading and understanding. This also aided codebreakers to understand what the subject of the intercepted message might be. Similarly, the listed addresses included in the message outlined the structure of the information network and its chain of command. By 1917 the electronic interception of messages in the trenches; in the air; from Y stations on the coast and Telegraph offices were part of an organized Information collection network.

Direction Finding

Marconi successfully tracked a radio signal from a Liner at sea before WW1 began. “Blinker” Hall created “Y” stations around the coasts to track radio signals from ships. By 1917, both the French and the British had an effective Direction-Finding network in the Trenches. After the Canadians captured Vimy ridge it was a ‘Y’ station that discovered the Germans had pulled back from the foot of the Ridge to a new defence line.

Radio Deception plans

The use of Signals to deceive the enemy is an old stratagem. Napoleon at the Battle of Austerlitz had his Buglers sound Austrian Bugle calls to confuse the Austrian enemy as they advanced. The Canadians during the 100 Days Campaign in WW1 used false Radio signals to

give the belief that their troops were far in the North, to hide their attack across the Canal du Nord.

Fuller Secure telephones

During the first Battle of the Somme the telephones and buzzer telegraph connecting by a single line and an earth return meant that the soil between the trenches was alive with buzzer and telephone induction that could be picked up by another instrument within 500 yards. By 1916 Captain Fuller had developed a solution which was in forward positions by 1917. The Fuller phone continued in use through WWII particularly by the Australians in the Pacific.

Ground to Air communication

Popham panels, pigeons, Aldis lights and messages wrapped around rocks developed into telegraph radios then voice microphones and the decryption of the German Artillery code. By 1917 aircraft could target, locate and send locations by radio, and aircraft could speak to each other.

Radio more effective

Radio began as large and fragile with a limited range. By 1917 a radio could fit into a truck or into a motorcycle sidecar. Infantry still used flags, lamps or carried telegraph wire and Morse code sender. The new armoured tanks and machine gun trucks or motorcycle recce units were the new cavalry.

Signal Intelligence was now part of operational planning

Signals Intelligence with deception plans, location of units and the discovery of battle plans were part of the Battle picture in planning. The Signals plan for Vimy and the Battle plans for the 100 days campaign were notable, particularly the Crossing of the Canal du Nord.

1918 Storm troopers and ciphers

1918-Stormtroopers and Ciphers

- 1918: ADFGVX Cipher
  - Used in the German army in WWI

	A	D	F	G	X
A	*B*	*T*	*A*	*L*	*P*
D	*D*	*H*	*O*	*Z*	*K*
F	*Q*	*F*	*V*	*S*	*N*
G	*G*	*J*	*C*	*U*	*X*
X	*M*	*R*	*E*	*W*	*Y*

The collapse of Russia released German troops for a new offensive. In June 1918 the German army were within 100 miles of Paris, and the allied lines were staggering. The combination of artillery, use of poisonous gas and rapidly, attacking sub-units punched holes into the Front lines. In the face of this rapid German advance, the French cut the telegraph wires and the. Germans were using Radio and the ADFGVX Code to coordinate their attacks.

The French had 6 Direction Finding and listening stations. The ADFGVX was recognized as a new code based on the Polybius square by Georges Painvin a cryptanalyst. A Listening station reported a message sent by a German unit only 80km north of Paris. Georges Painvin spent 24 hours and using Polybius cracked the ADFGVX cipher. The message read:
"rush munitions even by day if not seen".
Aerial recce confirmed the German build up. The French reinforced the position and 1 week later the attack on Paris failed. The German advance was stopped..

In 1918 the War became mobile. Telephone wire could not be laid quickly enough. Even Signaler Wheeler from the 50th Battalion of the 4th Division of the Canadian Expeditionary Force complained the advance was too quick and tactical signaling was by Flags and lamps. Radio came into its own with new codes for tactical moves. Reconnaissance units were formed with motorcycles and radio sidecars. The Radio had come of age.

Between the Wars

Between the wars, society changed across the world. There had been a war to end wars, some looked for peace and others looked for why they lost.

