; Program to simulate ENIGMA Machine

; Data

```
D000        07 00 03 06 04 01 08 02 05 09 (10 bytes)
            rot1:   db   07h, 00h, 03h, 06h, 04h, 01h, 08h, 02h, 05h, 09h

D100        01 03 06 07 00 05 02 04 08 09 (10 bytes)
            rot2:   db   01h, 03h, 06h, 07h, 00h, 05h, 02h, 04h, 08h, 09h

D200        07 01 02 00 05 03 08 06 04 09 (10 bytes)
            rot3:   db   07h, 01h, 02h, 00h, 05h, 03h, 08h, 06h, 04h, 09h

D300        07 05 09 04 03 01 08 00 06 02 (10 bytes)
            refl:   db   07h, 05h, 09h, 04h, 03h, 01h, 08h, 00h, 06h, 02h

D400        <3 bytes>   post:   ds   3

D500        <1 byte>    text:   ds   1
D501        <1 byte>    ciph:   ds   1
```

; Code

; Get Settings

```
C200    06   00                 mvi B, 00h
C202    CD   E7   02    ring1:  call rdkbd
C205    32   00   D4            sta post
C208    CD   6E   03            call modidt
C20B    11   FF   FF            lxi D, FFFFh
C20E    CD   F1   05            call delay
C211    CD   D7   01            call clear

C214    CD   E7   02    ring2:  call rdkbd
C217    32   01   D4            sta post+1
C21A    CD   6E   03            call modidt
C21D    11   FF   FF            lxi D, FFFFh
C220    CD   F1   05            call delay
C223    CD   D7   01            call clear

C226    CD   E7   02    ring3:  call rdkbd
C229    32   02   D4            sta post+2
C22C    CD   6E   03            call modidt
C22F    11   FF   FF            lxi D, FFFFh
C232    CD   F1   05            call delay
C235    CD   D7   01            call clear
C238    FF                      rst
```

```
; Start Encryption
C020        31   EF   FF                lxi SP, FFEFh
C023        CD   E7   02      textin:   call rdkbd
C026        32   00   D5                sta text
C029        32   01   D5                sta ciph

; Rotor 1
C02C        21   00   D4      rota1:    lxi H, post
C02F        34                          inr M
C030        7E                          mov A, M
C031        FE   0A                     cpi 0Ah
C033        DA   3B   C0                jc next1
C036        D6   0A                     sui 0Ah
C038        77                          mov M, A
C039        23                          inx H
C03A        34                          inr M

C03B        5F                next1:    mov E, A
C03C        21   00   D0                lxi H, rot1
C03F        7D                          mov A, L
C040        C6   0A                     adi 0Ah
C042        4F                          mov C, A

C043        16   00                     mvi D, 00h
C045        19                          dad D

C046        3A   01   D5                lda ciph
C049        85                          add L
C04A        B9                          cmp C
C04B        DA   50   C0                jc skip1
C04E        D6   0A                     sui 0Ah

C050        6F                skip1:    mov L, A
C051        7E                          mov A, M
C052        32   01   D5                sta ciph

; Rotor 2
C055        21   01   D4      rota2:    lxi H, post+1
C058        7E                          mov A, M
C059        FE   0A                     cpi 0Ah
C05B        DA   63   C0                jc next2
C05E        D6   0A                     sui 0Ah
C060        77                          mov M, A
C061        23                          inx H
C062        34                          inr M

C063        5F                next2:    mov E, A
C064        21   00   D1                lxi H, rot2
C067        7D                          mov A, L
C068        C6   0A                     adi 0Ah
```

```
C06A        4F                          mov C, A

C06B        19                          dad D

C06C        3A  01  D5                  lda ciph
C06F        85                          add L
C070        B9                          cmp C
C071        DA  76  C0                  jc skip2
C074        D6  0A                      sui 0Ah

C076        6F              skip2:      mov L, A
C077        7E                          mov A, M
C078        32  01  D5                  sta ciph

; Rotor 3
C07B        21  02  D4      rota3:      lxi H, post+2
C07E        7E                          mov A, M
C07F        FE  0A                      cpi 0Ah
C081        DA  87  C0                  jc next3
C084        D6  0A                      sui 0Ah
C086        77                          mov M, A

C087        5F              next3:      mov E, A
