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ENIGMA WIRINGS

Name of Machine: ZAEHLWERK (CA-15)

Source: 47

No wiring was found for this machine, but a brief comment on it is made here since it is of the Group II type.

The Zaehlwerk or Counter Enigma is a four-wheel model having gear drive and employing eccentric teeth for wheel progression. It was sold to the Dutch for military use. Subsequent to the outbreak of World War II, two machines were delivered to OKW at Stahnsdorf.

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ENIGMA WIRINGS

Name of Machine: GROUP II ENIGMA

Source: 4 (p. 1, 5, 6, 12, 18); 6a (p. 10, 17, 19); 6h (p. 1-3);
 10 (p. 82); 11 (p. 1); 15; 30; 31; 32 (p. 9); 44 (p. 2); 48;
 55 (p. 4, 172, 177); 61 (p. 1)

The Group II machine, also referred to as the German notation G machine, was the principal Enigma used by the Abwehr until the end of 1944, for European communications. The British ISK section solved the machine in December 1944.

Group II traffic centering on Berlin had approximately 270 out-stations including some ships. This group together with a large group centering on Paris, Brussels, The Hague, Sofia, Vienna, Warsaw, and Zagreb formed one network. These also worked with a large number of out-stations within the subgroups.

Of the three wirings included here, the first two were originally given in digital form. The last one, a twist-free version, appeared as presented in literal form. The first wiring was furnished by the British with the following additional data:

<u>Wheels:</u>	<u>Wheel characteristics:</u>	<u>Cyclometric turnover:</u>
I British Red	Red: 12. 10. 2. 2.	R.B.G.
II " Blue	Blue: 19. 3. 2. 2.	R O S A
III " Green	Green: 18. 8.	S P T B
		S P T C

<u>Clip Differences:</u>	<u>Wheel Twists:</u>
<u>English</u> <u>German</u>	Red = 8
Reflector = 17	Blue = 19
Red = 18	Green = 17
Blue = 12	
Green = 6	

<u>Conversion Table</u>	<u>English to German</u>
<u>Wheel Order</u> <u>Reflector</u>	Left Middle Right
R.G.B. -9 constant	- 2 + 1 -12
G.R.B.	- 7 -11 -12
B.R.G.	-11 - 9 - 6
R.B.G.	- 2 - 3 - 6
G.B.R.	- 7 + 6 + 8
B.G.R.	-11 +12 + 8

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ENIGMA WIRINGS

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GROUP II ENIGMA (continued)

The machine associated with the second wiring was presented as being a variation of the commercial Enigma, differing from it by having the wheels turn over cyclometrically, i.e., no wheel can turn over unless all wheels to the right of it are passing through a turnover position. The reflector also is turned over by the wheel immediately to its right. Like the British version, just described, these wheels have 11, 15, 17 turnovers fixed to the rings, but differ in notch placement and individual digit values. A literal wiring not included here, agrees with the second wiring in corresponding values but differs as to notch markings which are given as follows:

Green: A/B/C/DE/F/G/HI/JK/L/MNO/P/Q/RS/TU/V/W/XYZ/ - 17

Blue: A/BC/D/EF/G/H/IJK/LM/N/OPQ/RS/T/UV/WXY/Z/ - 15

Red: A/BCDE/F/GH/IJK/LM/N/OPQR/STU/VW/X/YZ - 11

A pencilled notation made on the paper giving this wiring reads: "wheels probably twisted".

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ENIGMA WIRINGS

Name of Machine: GROUP II ENIGMA

Endplate Sequence:

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

Rotors:

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

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

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

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

Notch patterns are indicated by /

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ENIGMA WIRINGS

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Name of Machine: GROUP II ENIGMA

Endplate Sequence:

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

Rotors:

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

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

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

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

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ENIGMA WIRINGS

Name of Machine: GROUP II ENIGMA

Endplate Sequence:

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

Rotors: (twist-free)

Red r. A/B/C/D/E/F/G/H/I/J/K/L/M/N/O/P/Q/R/S/T/U/V/W/X/Y/Z (17-notch)
1. W R V S U E J F P T L X H B I Q Y O K C A G N Z D M

