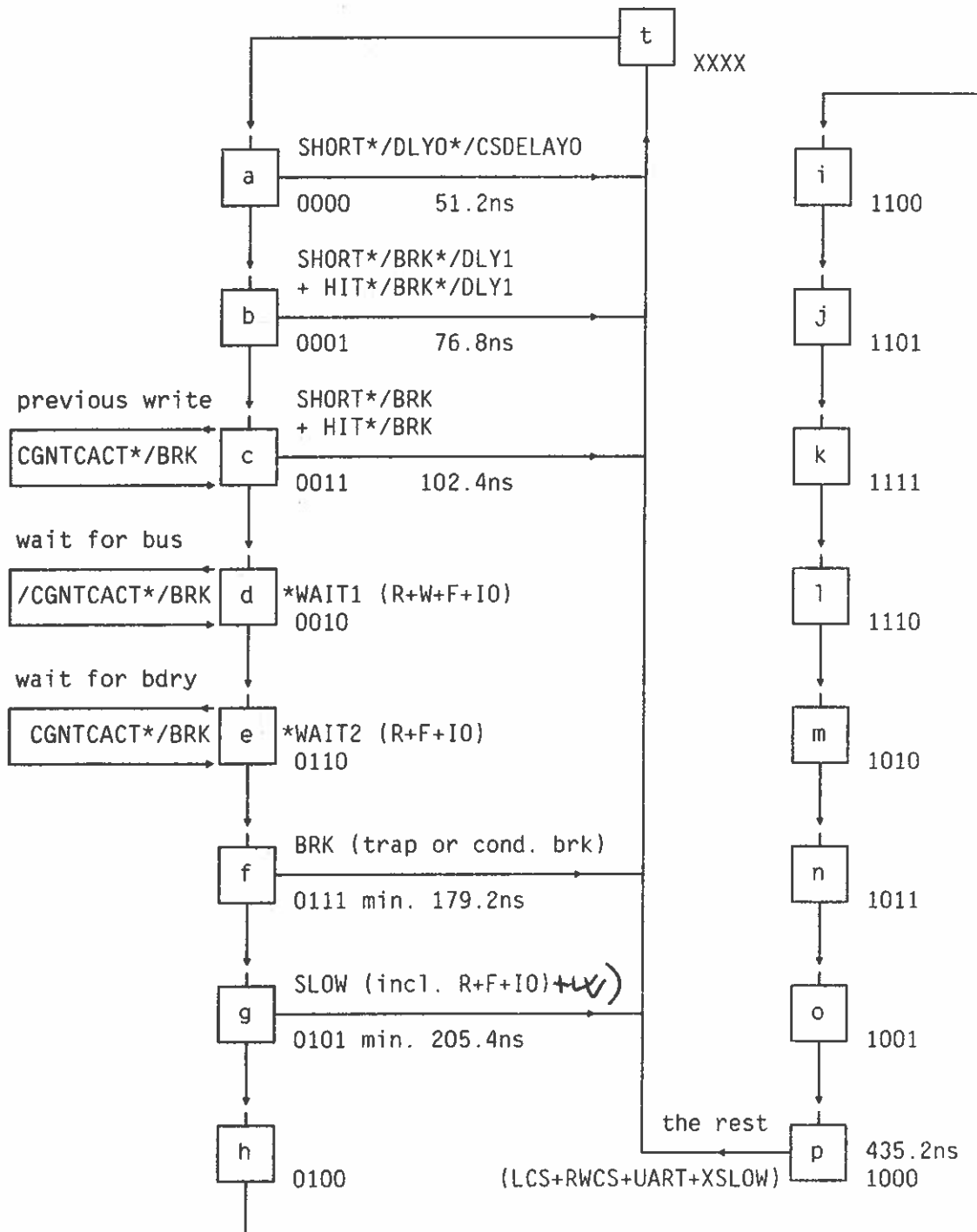
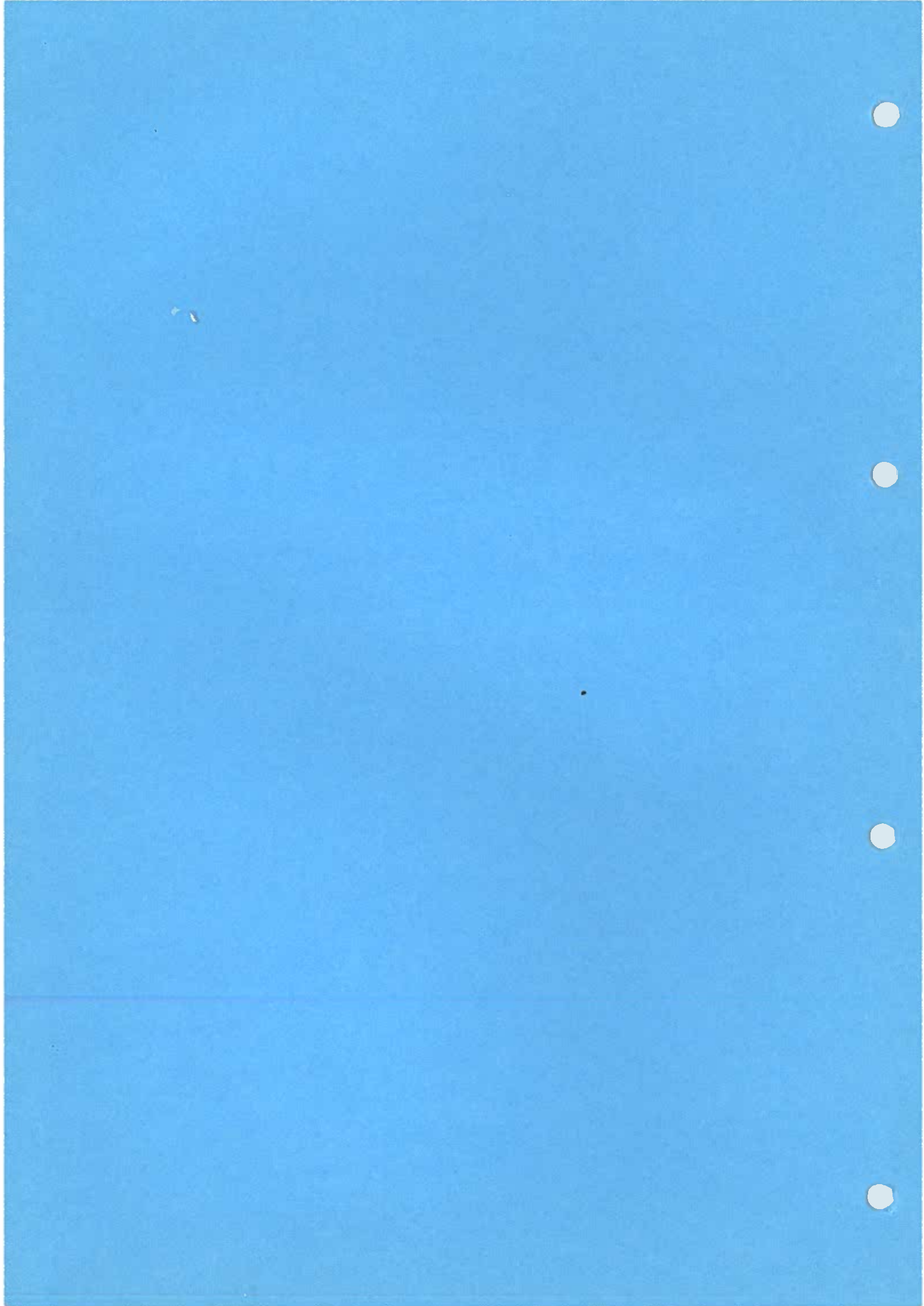


DELILAH CYCLE CONTROL STATE DIAGRAM.





CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C

C SIGLISTE EXTRACTOR VERS. 870225

C

C USER: /D1/USER/DELI/M3202B

C OPTION:4 DATE: 05-JUN-1987 10:32

C REGISTRATED 927 DIFFERENT SIGNALS

C 1 ERRORS, 0 WARNINGS DETECTED,

C 3 SIGNALS NOT PROCESSED. TOO MANY ENTRIES

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

END:

ERROR. 3 OVERFLOWS IN SIGNAL CONNECTIONS

PG NO: PAGE: BLK NO: BLOCK:

1	1.DRAW	1	-
2	2.DRAW	1	-
3	3.DRAW	1	-
4	4.DRAW	1	-
5	1.DRAW	2	-/BIF
6	1.DRAW	3	-/BIF/BCTL
7	1.DRAW	4	-/BIF/BCTL/BDRV
8	1.DRAW	5	-/BIF/BCTL/SYNC
9	1.DRAW	6	-/BIF/DPATH
10	1.DRAW	7	-/BIF/DPATH/BDLBD
11	1.DRAW	8	-/BIF/DPATH/CDLBD
12	1.DRAW	9	-/BIF/DPATH/LBDCTL
13	1.DRAW	10	-/BIF/DPATH/PESPEA
14	1.DRAW	11	-/BIF/DPATH/PPNLBD
15	1.DRAW	12	-/CPU
16	1.DRAW	13	-/CPU/CS
17	1.DRAW	14	-/CPU/CS/ACAL
18	1.DRAW	15	-/CPU/CS/CTL
19	1.DRAW	16	-/CPU/CS/PROM
20	1.DRAW	17	-/CPU/CS/TCV
21	1.DRAW	18	-/CPU/CS/WCS
22	2.DRAW	18	-/CPU/CS/WCS
23	1.DRAW	19	-/CPU/LAPA
24	1.DRAW	20	-/CPU/MMU
25	1.DRAW	21	-/CPU/MMU/CACHE
26	1.DRAW	22	-/CPU/MMU/CSR
27	1.DRAW	23	-/CPU/MMU/HIT
28	1.DRAW	24	-/CPU/MMU/PPNX
29	1.DRAW	25	-/CPU/MMU/PT
30	1.DRAW	26	-/CPU/MMU/PTIDB
31	1.DRAW	27	-/CPU/MMU/WCA
32	1.DRAW	28	-/CPU/PROC
33	1.DRAW	29	-/CPU/PROC/CGA
34	1.DRAW	30	-/CPU/PROC/CMDDEC
35	1.DRAW	31	-/CPU/STOC
36	1.DRAW	32	-/CYC
37	1.DRAW	33	-/IO
38	1.DRAW	34	-/IO/DCD
39	1.DRAW	35	-/IO/DCD/DGA
40	1.DRAW	36	-/IO/PANCAL
41	1.DRAW	37	-/IO/REG

42	1.DRAW	38	- / IO / UART
43	1.DRAW	39	- / MEM
44	1.DRAW	40	- / MEM / ADDR
45	1.DRAW	41	- / MEM / ADEC
46	1.DRAW	42	- / MEM / DATA
47	1.DRAW	43	- / MEM / ERROR
48	1.DRAW	44	- / MEM / LBDIF
49	1.DRAW	45	- / MEM / RAM
50	1.DRAW	46	- / MEM / RANC

C ***** SIGNAL NAME INFO *****

SIGNAL	£'s	DIRECT: PAGE+QUADR/COMP-PIN/TYPE
12V	13	B:2F1/A-C31!! B:2F2/RN2-1/4610X_101_102! B:2F2/RN2-1/4610X_101_102! B:2F2/RN2-1/4610X_101_102! B:2G2/RN2-1/4610X_101_102! B:2G2/RN2-1/4610X_101_102! B:2G2/RN2-1/4610X_101_102! O:42E2/34H-11/VP12/12! O:42E2/34H-14/ B:42F1/C9-1/2.2uF! I:42E4/35G-8/75150P B:42E5/R9-1/2.2KOHM! B:42E5/R10-1/2.2KOHM!
12VN	6	O:2D5/A-A8!! O:42E2/34H-2/VP12/12! O:42E2/34H-23/VP12/12! B:42F2/C10-2/2.2uF! I:42E4/35G-5/75150P B:42F4/R8-2/1.5KOHM!
5VSTBY	69	\$\$OVERFLOW\$\$ B:2E2/RN1-1/4610X_101_102! B:2E2/RN1-1/4610X_101_102! B:2E2/RN1-1/4610X_101_102! B:2E2/RN1-1/4610X_101_102! B:2D2/RN1-1/4610X_101_102! B:2D2/RN1-1/4610X_101_102! B:2B2/A-C24!! I:3A7/R4-1/1KOHM B:4G2 B:4G2/C-B30!! B:4G2/C-C30!! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H2/RN10-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:32H4/RN11-1/4610X_101_102! B:38A3/D1-2/3.3V_ZENER! I:39A4/RN17-1/4610X_101_103 I:39A4/RN17-1/4610X_101_103 I:39A4/RN17-1/4610X_101_103 I:39A4/RN17-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39A1/RN15-1/4610X_101_103 I:39B1/RN15-1/4610X_101_103 I:39C7/34D-L7/ND_DELDGA I:39C7/34D-C I:39A3/RN16-1/4610X_101_103 I:39A3/RN16-1/4610X_101_103 I:39A3/RN16-1/4610X_101_103 I:39A3/RN16-1/4610X_101_103
A0	£44 2	I:44D6/RN5-1/4610X_102_330 B:44D4/5H-23/74FCT861B!
A1	£44 2	I:44E6/RN5-3/4610X_102_330 B:44D4/5H-22/74FCT861B!
A2	£44 2	I:44E6/RN5-5/4610X_102_330 B:44D4/5H-21/74FCT861B!
A3	£44 2	I:44E6/RN5-7/4610X_102_330 B:44D4/5H-20/74FCT861B!
A4	£44 2	I:44E6/RN5-9/4610X_102_330 B:44D4/5H-19/74FCT861B!
A5	£44 2	I:44E6/RN6-1/4610X_102_330 B:44D4/5H-18/74FCT861B!
A6	£44 2	I:44E6/RN6-3/4610X_102_330 B:44D4/5H-17/74FCT861B!
A7	£44 2	I:44F6/RN6-5/4610X_102_330 B:44D4/5H-16/74FCT861B!
A8	£44 2	I:44F6/RN6-7/4610X_102_330 B:44D4/5H-15/74FCT861B!
A9	£44 2	I:44F6/RN6-9/4610X_102_330 B:44D4/5H-14/74FCT861B!
AA0	7	O:44D6/RN5-2/4610X_102_330! I:49C3/15H-4/SIP1M9 I:49C5/15J-4/SIP1M9 I:49E3/15K-4/SIP1M9 I:49E5/15L-4/SIP1M9 I:49G5/15N-4/SIP1M9 I:49G3/15M-4/SIP1M9

AA1	7	O:44E6/RN5-4/4610X_102_330! I:49C3/15H-5/SIP1M9 I:49C5/15J-5/SIP1M9 I:49E3/15K-5/SIP1M9 I:49E5/15L-5/SIP1M9 I:49G5/15N-5/SIP1M9 I:49G3/15M-5/SIP1M9
AA2	7	O:44E6/RN5-6/4610X_102_330! I:49C3/15H-7/SIP1M9 I:49C5/15J-7/SIP1M9 I:49E3/15K-7/SIP1M9 I:49E5/15L-7/SIP1M9 I:49G5/15N-7/SIP1M9 I:49G3/15M-7/SIP1M9
AA3	7	O:44E6/RN5-8/4610X_102_330! I:49C3/15H-8/SIP1M9 I:49C5/15J-8/SIP1M9 I:49E3/15K-8/SIP1M9 I:49E5/15L-8/SIP1M9 I:49G5/15N-8/SIP1M9 I:49G3/15M-8/SIP1M9
AA4	7	O:44E6/RN5-10/4610X_102_330! I:49C3/15H-11/SIP1M9 I:49C5/15J-11/SIP1M9 I:49E3/15K-11/SIP1M9 I:49E5/15L-11/SIP1M9 I:49G5/15N-11/SIP1M9 I:49G3/15M-11/SIP1M9
AA5	7	O:44E6/RN6-2/4610X_102_330! I:49C3/15H-12/SIP1M9 I:49C5/15J-12/SIP1M9 I:49E3/15K-12/SIP1M9 I:49E5/15L-12/SIP1M9 I:49G5/15N-12/SIP1M9 I:49G3/15M-12/SIP1M9
AA6	7	O:44E6/RN6-4/4610X_102_330! I:49C3/15H-14/SIP1M9 I:49C5/15J-14/SIP1M9 I:49E3/15K-14/SIP1M9 I:49E5/15L-14/SIP1M9 I:49G5/15N-14/SIP1M9 I:49G3/15M-14/SIP1M9
AA7	7	O:44F6/RN6-6/4610X_102_330! I:49C3/15H-15/SIP1M9 I:49C5/15J-15/SIP1M9 I:49E3/15K-15/SIP1M9 I:49E5/15L-15/SIP1M9 I:49G5/15N-15/SIP1M9 I:49G3/15M-15/SIP1M9
AA8	7	O:44F6/RN6-8/4610X_102_330! I:49C3/15H-17/SIP1M9 I:49C5/15J-17/SIP1M9 I:49E3/15K-17/SIP1M9 I:49E5/15L-17/SIP1M9 I:49G5/15N-17/SIP1M9 I:49G3/15M-17/SIP1M9
AA9	7	O:44F6/RN6-10/4610X_102_330! I:49C3/15H-18/SIP1M9 I:49C5/15J-18/SIP1M9 I:49E3/15K-18/SIP1M9 I:49E5/15L-18/SIP1M9 I:49G5/15N-18/SIP1M9 I:49G3/15M-18/SIP1M9
ABIT	£45 2	T:45E2/7G-19/PAL16R8B! I:45F2/8H-7/74LS248
ACOND~	2	O:33B7/28F-J2/ND_DELILAH! I:36B5/14D-6/PAL16R4D
ACT~	£6 1	T:6D2/10D-18/PAL16R8D!
ALUCLK	3	I:33B7/28F-B9/ND_DELILAH I:33A5/7F-5/74F14 O:36F2/9D-1/74F02!
AOK	£45 2	B:45C6/6G-19/PAL16R4D! I:45E7/2D-2/74F74
APR~	2	B:6D4/5D-19/PAL16R4D! I:7D7/7A-11/7407
BACT~	£12 2	I:12E4/2C-11/PAL16L8D B:12D6/1C-18/PAL16L8D!
BANK0	5	T:45C6/6G-15/PAL16R4D! T:45C4/9G-15/PAL16R4D! O:45E3/RN18-4/4610X_101_102! I:49B6/9H-2/74F00 I:49B7/9H-4/74F0
BANK1	5	T:45C6/6G-16/PAL16R4D! T:45C4/9G-16/PAL16R4D! O:45D3/RN18-3/4610X_101_102! I:49D6/9H-10/74F00 I:49D7/9H-12/74
BANK2	5	T:45C6/6G-17/PAL16R4D! T:45C4/9G-17/PAL16R4D! O:45D3/RN18-2/4610X_101_102! I:49F6/8G-10/74F00 I:49F7/8G-12/74
BAPR~	3	I:4C6/5C-17/74F244 B:4A6/C-A20!! O:7D7/7A-10/7407!
BBIT	£45 2	T:45E2/7G-18/PAL16R8B! I:45F2/8H-1/74LS248
BCGNT25	2	I:48C4/13F-11/AM29C821 T:50B6/5F-12/PAL16R8D!
BCGNT50	4	I:44B5/4H-13/AM29821 I:44B2/3H-13/AM29821 I:47D7/4F-3/PAL16L8B O:48C4/13F-14/AM29C821!
BCGNT50R~	2	I:46C5/2F-9/PAL16L8B O:48E4/3F-19/PAL16L8D!
BDAP25~	£8 2	O:8C3/3D-15/AM29C821! I:8E3/4D-10/AM29C821
BDAP50~	4	O:8E3/4D-15/AM29C821! I:12D6/1C-5/PAL16L8D O:48C4/13F-20/AM29C821! I:50E6/6F-5/PAL16R8D
BDAP~	3	I:4C6/5C-13/74F244 B:4A6/C-C18!! O:7D4/2A-3/7438!
BDRY25~	5	I:6D2/10D-7/PAL16R8D I:7D3/2B-1/74F00 O:8C3/3D-18/AM29C821! I:8E3/4D-7/AM29C821 I:12D2/11D-4/PAL16L8D
BDRY50~	9	I:6D6/8D-1/PAL16L8B I:6D4/5D-5/PAL16R4D I:7D3/2B-2/74F00 I:7D4/2A-2/7438 I:8E3/4D-8/AM29C821 O:8E3/4D- I:12D2/11D-5/PAL16L8D I:39C7/34D-B11/ND_DELDGA I:50E6/6F-9/PAL16
BDRY75~	2	I:6D6/8D-2/PAL16L8B O:8E3/4D-17/AM29C821!
BDRY~	4	I:4C6/5C-15/74F244 B:4A6/C-A19!! T:7D2/3A-3/74F241! O:48F4/7A-12/7407!
BD~0	3	B:4A5/C-C3!! B:10D6/6A-11/74AS648!

			I:13E5/8A-18/74PCT534
BD~1	3		B:4A5/C-A3!! B:10D6/6A-10/74AS648! I:13E5/8A-17/74PCT534
BD~10	3		B:4A3/C-C8!! B:10D4/5A-9/74AS648! I:13E3/9A-14/74PCT534
BD~11	3		B:4A3/C-A8!! B:10D4/5A-8/74AS648! I:13E3/9A-13/74PCT534
BD~12	3		B:4A3/C-C9!! B:10D4/5A-7/74AS648! I:13E3/9A-8/74PCT534
BD~13	3		B:4A3/C-A9!! B:10D4/5A-6/74AS648! I:13E3/9A-7/74PCT534
BD~14	3		B:4A2/C-C10!! B:10D4/5A-5/74AS648! I:13E3/9A-4/74PCT534
BD~15	3		B:4A2/C-A10!! B:10D4/5A-4/74AS648! I:13E3/9A-3/74PCT534
BD~16	4		B:4A2/C-B3!! B:10D2/4A-11/74AS648! I:13C5/10A-18/74PCT534 I:13C3/12A-18/74PCT534
BD~17	4		B:4A2/C-B4!! B:10D2/4A-10/74AS648! I:13C5/10A-17/74PCT534 I:13C3/12A-17/74PCT534
BD~18	4		B:4A2/C-B5!! B:10D2/4A-9/74AS648! I:13C5/10A-14/74PCT534 I:13C3/12A-14/74PCT534
BD~19	5		B:4A2/C-B6!! B:10D2/4A-8/74AS648! I:13C5/10A-13/74PCT534 I:13C3/12A-13/74PCT534 B:45C6/6G-12/PAL1
BD~2	3		B:4A5/C-C4!! B:10D6/6A-9/74AS648! I:13E5/8A-14/74PCT534
BD~20	5		B:4A1/C-B7!! B:10D2/4A-7/74AS648! I:13C5/10A-8/74PCT534 I:13C3/12A-8/74PCT534 I:45C6/6G-6/PAL16R4D
BD~21	5		B:4A1/C-B8!! B:10D2/4A-6/74AS648! I:13C5/10A-7/74PCT534 I:13C3/12A-7/74PCT534 I:45C6/6G-7/PAL16R4D
BD~22	4		B:4A1/C-B9!! B:10D2/4A-5/74AS648! I:13C5/10A-4/74PCT534 I:45C6/6G-8/PAL16R4D
BD~23	4		B:4A1/C-B10!! B:10D2/4A-4/74AS648! I:13C5/10A-3/74PCT534 I:45C6/6G-9/PAL16R4D
BD~3	3		B:4A5/C-A4!! B:10D6/6A-8/74AS648! I:13E5/8A-13/74PCT534
BD~4	3		B:4A4/C-C5!! B:10D6/6A-7/74AS648! I:13E5/8A-8/74PCT534
BD~5	3		B:4A4/C-A5!! B:10D6/6A-6/74AS648! I:13E5/8A-7/74PCT534
BD~6	3		B:4A4/C-C6!! B:10D6/6A-5/74AS648! I:13E5/8A-4/74PCT534
BD~7	3		B:4A4/C-A6!! B:10D6/6A-4/74AS648! I:13E5/8A-3/74PCT534
BD~8	3		B:4A4/C-C7!! B:10D4/5A-11/74AS648! I:13E3/9A-18/74PCT534
BD~9	3		B:4A3/C-A7!! B:10D4/5A-10/74AS648! I:13E3/9A-17/74PCT534
BERROR~	3		I:4F4/C-B21/ I:7D2/3A-17/74F241 T:7D2/3A-5/74F241!
BGNT25~	3		I:48C4/13F-9/AM29C821! O:48C4/13F-17/AM29C821! I:50E6/6F-7/PAL16R8D
BGNT50~	4		I:12D6/1C-3/PAL16L8D I:48E4/3F-7/PAL16L8D I:48C4/13F-10/AM29C821 O:48C4/13F-16/AM29C821!
BGNT75~	£48 2		I:48E4/3F-8/PAL16L8D O:48C4/13F-15/AM29C821!
BGNTCACT~	4		I:10D6/6A-22/74AS648 I:10D4/5A-22/74AS648 I:10D2/4A-22/74AS648 O:12D2/11D-19/PAL16L8D!
BGNT~	13		I:3A4/16A-6/74LS244 I:10D6/6A-23/74AS648 I:10D4/5A-23/74AS648 I:10D2/4A-23/74AS648 I:12D2/11D-11/PAL16L8 I:12D6/1C-2/PAL16L8D I:45C6/6G-11/PAL16R4D I:45E7/2D-1/74F74 I:48E4/3F-2/PAL16L8D I:48C4/13F-8/AM29C821 T:50B6/5F-17/PAL16R8D I:50E6/6F-4/PAL16R8D I:50E3/12G-9/74LS123
BINACK~	2		I:4F4/C-B19/ T:7D2/3A-14/74F241!
BINPUT25~	£8 2		O:8C3/3D-20/AM29C821! I:8E3/4D-5/AM29C821
BINPUT50~	3		I:8E3/4D-11/AM29C821 O:8E3/4D-20/AM29C821! I:12E4/2C-4/PAL16L8D
BINPUT75~	2		I:7D2/3A-6/74F241 O:8E3/4D-14/AM29C821!
BINPUT~	3		I:4C6/5C-6/74F244 B:4A6/C-A18!! O:7D6/7A-6/7407!

BINT~10	4	B:4D1/RN3-9/4610X_101_102! I:4C6/5C-2/74F244 O:4C3/C-A15!! O:41F5/14A-8/74LS38!
BINT~11	3	B:4D1/RN3-8/4610X_101_102! I:4E3/33C-17/74F244 O:4C3/C-C15!!
BINT~12	4	B:4D1/RN3-7/4610X_101_102! I:4E3/33C-15/74F244 O:4C3/C-A16!! O:41F4/14A-3/74LS38!
BINT~13	4	B:4D1/RN3-6/4610X_101_102! I:4E3/33C-13/74F244 O:4C3/C-C16!! O:41F5/14A-6/74LS38!
BINT~15	3	B:4D1/RN3-5/4610X_101_102! I:4E3/33C-11/74F244 O:4C3/C-C17!!
BIOXE~	3	I:4F5/C-C19/ T:7D2/3A-16/74F241! B:48E4/3F-14/PAL16L8D!
BIOXL~	2	I:46C5/2F-7/PAL16L8B B:48E4/3F-17/PAL16L8D!
BLOCK25~	2	I:6D6/8D-3/PAL16L8B O:8C3/3D-14/AM29C821!
BLOCKL25~	2	I:47D7/4F-2/PAL16L8B O:48C7/14F-23/AM29C821!
BLOCKL~	2	B:47D7/4F-16/PAL16L8B! I:48C7/14F-2/AM29C821
BLOCK~	2	B:6D6/8D-18/PAL16L8B! I:8C3/3D-11/AM29C821
BLRQ50~	2	O:48C4/13F-22/AM29C821! I:50B6/5F-6/PAL16R8D
BLRQ~	2	O:45E7/2D-6/74F74! I:48C4/13F-2/AM29C821
BMCL~	2	O:4F6/35A-2/7406! I:4F6/C-B20/
BMEM~	3	I:4F5/C-C20/ O:7D4/2A-6/7438! I:45C6/6G-5/PAL16R4D
BMINH~	2	O:4F7/7A-4/7407! I:4F7/C-B23/
BPERR25~	£8 2	O:8C3/3D-19/AM29C821! I:8E3/4D-6/AM29C821
BPERR50~	2	I:6D6/8D-4/PAL16L8B O:8E3/4D-19/AM29C821!
BPERR~	2	I:4C6/5C-8/74F244 O:4A6/C-B18!!
BREF~	2	I:4F4/C-A12/ O:7D6/7A-8/7407!
BREQ25~	£8 2	O:8C3/3D-16/AM29C821! I:8E3/4D-9/AM29C821
BREQ50~	2	I:6D2/10D-5/PAL16R8D O:8E3/4D-16/AM29C821!
BREQ~	2	I:4E3/33C-4/74F244 O:4C2/C-C12!!
BRK~	7	I:18B2/15F-9/PAL16L8D I:25E6/17F-9/74F10 O:34E3/29H-8/74F32! I:36E5/13D-7/PAL16L8D I:36D4/12D-9/PAL16R6D I:39C7/34D-F2/ND_DELGCA O:39A4/RN17-2/4610X_101_103! T:50B6/5F-13/PAL16R8D!
BSEM~	£50 1	
CA0	9	I:3F4/15C-17/74LS244 I:14D6/6C-18/74PCT374 I:24A2/21G-1/PAL16L8D I:25D6/24F-8/TMM2018D_25 I:25B6/20F-8/TMM I:25B3/16F-8/TMM2018D_25 I:25G3/21F-21/AM9150_20 I:25D3/23F-8/TM O:32D3/25F-23/AM29C821!
CA1	8	I:3F4/15C-15/74LS244 I:14D6/6C-17/74PCT374 I:25D6/24F-7/TMM2018D_25 I:25B6/20F-7/TMM2018D_25 I:25B3/16F-7/ I:25G3/21F-22/AM9150_20 I:25D3/23F-7/TMM2018D_25 O:32D3/25F-22/A
CA10	5	I:25D6/24F-19/TMM2018D_25 I:25B6/20F-19/TMM2018D_25 I:25B3/16F-19/TMM2018D_25 I:25D3/23F-19/TMM2018D_25 O:39C7/34D-
CA2	8	I:3F4/15C-13/74LS244 I:14D6/6C-14/74PCT374 I:25D6/24F-6/TMM2018D_25 I:25B6/20F-6/TMM2018D_25 I:25B3/16F-6/ I:25G3/21F-23/AM9150_20 I:25D3/23F-6/TMM2018D_25 O:32D3/25F-21/A
CA3	8	I:3F4/15C-11/74LS244 I:14D6/6C-13/74PCT374 I:25D6/24F-5/TMM2018D_25 I:25B6/20F-5/TMM2018D_25 I:25B3/16F-5/ I:25G3/21F-1/AM9150_20 I:25D3/23F-5/TMM2018D_25 O:32D3/25F-20/AM
CA4	8	I:3F4/15C-8/74LS244 I:14D6/6C-8/74PCT374 I:25D6/24F-4/TMM2018D_25 I:25B6/20F-4/TMM2018D_25 I:25B3/16F-4/ I:25G3/21F-2/AM9150_20 I:25D3/23F-4/TMM2018D_25 O:32D3/25F-19/AM
CA5	8	I:3F4/15C-6/74LS244 I:14D6/6C-7/74PCT374 I:25D6/24F-3/TMM2018D_25 I:25B6/20F-3/TMM2018D_25 I:25B3/16F-3/ I:25G3/21F-3/AM9150_20 I:25D3/23F-3/TMM2018D_25 O:32D3/25F-18/AM
CA6	8	I:3F4/15C-4/74LS244 I:14D6/6C-4/74PCT374 I:25D6/24F-2/TMM2018D_25 I:25B6/20F-2/TMM2018D_25 I:25B3/16F-2/ I:25G3/21F-4/AM9150_20 I:25D3/23F-2/TMM2018D_25 O:32D3/25F-17/AM
CA7	8	I:3F4/15C-2/74LS244 I:14D6/6C-3/74PCT374 I:25D6/24F-1/TMM2018D_25 I:25B6/20F-1/TMM2018D_25 I:25B3/16F-1/

CAS	8	I:25G3/21F-5/AM9150_20 I:25D3/23F-1/TMM2018D_25 O:32D3/25F-16/AM I:3F3/16G-17/74LS244 I:14D5/4B-18/74PCT374 I:25D6/24F-23/TMM2018D_25 I:25B6/20F-23/TMM2018D_25 I:25B3/16F-23/TMM2018D_25 I:25G3/21F-6/AM9150_20 I:25D3/23F-23/T O:32D3/25F-15/AM29C821!
CAS	8	I:3F3/16G-15/74LS244 I:14D5/4B-17/74PCT374 I:25D6/24F-22/TMM2018D_25 I:25B6/20F-22/TMM2018D_25 I:25B3/16F-22/TMM2018D_25 I:25G3/21F-7/AM9150_20 I:25D3/23F-22/T O:32D3/25F-14/AM29C821!
CACT25~	2	I:6D4/5D-4/PAL16R4D O:8C3/3D-17/AM29C821!
CACT~	6	T:6D2/10D-12/PAL16R8D! I:6D4/5D-3/PAL16R4D I:7D7/9D-9/74F02 I:8C3/3D-8/AM29C821 I:12D2/11D-8/PAL16L8D I:12E4/2C-1/PAL16L8D
CAS	4	I:49B7/9H-5/74F00 I:49D7/9H-13/74F00 I:49F7/8G-13/74F00 T:50E6/6F-14/PAL16R8D!
CAS~0	£49 5	I:49C3/15H-28/SIP1M9 I:49C3/15H-2/SIP1M9 I:49C5/15J-28/SIP1M9 I:49C5/15J-2/SIP1M9 O:49B7/9H-6/74F00!
CAS~1	£49 5	I:49E3/15K-28/SIP1M9 I:49E3/15K-2/SIP1M9 I:49E5/15L-28/SIP1M9 I:49E5/15L-2/SIP1M9 O:49D7/9H-11/74F00!
CAS~2	£49 5	I:49G5/15N-28/SIP1M9 I:49G5/15N-2/SIP1M9 I:49G3/15M-28/SIP1M9 I:49G3/15M-2/SIP1M9 O:49F7/8G-11/74F00!
CBIT	£45 2	T:45E2/7G-17/PAL16R8B! I:45F2/8H-2/74LS248
CBWRITE~	3	I:7E7/2A-9/7438 I:7D6/7A-5/7407 B:12E4/2C-18/PAL16L8D!
CCLR~	2	I:25G3/21F-20/AM9150_20 O:39C7/34D-J1/ND_DELDGA!
CC~0	£36 2	I:36E5/13D-2/PAL16L8D T:36D4/12D-16/PAL16R6D!
CC~1	3	I:18B2/15F-2/PAL16L8D I:36E5/13D-3/PAL16L8D T:36D4/12D-15/PAL16R6D!
CC~2	6	I:6D4/5D-2/PAL16R4D I:12D2/11D-3/PAL16L8D I:18B2/15F-3/PAL16L8D I:24A2/21G-8/PAL16L8D I:36E5/13D-4/PAL16L T:36D4/12D-14/PAL16R6D!
CC~3	3	I:18B2/15F-4/PAL16L8D I:36E5/13D-5/PAL16L8D T:36D4/12D-13/PAL16R6D!
CD0	6	I:3D6/20A-17/74LS244 B:11D5/6B-13/74AS646! O:11G2/RN20-9/4610X_101_102! B:25D6/24F-17/TMM2018D_25! I:33B7/28F-D17/ND_DELILAH O:35D5/15B-3/74PCT244!
CD1	6	I:3D6/20A-15/74LS244 B:11D5/6B-14/74AS646! O:11G2/RN20-8/4610X_101_102! B:25D6/24F-16/TMM2018D_25! I:33B7/28F-C16/ND_DELILAH O:35D5/15B-5/74PCT244!
CD10	6	I:3D4/18A-13/74LS244 O:11E2/RN19-7/4610X_101_102! B:11D4/7B-15/74AS646! B:25D3/23F-15/TMM2018D_25! I:33B7/28F-C16 O:35D3/14B-7/74PCT244!
CD11	6	I:3D4/18A-11/74LS244 O:11E2/RN19-6/4610X_101_102! B:11D4/7B-16/74AS646! B:25D3/23F-14/TMM2018D_25! I:33B7/28F-E14 O:35D3/14B-9/74PCT244!
CD12	6	I:3D4/18A-8/74LS244 O:11E2/RN19-5/4610X_101_102! B:11D4/7B-17/74AS646! B:25D3/23F-13/TMM2018D_25! I:33B7/28F-A17 O:35D3/14B-12/74PCT244!
CD13	6	I:3D4/18A-6/74LS244 O:11E2/RN19-4/4610X_101_102! B:11D4/7B-18/74AS646! B:25D3/23F-11/TMM2018D_25! I:33B7/28F-D15 O:35D3/14B-14/74PCT244!
CD14	6	I:3D4/18A-4/74LS244 O:11E2/RN19-3/4610X_101_102! B:11D4/7B-19/74AS646! B:25D3/23F-10/TMM2018D_25! I:33B7/28F-D14 O:35D3/14B-16/74PCT244!
CD15	6	I:3D4/18A-2/74LS244 O:11E2/RN19-2/4610X_101_102! B:11D4/7B-20/74AS646! B:25D3/23F-9/TMM2018D_25! I:33B7/28F-A16/ O:35D3/14B-18/74PCT244!
CD2	6	I:3D6/20A-13/74LS244 B:11D5/6B-15/74AS646! O:11G2/RN20-7/4610X_101_102! B:25D6/24F-15/TMM2018D_25! I:33B7/28F-C17/ND_DELILAH O:35D5/15B-7/74PCT244!
CD3	6	I:3D6/20A-11/74LS244 B:11D5/6B-16/74AS646!

			O:11G2/RN20-6/4610X_101_102! B:25D6/24F-14/TMM2018D_25! I:33B7/28F-F15/ND_DELILAH O:35D5/15B-9/74PCT244! I:3D6/20A-8/74LS244 B:11D5/6B-17/74AS646!
CD4	6		O:11G2/RN20-5/4610X_101_102! B:25D6/24F-13/TMM2018D_25! I:33B7/28F-D16/ND_DELILAH O:35D5/15B-12/74PCT244! I:3D6/20A-6/74LS244 B:11D5/6B-18/74AS646!
CD5	6		O:11G2/RN20-4/4610X_101_102! B:25D6/24F-11/TMM2018D_25! I:33B7/28F-G14/ND_DELILAH O:35D5/15B-14/74PCT244! I:3D6/20A-4/74LS244 B:11D5/6B-19/74AS646!
CD6	6		O:11F2/RN20-3/4610X_101_102! B:25D6/24F-10/TMM2018D_25! I:33B7/28F-F14/ND_DELILAH O:35D5/15B-16/74PCT244! I:3D6/20A-2/74LS244 B:11D5/6B-20/74AS646!
CD7	6		O:11F2/RN20-2/4610X_101_102! B:25D6/24F-9/TMM2018D_25! I:33B7/28F-E16/ND_DELILAH O:35D5/15B-18/74PCT244! I:3D4/18A-17/74LS244 O:11F2/RN19-9/4610X_101_102!
CD8	6		B:11D4/7B-13/74AS646! B:25D3/23F-17/TMM2018D_25! I:33B7/28F-B17 O:35D3/14B-3/74PCT244!
CD9	6		I:3D4/18A-15/74LS244 O:11E2/RN19-8/4610X_101_102! B:11D4/7B-14/74AS646! B:25D3/23F-16/TMM2018D_25! I:33B7/28F-E15 O:35D3/14B-5/74PCT244!
CEUART~	2		O:39C7/34D-N10/ND_DELDGA! I:42B3/32H-11/SC2661
CGABRK~	2		O:33B7/28F-R10/ND_DELILAH! I:34E3/29H-9/74F32
CGNT25~	3		I:48C4/13F-7/AM29C821 O:48C4/13F-19/AM29C821! I:50E6/6F-8/PAL16R8D
CGNT50~	4		I:6D4/5D-7/PAL16R4D I:12D2/11D-7/PAL16L8D I:48E4/3F-5/PAL16L8D O:48C4/13F-18/AM29C821!
CGNTCACT~	2		O:12D2/11D-12/PAL16L8D! I:36D4/12D-7/PAL16R6D
CGNT~	11		I:3A4/16A-8/74LS244 I:6D4/5D-6/PAL16R4D I:12D2/11D-6/PAL16L8D I:12E4/2C-2/PAL16L8D I:12D6/1C-1/PAL16L8D I:45C4/9G-11/PAL16R4D I:48E4/3F-3/PAL16L8D I:48C4/13F-6/AM29C821 T:50B6/5F-18/PAL16R8D! I:50E6/6F-3/PAL16R8D I:50D3/12G-1/74LS123
CLEAR25~	£8 2		O:8C3/3D-23/AM29C821! I:8E3/4D-2/AM29C821
CLEAR~	5		I:4F7/7A-3/7407 I:8C3/3D-2/AM29C821 O:39C7/34D-F11/ND_DELDGA! I:40D7/35C-2/MC68705U3 I:41E4/28A-1/7
CLK	11		I:3A4/16A-4/74LS244 I:3A7/21A-11/74LS374 I:17E7/31G-13/AM29841 I:34D3/19F-1/PAL16R4D I:34D4/22F-1/PAL16R I:36B5/14D-1/PAL16R4D I:36B3/15D-1/PAL16R4D O:36F2/14C-3/74F00! O:39A1/RN15-2/4610X_101_103! I:39C7/34D-D1/ND_DELDGA I:42C6/33G- I:38D1/13C-2/74LS393 I:38E2/13C-12/74LS393 O:38B3/12F-8/74S132! I:39C7/34D-A9/ND_DELDGA
CLRERR~	£46 3		B:46C5/2F-17/PAL16L8B! I:46D2/1H-11/AM29C833 I:46D4/2H-11/AM29C833
CLRQ~	2		B:45C4/9G-18/PAL16R4D! I:50B6/5F-5/PAL16R8D
CMWRITE~	£12 1		B:12E4/2C-17/PAL16L8D!
CON	5		I:25E6/17F-10/74F10 B:25F7/SW1-3/SECME090320102! B:25F7/LED1-2/RED! I:26D4/27H-11/74PCT244 I:26D4/27H-13/74PCT24
CONSOLE~	5		B:2E2/RN1-9/4610X_101_102! O:2D5/A-C21!! O:2D5/A-C30!! O:41G3/2A-11/7438! I:42C6/33G-6/AM29C821
CONTINUE~	3		B:4D1/RN3-4/4610X_101_102! I:4E3/33C-6/74F244 O:4C2/C-B15!!
CON~	4		B:25F7/SW1-1/SECME090320102! B:25F6/RN14-3/4610X_101_102! I:26D4/27H-15/74PCT244 I:27D6/19G-
CORR~	8		I:47C2/7C-14/74PCT374 B:47B1/RN4-2/4610X_101_222! O:49C3/15H-24/SIP1M9! O:49C5/15J-24/SIP1M9! O:49E3/15K-24/SIP1M O:49E5/15L-24/SIP1M9! O:49G5/15N-24/SIP1M9! O:49G3/15M-24/SIP1M9
CPN10	3		B:25B6/20F-17/TMM2018D_25! I:27D6/19G-18/74F521 O:31D5/10G-3/74PCT244!
CPN11	3		B:25B6/20F-16/TMM2018D_25! I:27D6/19G-16/74F521 O:31D5/10G-5/74PCT244!
CPN12	3		B:25B6/20F-15/TMM2018D_25! I:27D6/19G-14/74F521

		O:31D5/10G-7/74PCT244!
CPN13	3	B:25B6/20F-14/TMM2018D_25! I:27D6/19G-12/74F521 O:31D5/10G-9/74PCT244!
CPN14	3	B:25B6/20F-13/TMM2018D_25! I:27D6/19G-9/74F521 O:31D5/10G-12/74PCT244!
CPN15	3	B:25B6/20F-11/TMM2018D_25! I:27D6/19G-7/74F521 O:31D5/10G-14/74PCT244!
CPN16	3	B:25B6/20F-10/TMM2018D_25! I:27D6/19G-5/74F521 O:31D5/10G-16/74PCT244!
CPN17	3	B:25B6/20F-9/TMM2018D_25! I:27D6/19G-3/74F521 O:31D5/10G-18/74PCT244!
CPN18	3	B:25B3/16F-17/TMM2018D_25! I:27D3/18G-18/74F521 O:31D3/11G-3/74PCT244!
CPN19	3	B:25B3/16F-16/TMM2018D_25! I:27D3/18G-16/74F521 O:31D3/11G-5/74PCT244!
CPN20	3	B:25B3/16F-15/TMM2018D_25! I:27D3/18G-14/74F521 O:31D3/11G-7/74PCT244!
CPN21	3	B:25B3/16F-14/TMM2018D_25! I:27D3/18G-12/74F521 O:31D3/11G-9/74PCT244!
CPN22	3	B:25B3/16F-13/TMM2018D_25! I:27D3/18G-9/74F521 O:31D3/11G-12/74PCT244!
CPN23	3	B:25B3/16F-11/TMM2018D_25! I:27D3/18G-7/74F521 O:31D3/11G-14/74PCT244!
CRQ~	2	I:6D2/10D-2/PAL16R8D B:45C4/9G-13/PAL16R4D!
CSA0	3	I:17E4/31F-11/AM29841 I:17E5/32G-11/AM29841 O:33B7/28F-L3/ND_DELILAH!
CSA1	3	I:17E4/31F-10/AM29841 I:17E5/32G-10/AM29841 O:33B7/28F-P1/ND_DELILAH!
CSA10	3	I:17D2/29H-4/74F32 I:17E2/30H-7/74F373 O:33B7/28F-Q2/ND_DELILAH!
CSA11	3	I:17D1/29H-1/74F32 I:17E2/30H-4/74F373 O:33B7/28F-N4/ND_DELILAH!
CSA12	2	I:17E2/30H-3/74F373 O:33B7/28F-S1/ND_DELILAH!
CSA2	3	I:17E4/31F-9/AM29841 I:17E5/32G-9/AM29841 O:33B7/28F-L2/ND_DELILAH!
CSA3	3	I:17E4/31F-8/AM29841 I:17E5/32G-8/AM29841 O:33B7/28F-Q1/ND_DELILAH!
CSA4	3	I:17E4/31F-7/AM29841 I:17E5/32G-7/AM29841 O:33B7/28F-M4/ND_DELILAH!
CSA5	3	I:17E4/31F-6/AM29841 I:17E5/32G-6/AM29841 O:33B7/28F-L4/ND_DELILAH!
CSA6	3	I:17E4/31F-5/AM29841 I:17E5/32G-5/AM29841 O:33B7/28F-P2/ND_DELILAH!
CSA7	3	I:17E4/31F-4/AM29841 I:17E5/32G-4/AM29841 O:33B7/28F-N2/ND_DELILAH!
CSA8	3	I:17E4/31F-3/AM29841 I:17E5/32G-3/AM29841 O:33B7/28F-R1/ND_DELILAH!
CSA9	3	I:17E4/31F-2/AM29841 I:17E5/32G-2/AM29841 O:33B7/28F-N3/ND_DELILAH!
CSALUI0	4	B:20C3/19B-2/74LS245! B:21B6/18D-15/TMM2068D_25! B:22B6/18C-15/TMM2068D_25! I:33B7/28F-C1/ND_DELILAH
CSALUI1	4	B:20B3/16B-9/74LS245! B:21B4/17D-12/TMM2068D_25! B:22B4/17C-12/TMM2068D_25! I:33B7/28F-D4/ND_DELILAH
CSALUI2	4	B:20B3/16B-8/74LS245! B:21B4/17D-13/TMM2068D_25! B:22B4/17C-13/TMM2068D_25! I:33B7/28F-D2/ND_DELILAH
CSALUI3	4	B:20B3/16B-7/74LS245! B:21B4/17D-14/TMM2068D_25! B:22B4/17C-14/TMM2068D_25! I:33B7/28F-D3/ND_DELILAH
CSALUI4	4	B:20B3/16B-6/74LS245! B:21B4/17D-15/TMM2068D_25! B:22B4/17C-15/TMM2068D_25! I:33B7/28F-F4/ND_DELILAH
CSALUI5	4	B:20B3/16B-5/74LS245! B:21B2/16D-12/TMM2068D_25!

		B:22B2/16C-12/TMM2068D_25! I:33B7/28F-G4/ND_DELILAH
CSALUI6	4	B:20B3/16B-4/74LS245! B:21B2/16D-13/TMM2068D_25! B:22B2/16C-13/TMM2068D_25! I:33B7/28F-D1/ND_DELILAH
CSALUI7	5	B:20B3/16B-3/74LS245! B:21B2/16D-14/TMM2068D_25! B:22B2/16C-14/TMM2068D_25! I:33B7/28F-E4/ND_DELILAH I:36B3/15D-
CSALUI8	5	B:20B3/16B-2/74LS245! B:21B2/16D-15/TMM2068D_25! B:22B2/16C-15/TMM2068D_25! I:33B7/28F-A1/ND_DELILAH I:36B3/15D-
CSALUM0	5	B:20B4/20B-5/74LS245! B:21C2/20D-12/TMM2068D_25! B:22C2/20C-12/TMM2068D_25! I:33B7/28F-C2/ND_DELILAH I:36B3/15D-
CSALUM1	5	B:20B4/20B-4/74LS245! B:21C2/20D-13/TMM2068D_25! B:22C2/20C-13/TMM2068D_25! I:33B7/28F-C3/ND_DELILAH I:36B3/15D-
CSBIT0	4	B:20C7/29B-9/74LS245! B:21F7/31D-12/TMM2068D_25! B:22F7/31C-12/TMM2068D_25! I:33B7/28F-B6/ND_DELILAH
CSBIT1	4	B:20C7/29B-8/74LS245! B:21F7/31D-13/TMM2068D_25! B:22F7/31C-13/TMM2068D_25! I:33B7/28F-D8/ND_DELILAH
CSBIT10	4	B:20B7/28B-7/74LS245! B:21F4/29D-14/TMM2068D_25! B:22F4/29C-14/TMM2068D_25! I:33B7/28F-A3/ND_DELILAH
CSBIT11	4	B:20B7/28B-6/74LS245! B:21F4/29D-15/TMM2068D_25! B:22F4/29C-15/TMM2068D_25! I:33B7/28F-C6/ND_DELILAH
CSBIT12	4	B:20B7/28B-5/74LS245! B:21F2/28D-12/TMM2068D_25! B:22F2/28C-12/TMM2068D_25! I:33B7/28F-B3/ND_DELILAH
CSBIT13	4	B:20B7/28B-4/74LS245! B:21F2/28D-13/TMM2068D_25! B:22F2/28C-13/TMM2068D_25! I:33B7/28F-C5/ND_DELILAH
CSBIT14	4	B:20B7/28B-3/74LS245! B:21F2/28D-14/TMM2068D_25! B:22F2/28C-14/TMM2068D_25! I:33B7/28F-A2/ND_DELILAH
CSBIT15	4	B:20B7/28B-2/74LS245! B:21F2/28D-15/TMM2068D_25! B:22F2/28C-15/TMM2068D_25! I:33B7/28F-B4/ND_DELILAH
CSBIT2	4	B:20C7/29B-7/74LS245! B:21F7/31D-14/TMM2068D_25! B:22F7/31C-14/TMM2068D_25! I:33B7/28F-A5/ND_DELILAH
CSBIT20	4	B:20C6/27B-5/74LS245! B:21D6/26D-12/TMM2068D_25! B:22D6/26C-12/TMM2068D_25! I:33B7/28F-P4/ND_DELILAH
CSBIT3	4	B:20C7/29B-6/74LS245! B:21F7/31D-15/TMM2068D_25! B:22F7/31C-15/TMM2068D_25! I:33B7/28F-B7/ND_DELILAH
CSBIT4	4	B:20C7/29B-5/74LS245! B:21F6/30D-12/TMM2068D_25! B:22F6/30C-12/TMM2068D_25! I:33B7/28F-B5/ND_DELILAH
CSBIT5	4	B:20C7/29B-4/74LS245! B:21F6/30D-13/TMM2068D_25! B:22F6/30C-13/TMM2068D_25! I:33B7/28F-C7/ND_DELILAH
CSBIT6	4	B:20C7/29B-3/74LS245! B:21F6/30D-14/TMM2068D_25! B:22F6/30C-14/TMM2068D_25! I:33B7/28F-A4/ND_DELILAH
CSBIT7	4	B:20C7/29B-2/74LS245! B:21F6/30D-15/TMM2068D_25! B:22F6/30C-15/TMM2068D_25! I:33B7/28F-D7/ND_DELILAH
CSBIT8	4	B:20B7/28B-9/74LS245! B:21F4/29D-12/TMM2068D_25! B:22F4/29C-12/TMM2068D_25! I:33B7/28F-D6/ND_DELILAH
CSBIT9	4	B:20B7/28B-8/74LS245! B:21F4/29D-13/TMM2068D_25! B:22F4/29C-13/TMM2068D_25! I:33B7/28F-E7/ND_DELILAH
CSCA0	3	I:17E7/31G-11/AM29841 I:32D3/25F-2/AM29C821 O:33B7/28F-P14/ND_DELILAH!
CSCA1	3	I:17E7/31G-10/AM29841 I:32D3/25F-3/AM29C821 O:33B7/28F-P16/ND_DELILAH!
CSCA2	3	I:17E7/31G-9/AM29841 I:32D3/25F-4/AM29C821 O:33B7/28F-P15/ND_DELILAH!
CSCA3	3	I:17E7/31G-8/AM29841 I:32D3/25F-5/AM29C821 O:33B7/28F-P17/ND_DELILAH!
CSCA4	3	I:17E7/31G-7/AM29841 I:32D3/25F-6/AM29C821 O:33B7/28F-L14/ND_DELILAH!
CSCA5	3	I:17E7/31G-6/AM29841 I:32D3/25F-7/AM29C821 O:33B7/28F-M14/ND_DELILAH!
CSCA6	3	I:17E7/31G-5/AM29841 I:32D3/25F-8/AM29C821 O:33B7/28F-N17/ND_DELILAH!
CSCA7	3	I:17E7/31G-4/AM29841 I:32D3/25F-9/AM29C821

			O:33B7/28F-N15/ND_DELILAH!
CSCA8	3		I:17E7/31G-3/AM29841 I:32D3/25F-10/AM29C821
			O:33B7/28F-M16/ND_DELILAH!
CSCA9	3		I:17E7/31G-2/AM29841 I:32D3/25F-11/AM29C821
			O:33B7/28F-N16/ND_DELILAH!
CSCISELO	4		B:20B4/20B-3/74LS245! B:21C2/20D-14/TMM2068D_25!
			B:22C2/20C-14/TMM2068D_25! I:33B7/28F-B11/ND_DELILAH
CSCISEL1	4		B:20B4/20B-2/74LS245! B:21C2/20D-15/TMM2068D_25!
			B:22C2/20C-15/TMM2068D_25! I:33B7/28F-A10/ND_DELILAH
CSCOMM0	8		I:3A7/21A-13/74LS374 B:20C4/21B-9/74LS245!
			B:21C7/23D-12/TMM2068D_25! B:22C7/23C-12/TMM2068D_25!
			I:33B7/28F-G17/ND_DELILAH I:34D4/22F-6/PAL16R4D I:39C7/34D-L5/ND
			O:39A3/RN16-2/4610X_101_103!
CSCOMM1	8		I:3A7/21A-8/74LS374 B:20C4/21B-8/74LS245!
			B:21C7/23D-13/TMM2068D_25! B:22C7/23C-13/TMM2068D_25!
			I:33B7/28F-H15/ND_DELILAH I:34D4/22F-5/PAL16R4D O:39B1/RN15-10/4
			I:39C7/34D-M4/ND_DELDGA
CSCOMM2	8		I:3A7/21A-7/74LS374 B:20C4/21B-7/74LS245!
			B:21C7/23D-14/TMM2068D_25! B:22C7/23C-14/TMM2068D_25!
			I:33B7/28F-F17/ND_DELILAH I:34D4/22F-4/PAL16R4D O:39A1/RN15-9/46
			I:39C7/34D-N3/ND_DELDGA
CSCOMM3	8		I:3A7/21A-4/74LS374 B:20C4/21B-6/74LS245!
			B:21C7/23D-15/TMM2068D_25! B:22C7/23C-15/TMM2068D_25!
			I:33B7/28F-H14/ND_DELILAH I:34D4/22F-3/PAL16R4D O:39A1/RN15-8/46
			I:39C7/34D-M3/ND_DELDGA
CSCOMM4	8		I:3A7/21A-3/74LS374 B:20C4/21B-5/74LS245!
			B:21C6/22D-12/TMM2068D_25! B:22C6/22C-12/TMM2068D_25!
			I:33B7/28F-E17/ND_DELILAH I:34D4/22F-2/PAL16R4D O:39A1/RN15-7/46
			I:39C7/34D-L4/ND_DELDGA
CSDELAY0	5		B:20B6/24B-7/74LS245! B:21D4/25D-14/TMM2068D_25!
			B:22D4/25C-14/TMM2068D_25! I:36B5/14D-2/PAL16R4D I:36D4/12D-4/P
CSDELAY1	4		B:20B6/24B-6/74LS245! B:21D4/25D-15/TMM2068D_25!
			B:22D4/25C-15/TMM2068D_25! I:36B3/15D-2/PAL16R4D
CSDLY	4		B:20C6/27B-4/74LS245! B:21D6/26D-13/TMM2068D_25!
			B:22D6/26C-13/TMM2068D_25! I:36B5/14D-3/PAL16R4D
CSECOND	5		B:20C6/27B-2/74LS245! B:21D6/26D-15/TMM2068D_25!
			B:22D6/26C-15/TMM2068D_25! I:33B7/28F-G3/ND_DELILAH I:36B5/14D-
CSEM~	£50	1	T:50B6/5F-14/PAL16R8D!
CSIDBS0	7		B:20C4/21B-4/74LS245! B:21C6/22D-13/TMM2068D_25!
			B:22C6/22C-13/TMM2068D_25! I:33B7/28F-E1/ND_DELILAH I:34D3/19F-
			I:39C7/34D-C2/ND_DELDGA O:39A3/RN16-9/4610X_101_103!
CSIDBS1	7		B:20C4/21B-3/74LS245! B:21C6/22D-14/TMM2068D_25!
			B:22C6/22C-14/TMM2068D_25! I:33B7/28F-E3/ND_DELILAH I:34D3/19F-
			I:39C7/34D-D3/ND_DELDGA O:39A3/RN16-8/4610X_101_103!
CSIDBS2	7		B:20C4/21B-2/74LS245! B:21C6/22D-15/TMM2068D_25!
			B:22C6/22C-15/TMM2068D_25! I:33B7/28F-F2/ND_DELILAH I:34D3/19F-
			I:39C7/34D-C4/ND_DELDGA O:39A3/RN16-7/4610X_101_103!
CSIDBS3	7		B:20B4/20B-9/74LS245! B:21C4/21D-12/TMM2068D_25!
			B:22C4/21C-12/TMM2068D_25! I:33B7/28F-E2/ND_DELILAH I:34D3/19F-
			I:39C7/34D-A2/ND_DELDGA O:39A3/RN16-6/4610X_101_103!
CSIDBS4	7		B:20B4/20B-8/74LS245! B:21C4/21D-13/TMM2068D_25!
			B:22C4/21C-13/TMM2068D_25! I:33B7/28F-F1/ND_DELILAH I:34D3/19F-
			I:39C7/34D-A3/ND_DELDGA O:39A3/RN16-5/4610X_101_103!
CSLOOP	5		B:20C6/27B-3/74LS245! B:21D6/26D-14/TMM2068D_25!
			B:22D6/26C-14/TMM2068D_25! I:33B7/28F-G1/ND_DELILAH I:36B5/14D-
CSMIS0	8		I:3A7/21A-17/74LS374 B:20B4/20B-7/74LS245!
			B:21C4/21D-14/TMM2068D_25! B:22C4/21C-14/TMM2068D_25!
			I:33B7/28F-H13/ND_DELILAH I:34D4/22F-8/PAL16R4D I:39C7/34D-N2/ND
			O:39A3/RN16-4/4610X_101_103!
CSMIS1	8		I:3A7/21A-14/74LS374 B:20B4/20B-6/74LS245!

B:21C4/21D-15/TMM2068D_25! B:22C4/21C-15/TMM2068D_25!
 I:33B7/28F-F16/ND_DELILAH I:34D4/22F-7/PAL16R4D I:39C7/34D-K3/ND
 O:39A3/RN16-3/4610X_101_103!
 CSRASEL0 4 B:20C3/19B-6/74LS245! B:21B7/19D-15/TMM2068D_25!
 B:22B7/19C-15/TMM2068D_25! I:33B7/28F-H2/ND_DELILAH
 CSRASEL1 4 B:20C3/19B-5/74LS245! B:21B6/18D-12/TMM2068D_25!
 B:22B6/18C-12/TMM2068D_25! I:33B7/28F-G2/ND_DELILAH
 CSRB0 4 B:20C6/27B-9/74LS245! B:21D7/27D-12/TMM2068D_25!
 B:22D7/27C-12/TMM2068D_25! I:33B7/28F-H1/ND_DELILAH
 CSRB1 4 B:20C6/27B-8/74LS245! B:21D7/27D-13/TMM2068D_25!
 B:22D7/27C-13/TMM2068D_25! I:33B7/28F-H4/ND_DELILAH
 CSRB2 4 B:20C6/27B-7/74LS245! B:21D7/27D-14/TMM2068D_25!
 B:22D7/27C-14/TMM2068D_25! I:33B7/28F-J1/ND_DELILAH
 CSRB3 4 B:20C6/27B-6/74LS245! B:21D7/27D-15/TMM2068D_25!
 B:22D7/27C-15/TMM2068D_25! I:33B7/28F-H3/ND_DELILAH
 CSRBSEL0 4 B:20C3/19B-9/74LS245! B:21B7/19D-12/TMM2068D_25!
 B:22B7/19C-12/TMM2068D_25! I:33B7/28F-S2/ND_DELILAH
 CSRBSEL1 4 B:20C3/19B-8/74LS245! B:21B7/19D-13/TMM2068D_25!
 B:22B7/19C-13/TMM2068D_25! I:33B7/28F-Q3/ND_DELILAH
 CSSCOND 4 B:20B6/24B-9/74LS245! B:21D4/25D-12/TMM2068D_25!
 B:22D4/25C-12/TMM2068D_25! I:33B7/28F-S3/ND_DELILAH
 CSSST0 4 B:20C3/19B-4/74LS245! B:21B6/18D-13/TMM2068D_25!
 B:22B6/18C-13/TMM2068D_25! I:33B7/28F-D10/ND_DELILAH
 CSSST1 4 B:20C3/19B-3/74LS245! B:21B6/18D-14/TMM2068D_25!
 B:22B6/18C-14/TMM2068D_25! I:33B7/28F-A9/ND_DELILAH
 CSTS3 4 B:20B6/24B-5/74LS245! B:21D2/24D-12/TMM2068D_25!
 B:22D2/24C-12/TMM2068D_25! I:33B7/28F-R4/ND_DELILAH
 CSTS4 4 B:20B6/24B-4/74LS245! B:21D2/24D-13/TMM2068D_25!
 B:22D2/24C-13/TMM2068D_25! I:33B7/28F-S4/ND_DELILAH
 CSTS5 4 B:20B6/24B-3/74LS245! B:21D2/24D-14/TMM2068D_25!
 B:22D2/24C-14/TMM2068D_25! I:33B7/28F-P5/ND_DELILAH
 CSTS6 4 B:20B6/24B-2/74LS245! B:21D2/24D-15/TMM2068D_25!
 B:22D2/24C-15/TMM2068D_25! I:33B7/28F-P6/ND_DELILAH
 CSVECT 4 B:20B6/24B-8/74LS245! B:21D4/25D-13/TMM2068D_25!
 B:22D4/25C-13/TMM2068D_25! I:33B7/28F-N7/ND_DELILAH
 CSXRF 4 B:20C3/19B-7/74LS245! B:21B7/19D-14/TMM2068D_25!
 B:22B7/19C-14/TMM2068D_25! I:33B7/28F-R5/ND_DELILAH
 CX~ 2 T:36D4/12D-18/PAL16R6D! I:41C5/25A-2/74PCT244
 CYD~ 2 I:25F5/18F-6/PAL16R4D B:36F5/13D-17/PAL16L8D!
 DAP~ 4 B:6D4/5D-18/PAL16R4D! I:7D4/1F-11/74F04
 I:39C7/34D-M5/ND_DELDGA O:39A4/RN17-5/4610X_101_103!
 DA~ 4 I:41F4/11B-5/74LS04 O:42B3/32H-14/SC2661!
 O:42C5/RN7-3/4610X_101_103! I:42C6/33G-3/AM29C821
 DBAPR 7 I:6D6/8D-5/PAL16L8B I:10D6/6A-1/74AS648
 I:10D4/5A-1/74AS648 I:10D2/4A-1/74AS648 O:12D6/1C-19/PAL16L8D!
 I:45C6/6G-1/PAL16R4D I:45C6/6G-2/PAL16R4D
 DBIT £45 2 T:45E2/7G-16/PAL16R8B! I:45F2/8H-6/74LS248
 DD0 5 B:46D2/1H-23/AM29C833! O:46E1/RN21-2/4610X_101_103!
 B:49C3/15H-3/SIP1M9! B:49E3/15K-3/SIP1M9! B:49G3/15M-3/SIP1M9!
 DD1 5 B:46D2/1H-22/AM29C833! O:46E1/RN21-3/4610X_101_103!
 B:49C3/15H-6/SIP1M9! B:49E3/15K-6/SIP1M9! B:49G3/15M-6/SIP1M9!
 DD10 5 B:46D4/2H-22/AM29C833! O:46E2/RN22-3/4610X_101_103!
 B:49C5/15J-6/SIP1M9! B:49E5/15L-6/SIP1M9! B:49G5/15N-6/SIP1M9!
 DD11 5 B:46D4/2H-21/AM29C833! O:46E2/RN22-4/4610X_101_103!
 B:49C5/15J-10/SIP1M9! B:49E5/15L-10/SIP1M9! B:49G5/15N-10/SIP1M9!
 DD12 5 B:46D4/2H-20/AM29C833! O:46F2/RN22-5/4610X_101_103!
 B:49C5/15J-13/SIP1M9! B:49E5/15L-13/SIP1M9! B:49G5/15N-13/SIP1M9!
 DD13 5 B:46D4/2H-19/AM29C833! O:46F2/RN22-6/4610X_101_103!
 B:49C5/15J-16/SIP1M9! B:49E5/15L-16/SIP1M9! B:49G5/15N-16/SIP1M9!
 DD14 5 B:46D4/2H-18/AM29C833! O:46F2/RN22-7/4610X_101_103!

			B:49C5/15J-20/SIP1M9! B:49E5/15L-20/SIP1M9! B:49G5/15N-20/SIP1M
DD15	5		B:46D4/2H-17/AM29C833! O:46F2/RN22-8/4610X_101_103!
			B:49C5/15J-23/SIP1M9! B:49E5/15L-23/SIP1M9! B:49G5/15N-23/SIP1M
DD16	5		B:46D4/2H-16/AM29C833! O:46F2/RN22-9/4610X_101_103!
			B:49C5/15J-25/SIP1M9! B:49E5/15L-25/SIP1M9! B:49G5/15N-25/SIP1M
DD17	8		B:46D4/2H-15/AM29C833! O:46F2/RN22-10/4610X_101_103!
			I:49C5/15J-29/SIP1M9 O:49C5/15J-26/SIP1M9! I:49E5/15L-29/SIP1M9
			O:49E5/15L-26/SIP1M9! I:49G5/15N-29/SIP1M9 O:49G5/15N-26/SIP1M9!
DD2	5		B:46D2/1H-21/AM29C833! O:46E1/RN21-4/4610X_101_103!
			B:49C3/15H-10/SIP1M9! B:49E3/15K-10/SIP1M9! B:49G3/15M-10/SIP1M
DD3	5		B:46D2/1H-20/AM29C833! O:46F1/RN21-5/4610X_101_103!
			B:49C3/15H-13/SIP1M9! B:49E3/15K-13/SIP1M9! B:49G3/15M-13/SIP1M
DD4	5		B:46D2/1H-19/AM29C833! O:46F1/RN21-6/4610X_101_103!
			B:49C3/15H-16/SIP1M9! B:49E3/15K-16/SIP1M9! B:49G3/15M-16/SIP1M
DD5	5		B:46D2/1H-18/AM29C833! O:46F1/RN21-7/4610X_101_103!
			B:49C3/15H-20/SIP1M9! B:49E3/15K-20/SIP1M9! B:49G3/15M-20/SIP1M
DD6	5		B:46D2/1H-17/AM29C833! O:46F1/RN21-8/4610X_101_103!
			B:49C3/15H-23/SIP1M9! B:49E3/15K-23/SIP1M9! B:49G3/15M-23/SIP1M
DD7	5		B:46D2/1H-16/AM29C833! O:46F1/RN21-9/4610X_101_103!
			B:49C3/15H-25/SIP1M9! B:49E3/15K-25/SIP1M9! B:49G3/15M-25/SIP1M
DD8	8		B:46D2/1H-15/AM29C833! O:46F1/RN21-10/4610X_101_103!
			I:49C3/15H-29/SIP1M9 O:49C3/15H-26/SIP1M9! I:49E3/15K-29/SIP1M9
			O:49E3/15K-26/SIP1M9! I:49G3/15M-29/SIP1M9 O:49G3/15M-26/SIP1M9!
DD9	5		B:46D4/2H-23/AM29C833! O:46E2/RN22-2/4610X_101_103!
			B:49C5/15J-3/SIP1M9! B:49E5/15L-3/SIP1M9! B:49G5/15N-3/SIP1M9!
DDBAPR	£45	2	B:45C6/6G-18/PAL16R4D! I:45E7/2D-3/74F74
DISB~	£46	1	B:46C5/2F-16/PAL16L8B!
DISP1	£40	2	B:40D7/35C-12/MC68705U3! I:40E3/35A-13/7406
DISP2	£40	2	B:40D7/35C-13/MC68705U3! I:40E2/35A-11/7406
DISP3	£40	2	B:40D7/35C-14/MC68705U3! I:40E2/35A-9/7406
DISP4	£40	2	B:40D7/35C-15/MC68705U3! I:40E2/35A-5/7406
DISP5	£40	2	B:40D7/35C-16/MC68705U3! I:40E1/35A-3/7406
DIS~	£46	3	O:46C5/2F-19/PAL16L8B! I:46D5/14G-13/74F08
			B:46D5/LED5-2/RED!
DLY0~	£36	2	B:36B5/14D-19/PAL16R4D! I:36D4/12D-3/PAL16R6D
DLY1~	£36	2	B:36B3/15D-12/PAL16R4D! I:36D4/12D-2/PAL16R6D
DMA12~	£36	1	T:36B5/14D-15/PAL16R4D!
DMAP~	£36	1	T:36B5/14D-14/PAL16R4D!
DOREF~	£6	1	T:6D2/10D-17/PAL16R8D!
DOUBLE		2	I:24A2/21G-6/PAL16L8D O:33B7/28F-A7/ND_DELILAH!
DP~1		3	B:2F2/RN2-2/4610X_101_102! I:2H3/A-C25/
			O:40E3/35A-12/7406!
DP~2		3	B:2F2/RN2-3/4610X_101_102! I:2H4/A-C26/
			O:40E2/35A-10/7406!
DP~3		3	B:2F2/RN2-4/4610X_101_102! I:2H4/A-C27/
			O:40E2/35A-8/7406!
DP~4		3	B:2G2/RN2-5/4610X_101_102! I:2H4/A-C28/
			O:40E2/35A-6/7406!
DP~5		3	B:2G2/RN2-6/4610X_101_102! I:2H4/A-C29/
			O:40E1/35A-4/7406!
DSR~		4	B:2D3/A-C11!! B:2G3/A-A12!! B:2G2/RN2-7/4610X_101_102!
			B:2G3/A-C9!!
DSTB~		5	I:11D5/6B-1/74AS646 I:11D5/6B-2/74AS646
			I:11D4/7B-1/74AS646 I:11D4/7B-2/74AS646 B:12D2/11D-17/PAL16L8D!
DT~		2	I:25F5/18F-2/PAL16R4D O:39C7/34D-K1/ND_DELDGA!
DVACC~		2	I:24A2/21G-3/PAL16L8D O:39C7/34D-G1/ND_DELDGA!
EADR~		5	B:6D4/5D-12/PAL16R4D! I:12E4/2C-3/PAL16L8D
			I:14D6/6C-1/74PCT374 I:14D5/4B-1/74PCT374 I:14D3/3B-1/74PCT374
EAUTO~		3	B:2E2/RN1-7/4610X_101_102! O:2D4/A-C19!!
			I:42C6/33G-4/AM29C821

EBADR	4	I:10D6/6A-2/74AS648 I:10D4/5A-2/74AS648 I:10D2/4A-2/74AS648 B:12D6/1C-17/PAL16L8D!
EBD~	4	I:10D6/6A-21/74AS648 I:10D4/5A-21/74AS648 I:10D2/4A-21/74AS648 B:12D6/1C-13/PAL16L8D!
EBUS	3	I:3F5/7F-1/74F14 O:3E5/B-B3! O:3F5/RN13-2/4610X_101_102!
EBUS~	2	O:3F5/7F-2/74F14! I:12D6/1C-6/PAL16L8D
ECCR	3	O:33B7/28F-Q14/ND_DELILAH! I:46C5/2F-8/PAL16L8B I:48E4/3F-6/PAL16L8D
ECD~	3	O:24A2/21G-19/PAL16L8D! I:25D6/24F-18/TMM2018D_25 I:25D3/23F-18/TMM2018D_25
ECREQ	8	I:11D5/6B-23/74AS646 I:11D4/7B-23/74AS646 I:14D6/6C-11/74PCT374 I:14D5/4B-11/74PCT374 I:14D3/3B-11/74PCT3 O:39C7/34D-F1/ND_DELDGA! B:45C4/9G-12/PAL16R4D! I:45C4/9G-1/PAL1 I:18D2/30B-1/74F139 O:18C1/29A-3/74F08!
ECS~	2	I:18D2/30B-1/74F139 O:18C1/29A-3/74F08!
ECSL~	5	B:18B2/15F-18/PAL16L8D! I:20E6/8C-11/74PCT373 I:20E6/8C-1/74PCT373 I:20E5/9C-11/74PCT373 I:20E5/9C-1/74PCT373
ECSR~	2	I:26D4/27H-19/74PCT244 O:39C7/34D-B6/ND_DELDGA!
EDO~	4	I:32F2/32F-1/74PCT245 I:32F3/33F-1/74PCT245 I:33B7/28F-B10/ND_DELILAH O:39C7/34D-A8/ND_DELDGA!
EHISEG~	2	T:45E2/7G-12/PAL16R8B! I:45G3/8K-1/HP5082_7433
EIOD~	2	B:6D4/5D-13/PAL16R4D! I:7D2/3A-1/74F241
EIOR~	2	O:39C7/34D-A6/ND_DELDGA! I:42C6/33G-1/AM29C821
EIPL~	2	B:24A2/21G-16/PAL16L8D! I:28E5/9B-19/74PCT245
EIPUR~	3	B:24A2/21G-18/PAL16L8D! I:28B7/8B-1/74LS244 I:28B7/8B-19/74LS244
EIPU~	2	B:24A2/21G-17/PAL16L8D! I:28E3/10B-19/74PCT245
ELOWSEG~	2	T:45E2/7G-14/PAL16R8B! I:45G3/8K-7/HP5082_7433
ELOW~	17	B:18B2/15F-15/PAL16L8D! I:22B7/19C-9/TMM2068D_25 I:22B6/18C-9/TMM2068D_25 I:22B4/17C-9/TMM2068D_25 I:22B2/16C-9/ I:22C6/22C-9/TMM2068D_25 I:22C7/23C-9/TMM2068D_25 I:22C4/21C-9/T I:22C2/20C-9/TMM2068D_25 I:22D6/26C-9/TMM2068D_25 I:22D7/27C-9/T I:22D4/25C-9/TMM2068D_25 I:22D2/24C-9/TMM2068D_25 I:22F6/30C-9/T I:22F7/31C-9/TMM2068D_25 I:22F4/29C-9/TMM2068D_25 I:22F2/28C-9/T
EMCL~	3	I:24A2/21G-7/PAL16L8D O:41E4/28A-6/74LS273! B:41E2/LED2-2/RED!
EMD~	3	I:11D5/6B-21/74AS646 I:11D4/7B-21/74AS646 B:12D2/11D-18/PAL16L8D!
EMIDSEG~	2	T:45E2/7G-13/PAL16R8B! I:45G3/8K-4/HP5082_7433
EMPID~	2	I:33B7/28F-R11/ND_DELILAH O:39C7/34D-J3/ND_DELDGA!
EMP~	2	O:39C7/34D-J11/ND_DELDGA! I:40D7/35C-17/MC68705U3
EORF~	4	I:24A3/32C-10/74F32 B:36E5/13D-16/PAL16L8D! O:39A4/RN17-4/4610X_101_103! I:39C7/34D-N4/ND_DELDGA
EPANS~	4	O:39C7/34D-C5/ND_DELDGA! I:40G4/32B-1/74LS374 I:40G6/33B-1/74LS244 I:40G6/33B-19/74LS244
EPEAL~	3	B:47D7/4F-17/PAL16L8B! I:47E2/4C-1/74PCT374 I:47E4/6D-1/74PCT374
EPEA~	4	I:6D6/8D-11/PAL16L8B O:6C7/12C-6/74F32! I:13E5/8A-1/74PCT534 I:13E3/9A-1/74PCT534
EPESL~	3	B:47D7/4F-18/PAL16L8B! I:47C4/3C-1/74PCT374 I:47C2/7C-1/74PCT374
EPES~	4	I:6D6/8D-9/PAL16L8B O:6C7/12C-3/74F32! I:13C5/10A-1/74PCT534 I:13C3/12A-1/74PCT534
EPMAP~	3	B:24A2/21G-14/PAL16L8D! I:29B3/22G-18/TMM2018D_25 I:29B6/23G-18/TMM2018D_25
EPTI~	3	B:24A2/21G-15/PAL16L8D! I:30D3/17B-19/74PCT245 I:30D5/18B-19/74PCT245
EPT~	3	B:24A2/21G-13/PAL16L8D! I:29D3/24G-18/TMM2018D_25 I:29D6/25G-18/TMM2018D_25
ERF~	3	I:32F5/34F-18/TMM2018D_25 I:32F7/35F-18/TMM2018D_25

ESTOF~ 5 B:34D3/19F-19/PAL16R4D!
 I:28E3/10B-1/74PCT245 I:28E5/9B-1/74PCT245
 I:32F2/32F-19/74PCT245 I:32F3/33F-19/74PCT245 O:39C7/34D-N9/ND_

ETRAP~ 2 I:33B7/28F-Q6/ND_DELILAH B:36E5/13D-14/PAL16L8D!
 EUPP~ 17 B:18B2/15F-16/PAL16L8D! I:21B7/19D-9/TMM2068D_25
 I:21B6/18D-9/TMM2068D_25 I:21B4/17D-9/TMM2068D_25 I:21B2/16D-9/
 I:21C6/22D-9/TMM2068D_25 I:21C7/23D-9/TMM2068D_25 I:21C4/21D-9/T
 I:21C2/20D-9/TMM2068D_25 I:21D6/26D-9/TMM2068D_25 I:21D7/27D-9/T
 I:21D4/25D-9/TMM2068D_25 I:21D2/24D-9/TMM2068D_25 I:21F6/30D-9/T
 I:21F7/31D-9/TMM2068D_25 I:21F4/29D-9/TMM2068D_25 I:21F2/28D-9/T

EWCA~ 3 B:18B2/15F-17/PAL16L8D! I:18C1/29A-2/74F08
 I:33B7/28F-Q4/ND_DELILAH

EW~0 3 O:18D2/30B-4/74F139! I:20B7/28B-19/74LS245
 I:20C7/29B-19/74LS245

EW~1 3 O:18D2/30B-5/74F139! I:20B6/24B-19/74LS245
 I:20C6/27B-19/74LS245

EW~2 3 O:18D2/30B-6/74F139! I:20B4/20B-19/74LS245
 I:20C4/21B-19/74LS245

EW~3 3 O:18D2/30B-7/74F139! I:20B3/16B-19/74LS245
 I:20C3/19B-19/74LS245

FAPR £12 1 B:12D6/1C-16/PAL16L8D!

FATAL £47 2 I:47C2/7C-7/74PCT374 B:47B1/RN4-5/4610X_101_222!
 FETCH 4 I:13C3/12A-3/74PCT534 I:18B2/15F-8/PAL16L8D
 O:39C7/34D-M6/ND_DELDGA! I:47C2/7C-3/74PCT374

FIDB0 2 B:32F2/32F-18/74PCT245! B:33B7/28F-C15/ND_DELILAH!
 FIDB1 2 B:32F2/32F-17/74PCT245! B:33B7/28F-A15/ND_DELILAH!
 FIDB10 2 B:32F3/33F-16/74PCT245! B:33B7/28F-B12/ND_DELILAH!
 FIDB11 2 B:32F3/33F-15/74PCT245! B:33B7/28F-C12/ND_DELILAH!
 FIDB12 2 B:32F3/33F-14/74PCT245! B:33B7/28F-A12/ND_DELILAH!
 FIDB13 2 B:32F3/33F-13/74PCT245! B:33B7/28F-D11/ND_DELILAH!
 FIDB14 2 B:32F3/33F-12/74PCT245! B:33B7/28F-A11/ND_DELILAH!
 FIDB15 2 B:32F3/33F-11/74PCT245! B:33B7/28F-C11/ND_DELILAH!
 FIDB2 2 B:32F2/32F-16/74PCT245! B:33B7/28F-B14/ND_DELILAH!
 FIDB3 2 B:32F2/32F-15/74PCT245! B:33B7/28F-A14/ND_DELILAH!
 FIDB4 2 B:32F2/32F-14/74PCT245! B:33B7/28F-D13/ND_DELILAH!
 FIDB5 2 B:32F2/32F-13/74PCT245! B:33B7/28F-D12/ND_DELILAH!
 FIDB6 2 B:32F2/32F-12/74PCT245! B:33B7/28F-E11/ND_DELILAH!
 FIDB7 2 B:32F2/32F-11/74PCT245! B:33B7/28F-B13/ND_DELILAH!
 FIDB8 2 B:32F3/33F-18/74PCT245! B:33B7/28F-A13/ND_DELILAH!
 FIDB9 2 B:32F3/33F-17/74PCT245! B:33B7/28F-C13/ND_DELILAH!
 FMISS 2 I:27D3/18G-1/74F521 O:39C7/34D-L8/ND_DELDGA!
 FORM~ 3 I:18B2/15F-1/PAL16L8D I:36E5/13D-6/PAL16L8D
 O:39C7/34D-M8/ND_DELDGA!

