

## SORTED BY OPCODE NUMBER

## SORTED BY OPCODE MNEMONIC

Hex	Bin	Op	Arguments	Op	Hex	Bin	Arguments
0	0000	BR	NZP PCoffset9	ADD	1	0001	Dst Src1 0 00 Src2
0	0000	NOP	none (BR w/ 000 mask)	ADD	1	0001	Dst Src1 1 Immed5
1	0001	ADD	Dst Src1 0 00 Src2	AND	5	0101	Dst Src1 0 00 Src2
1	0001	ADD	Dst Src1 1 Immed5	AND	5	0101	Dst Src1 1 Immed5
2	0010	LD	Dst PCoffset9	BR	0	0000	NZP PCoffset9
3	0011	ST	Src PCoffset9	err	D	1101	Don'tCare12 (unused opcode)
4	0100	JSR	1 PCoffset11	JMP	C	1100	000 Base 000000
4	0100	JSRR	000 Base 000000	JSR	4	0100	1 PCoffset11
5	0101	AND	Dst Src1 0 00 Src2	JSRR	4	0100	000 Base 000000
5	0101	AND	Dst Src1 1 Immed5	LD	2	0010	Dst PCoffset9
6	0110	LDR	Dst Base Offset6	LDI	A	1010	Dst PCoffset9
7	0111	STR	Src Base Offset6	LDR	6	0110	Dst Base Offset6
8	1000	RTI	0000 0000 0000	LEA	E	1110	Dst PCoffset9
9	1001	NOT	Dst Src1 111111	NOP	0	1110	none (BR w/ 000 mask)
A	1010	LDI	Dst PCoffset9	NOT	9	1001	Dst Src1 111111
B	1011	STI	Src PCoffset9	RET	C	1100	000 111 000000 (JMP R7)
C	1100	JMP	000 Base 00000	RTI	8	1000	0000 0000 0000 0000
C	1100	RET	000 111 000000 (JMP R7)	ST	3	0011	Src PCoffset9
D	1101	err	Don'tCare12	STI	B	1011	Src PCoffset9
E	1110	LEA	Dst PCoffset9	STR	7	0111	Src Base Offset6
F	1111	TRAP	0000 TVector8	TRAP	F	1111	0000 TVector8

Trap vectors - Note TRAP modifies R7

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x20 - GETC   Read character from keyboard into R0[7..0]; clear R0[15..8].
x21 - OUT    Print character in R0[7..0].
x22 - PUTS   Print string of ASCII chars starting at location pointed to
             by R0 [One char per location; stop at x0000].
x23 - IN     Like x20 but prints a prompt on the screen first.
x24 - PUTSP  Like x22 but each location contains two characters; the one
             at 7..0 is printed first then the one at 15..8. Stop at x0000.
x25 - HALT   Halt execution.

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## Assembler Directives

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.ORIG  xnnnn  Start program at xnnnn
.FILL  n      Allocate 1 word of memory initialized to n
             (n can be a decimal or hex constant or a label)
.BLKW  n      Allocate n words of memory initialized to zero
.STRINGZ "str" For n-character string, allocate n+1 words (adds terminal null)
.END        Last line of assembler program

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## ASCII Characters:

Space = 32 = x20; Newline = 10 = xA; '0' = 48 = x30; 'A' = 65 = x41; 'a' = 97 = x61

Multiples of 16: 32 48 64 80 96 112 128 144 160 176 192 208 224 240 256