Blue A/B/C/D/E/F/G/H/I/J/K/L/M/N/O/P/Q/R/S/T/U/V/W/X/Y/Z (15-notch)
K G R Z M S I B A N Y H T Q X F W C L O V E D J P U

Green A/B/C/D/E/F/G/H/I/J/K/L/M/N/O/P/Q/R/S/T/U/V/W/X/Y/Z (11-notch)
F N W J U H P Z X R G O K A S I B Y T D L C Q E M V

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

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ENIGMA WIRINGS

Name of Machine: ORANGE ENIGMA

Source: 4 (p. 1, 6, 12); 10 (p. 82); 11 (p. 1); 15; 48; 55; 61 (p. 1)

The system GEQ, also known as ORANGE at SSA, was a German machine cipher used on the special diplomatic net by the Abwehr (Intelligence) and Sicherheitsdienst (Secret Police). According to the British, it constituted the majority of the traffic known to them as "ISK" or "Illicit Series Knox" - Mr. Knox being the analyst who first solved messages of this class.

Attention was first directed to GEQ in July 1942 upon the return of Col. S. Kullback (SSD) from England. In October 1943 the British sent a complete list of keys for April - September. The first solution was effected on 12 November.

The ORANGE Enigma used to encipher GEQ traffic was operated and controlled by the "Auslands Organisation", which dealt with Germans living abroad. It is a multi-turnover machine with a rotating reflector but without stecker. It differs from the commercial model only in the wiring of the wheels and in their motion. These are characterized individually as Red, Blue, Green, and Reflector, and positionally as fast, medium, slow, and reflector. The three regular wheels are interchangeable, giving six possible wheel orders. The reflector by its mechanico-electrical composition is a movable endplate rather than a true wheel and cannot be interchanged with the other wheels.

The motion of the ORANGE Enigma differs from that of the Commercial in the following manner: the medium wheel moves every 1, 2, 3, or 4 letters instead of every 26; the slow wheel moves at least once in every four moves of the medium wheel. The reflector moves during encipherment at least once for every four moves of the slow wheel. Presumably, motion is accomplished mechanically by notches on the rings of the wheels, as on the Commercial Enigma. Notches for the Red, Blue, and Green wheels are 17, 15, and 11 respectively. The position of the notches as shown in the wirings is with ring setting at A.

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ENIGMA WIRINGS

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Name of Machine: ORANGE ENIGMA

Endplate Sequence:

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

Rotors:

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

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

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

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

Notch patterns are indicated by /

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ENIGMA WIRINGS

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Name of Machine: GREEN and RED ENIGMAS

Source: 1 (p. 1); 6a (p. 10, 15-16, 21-23); 6e (p. 1-2); 25 (p. 1);
34 (p. 212, 215, 231, 262 ff., 309, 323-325); 41 (p. 4);
54 (p. 96); 55; 67

Enigma machines used by the German Intelligence Service between Berlin and South America have been associated with the colors "blue", "green", and "red". These colors were used confusedly in messages between the two points in reference to keys, stations, and the actual machines.

The BLUE key was never solved. The GREEN machine was used by the Abwehr in 1942 and solved in December of that year by the British and in February of 1943 by the U.S. Coast Guard. The RED machine, as used on the 3-N circuit, was apparently employed by the Abwehr and the Sicherheitsdienst to replace the Kryha (non-Enigma) machine and was solved by the British January 1944 and by the Coast Guard in March 1944. As a result of confusion between Berlin and Argentina with the introduction of the RED machine, a mix-up produced a machine using a combination of RED wheels and GREEN reflector. Apparently this machine was used by the 4-0 part of the Sicherheitsdienst group. At this time Argentina complained to Berlin of inability to decipher messages sent her because the machine being used at that end was the G-208 Enigma.

Another machine, the G-260, with a relettering of one between the wiring of its wheels and the wheels of the RED 3-Nan (twist-free) machine, was captured by Argentine Police in a raid on German agents' quarters, and was reported on by the U.S. Military Attache in Buenos Aires on 3 July 1945.