FUL~ 2 O:39C7/34D-K12/ND_DELDGA! I:40G6/33B-15/74LS244

GND 190 \$\$OVERFLOW\$\$ B:2B3/A-A17!! B:2B3/A-A18!! B:2B3/A-A19!!
 B:2B4/A-A20!! B:2B4/A-A21!! B:2B4/A-A22!! B:2B4/A-A23!! B:2B4/
 B:2B5/A-A25!! B:2B5/A-A26!! B:2B5/A-A27!! B:2B5/A-A28!! B:2B5/
 B:2B5/A-A32!! B:2B6/A-B32!! B:2B6/A-C32!! B:3H2/B-C1!! B:3H3/B
 B:3H3/B-B32!! B:3H3/B-C32!! I:3F2/17G-1/74LS244 I:3F2/17G-1/7
 I:3F3/16G-1/74LS244 I:3F3/16G-19/74LS244 I:3F4/15C-1/74LS244
 I:3F4/15C-19/74LS244 I:3A2/23A-1/74LS244 I:3A2/23A-19/74LS244
 I:3A3/22A-1/74LS244 I:3A3/22A-19/74LS244 I:3A4/16A-1/74LS244
 I:3A4/16A-19/74LS244 I:3A7/21A-1/74LS374 B:3C2/STR1-1/STR1! B:3
 B:3H2/B-B1!! B:4D4/C1-2/10rF! B:4G3/C-A1!! B:4G4/C-B1!! I:4C6/
 I:4C6/5C-19/74F244 B:4G4/C-C1!! I:4E3/33C-1/74F244 I:4E3/33C-19
 B:4G4/C-B32!! B:4G4/C-C32!! B:4G4/C-A32!! I:6D2/10D-11/PAL16R8D
 I:6D4/5D-11/PAL16R4D I:7D2/3A-15/74F241 I:8C3/3D-1/AM29C821
 I:8E3/4D-1/AM29C821 I:17E4/31F-1/AM29841 I:17E2/30H-1/74F373
 I:25F5/18F-11/PAL16R4D I:25D6/24F-20/TMM2018D_25 I:25B6/20F-18/T
 I:25B6/20F-20/TMM2018D_25 B:25F7/SW1-2/SECME090320102! I:25G6/21

			I:25G6/21H-13/74S260	I:25B3/16F-18/TMM2018D_25	I:25B3/16F-20/TMM
			I:25G3/21F-17/AM9150_20	I:25G3/21F-19/AM9150_20	I:25D3/23F-20/TM
			I:27D3/18G-2/74F521	I:27D3/18G-3/74F521	
GNT	3		O:13B3/11B-12/74LS04!	I:13C3/12A-4/74PCT534	
			I:47C2/7C-4/74PCT374		
GNT25~	2		I:7E3/1F-9/74F04	O:48C7/14F-15/AM29C821!	
GNT~	4		T:6D2/10D-13/PAL16R8D!	I:12D6/1C-8/PAL16L8D	
			I:13B3/11B-13/74LS04	I:48C7/14F-10/AM29C821	
H1EN~	4		I:44B5/4H-1/AM29821	I:46C5/2F-11/PAL16L8B	
			I:48E4/3F-1/PAL16L8D	T:50E6/6F-12/PAL16R8D!	
HIT	3		O:25G6/21H-5/74S260!	I:36D4/12D-8/PAL16R6D	
			I:39A5/13G-1/74F04		
HIT~	E39 3		O:39A4/RN17-8/4610X_101_103!	O:39A5/13G-2/74F04!	
			I:39C7/34D-E1/ND_DELDGA		
HIT~0	3		I:25F5/18F-7/PAL16R4D	I:25G6/21H-3/74S260	
			O:27D6/19G-19/74F521!		
HIT~1	3		I:25F5/18F-8/PAL16R4D	I:25G6/21H-2/74S260	
			O:27D3/18G-19/74F521!		
I1P	4		O:2D5/A-A7!!	B:42E5/R9-2/2.2KOHM!	B:42E5/R10-2/2.2KOHM!
			B:42E5/R2-2/5.6KOHM!		
IBAPR~	2		O:4C6/5C-3/74F244!	I:12D6/1C-7/PAL16L8D	
IBDAP~	4		O:4C6/5C-7/74F244!	I:8C3/3D-10/AM29C821	
			I:48E4/3F-9/PAL16L8D	I:48C4/13F-4/AM29C821	
IBDRY~	3		O:4C6/5C-5/74F244!	I:7D4/2A-4/7438	I:8C3/3D-7/AM29C821
IBINPUT~	3		O:4C6/5C-14/74F244!	I:8C3/3D-5/AM29C821	
			I:45C6/6G-4/PAL16R4D		
IBINT~10	2		O:4C6/5C-18/74F244!	I:33A4/34G-18/74PCT374	
IBINT~11	2		O:4E3/33C-3/74F244!	I:33A4/34G-17/74PCT374	
IBINT~12	2		O:4E3/33C-5/74F244!	I:33A4/34G-14/74PCT374	
IBINT~13	2		O:4E3/33C-7/74F244!	I:33A4/34G-13/74PCT374	
IBINT~15	2		O:4E3/33C-9/74F244!	I:33A4/34G-8/74PCT374	
IBPERR~	2		O:4C6/5C-12/74F244!	I:8C3/3D-6/AM29C821	
IBREQ~	3		O:4E3/33C-16/74F244!	I:7C4/1F-13/74F04	
			I:8C3/3D-9/AM29C821		
ICONTIN~	2		O:4E3/33C-14/74F244!	I:39C7/34D-B10/ND_DELDGA	
IDB0	26		I:3D3/19A-17/74LS244	T:13C5/10A-19/74PCT534!	
			T:13E5/8A-19/74PCT534!	O:19C4/23B-11/27256!	I:20E6/8C-18/74PCT3
			T:20E6/8C-19/74PCT373!	B:20C7/29B-11/74LS245!	B:20C6/27B-11/74LS
			B:20C4/21B-11/74LS245!	B:20C3/19B-11/74LS245!	O:26D4/27H-9/74PCT
			B:28E5/9B-11/74PCT245!	B:30D5/18B-9/74PCT245!	B:32F5/34F-9/TMM20
			B:32F2/32F-2/74PCT245!	B:32H2/RN10-2/4610X_101_102!	I:35D5/15B-
			B:39C7/34D-G13/ND_DELDGA!	T:40G4/32B-2/74LS374!	I:41E4/28A-18/74
			O:41C7/24A-3/74PCT244!	O:41C5/25A-3/74PCT244!	B:42B3/32H-27/SC26
			O:42C6/33G-14/AM29C821!	T:47C4/3C-19/74PCT374!	T:47E4/6D-19/74PC
IDB1	26		I:3D3/19A-15/74LS244	T:13C5/10A-16/74PCT534!	
			T:13E5/8A-16/74PCT534!	O:19C4/23B-12/27256!	I:20E6/8C-17/74PCT3
			T:20E6/8C-16/74PCT373!	B:20C7/29B-12/74LS245!	B:20C6/27B-12/74LS
			B:20C4/21B-12/74LS245!	B:20C3/19B-12/74LS245!	O:26D4/27H-7/74PCT
			B:28E5/9B-12/74PCT245!	B:30D5/18B-8/74PCT245!	B:32F5/34F-10/TMM2
			B:32F2/32F-3/74PCT245!	B:32H2/RN10-3/4610X_101_102!	I:35D5/15B-
			B:39C7/34D-G11/ND_DELDGA!	T:40G4/32B-5/74LS374!	I:41E4/28A-17/74
			O:41C7/24A-5/74PCT244!	O:41C5/25A-5/74PCT244!	B:42B3/32H-28/SC26
			O:42C6/33G-15/AM29C821!	T:47C4/3C-16/74PCT374!	T:47E4/6D-16/74PC
IDB10	20		I:3D2/17A-13/74LS244	T:13E3/9A-15/74PCT534!	
			T:13C3/12A-15/74PCT534!	O:19C6/26B-13/27256!	I:20E5/9C-14/74PCT
			T:20E5/9C-15/74PCT373!	B:20B7/28B-13/74LS245!	B:20B6/24B-13/74LS
			B:20B4/20B-13/74LS245!	B:20B3/16B-13/74LS245!	B:28E3/10B-13/74PC
			B:30D3/17B-7/74PCT245!	B:32F7/35F-11/TMM2018D_25!	B:32F3/33F-4/7
			B:32H4/RN11-3/4610X_101_102!	I:35D3/14B-13/74PCT244	O:40G6/33B-
			O:41C2/27A-7/74PCT244!	T:47C2/7C-15/74PCT374!	T:47E2/4C-15/74PCT

IDB11 21 I:3D2/17A-11/74LS244 T:13E3/9A-12/74PCT534!
T:13C3/12A-12/74PCT534! O:19C6/26B-15/27256! I:20E5/9C-13/74PCT
T:20E5/9C-12/74PCT373! B:20B7/28B-14/74LS245! B:20B6/24B-14/74LS
B:20B4/20B-14/74LS245! B:20B3/16B-14/74LS245! B:28E3/10B-14/74PC
B:30D3/17B-6/74PCT245! B:32F7/35F-13/TMM2018D_25! B:32F3/33F-5/7
B:32H4/RN11-4/4610X_101_102! I:35D3/14B-11/74PCT244 O:40G6/33B-
O:41C2/27A-9/74PCT244! O:42C6/33G-19/AM29C821! T:47C2/7C-12/74PC
T:47E2/4C-12/74PCT374!

IDB12 21 I:3D2/17A-8/74LS244 T:13E3/9A-9/74PCT534!
T:13C3/12A-9/74PCT534! O:19C6/26B-16/27256! I:20E5/9C-8/74PCT37
T:20E5/9C-9/74PCT373! B:20B7/28B-15/74LS245! B:20B6/24B-15/74LS2
B:20B4/20B-15/74LS245! B:20B3/16B-15/74LS245! B:28E3/10B-15/74PC
B:30D3/17B-5/74PCT245! B:32F7/35F-14/TMM2018D_25! B:32F3/33F-6/7
B:32H4/RN11-5/4610X_101_102! I:35D3/14B-8/74PCT244 O:40G6/33B-9
O:41C2/27A-12/74PCT244! O:42C6/33G-20/AM29C821! T:47C2/7C-9/74PC
T:47E2/4C-9/74PCT374!

IDB13 21 I:3D2/17A-6/74LS244 T:13E3/9A-6/74PCT534!
T:13C3/12A-6/74PCT534! O:19C6/26B-17/27256! I:20E5/9C-7/74PCT37
T:20E5/9C-6/74PCT373! B:20B7/28B-16/74LS245! B:20B6/24B-16/74LS2
B:20B4/20B-16/74LS245! B:20B3/16B-16/74LS245! B:28E3/10B-16/74PC
B:30D3/17B-4/74PCT245! B:32F7/35F-15/TMM2018D_25! B:32F3/33F-7/7
B:32H4/RN11-6/4610X_101_102! I:35D3/14B-6/74PCT244 O:40G6/33B-7
O:41C2/27A-14/74PCT244! O:42C6/33G-21/AM29C821! T:47C2/7C-6/74PC
T:47E2/4C-6/74PCT374!

IDB14 21 I:3D2/17A-4/74LS244 T:13E3/9A-5/74PCT534!
T:13C3/12A-5/74PCT534! O:19C6/26B-18/27256! I:20E5/9C-4/74PCT37
T:20E5/9C-5/74PCT373! B:20B7/28B-17/74LS245! B:20B6/24B-17/74LS2
B:20B4/20B-17/74LS245! B:20B3/16B-17/74LS245! B:28E3/10B-17/74PC
B:30D3/17B-3/74PCT245! B:32F7/35F-16/TMM2018D_25! B:32F3/33F-8/7
B:32H4/RN11-7/4610X_101_102! I:35D3/14B-4/74PCT244 O:40G6/33B-5
O:41C2/27A-16/74PCT244! O:42C6/33G-22/AM29C821! T:47C2/7C-5/74PC
T:47E2/4C-5/74PCT374!

IDB15 21 I:3D2/17A-2/74LS244 T:13E3/9A-2/74PCT534!
T:13C3/12A-2/74PCT534! O:19C6/26B-19/27256! I:20E5/9C-3/74PCT37
T:20E5/9C-2/74PCT373! B:20B7/28B-18/74LS245! B:20B6/24B-18/74LS2
B:20B4/20B-18/74LS245! B:20B3/16B-18/74LS245! B:28E3/10B-18/74PC
B:30D3/17B-2/74PCT245! B:32F7/35F-17/TMM2018D_25! B:32F3/33F-9/7
B:32H4/RN11-8/4610X_101_102! I:35D3/14B-2/74PCT244 O:40G6/33B-3
O:41C2/27A-18/74PCT244! O:42C6/33G-23/AM29C821! T:47C2/7C-2/74PC
T:47E2/4C-2/74PCT374!

IDB2 27 I:3D3/19A-13/74LS244 T:13C5/10A-15/74PCT534!
T:13E5/8A-15/74PCT534! O:19C4/23B-13/27256! I:20E6/8C-14/74PCT3
T:20E6/8C-15/74PCT373! B:20C7/29B-13/74LS245! B:20C6/27B-13/74LS
B:20C4/21B-13/74LS245! B:20C3/19B-13/74LS245! O:26D4/27H-5/74PCT
B:28E5/9B-13/74PCT245! B:30D5/18B-7/74PCT245! B:32F5/34F-11/TMM2
B:32F2/32F-4/74PCT245! B:32H2/RN10-4/4610X_101_102! B:34D4/22F-
I:35D5/15B-13/74PCT244 B:39C7/34D-H13/ND_DELPGA! T:40G4/32B-6/74
I:41E4/28A-14/74LS273 O:41C7/24A-7/74PCT244! O:41C5/25A-7/74PCT2
B:42B3/32H-1/SC2661! O:42C6/33G-16/AM29C821! T:47C4/3C-15/74PCT3
T:47E4/6D-15/74PCT374!

IDB3 25 I:3D3/19A-11/74LS244 T:13C5/10A-12/74PCT534!
T:13E5/8A-12/74PCT534! O:19C4/23B-15/27256! I:20E6/8C-13/74PCT3
T:20E6/8C-12/74PCT373! B:20C7/29B-14/74LS245! B:20C6/27B-14/74LS
B:20C4/21B-14/74LS245! B:20C3/19B-14/74LS245! B:28E5/9B-14/74PCT
B:30D5/18B-6/74PCT245! B:32F5/34F-13/TMM2018D_25! B:32F2/32F-5/7
B:32H2/RN10-5/4610X_101_102! I:35D5/15B-11/74PCT244
B:39C7/34D-H12/ND_DELPGA! T:40G4/32B-9/74LS374! I:41E4/28A-13/74
O:41C7/24A-9/74PCT244! O:41C5/25A-9/74PCT244! B:42B3/32H-2/SC266
O:42C6/33G-17/AM29C821! T:47C4/3C-12/74PCT374! T:47E4/6D-12/74PC

IDB4 26 I:3D3/19A-8/74LS244 T:13C5/10A-9/74PCT534!

			T:13E5/8A-9/74PCT534! O:19C4/23B-16/27256! I:20E6/8C-8/74PCT373 T:20E6/8C-9/74PCT373! B:20C7/29B-15/74LS245! B:20C6/27B-15/74LS2 B:20C4/21B-15/74LS245! B:20C3/19B-15/74LS245! O:26D4/27H-3/74PCT B:28E5/9B-15/74PCT245! B:30D5/18B-5/74PCT245! B:32F5/34F-14/TMM2 B:32F2/32F-6/74PCT245! B:32H2/RN10-6/4610X_101_102! I:35D5/15B- I:39C7/34D-H11/ND_DELDGA T:40G4/32B-12/74LS374! I:41E4/28A-8/74L O:41C7/24A-12/74PCT244! O:41C5/25A-12/74PCT244! B:42B3/32H-5/SC2 O:42C6/33G-18/AM29C821! T:47C4/3C-9/74PCT374! T:47E4/6D-9/74PCT3 I:3D3/19A-6/74LS244 T:13C5/10A-6/74PCT534!
IDB5	24		T:13E5/8A-6/74PCT534! O:19C4/23B-17/27256! I:20E6/8C-7/74PCT373 T:20E6/8C-6/74PCT373! B:20C7/29B-16/74LS245! B:20C6/27B-16/74LS2 B:20C4/21B-16/74LS245! B:20C3/19B-16/74LS245! B:28E5/9B-16/74PCT B:30D5/18B-4/74PCT245! B:32F5/34F-15/TMM2018D_25! B:32F2/32F-7/7 B:32H2/RN10-7/4610X_101_102! I:35D5/15B-6/74PCT244 I:39C7/34D-J T:40G4/32B-15/74LS374! I:41E4/28A-7/74LS273 O:41C7/24A-14/74PCT2 O:41C5/25A-14/74PCT244! B:42B3/32H-6/SC2661! T:47C4/3C-6/74PCT37 T:47E4/6D-6/74PCT374!
IDB6	24		I:3D3/19A-4/74LS244 T:13C5/10A-5/74PCT534! T:13E5/8A-5/74PCT534! O:19C4/23B-18/27256! I:20E6/8C-4/74PCT373 T:20E6/8C-5/74PCT373! B:20C7/29B-17/74LS245! B:20C6/27B-17/74LS2 B:20C4/21B-17/74LS245! B:20C3/19B-17/74LS245! B:28E5/9B-17/74PCT B:30D5/18B-3/74PCT245! B:32F5/34F-16/TMM2018D_25! B:32F2/32F-8/7 B:32H2/RN10-8/4610X_101_102! I:35D5/15B-4/74PCT244 I:39C7/34D-J T:40G4/32B-16/74LS374! I:41E4/28A-4/74LS273 O:41C7/24A-16/74PCT2 O:41C5/25A-16/74PCT244! B:42B3/32H-7/SC2661! T:47C4/3C-5/74PCT37 T:47E4/6D-5/74PCT374!
IDB7	24		I:3D3/19A-2/74LS244 T:13C5/10A-2/74PCT534! T:13E5/8A-2/74PCT534! O:19C4/23B-19/27256! I:20E6/8C-3/74PCT373 T:20E6/8C-2/74PCT373! B:20C7/29B-18/74LS245! B:20C6/27B-18/74LS2 B:20C4/21B-18/74LS245! B:20C3/19B-18/74LS245! B:28E5/9B-18/74PCT B:30D5/18B-2/74PCT245! B:32F5/34F-17/TMM2018D_25! B:32F2/32F-9/7 B:32H2/RN10-9/4610X_101_102! I:35D5/15B-2/74PCT244 I:39C7/34D-K T:40G4/32B-19/74LS374! I:41E4/28A-3/74LS273 O:41C7/24A-18/74PCT2 O:41C5/25A-18/74PCT244! B:42B3/32H-8/SC2661! T:47C4/3C-2/74PCT37 T:47E4/6D-2/74PCT374!
IDB8	21		I:3D2/17A-17/74LS244 T:13E3/9A-19/74PCT534! T:13C3/12A-19/74PCT534! O:19C6/26B-11/27256! I:20E5/9C-18/74PCT T:20E5/9C-19/74PCT373! B:20B7/28B-11/74LS245! B:20B6/24B-11/74LS B:20B4/20B-11/74LS245! B:20B3/16B-11/74LS245! B:28E3/10B-11/74PC I:28B7/8B-17/74LS244 B:30D3/17B-9/74PCT245! B:32F7/35F-9/TMM2018 B:32F3/33F-2/74PCT245! B:32H2/RN10-10/4610X_101_102! I:35D3/14B O:40G6/33B-18/74LS244! O:41C2/27A-3/74PCT244! T:47C2/7C-19/74PCT T:47E2/4C-19/74PCT374!
IDB9	20		I:3D2/17A-15/74LS244 T:13E3/9A-16/74PCT534! T:13C3/12A-16/74PCT534! O:19C6/26B-12/27256! I:20E5/9C-17/74PCT T:20E5/9C-16/74PCT373! B:20B7/28B-12/74LS245! B:20B6/24B-12/74LS B:20B4/20B-12/74LS245! B:20B3/16B-12/74LS245! B:28E3/10B-12/74PC B:30D3/17B-8/74PCT245! B:32F7/35F-10/TMM2018D_25! B:32F3/33F-3/7 B:32H4/RN11-2/4610X_101_102! I:35D3/14B-15/74PCT244 O:40G6/33B- O:41C2/27A-5/74PCT244! T:47C2/7C-16/74PCT374! T:47E2/4C-16/74PCT T:25F5/18F-14/PAL16R4D!
IHIT~	£25	1	O:4E3/33C-18/74F244! I:39C7/34D-C10/ND_DELDGA
ILOAD~		2	O:3G6/B-B6!! I:41C7/24A-17/74PCT244
INR0		2	O:3G6/B-B13!! I:41C7/24A-15/74PCT244
INR1		2	O:3G6/B-B7!! I:41C7/24A-13/74PCT244
INR2		2	O:3G5/B-B8!! I:41C7/24A-11/74PCT244
INR3		2	O:3G5/B-B17!! I:41C7/24A-8/74PCT244
INR4		2	O:3G5/B-B5!! I:41C7/24A-6/74PCT244
INR5		2	O:3G5/B-B4!! I:41C7/24A-4/74PCT244
INR6		2	O:3G5/B-B15!! I:41C7/24A-2/74PCT244
INR7		2	

INTRQ~	E33	2	B:33E5/TP1-1/TESTPOINT! O:33B7/28F-S11/ND_DELILAH!
IOC0	E41	2	O:41E4/28A-19/74LS273! I:41F5/14A-5/74LS38
IOC1	E41	2	O:41E4/28A-16/74LS273! I:41F4/29A-5/74F08
IOC2	E41	2	O:41E4/28A-15/74LS273! I:41F5/14A-9/74LS38
IOC3	E41	2	O:41E4/28A-12/74LS273! I:41F5/14A-4/74LS38
IOD~		4	T:6D2/10D-14/PAL16R8D! I:7D2/3A-11/74F241 I:7C5/8G-2/74F00 I:12E4/2C-6/PAL16L8D
IONI		2	O:33B7/28F-A6/ND_DELILAH! I:40D7/35C-21/MC68705U3
IORQ~		7	I:6D2/10D-3/PAL16R8D I:6D4/5D-9/PAL16R4D B:12D2/11D-14/PAL16L8D! I:36B6/25H-5/74F00 I:36B6/25H-9/74F00 O:39C7/34D-L6/ND_DELDGA! I:45C4/9G-3/PAL16R4D
IOXERR~		3	T:7D2/3A-9/74F241! O:7E1/RN13-6/4610X_101_102! I:33B7/28F-R13/ND_DELILAH
ISEMRO~		2	O:4C6/5C-16/74F244! I:8C3/3D-4/AM29C821
ISTOP~		2	O:4E3/33C-12/74F244! I:39C7/34D-A12/ND_DELDGA
LA10		7	I:3F3/16G-13/74LS244 I:23D5/23H-17/74PCT244 I:29B3/22G-8/TMM2018D_25 I:29D3/24G-8/TMM2018D_25 I:29B6/23G-8/ I:29D6/25G-8/TMM2018D_25 O:33B7/28F-M17/ND_DELILAH!
LA11		7	I:3F3/16G-11/74LS244 I:23D5/23H-15/74PCT244 I:29B3/22G-7/TMM2018D_25 I:29D3/24G-7/TMM2018D_25 I:29B6/23G-7/ I:29D6/25G-7/TMM2018D_25 O:33B7/28F-M15/ND_DELILAH!
LA12		7	I:3F3/16G-8/74LS244 I:23D5/23H-13/74PCT244 I:29B3/22G-6/TMM2018D_25 I:29D3/24G-6/TMM2018D_25 I:29B6/23G-6/ I:29D6/25G-6/TMM2018D_25 O:33B7/28F-L17/ND_DELILAH!
LA13		7	I:3F3/16G-6/74LS244 I:23D5/23H-11/74PCT244 I:29B3/22G-5/TMM2018D_25 I:29D3/24G-5/TMM2018D_25 I:29B6/23G-5/ I:29D6/25G-5/TMM2018D_25 O:33B7/28F-L15/ND_DELILAH!
LA14		7	I:3F3/16G-4/74LS244 I:23D5/23H-8/74PCT244 I:29B3/22G-4/TMM2018D_25 I:29D3/24G-4/TMM2018D_25 I:29B6/23G-4/ I:29D6/25G-4/TMM2018D_25 O:33B7/28F-K16/ND_DELILAH!
LA15		7	I:3F3/16G-2/74LS244 I:23D5/23H-6/74PCT244 I:29B3/22G-3/TMM2018D_25 I:29D3/24G-3/TMM2018D_25 I:29B6/23G-3/ I:29D6/25G-3/TMM2018D_25 O:33B7/28F-K17/ND_DELILAH!
LA16		7	I:3F2/17G-17/74LS244 I:23D5/23H-4/74PCT244 I:29B3/22G-2/TMM2018D_25 I:29D3/24G-2/TMM2018D_25 I:29B6/23G-2/ I:29D6/25G-2/TMM2018D_25 O:33B7/28F-K14/ND_DELILAH!
LA17		7	I:3F2/17G-15/74LS244 I:23D5/23H-2/74PCT244 I:29B3/22G-1/TMM2018D_25 I:29D3/24G-1/TMM2018D_25 I:29B6/23G-1/ I:29D6/25G-1/TMM2018D_25 O:33B7/28F-J17/ND_DELILAH!
LA18		7	I:3F2/17G-13/74LS244 I:23D3/15G-17/74PCT244 I:29B3/22G-23/TMM2018D_25 I:29D3/24G-23/TMM2018D_25 I:29B6/23G-23/TMM2018D_25 I:29D6/25G-23/TMM2018D_25 O:33B7/28F-K15/ND_DELILAH!
LA19		7	I:3F2/17G-11/74LS244 I:23D3/15G-15/74PCT244 I:29B3/22G-22/TMM2018D_25 I:29D3/24G-22/TMM2018D_25 I:29B6/23G-22/TMM2018D_25 I:29D6/25G-22/TMM2018D_25 O:33B7/28F-J16/ND_DELILAH!
LA20		7	I:3F2/17G-8/74LS244 I:23D3/15G-13/74PCT244 I:29B3/22G-19/TMM2018D_25 I:29D3/24G-19/TMM2018D_25 I:29B6/23G-19/TMM2018D_25 I:29D6/25G-19/TMM2018D_25 O:33B7/28F-H17/ND_DELILAH!
LA21		3	I:3F2/17G-6/74LS244 I:23D3/15G-11/74PCT244 O:33B7/28F-J14/ND_DELILAH!
LA22		3	I:3F2/17G-4/74LS244 I:23D3/15G-8/74PCT244 O:33B7/28F-H16/ND_DELILAH!
LA23		3	I:3F2/17G-2/74LS244 I:23D3/15G-6/74PCT244 O:33B7/28F-J15/ND_DELILAH!
LAA0		3	I:32F5/34F-8/TMM2018D_25 I:32F7/35F-8/TMM2018D_25 O:33B7/28F-K1/ND_DELILAH!
LAA1		3	I:32F5/34F-7/TMM2018D_25 I:32F7/35F-7/TMM2018D_25

			O:33B7/28F-J4/ND_DELILAH!
LAA2	3	I:32F5/34F-6/TMM2018D_25	I:32F7/35F-6/TMM2018D_25
		O:33B7/28F-K2/ND_DELILAH!	
LAA3	3	I:32F5/34F-5/TMM2018D_25	I:32F7/35F-5/TMM2018D_25
		O:33B7/28F-J3/ND_DELILAH!	
LAPA~	5	I:23D3/15G-1/74PCT244	I:23D3/15G-19/74PCT244
		I:23D5/23H-1/74PCT244	I:23D5/23H-19/74PCT244
			O:24A2/21G-12/PAL1
LBA0	4	I:32F5/34F-4/TMM2018D_25	I:32F7/35F-4/TMM2018D_25
		O:33B7/28F-L1/ND_DELILAH!	I:36B3/15D-9/PAL16R4D
LBA1	4	I:32F5/34F-3/TMM2018D_25	I:32F7/35F-3/TMM2018D_25
		O:33B7/28F-M1/ND_DELILAH!	I:36B3/15D-8/PAL16R4D
LBA2	3	I:32F5/34F-2/TMM2018D_25	I:32F7/35F-2/TMM2018D_25
		O:33B7/28F-K4/ND_DELILAH!	
LBA3	4	I:32F5/34F-1/TMM2018D_25	I:32F7/35F-1/TMM2018D_25
		O:33B7/28F-N1/ND_DELILAH!	I:36B3/15D-7/PAL16R4D
LBD0	9	I:3E7/4G-17/74F244	B:10D6/6A-13/74AS648!
		B:11D5/6B-11/74AS646!	T:14D6/6C-19/74PCT374!
			I:44B2/3H-2/AM2982
		I:46C5/2F-3/PAL16L8B	B:46D2/1H-2/AM29C833!
			I:47E4/6D-18/74PCT374
		O:47A5/RN25-2/4610X_101_102!	
LBD1	9	I:3E7/4G-15/74F244	B:10D6/6A-14/74AS648!
		B:11D5/6B-10/74AS646!	T:14D6/6C-16/74PCT374!
			I:44B2/3H-3/AM2982
		I:46C5/2F-4/PAL16L8B	B:46D2/1H-3/AM29C833!
			I:47E4/6D-17/74PCT374
		O:47A5/RN25-3/4610X_101_102!	
LBD10	8	I:3D7/5G-13/74F244	B:10D4/5A-15/74AS648!
		B:11D4/7B-9/74AS646!	T:14D5/4B-15/74PCT374!
			I:44B5/4H-3/AM29821
		B:46D4/2H-4/AM29C833!	I:47E2/4C-14/74PCT374
			O:47A4/RN24-4/4610X_
LBD11	8	I:3D7/5G-11/74F244	B:10D4/5A-16/74AS648!
		B:11D4/7B-8/74AS646!	T:14D5/4B-12/74PCT374!
			I:44B5/4H-4/AM29821
		B:46D4/2H-5/AM29C833!	I:47E2/4C-13/74PCT374
			O:47B4/RN24-5/4610X_
LBD12	8	I:3D7/5G-8/74F244	B:10D4/5A-17/74AS648!
		B:11D4/7B-7/74AS646!	T:14D5/4B-9/74PCT374!
			I:44B5/4H-5/AM29821
		B:46D4/2H-6/AM29C833!	I:47E2/4C-8/74PCT374
			O:47B4/RN24-6/4610X_1
LBD13	8	I:3D7/5G-6/74F244	B:10D4/5A-18/74AS648!
		B:11D4/7B-6/74AS646!	T:14D5/4B-6/74PCT374!
			I:44B5/4H-6/AM29821
		B:46D4/2H-7/AM29C833!	I:47E2/4C-7/74PCT374
			O:47B4/RN24-7/4610X_1
LBD14	8	I:3D7/5G-4/74F244	B:10D4/5A-19/74AS648!
		B:11D4/7B-5/74AS646!	T:14D5/4B-5/74PCT374!
			I:44B5/4H-7/AM29821
		B:46D4/2H-8/AM29C833!	I:47E2/4C-4/74PCT374
			O:47B4/RN24-8/4610X_1
LBD15	8	I:3D7/5G-2/74F244	B:10D4/5A-20/74AS648!
		B:11D4/7B-4/74AS646!	T:14D5/4B-2/74PCT374!
			I:44B5/4H-8/AM29821
		B:46D4/2H-9/AM29C833!	I:47E2/4C-3/74PCT374
			O:47B4/RN24-9/4610X_1
LBD16	5	B:10D2/4A-13/74AS648!	T:14D3/3B-19/74PCT374!
		I:44B5/4H-9/AM29821	I:47C4/3C-18/74PCT374
			O:47A3/RN23-2/4610X_1
LBD17	5	B:10D2/4A-14/74AS648!	T:14D3/3B-16/74PCT374!
		I:44B5/4H-10/AM29821	I:47C4/3C-17/74PCT374
			O:47A3/RN23-3/4610X_
LBD18	5	B:10D2/4A-15/74AS648!	T:14D3/3B-15/74PCT374!
		I:44B2/3H-11/AM29821	I:47C4/3C-14/74PCT374
			O:47A3/RN23-4/4610X_
LBD19	5	B:10D2/4A-16/74AS648!	T:14D3/3B-12/74PCT374!
		I:44B5/4H-11/AM29821	I:47C4/3C-13/74PCT374
			O:47B3/RN23-5/4610X_
LBD2	8	I:3E7/4G-13/74F244	B:10D6/6A-15/74AS648!
		B:11D5/6B-9/74AS646!	T:14D6/6C-15/74PCT374!
			I:44B2/3H-4/AM29821
		B:46D2/1H-4/AM29C833!	I:47E4/6D-14/74PCT374
			O:47A5/RN25-4/4610X_
LBD20	4	B:10D2/4A-17/74AS648!	T:14D3/3B-9/74PCT374!
		I:47C4/3C-8/74PCT374	O:47B3/RN23-6/4610X_101_102!
LBD21	4	B:10D2/4A-18/74AS648!	T:14D3/3B-6/74PCT374!
		I:47C4/3C-7/74PCT374	O:47B3/RN23-7/4610X_101_102!
LBD22	4	B:10D2/4A-19/74AS648!	T:14D3/3B-5/74PCT374!
		I:47C4/3C-4/74PCT374	O:47B3/RN23-8/4610X_101_102!
LBD23	4	B:10D2/4A-20/74AS648!	T:14D3/3B-2/74PCT374!
		I:47C4/3C-3/74PCT374	O:47B3/RN23-9/4610X_101_102!

LBD3	9	I:3E7/4G-11/74F244 B:10D6/6A-16/74AS648! B:11D5/6B-8/74AS646! T:14D6/6C-12/74PCT374! I:44B2/3H-5/AM29821 I:46C5/2F-5/PAL16L8B B:46D2/1H-5/AM29C833! I:47E4/6D-13/74PCT374 O:47B5/RN25-5/4610X_101_102!
LBD4	9	I:3E7/4G-8/74F244 B:10D6/6A-17/74AS648! B:11D5/6B-7/74AS646! T:14D6/6C-9/74PCT374! I:44B2/3H-6/AM29821 I:46C5/2F-6/PAL16L8B B:46D2/1H-6/AM29C833! I:47E4/6D-8/74PCT374 O:47B5/RN25-6/4610X_101_102!
LBD5	8	I:3E7/4G-6/74F244 B:10D6/6A-18/74AS648! B:11D5/6B-6/74AS646! T:14D6/6C-6/74PCT374! I:44B2/3H-7/AM29821 B:46D2/1H-7/AM29C833! I:47E4/6D-7/74PCT374 O:47B5/RN25-7/4610X_1
LBD6	8	I:3E7/4G-4/74F244 B:10D6/6A-19/74AS648! B:11D5/6B-5/74AS646! T:14D6/6C-5/74PCT374! I:44B2/3H-8/AM29821 B:46D2/1H-8/AM29C833! I:47E4/6D-4/74PCT374 O:47B5/RN25-8/4610X_1
LBD7	8	I:3E7/4G-2/74F244 B:10D6/6A-20/74AS648! B:11D5/6B-4/74AS646! T:14D6/6C-2/74PCT374! I:44B2/3H-9/AM29821 B:46D2/1H-9/AM29C833! I:47E4/6D-3/74PCT374 O:47B5/RN25-9/4610X_1
LBD8	8	I:3D7/5G-17/74F244 B:10D4/5A-13/74AS648! B:11D4/7B-11/74AS646! T:14D5/4B-19/74PCT374! I:44B2/3H-10/AM298 B:46D4/2H-2/AM29C833! I:47E2/4C-18/74PCT374 O:47A4/RN24-2/4610X_
LBD9	8	I:3D7/5G-15/74F244 B:10D4/5A-14/74AS648! B:11D4/7B-10/74AS646! T:14D5/4B-16/74PCT374! I:44B5/4H-2/AM2982 B:46D4/2H-3/AM29C833! I:47E2/4C-17/74PCT374 O:47A4/RN24-3/4610X_
LCS~	16	I:3A4/16A-11/74LS244 I:18B2/15F-5/PAL16L8D I:18C1/29A-1/74F08 I:19C6/26B-20/27256 I:19C6/26B-22/27256 I:19C4/23B-20/27256 I:19C4/23B-22/27256 I:33B7/28F-P10/ND_DELILA I:34D3/19F-8/PAL16R4D I:34D4/22F-9/PAL16R4D T:36B5/14D-17/PAL16R I:36F2/9D-5/74F02 I:36F2/9D-6/74F02 O:39A4/RN17-7/4610X_101_103! I:39C7/34D-E3/ND_DELDGA I:42A1/11B-1/74LS04
LDEXM~	E34 1	T:34D4/22F-17/PAL16R4D!
LDR~	E50 1	T:50B6/5F-15/PAL16R8D!
LERR~	7	B:6D6/8D-13/PAL16L8B! T:46D2/1H-10/AM29C833! T:46D4/2H-10/AM29C833! I:46E5/8J-1/74LS112 I:46E7/8J-13/74LS112 O:46F3/R21-2/330OHM! I:47D7/4F-8/PAL16L8B
LEVO	2	O:34D6/26H-12/PAL16L8B! I:40D7/35C-19/MC68705U3
LHIT	2	O:39C7/34D-M9/ND_DELDGA! I:40D7/35C-20/MC68705U3
LOAD~	4	O:2D4/A-C15!! B:4D1/RN3-2/4610X_101_102! I:4E3/33C-2/74F244 O:4C2/C-B12!!
LOCK~	3	B:2E2/RN1-8/4610X_101_102! O:2D4/A-C20!! I:42C6/33G-5/AM29C821
LOEN25~	E50 1	T:50B6/5F-16/PAL16R8D!
LOEN~	4	I:44B2/3H-1/AM29821 I:48E4/3F-4/PAL16L8D I:50B6/5F-2/PAL16R8D T:50E6/6F-13/PAL16R8D!
LPERR~	2	I:6D6/8D-7/PAL16L8B O:46E7/8J-7/74LS112!
LSHADOW	10	I:3A4/16A-15/74LS244 I:24A2/21G-11/PAL16L8D I:24A3/17F-3/74F10 I:25F5/18F-4/PAL16R4D I:27D3/18G-4/74F521 O:33B7/28F-Q16/ND_DELILAH! I:36B6/32C-4/74F32 I:36B6/32C-2/74F32 I:39C7/34D-F3/ND_DELDGA O:39A4/RN17-6/4610X_101_103!
LUA0	20	I:3A3/22A-11/74LS244 O:17E4/31F-14/AM29841! I:19C6/26B-8/27256 I:19C4/23B-8/27256 I:22B7/19C-16/TMM2068D_25 I:22B6/18C-16/TMM2068D_25 I:22B4/17C-16/TMM2068D_25 I:22B2/16C-1 I:22C6/22C-16/TMM2068D_25 I:22C7/23C-16/TMM2068D_25 I:22C4/21C-16/TMM2068D_25 I:22C2/20C-16/TMM2068D_25 I:22D6/26C-1 I:22D7/27C-16/TMM2068D_25 I:22D4/25C-16/TMM2068D_25 I:22D2/24C-16/TMM2068D_25 I:22F6/30C-16/TMM2068D_25 I:22F7/31C-1 I:22F4/29C-16/TMM2068D_25 I:22F2/28C-16/TMM2068D_25
LUA1	20	I:3A3/22A-8/74LS244 O:17E4/31F-15/AM29841! I:19C6/26B-7/27256 I:19C4/23B-7/27256 I:22B7/19C-17/TMM2068D_25 I:22B6/18C-17/TMM2068D_25 I:22B4/17C-17/TMM2068D_25 I:22B2/16C-1 I:22C6/22C-17/TMM2068D_25 I:22C7/23C-17/TMM2068D_25

I:22C4/21C-17/TMM2068D_25 I:22C2/20C-17/TMM2068D_25 I:22D6/26C-1
 I:22D7/27C-17/TMM2068D_25 I:22D4/25C-17/TMM2068D_25
 I:22D2/24C-17/TMM2068D_25 I:22F6/30C-17/TMM2068D_25 I:22F7/31C-1
 I:22F4/29C-17/TMM2068D_25 I:22F2/28C-17/TMM2068D_25
LUA10 20 I:3A2/23A-6/74LS244 T:17E2/30H-6/74F373!
 I:19C6/26B-2/27256 I:19C4/23B-2/27256 I:22B7/19C-7/TMM2068D_25
 I:22B6/18C-7/TMM2068D_25 I:22B4/17C-7/TMM2068D_25 I:22B2/16C-7/T
 I:22C6/22C-7/TMM2068D_25 I:22C7/23C-7/TMM2068D_25 I:22C4/21C-7/T
 I:22C2/20C-7/TMM2068D_25 I:22D6/26C-7/TMM2068D_25 I:22D7/27C-7/T
 I:22D4/25C-7/TMM2068D_25 I:22D2/24C-7/TMM2068D_25 I:22F6/30C-7/
 I:22F7/31C-7/TMM2068D_25 I:22F4/29C-7/TMM2068D_25 I:22F2/28C-7/T
LUA11 20 I:3A2/23A-4/74LS244 T:17E2/30H-5/74F373!
 I:19C6/26B-26/27256 I:19C4/23B-26/27256 I:22B7/19C-8/TMM2068D_2
 I:22B6/18C-8/TMM2068D_25 I:22B4/17C-8/TMM2068D_25 I:22B2/16C-8/T
 I:22C6/22C-8/TMM2068D_25 I:22C7/23C-8/TMM2068D_25 I:22C4/21C-8/T
 I:22C2/20C-8/TMM2068D_25 I:22D6/26C-8/TMM2068D_25 I:22D7/27C-8/T
 I:22D4/25C-8/TMM2068D_25 I:22D2/24C-8/TMM2068D_25 I:22F6/30C-8/
 I:22F7/31C-8/TMM2068D_25 I:22F4/29C-8/TMM2068D_25 I:22F2/28C-8/T
LUA12 9 I:3A2/23A-2/74LS244 I:17D6/11F-13/74S37
 I:17D6/11F-12/74S37 T:17E2/30H-2/74F373! I:17E7/31G-1/AM29841
 B:18B2/15F-13/PAL16L8D! I:19C6/26B-27/27256 I:19C4/23B-27/27256
 I:36B5/14D-8/PAL16R4D
LUA2 20 I:3A3/22A-6/74LS244 O:17E4/31F-16/AM29841!
 I:19C6/26B-6/27256 I:19C4/23B-6/27256 I:22B7/19C-18/TMM2068D_25
 I:22B6/18C-18/TMM2068D_25 I:22B4/17C-18/TMM2068D_25 I:22B2/16C-1
 I:22C6/22C-18/TMM2068D_25 I:22C7/23C-18/TMM2068D_25
 I:22C4/21C-18/TMM2068D_25 I:22C2/20C-18/TMM2068D_25 I:22D6/26C-1
 I:22D7/27C-18/TMM2068D_25 I:22D4/25C-18/TMM2068D_25
 I:22D2/24C-18/TMM2068D_25 I:22F6/30C-18/TMM2068D_25 I:22F7/31C-1
 I:22F4/29C-18/TMM2068D_25 I:22F2/28C-18/TMM2068D_25
LUA3 20 I:3A3/22A-4/74LS244 O:17E4/31F-17/AM29841!
 I:19C6/26B-5/27256 I:19C4/23B-5/27256 I:22B7/19C-19/TMM2068D_25
 I:22B6/18C-19/TMM2068D_25 I:22B4/17C-19/TMM2068D_25 I:22B2/16C-1
 I:22C6/22C-19/TMM2068D_25 I:22C7/23C-19/TMM2068D_25
 I:22C4/21C-19/TMM2068D_25 I:22C2/20C-19/TMM2068D_25 I:22D6/26C-1
 I:22D7/27C-19/TMM2068D_25 I:22D4/25C-19/TMM2068D_25
 I:22D2/24C-19/TMM2068D_25 I:22F6/30C-19/TMM2068D_25 I:22F7/31C-1
 I:22F4/29C-19/TMM2068D_25 I:22F2/28C-19/TMM2068D_25
LUA4 20 I:3A3/22A-2/74LS244 O:17E4/31F-18/AM29841!
 I:19C6/26B-4/27256 I:19C4/23B-4/27256 I:22B7/19C-1/TMM2068D_25
 I:22B6/18C-1/TMM2068D_25 I:22B4/17C-1/TMM2068D_25 I:22B2/16C-1/T
 I:22C6/22C-1/TMM2068D_25 I:22C7/23C-1/TMM2068D_25 I:22C4/21C-1/T
 I:22C2/20C-1/TMM2068D_25 I:22D6/26C-1/TMM2068D_25 I:22D7/27C-1/T
 I:22D4/25C-1/TMM2068D_25 I:22D2/24C-1/TMM2068D_25 I:22F6/30C-1/
 I:22F7/31C-1/TMM2068D_25 I:22F4/29C-1/TMM2068D_25 I:22F2/28C-1/T
LUA5 20 I:3A2/23A-17/74LS244 O:17E4/31F-19/AM29841!
 I:19C6/26B-3/27256 I:19C4/23B-3/27256 I:22B7/19C-2/TMM2068D_25
 I:22B6/18C-2/TMM2068D_25 I:22B4/17C-2/TMM2068D_25 I:22B2/16C-2/T
 I:22C6/22C-2/TMM2068D_25 I:22C7/23C-2/TMM2068D_25 I:22C4/21C-2/T
 I:22C2/20C-2/TMM2068D_25 I:22D6/26C-2/TMM2068D_25 I:22D7/27C-2/T
 I:22D4/25C-2/TMM2068D_25 I:22D2/24C-2/TMM2068D_25 I:22F6/30C-2/
 I:22F7/31C-2/TMM2068D_25 I:22F4/29C-2/TMM2068D_25 I:22F2/28C-2/T
LUA6 20 I:3A2/23A-15/74LS244 O:17E4/31F-20/AM29841!
 I:19C6/26B-25/27256 I:19C4/23B-25/27256 I:22B7/19C-3/TMM2068D_2
 I:22B6/18C-3/TMM2068D_25 I:22B4/17C-3/TMM2068D_25 I:22B2/16C-3/T
 I:22C6/22C-3/TMM2068D_25 I:22C7/23C-3/TMM2068D_25 I:22C4/21C-3/T
 I:22C2/20C-3/TMM2068D_25 I:22D6/26C-3/TMM2068D_25 I:22D7/27C-3/T
 I:22D4/25C-3/TMM2068D_25 I:22D2/24C-3/TMM2068D_25 I:22F6/30C-3/
 I:22F7/31C-3/TMM2068D_25 I:22F4/29C-3/TMM2068D_25 I:22F2/28C-3/T
LUA7 20 I:3A2/23A-13/74LS244 O:17E4/31F-21/AM29841!

			I:19C6/26B-24/27256 I:19C4/23B-24/27256 I:22B7/19C-4/TMM2068D_2
			I:22B6/18C-4/TMM2068D_25 I:22B4/17C-4/TMM2068D_25 I:22B2/16C-4/T
			I:22C6/22C-4/TMM2068D_25 I:22C7/23C-4/TMM2068D_25 I:22C4/21C-4/T
			I:22C2/20C-4/TMM2068D_25 I:22D6/26C-4/TMM2068D_25 I:22D7/27C-4/T
			I:22D4/25C-4/TMM2068D_25 I:22D2/24C-4/TMM2068D_25 I:22F6/30C-4/T
			I:22F7/31C-4/TMM2068D_25 I:22F4/29C-4/TMM2068D_25 I:22F2/28C-4/T
LUAB	20		I:3A2/23A-11/74LS244 O:17E4/31F-22/AM29841!
			I:19C6/26B-21/27256 I:19C4/23B-21/27256 I:22B7/19C-5/TMM2068D_2
			I:22B6/18C-5/TMM2068D_25 I:22B4/17C-5/TMM2068D_25 I:22B2/16C-5/T
			I:22C6/22C-5/TMM2068D_25 I:22C7/23C-5/TMM2068D_25 I:22C4/21C-5/T
			I:22C2/20C-5/TMM2068D_25 I:22D6/26C-5/TMM2068D_25 I:22D7/27C-5/T
			I:22D4/25C-5/TMM2068D_25 I:22D2/24C-5/TMM2068D_25 I:22F6/30C-5/T
			I:22F7/31C-5/TMM2068D_25 I:22F4/29C-5/TMM2068D_25 I:22F2/28C-5/T
LUA9	20		I:3A2/23A-8/74LS244 O:17E4/31F-23/AM29841!
			I:19C6/26B-23/27256 I:19C4/23B-23/27256 I:22B7/19C-6/TMM2068D_2
			I:22B6/18C-6/TMM2068D_25 I:22B4/17C-6/TMM2068D_25 I:22B2/16C-6/T
			I:22C6/22C-6/TMM2068D_25 I:22C7/23C-6/TMM2068D_25 I:22C4/21C-6/T
			I:22C2/20C-6/TMM2068D_25 I:22D6/26C-6/TMM2068D_25 I:22D7/27C-6/T
			I:22D4/25C-6/TMM2068D_25 I:22D2/24C-6/TMM2068D_25 I:22F6/30C-6/T
			I:22F7/31C-6/TMM2068D_25 I:22F4/29C-6/TMM2068D_25 I:22F2/28C-6/T
MACLK	4		I:17E4/31F-13/AM29841 I:17E5/32G-13/AM29841
			I:17E2/30H-11/74F373 O:36F4/14C-11/74F00!
MAP~	3		I:33B7/28F-S5/ND_DELILAH B:36E5/13D-13/PAL16L8D!
			I:36B5/14D-9/PAL16R4D
MCL	2		I:4F6/35A-1/7406 O:39C7/34D-F12/ND_DELDGA!
MCLK	3		I:32D3/25F-13/AM29C821 I:33B7/28F-S10/ND_DELILAH
			O:36F3/14C-8/74F00!
MDLY~	£36 1		T:36B5/14D-16/PAL16R4D!
MEM~	3		T:6D2/10D-16/PAL16R8D! I:7D2/3A-13/74F241
			I:7D5/8G-5/74F00
MISO	6		T:3A7/21A-16/74LS374! I:3C6/B-A14/ I:7D2/3A-2/74F241
			I:7C1/1F-5/74F04 I:12E4/2C-5/PAL16L8D I:42B3/32H-12/SC2661
MIS1	3		T:3A7/21A-15/74LS374! I:3C6/B-C14/ I:42B3/32H-10/SC2661
MOFF~	£45 5		I:45C6/6G-3/PAL16R4D I:45C4/9G-4/PAL16R4D
			I:45E2/7G-4/PAL16R8B B:45A5/SW2-3/SECME090320102!
			B:45A5/RN18-8/4610X_101_102!
MOR25~	2		I:6D6/8D-6/PAL16L8B O:48C7/14F-16/AM29C821!
MOR~	5		I:3A4/16A-13/74LS244 T:7D2/3A-7/74F241!
			O:7E1/RN13-7/4610X_101_102! I:33B7/28F-Q11/ND_DELILAH I:48C7/14
MREQ~	2		I:36B6/32C-1/74F32 O:39C7/34D-N7/ND_DELDGA!
MR~	13		I:6D2/10D-4/PAL16R8D I:6D6/8D-8/PAL16L8B
			O:8E3/4D-23/AM29C821! I:33B7/28F-F3/ND_DELILAH I:36B5/14D-7/PAL
			I:36C6/14G-4/74F08 B:46C5/2F-13/PAL16L8B! I:46D5/14G-12/74F08
			I:46D7/14G-10/74F08 I:47D7/4F-11/PAL16L8B I:48E4/3F-11/PAL16L8D
			I:50B6/5F-4/PAL16R8D I:50E6/6F-6/PAL16R8D
MSIZE0~	£45 2		B:45C4/9G-19/PAL16R4D! I:45E2/7G-2/PAL16R8B
MSIZE1~	£45 2		B:45C6/6G-13/PAL16R4D! I:45E2/7G-3/PAL16R8B
MWRITE50~	8		B:48E4/3F-13/PAL16L8D! O:48C7/14F-21/AM29C821!
			I:49C3/15H-21/SIP1M9 I:49C5/15J-21/SIP1M9 I:49E3/15K-21/SIP1M9
			I:49E5/15L-21/SIP1M9 I:49G5/15N-21/SIP1M9 I:49G3/15M-21/SIP1M9
MWRITE~	6		I:12D6/1C-4/PAL16L8D T:45C6/6G-14/PAL16R4D!
			T:45C4/9G-14/PAL16R4D! O:45E3/RN18-5/4610X_101_102! I:46C5/2F-1
			I:48C7/14F-3/AM29C821
NC	2		O:3A4/16A-3/74LS244! I:3C4/B-B22/
NOWRIT~	£36 1		T:36B3/15D-17/PAL16R4D!
NUBD	£25 2		T:25F5/18F-16/PAL16R4D! I:25G3/21F-9/AM9150_20
NUBI	£25 2		T:25F5/18F-17/PAL16R4D! I:25G3/21F-8/AM9150_20
O1P	4		I:2H4/A-A9/ B:42F3/D4-2/1N4148! B:42F3/H6-1/1KOHM!
			B:42F2/R5-1/1KOHM!

O2N	4	I:2H5/A-A10/ O:42E4/35G-6/75150P! B:42F3/R7-2/2200HM! B:42F4/R8-1/1.5KOHM!
OC0	5	B:2D2/RN1-3/4610X_101_102! O:2D3/A-C6!! I:38B1/10F-13/74F10 I:38B2/7F-9/74F14 B:38A1/STR19-2/STR2!
OC1	4	B:2D2/RN1-4/4610X_101_102! O:2D3/A-A6!! I:38B1/10F-2/74F10 I:38B2/12F-1/74S132
OER~	E46 3	O:46C5/2F-12/PAL16L8B! I:46D2/1H-1/AM29C833 I:46D4/2H-1/AM29C833
OET~	E46 3	B:46C5/2F-18/PAL16L8B! I:46D2/1H-14/AM29C833 I:46D4/2H-14/AM29C833
OPCLCS	2	T:34D4/22F-15/PAL16R4D! I:38C4/32C-13/74F32
OSC	10	I:6D2/10D-1/PAL16R8D I:6D4/5D-1/PAL16R4D I:8C3/3D-13/AM29C821 I:8E3/4D-13/AM29C821 I:36D4/12D-1/PAL16R6D O:38C1/11F-3/74S37! I:48C4/13F-13/AM29C821 I:48C7/14F-13/AM29C82 I:50B6/5F-1/PAL16R8D I:50E6/6F-1/PAL16R8D
OSCCL~	3	B:2D2/RN1-2/4610X_101_102! O:2D2/A-B3!! I:38B3/12F-9/74S132
OUBD	E25 2	B:25F5/18F-13/PAL16R4D! O:25G3/21F-11/AM9150_20!
OUBI	E25 2	B:25F5/18F-12/PAL16R4D! O:25G3/21F-10/AM9150_20!
OUTGRANT~	2	I:4F5/C-C23/ O:7E3/2B-8/74F00!
OUTIDENT~	3	I:4F5/C-C22/ O:7E1/RN3-10/4610X_101_102! T:7D2/3A-18/74F241!
PA0	4	T:39C7/34D-L13/ND_DELDGA! O:40C4/34A-7/MM58274! I:40G4/32B-3/74LS374 B:40D7/35C-33/MC68705U3!
PA1	4	T:39C7/34D-L12/ND_DELDGA! O:40C4/34A-6/MM58274! I:40G4/32B-4/74LS374 B:40D7/35C-34/MC68705U3!
PA2	4	T:39C7/34D-K11/ND_DELDGA! O:40C4/34A-5/MM58274! I:40G4/32B-7/74LS374 B:40D7/35C-35/MC68705U3!
PA3	4	T:39C7/34D-M13/ND_DELDGA! O:40C4/34A-4/MM58274! I:40G4/32B-8/74LS374 B:40D7/35C-36/MC68705U3!
PA4	4	T:39C7/34D-L10/ND_DELDGA! I:40C4/34A-12/MM58274 I:40G4/32B-13/74LS374 B:40D7/35C-37/MC68705U3!
PA5	4	T:39C7/34D-N12/ND_DELDGA! I:40C4/34A-11/MM58274 I:40G4/32B-14/74LS374 B:40D7/35C-38/MC68705U3!
PA6	4	T:39C7/34D-N11/ND_DELDGA! I:40C4/34A-10/MM58274 I:40G4/32B-17/74LS374 B:40D7/35C-39/MC68705U3!
PA7	4	T:39C7/34D-M10/ND_DELDGA! I:40C4/34A-9/MM58274 I:40G4/32B-18/74LS374 B:40D7/35C-40/MC68705U3!
PANOSC	2	O:39C7/34D-E11/ND_DELDGA! I:40D7/35C-8/MC68705U3
PAN~	2	I:33B7/28F-R9/ND_DELILAH O:39C7/34D-F13/ND_DELDGA!
PARERR~	2	B:6D6/8D-17/PAL16L8B! I:33B7/28F-S14/ND_DELILAH
PA~	4	I:6C7/12C-4/74F32 O:39C7/34D-A4/ND_DELDGA! I:46D7/14G-9/74F08 I:47D7/4F-6/PAL16L8B
PCR0	2	O:33B7/28F-Q15/ND_DELILAH! I:40D7/35C-24/MC68705U3
PCR1	2	O:33B7/28F-Q17/ND_DELILAH! I:40D7/35C-23/MC68705U3
PIL0	3	I:3A4/16A-2/74LS244 O:33B7/28F-A8/ND_DELILAH! I:34D6/26H-2/PAL16L8B
PIL1	3	I:3A3/22A-17/74LS244 O:33B7/28F-D9/ND_DELILAH! I:34D6/26H-3/PAL16L8B
PIL2	3	I:3A3/22A-15/74LS244 O:33B7/28F-B8/ND_DELILAH! I:34D6/26H-4/PAL16L8B
PIL3	3	I:3A3/22A-13/74LS244 O:33B7/28F-C9/ND_DELILAH! I:34D6/26H-5/PAL16L8B
PONI	4	O:33B7/28F-C8/ND_DELILAH! O:39A4/RN17-3/4610X_101_103! I:39C7/34D-E2/ND_DELDGA I:40D7/35C-22/MC68705U3
POWFAIL~	2	I:33B7/28F-P11/ND_DELILAH O:39C7/34D-E12/ND_DELDGA!
POWSENSE	2	O:38C6/7F-10/74F14! I:39C7/34D-A10/ND_DELDGA
POWSENSE~	5	B:4D4/C1-1/10nF! O:4C4/C-A29!! O:4C4/C-B29!! O:4C4/C-C29!! I:38C6/7F-11/74F14
PPN10	7	I:14D5/4B-14/74PCT374 O:23D5/23H-3/74PCT244!

		I:27D6/19G-17/74F521 B:28E5/9B-9/74PCT245! I:29F4/20G-7/IMS1400
		B:29B6/23G-17/TMM2018D_25! I:31D5/10G-17/74PCT244
PPN11	7	I:14D5/4B-13/74PCT374 O:23D5/23H-5/74PCT244!
		I:27D6/19G-15/74F521 B:28E5/9B-8/74PCT245! I:29F4/20G-6/IMS1400
		B:29B6/23G-16/TMM2018D_25! I:31D5/10G-15/74PCT244
PPN12	7	I:14D5/4B-8/74PCT374 O:23D5/23H-7/74PCT244!
		I:27D6/19G-13/74F521 B:28E5/9B-7/74PCT245! I:29F4/20G-5/IMS1400
		B:29B6/23G-15/TMM2018D_25! I:31D5/10G-13/74PCT244
PPN13	7	I:14D5/4B-7/74PCT374 O:23D5/23H-9/74PCT244!
		I:27D6/19G-11/74F521 B:28E5/9B-6/74PCT245! I:29F4/20G-4/IMS1400
		B:29B6/23G-14/TMM2018D_25! I:31D5/10G-11/74PCT244
PPN14	7	I:14D5/4B-4/74PCT374 O:23D5/23H-12/74PCT244!
		I:27D6/19G-8/74F521 B:28E5/9B-5/74PCT245! I:29F4/20G-3/IMS1400_
		B:29B6/23G-13/TMM2018D_25! I:31D5/10G-8/74PCT244
PPN15	7	I:14D5/4B-3/74PCT374 O:23D5/23H-14/74PCT244!
		I:27D6/19G-6/74F521 B:28E5/9B-4/74PCT245! I:29F4/20G-19/IMS1400
		B:29B6/23G-11/TMM2018D_25! I:31D5/10G-6/74PCT244
PPN16	7	I:14D3/3B-18/74PCT374 O:23D5/23H-16/74PCT244!
		I:27D6/19G-4/74F521 B:28E5/9B-3/74PCT245! I:29F4/20G-2/IMS1400_
		B:29B6/23G-10/TMM2018D_25! I:31D5/10G-4/74PCT244
PPN17	7	I:14D3/3B-17/74PCT374 O:23D5/23H-18/74PCT244!
		I:27D6/19G-2/74F521 B:28E5/9B-2/74PCT245! I:29F4/20G-1/IMS1400_
		B:29B6/23G-9/TMM2018D_25! I:31D5/10G-2/74PCT244
PPN18	8	I:14D3/3B-14/74PCT374 O:23D3/15G-3/74PCT244!
		I:27D3/18G-17/74F521 B:28E3/10B-9/74PCT245! O:28B7/8B-3/74LS244
		B:29B3/22G-17/TMM2018D_25! I:29F4/20G-18/IMS1400_25 I:31D3/11G-1
PPN19	9	I:14D3/3B-13/74PCT374 O:23D3/15G-5/74PCT244!
		I:27D3/18G-15/74F521 B:28E3/10B-8/74PCT245! O:28B7/8B-5/74LS244
		B:29B3/22G-16/TMM2018D_25! I:29F4/20G-17/IMS1400_25 I:31D3/11G-1
		I:45C4/9G-5/PAL16R4D
PPN20	9	I:14D3/3B-8/74PCT374 O:23D3/15G-7/74PCT244!
		I:27D3/18G-13/74F521 B:28E3/10B-7/74PCT245! O:28B7/8B-7/74LS244
		B:29B3/22G-15/TMM2018D_25! I:29F4/20G-16/IMS1400_25 I:31D3/11G-1
		I:45C4/9G-6/PAL16R4D
PPN21	9	I:14D3/3B-7/74PCT374 O:23D3/15G-9/74PCT244!
		I:27D3/18G-11/74F521 B:28E3/10B-6/74PCT245! O:28B7/8B-9/74LS244
		B:29B3/22G-14/TMM2018D_25! I:29F4/20G-15/IMS1400_25 I:31D3/11G-1
		I:45C4/9G-7/PAL16R4D
PPN22	9	I:14D3/3B-4/74PCT374 O:23D3/15G-12/74PCT244!
		I:27D3/18G-8/74F521 B:28E3/10B-5/74PCT245! O:28B7/8B-12/74LS244
		B:29B3/22G-13/TMM2018D_25! I:29F4/20G-13/IMS1400_25 I:31D3/11G-8
		I:45C4/9G-8/PAL16R4D
PPN23	9	I:14D3/3B-3/74PCT374 O:23D3/15G-14/74PCT244!
		I:27D3/18G-6/74F521 B:28E3/10B-4/74PCT245! O:28B7/8B-14/74LS244
		B:29B3/22G-11/TMM2018D_25! I:29F4/20G-14/IMS1400_25 I:31D3/11G-6
		I:45C4/9G-9/PAL16R4D
PPN24	3	B:28E3/10B-3/74PCT245! O:28B7/8B-16/74LS244!
		B:29B3/22G-10/TMM2018D_25!
PPN25	4	B:28E3/10B-2/74PCT245! O:28B7/8B-18/74LS244!
		B:29B3/22G-9/TMM2018D_25! I:29F4/20G-12/IMS1400_25
PPOSC	2	O:38D1/13C-5/74LS393! I:42B3/32H-20/SC2661
PRES	£40 2	I:40G6/33B-17/74LS244 O:40F7/13G-4/74F04!
PS~	3	I:6C7/12C-1/74F32 O:39C7/34D-A7/ND_DELIDGA!
		I:47D7/4F-4/PAL16L8B
PT0	2	B:29D6/25G-17/TMM2018D_25! B:30D5/18B-11/74PCT245!
PT1	2	B:29D6/25G-16/TMM2018D_25! B:30D5/18B-12/74PCT245!
PT10	3	B:29D3/24G-15/TMM2018D_25! B:30D3/17B-13/74PCT245!
		I:33B7/28F-Q7/ND_DELILAH
PT11	3	B:29D3/24G-14/TMM2018D_25! B:30D3/17B-14/74PCT245!
		I:33B7/28F-R8/ND_DELILAH

PT12	3	B:29D3/24G-13/TMM2018D_25! B:30D3/17B-15/74PCT245! I:33B7/28F-R7/ND_DELILAH
PT13	3	B:29D3/24G-11/TMM2018D_25! B:30D3/17B-16/74PCT245! I:33B7/28F-S8/ND_DELILAH
PT14	3	B:29D3/24G-10/TMM2018D_25! B:30D3/17B-17/74PCT245! I:33B7/28F-P8/ND_DELILAH
PT15	3	B:29D3/24G-9/TMM2018D_25! B:30D3/17B-18/74PCT245! I:33B7/28F-S9/ND_DELILAH
PT2	2	B:29D6/25G-15/TMM2018D_25! B:30D5/18B-13/74PCT245!
PT3	2	B:29D6/25G-14/TMM2018D_25! B:30D5/18B-14/74PCT245!
PT4	2	B:29D6/25G-13/TMM2018D_25! B:30D5/18B-15/74PCT245!
PT5	2	B:29D6/25G-11/TMM2018D_25! B:30D5/18B-16/74PCT245!
PT6	2	B:29D6/25G-10/TMM2018D_25! B:30D5/18B-17/74PCT245!
PT7	2	B:29D6/25G-9/TMM2018D_25! B:30D5/18B-18/74PCT245!
PT8	2	B:29D3/24G-17/TMM2018D_25! B:30D3/17B-11/74PCT245!
PT9	3	B:29D3/24G-16/TMM2018D_25! B:30D3/17B-12/74PCT245! I:33B7/28F-S7/ND_DELILAH
PWCL	2	O:38C4/32C-11/74F32! I:39C7/34D-A11/ND_DELDGA
QA~	£50 1	T:50E6/6F-19/PAL16R8D!
QB~	£50 1	T:50E6/6F-18/PAL16R8D!
QC~	£50 1	T:50E6/6F-17/PAL16R8D!
QD~	£50 1	T:50E6/6F-16/PAL16R8D!
Q~0	2	T:6D4/5D-17/PAL16R4D! I:12D2/11D-1/PAL16L8D
Q~1	£6 1	T:6D4/5D-16/PAL16R4D!
Q~2	2	T:6D4/5D-15/PAL16R4D! I:12D2/11D-2/PAL16L8D
RAS	4	I:49B6/9H-1/74F00 I:49D6/9H-9/74F00 I:49F6/8G-9/74F00 T:50E6/6F-15/PAL16R8D!
RAS~0	£49 3	O:49B6/9H-3/74F00! I:49C3/15H-27/SIP1M9 I:49C5/15J-27/SIP1M9
RAS~1	£49 3	I:49E3/15K-27/SIP1M9 I:49E5/15L-27/SIP1M9 O:49D6/9H-8/74F00!
RAS~2	£49 3	I:49G5/15N-27/SIP1M9 I:49G3/15M-27/SIP1M9 O:49F6/8G-8/74F00!
RD	£42 2	I:42B3/32H-3/SC2661 O:42F6/7F-4/74F14!
RDATA	4	I:46D2/1H-13/AM29C833 I:46D4/2H-13/AM29C833 I:47D7/4F-1/PAL16L8B O:48E4/3F-12/PAL16L8D!
READ	£40 2	I:40G6/33B-13/74LS244 B:40D7/35C-31/MC68705U3!
REF100~	£48 2	B:48E4/3F-15/PAL16L8D! O:48C7/14F-17/AM29C821!
REFRQ25~	£8 2	O:8C3/3D-22/AM29C821! I:8E3/4D-3/AM29C821
REFRQ50~	2	I:6D2/10D-6/PAL16R8D O:8E3/4D-22/AM29C821!
REFRQ~	3	I:8C3/3D-3/AM29C821 O:39C7/34D-C13/ND_DELDGA! I:45C2/2D-11/74F74
REF~	4	T:6D2/10D-15/PAL16R8D! I:7D6/7A-9/7407 I:39C7/34D-C9/ND_DELDGA I:48C7/14F-5/AM29C821
RERR~	4	B:6D6/8D-16/PAL16L8B! I:6C7/12C-2/74F32 I:6C7/12C-5/74F32 I:47D7/4F-5/PAL16L8B
RESET	£41 1	O:41E4/28A-2/74LS273!
RESTART~	2	B:4D1/RN3-3/4610X_101_102! O:4C2/C-B13/!
RFO	7	I:18D2/30B-2/74F139 I:18D2/30B-14/74F139 I:19C6/26B-10/27256 I:19C4/23B-10/27256 I:32F5/34F-23/TMM2018D_25 I:32F7/35F-23/TMM2018D_25 O:33B7/28F-K5/ND_DELILAH!
RF1	7	I:18D2/30B-3/74F139 I:18D2/30B-13/74F139 I:19C6/26B-9/27256 I:19C4/23B-9/27256 I:32F5/34F-22/TMM2018D_25 I:32F7/35F-22/TMM2018D_25 O:33B7/28F-M2/ND_DELILAH!
RGNT~	4	I:45C2/2D-13/74F74 B:48E4/3F-16/PAL16L8D! T:50B6/5F-19/PAL16R8D! I:50E6/6F-2/PAL16R8D
RINR~	3	O:39C7/34D-B5/ND_DELDGA! I:41C7/24A-1/74PCT244 I:41C7/24A-19/74PCT244
RLRQ~	2	O:45C2/2D-8/74F74! I:50B6/5F-3/PAL16R8D
RMM~	3	O:39A1/RN15-4/4610X_101_103! I:39C7/34D-L9/ND_DELDGA

			B:40D7/35C-28/MC68705U3!
ROCLK~	£40	2	I:40C4/34A-2/MM58274 B:40D7/35C-27/MC68705U3!
RRF~	£34	1	T:34D3/19F-17/PAL16R4D!
RTOSC		2	O:38E2/13C-8/74LS393! I:39C7/34D-C8/ND_DELDGA
RT~		5	B:12D2/11D-13/PAL16L8D! I:24A2/21G-4/PAL16L8D I:25F5/18F-3/PAL16R4D I:36B6/32C-5/74F32 O:39C7/34D-J2/ND_DELDG
RUART~		2	O:39C7/34D-B8/ND_DELDGA! I:42B3/32H-13/SC2661
RUN~		3	I:2H3/A-C18/ O:4F7/7A-2/7407! I:4F7/C-B14/
RWCS~		3	I:18B2/15F-6/PAL16L8D I:36E5/13D-8/PAL16L8D O:39C7/34D-N8/ND_DELDGA!
RXD		2	O:2D3/A-C8/! B:42E6/R3-2/2.2KOHM!
SAPR	£12	1	B:12D6/1C-15/PAL16L8D!
SCONS~	£41	3	O:41E4/28A-5/74LS273! I:41F4/29A-4/74F08 I:41G3/11B-3/74LS04
SEL5MS~		3	O:3A7/B-B14/! O:3A7/R4-2/1KOHM! I:39C7/34D-B9/ND_DELDGA
SEMRQ25~	£8	2	O:8C3/3D-21/AM29C821! I:8E3/4D-4/AM29C821
SEMRQ50~		3	I:6D2/10D-8/PAL16R8D O:8E3/4D-21/AM29C821! I:50B6/5F-8/PAL16R8D
SEMRQ~		3	I:4C6/5C-4/74F244 B:4A5/C-A17/! O:7E7/2A-8/7438!
SEM~		2	T:6D2/10D-19/PAL16R8D! I:7E3/2B-5/74F00
SHORT~		2	B:36D4/12D-12/PAL16R6D! O:39C7/34D-H3/ND_DELDGA!
SIOC~		2	O:39C7/34D-K2/ND_DELDGA! I:41E4/28A-11/74LS273
SLOW~		2	B:36D4/12D-19/PAL16R6D! O:39C7/34D-H2/ND_DELDGA!
SO	£42	4	O:42B3/32H-19/SC2661! I:42E4/35G-2/75150P I:42E4/35G-3/75150P I:42E4/35G-1/75150P
SPEA		4	O:6D6/8D-19/PAL16L8B! I:13C5/10A-11/74PCT534 I:13E5/8A-11/74PCT534 I:13E3/9A-11/74PCT534
SPEAL	£47	4	O:47D7/4F-12/PAL16L8B! I:47C4/3C-11/74PCT374 I:47E2/4C-11/74PCT374 I:47E4/6D-11/74PCT374
SPES		2	O:6D6/8D-12/PAL16L8B! I:13C3/12A-11/74PCT534
SPESL	£47	2	O:47D7/4F-19/PAL16L8B! I:47C2/7C-11/74PCT374
SSEMA~		3	I:7D7/9D-8/74F02 O:39C7/34D-M1/ND_DELDGA! I:50B6/5F-7/PAL16R8D
STAT0	£40	2	I:40G6/33B-2/74LS244 B:40D7/35C-9/MC68705U3!
STAT1	£40	2	I:40G6/33B-4/74LS244 B:40D7/35C-10/MC68705U3!
STAT2	£40	2	I:40G6/33B-6/74LS244 B:40D7/35C-11/MC68705U3!
STAT3		4	O:39A1/RN15-6/4610X_101_103! I:39C7/34D-D2/ND_DELDGA I:40G6/33B-8/74LS244 B:40D7/35C-29/MC68705U3!
STAT4		3	O:39A1/RN15-5/4610X_101_103! I:39C7/34D-C1/ND_DELDGA B:40D7/35C-30/MC68705U3!
STAT7	£40	3	B:40D7/35C-32/MC68705U3! I:40F7/13G-3/74F04 O:40E7/RN8-10/4610X_101_103!
STOC~		5	I:35D3/14B-1/74PCT244 I:35D3/14B-19/74PCT244 I:35D5/15B-1/74PCT244 I:35D5/15B-19/74PCT244 O:39C7/34D-H1/ND_D
STOP~		4	B:2E2/RN1-10/4610X_101_102! O:2D4/A-C17/! I:4E3/33C-8/74F244 O:4C2/C-B16/!
STP		3	I:4F7/7A-1/7407 I:33B7/28F-R6/ND_DELDGA O:39C7/34D-E13/ND_DELDGA!
SWDIS~	£46	3	I:46C5/2F-2/PAL16L8B B:46A4/SW4-3/SECME_SPDT! O:46A4/RN14-6/4610X_101_102!
SWLD		2	O:2G3/R1-2/1KOHM! I:2H3/A-A15/
SWMCL~		4	O:2D4/A-C16/! B:2E2/RN1-6/4610X_101_102! B:2E6/SW3-1/SECME436231205! I:38B4/12F-13/74S132
TBMT~		4	I:41F5/11B-9/74LS04 O:42B3/32H-15/SC2661! O:42B5/RN7-2/4610X_101_103! I:42C6/33G-2/AM29C821
TERM~		13	I:6D4/5D-8/PAL16R4D I:12D2/11D-9/PAL16L8D I:18B2/15F-11/PAL16L8D I:24A3/17F-5/74F10 I:25F5/18F-5/PAL16R4D I:32E7/17F-13/74F10 I:36E5/13D-1/PAL16L8D T:36D4/12D-17/PAL16R6D I:36F2/14C-2/74F00 I:36F2/9D-2/74F02 I:36F5/14G-1/74F08 I:36F3/

			I:36F4/14C-12/74F00
TEST0	£33	2	B:33E6/TP6-1/TESTPOINT! O:33B7/28F-N11/ND_DELILAH!
TEST1	£33	2	B:33E5/TP5-1/TESTPOINT! O:33B7/28F-P12/ND_DELILAH!
TEST2	£33	2	B:33E5/TP4-1/TESTPOINT! O:33B7/28F-Q12/ND_DELILAH!
TEST3	£33	2	B:33D5/TP3-1/TESTPOINT! O:33B7/28F-R15/ND_DELILAH!
TEST4	£33	2	B:33D5/TP2-1/TESTPOINT! O:33B7/28F-Q13/ND_DELILAH!
TOUT		2	I:7D2/3A-19/74F241 O:39C7/34D-D12/ND_DELDGA!
TRAALD~		5	O:39C7/34D-C6/ND_DELDGA! I:41C2/27A-1/74PCT244 I:41C2/27A-19/74PCT244 I:41C5/25A-1/74PCT244 I:41C5/25A-19/74PC
TRAP~		2	O:33B7/28F-Q9/ND_DELILAH! I:36E5/13D-9/PAL16L8D
TST~	£46	1	B:46C5/2F-15/PAL16L8B!
TWRF~	£32	3	I:32F5/34F-21/TMM2018D_25 I:32F7/35F-21/TMM2018D_25 O:32E7/17F-12/74F10!
TXD		3	I:2H2/A-C7! O:42E4/35G-7/75150P! B:42G4/C8-1/1000pF!
UCLK		6	I:25F5/18F-1/PAL16R4D I:26C5/24H-3/74F74 I:33B7/28F-Q8/ND_DELILAH O:36F5/14G-3/74F08! O:39A1/RN15-3/4610 I:39C7/34D-N5/ND_DELDGA
USED~	£25	2	B:25F5/18F-19/PAL16R4D! I:25G6/21H-1/74S260
UUA0		18	O:17E5/32G-14/AM29841! O:17E7/31G-14/AM29841! I:21B7/19D-16/TMM2068D_25 I:21B6/18D-16/TMM2068D_25 I:21B4/17D-16/TMM2068D_25 I:21B2/16D-16/TMM2068D_25 I:21C6/22D-1 I:21C7/23D-16/TMM2068D_25 I:21C4/21D-16/TMM2068D_25 I:21C2/20D-16/TMM2068D_25 I:21D6/26D-16/TMM2068D_25 I:21D7/27D-1 I:21D4/25D-16/TMM2068D_25 I:21D2/24D-16/TMM2068D_25 I:21F6/30D-16/TMM2068D_25 I:21F7/31D-16/TMM2068D_25 I:21F4/29D-1 I:21F2/28D-16/TMM2068D_25
UUA1		18	O:17E5/32G-15/AM29841! O:17E7/31G-15/AM29841! I:21B7/19D-17/TMM2068D_25 I:21B6/18D-17/TMM2068D_25 I:21B4/17D-17/TMM2068D_25 I:21B2/16D-17/TMM2068D_25 I:21C6/22D-1 I:21C7/23D-17/TMM2068D_25 I:21C4/21D-17/TMM2068D_25 I:21C2/20D-17/TMM2068D_25 I:21D6/26D-17/TMM2068D_25 I:21D7/27D-1 I:21D4/25D-17/TMM2068D_25 I:21D2/24D-17/TMM2068D_25 I:21F6/30D-17/TMM2068D_25 I:21F7/31D-17/TMM2068D_25 I:21F4/29D-1 I:21F2/28D-17/TMM2068D_25
UUA10		17	T:17E2/30H-16/74F373! I:21B7/19D-7/TMM2068D_25 I:21B6/18D-7/TMM2068D_25 I:21B4/17D-7/TMM2068D_25 I:21B2/16D-7/ I:21C6/22D-7/TMM2068D_25 I:21C7/23D-7/TMM2068D_25 I:21C4/21D-7/T I:21C2/20D-7/TMM2068D_25 I:21D6/26D-7/TMM2068D_25 I:21D7/27D-7/T I:21D4/25D-7/TMM2068D_25 I:21D2/24D-7/TMM2068D_25 I:21F6/30D-7/T I:21F7/31D-7/TMM2068D_25 I:21F4/29D-7/TMM2068D_25 I:21F2/28D-7/ I:21F2/28D-17/TMM2068D_25
UUA11		17	T:17E2/30H-15/74F373! I:21B7/19D-8/TMM2068D_25 I:21B6/18D-8/TMM2068D_25 I:21B4/17D-8/TMM2068D_25 I:21B2/16D-8/ I:21C6/22D-8/TMM2068D_25 I:21C7/23D-8/TMM2068D_25 I:21C4/21D-8/T I:21C2/20D-8/TMM2068D_25 I:21D6/26D-8/TMM2068D_25 I:21D7/27D-8/T I:21D4/25D-8/TMM2068D_25 I:21D2/24D-8/TMM2068D_25 I:21F6/30D-8/T I:21F7/31D-8/TMM2068D_25 I:21F4/29D-8/TMM2068D_25 I:21F2/28D-8/ I:21F2/28D-18/TMM2068D_25
UUA2		18	O:17E5/32G-16/AM29841! O:17E7/31G-16/AM29841! I:21B7/19D-18/TMM2068D_25 I:21B6/18D-18/TMM2068D_25 I:21B4/17D-18/TMM2068D_25 I:21B2/16D-18/TMM2068D_25 I:21C6/22D-1 I:21C7/23D-18/TMM2068D_25 I:21C4/21D-18/TMM2068D_25 I:21C2/20D-18/TMM2068D_25 I:21D6/26D-18/TMM2068D_25 I:21D7/27D-1 I:21D4/25D-18/TMM2068D_25 I:21D2/24D-18/TMM2068D_25 I:21F6/30D-18/TMM2068D_25 I:21F7/31D-18/TMM2068D_25 I:21F4/29D-1 I:21F2/28D-18/TMM2068D_25
UUA3		18	O:17E5/32G-17/AM29841! O:17E7/31G-17/AM29841! I:21B7/19D-19/TMM2068D_25 I:21B6/18D-19/TMM2068D_25 I:21B4/17D-19/TMM2068D_25 I:21B2/16D-19/TMM2068D_25 I:21C6/22D-1 I:21C7/23D-19/TMM2068D_25 I:21C4/21D-19/TMM2068D_25 I:21C2/20D-19/TMM2068D_25 I:21D6/26D-19/TMM2068D_25 I:21D7/27D-1 I:21D4/25D-19/TMM2068D_25 I:21D2/24D-19/TMM2068D_25

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I:21F6/30D-19/TMM2068D_25 I:21F7/31D-19/TMM2068D_25 I:21F4/29D-1
I:21F2/28D-19/TMM2068D_25
UUA4 18 O:17E5/32G-18/AM29841! O:17E7/31G-18/AM29841!
I:21B7/19D-1/TMM2068D_25 I:21B6/18D-1/TMM2068D_25 I:21B4/17D-1/
I:21B2/16D-1/TMM2068D_25 I:21C6/22D-1/TMM2068D_25 I:21C7/23D-1/T
I:21C4/21D-1/TMM2068D_25 I:21C2/20D-1/TMM2068D_25 I:21D6/26D-1/T
I:21D7/27D-1/TMM2068D_25 I:21D4/25D-1/TMM2068D_25 I:21D2/24D-1/T
I:21F6/30D-1/TMM2068D_25 I:21F7/31D-1/TMM2068D_25 I:21F4/29D-1/
I:21F2/28D-1/TMM2068D_25
UUA5 18 O:17E5/32G-19/AM29841! O:17E7/31G-19/AM29841!
I:21B7/19D-2/TMM2068D_25 I:21B6/18D-2/TMM2068D_25 I:21B4/17D-2/
I:21B2/16D-2/TMM2068D_25 I:21C6/22D-2/TMM2068D_25 I:21C7/23D-2/T
I:21C4/21D-2/TMM2068D_25 I:21C2/20D-2/TMM2068D_25 I:21D6/26D-2/T
I:21D7/27D-2/TMM2068D_25 I:21D4/25D-2/TMM2068D_25 I:21D2/24D-2/T
I:21F6/30D-2/TMM2068D_25 I:21F7/31D-2/TMM2068D_25 I:21F4/29D-2/
I:21F2/28D-2/TMM2068D_25
UUA6 18 O:17E5/32G-20/AM29841! O:17E7/31G-20/AM29841!
I:21B7/19D-3/TMM2068D_25 I:21B6/18D-3/TMM2068D_25 I:21B4/17D-3/
I:21B2/16D-3/TMM2068D_25 I:21C6/22D-3/TMM2068D_25 I:21C7/23D-3/T
I:21C4/21D-3/TMM2068D_25 I:21C2/20D-3/TMM2068D_25 I:21D6/26D-3/T
I:21D7/27D-3/TMM2068D_25 I:21D4/25D-3/TMM2068D_25 I:21D2/24D-3/T
I:21F6/30D-3/TMM2068D_25 I:21F7/31D-3/TMM2068D_25 I:21F4/29D-3/
I:21F2/28D-3/TMM2068D_25
UUA7 18 O:17E5/32G-21/AM29841! O:17E7/31G-21/AM29841!
I:21B7/19D-4/TMM2068D_25 I:21B6/18D-4/TMM2068D_25 I:21B4/17D-4/
I:21B2/16D-4/TMM2068D_25 I:21C6/22D-4/TMM2068D_25 I:21C7/23D-4/T
I:21C4/21D-4/TMM2068D_25 I:21C2/20D-4/TMM2068D_25 I:21D6/26D-4/T
I:21D7/27D-4/TMM2068D_25 I:21D4/25D-4/TMM2068D_25 I:21D2/24D-4/T
I:21F6/30D-4/TMM2068D_25 I:21F7/31D-4/TMM2068D_25 I:21F4/29D-4/
I:21F2/28D-4/TMM2068D_25
UUA8 18 O:17E5/32G-22/AM29841! O:17E7/31G-22/AM29841!
I:21B7/19D-5/TMM2068D_25 I:21B6/18D-5/TMM2068D_25 I:21B4/17D-5/
I:21B2/16D-5/TMM2068D_25 I:21C6/22D-5/TMM2068D_25 I:21C7/23D-5/T
I:21C4/21D-5/TMM2068D_25 I:21C2/20D-5/TMM2068D_25 I:21D6/26D-5/T
I:21D7/27D-5/TMM2068D_25 I:21D4/25D-5/TMM2068D_25 I:21D2/24D-5/T
I:21F6/30D-5/TMM2068D_25 I:21F7/31D-5/TMM2068D_25 I:21F4/29D-5/
I:21F2/28D-5/TMM2068D_25
UUA9 18 O:17E5/32G-23/AM29841! O:17E7/31G-23/AM29841!
I:21B7/19D-6/TMM2068D_25 I:21B6/18D-6/TMM2068D_25 I:21B4/17D-6/
I:21B2/16D-6/TMM2068D_25 I:21C6/22D-6/TMM2068D_25 I:21C7/23D-6/T
I:21C4/21D-6/TMM2068D_25 I:21C2/20D-6/TMM2068D_25 I:21D6/26D-6/T
I:21D7/27D-6/TMM2068D_25 I:21D4/25D-6/TMM2068D_25 I:21D2/24D-6/T
I:21F6/30D-6/TMM2068D_25 I:21F7/31D-6/TMM2068D_25 I:21F4/29D-6/
I:21F2/28D-6/TMM2068D_25
VAL 2 O:39C7/34D-B4/ND_DELDGA! I:40G6/33B-11/74LS244
VCC 158 $$OVERFLOW$$ I:3C4/RN13-1/4610X_101_102
I:3C6/RN13-1/4610X_101_102 B:3H1/B-A2!! B:3H1/B-B2!! B:3H1/B-C2
I:3F5/RN13-1/4610X_101_102 B:3H1/B-A31!! B:3H2/B-B31!! B:3H2/B-
B:4G3/C-A31!! B:4G3/C-B31!! B:4G3/C-C31!! B:4D1/RN3-1/4610X_101
B:4D1/RN3-1/4610X_101_102! B:4D1/RN3-1/4610X_101_102!
B:4D1/RN3-1/4610X_101_102! B:4D1/RN3-1/4610X_101_102!
B:4D1/RN3-1/4610X_101_102! B:4D1/RN3-1/4610X_101_102!
B:4D1/RN3-1/4610X_101_102! B:4G2/C-A2!! B:4G2/C-B2!! B:4G3/C-C2
I:7E1/RN3-1/4610X_101_102 I:7E1/RN13-1/4610X_101_102
I:7E1/RN13-1/4610X_101_102 I:11E2/RN19-1/4610X_101_102
I:11E2/RN19-1/4610X_101_102 I:11E2/RN19-1/4610X_101_102
I:11E2/RN19-1/4610X_101_102 I:11E2/RN19-1/4610X_101_102 I:11D5/6
I:11F2/RN19-1/4610X_101_102 I:11D4/7B-22/74AS646 I:11F2/RN20-1/4
I:11G2/RN20-1/4610X_101_102 I:11G2/RN20-1/4610X_101_102

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			I:11G2/RN20-1/4610X_101_102 I:11G2/RN20-1/4610X_101_102
			I:11G2/RN20-1/4610X_101_102 I:11G2/RN20-1/4610X_101_102
			I:11F2/RN20-1/4610X_101_102 I:19C6/26B-1/27256 I:19C4/23B-1/2725
			B:25F6/RN14-1/4610X_101_102! B:25F6/RN14-1/4610X_101_102!
			I:26B4/RN9-1/4610X_101_102 I:26C4/RN9-1/4610X_101_102
			I:33B7/28F-B2/ND_DELILAH I:33B7/28F-R2/ND_DELILAH I:33B7/28F-K3
VEX		3	T:34D4/22F-16/PAL16R4D! I:34E3/29H-10/74F32
			I:36E5/13D-11/PAL16L8D
WAIT1	£36	2	I:36D4/12D-5/PAL16R6D O:36C6/14G-6/74F08!
WAIT2	£36	2	I:36D4/12D-6/PAL16R6D O:36B6/25H-8/74F00!
WBD~		4	I:10D6/6A-3/74AS648 I:10D4/5A-3/74AS648
			I:10D2/4A-3/74AS648 O:12E4/2C-19/PAL16L8D!
WCA~		12	B:18B2/15F-14/PAL16L8D! I:24A2/21G-9/PAL16L8D
			B:25F5/18F-18/PAL16R4D! I:25D6/24F-21/TMM2018D_25 I:25B6/20F-21
			I:25B3/16F-21/TMM2018D_25 I:25G3/21F-18/AM9150_20 I:25D3/23F-21/
			I:31D3/11G-1/74PCT244 I:31D3/11G-19/74PCT244 I:31D5/10G-1/74PCT2
			I:31D5/10G-19/74PCT244
WCHIM~		3	I:24A2/21G-5/PAL16L8D I:24A3/32C-9/74F32
			O:39C7/34D-L1/ND_DELIDGA!
WCINH~		3	I:25E6/17F-11/74F10 I:26C5/24H-2/74F74
			O:29F4/20G-8/IMS1400_25!
WCLIM~		2	O:24A3/32C-8/74F32! I:29F4/20G-9/IMS1400_25
WCSTB~	£18	2	O:18B2/15F-12/PAL16L8D! I:18D2/30B-15/74F139
WCS~		10	I:18B2/15F-7/PAL16L8D I:20B7/28B-1/74LS245
			I:20B6/24B-1/74LS245 I:20B4/20B-1/74LS245 I:20B3/16B-1/74LS245
			I:20C7/29B-1/74LS245 I:20C6/27B-1/74LS245 I:20C4/21B-1/74LS245
			I:20C3/19B-1/74LS245 O:33B7/28F-P3/ND_DELILAH!
WICA~	£18	5	O:18B2/15F-19/PAL16L8D! I:18E2/29J-2/74F08
			I:18E2/29J-5/74F08 I:18E3/29J-10/74F08 I:18E3/29J-13/74F08
WLBD~		3	I:11D5/6B-3/74AS646 I:11D4/7B-3/74AS646
			O:12E4/2C-12/PAL16L8D!
WMAF~		5	O:24A3/17F-6/74F10! I:29B3/22C-21/TMM2018D_25
			I:29D3/24G-21/TMM2018D_25 I:29B6/23G-21/TMM2018D_25
			I:29D6/25G-21/TMM2018D_25
WMM~	£40	2	I:40G4/32B-11/74LS374 B:40D7/35C-25/MC68705U3!
WRCLK~	£40	2	I:40C4/34A-3/MMS8274 B:40D7/35C-26/MC68705U3!
WRFSTB		2	I:32E7/17F-2/74F10 B:36E5/13D-18/PAL16L8D!
WRITE		7	I:12E4/2C-7/PAL16L8D I:24A2/21G-2/PAL16L8D
			I:24A3/17F-4/74F10 I:30D3/17B-1/74PCT245 I:30D5/18B-1/74PCT245
			O:39C7/34D-N6/ND_DELIDGA! I:45C4/9G-2/PAL16R4D
WTRTF		5	I:32F5/34F-20/TMM2018D_25 I:32F7/35F-20/TMM2018D_25
			I:32E7/17F-1/74F10 O:33B7/28F-D5/ND_DELILAH! I:34D3/19F-7/PAL16
WU~0		5	O:18E2/29J-3/74F08! I:21F6/30D-11/TMM2068D_25
			I:21F7/31D-11/TMM2068D_25 I:21F4/29D-11/TMM2068D_25
			I:21F2/28D-11/TMM2068D_25
WU~1		5	O:18E2/29J-6/74F08! I:21D6/26D-11/TMM2068D_25
			I:21D7/27D-11/TMM2068D_25 I:21D4/25D-11/TMM2068D_25
			I:21D2/24D-11/TMM2068D_25
WU~2		5	O:18E3/29J-8/74F08! I:21C6/22D-11/TMM2068D_25
			I:21C7/23D-11/TMM2068D_25 I:21C4/21D-11/TMM2068D_25
			I:21C2/20D-11/TMM2068D_25
WU~3		5	O:18E3/29J-11/74F08! I:21B7/19D-11/TMM2068D_25
			I:21B6/18D-11/TMM2068D_25 I:21B4/17D-11/TMM2068D_25
			I:21B2/16D-11/TMM2068D_25
WN~0		6	O:18D2/30B-12/74F139! I:18E2/29J-1/74F08
			I:22F6/30C-11/TMM2068D_25 I:22F7/31C-11/TMM2068D_25
			I:22F4/29C-11/TMM2068D_25 I:22F2/28C-11/TMM2068D_25
WN~1		6	O:18D2/30B-11/74F139! I:18E2/29J-4/74F08
			I:22D6/26C-11/TMM2068D_25 I:22D7/27C-11/TMM2068D_25
			I:22D4/25C-11/TMM2068D_25 I:22D2/24C-11/TMM2068D_25

WW~2	6	O:18D2/30B-10/74F139! I:18E3/29J-9/74F08 I:22C6/22C-11/TMM2068D_25 I:22C7/23C-11/TMM2068D_25 I:22C4/21C-11/TMM2068D_25 I:22C2/20C-11/TMM2068D_25
WW~3	6	O:18D2/30B-9/74F139! I:18E3/29J-12/74F08 I:22B7/19C-11/TMM2068D_25 I:22B6/18C-11/TMM2068D_25 I:22B4/17C-11/TMM2068D_25 I:22B2/16C-11/TMM2068D_25
XBGNT~	2	O:3A4/16A-14/74LS244! I:3B4/B-A10/
XCA0	2	I:3G4/B-A26/ O:3F4/15C-3/74LS244!
XCA1	2	I:3G4/B-C26/ O:3F4/15C-5/74LS244!
XCA2	2	I:3G4/B-A25/ O:3F4/15C-7/74LS244!
XCA3	2	I:3G4/B-C25/ O:3F4/15C-9/74LS244!
XCA4	2	I:3G4/B-A24/ O:3F4/15C-12/74LS244!
XCA5	2	I:3G4/B-C24/ O:3F4/15C-14/74LS244!
XCA6	2	I:3G4/B-A23/ O:3F4/15C-16/74LS244!
XCA7	2	I:3G3/B-C23/ O:3F4/15C-18/74LS244!
XCA8	2	I:3G3/B-A30/ O:3F3/16G-3/74LS244!
XCA9	2	I:3G3/B-C30/ O:3F3/16G-5/74LS244!
XCGNT~	2	O:3A4/16A-12/74LS244! I:3C4/B-B16/
XCLK	2	O:3A4/16A-16/74LS244! I:3C3/B-C10/
XCOMM0	2	T:3A7/21A-12/74LS374! I:3B6/B-A13/
XCOMM1	2	T:3A7/21A-9/74LS374! I:3C6/B-C12/
XCOMM2	2	T:3A7/21A-6/74LS374! I:3B6/B-A11/
XCOMM3	2	T:3A7/21A-5/74LS374! I:3C6/B-C11/
XCOMM4	2	T:3A7/21A-2/74LS374! I:3B6/B-C13/
XIDB0	4	O:3D3/19A-3/74LS244! O:3D6/20A-3/74LS244! O:3E7/4G-3/74F244! I:3E3/B-A17/
XIDB1	4	O:3D3/19A-5/74LS244! O:3D6/20A-5/74LS244! O:3E7/4G-5/74F244! I:3E3/B-C17/
XIDB10	4	O:3D2/17A-7/74LS244! O:3D4/18A-7/74LS244! O:3D7/5G-7/74F244! I:3E1/B-A21/
XIDB11	4	O:3D2/17A-9/74LS244! O:3D4/18A-9/74LS244! O:3D7/5G-9/74F244! I:3E1/B-C21/
XIDB12	4	O:3D2/17A-12/74LS244! O:3D4/18A-12/74LS244! O:3D7/5G-12/74F244! I:3E1/B-A19/
XIDB13	4	O:3D2/17A-14/74LS244! O:3D4/18A-14/74LS244! O:3D7/5G-14/74F244! I:3E1/B-C19/
XIDB14	4	O:3D2/17A-16/74LS244! O:3D4/18A-16/74LS244! O:3D7/5G-16/74F244! I:3E1/B-A22/
XIDB15	4	O:3D2/17A-18/74LS244! O:3D4/18A-18/74LS244! O:3D7/5G-18/74F244! I:3E1/B-C22/
XIDB2	4	O:3D3/19A-7/74LS244! O:3D6/20A-7/74LS244! O:3E7/4G-7/74F244! I:3E3/B-A18/
XIDB3	4	O:3D3/19A-9/74LS244! O:3D6/20A-9/74LS244! O:3E7/4G-9/74F244! I:3E3/B-C18/
XIDB4	4	O:3D3/19A-12/74LS244! O:3D6/20A-12/74LS244! O:3E7/4G-12/74F244! I:3E2/B-C16/
XIDB5	4	O:3D3/19A-14/74LS244! O:3D6/20A-14/74LS244! O:3E7/4G-14/74F244! I:3E2/B-A16/
XIDB6	4	O:3D3/19A-16/74LS244! O:3D6/20A-16/74LS244! O:3E7/4G-16/74F244! I:3E2/B-C15/
XIDB7	4	O:3D3/19A-18/74LS244! O:3D6/20A-18/74LS244! O:3E7/4G-18/74F244! I:3E2/B-A15/
XIDB8	4	O:3D2/17A-3/74LS244! O:3D4/18A-3/74LS244! O:3D7/5G-3/74F244! I:3E2/B-C20/
XIDB9	4	O:3D2/17A-5/74LS244! O:3D4/18A-5/74LS244! O:3D7/5G-5/74F244! I:3E2/B-A20/
XLA10	2	I:3G3/B-A29/ O:3F3/16G-7/74LS244!
XLA11	2	I:3G3/B-C29/ O:3F3/16G-9/74LS244!
XLA12	2	I:3G2/B-A28/ O:3F3/16G-12/74LS244!
XLA13	2	I:3G2/B-C28/ O:3F3/16G-14/74LS244!

