

# An Overview of Enigma K Machines

## Introduction

Enigma K is basically the same machine as the [commercial machine A27](#), the improved version of the original [Enigma D also called A26](#). The introduction of the K-series of machines is a logical extension of the decision to separate the [Zählwerk machines A28](#) into their own series. The redesign of the A28 then resulted in the [G-series of machines](#). This left the commercial Enigma A27 and the Reichswehr Enigma I on the original A-series of machines. The confusion of having originally three different machine designs on one serial number series must have made itself apparent rather early, but it took considerable time before this was rectified. The G-series started with the 24 machines, G 101 – G 124, sold to Hungary in 1931.

The K-series came five years later, in October 1936, when the first machines, K 201 – K 202, were delivered to Spain.

Some of the special wirings are listed in its own table at the end. The first eight wirings, from **A to U**, called *Schaltung* by the Germans, are the original names used by Heimsoeth und Rinke and the Reichswehr. The following seven wiring names have been invented by the author to simplify the description of the machines using these special wirings. The first, **B ext.**, is the name for the extra wheels IV and V used together with the wheels with wiring **B**. Similarly, the name **D ext.** has been chosen for the extra wheels IV to VI used with some of the machines with wiring **D** delivered to Italy. Wiring **RB** is the special wiring used by the *Reichsbahn*, while **RKM 1** and **RKM 2** are special wirings used for machines ordered by the *Reichskriegsministerium, In 7 V*. **RPM** is the special wiring used by the *Reichspostministerium* and **CHDF** is the wiring used on the machines delivered to the General Staff of the Croatian Home Defence Forces (*Kroatische Landwehr – Hrvatsko Domobranstvo*)<sup>[1]</sup>.

Some of the machines were rewired during the war for use with other end users than the original user. These machines are entered again in the list, indented under the original entry. The machines are listed with the country of the user and, when known, the identity of the user and its location. For machines used by Germany, Italy and Spain in Italy and Spain it is not always fully clear who is the user and who is the real owner of the machines. Many of the machines changed hands and they were most likely on loan from Germany to Italy and Spain during the Spanish Civil War.

Some machines that were identified as being used by the German Abwehr by the ISK and ISOS sections of GC&CS and documented in their reports have been added. A few of these machines have rather high serial numbers, such as K 1230, K 1236, K 1237 and K 1245. It is possible that these machines instead are of the early Enigma A27 type with serial numbers in the A-series in the range A 1213 – A 1252. The Abwehr people who wrote the messages about the Enigma K machines deliveries to Spain and Portugal, might not have paid attention to the difference in serial number series and put down all these machines as Enigma K. However, we cannot exclude that

K-machines with these high numbers existed. The highest number documented in the H&R documents is K 967. From [5, 6] we see that H&R received another order for 100 Enigma K machines, order OKH SS 222–6401/42 dated 10 July 1942, that would be delivered on demand. At the same time H&R had several large orders, for more than 200 Enigma K machine, for the *Oberkommando der Kriegsmarine*, OKM. These orders were for the Enigma T version for Japan, but which meant that production lines were running for a large number of Enigma K machines in 1942. The order to cease the production of Enigma G and Enigma K machines was given to H&R and the production firm Konski & Krüger in a letter dated 11 November 1943. The only exception to this order was to fulfil the production order of the outstanding 180 Enigma T machines for Japan, with the planned completion for the end January 1944. If Abwehr's decision, to put into service a number of Enigma K machines with new nine-notch wheels and the pluggable reflector D at the end of 1944, modified the cessation order of November 1943 is unknown.

Perhaps the most astonishing use of Enigma K by the German authorities is the fact that the German naval attachés, Marineattaché, used the Enigma K as their main cipher system from about mid-1939 to the end of 1944, and possibly until the end of the war. The Chiffriermaschine DJ, Enigma K with special wiring DJ, was used by the naval attachés in Buenos Aires, Den Haag, Helsinki, Istanbul, Copenhagen, Madrid, Moscow, Oslo, Rome, Stockholm, Tokyo and Washington. The machine was also used in the direct communications between the German and Italian naval commands in respectively Berlin and Rome. A more detailed study of this machine and its use is planned for publication.