Still another Enigma, the B-207 (RED "B" machine) is included herein chiefly because the term "RED" has also been tacked on to it. No evidence has been found to indicate that this is a South American machine or that it belongs to this group at all. Only the wiring as shown last, following the more detailed account of these machines under their RED, GREEN, or Sicherheitsdienst Group (4-0) headings, was available. No attempt has been made in this paper to account for any of the differences found.

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ENIGMA WIRINGS

Name of Machine: GREEN ENIGMA (3-KING) (3-K)

Source: 1 (p. 1); 6a (p. 10, 15-16); 34 (p. 231, 324); 55; 67

The 3-King (GREEN) machine, also referred to as the 3-K and the South American GREEN Enigma, was first heard 10 October 1942. The machine is a multiple-notch Enigma employing cyclometric motion, that is, no wheel can turn unless the notches on all wheels to the right are in position. Thus, the cycle of this machine is 26^4 , since the reflector wheel is also mechanically stepped. All known multiple-notch machines have the same distribution of notches on their 11-, 15-, and 17-notch wheels. This turnover pattern plus the rotary reflector produces a "lobster" effect.

Four versions of the GREEN machine are included in this account. Two - the second and fourth - were originally in digital form but are presented here, for convenience, in literal form. The first one, which probably has twists, agrees correspondingly in letter value with the second one, but differs in notch placement. The third and fourth are different from each other as well as from the first and second wirings in letter value and notch placement. All four versions are alike, however, in notch pattern which is reportedly the same as for the Group II machine.

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ENIGMA WIRINGS

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Name of Machine: GREEN ENIGMA (3-KING) (3-K)

Endplate Sequence:

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

Rotors:

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

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

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

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

Notch patterns are indicated by /

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ENIGMA WIRINGS

Name of Machine: GREEN ENIGMA (3-KING) (3-K)

Endplate Sequence:

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

Rotors:

- I. A/B/C D/E/F G/H I/J/K L/M N/O/P Q/R/S T/U/V W/X Y/Z
A Y X P G O W L V K R E I M C S N J D B Z T Q H U F
- II. A B/C D/E/F G/H I J/K/L/M N/O/P Q/R/S/T U/V/W X/Y/Z
A Q I Y G S H O F D P V K W Z R X E M J C U N T B L
- III. A/B C/D/E/F G/H I/J/K L/M/N/O/P Q/R S/T/U/V W X/Y/Z/
A U L T I R J N H D P C O B Z S Y G Q V E K X W F M

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

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ENIGMA WIRINGS

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Name of Machine: SOUTH AMERICAN (GREEN)

Endplate Sequence:

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

Rotors:

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

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

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

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

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ENIGMA WIRINGS

Name of Machine: GREEN ENIGMA (3-KING) (3-K)

Endplate Sequence:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Endplate)
(Keyboard)Rotors:

- I. 1. A B C D/E/F G/H I J/K L/M/N O P Q/R S T/U V/W/X Y Z/ (11-notch)
r. A T O S L Z E X M R J H N Q F D W K P V Y I G C B U
- II. A B/C D E/F/G/H I J/K L/M/N O P/Q R/S/T U/V W X/Y/Z/ (15-notch)
A Y U J R I E G C T M Z S W H K B P F X V L N Q D O
- III. A/B/C D/E/F/G H/I J/K/L M N/O/P/Q R/S T/U/V/W X Y/Z/ (17-notch)
A N L J U Y R I E G V C Z H M K S F P D B T X W Q O

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

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ENIGMA WIRINGS

Name of Machine: RED ENIGMA (3-NAN) (3-N)

Source: 6a (p. 10, 21-23); 6e (p. 1-2); 25 (p. 1); 34 (p. 212, 215, 262 ff., 309, 323-325); 41 (p. 4); 54 (p. 96); 55 (p. 4)

The RED (Rot) machine was used by the Abwehr and the Sicherheitsdienst for communications to South America on the 3-N circuit. The first mention of its appearance was in a message from Argentina to Berlin on 4 November 1943. It was solved independently by the British in January 1944 and by the U.S. Coast Guard in March 1944.