In 1918 the British Army committed to Radio interception and in 1920 the Official Secrets Act required Cable companies to hand to the government copies of all cables passing through the UK within 10 days of being received.

1923 Churchill published his book, “The World Crisis” and wrote about the importance of code books seized from the German ship “Magdeburg “. Also, in 1923 the Royal Navy published its official history stating the importance of radio interception and cryptanalysis.

German U-Boat Commander Doenitz, who was sunk and captured by the British was released from a Prisoner of War Camp, had read these histories and studied their application. In 1925 the German military held an inquiry into suspicions that their codes had been broken in WW1. In 1926 the German military began purchasing ENIGMA machines from Scherbius. By the end of WWII, the German military and government had purchased 30,000 machines in a variety of configurations.

By 1934 the first Japanese Naval Ciphers had been broken by Room 40. In 1937 the Italian Enigma was being read and in October 1939 Dilly Knox and Alan Turing were reading their first German Enigma message.

Electro Mechanical.

Pencil and paper encryption go electric and mechanical.

ENIGMA

Encoding and decoding using a pencil and paper became transformed with wires; and keyboard input. An electrical signal went through the scrambling unit and then back again until the ciphertext is displayed on an electric light display. Later a choice of additional rotors and a plug board were added**.**
The message was then sent or received using Morse Code sent over High Frequency Radio. The Enigma machine was distributed to U boats, battleships, trawlers, the railways and command units in the Field and the Luftwaffe. Government records and the supply network information were also using the Enigma
The Enigma was key to Germany's Blitzkrieg where coded reports and commands were secure using Enigma.

In 1918, when Arthur Scherbius and Ritter invented an electric and mechanical cipher machine called Enigma, no one wanted one. Other inventors had the same problem.
In 1919 Alexander Koch invented an electro-mechanical cipher machine in the Netherlands, no one wanted it.
In 1920 Arid Damm in Sweden produced another, no one wanted it.
In 1920 Edward Hebern in America built a factory and called his machine the "Sphinx of the Wireless". When he marketed it, Henry Stinson the American Secretary of State said, "Gentlemen should not read each other's mail"
Quietly in room 40 of the Admiralty Building, in similar offices of the Deuxieme Bureau in France and in Poland, cryptanalysts carried on their secret tasks between the wars.
In 1926 the Polish were finding German messages they could not decrypt. Poland could not relax. They formed a new cipher bureau and made contact with their French allies. In 1929 an Enigma machine was mistakenly sent from Germany to Poland and held for onward posting for Germany. The Polish Cypher Bureau had two engineers copy its design and build a copy machine before returning the original. Capt Ciezki and his team began their work.
In 1931, Hans Thilo Schmidt became a spy for the French and began to pass Enigma information which was passed to the Polish.
June 1939 a liaison began between British, French and Polish codebreakers.
In September 1939 Germany invaded Poland.

In the second World War. Technology for messages changed

In 1939 as in WW1, armies still went to war with Signal flags, Aldis lamps, heliographs and pigeons. Radios and Fuller phones were improving in technology and codes and ciphers were changing.

In the 1930's Wireless technology created an explosion of transmissions across the ether. There was a need for ciphers and codes that could give short term and longer-term security.

The Germans needed a quick and effective cipher system. A balance between the speed of a message and the need to keep it secret. Although Enigma was deployed to senior command headquarters, there was a need for tactical encryption with German Field units. They used "Double Playfair" the British Code used in WW1 and still used between the wars. Based on the Polybius Square of 200BC It was quick, simple and provided low-level encryption for both the German and British armies in 1939.

Technology

Flags range 7 miles 7-10 wpm. Lamp range 20 miles 4-10 wpm. Heliograph 30 miles 5-16 wpm

Radio had 4 main sets. #18 set for company and Battalion, range 5 miles weight 30lbs. #38 set for company and talking to tanks, range 2 miles. #19 set for armoured vehicles with 3 channels A for HQ, B tank to tank, C internal for the crew of the tank. #22 set with a slightly longer range inter formation or for artillery.

