

MASTER

Ontwerp en bouw van een centrale simulator, en het ontwerp van de besturing van een abonneegroep van een TDM-telefoonsysteem

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```
*****  
*                                                                 *  
* BEDRADINGSLIJST VAN HET OUTPUT- *  
* DEEL VAN EEN TDM-CENTRALE- *  
* SIMULATOR. *  
*                                                                 *  
* AFSTUDEEROPDRACHT C.J.MJSTERS *  
*                                                                 *  
* DSLPROG      11/05/71      12.43.46 *  
*****
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1  F7404          4002404080800004 COORD=DLINE,PINS1=IO.....A.....V,      *
PINS2=..IO..A.....V,PINS3=.....IOA.....V,PINS4=.....AOI.....V,      *
PINS5=.....A..OI..V,PINS6=.....A.....OIV,
2  SN74H04       4002404080800004 COORD=DLINE,PINS1=IO.....A.....V,      *
PINS2=..IO..A.....V,PINS3=.....IOA.....V,PINS4=.....AOI.....V,      *
PINS5=.....A..OI..V,PINS6=.....A.....OIV,
3  F7400          4002404080800004 COORD=DLINE,PINS1=IIO....A.....V,      *
PINS2=...IIOA.....V,PINS3=.....AOII...V,PINS4=.....A...OIIV,
4  F7410          4002404080800004 COORD=DLINE,PINS1=II.....A.....OIV,      *
PINS2=...IIIOA.....V,PINS3=.....AOIII...V,
5  F7420          4002404080800004 COORD=DLINE,PINS1=II•IIOA.....V,      *
PINS2=.....AOII•IIV,
6  F7430          4002404080800004 COORD=DLINE,PINS1=IIIIIIIAO•II•V,
7  F7440          4002404080800004 COORD=DLINE,PINS1=II•IIOA.....V,      *
PINS2=.....AOII•IIV,
8  F7474          4002404080800004 COORD=DLINE,PINS1=RDCSONA.....V,      *
PINS2=.....ANOSCDRV,
9  F7476          4002404080800004 COORD=DLINE16,PINS1=CSRJV.....ANOK,      *
PINS2=.....VCSRJNOKA...,
10 F7402          4002404080800004 COORD=DLINE,PINS1=OII....A.....V,      *
PINS2=...OIIA.....V,PINS3=.....AIIO...V,PINS4=.....A...IIOV,
11 SN7486         4002404080800004 COORD=DLINE,PINS1=IIO....A.....V,      *
PINS2=...IIOA.....V,PINS3=.....AOII...V,PINS4=.....A...OIIV,
12 F9000          4002404080800004 COORD=DLINE,PINS1=PSKJJOANCKKJRV,
13 SN74H103       4002404080800004 COORD=DLINE,PINS1=CRKV.....AONJ,      *
PINS2=...VCRJNOKA...,
14 SN74H20        4002404080800004 COORD=DLINE,PINS1=II•IIOA.....V,      *
PINS2=.....AOII•IIV,
15 SN74150        4002404080800004 COORD=DLINE24,PINS1=IIIIIIIIIIIOIAIIIIIIIIIIIV,
16 F9022          4002404080800004 COORD=DLINE16,PINS1=RCJKSONA.....P•V,      *
PINS2=•C.....ANOSKJPRV
17 CONTACT0       0000000000000000 001-014 007013,006013,005013,004013,003013,      *
002013,001013,001016,002016,003016,004016,005016,006016,007016
18 CONTACT1       0000000000000000 015-028 016013,015013,014013,013013,012013,      *
011013,010013,010016,011016,012016,013016,014016,015016,016016
19 CONTACT2       0000000000000000 029-042 052037,051037,050037,049037,048037,      *
047037,046037,046040,047040,048040,049040,050040,051040,052040
20 CONTACT3       0000000000000000 043-044 016019,015019,
21 CONTACT4       0000000000000000 045-049 034037,033037,033040,034040,032037,
22 POWER          0000000000000000 NULV=A (BK),PLUS5=V (RD),MIN5=M (BW),
23 SPEC           0000000000000000 LOGCOL=WT,WIREFUN=AND,
