

PROGRAM

BYTES

LOCATION	OBJECT CODE	SOURCE STATEMENT
φφφφ	φφ	NOP
φφ	21 φφ 1 φ	LD HL, 1 φφ φ H
φ4	φ6 3 φ	LD B, 3 φ H
φ6	9 7	SUB A
φ7	7 7	LD (HL), A ←
φ8	2 3	INCH L
φ9	1 φ F C	DJNZ, -2 →
φB	21 φ4 1 φ	LD HL, 1 φ φ4 H
φE	22 1E 1 φ	LD (1 φ 1 E H), HL
11	31 φ8 1 φ	LD SP, 1 φ φ8 H
14	D3 32	OUT(32 H), A
16	18 49	JR J+
18	E3	EX(SP), HL
19	D3 32	OUT(32 H), A
1B	2 B	DEC HL
1C	E3	EX(SP), HL
1D	C9	RET
1E	φφφφ	NOP
φφ 2φ	E3	EX(SP), HL
21	2 B	DEC HL
22	F5	PUSH AF
23	3A 2C 1 φ	LDA, (1 φ 2 C H)
26	7 7	LD (HL), A
27	A 11	POP AF
28	E5	PUSH HL
29	21 φφ φφ	LD HL, φφ φ H
2C	22 2A 1 φ	LD (1 φ 2 A H), HL
2F	D3 32	OUT(32 H), A
φφ 31	E1	POP HL
32	E3	EX(SP), HL
33	C9	RET
34	φφφφφφφφ	NOP
38	C3 3 φ φ φ φ φ	JPI φ 3 φ IM 1 resp near Ram
3B	9 7	SUB A
3C	φE 2 φ	LD C, 2 φ H
φφ 3E	φ6 φ2	LD B, φ2 H
φφ 4φ	ED 6 7	RRD
φφ 42	ED 7 9	OUT(C), A
φφ 44	φC	INCC
φφ 45	1 φ F 9	DJNZ, -5
φφ 47	ED 6 7	RRD
φφ 49	C9	RET
φφ 4A	9 7	SUB A
φφ 4B	φE 2 2	LD C, 2 2 H
φφ 4D	16 φ2	LD D, φ2 H
φφ 4F	φ6 φ2	LD B, φ2 H
φφ 51	ED 6 7	RRD

BLANK MON RAM
1 φφφ H TM 1 φ2 F

SET USER SP
SET MON SP
SET NMI-GEN.

USER ReSTART
Set NMI-gen
addr DF

→ NMI

Restart E7
addr. break.
USER break Resp
horizontal data in mem

reset break addr

set NMI-gen
φφ 6EH

→ NMI

IM 1 resp near Ram
Loc 1 φ3 φ H

display addr 2 φ H on 21 H
8 Bit Display SUB.

display addr 22 H φ/m25H

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LOCATION	OBJECT CODE	SOURCE STATEMENT
53	ED 79	OUT(C), A 16Bit Display SUB
55	FC	INCC
56	1F 9	DJNZ, -5
58	ED 67	R RD
5A	23	INCH L
5B	15	DECD
5C	2F 1	JRNZ, -13
5E	2B	DEC H L
5F	2B	DEC H L
60	C9	RET
61	3E 8	LDA, 8H stop rec
63	D3 3	OUT(3H), A → NMI
65	FF	NOP
66	F5	PUSH AF save AF
67	3A 2F 1	LDA, (12FH) NMI-gn mask
6A	FE	CD 00H reset?
6C	2F 4	JRNZ, +6 rec
6E	F1	POP AF heritel stackpoint
6F	F1	POP AF
70	18 2 2	JR +36
72	F1	POP AF heritel AF
73	E3	EX(SP), HL
74	22 2 1	LD(12FH), HL PC
77	E3	EX(SP), HL
78	33	INCS P
79	33	INCS P
7A	ED 73 1E 1	LD(101EH), SP SP
7E	31 1E 1	LDSP, 101EH mon stack
81	DD 25	PUSH IX save reg
83	FD 25	PUSH IY
85	D9	EXX
86	8	EX AF, AF' save reg
87	F5	PUSH AF
88	C5	PUSH BC
89	D5	PUSH DE
8A	E5	PUSH HL
8B	D9	EXX
8C	8	EX AF, AF'
8D	F5	PUSH AF
8E	C5	PUSH BC
8F	D5	PUSH DE
90	E5	PUSH HL
91	ED 57	LDA, I
93	F5	PUSH AF
94	21 2 1	LDHL, 1020H
97	CD 4A	CALL 4AH display PC
9A	2A 2 1	LDHL, (12FH)
9D	7E	LDA, (HL)

