**Program Status Word**

| **Instruction** | **Step** | **HLT** | **RI** | **RO** | **MI** | **PI** | **PO** | **PE** | **II** | **DI** | **DO** | **CI** | **CO** | **BI** | **BO** | **AI** | **AO** | **ALI** | **ALO** | **CYI** | **OI/**  **OO** | **AC/**  **BC** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 00000000/  10000111 | 000 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000000/  10000111 | 001 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **ADD** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10000000/  10000011 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 10000000/  10000011 | 011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **SUB** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10000100/  10000111 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 10000100/  10000111 | 011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **LD/ST/JC/ JNC/JMP** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00000000/  000010011 | 010 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000000/  000010011 | 011 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **LD** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00000000 | 100 | 0 | 0 | 1 | 0 | 0 | 0 | 0. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000001 | 100 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000010 | 100 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000011 | 100 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Instruction** | **Step** | **HLT** | **RI** | **RE** | **MI** | **PI** | **PE** | **P+** | **II** | **DI** | **DE** | **CI** | **CE** | **AI** | **AE** | **BI** | **BE** | **ALI** | **ALE** | **ALU+-** | **OI/**  **OE** | **AC/**  **BC** |
| **ST** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00000100 | 100 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000101 | 100 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 00000110 | 100 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00000111 | 100 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **JC** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00001000/  00001011 | 100 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **JNC** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00001100/  00001111 | 100 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **JMP** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00010000/  00010011 | 100 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **JR** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00010100 | 010 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00010101 | 010 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 00010110 | 010 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00010111 | 010 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **HLT** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00011100/  00011111 | 010 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **CLR** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00011000 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/0 |
| 00011001 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/1 |
| **Instruction** | **Step** | **HLT** | **RI** | **RE** | **MI** | **PI** | **PE** | **P+** | **II** | **DI** | **DE** | **CI** | **CE** | **AI** | **AE** | **BI** | **BE** | **ALI** | **ALE** | **ALU+-** | **OI/**  **OE** | **AC/**  **BC** |
| **OUT** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00100000 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1/0 | 0 |
| 00100001 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1/0 | 0 |
| 00100010 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/0 | 0 |
| 00100011 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **IN** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 00100100 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0/1 | 0 |
| 00100101 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0/1 | 0 |
| 00100110 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/1 | 0 |
| 00100111 | 010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/1 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Addresses

0

1

10

11

100

101

110

111

1000

1001

1010

1011

1100

1101

1110

1111

10000

10001

10010

10011

10100

10101

10110

10111

11000

11001

11010

11011

11100

11101

11110

11111

100000

100001

100010

100011

100100

100101

100110

100111

101000

101001

101010

101011

101100

101101

101110

101111

110000

110001

110010

110011

110100

110101

110110

110111

111000

111001

111010

111011

111100

111101

111110

111111

1000000

1000001

1000010

1000011

1000100

1000101

1000110

1000111

1001000

1001001

1001010

1001011

1001100

1001101

1001110

1001111

1010000

1010001

1010010

1010011

1010100

1010101

1010110

1010111

1011000

1011001

1011010

1011011

1011100

1011101

1011110

1011111

1100000

1100001

1100010

1100011

1100100

1100101

1100110

1100111

1101000

1101001

1101010

1101011

1101100

1101101

1101110

1101111

1110000

1110001

1110010

1110011

1110100

1110101

1110110

1110111

1111000

1111001

1111010

1111011

1111100

1111101

1111110

1111111

10000000

10000001

10000010

10000011

10000100

10000101

10000110

10000111

10001000

10001001

10001010

10001011

10001100

10001101

10001110

10001111

10010000

10010001

10010010

10010011

10010100

10010101

10010110

10010111

10011000

10011001

10011010

10011011

10011100

10011101

10011110

10011111

10100000

10100001

10100010

10100011

10100100

10100101

10100110

10100111

10101000

10101001

10101010

10101011

10101100

10101101

10101110

10101111

10110000

10110001

10110010

10110011

10110100

10110101

10110110

10110111

10111000

10111001

10111010

10111011

10111100

10111101

10111110

10111111

11000000

11000001

11000010

11000011

11000100

11000101

11000110

11000111

11001000

11001001

11001010

11001011

11001100

11001101

11001110

11001111

11010000

11010001

11010010

11010011

11010100

11010101

11010110

11010111

11011000

11011001

11011010

11011011

11011100

11011101

11011110

11011111

11100000

11100001

11100010

11100011

11100100

11100101

11100110

11100111

11101000

11101001

11101010

11101011

11101100

11101101

11101110

11101111

11110000

11110001

11110010

11110011

11110100

11110101

11110110

11110111

11111000

11111001

11111010

11111011

11111100

11111101

11111110

11111111

100000000

100000001

100000010

100000011

100000100

100000101

100000110

100000111

100001000

100001001

100001010

100001011

100001100

100001101

100001110

100001111

100010000

100010001

100010010

100010011

100010100

100010101

100010110

100010111

100011000

100011001

100011010

100011011

100011100

100011101

100011110

100011111

100100000

100100001

100100010

100100011

100100100

100100101

100100110

100100111

100101000

100101001

100101010

100101011

100101100

100101101

100101110

100101111

100110000

100110001

100110010

100110011

100110100

100110101

100110110

100110111

100111000

100111001

100111010

100111011

100111100

100111101

100111110

100111111

10000000000

10000000001

10000000010

10000000011

10000000100

10000000101

10000000110

10000000111

10000001000

10000001001

10000001010

10000001011

10000001100

10000001101

10000001110

10000001111

10000010000

10000010001

10000010010

10000010011

10000010100

10000010101

10000010110

10000010111

10000011000

10000011001

10000011010

10000011011

10000011100

10000011101

10000011110

10000011111

10000100000

10000100001

10000100010

10000100011

10000100100

10000100101

10000100110

10000100111

10000101000

10000101001

10000101010

10000101011

10000101100

10000101101

10000101110

10000101111

10000110000

10000110001

10000110010

10000110011

10000110100

10000110101

10000110110

10000110111

10000111000

10000111001

10000111010

10000111011

10000111100

10000111101

10000111110

10000111111