24 DLINE          0000000000000000 008X005 0701,0601,0501,0401,0301,0201,0101,      *
0104,0204,0304,0404,0504,0604,0704,
25 DLINE16        0000000000000000 009X005 0801,0701,0601,0501,0401,0301,0201,0101,*
0104,0204,0304,0404,0504,0604,0704,0804,
26 DLINE24        0000000000000000 013X008 1201,1101,1001,0901,0801,0701,0601,0501,*
0401,0301,0201,0101,0107,0207,0307,0407,0507,0607,0707,0807,0907,1007,*
1107,1207,
27 BOARD          0000000000000000 HOR=A-F,VERT=1-12,PITCH=9X6,

```

				DECLARE WITH POSITIONS	
2					
3	MULTO	SN74150	A1	WOORD00 (8), WOORD01 (5), WOORD02 (2), WOORD03 (7), WOORD04 (6), WOORD05 (1), WOORD06 (23), WOORD07 (20), WOORD08 (17), WOORD09 (22), WOORD010 (21), WOORD011 (16), BT0 (15), BT1 (14), BT2 (13), BT3 (11), DRIE2 (9)	* * *
4	MULTX	SN74150	C1	WOORDX0 (8), WOORDX1 (5), WOORDX2 (2), WOORDX3 (7), WOORDX4 (6), WOORDX5 (1), WOORDX6 (23), WOORDX7 (20), WOORDX8 (17), WOORDX9 (22), WOORDX10 (21), WOORDX11 (16), BT0 (15), BT1 (14), BT2 (13), BT3 (11), KFFX (9)	* * *
5	BT0	F7476	C3	C=KLOK R=EEN S=EEN J=EEN K=EEN	* * * *
6	BT1	F7476	C3	C=KLOK R=EEN S=EEN J=BT2/N K=BT2	* * * *
7	BT2	F7476	D3	C=KLOK R=RESNAND S=EEN J=BT1 K=BT1	* * * *
8	BT3	F7476	D3	C=KLOK R=EEN S=EEN J=TELINVO K=TELINVO	* * * *
9	TELNANDO	F7400	E3	BT0, BT2	
10	TELINVO	F7404	F2	TELNANDO	
11	BDCOD0	F7420	E2	BT0/N, BT1/N, BT2/N, BT3/N	
12	BDCOD1	F7420	E2	BT0, BT1, BT2, BT3	
13	BDCOD2	F7420	E1	BT0/N, BT1, BT2/N, BT3	
14	TELNAND1	F7400	E3	BDCOD0, BDCOD1	
15	TELINV1	F7404	F2	BDCOD2	
16	RESNAND	F7420	E1	BT1/N, BT1/N, BT2, BT2	
17	KTO	F9022	D4	C=NONKLOK R=EEN S=EEN J=TELINV1 P=TELINV1	* * * *
18	* K-INPUT AAN AARDE				
19	KT1	F9022	D4	C=NONKLOK R=EEN S=EEN J=KTO K=KTO/N P=TELINV1	* * * * *
20	KT2	F9022	E4	C=NONKLOK R=EEN S=EEN J=TELINV2 K=TELNAND2 P=TELINV1	* * * * *
21	KT3	F9022	E4	C=NONKLOK R=EEN	* *

				S=EEN	*
				J=TELNORO	*
				K=TELINV4	*
				P=TELINV1	
22	KT4	F9022	F4	C=NONKLOK	*
				R=EEN	*
				S=EEN	*
				J=TELINV3	*
				K=TELNAND3	*
				P=TELINV1	
23	KT5	F9022	F4	C=NONKLOK	*
				R=EEN	*
				S=EEN	*
				J=TELNOR1	*
				K=TELINV5	*
				P=TELINV1	
24	TELNAND2	F7400	E3	KT0,KT1	
25	TELINV2	F7404	F2	TELNAND2	
26	TELNORO	F7402	F3	TELNAND2,KT2/N	
27	TELNAND3	F7400	E3	TELNORO,KT3	
28	TELINV3	F7404	F2	TELNAND3	
29	TELNOR1	F7402	F3	TELNAND3,KT4/N	
30	TELINV4	F7404	F2	TELNORO	
31	TELINV5	F7404	F2	TELNOR1	
32	TD0	F7430	E5	KT0/N,KT1/N,KT2/N,KT3/N,KT4/N,KT5/N,KT5/N,KT5/N	
33	TD31	F7430	F5	KT0/N,KT1/N,KT2/N,KT3/N,KT4/N,KT5,KT5,KT5	
34	EXCLOR0	SN7486	E6	KT0/N,SELECT0	
35	EXCLOR1	SN7486	E6	KT1/N,SELECT1	
36	EXCLOR2	SN7486	E6	KT2/N,SELECT2	
37	EXCLOR3	SN7486	E6	KT3/N,SELECT3	
38	EXCLOR4	SN7486	F6	KT4/N,SELECT4	
39	EXCLOR5	SN7486	F6	KT5/N,SELECT5	
40	TDX	F7430	E7	EXCLOR0,EXCLOR1,EXCLOR2,EXCLOR3,EXCLOR4,EXCLOR5,	*
				OUTX0,OUTX0	
41	KFF0	F7474	C4	C=NONKLOK	*
				R=EEN	*
				S=EEN	*
				D=TD0	
42	KFFX	F7474	C4	C=NONKLOK	*
				R=EEN	*
				S=EEN	*
				D=IDX	
43	DRIE0	F7410	D5	TELNAND1,KFF0,KFFX	
44	DRIE1	F7410	D5	MULT0,MULTX,DRIE0	
45	DRIE2	F7410	D5	OUT00,KFF0/N,KFF0/N	
46	OUT00	F7476	C5	C=KLOK	*
				J=ONORO	*
				K=ONOR1	*
				S=CONTX	*
				R=DEBO01	
47	OUT01	F7476	C5	C=KLOK	*
				J=ONOR2	*
				S=EEN	*