PROGRAM

BYTES

LOCATION		OBJECT CODE	SOURCE	STATEMENT
$\phi\phi$ 9E		21 2 D 1 ϕ	LDHL	1 ϕ 2 D H
A1		77	LD(HL)	A
A2		CD 3 B $\phi\phi$	CALL	$\phi\phi$ 3 B H
A5		18 5 D	JR β +	$\phi 1 \phi 2 \rightarrow \phi 1 \phi 4 H$
A7		D9	EXX	
A8		1 ϕ ϕ 5	LDD	ϕ 5 H
AA	1E ϕ 3	ϕ 6 ϕ 4	LDB	ϕ 4 H
AC		ϕ E 2 ϕ	LDC	2 ϕ H
AE		ED 7 8	INA	(C)
$\phi\phi$ B ϕ		FE $\phi\phi$	CP $\phi\phi$ H	
B2		2 ϕ F 4	JRNZ	ϕ - 1 ϕ
B4		ϕ C	INCC	
B5		1 ϕ F 7	DJNZ	ϕ - 7
B7		CD EB $\phi\phi$	CALL	$\phi\phi$ EB H
BA		15	DEC D	
BB	1E 29	2 ϕ ED	JRNZ	ϕ - 1 γ
BD		1 ϕ ϕ 4	LDD	ϕ 4 H
BF		ϕ E 2 ϕ	LDC	2 ϕ H
$\phi\phi$ C1		ED 7 8	INA	(C)
C3		ϕ 6 ϕ 8	LDB	ϕ 8 H
C5		ϕ 7	RLCA	
C6		3 ϕ ϕ 8	JRC	ϕ + 1 ϕ
C8		1 ϕ FB	DJNZ	ϕ - 3
CA		ϕ C	INCC	
CB		15	DEC D	
CC		2 ϕ F 3	JRNZ	ϕ - 1 1
CE		18 ED	JR ϕ -	1 γ
$\phi\phi$ D ϕ		7 8	LDA	B
D1		ϕ 6 ϕ 5	S4B ϕ	5 H
D3		3 ϕ ϕ A	JRC	ϕ + 1 2
D5		3 E 1 γ	LDA	1 γ H
D7		9 ϕ	S4BB	
D8		15	DEC D	
D9		2 ϕ ϕ E	JRZ	ϕ + 1 6
DB		C 6 ϕ 3	ADDA	ϕ 3 H
DD		1 ϕ F 9	JR ϕ -	5
DF		3 E ϕ 4	LDA	ϕ 4 H
$\phi\phi$ E1		9 ϕ	S4BB	
E2		15	DEC D	
E3		2 ϕ ϕ 4	JRZ	ϕ + 6
E5		C 6 ϕ 4	ADDA	ϕ 4 H
E7		18 F 9	JR ϕ -	5
EQ		D9	EXX	
EA		C9	RET	
EB		ϕ 6 ϕ 2	LDB	ϕ 1 H
ED		3 E 2 γ	LDA	2 γ H
EF		D 3 1 3	OUT (1	3 H) A
FI		3 E 6 ϕ	LDA	6 ϕ H

display mem dat

ry-actr keyb $2\phi H + m^{23}$
geen toets gebruikt

wacht = 6,7 ms. T

ry teller
ry-actr keyb $2\phi H + m^{23}$

kolom teller

kolom nog gevonden

ry - no.

ry no

$26,7 ms$
 $2\phi ms$

T = 10 ms.