Like the GREEN Enigma, it is a multiple-notch machine employing cyclometric motion. The cycle of the machine is 26^4 since the reflector wheel is also mechanically stepped. It has the 11-15-17 turnover pattern distribution plus the rotating reflector which produces the "lobster" effect. Through a message from Berlin to Argentina, which indicated the wheel order as R231, the Coast Guard verified that wheels 1, 2, and 3 had 17, 15, and 11 turnovers respectively. A curious thing about the reflector is that it is the same as for the old Commercial machine.

Of the four wirings included with this account, the first one, a literal version with notches marked, corresponded to a digital version, not included here, which was labeled "Mercedes RED" but which showed no notch placement and had no explanatory data accompanying it. The second and third wirings are U.S. Coast Guard recoveries. They give no notch placement. The last wiring is a British version, given originally in digital form. It is correspondingly different from all the other versions and its turnover pattern is indicated as being the same as that for the Group II machines.

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ENIGMA WIRINGS

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Name of Machine: RED ENIGMA (3-NAN) (3-N)

Endplate Sequence:

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

Rotors: (twist-free)

Red I r. A/B/C/D E/F/G H/I J/K/L/M N/O/P/Q/R S/T U/V/W/X Y/Z (17-notch)
l. B R O A K J P Z T L G V X S H E Y U F N I M D W C Q

Blue II A/B C/D/E F/G/H/I J K/L M/N/O P Q/R S/T/U V/W X Y/Z (15-notch)
B L H A U O I W Z Q N R F M C K Y J D X G T E P S V

Green III A/B C D E/F/G H/I J K/L M/N/O P Q/R/S T U/V W/X/Y Z (11-notch)
U C G Y D K R P L Z W N J X H V O F B A T I S M Q E

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

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ENIGMA WIRINGS

Name of Machine: RED ENIGMA (3-NAN) (3-N)

Endplate Sequence:

ABCDEFGHIJKLMNOPQRSTUVWXYZ (Endplate)
QWERTZUIOASDFGHJKPYXCVBNML (Keyboard)

Rotors: (with twists)

I. r. ABCDEFGHIJKLMNOPQRSTUVWXYZ (17-notch)
l. AYWPSKOUFEJVTGZBNIRLXMQHD

II. ABCDEFGHIJKLMNOPQRSTUVWXYZ (15-notch)
AEPNZLIDVHJWTCXFROGBYMQUKS

III. ABCDEFGHIJKLMNOPQRSTUVWXYZ (11-notch)
ADYQBNULEHWKPGXFVTZOJMCISR

Reflector: ABCDEFGHIJKLMNOPQRSTUVWXYZ (twist-free)
LDSBFEQZXRPAYWVKGCUTONIMH

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ENIGMA WIRINGS

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Name of Machine: RED ENIGMA (3-NAN) (3-N)

Endplate Sequence:

ABCDEFGHIJKLMNOPQRSTUVWXYZ (Endplate)
QWERTZUIOASDFGHJKPYXCVB NML (Keyboard)

Rotors: (twist-free)

I. r. ABCDEFGHIJKLMNOPQRSTUVWXYZ
l. DAYWPSKOUFEJVTGZBNIRLXMQH

II. ABCDEFGHIJKLMNOPQRSTUVWXYZ
DAOSWMUCGRPB NKFXJLYVEZHTQI

III. ABCDEFGHIJKLMNOPQRSTUVWXYZ
TSBEZRCOV MFI XLQHYGWUAPKNDJ

Reflector: ABCDEFGHIJKLMNOPQRSTUVWXYZ
LDSBF EQZXRPA YWVKGCUTONIMH

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ENIGMA WIRINGS

Name of Machine: SOUTH AMERICAN II (RED)

Endplate Sequence:

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

Rotors:

Red r. A/B/C/D E/F/G/H I/J K/L/M N/O/P/Q/R S/T U/V/W/X Y Z/
 l. C S P B L K Q A U M H W Y T I F Z V G O J N E X D R

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

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

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

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ENIGMA WIRINGS

Name of Machine: SICHERHEITSDIENST GROUP (4-Q) ENIGMA

Source: 34 (p. 324-325)

The only instance known up to this time of a machine using RED Enigma wheels and GREEN Enigma reflector was the case of the super-enciphered instructions for the RED machine when first sent to Argentina. A Berlin message of 5 December 1943 read: "We got the machines mixed up here".