				R=DEBO01	
48	* OUT01: K-INPUT AAN AARDE LEGGEN				
49	OUTX0	F7476	C6	C=KLOK	*
				J=XNORO	*

				K=XNOR1	*
				S=EEN	*
				R=DEBOX1	
50	OUTX1	F7476	C6	C=KLOK	*
				J=XNOR2	*
				S=EEN	*
				R=DEBOX1	
51	* OUTX1: K-INPUT AAN AARDE LEGGEN				
52	ONORO	F7402	B5	TD31,OUT01	
53	ONOR1	F7402	B5	TD31,OUT01/N	
54	ONOR2	F7402	B5	KFF0,OUT00/N	
55	XNORO	F7402	B6	KFF0,OUTX1	
56	XNOR1	F7402	B6	KFF0,OUTX1/N	
57	XNOR2	F7402	B6	TD31,OUTX0/N	
58	DEBO00	F7400	D6	DRUK01,DEBO01	
59	DEBO01	F7400	D6	DRUK00,DEBO00	
60	DEBOX0	F7400	D6	DRUKX1,DEBOX1	
61	DEBOX1	F7400	D6	DRUKX0,DEBOX0	
62	POORT0	SN74H20	F9		
63	* POORT0: PINS 1,2,4 EN 5 AAN OUTPUT OSCILLATOR				
64	DELER0	SN74H103	E9	C=POORT0	*
				R=EEN	*
				J=EEN	*
				K=EEN	
65	DELER1	SN74H103	E9	C=DELER0	*
				R=EEN	*
				J=EEN	*
				K=EEN	
66	POORT1	SN74H20	F9	DELER1,DELER1,DELER1,DELER1	
67	DELER2	F9000	D9	C=POORT1	*
				R=EEN	*
				S=EEN	*
				J=EEN,EEN,EEN	*
				K=EEN,EEN,EEN	*
				P=EEN	
68	KLOK	F7440	C9	DELER2,DELER2,DELER2,DELER2	
69	NONKLOK	F7440	C9	KLOK,KLOK,KLOK,KLOK	
70	DATFF0	F7474	C8	C=NONKLOK	*
				R=EEN	*
				S=EEN	*
				D=DRIE1	
71	MONAND0	F7400	B9	KLOK,DATFF0/N	
72	MONAND1	F7400	B9	DELER2,DATFF0	
73	MONAND2	F7400	B9	MONAND0,MONAND1	
74	DELAY0	F7404	A9	POORT1	
75	DELAY1	F7404	A9	DELAY0	
76	DELAY2	F7404	A9	DELAY1	
77	DELAY3	F7404	A9	DELAY2	
78	DATFF1	F7474	C8	C=DELAY3	*
				R=EEN	*
				S=EEN	*
				D=MONAND2	
79	WOORD00	INPUT	14		
80	WOORD01	INPUT	1		
81	WOORD02	INPUT	13		
82	WOORD03	INPUT	2		
83	WOORD04	INPUT	12		

84	WOORD05	INPUT	3	
85	WOORD06	INPUT	11	
86	WOORD07	INPUT	4	
87	WOORD08	INPUT	10	
88	WOORD09	INPUT	5	
89	WOORD010	INPUT	9	
90	WOORD011	INPUT	6	
91	WOORDX0	INPUT	28	
92	WOORDX1	INPUT	15	
93	WOORDX2	INPUT	27	
94	WOORDX3	INPUT	16	
95	WOORDX4	INPUT	26	
96	WOORDX5	INPUT	17	
97	WOORDX6	INPUT	25	
98	WOORDX7	INPUT	18	
99	WOORDX8	INPUT	24	
100	WOORDX9	INPUT	19	
101	WOORDX10	INPUT	23	
102	WOORDX11	INPUT	20	
103	SELECT0	INPUT	42	
104	SELECT1	INPUT	29	
105	SELECT2	INPUT	41	
106	SELECT3	INPUT	30	
107	SELECT4	INPUT	40	
108	SELECT5	INPUT	31	
109	DRUK00	INPUT	39	
110	DRUK01	INPUT	37	
111	DRUKX0	INPUT	32	
112	DRUKX1	INPUT	34	
113	CONTX	INPUT	35	
114	RESIST0	OUTPUT	45	DRUK00
115	RESIST1	OUTPUT	46	DRUK01
116	RESIST2	OUTPUT	47	DRUKX0
117	RESIST3	OUTPUT	48	DRUKX1
118	MIN	INPUT	38	
119	EEN	INPUT	43	
120	OUTPUT0	SN74H04	B8	DATFF1
121	OUTPUT1	SN74H04	B8	DATFF1
122	OUTPUT2	SN74H04	B8	DATFF1
123	* OUTPUTS VAN	OUTPUT0, 1, EN 2	DOORVERBINDEN EN GETWIST UITVOEREN	
124	NOUTPUT0	SN74H04	B8	OUTPUT0
125	NOUTPUT1	SN74H04	B8	OUTPUT0
126	NOUTPUT2	SN74H04	B8	OUTPUT0
127	* OUTPUTS VAN	NOUTPUT0, 1, EN 2	DOORVERBINDEN EN GETWIST UITVOEREN	
128		END		

SYMBOL TABLE

SYMBOL	INDEXES		OVERLAY	TYPE
	LOWER	UPPER		
MULT0				CIRCUIT
MULTX				CIRCUIT
BT0				CIRCUIT
BT1				CIRCUIT
BT2				CIRCUIT
BT3				CIRCUIT
TELNAND0				CIRCUIT
TELINV0				CIRCUIT
BDCOD0				CIRCUIT
BDCOD1				CIRCUIT
BDCOD2				CIRCUIT
TELNAND1				CIRCUIT
TELINV1				CIRCUIT
RESNAND				CIRCUIT
KT0				CIRCUIT
KT1				CIRCUIT
KT2				CIRCUIT
KT3				CIRCUIT
KT4				CIRCUIT
KT5				CIRCUIT
TELNAND2				CIRCUIT
TELINV2				CIRCUIT
TELNOR0				CIRCUIT
TELNAND3				CIRCUIT
TELINV3				CIRCUIT
TELNOR1				CIRCUIT
TELINV4				CIRCUIT