PROGRAM

BYTES

LOCATION	OBJECT CODE	SOURCE	STATEMENT
φ φ F3	D313	OUT (13H), A	
F5	DB13	IN A, (13H)	
F7	FE φ1	CP φ1 H	
F9	2 φ FA	IRNZ, φ - 4	
F B	DB13	IN A, (13H)	
FD	FE φ1	CP φ1 H	
FF	28 FA	IRZ, φ - 4	
φ 1 φ1	1 φ F2	DI NZ, φ - 12	
1 φ3	C9	RET	
1 φ4	C D A 7 φ φ	CALL φ φ A 7 H	
1 φ7	FE11	CP 11 H	
1 φ9	CA65 φ2	JRZ, φ265H	
1 φ2	FE12	CP 12 H	
1 φE	CA81 φ3	JRZ, φ381H	
111	FE13	CP 13 H	
113	CA5 φ φ2	JRZ, φ25 φ H	
116	FE14	CP 14 H	
118	CA φ3 φ2	JRZ, φ2 φ3 H	
11 B	FE15	CP 15 H	
11 D	CA65 φ2	JRZ, 0265H	
12 φ	FE16	CP 16 H	
122	CA41 φ1	JRZ, φ141H	
125	FE17	CP 17 H	
127	CA41 φ1	JRZ, φ141H	
12A	FE18	CP 18 H	
12C	CA7A φ1	JRZ, φ17AH	
12F	FE19	CP 19 H	
131	CA φ8 φ2	JRZ, φ2 φ8 H	
134	FE1A	CP 1A H	
136	CA49 φ2	JRZ, φ2 49 49H	
139	FE1B	CP 1B H	
13 B	CA FE φ1	JRZ, φ1 FEH	
13 E	18 C4	JR φ - 58	
φ 1 4 φ	φ φ	NO P	
41	21 2 φ 1 φ	LD HL, 1 φ 2 φ H	
44	CD 4A φ φ	CALL φ φ 4A H	
47	2A 2 φ 1 φ	LD HL, (1 φ 2 φ) H	
46			
4A	7E	LDA, (HL)	
4B	EB	EX HL, DE	
4C	21 2 D 1 φ	LD HL, 1 φ 2 D H	
4F	77	LD (HL), A	
5 φ	CD 3 B φ φ	CALL φ φ 3 B H	
53	CD A 7 φ φ	CALL φ φ A 7 H	
56	FE1 φ	CP 1 φ H	
58	3 φ φ 4	JR NC, + 6	
5A	ED 6 F	R LD	
5C	18 F2	JR - 12	

save?

load?

I/O?

EI?

MV?

mem → ?

mem ← ?

REG?

RUN?

STEP?

BREAK?

mem ←

uses key board.