XLA14	2	I:3G2/B-A27/ O:3F3/16G-16/74LS244!
XLA15	2	I:3G2/B-C27/ O:3F3/16G-18/74LS244!
XLA16	2	I:3G2/B-B27/ O:3F2/17G-3/74LS244!
XLA17	2	I:3G2/B-B26/ O:3F2/17G-5/74LS244!
XLA18	2	I:3G1/B-B23/ O:3F2/17G-7/74LS244!
XLA19	2	I:3G1/B-B24/ O:3F2/17G-9/74LS244!
XLA20	2	I:3G1/B-B25/ O:3F2/17G-12/74LS244!
XLA21	2	I:3G1/B-B30/ O:3F2/17G-14/74LS244!
XLA22	2	I:3G1/B-B28/ O:3F2/17G-16/74LS244!
XLA23	2	I:3G1/B-B29/ O:3F2/17G-18/74LS244!
XLCS~	2	O:3A4/16A-9/74LS244! I:3B4/B-A12/
XLSHADOW	2	O:3A4/16A-5/74LS244! I:3B4/B-B21/
XLUA0	2	O:3A3/22A-9/74LS244! I:3B3/B-C8/
XLUA1	2	O:3A3/22A-12/74LS244! I:3C2/B-A9/
XLUA10	2	O:3A2/23A-14/74LS244! I:3B1/B-C5/
XLUA11	2	O:3A2/23A-16/74LS244! I:3C1/B-A6/
XLUA12	2	O:3A2/23A-18/74LS244! I:3B1/B-A8/
XLUA2	2	O:3A3/22A-14/74LS244! I:3B2/B-C7/
XLUA3	2	O:3A3/22A-16/74LS244! I:3C2/B-A7/
XLUA4	2	O:3A3/22A-18/74LS244! I:3B2/B-A3/
XLUA5	2	O:3A2/23A-3/74LS244! I:3C2/B-C3/
XLUA6	2	O:3A2/23A-5/74LS244! I:3B1/B-A4/
XLUA7	2	O:3A2/23A-7/74LS244! I:3C1/B-C4/
XLUA8	2	O:3A2/23A-9/74LS244! I:3B1/B-A5/
XLUA9	2	O:3A2/23A-12/74LS244! I:3C1/B-C6/
XMOR~	2	O:3A4/16A-7/74LS244! I:3C4/B-B18/
XPIL0	2	O:3A4/16A-18/74LS244! I:3B3/B-B9/
XPIL1	2	O:3A3/22A-3/74LS244! I:3C3/B-B10/
XPIL2	2	O:3A3/22A-5/74LS244! I:3B3/B-B12/
XPIL3	2	O:3A3/22A-7/74LS244! I:3C3/B-B11/
XS11E41	E41 2	B:41C5/TH1-4/217057GF! O:41C5/RN9-3/4610X_101_102!
XS116E41	E41 3	I:41C2/27A-2/74PCT244 B:41A1/STR2-2/STR2! B:41A1/RN8-2/4610X_101_103!
XS117E36	E36 2	O:36B6/25H-6/74F00! I:36C6/14G-5/74F08
XS117E41	E41 3	I:41C2/27A-4/74PCT244 B:41A2/STR3-2/STR2! B:41B1/RN8-3/4610X_101_103!
XS118E41	E41 3	I:41C2/27A-6/74PCT244 B:41A2/STR4-2/STR2! B:41B1/RN8-4/4610X_101_103!
XS119E41	E41 3	I:41C2/27A-8/74PCT244 B:41A2/STR5-2/STR2! B:41B1/RN8-5/4610X_101_103!
XS120E41	E41 3	I:41C2/27A-11/74PCT244 B:41A2/STR6-2/STR2! B:41B1/RN8-6/4610X_101_103!
XS120E42	E42 2	B:42F3/R7-1/2200HM! B:42F3/D4-1/1N4148!
XS121E41	E41 3	I:41C2/27A-13/74PCT244 B:41A2/STR7-2/STR2! B:41B1/RN8-7/4610X_101_103!
XS122E41	E41 3	I:41C2/27A-15/74PCT244 B:41A3/STR8-2/STR2! B:41B1/RN8-8/4610X_101_103!
XS123E41	E41 3	I:41C2/27A-17/74PCT244 B:41A3/STR9-2/STR2! B:41B1/RN8-9/4610X_101_103!
XS124E36	E36 2	B:36E5/13D-15/PAL16L8D! I:36F5/14G-2/74F08
XS124E41	E41 3	B:41A4/STR10-2/STR2! I:41C5/25A-4/74PCT244 B:41A4/RN7-5/4610X_101_103!
XS125E36	E36 2	I:36F2/14C-1/74F00 B:36E1/R18-2/2.2KOHM!
XS125E41	E41 3	I:41C5/25A-6/74PCT244 B:41A4/STR11-2/STR2! B:41A4/RN7-6/4610X_101_103!
XS126E41	E41 3	I:41C5/25A-8/74PCT244 B:41A4/STR12-2/STR2! B:41A4/RN7-7/4610X_101_103!
XS127E25	E25 2	I:25F5/18F-9/PAL16R4D O:25E6/17F-8/74F10!
XS130E42	E42 4	B:42E5/R2-1/5.6KOHM! B:42E5/D5-1/1N4148! B:42E6/R3-1/2.2KOHM! I:42F6/7F-3/74F14

XS14E38	E38	2	O:38D1/13C-6/74LS393! I:38E2/13C-13/74LS393
XS147E40	E40	5	B:40B1/T2-3/2N2907! B:40D2/C4-1/100nF! I:40C4/34A-16/MM58274 B:40C1/D2-2/1N4148! O:40C1/R16-2/10KOHM!
XS148E25	E25	2	B:25F6/RN14-2/4610X_101_102! B:25F7/LED1-1/RED!
XS156E50	E50	2	B:50D2/R22-2/330OHM! B:50D2/LED6-1/GREEN!
XS157E50	E50	2	B:50E2/LED7-1/YELLOW! B:50E2/R23-2/330OHM!
XS16E26	E26	2	O:26B4/RN9-6/4610X_101_102! I:26C5/24H-1/74F74
XS166E50	E50	2	B:50D2/LED6-2/GREEN! O:50D3/12G-4/74LS123!
XS167E50	E50	2	B:50E2/LED7-2/YELLOW! O:50E3/12G-12/74LS123!
XS168E40	E40	2	I:40C4/34A-1/MM58274 B:40B3/T1-3/2N2222!
XS174E40	E40	3	I:40A2/T3-2/2N2907 B:40A3/D3-2/4.3V_ZENER! O:40A2/R13-2/4.7KOHM!
XS175E40	E40	2	B:40A3/D3-1/4.3V_ZENER! I:40A3/R14-1/2.2KOHM
XS176E50	E50	3	I:50D3/12G-15/74LS123 O:50D2/R24-2/180KOHM! B:50D2/C13-1/2.2uF!
XS178E40	E40	2	B:40A2/T3-3/2N2907! I:40B3/R12-1/10KOHM
XS179E50	E50	3	I:50E3/12G-7/74LS123 B:50E2/C14-1/2.2uF! O:50E2/R25-2/180KOHM!
XS18E26	E26	2	O:26C4/RN9-7/4610X_101_102! I:26C5/24H-4/74F74
XS18E36	E36	2	O:36E5/13D-19/PAL16L8D! I:36F3/14C-10/74F00
XS184E40	E40	2	O:40B3/R12-2/10KOHM! I:40B3/T1-2/2N2222
XS19E36	E36	2	O:36E5/13D-12/PAL16L8D! I:36F4/14C-13/74F00
XS195E40	E40	2	I:40C2/BATT1-2/BATT1 B:40C1/D2-1/1N4148!
XS197E40	E40	2	I:40B1/T2-2/2N2907 I:40C1/R16-1/10KOHM
XS2E7	E7	2	I:7D2/3A-4/74F241 O:7C1/1F-6/74F04!
XS200E40	E40	2	B:40E4/TP7-1/TESTPOINT! O:40C4/34A-13/MM58274!
XS21E7	E7	2	I:7D4/2A-5/7438 O:7D5/8G-6/74F00!
XS26E38	E38	2	O:38B2/12F-6/74S132! I:38C1/11F-2/74S37
XS268E33	E33	3	I:33B7/28F-S17/ND_DELILAH B:33A5/RN12-4/4610X_101_103! B:33A6/STR15-2/STR2!
XS269E33	E33	3	I:33B7/28F-R14/ND_DELILAH B:33A5/RN12-3/4610X_101_103! B:33A6/STR14-2/STR2!
XS27E7	E7	2	O:7D4/1F-10/74F04! I:7D4/2A-1/7438
XS270E33	E33	3	B:33A6/STR13-2/STR2! I:33B7/28F-S16/ND_DELILAH B:33A5/RN12-2/4610X_101_103!
XS277E33	E33	2	I:33B7/28F-P7/ND_DELILAH B:33A6/RN12-5/4610X_101_103!
XS278E33	E33	2	I:33B7/28F-S6/ND_DELILAH B:33A6/RN12-6/4610X_101_103!
XS281E33	E33	2	I:33B7/28F-P13/ND_DELILAH B:33A7/RN12-9/4610X_101_103!
XS295E33	E33	2	I:33B7/28F-Q5/ND_DELILAH B:33A7/RN12-8/4610X_101_103!
XS3E33	E33	2	T:33A4/34G-9/74PCT374! I:33B7/28F-S13/ND_DELILAH
XS3E42	E42	2	B:42B7/TH2-6/217057GF! I:42C6/33G-11/AM29C821
XS30E38	E38	5	I:38B3/12F-10/74S132 B:38A3/D1-1/3.3V_ZENER! I:38A4/R11-1/1KOHM B:38A4/C3-1/10nF! I:38B4/12F-12/74S132
XS310E48	E48	2	B:48E4/3F-18/PAL16L8D! I:48F4/7A-13/7407
XS32E40	E40	3	I:40C4/34A-15/MM58274 B:40C3/X2-1/32.768KHZ! B:40D3/C5-1/22pF!
XS321E48	E48	2	I:48C7/14F-4/AM29C821 O:48C7/14F-22/AM29C821!
XS322E48	E48	2	I:48C4/13F-3/AM29C821 O:48C4/13F-23/AM29C821!
XS323E48	E48	2	I:48C4/13F-5/AM29C821 O:48C4/13F-21/AM29C821!
XS327E48	E48	2	I:48C7/14F-6/AM29C821 O:48C7/14F-20/AM29C821!
XS328E48	E48	2	I:48C7/14F-7/AM29C821 O:48C7/14F-19/AM29C821!
XS329E48	E48	2	I:48C7/14F-8/AM29C821 O:48C7/14F-18/AM29C821!
XS33E40	E40	3	O:40C4/34A-14/MM58274! B:40C3/X2-2/32.768KHZ! B:40D3/C6-1/22pF!
XS340E45	E45	2	I:45E2/7G-1/PAL16R8B O:45C2/2D-9/74F74!
XS360E3	E3	6	I:3D6/20A-1/74LS244 I:3D6/20A-19/74LS244 I:3D4/18A-1/74LS244 I:3D4/18A-19/74LS244 B:3C5/STR17-1/STR1! O:3C4/RN13-4/4610X_101_102!
XS372E3	E3	6	I:3D7/5G-1/74F244 I:3D7/5G-19/74F244 I:3E7/4G-1/74F244 I:3E7/4G-19/74F244 B:3C7/STR18-1/STR1! O:3C6/RN13-5/4610X_101_1

XS374E45	E45	3	O:45C1/RN18-7/4610X_101_102! I:45C2/2D-12/74F74 I:45C2/2D-10/74F74
XS375E45	E45	2	I:45E7/2D-4/74F74 O:45E6/RN18-6/4610X_101_102!
XS38E7	E7	2	I:7E7/2A-10/7438 O:7D7/9D-10/74F02!
XS382E45	E45	2	I:45G3/8K-10/HP5082_7433 O:45F2/8H-13/74LS248!
XS383E45	E45	2	I:45G3/8K-8/HP5082_7433 O:45F2/8H-12/74LS248!
XS384E45	E45	2	I:45G3/8K-5/HP5082_7433 O:45F2/8H-11/74LS248!
XS385E45	E45	2	I:45G3/8K-3/HP5082_7433 O:45F2/8H-10/74LS248!
XS386E45	E45	2	I:45G3/8K-2/HP5082_7433 O:45F2/8H-9/74LS248!
XS387E45	E45	2	I:45G3/8K-11/HP5082_7433 O:45F2/8H-15/74LS248!
XS388E45	E45	2	I:45G3/8K-9/HP5082_7433 O:45F2/8H-14/74LS248!
XS4E26	E26	2	I:26D4/27H-17/74PCT244 O:26C5/24H-6/74F74!
XS4E33	E33	2	T:33A4/34G-12/74PCT374! I:33B7/28F-R12/ND_DELILAH
XS4E42	E42	2	B:42B7/TH2-2/217057GF! I:42C6/33G-10/AM29C821
XS428E47	E47	2	I:47C2/7C-8/74PCT374 B:47B1/RN4-4/4610X_101_222!
XS429E47	E47	2	I:47C2/7C-13/74PCT374 B:47B1/RN4-3/4610X_101_222!
XS44E41	E41	2	B:41E2/LED2-1/RED! O:41E2/RN14-4/4610X_101_102!
XS45E41	E41	2	B:41E2/LED3-1/GREEN! O:41E2/RN14-5/4610X_101_102!
XS453E3	E3	6	I:3D2/17A-1/74LS244 I:3D2/17A-19/74LS244 I:3D3/19A-1/74LS244 I:3D3/19A-19/74LS244 B:3C2/STR16-1/STR1! O:3C2/RN13-3/4610X_101_102!
XS48E41	E41	2	O:41F4/29A-6/74F08! I:41F4/14A-1/74LS38
XS48E7	E7	2	O:7D3/2B-3/74F00! I:7E3/2B-4/74F00
XS5E33	E33	2	T:33A4/34G-15/74PCT374! I:33B7/28F-N10/ND_DELILAH
XS5E38	E38	2	O:38B2/12F-3/74S132! I:38B2/12F-5/74S132
XS5E42	E42	2	B:42B7/TH2-5/217057GF! I:42C6/33G-9/AM29C821
XS51E7	E7	2	I:7E3/2B-9/74F00 O:7E3/2B-6/74F00!
XS52E7	E7	2	I:7E3/2B-10/74F00 O:7E3/1F-8/74F04!
XS56E7	E7	2	I:7D5/8G-4/74F00 O:7C5/8G-3/74F00!
XS57E7	E7	2	I:7C5/8G-1/74F00 O:7C4/1F-12/74F04!
XS58E41	E41	2	O:41E4/28A-9/74LS273! B:41E2/LED3-2/GREEN!
XS6E33	E33	2	T:33A4/34G-16/74PCT374! I:33B7/28F-S12/ND_DELILAH
XS6E38	E38	2	O:38B2/7F-8/74F14! I:38B2/12F-4/74S132
XS6E41	E41	2	B:41C5/TH1-3/217057GF! I:41C5/25A-11/74PCT244
XS6E42	E42	2	B:42B7/TH2-3/217057GF! I:42C6/33G-8/AM29C821
XS611E44	E44	3	O:44B5/4H-14/AM29821! O:44B2/3H-14/AM29821! B:44D4/5H-11/74FCT861B!
XS612E44	E44	3	O:44B5/4H-15/AM29821! O:44B2/3H-15/AM29821! B:44D4/5H-10/74FCT861B!
XS613E44	E44	3	O:44B5/4H-16/AM29821! O:44B2/3H-16/AM29821! B:44D4/5H-9/74FCT861B!
XS614E44	E44	3	O:44B5/4H-17/AM29821! O:44B2/3H-17/AM29821! B:44D4/5H-8/74FCT861B!
XS615E44	E44	3	O:44B5/4H-18/AM29821! O:44B2/3H-18/AM29821! B:44D4/5H-7/74FCT861B!
XS616E44	E44	3	O:44B5/4H-19/AM29821! O:44B2/3H-19/AM29821! B:44D4/5H-6/74FCT861B!
XS617E44	E44	3	O:44B5/4H-20/AM29821! O:44B2/3H-20/AM29821! B:44D4/5H-5/74FCT861B!
XS618E44	E44	3	O:44B5/4H-21/AM29821! O:44B2/3H-21/AM29821! B:44D4/5H-4/74FCT861B!
XS619E44	E44	3	O:44B5/4H-22/AM29821! O:44B2/3H-22/AM29821! B:44D4/5H-3/74FCT861B!
XS62E40	E40	2	B:40D7/X3-2/4MHZ! I:40D7/35C-6/MC68705U3
XS620E44	E44	3	O:44B5/4H-23/AM29821! O:44B2/3H-23/AM29821! B:44D4/5H-2/74FCT861B!
XS622E44	E44	2	I:44D4/5H-1/74FCT861B B:44D2/R15-2/2.2KOHM!
XS63E40	E40	3	B:40D7/X3-1/4MHZ! B:40D7/C7-1/22pF! I:40D7/35C-5/MC68705U3
XS65E41	E41	2	I:41F4/14A-2/74LS38 O:41F4/11B-6/74LS04!

XS69E41 £41 2 I:41F5/14A-10/74LS38 O:41F5/11B-8/74LS04!
 XS7E33 £33 2 T:33A4/34G-19/74PCT374! I:33B7/28F-Q10/ND_DELILAH
 XS7E41 £41 2 B:41C5/TH1-5/217057GF! I:41C5/25A-13/74PCT244
 XS73E38 £38 2 O:38B4/12F-11/74S132! I:38C4/32C-12/74F32
 XS76E36 £36 2 I:36B6/25H-10/74F00 O:36B6/32C-6/74F32!
 XS768E46 £46 2 I:46E5/8J-15/74LS112 O:46D5/14G-11/74F08!
 XS77E36 £36 2 I:36B6/25H-4/74F00 O:36B6/32C-3/74F32!
 XS786E46 £46 2 I:46E7/8J-14/74LS112 O:46D7/14G-8/74F08!
 XS790E46 £46 5 I:46E5/8J-3/74LS112 I:46E5/8J-4/74LS112
 I:46E7/8J-11/74LS112 I:46E7/8J-10/74LS112 O:46E4/RN14-8/4610X_1
 XS792E46 £46 2 O:46E5/8J-6/74LS112! B:46F5/LED4-2/RED!
 XS793E46 £46 2 B:46D5/LED5-1/RED! O:46D5/RN14-7/4610X_101_102!
 XS795E46 £46 2 B:46F5/LED4-1/RED! O:46F4/RN14-9/4610X_101_102!
 XS8E33 £33 2 I:33A4/34G-11/74PCT374 O:33A5/7F-6/74F14!
 XS8E38 £38 2 O:38B1/10F-12/74F10! I:38C1/11F-1/74S37
 XS8E41 £41 2 B:41C5/TH1-2/217057GF! I:41C5/25A-15/74PCT244
 XS80E42 £42 2 B:42B7/TH2-4/217057GF! O:42B6/RN9-2/4610X_101_102!
 XS83E17 £17 4 I:17E5/32G-1/AM29841 I:17D2/29H-5/74F32
 I:17D1/29H-2/74F32 O:17D6/11F-11/74S37!
 XS85E42 £42 2 O:42C5/RN7-4/4610X_101_103! I:42C6/33G-7/AM29C821
 XS87E17 £17 2 O:17D1/29H-3/74F32! I:17E2/30H-14/74F373
 XS88E17 £17 2 O:17D2/29H-6/74F32! I:17E2/30H-17/74F373
 XS9E41 £41 2 B:41C5/TH1-6/217057GF! I:41C5/25A-17/74PCT244
 XS91E42 £42 2 I:42B3/32H-21/SC2661 O:42A1/11B-2/74LS04!
 XS92E41 £41 3 O:41G3/11B-4/74LS04! I:41G3/2A-12/7438
 I:41G3/2A-13/7438
 XS93E36 £36 2 O:36F2/9D-4/74F02! I:36F2/9D-3/74F02
 XTAL1 £38 3 I:38D1/13C-1/74LS393 O:38A1/X4-3/39.3216MHZ!
 I:38B1/10F-1/74F10
 XTAL2 £38 2 O:38A2/X1-3/35MHZ! I:38B2/12F-2/74S132
 XTR 5 B:2E2/RN1-5/4610X_101_102! O:2D3/A-B4/! O:2D3/A-C23/!
 B:42B3/32H-25/SC2661! B:42B3/32H-9/SC2661!

SIGNAL TYPE: " " HIERARCHICAL BETWEEN BLOCKS
 ----- "+n" INTERPAGE ONLY ON BLOCK NO. n
 "Em" INTRAPAGE ONLY ON PAGE NO. m

\$FORMAT_CARD\$
16A 100C
\$END\$

CSBITS CSALUI(8:0),CSSST(1:0),CSRASEL(1:0),&
CSBITS CSXRF,CSRBSSEL(1:0),CSCISEL(1:0),CSALUM(1:0),CSMIS(1:0),&
CSBITS CSIDBS(4:0),CSCOMM(4:0),CSTS(6:3),CSDelay(1:0),CSVECT,&
CSBITS CSSCOND,CSECOND,CSLOOP,CSDLY,CSBIT20,CSRB(3:0),CSBIT(15:0)

TOPCSB CSALUI(8:7),CSALUM(1:0),CSMIS(1:0),CSIDBS(4:0),CSCOMM(4:0),&
TOPCSB CSDelay(1:0),CSECOND,CSLOOP,CSDLY

CYCCSB CSALUI(8:7),CSALUM(1:0),CSDelay(1:0),CSECOND,CSLOOP,CSDLY

IOCSB CSMIS(1:0),CSIDBS(4:0),CSCOMM(4:0)

PLUGCSB CSMIS(1:0),CSCOMM(4:0)

TIMING ALUCLK,CC~(3:1),CLK,CYD~,EORF~,ETRAP~,MACLK,MAP~,MCLK,OSC,TERM~,UCLK,WRF

CPUTIM ALUCLK,CC~(3:1),CLK,CYD~,EORF~,ETRAP~,MACLK,MAP~,MCLK,TERM~,UCLK,WRFSTB

CSTIM CC~(3:1),CLK,MACLK,TERM~

PROCTIM ALUCLK,CLK,ETRAP~,MAP~,MCLK,TERM~,UCLK,WRFSTB

MMUTIM CC~2,CYD~,EORF~,TERM~,UCLK

CYCTIM ALUCLK,CC~(3:1),CLK,CYD~,EORF~,ETRAP~,MACLK,MAP~,MCLK,TERM~,UCLK,WRFSTB

IOTIM CLK,EORF~,UCLK

BIFTIM CC~2,OSC,TERM~

CNTL ACOND~,BDRY50~,BGNT~,BGNT50~,BRK~,CA10,CCLR~,CGNT~,&

CNTL CGNTCACT~,CGNT50~,CLEAR~,CRQ~,CX~,DAP~,DT~,&

CNTL DVACC~,ECCR,ECEQ~,ECSR~,EDO~,EMCL~,&

CNTL EMPID~,ESTOF~,FETCH,FMISS,FORM~,&

CNTL GNT,HIT,IONI,IORQ~,LCS~,LERR~,LEV0,LPERR~,LSHADOW,&

CNTL MCL,MR~,MREQ~,MWRITE~,OPCLCS,PA~,PCR(1:0),&

CNTL PIL(3:0),PONI,PS~,REF~,REFRQ~,RERR~,&

CNTL RT~,RWCS~,SEMRQ50~,SHORT~,SLOW~,&

CNTL SSEMA~,STOC~,STP,TOUT,TRAP~,VEX,WCHIM~,WRITE

CPUCNTL ACOND~,BRK~,CA10,CCLR~,DOUBLE,DT~,DVACC~,ECCR,ECSR~,EDO~,&

CPUCNTL EMCL~,EMPID~,ESTOF~,FETCH,FMISS,FORM~,HIT,IONI,LCS~,LEV0,&

CPUCNTL LSHADOW,MR~,OPCLCS,PCR(1:0),PIL(3:0),PONI,RT~,RWCS~,STOC~,STP,&

CPUCNTL TRAP~,VEX,WCHIM~,WRITE

CPUCNTLI CA10,CCLR~,DT~,DVACC~,ECSR~,EDO~,&

CPUCNTLI EMCL~,EMPID~,ESTOF~,FETCH,FMISS,FORM~,LCS~,&

CPUCNTLI MR~,RT~,RWCS~,STOC~,STP,&

CPUCNTLI WCHIM~,WRITE

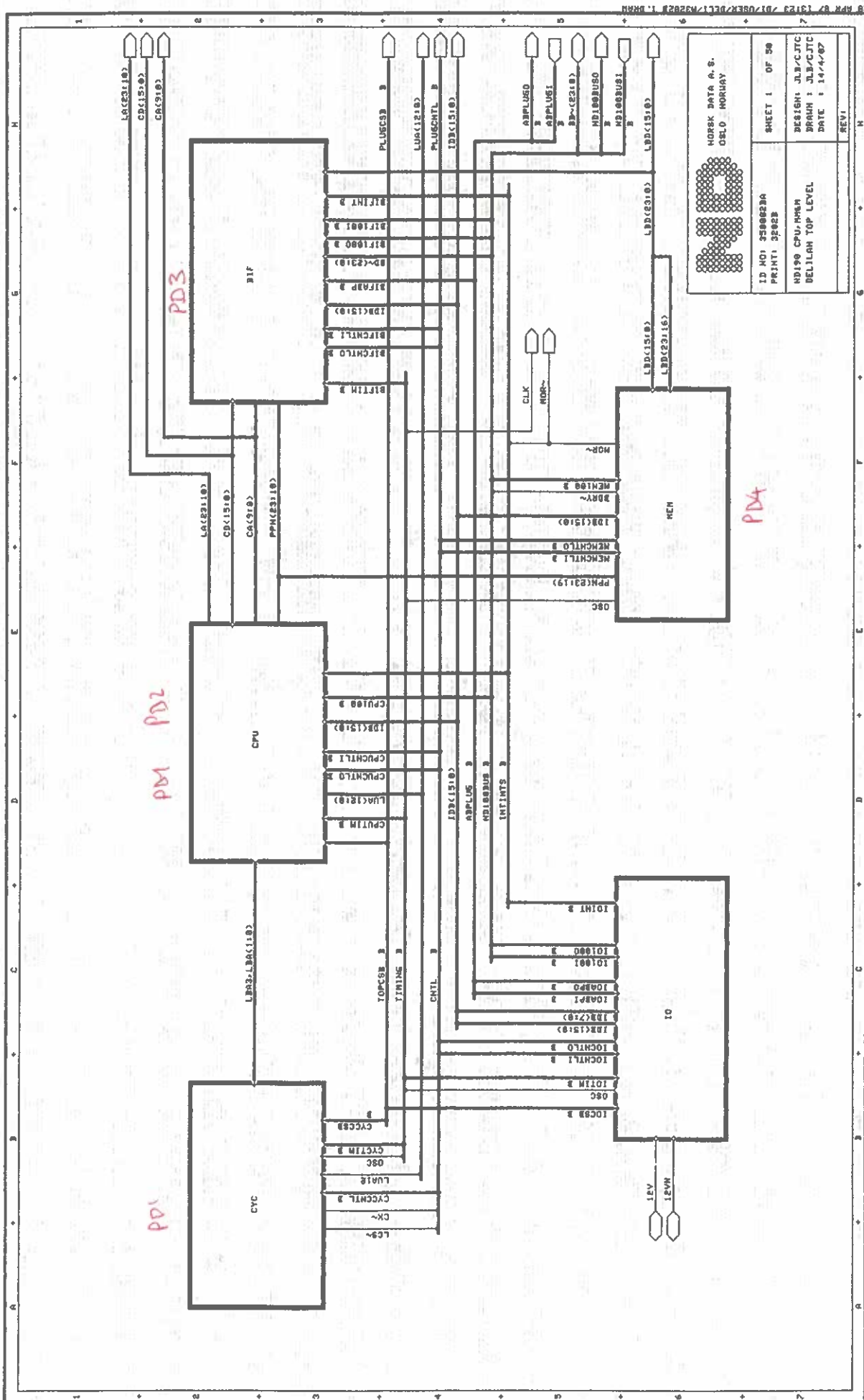
CPUCNTLO ACOND~,BRK~,ECCR,&

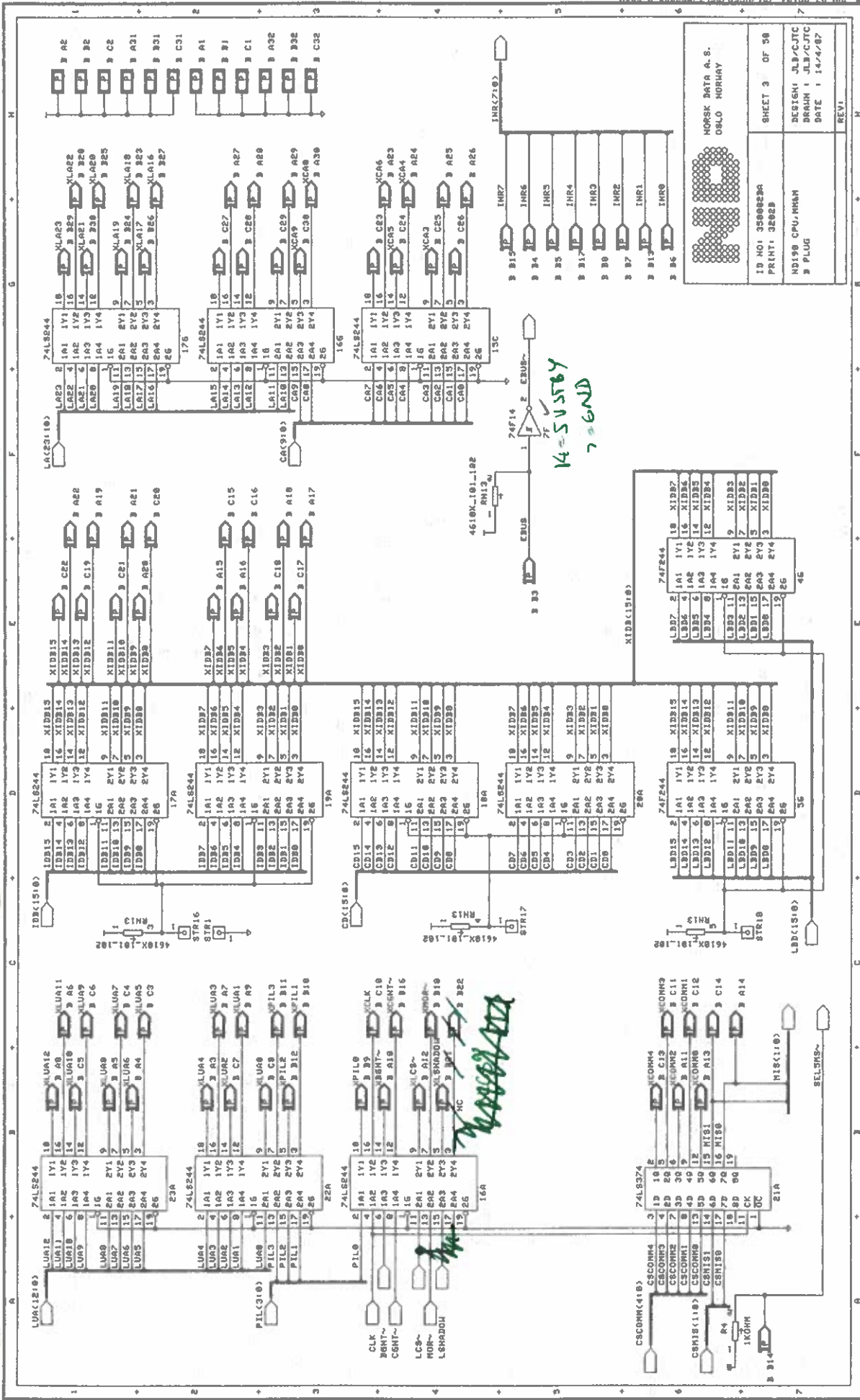
CPUCNTLO HIT,IONI,LEV0,&

CPUCNTLO	LSHADOW, OPCLCS, PCR(1:0), PIL(3:0), PONI, &
CPUCNTLO	TRAP~, VEX
PROCNTLI	EDO~, &
PROCNTLI	EMPID~, ESTOF~, LCS~, &
PROCNTLI	MR~, STP
PROCNTLO	ACOND~, BRK~, DOUBLE, ECCR, &
PROCNTLO	IONI, LEV0, &
PROCNTLO	LSHADOW, OPCLCS, PCR(1:0), PIL(3:0), PONI, &
PROCNTLO	TRAP~, VEX
CSCNTL	BRK~, FETCH, FORM~, LCS~, RWCS~
MMUCNTL	BRK~, CA10, CCLR~, DOUBLE, DT~, DVACC~, ECSR~, &
MMUCNTL	EMCL~, ESTOF~, FMISS, &
MMUCNTL	LSHADOW, RT~, &
MMUCNTL	WCHIM~, WRITE
CYCCNTL	ACOND~, BRK~, CGNTCACT~, FORM~, HIT, IORQ~, LSHADOW, MR~, MREQ~, RT~, RWCS~, &
CYCCNTL	SHORT~, SLOW~, TRAP~, VEX
IOCNTL	BDRY50~, BRK~, CA10, CCLR~, CLEAR~, CX~, DAP~, &
IOCNTL	DT~, DVACC~, ECREQ, ECSR~, EDO~, EMCL~, &
IOCNTL	EMPID~, ESTOF~, FETCH, FMISS, FORM~, HIT, IONI, IORQ~, LCS~, LEV0, LSHADOW, &
IOCNTL	MCL, MREQ~, OPCLCS, PA~, PCR(1:0), PONI, PS~, REF~, REFRQ~, RT~, RWCS~, SHORT~, SLOW
IOCNTL	SSEMA~, STOC~, STP, TOUT, WCHIM~, WRITE
IOCNTLI	BDRY50~, BRK~, CX~, DAP~, &
IOCNTLI	HIT, IONI, LCS~, LEV0, LSHADOW, &
IOCNTLI	OPCLCS, PCR(1:0), PONI, REF~
IOCNTLO	CA10, CCLR~, CLEAR~, &
IOCNTLO	DT~, DVACC~, ECREQ, ECSR~, EDO~, EMCL~, &
IOCNTLO	EMPID~, ESTOF~, FETCH, FMISS, FORM~, IORQ~, &
IOCNTLO	MCL, MREQ~, PA~, PS~, REFRQ~, RT~, RWCS~, SHORT~, SLOW~, &
IOCNTLO	SSEMA~, STOC~, STP, TOUT, WCHIM~, WRITE
DCDCNTLI	BDRY50~, BRK~, DAP~, &
DCDCNTLI	HIT, LCS~, LSHADOW, &
DCDCNTLI	OPCLCS, PONI, REF~
DGACNTLI	BDRY50~, BRK~, DAP~, &
DGACNTLI	HIT, LCS~, LSHADOW, &
DGACNTLI	PONI, REF~
DCDCNTLO	CA10, CCLR~, CLEAR~, DT~, DVACC~, ECREQ, ECSR~, EDO~, &
DCDCNTLO	EMPID~, ESTOF~, FETCH, FMISS, FORM~, IORQ~, &
DCDCNTLO	MCL, MREQ~, PA~, PS~, REFRQ~, RT~, RWCS~, SHORT~, SLOW~, &
DCDCNTLO	SSEMA~, STOC~, STP, TOUT, WCHIM~, WRITE
PANCALCNTL	CLEAR~, IONI, LEV0, PCR(1:0), PONI
REGCNTL	CLEAR~, CX~
BIFCNTLI	BGNT~, BGNT50~, CGNT~, CGNT50~, CLEAR~, CRQ~, ECREQ, &
BIFCNTLI	FETCH, GNT25~, IORQ~, LERR~, LPERR~, MOR25~, MWRITE~, PA~, &
BIFCNTLI	PS~, REFRQ~, RT~, SSEMA~, TOUT, WRITE
BIFCNTLO	BDRY50~, CGNTCACT~, DAP~, DBAPR, &

BIFCNTLO	GNT, GNT~, MR~, &
BIFCNTLO	REF~, RERR~, SEMRQ50~
MEMCNTLI	BDRY50~, DBAPR, ECCR, ECREQ, FETCH, GNT, GNT~, IORQ~, &
MEMCNTLI	MR~, PA~, PS~, REF~, &
MEMCNTLI	REFRQ~, RERR~, SEMRQ50~, SSEMA~, WRITE
MEMCNTLO	BGNT~, BGNT50~, CGNT~, CGNT50~, CRQ~, GNT25~, &
MEMCNTLO	LERR~, LPERR~, MOR25~, MWRITE~
PLUGCNTL	BGNT~, CGNT~, CLEAR~, LCS~, LSHADOW, MCL, PIL(3:0), STP
ABPLUG	CONSOLE~, DP~(5:1), EAUTO~, EBUS~, I1P, INR(7:0), LOCK~, &
ABPLUG	MIS(1:0), OC(1:0), O1P, O2N, OSCCL~, &
ABPLUG	RXD, SEL5MS~, SWMCL~, TXD, XTR
ABPLUGI	CONSOLE~, EAUTO~, EBUS~, I1P, INR(7:0), LOCK~, &
ABPLUGI	MIS(1:0), OC(1:0), OSCCL~, &
ABPLUGI	RXD, SEL5MS~, SWMCL~, XTR
ABPLUGO	DP~(5:1), &
ABPLUGO	O1P, O2N, &
ABPLUGO	TXD
IOABPI	CONSOLE~, EAUTO~, I1P, INR(7:0), LOCK~, MIS(1:0), &
IOABPI	OC(1:0), OSCCL~, &
IOABPI	RXD, SEL5MS~, SWMCL~, XTR
IOABPO	DP~(5:1), O1P, O2N, TXD
DCDABP	OC(1:0), OSCCL~, SEL5MS~, SWMCL~
UARTABPI	EAUTO~, I1P, LOCK~, MIS(1:0), RXD, XTR
UARTABPO	O1P, O2N, TXD
BIFABP	EBUS~, MIS0
ND100BUS	BAPR~, BDAP~, BDRY~, BERROR~, BINACK~, &
ND100BUS	BINPUT~, BINT~(13:12), BINT~10, BIOXE~, BMEM~, &
ND100BUS	BREF~, &
ND100BUS	IBAPR~, IBDAP~, IBDRY~, IBINPUT~, IBINT~15, IBINT~(13:10), IBPERR~, &
ND100BUS	IBREQ~, ICONTIN~, ILOAD~, ISEMRQ~, ISTOP~, &
ND100BUS	OUTGRANT~, OUTIDENT~, POWSENSE~, &
ND100BUS	SEMRQ~
ND100BUSI	IBAPR~, IBDAP~, IBDRY~, IBINPUT~, IBINT~15, IBINT~(13:10), IBPERR~, &
ND100BUSI	IBREQ~, ICONTIN~, ILOAD~, ISEMRQ~, ISTOP~, POWSENSE~
ND100BUSO	BAPR~, BDAP~, BDRY~, BERROR~, BINACK~, &
ND100BUSO	BINPUT~, BINT~(13:12), BINT~10, BIOXE~, BMEM~, &
ND100BUSO	BREF~, &
ND100BUSO	OUTGRANT~, OUTIDENT~, &
ND100BUSO	SEMRQ~

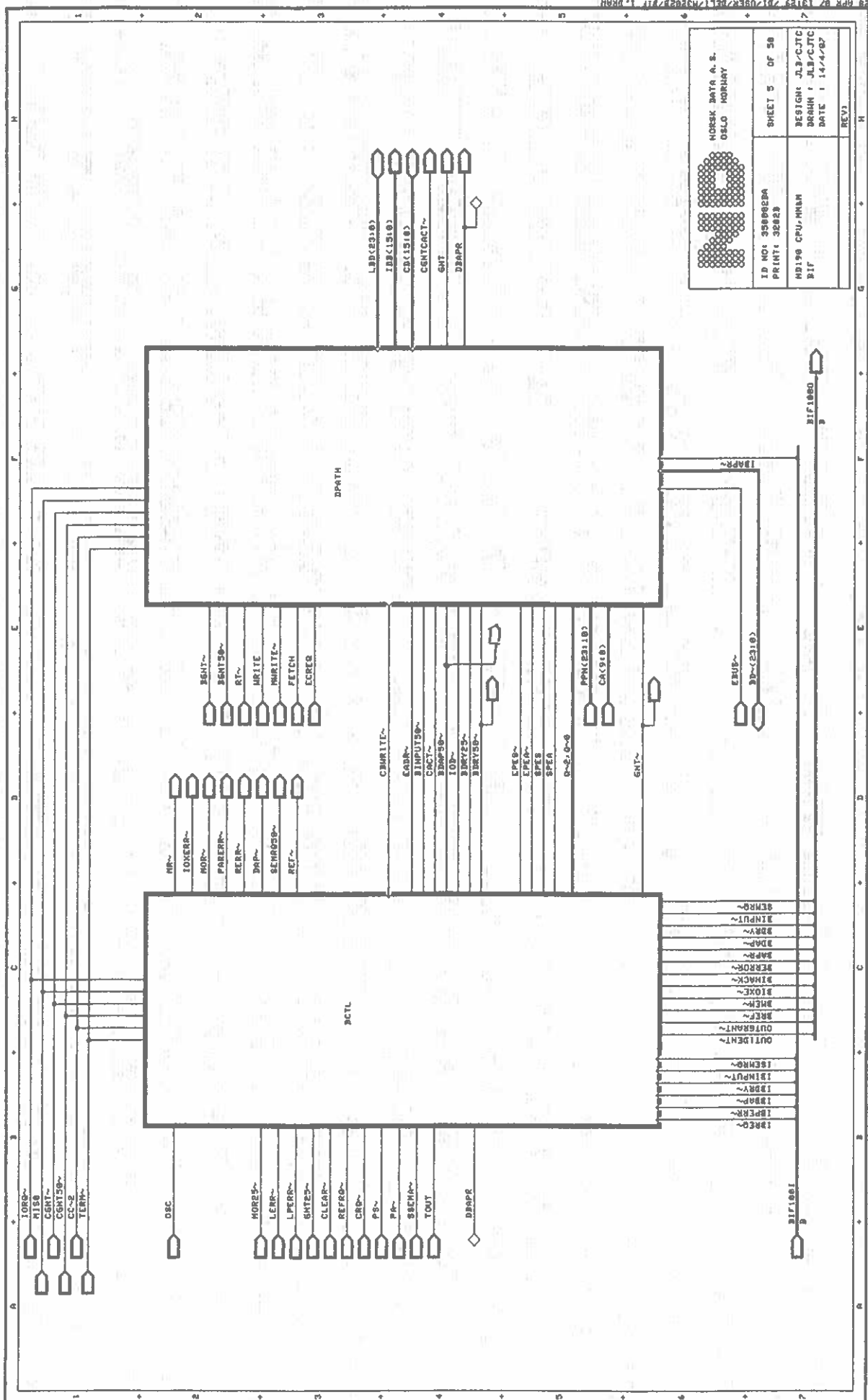
CPU100	IBINT [~] 15, IBINT [~] (13:10)
IO1001	ICONTIN [~] , ILOAD [~] , POWSENSE [~] , ISTOP [~]
IO1000	BINT [~] (13:12), BINT [~] 10
DGA100	ICONTIN [~] , ILOAD [~] , ISTOP [~]
BIF1001	IBAPR [~] , IBAP [~] , BDRY [~] , IBINPUT [~] , IBPERR [~] , IBREQ [~] , &
BIF1001	ISEMRQ [~]
BIF1000	BAPR [~] , BDAP [~] , BDRY [~] , BERROR [~] , BINACK [~] , BINPUT [~] , BIOXE [~] , BMEM [~] , &
BIF1000	BREF [~] , &
BIF1000	OUTGRANT [~] , OUTIDENT [~] , SEMRQ [~]
MEM100	IBAP [~] , BD [~] (23:19), IBINPUT [~] , BIOXE [~] , BMEM [~]
INTINTS	MOR [~] , IOXERR [~] , PAN [~] , PARERR [~] , POWFAIL [~]
BIFINT	IOXERR [~] , MOR [~] , PARERR [~]
IOINT	PAN [~] , POWFAIL [~]
DCDPANCALO	EMP [~] , EPANS [~] , FUL [~] , LHIT, PANOSC, PA(7:0), VAL
DCDPANCALI	RMM [~] , STAT(4:3)
DGAIP	CLK, UCLK, CLOSC, RTOSC, POWSENSE, PWCL, REF [~] , SEL5MS [~] , BDRY50 [~] , &
DGAIP	ISTOP [~] , ILOAD [~] , ICONTIN [~] , RMM [~] , STAT(4:3), CSCOMM(4:0), &
DGAIP	CSMIS(1:0), CSIDBS(4:0), BRK [~] , PONI, EORF [~] , &
DGAIP	DAP [~] , LSHADOW, LCS [~]

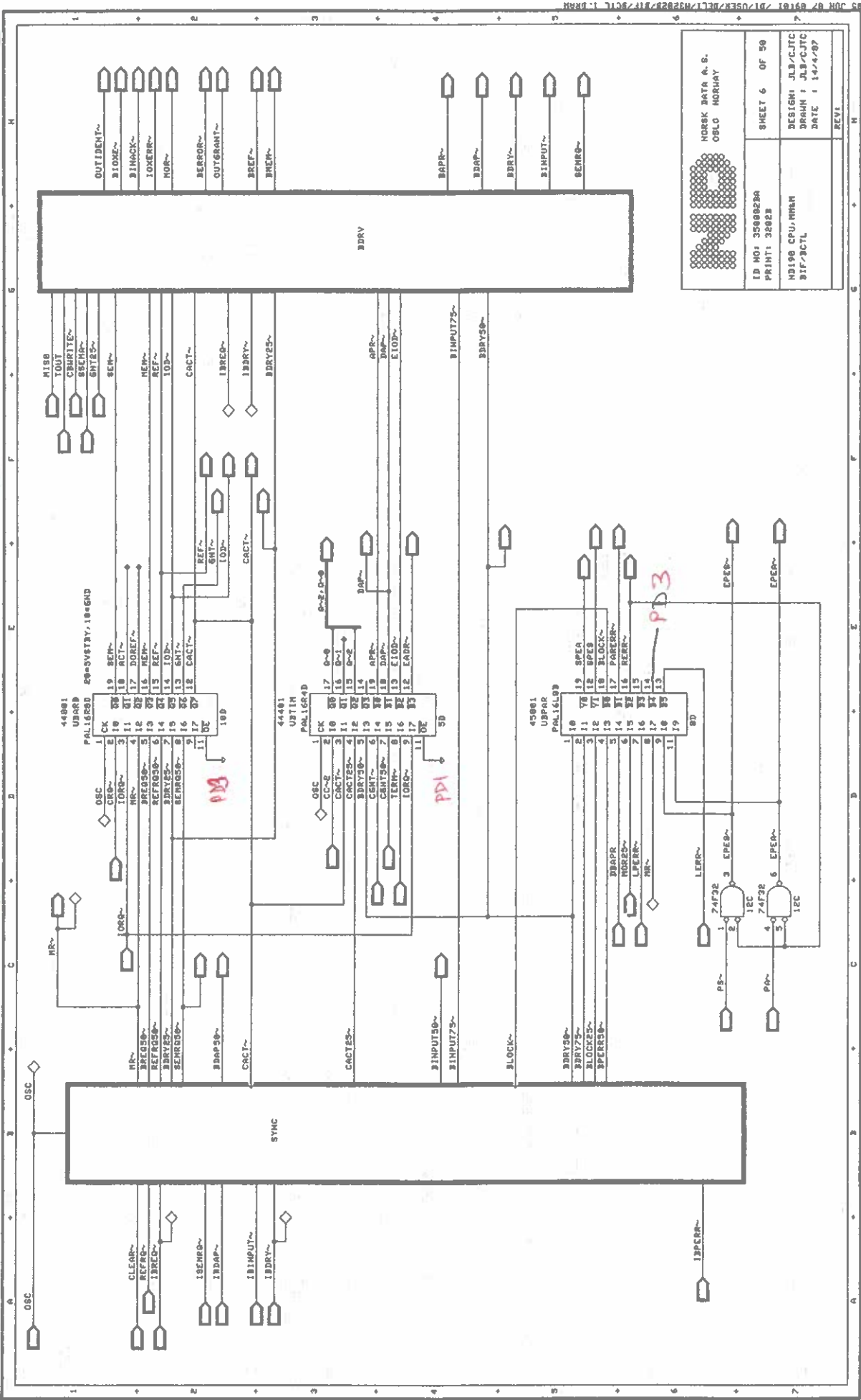




14-5156Y
706ND

	ID NO1 350023A PRINT: 3502B	SHEET 3 OF 30	DESKTOP JLB/CJTC DRAWN: JLB/CJTC DATE: 1-4-87
	ND190 CPU, MHAN 3 PLUG		REV1

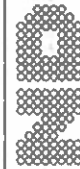
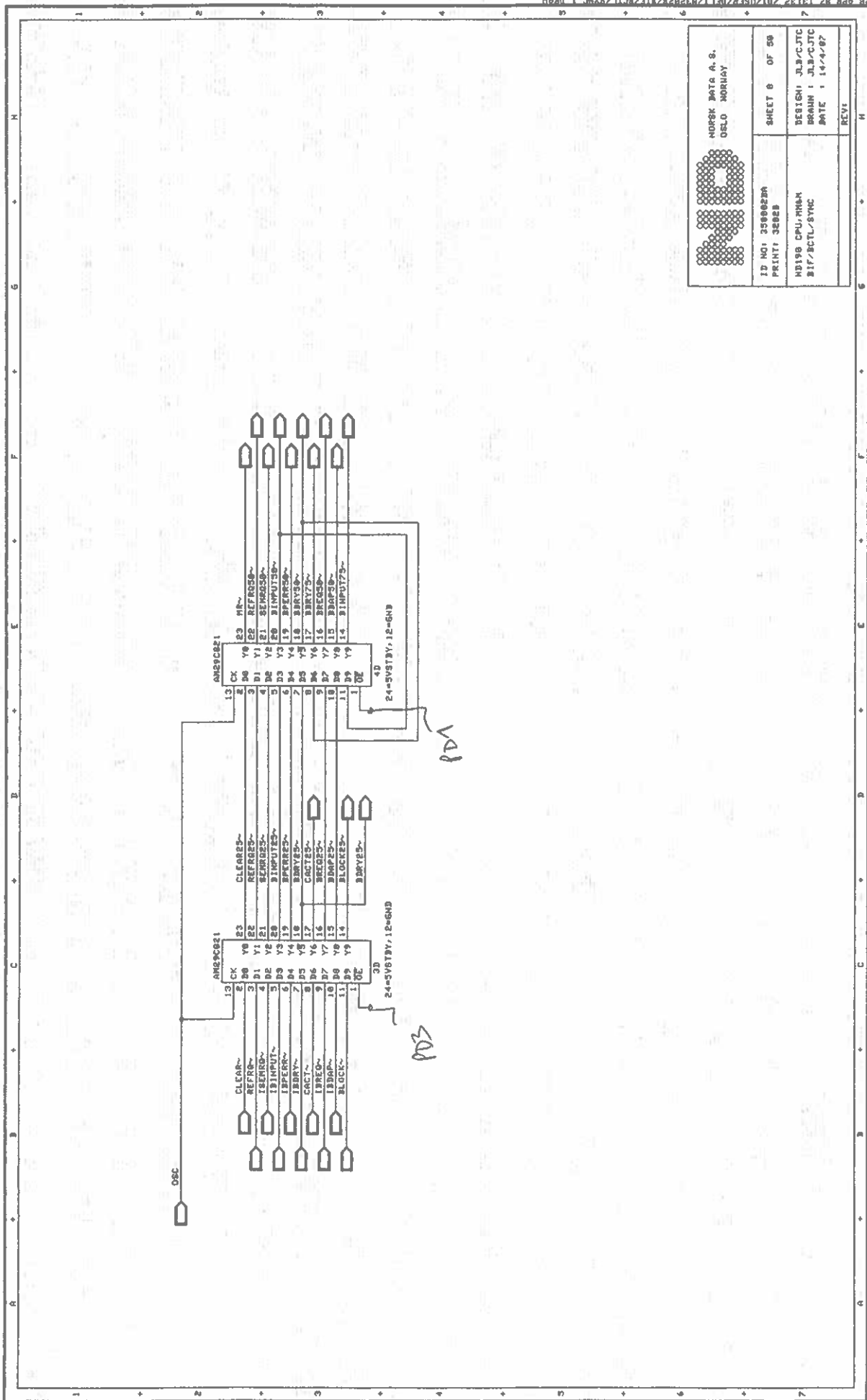




NORDBATA A.S.
OSLO NORWAY

ID NO: 3580230	SHEET 6 OF 50
PRINT: 32023	DESIGN: JLB/CJTC
NO: 190 CPU: MMH	DRAWN: JLB/CJTC
BIF: 9CTL	DATE: 14/4/87
	REV: 1

35 JOR 87 09101 / 01/05EN/MLT/M32023/BIF/9CTL 1.DRAW



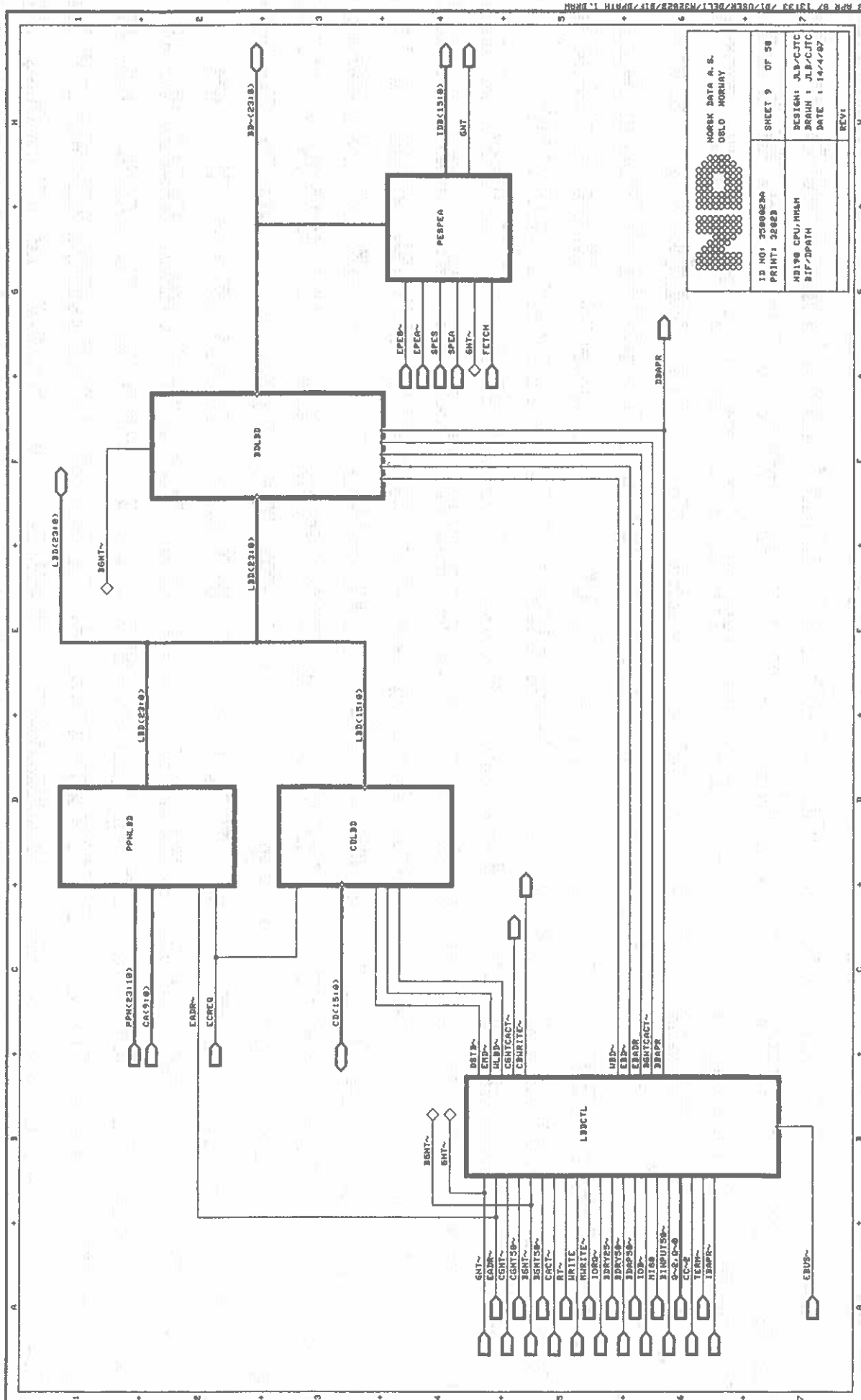
NDREK DATA A. S.
OSLO NORWAY

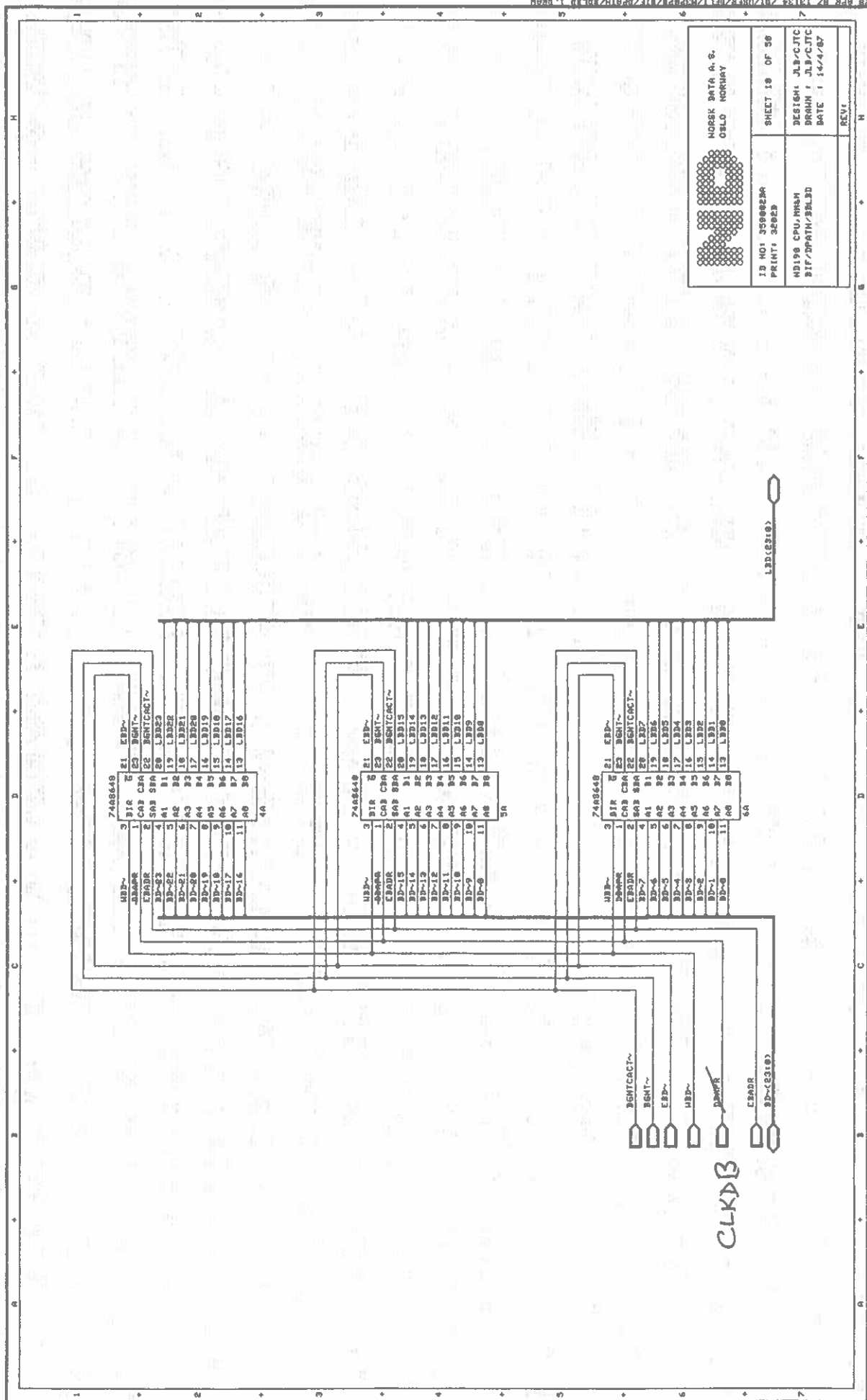
ID NO: 3598020A
PRINT: 32023

SHEET 6 OF 58

DESIGN: JLB/CJTC
BRANCH: JLB/CJTC
DATE: 14/4/87

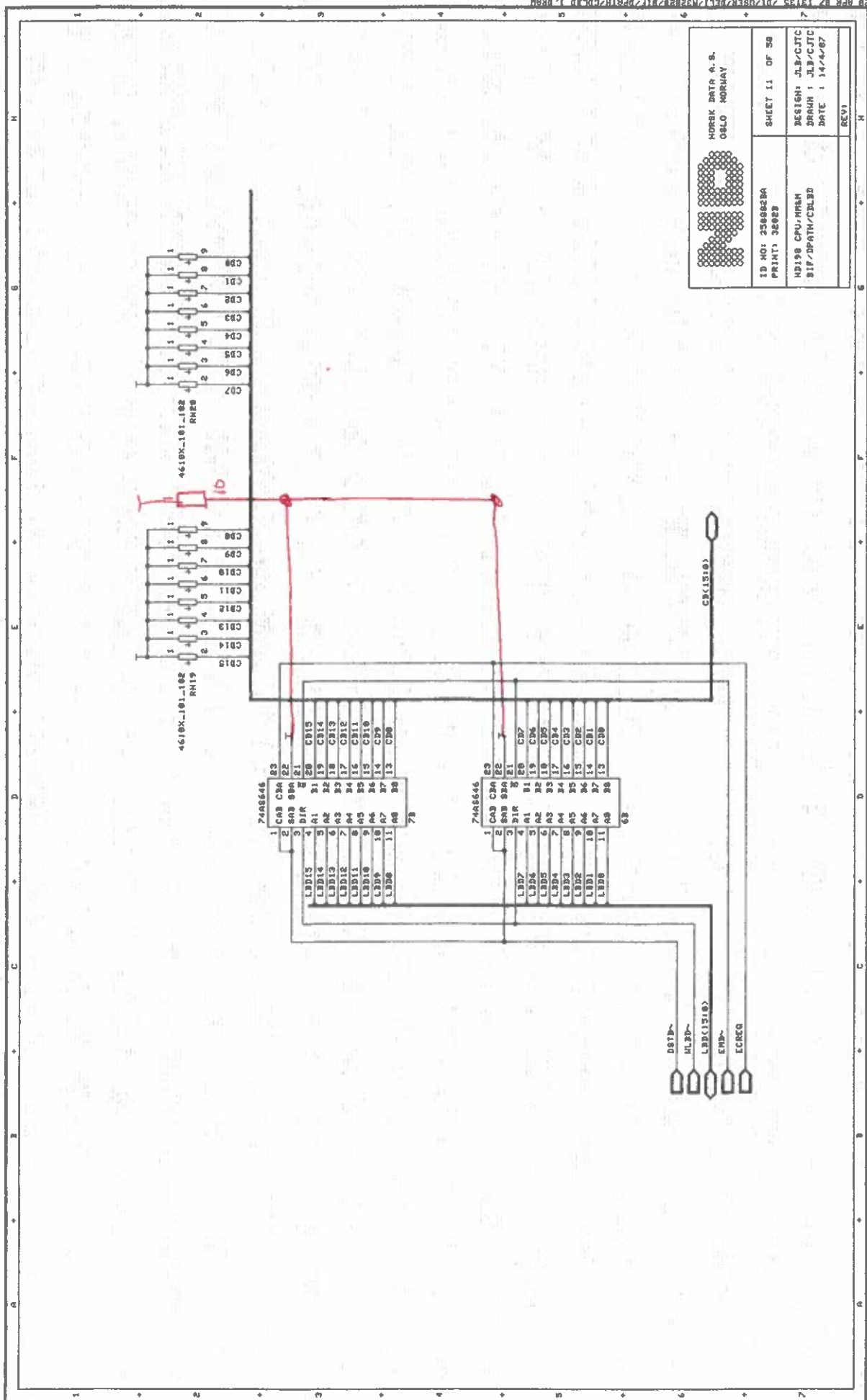
REV: 1

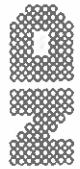




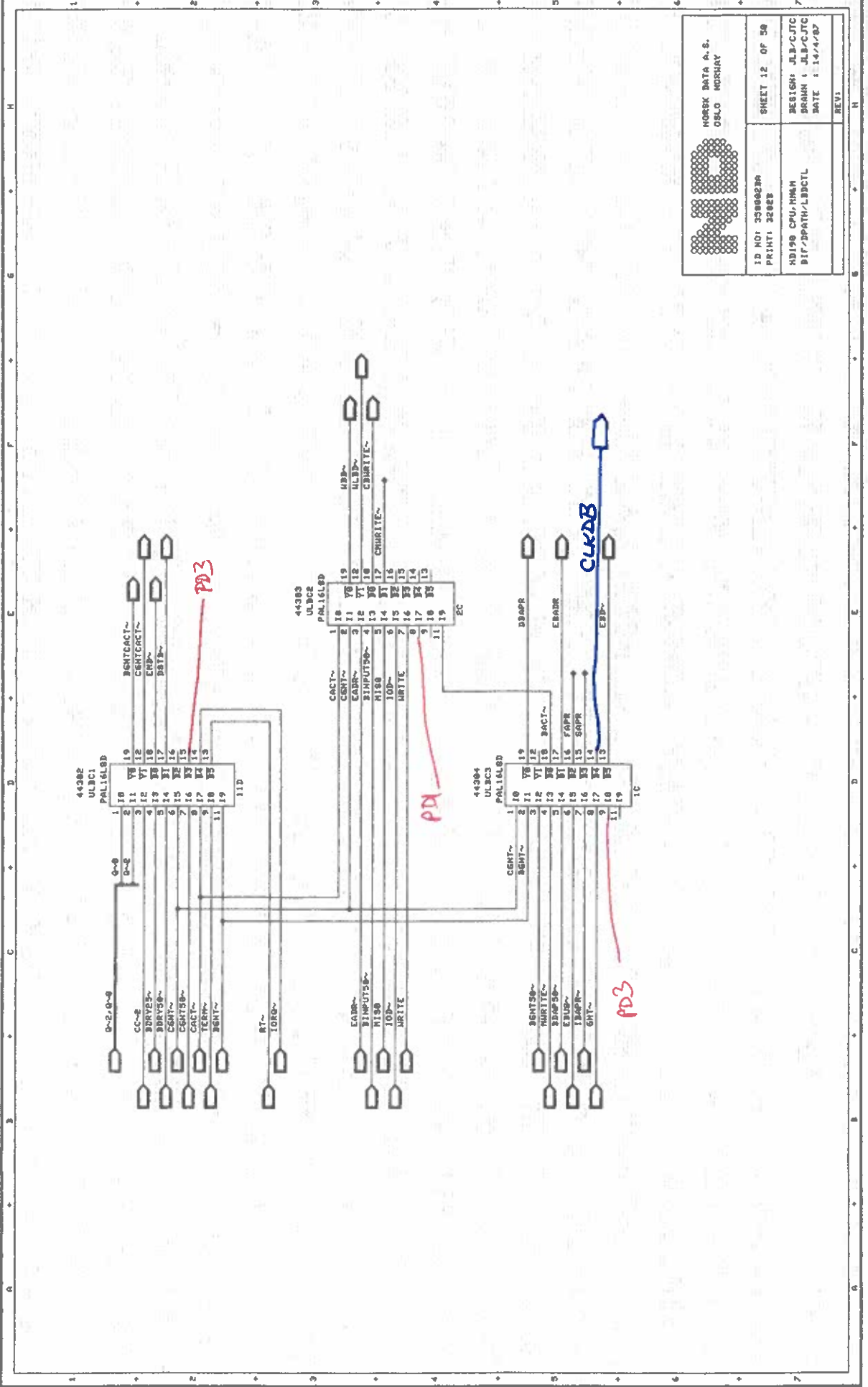
NORSK DATA A. S.
OSLO NORWAY

740649	PRINT: 32023	SHEET 10 OF 98
ND198 CPU/M3M BIF/DPATH/38L3D	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 14/4/87	REV:



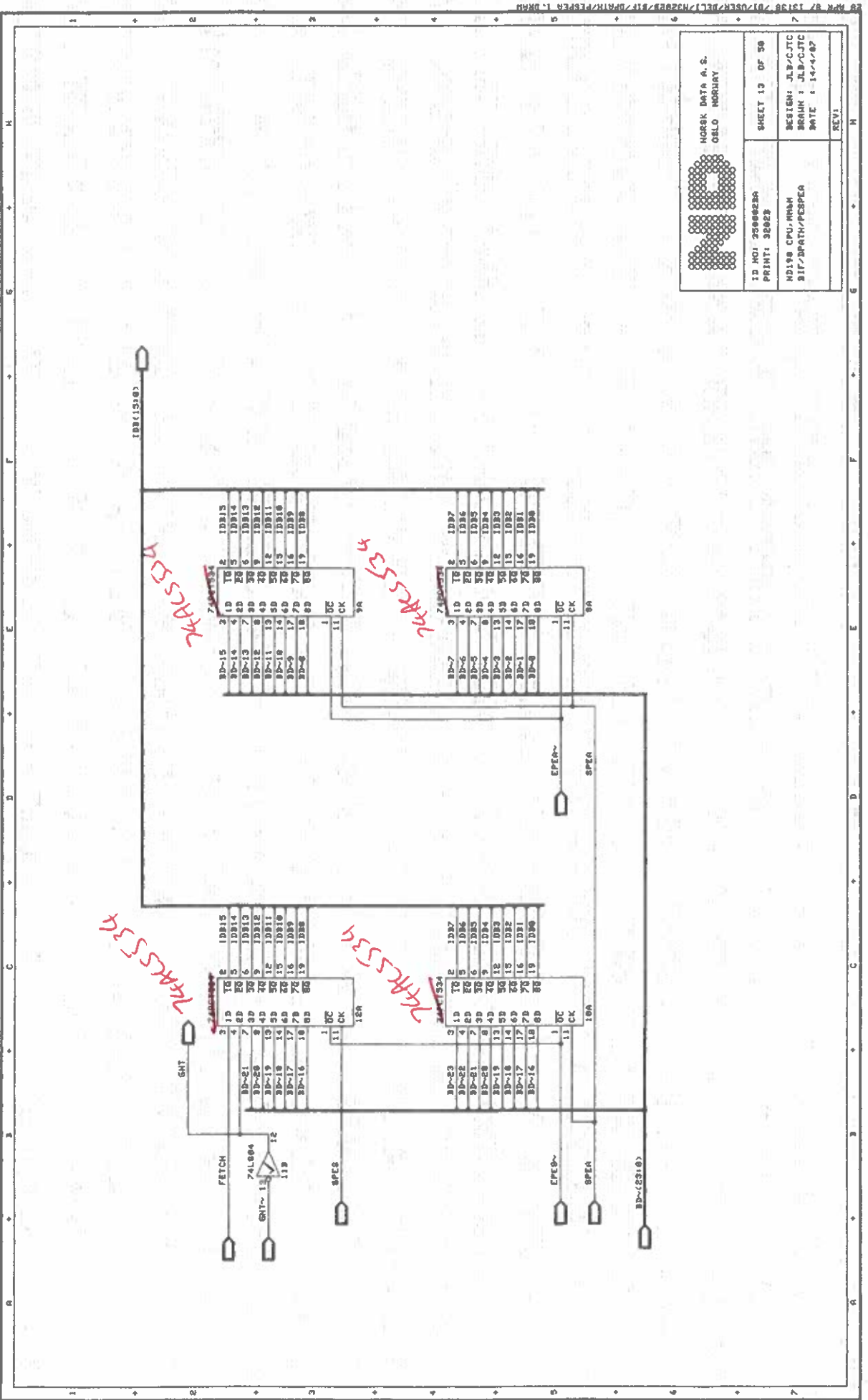
		HORRICK DATA A. S. OSLO NORWAY	
ID NO: 250002BA PRINT: 3202B	SHEET 11 OF 50	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 14/4/87	
NO: 198 CPU, MPM 817/DPATH/CALD	REV: 1		

28 APR 87 13135 741/OREN/DEL1/NEBBE/817/DPATH/CALD 1.DRAW

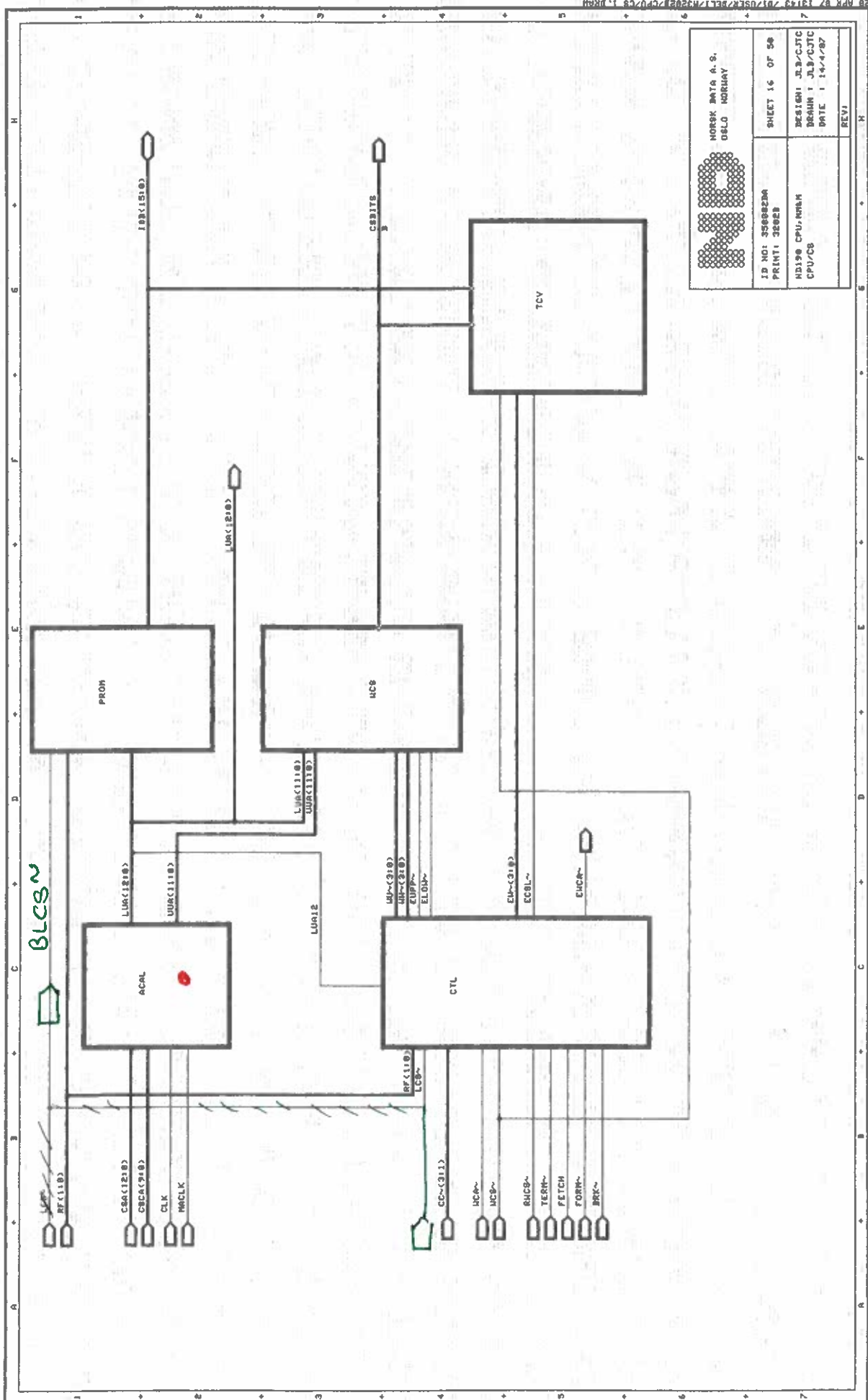


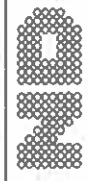
NORSK DATA A.S.
OSLO NORWAY

1D NO: 35880230 PRINT: 32003	SHEET 12 OF 50
DESIGN: JLB/CJIC BRAM: JLB/CJIC DATE: 14/4/82	REV: 1



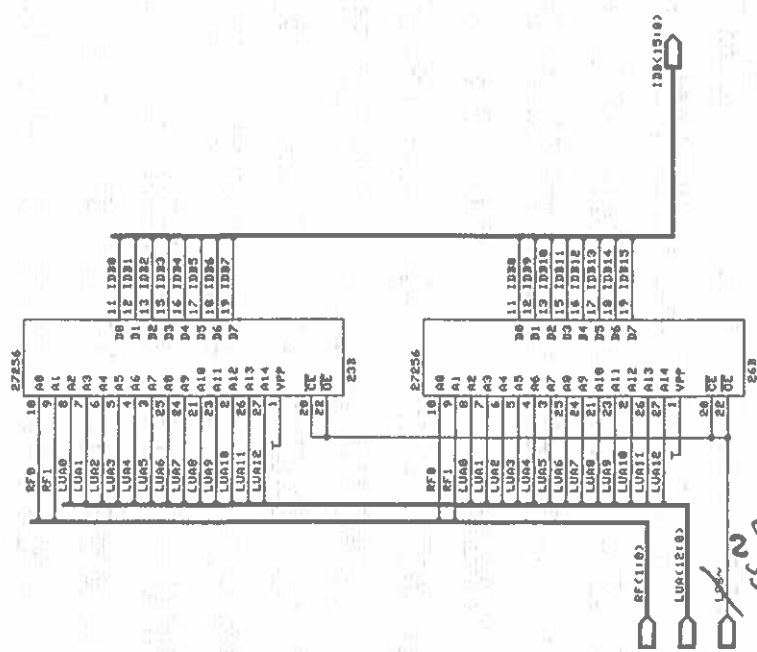
	HOBBS DATA A. S. OSLO NORWAY	
	ID NO: 2500028A PRINT: 30028	SHEET 13 OF 50
HD100 CPU, MMH BIT/DATA/PEP/EA		DESIGN: JLB/CJC SKETCH: JLB/CJC DATE: 14/4/87
		REV:



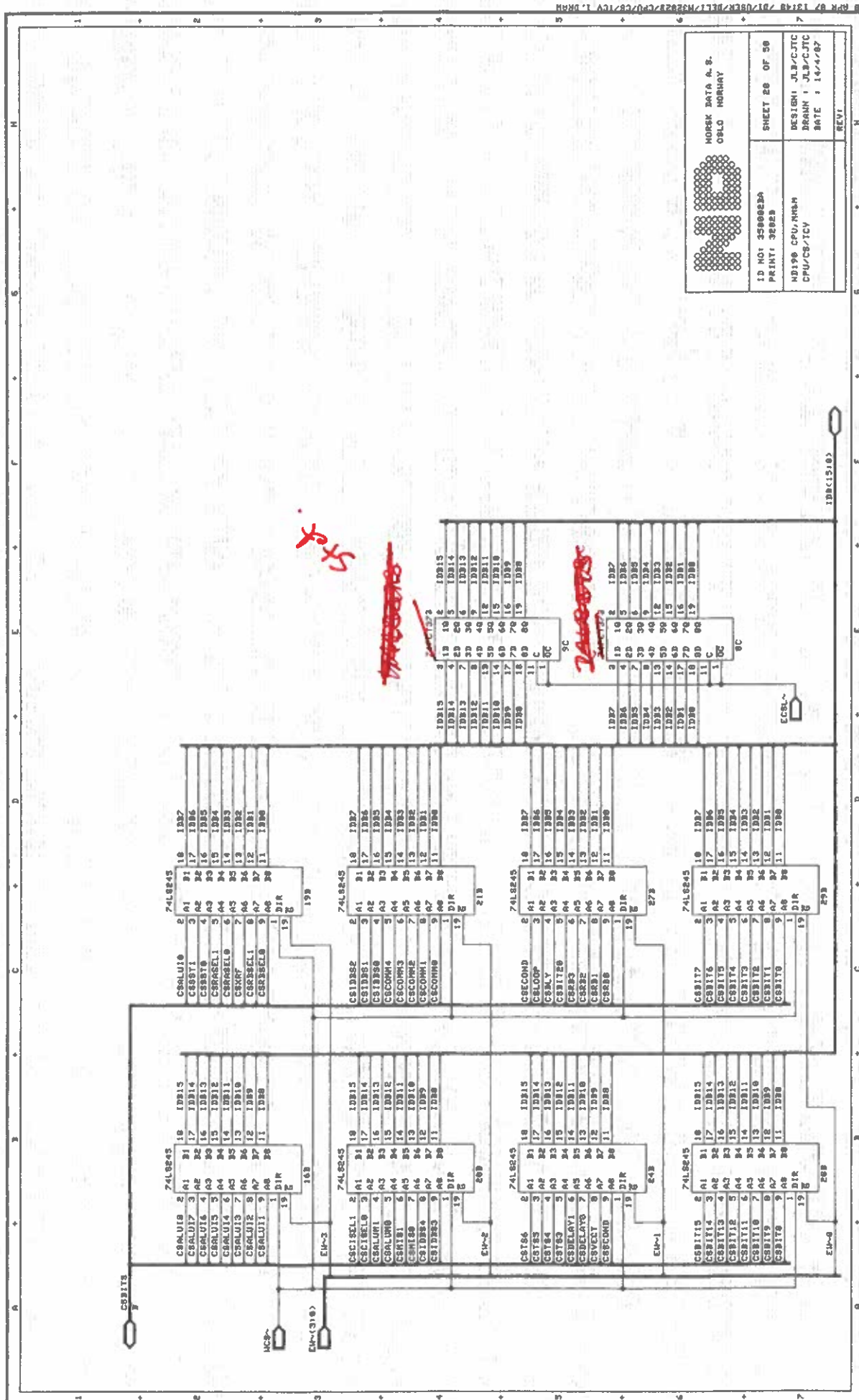


NORSK DATA A.S.
OSLO NORWAY

ID NO: 358828A PRINT: 35828	SHEET 19 OF 58
ND198 CPU-MRSM CPU/CS-PRON	DESIGN: J.B./CJC DRAWN: J.B./CJC DATE: 1.14.87
REV:	



bus
busses



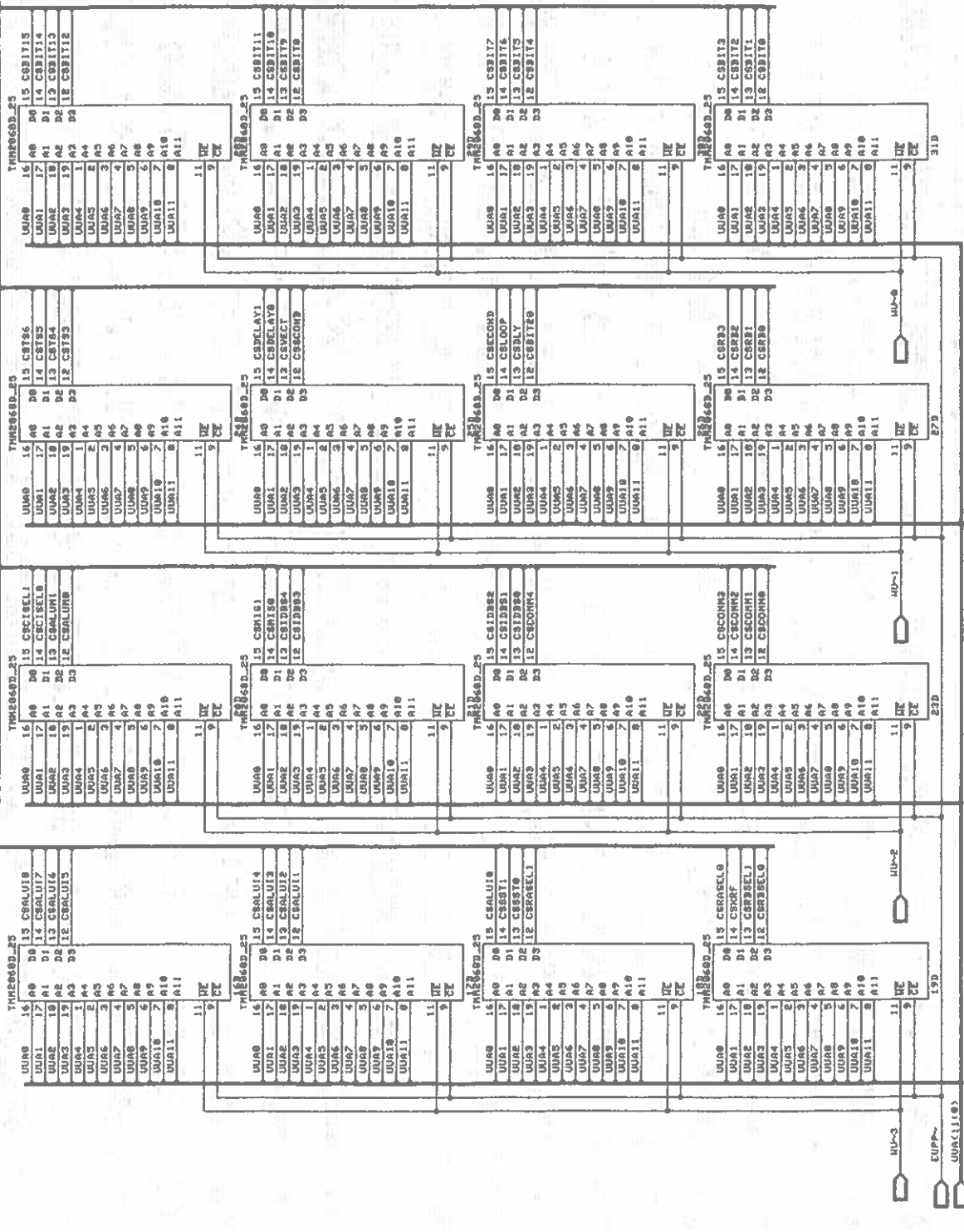
WORK DATA A.S.
OSLO NORWAY

ID NO: 350022A
 SHEET 20 OF 50

IND196 CPU, NRM	DESIGN: JLJ/CJTC
CPU/C8/ICV	DRAWN: JLJ/CJTC
	DATE: 11/4/87

REV:

CSBIT6



10161687-20

ID NO: 350029A
PRINT: 32029
SHEET 21 OF 50
DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 14/4/87

28 APR 87 13149 /D1/DCK/DEL1/NEB2/LPU/CS/MS 1.DRAW

ID NO: 350023A
PRINT: 3202B
SHEET 22 OF 50
N0190 CPU:MM&M
DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
/CPU/CB/UCS
DATE: 14/4-87

05 10 23 13348

DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 14/4/87

ID NO: 35890234

ИД198 СРД, ММЛМ

83H/83/UCB

1. *Journal of the American Medical Association*, 1997; 277: 1033-1036.