TELINV5				CIRCUIT
TD0				CIRCUIT
TD31				CIRCUIT
EXCLOR0				CIRCUIT
EXCLOR1				CIRCUIT
EXCLOR2				CIRCUIT
EXCLOR3				CIRCUIT
EXCLOR4				CIRCUIT
EXCLOR5				CIRCUIT
TDX				CIRCUIT
KFF0				CIRCUIT
KFFX				CIRCUIT
DRIE0				CIRCUIT
DRIE1				CIRCUIT
DRIE2				CIRCUIT
OUT00				CIRCUIT
OUT01				CIRCUIT
OUTX0				CIRCUIT
OUTX1				CIRCUIT
ONOR0				CIRCUIT
ONOR1				CIRCUIT
ONOR2				CIRCUIT
XNOR0				CIRCUIT
XNOR1				CIRCUIT
XNOR2				CIRCUIT

DEB000	CIRCUIT
DEB001	CIRCUIT
DEBOX0	CIRCUIT
DEBOX1	CIRCUIT
POORT0	CIRCUIT
DELER0	CIRCUIT
DELER1	CIRCUIT
POORT1	CIRCUIT
DELER2	CIRCUIT
KLOK	CIRCUIT
NONKLOK	CIRCUIT
DATFF0	CIRCUIT
MONAND0	CIRCUIT
MONAND1	CIRCUIT
MONAND2	CIRCUIT
DELAY0	CIRCUIT
DELAY1	CIRCUIT
DELAY2	CIRCUIT
DELAY3	CIRCUIT
DATFF1	CIRCUIT
WOORD00	INPUT
WOORD01	INPUT
WOORD02	INPUT
WOORD03	INPUT
WOORD04	INPUT
WOORD05	INPUT
WOORD06	INPUT
WOORD07	INPUT
WOORD08	INPUT
WOORD09	INPUT
WOORD010	INPUT
WOORD011	INPUT
WOORDX0	INPUT
WOORDX1	INPUT
WOORDX2	INPUT
WOORDX3	INPUT
WOORDX4	INPUT
WOORDX5	INPUT
WOORDX6	INPUT
WOORDX7	INPUT
WOORDX8	INPUT
WOORDX9	INPUT
WOORDX10	INPUT
WOORDX11	INPUT
SELECT0	INPUT
SELECT1	INPUT
SELECT2	INPUT
SELECT3	INPUT
SELECT4	INPUT
SELECT5	INPUT
DRUK00	INPUT
DRUK01	INPUT
DRUKX0	INPUT
DRUKX1	INPUT
CONTX	INPUT
RESIST0	OUTPUT
RESIST1	OUTPUT

RESIST2
RESIST3
MIN
EEN
OUTPUT0
OUTPUT1
OUTPUT2
NOUTPUT0
NOUTPUT1
NOUTPUT2

OUTPUT
OUTPUT
INPUT
INPUT
CIRCUIT
CIRCUIT
CIRCUIT
CIRCUIT
CIRCUIT
CIRCUIT
CIRCUIT

	A	B	C	D	E	F
1	SN74150	SN74150	SN74150	SN74150	F7420	
2	SN74150	SN74150	SN74150	SN74150	F7420	F7404
3	CONTACTS	CONTACTS	F7476	F7476	F7400	F7402
4		CONTACTS	F7474	F9022	F9022	F9022
5		F7402	F7476	F7410	F7430	F7430
6		F7402	F7476	F7400	SN7486	SN7486
7				CONTACTS	F7430	CONTACTS
8		SN74H04	F7474			
9	F7404	F7400	F7440	F9000	SN74H103	SN74H20

NUMBERS OF NEEDED MODULES

SN74150	2
F7420	2
F7404	2
F7476	4
F7400	3
F7402	3
F7474	2
F9022	3
F7410	1
F7430	3
SN7486	2
SN74H04	1
F7440	1
F9000	1
SN74H103	1
SN74H20	1

				DECLARE WITH POSITIONS	
2					
3	MULTO	SN74150	(A1)	I = WOORD00 (8), WOORD01 (5), WOORD02 (2), WOORD03 (7), WOORD04 (6), WOORD05 (1), WOORD06 (23), WOORD07 (20), WOORD08 (17), WOORD09 (22), WOORD010 (21), WOORD011 (16), BT0/15 (15), BT1/11 (14), BT2/15 (13), BT3/11 (11), DRIE2/8 (9)	
4	MULTX	SN74150	(C1)	I = WOORDX0 (8), WOORDX1 (5), WOORDX2 (2), WOORDX3 (7), WOORDX4 (6), WOORDX5 (1), WOORDX6 (23), WOORDX7 (20), WOORDX8 (17), WOORDX9 (22), WOORDX10 (21), WOORDX11 (16), BT0/15 (15), BT1/11 (14), BT2/15 (13), BT3/11 (11), KFFX/9 (9)	
5	BT0	F7476	(C3)	C = KLOK/6 (1) R = EEN (3) S = EEN (2) J = EEN (4) K = EEN (16)	* * * *
6	BT1	F7476	(C3)	C = KLOK/6 (6) R = EEN (8) S = EEN (7) J = BT2/14 (9) K = BT2/15 (12)	* * * *
7	BT2	F7476	(D3)	C = KLOK/6 (1) R = RESNAND/8 (3) S = EEN (2) J = BT1/11 (4) K = BT1/11 (16)	* * * *
8	BT3	F7476	(D3)	C = KLOK/6 (6) R = EEN (8) S = EEN (7) J = TELINV0/2 (9) K = TELINV0/2 (12)	* * * *
9	TELNANDO	F7400	(E3)	I = BT0/15 (1), BT2/15 (2)	
10	TELINV0	F7404	(F2)	I = TELNANDO/3 (1)	
11	BDCOD0	F7420	(E2)	I = BT0/14 (1), BT1/10 (2), BT2/14 (4), BT3/10 (5)	
12	BDCOD1	F7420	(E2)	I = BT0/15 (9), BT1/11 (10), BT2/15 (12), BT3/11 (13)	
13	BDCOD2	F7420	(E1)	I = BT0/14 (1), BT1/11 (2), BT2/14 (4), BT3/11 (5)	