## Known users and locations

- K 201 — Spain, special wiring **F** (1)
- K 202 — Spain, General Franco's Headquarters, wiring **F** (1)
- K 203 — Spain, General Command of the Balearic Islands (1)
- K 204 — Spain, General Franco's Mobile Headquarter "Terminus" (1)
- K 205 — Spain, General Command of the Balearic Islands (1)
- K 206 — Spain, 7th Military Region (1)
- K 207 — Spain, East Army (1)
- K 208 — Spain, Galicia Army Corps (1)
- K 209 – K 212 — Unknown, wiring **E** (4)
  - K 209 – K 212 — equipped with wheels IV and V, wiring **B ext.**, (1937)
- K 213 – K 232 — Bulgarian Authorities, commercial wiring, (Jan. 1937) (20)
- K 234 – K 235 — Italy, Italian Naval Mission in Spain (2)
  - K 234 – K 235 — Germany, German Naval Attaché in Rome, return to Berlin, wiring **D**. (07.11.1939), see [10] (2)
- K 236 — Italy, wiring D, in Spain (05.08.1939) (1)
- K 238 — Italian Navy Ministry, Rome (1)
  - K 238 — Germany, German Naval Attaché in Rome, return to Berlin, wiring **D**. (07.11.1939), see [10] (1)

- K 240 — Italy, wiring D, in Spain (05.08.1939) (1)
- K 241 — Italy, Italian Navy, Rhodes, wiring **D** and wiring **D ext.** (1)
  - K 241 — Germany, German Naval Attaché in Rome, return to Berlin, wiring **D.** (07.11.1939), see [10] (1)
- K 242 — Italy, Italian Navy, Rome, used with Naval Attaché Tokio, wiring **DJ.** (1)
- K 243 — Italy, Rome, used with German cryptographic section Berlin, wiring **DJ.** (1)
  - K 242 – K 243 — Germany, German Naval Attaché in Rome, wiring **DJ.** (29.04.1939), see [10] (2)
  - K 242 – K 247 — Germany, German Naval Attaché in Rome, wiring **DJ.** (29.04.1939), see [10] (6)
- K 249 — Germany, German Abwehr station in Lisbon, see [4, 7] (1)
- K 250 — Germany, German Naval Attaché in Copenhagen, wiring **DJ.** (15.11.1939), see [14] (1)
  - K 250 — Germany, German Naval Attaché in Copenhagen, machine malfunctions, will be replaced with K 269. (23.03.1940), see [15]
  - K 250 — Germany, German Naval Attaché in Madrid, returned for repair, wiring **DJ.** (11.03.1941), see [8]
  - K 250 — Germany, German Naval Attaché in Helsinki, second DJ machine. (25.06.1941), see [13] <sup>[2]</sup>
- K 253 — Germany, German Naval Attaché in Madrid, replacement for K 274, wiring **DJ.** (14.06.1941), see [8] (1)
- K 255 — Italy, Italian Navy, Commander in Chief Naval Forces, wiring **D** and wiring **D ext.** (1)
- K 256 — Italy, wiring D, in Spain (05.08.1939) (1)
  - K 257 — Italy, Italian Navy, Betasom (Bordeaux), wiring **D** and wiring **D ext.** (1)
- K 259 — Italy, Italian Navy, Centro Calabria, wiring **D** and wiring **D ext.** (1)
- K 261 — Italy, wiring D, in Spain (05.08.1939) (1)
- K 265 — Germany, German Naval Attaché in Rome, return to Berlin, wiring **D.** (07.11.1939), see [10] (1)
- K 269 — Germany, German Naval Attaché in Copenhagen, wiring **DJ.** (23.03.1940), see [15] (1)
- K 270 — Germany, German Naval Attaché in Oslo, returned to Admiral Norwegen, wiring **DJ.** (27.05.1940), see [9] (1)
  - K 270 — Germany, German Naval Attaché in Moscow, replacement for K 272, see [12]
- K 272 — Germany, German Naval Attaché in Moscow, wiring **DJ.**, ordered on 18.11.1939, delivered on 19.12.1939, see [12] (1)
  - K 272 — One tooth of tooth wheel on rotor I broken. Machine replaced with K 270, K 272 returned to Berlin. (03.12.1940), see [12]
  - K 272 — Germany, German Naval Attaché in Madrid, replacement for K 250, wiring **DJ.** (03.05.1941), see [8] (1)
- K 274 — Germany, German Naval Attaché in Madrid, returned for repair, wiring **DJ.** (04.06.1941), see [8] (1)