05 10 23 13348

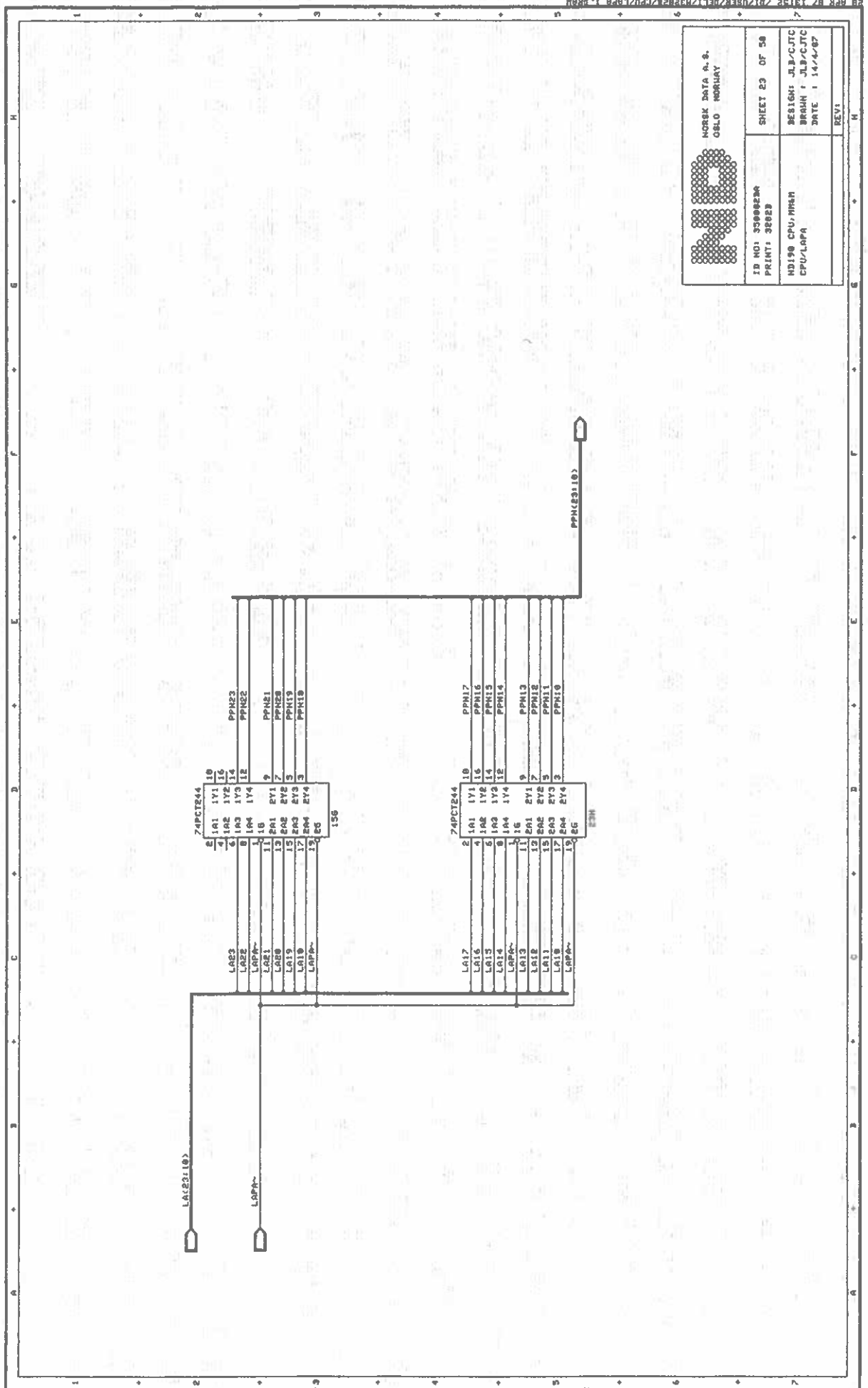
DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 14/4/87

ID NO: 35890234

ИД198 СРД, ММЛМ

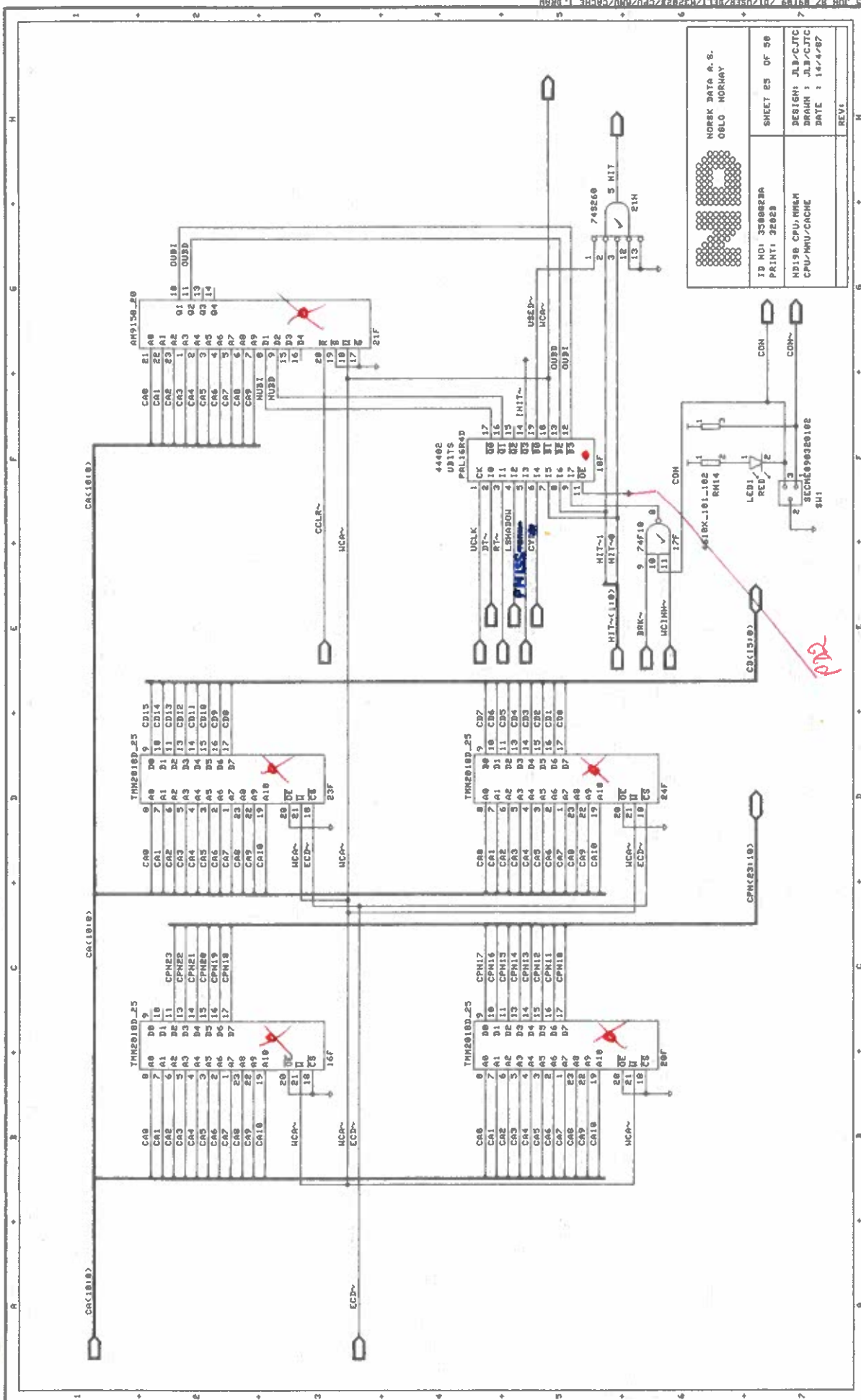
83H/83/UCB

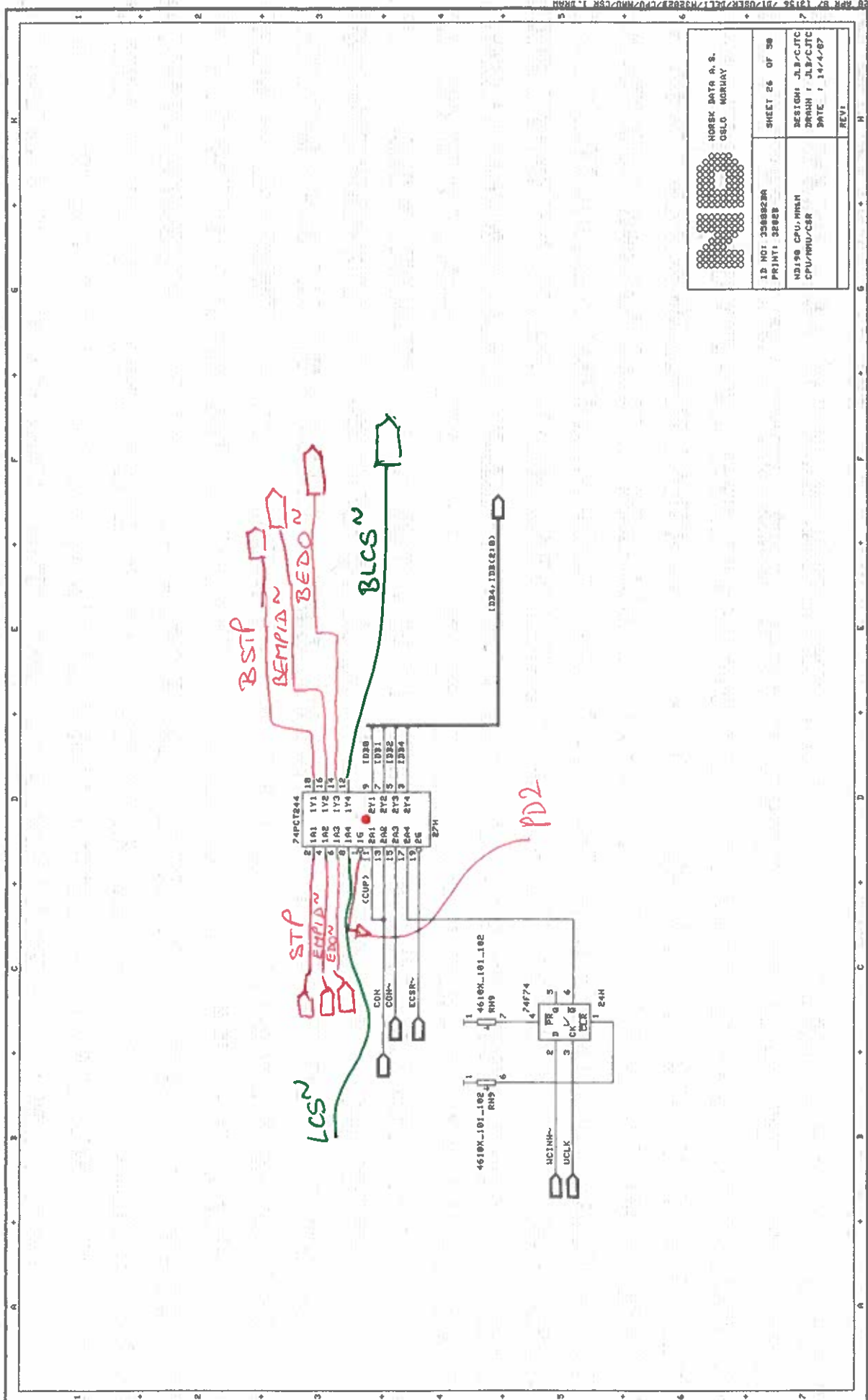
1. *Journal of the American Medical Association*, 1997; 278: 1039-1044.

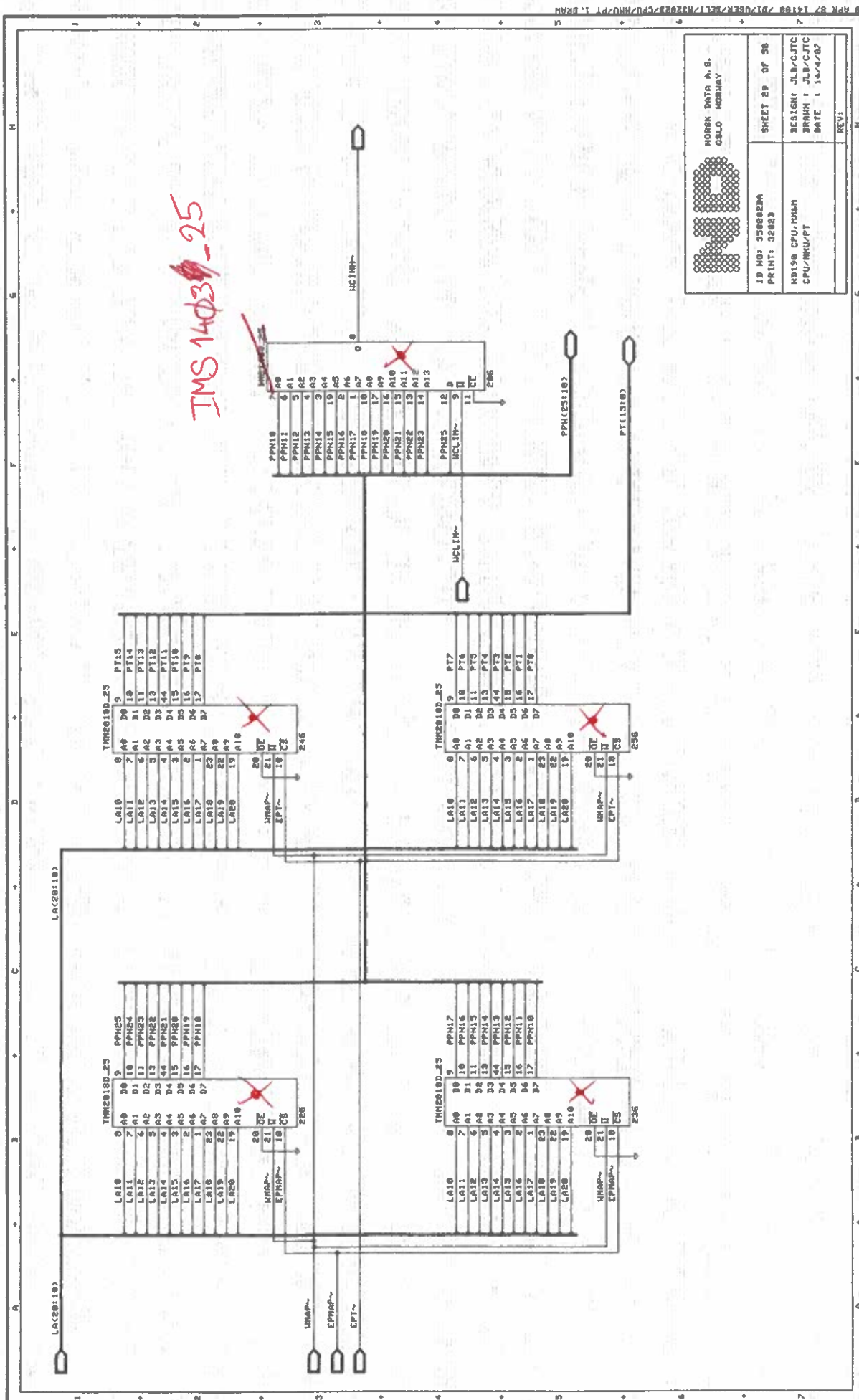


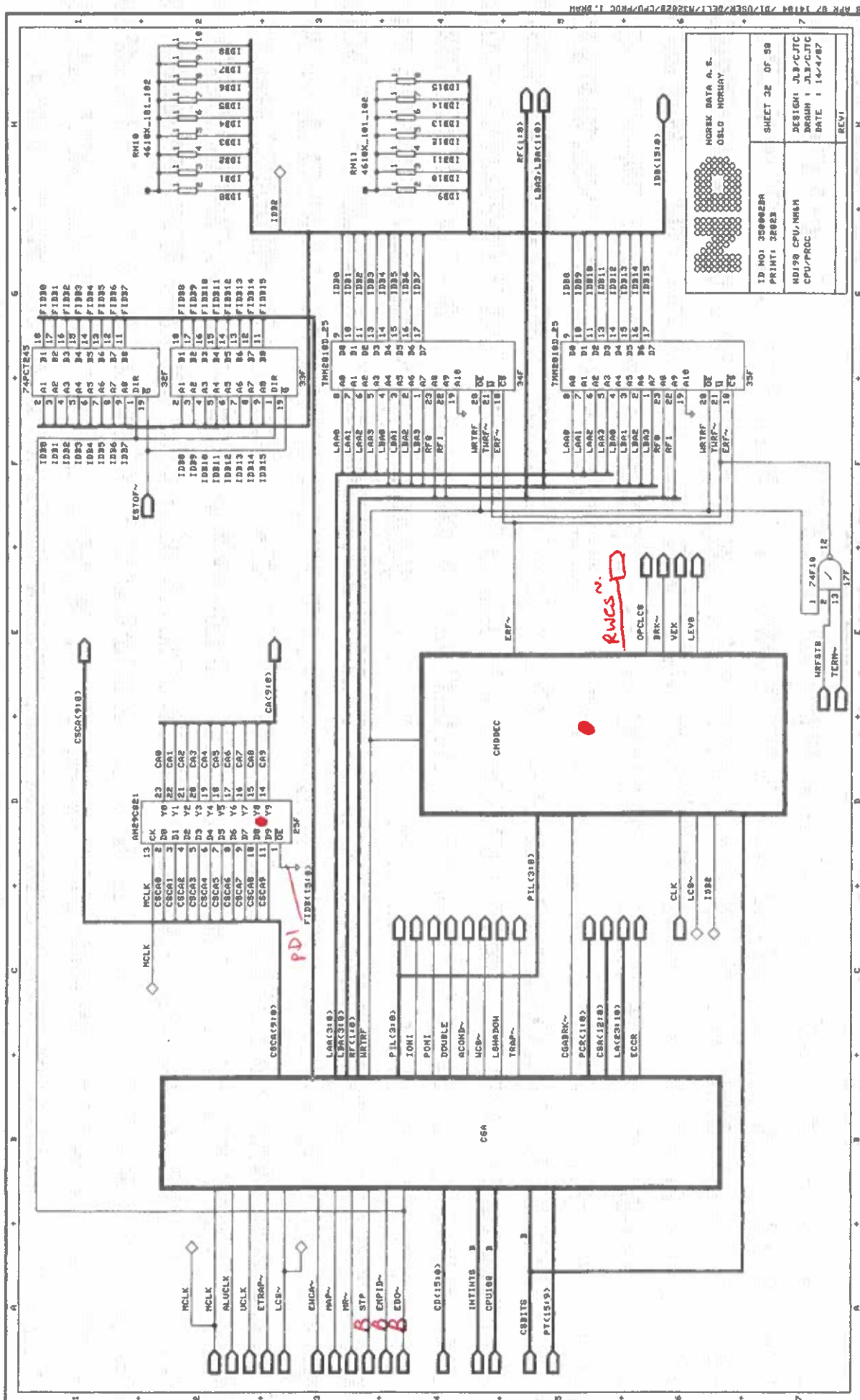


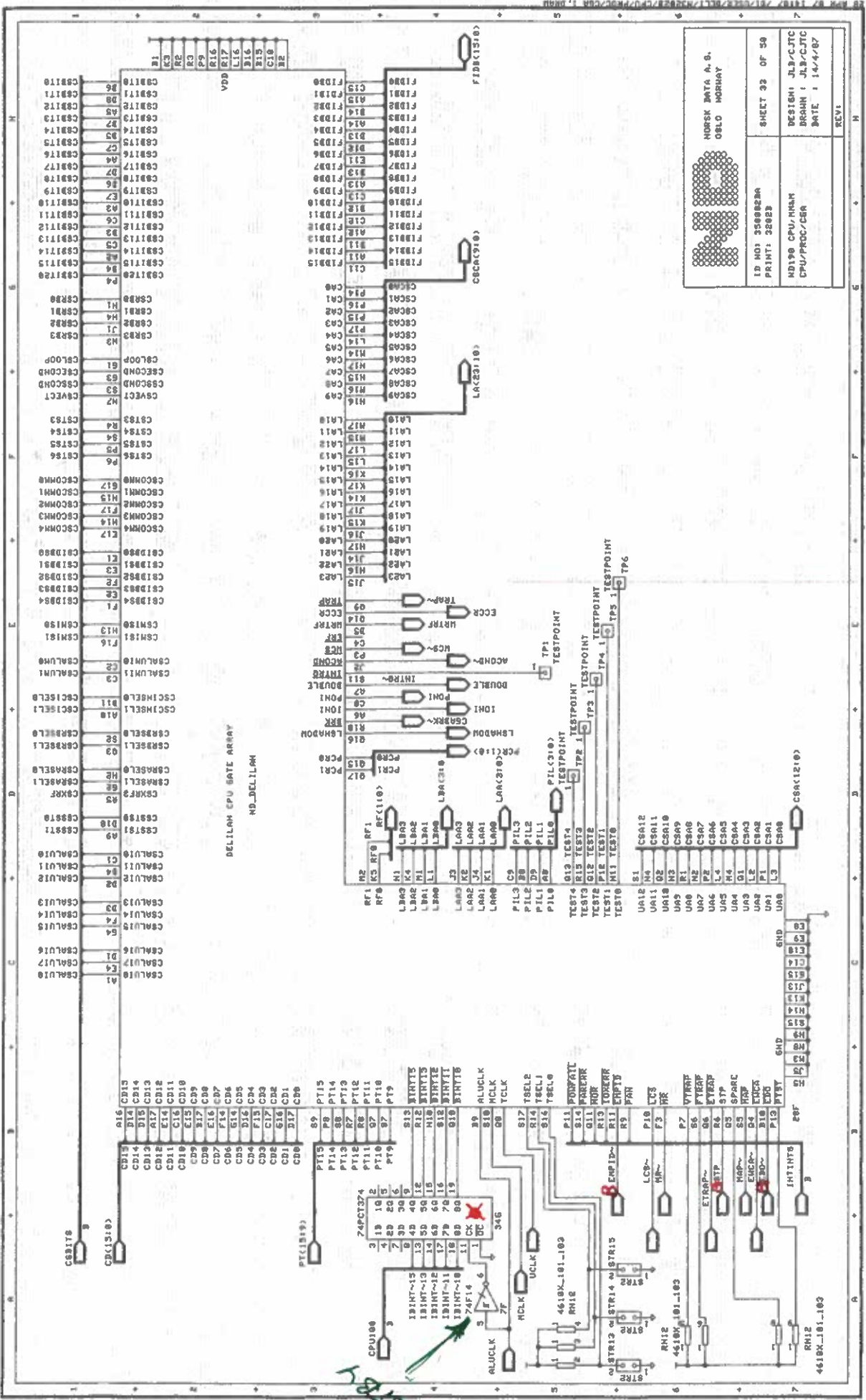
 NORSK DATA A.S. OSLO NORWAY	IB NO: 2358023A PRINT: 2822	SHEET 24 OF 50	DESIGN: JB/CJC DRAIN: JB/CJC DATE: 14/4/82	8711
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NOISE DATA A.8.
OSLO NORMAY

SHEET 32 OF 50

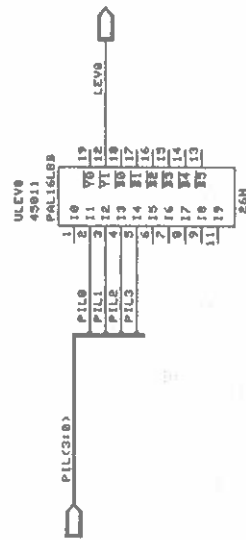
DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 14/4/87

ID NO: 350828A
PRINT: 350828

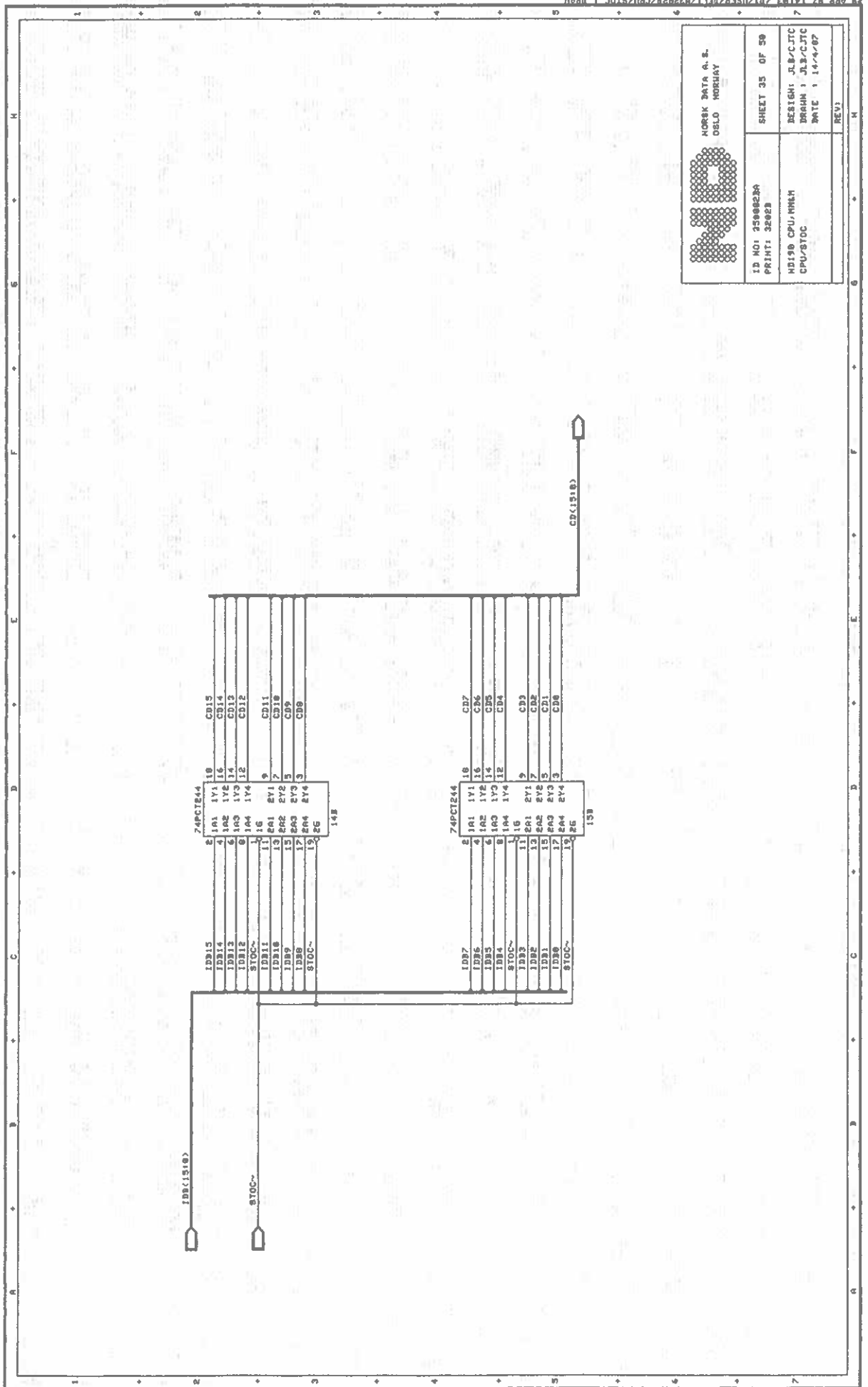
NO:190 CPU/MEM
CPU/PROC/GER

REV:

TEST


$$2 \text{ RWCS}$$

	ID NO: 350022A PRINT: 30023	SHEET 34 OF 58	MORSK DATA A.S. OSLO NORWAY
	W1919 CPU-KH/M CPU/PROC-CH3DEC	DESIGN: JLB/CJTC DRAWH: JLB/CJTC DATE: 14/4/87	REV1



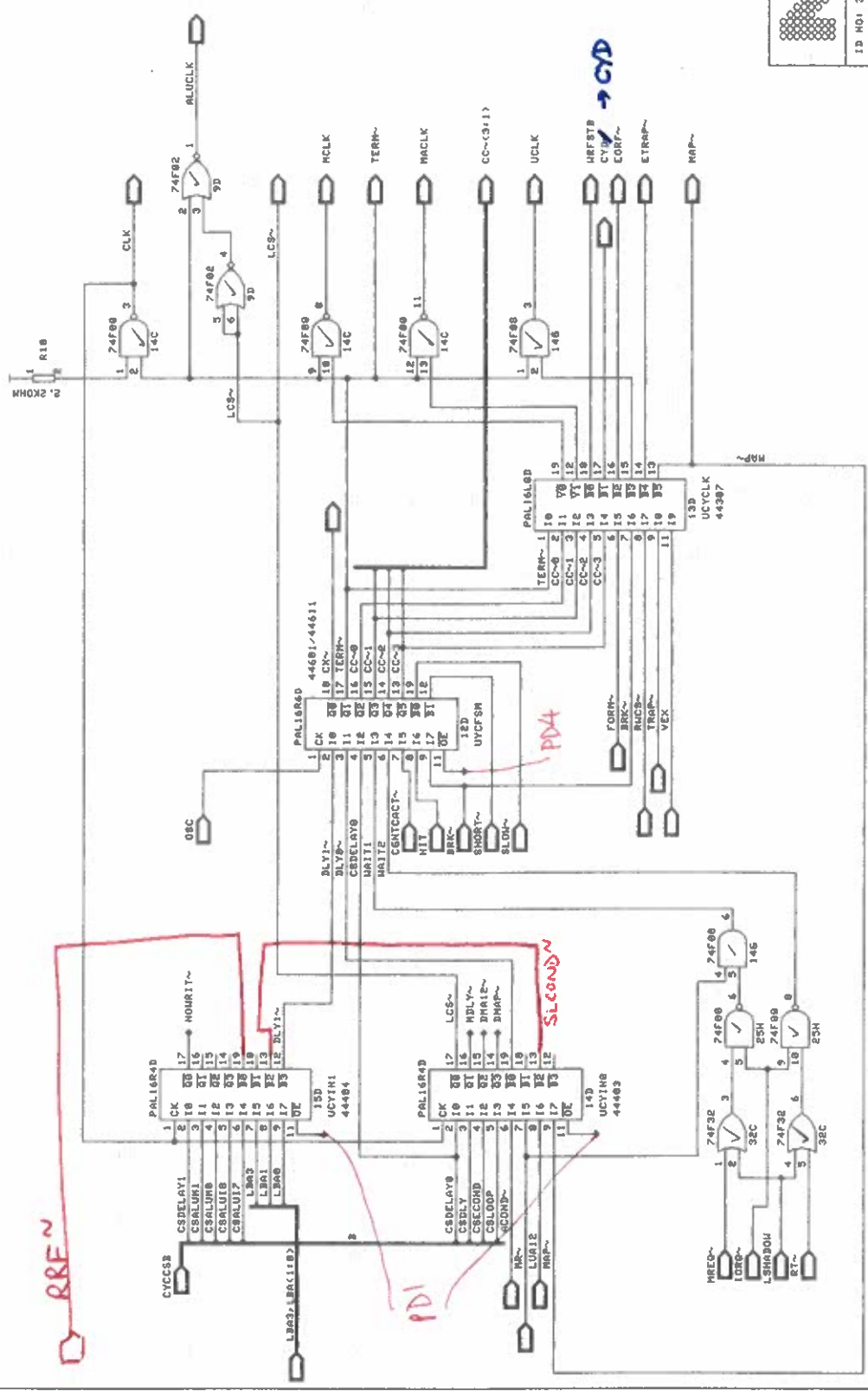
NORIK DATA A.S.
OSLO NORWAY

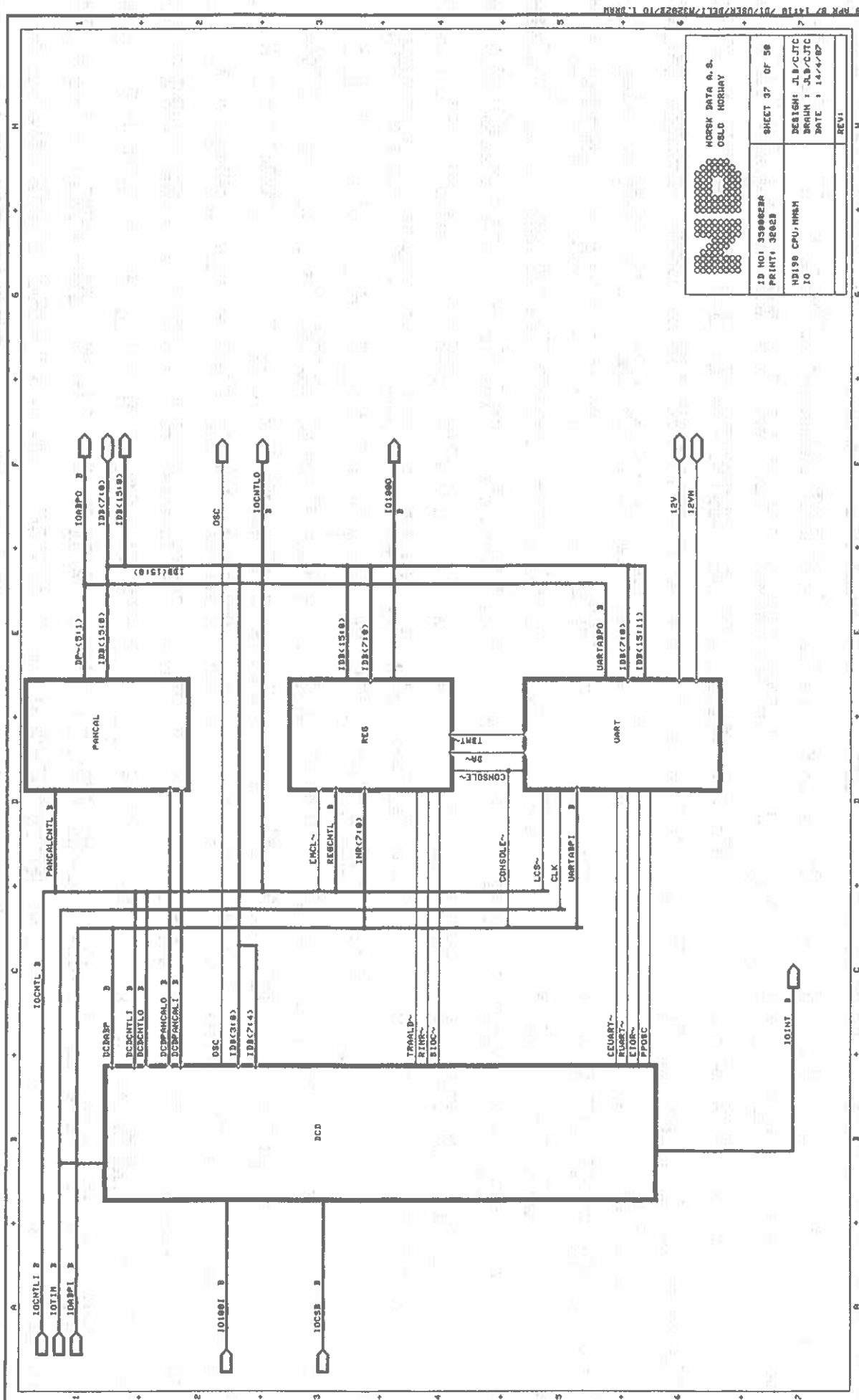
ID NO: 25080238	SHEET 35 OF 50
PRINT: 20023	DESIGN: J.B./J.T.C.
NO:139 CPU/MEM	DRAWN: J.B./J.T.C.
CPU/STOC	DATE: 14/4/87
REV:1	

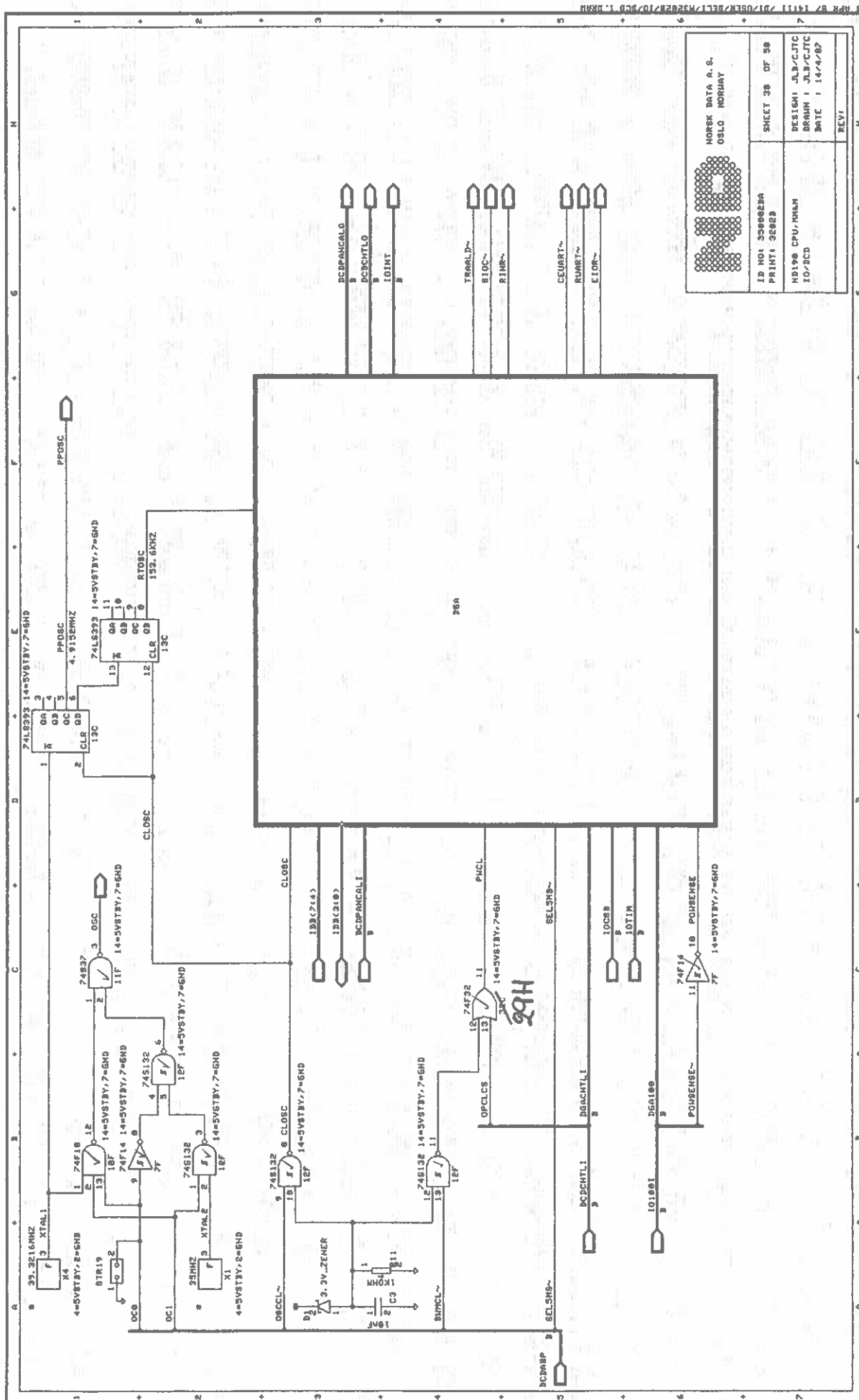


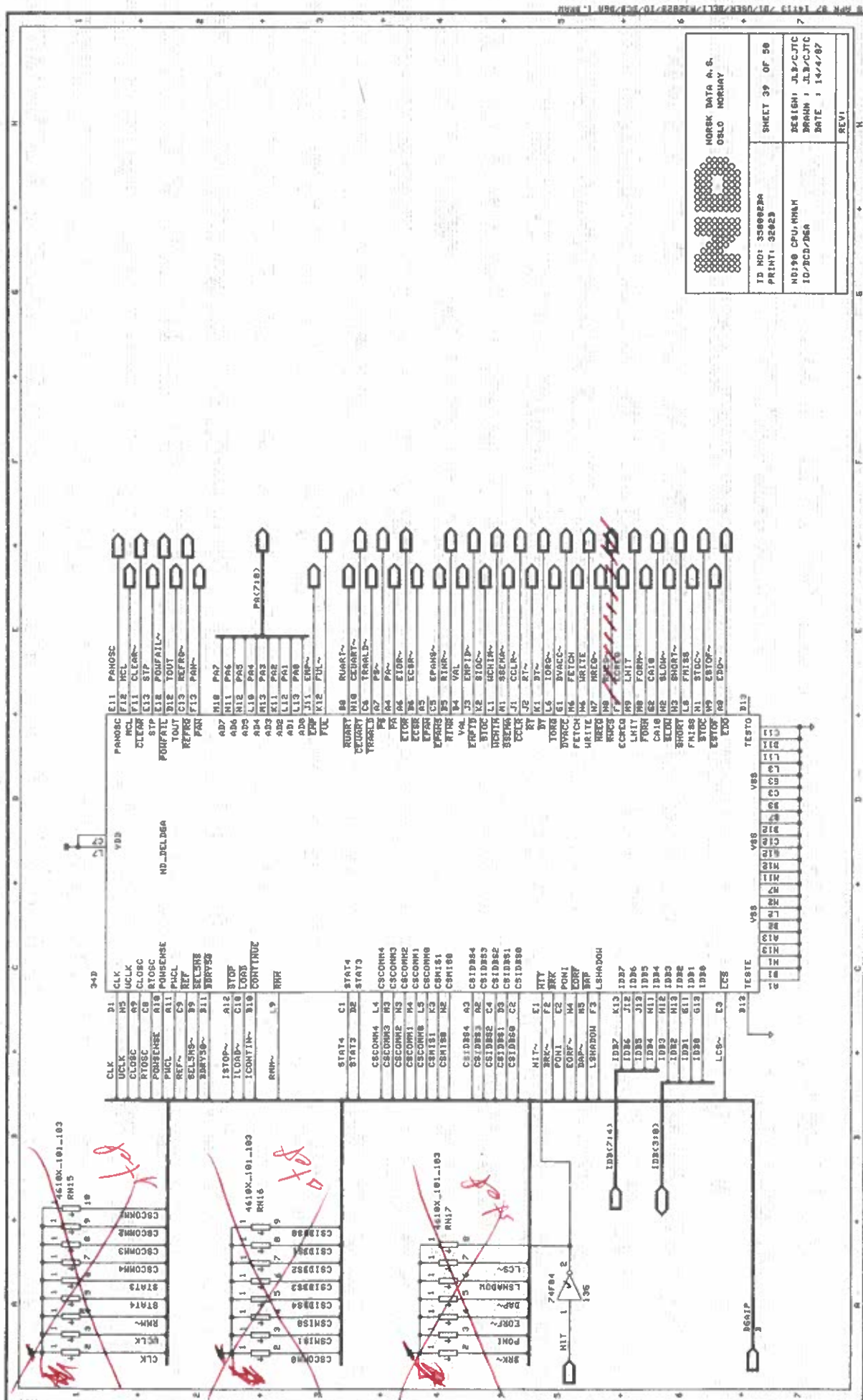
NORSK DATA A.S.
OSLO NORWAY

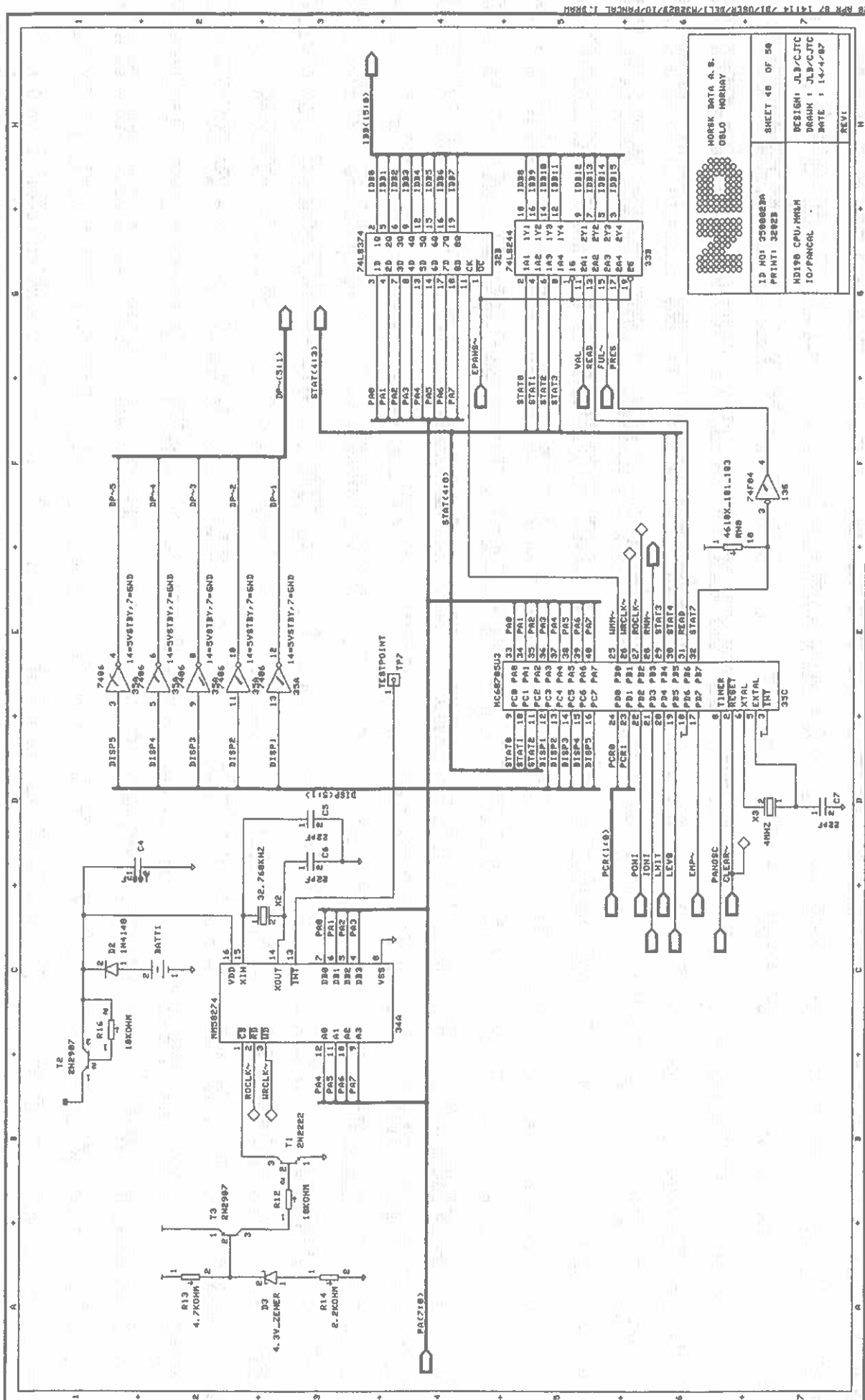
13 NO1 3500023A PRINT1 20023	SHEET 36 OF 56
NO190 CPU/MHAM CYC	DESIGN: J.B./C.JTC DRAWN: J.B./C.JTC DATE: 14/4/87
REV1	



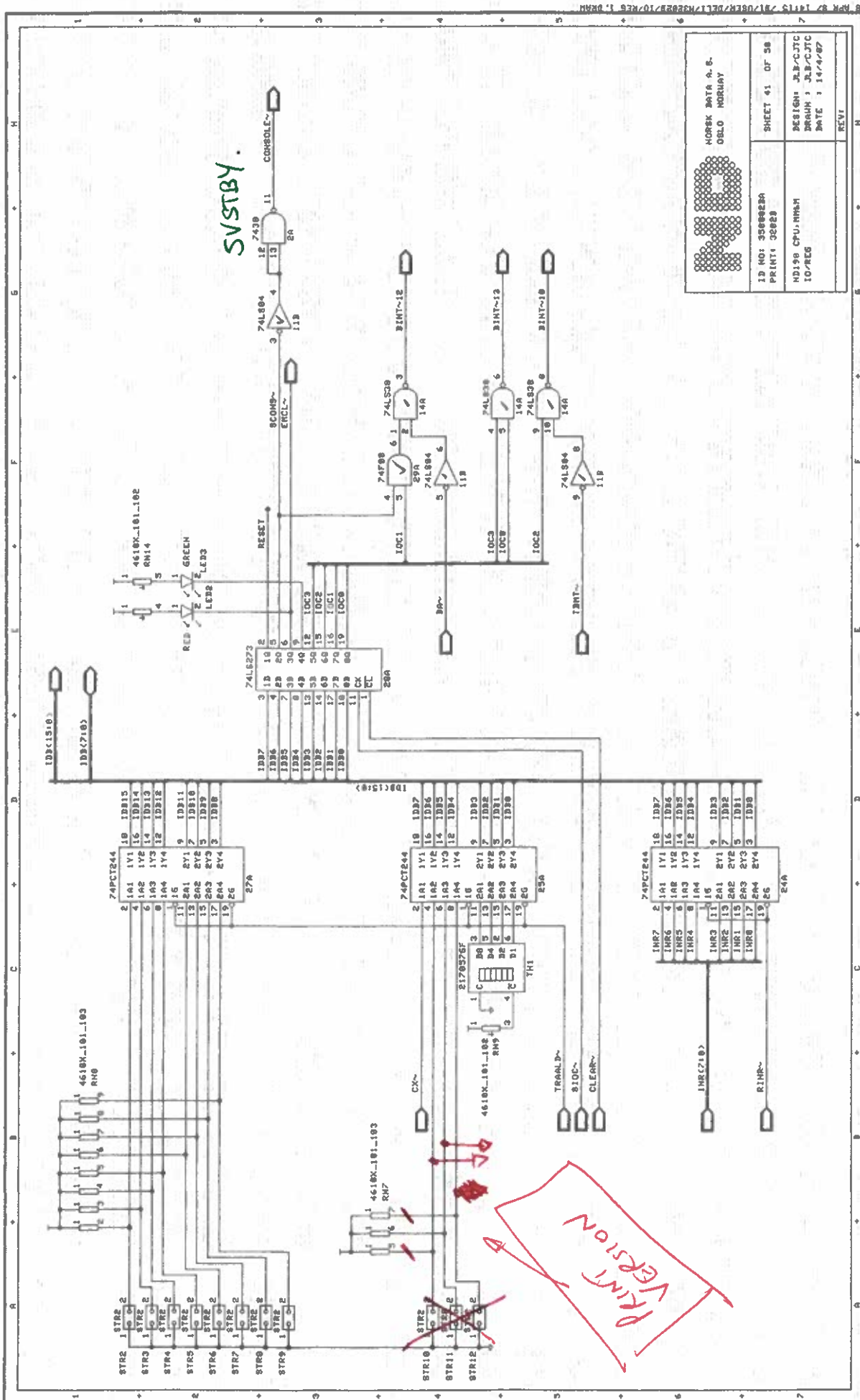




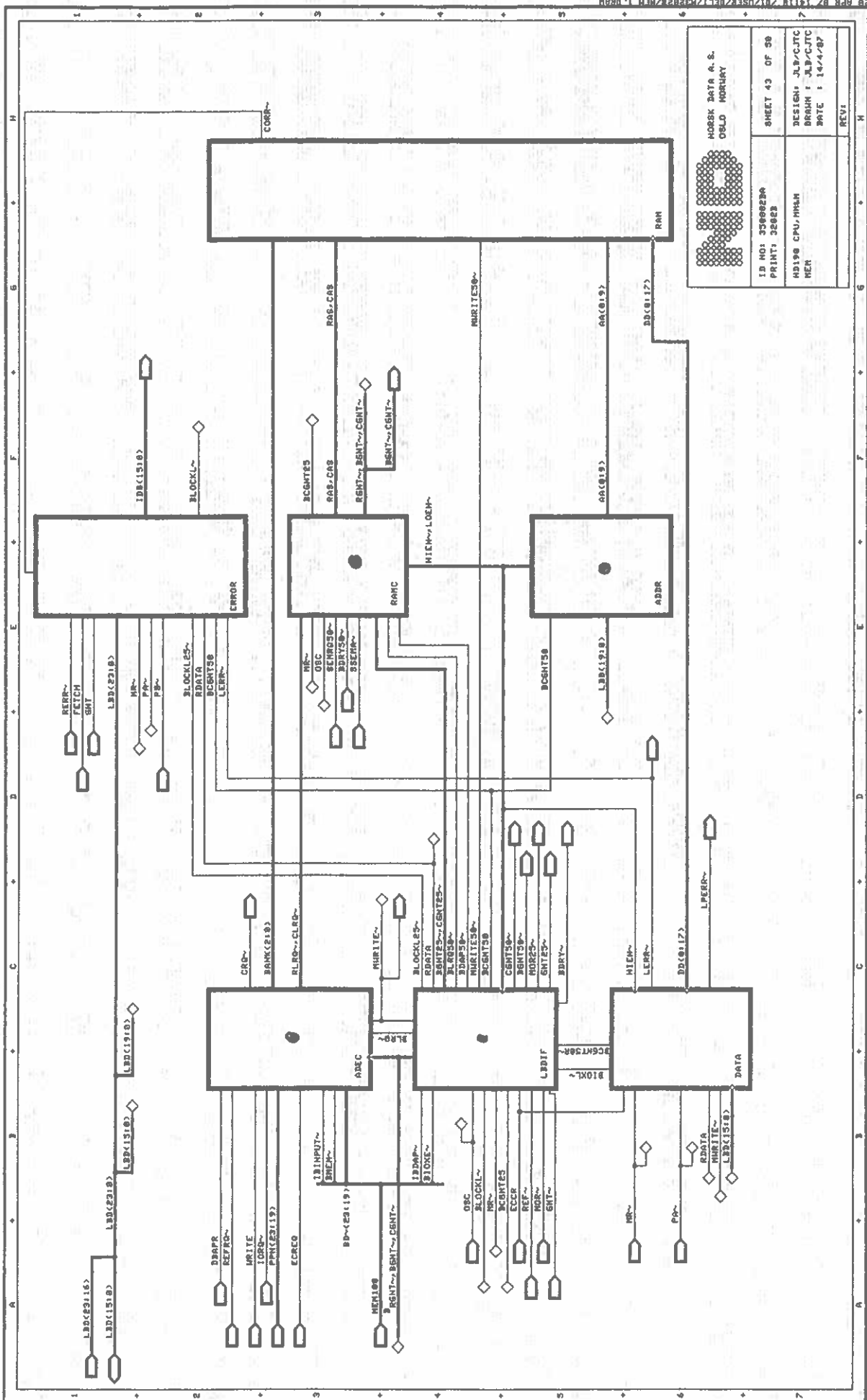


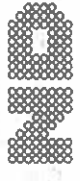


28 APR 87 14114 /DI/USCR/DELI/H32821/IO/PANCAI 1:JHAM

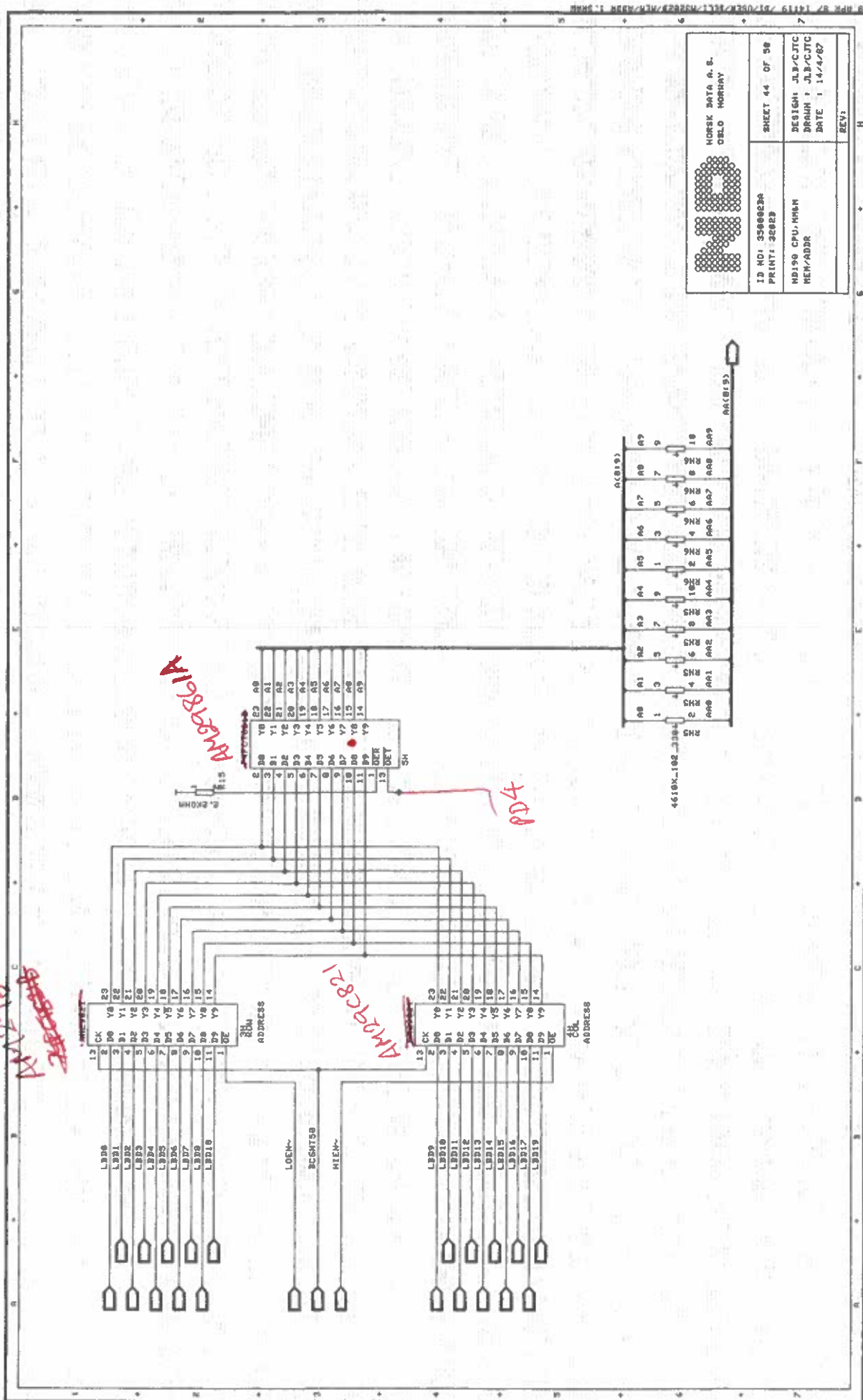


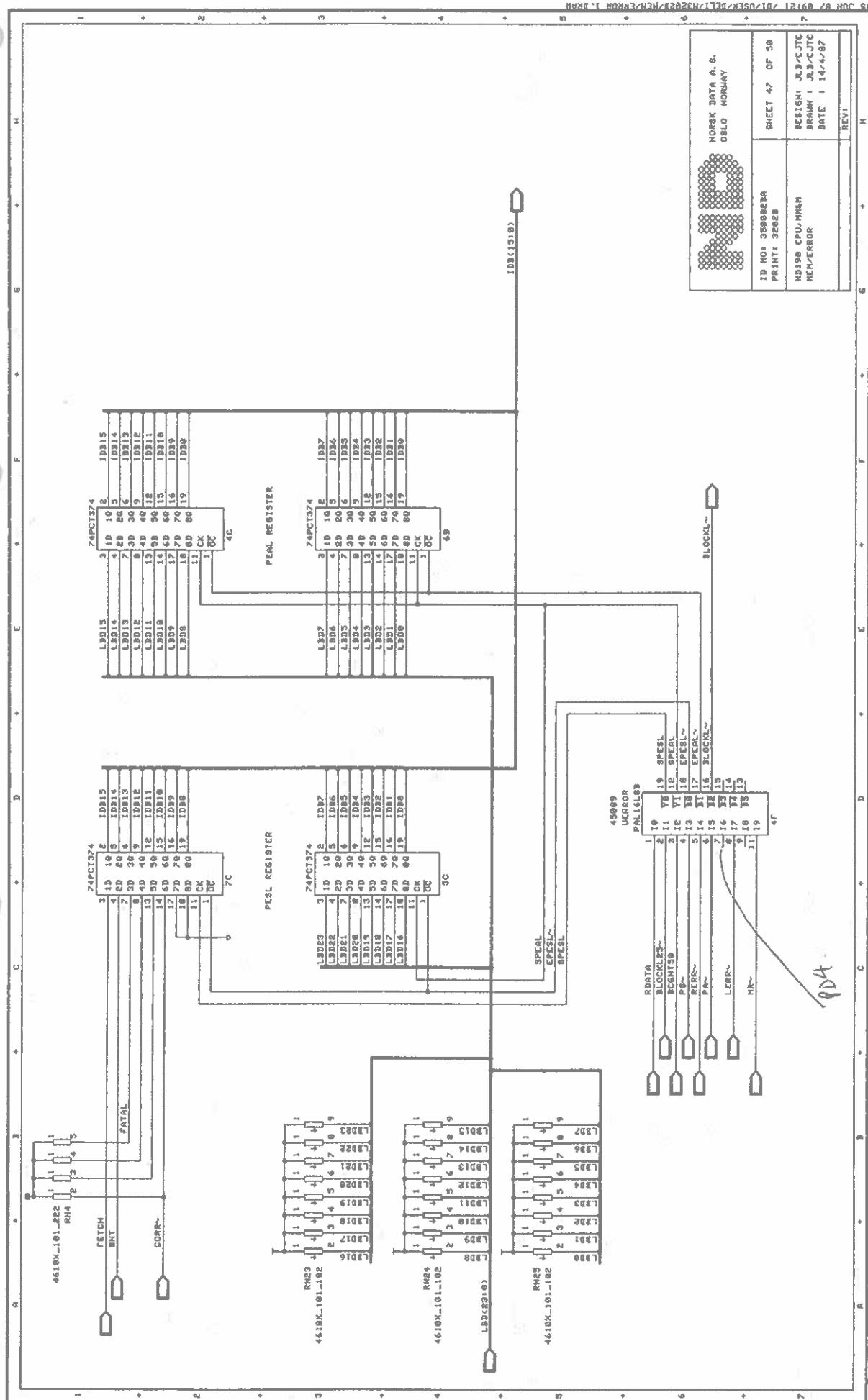
28 APR 87 14:15 /01/08LR/DELI/M32022/10/REG 1. ORAM

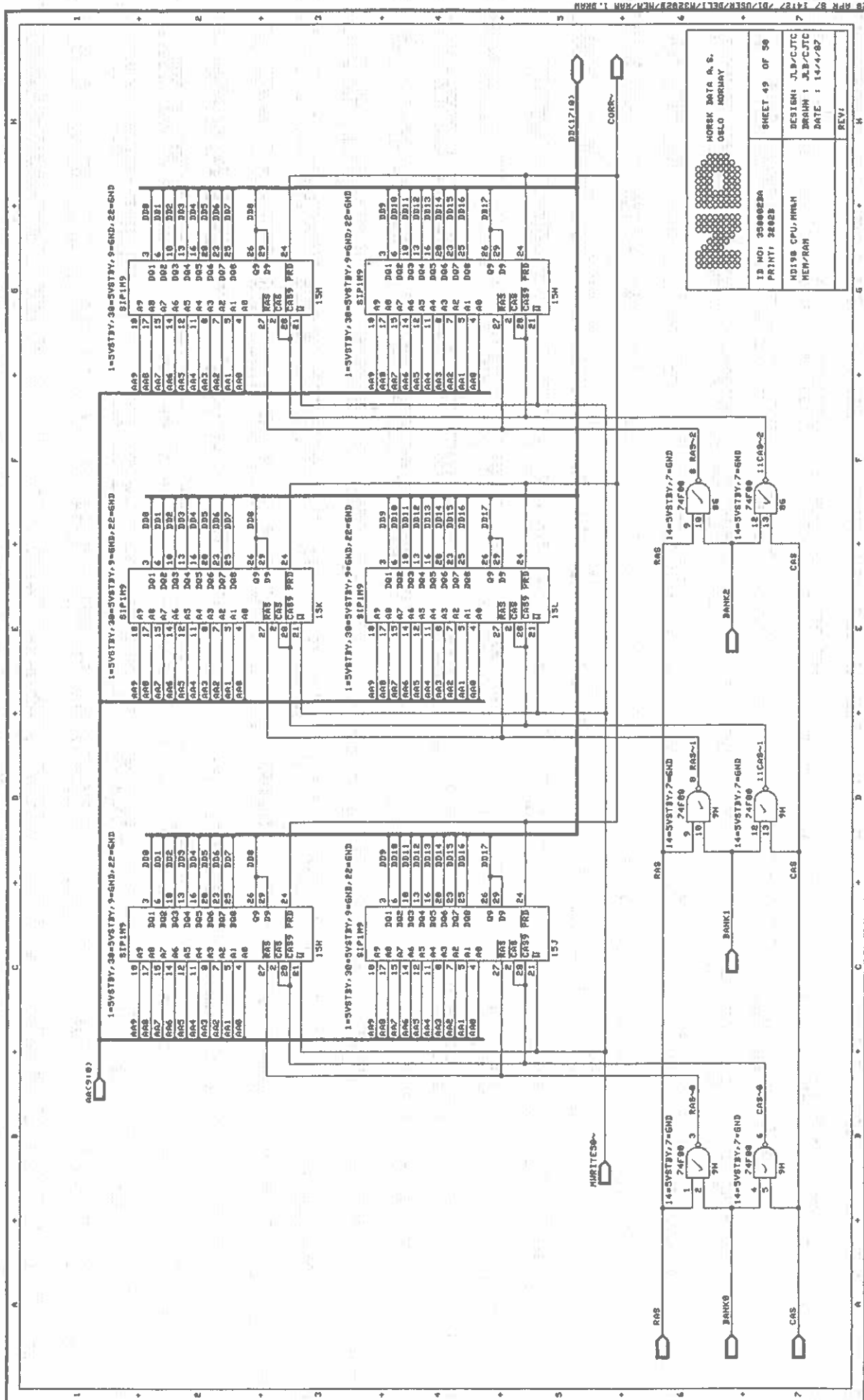


ADDRESS DATA A.S. OSD MEMORY	
	ID NO: 3568280 PRINT: 38828
DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 14/4/87	SHEET 43 OF 58 M3198 CPU, MHLH MEN
REV:	

28 APR 87 14110 JLB/OSK/MLL/M3198/MEN L.DRAW

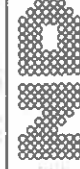
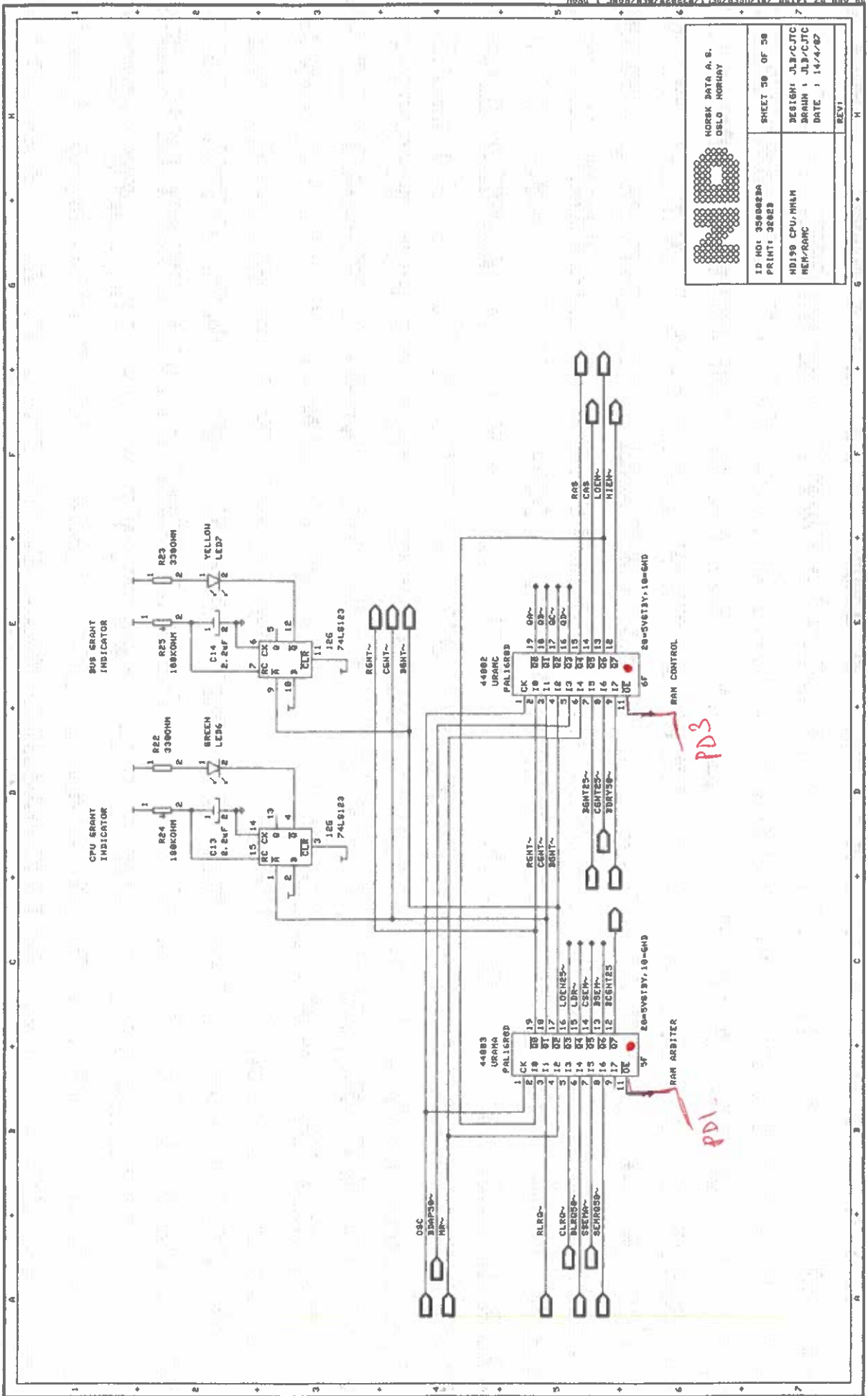






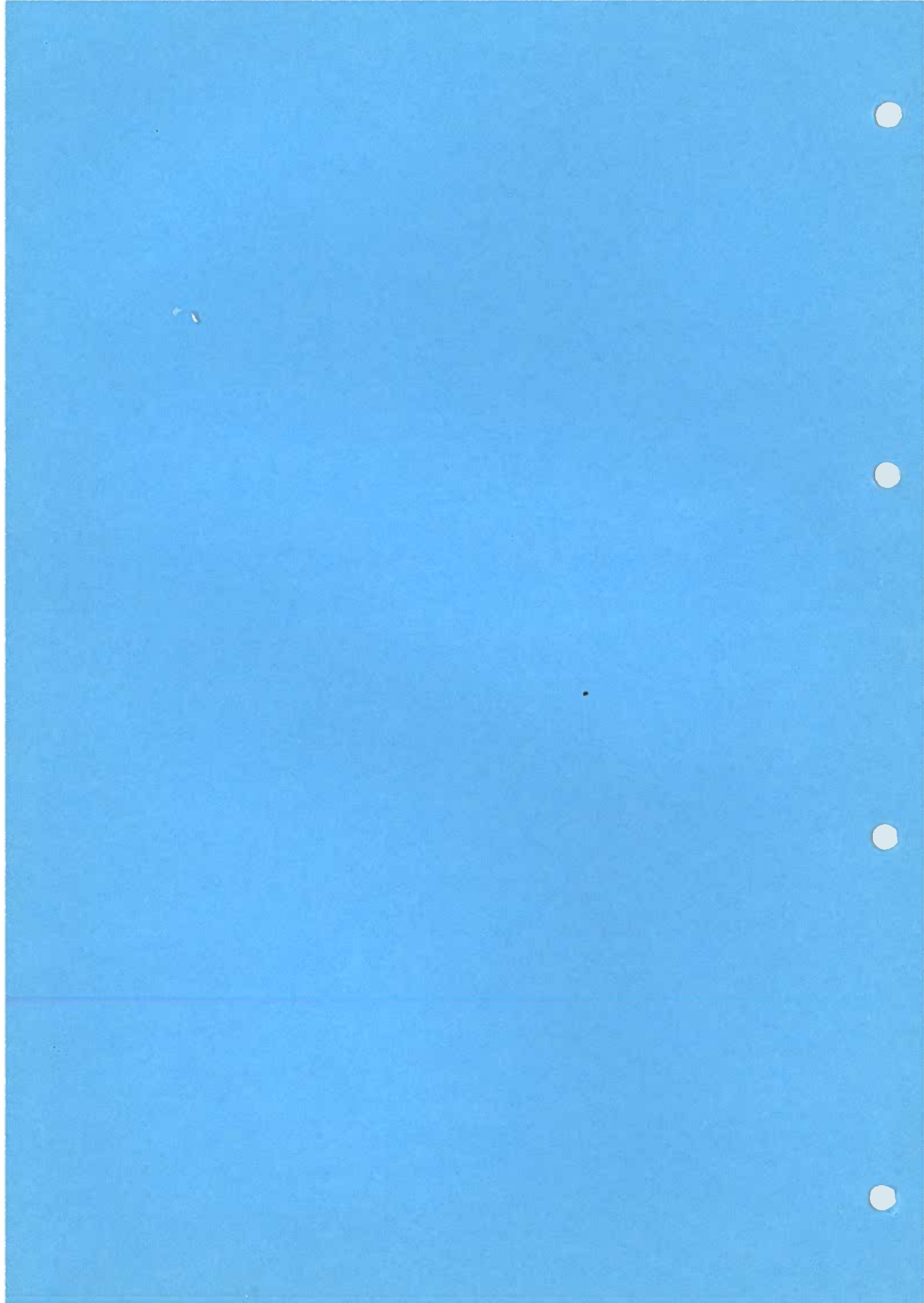
HOREK DATA A. S. OSLO NORWAY	
18 NO: 350028A PRINT: 32028	SHEET 49 OF 98
MD198 CPU, MEM MEM/ROM	DESIGN: JLB/CJC DRAWN: JLB/CJC DATE: 14/4/82
	REV: 1

28 APR 87 14:17 / D1/05EN/BELT/M3028/HEM/KRM 1.000



HORSK DATA A.S.
OSLO NORWAY

ID NO: 3500482A PRINT: 35023	SHEET 30 OF 50
HD199 CPU/MNM MEM/RMC	DESIGN: JLB/CJC DRAWN: JLB/CJC DATE: 14/4/87
	REV:



PAL's for board no. 3202C. ND120/CX. Last update 12. October 1987.
Standard is 4Mb memory configured contiguously from address 0.

Pos.no.	Check-sum	Device	Max. delay	Stock no.	Reg. no.	Mnemonic
11D	388B	16L8D *	10ns	513035	44302B	LBC1
2C	3932	16L8D *	10ns	513035	44303B	LBC2
1C	508A	16L8D *	10ns	513035	44304E	LBC3
15F		16L8D	10ns	513035	44305D	CSCTL
21G	7856	16L8D	10ns	513035	44306A	MMUCTL
13D	834E	16L8D	10ns	513035	44307C	CYCLK
3F	46FA	16L8D	10ns	513035	44310D	LBDIF
5D	59AF	16R4D	10ns	513060	44401B	BTIM
18F		16R4D	10ns	513060	44402D	UBITS
14D		16R4D	10ns	513060	44403C	CYINO
15D		16R4D	10ns	513060	~~44404C~~	CYIN1 44404D
19F	0F93	16R4D	10ns	513060	44407A	ERFIX
9G	44C7	16R4D	10ns	513060	44445B	CADEC
6G	3EF5	16R4D	10ns	513060	44446B	BADEC
22F	3160	16R4D	10ns	513060	~~44408B~~	VXFIX 44608A
12D	7F40	16R6D	10ns	513061	44601B	CYCFSM
10D	6B08	16R8D	10ns	513062	44801A	BARB
5F	605E	16R8D	10ns	513062	44803A	RAMA
6F		16R8B	15ns	500829	44902C	RAMC NEW
7G	48B4	16R8B	15ns	500829	44904B	MSIZE
8D	5963	16L8B *	15ns	500827	45001B	BPAR
2F		16L8B	15ns	500827	45008B	DATA NEW*
4F	43ED	16L8B *	15ns	500827	45009B	ERROR
26H		16R4B	15ns		44511A	LEVO NEW
26H		16L8B	15ns		45011A	LEVO OLD

PAL's for board no. 3202B. ND120/CX 2Mb version.
Replace 44445X with 44425X, and 44446X with 44426X.

9G	411E	16R4D	10ns	513060	44425B	CADEC
6G	42EF	16R4D	10ns	513060	44426B	BADEC

PAL's for board no. 3202B. ND120/CX 6Mb version.
Replace 44445X with 44465X, and 44446X with 44466X.

9G	4441	16R4D	10ns	513060	44465B	CADEC
6G	42EF	16R4D	10ns	513060	44466B	BADEC

PROM's

Pos.no.	Check-sum	Device	Max. delay	Stock no.	Reg. no.	Floating Bit format no.
23B		27256	250ns	500854	45132J	32bit 0-7
26B		27256	250ns	500854	45133J	32bit 8-15
23B		27256	250ns	500854	45148J	48bit 0-7
26B		27256	250ns	500854	45149J	48bit 8-15

* Will not work on the B-print. (Use versions without test mode).
NEW* Can use the previous version instead of a blank for raw pal.
OLD Need not be replaced on existing C-prints, but must be on all D-prints.

PAL's for board no. 3202B. ND120/CX. Last update 13 July 1987.
Standard is 4Mb memory configured contiguously from address 0.

Pos.no.	Check-sum	Device	Max. delay	Stock no.	Reg. no.	Mnemonic
11D	3BAB	16L8D	10ns	513035	44302A	LBC1
2C	393A	16L8D	10ns	513035	44303A	LBC2
1C	418B	16L8D	10ns	513035	44304A	LBC3
15F	51E1	16L8D	10ns	513035	44305A	CSCTL
21G	7856	16L8D	10ns	513035	44306A	MMUCTL
13D	834E	16L8D	10ns	513035	44307C	CYCLK
3F	43C4	16L8D	10ns	513035	44310A	LBDIF
5D	4913	16R4D	10ns	513060	44401A	BTIM
18F	27CB	16R4D	10ns	513060	44402A	UBITS
14D	3A22	16R4D	10ns	513060	44403A	CYINO
15D	0F58	16R4D	10ns	513060	44404A	CYIN1
19F	0F93	16R4D	10ns	513060	44407A	ERFIX
22F	3160	16R4D	10ns	513060	44408B	VXFIX
9G	44C7	16R4D	10ns	513060	44445B	CADEC
6G	3EF5	16R4D	10ns	513060	44446B	BADEC
12D	5D88	16R6D	10ns	513061	44601A	CYCFSM
10D	6B08	16R8D	10ns	513062	44801A	BARB
6F	5C1D	16R8D	10ns	513062	44802A	RAMC
5F	605E	16R8D	10ns	513062	44803A	RAMA
7G	48B4	16R8B	15ns		44904B	MSIZE
8D	5BE3	16L8B	15ns	500827	45001A	BPAR
2F	546C	16L8B	15ns	500827	45008A	DATA
4F	448D	16L8B	15ns	500827	45009A	ERROR
26H	13CA	16L8B	15ns	500827	45011A	LEVO
					44511A	"

PAL's for board no. 3202B. ND120/CX 2Mb version.
Replace 44445X with 44425X, and 44446X with 44426X.