14	TELNAND1	F7400	(E3)	I = BDCOD0/6 (4), BDCOD1/8 (5)	
15	TELINV1	F7404	(F2)	I = BDCOD2/6 (3)	
16	RESNAND	F7420	(E1)	I = BT1/10 (9), BT1/10 (10), BT2/15 (12), BT2/15 (13)	
17	KT0	F9022	(D4)	C = NONKLOK/8 (2) R = EEN (1) S = EEN (5) J = TELINV1/4 (3) P = TELINV1/4 (14)	* * * *
18	* K-INPUT AAN AARDE				
19	KT1	F9022	(D4)	C = NONKLOK/8 (2) R = EEN (15) S = EEN (11) J = KT0/6 (13) K = KT0/7 (12) P = TELINV1/4 (14)	* * * * *
20	KT2	F9022	(E4)	C = NONKLOK/8 (2) R = EEN (1) S = EEN (5) J = TELINV2/6 (3) K = TELNAND2/8 (4) P = TELINV1/4 (14)	* * * * *

21	KT3	F9022	(E4)	C = NONKLOK/8 (2) R = EEN (15) S = EEN (11) J = TELNOR0/1 (13) K = TELINV4/10 (12) P = TELINV1/4 (14)	* * * * *
22	KT4	F9022	(F4)	C = NONKLOK/8 (2) R = EEN (1) S = EEN (5) J = FELINV3/8 (3) K = TELNAND3/11 (4) P = FELINV1/4 (14)	* * * * *
23	KT5	F9022	(F4)	C = NONKLOK/8 (2) R = EEN (15) S = EEN (11) J = FELNOR1/4 (13) K = TELINV5/12 (12) P = FELINV1/4 (14)	* * * * *
24	TELNAND2	F7400	(E3)	I = KT0/6 (9), KT1/10 (10)	
25	TELINV2	F7404	(F2)	I = FELNAND2/8 (5)	
26	TELNOR0	F7402	(F3)	I = TELNAND2/8 (2), KT2/7 (3)	
27	TELNAND3	F7400	(E3)	I = TELNOR0/1 (12), KT3/10 (13)	
28	TELINV3	F7404	(F2)	I = TELNAND3/11 (9)	
29	TELNOR1	F7402	(F3)	I = TELNAND3/11 (5), KT4/7 (6)	
30	TELINV4	F7404	(F2)	I = TELNOR0/1 (11)	
31	TELINV5	F7404	(F2)	I = TELNOR1/4 (13)	
32	TD0	F7430	(E5)	I = KT0/7 (1), KT1/9 (2), KT2/7 (3), KT3/9 (4), KT4/7 (5), KT5/9 (6), KT5/9 (11), KT5/9 (12)	
33	TD31	F7430	(F5)	I = KT0/7 (1), KT1/9 (2), KT2/7 (3), KT3/9 (4), KT4/7 (5), KT5/10 (6), KT5/10 (11), KT5/10 (12)	
34	EXCLOR0	SN7486	(E6)	I = KT0/7 (1), SELECT0 (2)	
35	EXCLOR1	SN7486	(E6)	I = KT1/9 (4), SELECT1 (5)	
36	EXCLOR2	SN7486	(E6)	I = KT2/7 (9), SELECT2 (10)	
37	EXCLOR3	SN7486	(E6)	I = KT3/9 (12), SELECT3 (13)	
38	EXCLOR4	SN7486	(F6)	I = KT4/7 (1), SELECT4 (2)	
39	EXCLOR5	SN7486	(F6)	I = KT5/9 (4), SELECT5 (5)	
40	TDX	F7430	(E7)	I = EXCLOR0/3 (1), EXCLOR1/6 (2), EXCLOR2/8 (3), EXCLOR3/11 (4), EXCLOR4/3 (5), EXCLOR5/6 (6), OUTX0/15 (11), OUTX0/15 (12)	
41	KFF0	F7474	(C4)	C = NONKLOK/8 (3) R = EEN (1) S = EEN (4) D = TD0/8 (2)	* * * *
42	KFFX	F7474	(C4)	C = NONKLOK/8 (11) R = EEN (13) S = EEN (10) D = TDX/8 (12)	* * * *
43	DRIE0	F7410	(D5)	I = TELNAND1/6 (1), KFF0/5 (2), KFFX/9 (13)	
44	DRIE1	F7410	(D5)	I = MULT0/10 (3), MULTX/10 (4), DRIE0/12 (5)	
45	DRIE2	F7410	(D5)	I = OUT00/15 (9), KFF0/6 (10), KFF0/6 (11)	
46	OUT00	F7476	(C5)	C = KLOK/6 (1) J = ONOR0/1 (4) K = ONOR1/4 (16) S = CONTX (2) R = DEBO01/6 (3)	* * * * *
47	OUT01	F7476	(C5)	C = KLOK/6 (6) J = ONOR2/10 (9)	* *

				S = EEN (7)	*
				R = DEBO01/6 (8)	
48	* OUT01: K-INPUT AAN AARDE LEGGEN				
49	OUTX0	F7476	(C6)	C = KLOK/6 (1)	*
				J = XNOR0/1 (4)	*
				K = XNOR1/4 (16)	*
				S = EEN (2)	*
				R = DEBOX1/11 (3)	
50	OUTX1	F7476	(C6)	C = KLOK/6 (6)	*
				J = XNOR2/10 (9)	*
				S = EEN (7)	*
				R = DEBOX1/11 (3)	
51	* OUTX1: K-INPUT AAN AARDE LEGGEN				
52	ONOR0	F7402	(B5)	I = TD31/8 (2), OUT01/11 (3)	
53	ONOR1	F7402	(B5)	I = TD31/8 (5), OUT01/10 (6)	
54	ONOR2	F7402	(B5)	I = KFF0/5 (8), OUT00/14 (9)	
55	XNOR0	F7402	(B6)	I = KFF0/5 (2), OUTX1/11 (3)	
56	XNOR1	F7402	(B6)	I = KFF0/5 (5), OUTX1/10 (6)	