PROGRAM

BYTES

LOCATION	OBJECT CODE	SOURCE	STATEMENT
φ 1 5 E	4 6	LD B, (HL)	
5 F	EB	EX HL, DE	
6 φ	7 φ	LD (HL), B	
6 1	FE 1 6	CP 1 6 H	
6 3	2 8 φ 7	JR Z, + 9	
6 5	FE 1 7	CP 1 7 H	
6 7	2 8 φ 5	JR Z, + 7	
6 9	C 3 φ 7 φ 1	JP φ 1 φ 7 H	
6 C	2 3	INC HL	
6 D	2 3	INC HL	
6 E	2 B	DEC HL	
6 F	2 2 2 φ 1 φ	LD (1 φ 2 φ H), HL	
1 7 2	1 8 C D	JR - 4 9	
7 4	φ φ		
7 5	φ φ		
7 6	φ φ		
7 7	φ φ		
7 8	φ φ		
7 9	φ φ		
7 A	CD A 7 φ φ	CALL φ φ A 7 H	REG. sees keyboard
7 D	2 1 i A 1 φ	LD HL, 1 φ 1 A H	
8 φ	FE φ 3	CP φ 3 H	
8 2	2 8 6 7	JR Z, + 1 0 5	IY
8 4	2 3	INC HL	
8 5	2 3	INC HL	
8 6	FE φ 2	CP φ 2 H	
8 8	2 8 6 1	JR Z, + 9 9	IX
8 A	2 3	INC HL	
8 B	2 3	INC HL	
8 C	FE φ 1	CP φ 1 H	
8 E	2 8 5 B	JR Z, + 3	SP
9 φ	2 3	INC HL	
9 1	2 3	INC HL	
9 2	FE φ φ	CP φ φ H	
9 4	2 8 5 5	JR Z, + 8 7	PC
9 6	2 1 φ 9 i φ	LD HL, 1 φ φ 9 H	
9 9	FE φ 5	CP φ 5 H	
9 B	2 8 5 F	JR Z, + 4 9	I
9 D	φ φ φ 1	LD BC, φ φ φ φ H	
φ 1 A 1	FE φ 7	CP φ 7 H	
A 3	2 φ φ 5	JR NZ, + 7	
A 5	φ E φ 8	LD C, φ 8 H	
A 7	CD A 7 φ φ	CALL φ φ A 7 H	sees keyboard
A A	2 1 φ A 1 φ	LD HL, 1 φ φ A H	
A D	FE φ 9	CP φ 9 H	
A F	2 8 2 A	JR Z, + 4 4	L

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BYTES

LOCATION	OBJECT CODE	SOURCE	STATEMENT
$\phi 1$ B1	23	INCHL	
B2	FE $\phi 8$	CP $\phi 8$ H	
B4	28 25	JRZ + 39	H
B6	23	INCHL	
B7	FE ϕE	CP ϕE H	
B9	28 20	JRZ + 34	E
Bb	23	INCHL	
Bc	FE ϕD	CP ϕD H	
BE	28 1B	JRZ + 29	D
$\phi 1$ C ϕ	23	INCHL	
C1	FE ϕC	CP ϕC H	
C3	28 16	JRZ + 24	C
C5	23	INCHL	
C6	FE ϕB	CP ϕB H	
C8	28 11	JRZ + 19	B
CA	23	INCHL	
Cb	FE ϕF	CP ϕF H	
Cd	28 ϕC	JRZ + 14	F
Cf	23	INCHL	
D ϕ	FE ϕA	CP ϕA H	
D2	28 $\phi 7$	JRZ + 9	A
D4	FE 1 ϕ	CP 1 ϕ H	
D6	D2 $\phi 7$ $\phi 1$	JRNC, $\phi 1$ $\phi 7$ H	
D9	18 CC	JR - 50	
D3	$\phi 9$	ADD HL, BC	
Dc	CD 3B $\phi \phi$	CALL $\phi \phi 3B$	
Df	CD A7 $\phi \phi$	CALL $\phi \phi A7$ H	less keyboard.
E2	FE 1 ϕ	CP 1 ϕ H	
E4	D2 $\phi 7$ $\phi 1$	JRNC, $\phi 1$ $\phi 7$ H	
E7	ED 6F	RLD	
E9	18 FI	JR - 13	
E3	CD 4A $\phi \phi$	CALL $\phi \phi 4A$	
EL	CD A7 $\phi \phi$	CALL $\phi \phi A7$ H	less keyboard.
F1	FE 1 ϕ	CP 1 ϕ H	
F3	D2 $\phi 7$ $\phi 1$	JRNC, $\phi 1$ $\phi 7$ H	
F6	ED 6F	RLD	
F8	23	INCHL	
F9	ED 6F	RLD	
Fb	2B	DECHL	
Fc	18 ED	JR - 17	
$\phi 1$ FE	21 2A 1 ϕ	LD HL, 1 $\phi 2$ AH	
FF			
2 $\phi 1$	18 E8	JR - 22	
$\phi 2$ $\phi 3$	FB	EI	
$\phi 4$	C3 $\phi 4$ $\phi 1$	JR $\phi 1$ $\phi 4$ H	
$\phi 7$	$\phi \phi$	NOP	
$\phi 8$	3E ϕF	LDA, ϕF H	NMI - gm. mark run