9G	411E	16R4D	10ns	513060	44425B	CADEC
6G	42EF	16R4D	10ns	513060	44426B	BADEC

PAL's for board no. 3202B. ND120/CX 6Mb version.
Replace 44445X with 44465X, and 44446X with 44466X.

9G	4441	16R4D	10ns	513060	44465B	CADEC
6G	42EF	16R4D	10ns	513060	44466B	BADEC

PROM's

Pos.no.	Check-sum	Device	Max. delay	Stock no.	Reg. no.	Floating Bit format no.
23B	8025	27256	250ns	500854	45132F	32bit 0-7
26B	C9B6	27256	250ns	500854	45133F	32bit 8-15
23B	6541	27256	250ns	500854	45148F	48bit 0-7
26B	8AFD	27256	250ns	500854	45149F	48bit 8-15

PAL16L8

JLB/CJTC 14AUG86

44302B,11D,LBC1

/Q0 /Q2 /CC2 /BDY25 /BDY50 /CGNT /CGNT50 /CACT /TERM GND
/BGNT /CGNTCACT /RT /IORQ TEST NC16 /DSTB /EMD /BGNTCACT VCC

```
IF (/TEST) EMD = Q2 * Q0 * CACT      ; CPU CYCLE TO BUS SET
      + EMD * CACT                    ; "                HOLD
      + CGNT * CGNT50                 ; CPU CYCLE TO MEM SET
      + EMD * RT * CC2 * /TERM        ; ) HOLD TERMS FOR
      + EMD * IORQ * CC2 * /TERM      ; ) CPU READ, FETCH AND
                                      ; ) MAP CYCLES
```

IF (/TEST) CGNTCACT = CGNT + CACT

IF (/TEST) BGNTCACT = BGNT + CACT

IF (/TEST) DSTB = CGNT + CACT * /BDY50 * /BDY25 * /IORQ
 + CACT * IORQ * CC2 ; IOX CYCLE

DESCRIPTION

```
; 060387 JLB: EMD WAS HOLDING IN ADDRESS PART OF IOX CYCLES AFTER
; BUFFERED WRITE CYCLES.
; EMD - ENABLE DATA PATH BETWEEN CD AND LBD
; 270387 CJTC: NEW SIGNAL DSTB TO SAMPLE DATA AT LBD/CD BUFFERS ON
; CPU FROM BUS READ, AT BDY.
; 040487 JLB: DSTB MUST NOT CLOCK DATA BEFORE CACT GOES OFF IN IOXES.
; (NEGATIVE SETUP OF DATA IN BUS SPECS.)
;
; 180587 CJTC: 3202B
; 070887 JLB: 3202C ONLY! (TEST MODE).
```

PAL16L8

JLB/CJTC 15AUG86

44303B,2C,LBC2 - LOCAL DATA BUS CONTROL PAL

/CACT /CGNT /EADR /BINPUT50 MISO /IOD WRITE TEST NC9 GND
/BACT /WLBD NC13 NC14 NC15 NC16 /CMWRITE /CBWRITE /WBD VCC

; LBD TO BD TRANSCEIVER
; -----

; WBD - DIRECTION FROM LBD TO BD

IF (/TEST) WBD = EADR ; ADDRESS FROM CPU TO BUS
+ CBWRITE ; CPU WRITE CYCLE TO BUS
+ IOD * MISO * /BINPUT50 ; OUTPUT PART OF IOX
+ BACT ; DMA OUTPUT CYCLE

; (CBWRITE) - CPU TO BUS WRITE. STARTS ONLY WHEN THE BUS IS GRANTED.
; LASTS UNTIL THE END OF THE BUS CYCLE.

IF (/TEST) CBWRITE = WRITE * CACT
+ CBWRITE * CACT

; CD TO LBD TRANSCEIVER
; -----

; WLBD - DIRECTION FROM CD TO LBD

IF (/TEST) WLBD = CBWRITE ; CPU WRITE CYCLE TO BUS
+ CMWRITE ; CPU WRITE CYCLE TO LOCAL MEMORY
+ IOD * MISO * /BINPUT50 ; OUTPUT PART OF IOX

; (CMWRITE) - CPU WRITE TO LOCAL MEMORY. LASTS UNTIL END OF MEMORY CYCLE
; ON BUFFERED WRITE.

IF (/TEST) CMWRITE = WRITE * CGNT
+ CMWRITE * CGNT

DESCRIPTION

; 180587 - 3202B
; 070887 JLB: 3202C ONLY ! (TEST MODE).

PAL16L8

CJTC 02SEP86

44304E,1C,LBC3 - LOCAL DATA BUS CONTROL PAL

/CGNT /BGNT /BGNT50 /MWRITE /BDAP50 /EBUS /IBAPR /GNT TEST GND
NC11 NC12 /EBD CLKBD SAPR FAPR EBADR /BACT DBAPR VCC

; BACT - BUS ACTIVITY. LASTS FOR COMPLETE DMA TO LOCAL MEMORY
; CYCLE (ONLY ON MEMORY READ)

IF (/TEST) BACT = BGNT50 * /MWRITE ; ENABLE FOR DATA ONLY AFTER ADDRESS
+ BACT * BDAP50 ; HOLD AFTER BDAP FINISHED

; EBD - ENABLE BUS DATA. ENABLE LBD TO BD TRANSCEIVER
; SHOULD BE DISABLED DURING CGNT * /BACT, IE DISABLE WHEN CPU
; IS ACCESSING LOCAL MEMORY, EXCEPT WHEN TRANSCEIVER IS BEING USED
; AS A REGISTER TO HOLD DATA FROM A PREVIOUS DMA MEMORY READ.

IF (/TEST) EBD = EBUS * /CGNT * /GNT
+ EBUS * BGNT
+ EBUS * BACT

; EBADR - ENABLE ADDRESS FROM BUS TO LOCAL MEMORY

IF (/TEST) /EBADR = /GNT * /BGNT ;TURN ON AT BAPR WITH GNT
+ /IBAPR * /EBADR ;HOLD UNTIL BGNT AND GNT BOTH GONE
+ /GNT * /EBADR

; SLOW INVERSION

IF (/TEST) /FAPR = /IBAPR
IF (/TEST) /SAPR = /FAPR
IF (/TEST) /DBAPR = /SAPR

; CLOCK PULSE TO 648'S.

IF (/TEST) /CLKBD = /SAPR * /BGNT50 ; CLOCK ADDRESSES ON DELAYED BAPR.
+ /SAPR * /BDAP50 ; CLOCK DATA 50NS AFTER START OF
+ /SAPR * /MWRITE ; BGNT*BDAP ON MEMORY WRITES FROM DMA.

DESCRIPTION

; 200387 CJTC: NEED TO SLOW DOWN APR TO AS648 BUS TCVRs. PUT IT
; THROUGH THIS PAL INSTEAD OF F04
; 200387 JLB: EBADR COMES ON AT BAPR TO AVOID SPIKE ON LBD.
; NEW INPUT CGNT[™]
; 230387 JLB: APR DELAYED 3XPAL DELAY
; 240387 JLB: EBD MUST NOT CHANGE WHEN DATA IS Clocked IN.
;
; 180587 - 3202B
; 310787 JLB: BUFFERED DMA WRITE: CLOCK DATA IN 648'S ALSO.
; 040887 JLB: BUFFERED DMA WRITE: NEED TO ENABLE THE REGISTER IN THE
; 648'S FOR THE PERIOD OF BGNT.
; 060887 D JLB: EBADR CHANGED TO MAKE BUFFERED DMA WRITE WORK.
; 090887 E JLB: TEST MODE FOR C-PRINT.

PAL16L8
JLB 26NOV86
44305D,15F,CSCTL

/FORM /CC1 /CC2 /CC3 /LCS /RWCS /WCS FETCH /BRK GND
/TERM /WCSTB LUA12 /WCA /ELOW /EUPP /EWCA /ECSL /WICA VCC

; CONTROL STORE CONTROL

IF (VCC) WICA = WCA * FETCH * /TERM ;WRITE PULSE TO MICROINSTRUCTION CACHE

IF (VCC) WCSTB = /CC3 * CC2 * CC1 * WCS * RWCS ; e+f WRITE PULSE TO WRITEABLE
+ CC3 * /CC2 * CC1 * LCS ;m+n WRITE PULSE DURING LOAD CONTROL

IF (VCC) ECSL = RWCS * /WCS * CC3 * /TERM ;READ CONTROL STORE HOLD
+ RWCS * /WCS * /CC1 * CC2 * /TERM ;HOLD OVERLAP WITH EWCA

IF (VCC) EWCA = RWCS * /CC3 * CC2 * /TERM ;ENABLE WCA REG. IN MIC ONTO MA
+ RWCS * /CC3 * CC1 * /TERM ; AVOID BLIP ON NEXT CYCLE

IF (VCC) EUPP = LUA12 ;NORMAL ADDRESSING
+ WCA * FETCH ;WRITE INTO MICROINSTRUCTION CACHE
+ FETCH * /CC1 * /CC2 * /CC3 * /TERM ;ENABLE IN THE FIRST 50NS
; + HOLD TIME = 75NS

IF (VCC) ELOW = /LUA12 * /FETCH ;NORMAL ADDRESSING. ON FETCH EITHER MI
+ /LUA12 * TERM ;ENABLE ACCORDING TO LUA12 BEFORE FET
+ FORM * /BRK * CC2 * /TERM ;OR A MAP IS USED.
+ FORM * /BRK * CC3 * /TERM ;DO A MAP
+ /LUA12 * BRK * CC2 * /TERM ;ON BRK: USE BANK SELECTED BY LUA12.
+ /LUA12 * BRK * CC3 * /TERM ;

DESCRIPTION

; 130387 JLB: ELOW ALWAYS ENABLED ON TERM IF LUA12 IS LOW.
; MAY SPEED UP NON FETCH CYCLES.

; 180587 3202B

; 090687 JLB: EWCA MUST NOT BE ENABLED DURING a AND b. WILL CREATE BLIP ON
; NEXT CYCLE.

; 090687 JLB: ECSL HOLD IN g AND h.

; 030987 JLB: WRITE IN CONTROL STORE DOES NOT WORK. WRITE PULSE STARTS TOO
; SOON. WCSTB CHANGED TO e+f IN THIS CASE, AND TO m+n DURING LCS
; TO BE ABLE TO USE 250ns PROMS.

PAL16L8
JLB 26NOV86
44306A,21G,MMUCTL

CA0 WRITE /DVACC /RT /WCHIM DOUBLE /EMCL /CC2 /WCA GND
LSHADOW /LAPA /EPT /EPMAP /EPTI /EIPL /EIPU /EIPUR /ECD VCC

; MEMORY MANAGEMENT CONTROL

IF (VCC) ECD = WCA * /LSHADOW ;DISABLE CACHE ON SHADOW ACCESSES
+ RT * /LSHADOW * /CC2 ;ENABLE WHEN WRITING IN CACHE
;ENABLE IN THE FIRST PART OF READ/FETCH CYCLES

IF (VCC) LAPA = DVACC * /LSHADOW * /WCHIM ;LA TO PPN WHEN VIRTUAL ACCESSES ARE DISABLED
;WE ARE NOT ACCESSING SHADOW MEMORY OR WRITIN
;CACHE INHIBIT MAP

IF (VCC) EIPUR = /DOUBLE * LSHADOW * WRITE ;WRITING IN SHADOW IN REX MODE WILL MASK AWAY
;THE PROTECT BITS

IF (VCC) EIPU = WCHIM ;PASS PAGE NUMBER TO BE INHIBITED FROM IDB
+ DOUBLE * LSHADOW * CA0 ;SHADOW ACCESSES IN SEX MODE
+ DOUBLE * LSHADOW * WRITE ;WRITING IN SHADOW IN SEX MODE WILL WRITE A F
;BIT PAGE NUMBER

IF (VCC) EIPL = WCHIM ;PASS PAGE NUMBER TO BE INHIBITED FROM IDB
+ DOUBLE * LSHADOW * CA0 ;SHADOW ACCESSES IN SEX MODE
+ LSHADOW * WRITE ;WRITING LOWER BYTE (SAME FOR REX AND SEX)

IF (VCC) EPTI = LSHADOW * /EMCL * WRITE ;DISABLE DURING EMCL TO AVOID JAMMING THE IDB
+ LSHADOW * /EMCL * /DOUBLE ;ENABLE ONLY WHEN IN SHADOW
+ LSHADOW * /EMCL * /CA0 ;DISABLE WHEN IN SEX MODE WE ARE READ/FETCHIN
;ADDRESSES. (USE OTHER SRAM BLOCK).

IF (VCC) EPMAP = /WCHIM * /DVACC * /WRITE ;DISABLE WHEN WRITING THE CACHE INHIBIT MAP
+ /WCHIM * /DVACC * /LSHADOW ;DISABLE WHEN VIRTUAL ACCESS IS DISABLED AN
+ /WCHIM * /DVACC * /DOUBLE ;ACCESSING SHADOW MEMORY EITHER.
+ /WCHIM * /DVACC * CA0 ;DISABLE ON SHADOW MEMORY WRITE IN SEX MODE
+ /WCHIM * LSHADOW * /WRITE ;ADDRESSES.
+ /WCHIM * LSHADOW * /DOUBLE
+ /WCHIM * LSHADOW * CA0

IF (VCC) EPT = /WRITE * /EMCL ; DISBALE ON EMCL OR
+ /LSHADOW * /EMCL ; WRITING IN OTHER HALF
+ /DOUBLE * /EMCL ; WHEN IN SEX MODE
+ /CA0 * /EMCL

DESCRIPTION

; 25/2/87 JLB EQUATION FOR EPT MISSING
; 18/5/87 3202B

PAL16L8
JLB 26NOV86
44307C,13D,CYCLK

/TERM /CC0 /CC1 /CC2 /CC3 /FORM /BRK /RWCS /TRAP GND
VEX /MACLK /MAP /ETRAP UCLK /EORF CYD WRFSTB /MCLK VCC

; CYCLE CONTROL CLOCK GENERATOR.

IF (VCC) MCLK = RWCS * /CC3 ;BECAUSE THE CONTROL STORE ADDRESS TO B
+ RWCS * CC2 ;IN PRESENTED ONTO MA. THEN THE ADDRESS
;STORE LOCATION TO BE EXECUTED IS PRESE

IF (VCC) /WRFSTB = CC3 ;b ON 75NS CYCLES TO PROVIDE A WRITE PU
+ CC2
+ CC1
+ /CC0
+ TERM

IF (VCC) /CYD = CC3 ; d + e + f WRITE PULSE USED IN WMAP AND WCA
+ /CC1
+ /CC2 * CC0
+ TERM

IF (VCC) EORF = /CC3 * /CC2 * CC1 * /CC0 * /TERM ;d MISC WRITE PULSE.

IF (VCC) /UCLK = CC3 ;ON c ON ALL MEMORY REQUESTS.
+ CC2 ;USED TO UPDATE USED BITS AND CLOCK TRA
+ /CC1
+ /CC0
+ TERM ;EXPERIMENT TO SEE IF UCLK ON TERM WAS DANGEROUS.

IF (VCC) MAP = FORM * /BRK * CC2 * /TERM ;MUST NOT COME BEFORE ALL SHORT CYCLES

IF (VCC) MACLK = MAP * /CC3 * CC2 * CC1 ;e+f CAPTURE CD FROM MEMORY THROUGH M
+ TRAP * /CC3 * CC1 * /CC0 ;d+e CAPTURE TRAP VECTOR
+ RWCS * /CC3 ; CAPTURE MICROADDRESS AFTER EWCA
+ RWCS * CC2 * /CC1 ; TURNED OFF

IF (VCC) ETRAP = /TERM * /VEX * CC3 ; ENABLE TRAPS ONLY OUTSIDE t OR a
+ /TERM * /VEX * CC2 ; UNSTABLE TRAP IN THIS PERIOD
+ /TERM * /VEX * CC1 ; CAN DESTROY MA !
+ /TERM * /VEX * CC0 ; DISABLE TRAPS DURING VEX

DESCRIPTION

;280287 JLB: ECREQ TO LOCAL MEMORY GIVES TWO CGNTS. A SHORTER EORF,
; I.E. ONLY ON e AND NOT ON f, WILL MAKE ECREQ GO OFF 25NS SOONER
;AND HOPEFULLY CURE THIS.
;010387 JLB: ETRAP NEW OUTPUT. WILL DISABLE TRAP ON t AND a.
;080387 JLB: REMOVED UCLK ON CACHE HIT CYCLES.
;160387 JLB: REMOVED TERM IN MCLK AND MACLK TO PROVIDE SYMMETRICAL
; CLOCKS IN 50 NS CYCLES.
;170387 JLB/CJTC: REMOVED MREQ - NEEDED THE INPUT FOR NEW SIGNAL VEX.
; VEX SHOULD DISABLE TRAPS.
;180387 JLB: EORF ON d ONLY. MACLK ON e + f ON MAP.

;
; 270487 : M3202B
;B 300687 JLB: CYD POSITIVE POLARITY.
;C 130787 JLB: CYD FROM d TO f.

AL16L8

ADGD 13/8/86

44310D,3F,LBDIF

/HIEN /BGNT /CGNT /LOEN /CGNT50 ECCR /BGNT50 /BGNT75 /BDAP50 GND
/MR RDATA /MWRITE50 /BIOXE /REF100 RAS /BIOXL /BDRY /BCGNT50R VCC

IF (VCC) BCGNT50R = /MWRITE50 * BGNT * BGNT50 ;FROM 50NS AFTER GNT ON READ C
+ /MWRITE50 * CGNT * CGNT50 ;LASTS FOR THE REST OF THE CYC

IF (VCC) BDRY = /MWRITE50 * BDAP50 * BGNT * /LOEN * /HIEN * /RAS ;BUS READ FROM LOCAL M
+ MWRITE50 * BDAP50 * BGNT50 * BGNT ;BUS WRITE TO LOCAL MEM.
+ BIOXL * ECCR ;IOX=ECCR
+ /MR * BDRY * BDAP50 ;HOLD TERM FOR MEMORY
+ /MR * BDRY * BIOXE ;HOLD TERM FOR IOX CYCLE
+ REF100
+ /MWRITE50 * BDAP50 * /BGNT50 * BGNT75 ;LATE BDRY FOR 10MHZ DISK.

F (VCC) BIOXL = BIOXE * /BGNT * /CGNT

IF (VCC) /RDATA = MWRITE50 ;INDICATES DATA READY ON READ CYCLES
+ LOEN
+ HIEN
+ /BGNT * /CGNT
+ RAS

DESCRIPTION

;280287 JLB: ECCR WRONG POLARITY, RESPONDS WITH BDRY TO ALL NON-
;EXISTING IOX-ES.

;280287 JLB: NEW INPUT REF~, TO GENERATE A REF PULSE OF 175-200NS
;DURATION BY GENERATING BDRY~.

;

;180587 M3202B

;090787 B JLB: RAS USED IN RDATA TO AVOID SPIKE ON TRANSITION FROM
; LOEN TO HIEN.

;290787 C JLB: BD HAD A TYPICAL SETUP TIME OF 140NS BEFORE BDRY ON DMA READ
; CHANGED TO 65NS (25NS REQUIRED). DMA BUFFERED WRITE: BDRY START
; 50NS AFTER BGNT GOES ACTIVE ON DMA WRITE, AND LASTS UNTIL BGNT
; OR BDAP50 GOES OFF (105NS MIN.). THIS IS TO GIVE TIME FROM
; GRANT OFF TO BMEM ON IN THE FOLLOWING CYCLE.

;110887 D JLB: BDRY CAN BE LOST IF BDRY50 IS NOT PRESENT AT THE TIME STATE
; 7 IN THE RAM CONTROL IS REACHED. HAPPENS WITH 10MHZ DISK CONTR.
; SINTRAN STOPS ON LEVEL 14 DURING STARTUP.

PAL16R4

JLB 12AUG86

BTIM.PAL

44401B,5D,BTIM

OSC /CC2 /CACT /CACT25 /BDY50 /CGNT /CGNT50 /TERM /IORQ GND
/OE /EADR /EIOD /NC14 /Q2 /Q1 /Q0 /DAP /APR VCC

Q0 := CACT * /Q2 * /Q1 * /Q0 * /CACT25
+ /Q2 * /Q1 * Q0
+ Q2 * Q1 * Q0
+ Q2 * Q1 * /Q0

Q1 := /Q2 * Q0 * Q1
+ /Q2 * Q0 * /Q1
+ Q1 * /Q0 * Q2
+ Q1 * /Q0 * /Q2

Q2 := Q1 * /Q0 * Q2
+ Q1 * /Q0 * /Q2
+ Q2 * Q0 * Q1
+ Q2 * Q0 * /Q1

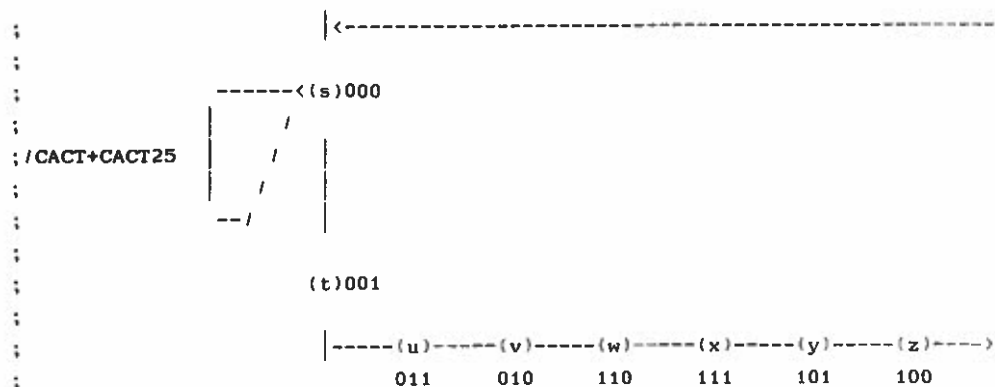
IF (VCC) APR = /Q2 * Q1 * CACT

IF (VCC) EADR = /Q2 * Q0 * CACT ; t + u
+ /Q2 * Q1 * CACT ; u + v
+ Q1 * /Q0 * CACT ; v + w
+ /Q2 * /Q1 * /Q0 * CACT * /CACT25 ; s
+ CGNT * /CGNT50 ; address part for CPU cycle

IF (VCC) DAP = /Q2 * /Q1 * /Q0 * CACT * CACT25
+ DAP * /TERM * IORQ * CC2

IF (VCC) EIOD = IORQ * /Q2 * /Q1 * /Q0 * CACT * CACT25 * /BDY50 * CC2
;STARTS WHEN THE s STATE HAS BEEN REACHED AFTER COMPLETING THE LOOP.

DESCRIPTION



; 010387 JLB: EIOD TOO SOON, ONLY 15NS SETUP FOR BD BEFORE BIOXE.
; WOULD NOT LOAD FROM FLOPPY, EIOD FRONT FLANK DELAYED 25NS.

; SAME WITH DAP. DAP HELD FOR THE REST OF THE CYCLE UNTIL TERM
; ON IORQ.
; 060387 JLB: DAP HELD INTO ADDRESS PART OF IOX CYCLES AFTER A
; BUFFERED WRITE CYCLE. SWAPPED IOD FOR IORQ IN EIOD.
; USING CC2 (NEW INPUT) TO QUALIFY DAP AND EIOD
; STATE MACHINE
;
; 180587 M3202B
; 090887 B JLB: MAXIMIZED EQUATIONS TO MATCH CLOCK SKEW.

PAL16R4
JLB/CJTC 8AUG86
44402D,18F,UBITS

UCLK /DT /RT LSHADOW FMISS CYD /HITO /HIT1 /EWC GND
/OE OUBI OUBD /IHIT NC15 NUBD NUBI /WCA /USED VCC

; CACHE USED BIT CONTROL

IHIT := HIT1 * HIT0 * OUBI * RT * /DT * /WCA ;FETCH
+ HIT1 * HIT0 * OUBD * RT * DT * /WCA ;READ

IF (VCC) USED = OUBI * RT * /DT * /WCA ;FETCH
+ OUBD * RT * DT * /WCA ;READ

IF (VCC) WCA = /RT * DT * EWC * CYD * /FMISS * /LSHADOW ;WRITE OUTSIDE SHADOW
+ RT * /IHIT * EWC * CYD * /FMISS * /LSHADOW ;FETCH/READ WITHOUT HIT
;OUTSIDE SHADOW

/NUBI := DT * /OUBI ; READ OR WRITE KEEP OLD VALUE
+ /RT * DT * HIT0 * HIT1 ; CLEAR IF WRITE WITH HIT

/NUBD := RT * /DT * /OUBD ; IF FETCH KEEP OLD VALUE

DESCRIPTION

;B 050387 JLB: USED BITS INVERTED TO ACTIVE HIGH.
;C 060387 JLB: SHOULD NOT PRODUCE WCA WHEN IN SHADOW.
;D 120387 JLB: HIT PATH IMPROVED

; 180576 M3202B

;B 300687 JLB: CYD POSITIVE POLARITY.
;C 130787 JLB: HOLD TERM ON WCA REMOVED BECAUSE CYD FROM d TO f.
;D 030987 JLB: TERM REMOVED AS AN INPUT, FMISS NEW INPUT PIN 5.
; WCA SHOULD NOT APPEAR WHEN FMISS (TSET FAILS).

PAL16R4
JLB 26NOV86
44403C,15D,CYIN0

CLK CSDELAY0 CSDLY CSECOND CSLOOP /ACOND /MR LUA12 /MAP GND
/OE /NC12 /SLCOND /DMAP /DMA12 /MDLY /LCS /NC18 /DLY0 VCC

; CYCLE CONTROL INPUT GENERATOR. PART 0.

```
IF (VCC) DLY0 = MDLY           ;25NS DELAY ON MICROCODE REQUEST
    + CSDELAY0                 ;25NS DELAY OF PREVIOUS CYCLE ON MICROC
    + ACOND * CSECOND          ;CONDITIONAL MICROSEQUENCING
    + ACOND * CSLOOP           ;USING ALU RESULT
    + LUA12 * /DMA12           ;
    + /LUA12 * DMA12           ;CHANGING FROM LOWER TO UPPER CONTROL
    + DMAP                     ; AFTER MAP TO AVOID CSDELAY BEEING TO
```

```
LCS := MR
    + /DMA12 * /LUA12 * LCS     ;LCS FROM MR AND UNTIL MA12 HAS GONE H
    + DMA12 * LUA12 * LCS       ;I.E. LMA COUNTED FROM 0 TO 8K.
    + /DMA12 * LUA12 * LCS
```

MDLY := CSDLY

DMA12 := LUA12

DMAP := MAP

```
IF (VCC) SLCOND = ACOND * CSECOND
    + ACOND * CSLOOP
```

DESCRIPTION

```
; 270487 : M3202B
; 160687 JLB: DLY0 AFTER EVERY MAP.
; 070987 C JLB: SLCOND NEW OUTPUT USED IN 44404
```

PAL16R4
JLB 26NOV86

44404C,14D,CYIN1
CLK CSDELAY1 CSALUM1 CSALUM0 CSALUI8 CSALUI7 LBA3 LBA1 LBA0 GND
/OE /DLY1 /SLCOND /NC14 /NC15 /NC16 /NOWRIT /NC18 /RRF VCC

; CYCLE CONTROL INPUT GENERATOR. PART 1.

IF (VCC) DLY1 = CSDELAY1 * /LBA3 * LBA1 * LBA0 ; 25NS DELAY OF PREVIOUS CYC
+ RRF * SLCOND ; ON MICROCODE REQUEST IN AD
; DLY0. NB.! MUST ALSO HAVE
; OF LONG COMPUTATION TIME.
; THIS DELAY IS ONLY USED WH
; IS USED
; FOR ADDRESS COMPUTATION IN

NOWRIT := /CSALUM1 * /CSALUI8 * /CSALUI7
+ /CSALUM0 * /CSALUI8 * /CSALUI7

DESCRIPTION

CAN BE CHANGED TO 16R6 IF NEEDED

; 270487 M3202B
; 150687 JLB: DELAY ALSO WHEN WE ARE NOT WRITING TO B- OR X-REGISTER.
; (THEY CAN STILL BE USED FOR ADDRESS COMPUTATION IN THE NEXT CYCLE !!!)
; 070987 C: DLY1 WHEN WE HAVE AN ALU CONDITION USED IN MICROBRANCHING COMBI
; WITH IDBS REG IN THE PREVIOUS CYCLE.

PAL16R4

JLB 25FEB87

44407A,19F,ERFFIX

CLK IDBS0 IDBS1 IDBS2 IDBS3 IDBS4 WRTRF /LCS NC9 GND
/OE /NC12 /NC13 /NC14 /NC15 /NC16 /RRF /NC18 /ERF VCC

; IDBS = REG FILE = 5

RRF := /LCS * /IDBS4 * /IDBS3 * IDBS2 * /IDBS1 * IDBS0

; ERF

IF (VCC) ERF = RRF
+ WRTRF

DESCRIPTION

; 180587 M3202B

PAL16R4
JLB/CJTC 17MAR87
44408B,22F,VEXFIX

CLK C4 C3 C2 C1 C0 M1 M0 /LCS GND
/OE IDB2 NC13 /RWCS OPCLCS VEX /LDEXM NC18 NC19 VCC

; TO FIX VIRTUAL EXAMINE BUG IN CGA
; + MISC. OTHER BUGS.

LDEXM := C4 * /C3 * /C2 * /C1 * C0 * M1 * M0 * /LCS ; COMMAND 21.3

/VEX := LDEXM * /IDB2 ; CLEAR
+ /LDEXM * /VEX ; HOLD CLEAR
+ LCS

/OPCLCS := /C4 + /C3 + /C2 + /C1 + C0 + /M1 + M0 + LCS ; COMMAND 36.2

RWCS := C4 * C3 * C2 * C1 * /C0 * /M1 * M0 * /LCS ; COMMAND 36.1

DESCRIPTION

; 180587 M3202B
; 150687 RWCS SIGNAL TOO SLOW FROM NEC G.A. MUST BE DONE IN A PAL.
; 010787 REGISTRATION NUMBER CHANGED FROM 44501B

PAL16R4

ADGD 18/8/86

44415B,9G,CADEC

CPU ADDRESS DECODER FOR 1MB MEMORY

CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20
* /PPN19 * /MOFF ;1MB

IF (VCC) CRQ = ECREQ * IORQ ;ECREQ WILL HOLD UNT
+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21
+ ECREQ * PPN20
+ ECREQ * PPN19

/BANK0 := PPN21 + PPN20

/BANK2 := PPN21 + /PPN20

/BANK1 := /PPN21 + PPN20

MSIZE0 = VCC

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.

; 150387 JLB: WRITE WAS WRONG POLARITY.

; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.

; 180587 M3202B

; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4

ADGD 18/8/86

44416B,6G,BADEC

DMA ADDRESS DECODE FOR 1MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + BD20 + BD19 + MOFF ;1 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK2 := BD21 + /BD20

/BANK1 := /BD21 + BD20

MSIZE1 = VCC

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.

; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !

; CHANGED TO AOK

; 180587 M3202B

; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4
 ADGD 18/8/86
 44425B,9G,CADEC
 CPU ADDRESS DECODER FOR 2MB MEMORY
 CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND
 /CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LINE R
 ;TO ALLOW MA
 ;IN THE ADDR
 ;THE 4MB (2M
 ;NEED NO HOL
 IF (VCC) CRQ = ECREQ * IORQ ;ECREQ WILL HOLD UNT

+ ECREQ * MOFF
 + ECREQ * PPN23
 + ECREQ * PPN22
 + ECREQ * PPN21
 + ECREQ * PPN20

/BANK0 := PPN21 + PPN20

/BANK2 := PPN21 + /PPN20

/BANK1 := /PPN21 + PPN20

MSIZE0 = GND

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.
 ; 150387 JLB: WRITE WAS WRONG POLARITY.
 ; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.
 ; 180587 M3202B
 ; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4

ADGD 18/8/86

44426B,6G,BADEC

DMA ADDRESS DECODE FOR 2MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + BD20 + MOFF ;2 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK2 := BD21 + /BD20

/BANK1 := /BD21 + BD20

MSIZE1 = GND

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.

; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !

; CHANGED TO AOK

; 180587 M3202B

; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4

ADGD 18/8/86

44445B,9G,CADEC

CPU ADDRESS DECODER FOR 4MB MEMORY

CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

```
IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LINE R
                                                    ;TO ALLOW MA
+ ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * PPN20 * /MOFF ;IN THE ADDR
                                                    ;THE 4MB (2M
                                                    ;NEED NO HOL
IF (VCC) CRQ = ECREQ * IORQ ;ECREQ WILL HOLD UNT
+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21
```

/BANK0 := PPN21 + PPN20

/BANK2 := PPN21 + /PPN20

/BANK1 := /PPN21 + PPN20

MSIZE0 = VCC

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY. PPN18 AND PPN19 REMOVED.

; 150387 JLB: WHITE WAS WRONG POLARITY.

; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.

; 180587 M3202B

; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4

ADGD 18/8/86

44446B,6G,BADEC

DMA ADDRESS DECODE FOR 4MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + MOFF ;4 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK2 := BD21 + /BD20

/BANK1 := /BD21 + BD20

MSIZE1 = GND

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.

; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !

; CHANGED TO AOK

: 180587 M3202B

; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4

ADGD 18/8/86

44465B,9G,CADEC

CPU ADDRESS DECODER FOR 6MB MEMORY

CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LINE R
+ ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * PPN20 * /MOFF ;TO ALLOW MA
+ ECREQ * /IORQ * /PPN23 * /PPN22 * PPN21 * /PPN20 * /MOFF ;IN THE ADDR
;THE 4MB (2M
;NEED NO HOL
;ECREQ WILL

IF (VCC) CRQ = ECREQ * IORQ
+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21 * PPN20

/BANK0 := PPN21 + PPN20

/BANK2 := PPN21 + /PPN20

/BANK1 := /PPN21 + PPN20

MSIZE0 = GND

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.

; 150387 JLB: WRITE WAS WRONG POLARITY.

; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.

; 180587 M3202B

; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4

ADGD 18/8/86

44466B,6G,BADEC

DMA ADDRESS DECODE FOR 6MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM
+ BD23
+ BD22
+ BD21 * BD20
+ MOFF ;6 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK2 := BD21 + /BD20

/BANK1 := /BD21 + BD20

MSIZE1 = VCC

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED
; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.
; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR '
; CHANGED TO AOK

; 180587 M3202B
; 060687 JLB: SWAPPED BANK1 AND BANK2 TO PROVIDE ENOUGH SPACE FOR PACKAGES.

PAL16R4
CJTC 30SEP87
44511A,26H,LEV0

CLK PILO PIL1 PIL2 PIL3 CLK /MREQ /WCA NC9 GND
/OE LEV0 /NC13 /NC14 /NC15 /NC16 CUP /NC18 /CWR VCC

; LEVEL ZERO

IF (VCC) /LEV0 = PIL3
+ PIL2
+ PIL1
+ PILO

; (CWR)

IF (VCC) CWR = MREQ * WCA ; SET ON WRITE TO CACHE
+ CWR * /CLK ; HOLD UNTIL START OF NEXT CYCLE

; CUP

/CUP := /CWR * MREQ ; CUP := CWR * MREQ ; SET ON WRITE TO CACHE
+ /CUP * /MREQ ; + CUP * /MREQ ; HOLD UNTIL NEXT MREQ

DESCRIPTION

; 180587 M3202B

061087 CJTC : ADDED CACHE UPDATE BIT (CUP) FOR M3202D

PAL16R6
JLB 26NOV86
44601B,12D,CYCFSM

OSC /DLY1 /DLY0 CSDELAY0 WAIT1 WAIT2 /CGNTCACT HIT /BRK GND
/OE /SHORT /CC3 /CC2 /CC1 /CC0 /TERM /CX /SLOW VCC

; CYCLE CONTROL STATE COUNTER. FAST VERSION (ND-120/CX).

CX := VCC ; THIS IS THE FAST VERSION

TERM := /CC3 * /CC2 * /CC1 * /CC0 * SHORT * /TERM * /DLY0 * /CSDELAY0 ;50NS CYCLE
+ /CC3 * /CC2 * /CC1 * CC0 * SHORT * /BRK * /DLY1 * /TERM ;75NS CYCLE
+ /CC3 * /CC2 * /CC1 * CC0 * HIT * /BRK * /DLY1 * /TERM ;75NS CYCLE
+ /CC3 * /CC2 * CC1 * CC0 * SHORT * /BRK * /TERM ;100NS CYCLE
+ /CC3 * /CC2 * CC1 * CC0 * HIT * /BRK * /TERM ;100NS CYCLE
+ /CC3 * CC2 * CC1 * CC0 * BRK * /TERM ;BRK CYCLE (>200
+ /CC3 * CC2 * /CC1 * CC0 * SLOW * /TERM ;SLOW CYCLES INCL. FE
+ CC3 * /CC2 * /CC1 * /CC0 * /TERM ;UART,LCS,RWCS CYCLES

CC3 := CC2 * /CC1 * /CC0 * /TERM ;h+i+j+k+l+m+n+o
+ CC3 * CC1 * /TERM * CC2
+ CC3 * CC1 * /TERM * /CC2
+ CC3 * CC0 * /TERM * CC2 * CC1
+ CC3 * CC0 * /TERM * /CC2 * CC1
+ CC3 * CC0 * /TERM * CC2 * /CC1
+ CC3 * CC0 * /TERM * /CC2 * /CC1

CC2 := /CC3 * CC2 * CC1 * /TERM ;e+f+g+h+i+j+k
+ CC2 * /CC1 * /TERM * CC3
+ CC2 * /CC1 * /TERM * /CC3
+ CC2 * CC0 * /TERM * CC3
+ CC2 * CC0 * /TERM * /CC3
+ /CC3 * /CC2 * CC1 * /CC0 * CGNTCACT * /TERM ;d WAIT FOR BUS IF
+ /CC3 * /CC2 * CC1 * /CC0 * /WAIT1 * /TERM ;d WAIT1 AND NOT
+ /CC3 * /CC2 * CC1 * /CC0 * BRK * /TERM ;d BRK

CC1 := /CC3 * /CC2 * CC0 * /TERM * CC1 ;b+c+d+e+j+k+l+m
+ /CC3 * /CC2 * CC0 * /TERM * /CC1
+ CC3 * CC2 * CC0 * /TERM * CC1
+ CC3 * CC2 * CC0 * /TERM * /CC1
+ CC1 * /CC0 * /TERM * CC2 * CC3
+ CC1 * /CC0 * /TERM * CC2 * /CC3
+ CC1 * /CC0 * /TERM * /CC2 * CC3
+ CC1 * /CC0 * /TERM * /CC2 * /CC3

CC0 := /CC3 * /CC2 * /CC1 * /TERM ;a+b+f+i+j+m+n
+ /CC3 * CC2 * CC1 * CC0 * /TERM
+ CC3 * CC2 * /CC1 * /TERM
+ CC3 * /CC2 * CC1 * /TERM
+ /CC3 * CC2 * CC1 * /CC0 * /CGNTCACT * /TERM ;e WAIT FOR BUS OR LOC
+ /CC3 * CC2 * CC1 * /CC0 * BRK * /TERM ;e MEM CYCLE TO FINISH
+ /CC3 * CC2 * CC1 * /CC0 * /WAIT2 * /TERM ;e IF WAIT2 AND NOT BRK
+ /CC3 * /CC2 * CC1 * CC0 * CGNTCACT * /BRK * /TERM ;e PREV WRITE.

DESCRIPTION

; 060387 JLB: MOD'S FROM SLOW VERSION IMPLEMENTED.
; 060387 JLB: 100 NS CYCLE MIN. NO BUFFERED WRITE.
; 070387 JLB: 75 NS CYCLE MIN. NO BUFFERED WRITE.
; 120387 JLB: IMPROVED HIT PATH. FORM~ REMOVED. HIT INPUT ON PIN 12.
; SHORT IN ON PIN 4.
; 120387 JLB: 50 NS CYCLE ON SHORT
; 180387 JLB: MR GATED WITH WAIT1 OUTSIDE. NEW INPUT CSDELAY0.
; 180387 JLB: BUFFERED WRITE.
; 180387 JLB: 175NS SLOW & BRK CYCLES.
; 210387 JLB: 200NS SLOW CYCLES, 175NS BRK CYCLES.

; 270487 M3202B
; 060887 JLB: MAXIMIZED EQUATIONS TO MATCH CLOCK SKEW.

PAL16R8
JLB/CJTC 11AUG86
44801A,10D,BARB

OSC /CRQ /IORQ /MR /BRQ50 /REFRQ50 /BDY25 /SEMRQ50 NC9 GND
/OE /CACT /GNT /IOD /REF /MEM /DOREF /ACT /SEM VCC

; CACT - CPU IS ACTIVE ON THE ND100 BUS

CACT := CRQ * /REFRQ50 * /BRQ50 * /REF * /GNT * /SEM * /BDY25 * /MR ; 4
+ CRQ * /REFRQ50 * DOREF * /REF * /GNT * /SEM * /BDY25 * /MR ; 2
+ CACT * /BDY25 * /MR ; HOLD
+ CRQ * SEM * /GNT * /BDY25 * /MR ; SEMAPHORE

; REF - REFRESH GRANT ON ND100 BUS

REF := REFRQ50 * /CACT * /GNT * /SEM * /BDY25 ; 1
+ REF * /BDY25 ; HOLD
+ REFRQ50 * MR ; ALWAYS GRANT REFRESH DURING MR

; GNT - GRANT ND100 BUS TO A DMA DEVICE OR EXTERNAL BUS CONTROLLER

GNT := BRQ50 * /REFRQ50 * /CRQ * /REF * /CACT * /SEM * /BDY25 * /MR ; 3
+ BRQ50 * /REFRQ50 * /DOREF * /REF * /CACT * /SEM * /BDY25 * /MR ; 3
+ GNT * /BDY25 * /MR ; HOLD
+ BRQ50 * SEM * GNT * /MR ; SEMAPHORE

; IOD - IO SIGNAL TO LAST FOR THE ENTIRE BUS CYCLE

IOD := IORQ * CRQ * /REFRQ50 * /BRQ50 * /REF * /GNT * /SEM * /BDY25 * /MR ; 4
+ IORQ * CRQ * /REFRQ50 * DOREF * /REF * /GNT * /SEM * /BDY25 * /MR ; 2
+ IOD * /BDY25 * /MR ; HOLD
+ IORQ * CRQ * SEM * /GNT * /BDY25 * /MR ; SEMAPHORE

; MEM - MEM SIGNAL TO LAST FOR ENTIRE BUS CYCLE

; GENERATES BMEM WHICH IS PRESENT ON REFRESH, CPU MEMORY AND DMA CYCLES

MEM := BRQ50 * /IORQ * /IOD * /BDY25 * /MR
+ BRQ50 * /CRQ * /IOD * /BDY25 * /MR
+ BRQ50 * /DOREF * /IOD * /BDY25 * /MR
+ CRQ * /IORQ * /IOD * /BDY25 * /MR
+ REFRQ50 * /IOD * /BDY25
+ REFRQ50 * MR
+ MEM * /BDY25 * /MR

; SEM - SEMAPHORE GRANT SIGNAL

SEM := SEMRQ50 * /MR * BDY25
+ SEM * /MR * /ACT

; ACT - BUS IS ACTIVE

ACT := CACT * /BDY25 * /MR
+ GNT * /BDY25 * /MR

+ REF * /BDRY25 * /MR

; DOREF - INDICATES THAT LAST BUS CYCLE WAS A REFRESH

DOREF := REF * /MR * BDRY25

+ DOREF * /MR * /CACT * /GNT * /REF

DESCRIPTION

; PRIORITY:

- ; 1. REFRESH
- ; 2. CPU REQUEST AFTER A REFRESH
- ; 3. BUS REQUEST
- ; 4. CPU REQUEST

; 26/2-87JLB: WRONG HOLD TERM IN IOD.

;

; 180587 M3202B

PAL16R8
ADGD/13/8/86
44803A,5F,RAMA

OSC /LOEN /RLRQ /MR /CLRQ /BLRQ50 /SSEMA /SEMRQ50 NC9 GND
/OE BCGNT25 /BSEM /CSEM /LDR /LOEN25 /BGNT /CGNT /RGNT VCC

RGNT := RLRQ * /CSEM * /BSEM * /RGNT * /CGNT * /BGNT ;RLRQ HIGHEST PRIORITY
+ RGNT * /LOEN * /LOEN25 ;HOLD TO END OF DRAM CYCLE
+ RGNT * LOEN * LOEN25
+ RGNT * LOEN * /LOEN25

CGNT := /MR * /CSEM * /BSEM * CLRQ * /BLRQ50 * /RLRQ * /RGNT * /CGNT * /BGNT
;CLRQ ALONE
+ /MR * /CSEM * /BSEM * LDR * /RLRQ * CLRQ * /RGNT * /CGNT * /BGNT
;CLRQ * LAST DONE REF
+ /MR * CSEM * /BSEM * CLRQ * /RGNT * /CGNT * /BGNT ;CLRQ WITH SEMAPHOR
+ CGNT * /LOEN * /LOEN25 * /MR
+ CGNT * LOEN * LOEN25 * /MR
+ CGNT * LOEN * /LOEN25 * /MR

BGNT := /MR * /CSEM * /BSEM * /RLRQ * /CLRQ * BLRQ50 * /RGNT * /CGNT * /BGNT ;BLRQ ALO
+ /MR * /CSEM * /BSEM * /LDR * /RLRQ * BLRQ50 * /RGNT * /CGNT * /BGNT ;BLRQ * N
+ /MR * /CSEM * BSEM * BLRQ50 * /RGNT * /CGNT * /BGNT ;BLRQ WITH
+ BGNT * /LOEN * /LOEN25 * /MR
+ BGNT * LOEN * LOEN25 * /MR
+ BGNT * LOEN * /LOEN25 * /MR

LDR := RGNT ;SET ON REFRESH
+ LDR * /CGNT * /BGNT ;HOLD UNTIL NEXT B OR C-GNT

CSEM := /MR * SSEMA * CGNT ;SET ON SSEMA * CGNT
+ /MR * CSEM * LOEN25 * LOEN ;HOLD UNTIL END OF 2ND. CGNT
+ /MR * CSEM * LOEN25 * /LOEN
+ /MR * CSEM * /LOEN25 * /LOEN

BSEM := /MR * SEMRQ50 * BGNT ;SET IN SEMRQ50 * BGNT
+ /MR * BSEM * LOEN25 * LOEN ;HOLD UNTIL END OF 2ND. BGNT
+ /MR * BSEM * LOEN25 * /LOEN
+ /MR * BSEM * /LOEN25 * /LOEN

LOEN25 := LOEN

/BCGNT25 := /BGNT * /CGNT

DESCRIPTION

PRIORITY: 1. REFRESH
2. CPU * LAST DONE REFRESH
3. BUS
4. CPU

; 270387 CJTC: INCREASE PERIOD BETWEEN SUCCESSIVE GRANTS BY 25NS BY
; INTRODUCING NEW SIGNAL MFREE25~ AND NOT GRANTING ANYTHING UNTIL
; THIS IS TRUE
; 020487 JLB: MFREE NOT NEEDED, BUT TO AVOID POWER UP PROBLEMS MCL~ ADDED.
;
; 180587 M3202B

PAL16R8

ADGD 13/8/86

44902C,6F,RAMC

OSC /RGNT /CGNT /BGNT /BDAP50 /MR /BGNT25 /CGNT25 /BDRY50 GND
/OE /HIEN /LOEN CAS RAS /QD /QC /QB /QA VCC

QA := QD * QC * QB * QA * /RGNT * /CGNT25 * /BGNT25
+ /QD * /QB
+ /QD * QC
+ QD * /QC
+ /QB * QA * QD * QC
+ /QB * QA * /QD * QC
+ /QB * QA * QD * /QC
+ /QB * QA * /QD * /QC

QB := /QD * QA * QB
+ /QD * QA * /QB
+ /QD * /QA * QB
+ /QD * /QA * /QB
+ QA * QC
+ QA * /QC
+ /QC * QB

QC := QD * QC * /QB * /QA * BGNT25 * /BDAP50 * /MR * /BDRY50
+ /QD * /QB * QA
+ /QD * /QB * /QA
+ QC * QA * /QD
+ QC * QA * QD
+ QB * /QA * /QD
+ QB * /QA * QD

QD := /QB * /QA * QC
+ /QB * QA * QC
+ /QB * QA * /QC
+ /QB * /QA * /QC
+ QC * QB * /QD
+ QC * QB * QD
+ QD * /QA

/RAS := /QD * QC * QB ;RAS=1,2,3,4,5,6
+ /QD * QC * /QB
+ /QD * /QC * QB
+ /QD * /QC * /QB
+ QC * QA * QD
+ QC * QA * /QD
+ /QC * QB * /QA

LOEN := QD * /QB * /QA * QC ;LOEN=3,4,5,6
+ QD * /QB * /QA * /QC
+ QD * /QC * QA * QB
+ QD * /QC * QA * /QB

HIEN := QD * QC * QB * QA ;HIEN=0,1,2,8
+ QD * QC * QB * /QA
+ /QD * QB * /QA * QC
+ /QD * QB * /QA * /QC

/CAS := QC * /RGNT ;CAS=4,5,6,7,8

```

+ /QD * RGNT                ;CAS ON REFRESH=1,2,3,4,5
+ /QD * /QB
+ QC * /QB * QA
+ QD * QB * /QA * /RGNT
+ QD * /QC * QB * RGNT

```

DESCRIPTION

```

;0)1111 IDLE UNIT NEXT GNT OF ANY TYPE
;1)1110
;2)1100 PAUSE UNTIL BDAP OCCURS (ONLY ON BGNTS)
;      NO WAIT STATE ON CPU TO MEMORY WRITE
;3)1000
;4)1001
;5)1011

;6)0011
;7)0010
;8)0110
;OTHER STATES WILL GO TO IDLE AFTER 1 OSC PERIOD.

```

```

;190387 JLB: RAS & CAS INVERTED.
;190387 JLB: BGNT25 NEW INPUT. USED TO DELAY STATE MACHINE TURN ON 25NS ON
; BUS CYCLES.
;230387 CJTC: CGNT25 NEW INPUT. USED TO DELAY STATE MACHINE TURN ON 25NS ON
; CPU CYCLES.
; 020487 JLB: BDRY50 WILL GET US OUT OF THE WAIT STATE ON TIMEOUT.
;
; 180587 M3202B
; 091087 C CJTC: STATE MACHINE CHANGED TO GIVE TRANSITION ON QD BETWEEN
                STATES 5 AND 6. NEED FOR CLRERR IN 45008B.
                CHANGED FROM 44802C BECAUSE PATTERN SENSITIVITY WITH
                MMI 10NS PALS

```

PAL16R8
CJTC 180587
44904B,7G,SIZEIND

CLK /MSIZE0 /MSIZE1 /MOFF NC5 NC6 NC7 NC8 NC9 GND
/OE /EHI /EMID /ELOW NC15 DBIT CBIT BBIT ABIT VCC

; MEMORY SIZE INDICATOR FOR 0, 2, 4 OR 6 MB MEMORY ARRAYS

EHI := EMID + ELOW * EHI + /ELOW * /EHI ; ENABLE DIGIT 3

EMID := ELOW * /EMID * /EHI ; ENABLE DIGIT 2

ELOW := /ELOW * /EMID * EHI ; ENABLE DIGIT 1

/ABIT := MOFF
+ MSIZE0 * EMID
+ EHI
+ ELOW

/BBIT := MOFF
+ /MSIZE1 * /MSIZE0 * EMID
+ MSIZE1 * MSIZE0 * EMID
+ EHI
+ ELOW

/CBIT := /MSIZE1 * ELOW
+ /MSIZE0 * ELOW
+ EHI
+ EMID
+ MOFF

/DBIT := VCC

DESCRIPTION

MEMORY SIZE	S1	S0
-----	--	--
2MB	F	F
4MB	F	T
6MB	T	F
1MB	T	T

DIGIT ENABLE BITS : ELOW --> EMID --> EHI

; 170687 CJTC/JLB: ADDED 1MB INDICATION.

PAL16L8
JLB/CJTC 11AUG86
45001B,8D,BPAR

/BDY50 /BDY75 /BLOCK25 /BPERR50 DBAPR /MOR25 /LPERR /MR /EPES GND
/EPEA SPES /LERR TEST NC15 /RERR /PARERR /BLOCK SPEA VCC

; STROBE PARITY ERROR STATUS WORD

IF (/TEST) /SPES = /BDY50 * /BDY75
+ BDRY50 * BDRY75
+ /BDY50 * BDRY75
+ BLOCK25
+ EPEA
+ EPES
+ MR

; STROBE PARITY ERROR ADDRESS

IF (/TEST) /SPEA = /DBAPR + BLOCK25 + EPEA + MR

; BLOCK SIGNAL FOR PES AND PEA STROBE - BLOCK ON ERROR, RELEASE ON PEA READ

IF (/TEST) BLOCK = BDRY50 * /BDY75 * /EPEA * /EPES * MOR25 * /MR
+ BDRY50 * /BDY75 * /EPEA * /EPES * BPERR50 * /MR
+ BLOCK * /EPEA * /MR

; PARITY ERROR SIGNALS FROM BUS AND LOCAL MEMORY

IF (/TEST) PARERR = BDRY50 * /BDY75 * BPERR50 * /MR
+ LERR

; REMOTE ERROR - LAST ERROR WAS FROM MEMORY ATTACHED TO THE ND100 BUS
; WILL BE OVERRIDEN BY AN ERROR FROM LOCAL MEMORY (PERR1 AND PERR0)

IF (/TEST) RERR = BPERR50 * /MR ;SET REMOTE ERROR ON BUS PARITY E
+ RERR * /LPERR * /MR ;HOLD UNTIL A LOCAL MEMORY ERROR
+ MOR25 * /MR ;=> LOCAL ERROR HAS PRIORITY

DESCRIPTION

; 260387 CJTC: NEED TO USE DELAYED BAPR (DBAPR) INSTEAD OF BAPR IN
; PRODUCING SPEA. POLARITY CHANGE.
; 260387 JLB: BLOCK SIGNAL MUST NOT BE PRODUCED ON LOCAL MEMORY ERROR.
; IT WILL ONLY BE UNLOCKED ON PEA READ FROM REMOTE ERROR PEA.
; 260387 JLB: PERR HANDLING CHANGED.
; 070487 JLB: RERR MUST LATCH UP ON MOR ALSO.

; 180587 M3202B
; 090887 B JLB: TEST MODE FOR C-PRINT.

PAL16L8

ADGD 18/8/86

45008B,2F,DATA

/MWRITE /SWDIS LBD0 LBD1 LBD3 LBD4 /BIOXL ECCR /BCGNT50R GND
/HIEN /OER /MR /QD /TST /DISB /CLRERR /OET /DIS VCC

IF (VCC) OET = MWRITE ;ON WRITE TO MEMORY

IF (VCC) OER = BCGNT50R ;ON READ FROM MEMORY AFTER THE ADDRESS PE
+ TST * MWRITE ;ON WRITE IN TEST MODE BOTH OER AND OET S

IF (VCC) CLRERR = MR ;CLEAR PARITY ERROR ON MR, READING EPESL
+ /BCGNT50R
+ DISB
+ QD

IF (VCC) DISB = LBD3 * BIOXL * ECCR ;SET IF LDB3=1 AND IOX=ECCR
+ /MR * DISB * /BIOXL ;HOLD UNTIL NEXT IOX=ECCR
+ /MR * DISB * /ECCR

IF (VCC) TST = LBD0 * BIOXL * ECCR ;SET IF ANY OF LBD0,1,4 AND IOX=ECCR
+ LBD1 * BIOXL * ECCR ;HOLD UNTIL IOX=ECCR
+ LBD4 * BIOXL * ECCR
+ /MR * TST * /BIOXL
+ /MR * TST * /ECCR

IF (VCC) DIS = DISB + SWDIS

DESCRIPTION

; 200387 CJTC: LOGICAL ERRORS IN EQUATIONS FOR DISB AND TST
; 260387 CJTC: CHANGED PIN 2 /EPESL TO /EPEAL - CIRCUIT CHANGE ONLY!!!
; 260387 JLB: CLRERR COMES IMMEDIATELY TO MAKE PERRO&1 PULSES ONLY!!!

; 180587 M3202B
; 091087 B CJTC: AM29833 ARE GIVING ERROR OUTPUT EVEN BEFORE CLOCKED.
; QD GOES INACTIVE ON 6, JUST BEFORE RDATA THUS STOPPING
; THE FALSE CLOCKING OF THE 29833 BY HOLDING CLRERR TRUE.

PAL16L8
ADGD 12AUG86
45009B,4F,ERROR

RDATA /BLOCKL25 BCGNT50 /PS /RERR /PA TEST /LERR NC9 GND
/MR SPEAL /NC13 /NC14 /NC15 /BLOCKL /EPEAL /EPESL SPESL VCC

IF (/TEST) /SPESL = /RDATA + BLOCKL25 + EPEAL + EPESL + MR ;RDATA USED AS WRITE
;PULSE WHEN NOT BLOCKED
IF (/TEST) /SPEAL = /BCGNT50 + BLOCKL25 + EPEAL + MR ;BCGNT USED AS WRITE
;PULSE

IF (/TEST) EPESL = PS * /RERR ;ENABLE IF ERROR IN LOCAL MEMORY

IF (/TEST) EPEAL = PA * /RERR

IF (/TEST) BLOCKL = RDATA * /EPEAL * /EPESL * LERR * /MR ;SET ON LOCAL ERROR
+ BLOCKL * /PA * /MR ;HOLD TILL PEA READ

DESCRIPTION

; 2/1-87JLB: RDATA PIN 1.
; 070487 JLB: MUST NOT LOCK ON MOR, THAT IS DONE IN THE BUS INTERFACE ANYWAY
; UNBLOCK ON PA (I.E. ALSO IF THE BUS PEA WAS READ)
; 150487 CJTC: NO!!! SPIKES ON SPEAL - USE BLOCKL25 INSTEAD OF BLOCKL
;
; 180587 : M3202B
; 090887 B JLB: TEST MODE FOR C-PRINT.

PAL16L8
JLB/CJTC 14AUG86
44302A,11D,LBC1

/Q0 /Q2 /CC2 /BDY25 /BDY50 /CGNT /CGNT50 /CACT /TERM GND
/BGNT /CGNTCACT /RT /IORQ NC15 NC16 /DSTB /EMD /BGNTCACT VCC

```
IF (VCC) EMD = Q2 * Q0 * CACT          ; CPU CYCLE TO BUS SET
      + EMD * CACT                      ;      "      HOLD
      + CGNT * CGNT50                   ; CPU CYCLE TO MEM SET
      + EMD * RT * CC2 * /TERM          ; ) HOLD TERMS FOR
      + EMD * IORQ * CC2 * /TERM        ; ) CPU READ, FETCH AND
                                          ; ) MAP CYCLES
```

IF (VCC) CGNTCACT = CGNT + CACT

IF (VCC) BGNTCACT = BGNT + CACT

IF (VCC) DSTB = CGNT + CACT * /BDY50 * /BDY25 * /IORQ
 + CACT * IORQ * CC2 ; IOX CYCLE

DESCRIPTION

; 060387 JLB: EMD WAS HOLDING IN ADDRESS PART OF IOX CYCLES AFTER
; BUFFERED WRITE CYCLES.
; EMD - ENABLE DATA PATH BETWEEN CD AND LBD
; 270387 CJTC: NEW SIGNAL DSTB TO SAMPLE DATA AT LBD/CD BUFFERS ON
; CPU FROM BUS READ, AT BDRY.
; 040487 JLB: DSTB MUST NOT CLOCK DATA BEFORE CACT GOES OFF IN IOXES.
; (NEGATIVE SETUP OF DATA IN BUS SPECS.)
;
; 180587 CJTC: 3202B

7
B
P
Cpnt.

PAL16L8

JLB/CJTC 15AUG86

44303A,2C,LBC2 - LOCAL DATA BUS CONTROL PAL

/CACT /CGNT /EADR /BINPUT50 MISO /IOD WRITE NC8 NC9 GND

/BACT /WLBD NC13 NC14 NC15 NC16 /CMWRITE /CBWRITE /WBD VCC

; LBD TO BD TRANSCEIVER

; -----

; WBD - DIRECTION FROM LBD TO BD

IF (VCC) WBD = EADR	; ADDRESS FROM CPU TO BUS
+ CBWRITE	; CPU WRITE CYCLE TO BUS
+ IOD * MISO * /BINPUT50	; OUTPUT PART OF IOX
+ BACT	; DMA OUTPUT CYCLE

; (CBWRITE) - CPU TO BUS WRITE. STARTS ONLY WHEN THE BUS IS GRANTED.
; LASTS UNTIL THE END OF THE BUS CYCLE.

IF (VCC) CBWRITE = WRITE * CACT
+ CBWRITE * CACT

; CD TO LBD TRANSCEIVER

; -----

; WLBD - DIRECTION FROM CD TO LBD

IF (VCC) WLBD = CBWRITE	; CPU WRITE CYCLE TO BUS
+ CMWRITE	; CPU WRITE CYCLE TO LOCAL MEMORY
+ IOD * MISO * /BINPUT50	; OUTPUT PART OF IOX

; (CMWRITE) - CPU WRITE TO LOCAL MEMORY. LASTS UNTIL END OF MEMORY CYCLE
; ON BUFFERED WRITE.

IF (VCC) CMWRITE = WRITE * CGNT
+ CMWRITE * CGNT

DESCRIPTION

; 180587 - 3202B

B
CACT
CGNT

PAL16L8

CJTC 02SEP86

44304A,1C,LBC3 - LOCAL DATA BUS CONTROL PAL

/CGNT /BGNT /BGNT50 /MWRITE /BDAP50 /EBUS /IBAPR /GNT NC9 GND
NC11 NC12 /EBD NC14 SAPR FAPR EBADR /BACT DBAPR VCC

; BACT - BUS ACTIVITY. LASTS FOR COMPLETE DMA TO LOCAL MEMORY
; CYCLE (ONLY ON MEMORY READ)

IF (VCC) BACT = BGNT50 * /MWRITE ; ENABLE FOR DATA ONLY AFTER ADDRESS
+ BACT * BDAP50 ; HOLD AFTER BDAP FINISHED

; EBD - ENABLE BUS DATA. ENABLE LBD TO BD TRANSCEIVER
; SHOULD BE DISABLED DURING CGNT * /BACT. IE DISABLE WHEN CPU
; IS ACCESSING LOCAL MEMORY, EXCEPT WHEN TRANSCEIVER IS BEING USED
; AS A REGISTER TO HOLD DATA FROM A PREVIOUS DMA MEMORY READ.

IF (VCC) EBD = EBUS * /CGNT * /GNT
+ EBUS * GNT * BGNT
+ EBUS * BACT

- GNT not needed.

; EBADR - ENABLE ADDRESS FROM BUS TO LOCAL MEMORY

IF (VCC) /EBADR = /IBAPR * BGNT50 ; TURN ON AT BAPR WITH GNT
+ /IBAPR * /EBADR ; HOLD UNTIL BGNT50 OR IN
+ /GNT ; W.C. UNTIL GNT GOES OFF.

; SLOW INVERSION

IF (VCC) /FAPR = /IBAPR
IF (VCC) /SAPR = /FAPR
IF (VCC) /DBAPR = /SAPR

DESCRIPTION

; 200387 CJTC: NEED TO SLOW DOWN APR TO AS648 BUS TCVRs. PUT IT
; THROUGH THIS PAL INSTEAD OF F04
; 200387 JLB: EBADR COMES ON AT BAPR TO AVOID SPIKE ON LBD.
; NEW INPUT CGNT~
; 230387 JLB: APR DELAYED 3XPAL DELAY
; 240387 JLB: EBD MUST NOT CHANGE WHEN DATA IS CLOCKED IN.
;
; 180587 - 3202B

B

PAL16L8
JLB 26NOV86
44305A, 15F, CSCTL

/FORM /CC1 /CC2 /CC3 /LCS /RWCS /WCS FETCH /BRK GND
/TERM /WCSTB LUA12 /WCA /ELOW /EUPP /EWCA /ECSL /WICA VCC

; CONTROL STORE CONTROL

IF (VCC) WICA = WCA * FETCH * /TERM ;WRITE PULSE TO MICROINSTRUCTION CACHE

IF (VCC) WCSTB = /CC3 * CC1 * WCS * RWCS ;WRITE PULSE TO WRITEABLE CONTROL STORE

+ CC3 * CC2 * CC1 * LCS ;WRITE PULSE DURING LOAD CONTROL STORE

IF (VCC) ECSL = RWCS * /WCS * CC3 * /TERM ;READ CONTROL STORE HOLD

IF (VCC) EWCA = RWCS * /CC3 * /TERM ;ENABLE WCA REG. IN MIC ONTO MA

+ RWCS * /CC3 * /TERM

IF (VCC) EUPP = LUA12 ;NORMAL ADDRESSING

+ WCA * FETCH ;WRITE INTO MICROINSTRUCTION CACHE

+ FETCH * /CC1 * /CC2 * /CC3 * /TERM;

IF (VCC) ELOW = /LUA12 * /FETCH ;NORMAL ADDRESSING. ON FETCH EITHER MICROINSTU

+ /LUA12 * TERM ;ENABLE ACCORDING TO LUA12 BEFORE FETCH VALID

+ FORM * /BRK * CC2 * /TERM ;OR A MAP IS USED.

+ FORM * /BRK * CC3 * /TERM ;DO A MAP

+ /LUA12 * BRK * CC2 * /TERM ;ON BRK: USE BANK SELECTED BY LUA12.

+ /LUA12 * BRK * CC3 * /TERM ;

DESCRIPTION

; 130387 JLB: ELOW ALWAYS ENABLED ON TERM IF LUA12 IS LOW.

; MAY SPEED UP NON FETCH CYCLES.

; 180587 3202B

AL16L8

CJTC 02SEP86

44304D,1C,LBC3 - LOCAL DATA BUS CONTROL PAL

/CGNT /BGNT /BGNT50 /MWRITE /BDAP50 /EBUS /IBAPR /GNT NC9 GND
NC11 NC12 /EBD CLKBD SAPR FAPR EBADR /BACT DBAPR VCC

; BACT - BUS ACTIVITY. LASTS FOR COMPLETE DMA TO LOCAL MEMORY
CYCLE (ONLY ON MEMORY READ)

IF (VCC) BACT = BGNT50 * /MWRITE ; ENABLE FOR DATA ONLY AFTER ADDRESS
+ BACT * BDAP50 ; HOLD AFTER BDAP FINISHED

; EBD - ENABLE BUS DATA. ENABLE LBD TO BD TRANSCEIVER
SHOULD BE DISABLED DURING CGNT * /BACT, IE DISABLE WHEN CPU
IS ACCESSING LOCAL MEMORY, EXCEPT WHEN TRANSCEIVER IS BEING USED
AS A REGISTER TO HOLD DATA FROM A PREVIOUS DMA MEMORY READ.

IF (VCC) EBD = EBUS * /CGNT * /GNT
+ EBUS * BGNT
+ EBUS * BACT

; EBADR - ENABLE ADDRESS FROM BUS TO LOCAL MEMORY

IF (VCC) /EBADR = /GNT * /BGNT ;TURN ON AT BAPR WITH GNT
+ /IBAPR * /EBADR ;HOLD UNTIL BGNT AND GNT BOTH GONE
+ /GNT * /EBADR

; SLOW INVERSION

IF (VCC) /FAPR = /IBAPR
IF (VCC) /SAPR = /FAPR
IF (VCC) /DBAPR = /SAPR

; CLOCK PULSE TO 648'S.

IF (VCC) /CLKBD = /SAPR * /BGNT50 ; CLOCK ADDRESSES ON DELAYED BAPR.
+ /SAPR * /BDAP50 ; CLOCK DATA 50NS AFTER START OF
+ /SAPR * /MWRITE ; BGNT*BDAP ON MEMORY WRITES FROM DMA.

DESCRIPTION

; 200387 CJTC: NEED TO SLOW DOWN APR TO AS648 BUS TCVRs. PUT IT
THROUGH THIS PAL INSTEAD OF F04
; 200387 JLB: EBADR COMES ON AT BAPR TO AVOID SPIKE ON LBD.
; NEW INPUT CGNT~
; 230387 JLB: APR DELAYED 3XPAL DELAY
; 240387 JLB: EBD MUST NOT CHANGE WHEN DATA IS CLOCKED IN.
; 180587 - 3202B
; 310787 JLB: BUFFERED DMA WRITE: CLOCK DATA IN 648'S ALSO.
; 040887 JLB: BUFFERED DMA WRITE: NEED TO ENABLE THE REGISTER IN THE
648'S FOR THE PERIOD OF BGNT.
; 060887 D JLB: EBADR CHANGED TO MAKE BUFFERED DMA WRITE WORK.

E. R. C. 12/1/86



PAL16L8
JLB 26NOV86
44305C,15F,CSTL

/FORM /CC1 /CC2 /CC3 /LCS /RWCS /WCS FETCH /BRK GND
/TERM /WCSTB LUA12 /WCA /ELOW /EUPP /EWCA /ECSL /WICA VCC

; CONTROL STORE CONTROL

IF (VCC) WICA = WCA * FETCH * /TERM ;WRITE PULSE TO MICROINSTRUCTION CACHE
IF (VCC) WCSTB = /CC3 * CC1 * WCS * RWCS ;WRITE PULSE TO WRITEABLE CONTROL STORE
+ CC3 * CC2 * CC1 * LCS ;WRITE PULSE DURING LOAD CONTROL STORE
IF (VCC) ECSL = RWCS * /WCS * CC3 * /TERM ;READ CONTROL STORE HOLD
+ RWCS * /WCS * /CC1 * CC2 * /TERM ;HOLD OVERLAP WITH EWCA
IF (VCC) EWCA = RWCS * /CC3 * CC2 * /TERM ;ENABLE WCA REG. IN MIC ONTO MA
+ RWCS * /CC3 * CC1 * /TERM ; AVOID BLIP ON NEXT CYCLE
IF (VCC) EUPP = LUA12 ;NORMAL ADDRESSING
+ WCA * FETCH ;WRITE INTO MICROINSTRUCTION CACHE
+ FETCH * /CC1 * /CC2 * /CC3 * /TERM ;ENABLE IN THE FIRST 50NS
; + HOLD TIME = 75NS
IF (VCC) ELOW = /LUA12 * /FETCH ;NORMAL ADDRESSING. ON FETCH EITHER MICR
+ /LUA12 * TERM ;ENABLE ACCORDING TO LUA12 BEFORE FETCH
+ FORM * /BRK * CC2 * /TERM ;OR A MAP IS USED.
+ FORM * /BRK * CC3 * /TERM ;DO A MAP
+ /LUA12 * BRK * CC2 * /TERM ;ON BRK: USE BANK SELECTED BY LUA12.
+ /LUA12 * BRK * CC3 * /TERM ;

DESCRIPTION

; 130387 JLB: ELOW ALWAYS ENABLED ON TERM IF LUA12 IS LOW.
; MAY SPEED UP NON FETCH CYCLES.
; 180587 3202B
; 090687 JLB: EWCA MUST NOT BE ENABLED DURING a AND b. WILL CREATE BLIP ON
; NEXT CYCLE.
; 090687 JLB: ECSL HOLD IN g AND h.



PAL16L8
JLB 26NOV86
44307A,13D,CYCLK

/TERM /CC0 /CC1 /CC2 /CC3 /FORM /BRK /RWCS /TRAP GND
VEX /MACLK /MAP /ETRAP UCLK /EORF /CYD WRFSTB /MCLK VCC

; CYCLE CONTROL CLOCK GENERATOR.

IF (VCC) MCLK = RWCS * /CC3 ;BECAUSE THE CONTROL STORE ADDRESS TO B
+ RWCS * CC2 ;IN PRESENTED ONTO MA. THEN THE ADDRESS
;STORE LOCATION TO BE EXECUTED IS PRESE

IF (VCC) /WRFSTB = CC3 ;b ON 75NS CYCLES TO PROVIDE A WRITE PU
+ CC2
+ CC1
+ /CC0
+ TERM

IF (VCC) CYD = /CC3 * /CC2 * CC1 * /CC0 * /TERM ;d USED TO START WRITE PULSE TO CAC

IF (VCC) EORF = /CC3 * /CC2 * CC1 * /CC0 * /TERM ;d MISC WRITE PULSE.

IF (VCC) /UCLK = CC3 ;ON c ON ALL MEMORY REQUESTS.
+ CC2 ;USED TO UPDATE USED BITS AND CLOCK TRA
+ /CC1
+ /CC0
+ TERM ;EXPERIMENT TO SEE IF UCLK ON TERM WAS DANGEROUS.

IF (VCC) MAP = FORM * /BRK * CC2 * /TERM ;MUST NOT COME BEFORE ALL SHORT CYCLES

IF (VCC) MACLK = MAP * /CC3 * CC2 * CC1 ;e+f CAPTURE CD FROM MEMORY THROUGH M
+ TRAP * /CC3 * CC1 * /CC0 ;d+e CAPTURE TRAP VECTOR
+ RWCS * /CC3 ; CAPTURE MICROADDRESS AFTER EWCA
+ RWCS * CC2 * /CC1 ; TURNED OFF

IF (VCC) ETRAP = /TERM * /VEX * CC3 ; ENABLE TRAPS ONLY OUTSIDE t OR a
+ /TERM * /VEX * CC2 ; UNSTABLE TRAP IN THIS PERIOD
+ /TERM * /VEX * CC1 ; CAN DESTROY MA !
+ /TERM * /VEX * CC0 ; DISABLE TRAPS DURING VEX

DESCRIPTION

;280287 JLB: ECREQ TO LOCAL MEMORY GIVES TWO CGNTS. A SHORTER EORF,
; I.E. ONLY ON e AND NOT ON f, WILL MAKE ECREQ GO OFF 25NS SOONER
;AND HOPEFULLY CURE THIS.
;010387 JLB: ETRAP NEW OUTPUT. WILL DISABLE TRAP ON t AND a.
;080387 JLB: REMOVED UCLK ON CACHE HIT CYCLES.
;160387 JLB: REMOVED TERM IN MCLK AND MACLK TO PROVIDE SYMMETRICAL
; CLOCKS IN 50 NS CYCLES.
;170387 JLB/CJTC: REMOVED MREQ - NEEDED THE INPUT FOR NEW SIGNAL VEX.
; VEX SHOULD DISABLE TRAPS.
;180387 JLB: EORF ON d ONLY. MACLK ON e + f ON MAP.
;
; 270487 : M3202B

PAL16L8
ADGD 13/8/86
44310A,3F,LBDIF

/HIEN /BGNT /CGNT /LOEN /CGNT50 ECCR /BGNT50 /BGNT75 /BDAP GND
/MR RDATA /MWRITE50 /BIOXE /REF100 /RGNT /BIOXL /BDRY /BCGNT50R VCC

IF (VCC) BCGNT50R = /MWRITE50 * BGNT * BGNT50 ;FROM 50NS AFTER GNT ON READ C
+ /MWRITE50 * CGNT * CGNT50 ;LASTS FOR THE REST OF THE CYC

IF (VCC) BDRY = /MWRITE50 * BDAP * /BGNT50 * BGNT75 ;BUS READ FROM LOCAL MEM. NEED
+ MWRITE50 * BGNT * BDAP * /LOEN * /HIEN ;BUS WRITE TO LOCAL MEMORY.
+ BIOXL * ECCR ;IOX=ECCR
+ /MR * BDRY * BDAP ;HOLD TERM FOR MEMORY CYCLES
+ /MR * BDRY * BIOXE ;HOLD TERM FOR IOX CYCLE
+ REF100

IF (VCC) BIOXL = BIOXE * /BGNT * /CGNT

IF (VCC) /RDATA = MWRITE50 ;INDICATES DATA READY ON READ CYCLES
+ LOEN
+ HIEN
+ RGNT

DESCRIPTION

;280287 JLB: ECCR WRONG POLARITY, RESPONDS WITH BDRY TO ALL NON-
EXISTING IOX-ES.

;280287 JLB: NEW INPUT REF~, TO GENERATE A REF PULSE OF 175-200NS
DURATION BY GENERATING BDRY~.

;

;180587 M3202B

PAL16L8

ADGD 13/8/86

44310B,3F,LBDIF

/HIEN /BGNT /CGNT /LOEN /CGNT50 ECCR /BGNT50 /BGNT75 /BDAP GND
/MR RDATA /MWRITE50 /BIOXE /REF100 RAS /BIOXL /BDRY /BCGNT50R VCC

IF (VCC) BCGNT50R = /MWRITE50 * BGNT * BGNT50 ;FROM 50NS AFTER GNT ON READ C
+ /MWRITE50 * CGNT * CGNT50 ;LASTS FOR THE REST OF THE CYC

IF (VCC) BDRY = /MWRITE50 * BDAP * /BGNT50 * BGNT75 ;BUS READ FROM LOCAL MEM. NEED *setup before BDRY*
+ MWRITE50 * BGNT * BDAP * /LOEN * /HIEN ;BUS WRITE TO LOCAL MEMORY.
+ BIOXL * ECCR ;IOX=ECCR
+ /MR * BDRY * BDAP ;HOLD TERM FOR MEMORY CYCLES
+ /MR * BDRY * BIOXE ;HOLD TERM FOR IOX CYCLE
+ REF100

IF (VCC) BIOXL = BIOXE * /BGNT * /CGNT

IF (VCC) /RDATA = MWRITE50 ;INDICATES DATA READY ON READ CYCLES
+ LOEN
+ HIEN
+ /BGNT * /CGNT
+ RAS

DESCRIPTION

;280287 JLB: ECCR WRONG POLARITY, RESPONDS WITH BDRY TO ALL NON-
;EXISTING IOX-ES.

;280287 JLB: NEW INPUT REF~, TO GENERATE A REF PULSE OF 175-200NS
;DURATION BY GENERATING BDRY~.

;

;180587 M3202B

;090787 B JLB: RAS USED IN RDATA TO AVOID SPIKE ON TRANSITION FROM
; LOEN TO HIEN.

PAL16R4

JLB 12AUG86

BTIM.PAL

44401A,5D,BTIM

OSC /CC2 /CACT /CACT25 /BDY50 /CGNT /CGNT50 /TERM /IORQ GND
/OE /EADR /EIOD /NC14 /Q2 /Q1 /Q0 /DAP /APR VCC

Q0 := CACT * /Q2 * /Q1 * /Q0 * /CACT25
+ /Q2 * /Q1 * Q0
+ Q2 * Q1

Q1 := /Q2 * Q0
+ Q1 * /Q0

Q2 := Q1 * /Q0
+ Q2 * Q0

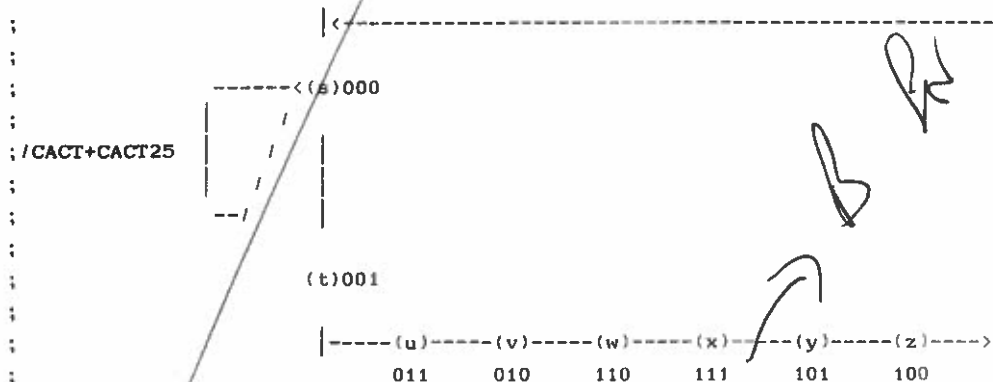
IF (VCC) APR = /Q2 * Q1 * CACT

IF (VCC) EADR = /Q2 * Q0 * CACT ; t + u
+ /Q2 * Q1 * CACT ; u + v
+ Q1 * /Q0 * CACT ; v + w
+ /Q2 * /Q1 * /Q0 * CACT * /CACT25 ; s
+ CGNT * /CGNT50 ; address part for CPU cycle

IF (VCC) DAP = /Q2 * /Q1 * /Q0 * CACT * CACT25
+ DAP * /TERM * IORQ * CC2

IF (VCC) EIOD = IORQ * /Q2 * /Q1 * /Q0 * CACT * CACT25 * /BDY50 * CC2
;STARTS WHEN THE s STATE HAS BEEN REACHED AFTER COMPLETING THE LOOP.

DESCRIPTION



; 010387 JLB: EIOD TOO SOON, ONLY 15NS SETUP FOR BD BEFORE BIOXE.
; WOULD NOT LOAD FROM FLOPPY. EIOD FRONT FLANK DELAYED 25NS.
; SAME WITH DAP. DAP HELD FOR THE REST OF THE CYCLE UNTIL TERM
; ON IORQ.
; 060387 JLB: DAP HELD INTO ADDRESS PART OF IOX CYCLES AFTER A
; BUFFERED WRITE CYCLE. SWAPPED IOD FOR IORQ IN EIOD.
; USING CC2 (NEW INPUT) TO QUALIFY DAP AND EIOD

; STATE MACHINE
;
; 180587 M3202B

PAL16R4
JLB/CJTC 8AUG86
44402A,18F,UBITS

UCLK /DT /RT LSHADOW /TERM /CYD /HITO /HIT1 /EWC GND
/OE OUBI OUBD /IHIT NC15 NUBD NUBI /WCA /USED VCC

; CACHE USED BIT CONTROL

IHIT := HIT1 * HIT0 * OUBI * RT * /DT * /WCA ;FETCH
+ HIT1 * HIT0 * OUBD * RT * DT * /WCA ;READ

IF (VCC) USED = OUBI * RT * /DT * /WCA ;FETCH
+ OUBD * RT * DT * /WCA ;READ

IF (VCC) WCA = /RT * DT * EWC * CYD * /TERM * /LSHADOW ;WRITE OUTSIDE SHADOW
+ RT * /IHIT * EWC * CYD * /TERM * /LSHADOW ;FETCH/READ WITHOUT HIT
+ WCA * /TERM ;OUTSIDE SHADOW

/NUBI := DT * /OUBI ; READ OR WRITE KEEP OLD VALUE
+ /RT * DT * HIT0 * HIT1 ; CLEAR IF WRITE WITH HIT

/NUBD := RT * /DT * /OUBD ; IF FETCH KEEP OLD VALUE

DESCRIPTION

;B 050387 JLB: USED BITS INVERTED TO ACTIVE HIGH.
;C 060387 JLB: SHOULD NOT PRODUCE WCA WHEN IN SHADOW.
;D 120387 JLB: HIT PATH IMPROVED

; 180576 M3202B

PAL16R4
JLB/CJTC 8AUG86
44402C,18F,UBITS

UCLK /DT /RT LSHADOW /TERM CYD /HITO /HIT1 /EWC GND
/OE OUBI OUBD /IHIT NC15 NUBD NUBI /WCA /USED VCC

; CACHE USED BIT CONTROL

IHIT := HIT1 * HIT0 * OUBI * RT * /DT * /WCA ;FETCH
+ HIT1 * HIT0 * OUBD * RT * DT * /WCA ;READ

IF (VCC) USED = OUBI * RT * /DT * /WCA ;FETCH
+ OUBD * RT * DT * /WCA ;READ

IF (VCC) WCA = /RT * DT * EWC * CYD * /TERM * /LSHADOW ;WRITE OUTSIDE SHADOW
+ RT * /IHIT * EWC * CYD * /TERM * /LSHADOW ;FETCH/READ WITHOUT HIT
;OUTSIDE SHADOW

/NUBI := DT * /OUBI ; READ OR WRITE KEEP OLD VALUE
+ /RT * DT * HIT0 * HIT1 ; CLEAR IF WRITE WITH HIT

/NUBD := RT * /DT * /OUBD ; IF FETCH KEEP OLD VALUE

DESCRIPTION

;B 050387 JLB: USED BITS INVERTED TO ACTIVE HIGH.

;C 060387 JLB: SHOULD NOT PRODUCE WCA WHEN IN SHADOW.

;D 120387 JLB: HIT PATH IMPROVED

; 180576 M3202B

;B 300687 JLB: CYD POSITIVE POLARITY.

;C 130787 JLB: HOLD TERM ON WCA REMOVED BECAUSE CYD FROM d TO f.



PAL16R4
JLB 26NOV86
44403A,15D,CYIN0

CLK CSDelay0 CSDLY CSECOND CSLOOP /ACOND /MR LUA12 /MAP GND
/OE /NC12 /NC13 /DMAP /DMA12 /MDLY /LCS /NC18 /DLY0 VCC

; CYCLE CONTROL INPUT GENERATOR. PART 0.

IF (VCC) DLY0 = MDLY	;25NS DELAY ON MICROCODE REQUEST
+ CSDelay0	;25NS DELAY OF PREVIOUS CYCLE ON MICROCODE REQUEST
+ ACOND * CSECOND	;CONDITIONAL MICROSEQUENCING
+ ACOND * CSLOOP	;USING ALU RESULT
+ LUA12 * /DMA12	;
+ /LUA12 * DMA12	;CHANGING FROM LOWER TO UPPER CONTROL STORE AND VIC
+ DMAP * ~~LUA12~~	;

LCS := MR	
+ /DMA12 * /LUA12 * LCS	;LCS FROM MR AND UNTIL MA12 HAS GONE HIGH AND THEN
+ DMA12 * LUA12 * LCS	;I.E. LMA COUNTED FROM 0 TO 8K.
+ /DMA12 * ~~LUA12~~ * LCS	

MDLY := CSDLY

DMA12 := LUA12

DMAP := MAP

DESCRIPTION

; 270487 : M3202B

PAL16R4
JLB 26NOV86
44403B,15D,CYINO

CLK CSDELAY0 CSDLY CSECOND CSLOOP /ACOND /MR LUA12 /MAP GND
/OE /NC12 /NC13 /DMAP /DMA12 /MDLY /LCS /NC18 /DLY0 VCC

; CYCLE CONTROL INPUT GENERATOR. PART 0.