The Enigma involved here was used by the 4-Q component of the Sicherheitsdienst group and recovered by the U.S. Coast Guard. Its RED wheels agree with those used in the RED (twist-free) machine and its GREEN reflector agrees with the reflector used in the GREEN 3-King machine previously discussed. No notch pattern or placement is shown, but the pattern possibly follows the 17-15-11 design of all known multiple-notch machines.

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ENIGMA WIRINGS

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Name of Machine: SICHERHEITSDIENST GROUP (4-0) ENIGMA

Endplate Sequence:

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

Red Enigma
Rotors:

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

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

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

Green Enigma
Reflector:

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

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ENIGMA WIRINGS

Name of Machine: B-207 ENIGMA (RED "B" MACHINE)

Endplate Sequence:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Endplate)
(Keyboard)Rotors:

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

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

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

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

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ENIGMA WIRINGS

Name of Machine: KK (GERMAN ARMISTICE COMMISSION ENIGMA)

Source: 4 (p. 18); 6h (p. 1-3); 29 (p. 1); 55 (p. 4, 173, 178)

This machine, referred to by the Germans as the KK Enigma, was captured October 1942 in North Africa. It was used by the German Armistice Commission in French Africa until the early winter of 1942. It is a revised version of the 11-15-17 Group II Enigma. There are three wheels and a rotatable reflector. Wheel I has 17 turnovers; wheel II, 15; and wheel III, 11. There is reason to believe that this machine is one of the "G" series, a letter designation which accompanied most of the cyclometric machines with rotating reflectors.

Mr. William F. Friedman of the Signal Security Agency, who visited the ISK Section at Bletchley Park, says of this machine: "With regard to the traffic used by the German Armistice Commission, it was stated that the British obtained a machine by capture before they were able to solve any traffic. This machine is of the standard ISK type, but has special wirings. One of these machines was captured by American Forces in the Torch Operation and was sent to B.P. where it is still on hand. It is a nicer job than the ordinary E. It also has several additional features, the most important of which is that it has a letter counter and a mechanism whereby the rotors can be rapidly moved forward or backward by a hand crank." (cf. Zaehlwerk CA-15).

Two wirings of the KK Enigma are included here; the first is a British version and the second is the U.S. Army Signal Corps wiring. The turnovers on the British version are the same as for the Group II machine.

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ENIGMA WIRINGS

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Name of Machine: KK (GERMAN ARMISTICE COMMISSION ENIGMA)

Endplate Sequence:

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

Rotors:

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

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

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

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

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ENIGMA WIRINGS

Name of Machine: KK ENIGMA (Revised GROUP II)

Endplate Sequence:

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

Rotors:

Red r. A B C/D/E/F/G/H/I/J/K L/M/N O/P/Q R S T U/V/W/X/Y/Z
 l. M X U I G C Q O V K J F B Y W S H D N R A Z P L E T

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

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

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

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ENIGMA WIRINGS

Name of Machine: G-208 ENIGMA

Source: 16 (p. 3); 40 (p. 5)

While the debris was being cleaned up in the radio station of the Alexander Barracks in the Hague, an Enigma wheel was found bearing the markings II and G-208. Notches are not indicated on the wiring that follows, but Source maintains that it had "many skip notches". For this reason, and also because of the markings found on the wheel it is included here with Group II machines.

The G-208 Enigma was reported sold with a machine to the Dutch State with the consent of OKW.

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ENIGMA WIRINGS

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Name of Machine: G-208 ENIGMA

Endplate Sequence:

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

Rotors:

- I. r. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
1.
- II. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
S L V G B T F X J Q O H E W I R Z Y A M K P C N D U
- III. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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

Notch patterns are indicated by /

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ENIGMA WIRINGS

Name of Machine: G-260 ENIGMA

Source: 3 (p. 1-4); 6a (p. 23)

This machine was captured by the Argentine Police in a raid on German agent quarters. It was loaned to the U.S. Military Attache in Buenos Aires, who examined and photographed it. The following account is from his report.

