

Microcode Instructions

Instructions	A B C D E F						A B C D											K24.E		K24.F	
	WR.MX	R.MX	AD.MX	INC.MX	LUOP	SF.MX	A.MX	A.MX	C.MX	C.MX	C.MX	NX	NX	NX	ADX.MX	R.MX	FH	WR.MX			
*DP := 0	FB	12	0	0	10	0	F	B	1	2	0	0	0	0	0	0	0	0	0		
*DP := A	F0	12	0	0	10	0	F	0	1	2	0	0	0	0	0	0	0	0	0		
*DP := A&X	FE	12	0	0	10	0	F	E	1	2	0	0	0	0	0	0	0	0	0		
*DP := A&X AND DPH+1	EE	12	80	0	10	0	E	E	1	2	8	0	0	0	0	0	0	0	0		
*DP := T	F5	12	0	0	10	0	F	5	1	2	0	0	0	0	0	0	0	0	0		
*DP := X	F3	12	0	0	10	0	F	3	1	2	0	0	0	0	0	0	0	0	0		
*DP := X AND DPH+1	E3	12	80	0	10	0	E	3	1	2	8	0	0	0	0	0	0	0	0		
*DP := Y	F4	12	0	0	10	0	F	4	1	2	0	0	0	0	0	0	0	0	0		
*DP := Y AND DPH+1	E4	12	80	0	10	0	E	4	1	2	8	0	0	0	0	0	0	0	0		
*DPt := A	F0	22	0	0	10	0	F	0	2	2	0	0	0	0	0	0	0	0	0		
*DPt := A&X	FE	22	0	0	10	0	F	E	2	2	0	0	0	0	0	0	0	0	0		
*DPt := A&X AND DPH+1	EE	22	80	0	10	0	E	E	2	2	8	0	0	0	0	0	0	0	0		
*DPt := DPL	FA	22	0	0	10	0	F	A	2	2	0	0	0	0	0	0	0	0	0		
*SP := 0; SP -= 1	FB	57	0	0	30	0	F	B	5	7	0	0	0	0	0	0	0	0	0		
*SP := A; SP -= 1	F0	57	0	0	10	0	F	0	5	7	0	0	0	0	0	0	0	0	0		
*SP := B; SP -= 1	F0	57	C0	0	10	0	F	0	5	7	C	0	0	0	0	0	0	0	0		
*SP := DBR SP -= 1	FC	57	0	0	32	0	F	C	5	7	0	0	0	0	0	0	0	0	0		
*SP := DH; SP -= 1	FC	57	0	0	34	0	F	C	5	7	0	0	0	0	0	0	0	0	0		
*SP := DPH; SP -= 1	F1	57	0	0	10	0	F	1	5	7	0	0	0	0	0	0	0	0	0		
*SP := DPL; SP -= 1	FA	57	0	0	10	0	F	A	5	7	0	0	0	0	0	0	0	0	0		
*SP := P; SP -= 1	F7	57	0	0	10	0	F	7	5	7	0	0	0	0	0	0	0	0	0		
*SP := P; SP -= 1; PBR.CLR	F7	57	0	0	10	10	F	7	5	7	0	0	0	0	0	0	0	0	0		
*SP := PBR; SP -= 1	FC	57	0	0	31	0	F	C	5	7	0	0	0	0	0	0	0	0	0		
*SP := PCH; SP -= 1	F9	57	0	0	10	0	F	9	5	7	0	0	0	0	0	0	0	0	0		
*SP := PCL; SP -= 1	F8	57	0	0	10	0	F	8	5	7	0	0	0	0	0	0	0	0	0		
*SP := T; SP -= 1	F5	57	0	0	10	0	F	5	5	7	0	0	0	0	0	0	0	0	0		
*SP := X; SP -= 1	F3	57	0	0	10	0	F	3	5	7	0	0	0	0	0	0	0	0	0		
*SP := Y; SP -= 1	F4	57	0	0	10	0	F	4	5	7	0	0	0	0	0	0	0	0	0		
*zDP := 0	FB	42	0	0	10	0	F	B	4	2	0	0	0	0	0	0	0	0	0		
*zDP := A	F0	42	0	0	10	0	F	0	4	2	0	0	0	0	0	0	0	0	0		
*zDP := A&X	FE	42	0	0	10	0	F	E	4	2	0	0	0	0	0	0	0	0	0		
*zDP := T	F5	42	0	0	10	0	F	5	4	2	0	0	0	0	0	0	0	0	0		
*zDP := X	F3	42	0	0	10	0	F	3	4	2	0	0	0	0	0	0	0	0	0		
*zDP := Y	F4	42	0	0	10	0	F	4	4	2	0	0	0	0	0	0	0	0	0		
A := 0	AB	2	8	0	0	0	A	B	0	2	0	8	0	0	0	0	0	0	0		
A := A - 1; SETF(NZ); IR := *PC; PC += 1; END	A0	8	FC	44	0	0	A	0	0	8	F	C	0	1	0	0	0	0	0		
A := A + 1; SETF(NZ); IR := *PC; PC += 1; END	A0	8	C	4C	0	0	A	0	0	8	C	0	1	0	0	1	0	0	0		