- K 275 — Germany, German Naval Attaché in Tokyo, delivery of machine, wiring **DJ**. (16.12.1941), see [11] (1)
- K 283 – K 284 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (2)
- K 287 — Spain, Head of Air Forces (1)
- K 288 — Spain, 1st Army Corps (1)
- K 289 — Spain, General Command of the Canary Islands (1)
- K 290 — Spain, Centre Army (1)
- K 291 — Spain, Aragón Army Corps (1)
- K 292 — Spain, Castile Army Corps (1)
- K 293 — Spain, Navarre Army Corps (1)
- K 294 — Spain, Reserve (1)
- K 295 — Spain, Morocco Army Corps (1)
- K 296 — Spain, 6th Military Region (1)
- K 297 — Italy, Italian Naval Mission in Spain (1)
  - K 297 — Italy, returned to Berlin via German Naval Attaché in Rome, wiring **D**. (07.11.1939), see [10] (1)
- K 298 — Italy, wiring D, reported in Spain, but returned to German office in Italy, Missione Navale Tedesca, (05.08.1939) (1)
- K 302 – K 311 — Italy, Italian Air Ministry (10)
- K 312 – K 315 — Germany, Reichswehr, In 7 V, special wiring **RKM 2**, (Nov. 1937) (4)
  - K 313 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
- K 316 – K 319 — Germany, Reichswehr, In 7 V, special wiring **RKM 1**, (Nov. 1937) (4)
  - K 317 – K 319 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (3)
- K 320 – K 322 — Germany, Reichspost Ministerium, special wiring, (Nov. 1937) (3)
- K 323 – K 324 — Switzerland, commercial wiring, part of 14 machines delivered by C. Lorenz A.G., Berlin (02.02.1938) (2)
- K 350 — Switzerland, commercial wiring, part of Lorenz shipment of 14 machines (1) <sup>[3]</sup>
- K 356 – K 358 — Spain, Spanish Morocco, commercial wiring (3)
- K 360 – K 400 — Switzerland, commercial wiring, order no. 22890, (17.03.1939) (40) <sup>[4]</sup>
  - K 396 — Switzerland, commercial wiring, delivered with wrong key top for the ‘O’ letter key. (31.03.1939)
- K 401 – K 415 — Switzerland, commercial wiring, order no. 22892, (19.05.1939) (15)
- K 416 – K 425 — Switzerland, commercial wiring, order no. 22891, (19.05.1939) (10)
- K 428 – K 429 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (2)
- K 430 – K 431 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (2)
- K 432 – K 441 — Germany, Reichsbahn, Reichbahndirektion Berlin, special wiring **RB**, (1940) (10)
- K 448 – K 465 — Germany, Reichsbahn, Ostbahn in Krakow, special wiring **RB**, (1940) (18)
- K 469 – K 470 — Germany, Illies & Co, Berlin, commercial wiring (2)
- K 471 – K 500 — Switzerland, commercial wiring (30)
- K 501 – K 550 — Switzerland, commercial wiring (50)
- K 582 — Germany, German Abwehr station in Madrid, see [4]