IF (VCC) DLY0 = MDLY ;25NS DELAY ON MICROCODE REQUEST
+ CSDELAY0 ;25NS DELAY OF PREVIOUS CYCLE ON MICROCODE REQUEST
+ ACOND * CSECOND ;CONDITIONAL MICROSEQUENCING
+ ACOND * CSLOOP ;USING ALU RESULT
+ LUA12 * /DMA12 ;
+ /LUA12 * DMA12 ;CHANGING FROM LOWER TO UPPER CONTROL STORE AND VIC
+ DMAP ; AFTER MAP TO AVOID CSDELAY BEEING TO LATE.

LCS := MR
+ /DMA12 * /LUA12 * LCS ;LCS FROM MR AND UNTIL MA12 HAS GONE HIGH AND THEN
+ DMA12 * LUA12 * LCS ;I.E. LMA COUNTED FROM 0 TO 8K.
+ /DMA12 * LUA12 * LCS

MDLY := CSDLY

DMA12 := LUA12

DMAP := MAP

DESCRIPTION

; 270487 : M3202B
; 160687 JLB: DLY0 AFTER EVERY MAP.



PAL16R4
JLB 26NOV86

44404A, 14D, CYIN1

CLK CSDELAY1 CSALUM1 CSALUM0 CSALUI8 CSALUI7 LBA3 LBA1 LBA0 GND
/OE /DLY1 /NC13 /NC14 /NC15 /NC16 /NOWRIT /NC18 /NC19 VCC

; CYCLE CONTROL INPUT GENERATOR. PART 1.

IF (VCC) DLY1 = CSDELAY1 * /LBA3 * LBA1 * LBA0 * /NOWRIT ; 25NS DELAY OF PREVIOUS CYCLE
; ON MICROCODE REQUEST IN ADDIT
; DLY0. NB. MUST ALSO HAVE DLY
; OF LONG COMPUTATION TIME.
; THIS DELAY IS ONLY USED WHEN
; IS WRITTEN INTO AND ONE OF TH
; FOR ADDRESS COMPUTATION IN TH

NOWRIT := /CSALUM1 * /CSALUI8 * /CSALUI7
+ /CSALUM0 * /CSALUI8 * /CSALUI7

DESCRIPTION

CAN BE CHANGED TO 16R6 IF NEEDED

; 270487 M3202B

PAL16R4
JLB 26NOV86

44404B,14D,CYIN1

CLK CSDELAY1 CSALUM1 CSALUM0 CSALUI8 CSALUI7 LBA3 LBA1 LBA0 GND
/OE /DLY1 /NC13 /NC14 /NC15 /NC16 /NOWRIT /NC18 /NC19 VCC

; CYCLE CONTROL INPUT GENERATOR. PART 1.

IF (VCC) DLY1 = CSDELAY1 * /LBA3 * LBA1 * LBA0 ; 25NS DELAY OF PREVIOUS CYCLE
; ON MICROCODE REQUEST IN ADDITION TO
; DLY0. NB.! MUST ALSO HAVE DLY0 BECAUSE
; OF LONG COMPUTATION TIME.
; THIS DELAY IS ONLY USED WHEN X OR B
; IS USED
; FOR ADDRESS COMPUTATION IN THE NEXT CYC

NOWRIT := /CSALUM1 * /CSALUI8 * /CSALUI7
+ /CSALUM0 * /CSALUI8 * /CSALUI7

DESCRIPTION

CAN BE CHANGED TO 16R6 IF NEEDED

; 270487 M3202B
; 150687 JLB: DELAY ALSO WHEN WE ARE NOT WRITING TO B- OR X-REGISTER.
; (THEY CAN STILL BE USED FOR ADDRESS COMPUTATION IN THE NEXT CYCLE !!!)

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PAL16R4

ADGD 18/8/86

44425A,9G,CADEC

CPU ADDRESS DECODER FOR 2MB MEMORY

CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LINE R
;TO ALLOW MA
;IN THE ADDR
;THE 4MB (2M
;NEED NO HOL
;ECREQ WILL HOLD UNT

IF (VCC) CRQ = ECREQ * IORQ
+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21
+ ECREQ * PPN20

/BANK0 := PPN21 + PPN20

/BANK1 := PPN21 + /PPN20

/BANK2 := /PPN21 + PPN20

MSIZE0 = GND

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.
; 150387 JLB: WRITE WAS WRONG POLARITY.
; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.
; 180587 M3202B

PAL16R4

ADGD 18/8/86

44426A,6G,BADEC

DMA ADDRESS DECODE FOR 2MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + BD20 + MOFF ;2 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK1 := BD21 + /BD20

/BANK2 := /BD21 + BD20

MSIZE1 = GND

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.

; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !

; CHANGED TO AOK

; 180587 M3202B

PAL16R4

ADGD 18/8/86

44445A,9G,CADEC

CPU ADDRESS DECODER FOR 4MB MEMORY

CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LINE R
;TO ALLOW MA
+ ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * PPN20 * /MOFF ;IN THE ADDR
;THE 4MB (2M
;NEED NO HOL
IF (VCC) CRQ = ECREQ * IORQ ;ECREQ WILL HOLD UNT

+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21

/BANK0 := PPN21 + PPN20

/BANK1 := PPN21 + /PPN20

/BANK2 := /PPN21 + PPN20

MSIZE0 = VCC

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY. PPN18 AND PPN19 REMOVED.

; 150387 JLB: WRITE WAS WRONG POLARITY.

; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.

; 180587 M3202B

PAL16R4

ADGD 18/8/86

44446A,6G,BADEC

DMA ADDRESS DECODE FOR 4MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + MOFF ;4 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK1 := BD21 + /BD20

/BANK2 := /BD21 + BD20

MSIZE1 = GND

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.

; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !

; CHANGED TO AOK

; 180587 M3202B

PAL16R4

ADGD 18/8/86

44465A,9G,CADEC

CPU ADDRESS DECODER FOR 6MB MEMORY

CK WRITE /IORQ /MOFF PPN19 PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE BANK0 BANK1 BANK2 /CLRQ /MSIZE0 VCC

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LINE R
+ ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * PPN20 * /MOFF ;TO ALLOW MA
+ ECREQ * /IORQ * /PPN23 * /PPN22 * PPN21 * /PPN20 * /MOFF ;IN THE ADDR
;THE 4MB (2M
;NEED NO HOL
;ECREQ WILL

IF (VCC) CRQ = ECREQ * IORQ
+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21 * PPN20

/BANK0 := PPN21 + PPN20

/BANK1 := PPN21 + /PPN20

/BANK2 := /PPN21 + PPN20

MSIZE0 = GND

DESCRIPTION

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.
; 150387 JLB: WRITE WAS WRONG POLARITY.
; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.
; 180587 M3202B

PAL16R4

ADGD 18/8/86

44466A,6G,BADEC

DMA ADDRESS DECODE FOR 6MB MEMORY

DBAPR DBAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 GND
/BGNT /BD19 /MSIZE1 /MWRITE BANK0 BANK1 BANK2 DDBAPR AOK VCC

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM
+ BD23
+ BD22
+ BD21 * BD20
+ MOFF ;6 MB

IF (VCC) /DDBAPR = /DBAPR

/BANK0 := BD21 + BD20

/BANK1 := BD21 + /BD20

/BANK2 := /BD21 + BD20

MSIZE1 = VCC

DESCRIPTION

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED
; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY. BD18 AND BD19 REMOVED.
; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !
; CHANGED TO AOK

; 180587 M3202B

PAL16R4
JLB/CJTC 17MAR87
44501A,22F,VEXFIX

CLK C4 C3 C2 C1 C0 M1 M0 /LCS GND
/OE IDB2 NC13 NC14 OPCLCS VEX /LDEXM NC18 NC19 VCC

; TO FIX VIRTUAL EXAMINE BUG IN CGA

LDEXM := C4 * /C3 * /C2 * /C1 * C0 * M1 * M0 * /LCS ; COMMAND 21.3

/VEX := LDEXM * /IDB2 ; CLEAR
+ /LDEXM * /VEX ; HOLD CLEAR
+ LCS

/OPCLCS := /C4 + /C3 + /C2 + /C1 + C0 + /M1 + M0 + LCS ; COMMAND 36.2

DESCRIPTION

; 180587 M3202B

Handwritten notes in red ink:
A diagonal line from the bottom left to the top right.
A wavy line with the word "VEX" written vertically along it.
The word "VEX" written horizontally near the bottom of the wavy line.
The word "LCS" written vertically near the top of the wavy line.
A small "1" written near the top of the wavy line.

PAL16R4
JLB/CJTC 17MAR87
44501B,22F,VEXFIX

CLK C4 C3 C2 C1 C0 M1 M0 /LCS GND
/OE IDB2 NC13 /RWCS OPCLCS VEX /LDEXM NC18 NC19 VCC

; TO FIX VIRTUAL EXAMINE BUG IN CGA
; + MISC. OTHER BUGS.

LDEXM := C4 * /C3 * /C2 * /C1 * C0 * M1 * M0 * /LCS ; COMMAND 21.3

/VEX := LDEXM * /IDB2 ; CLEAR
+ /LDEXM * /VEX ; HOLD CLEAR
+ LCS

/OPCLCS := /C4 + /C3 + /C2 + /C1 + C0 + /M1 + M0 + LCS ; COMMAND 36.2

RWCS := C4 * C3 * C2 * C1 * /C0 * /M1 * M0 * /LCS ; COMMAND 36.1

DESCRIPTION

; 180587 M3202B
; 150687 RWCS SIGNAL TOO SLOW FROM NEC G.A. MUST BE DONE IN A PAL.

move to 44501B

PAL16R6
JLB 26NOV86
44601A,12D,CYCFSM

OSC /DLY1 /DLY0 CSDelay0 WAIT1 WAIT2 /CGNTCACT HIT /BRK GND
/OE /SHORT /CC3 /CC2 /CC1 /CC0 /TERM /CX /SLOW VCC

; CYCLE CONTROL STATE COUNTER. FAST VERSION.

CX := VCC ; THIS IS THE FAST VERSION

TERM := /CC3 * /CC2 * /CC1 * /CC0 * SHORT * /TERM * /DLY0 * /CSDelay0 ;50NS CYCLE
+ /CC3 * /CC2 * /CC1 * CC0 * SHORT * /BRK * /DLY1 * /TERM ;75NS CYCLE
+ /CC3 * /CC2 * /CC1 * CC0 * HIT * /BRK * /DLY1 * /TERM ;75NS CYCLE
+ /CC3 * /CC2 * CC1 * CC0 * SHORT * /BRK * /TERM ;100NS CYCLE
+ /CC3 * /CC2 * CC1 * CC0 * HIT * /BRK * /TERM ;100NS CYCLE
+ /CC3 * CC2 * CC1 * CC0 * BRK * /TERM ;BRK CYCLE (200
+ /CC3 * CC2 * /CC1 * CC0 * SLOW * /TERM ;SLOW CYCLES INCL. FE
+ CC3 * /CC2 * /CC1 * /CC0 * /TERM ;UART,LCS,RWCS CYCLES

CC3 := CC2 * /CC1 * /CC0 * /TERM ;h+i+j+k+l+m+n+o
+ CC3 * CC1 * /TERM
+ CC3 * CC0 * /TERM

CC2 := /CC3 * CC2 * CC1 * /TERM ;e+f+g+h+i+j+k
+ CC2 * /CC1 * /TERM
+ CC2 * CC0 * /TERM
+ /CC3 * /CC2 * CC1 * /CC0 * CGNTCACT * /TERM ;d WAIT FOR BUS IF
+ /CC3 * /CC2 * CC1 * /CC0 * /WAIT1 * /TERM ;d WAIT1 AND NOT
+ /CC3 * /CC2 * CC1 * /CC0 * BRK * /TERM ;d BRK

CC1 := /CC3 * /CC2 * CC0 * /TERM ;b+c+d+e+j+k+l+m
+ CC3 * CC2 * CC0 * /TERM
+ CC1 * /CC0 * /TERM

CC0 := /CC3 * /CC2 * /CC1 * /TERM ;a+b+f+i+j+m+n
+ /CC3 * CC2 * CC1 * CC0 * /TERM
+ CC3 * CC2 * /CC1 * /TERM
+ CC3 * /CC2 * CC1 * /TERM
+ /CC3 * CC2 * CC1 * /CC0 * /CGNTCACT * /TERM ;e WAIT FOR BUS OR LOC
+ /CC3 * CC2 * CC1 * /CC0 * BRK * /TERM ;e MEM CYCLE TO FINISH
+ /CC3 * CC2 * CC1 * /CC0 * /WAIT2 * /TERM ;e IF WAIT2 AND NOT BRK
+ /CC3 * /CC2 * CC1 * CC0 * CGNTCACT * /BRK * /TERM ;c PREV WRITE.

DESCRIPTION

; 060387 JLB: MOD'S FROM SLOW VERSION IMPLEMENTED.
; 060387 JLB: 100 NS CYCLE MIN. NO BUFFERED WRITE.
; 070387 JLB: 75 NS CYCLE MIN. NO BUFFERED WRITE.
; 120387 JLB: IMPROVED HIT PATH. FORM~ REMOVED. HIT INPUT ON PIN 12.
; SHORT IN ON PIN 4.
; 120387 JLB: 50 NS CYCLE ON SHORT
; 180387 JLB: MR GATED WITH WAIT1 OUTSIDE. NEW INPUT CSDelay0.
; 180387 JLB: BUFFERED WRITE.
; 180387 JLB: 175NS SLOW & BRK CYCLES.
; 210387 JLB: 200NS SLOW CYCLES, 175NS BRK CYCLES.

Print

CB

↑



; 270487 M3202B



PAL16R8
ADGD 13/8/8G
44802A,6F,RAMC

OSC /RGNT /CGNT /BGNT /BDAP50 /MR /BGNT25 /CGNT25 /BDRY50 GND
/OE /HIEN /LOEN CAS RAS /QD /QC /QB /QA VCC

QA := /QD * /QC * /QB
+ QD * /QC * QB

QB := QC

+ QB * /QA

+ /QD * QA

+ QB * BGNT25 * /BDAP50 * /MR * /BDRY50

QC := /QD * QC

+ QC * /QB

+ QC * QA

+ /QD * QB * /QA

+ QC * /RGNT * /CGNT25 * /BGNT25

QD := QC

+ QB * /QA

+ QD * QA

/RAS := QC

+ /QD * QA

+ /QD * QB

LOEN := /QC * /QB * /QA

+ QD * /QC * QA

HIEN := QD * QB * /QA

+ /QD * /QC * QB

/CAS := QB * /QA * /RGNT

+ QD * QB * /RGNT

+ QC * /QB

+ QC * QA

+ /QD * RGNT

DESCRIPTION

;190387 JLB: RAS & CAS INVERTED.

;190387 JLB: BGNT25 NEW INPUT. USED TO DELAY STATE MACHINE TURN ON 25NS ON
; BUS CYCLES.

;230387 CJTC: CGNT25 NEW INPUT. USED TO DELAY STATE MACHINE TURN ON 25NS ON
; CPU CYCLES.

; 020487 JLB: BDRY50 WILL GET US OUT OF THE WAIT STATE ON TIMEOUT.

;

; 180587 M3202B

;0)1110 IDLE UNIT NEXT GNT OF ANY TYPE

;1)1010

;2)1011 PAUSE UNTIL BDAP OCCURS (ONLY ON BGNTS)

; NO WAIT STATE ON CPU TO MEMORY WRITE

;3)1001

;4)1000

;5)0000

;6)0001

;7)0011

;8)0010

;OTHER STATES WILL GO TO IDLE AFTER 1 OSC PE

;RAS=1,2,3,4,5,6

;LOEN=3,4,5,6

;HIEN=0,1,2,8

;CAS=4,5,6,7,8

;CAS ON REFRESH=1,2,3,4,5

moved to 44902C

PAL16R8
CJTC 180587
44904A,7G,SIZEIND

CLK /MSIZE0 /MSIZE1 /MOFF NC5 NC6 NC7 NC8 NC9 GND
/OE /EHI /EMID /ELOW NC15 DBIT CBIT BBIT ABIT VCC

; MEMORY SIZE INDICATOR FOR 0, 2, 4 OR 6 MB MEMORY ARRAYS

EHI := EMID + ELOW * EHI + /ELOW * /EHI ; ENABLE DIGIT 3

EMID := ELOW * /EMID * /EHI ; ENABLE DIGIT 2

ELOW := /ELOW * /EMID * EHI ; ENABLE DIGIT 1

/ABIT := MOFF
+ /MSIZE1 * MSIZE0 * EMID
+ EHI
+ ELOW

/BBIT := MOFF
+ /MSIZE1 * /MSIZE0 * EMID + MSIZE1 * MSIZE0 * EMID
+ EHI
+ ELOW

/CBIT := VCC
/DBIT := VCC
DESCRIPTION

← {
+ /MSIZE1 * ELOW
+ /MSIZE0 * ELOW
+ EHI
+ EMID

MEMORY SIZE	S1	S0
-----	--	--
2MB	F	F
4MB	F	T
6MB	T	F
SPARE	T	T

DIGIT ENABLE BITS : ELOW --> EMID --> EHI

PAL16L8
JLB/CJTC 11AUG86
45001A,8D,BPAR

/BDY50 /BDY75 /BLOCK25 /BPERR50 DBAPR /MOR25 /LPERR /MR /EPES GND
/EPEA SPES /LERR NC14 NC15 /RERR /PARERR /BLOCK SPEA VCC

; STROBE PARITY ERROR STATUS WORD

IF (VCC) /SPES = /BDY50 * /BDY75
+ BDRY50 * BDRY75
+ /BDY50 * BDRY75
+ BLOCK25
+ EPEA
+ EPES
+ MR

; STROBE PARITY ERROR ADDRESS

IF (VCC) /SPEA = /DBAPR + BLOCK25 + EPEA + MR

; BLOCK SIGNAL FOR PES AND PEA STROBE - BLOCK ON ERROR, RELEASE ON PEA READ

IF (VCC) BLOCK = BDRY50 * /BDY75 * /EPEA * /EPES * MOR25 * /MR
+ BDRY50 * /BDY75 * /EPEA * /EPES * BPERR50 * /MR
+ BLOCK * /EPEA * /MR

; PARITY ERROR SIGNALS FROM BUS AND LOCAL MEMORY

IF (VCC) PARERR = BDRY50 * /BDY75 * BPERR50 * /MR
+ LERR

; REMOTE ERROR - LAST ERROR WAS FROM MEMORY ATTACHED TO THE ND100 BUS

; WILL BE OVERRIDEN BY AN ERROR FROM LOCAL MEMORY (PERR1 AND PERR0)

IF (VCC) RERR = BPERR50	* /MR	;SET REMOTE ERROR ON BUS PARITY ERR
+ RERR * /LPERR	* /MR	;HOLD UNTIL A LOCAL MEMORY ERROR
+ MOR25	* /MR	;=> LOCAL ERROR HAS PRIORITY

DESCRIPTION

; 260387 CJTC: NEED TO USE DELAYED BAPR (DBAPR) INSTEAD OF BAPR~ IN
; PRODUCING SPEA. POLARITY CHANGE.
; 260387 JLB: BLOCK SIGNAL MUST NOT BE PRODUCED ON LOCAL MEMORY ERROR.
; IT WILL ONLY BE UNLOCKED ON PEA READ FROM REMOTE ERROR PEA.
; 260387 JLB: PERR HANDLING CHANGED.
; 070487 JLB: RERR MUST LATCH UP ON MOR ALSO.
; 180587 M3202B

PAL16L8
ADGD 18/8/86
45008A,2F,DATA

/MWRITE /SWDIS LBD0 LBD1 LBD3 LBD4 /BIOXL ECCR /BCGNT50R GND
/HIEN /OER /MR NC14 /TST /DISB /CLRERR /OET /DIS VCC

IF (VCC) OET = MWRITE ;ON WRITE TO MEMORY

IF (VCC) OER = BCGNT50R ;ON READ FROM MEMORY AFTER THE ADDRESS PE
+ TST * MWRITE ;ON WRITE IN TEST MODE BOTH OER AND OET S

IF (VCC) CLRERR = MR ;CLEAR PARITY ERROR ON MR, READING EPESL
+ /BCGNT50R
+ DISB

IF (VCC) DISB = LBD3 * BIOXL * ECCR ;SET IF LBD3=1 AND IOX=ECCR
+ /MR * DISB * /BIOXL ;HOLD UNTIL NEXT IOX=ECCR
+ /MR * DISB * /ECCR

IF (VCC) TST = LBD0 * BIOXL * ECCR ;SET IF ANY OF LBD0,1,4 AND IOX=ECCR
+ LBD1 * BIOXL * ECCR ;HOLD UNTIL IOX=ECCR
+ LBD4 * BIOXL * ECCR
+ /MR * TST * /BIOXL
+ /MR * TST * /ECCR

IF (VCC) DIS = DISB + SWDIS

DESCRIPTION

; 200387 CJTC: LOGICAL ERRORS IN EQUATIONS FOR DISB AND TST
; 260387 CJTC: CHANGED PIN 2 /EPESL TO /EPEAL - CIRCUIT CHANGE ONLY!!!
; 260387 JLB: CLRERR COMES IMMEDIATELY TO MAKE PERRO&1 PULSES ONLY!!!
; 180587 M3202B

PAL16L8
ADGD 12AUG86
45009A,4F,ERROR

RDATA /BLOCKL25 BCGNT50 /PS /RERR /PA NC7 /LERR NC9 GND
/MR SPEAL /NC13 /NC14 /NC15 /BLOCKL /EPEAL /EPESL SPESL VCC

IF (VCC) /SPESL = /RDATA + BLOCKL25 + EPEAL + EPESL + MR ;RDATA USED AS WRITE
;PULSE WHEN NOT BLOCKED
IF (VCC) /SPEAL = /BCGNT50 + BLOCKL25 + EPEAL + MR ;BCGNT USED AS WRITE
;PULSE

IF (VCC) EPESL = PS * /RERR ;ENABLE IF ERROR IN LOCAL MEMORY

IF (VCC) EPEAL = PA * /RERR

IF (VCC) BLOCKL = RDATA * /EPEAL * /EPESL * LERR * /MR ;SET ON LOCAL ERROR
+ BLOCKL * /PA * /MR ;HOLD TILL PEA READ

DESCRIPTION

; 2/1-87JLB: RDATA PIN 1.
; 070487 JLB: MUST NOT LOCK ON MOR, THAT IS DONE IN THE BUS INTERFACE ANYWAY
; UNBLOCK ON PA (I.E. ALSO IF THE BUS PEA WAS READ)
; 150487 CJTC: NO!!! SPIKES ON SPEAL - USE BLOCKL25 INSTEAD OF BLOCKL
;
; 180587 : M3202B

PAL16L8
JLB 7JAN87
45011A,26H,LEV0

NC1 PILO PIL1 PIL2 PIL3 NC6 NC7 NC8 NC9 GND
/NC11 LEV0 /NC13 /NC14 /NC15 /NC16 /NC17 /NC18 /NC19 VCC

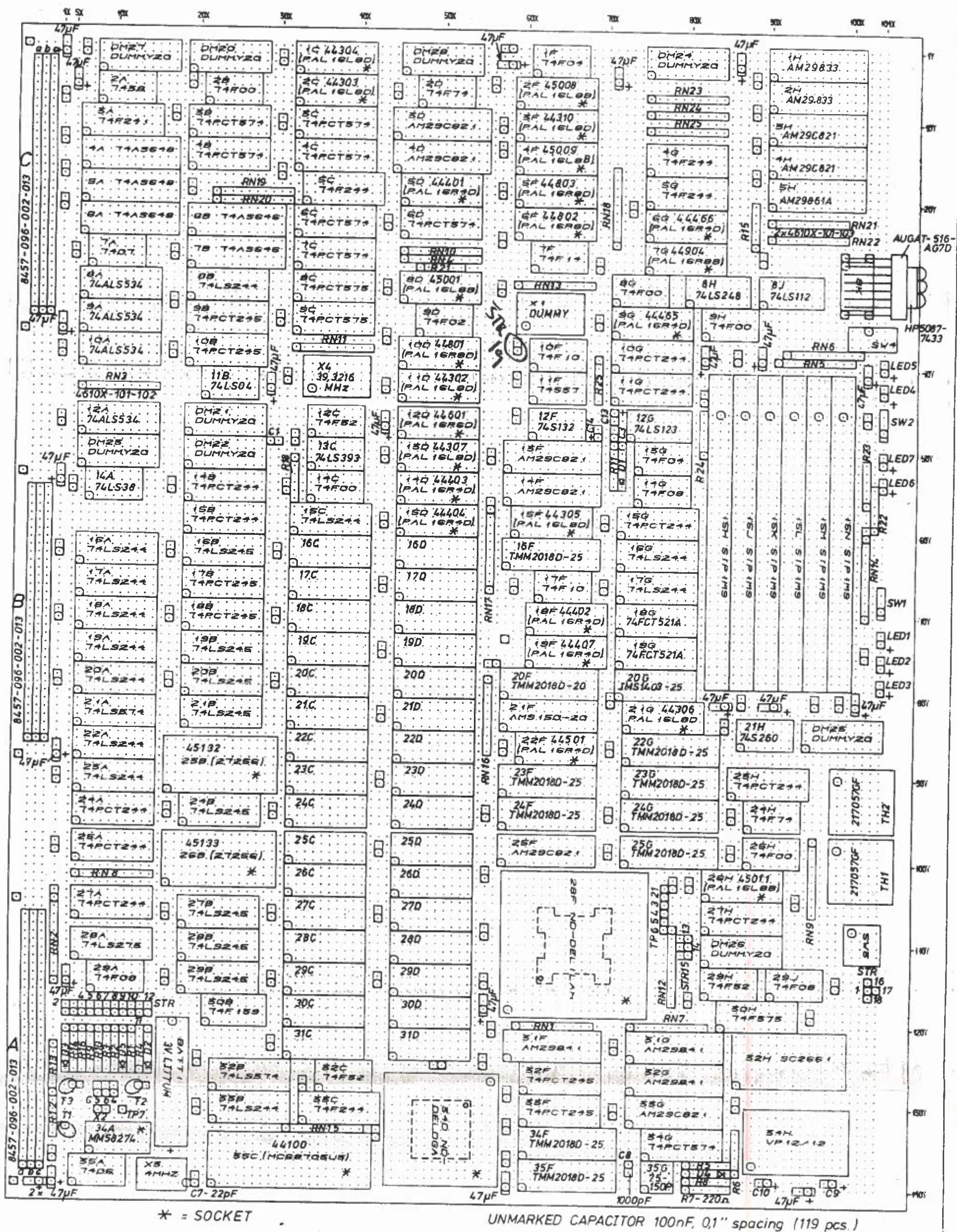
; LEVEL ZERO

IF (VCC) /LEV0 = PIL3
+ PIL2
+ PIL1
+ PILO

DESCRIPTION

; 180587 M3202B

moved to 44511A



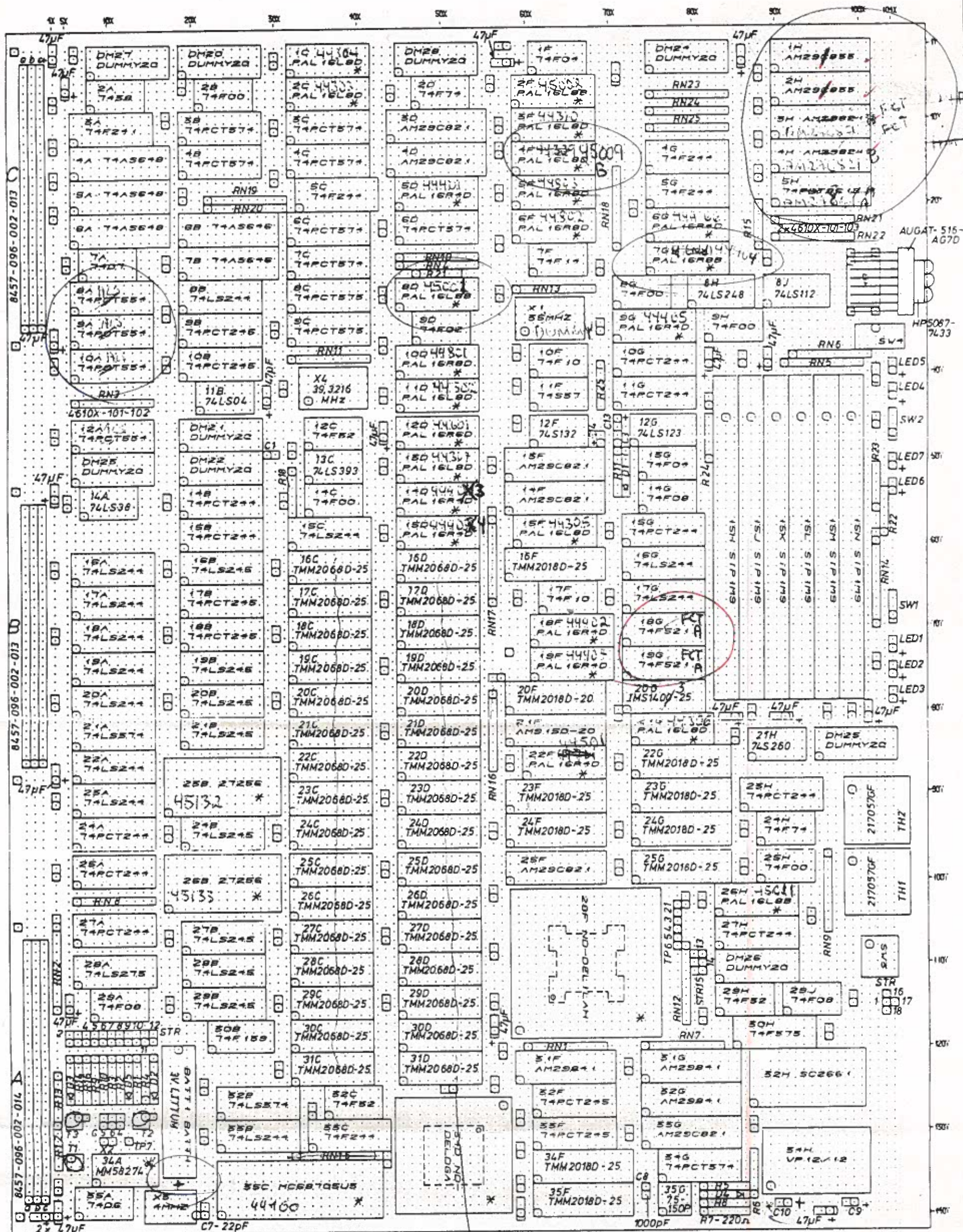
* = SOCKET

UNMARKED CAPACITOR 100nF, 0,1" spacing (119 pcs.)

CORRECTIONS WITHOUT ECO

UNMARKED IC's 16C-31C, 16D-31D = IDT6168A-20

No	Description	Date / Sign

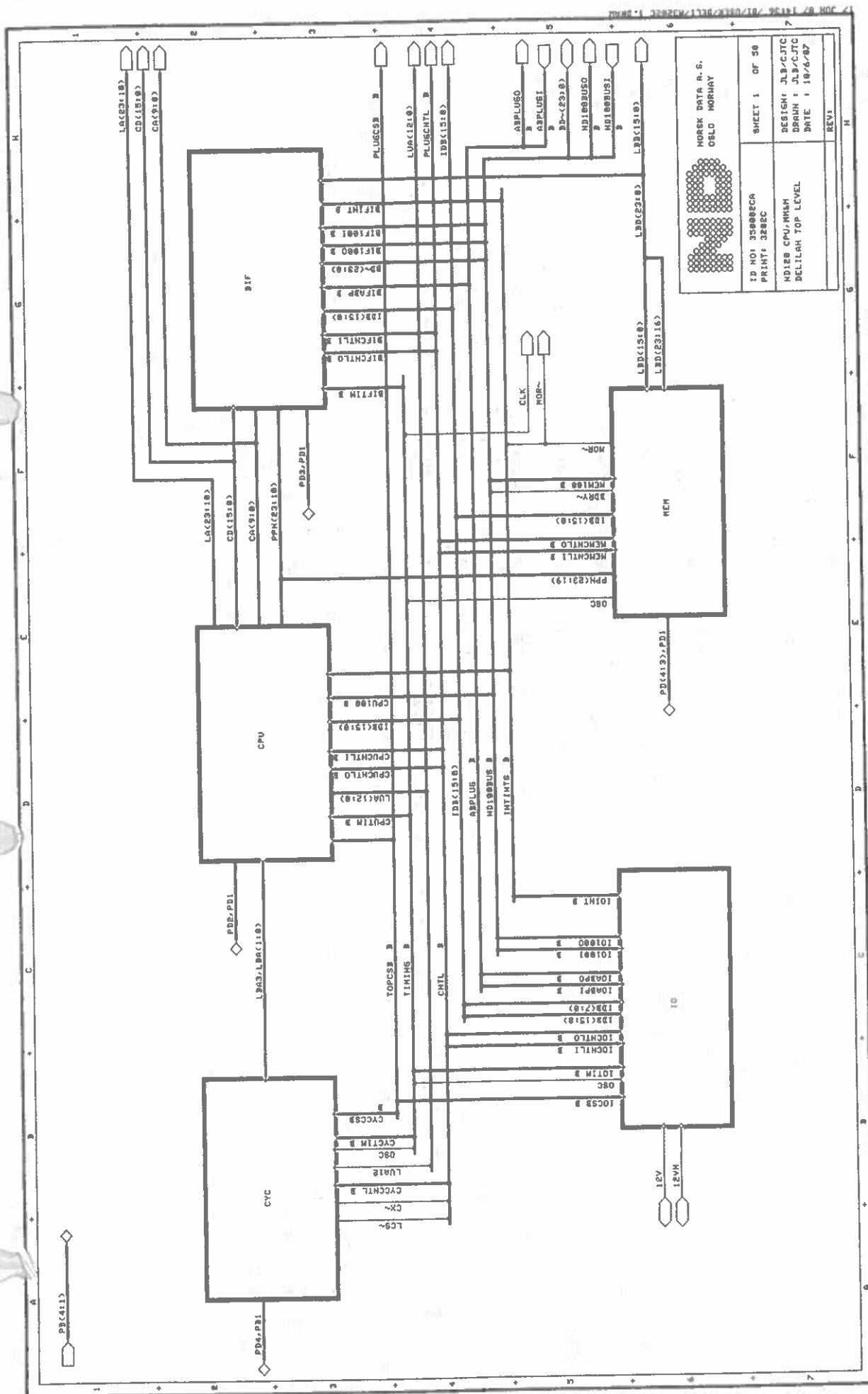


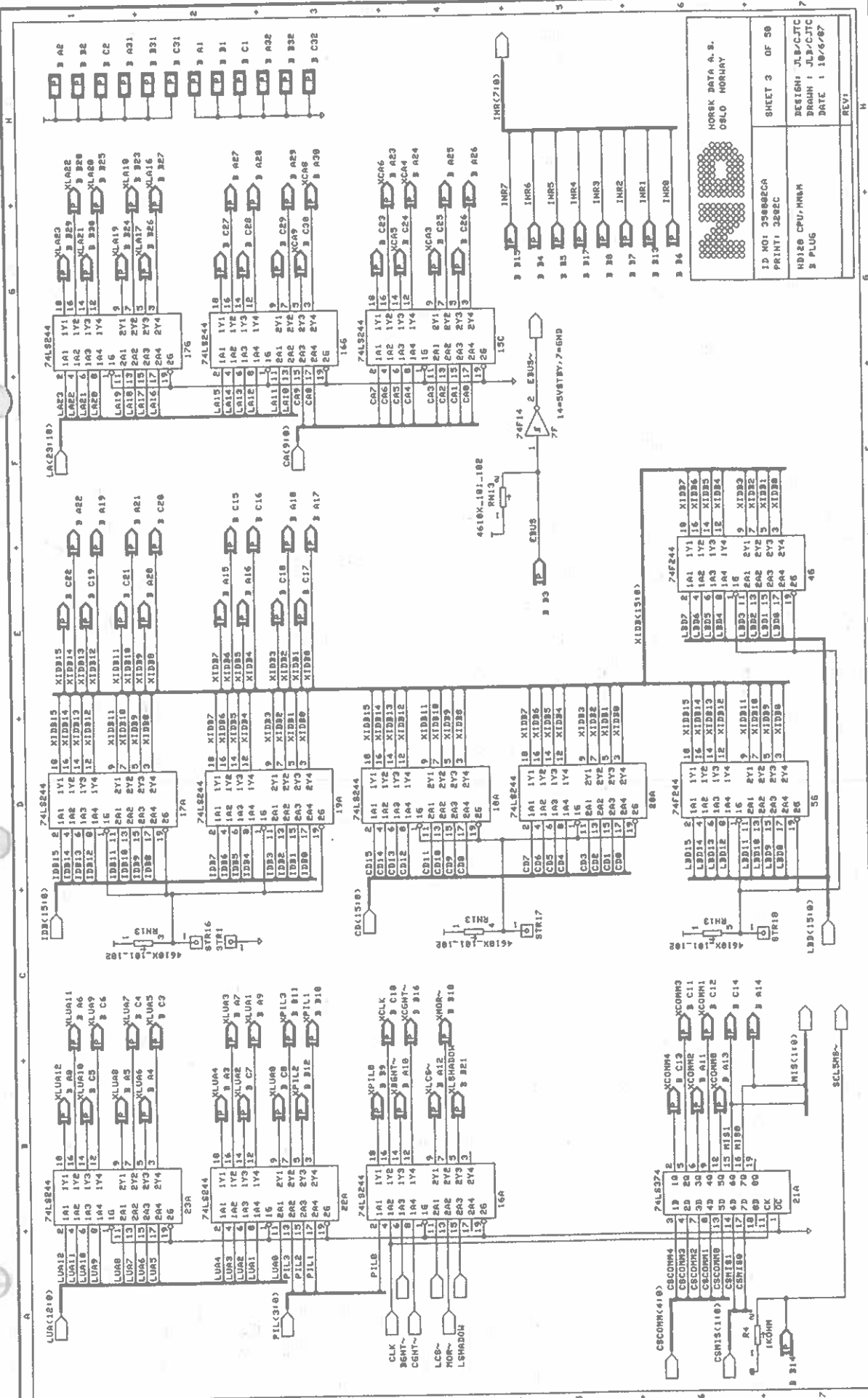
* = SOCKET

UNMARKED CAPACITOR 100nF, 0,1" spacing (119 pcs.)

10T 61685A-20P

CORRECTIONS WITHOUT ECO		
No	Description	Date/Sign





DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 10/6/87

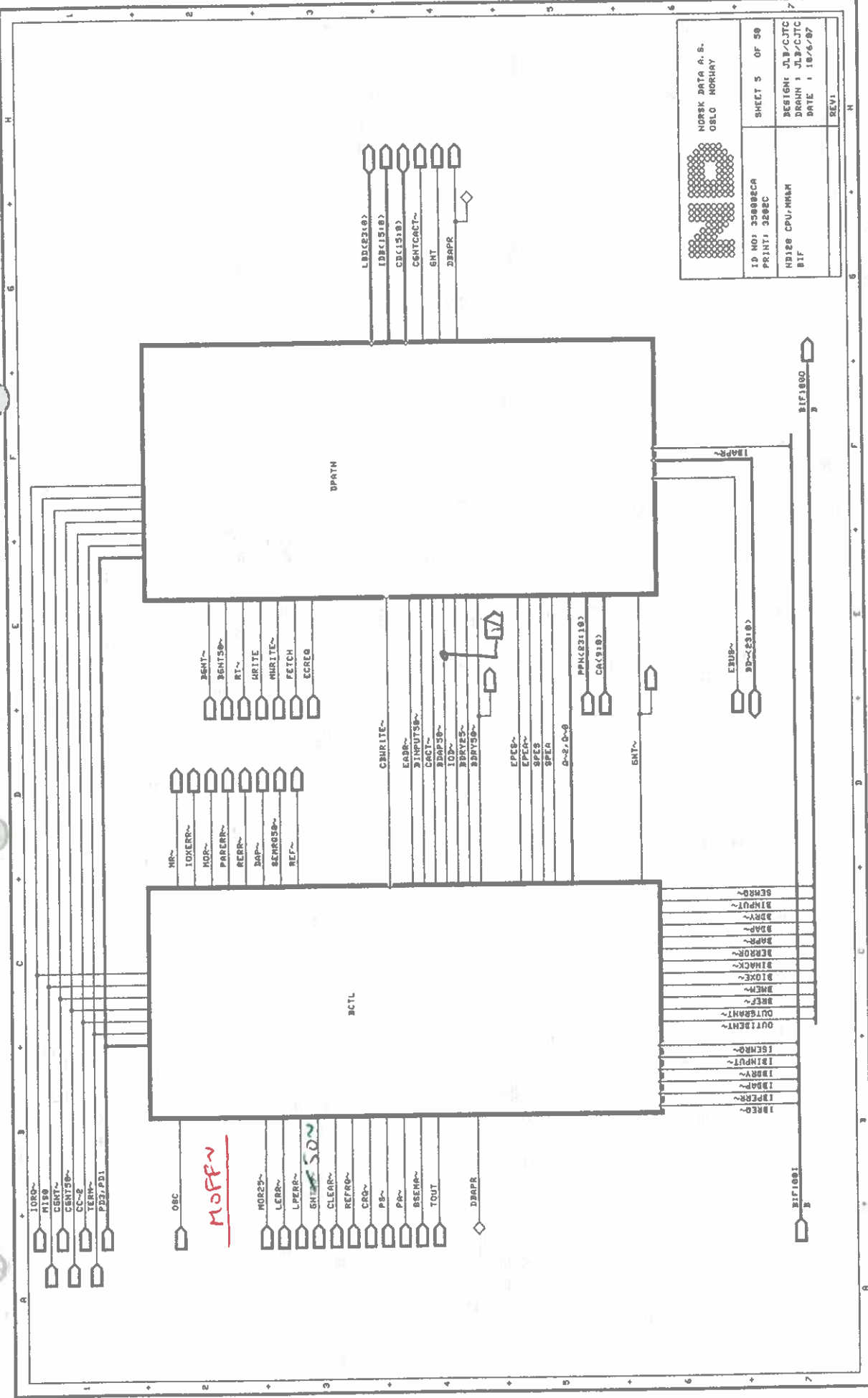
SHEET 3 OF 50

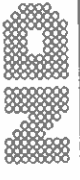
10 MOI 35882CA
PRINTI 2282C

ND128 CPU-MEM
3 PLUG

HORSE DATA A.S.
OSLO NORWAY

1/ JUN 87 14:42 / D1/06ER/DELTA/MS202C/BIF 1.DRAW





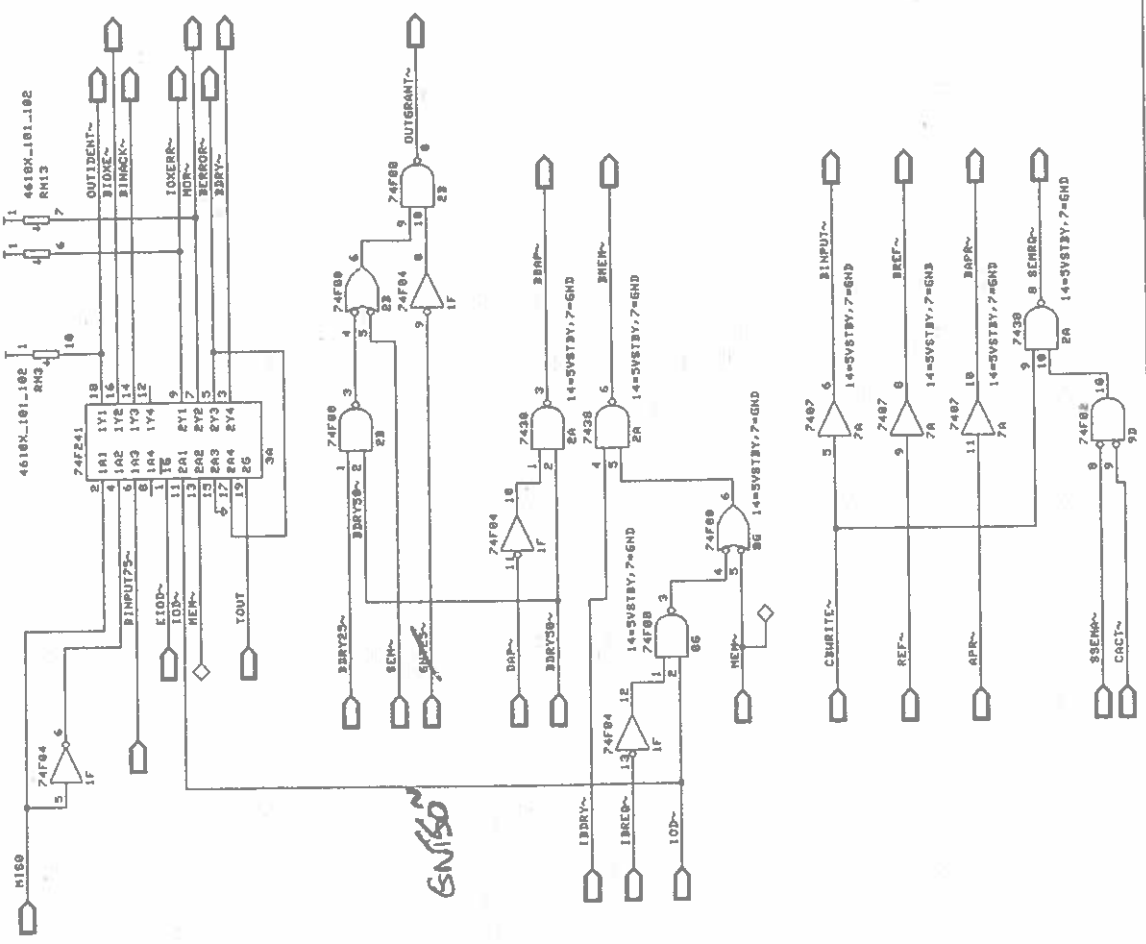
NORSK DATA A.S.
OSLO NORWAY

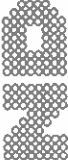
10 NO: 35002CA PRINT: 3202C	SHEET 5 OF 50
DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 18/6/87	
REV1	

MOPFV

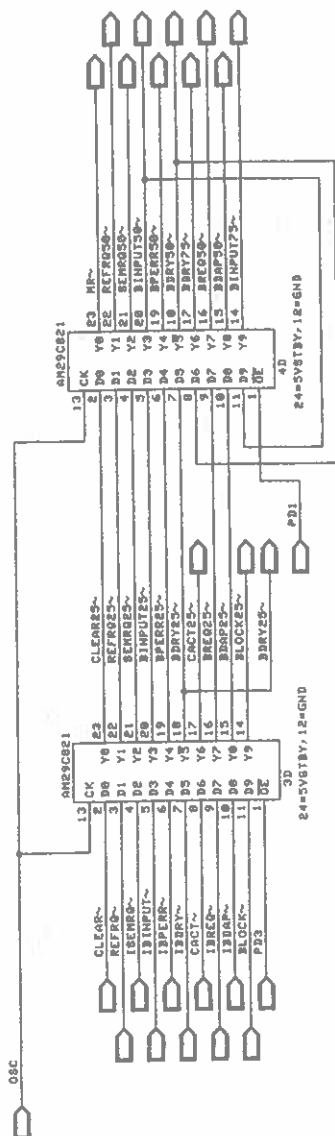
502

H G F E D C B A



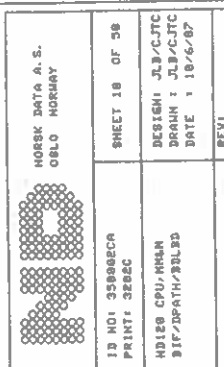
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ID NO: 350082CA PRINT: 3202C	SHEET 7 OF 50		
ND120 CPU-MMH BIF/SCIL/BDY	DESIGN: JLB/CJTC BRANN: JLB/CJTC DATE: 10/6/87		
	REV:		

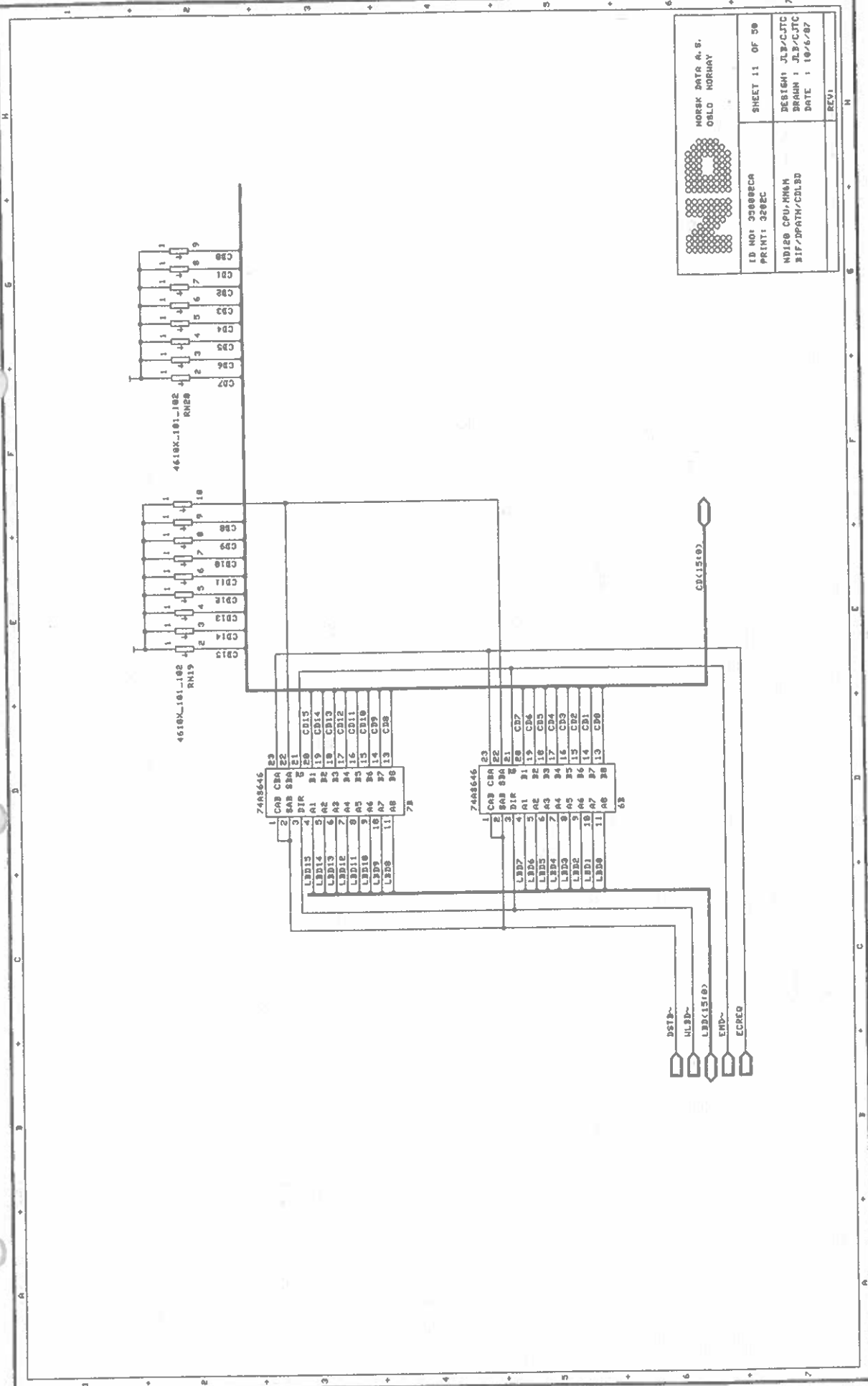
1 JUN 87 14:45 / D1/DBK/DELTA/MS202C/BIF/SCIL/BDY I. BRANN



		MORSAK DATA A.S. OSLO NORWAY	
ID NO: 350802CA PRINT: 3882C	SHEET 8 OF 59		
MD128 CPU/MEM BIF/BCL/SYNC	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 19/6/87		
	REV:		

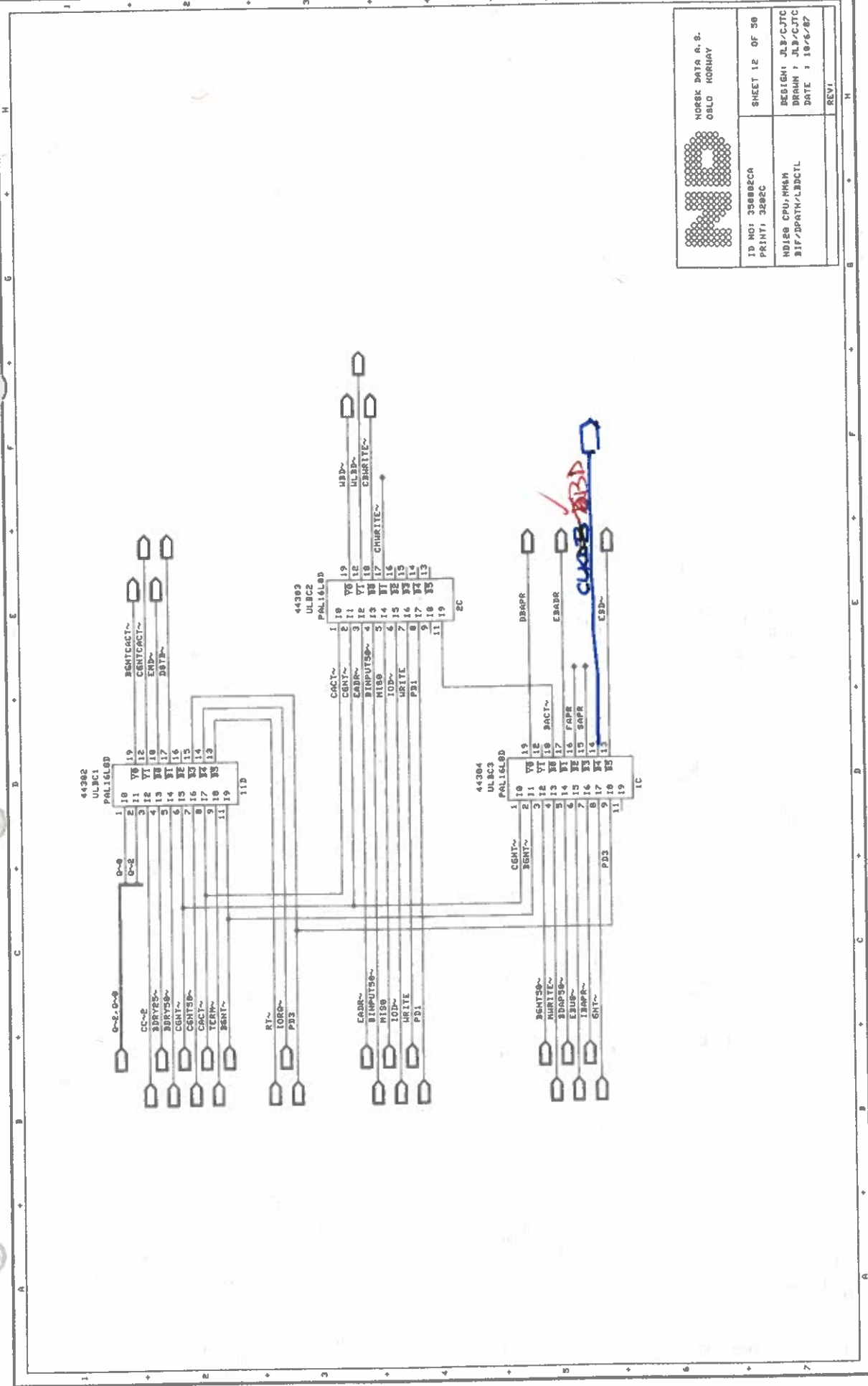
17 JUN 87 14:46 / D1/USER/DEL1/MS282C/BIF/BCL/SYNC 1.DRAW





MORSK DATA A. S. OSLO NORWAY	
ID NO: 35008CA PRINT: 320EC	SHEET 11 OF 50
ND120 CPU,MMH BIF/DPATH/CDLSD	DESIGN: JLB/CJTC BRANN: JLB/CJTC DATE: 10/6/87
REV:	REV:

1 JUN 87 14151 /BI/OSK/DEL/1/2202C/BIF/DPATH/LBDCTL 1. DRAM



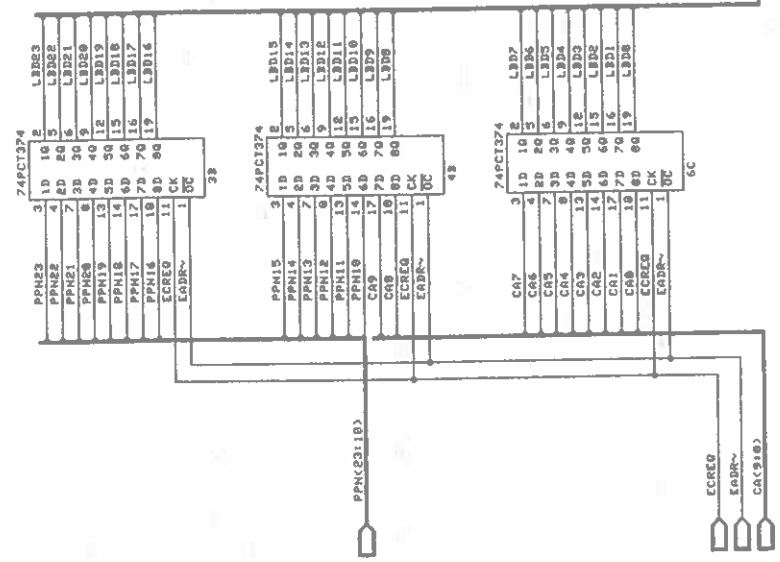
NORSK DATA A. S. OSLO NORWAY	
19 NO: 358802CA PRINT: 2202C	SHEET 12 OF 38
ND180 CPU:MMH BIF/DPATH/LBDCTL	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 19/6/87
REV:	

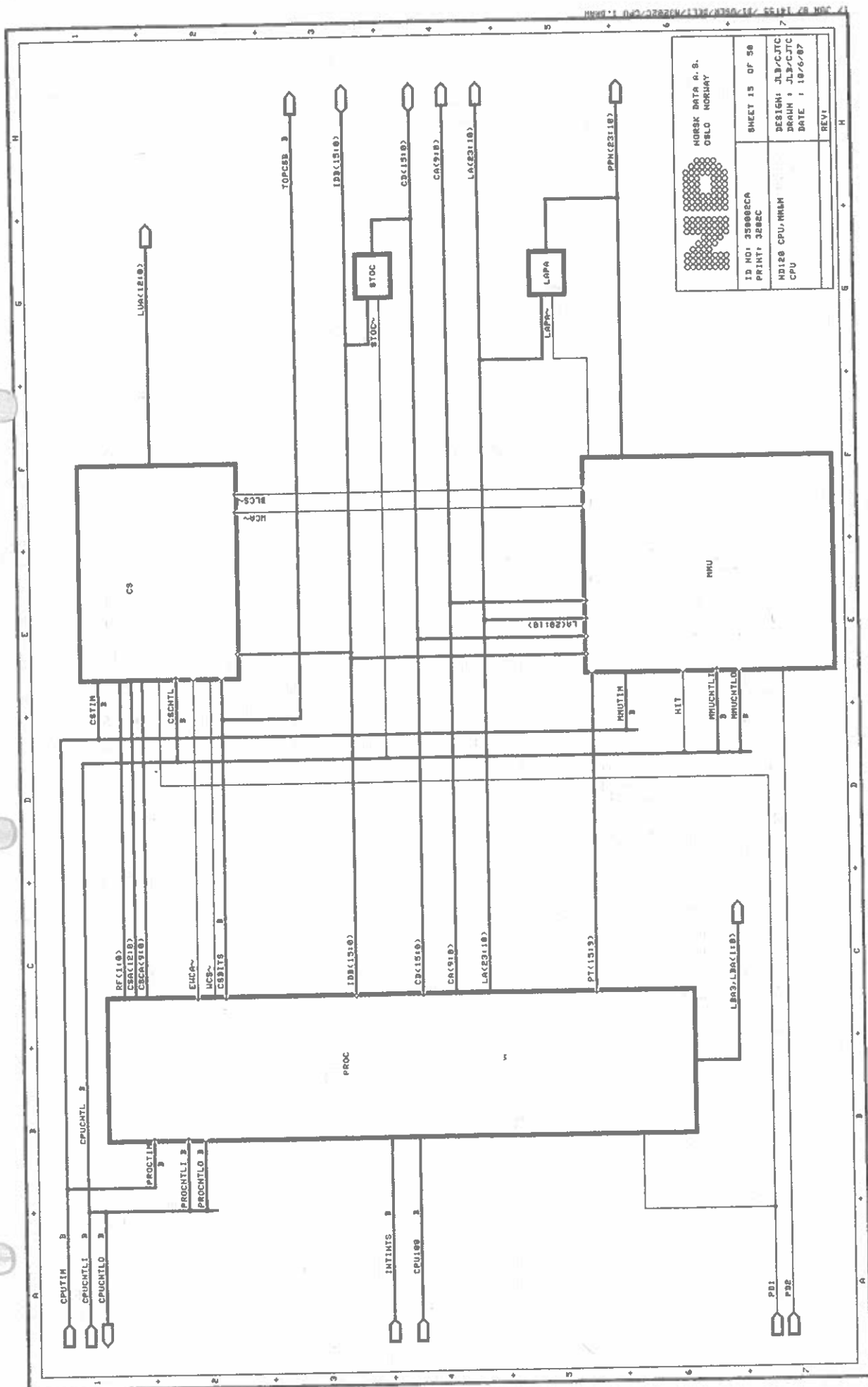


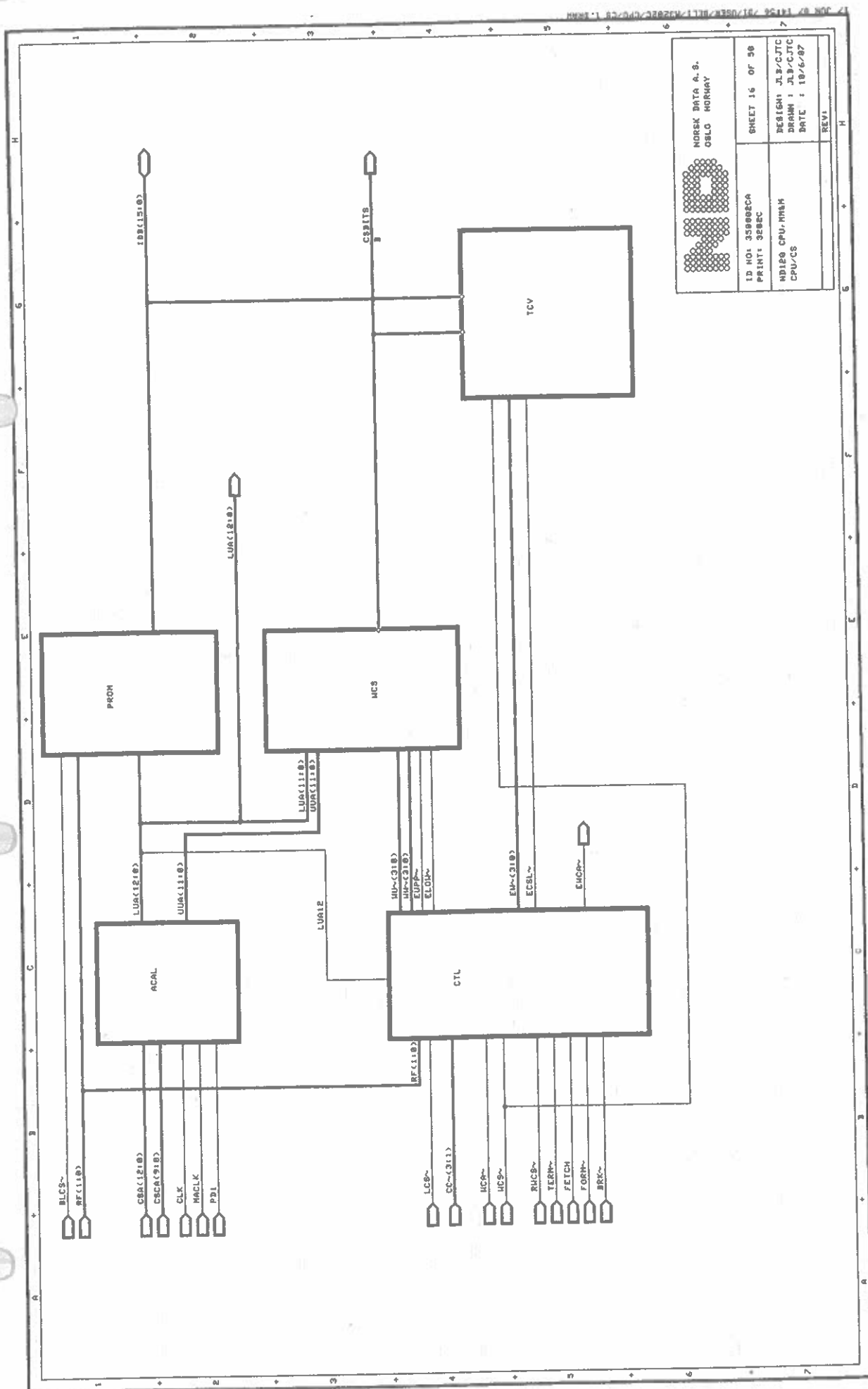
	ID NO: 350082CA PROJECT 35052	SHEET 13 OF 58 DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 10/6/87	NORSK DATA A. S. OSLO NORWAY
	MILES CPU N44H BIT/DATA/PEEPER	REV:	

17 JUN 87 14:34 J17/DBK/DEL17/MSBEC/317/DPATH/PPHLD 1.DRAW

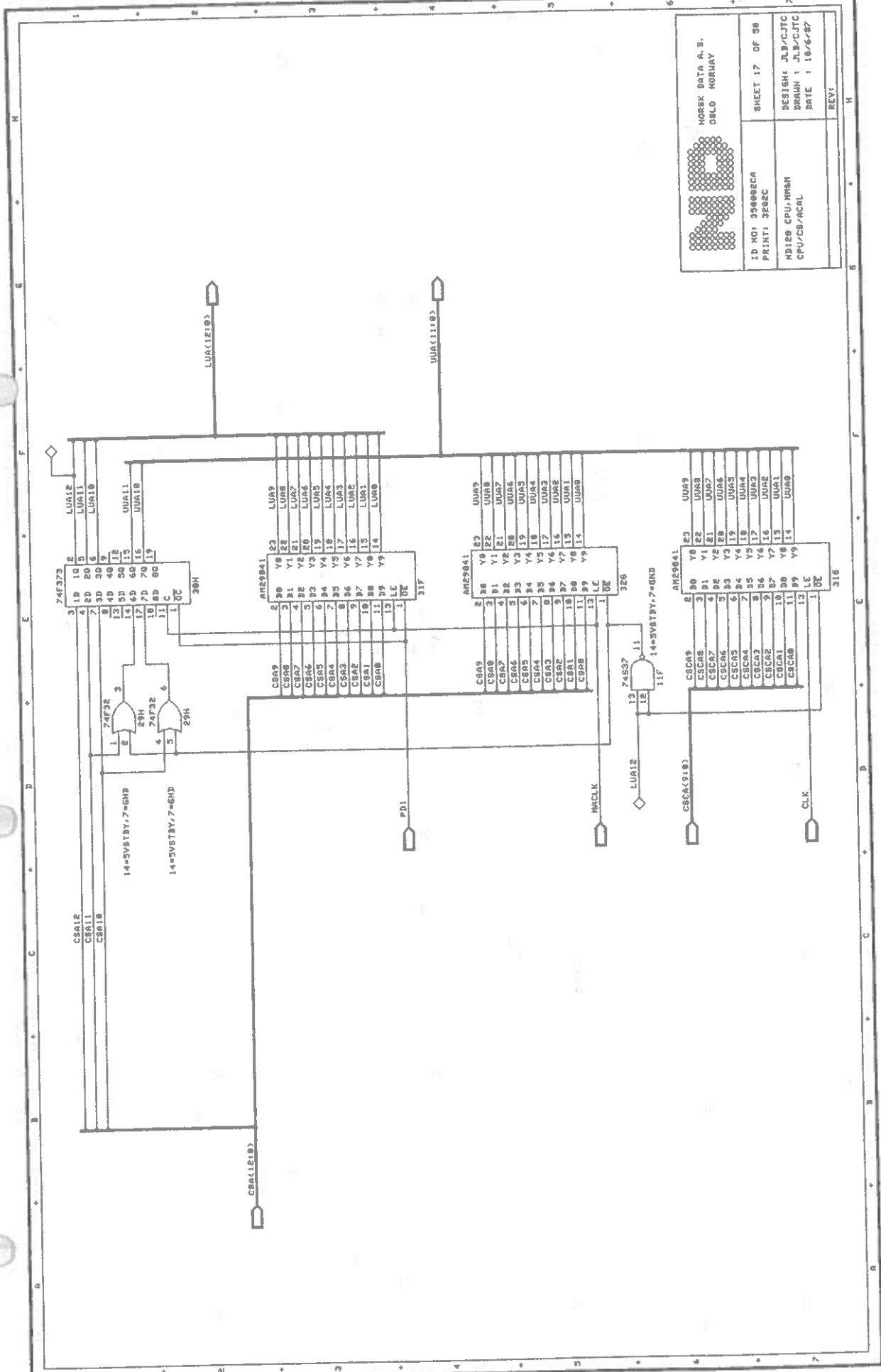
	
NORSE DATA A.S. OSLO NORWAY	
TD NO: 358802CA PRINT: 3202C	SHEET 14 OF 50
WD128 CPU,MMM 317/DPATH/PPHLD	DESIGN: JLB/CJC DRAWN: JLB/CJC DATE: 10/6/87
REV:	







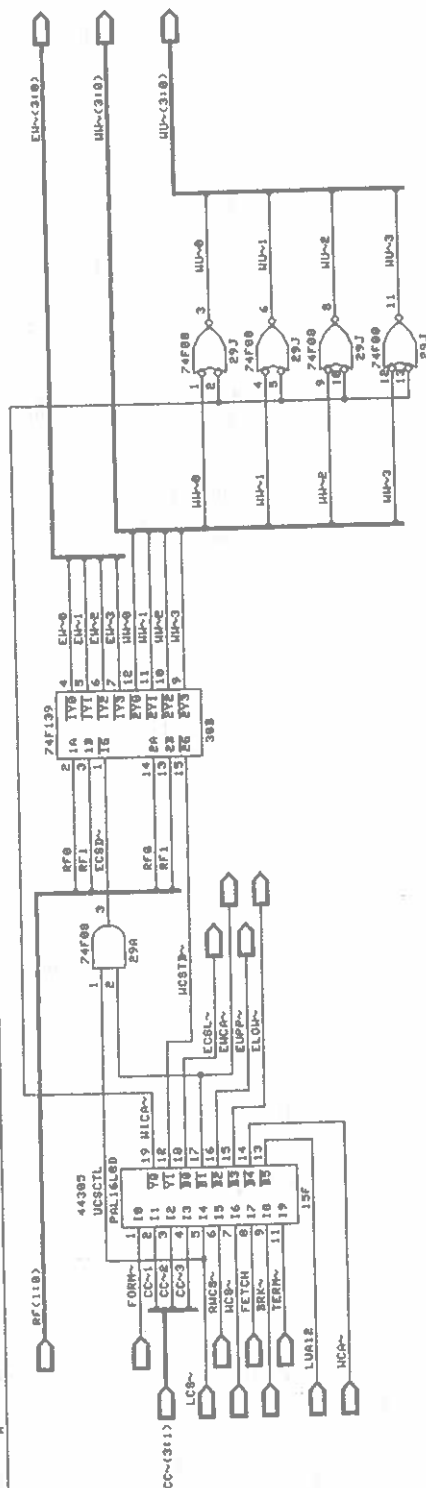
17 JAN 87 14:57 / 31/05/87 BIL/17/02/87 CPU/CS/ACAL 1.0000



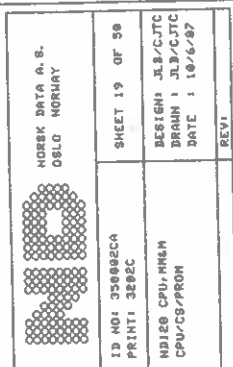


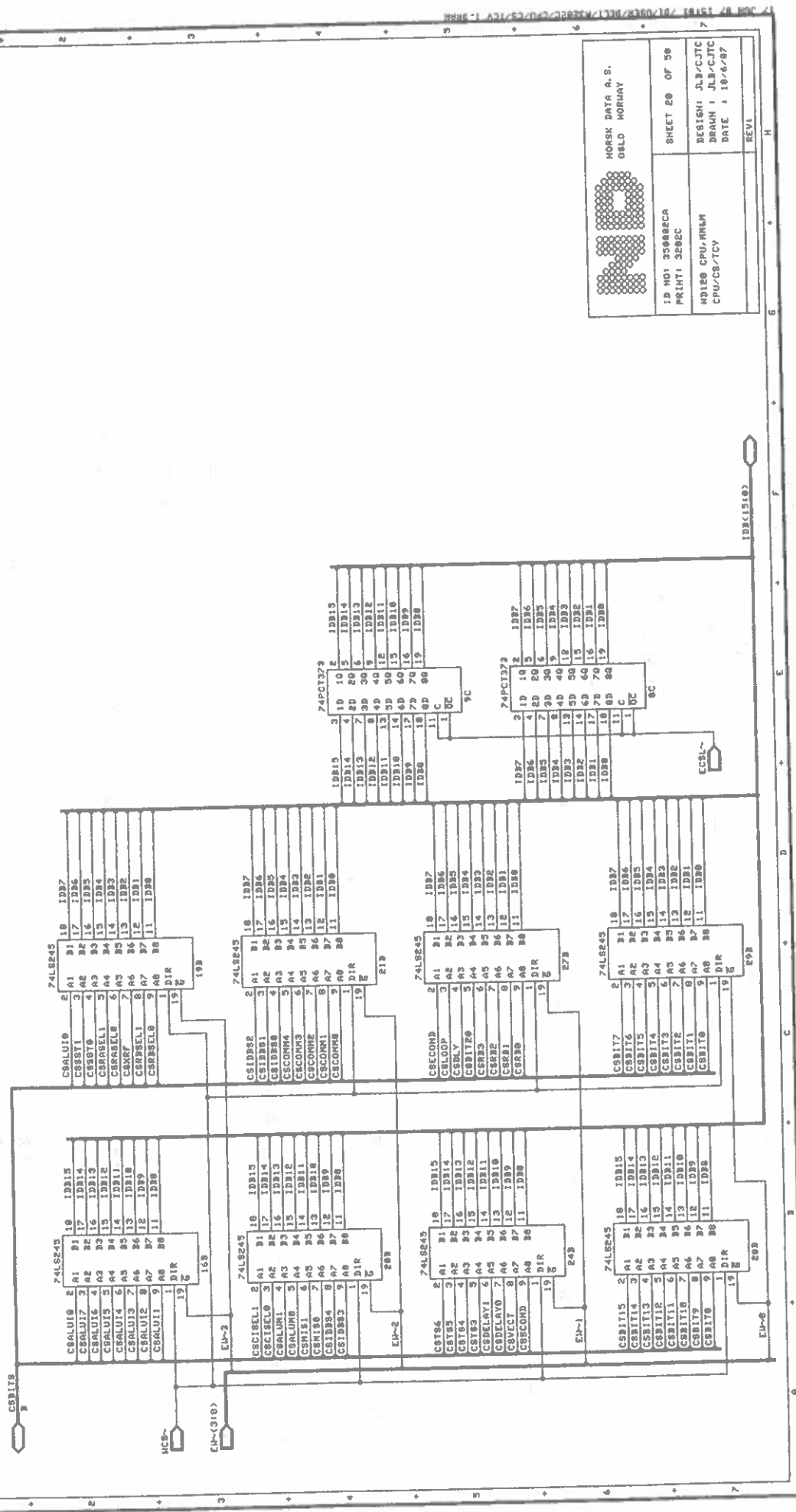
NORSK DATA A.S.
OSLO NORWAY

ID NO: 350002CA PRINT: 3282C	SHEET 17 OF 58
ND128 CPU/MEM CPU/CS/ACAL	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 10/6/87
REVI	REV1



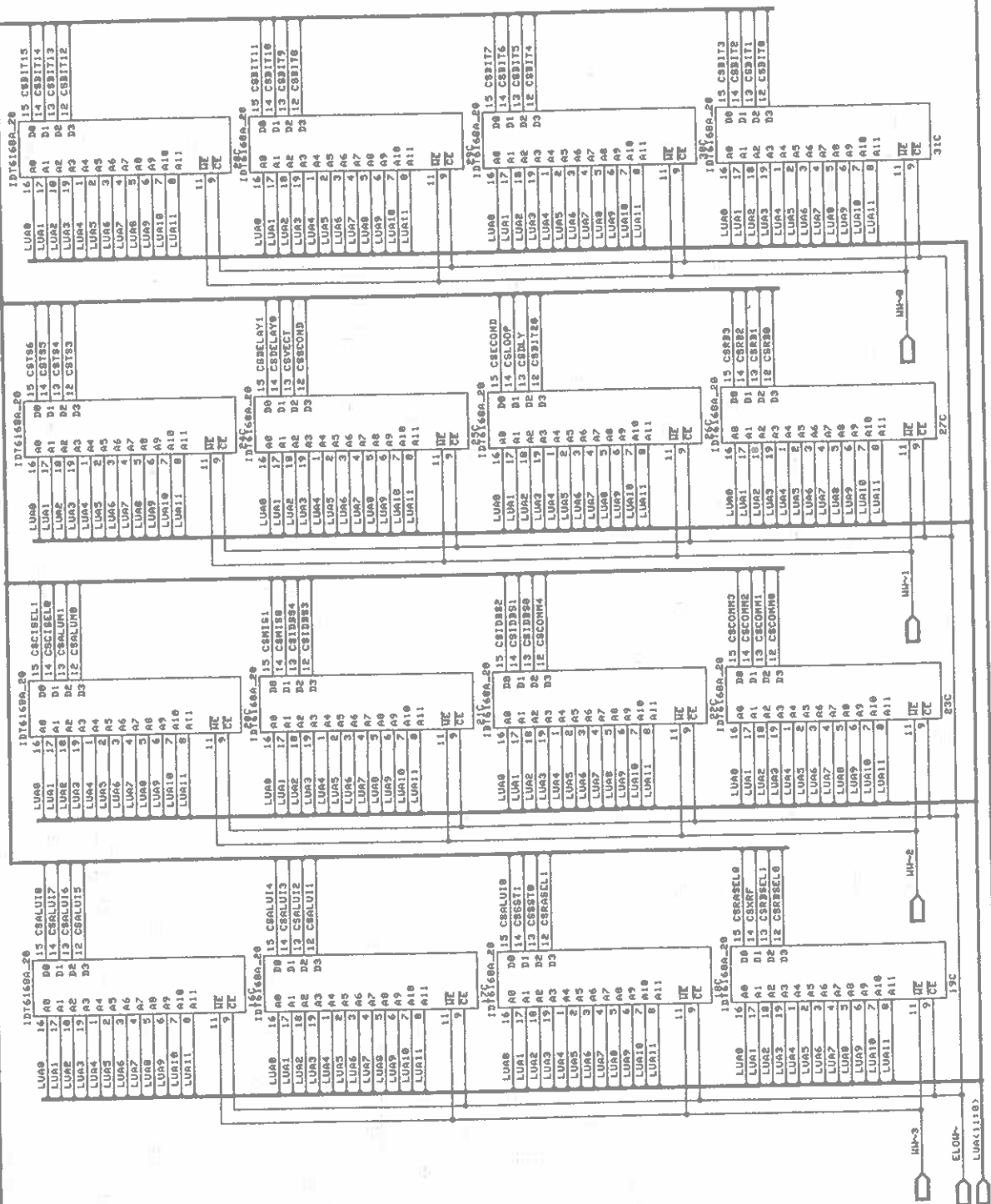
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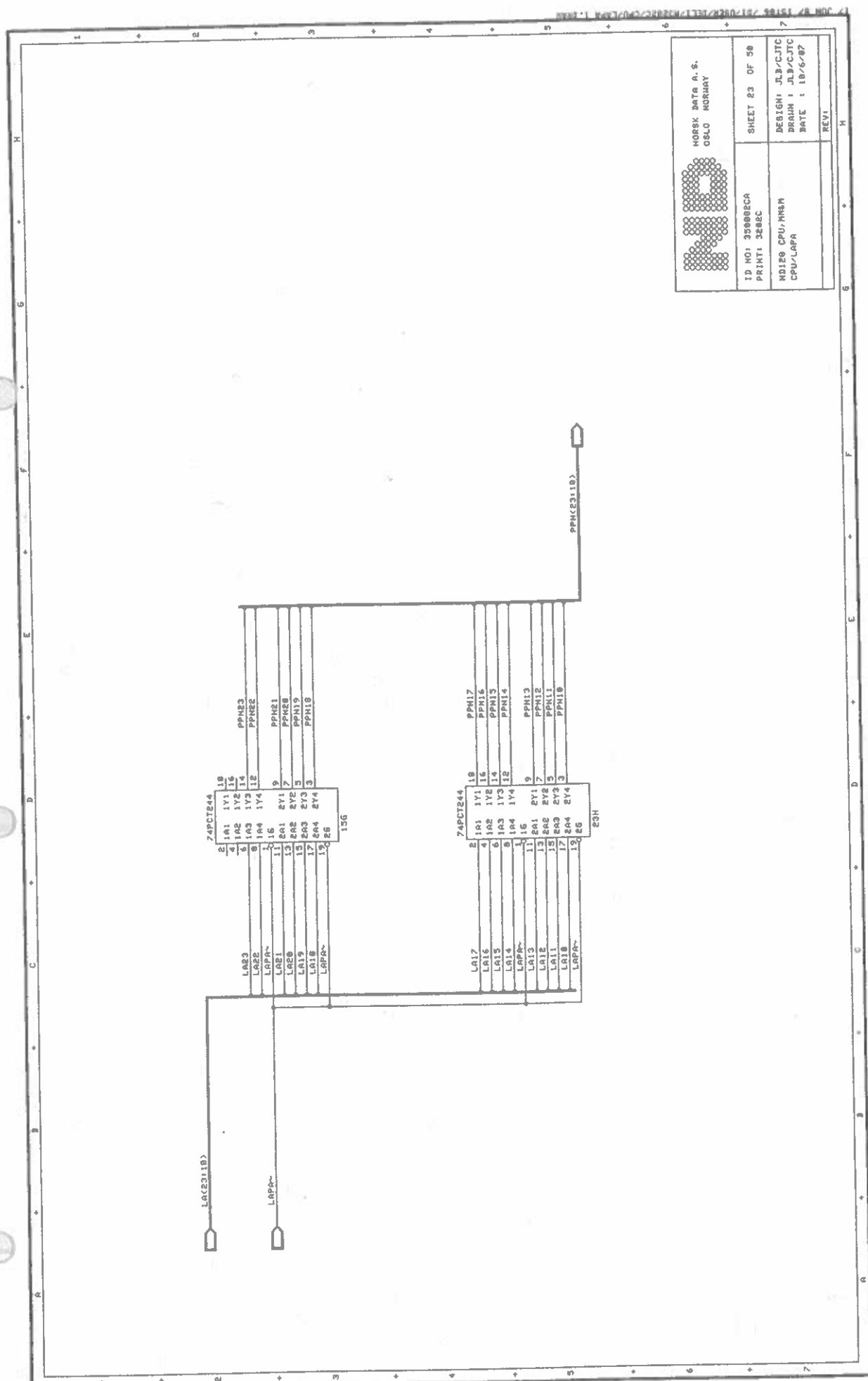


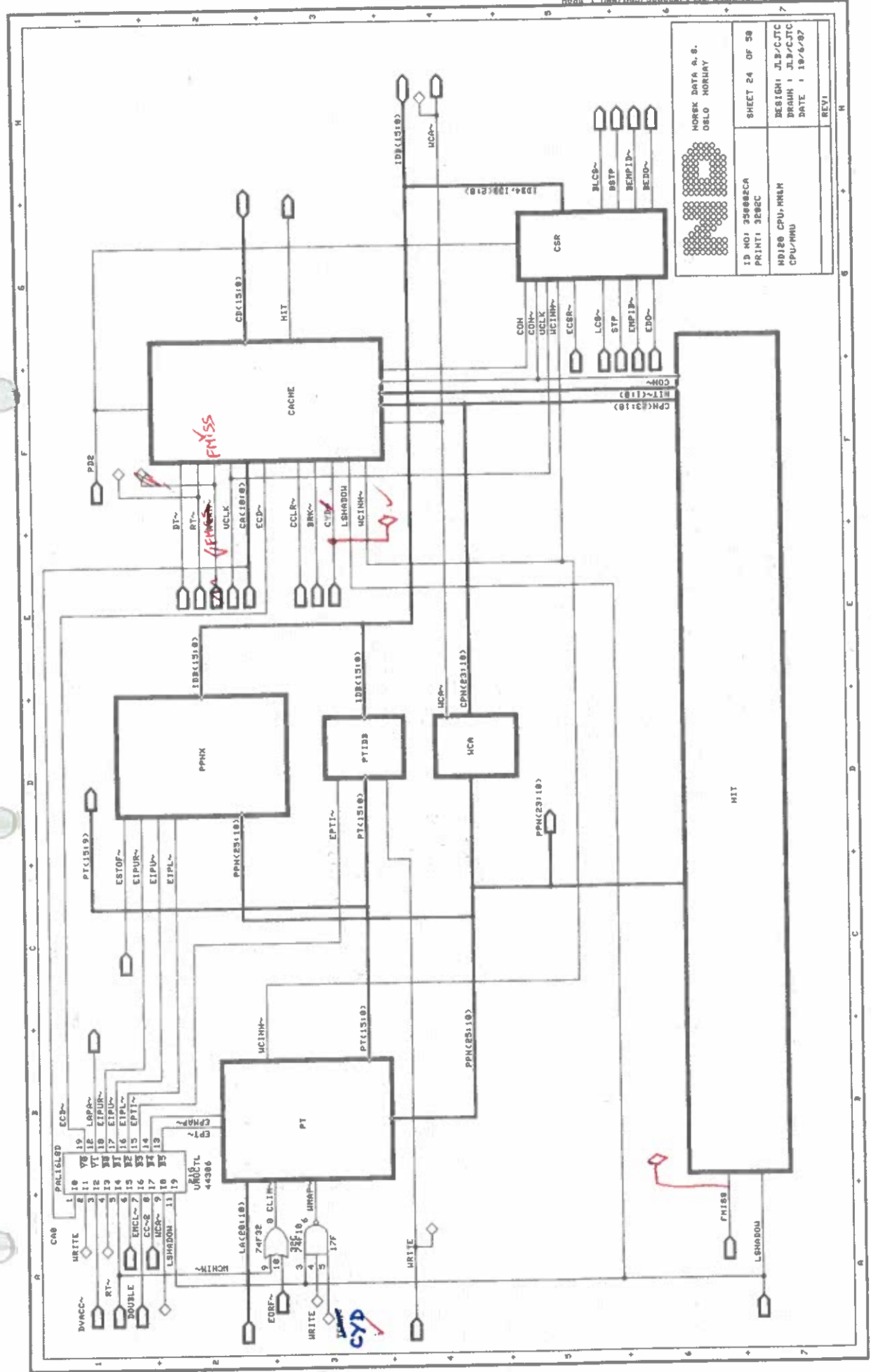


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DRAWN: JLBCJT
DATE: 10/6/87
SHEET 22 OF 36





