

# Mnemonics

Mnemonic	Code	Wirkung	Flags C Z	#	Zyklen	Bemerkung
ADB	20	(P)+A->(P) (P+1)+B+C->(P+1)	**	1	5	P+1->P
ADCM	196	(P)+A+C->(P)	**	1	3	
ADIA n	116,n	A+n->A	**	2	4	
ADIM n	112,n	(P)+n->(P)	**	2	4	
ADM	68	(P)+A->(P)	**	1	3	
ADN	12	(P)+A->(P)... (P-I)+C->(P-I)	**	1	7+3*I	P-I-1->P BCD
ADW	14	(P)+(Q)->(P)... (P-I)+(Q-I)+C-> (P-I)	**	1	7+3*I	P-I-1->P Q-I-2->Q BCD
ANIA n	100,n	A AND n->A	-*	2	4	
ANID n	212,n	(DP) AND n>(DP)	-*	2	6	
ANIM n	96,n	(P) AND n->(P)	-*	2	4	
ANMA	70	(P) AND A->(P)	-*	1	3	
CAL nm	224,n,m	PC+2>(R-1,R-2) R-2->R, nm->PC	--	2	7	0<=n<=31
CALL nm	120,n,m	PC+3->(R-1,R-2), R-2->R, nm->PC	--	3	8	
CPIA n	103,n	A-n	**	2	4	
CPIM n	99,n	(P)-n	**	2	4	
CPMA	199	(P)-A	**	1	3	
DATA	53	(BA)...(BA+1)-> (P)...(P+1)	--	1	11+4*I	auch für int. ROM
DECA	67	A-1->A	**	1	4	2->Q
DECB	195	B-1->B	**	1	4	3->Q
DECI	65	I-1->I	**	1	4	0->Q
DECJ	193	J-1->J	**	1	4	1->Q
DECK	73	K-1->K	**	1	4	8->Q
DECL	201	L-1->L	**	1	4	9->Q
DECP	81	P-1->P	--	1	2	
DECV	75	V-1->V	**	1	4	10->Q
DECW	203	W-1->W	**	1	4	11->Q
DX	5	X-1->X, X->DP	--	1	6	5->Q
DXL	37	X-1->X, X->DP, (DP)->A	--	1	7	5->Q
DY	7	Y-1->Y, Y->DP		1	6	7->Q
DYS	39	Y-1->Y, Y->DP, A->(DP)	--	1	7	7->Q
ETC n,m ... nm	105 n,nm	FOR i=1 TO H IF A=n nm->PC NEXT i	-*	)	1)	
EXAB	218	A<->B	--	1	3	
EXAM	219	A<->(P)	--	1	3	
EXB	11	(P)...(P+J)<-> (Q)...(Q+J)	--	1	6+3*J	P+J+1->P Q+J+1->Q