- K 583 – K 584 — Italy, Italian Military Attache Rome, special wiring (2)
  - K 583 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
- K 585 — Croatia, Croatian General Staff, special wiring **CHDF**, (March 1944) (1)
- K 589 – K 590 — Croatia, Croatian General Staff, special wiring **CHDF**, (March 1944) (2)
- K 601 – K 620 — Italy, Italian B.d.U. Bordeaux, wiring D, (07.04.1941), see [11] (20)
- K 614 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
- K 619 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
- K 621 — Italy, Italian Army, Leros, special wiring **D** and wiring **D ext.** (1940) (1)
  - K 621 — Croatia, Croatian General Staff, special wiring **CHDF**, (March 1944) (1)
- K 622 — Italy, Italian Army, Pula, special wiring **D** and wiring **D ext.** (1940) (1)
- K 623 — Italy, Italian Army, Hyères, special wiring **D** and wiring **D ext.** (1940) (1)
- K 624 — Italy, Italian Army, 6th Army Sicily, special wiring **D** and wiring **D ext.** (1940) (1)
- K 625 – K 664 — Italy, Italian B.d.U. Bordeaux, wiring D, (07.04.1941) (40)
- K 667 — Italy, Italian Army, Rome, special wiring **D** and wiring **D ext.** (1)
- K 668 — Italy, Italian Army, Marisudest, special wiring **D** and wiring **D ext.** (1)
- K 669 — Italy, Italian Army, 13th Army Sardinia, special wiring **D** and wiring **D ext.** (1)
- K 735 – K 736 — Germany, Auswärtige Amt (Foreign Office), special wiring, (1941) (2)
- K 739 – K 744 — Germany, OKW Stab WNV/Fu, special wiring **B**, (1941) (6)
 

wiring **B ext.** for wheels IV and V. End user — ObdL/Chef NVW

  - K 739 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
  - K 741 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
  - K 743 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (1)
- K 745 – K 754 — Germany, OKW Stab WNV (10)
- K 755 – K 858 — Switzerland, commercial wiring (104)
- K 859 – K 958 — Germany, OKH (100)
  - K 859 – K 862 — Croatia, Croatian General Staff, special wiring **CHDF**, (Nov. 1943) (4)
  - K 881 – K 892 — Croatia, Croatian General Staff, special wiring **CHDF**, (July 1942) (12)
- K 893 – K 912 — Germany, Reichsbahn, Reichbahndirektion Berlin, special wiring **RB**, (1943) (20)
- K 959 – K 960 — Germany, OKW Stab WNV (2)
- K 961 — Italy, Italian Naval Attache, special wiring **D**, (1941) (1)
 

wiring **D ext.**, (1941)
- K 962 – K 963 — Japan, Japanese Navy, commercial wiring (2)
- K 964 – K 967 — Italy, Italian Embassy Berlin, special wiring **D**, (1941) (4)
- **K 1230** — Germany, German Abwehr station in Lisbon, see [4] **NB!!** <sup>[5]</sup>
- **K 1236** — Germany, German Abwehr station in Lisbon, see [4]
- **K 1237** — Germany, German Abwehr station in Madrid, see [4]
- **K 1245** — Germany, German Abwehr station in Madrid, see [4]

## Wheel Wiring Drawings

Wiring	Wheel drawing	Date
Commercial	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 87 a – c	27.07.1927
A	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz ??	21.2.1934
B	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 171 a – c	Sept. 1936
C	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 172 a – c	Sept. 1936
D	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 173 a – c	09.09.1936
DJ, OKM	UKW: Ch 11 Tz 258, I – III: Ch 11 Tz 257 a – c	
E	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 175 a – c	11.11.1936
F	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 174 a – c	Sept. 1936
U	UKW: Ch 15 Tz 115, I – III: Ch 15 Tz 114 a – c	13.08.1936
B ext.	IV – V: Ch 11 Tz 183 a – b	01.03.1937
D ext.	IV – VI: Ch 11 Tz 350 a – c	1941
RB	UKW: Ch 11 Tz 271, I – III: Ch 11 Tz 272 a– c	Jan. 1940
RKM 1	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 197 a-c	Nov. 1937
RKM 2	UKW: Ch 11 Tz 86 a, I - III: Ch 11 Tz 214 a-c	Nov. 1937
RPM	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 215 a-c	Nov. 1937
CHDF	UKW: Ch 11 Tz 86, I – III: Ch 11 Tz 364 a – c	July 1942