A := A AND B; SETF(NZCV); IR := *PC; PC += 1; END.D	A0	8	CE	55	0	0	A	0	0	8	C	E	0	1	0	1	0	1	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	8E	2F	0	0	A	0	0	8	E	0	0	1	0	1	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	8C	4	0	0	A	0	0	8	C	0	0	0	0	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END.ARN	A0	8	8D	7	0	0	A	0	0	8	D	0	0	0	0	1	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	AD	44	0	0	A	0	0	8	A	D	0	0	0	1	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	6C	4	0	0	A	0	0	8	6	C	0	0	0	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	AD	24	0	0	A	0	0	8	A	D	0	0	0	1	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	EC	4	0	0	A	0	0	8	E	C	0	0	0	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	2	A8	50	0	0	A	0	0	2	A	8	0	1	0	1	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	A8	54	0	0	A	0	0	8	A	8	0	1	0	1	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	AD	54	0	0	A	0	0	8	A	D	0	1	0	1	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	AD	2C	0	0	A	0	0	8	A	D	0	0	1	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	3E	55	0	0	A	0	0	8	3	E	0	1	0	1	0	1	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A0	8	CC	4	0	0	A	0	0	8	C	C	0	0	0	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	AC	2	8	40	6	0	A	C	0	2	0	8	0	1	0	0	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A2	8	C	44	0	0	A	2	0	8	C	0	0	1	0	0	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A5	8	8	44	0	0	A	5	0	8	0	8	0	0	0	0	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A3	8	8C	4	0	0	A	3	0	8	8	C	0	0	0	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A3	8	C	44	0	0	A	3	0	8	0	C	0	1	0	0	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	A4	8	C	44	0	0	A	4	0	8	0	C	0	1	0	0	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	B0	8	8F	34	0	0	B	0	0	8	F	0	0	1	1	0	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	B0	8	8B	34	0	0	B	0	0	8	B	0	0	1	0	1	0	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	B0	8	8B	4	0	0	B	0	0	8	B	0	0	0	0	0	1	0	0		
A := A AND B; SETF(NZ); IR := *PC; PC += 1; END	B0	8	3D	4C	0	0	B	0	0	8	3	D	0	1	0	0	1	0	0		
AXS := SP AND B; SETF(NZ); IR := *PC; PC += 1; END	62	8	8C	4	0	0	6	2	0	8	8	C	0	0	0	0	0	0	0		
B := *DP	B0	12	0	0	10	0	B	0	1	2	0	0	0	0	0	0	0	0	0		
B := *DP; DPL += 1	B0	14	0	0	10	0	B	0	1	4	0	0	0	0	0	0	0	0	0		
B := *DP; ML	C0	12	0	0	10	0	C	0	1	2	0	0	0	0	0	0	0	0	0		
B := *DP; T := !A AND B	50	12	48	0	10	0	5	0	1	2	4	8	0	0	0	0	0	0	0		
B := *DP; T := A OR B	50	12	E8	0	10	0	5	0	1	2	E	8	0	0	0	0	0	0	0		
B := *Dpt	B0	22	0	0	10	0	B	0	2	2	0	0	0	0	0	0	0	0	0		
B := *Dpt; ML	C0	22	0	0	10	0	C	0	2	2	0	0	0	0	0	0	0	0	0		
B := *PC	B0	2	0	0	10	0	B	0	0	2	0	0	0	0	0	0	0	0	0		
B := *SP	B0	52	0	0	10	0	B	0	5	2	0	0	0	0	0	0	0	0	0		