C088        21  00  D2                  lxi H, rot3
C08B        7D                          mov A, L
C08C        C6  0A                      adi 0Ah
C08E        4F                          mov C, A

C08F        19                          dad D

C090        3A  01  D5                  lda ciph
C093        85                          add L
C094        B9                          cmp C
C095        DA  9A  C0                  jc skip3
C098        D6  0A                      sui 0Ah

C09A        6F              skip3:      mov L, A
C09B        7E                          mov A, M
C09C        32  01  D5                  sta ciph


; Reflection Module
C09F        21  00  D3      refl1:      lxi H, refl
C0A2        7D                          mov A, L
C0A3        C6  0A                      adi 0Ah
C0A5        4F                          mov C, A

C0A6        3A  01  D5                  lda ciph
C0A9        85                          add L
```

```
C0AA    B9                      cmp C
C0AB    DA  B0  C0              jc skip4
C0AE    D6  0A                  sui 0Ah

C0B0    6F              skip4:  mov L, A
C0B1    7E                      mov A, M
C0B2    32   01  D5             sta ciph

; Inverse 1 (Rotor 3)
C0B5    47              invr1:  mov B, A
C0B6    0E   FF                 mvi C, 0ffh

C0B8    21   00  D2             lxi H, rot3
C0BB    7D                      mov A, L
C0BC    C6  0A                  adi 0Ah
C0BE    57                      mov D, A

C0BF    21   02  D4             lxi H, post+2
C0C2    7E                      mov A, M
C0C3    21   00  D2             lxi H, rot3
C0C6    85                      add L
C0C7    6F                      mov L, A

C0C8    0C              comp1:  inr C
C0C9    5E                      mov E, M

C0CA    23                      inx H
C0CB    7D                      mov A, L
C0CC    BA                      cmp D
C0CD    DA  D3  C0              jc skip5
C0D0    D6  0A                  sui 0Ah
C0D2    6F                      mov L, A

C0D3    7B              skip5:  mov A, E
C0D4    B8                      cmp B
C0D5    C2  C8  C0              jnz comp1
C0D8    79                      mov A, C
C0D9    32   01  D5             sta ciph

; Inverse 2 (Rotor 2)
C0DC    47              invr2:  mov B, A
C0DD    0E  FF                  mvi C, 0ffh

C0DF    21  00  D1              lxi H, rot2
C0E2    7D                      mov A, L
C0E3    C6  0A                  adi 0Ah
C0E5    57                      mov D, A

C0E6    21  01  D4              lxi H, post+1
C0E9    7E                      mov A, M
```

```
C0EA    21  00  D1              lxi H, rot2
C0ED    85                      add L
C0EE    6F                      mov L, A

C0EF    0C              comp2:  inr C
C0F0    5E                      mov E, M

C0F1    23                      inx H
C0F2    7D                      mov A, L
C0F3    BA                      cmp D
C0F4    DA  FA  C0              jc skip6
C0F7    D6  0A                  sui 0Ah
C0F9    6F                      mov L, A

C0FA    7B              skip6:  mov A, E
C0FB    B8                      cmp B
C0FC    C2  EF  C0              jnz comp2
C0FF    79                      mov A, C
C100    32  01  D5              sta ciph
```

; Inverse 3 (Rotor 1)

```
C103    47              invr3:  mov B, A
C104    0E  FF                  mvi C, 0ffh

C106    21  00  D0              lxi H, rot1
C109    7D                      mov A, L
C10A    C6  0A                  adi 0Ah
C10C    57                      mov D, A

C10D    21  00  D4              lxi H, post
C110    7E                      mov A, M
C111    21  00  D0              lxi H, rot1
C114    85                      add L
C115    6F                      mov L, A

C116    0C              comp3:  inr C
C117    5E                      mov E, M

C118    23                      inx H
C119    7D                      mov A, L
C11A    BA                      cmp D
C11B    DA  21  C1              jc skip7
C11E    D6  0A                  sui 0Ah
C120    6F                      mov L, A

C121    7B              skip7:  mov A, E
C122    B8                      cmp B
C123    C2  16  C1              jnz comp3
C126    79                      mov A, C
C127    32  01  D5              sta ciph
```

; Show output

C12A	06 00	mvi B, 00h
C12C	CD 6E 03	call modidt

; Rerun

C12F	11 FF FF	lxi D, FFFFh
C132	CD F1 05	call delay
C135	CD D7 01	call clear
C138	C2 23 C0	jmp textin
C13B	FF	rst