## References

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3. Soler Fuensanta, José Ramón, López-Brea Espiau, Francisco Javier, and Weierud, Frode; [Spanish Enigma: A History of the Enigma in Spain](#), Cryptologia Volume 34, Issue 4 October 2010 , pp. 301-328. [Author's Copy](#) – [Complementary Article Information](#)
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6. Heimsoeth & Rinke. 1942. [Orders for cipher equipment, dated 22 December 1942](#)
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8. Marine. 1941. Marineattachégruppe Spanien, Bd. 5: Mobilmachung. RM 11/29, pp. 381–383, 567–569. Bundesarchiv, Freiburg.
9. Marine. 1940. Marineattachégruppe Norwegen, Mobilmachung. RM 11/40, pp. 25–117. Bundesarchiv, Freiburg.
10. Marine. 1939. Marineattachégruppe Italien, Bd. 1. RM 11/59, pp. 172–180, 300. Bundesarchiv, Freiburg.
11. Marine. 1939. Marineattachégruppe Japan, Bd. 1: Mobilmachung. RM 11/74, pp. 309–313. Bundesarchiv, Freiburg.
12. Marine. 1941. Marineattachégruppe Sowjetunion, Rußland – Mobilmachung. RM 11/34, pp. 185–189, 243–249, 319–323. Bundesarchiv, Freiburg.
13. Marine. 1941. Marineattaché Helsinki, Bd. 1: Finnland - Mob. RM 12-II/14, pp. 203. Bundesarchiv, Freiburg.
14. Marine. 1939. Marineattaché Kopenhagen, Bd. 1: Geheime Kommandosache II. RM 12-II/34, pp. 23. Bundesarchiv, Freiburg.
15. Marine. 1939. Marineattaché Kopenhagen, Bd. 1: Geheime Kommandosache II. RM 12-II/34, pp. 49. Bundesarchiv, Freiburg.

## Notes

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1. *Hrvatsko domobranstvo* is also referred to as the *Kroatische Heimwehr*. According to Davor Zebec's Ph.D. dissertation "[The mass killings in 1945 after the end of the war in Yugoslavian battlegrounds. A comparison of Croatian and Slovenian historiography](#)" the *Kroatische Landwehr* or rather *Kroatische Heimwehr* was created in April 1941. Quote: "*Mit Zustimmung der Wehrmacht gründete der NDH-Staat bereits im April 1941 die Kroatische Landwehr bzw. Heimwehr (Hrvatsko Domobranstvo), die sog. Domobrani.* — With the approval of the Wehrmacht, the NDH state (*Nezavisna Država Hrvatska* — Independent State of Croatia) founded the Croatian Home Guard (*Hrvatsko Domobranstvo*), the so-called *Domobrani*, in April 1941." ↩
2. Apart from in Italy and Japan, this is the only case where it has been discovered that the naval attaché had more than one DJ machine. This is an indication of the importance of the Finnish office and the amount of traffic they handled after the invasion of Russia in June 1941. ↩
3. The first Enigma machines delivered to Switzerland were part of a contract with the German communication firm C. Lorenz A.G., Berlin-Tempelhof, Lorenzweg for fourteen 1.5 kW radio stations for the Swiss Army. The machine K 350 was lent to the Swiss Foreign Office for their use in April 1941. Private communication with Rudolf Ritter on 10 June 2001. ↩
4. The serial numbers K 360 – K 400 and K 416 – K 425 have been deducted from the correspondence between Heimsoeth & Rinke and the Swiss defence department concerning the three orders no. 22890 for 40 Enigma K, and no. 22891 and 22892, for respectively 10 and 15 units. The order no. 22892 for 15 Enigma K machine is known to have the serial numbers K 401 – K 415. ↩
5. Most like the machines K 1230 – K 1245 are Enigma A27 with serial numbers in the A-series, such that the machines in reality are A 1230, A 1236, A 1237 and A 1245. Reference [10, p. 300] mentions the machines A 1236, A 1238 and A 1250, all with wiring D, being returned to Berlin from the German Marine attaché in Rome. ↩