B := *zDP	B0	42	0	0	10	0	B	0	4	2	0	0	0	0	0	0	0	0	0		
B := *zDP; DPL += 1	B0	44	0	0	10	0	B	0	4	4	0	0	0	0	0	0	0	0	0		
B := *zDP; ML	C0	42	0	0	10	0	C	0	4	2	0	0	0	0	0	0	0	0	0		
B := *zDP; T := !A AND B	50	42	48	0	10	0	5	0	4	2	4	8	0	0	0	0	0	0	0		
B := *zDP; T := A OR B	50	42	E8	0	10	0	5	0	4	2	E	8	0	0	0	0	0	0	0		
BAR := A	B0	2	8	40	0	5	B	0	0	2	0	8	0	0	0	0	0	0	0		
BAR := DH; SETF(NZ); IR := *PC; PC += 1; END	BC	8	C	44	4	5	B	C	0	8	0	C	0	1	0	0	0	0	0		
CFG := T; IR := *PC; PC += 1; END	B5	8	8	44	0	6	B	5	0	8	0	8	0	1	0	0	0	0	0		
DBR := B; SETF(NZ); IR := *PC; PC += 1; END	B0	8	CC	4	0	2	B	0	0	8	C	C	0	0	0	0	0	0	0		
DH := *SP; SP += 1	B0	56	0	0	30	4	B	0	5	6	0	0	0	0	0	0	0	0	0		
DH := BAR; SETF(NZ); IR := *PC; PC += 1; END	BC	8	C	44	5	4	B	C	0	8	0	C	0	1	0	0	0	0	0		
DPH := *PC; PC += 1	10	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0		
DPH := *zDP	10	42	0	0	10	0	1	0	4	2	0	0	0	0	0	0	0	0	0		
DPH := *zDP; DPL += 1	10	44	0	0	30	40	1	0	4	4	0	0	0	0	0	0	0	0	0		
DPH := 1	10	2	8	8	0	0	1	0	0	2	0	8	0	0	0	0	0	0	0		
DPH := B + 0; USE(IC); B := *DP	10	12	C8	18	0	0	1	0	1	2	C	8	0	0	0	0	1	0	0		
DPH := B + 0; USE(IC); B := *PBA	10	32	C8	18	0	0	1	0	3	2	C	8	0	0	0	0	1	0	0		
DPH := DPH + 0; USE(IC); B := *DP	11	12	8	58	0	0	1	1	1	2	0	8	0	1	0	1	1	0	0		
DPH := DPH + 0; USE(IC); B := *Dpt	11	22	8	58	0	0	1														

DPL := B + Y; B := *PC	4	2	C8	40	0	0	0	4	0	2	C	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
DPL := B + Y; B := *PC; PC += 1	4	0	C8	40	0	0	0	4	0	0	C	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
DPL := B + Y; B := *zDP	4	42	C8	40	0	0	0	4	4	2	C	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
DPL := B + Y; DPH.db := *DP; INCDPH.C	4	92	C8	42	10	0	0	4	9	2	C	8	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0
DPL := B + Y; DPH.db := *PC; PC += 1	4	80	C8	40	0	0	0	4	8	0	C	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
DPL := B + Y; DPH.db := *PC; PC += 1; INCDPH.C	4	80	C8	42	0	0	0	4	8	0	C	8	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
DPL := B + Y; DPH.db := *zDP	4	C2	C8	40	10	0	0	4	C	2	C	8	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
DPL := B + Y; DPH.db := *zDP; INCDPH.C	4	C2	C8	42	10	0	0	4	C	2	C	8	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0
DPL := PCL + B + 1; B := *PC	8	2	C8	48	0	0	0	8	0	2	C	8	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
DPL := T	5	2	8	40	0	0	0	5	0	2	0	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
IR := *DP; PC += 1; END	B0	18	0	4	0	0	0	B	0	1	8	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