PROGRAM

BYTES

LOCATION	OBJECT CODE	SOURCE STATEMENT
02 0A	32 2 F 1 0	LD(1 0 2 F), A
02 0D	2 H 2 A 1 0	LD HL, (1 0 2 A H)
10	7 E	LDA, (HL)
11	32 2 C 1 0	LD(1 0 2 C H), A
14	3 E E 7	LDA, E 7 H
16	7 7	LD(HL), A
17	ED 7 B 1 E 1 0	LD SP, (1 0 1 E H)
1B	2 A 2 0 1 0	LD HL, (1 0 2 0 H)
1E	E 5	PUSH HL
1F	3 i 0 0 1 0	LD SP, 1 0 0 8 H
22	F 1	POP A F
23	ED 4 7	LDI, A
25	E 1	POP HL
26	D 1	POP DE
27	C 1	POP BC
28	F 1	POP A F
29	D 9	EXX
2A	0 8	EX AF, A F'
2B	E 1	POP HL
2C	D 1	POP DE
2D	C 1	POP BC
2E	F 1	POP A F
2F	D 9	EXX
30	0 8	EX AF, A F'
31	F D E 1	POP E Y
33	D D E 1	POP I X
35	ED 7 B 1 E 1 0	LD SP, (1 0 1 E H)
39	3 B	DECS P
3A	3 B	DECS P
3B	F 5	PUSH A F
3C	3 A 2 F 1 0	LDA, (1 0 2 F)
3F	F E 0 F	CP 0 F H
41	D 3 3 3	OUT(3 3 H), A
43	2 8 0 2	IRZ, 0 + 4
45	D 3 3 2	OUT(3 2 H), A
47	F 1	POP A F
48	C 9	RET
49	3 E F F	LDA, F F H
4B	32 2 F 1 0	LD(1 0 2 F H), A
4E	1 8 C 7	IR 0 -
50	D B 0 0	IN A, (0 0 H)
52	6 7	LD H, A
53	D B 0 1	IN A, (0 1 H)
55	6 F	LD L, A
56	2 2 2 D 1 0	LD(1 0 2 D H), HL
59	2 1 2 D 1 0	LD HL, 1 0 2 D H
5C	C D 4 A 0 0	CALL 1 0 0 4 H

AUN.

SET UP 1
BIT

un ?
reset NMi-gen
un
step, set NMi-gen

pro port A

pro port B.

PROGRAM

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LOCATION	OBJECT CODE	SOURCE	STATEMENT
φ 2 5 F	C 3 φ 4 φ 1	J P φ 1 φ 4 H	
6 2	φ φ		
6 3	φ φ		
6 4	φ φ		
6 5	5 F	L D E, A	save key
6 6	3 E 1 A	L D A, 1 A H	display B A
6 8	D 3 2 φ	O U T (2 φ H), A	
6 A	3 E φ B	L D A, φ B H	
6 C	D 3 2 1	O U T (2 1 H), A	
6 E	2 1 2 3 1 φ	L D H L, 1 φ 2 3 H	begin adr
7 1	C D φ φ φ 4	C A L L φ 4 φ φ H	zelfde key? DW
7 4	B B	C P E	→ F2
7 5	C 2 φ 7 φ 1	J P N Z, φ 1 φ 7 H	ja, display E A
7 8	3 E φ E	L D A, φ E H	eind adr
7 A	D 3 2 1	O U T (2 1 H), A	
7 C	2 3	I N C H L	
7 D	2 3	I N C H L	
7 E	C D φ φ φ 4	C A L L φ 4 φ φ H	zelfde key? DW
8 1	B B	C P E	→ F2
8 2	C 2 φ 7 φ 1	J P N Z, φ 1 φ 7 H	save?
8 5	F E 1 1	C P I 1 H	
8 7	2 8 φ D	J R Z, φ + 1 5	
8 9	3 E φ D	L D A, φ D H	nee, display D A
8 B	D 3 2 1	O U T (2 1 H), A	dest adr
8 D	2 3	I N C H L	
8 E	2 3	I N C H L	
8 F	C D φ φ φ 4	C A L L φ 4 φ φ H	zelfde key? DW
9 2	B B	C P E	→ F2
9 3	C 2 φ 7 φ 1	J P N Z, φ 1 φ 7 H	eind adr
9 6	2 A 2 5 1 φ	L D H L, (1 φ 2 5 H)	begin adr
9 9	E D 5 B 2 3 1 φ	L D D E, (1 φ 2 3 H)	aantal bytes = 1
9 D	E D 5 2	B B C H L, D E	begin adr > eind adr, →
9 F	D A φ 4 φ 1	J P C, φ 1 φ 4 H	
φ 2 A 2	4 4	L D B, H	
A 3	4 D	L D C, L	
A 4	E B	E X D E, H L	
A 5	F E 1 1	C P I 1 H	save?
A 7	2 8 1 F	J R Z, φ + 3 3	dest. adr
A 9	E D 5 B 2 7 1 φ	L D D E, (1 0 2 7 H)	
A D	E D 5 2	S I B C H L, D E	dest adr > begin adr
A F	3 8 φ 7	J R C, φ + 9	herstel begin adr
B 1	E D 5 A	A D C H L, D E	
B 3	φ 3	I N C B C	move
B 4	E D B φ	L D I R	
B 6	1 8 φ 9	J R φ + 1 1	
B 8	E B	E X D E, H L	
B 9	φ 9	J R φ + 1 1	dest eind adr
		A D D H L, B C	