EXBD	27	(P)...(P+J)<-> (DP)...(DP+J)	--	1	7+6*J	P+J+1->p DP+J->DP
EXW	9	(P)...(P+I)<-> (Q)...(Q+I)	--	1	6+3*I	P+I+1->P Q+I+1->Q
EXWD	25	(P)...(P+I)<-> (DP)...(DP+I)	--	1	7+6*I	P+I+1->P DP+I->DP
FILD	31	A->(DP)...(DP+I)	--	1	4+3*1	DP+I->DP
FILM	30	A->(P)...(P+I)	--	1	5+I	P+I+1->P
INA	76	IA-Port->A	- *	1	2	
IMB	204	IB-Port->A	- *	1	2	
INCA	66	A+1->A	**	1	4	2->Q
INCB	194	B+1->B	**	1	4	3->Q
INCI	64	I+1->I	**	1	4	
IMCJ	192	J+1->J	**	1	4	1->Q
INCK	72	K+1->K	**	1	4	8->Q
JNCL	200	L+1->L	**	1	4	9->Q
INCP	80	P+1->P	--	1	2	
INCV	74	V+1->V	**	1	4	10->Q
INCW	202	W+1->W	**	1	4	
IX	4	X+1->X, X->DP	--	1	6	5->Q
IXL	36	X+1->X, X->DP, (DP)->A	--	1	7	5->Q
IY	6	Y+1->Y, Y->DP	--	1	6	7->Q
IYS	38	Y+1->Y, Y->DP, A->(DP)	--	1	7	7->Q
JP nm	121,n,m	nm->PC	--	3	6	
JPC nm	127,n,m	IF C=1 nm->PC	--	3	6	
JPNC nm	125,n,m	IF C=0 nm->PC	--	3	6	
JPNZ nm	124,n,m	IF Z=0 nm->PC	--	3	6	
JPZ nm	126,n,m	IF Z=1 nm->PC	--	3	6	
JPZM n	57,n	IF Z=1 PC+1-n->PC	--	2	7/4	
JRCN n	59,n	IF C=1 PC+1-n->PC	--	2	7/4	
JRCP n	58,n	IF C=1 PC+1+n->PC	--	2	7/4	
JRM n	45,n	PC-1-n->PC	--	2	7	
JRNCM n	43,n	IF C=0 PC+1-n->PC	--	2	7/4	
JRNCP n	42,n	IF C=0 PC+1+n->PC	--	2	7/4	
JRNZM n	41,n	IF Z=0 PC+1-n->PC	--	2	7/4	
JRNZP n	40,n	IF Z=0 PC+1+n->PC	--	2	7/4	
JRP n	44,n	PC+1+n->PC	--	2	7	
JRZN n	57,n	IF Z=1 PC+1-n->PC	--	2	7/4	
JRZP n	56,n	IF Z=1 PC+1+n->PC	--	2	7/4	
LDD	87	(DP)->A	--	1	3	

LDM	89	(P)->A	--	1	2	
LDP	32	P->A	--	1	2	
LDQ	33	Q->A	--	1	2	
LDR	34	R->A	--	1	2	
LIA n	2,n	n->A	--	2	4	
LIB n	3,n	n->B	--	2	4	
LIDL m	17,m	m->DPL	--	2	5	
LIDP nm	16,n,m	nm->DP	--	3	8	
LII n	0,n	n->I	--	2	4	
LIJ n	1,n	n->J	--	2	4	
LIP n	18,n	n->P	--	2	4	
LIQ n	19,n	n->Q	--	2	4	
LOOP n	47,n	(R)-1->(R), IF C=0 DP+1-n->DP	**	2	10/7	
LP n	128+n	n->P	--	1	2	0<=n<63
MVB	10	(Q)...(Q+J)-> (P)...(P+J)	--	1	5+2*J	P+J+1->P Q+J+1->Q
MVBD	26	(DP)...(DP+J)-> (P)...(P+J)	--	1	5+4*J	P+J+1->P DP+J->DP
MVDM	83	(P)->(DP)	--	1	3	
MVMD	85	(DP)->(P)	--	1	3	
MVW	8	(Q)...(Q+I)-> (P)...(P+I)	--	1	5+2*I	P+I+1->P Q+I+1->Q
MVWD	24	(DP)...(DP+I)-> (P)...(P+I)	--	1	5+4*I	P+I+1->P DP+I->DP
NOPT	206	No Operation	--	1	3	
NOPW	77	No Operation	--	1	2	
ORIA n	101,n	A OR n->A	-*	2	4	
ORID n	213,n	(DP) OR n->(DP)	-*	2	6	
ORIM n	97,n	(P) OR n->(P)	-*	2	4	
ORMA n	71,n	(DP) OR n->(DP)	-*	1	3	
OUTA	93	(92)->IA-Port	--	1	3	92->Q
OUTB	221	(93)->IB-Port	--	1	2	93->Q
OUTC	223	(95)->C-PORT	--	1	2	
OUTF	95	(94)->F0-Port	--	1	3	94->Q
POP	91	(R)->A, R+1->R	--	1	2	
PTC	122	n->H,nm->(R-1, R-2), R-2->R	-*	4	9	
PUSH	52	(R)->A, R-1->R	--	1	3	
RC	209	0->C, 1->Z	**	1	2	
RTN	55	(R-1,R-2)->PC R+2->R	--	1	4	
SBB	21	(P)-1->(P) (P+1)-B-C->(P+1)	**	1	5	P+1->P
SBCM	197	(P)-A-C->(P)	**	1	3	
SBIA n	117,n	A-n->A	**	2	4	
SBIM n	113,n	(P)-n->(P)	**	2	4	
SBM	69	(P)-A->(P)	**	1	3	
SBN	13	(P)-A->(P) (P-I)-C->(P-I)	**	1	7+3*I	P-I-1->P BCD
SBW	15	(P)-(Q)->(P)	**	1	7+3*I	P-I-1->P