Radio Signals-Enigma

In 1939 soon after the declaration of war against Germany, a British Telegraph ship cut the undersea telegraph cables from Germany. As the French and British armies pulled back from the German army, telegraph and telephone networks were cut. These acts encouraged the Germans to use Radio as a reliable means for communication. For rapid movement and control Enigma provided Formation headquarters with secure messaging.

Dr Jones a British Scientific Intelligence officer wrote," There has never been anything comparable in any other period of history to the impact of radio to probe the deployments, the intentions of the enemy without spies or frigates."

Wireless Wars had begun

Bletchley Park had been set up and new and old code breakers recruited to apply academic research discipline to cryptanalysis. There were differences in the way intelligence was collected and managed between the Allies and the Germans. Both had each of their armed and security services collecting information and administering its dissemination at a tactical level. The Allies had an overarching organization that coordinated strategic intelligence which included signals intelligence. Hitler created multiple competing organizations that reported to him and his supreme council. By the end of the war the Germans had an estimated 30,000 people working in 6 separate intelligence agencies. This was a crucial factor in determining the Allied deception plan for D-Day known as Operation Bodyguard.

Further factors in the Wireless War was the time it took for Transmissions to be located and identified; for messages to be intercepted, and deciphered.; and the ability of the organization to use the intelligence in a dynamic way. Land armies move swiftly and can use various means to communicate such as telephone, telegraph or dispatches. A ship or submarine relies on radio for distance communication, reporting and receiving orders. Aircraft rely on radio for navigation; communication once in flight and for receiving directions. The use of ciphers and codes could protect the message but not the method of transmitting. Enigma provided the German Forces with confidence in the security of their messages.

Y Stations - Listening stations

Radio helped armies discover deployments without spies or reconnaissance. The B Dienst in Germany; Rommel in Africa; Bletchley Park in UK.
Y stations listened and wrote down the messages.

On D Day 6 June 1944 Eva Eitfler listened in a deep bunker under the central square in Caen, in Normandy. Eva was a Luftwaffe operator listening to the airwaves and recording unit transmissions. She recalled, "The messages were endless letters and numbers "ACX L 5 O W" the night was quiet the weather was worse. Towards midnight it changed, there was a sense of urgency. At 01:00 everything erupted from right across the coastal zone. "I was working faster and faster, as soon as I had finished a hand behind me grabbed the paper straight away. I was glued to my table. Something momentous was happening I could feel it. I was poised on my chair, headphones on; I wrote like a maniac until my wrists ached. In the early hours I was relieved by a Navy officer, I asked "What happened? Is it something serious?" The reply was in a grave voice, "Something serious." The officer sat down and continued taking down the messages.

"Towards midnight it changed, there was a sense of urgency…everything erupted," Eva went next door into the Control room. "It was incredible a huge map of the channel on the wall, pinned with little markers and coloured flags, hundreds of them, parachutists in the heart of Normandy the look in everyone's eyes was tense. Senior officers had been arriving all night, even a couple of Generals. So, this was it the" Invasiontag."
Communications were important for the Luftwaffe. Out of 2.3 million members in the Luftwaffe, 305,000 were signals personnel.

On D Day 6 June 1944 Elizabeth Taylor, a Royal Navy WREN was across the Channel in England beneath Dover Castle. WREN Taylor was on attachment from her Y station in Scarborough in Yorkshire on the coast of north east England. "We could hear it. There was panic… It was the way they were using their keys .the Morse. The messages were panicky. They stopped sending Morse in cipher, it was in plain German. Very rapid, not waiting, just sending…Not waiting for acknowledge. Just sending." WREN Taylor recalled that as she travelled to Dover "the fields were full of tents and troops. On leaving after duty, "the next day the fields were empty, they had all gone. Later I heard it was the invasion."

Y Station-Direction Finding

Direction Finding

Triangulating the location of a wireless transmitter and analyzing the transmission properties provides information without having to break codes or decipher messages. It also locates where the station is and enables the station to be tracked The German Y service was very active. Hans Otto Behrandt, Rommel's Signals Officer believed "The Y service was the best source of Intelligence."