57	XNOR2	F7402	(B6)	I = TD31/8 (8), OUTX0/14 (9)	
58	DEEO00	F7400	(D6)	I = DRUK01 (1), DEBO01/6 (2)	
59	DEBO01	F7400	(D6)	I = DRUK00 (4), DEBO00/3 (5)	
60	DEEOX0	F7400	(D6)	I = DRUKX1 (9), DEBOX1/11 (10)	
61	DEBOX1	F7400	(D6)	I = DRUKX0 (12), DEBOX0/8 (13)	
62	POORT0	SN74H20	(F9)		
63	* POORT0: PINS 1,2,4 EN 5 AAN OUTPUT OSCILLATOR				
64	DELER0	SN74H103	(E9)	C = POORT0/6 (1)	*
				R = EEN (2)	*
				J = EEN (14)	*
				K = EEN (3)	
65	DELER1	SN74H103	(E9)	C = DELER0/12 (5)	*
				R = EEN (6)	*
				J = EEN (7)	*
				K = EEN (10)	
66	POORT1	SN74H20	(F9)	I = DELER1/9 (9), DELER1/9 (10), DELER1/9 (12), DELER1/9 (13)	
67	DELER2	F9000	(D9)	C = POORT1/8 (9)	*
				R = EEN (13)	*
				S = EEN (2)	*
				J = EEN (4), EEN (5), EEN (12)	*
				K = EEN (3), EEN (10), EEN (11)	*
				P = EEN (1)	
68	KLOK	F7440	(C9)	I = DELER2/6 (1), DELER2/6 (2), DELER2/6 (4), DELER2/6 (5)	
69	NONKLOK	F7440	(C9)	I = KLOK/6 (9), KLOK/6 (10), KLOK/6 (12), KLOK/6 (13)	
70	DATFF0	F7474	(C8)	C = NONKLOK/8 (3)	*
				R = EEN (1)	*
				S = EEN (4)	*
				D = DRIE1/5 (2)	
71	MONAND0	F7400	(B9)	I = KLOK/6 (1), DATFF0/6 (2)	
72	MONAND1	F7400	(B9)	I = DELER2/6 (4), DATFF0/5 (5)	
73	MONAND2	F7400	(B9)	I = MONAND0/3 (9), MONAND1/6 (10)	
74	DELAY0	F7404	(A9)	I = POORT1/8 (1)	
75	DELAY1	F7404	(A9)	I = DELAY0/2 (3)	
76	DELAY2	F7404	(A9)	I = DELAY1/4 (5)	
77	DELAY3	F7404	(A9)	I = DELAY2/6 (9)	
78	DATFF1	F7474	(C8)	C = DELAY3/8 (11)	*
				R = EEN (13)	*

S = EEN (10)
D = MONAND2/8 (12)

*

79	WOORD00	INPUT	(14)	
80	WOORD01	INPUT	(1)	
81	WOORD02	INPUT	(13)	
82	WOORD03	INPUT	(2)	
83	WOORD04	INPUT	(12)	
84	WOORD05	INPUT	(3)	
85	WOORD06	INPUT	(11)	
86	WOORD07	INPUT	(4)	
87	WOORD08	INPUT	(10)	
88	WOORD09	INPUT	(5)	
89	WOORD010	INPUT	(9)	
90	WOORD011	INPUT	(6)	
91	WOORDX0	INPUT	(28)	
92	WOORDX1	INPUT	(15)	
93	WOORDX2	INPUT	(27)	
94	WOORDX3	INPUT	(16)	
95	WOORDX4	INPUT	(26)	
96	WOORDX5	INPUT	(17)	
97	WOORDX6	INPUT	(25)	
98	WOORDX7	INPUT	(18)	
99	WOORDX8	INPUT	(24)	
100	WOORDX9	INPUT	(19)	
101	WOORDX10	INPUT	(23)	
102	WOORDX11	INPUT	(20)	
103	SELECT0	INPUT	(42)	
104	SELECT1	INPUT	(29)	
105	SELECT2	INPUT	(41)	
106	SELECT3	INPUT	(30)	
107	SELECT4	INPUT	(40)	
108	SELECT5	INPUT	(31)	
109	DRUK00	INPUT	(39)	
110	DRUK01	INPUT	(37)	
111	DRUKX0	INPUT	(32)	
112	DRUKX1	INPUT	(34)	
113	CONTX	INPUT	(35)	
114	RESIST0	OUTPUT	(45)	I = DRUK00
115	RESIST1	OUTPUT	(46)	I = DRUK01
116	RESIST2	OUTPUT	(47)	I = DRUKX0
117	RESIST3	OUTPUT	(48)	I = DRUKX1
118	MIN	INPUT	(38)	
119	EEN	INPUT	(43)	
120	OUTPUT0	SN74H04	(B8)	I = DATFF1/9 (1)
121	OUTPUT1	SN74H04	(B8)	I = DATFF1/9 (3)
122	OUTPUT2	SN74H04	(B8)	I = DATFF1/9 (5)
123	* OUTPUTS VAN OUTPUT0, 1, EN 2 DOORVERBINDEN EN GETWIST UITVOEREN			
124	NOUTPUT0	SN74H04	(B8)	I = OUTPUT0/2 (9)
125	NOUTPUT1	SN74H04	(B8)	I = OUTPUT0/2 (11)
126	NOUTPUT2	SN74H04	(B8)	I = OUTPUT0/2 (13)
127	* OUTPUTS VAN NOUTPUT0, 1, EN 2 DOORVERBINDEN EN GETWIST UITVOEREN			
128	END			

CONNECTION	WIRE	COLOR	POINT1	POINT2	WIRELENGTH
80	1	WT	*A1/10	D5/3	69
17	2	WT	D5/8	*A1/9	67
81	3	WT	*C1/10	D5/4	50
87	4	WT	C5/2	35 F7	49
94	5	WT	F5/8	B5/2	50
77	6	WT	E7/8	C4/12	43
38	7	WT	C3/10	E1/9	46
23	8	WT	*C1/1	17 B3	44
24	9	WT	25 B3	*C1/23	41
28	10	WT	*C1/21	23 B3	41