The serial number G-260 appears on the exterior of the box containing the machine as well as on each intermediate wheel, the reflector, and the endplate. The contacts on the endplate follow the same order as the letters on the keyboard but in a counter-clockwise direction, i.e., the first letter to the left of Q is W, and the second letter to the left of Q is E.

When the machine was received for examination the wheels had been placed on the wheel shaft in the following order, from left to right, No. 3, 2, 1. The spring clip of wheel I was set at D; of II, at C; of III, at B; of the reflector, at D. The wiring of point to plate contacts while the alphabets were in the above positions was as indicated in the first wiring version presented after this account.

This report of the Military Attache shows a relettering of one between the wiring of wheels themselves and the recovered wiring of the 3-NAN twist-free machine. Due to the notational difficulties encountered between Washington and station "X" in England this is not surprising. The new wiring as given in the Military Attache's report (omitted by Source) is to be preferred to the old wiring. The conversion may be accomplished as follows: increase the letter on both right and left wiring specifications by one, i.e., A - B, B - C, etc. It will be noted that the reflector is the old commercial reflector. The second wiring given here has been converted on the basis of the 3-NAN wiring previously discussed under the heading: RED Enigma.

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ENIGMA WIRINGS

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Name of Machine: G-260 ENIGMA

Endplate Sequence:

ABCDEFGHIJKLMNOPQRSTUVWXYZ (Endplate)
QWERTZUIOASDFGHJKPYXCVBNML (Keyboard)

Rotors:

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

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

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

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

Notch patterns are indicated by /

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ENIGMA WIRINGS

Name of Machine: G-260 ENIGMA

Endplate Sequence:

ABCDEFGHIJKLMNOPQRSTUVWXYZ (Endplate)
QWERTZUIOASDFGHJKPYXCVBNML (Keyboard)

Rotors:

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

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

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

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

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ENIGMA WIRINGS

Name of Machine: KD (NEW ISK UNSTECKERED ENIGMA)

Source: 6L (p. 1); 6m (p. 1-2); 38 (p. 1); 55 (p. 4, 176, 179)

The KD machine is an unsteckered, non-cyclometric Enigma which derived its short title from the fact that all its wheels were marked K by the manufacturer and from its use of a pluggable or D (Dora) type reflector. It was introduced 3 December 1944 on the Berlin - Madrid - Lisbon clandestine, three-way network. For security reasons it was used as a Group II replacement by the Abwehr for its German Agent system in the last year of the War. It was solved by the British ISK Section in January 1945. By 28 January the wiring for six wheels had been recovered, and at that time it was thought, somewhat dubiously, that a seventh wheel might still turn up. The six wheels have like turnover patterns and nine notches per wheel. The British wiring that follows was originally presented in digital instead of literal form.

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ENIGMA WIRINGS

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Name of Machine: KD (NEW ISK UNSTECKERED ENIGMA)

Endplate Sequence:

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

Rotors:

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

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

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

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

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

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

Reflector: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
(pluggable)

Notch patterns are indicated by /

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ENIGMA WIRINGS

Name of Machine: RAILWAY ENIGMA

Source: 42 (p. 254)

The Railway Enigma is a simple unsteckered machine with three wheels and a movable reflector. Six wheel orders were possible. Each wheel had one turnover notch, and the turnover mechanism was the same as for the standard Service Enigma. The reflector had no turnover mechanism. No specimen of this Enigma ever fell into Allied hands. The wiring was recovered as a result of the extreme weakness of the original indicator system. (Wiring was not given by Source). The wheel known to cryptanalysts as I, was known to the Germans as III, and vice versa.

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ENIGMA WIRINGS

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Name of Machine: RAILWAY ENIGMA

Endplate Sequence:

ABCDEFGHIJKLMNOPQRSTUVWXYZ (Endplate)
QWERTZUIOASDFGHJKPYXCVBNML (Keyboard)

Rotors:

- I. r. 1. ABCDEFGHIJKLMNOPQRSTUVWXYZ
- II. ABCDE/FGHIJKLMNOPQRSTUVWXYZ
- III. ABCDEFGHIJKLMNOPQRSTUVWXYZ

Reflector: ABCDEFGHIJKLMNOPQRSTUVWXYZ

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