When hunting U Boats, Direction Finding was key to locating their hourly signal . Elizabeth Taylor with her Marconi set would find them. Then the Direction Finders would track them "Most of the hour was taken up by automatic repeats (from German Control) of old messages from 5 minutes to the hour, to the hour itself, radio silence was maintained. "This was important, this was the time when U-boats were likely to surface to transmit to their control "

 "These were usually short coded messages preceded by ƀ,ƀ,ƀ and then a short message in 4 letter code (rather less important to us than to be able to take bearings "B" and "ƀ" (_ . . . _) "we would stick up an arm and scribble the message down and yell out the frequency. The Supervisor would immediately pass it to the Direction Finders"

Analysis Wars

X Stations

The German B-Dienst broke some of the Allied Codes :
the US State Department,
Polish and Free French Codes; the RAF 4-character cipher,
the US M-209 cipher
the Battle of the Atlantic the B-Diest broke the Convoy codes until late1944.
The British 8th Army suffered badly when fighting Rommel until it was realized that an Italian spy had copied the British code given to the American Ambassador in Tripoli.

Bletchley
Code breaking achievements:
1941-1942 Crete, North Africa, Malaya Knew the enemy plans.
1942-45. Jamming navigational and radar beams. “Beam-benders”
1942-1944 Locating U boats and Wolfpacks.
1942 North Africa El Alamein deception of German Forces.
1943-1944 Operation Zeppelin creating fictional Army in Egypt to keep 22 enemy Divisions in Yugoslavia and Greece after- D-Day.

Helen Currie was an ATS Lance Cpl working on the “Tunnies” at Bletchley Park. “The traffic became almost more than we could cope with. My assignment was German Army traffic. We pushed the buttons and then typing the text and only when clear German appeared could one breathe a sigh of relief. We typed to the end of the German message then placed it in the out basket.”

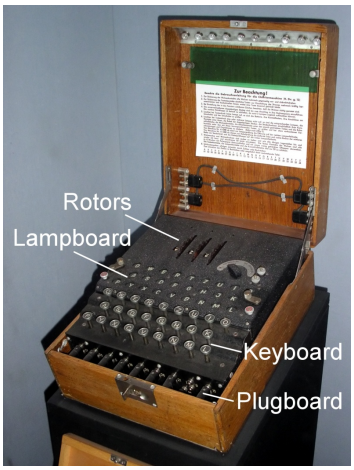
German achievements:
The British section of the German Interception Unit read the British traffic. They succeeded in breaking the British War Office Code that was captured in the Spring of 1941.
War Office Code breaking was successful during the first siege of Tobruk. The success resulted in eight German cryptanalysts being sent to Athens to work rather than sending the encoded messages back to Berlin. There were difficulties with the War Office Code which prevented its decoding for 8-9 months.
Then in 1942, Rommel's Signal Intelligence Company 621 was captured in North Africa. The British now learned that their code was being read. A German intelligence officer called this source "this incomparable source of authentic and reliable information which…contributed so decisively during the first half of 1942 to our victories in North Africa."

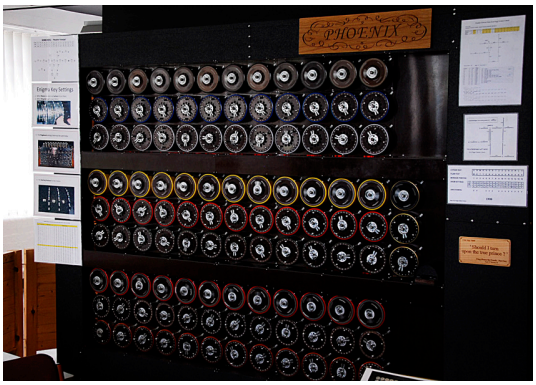
At sea the Royal Navy's ciphers were taken from HMS SEAL, a submarine captured in May 1940. The German's could read the Royal Navy's codes until August 1940. Throughout the first part of WW11 the B-Dienst were able to read the British Convoy Codes with dire consequences until 1943. The German ability to read the Allied codes was particularly damaging during the Battle of the Atlantic. Lt General Albert Praun 'the Wermarcht's last Signals Officer (quote from Max Hasting's book The Secret War) " The achievements of German communications intelligence …may speak in favour of the German type of intelligence organization…gave the German commanders a hitherto unattained degree of signal security."
The Germans believed in the integrity of ENIGMA even after 6 years of war.