20	11	WT	27 B3	*C1/2	45
120	12	WT	C8/11	A9/8	43
22	13	WT	26 B3	*C1/6	42
19	14	WT	*C1/5	15 B3	38
21	15	WT	16 B3	*C1/7	37
18	16	WT	*C1/8	28 B3	38
25	17	WT	18 B3	*C1/20	35
27	18	WT	*C1/22	19 B3	38
29	19	WT	20 B3	*C1/16	33
26	20	WT	*C1/17	24 B3	35
1	21	WT	14 A3	*A1/8	33
5	22	WT	*A1/6	12 A3	33
3	23	WT	13 A3	*A1/2	36
6	24	WT	*A1/1	3 A3	35
7	25	WT	11 A3	*A1/23	32
11	26	WT	*A1/21	9 A3	32
15	27	WT	*A1/13	*C1/13	34
16	28	WT	*C1/11	E1/5	35
42	29	WT	E1/6	F2/3	34
36	30	WT	F2/1	E3/3	33
55	31	WT	E3/10	D4/10	32
59	32	WT	D4/9	E6/4	37
64	33	WT	E6/5	29 F7	35
63	34	WT	42 F7	E6/2	35
60	35	WT	E6/12	E4/9	32
50	36	WT	E4/12	F2/10	36
47	37	WT	F2/6	E4/3	33
78	38	WT	E3/6	D5/1	32
76	39	WT	E5/8	C4/2	38
43	40	WT	C4/11	C8/3	38
112	41	WT	C8/2	D5/6	39
86	42	WT	C5/16	B5/4	32
79	43	WT	B6/2	C4/5	34
30	44	WT	C4/9	D5/13	35
91	45	WT	C6/16	B6/4	32
32	46	WT	C8/10	D9/13	34
110	47	WT	D9/9	F9/8	33
73	48	WT	E7/5	F6/3	33
65	49	WT	41 F7	E6/10	34
121	50	WT	C8/12	B9/8	35
16	51	WT	D3/11	E2/13	34
39	52	WT	D3/10	E2/5	35
40	53	WT	E2/6	E3/4	24
14	54	WT	E2/10	E1/2	28
34	55	WT	E1/8	D3/3	29

CONNECTION	WIRE	COLOR	POINT1	POINT2	WIRELENGTH
32	56	WT	D3/2	C3/16	27
43	57	WT	C4/3	D4/2	27
15	58	WT	D3/15	C3/12	28
14	59	WT	C3/11	*C1/14	26
13	60	WT	*C1/15	C3/15	29
33	61	WT	C3/9	D3/14	30
56	62	WT	E4/7	E5/3	25
59	63	WT	E5/2	F5/2	25
56	64	WT	F5/3	F3/3	28
48	65	WT	F3/2	F2/5	25
51	66	WT	F2/8	F4/3	30
52	67	WT	F4/4	F3/5	24
	68	WT	F2/9	E3/11	29
57	69	WT	E3/13	E4/10	26
58	70	WT	E5/5	F5/5	25
60	71	WT	F5/4	E5/4	25
61	72	WT	E5/6	F4/9	27
43	73	WT	E4/2	F4/2	25
44	74	WT	F4/14	E4/14	25
54	75	WT	F4/12	F2/12	29
13	76	WT	E3/1	E2/9	24
95	77	WT	C5/11	B5/3	26
94	78	WT	B5/5	B6/8	27
100	79	WT	B6/9	C6/14	29
98	80	WT	C6/11	B6/3	26
97	81	WT	B5/9	C5/14	29
32	82	WT	C6/2	C8/4	31
114	83	WT	C8/5	B9/5	31
111	84	WT	B9/4	C9/5	24
113	85	WT	C8/6	B9/2	27
99	86	WT	C6/10	B6/6	28
96	87	WT	B5/6	C5/10	28
104	88	WT	D6/9	48 D7	27
102	89	WT	45 D7	D6/4	25
74	90	WT	E7/5	F6/6	31
68	91	WT	F6/5	31 F7	24
67	92	WT	40 F7	F6/2	26
66	93	WT	30 F7	E6/13	28
69	94	WT	E6/3	E7/1	24
70	95	WT	E7/2	E6/6	26
32	96	WT	C3/8	43 B4	25
2	97	WT	1 A3	*A1/5	29
4	98	WT	*A1/7	2 A3	28
8	99	WT	4 A3	*A1/20	26
10	100	WT	*A1/22	5 A3	29
12	101	WT	6 A3	*A1/16	24
9	102	WT	10 A3	*A1/17	27
32	103	WT	C3/7	C3/4	19
	104	WT	C3/3	C3/2	17
31	105	WT	C3/1	C3/6	21
32	106	WT	C4/4	C4/1	19
	107	WT	C4/13	C4/10	19
31	108	WT	C5/6	C5/1	21
88	109	WT	C5/3	C5/8	21
32	110	WT	C5/7	C6/7	22

CONNECTION	WIRE	COLOR	POINT1	POINT2	WIRELENGTH	
	31	111	WT	C6/6	C6/1	21
	92	112	WT	C6/3	C6/8	21
	89	113	WT	C5/9	B5/10	23
	79	114	WT	B5/8	B6/5	21
	93	115	WT	B6/10	C6/9	23
	90	116	WT	B6/1	C6/4	23
	83	117	WT	C5/15	D5/9	20
	84	118	WT	D5/10	D5/11	17
	82	119	WT	D5/12	D5/5	21
	45	120	WT	D4/13	D4/6	21
	46	121	WT	D4/7	D4/12	21
	32	122	WT	D4/11	D4/15	20
	44	123	WT	D4/14	D4/3	19
	32	124	WT	D4/1	D4/5	20
	35	125	WT	D3/9	D3/12	19
	31	126	WT	D3/6	D3/1	21
	41	127	WT	E2/8	E3/5	21
	48	128	WT	E3/8	E4/4	23
	32	129	WT	E4/5	E4/1	20
		130	WT	E4/15	E4/11	20
	49	131	WT	E4/13	E3/12	22
	15	132	WT	E3/2	E2/12	20
	38	133	WT	E2/2	E1/10	22
	15	134	WT	E1/12	E1/13	17
	33	135	WT	E1/4	E2/4	22
	37	136	WT	E2/1	E1/1	22
	49	137	WT	F2/11	F3/1	22
	53	138	WT	F2/13	F3/4	21
	58	139	WT	F3/6	F4/7	22
	32	140	WT	F4/5	F4/11	20