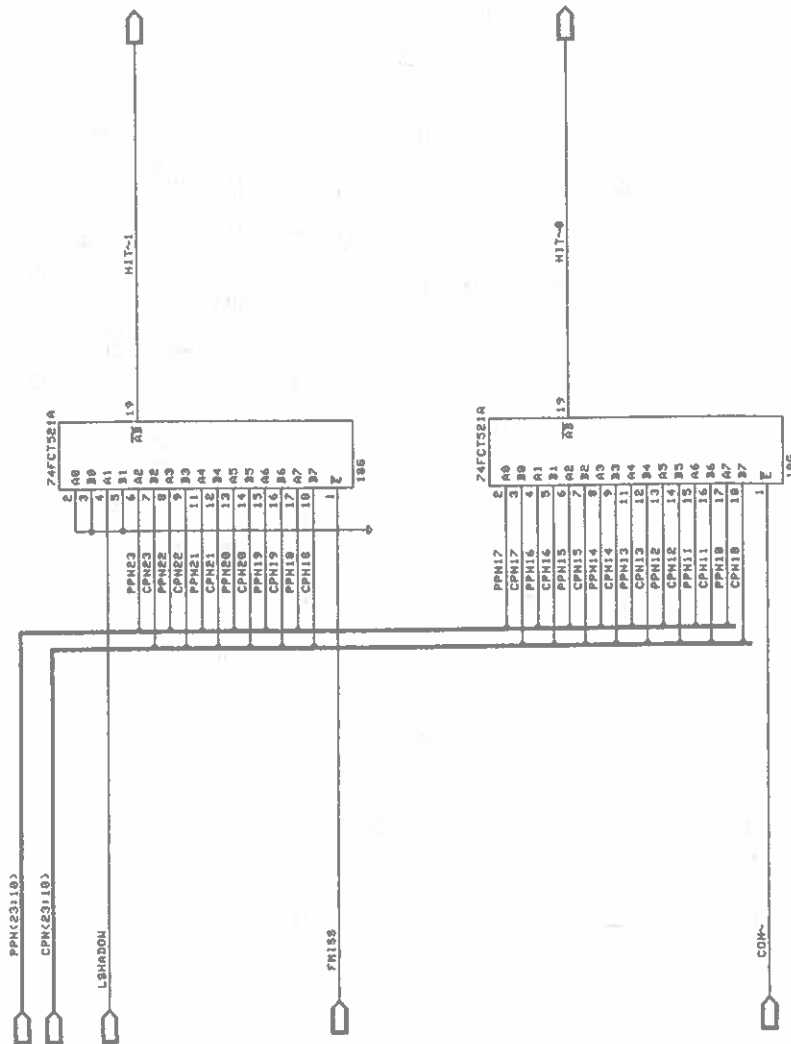


NOREK DATA A.S. OSLO NORWAY	
13 NOJ 35082CA PRINTI 3282C	SHEET 24 OF 50
ND180 CPU/MEM CPU/MEM	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 19/6/87
REV1	

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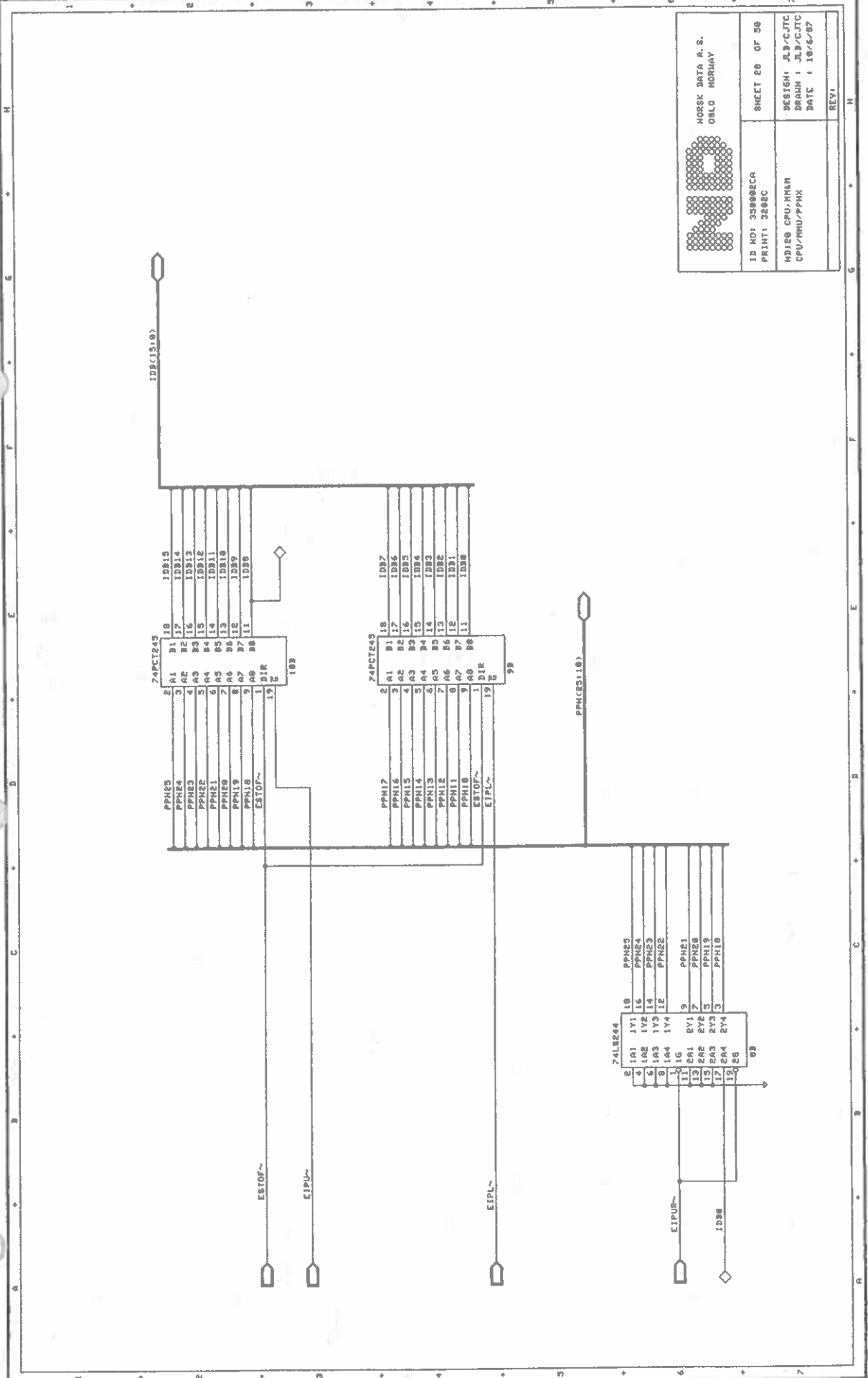


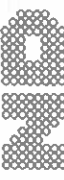
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M150 CPU/MHM CPU/MHM/CSR	DESIG: JLB/CJTC DRAW: JLB/CJTC DATE: 10/6/87
	REV: 1



		NORSK DATA A.S. OSLO NORWAY	
1D NO: 358082CA PRINT: 3282C	SHEET 27 OF 58		
NO120 CPU/MHM CPU/MRU/HIT	DESIGN: JLB/CJTC DRAHN: JLB/CJTC DATE: 10/6/87		
REV:			

1 JUN 87 1511Z 701050K/DEL17M3282C/CPU/MRU/HIT 1.DRAHN





NORDBANK DATA A.S.
OSLO NORWAY

ID NO: 359802CA
PRINT: 2002C

DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 18/6/87

SHEET 20 OF 50

REV:

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LA(20:10)

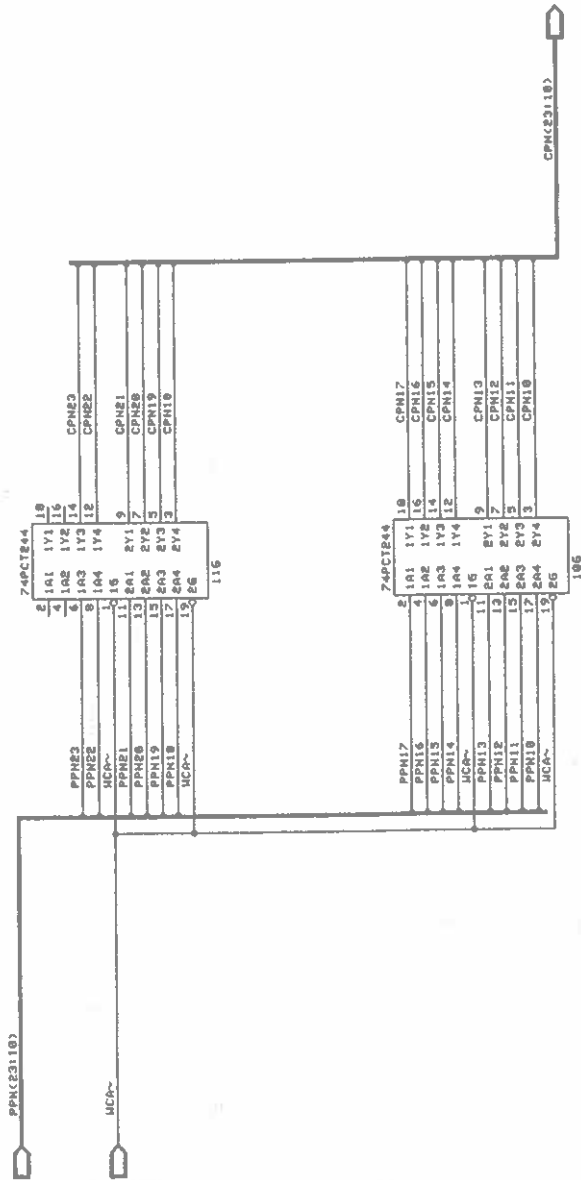
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LA125	19	A114	124	PN10
LA126	18	A115	125	PN09
LA127	17	A116	126	PN08
LA128	16	A117	127	PN07
LA129	15	A118	128	PN06
LA130	14	A119	129	PN05
LA131	13	A120	130	PN04
LA132	12	A121	131	PN03
LA133	11	A122	132	PN02
LA134	10	A123	133	PN01
LA135	9	A124	134	PN00
LA136	8	A125	135	PN99
LA137	7	A126	136	PN98
LA138	6	A127	137	PN97
LA139	5	A128	138	PN96
LA140	4	A129	139	PN95
LA141	3	A130	140	PN94
LA142	2	A131	141	PN93
LA143	1	A132	142	PN92
LA144	23	A133	143	PN91
LA145	22	A134	144	PN90
LA146	19	A135	145	PN89
LA147	18	A136	146	PN88
LA148	17	A137	147	PN87
LA149	16	A138	148	PN86
LA150	15	A139	149	PN85
LA151	14	A140	150	PN84
LA152	13	A141	151	PN83
LA153	12	A142	152	PN82
LA154	11	A143	153	PN81
LA155	10	A144	154	PN80
LA156	9	A145	155	PN79
LA157	8	A146	156	PN78
LA158	7	A147	157	PN77
LA159	6	A148	158	PN76
LA160	5	A149	159	PN75
LA161	4	A150	160	PN74
LA162	3	A151	161	PN73
LA163	2	A152	162	PN72
LA164	1	A153	163	PN71
LA165	23	A154	164	PN70
LA166	22	A155	165	PN69
LA167	19	A156	166	PN68
LA168	18	A157	167	PN67
LA169	17	A158	168	PN66
LA170	16	A159	169	PN65
LA171	15	A160	170	PN64
LA172	14	A161	171	PN63
LA173	13	A162	172	PN62
LA174	12	A163	173	PN61
LA175	11	A164	174	PN60
LA176	10	A165	175	PN59
LA177	9	A166	176	PN58
LA178	8	A167	177	PN57
LA179	7	A168	178	PN56
LA180	6	A169	179	PN55
LA181	5	A170	180	PN54
LA182	4	A171	181	PN53
LA183	3	A172	182	PN52
LA184	2	A173	183	PN51
LA185	1	A174	184	PN50
LA186	23	A175	185	PN49
LA187	22	A176	186	PN48
LA188	19	A177	187	PN47
LA189	18	A178	188	PN46
LA190	17	A179	189	PN45
LA191	16	A180	190	PN44
LA192	15	A181	191	PN43
LA193	14	A182	192	PN42
LA194	13	A183	193	PN41
LA195	12	A184	194	PN40
LA196	11	A185	195	PN39
LA197	10	A186	196	PN38
LA198	9	A187	197	PN37
LA199	8	A188	198	PN36
LA200	7	A189	199	PN35
LA201	6	A190	200	PN34
LA202	5	A191	201	PN33
LA203	4	A192	202	PN32
LA204	3	A193	203	PN31
LA205	2	A194	204	PN30
LA206	1	A195	205	PN29
LA207	23	A196	206	PN28
LA208	22	A197	207	PN27
LA209	19	A198	208	PN26
LA210	18	A199	209	PN25
LA211	17	A200	210	PN24
LA212	16	A201	211	PN23
LA213	15	A202	212	PN22
LA214	14	A203	213	PN21
LA215	13	A204	214	PN20
LA216	12	A205	215	PN19
LA217	11	A206	216	PN18
LA218	10	A207	217	PN17
LA219	9	A208	218	PN16
LA220	8	A209	219	PN15
LA221	7	A210	220	PN14
LA222	6	A211	221	PN13
LA223	5	A212	222	PN12
LA224	4	A213	223	PN11
LA225	3	A214	224	PN10
LA226	2	A215	225	PN09
LA227	1	A216	226	PN08
LA228	23	A217	227	PN07
LA229	22	A218	228	PN06
LA230	19	A219	229	PN05
LA231	18	A220	230	PN04
LA232	17	A221	231	PN03
LA233	16	A222	232	PN02
LA234	15	A223	233	PN01
LA235	14	A224	234	PN00
LA236	13	A225	235	PN99
LA237	12	A226	236	PN98
LA238	11	A227	237	PN97
LA239	10	A228	238	PN96
LA240	9	A229	239	PN95
LA241	8	A230	240	PN94
LA242	7	A231	241	PN93
LA243	6	A232	242	PN92
LA244	5	A233	243	PN91
LA245	4	A234	244	PN90
LA246	3	A235	245	PN89
LA247	2	A236	246	PN88
LA248	1	A237	247	PN87
LA249	23	A238	248	PN86
LA250	22	A239	249	PN85
LA251	19	A240	250	PN84
LA252	18	A241	251	PN83
LA253	17	A242	252	PN82
LA254	16	A243	253	PN81
LA255	15	A244	254	PN80
LA256	14	A245	255	PN79
LA257	13	A246	256	PN78
LA258	12	A247	257	PN77
LA259	11	A248	258	PN76
LA260	10	A249	259	PN75
LA261	9	A250	260	PN74
LA262	8	A251	261	PN73
LA263	7	A252	262	PN72
LA264	6	A253	263	PN71
LA265	5	A254	264	PN70
LA266	4	A255	265	PN69
LA267	3	A256	266	PN68
LA268	2	A257	267	PN67
LA269	1	A258	268	PN66
LA270	23	A259	269	PN65
LA271	22	A260	270	PN64
LA272	19	A261	271	PN63
LA273	18	A262	272	PN62
LA274	17	A263	273	PN61
LA275	16	A264	274	PN60
LA276	15	A265	275	PN59
LA277	14	A266	276	PN58
LA278	13	A267	277	PN57
LA279	12	A268	278	PN56
LA280	11	A269	279	PN55
LA281	10	A270	280	PN54
LA282	9	A271	281	PN53
LA283	8	A272	282	PN52
LA284	7	A273	283	PN51
LA285	6	A274	284	PN50
LA286	5	A275	285	PN49
LA287	4	A276	286	PN48
LA288	3	A277	287	PN47
LA289	2	A278	288	PN46
LA290	1	A279	289	PN45
LA291	23	A280	290	PN44
LA292	22	A281	291	PN43
LA293	19	A282	292	PN42
LA294	18	A283	293	PN41
LA295	17	A284	294	PN40
LA296	16	A285	295	PN39
LA297	15	A286</		

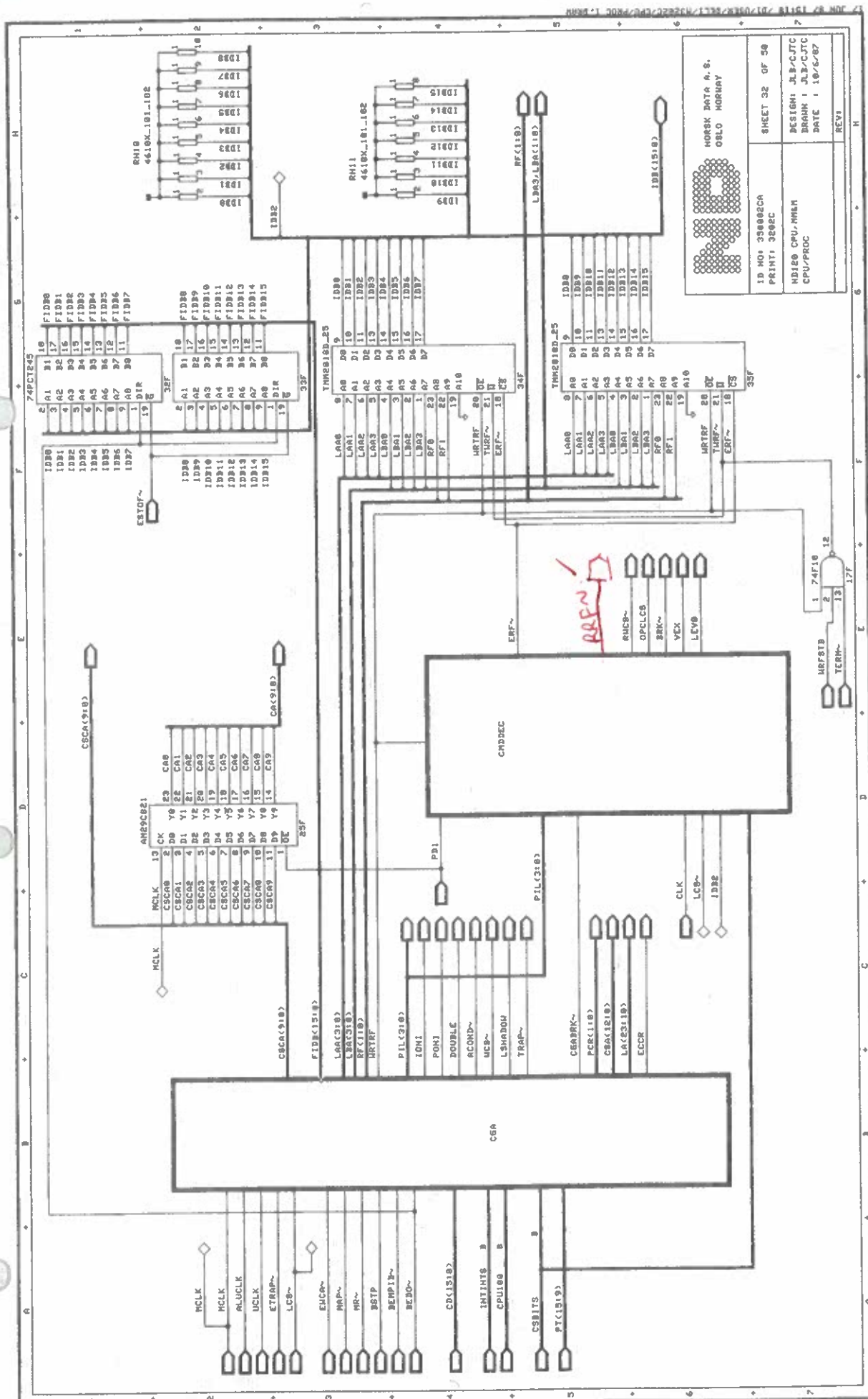


3

		NORSK DATA A.S. OSLO NORWAY	
ID NO: 35882CA PRINT: 2282C	SHEET 31 OF 50		
DESIGN: JLB/CLJC DRAWN: JLB/CLJC DATE: 10/6/87	REV:		

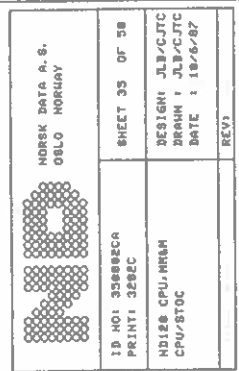


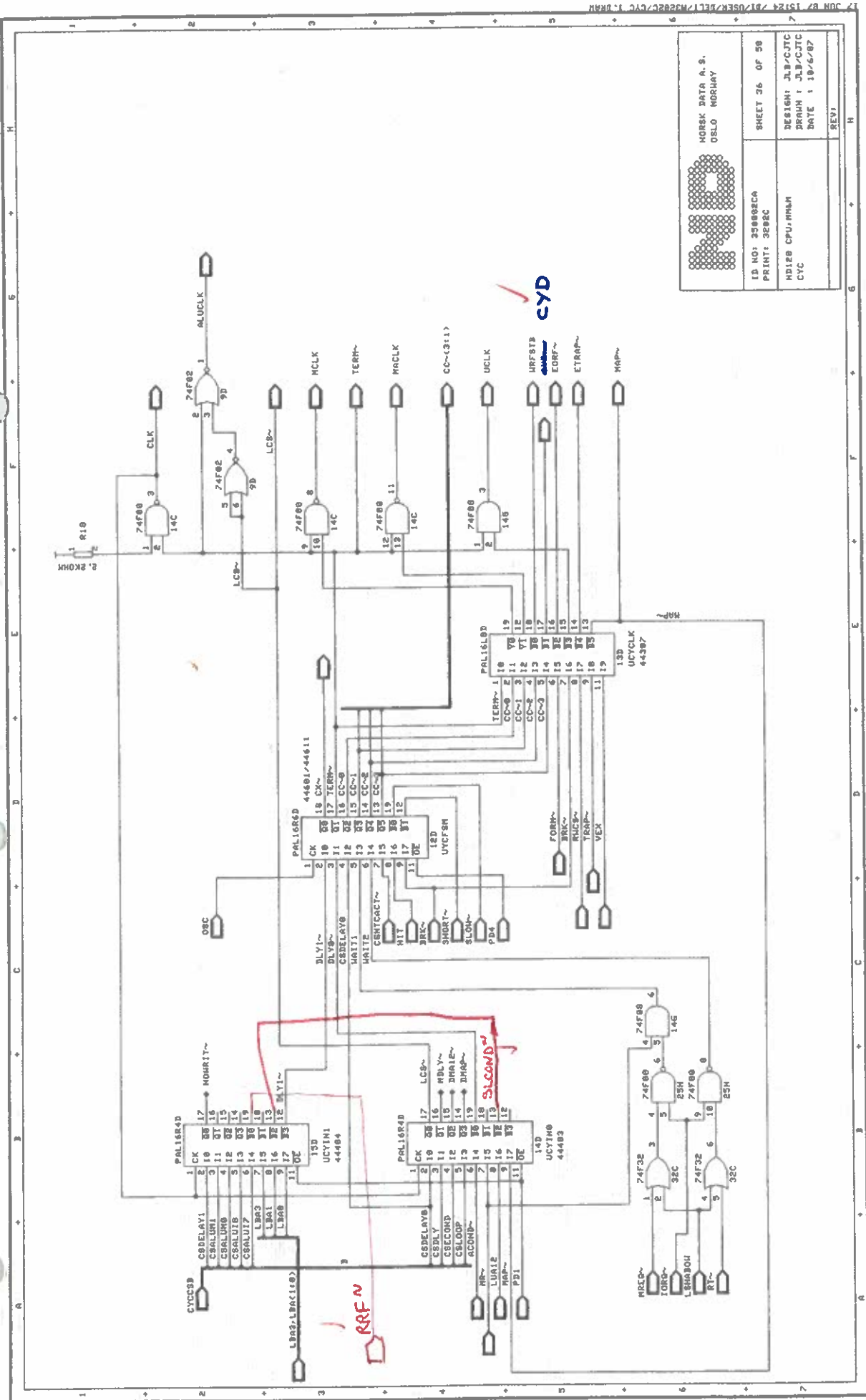
17 JUN 87 13:17 /BI/USER/DEL/1/N282C/CPU/MNU/MCA 1.1.BRM

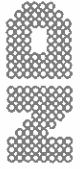




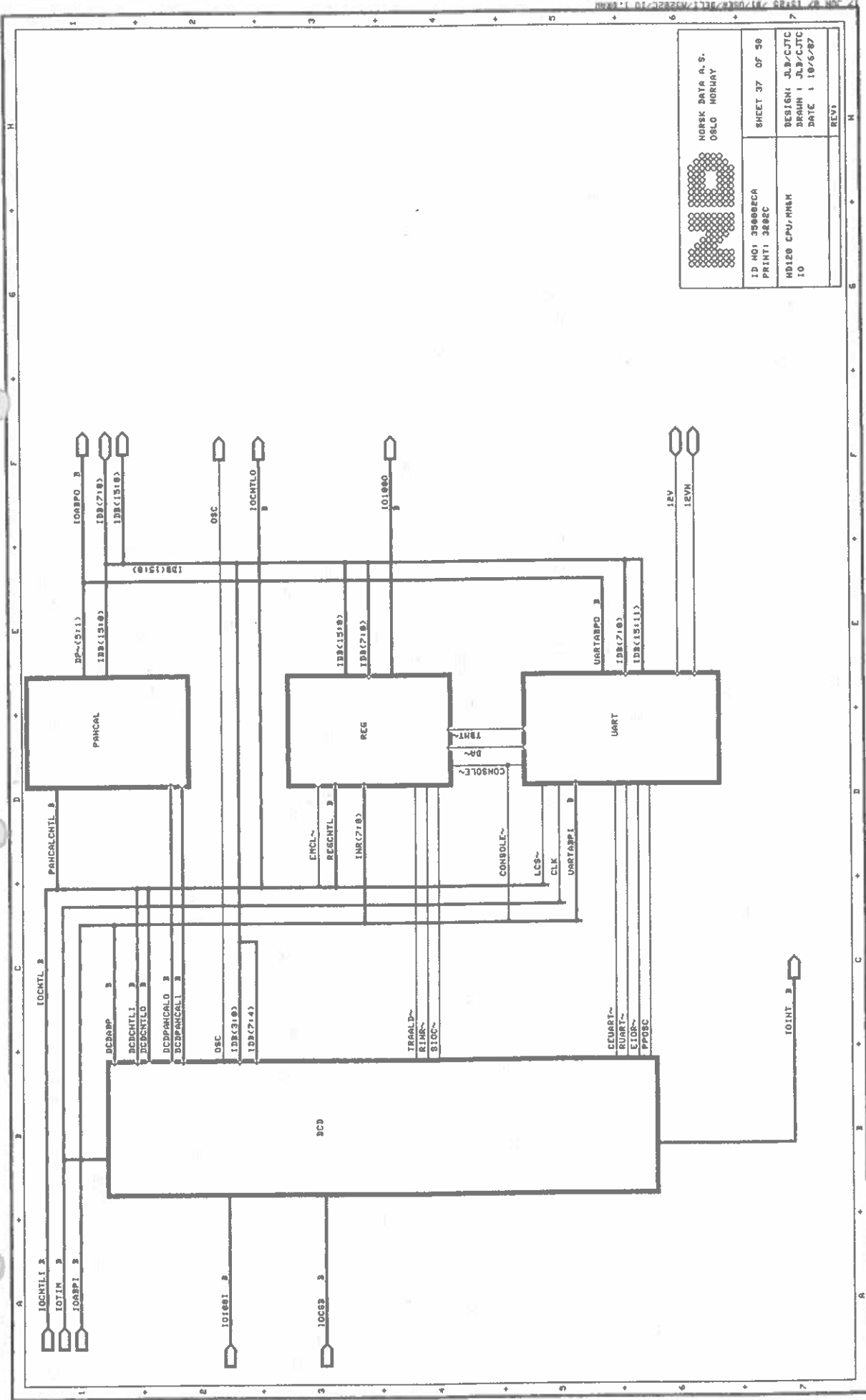
	NORSE DATA A.S. OSLO NORWAY	SHEET 34 OF 50	DESIGN: JLB/JTC DRAWM: JLB/JTC DATE: 10/6/87
ID NO: 35085CA PRINT: 320EC	ND120 CPU, MMX CPU/PROC/CHDEC	REV:	



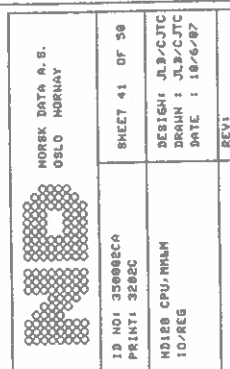


 HORSK DATA A.S. OSLO NORWAY		SHEET 36 OF 50	
ID NO: 258882CA	PRINT: 35282C	DESIGN: JLB/CJC	
MD128 CPU/MNLM	CYC	DATE: 1 10/6/87	
		REV: 1	

17 JUN 87 15:14 / 701/058K/DELTA/M282C/CYC 1.0000



NORSK DATA A. S. OSCO NORWAY	
ID NO: 356882CA PRINT: 3282C	SHEET 37 OF 59
HD120 CPU/MEM 10	DESIGN: JB/CJTC DRAWN: JB/CJTC DATE: 10/6/87
REV:	



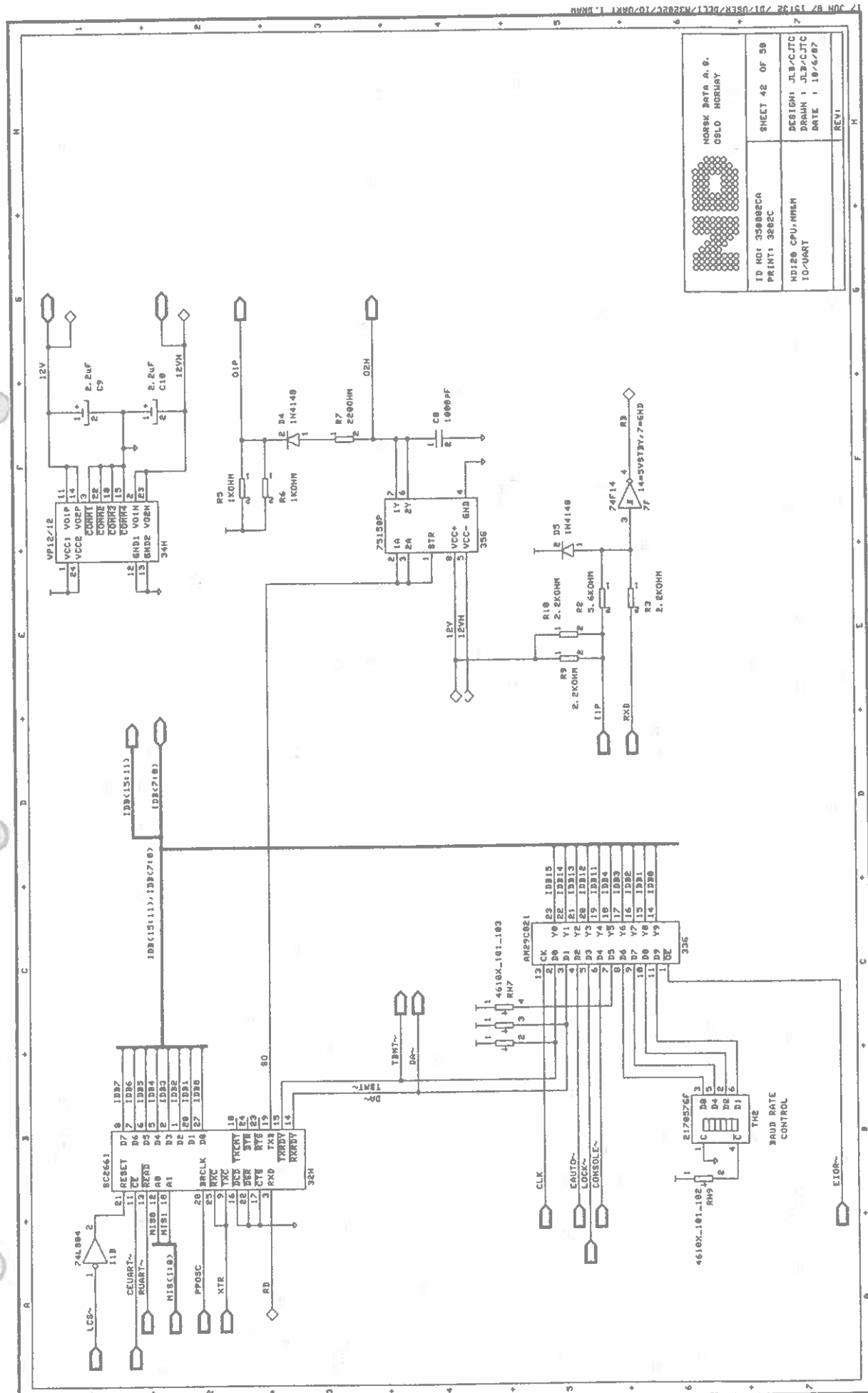
ID NO: 350002CA

SHEET 41 OF 50

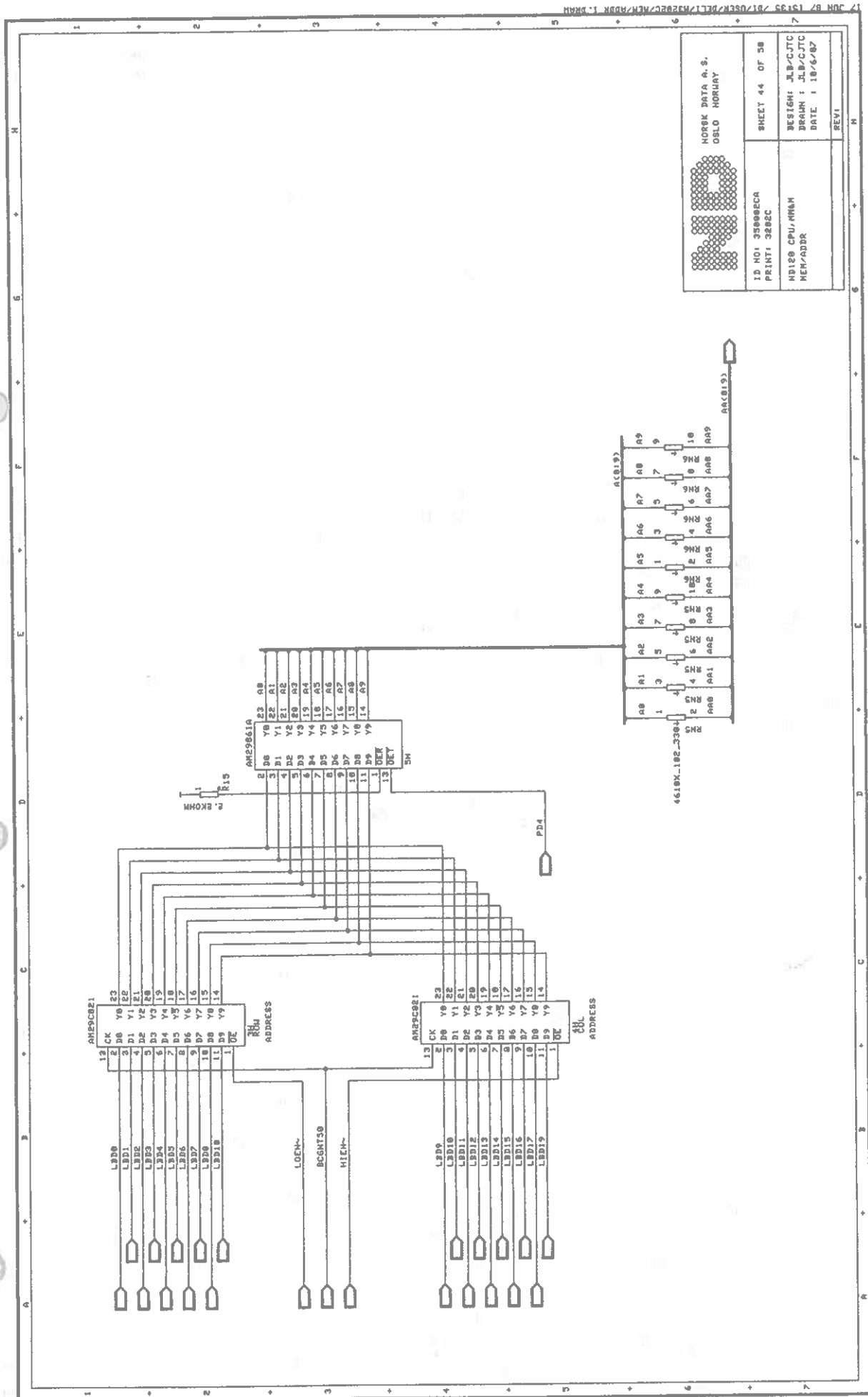
DESIGN: J.D./C.J.T.

DATE : 10/6/07

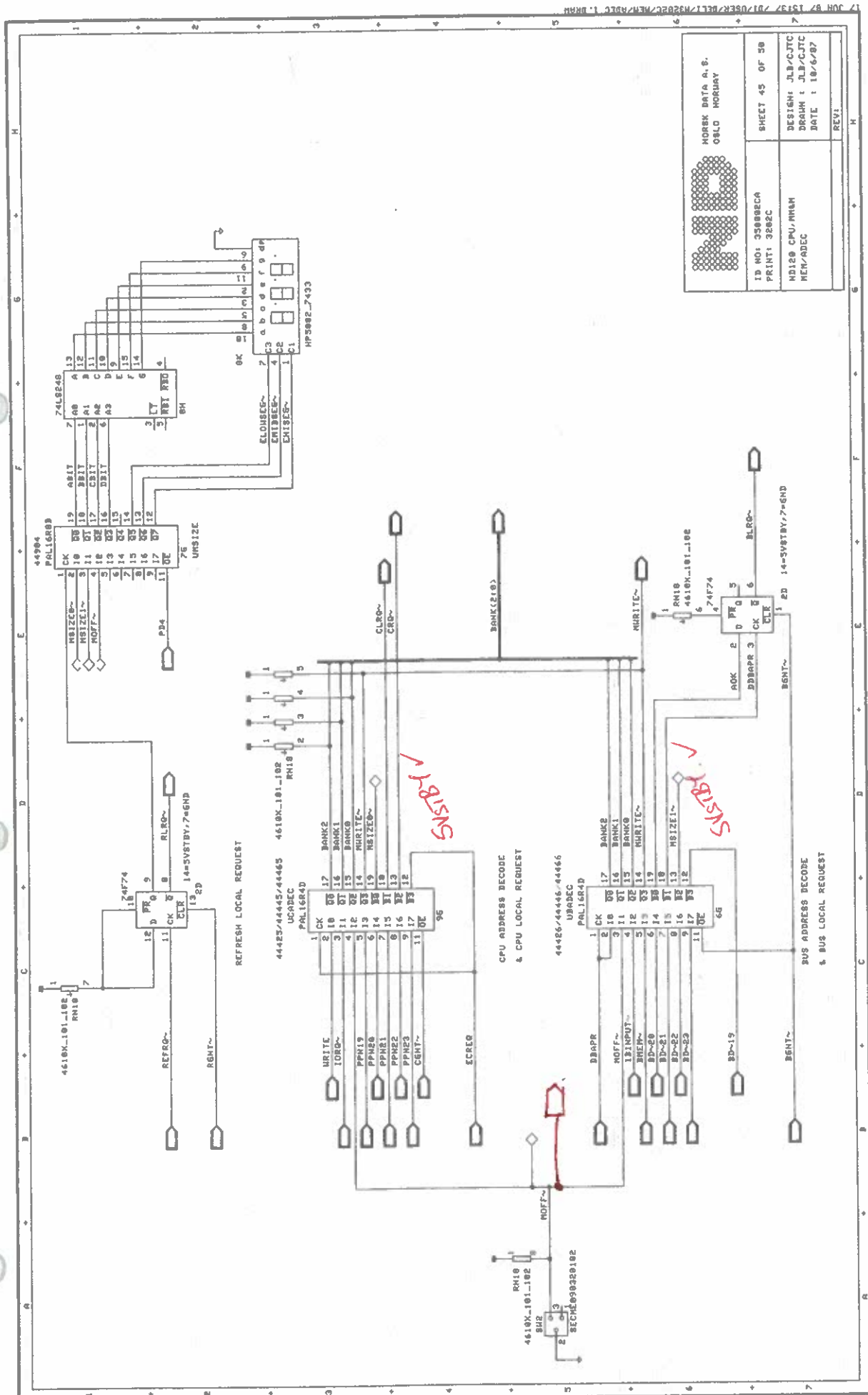
REV:

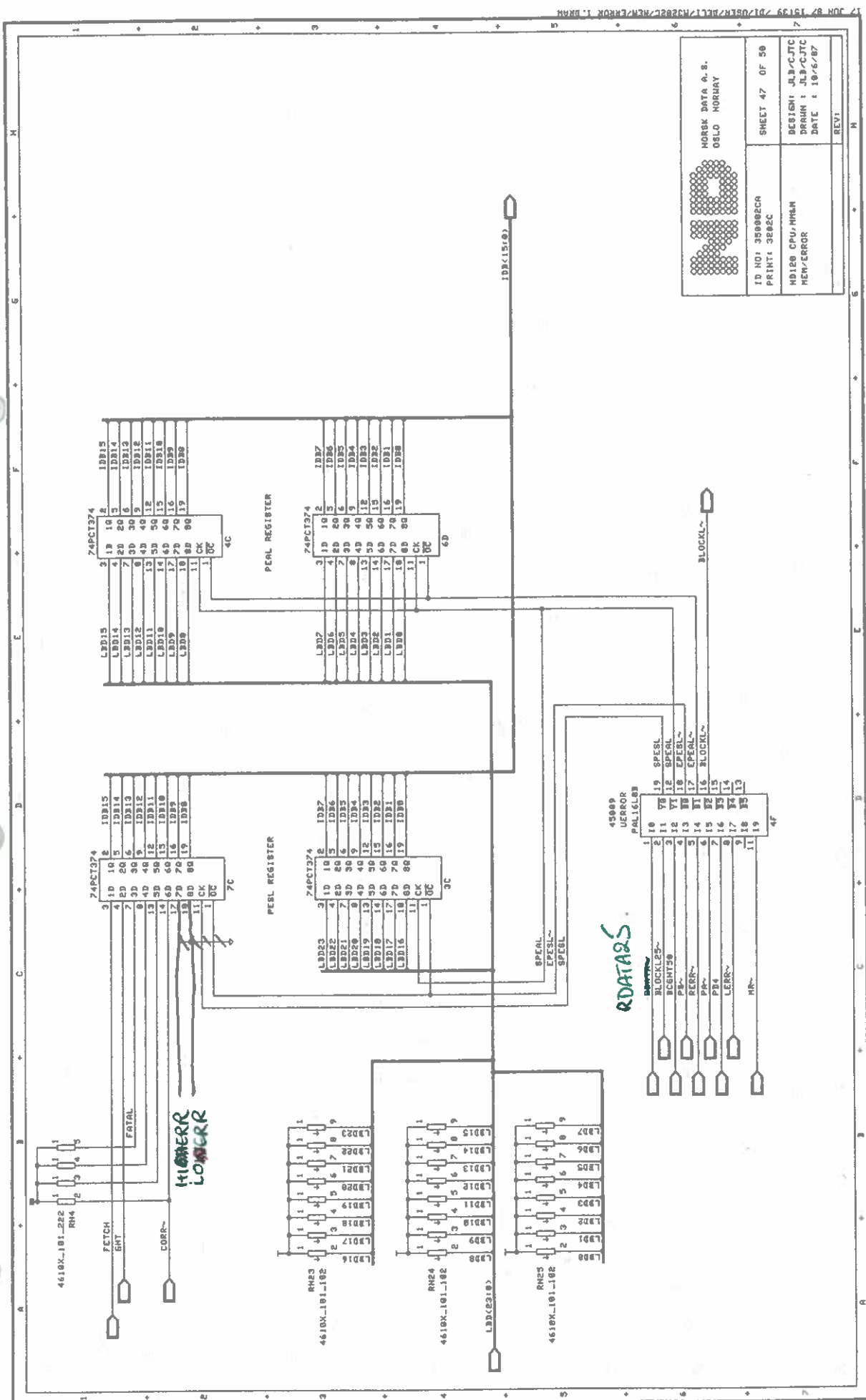


	ID NO: 3380082CA PRINT: 3382C	SHEET 42 OF 59	DESIGNS: JLB/CJTC DRAWN: JLB/CJTC DATE: 10-6-87
	NOISE: CPU/MHLM IO-MART		87M1

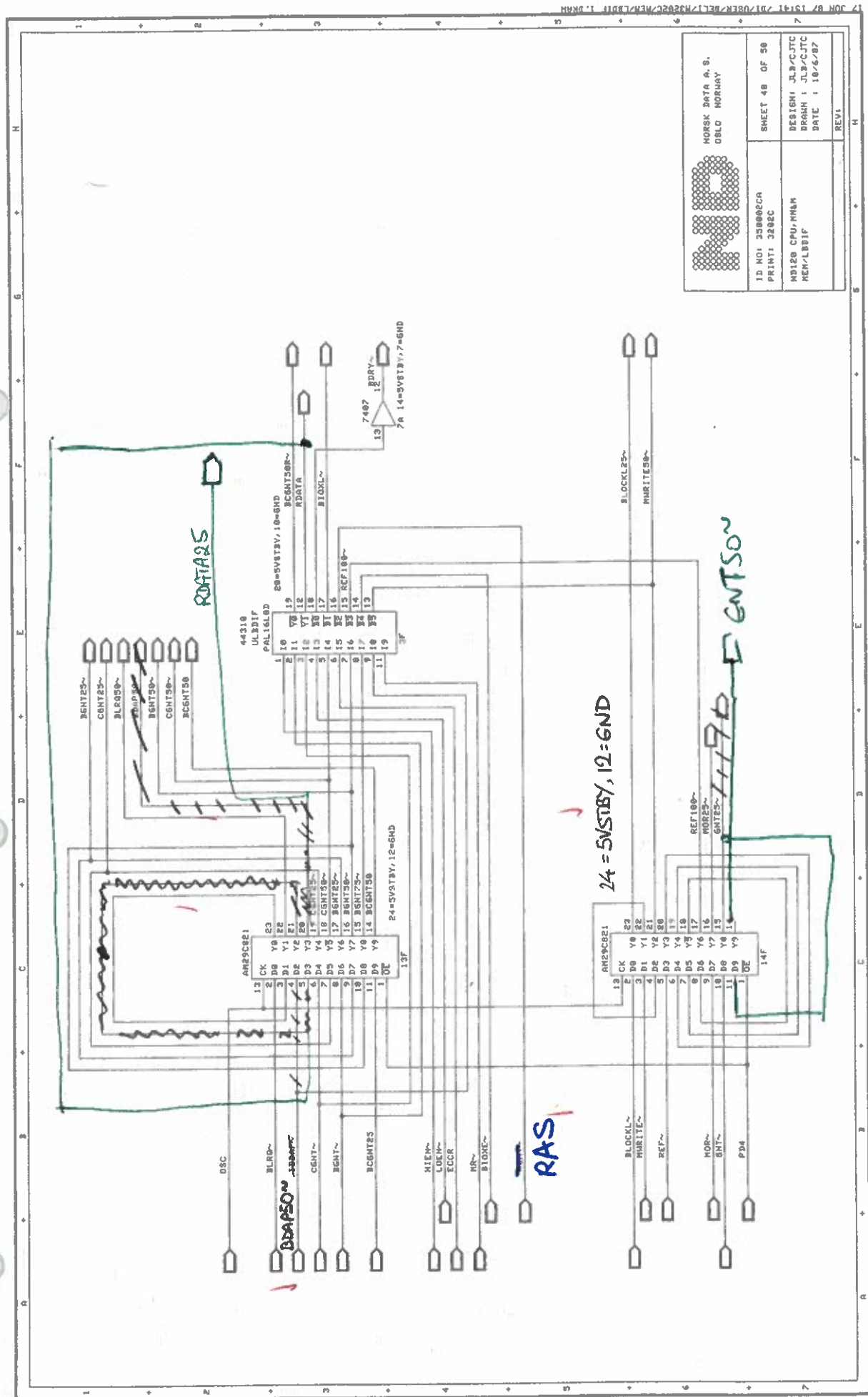


		NORSK DATA A.S. OSLO NORWAY	
ID NO: 35002CA PRINT: 3222C	SHEET 44 OF 58		
ND120 CPU/MEM MEM/ADDR	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 18/6/87		
	REV: 1		

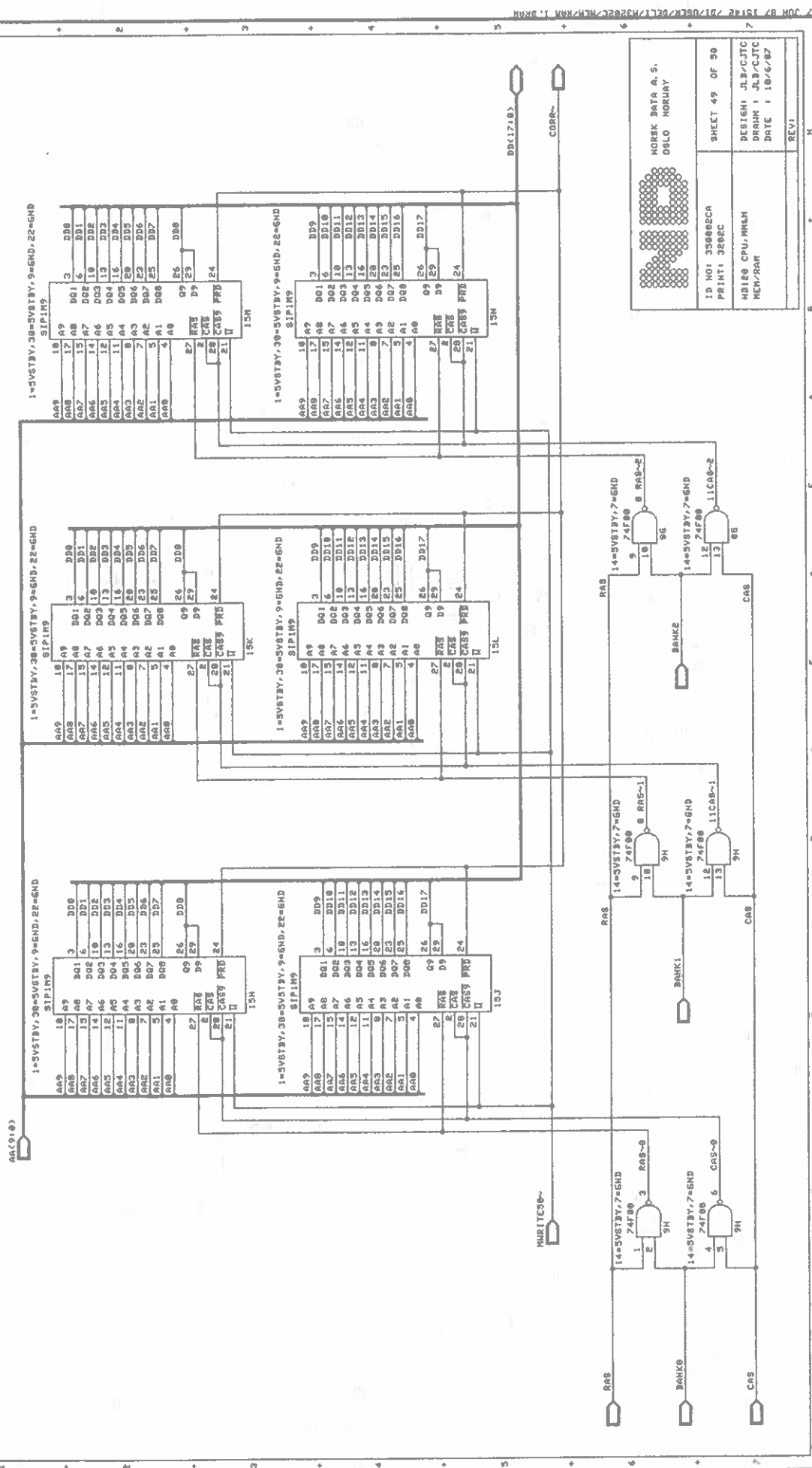




7/20/2011 1:13:39 PM /D:/USER/DELL/M3282C/MEM/ERR001.DRAW



17 JUN 87 15:41 /DI/UBEN/DEL/17/13202C/MEM/LBDIF 1.DRAW



1=5VSTBY, 30=5VSTBY, 9=GND, 22=GND
SIP1N9

1=5VSTBY, 30=5VSTBY, 9=GND, 22=GND
SIP1N9

1=5VSTBY, 30=5VSTBY, 9=GND, 22=GND
SIP1N9

1=5VSTBY, 30=5VSTBY, 9=GND, 22=GND
SIP1N9

1=5VSTBY, 30=5VSTBY, 9=GND, 22=GND
SIP1N9

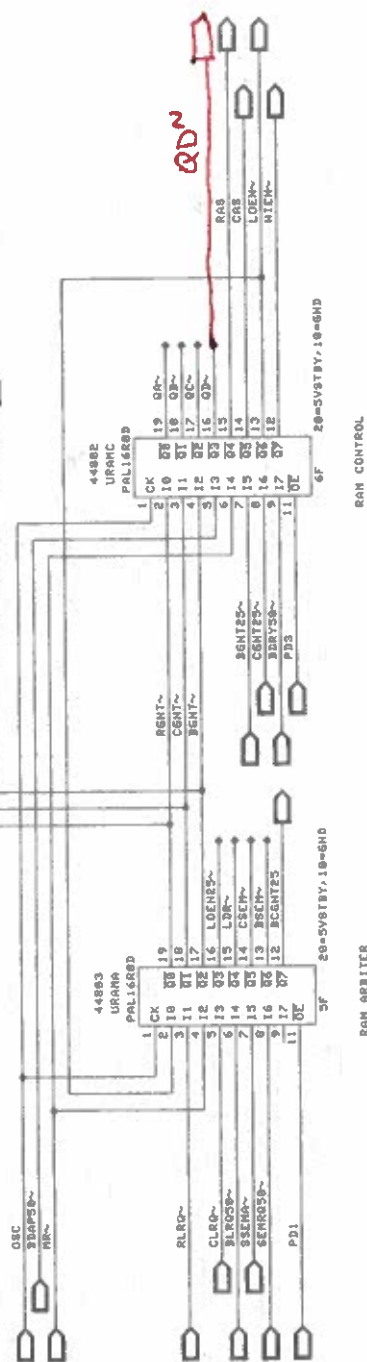
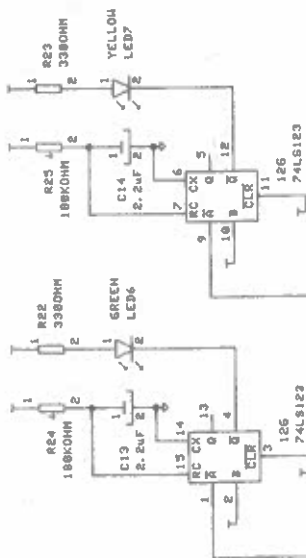
1=5VSTBY, 30=5VSTBY, 9=GND, 22=GND
SIP1N9

NORSK DATA A.S. OSLO NORWAY	
ID NO1 35802CA PRINT: 3580C	SHEET 49 OF 50
MD120 CPU, MM16 MEM/RAM	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 10/6/87
REVI	

17 JUN 87 15:42 / D:\USER\DELTA\H202C\MEM\RAM 1.DRAW

CPU GRANT
INDICATOR

BUS GRANT
INDICATOR



HORSK DATA A.S. OSLO NORWAY	
ID NO: 35002CA PRINT: 3282C	SHEET 30 OF 50
ND128 CPU, MMH NEW/RANC	DESIGN: JLB/CJC DRAWN: JLB/CJC DATE: 10/6/87
	REV:

M3202C
C16 115T

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C SIGLISTE EXTRACTOR VERS. 870225
C
C USER: /D1/USER/DELI/M3202C
C OPTION:4 DATE: 16-JUN-1987 19:09
C REGISTERED 933 DIFFERENT SIGNALS
C 1 ERRORS, 0 WARNINGS DETECTED,
C 3 SIGNALS NOT PROCESSED. TOO MANY ENTRIES
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

END:
ERROR. 3 OVERFLOWS IN SIGNAL CONNECTIONS

PG NO: PAGE: BLK NO: BLOCK:

1	1.DRAW	1	-
2	2.DRAW	1	-
3	3.DRAW	1	-
4	4.DRAW	1	-
5	1.DRAW	2	-/BIF
6	1.DRAW	3	-/BIF/BCTL
7	1.DRAW	4	-/BIF/BCTL/BDRV
8	1.DRAW	5	-/BIF/BCTL/SYNC
9	1.DRAW	6	-/BIF/DPATH
10	1.DRAW	7	-/BIF/DPATH/BDLBD
11	1.DRAW	8	-/BIF/DPATH/CDLBD
12	1.DRAW	9	-/BIF/DPATH/LBDCTL
13	1.DRAW	10	-/BIF/DPATH/PESPEA
14	1.DRAW	11	-/BIF/DPATH/PPNLBD
15	1.DRAW	12	-/CPU
16	1.DRAW	13	-/CPU/CS
17	1.DRAW	14	-/CPU/CS/ACAL
18	1.DRAW	15	-/CPU/CS/CTL
19	1.DRAW	16	-/CPU/CS/PROM
20	1.DRAW	17	-/CPU/CS/TCV
21	1.DRAW	18	-/CPU/CS/WCS
22	2.DRAW	18	-/CPU/CS/WCS
23	1.DRAW	19	-/CPU/LAPA
24	1.DRAW	20	-/CPU/MMU
25	1.DRAW	21	-/CPU/MMU/CACHE
26	1.DRAW	22	-/CPU/MMU/CSR
27	1.DRAW	23	-/CPU/MMU/HIT
28	1.DRAW	24	-/CPU/MMU/PPNX
29	1.DRAW	25	-/CPU/MMU/PT
30	1.DRAW	26	-/CPU/MMU/PTIDB
31	1.DRAW	27	-/CPU/MMU/WCA
32	1.DRAW	28	-/CPU/PROC
33	1.DRAW	29	-/CPU/PROC/CGA
34	1.DRAW	30	-/CPU/PROC/CMDDEC
35	1.DRAW	31	-/CPU/STOC
36	1.DRAW	32	-/CYC
37	1.DRAW	33	-/IO
38	1.DRAW	34	-/IO/DCD
39	1.DRAW	35	-/IO/DCD/DGA
40	1.DRAW	36	-/IO/PANCAL
41	1.DRAW	37	-/IO/REG
42	1.DRAW	38	-/IO/UART
43	1.DRAW	39	-/MEM
44	1.DRAW	40	-/MEM/ADDR
45	1.DRAW	41	-/MEM/ADEC
46	1.DRAW	42	-/MEM/DATA
47	1.DRAW	43	-/MEM/ERROR
48	1.DRAW	44	-/MEM/LBDIF
49	1.DRAW	45	-/MEM/RAM
50	1.DRAW	46	-/MEM/RAMC

C ***** SIGNAL NAME INFO *****

SIGNAL # 's
SIGTYPE DIRECT: PAGE+QUADR/COMP-PIN/TYPE

12V	13	B:2F1/A-C31!! B:2F2/RN2-1/4610X 101 102! B:2F2/RN2-1/4610X 101 102! B:2F2/RN2-1/4610X 101 102! B:2G2/RN2-1/4610X 101 102! B:2G2/RN2-1/4610X 101 102! B:2G2/RN2-1/4610X 101 102! O:42E2/34H-11/VP12/12! B:42F1/C9-1/2.2uF I:42E4/35G-8/75150P B:42E5/R9-1/2.2KOHM! B:42E5/R10-1/2.2KOHM!
12VN	5	O:2D5/A-A8!! O:42E2/34H-2/VP12/12! O:42E2/34H-23/VP12/12! B:42F2/C10-2/2.2uF! I:42E4/35G-5/75150P

SVSTBY	70	\$\$\$OVERFLOW\$\$\$ B:2E2/RN1-1/4610X 101 102! B:2E2/RN1-1/4610X 101 102! B:2E2/RN1-1/4610X 101 102! B:2E2/RN1-1/4610X 101 102! B:2D2/RN1-1/4610X 101 102! B:2D2/RN1-1/4610X 101 102! I:2A5/R8-1/1KOHM B:2B1/A-C24!! I:3A7/R4-1/1KOHM
+		
		B:4G2/C-A30!! B:4G2/C-B30!! B:4G2/C-C30!! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H2/RN10-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:32H4/RN11-1/4610X 101 102! B:38A3/D1-2/3.3V ZENER! I:39A4/RN17-1/4610X 101 103 I:39A4/RN17-1/4610X 101 103 I:39A4/RN17-1/4610X 101 103 I:39A4/RN17-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39A1/RN15-1/4610X 101 103 I:39B1/RN15-1/4610X 101 103 I:39C7/34D-L7/ND_DELDGA I:39C7/34D-C7/ND_DELDGA
+		
		I:39A3/RN16-1/4610X 101 103 I:39A3/RN16-1/4610X 101 103 I:39A3/RN16-1/4610X 101 103 I:39A3/RN16-1/4610X 101 103
A0	#44 2	I:44D6/RN5-1/4610X 102 330 B:44D4/5H-23/AM29861A!
A1	#44 2	I:44E6/RN5-3/4610X 102 330 B:44D4/5H-22/AM29861A!
A2	#44 2	I:44E6/RN5-5/4610X 102 330 B:44D4/5H-21/AM29861A!
A3	#44 2	I:44E6/RN5-7/4610X 102 330 B:44D4/5H-20/AM29861A!
A4	#44 2	I:44E6/RN5-9/4610X 102 330 B:44D4/5H-19/AM29861A!
A5	#44 2	I:44E6/RN6-1/4610X 102 330 B:44D4/5H-18/AM29861A!
A6	#44 2	I:44E6/RN6-3/4610X 102 330 B:44D4/5H-17/AM29861A!
A7	#44 2	I:44F6/RN6-5/4610X 102 330 B:44D4/5H-16/AM29861A!
A8	#44 2	I:44F6/RN6-7/4610X 102 330 B:44D4/5H-15/AM29861A!
A9	#44 2	I:44F6/RN6-9/4610X 102 330 B:44D4/5H-14/AM29861A!
AA0	7	O:44D6/RN5-2/4610X 102 330! I:49C3/15H-4/SIP1M9 I:49C5/15J-4/SIP1M9 I:49E3/15K-4/SIP1M9 I:49E5/15L-4/SIP1M9 I:49G5/15N-4/SIP1M9 I:49G3/15M-4/SIP1M9
AA1	7	O:44E6/RN5-4/4610X 102 330! I:49C3/15H-5/SIP1M9 I:49C5/15J-5/SIP1M9 I:49E3/15K-5/SIP1M9 I:49E5/15L-5/SIP1M9 I:49G5/15N-5/SIP1M9 I:49G3/15M-5/SIP1M9
AA2	7	O:44E6/RN5-6/4610X 102 330! I:49C3/15H-7/SIP1M9 I:49C5/15J-7/SIP1M9 I:49E3/15K-7/SIP1M9 I:49E5/15L-7/SIP1M9 I:49G5/15N-7/SIP1M9 I:49G3/15M-7/SIP1M9
AA3	7	O:44E6/RN5-8/4610X 102 330! I:49C3/15H-8/SIP1M9 I:49C5/15J-8/SIP1M9 I:49E3/15K-8/SIP1M9 I:49E5/15L-8/SIP1M9 I:49G5/15N-8/SIP1M9 I:49G3/15M-8/SIP1M9
AA4	7	O:44E6/RN5-10/4610X 102 330! I:49C3/15H-11/SIP1M9 I:49C5/15J-11/SIP1M9 I:49E3/15K-11/SIP1M9 I:49E5/15L-11/SIP1M9 I:49G5/15N-11/SIP1M9 I:49G3/15M-11/SIP1M9
AA5	7	O:44E6/RN6-2/4610X 102 330! I:49C3/15H-12/SIP1M9 I:49C5/15J-12/SIP1M9 I:49E3/15K-12/SIP1M9 I:49E5/15L-12/SIP1M9 I:49G5/15N-12/SIP1M9 I:49G3/15M-12/SIP1M9
AA6	7	O:44E6/RN6-4/4610X 102 330! I:49C3/15H-14/SIP1M9 I:49C5/15J-14/SIP1M9 I:49E3/15K-14/SIP1M9 I:49E5/15L-14/SIP1M9 I:49G5/15N-14/SIP1M9 I:49G3/15M-14/SIP1M9
AA7	7	O:44F6/RN6-6/4610X 102 330! I:49C3/15H-15/SIP1M9 I:49C5/15J-15/SIP1M9 I:49E3/15K-15/SIP1M9 I:49E5/15L-15/SIP1M9 I:49G5/15N-15/SIP1M9 I:49G3/15M-15/SIP1M9
AA8	7	O:44F6/RN6-8/4610X 102 330! I:49C3/15H-17/SIP1M9 I:49C5/15J-17/SIP1M9 I:49E3/15K-17/SIP1M9 I:49E5/15L-17/SIP1M9 I:49G5/15N-17/SIP1M9 I:49G3/15M-17/SIP1M9
AA9	7	O:44F6/RN6-10/4610X 102 330! I:49C3/15H-18/SIP1M9 I:49C5/15J-18/SIP1M9 I:49E3/15K-18/SIP1M9 I:49E5/15L-18/SIP1M9 I:49G5/15N-18/SIP1M9 I:49G3/15M-18/SIP1M9
ABIT	#45 2	T:45E2/7G-19/PAL16R8B! I:45F2/8H-7/74LS248
ACOND~	2	O:33B7/28F-J2/ND DELILAH! I:36B5/14D-6/PAL16R4D
ACT~	#6 1	T:6D2/10D-18/PAL16R8D!
ALUCLK	3	I:33B7/28F-B9/ND DELILAH I:33A5/7F-5/74F14 O:36F2/9D-1/74F02!
AOK	#45 2	B:45C6/6G-19/PAL16R4D! I:45E7/2D-2/74F74
APR~	2	B:6D4/5D-19/PAL16R4D! I:7D7/7A-11/7407
BACT~	#12 2	I:12E4/2C-11/PAL16L8D B:12D6/1C-18/PAL16L8D!
BANK0	5	T:45C6/6G-15/PAL16R4D! T:45C4/9G-15/PAL16R4D! O:45E3/RN18-4/4610X 101 102! I:49B6/9H-2/74F00 I:49B7/9H-4/74F00
BANK1	5	T:45C6/6G-16/PAL16R4D! T:45C4/9G-16/PAL16R4D! O:45D3/RN18-3/4610X 101 102! I:49D6/9H-10/74F00 I:49D7/9H-12/74F00
BANK2	5	T:45C6/6G-17/PAL16R4D! T:45C4/9G-17/PAL16R4D! O:45D3/RN18-2/4610X 101 102! I:49F6/8G-10/74F00 I:49F7/8G-12/74F00
BAPR~	3	I:4C6/5C-17/74F244 B:4A6/C-A20!! O:7D7/7A-10/7407!
BBIT	#45 2	T:45E2/7G-18/PAL16R8B! I:45F2/8H-1/74LS248
BCGNT25	2	I:48C4/13F-11/AM29C821 T:50B6/5F-12/PAL16R8D!
BCGNT50	4	I:44B5/4H-13/AM29C821 I:44B2/3H-13/AM29C821 I:44D7/4F-3/PAL16L8B O:48C4/13F-14/AM29C821!
BCGNT50R~	2	I:46C5/2F-9/PAL16L8B O:48E4/3F-19/PAL16L8D!

BDAP25~	#8	2	0:8C3/3D-15/AM29C821! I:8E3/4D-10/AM29C821
BDAP50~		4	0:8E3/4D-15/AM29C821! I:12D6/1C-5/PAL16L8D 0:48C4/13F-20/AM29C821! I:50E6/6F-5/PAL16R8D
BDAP~		3	I:4C6/5C-13/74F244 B:4A6/C-C18!! O:7D4/2A-3/7438!
BDRY25~		5	I:6D2/10D-7/PAL16R8D I:7D3/2B-1/74F00 O:8C3/3D-18/AM29C821! I:8E3/4D-7/AM29C821 I:12D2/11D-4/PAL16L8D
BDRY50~		9	I:6D6/8D-1/PAL16L8B I:6D4/5D-5/PAL16R4D I:7D3/2B-2/74F00 I:7D4/2A-2/7438 I:8E3/4D-8/AM29C821 O:8E3/4D-18/AM29C821!
+			
BDRY75~		2	I:12D2/11D-5/PAL16L8D I:39C7/34D-B11/ND DELDGA I:50E6/6F-9/PAL16R8D
BDRY~		4	I:6D6/8D-2/PAL16L8B O:8E3/4D-17/AM29C821! I:4C6/5C-15/74F244 B:4A6/C-A19!! T:7D2/3A-3/74F241! O:48F4/7A-12/7407!
BD~0		3	B:4A5/C-C3!! B:10D6/6A-11/74AS648! I:13E5/8A-18/74ALS534
BD~1		3	B:4A5/C-A3!! B:10D6/6A-10/74AS648! I:13E5/8A-17/74ALS534
BD~10		3	B:4A3/C-C8!! B:10D4/5A-9/74AS648! I:13E3/9A-14/74ALS534
BD~11		3	B:4A3/C-A8!! B:10D4/5A-8/74AS648! I:13E3/9A-13/74ALS534
BD~12		3	B:4A3/C-C9!! B:10D4/5A-7/74AS648! I:13E3/9A-8/74ALS534
BD~13		3	B:4A3/C-A9!! B:10D4/5A-6/74AS648! I:13E3/9A-7/74ALS534
BD~14		3	B:4A2/C-C10!! B:10D4/5A-5/74AS648! I:13E3/9A-4/74ALS534
BD~15		3	B:4A2/C-A10!! B:10D4/5A-4/74AS648! I:13E3/9A-3/74ALS534
BD~16		4	B:4A2/C-B3!! B:10D2/4A-11/74AS648! I:13C5/10A-18/74ALS534 I:13C3/12A-18/74ALS534
BD~17		4	B:4A2/C-B4!! B:10D2/4A-10/74AS648! I:13C5/10A-17/74ALS534 I:13C3/12A-17/74ALS534
BD~18		4	B:4A2/C-B5!! B:10D2/4A-9/74AS648! I:13C5/10A-14/74ALS534 I:13C3/12A-14/74ALS534
BD~19		5	B:4A2/C-B6!! B:10D2/4A-8/74AS648! I:13C5/10A-13/74ALS534 I:13C3/12A-13/74ALS534 B:45C6/6G-12/PAL16R4D!
BD~2		3	B:4A5/C-C4!! B:10D6/6A-9/74AS648! I:13E5/8A-14/74ALS534
BD~20		5	B:4A1/C-B7!! B:10D2/4A-7/74AS648! I:13C5/10A-8/74ALS534 I:13C3/12A-8/74ALS534 I:45C6/6G-6/PAL16R4D
BD~21		5	B:4A1/C-B8!! B:10D2/4A-6/74AS648! I:13C5/10A-7/74ALS534 I:13C3/12A-7/74ALS534 I:45C6/6G-7/PAL16R4D
BD~22		4	B:4A1/C-B9!! B:10D2/4A-5/74AS648! I:13C5/10A-4/74ALS534 I:45C6/6G-8/PAL16R4D
BD~23		4	B:4A1/C-B10!! B:10D2/4A-4/74AS648! I:13C5/10A-3/74ALS534 I:45C6/6G-9/PAL16R4D
BD~3		3	B:4A5/C-A4!! B:10D6/6A-8/74AS648! I:13E5/8A-13/74ALS534
BD~4		3	B:4A4/C-C5!! B:10D6/6A-7/74AS648! I:13E5/8A-8/74ALS534
BD~5		3	B:4A4/C-A5!! B:10D6/6A-6/74AS648! I:13E5/8A-7/74ALS534
BD~6		3	B:4A4/C-C6!! B:10D6/6A-5/74AS648! I:13E5/8A-4/74ALS534
BD~7		3	B:4A4/C-A6!! B:10D6/6A-4/74AS648! I:13E5/8A-3/74ALS534
BD~8		3	B:4A4/C-C7!! B:10D4/5A-11/74AS648! I:13E3/9A-18/74ALS534
BD~9		3	B:4A3/C-A7!! B:10D4/5A-10/74AS648! I:13E3/9A-17/74ALS534
BEDO~		4	O:26D4/27H-14/74PCT244! I:32F2/32F-1/74PCT245 I:32F3/33F-1/74PCT245 I:33B7/28F-B10/ND DELILAH
BEMPID~		2	O:26D4/27H-16/74PCT244! I:33B7/28F-R11/ND DELILAH
BERROR~		3	I:4F4/C-B21! I:7D2/3A-17/74F241 T:7D2/3A-5/74F241!
BGNT25~		3	I:48C4/13F-9/AM29C821 O:48C4/13F-17/AM29C821! I:50E6/6F-7/PAL16R8D
BGNT50~		4	I:12D6/1C-3/PAL16L8D I:48E4/3F-7/PAL16L8D I:48C4/13F-10/AM29C821 O:48C4/13F-16/AM29C821!
BGNT75~	#48	2	I:48E4/3F-8/PAL16L8D O:48C4/13F-15/AM29C821!
BGNTCACT~		4	I:10D6/6A-22/74AS648 I:10D4/5A-22/74AS648 I:10D2/4A-22/74AS648 O:12D2/11D-19/PAL16L8D!
BGNT~		13	I:3A4/16A-6/74LS244 I:10D6/6A-23/74AS648 I:10D4/5A-23/74AS648 I:10D2/4A-23/74AS648 I:12D2/11D-11/PAL16L8D I:12D6/1C-2/PAL16L8D I:45C6/6G-11/PAL16R4D I:45E7/2D-1/74F74 I:48E4/3F-2/PAL16L8D I:48C4/13F-8/AM29C821 T:50B6/5F-17/PAL16R8D! I:50E6/6F-4/PAL16R8D I:50E3/12G-9/74LS123
BINACK~		2	I:4F4/C-B19! T:7D2/3A-14/74F241!
BINPUT25~	#8	2	O:8C3/3D-20/AM29C821! I:8E3/4D-5/AM29C821
BINPUT50~		3	I:8E3/4D-11/AM29C821 O:8E3/4D-20/AM29C821! I:12E4/2C-4/PAL16L8D
BINPUT75~		2	I:7D2/3A-6/74F241 O:8E3/4D-14/AM29C821!
BINPUT~		3	I:4C6/5C-6/74F244 B:4A6/C-A18!! O:7D6/7A-6/7407!
BINT~10		4	B:4D1/RN3-9/4610X 101 102! I:4C6/5C-2/74F244 O:4C3/C-A15!! O:41F5714A-8/74LS38!
BINT~11		3	B:4D1/RN3-8/4610X 101 102! I:4E3/33C-17/74F244 O:4C3/C-C15!!
BINT~12		4	B:4D1/RN3-7/4610X 101 102! I:4E3/33C-15/74F244 O:4C3/C-A16!! O:41F4714A-3/74LS38!
BINT~13		4	B:4D1/RN3-6/4610X 101 102! I:4E3/33C-13/74F244

BINT~15	3	O:4C3/C-C16!! O:41F5/14A-6/74LS38! B:4D1/RN3-5/4610X_101_102! I:4E3/33C-11/74F244 O:4C3/C-C17!!
BIOXE~	3	I:4F5/C-C19! T:7D2/3A-16/74F241! B:48E4/3F-14/PAL16L8D!
BIOXL~	2	I:46C5/2F-7/PAL16L8B B:48E4/3F-17/PAL16L8D!
BLCS~	5	I:19C6/26B-20/27256 I:19C6/26B-22/27256 I:19C4/23B-20/27256 I:19C4/23B-22/27256 O:26D4/27H-12/74PCT244!
BLOCK25~	2	I:6D6/8D-3/PAL16L8B O:8C3/3D-14/AM29C821!
BLOCKL25~	2	I:47D7/4F-2/PAL16L8B O:48C7/14F-23/AM29C821!
BLOCKL~	2	B:47D7/4F-16/PAL16L8B! I:48C7/14F-2/AM29C821
BLOCK~	2	B:6D6/8D-18/PAL16L8B! I:8C3/3D-11/AM29C821
BLRQ50~	2	O:48C4/13F-22/AM29C821! I:50B6/5F-6/PAL16R8D
BLRQ~	2	O:45E7/2D-6/74F74! I:48C4/13F-2/AM29C821
BMCL~	2	O:4F6/35A-2/7406! I:4F6/C-B20/
BMEM~	3	I:4F5/C-C20/ O:7D4/2A-6/7438! I:45C6/6G-5/PAL16R4D
BMINH~	2	O:4F7/7A-4/7407! I:4F7/C-B23/
BPERR25~	#8 2	O:8C3/3D-19/AM29C821! I:8E3/4D-6/AM29C821
BPERR50~	2	I:6D6/8D-4/PAL16L8B O:8E3/4D-19/AM29C821!
BPERR~	2	I:4C6/5C-8/74F244 O:4A6/C-B18!!
BREF~	2	I:4F4/C-A12/ O:7D6/7A-8/7407!
BREQ25~	#8 2	O:8C3/3D-16/AM29C821! I:8E3/4D-9/AM29C821
BREQ50~	2	I:6D2/10D-5/PAL16R8D O:8E3/4D-16/AM29C821!
BREQ~	2	I:4E3/33C-4/74F244 O:4C2/C-C12!!
BRK~	7	I:18B2/15F-9/PAL16L8D I:25E6/17F-9/74F10 O:34E3/29H-8/74F32! I:36E5/13D-7/PAL16L8D I:36D4/12D-9/PAL16R6D I:39C7/34D-F2/ND DELDGA O:39A4/RN17-2/4610X_101_103! T:50B6/5F-13/PAL16R8D!
BSEM~	#50 1	O:26D4/27H-18/74PCT244! I:33B7/28F-R6/ND DELILAH
BSTP	2	I:3F4/15C-17/74LS244 I:14D6/6C-18/74PCT374
CA0	9	I:24A2/21G-1/PAL16L8D I:25D6/24F-8/TMM2018D_25 I:25B6/20F-8/TMM2018D_25 I:25B3/16F-8/TMM2018D_25 I:25G3/21F-21/AM9150_20 I:25D3/23F-8/TMM2018D_25 O:32D3/25F-23/AM29C821!
CA1	8	I:3F4/15C-15/74LS244 I:14D6/6C-17/74PCT374 I:25D6/24F-7/TMM2018D_25 I:25B6/20F-7/TMM2018D_25 I:25B3/16F-7/TMM2018D_25
CA10	5	I:25G3/21F-22/AM9150_20 I:25D3/23F-7/TMM2018D_25 O:32D3/25F-22/AM29C821! I:25D6/24F-19/TMM2018D_25 I:25B6/20F-19/TMM2018D_25 I:25B3/16F-19/TMM2018D_25 I:25D3/23F-19/TMM2018D_25 O:39C7/34D-G2/ND DELDGA
CA2	8	I:3F4/15C-13/74LS244 I:14D6/6C-14/74PCT374 I:25D6/24F-6/TMM2018D_25 I:25B6/20F-6/TMM2018D_25 I:25B3/16F-6/TMM2018D_25
CA3	8	I:25G3/21F-23/AM9150_20 I:25D3/23F-6/TMM2018D_25 O:32D3/25F-21/AM29C821! I:3F4/15C-11/74LS244 I:14D6/6C-13/74PCT374 I:25D6/24F-5/TMM2018D_25 I:25B6/20F-5/TMM2018D_25 I:25B3/16F-5/TMM2018D_25
CA4	8	I:25G3/21F-1/AM9150_20 I:25D3/23F-5/TMM2018D_25 O:32D3/25F-20/AM29C821! I:3F4/15C-8/74LS244 I:14D6/6C-8/74PCT374 I:25D6/24F-4/TMM2018D_25 I:25B6/20F-4/TMM2018D_25 I:25B3/16F-4/TMM2018D_25
CA5	8	I:25G3/21F-2/AM9150_20 I:25D3/23F-4/TMM2018D_25 O:32D3/25F-19/AM29C821! I:3F4/15C-6/74LS244 I:14D6/6C-7/74PCT374 I:25D6/24F-3/TMM2018D_25 I:25B6/20F-3/TMM2018D_25 I:25B3/16F-3/TMM2018D_25
CA6	8	I:25G3/21F-3/AM9150_20 I:25D3/23F-3/TMM2018D_25 O:32D3/25F-18/AM29C821! I:3F4/15C-4/74LS244 I:14D6/6C-4/74PCT374 I:25D6/24F-2/TMM2018D_25 I:25B6/20F-2/TMM2018D_25 I:25B3/16F-2/TMM2018D_25
CA7	8	I:25G3/21F-4/AM9150_20 I:25D3/23F-2/TMM2018D_25 O:32D3/25F-17/AM29C821! I:3F4/15C-2/74LS244 I:14D6/6C-3/74PCT374 I:25D6/24F-1/TMM2018D_25 I:25B6/20F-1/TMM2018D_25 I:25B3/16F-1/TMM2018D_25
CA8	8	I:25G3/21F-5/AM9150_20 I:25D3/23F-1/TMM2018D_25 O:32D3/25F-16/AM29C821! I:3F3/16G-17/74LS244 I:14D5/4B-18/74PCT374 I:25D6/24F-23/TMM2018D_25 I:25B6/20F-23/TMM2018D_25 I:25B3/16F-23/TMM2018D_25 I:25G3/21F-6/AM9150_20 I:25D3/23F-23/TMM2018D_25
CA9	8	O:32D3/25F-15/AM29C821! I:3F3/16G-15/74LS244 I:14D5/4B-17/74PCT374 I:25D6/24F-22/TMM2018D_25 I:25B6/20F-22/TMM2018D_25 I:25B3/16F-22/TMM2018D_25 I:25G3/21F-7/AM9150_20 I:25D3/23F-22/TMM2018D_25
CACT25~	2	O:32D3/25F-14/AM29C821!
CACT~	6	I:6D4/5D-4/PAL16R4D O:8C3/3D-17/AM29C821! T:6D2/10D-12/PAL16R8D! I:6D4/5D-3/PAL16R4D I:7D7/9D-9/74F02 I:8C3/3D-8/AM29C821 I:12D2/11D-8/PAL16L8D I:12E4/2C-1/PAL16L8D
CAS	4	I:49B7/9H-5/74F00 I:49D7/9H-13/74F00 I:49F7/8G-13/74F00 T:50E6/6F-14/PAL16R8D!
CAS~0	#49 5	I:49C3/15H-28/SIP1M9 I:49C3/15H-2/SIP1M9
CAS~1	#49 5	I:49C5/15J-28/SIP1M9 I:49C5/15J-2/SIP1M9 O:49B7/9H-6/74F00! I:49E3/15K-28/SIP1M9 I:49E3/15K-2/SIP1M9

CAS~2	#49	5	I:49E5/15L-28/SIP1M9 I:49E5/15L-2/SIP1M9 O:49D7/9H-11/74F00! I:49G5/15N-28/SIP1M9 I:49G5/15N-2/SIP1M9 I:49G3/15M-28/SIP1M9 I:49G3/15M-2/SIP1M9 O:49F7/8G-11/74F00!
CBIT	#45	2	T:45E2/7G-17/PAL16R8B! I:45F2/8H-2/74LS248
CBWRITE~		3	I:7E7/2A-9/7438 I:7D6/7A-5/7407 B:12E4/2C-18/PAL16L8D!
CCLR~		2	I:25G3/21F-20/AM9150 20 O:39C7/34D-J1/ND DELDGA!
CC~0	#36	2	I:36E5/13D-2/PAL16L8D T:36D4/12D-16/PAL16R6D!
CC~1		3	I:18B2/15F-2/PAL16L8D I:36E5/13D-3/PAL16L8D T:36D4/12D-15/PAL16R6D!
CC~2		6	I:6D4/5D-2/PAL16R4D I:12D2/11D-3/PAL16L8D I:18B2/15F-3/PAL16L8D I:24A2/21G-8/PAL16L8D I:36E5/13D-4/PAL16L8D T:36D4/12D-14/PAL16R6D!
CC~3		3	I:18B2/15F-4/PAL16L8D I:36E5/13D-5/PAL16L8D T:36D4/12D-13/PAL16R6D!
CD0		6	I:3D6/20A-17/74LS244 B:11D5/6B-13/74AS646! O:11G2/RN20-9/4610X 101 102! B:25D6/24F-17/TMM2018D_25! I:33B7/28F-D17/ND DELILAH O:35D5/15B-3/74PCT244!
CD1		6	I:3D6/20A-15/74LS244 B:11D5/6B-14/74AS646! O:11G2/RN20-8/4610X 101 102! B:25D6/24F-16/TMM2018D_25! I:33B7/28F-G16/ND DELILAH O:35D5/15B-5/74PCT244!
CD10		6	I:3D4/18A-13/74LS244 O:11E2/RN19-7/4610X 101 102! B:11D4/7B-15/74AS646! B:25D3/23F-15/TMM2018D_25! I:33B7/28F-C16/ND DELILAH O:35D3/14B-7/74PCT244!
CD11		6	I:3D4/18A-11/74LS244 O:11E2/RN19-6/4610X 101 102! B:11D4/7B-16/74AS646! B:25D3/23F-14/TMM2018D_25! I:33B7/28F-E14/ND DELILAH O:35D3/14B-9/74PCT244!
CD12		6	I:3D4/18A-8/74LS244 O:11E2/RN19-5/4610X 101 102! B:11D4/7B-17/74AS646! B:25D3/23F-13/TMM2018D_25! I:33B7/28F-A17/ND DELILAH O:35D3/14B-12/74PCT244!
CD13		6	I:3D4/18A-6/74LS244 O:11E2/RN19-4/4610X 101 102! B:11D4/7B-18/74AS646! B:25D3/23F-11/TMM2018D_25! I:33B7/28F-D15/ND DELILAH O:35D3/14B-14/74PCT244!
CD14		6	I:3D4/18A-4/74LS244 O:11E2/RN19-3/4610X 101 102! B:11D4/7B-19/74AS646! B:25D3/23F-10/TMM2018D_25! I:33B7/28F-D14/ND DELILAH O:35D3/14B-16/74PCT244!
CD15		6	I:3D4/18A-2/74LS244 O:11E2/RN19-2/4610X 101 102! B:11D4/7B-20/74AS646! B:25D3/23F-9/TMM2018D_25! I:33B7/28F-A16/ND DELILAH O:35D3/14B-18/74PCT244!
CD2		6	I:3D6/20A-13/74LS244 B:11D5/6B-15/74AS646! O:11G2/RN20-7/4610X 101 102! B:25D6/24F-15/TMM2018D_25! I:33B7/28F-C17/ND DELILAH O:35D5/15B-7/74PCT244!
CD3		6	I:3D6/20A-11/74LS244 B:11D5/6B-16/74AS646! O:11G2/RN20-6/4610X 101 102! B:25D6/24F-14/TMM2018D_25! I:33B7/28F-F15/ND DELILAH O:35D5/15B-9/74PCT244!
CD4		6	I:3D6/20A-8/74LS244 B:11D5/6B-17/74AS646! O:11G2/RN20-5/4610X 101 102! B:25D6/24F-13/TMM2018D_25! I:33B7/28F-D16/ND DELILAH O:35D5/15B-12/74PCT244!
CD5		6	I:3D6/20A-6/74LS244 B:11D5/6B-18/74AS646! O:11G2/RN20-4/4610X 101 102! B:25D6/24F-11/TMM2018D_25! I:33B7/28F-G14/ND DELILAH O:35D5/15B-14/74PCT244!
CD6		6	I:3D6/20A-4/74LS244 B:11D5/6B-19/74AS646! O:11F2/RN20-3/4610X 101 102! B:25D6/24F-10/TMM2018D_25! I:33B7/28F-F14/ND DELILAH O:35D5/15B-16/74PCT244!
CD7		6	I:3D6/20A-2/74LS244 B:11D5/6B-20/74AS646! O:11F2/RN20-2/4610X 101 102! B:25D6/24F-9/TMM2018D_25! I:33B7/28F-E16/ND DELILAH O:35D5/15B-18/74PCT244!
CD8		6	I:3D4/18A-17/74LS244 O:11F2/RN19-9/4610X 101 102! B:11D4/7B-13/74AS646! B:25D3/23F-17/TMM2018D_25! I:33B7/28F-B17/ND DELILAH O:35D3/14B-3/74PCT244!
CD9		6	I:3D4/18A-15/74LS244 O:11E2/RN19-8/4610X 101 102! B:11D4/7B-14/74AS646! B:25D3/23F-16/TMM2018D_25! I:33B7/28F-E15/ND DELILAH O:35D3/14B-5/74PCT244!
CEUART~		2	O:39C7/34D-N10/ND DELDGA! I:42B3/32H-11/SC2661
CGABRK~		2	O:33B7/28F-R10/ND DELILAH! I:34E3/29H-9/74F32
CGNT25~		3	I:48C4/13F-7/AM29C821 O:48C4/13F-19/AM29C821! I:50E6/6F-8/PAL16R8D
CGNT50~		4	I:6D4/5D-7/PAL16R4D I:12D2/11D-7/PAL16L8D I:48E4/3F-5/PAL16L8D O:48C4/13F-18/AM29C821!
CGNTCACT~		2	O:12D2/11D-12/PAL16L8D! I:36D4/12D-7/PAL16R6D
CGNT~		11	I:3A4/16A-8/74LS244 I:6D4/5D-6/PAL16R4D I:12D2/11D-6/PAL16L8D I:12E4/2C-2/PAL16L8D I:12D6/1C-1/PAL16L8D I:45C4/9G-11/PAL16R4D I:48E4/3F-3/PAL16L8D I:48C4/13F-6/AM29C821 T:50B6/5F-18/PAL16R8D! I:50E6/6F-3/PAL16R8D I:50D3/12G-1/74LS123
CLEAR25~	#8	2	O:8C3/3D-23/AM29C821! I:8E3/4D-2/AM29C821
CLEAR~		5	I:4F7/7A-3/7407 I:8C3/3D-2/AM29C821 O:39C7/34D-F11/ND DELDGA! I:40D7/35C-2/MC68705U3 I:41E4/28A-1/74LS273

CLK	11	I:3A4/16A-4/74LS244 I:3A7/21A-11/74LS374 I:17E7/31G-13/AM29841 I:34D3/19F-1/PAL16R4D I:34D4/22F-1/PAL16R4D I:36B5/14D-1/PAL16R4D I:36B3/15D-1/PAL16R4D O:36F2/14C-3/74F00! O:39A1/RN15-2/4610X_101_103! I:39C7/34D-D1/ND_DELDGA I:42C6/33G-13/AN29C821
CLOC	4	I:38D1/13C-2/74LS393 I:38E2/13C-12/74LS393 O:38B3/12F-8/74S132! I:39C7/34D-A9/ND_DELDGA
CLRERR~	#46 3	B:46C5/2F-17/PAL16L8B! I:46D2/1H-11/AM29833 I:46D4/2H-11/AM29833
CLRQ~	2	B:45C4/9G-18/PAL16R4D! I:50B6/5F-5/PAL16R8D
CMWRITE~	#12 1	B:12E4/2C-17/PAL16L8D!
CON	5	I:25E6/17F-10/74F10 B:25F7/SW1-3/SECME090320102! B:25F7/LED1-2/RED! I:26D4/27H-11/74PCT244 I:26D4/27H-13/74PCT244
CONSOLE~	5	B:2E2/RN1-9/4610X_101_102! O:2D5/A-C21!! O:2D5/A-C30!! O:41G3/2A-11/7438! I:42C6/33G-6/AM29C821
CONTINUE~	3	B:4D1/RN3-4/4610X_101_102! I:4E3/33C-6/74F244 O:4C2/C-B15!!
CON~	4	B:25F7/SW1-1/SECME090320102! B:25F6/RN14-3/4610X_101_102! I:26D4/27H-15/74PCT244 I:27D6/19G-1/74FCT521A
CORR~	8	I:47C2/7C-14/74PCT374 B:47B1/RN4-2/4610X_101_222! O:49C3/15H-24/SIP1M9! O:49C5/15J-24/SIP1M9! O:49E3/15K-24/SIP1M9! O:49E5/15L-24/SIP1M9! O:49G5/15N-24/SIP1M9! O:49G3/15M-24/SIP1M9!
CPN10	3	B:25B6/20F-17/TMM2018D 25! I:27D6/19G-18/74FCT521A O:31D5/10G-3/74PCT244!
CPN11	3	B:25B6/20F-16/TMM2018D 25! I:27D6/19G-16/74FCT521A O:31D5/10G-5/74PCT244!
CPN12	3	B:25B6/20F-15/TMM2018D 25! I:27D6/19G-14/74FCT521A O:31D5/10G-7/74PCT244!
CPN13	3	B:25B6/20F-14/TMM2018D 25! I:27D6/19G-12/74FCT521A O:31D5/10G-9/74PCT244!
CPN14	3	B:25B6/20F-13/TMM2018D 25! I:27D6/19G-9/74FCT521A O:31D5/10G-12/74PCT244!
CPN15	3	B:25B6/20F-11/TMM2018D 25! I:27D6/19G-7/74FCT521A O:31D5/10G-14/74PCT244!
CPN16	3	B:25B6/20F-10/TMM2018D 25! I:27D6/19G-5/74FCT521A O:31D5/10G-16/74PCT244!
CPN17	3	B:25B6/20F-9/TMM2018D 25! I:27D6/19G-3/74FCT521A O:31D5/10G-18/74PCT244!
CPN18	3	B:25B3/16F-17/TMM2018D 25! I:27D3/18G-18/74FCT521A O:31D3/11G-3/74PCT244!
CPN19	3	B:25B3/16F-16/TMM2018D 25! I:27D3/18G-16/74FCT521A O:31D3/11G-5/74PCT244!
CPN20	3	B:25B3/16F-15/TMM2018D 25! I:27D3/18G-14/74FCT521A O:31D3/11G-7/74PCT244!
CPN21	3	B:25B3/16F-14/TMM2018D 25! I:27D3/18G-12/74FCT521A O:31D3/11G-9/74PCT244!
CPN22	3	B:25B3/16F-13/TMM2018D 25! I:27D3/18G-9/74FCT521A O:31D3/11G-12/74PCT244!
CPN23	3	B:25B3/16F-11/TMM2018D 25! I:27D3/18G-7/74FCT521A O:31D3/11G-14/74PCT244!
CRQ~	2	I:6D2/10D-2/PAL16R8D B:45C4/9G-13/PAL16R4D!
CSA0	3	I:17E4/31F-11/AM29841 I:17E5/32G-11/AM29841 O:33B7/28F-L3/ND_DELILAH!
CSA1	3	I:17E4/31F-10/AM29841 I:17E5/32G-10/AM29841 O:33B7/28F-P1/ND_DELILAH!
CSA10	3	I:17D2/29H-4/74F32 I:17E2/30H-7/74F373 O:33B7/28F-Q2/ND_DELILAH!
CSA11	3	I:17D1/29H-1/74F32 I:17E2/30H-4/74F373 O:33B7/28F-N4/ND_DELILAH!
CSA12	2	I:17E2/30H-3/74F373 O:33B7/28F-S1/ND_DELILAH!
CSA2	3	I:17E4/31F-9/AM29841 I:17E5/32G-9/AM29841 O:33B7/28F-L2/ND_DELILAH!
CSA3	3	I:17E4/31F-8/AM29841 I:17E5/32G-8/AM29841 O:33B7/28F-Q1/ND_DELILAH!
CSA4	3	I:17E4/31F-7/AM29841 I:17E5/32G-7/AM29841 O:33B7/28F-M4/ND_DELILAH!
CSA5	3	I:17E4/31F-6/AM29841 I:17E5/32G-6/AM29841 O:33B7/28F-L4/ND_DELILAH!
CSA6	3	I:17E4/31F-5/AM29841 I:17E5/32G-5/AM29841 O:33B7/28F-P2/ND_DELILAH!
CSA7	3	I:17E4/31F-4/AM29841 I:17E5/32G-4/AM29841 O:33B7/28F-N2/ND_DELILAH!
CSA8	3	I:17E4/31F-3/AM29841 I:17E5/32G-3/AM29841 O:33B7/28F-R1/ND_DELILAH!
CSA9	3	I:17E4/31F-2/AM29841 I:17E5/32G-2/AM29841 O:33B7/28F-N3/ND_DELILAH!
CSALUI0	4	B:20C3/19B-2/74LS245! B:21B6/18D-15/IDT6168A 20! B:22B6/18C-15/IDT6168A 20! I:33B7/28F-C1/ND_DELILAH
CSALUI1	4	B:20B3/16B-9/74LS245! B:21B4/17D-12/IDT6168A 20! B:22B4/17C-12/IDT6168A 20! I:33B7/28F-D4/ND_DELILAH
CSALUI2	4	B:20B3/16B-8/74LS245! B:21B4/17D-13/IDT6168A 20! B:22B4/17C-13/IDT6168A 20! I:33B7/28F-D2/ND_DELILAH
CSALUI3	4	B:20B3/16B-7/74LS245! B:21B4/17D-14/IDT6168A 20!