Key Bletchley intelligence organizational achievements
The breaking of ENIGMA and the LORENZ traffic between 1943 and 1945.
The analysis routine dividing the intercepts into Navy, Airforce, and Army.
The supporting analysis of a large and comprehensive record system that linked new cipher words with times and dates.
The technical deciphering methods that moved from pen and pencil, to electro mechanical machines to purely electric in only 3 years.

Enigma and The Bombe

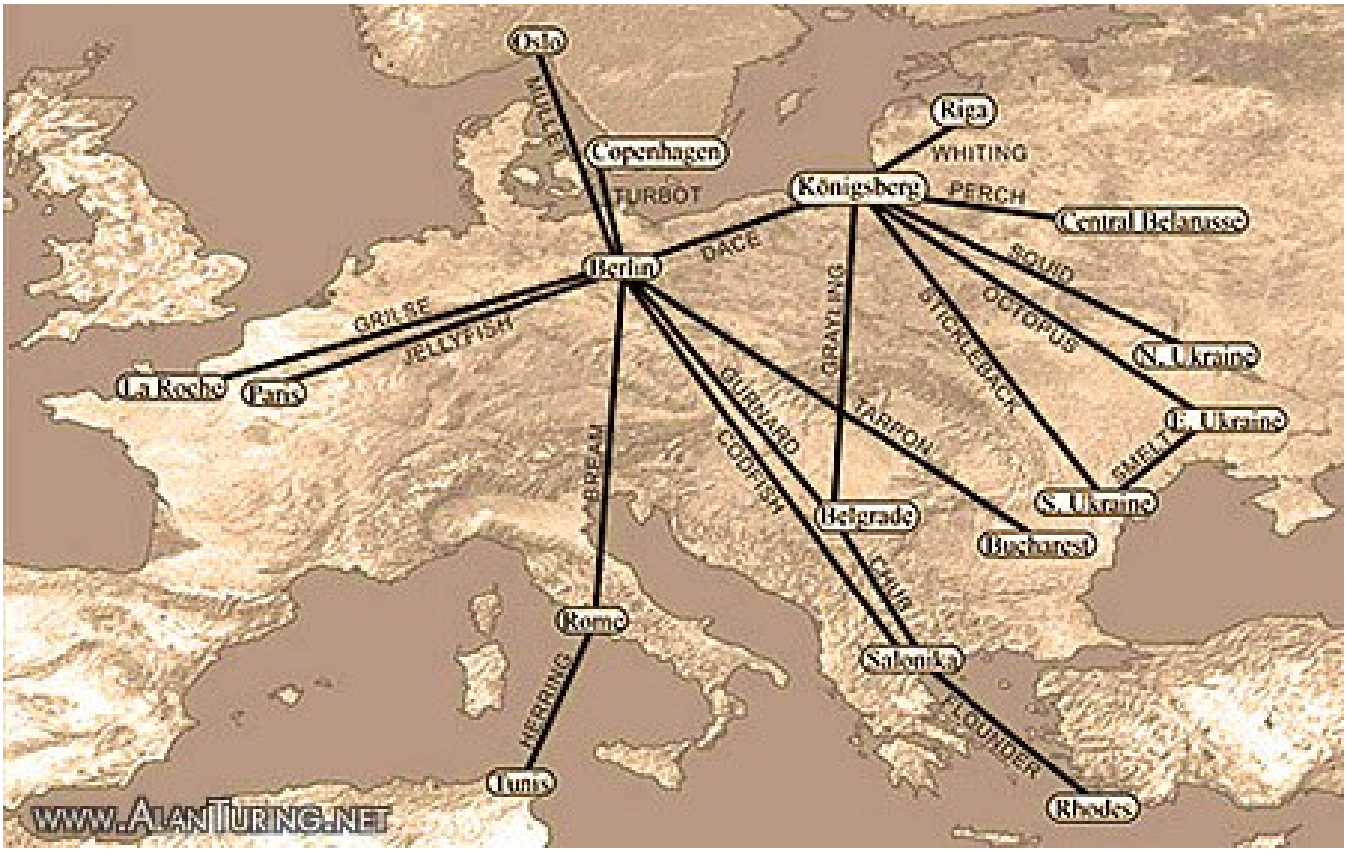
Machine v Machine



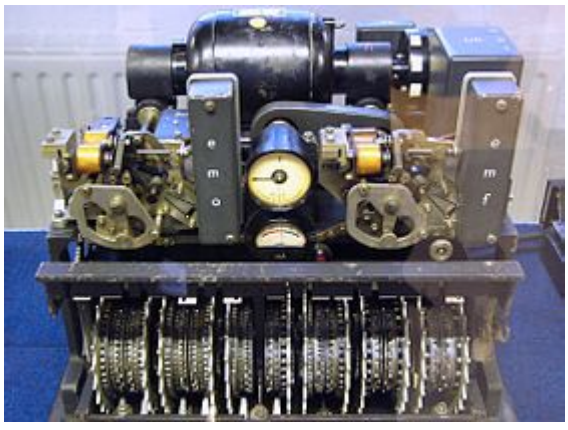


The Bombe replicated the cipher wheels used in the Enigma Machine to break the code with varying success. Bletchley Park analyzed both the radio traffic patterns and decrypted the messages. An early success was passing on the analysis to evacuate the British Army from Dunkirk. By analyzing repeated phrases in routine messages 'Cribs' could be identified to test in the "Bombes" to find the Enigma wheel order and plug setting. An early 'Crib' identified by Gordan Welchman was from a transmitter in Brittany that regularly reported "Brittany German Officer. Lone Aircraft approaching". By identifying the repeated message, Welchman encouraged the daily transmission of the message by having a plane fly over the transmitter each morning. The daily transmission helped to identify the new daily Enigma setting.