PROGRAM

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LOCATION		OBJECT CODE	SOURCE	STATEMENT
2 BA		EB	EX DE, HL	
BB		3	INC BC	
BC		2A 25 1	LD HL, (1 25 H)	eind adres
BF		ED B 8	LDDR	move
CI	FF	3E 0A	LDA, 0A H	doof punt
C3		D3 2	OUT (2 H), A	
C5	1	C3 04 01	JR 01 04 H	functie bepaling
C8		3	INC BC	
C9		ED 43 27 1	LD (1 27 H), BC	aantal bytes
CD		D9	EXX	
CE	47	CD 11 04	CALL 04 11 H	init rec IN
DI		3E 07	LDA, 07 H	schrijf 1 = IRG
D3		D3 3	OUT (3 H), A	
D5		06 28	LDB, 28 H	
D7		CD ED 00	CALL 00 ED H	T2 = 400 ms
DA		21 22 1	LD HL, 1 22 H	mon nam adr.
DD		01 07 00	LDBC, 00 07 H	byte teller
E0		16 AA	LDD, AA H	preamble in buffer
E2		3E 07	LDA, 07 H	CTC - ch 3, C = 200, 34
E4		D3 13	OUT (13 H), A	
E6		3E 20	LDA, 20 H	
E8		D3 13	OUT (13 H), A	
EA		CD 1A 03	CALL 03 1A H	zend preamble ZB1
ED		D9	EXX	
EE		CD 19 03	CALL 03 19 H	zend bytes ZB2
F1		D9	EXX	
F2		01 01 00	LDBC, 00 01 H	zend postamble
F5		16 AA	LDD, AA H	
F7		CD 1A 03	CALL 03 1A H	ZB1
FA		06 28	LDB, 28 H	
FC		CD ED 00	CALL 00 ED H	T2 = 400 ms = IRG
FF		3E 08	LDA, 08 H	stop rec
01	3	D3 3	OUT (3 H), A	
03		CD 4E 03	CALL 03 4E H	terugspelen BT
06		D9	EXX	
07		78	LDA, B	BC = 0? (alle bytes geh)
08		B1	ORC	
09		28 B6	JRZ, 0 -	ja, doofpunt
0B		3E 0E	LDA, 0E H	nee, display EE
0D		18 B4	JR 0 -	
0F		00 00	NOP	
11		D3 3	IN A, (3 H)	
13		CB 77	BIT 6, A	clear leader?
15		C0	RET NZ	alle bytes gehad?
16		ED A1	CPI	
18		E0	RET P 0	byte in Buffer
19		56	LDD, (HL)	