IR := *PC; PC += 1; END	0	8	0	4	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
IR := *PC; PC += 1; END.INT	0	8	0	6	0	0	0	0	0	0	8	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
NOP	B0	32	0	0	0	0	0	B	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P := *SP	70	52	0	0	10	0	0	7	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
P := *SP; SP += 1	70	56	0	0	10	0	0	7	0	5	6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
P := P AND !B; IR := *PC; PC += 1; END	77	8	28	4	0	0	0	7	7	0	8	2	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0
P := P OR B; IR := *PC; PC += 1; END	77	8	E8	4	0	0	0	7	7	0	8	E	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0
PBR := *PC; PC += 1	B0	0	0	0	0	1	0	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PBR := *SP	B0	52	0	0	30	1	0	B	0	5	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1
PBR := 0	BB	2	8	0	0	1	0	B	B	0	2	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PC -= 1	0	33	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCH := *DP	90	12	0	0	0	0	0	9	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCH := *fDP; SETF(SEI/CLD)	90	62	2	0	0	0	0	9	0	6	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCH := *SP	90	52	0	0	10	0	0	9	0	5	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
PCH := *SP; SP += 1	90	56	0	0	10	0	0	9	0	5	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
PCH := B + 0; USE(IC)	90	32	C8	18	0	0	0	9	0	3	2	C	8	0	0	0	1	1	0	0	0	0	0	0	0	0	0
PCH = PCH + signnextend(*); USE(IC)	99	2	C8	78	0	0	0	9	9	0	2	C	8	0	1	1	1	1	0	0	0	0	0	0	0	0	0
PCL := *DP	80	12	0	0	10	0	0	8	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
PCL := *DP; DPL += 1	80	14	0	0	0	0	0	8	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCL := *fCP; DPL += 1	80	74	0	0	0	0	0	8	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PCL := *SP; SP += 1	80	56	0	0	10	0	0	8	0	5	6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
PCL := B + X; B := *PC	83	2	C8	40	0	0	0	8	3	0	2	C	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0
PCL := PCL + B; EXIT.CC	88	2	C8	41	0	0	0	8	8	0	2	C	8	0	1	0	0	0	0	0	0	0	1	0	0	0	0
SETF(OPCODE 0); IR := *PC; PC += 1; END	B0	8	9	4	0	0	0	B	0	0	8	0	9	0	0	0	0	0	0	1	0	0	0	0	0	0	0
SETF(OPCODE 1); IR := *PC; PC += 1; END	B0	8	F9	4	0	0	0	B	0	0	8	F	9	0	0	0	0	0	0	1	0	0	0	0	0	0	0
SP := A&X; IR := *PC; PC += 1; END	2E	8	8	44	0	0	0	2	E	0	8	0	8	0	1	0	0	0	0	1	0	0	0	0	0	0	0
SP := A; IR := *PC; PC += 1; END	20	8	8	44	0	0	0	2	0	0	8	0	8	0	1	0	0	0	0	1	0	0	0	0	0	0	0
SP := X; IR := *PC; PC += 1; END	23	8	8	44	0	0	0	2	3	0	8	0	8	0	1	0	0	0	0	1	0	0	0	0	0	0	0