Lyward and Smith in the Air Ministry developed the Type X from an Enigma the Air Ministry had borrowed in 1934
The TYPEX cipher machine was not broken by the Germans.
The Germans had captured several examples of the Type X device during the chaotic British retreat to Dunkirk in 1940. the German Signals Service, recognized it as a close copy of its own Enigma. It was a blatant infringement of the enigma's patent, and as such enjoyed most of its high security qualities. Accordingly, the German Signal Service deployed only a handful of personnel to the task of studying the Type X intercepts. It was their mistaken belief that any prolonged examination of Allied Strategic signals would be a waste of time

Lorenz and Colossus



From 1941 the Germans sent High Command messages on a Lorenz and a Siemans Teleprinter network using a Vernam Cipher. The teleprinter Hubs were across the German area of operations. The map indicates the Bletchley code words given to the separate networks.



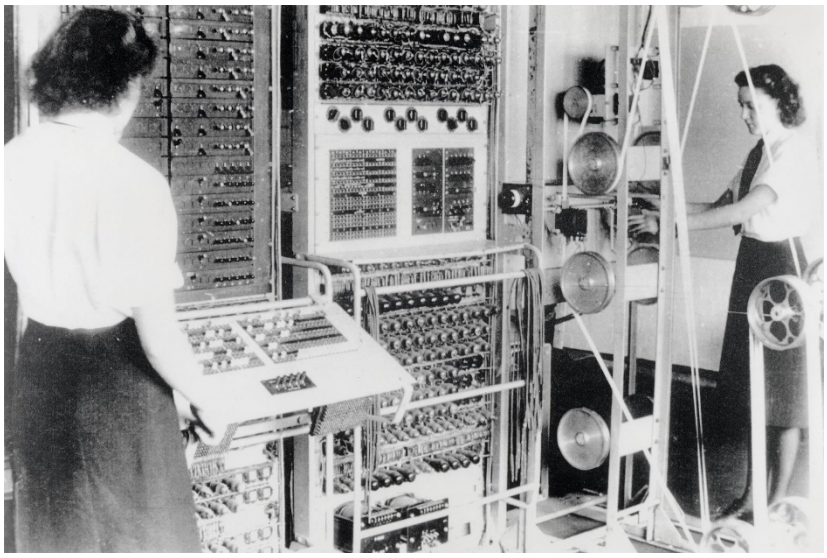
August 1941 Col Tiltman was able to break the first message. The machine had 12 wheels compared to the 3-wheel Enigma. It was easy to use and very secure. Each station had a different wheel pattern using a Baudot alphabet where each letter had 5 impulses.