PROGRAM

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LOCATION	OBJECT CODE	SOURCE STATEMENT
31A	1E 1 0	LDC, 1 0 H
1C	3E 0 3	LDA, 0 3 H
1E	CB 0 A	RRC D
2 0	3F	CCF
2 1	17	RLA
2 2	0 8	EX AF, AF'
2 3	DB 1 3	IN A, (13 H)
2 5	FE 0 3	CP 0 3 H
2 7	3 0 F A	JR NC, 0 - 4
2 9	0 8	EX AF, AF'
2 A	D 3 3 0	OUT (3 0 H), A
2 C	1 D	DEC C
2 D	2 8 C 2	JR Z, 0 - 2 8
2 F	1 F	RRA
3 0	CB 4 3	BIT 0, E
3 2	2 0 EC	JR NZ, 0 - 1 8
3 4	1 0 E 8	JR 0 - 2 2
3 6	DB 3 0	IN A, (30 H)
3 8	CB 6 F	BIT 5, A
3 A	2 0 0 E	JR NZ, 0 + 1 6
3 C	CD 4 E 0 3	CALL 0 3 4 E H
3 F	3 E 0 4	LDA, 0 4 H
4 1	D 3 3 0	OUT 3 0 H, A
4 3	DB 3 0	IN A, 3 0 H
4 5	CB 7 7	BIT 6, A
4 7	2 8 F A	JR Z, 0 - 4
4 9	C 9	RET
4 A	E 1	POP H L
4 B	C 3 0 4 0 1	JR 0 1 0 4 H
4 E	3 E 1 0	LDA, 1 0 H
5 0	D 3 3 0	OUT (3 0 H), A
5 2	0 6 6 4	LDB, 6 4 H
5 4	CD ED 0 0	CALL 0 0 ED H
5 7	DB 3 0	IN A, (30 H)
5 9	CB 7 7	BIT 6, A
5 B	2 8 F A	JR Z, 0 - 4
5 D	0 6 0 5	LDB, 0 5 H
5 F	CD ED 0 0	CALL 0 0 ED H
6 2	DB 3 0	IN A, (3 0 H)
6 4	CB 7 7	BIT 6, A
6 6	2 8 E F	JR Z, 0 - 1 5
6 8	3 E 0 8	LDA, 0 8 H
6 A	D 3 3 0	OUT (3 0 H), A
6 C	0 6 0 5	LDB, 0 5 H
6 E	CD ED 0 0	CALL 0 0 ED H
7 1	3 E 0 4	LDA, 0 4 H
7 3	D 3 3 0	OUT (3 0 H), A

set bit teller

complement bit

t = 200 ms.

zend bit

volgende byte

volgende bit.

cas aanwering? cs

begin tape 131
langzaam voorwaart

snel terugspelen

1 sec

wacht op clear lead T2

50 ms?

T2

stop rec

reset auto stop 50 ms
langzaam voorwaart T2

PROGRAM BYTES

LOCATION	OBJECT CODE	SOURCE STATEMENT
0375	DB 3 0	IN A, (30H) ← wacht on tape
77	CB 7 7	BIT 6, A
79	2 0 FA	JR NZ, 4 ←
7B	3 E 0 8	LDA, 08H
7D	D 3 3 0	OUT (30H), A
7F	C 9	RET
80	0 0	NOP
81	3 E 1 B	LDA, 1BH
83	D 3 2 0	OUT (20H), A
85	C D 1 1 0 4	CALL 0411H
86	0 6 1 E	LDB, 1EH
8A	C D E D 0 0	CALL 00EDH
8D	2 1 2 2 1 0	LHL, 1022H
90	0 1 0 7 0 0	LDBC, 0007H
93	1 6 0 7	LDD, 07H
95	1 E 0 2	LDE, 02H
97	D 9	EXX
98	0 2 3 0	LDC, 30H
9A	1 6 D 5	LDD, D5H
9C	E D 7 8	IN A, (C) ←
03 9E	FA 9 C 0 8	JPM, 039CH ←
A1	E D 7 8	IN A, (C) ←
A3	F 2 A 1 0 3	JPP, 03A1H ←
A6	0 8	EX AF, AF'
A7	3 E C 0	LDA, 0CH
A9	0 0	NOP
AA	1 0 0 3	JR 0+5
AC	0 8	EX AF, AF' ←
AD	D B 1 3	IN A, (13H) ←
AF	9 2	SUB D ←
B0	C B 2 F	SRA A
B2	8 2	ADD A, 0
B3	C B 2 A	SRA D
B5	C B 2 A	SRA D
B7	9 2	SUB D
B8	5 7	LDD, A

