

~~TOP SECRET FROTH~~

IV. ENIGMA WIRINGS

B. Steckered Enigmas

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ENIGMA WIRINGS

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Name of Machine: GERMAN SERVICE ENIGMA

Source: 25 (p. 1); 27 (p. 3, 4, 7); 33 (p. 2); 35 (p. 12, 14, 26, 29, 87); 43 (p. 1.1-1.3, 2.1, 7.1); 55 (p.4)

The Steckered or Plugboard Service Enigma was a three-wheel machine used by the German Army and Air Force and for a time, by the Navy. It was equipped with five wheels that could be used interchangeably in the fast, medium, or slow position of the machine, giving 60 wheel orders. As the Army used the machine, the wheel order selected for one day was rotated in cyclic order. These five wheels, called Sigma wheels, were given the numbers I through V. They had one notch each and were wired differently. The endplate was pluggable and the reflector plate, known as A or Anton, was fixed but unpluggable. The Army used six steckers and the Air Force used a varied number of steckers, usually more than six.

The Navy used the same basic machine with six steckers, but almost immediately instead of five wheels, there were eight from which to select three for the fast, medium, and slow positions: the five Sigma wheels (I-V) and three Delta wheels (VI-VIII). The Sigma wheels had one notch each; the Deltas, two.

The Poles had managed to get pictures of the keys for this machine for a period of three months during which time the wheel order had remained unchanged. As a result of this, they broke the first three Sigma wheels. The British took up where the Poles left off, starting to work on traffic of May 1937. During the summer of 1937 the A reflector had changed to the B reflector, and by April of 1940 ten steckers were in use. By August 1940 the British broke the No. VIII Delta wheel, the last new wheel to be introduced during the War.

In February 1942 the German Navy abandoned the old B reflector. A new B reflector plate and a No. IX additional wheel (Zusatzwalze), referred to as the Beta wheel, were introduced to occupy the space previously taken up by the old B reflector. Thus the machine was now a four-wheel Enigma. The first three positions, as before were occupied by any three of the five one-notched Sigma wheels and Delta wheels; the fourth position was occupied by the No. IX Beta wheel which was so wired that when set at the letter A its effect, combined with that of the new B reflector, would be equivalent to the old B reflector. This was done to permit intercommunication between holders of the three-wheel and four-wheel Enigmas.

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GERMAN SERVICE ENIGMA (continued)

In July 1943 an alternate reflector, the C or Caesar, and an alternate Zusatzwalze, the No. X or Gamma wheel, were introduced. The Gamma wheel, when set at letter A and used with the C reflector, produced the effect of the old C reflector, broken in 1940 as a result of German error. The Caesar and Gamma wheels were broken in July 1943. Later it was discovered that these wheels had been captured in North Africa but had never been sent on to Bletchley Park.

The Zusatzwalzen differed from the other wheels in that they had 26 studs on each side. They were equipped with rings which were never actually used until near the end of the war. They were set by hand to any position and were not moved mechanically. The new B and C reflectors could be inserted only one way and remained fixed throughout the enciphering process.

The C reflector was never brought into use on Army or Air Force keys; their next reflector was the pluggable D or Dora, introduced near the end of the War by the Air Force. This reflector had a shell which could be removed, and an arrangement of plugs effecting a stecker of the contact connections.

The write-ups that follow discuss various versions of the German Service Enigma. The order of their appearance is: British version (one wiring), U.S. Navy version (five wirings), U.S. Army Signal Corps version (two wirings), the YELLOW Enigma (two wirings).

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