The Teleprinter networks were attacked by Professor Good and Donald Michie exploiting the operator mistakes such as repeated messages using frequency analysis and concentrating on the Berlin to Paris “jellyfish “link. By 1945 they had a team of 11 cryptographers and 113 staff working 3 shifts. In another part of Bletchley known as the Newmanry , after Max Newman a mathematician, Col Tiltman intercepted and deciphered a message to Salonika asking the sender to “Send again”. It was an opportunity not to be missed

and with Bill Tutte a mathematician, set to work. By early 1942, Bill Tutte by listening to the noises the code made when transmitted, was able to create a theoretical model of the Lorenz. Max Newman asked Tommy Flowers to build a Lorenz. In 1942 the teleprinter traffic was being deciphered by hand. With the mathematician team of Max Newman, Alan Turing and Bill Tutte, the Lorenz in February 1944 was being deciphered by Tommy Flowers and "Colossus".

Colossus was an electro-mechanical machine with 1,500 valves and ran accurately as long as it was not switched off. Colossus had finished its testing and was consistently operational by 1st June 1944.

Tommy Flowers wrote "On the 5 June Eisenhower was in conference…when a courier arrived from Bletchley Park …. Hitler had sent Field Marshal Rommel battle orders by radio transmission which Bletchley Park had decoded with the aid of the new Colossus. Hitler had told Rommel that the invasion of Normandy was imminent but that this would not be the real invasion. It was a feint to draw troops away from the channel ports against which the real invasion would be launched later. Rommel was not to move any troops. He was to await the real invasion which could be expected 5 days after the Normandy landing. Eisenhower …. just handed the paper back to the courier and said, "We go tomorrow". And on the morrow, 6 June they went.



Operation Bodyguard

D-Day brought together a coordinated and controlled Signals Battle plan that is worthy of retelling**.**
Against the Allies was a German Army of 300 Divisions,
58 Divisions in France, Belgium and the Netherlands. In Normandy there were 150,000 soldiers of the 7th Army of whom 50,000 were in the actual landing zone. The Allies would land on 5 beaches with five infantry and three airborne divisions, 156,000 troops.

D Day began in Tehran in November 1943. The allied commanders met and agreed that Europe would be the focus. Churchill shared with the Conference that a plan was already in the making and it relied on deception. OPERATION OVERLORD would be protected by a "Bodyguard of Lies." OPERATION BODYGUARD became the umbrella cover name for 35 deception operations designed to deliberately deceive Hitler and the German Armed Forces High Command (Oberkommando der Wehrmacht-OKW) as to the true intentions and objectives of Allied operations throughout 1944. The aim was to target the beliefs of the German command, to add a mixture of real and false threats to deceive Hitler and his command to when and where the attack would come.

A key factor in the success of the Deception plan was that it was coordinated at the highest level, the Supreme Headquarters Allied Expeditionary Force. The Committee of Special Means had the authority to coordinate the Intelligence agencies that created fake armies; administered spies, turned enemy agents; orchestrated counter intelligence and approved the

first computer to break into enemy communications. By contrast the Nazi command was focused through Hitler who held power by creating separate and competing agencies.

ROYAL FLUSH was the combined diplomatic deceptions in Sweden, Spain, and Turkey to join the Allies or to permit building airfields and logistical facilities.

FORTITUDE NORTH

A combined Operation with Operation GRAFFHAM as the deception at the Diplomatic level to pressure the Swedish government into granting access to Swedish facilities for the Allied invasion of Germany through Norway, Denmark and Sweden. Operation SKYE was a Radio deception of a fake army in Scotland waiting to invade Norway. The Germans sent a bomber that bombed the headquarters for the fake army in Edinburgh Castle.