display 11B

init rec IN

wacht. T2

adr mon nam

aantal bytes

aantal bits

1/oadr rec

next w (299,945)

wacht on 0

wacht on 1

next t1 (416,6ms)

t1

save w

SYSTEMBUS

mon RAM 1φ22
PROJECT CODE

23
24
25
26
27
28
29
30
31
preamble
} begin adres
} eind adres
} aantal bytes

SHEET

12

BYTES

PROGRAM

LOCATION	OBJECT CODE	SOURCE	STATEMENT
3B9	3E07	LDA, 07H	timer
BB	D313	OUT(13H), A	
BD	3E F0	LDA, F0H	
BF	D313	OUT(13H), A	
C1	08	EX AF, AF	
C2	D9	EXX	
C3	17	RLA	
C4	CB1E	RR(HL)	data bit in mem
C6	15	DEC D	
C7	2011	JRNZ, 0+19	valgende bit
C9	1608	LDD, 08H	
CB	EDA1	CPI	
CD	EAD A03	JPPE, 03DAH	valgende byte
D0	1D	DECE	
D1	2A23 10	LDDH, (1023H)	start addr mem
D4	201D	JR2, 0+31	
D6	ED4B27 10	LDDC, (1027H)	aantal bytes
DA	D9	EXX	
DB	D313	INA, (13H)	
DD	BA	CPD	E2 → W?
DE	30FB	JRNC, 0-3	
E0	ED70	INA, (C)	
E2	F2EC03	JPP, 03ECH	wacht op 0
E5	ED70	INA, (C)	
E7	FAE503	JPM, 03ESH	
EA	10C0	JR0-	
EC	ED70	INA, (C)	wacht op 1
EE	F2EC03	JPP, 03ECH	
FI	10B9	JR0-	
F3	3E08	LDA, 08H	stop rec
F5	D330	OUT(30H), A	
F7	CD4E03	CALL 034EH	terugspelen
FA	222010	LDD(1020H), HL	display begin-addr
FD	C39400	JP 0094H	of automatische reset door JP 0200
0400	CD4A00	CALL 004AH	display reg IIII II
03	CD A700	CALL 00A7H	des key
06	FE10	CP 10H	functie toets?
08	D0	RET NC	ja, return →
09	ED6F	RLD	nee, schief key ing
0B	23	INC HL	
0C	ED6F	RLD	
0E	2B	DECHL	herstel HL
0F	10EF	JR 0-15	valgende key
4111	DB30	INA, (30H)	
13	CB6F	BIT 5, A	cas aanwijzing? C
15	200E	JRNZ, 0+16	*
17	CD4E03	CALL 034EH	begin tape B

PROGRAM

BYTES

LOCATION		OBJECT CODE	SOURCE	STATEMENT
041A	00, 06	3E04	LD A	04H
1C	00	D330	OUT (30H), A	↓ langzaam voorwaart
1E	00, 04	0605	LD B	05H
20	00, 07	CD0D00	CALL 00EDH	↑ wacht 50 ms
23	00, 07	DB30	IN A, (30H)	↑ wacht op hole
25	00, 07	CB77	BIT 6, A	
27	00, 07	20FA	JR 2, 04	
29	00, 07	C9	RET	
2A	00, 07	E1	POP HL	← herstel SP
2B	00, 07	C30401	JP 0104H	→ functiebeëindiging F