SP += 1; B := *SP	B0	56	0	0	0	0	0	B	0	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPI (ALU PASS B)	B6	2	C0	0	0	0	0	B	6	0	2	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STP; IR := *PC; PC += 1; END	BD	8	0	4	0	0	0	B	D	0	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
T := !B; B := *PC; PC += 1; EXIT.BTF	50	0	38	3	0	0	0	5	0	0	0	3	8	0	0	0	0	0	0	0	0	1	1	0	0	0	0
T := !BCG OR B;	5F	2	D8	0	0	0	0	5	F	0	2	D	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T := *zDP; DPL += 1	50	44	0	0	10	0	0	5	0	4	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
T := 0 ASL B; SETF(NZC)	5B	32	CD	80	0	0	0	5	B	3	2	C	D	1	0	0	0	0	0	0	0	0	0	0	0	0	0
T := 0 LSR B; SETF(NZC)	5B	32	CD	20	0	0	0	5	B	3	2	C	D	0	0	1	0	0	0	0	0	0	0	0	0	0	0
T := 0 ROL B; SETF(NZC)	5B	32	CD	90	0	0	0	5	B	3	2	C	D	1	0	0	1	0	0	0	0	0	0	0	0	0	0
T := 0 ROR B; SETF(NZC)	5B	32	CD	28	0	0	0	5	B	3	2	C	D	0	0	1	0	1	0	0	0	0	0	0	0	0	0
T := A	50	2	8	40	0	0	0	5	0	0	2	0	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0
T := B - 1; SETF(NZ)	50	32	FC	80	0	0	0	5	0	3	2	F	C	1	0	0	0	0	0	0	0	0	0	0	0	0	0
T := B + 1; SETF(NZ)	50	32	C	88	0	0	0	5	0	3	2	0	C	1	0	0	0	0	1	0	0	0	0	0	0	0	0
T := B + Y; DPH.db := *DP	54	92	C8	40	10	0	0	5	4	9	2	C	8	0	1	0	0	0	0	0	0	0	1	0	0	0	0
T := B + Y; DPH.db := *zDP	54	C2	C8	40	10	0	0	5	4	C	2	C	8	0	1	0	0	0	0	0	0	0	1	0	0	0	0
T := B + Y; DPH.db := *zDP; DPL += 1	54	C4	C8	40	30	40	0	5	4	C	4	C	8	0	1	0	0	0	0	0	0	0	3	0	4	0	0
T := B; B := *PC; PC += 1; EXIT.BTF	50	0	C8	3	0	0	0	5	0	0	0	C	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0
T := BAR	5C	2	8	40	5	0	0	5	C	0	2	0	8	0	1	0	0	0	0	0	0	0	0	0	5	0	0
T := BCG AND B;	5F	2	88	0	0	0	0	5	F	0	2	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TBR := *PC; PC += 1	B0	0	0	0	0	3	0	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
TBR := *zDP	B0	42	0	0	30	43	0	B	0	4	2	0	0	0	0	0	0	0	0	0	0	0	3	0	4	3	
TBR := DBR + 0; USE(IC)	BC	2	8	58	2	3	0	B	C	0	2	0	8	0	1	0	1	1	0	0	0	0	2	0	3	0	3
TBR := TBR + 0; USE(IC)	BC	2	8	58	3	3	0	B	C	0	2	0	8	0	1	0	1	1	0	0	0	0	3	0	3	0	3
WAI; IR := *PC; PC += 1; END	D0	8	0	4	0	0	0	D	0	0	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
X := *DP	30	12	0	0	10	0	0	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
X := *DPt	30	22	0	0	10	0	0	3	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
X := *PC; PC += 1	30	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
X := *zDP	30	42	0	0	10	0	0	3	0	4	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
X := A&X SBC1 B; SETF(NZC); IR := *PC; PC += 1; END	3E	8	3D	4C	0	0	0																				