	62	141	WT	F4/10	F5/6	19
		142	WT	F5/12	F5/11	17
	46	143	WT	E6/1	E5/1	22
	61	144	WT	E5/11	E5/12	17
	71	145	WT	E6/8	E7/3	23
	72	146	WT	E7/4	E6/11	19
	101	147	WT	D6/1	46 D7	23
	92	148	WT	D6/11	D6/10	17
	105	149	WT	D6/12	47 D7	23
	106	150	WT	D6/8	D6/13	21
	103	151	WT	D6/3	D6/5	18
	88	152	WT	D6/6	D6/2	20
	75	153	WT	E7/12	E7/11	17
	32	154	WT	E9/3	E9/2	17
	107	155	WT	E9/1	F9/6	20
	109	156	WT	F9/12	F9/13	17
		157	WT	F9/10	F9/9	17
	108	158	WT	E9/12	E9/5	21
	32	159	WT	E9/10	E9/14	20
		160	WT	E9/6	E9/7	17
		161	WT	D9/1	D9/2	17
		162	WT	D9/3	D9/4	17
		163	WT	D9/5	D9/10	19
		164	WT	D9/11	D9/12	17
	111	165	WT	D9/6	C9/1	20

CONNECTION	WIRE	COLOR	POINT1	POINT2	WIRELENGTH
	166	WT	C9/2	C9/4	18
31	167	WT	C9/6	B9/1	20
115	168	WT	B9/3	B9/9	22
116	169	WT	B9/10	B9/6	20
123	170	WT	B8/9	B8/11	18
	171	WT	B8/13	B8/2	19
122	172	WT	B8/3	B8/5	18
	173	WT	B8/1	C8/9	23
32	174	WT	C8/13	C8/1	20
31	175	WT	C9/10	C9/9	17
	176	WT	C9/12	C9/13	17
117	177	WT	A9/2	A9/3	17
118	178	WT	A9/4	A9/5	17
119	179	WT	A9/6	A9/9	19
85	180	WT	B5/1	C5/4	23
14	181	WT	D3/4	D3/16	22
32	182	WT	D3/7	D3/8	17
	183	WT	F4/15	F4/1	20
37	184	WT	E2/1	C3/14	44
110	185	WT	A9/1	D9/9	41
35	186	WT	D3/12	F2/2	45
44	187	WT	F2/4	F4/14	33
46	188	WT	E6/1	D4/12	37
79	189	WT	D5/2	C4/5	34
84	190	WT	C4/6	D5/10	35
75	191	WT	C6/15	E7/11	37
102	192	WT	45 D7	39 F7	34
101	193	WT	37 F7	46 D7	33
104	194	WT	48 D7	34 F7	32
105	195	WT	32 F7	47 D7	35
31	196	WT	C6/6	B9/1	39
30	197	WT	C4/9	*C1/9	39
16	198	WT	*C1/11	*A1/11	34
13	199	WT	*A1/15	*C1/15	34
14	200	WT	*C1/14	*A1/14	34
13	201	WT	C3/15	E2/9	35
33	202	WT	E2/4	D3/14	32
58	203	WT	E5/5	F6/1	35
48	204	WT	E4/4	F3/2	32
53	205	WT	F3/4	F4/13	26
32	206	WT	F4/11	E4/11	25
44	207	WT	E4/14	D4/14	25
43	208	WT	D4/2	E4/2	25
49	209	WT	E3/12	F2/11	30
16	210	WT	E2/13	E1/5	28
14	211	WT	E2/10	D3/4	26
	212	WT	D3/16	C3/11	30
15	213	WT	C3/12	*C1/13	28
31	214	WT	C3/6	C5/6	28
88	215	WT	C5/3	D6/6	27
92	216	WT	D6/10	C6/3	25
32	217	WT	D4/11	E4/5	29
56	218	WT	E4/7	E6/9	31
61	219	WT	E5/12	F6/4	27
56	220	WT	F5/3	E5/3	25

CONNECTION	WIRE	COLOR	POINT1	POINT2	WIRELENGTH
59	221	WT	E5/2	E6/4	24
46	222	WT	E5/1	F5/1	25
15	223	WT	E3/2	D3/15	27
45	224	WT	D4/6	E3/9	27
43	225	WT	C8/3	C9/8	29
32	226	WT	D4/5	C3/16	24
109	227	WT	F9/9	E9/9	25
32	228	WT	E9/7	D9/1	19
	229	WT	D9/2	D9/3	17
	230	WT	D9/4	D9/5	17
	231	WT	D9/13	D9/12	17
	232	WT	D9/11	D9/10	17
111	233	WT	C9/1	C9/2	17
	234	WT	C9/4	C9/5	17
31	235	WT	C9/6	C9/9	19
	236	WT	C9/10	C9/12	18
32	237	WT	C8/13	C8/10	19
	238	WT	C8/4	C8/1	19
122	239	WT	B8/1	B8/3	18
123	240	WT	B8/11	B8/13	18
31	241	WT	C6/1	C5/1	22
32	242	WT	C4/13	C4/1	20
43	243	WT	C4/3	C4/11	20
32	244	WT	C4/10	C5/7	20
94	245	WT	B5/2	B5/5	19
32	246	WT	43 B4	C4/4	22
	247	WT	C3/3	C3/4	17
	248	WT	C3/2	D3/8	19
	249	WT	D3/7	D3/2	21
31	250	WT	D3/6	C3/1	20
32	251	WT	C3/7	C3/8	17
	252	WT	D4/15	D4/1	20
60	253	WT	E4/9	E5/4	22
61	254	WT	E5/6	E5/11	21
32	255	WT	E4/15	E4/1	20
58	256	WT	F4/7	F5/5	23
62	257	WT	F5/6	F5/11	21
32	258	WT	F4/1	F4/5	20
52	259	WT	F3/5	F2/9	20
15	260	WT	E1/12	E2/12	22
38	261	WT	E1/10	E1/9	17
32	262	WT	C6/7	C6/2	21
79	263	WT	B6/2	B6/5	19
32	264	WT	E9/6	E9/3	19
109	265	WT	F9/10	F9/12	18
32	266	WT	E9/2	E9/14	20

TOTAL WIRE-LENGTH 17 METERS

