## Boolean Signals

| | |
|---|---|
| LD.MAR | GateMARMUX |
| LD.MDR | GateMDR |
| LD.REG | GatePC |
| LD.CC | GateALU |
| LD.PC | LD.IR |
| MEM.EN | |

| Signal Name | Possible Values |
|---|---|
| ALUK | ADD, AND, NOT, PASSA |
| ADDR1MUX | PC, BaseR |
| ADDR2MUX | ZERO, offset6, PCoffset9, PCoffset11 |
| PCMUX | PC+1, ADDER, BUS |
| MARMUX | ZEXT, ADDER |
| SR2MUX | SR2, SEXT |
| R.W | R (0), W (1) |

| Mnemonic | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *ADD | 0 | 0 | 0 | 1 | DR | | | SR1 | | | 0 | 0 | 0 | SR2 | | |
| *ADD | 0 | 0 | 0 | 1 | DR | | | SR1 | | | 1 | imm5 | | | | |
| *AND | 0 | 1 | 0 | 1 | DR | | | SR1 | | | 0 | 0 | 0 | SR2 | | |
| *AND | 0 | 1 | 0 | 1 | DR | | | SR1 | | | 1 | imm5 | | | | |
| BR | 0 | 0 | 0 | 0 | n | z | p | PCoffset9 | | | | | | | | |
| JMP | 1 | 1 | 0 | 0 | 0 | 0 | 0 | BaseR | | | 0 | 0 | 0 | 0 | 0 | 0 |
| JSR | 0 | 1 | 0 | 0 | 1 | PCoffset11 | | | | | | | | | | |
| JSRR | 0 | 1 | 0 | 0 | 0 | 0 | 0 | BaseR | | | 0 | 0 | 0 | 0 | 0 | 0 |
| *LD | 0 | 0 | 1 | 0 | DR | | | PCoffset9 | | | | | | | | |
| *LDI | 1 | 0 | 1 | 0 | DR | | | PCoffset9 | | | | | | | | |
| *LDR | 0 | 1 | 1 | 0 | DR | | | BaseR | | | offset6 | | | | | |
| LEA | 1 | 1 | 1 | 0 | DR | | | PCoffset9 | | | | | | | | |
| *NOT | 1 | 0 | 0 | 1 | DR | | | SR | | | 1 | 1 | 1 | 1 | 1 | 1 |
| reserved | 1 | 1 | 0 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| RTI | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ST | 0 | 0 | 1 | 1 | SR | | | PCoffset9 | | | | | | | | |
| STI | 1 | 0 | 1 | 1 | SR | | | PCoffset9 | | | | | | | | |
| STR | 0 | 1 | 1 | 1 | SR | | | BaseR | | | offset6 | | | | | |
| TRAP | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | trapvect8 | | | | | | | |

* modifies condition codes NZP

| Trap Vector | Assembler Name |
|---|---|
| x20 | GETC |
| x21 | OUT or PUTC |
| x22 | PUTS |
| x23 | IN |
| x25 | HALT |

| Character | ASCII Code |
|---|---|
| NUL | x00 |
| A | x41 |
| B | x42 |
| C | x43 |
| D | x44 |

| Device Register | Addr |
|---|---|
| Keyboard Status Register | xFE00 |
| Keyboard Data Register | xFE02 |
| Display Status Register | xFE04 |
| Display Data Register | xFE06 |