		(P-I)-(Q-I)-C->				Q-I-2->Q
		(P-I)				BCD
SC	208	1->C, 1->Z	**	1	2	
SL	90	C->A7...A0->C	--	1	2	
SLW	29	(P-1)...(P)	--	1	5+I	P-I-1->P
		4 Bit SL				
SR	210	C->A0...A7->C	*-	1	2	
SRW	28	(P)...(P+I)	--	1	5+I	P+I+1->P
		4 Bit SR				
STD	82	A->(DP)	--	1	2	
STP	48	A->P	--	1	2	
STQ	49	A->Q	--	1	2	
STR	50	A->R	--	1	2	
SWP	88	A0...A3<->	--	1	2	
		A4...A7				
TEST n	107,n	TEST-Byte AND n	-*	2	4	
TSIA n	102,n	A AND n	-*	2	4	
TSID n	214,n	(DP) AND n	-*	2	6	
TSIM n	98,n	(P) AND n	-*	2	4	
WAIT n	78,n	No Operation	--	2	6+n	

## Registers

Register	Address	Description Notes
P		7 bits Internal RAM pointer
Q		7 bits Internal RAM pointer
R		7 bits Internal RAM stack pointer
PC		16 bits Program Counter
DP		16 bits Data Pointer
Z		Zero Flag
C		Carry Flag
D		Internal Index (not accessible to user)
I	&00	Index
J	&01	Index
A	&02	Main Accumulator
B	&03	Secondary Accumulator
XL	&04	X = XL + 256 x XH
XH	&05	
YL	&06	Y = YL + 256 x YH
YH	&07	
K	&08	General use
L	&09	General use
M	&0A	General use
N	&0B	General use
	&0C - &5B	System Stack (starts at &5B and increases downwards)
IA	&5C	I/O port A
IB	&5D	I/O port B
FO	&5E	I/O port F
OUTC	&5F	Control Port

# Ports

## A Port

Bit	Description
0-7	Keyboard Column

## B Port

Bit	Description
0	-
1	-
2	-
3	Pin 8 printer, I
4	Pin 9 printer, IO
5	Pin 3 serial, IO
6	Pin 5 serial, IO
7	Pin 8 serial, IO

## C Port

Bit	Description
0	Display 1=On/0=Off
1	Counter Reset
2	CPU Halt
3	Computer 0=On/1=Off
4	Beeper Frequency 0=2kHz/1=4kHz
5	Beeper 1=On/0=Off (Off: Bit 4: Beeper 1=On/0=Off)
6	-
7	-

## F Port

Bit	Description
0	-
1	Pin 2 serial, O
2	Switch RAM Bank, 0=Bank 0, 1=Bank 1
3	-
4	-
5	-
6	-
7	-

## Test Command

Bit	Description
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0	System clock 512 ms
1	System clock 2 ms
2	-
3	BRK/ON key
4	-
5	-
6	RESET key
7	Cassette Input - Pin 6 printer, I

## RAM Ports

### Adress &3E00

Value	Description
0-7	Keyboard Row

### Adress &3800

Bit	Description
0	Pin 4 serial and 11 printer, O
1	Pin 14 serial, O
2	Pin 11 serial, O
3	-
4	-
5	-
6	-
7	-

### Adress &3400 - ROM Bank Switch

Value	Description
0	Bank 0
1	Bank 1
2	Bank 2
3	Bank 3
4	Bank 4
5	Bank 5
6	Bank 6
7	Bank 7