Operation ZEPPELIN threatened an attack across the Black Sea into Rumania and into the Balkans. A fabricated army of tents and fake vehicles was created in Egypt. as an invasion force. Operation FERDINAND created threats of landings from the Mediterranean and through Italy. The attacks into the Bordeaux region of France were called IRONSIDE.

FORTITUDE SOUTH

A main Allied effort of an invasion into Pas de Calais was named. FORTITUDE SOUTH. It combined Operation NEPTUNE the amphibious landings in Normandy; Operation TAXABLE landings at Fécamp, northeast of Le Havre. Operation GLIMMER to threaten landings at Boulogne, near the Pas-de-Calais. These operations included such notable units as HMCS HAIDA, now berthed in Hamilton, Ontario and the Dambuster Squadron of renown. Building on the reputation and renown of US General Patton was Operation QUICKSILVER: the deception operation that created the First United States Army Group (FUSAG) and the plan to invade Pas-de-Calais.

Operation QUICKSILVER, was a six-part plan to make FUSAG 'real' to the German planners. It would create scripted radio traffic, with 'Special Means' reports to the Abwehr. With such a large Army sitting in south eastern England within sight of German Coastal, Air and Navy Units a physical deception plan would need to be believable and credible. Large tented camps were created with smoking stoves; vehicle tracks led into woodlands; dirt roads into forests. Blow-up tanks and vehicles, guns and trucks resembled staging areas. In the harbours and inlets 260 canvas landing craft appeared. A fake oil refinery near Dover was bombed and shelled by the Germans multiple times.

Many of the personnel involved in this activity did not have the training to record radio messages familiar to the enemy. Therefore, they made a great effort to record real exercise radio traffic on the new magnetic wire recorders; then they fabricated scripts for timely message transmittals.

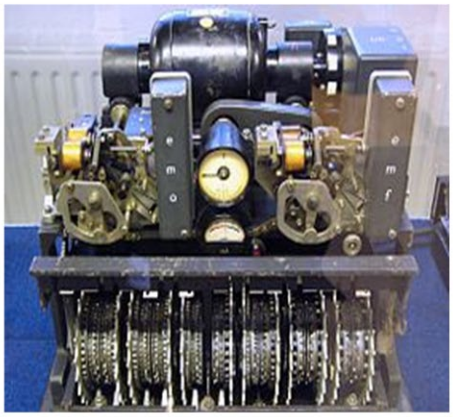
These operations and others focused on the psychological aim of paralyzing the ability of the Germans to react by creating so many threats to the Reich that Hitler could not reinforce at any one point. The deciphering of ENIGMA and especially the Lorenz teleprinter cipher gave an

insight into what the plans and fears were of Hitler and the OKW. The reading of the Purple Japanese Code gave insight from a trusted confidant and ally of Hitler's plans.
Double Agents were asked questions which indicated what the enemy were interested in. Germany had three primary means of collection prior to the actual invasion: aerial reconnaissance, spies, and signals intelligence. The coordinating committee had the power and information to "paint a picture" of exactly what the allies wanted the Germans to see.

After the War. Enigma & Lorenz

Electro Mechanical devices

Enigma,
Bombe,
Lorenz,
Colossus.



At the end of the war, Britain captured thousands of ENIGMA machines and distributed them to former colonies and other agencies who believed them to be secure. The Soviet Armies captured command headquarters where the majority of the Lorenz SZ40 teleprinters were operational. It was likely Enigma and Lorenz would continue to be used.

Bletchley Park was ordered to be closed and the staff including the Soviet spies Cairncross from Bletchey and Philby in MI6 were sworn to secrecy. The staff witnessed the destruction of records and equipment.

Colossus and Bombes were seen to be destroyed, and records burnt. But certain equipment was moved and the Government Communications HQ continued.

After 1945 The German Border police continued to use Enigma to track War Criminals as part of the German Federal Ministry of the Interior. The machines were used to encipher names and birth dates until 1974 when Winterbotham's book revealed how the Enigma had been broken by the British.

Technology continues to change

The Message -the Method - the Moment stay the same