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Test Plan

With each prototype in the Enigma Machine, there are three tests. Each test has specific settings. Throughout each prototype, the test’s settings remain the same. In some prototypes, settings are added to the test, such as adding the rotor settings. In the process of testing, I will enter some clear text to encrypt. Then, the program should encrypt the clear text and output it onto the screen. All non-alphabetic text will remain the same. To ensure that the encryption process is running correctly, I will calculate all encryption by hand and develop the expected output.

Cleartext Phrase: “Hello, my name is Holland.”

1. Plugboard (Single Stepping)

Test1:

Plugboard settings: a-a, b-b, c-c, d-d, e-e, f-f, g-g, h-h, i-i, j-j, k-k, l-l, m-m, n-n, o-

o, p-p, q-q, r-r, s-s, t-t, u-u, v-v, w-w, x-x, y-y, z-z

Test2:

Plugboard settings: a-z, b-y, c-x, d-w, e-v, f-u, g-t, h-s, i-r, j-q, k-p, l-o, m-n

Test 3:

Plugboard settings: a-c, b-d, e-g, f-h, i-k, j-l, m-o, n-p, q-s, r-t, u-w, v-x, y-z

2. Plugboard + Right Rotor (Single Stepping)

Test 1:

Right Rotor Letter: a

Right Rotor Type: 1

Test 2:

Right Rotor Letter: a

Right Rotor Type: 1

Test 3:

Right Rotor Letter: m

Right Rotor Type: 3

3. Plugboard + Right Rotor + Middle Rotor (Single Stepping)

Test 1:

Middle Rotor Letter: a

Middle Rotor Type: 1

Test 2:

Middle Rotor Letter: b

Middle Rotor Type: 2

Test 3:

Middle Rotor Letter: z

Middle Rotor Type: 2

4. Plugboard + Right Rotor + Middle Rotor + Left Rotor (Single Stepping)

Test 1:

Left Rotor Letter: a

Left Rotor Type: 1

Test 2:

Left Rotor Letter: c

Left Rotor Type: 3

Test 3:

Left Rotor Letter: a

Left Rotor Type: 1

5. Plugboard + Right Rotor + Middle Rotor + Left Rotor + Reflector (Single Stepping)

6. Plugboard + Right Rotor + Middle Rotor + Left Rotor + Reflector + Left Rotor (Single

Stepping)

7. Plugboard + Right Rotor + Middle Rotor + Left Rotor + Reflector + Left Rotor + Middle

Rotor (Single Stepping)

8. Plugboard + Right Rotor + Middle Rotor + Left Rotor + Reflector + Left Rotor + Middle

Rotor + Right Rotor (Single Stepping)

9. Plugboard + Right Rotor + Middle Rotor + Left Rotor + Reflector + Left Rotor + Middle

Rotor + Right Rotor + Plugboard (Single Stepping)

10. Plugboard + Right Rotor + Middle Rotor + Left Rotor + Reflector + Left Rotor + Middle

Rotor + Right Rotor + Plugboard (Double Stepping)

For the frequency analysis prototype, there will also be three different tests. For each test, a large amount of text will be run through the Enigma Machine. Then I will run the encrypted text through frequency analysis and cross check it with the original text. Then I will determine the frequency analysis’s accuracy.