B:22B4/17C-14/IDT6168A 20! I:33B7/28F-D3/ND DELILAH
CSALUI4 4 B:20B3/16B-6/74LS245! B:21B4/17D-15/IDT6168A 20!
B:22B4/17C-15/IDT6168A 20! I:33B7/28F-F4/ND DELILAH
CSALUI5 4 B:20B3/16B-5/74LS245! B:21B2/16D-12/IDT6168A 20!
B:22B2/16C-12/IDT6168A 20! I:33B7/28F-G4/ND DELILAH
CSALUI6 4 B:20B3/16B-4/74LS245! B:21B2/16D-13/IDT6168A 20!
B:22B2/16C-13/IDT6168A 20! I:33B7/28F-D1/ND DELILAH
CSALUI7 5 B:20B3/16B-3/74LS245! B:21B2/16D-14/IDT6168A 20!
B:22B2/16C-14/IDT6168A 20! I:33B7/28F-E4/ND DELILAH I:36B3/15D-6/PAL16R4D
CSALUI8 5 B:20B3/16B-2/74LS245! B:21B2/16D-15/IDT6168A 20!
B:22B2/16C-15/IDT6168A 20! I:33B7/28F-A1/ND DELILAH I:36B3/15D-5/PAL16R4D
CSALUM0 5 B:20B4/20B-5/74LS245! B:21C2/20D-12/IDT6168A 20!
B:22C2/20C-12/IDT6168A 20! I:33B7/28F-C2/ND DELILAH I:36B3/15D-4/PAL16R4D
CSALUM1 5 B:20B4/20B-4/74LS245! B:21C2/20D-13/IDT6168A 20!
B:22C2/20C-13/IDT6168A 20! I:33B7/28F-C3/ND DELILAH I:36B3/15D-3/PAL16R4D
CSBIT0 4 B:20C7/29B-9/74LS245! B:21F7/31D-12/IDT6168A 20!
B:22F7/31C-12/IDT6168A 20! I:33B7/28F-B6/ND DELILAH
CSBIT1 4 B:20C7/29B-8/74LS245! B:21F7/31D-13/IDT6168A 20!
B:22F7/31C-13/IDT6168A 20! I:33B7/28F-D8/ND DELILAH
CSBIT10 4 B:20B7/28B-7/74LS245! B:21F4/29D-14/IDT6168A 20!
B:22F4/29C-14/IDT6168A 20! I:33B7/28F-A3/ND DELILAH
CSBIT11 4 B:20B7/28B-6/74LS245! B:21F4/29D-15/IDT6168A 20!
B:22F4/29C-15/IDT6168A 20! I:33B7/28F-C6/ND DELILAH
CSBIT12 4 B:20B7/28B-5/74LS245! B:21F2/28D-12/IDT6168A 20!
B:22F2/28C-12/IDT6168A 20! I:33B7/28F-B3/ND DELILAH
CSBIT13 4 B:20B7/28B-4/74LS245! B:21F2/28D-13/IDT6168A 20!
B:22F2/28C-13/IDT6168A 20! I:33B7/28F-C5/ND DELILAH
CSBIT14 4 B:20B7/28B-3/74LS245! B:21F2/28D-14/IDT6168A 20!
B:22F2/28C-14/IDT6168A 20! I:33B7/28F-A2/ND DELILAH
CSBIT15 4 B:20B7/28B-2/74LS245! B:21F2/28D-15/IDT6168A 20!
B:22F2/28C-15/IDT6168A 20! I:33B7/28F-B4/ND DELILAH
CSBIT2 4 B:20C7/29B-7/74LS245! B:21F7/31D-14/IDT6168A 20!
B:22F7/31C-14/IDT6168A 20! I:33B7/28F-A5/ND DELILAH
CSBIT20 4 B:20C6/27B-5/74LS245! B:21D6/26D-12/IDT6168A 20!
B:22D6/26C-12/IDT6168A 20! I:33B7/28F-P4/ND DELILAH
CSBIT3 4 B:20C7/29B-6/74LS245! B:21F7/31D-15/IDT6168A 20!
B:22F7/31C-15/IDT6168A 20! I:33B7/28F-B7/ND DELILAH
CSBIT4 4 B:20C7/29B-5/74LS245! B:21F6/30D-12/IDT6168A 20!
B:22F6/30C-12/IDT6168A 20! I:33B7/28F-B5/ND DELILAH
CSBIT5 4 B:20C7/29B-4/74LS245! B:21F6/30D-13/IDT6168A 20!
B:22F6/30C-13/IDT6168A 20! I:33B7/28F-C7/ND DELILAH
CSBIT6 4 B:20C7/29B-3/74LS245! B:21F6/30D-14/IDT6168A 20!
B:22F6/30C-14/IDT6168A 20! I:33B7/28F-A4/ND DELILAH
CSBIT7 4 B:20C7/29B-2/74LS245! B:21F6/30D-15/IDT6168A 20!
B:22F6/30C-15/IDT6168A 20! I:33B7/28F-D7/ND DELILAH
CSBIT8 4 B:20B7/28B-9/74LS245! B:21F4/29D-12/IDT6168A 20!
B:22F4/29C-12/IDT6168A 20! I:33B7/28F-D6/ND DELILAH
CSBIT9 4 B:20B7/28B-8/74LS245! B:21F4/29D-13/IDT6168A 20!
B:22F4/29C-13/IDT6168A 20! I:33B7/28F-E7/ND DELILAH
CSCA0 3 I:17E7/31G-11/AM29841 I:32D3/25F-2/AM29C821
O:33B7/28F-P14/ND DELILAH!
CSCA1 3 I:17E7/31G-10/AM29841 I:32D3/25F-3/AM29C821
O:33B7/28F-P16/ND DELILAH!
CSCA2 3 I:17E7/31G-9/AM29841 I:32D3/25F-4/AM29C821
O:33B7/28F-P15/ND DELILAH!
CSCA3 3 I:17E7/31G-8/AM29841 I:32D3/25F-5/AM29C821
O:33B7/28F-P17/ND DELILAH!
CSCA4 3 I:17E7/31G-7/AM29841 I:32D3/25F-6/AM29C821
O:33B7/28F-L14/ND DELILAH!
CSCA5 3 I:17E7/31G-6/AM29841 I:32D3/25F-7/AM29C821
O:33B7/28F-M14/ND DELILAH!
CSCA6 3 I:17E7/31G-5/AM29841 I:32D3/25F-8/AM29C821
O:33B7/28F-N17/ND DELILAH!
CSCA7 3 I:17E7/31G-4/AM29841 I:32D3/25F-9/AM29C821
O:33B7/28F-N15/ND DELILAH!
CSCA8 3 I:17E7/31G-3/AM29841 I:32D3/25F-10/AM29C821
O:33B7/28F-M16/ND DELILAH!
CSCA9 3 I:17E7/31G-2/AM29841 I:32D3/25F-11/AM29C821
O:33B7/28F-N16/ND DELILAH!
CSCISEL0 4 B:20B4/20B-3/74LS245! B:21C2/20D-14/IDT6168A 20!
B:22C2/20C-14/IDT6168A 20! I:33B7/28F-B11/ND DELILAH
CSCISEL1 4 B:20B4/20B-2/74LS245! B:21C2/20D-15/IDT6168A 20!
B:22C2/20C-15/IDT6168A 20! I:33B7/28F-A10/ND DELILAH
CSCOMM0 8 I:3A7/21A-13/74LS374 B:20C4/21B-9/74LS245!
B:21C7/23D-12/IDT6168A 20! B:22C7/23C-12/IDT6168A 20!
I:33B7/28F-G17/ND DELILAH I:34D4/22F-6/PAL16R4D I:39C7/34D-L5/ND DELDGA
O:39A3/RN16-2/4610X 101 103!
CSCOMM1 8 I:3A7/21A-8/74LS374 B:20C4/21B-8/74LS245!
B:21C7/23D-13/IDT6168A 20! B:22C7/23C-13/IDT6168A 20!
I:33B7/28F-H15/ND DELILAH I:34D4/22F-5/PAL16R4D O:39B1/RN15-10/4610X 101 103
I:39C7/34D-M4/ND DELDGA
CSCOMM2 8 I:3A7/21A-7/74LS374 B:20C4/21B-7/74LS245!
B:21C7/23D-14/IDT6168A 20! B:22C7/23C-14/IDT6168A 20!

		I:33B7/28F-F17/ND DELILAH I:34D4/22F-4/PAL16R4D O:39A1/RN15-9/4610X 101 103!
CSCOMM3	8	I:39C7/34D-N3/ND DELDGA I:3A7/21A-4/74LS374 B:20C4/21B-6/74LS245! B:21C7/23D-15/IDT6168A 20! B:22C7/23C-15/IDT6168A 20! I:33B7/28F-H14/ND DELILAH I:34D4/22F-3/PAL16R4D O:39A1/RN15-8/4610X 101 103!
CSCOMM4	8	I:39C7/34D-M3/ND DELDGA I:3A7/21A-3/74LS374 B:20C4/21B-5/74LS245! B:21C6/22D-12/IDT6168A 20! B:22C6/22C-12/IDT6168A 20! I:33B7/28F-E17/ND DELILAH I:34D4/22F-2/PAL16R4D O:39A1/RN15-7/4610X 101 103!
CSDELAY0	5	I:39C7/34D-L4/ND DELDGA B:20B6/24B-7/74LS245! B:21D4/25D-14/IDT6168A 20!
CSDELAY1	4	B:22D4/25C-14/IDT6168A 20! I:36B5/14D-2/PAL16R4D I:36D4/12D-4/PAL16R6D B:20B6/24B-6/74LS245! B:21D4/25D-15/IDT6168A 20!
CSDLY	4	B:22D4/25C-15/IDT6168A 20! I:36B3/15D-2/PAL16R4D B:20C6/27B-4/74LS245! B:21D6/26D-13/IDT6168A 20!
CSECOND	5	B:22D6/26C-13/IDT6168A 20! I:36B5/14D-3/PAL16R4D B:20C6/27B-2/74LS245! B:21D6/26D-15/IDT6168A 20!
CSEM	#50 1	B:22D6/26C-15/IDT6168A 20! I:33B7/28F-G3/ND DELILAH I:36B5/14D-4/PAL16R4D T:50B6/5F-14/PAL16R8D!
CSIDBS0	7	B:20C4/21B-4/74LS245! B:21C6/22D-13/IDT6168A 20! B:22C6/22C-13/IDT6168A 20! I:33B7/28F-E1/ND DELILAH I:34D3/19F-2/PAL16R4D
CSIDBS1	7	I:39C7/34D-C2/ND DELDGA O:39A3/RN16-9/4610X 101 103! B:20C4/21B-3/74LS245! B:21C6/22D-14/IDT6168A 20! B:22C6/22C-14/IDT6168A 20! I:33B7/28F-E3/ND DELILAH I:34D3/19F-3/PAL16R4D
CSIDBS2	7	I:39C7/34D-D3/ND DELDGA O:39A3/RN16-8/4610X 101 103! B:20C4/21B-2/74LS245! B:21C6/22D-15/IDT6168A 20! B:22C6/22C-15/IDT6168A 20! I:33B7/28F-F2/ND DELILAH I:34D3/19F-4/PAL16R4D
CSIDBS3	7	I:39C7/34D-C4/ND DELDGA O:39A3/RN16-7/4610X 101 103! B:20B4/20B-9/74LS245! B:21C4/21D-12/IDT6168A 20! B:22C4/21C-12/IDT6168A 20! I:33B7/28F-E2/ND DELILAH I:34D3/19F-5/PAL16R4D
CSIDBS4	7	I:39C7/34D-A2/ND DELDGA O:39A3/RN16-6/4610X 101 103! B:20B4/20B-8/74LS245! B:21C4/21D-13/IDT6168A 20! B:22C4/21C-13/IDT6168A 20! I:33B7/28F-F1/ND DELILAH I:34D3/19F-6/PAL16R4D
CSLOOP	5	I:39C7/34D-A3/ND DELDGA O:39A3/RN16-5/4610X 101 103! B:20C6/27B-3/74LS245! B:21D6/26D-14/IDT6168A 20!
CSMIS0	8	B:22D6/26C-14/IDT6168A 20! I:33B7/28F-G1/ND DELILAH I:36B5/14D-5/PAL16R4D I:3A7/21A-17/74LS374 B:20B4/20B-7/74LS245! B:21C4/21D-14/IDT6168A 20! B:22C4/21C-14/IDT6168A 20! I:33B7/28F-H13/ND DELILAH I:34D4/22F-8/PAL16R4D T:39C7/34D-N2/ND DELDGA O:39A3/RN16-4/4610X 101 103!
CSMIS1	8	I:3A7/21A-14/74LS374 B:20B4/20B-6/74LS245! B:21C4/21D-15/IDT6168A 20! B:22C4/21C-15/IDT6168A 20! I:33B7/28F-F16/ND DELILAH I:34D4/22F-7/PAL16R4D T:39C7/34D-K3/ND DELDGA O:39A3/RN16-3/4610X 101 103!
CSRASEL0	4	B:20C3/19B-6/74LS245! B:21B7/19D-15/IDT6168A 20! B:22B7/19C-15/IDT6168A 20! I:33B7/28F-H2/ND DELILAH
CSRASEL1	4	B:20C3/19B-5/74LS245! B:21B6/18D-12/IDT6168A 20! B:22B6/18C-12/IDT6168A 20! I:33B7/28F-G2/ND DELILAH
CSRB0	4	B:20C6/27B-9/74LS245! B:21D7/27D-12/IDT6168A 20! B:22D7/27C-12/IDT6168A 20! I:33B7/28F-H1/ND DELILAH
CSRB1	4	B:20C6/27B-8/74LS245! B:21D7/27D-13/IDT6168A 20! B:22D7/27C-13/IDT6168A 20! I:33B7/28F-H4/ND DELILAH
CSRB2	4	B:20C6/27B-7/74LS245! B:21D7/27D-14/IDT6168A 20! B:22D7/27C-14/IDT6168A 20! I:33B7/28F-J1/ND DELILAH
CSRB3	4	B:20C6/27B-6/74LS245! B:21D7/27D-15/IDT6168A 20! B:22D7/27C-15/IDT6168A 20! I:33B7/28F-H3/ND DELILAH
CSRBSELO	4	B:20C3/19B-9/74LS245! B:21B7/19D-12/IDT6168A 20! B:22B7/19C-12/IDT6168A 20! I:33B7/28F-S2/ND DELILAH
CSRBSEL1	4	B:20C3/19B-8/74LS245! B:21B7/19D-13/IDT6168A 20! B:22B7/19C-13/IDT6168A 20! I:33B7/28F-Q3/ND DELILAH
CSSCOND	4	B:20B6/24B-9/74LS245! B:21D4/25D-12/IDT6168A 20! B:22D4/25C-12/IDT6168A 20! I:33B7/28F-S3/ND DELILAH
CSSST0	4	B:20C3/19B-4/74LS245! B:21B6/18D-13/IDT6168A 20! B:22B6/18C-13/IDT6168A 20! I:33B7/28F-D10/ND DELILAH
CSSST1	4	B:20C3/19B-3/74LS245! B:21B6/18D-14/IDT6168A 20! B:22B6/18C-14/IDT6168A 20! I:33B7/28F-A9/ND DELILAH
CSTS3	4	B:20B6/24B-5/74LS245! B:21D2/24D-12/IDT6168A 20! B:22D2/24C-12/IDT6168A 20! I:33B7/28F-R4/ND DELILAH
CSTS4	4	B:20B6/24B-4/74LS245! B:21D2/24D-13/IDT6168A 20! B:22D2/24C-13/IDT6168A 20! I:33B7/28F-S4/ND DELILAH
CSTS5	4	B:20B6/24B-3/74LS245! B:21D2/24D-14/IDT6168A 20! B:22D2/24C-14/IDT6168A 20! I:33B7/28F-P5/ND DELILAH
CSTS6	4	B:20B6/24B-2/74LS245! B:21D2/24D-15/IDT6168A 20! B:22D2/24C-15/IDT6168A 20! I:33B7/28F-P6/ND DELILAH
CSVECT	4	B:20B6/24B-8/74LS245! B:21D4/25D-13/IDT6168A 20! B:22D4/25C-13/IDT6168A 20! I:33B7/28F-N7/ND DELILAH
CSXRF	4	B:20C3/19B-7/74LS245! B:21B7/19D-14/IDT6168A 20!

CX~	2	B:22B7/19C-14/IDT6168A 20! I:33B7/28F-R5/ND DELILAH
CYD~	2	T:36D4/12D-18/PAL16R6D! I:41C5/25A-2/74PCT244
DAP~	4	I:25F5/18F-6/PAL16R4D B:36E5/13D-17/PAL16L8D!
		B:6D4/5D-18/PAL16R4D! I:7D4/1F-11/74F04
DA~	4	I:39C7/34D-M5/ND DELDGA O:39A4/RN17-5/4610X 101 103!
		I:41F4/11B-5/74LS04 O:42B3/32H-14/SC2661!
DBAPR	7	O:42C5/RN7-3/4610X 101 103! I:42C6/33G-3/AM29C821
		I:6D6/8D-5/PAL16L8B I:10D6/6A-1/74AS648
		I:10D4/5A-1/74AS648 I:10D2/4A-1/74AS648 O:12D6/1C-19/PAL16L8D!
		I:45C6/6G-1/PAL16R4D I:45C6/6G-2/PAL16R4D
DBIT	#45 2	T:45E2/7G-16/PAL16R8B! I:45F2/8H-6/74LS248
DD0	5	B:46D2/1H-23/AM29833! O:46E1/RN21-2/4610X 101 103!
		B:49C3/15H-3/SIP1M9! B:49E3/15K-3/SIP1M9! B:49G3/15M-3/SIP1M9!
DD1	5	B:46D2/1H-22/AM29833! O:46E1/RN21-3/4610X 101 103!
		B:49C3/15H-6/SIP1M9! B:49E3/15K-6/SIP1M9! B:49G3/15M-6/SIP1M9!
DD10	5	B:46D4/2H-22/AM29833! O:46E2/RN22-3/4610X 101 103!
		B:49C5/15J-6/SIP1M9! B:49E5/15L-6/SIP1M9! B:49G5/15N-6/SIP1M9!
DD11	5	B:46D4/2H-21/AM29833! O:46E2/RN22-4/4610X 101 103!
		B:49C5/15J-10/SIP1M9! B:49E5/15L-10/SIP1M9! B:49G5/15N-10/SIP1M9!
DD12	5	B:46D4/2H-20/AM29833! O:46F2/RN22-5/4610X 101 103!
		B:49C5/15J-13/SIP1M9! B:49E5/15L-13/SIP1M9! B:49G5/15N-13/SIP1M9!
DD13	5	B:46D4/2H-19/AM29833! O:46F2/RN22-6/4610X 101 103!
		B:49C5/15J-16/SIP1M9! B:49E5/15L-16/SIP1M9! B:49G5/15N-16/SIP1M9!
DD14	5	B:46D4/2H-18/AM29833! O:46F2/RN22-7/4610X 101 103!
		B:49C5/15J-20/SIP1M9! B:49E5/15L-20/SIP1M9! B:49G5/15N-20/SIP1M9!
DD15	5	B:46D4/2H-17/AM29833! O:46F2/RN22-8/4610X 101 103!
		B:49C5/15J-23/SIP1M9! B:49E5/15L-23/SIP1M9! B:49G5/15N-23/SIP1M9!
DD16	5	B:46D4/2H-16/AM29833! O:46F2/RN22-9/4610X 101 103!
		B:49C5/15J-25/SIP1M9! B:49E5/15L-25/SIP1M9! B:49G5/15N-25/SIP1M9!
DD17	8	B:46D4/2H-15/AM29833! O:46F2/RN22-10/4610X 101 103!
		I:49C5/15J-29/SIP1M9 O:49C5/15J-26/SIP1M9! I:49E5/15L-29/SIP1M9
		O:49E5/15L-26/SIP1M9! I:49C5/15N-29/SIP1M9 O:49G5/15N-26/SIP1M9!
DD2	5	B:46D2/1H-21/AM29833! O:46E1/RN21-4/4610X 101 103!
		B:49C3/15H-10/SIP1M9! B:49E3/15K-10/SIP1M9! B:49G3/15M-10/SIP1M9!
DD3	5	B:46D2/1H-20/AM29833! O:46F1/RN21-5/4610X 101 103!
		B:49C3/15H-13/SIP1M9! B:49E3/15K-13/SIP1M9! B:49G3/15M-13/SIP1M9!
DD4	5	B:46D2/1H-19/AM29833! O:46F1/RN21-6/4610X 101 103!
		B:49C3/15H-16/SIP1M9! B:49E3/15K-16/SIP1M9! B:49G3/15M-16/SIP1M9!
DD5	5	B:46D2/1H-18/AM29833! O:46F1/RN21-7/4610X 101 103!
		B:49C3/15H-20/SIP1M9! B:49E3/15K-20/SIP1M9! B:49G3/15M-20/SIP1M9!
DD6	5	B:46D2/1H-17/AM29833! O:46F1/RN21-8/4610X 101 103!
		B:49C3/15H-23/SIP1M9! B:49E3/15K-23/SIP1M9! B:49G3/15M-23/SIP1M9!
DD7	5	B:46D2/1H-16/AM29833! O:46F1/RN21-9/4610X 101 103!
		B:49C3/15H-25/SIP1M9! B:49E3/15K-25/SIP1M9! B:49G3/15M-25/SIP1M9!
DD8	8	B:46D2/1H-15/AM29833! O:46F1/RN21-10/4610X 101 103!
		I:49C3/15H-29/SIP1M9 O:49C3/15H-26/SIP1M9! I:49E3/15K-29/SIP1M9
		O:49E3/15K-26/SIP1M9! I:49G3/15M-29/SIP1M9 O:49G3/15M-26/SIP1M9!
DD9	5	B:46D4/2H-23/AM29833! O:46E2/RN22-2/4610X 101 103!
		B:49C5/15J-3/SIP1M9! B:49E5/15L-3/SIP1M9! B:49G5/15N-3/SIP1M9!
DDBAPR	#45 2	B:45C6/6G-18/PAL16R4D! I:45E7/2D-3/74F74
DISB~	#46 1	B:46C5/2F-16/PAL16L8B!
DISP1	#40 2	B:40D7/35C-12/MC68705U3! I:40E3/35A-13/7406
DISP2	#40 2	B:40D7/35C-13/MC68705U3! I:40E2/35A-11/7406
DISP3	#40 2	B:40D7/35C-14/MC68705U3! I:40E2/35A-9/7406
DISP4	#40 2	B:40D7/35C-15/MC68705U3! I:40E2/35A-5/7406
DISP5	#40 2	B:40D7/35C-16/MC68705U3! I:40E1/35A-3/7406
DIS~	#46 3	O:46C5/2F-19/PAL16L8B! I:46D5/14G-13/74F08
		B:46D5/LED5-2/RED!
DLY0~	#36 2	B:36B5/14D-19/PAL16R4D! I:36D4/12D-3/PAL16R6D
DLY1~	#36 2	B:36B5/15D-12/PAL16R4D! I:36D4/12D-2/PAL16R6D
DMA12~	#36 1	T:36B5/14D-15/PAL16R4D!
DMA~	#36 1	T:36B5/14D-14/PAL16R4D!
DORF~	#6 1	T:6D2/10D-17/PAL16R8D!
DOUBLE	2	I:24A2/21G-6/PAL16L8D O:33B7/28F-A7/ND DELILAH!
DP~1	3	B:2F2/RN2-2/4610X 101 102! I:2H3/A-C257
		O:40E3/35A-12/7406!
DP~2	3	B:2F2/RN2-3/4610X 101 102! I:2H4/A-C26/
		O:40E2/35A-10/7406!
DP~3	3	B:2F2/RN2-4/4610X 101 102! I:2H4/A-C27/
		O:40E2/35A-8/7406!
DP~4	3	B:2G2/RN2-5/4610X 101 102! I:2H4/A-C28/
		O:40E2/35A-6/7406!
DP~5	3	B:2G2/RN2-6/4610X 101 102! I:2H4/A-C29/
		O:40E1/35A-4/7406!
DSR~	4	B:2D3/A-C11!! B:2G3/A-A12!! B:2G2/RN2-7/4610X 101 102!
		B:2G3/A-C9!!
DSTB~	5	I:11D5/6B-1/74AS646 I:11D5/6B-2/74AS646
		I:11D4/7B-1/74AS646 I:11D4/7B-2/74AS646 B:12D2/11D-17/PAL16L8D!
DT~	2	I:25F5/18F-2/PAL16R4D O:39C7/34D-K1/ND DELDGA!
DVACC~	2	I:24A2/21G-3/PAL16L8D O:39C7/34D-G1/ND DELDGA!
EADR~	5	B:6D4/5D-12/PAL16R4D! I:12E4/2C-3/PAL16L8D
		I:14D6/6C-1/74PCT374 I:14D5/4B-1/74PCT374 I:14D3/3B-1/74PCT374
EAUTO~	3	B:2E2/RN1-7/4610X 101 102! O:2D4/A-C19!!
		I:42C6/33G-4/AM29C821~

EBADR	4	I:10D6/6A-2/74AS648 I:10D4/5A-2/74AS648 I:10D2/4A-2/74AS648 B:12D6/1C-17/PAL16L8D!
EBD~	4	I:10D6/6A-21/74AS648 I:10D4/5A-21/74AS648 I:10D2/4A-21/74AS648 B:12D6/1C-13/PAL16L8D!
EBUS	3	I:3F5/7F-1/74F14 O:3E5/B-B3/! O:3F5/RN13-2/4610X 101 102!
EBUS~	2	O:3F5/7F-2/74F14! I:12D6/1C-6/PAL16L8D
ECCR	3	O:33B7/28F-Q14/ND DELILAH! I:46C5/2F-8/PAL16L8B I:48E4/3F-6/PAL16L8D
ECD~	3	O:24A2/21G-19/PAL16L8D! I:25D6/24F-18/TMM2018D_25 I:25D3/23F-18/TMM2018D_25
ECREQ	8	I:11D5/6B-23/74AS646 I:11D4/7B-23/74AS646 I:14D6/6C-11/74PCT374 I:14D5/4B-11/74PCT374 I:14D3/3B-11/74PCT374 O:39C7/34D-F1/ND DELDGA! B:45C4/9G-12/PAL16R4D! I:45C4/9G-1/PAL16R4D
ECSD~	#18 2	I:18D2/30B-1/74F139 O:18C1/29A-3/74F08!
ECSL~	5	B:18B2/15F-18/PAL16L8D! I:20E6/8C-11/74PCT373 I:20E6/8C-1/74PCT373 I:20E5/9C-11/74PCT373 I:20E5/9C-1/74PCT373
ECSR~	2	I:26D4/27H-19/74PCT244 O:39C7/34D-B6/ND DELDGA!
EDO~	2	I:26D4/27H-6/74PCT244 O:39C7/34D-A8/ND DELDGA!
EHISEG~	#45 2	T:45E2/7G-12/PAL16R8B! I:45G3/8K-1/HP5082 7433
EIOD~	2	B:6D4/5D-13/PAL16R4D! I:7D2/3A-1/74F241
EIOR~	2	O:39C7/34D-A6/ND DELDGA! I:42C6/33G-1/AM29C821
EIPL~	2	B:24A2/21G-16/PAL16L8D! I:28E5/9B-19/74PCT245
EIPUR~	3	B:24A2/21G-18/PAL16L8D! I:28B7/8B-1/74LS244 I:28B7/8B-19/74LS244
EIPU~	2	B:24A2/21G-17/PAL16L8D! I:28E3/10B-19/74PCT245
ELOWSEG~	#45 2	T:45E2/7G-14/PAL16R8B! I:45G3/8K-7/HP5082 7433
ELow	17	B:18B2/15F-15/PAL16L8D! I:22B7/19C-9/IDT6168A_20 I:22B6/18C-9/IDT6168A_20 I:22B4/17C-9/IDT6168A_20 I:22B2/16C-9/IDT6168A_20
+		I:22C6/22C-9/IDT6168A_20 I:22C7/23C-9/IDT6168A_20 I:22C4/21C-9/IDT6168A_20
+		I:22C2/20C-9/IDT6168A_20 I:22D6/26C-9/IDT6168A_20 I:22D7/27C-9/IDT6168A_20
+		I:22D4/25C-9/IDT6168A_20 I:22D2/24C-9/IDT6168A_20 I:22F6/30C-9/IDT6168A_20
+		I:22F7/31C-9/IDT6168A_20 I:22F4/29C-9/IDT6168A_20 I:22F2/28C-9/IDT6168A_20
EMCL~	3	I:24A2/21G-7/PAL16L8D O:41E4/28A-6/74LS273! B:41E2/LED2-2/RED!
EMD~	3	I:11D5/6B-21/74AS646 I:11D4/7B-21/74AS646 B:12D2/11D-18/PAL16L8D!
EMIDSEG~	#45 2	T:45E2/7G-13/PAL16R8B! I:45G3/8K-4/HP5082 7433
EMPID~	2	I:26D4/27H-4/74PCT244 O:39C7/34D-J3/ND DELDGA!
EMP~	2	O:39C7/34D-J11/ND DELDGA! I:40D7/35C-17/MC68705U3
EORF~	4	I:24A3/32C-10/74F32 B:36E5/13D-16/PAL16L8D! O:39A4/RN17-4/4610X 101 103! I:39C7/34D-N4/ND DELDGA
EPANS~	4	O:39C7/34D-C5/ND DELDGA! I:40G4/32B-1/74LS374 I:40G6/33B-1/74LS244 I:40G6/33B-19/74LS244
EPEAL~	#47 3	B:47D7/4F-17/PAL16L8B! I:47E2/4C-1/74PCT374 I:47E4/6D-1/74PCT374
EPEA~	4	I:6D6/8D-11/PAL16L8B O:6C7/12C-6/74F32! I:13E5/8A-1/74ALS534 I:13E3/9A-1/74ALS534
EPESL~	#47 3	B:47D7/4F-18/PAL16L8B! I:47C4/3C-1/74PCT374 I:47C2/7C-1/74PCT374
EPES~	4	I:6D6/8D-9/PAL16L8B O:6C7/12C-3/74F32! I:13C5/10A-1/74ALS534 I:13C3/12A-1/74ALS534
EPMAP~	3	B:24A2/21G-14/PAL16L8D! I:29B3/22G-18/TMM2018D_25 I:29B6/23G-18/TMM2018D_25
EPTI~	3	B:24A2/21G-15/PAL16L8D! I:30D3/17B-19/74PCT245 I:30D5/18B-19/74PCT245
EPT~	3	B:24A2/21G-13/PAL16L8D! I:29D3/24G-18/TMM2018D_25 I:29D6/25G-18/TMM2018D_25
ERF~	3	I:32F5/34F-18/TMM2018D_25 I:32F7/35F-18/TMM2018D_25 B:34D3/19F-19/PAL16R4D!
ESTOF~	5	I:28E3/10B-1/74PCT245 I:28E5/9B-1/74PCT245 I:32F2/32F-19/74PCT245 I:32F3/33F-19/74PCT245 O:39C7/34D-N9/ND DELDGA!
ETRAP~	2	I:33B7/28F-Q6/ND DELILAH B:36E5/13D-14/PAL16L8D!
EUPP~	17	B:18B2/15F-16/PAL16L8D! I:21B7/19D-9/IDT6168A_20 I:21B6/18D-9/IDT6168A_20 I:21B4/17D-9/IDT6168A_20 I:21B2/16D-9/IDT6168A_20
+		I:21C6/22D-9/IDT6168A_20 I:21C7/23D-9/IDT6168A_20 I:21C4/21D-9/IDT6168A_20
+		I:21C2/20D-9/IDT6168A_20 I:21D6/26D-9/IDT6168A_20 I:21D7/27D-9/IDT6168A_20
+		I:21D4/25D-9/IDT6168A_20 I:21D2/24D-9/IDT6168A_20 I:21F6/30D-9/IDT6168A_20
+		I:21F7/31D-9/IDT6168A_20 I:21F4/29D-9/IDT6168A_20 I:21F2/28D-9/IDT6168A_20
EWCA~	3	B:18B2/15F-17/PAL16L8D! I:18C1/29A-2/74F08 I:33B7/28F-Q4/ND DELILAH
EW~0	3	O:18D2/30B-4/74F139! I:20B7/28B-19/74LS245 I:20C7/29B-19/74LS245
EW~1	3	O:18D2/30B-5/74F139! I:20B6/24B-19/74LS245 I:20C6/27B-19/74LS245
EW~2	3	O:18D2/30B-6/74F139! I:20B4/20B-19/74LS245

I:20C4/21B-19/74LS245
EW~3 3 O:18D2/30B-7/74F139! I:20B3/16B-19/74LS245
I:20C3/19B-19/74LS245
FAPR #12 1 B:12D6/1C-16/PAL16L8D!
FATAL #47 2 I:47C2/7C-7/74PCT374 B:47B1/RN4-5/4610X 101 222!
FETCH 4 I:13C3/12A-3/74ALS534 I:18B2/15F-8/PAL16L8D
O:39C7/34D-M6/ND DELDGA! I:47C2/7C-3/74PCT374
FIDB0 2 B:32F2/32F-18/74PCT245! B:33B7/28F-C15/ND DELILAH!
FIDB1 2 B:32F2/32F-17/74PCT245! B:33B7/28F-A15/ND DELILAH!
FIDB10 2 B:32F3/33F-16/74PCT245! B:33B7/28F-B12/ND DELILAH!
FIDB11 2 B:32F3/33F-15/74PCT245! B:33B7/28F-C12/ND DELILAH!
FIDB12 2 B:32F3/33F-14/74PCT245! B:33B7/28F-A12/ND DELILAH!
FIDB13 2 B:32F3/33F-13/74PCT245! B:33B7/28F-D11/ND DELILAH!
FIDB14 2 B:32F3/33F-12/74PCT245! B:33B7/28F-A11/ND DELILAH!
FIDB15 2 B:32F3/33F-11/74PCT245! B:33B7/28F-C11/ND DELILAH!
FIDB2 2 B:32F2/32F-16/74PCT245! B:33B7/28F-B14/ND DELILAH!
FIDB3 2 B:32F2/32F-15/74PCT245! B:33B7/28F-A14/ND DELILAH!
FIDB4 2 B:32F2/32F-14/74PCT245! B:33B7/28F-D13/ND DELILAH!
FIDB5 2 B:32F2/32F-13/74PCT245! B:33B7/28F-D12/ND DELILAH!
FIDB6 2 B:32F2/32F-12/74PCT245! B:33B7/28F-E11/ND DELILAH!
FIDB7 2 B:32F2/32F-11/74PCT245! B:33B7/28F-B13/ND DELILAH!
FIDB8 2 B:32F3/33F-18/74PCT245! B:33B7/28F-A13/ND DELILAH!
FIDB9 2 B:32F3/33F-17/74PCT245! B:33B7/28F-C13/ND DELILAH!
FMIS 2 I:27D3/18G-1/74FCT521A O:39C7/34D-L8/ND DELDGA!
FORM~ 3 I:18B2/15F-1/PAL16L8D I:36E5/13D-6/PAL16L8D
O:39C7/34D-M8/ND DELDGA!
FUL~ 2 O:39C7/34D-K12/ND DELDGA! I:40G6/33B-15/74LS244
GND 166 \$SOVERFLOW\$ B:2B2/A-A17!! B:2B2/A-A18!! B:2B3/A-A19!!
B:2B3/A-A20!! B:2B3/A-A21!! B:2B3/A-A22!! B:2B3/A-A23!! B:2B4/A-A24!!
B:2B4/A-A25!! B:2B4/A-A26!! B:2B4/A-A27!! B:2B4/A-A28!! B:2B5/A-A29!!
B:2B5/A-A32!! B:2B5/A-B32!! B:2B5/A-C32!! B:3H2/B-C1!! B:3H3/B-A32!!
B:3H3/B-B32!! B:3H3/B-C32!! I:3F2/17G-1/74LS244 I:3F2/17G-19/74LS244
I:3F3/16G-1/74LS244 I:3F3/16G-19/74LS244 I:3F4/15C-1/74LS244
I:3F4/15C-19/74LS244 I:3A2/23A-1/74LS244 I:3A2/23A-19/74LS244
I:3A3/22A-1/74LS244 I:3A3/22A-19/74LS244 I:3A4/16A-1/74LS244
I:3A4/16A-19/74LS244 I:3A7/21A-1/74LS374 B:3C2/STR1-1/STR1! B:3H2/B-A1!!
B:3H2/B-B1!! B:4D4/C1-2/10nF! B:4G3/C-A1!! B:4G4/C-B1!! B:4G4/C-C1!!
B:4G4/C-B32!! B:4G4/C-C32!! B:4G4/C-A32!! I:7D2/3A-15/74F241
I:25D6/24F-20/TMM2018D_25 I:25B6/20F-18/TMM2018D_25 I:25B6/20F-20/TMM2018D_2
5
B:25F7/SW1-2/SECME090320102! I:25G6/21H-12/74S260 I:25G6/21H-13/74S260
I:25B3/16F-18/TMM2018D_25 I:25B3/16F-20/TMM2018D_25 I:25G3/21F-17/AM9150_20
I:25G3/21F-19/AM9150_20 I:25D3/23F-20/TMM2018D_25 I:27D3/18G-2/74FCT521A
I:27D3/18G-3/74FCT521A I:27D3/18G-5/74FCT521A I:28B7/8B-2/74LS244
I:28B7/8B-4/74LS244 I:28B7/8B-6/74LS244 I:28B7/8B-8/74LS244
I:28B7/8B-11/74LS244 I:28B7/8B-13/74LS244 I:28B7/8B-15/74LS244
I:29B3/22G-20/TMM2018D_25 I:29F4/20G-11/IMS1403_25
O:13B3/11B-12/74LS04! I:13C3/12A-4/74ALS534
I:47C2/7C-4/74PCT374
GNT 3 I:7E3/1F-9/74F04 O:48C7/14F-15/AM29C821!
GNT25~ 2 I:6D2/10D-13/PAL16R8D! I:12D6/1C-8/PAL16L8D
GNT~ 4 I:13B3/11B-13/74LS04 I:48C7/14F-10/AM29C821
HIEN~ 4 I:44B5/4H-1/AM29C821 I:46C5/2F-11/PAL16L8B
I:48E4/3F-1/PAL16L8D T:50E6/6F-12/PAL16R8D!
HIT 3 O:25G6/21H-5/74S260! I:36D4/12D-8/PAL16R6D
I:39A5/13G-1/74F04
HIT~ #39 3 O:39A4/RN17-8/4610X 101 103! O:39A5/13G-2/74F04!
I:39C7/34D-E1/ND DELDGA
HIT~0 3 I:25F5/18F-7/PAL16R4D I:25G6/21H-3/74S260
O:27D6/19G-19/74FCT521A!
HIT~1 3 I:25F5/18F-8/PAL16R4D I:25G6/21H-2/74S260
O:27D3/18G-19/74FCT521A!
IIP 4 O:2D5/A-A7!! B:42E5/R9-2/2.2KOHM! B:42E5/R10-2/2.2KOHM!
B:42E5/R2-2/5.6KOHM!
IBAPR~ 2 O:4C6/5C-3/74F244! I:12D6/1C-7/PAL16L8D
IBDAP~ 4 O:4C6/5C-7/74F244! I:8C3/3D-10/AM29C821
I:48E4/3F-9/PAL16L8D I:48C4/13F-4/AM29C821
IBDRY~ 3 O:4C6/5C-5/74F244! I:7D4/2A-4/7438 I:8C3/3D-7/AM29C821
IBINPUT~ 3 O:4C6/5C-14/74F244! I:8C3/3D-5/AM29C821
I:45C6/6G-4/PAL16R4D
IBINT~10 2 O:4C6/5C-18/74F244! I:33A4/34G-18/74PCT374
IBINT~11 2 O:4E3/33C-3/74F244! I:33A4/34G-17/74PCT374
IBINT~12 2 O:4E3/33C-5/74F244! I:33A4/34G-14/74PCT374
IBINT~13 2 O:4E3/33C-7/74F244! I:33A4/34G-13/74PCT374
IBINT~15 2 O:4E3/33C-9/74F244! I:33A4/34G-8/74PCT374
IBPERR~ 2 O:4C6/5C-12/74F244! I:8C3/3D-6/AM29C821
IBREQ~ 3 O:4E3/33C-16/74F244! I:7C4/1F-13/74F04
I:8C3/3D-9/AM29C821
ICONTIN~ 2 O:4E3/33C-14/74F244! I:39C7/34D-B10/ND DELDGA
IDB0 26 I:3D3/19A-17/74LS244 T:13C5/10A-19/74ALS534!
T:13E5/8A-19/74ALS534! O:19C4/23B-11/27256! I:20E6/8C-18/74PCT373
T:20E6/8C-19/74PCT373! B:20C7/29B-11/74LS245! B:20C6/27B-11/74LS245!
B:20C4/21B-11/74LS245! B:20C3/19B-11/74LS245! O:26D4/27H-9/74PCT244!

		B:28E5/9B-11/74PCT245! B:30D5/18B-9/74PCT245! B:32F5/34F-9/TMM2018D 25! B:32F2/32F-2/74PCT245! B:32H2/RN10-2/4610X 101 102! I:35D5/15B-17/74PCT244
IDB1	26	B:39C7/34D-G13/ND DELDGA! T:40G4/32B-2/74LS374! I:41E4/28A-18/74LS273 O:41C7/24A-3/74PCT244! O:41C5/25A-3/74PCT244! B:42B3/32H-27/SC2661! O:42C6/33G-14/AM29C821! T:47C4/3C-19/74PCT374! T:47E4/6D-19/74PCT374! I:3D3/19A-15/74LS244 T:13C5/10A-16/74ALS534! T:13E5/8A-16/74ALS534! O:19C4/23B-12/27256! I:20E6/8C-17/74PCT373 T:20E6/8C-16/74PCT373! B:20C7/29B-12/74LS245! B:20C6/27B-12/74LS245! B:20C4/21B-12/74LS245! B:20C3/19B-12/74LS245! O:26D4/27H-7/74PCT244! B:28E5/9B-12/74PCT245! B:30D5/18B-8/74PCT245! B:32F5/34F-10/TMM2018D 25! B:32F2/32F-3/74PCT245! B:32H2/RN10-3/4610X 101 102! I:35D5/15B-15/74PCT244
IDB10	20	B:39C7/34D-G11/ND DELDGA! T:40G4/32B-5/74LS374! I:41E4/28A-17/74LS273 O:41C7/24A-5/74PCT244! O:41C5/25A-5/74PCT244! B:42B3/32H-28/SC2661! O:42C6/33G-15/AM29C821! T:47C4/3C-16/74PCT374! T:47E4/6D-16/74PCT374! I:3D2/17A-13/74LS244 T:13E3/9A-15/74ALS534! T:13C3/12A-15/74ALS534! O:19C6/26B-13/27256! I:20E5/9C-14/74PCT373 T:20E5/9C-15/74PCT373! B:20B7/28B-13/74LS245! B:20B6/24B-13/74LS245! B:20B4/20B-13/74LS245! B:20B3/16B-13/74LS245! B:28E3/10B-13/74PCT245! B:30D3/17B-7/74PCT245! B:32F7/35F-11/TMM2018D 25! B:32F3/33F-4/74PCT245! B:32H4/RN11-3/4610X 101 102! I:35D3/14B-13/74PCT244 O:40G6/33B-14/74LS244
IDB11	21	O:41C2/27A-7/74PCT244! T:47C2/7C-15/74PCT374! T:47E2/4C-15/74PCT374! I:3D2/17A-11/74LS244 T:13E3/9A-12/74ALS534! T:13C3/12A-12/74ALS534! O:19C6/26B-15/27256! I:20E5/9C-13/74PCT373 T:20E5/9C-12/74PCT373! B:20B7/28B-14/74LS245! B:20B6/24B-14/74LS245! B:20B4/20B-14/74LS245! B:20B3/16B-14/74LS245! B:28E3/10B-14/74PCT245! B:30D3/17B-6/74PCT245! B:32F7/35F-13/TMM2018D 25! B:32F3/33F-5/74PCT245! B:32H4/RN11-4/4610X 101 102! I:35D3/14B-11/74PCT244 O:40G6/33B-12/74LS244
IDB12	21	O:41C2/27A-9/74PCT244! O:42C6/33G-19/AM29C821! T:47C2/7C-12/74PCT374! T:47E2/4C-12/74PCT374! I:3D2/17A-8/74LS244 T:13E3/9A-9/74ALS534! T:13C3/12A-9/74ALS534! O:19C6/26B-16/27256! I:20E5/9C-8/74PCT373 T:20E5/9C-9/74PCT373! B:20B7/28B-15/74LS245! B:20B6/24B-15/74LS245! B:20B4/20B-15/74LS245! B:20B3/16B-15/74LS245! B:28E3/10B-15/74PCT245! B:30D3/17B-5/74PCT245! B:32F7/35F-14/TMM2018D 25! B:32F3/33F-6/74PCT245! B:32H4/RN11-5/4610X 101 102! I:35D3/14B-8/74PCT244 O:40G6/33B-9/74LS244! O:41C2/27A-12/74PCT244! O:42C6/33G-20/AM29C821! T:47C2/7C-9/74PCT374! T:47E2/4C-9/74PCT374!
IDB13	21	I:3D2/17A-6/74LS244 T:13E3/9A-6/74ALS534! T:13C3/12A-6/74ALS534! O:19C6/26B-17/27256! I:20E5/9C-7/74PCT373 T:20E5/9C-6/74PCT373! B:20B7/28B-16/74LS245! B:20B6/24B-16/74LS245! B:20B4/20B-16/74LS245! B:20B3/16B-16/74LS245! B:28E3/10B-16/74PCT245! B:30D3/17B-4/74PCT245! B:32F7/35F-15/TMM2018D 25! B:32F3/33F-7/74PCT245! B:32H4/RN11-6/4610X 101 102! I:35D3/14B-6/74PCT244 O:40G6/33B-7/74LS244! O:41C2/27A-14/74PCT244! O:42C6/33G-21/AM29C821! T:47C2/7C-6/74PCT374! T:47E2/4C-6/74PCT374!
IDB14	21	I:3D2/17A-4/74LS244 T:13E3/9A-5/74ALS534! T:13C3/12A-5/74ALS534! O:19C6/26B-18/27256! I:20E5/9C-4/74PCT373 T:20E5/9C-5/74PCT373! B:20B7/28B-17/74LS245! B:20B6/24B-17/74LS245! B:20B4/20B-17/74LS245! B:20B3/16B-17/74LS245! B:28E3/10B-17/74PCT245! B:30D3/17B-3/74PCT245! B:32F7/35F-16/TMM2018D 25! B:32F3/33F-8/74PCT245! B:32H4/RN11-7/4610X 101 102! I:35D3/14B-4/74PCT244 O:40G6/33B-5/74LS244! O:41C2/27A-16/74PCT244! O:42C6/33G-22/AM29C821! T:47C2/7C-5/74PCT374! T:47E2/4C-5/74PCT374!
IDB15	21	I:3D2/17A-2/74LS244 T:13E3/9A-2/74ALS534! T:13C3/12A-2/74ALS534! O:19C6/26B-19/27256! I:20E5/9C-3/74PCT373 T:20E5/9C-2/74PCT373! B:20B7/28B-18/74LS245! B:20B6/24B-18/74LS245! B:20B4/20B-18/74LS245! B:20B3/16B-18/74LS245! B:28E3/10B-18/74PCT245! B:30D3/17B-2/74PCT245! B:32F7/35F-17/TMM2018D 25! B:32F3/33F-9/74PCT245! B:32H4/RN11-8/4610X 101 102! I:35D3/14B-2/74PCT244 O:40G6/33B-3/74LS244! O:41C2/27A-18/74PCT244! O:42C6/33G-23/AM29C821! T:47C2/7C-2/74PCT374! T:47E2/4C-2/74PCT374!
IDB2	27	I:3D3/19A-13/74LS244 T:13C5/10A-15/74ALS534! T:13E5/8A-15/74ALS534! O:19C4/23B-13/27256! I:20E6/8C-14/74PCT373 T:20E6/8C-15/74PCT373! B:20C7/29B-13/74LS245! B:20C6/27B-13/74LS245! B:20C4/21B-13/74LS245! B:20C3/19B-13/74LS245! O:26D4/27H-5/74PCT244! B:28E5/9B-13/74PCT245! B:30D5/18B-7/74PCT245! B:32F5/34F-11/TMM2018D 25! B:32F2/32F-4/74PCT245! B:32H2/RN10-4/4610X 101 102! B:34D4/22F-12/PAL16R4D!
IDB3	25	I:35D5/15B-13/74PCT244 B:39C7/34D-H13/ND DELDGA! T:40G4/32B-6/74LS374! I:41E4/28A-14/74LS273 O:41C7/24A-7/74PCT244! O:41C5/25A-7/74PCT244! B:42B3/32H-1/SC2661! O:42C6/33G-16/AM29C821! T:47C4/3C-15/74PCT374! T:47E4/6D-15/74PCT374! I:3D3/19A-11/74LS244 T:13C5/10A-12/74ALS534! T:13E5/8A-12/74ALS534! O:19C4/23B-15/27256! I:20E6/8C-13/74PCT373 T:20E6/8C-12/74PCT373! B:20C7/29B-14/74LS245! B:20C6/27B-14/74LS245! B:20C4/21B-14/74LS245! B:20C3/19B-14/74LS245! B:28E5/9B-14/74PCT245! B:30D5/18B-6/74PCT245! B:32F5/34F-13/TMM2018D 25! B:32F2/32F-5/74PCT245! B:32H2/RN10-5/4610X 101 102! I:35D5/15B-11/74PCT244 B:39C7/34D-H12/ND DELDGA! T:40G4/32B-9/74LS374! I:41E4/28A-13/74LS273 O:41C7/24A-9/74PCT244! O:41C5/25A-9/74PCT244! B:42B3/32H-2/SC2661!

IBD4 26 O:42C6/33G-17/AM29C821! T:47C4/3C-12/74PCT374! T:47E4/6D-12/74PCT374!
I:3D3/19A-8/74LS244 T:13C5/10A-9/74ALS534!
T:13E5/8A-9/74ALS534! O:19C4/23B-16/27256! I:20E6/8C-8/74PCT373
T:20E6/8C-9/74PCT373! B:20C7/29B-15/74LS245! B:20C6/27B-15/74LS245!
B:20C4/21B-15/74LS245! B:20C3/19B-15/74LS245! O:26D4/27H-3/74PCT244!
B:28E5/9B-15/74PCT245! B:30D5/18B-5/74PCT245! B:32F5/34F-14/TMM2018D 25!
B:32F2/32F-6/74PCT245! B:32H2/RN10-6/4610X_101_102! I:35D5/15B-8/74PCT244
+
IBD5 24 I:39C7/34D-H11/ND DELDGA T:40G4/32B-12/74LS374! I:41E4/28A-8/74LS273
O:41C7/24A-12/74PCT244! O:41C5/25A-12/74PCT244! B:42B3/32H-5/SC2661!
O:42C6/33G-18/AM29C821! T:47C4/3C-9/74PCT374! T:47E4/6D-9/74PCT374!
I:3D3/19A-6/74LS244 T:13C5/10A-6/74ALS534!
T:13E5/8A-6/74ALS534! O:19C4/23B-17/27256! I:20E6/8C-7/74PCT373
T:20E6/8C-6/74PCT373! B:20C7/29B-16/74LS245! B:20C6/27B-16/74LS245!
B:20C4/21B-16/74LS245! B:20C3/19B-16/74LS245! B:28E5/9B-16/74PCT245!
B:30D5/18B-4/74PCT245! B:32F5/34F-15/TMM2018D 25! B:32F2/32F-7/74PCT245!
B:32H2/RN10-7/4610X_101_102! I:35D5/15B-6/74PCT244 I:39C7/34D-J13/ND DELDGA
+
IBD6 24 T:40G4/32B-15/74LS374! I:41E4/28A-7/74LS273 O:41C7/24A-14/74PCT244!
O:41C5/25A-14/74PCT244! B:42B3/32H-6/SC2661! T:47C4/3C-6/74PCT374!
T:47E4/6D-6/74PCT374!
I:3D3/19A-4/74LS244 T:13C5/10A-5/74ALS534!
T:13E5/8A-5/74ALS534! O:19C4/23B-18/27256! I:20E6/8C-4/74PCT373
T:20E6/8C-5/74PCT373! B:20C7/29B-17/74LS245! B:20C6/27B-17/74LS245!
B:20C4/21B-17/74LS245! B:20C3/19B-17/74LS245! B:28E5/9B-17/74PCT245!
B:30D5/18B-3/74PCT245! B:32F5/34F-16/TMM2018D 25! B:32F2/32F-8/74PCT245!
B:32H2/RN10-8/4610X_101_102! I:35D5/15B-4/74PCT244 I:39C7/34D-J12/ND DELDGA
+
IBD7 24 T:40G4/32B-16/74LS374! I:41E4/28A-4/74LS273 O:41C7/24A-16/74PCT244!
O:41C5/25A-16/74PCT244! B:42B3/32H-7/SC2661! T:47C4/3C-5/74PCT374!
T:47E4/6D-5/74PCT374!
I:3D3/19A-2/74LS244 T:13C5/10A-2/74ALS534!
T:13E5/8A-2/74ALS534! O:19C4/23B-19/27256! I:20E6/8C-3/74PCT373
T:20E6/8C-2/74PCT373! B:20C7/29B-18/74LS245! B:20C6/27B-18/74LS245!
B:20C4/21B-18/74LS245! B:20C3/19B-18/74LS245! B:28E5/9B-18/74PCT245!
B:30D5/18B-2/74PCT245! B:32F5/34F-17/TMM2018D 25! B:32F2/32F-9/74PCT245!
B:32H2/RN10-9/4610X_101_102! I:35D5/15B-2/74PCT244 I:39C7/34D-K13/ND DELDGA
+
IBD8 21 T:40G4/32B-19/74LS374! I:41E4/28A-3/74LS273 O:41C7/24A-18/74PCT244!
O:41C5/25A-18/74PCT244! B:42B3/32H-8/SC2661! T:47C4/3C-2/74PCT374!
T:47E4/6D-2/74PCT374!
I:3D2/17A-17/74LS244 T:13E3/9A-19/74ALS534!
T:13C3/12A-19/74ALS534! O:19C6/26B-11/27256! I:20E5/9C-18/74PCT373
T:20E5/9C-19/74PCT373! B:20B7/28B-11/74LS245! B:20B6/24B-11/74LS245!
B:20B4/20B-11/74LS245! B:20B3/16B-11/74LS245! B:28E3/10B-11/74PCT245!
I:28B7/8B-17/74LS244 B:30D3/17B-9/74PCT245! B:32F7/35F-9/TMM2018D 25!
B:32F3/33F-2/74PCT245! B:32H2/RN10-10/4610X_101_102! I:35D3/14B-17/74PCT244
+
IBD9 20 O:40G6/33B-18/74LS244! O:41C2/27A-3/74PCT244! T:47C2/7C-19/74PCT374!
T:47E2/4C-19/74PCT374!
I:3D2/17A-15/74LS244 T:13E3/9A-16/74ALS534!
T:13C3/12A-16/74ALS534! O:19C6/26B-12/27256! I:20E5/9C-17/74PCT373
T:20E5/9C-16/74PCT373! B:20B7/28B-12/74LS245! B:20B6/24B-12/74LS245!
B:20B4/20B-12/74LS245! B:20B3/16B-12/74LS245! B:28E3/10B-12/74PCT245!
B:30D3/17B-8/74PCT245! B:32F7/35F-10/TMM2018D 25! B:32F3/33F-3/74PCT245!
B:32H4/RN11-2/4610X_101_102! I:35D3/14B-15/74PCT244 O:40G6/33B-16/74LS244!
+
IHIT~ #25 1 O:41C2/27A-5/74PCT244! T:47C2/7C-16/74PCT374! T:47E2/4C-16/74PCT374!
ILOAD~ 2 T:25F5/18F-14/PAL16R4D!
INR0 2 O:4E3/33C-18/74F244! I:39C7/34D-C10/ND DELDGA
INR1 2 O:3G6/B-B6!! I:41C7/24A-17/74PCT244
INR2 2 O:3G6/B-B13!! I:41C7/24A-15/74PCT244
INR3 2 O:3G6/B-B7!! I:41C7/24A-13/74PCT244
INR4 2 O:3G5/B-B8!! I:41C7/24A-11/74PCT244
INR5 2 O:3G5/B-B17!! I:41C7/24A-8/74PCT244
INR6 2 O:3G5/B-B5!! I:41C7/24A-6/74PCT244
INR7 2 O:3G5/B-B4!! I:41C7/24A-4/74PCT244
INR8 2 O:3G5/B-B15!! I:41C7/24A-2/74PCT244
INTRQ~ #33 2 B:33E5/TP1-1/TESTPOINT! O:33B7/28F-S11/ND DELILAH!
IOC0 #41 2 O:41E4/28A-19/74LS273! I:41F5/14A-5/74LS38
IOC1 #41 2 O:41E4/28A-16/74LS273! I:41F4/29A-5/74F08
IOC2 #41 2 O:41E4/28A-15/74LS273! I:41F5/14A-9/74LS38
IOC3 #41 2 O:41E4/28A-12/74LS273! I:41F5/14A-4/74LS38
IOD~ 4 T:6D2/10D-14/PAL16R8D! I:7D2/3A-11/74F241
I:7C5/8G-2/74F00 I:12E4/2C-6/PAL16L8D
IONI 2 O:33B7/28F-A6/ND DELILAH! I:40D7/35C-21/MC68705U3
IORQ~ 7 I:6D2/10D-3/PAL16R8D I:6D4/5D-9/PAL16R4D
B:12D2/11D-14/PAL16L8D! I:36B6/25H-5/74F00 I:36B6/25H-9/74F00
O:39C7/34D-L6/ND DELDGA! I:45C4/9G-3/PAL16R4D
IOXERR~ 3 T:7D2/3A-9/74F241! O:7E1/RN13-6/4610X_101_102!
I:33B7/28F-R13/ND DELILAH
ISEMRQ~ 2 O:4C6/5C-16/74F244! I:8C3/3D-4/AM29C821
ISTOP 2 O:4E3/33C-12/74F244! I:39C7/34D-A12/ND DELDGA
LA10 7 I:3F3/16G-13/74LS244 I:23D5/23H-17/74PCT244

LA11	7	I:29B3/22G-8/TMM2018D_25	I:29D3/24G-8/TMM2018D_25	I:29B6/23G-8/TMM2018D_25
		I:29D6/25G-8/TMM2018D_25	O:33B7/28F-M17/ND DELILAH!	
		I:3F3/16G-11/74LS244	I:23D5/23H-15/74PCT244	
		I:29B3/22G-7/TMM2018D_25	I:29D3/24G-7/TMM2018D_25	I:29B6/23G-7/TMM2018D_25
LA12	7	I:29D6/25G-7/TMM2018D_25	O:33B7/28F-M15/ND DELILAH!	
		I:3F3/16G-8/74LS244	I:23D5/23H-13/74PCT244	
		I:29B3/22G-6/TMM2018D_25	I:29D3/24G-6/TMM2018D_25	I:29B6/23G-6/TMM2018D_25
LA13	7	I:29D6/25G-6/TMM2018D_25	O:33B7/28F-L17/ND DELILAH!	
		I:3F3/16G-6/74LS244	I:23D5/23H-11/74PCT244	
		I:29B3/22G-5/TMM2018D_25	I:29D3/24G-5/TMM2018D_25	I:29B6/23G-5/TMM2018D_25
LA14	7	I:29D6/25G-5/TMM2018D_25	O:33B7/28F-L15/ND DELILAH!	
		I:3F3/16G-4/74LS244	I:23D5/23H-8/74PCT244	
		I:29B3/22G-4/TMM2018D_25	I:29D3/24G-4/TMM2018D_25	I:29B6/23G-4/TMM2018D_25
LA15	7	I:29D6/25G-4/TMM2018D_25	O:33B7/28F-K16/ND DELILAH!	
		I:3F3/16G-2/74LS244	I:23D5/23H-6/74PCT244	
		I:29B3/22G-3/TMM2018D_25	I:29D3/24G-3/TMM2018D_25	I:29B6/23G-3/TMM2018D_25
LA16	7	I:29D6/25G-3/TMM2018D_25	O:33B7/28F-K17/ND DELILAH!	
		I:3F2/17G-17/74LS244	I:23D5/23H-4/74PCT244	
		I:29B3/22G-2/TMM2018D_25	I:29D3/24G-2/TMM2018D_25	I:29B6/23G-2/TMM2018D_25
LA17	7	I:29D6/25G-2/TMM2018D_25	O:33B7/28F-K14/ND DELILAH!	
		I:3F2/17G-15/74LS244	I:23D5/23H-2/74PCT244	
		I:29B3/22G-1/TMM2018D_25	I:29D3/24G-1/TMM2018D_25	I:29B6/23G-1/TMM2018D_25
LA18	7	I:29D6/25G-1/TMM2018D_25	O:33B7/28F-J17/ND DELILAH!	
		I:3F2/17G-13/74LS244	I:23D3/15G-17/74PCT244	
		I:29B3/22G-23/TMM2018D_25	I:29D3/24G-23/TMM2018D_25	
		I:29B6/23G-23/TMM2018D_25	I:29D6/25G-23/TMM2018D_25	
LA19	7	O:33B7/28F-K15/ND DELILAH!		
		I:3F2/17G-11/74LS244	I:23D3/15G-15/74PCT244	
		I:29B3/22G-22/TMM2018D_25	I:29D3/24G-22/TMM2018D_25	
		I:29B6/23G-22/TMM2018D_25	I:29D6/25G-22/TMM2018D_25	
LA20	7	O:33B7/28F-J16/ND DELILAH!		
		I:3F2/17G-8/74LS244	I:23D3/15G-13/74PCT244	
		I:29B3/22G-19/TMM2018D_25	I:29D3/24G-19/TMM2018D_25	
		I:29B6/23G-19/TMM2018D_25	I:29D6/25G-19/TMM2018D_25	
LA21	3	O:33B7/28F-H17/ND DELILAH!		
		I:3F2/17G-6/74LS244	I:23D3/15G-11/74PCT244	
		O:33B7/28F-J14/ND DELILAH!		
		I:3F2/17G-4/74LS244	I:23D3/15G-8/74PCT244	
LA22	3	O:33B7/28F-H16/ND DELILAH!		
		I:3F2/17G-2/74LS244	I:23D3/15G-6/74PCT244	
		O:33B7/28F-J15/ND DELILAH!		
		I:3F2/17G-1/74LS244	I:23D3/15G-5/74PCT244	
LAA0	3	O:33B7/28F-K1/ND DELILAH!		
		I:32F5/34F-8/TMM2018D_25	I:32F7/35F-8/TMM2018D_25	
		O:33B7/28F-K1/ND DELILAH!		
		I:32F5/34F-7/TMM2018D_25	I:32F7/35F-7/TMM2018D_25	
LAA1	3	O:33B7/28F-J4/ND DELILAH!		
		I:32F5/34F-6/TMM2018D_25	I:32F7/35F-6/TMM2018D_25	
		O:33B7/28F-K2/ND DELILAH!		
		I:32F5/34F-5/TMM2018D_25	I:32F7/35F-5/TMM2018D_25	
LAA2	3	O:33B7/28F-J3/ND DELILAH!		
		I:23D3/15G-1/74PCT244	I:23D3/15G-19/74PCT244	
		I:23D5/23H-1/74PCT244	I:23D5/23H-19/74PCT244	O:24A2/21G-12/PAL16L8D!
		I:32F5/34F-4/TMM2018D_25	I:32F7/35F-4/TMM2018D_25	
LAA3	3	O:33B7/28F-L1/ND DELILAH!	I:36B3/15D-9/PAL16R4D	
		I:32F5/34F-3/TMM2018D_25	I:32F7/35F-3/TMM2018D_25	
		O:33B7/28F-M1/ND DELILAH!	I:36B3/15D-8/PAL16R4D	
		I:32F5/34F-2/TMM2018D_25	I:32F7/35F-2/TMM2018D_25	
LAA0	3	O:33B7/28F-K4/ND DELILAH!		
		I:32F5/34F-1/TMM2018D_25	I:32F7/35F-1/TMM2018D_25	
		O:33B7/28F-N1/ND DELILAH!	I:36B3/15D-7/PAL16R4D	
		I:3E7/4G-17/74F244	B:10D6/6A-13/74AS648!	
LBA0	4	B:11D5/6B-11/74AS646!	T:14D6/6C-19/74PCT374!	I:44B2/3H-2/AM29C821
		I:46C5/2F-3/PAL16L8B	B:46D2/1H-2/AM29833!	I:47E4/6D-18/74PCT374
		O:47A5/RN25-2/4610X_101_102!		
		I:3E7/4G-15/74F244	B:10D6/6A-14/74AS648!	
LBA1	4	B:11D5/6B-10/74AS646!	T:14D6/6C-16/74PCT374!	I:44B2/3H-3/AM29C821
		I:46C5/2F-4/PAL16L8B	B:46D2/1H-3/AM29833!	I:47E4/6D-17/74PCT374
		O:47A5/RN25-3/4610X_101_102!		
		I:3D7/5G-13/74F244	B:10D4/5A-15/74AS648!	
LBA2	3	B:11D4/7B-9/74AS646!	T:14D5/4B-15/74PCT374!	I:44B5/4H-3/AM29C821
		B:46D4/2H-4/AM29833!	I:47E2/4C-14/74PCT374	O:47A4/RN24-4/4610X_101_102!
		I:3D7/5G-11/74F244	B:10D4/5A-16/74AS648!	
		B:11D4/7B-8/74AS646!	T:14D5/4B-12/74PCT374!	I:44B5/4H-4/AM29C821
LBA3	4	B:46D4/2H-5/AM29833!	I:47E2/4C-13/74PCT374	O:47B4/RN24-5/4610X_101_102!
		I:3D7/5G-8/74F244	B:10D4/5A-17/74AS648!	
		B:11D4/7B-7/74AS646!	T:14D5/4B-9/74PCT374!	I:44B5/4H-5/AM29C821
		B:46D4/2H-6/AM29833!	I:47E2/4C-8/74PCT374	O:47B4/RN24-6/4610X_101_102!
LBD0	9	I:3D7/5G-6/74F244	B:10D4/5A-18/74AS648!	
LBD1	9			
LBD10	8			
LBD11	8			
LBD12	8			
LBD13	8			

			B:11D4/7B-6/74AS646! T:14D5/4B-6/74PCT374! I:44B5/4H-6/AM29C821
			B:46D4/2H-7/AM29833! I:47E2/4C-7/74PCT374 O:47B4/RN24-7/4610X 101 102!
LBD14	8		I:3D7/5G-4/74F244 B:10D4/5A-19/74AS648!
			B:11D4/7B-5/74AS646! T:14D5/4B-5/74PCT374! I:44B5/4H-7/AM29C821
			B:46D4/2H-8/AM29833! I:47E2/4C-4/74PCT374 O:47B4/RN24-8/4610X 101 102!
LBD15	8		I:3D7/5G-2/74F244 B:10D4/5A-20/74AS648!
			B:11D4/7B-4/74AS646! T:14D5/4B-2/74PCT374! I:44B5/4H-8/AM29C821
			B:46D4/2H-9/AM29833! I:47E2/4C-3/74PCT374 O:47B4/RN24-9/4610X 101 102!
LBD16	5		B:10D2/4A-13/74AS648! T:14D3/3B-19/74PCT374!
			I:44B5/4H-9/AM29C821 I:47C4/3C-18/74PCT374 O:47A3/RN23-2/4610X 101 102!
LBD17	5		B:10D2/4A-14/74AS648! T:14D3/3B-16/74PCT374!
			I:44B5/4H-10/AM29C821 I:47C4/3C-17/74PCT374 O:47A3/RN23-3/4610X 101 102!
LBD18	5		B:10D2/4A-15/74AS648! T:14D3/3B-15/74PCT374!
			I:44B2/3H-11/AM29C821 I:47C4/3C-14/74PCT374 O:47A3/RN23-4/4610X 101 102!
LBD19	5		B:10D2/4A-16/74AS648! T:14D3/3B-12/74PCT374!
			I:44B5/4H-11/AM29C821 I:47C4/3C-13/74PCT374 O:47B3/RN23-5/4610X 101 102!
LBD2	8		I:3E7/4G-13/74F244 B:10D6/6A-15/74AS648!
			B:11D5/6B-9/74AS646! T:14D6/6C-15/74PCT374! I:44B2/3H-4/AM29C821
			B:46D2/1H-4/AM29833! I:47E4/6D-14/74PCT374 O:47A5/RN25-4/4610X 101 102!
LBD20	4		B:10D2/4A-17/74AS648! T:14D3/3B-9/74PCT374!
			I:47C4/3C-8/74PCT374 O:47B3/RN23-6/4610X 101 102!
LBD21	4		B:10D2/4A-18/74AS648! T:14D3/3B-6/74PCT374!
			I:47C4/3C-7/74PCT374 O:47B3/RN23-7/4610X 101 102!
LBD22	4		B:10D2/4A-19/74AS648! T:14D3/3B-5/74PCT374!
			I:47C4/3C-4/74PCT374 O:47B3/RN23-8/4610X 101 102!
LBD23	4		B:10D2/4A-20/74AS648! T:14D3/3B-2/74PCT374!
			I:47C4/3C-3/74PCT374 O:47B3/RN23-9/4610X 101 102!
LBD3	9		I:3E7/4G-11/74F244 B:10D6/6A-16/74AS648!
			B:11D5/6B-8/74AS646! T:14D6/6C-12/74PCT374! I:44B2/3H-5/AM29C821
			I:46C5/2F-5/PAL16L8B B:46D2/1H-5/AM29833! I:47E4/6D-13/74PCT374
			O:47B5/RN25-5/4610X 101 102!
LBD4	9		I:3E7/4G-8/74F244 B:10D6/6A-17/74AS648!
			B:11D5/6B-7/74AS646! T:14D6/6C-9/74PCT374! I:44B2/3H-6/AM29C821
			I:46C5/2F-6/PAL16L8B B:46D2/1H-6/AM29833! I:47E4/6D-8/74PCT374
			O:47B5/RN25-6/4610X 101 102!
LBD5	8		I:3E7/4G-6/74F244 B:10D6/6A-18/74AS648!
			B:11D5/6B-6/74AS646! T:14D6/6C-6/74PCT374! I:44B2/3H-7/AM29C821
			B:46D2/1H-7/AM29833! I:47E4/6D-7/74PCT374 O:47B5/RN25-7/4610X 101 102!
LBD6	8		I:3E7/4G-4/74F244 B:10D6/6A-19/74AS648!
			B:11D5/6B-5/74AS646! T:14D6/6C-5/74PCT374! I:44B2/3H-8/AM29C821
			B:46D2/1H-8/AM29833! I:47E4/6D-4/74PCT374 O:47B5/RN25-8/4610X 101 102!
LBD7	8		I:3E7/4G-2/74F244 B:10D6/6A-20/74AS648!
			B:11D5/6B-4/74AS646! T:14D6/6C-2/74PCT374! I:44B2/3H-9/AM29C821
			B:46D2/1H-9/AM29833! I:47E4/6D-3/74PCT374 O:47B5/RN25-9/4610X 101 102!
LBD8	8		I:3D7/5G-17/74F244 B:10D4/5A-13/74AS648!
			B:11D4/7B-11/74AS646! T:14D5/4B-19/74PCT374! I:44B2/3H-10/AM29C821
			B:46D4/2H-2/AM29833! I:47E2/4C-18/74PCT374 O:47A4/RN24-2/4610X 101 102!
LBD9	8		I:3D7/5G-15/74F244 B:10D4/5A-14/74AS648!
			B:11D4/7B-10/74AS646! T:14D5/4B-16/74PCT374! I:44B5/4H-2/AM29C821
			B:46D4/2H-3/AM29833! I:47E2/4C-17/74PCT374 O:47A4/RN24-3/4610X 101 102!
LCS~	13		I:3A4/16A-11/74LS244 I:18B2/15F-5/PAL16L8D
			I:18C1/29A-1/74F08 I:26D4/27H-8/74PCT244 I:33B7/28F-P10/ND DELILAH
			I:34D3/19F-8/PAL16R4D I:34D4/22F-9/PAL16R4D T:36B5/14D-17/PAL16R4D!
			I:36F2/9D-5/74F02 I:36F2/9D-6/74F02 O:39A4/RN17-7/4610X 101 103!
			I:39C7/34D-E3/ND DELDGA I:42A1/11B-1/74LS04
LDEXM~	#34	1	T:34D4/22F-17/PAL16R4D!
LDR~	#50	1	T:50B6/5F-15/PAL16R8D!
LERR~	7		B:6D6/8D-13/PAL16L8B! T:46D2/1H-10/AM29833!
			T:46D4/2H-10/AM29833! I:46E5/8J-1/74LS112 I:46E7/8J-13/74LS112
			O:46F3/R21-2/3300HM! I:47D7/4F-8/PAL16L8B
LEVO	2		O:34D6/26H-12/PAL16L8B! I:40D7/35C-19/MC68705U3
LHIT	2		O:39C7/34D-M9/ND DELDGA! I:40D7/35C-20/MC68705U3
LOAD~	4		O:2D4/A-C15!! B:4D1/RN3-2/4610X 101 102!
			I:4E3/33C-2/74F244 O:4C2/C-B12/T
LOCK~	3		B:2E2/RN1-8/4610X 101 102! O:2D4/A-C20!!
			I:42C6/33G-5/AM29C821
LOEN25~	#50	1	T:50B6/5F-16/PAL16R8D!
LOEN~	4		I:44B2/3H-1/AM29C821 I:48E4/3F-4/PAL16L8D
			I:50B6/5F-2/PAL16R8D T:50E6/6F-13/PAL16R8D!
LPERR~	2		I:6D6/8D-7/PAL16L8B O:46E7/8J-7/74LS112!
LSHADOW	10		I:3A4/16A-15/74LS244 I:24A2/21G-11/PAL16L8D
			I:24A3/17F-3/74F10 I:25F5/18F-4/PAL16R4D I:27D3/18G-4/74FCT521A
			O:33B7/28F-Q16/ND DELILAH! I:36B6/32C-4/74F32 I:36B6/32C-2/74F32
			I:39C7/34D-F3/ND DELDGA O:39A4/RN17-6/4610X 101 103!
LUA0	20		I:3A3/22A-11/74LS244 O:17E4/31F-14/AM29841!
			I:19C6/26B-8/27256 I:19C4/23B-8/27256 I:22B7/19C-16/IDT6168A 20
			I:22B6/18C-16/IDT6168A 20 I:22B4/17C-16/IDT6168A 20 I:22B2/16C-16/IDT6168A 20
			I:22C6/22C-16/IDT6168A 20 I:22C7/23C-16/IDT6168A 20
			I:22C4/21C-16/IDT6168A 20 I:22C2/20C-16/IDT6168A 20 I:22D6/26C-16/IDT6168A 20
			I:22D7/27C-16/IDT6168A 20 I:22D4/25C-16/IDT6168A 20
			I:22D2/24C-16/IDT6168A 20 I:22F6/30C-16/IDT6168A 20 I:22F7/31C-16/IDT6168A 20

LUA1	20	I:22F4/29C-16/IDT6168A_20	I:22F2/28C-16/IDT6168A_20
		I:3A3/22A-8/74LS244	O:17E4/31F-15/AM29841!
		I:19C6/26B-7/27256	I:19C4/23B-7/27256
		I:22B7/19C-17/IDT6168A_20	I:22B6/18C-17/IDT6168A_20
LUA10	20	I:22C6/22C-17/IDT6168A_20	I:22C7/23C-17/IDT6168A_20
		I:22C4/21C-17/IDT6168A_20	I:22C2/20C-17/IDT6168A_20
		I:22D7/27C-17/IDT6168A_20	I:22D4/25C-17/IDT6168A_20
		I:22D2/24C-17/IDT6168A_20	I:22F6/30C-17/IDT6168A_20
LUA11	20	I:22F4/29C-17/IDT6168A_20	I:22F2/28C-17/IDT6168A_20
		I:3A2/23A-6/74LS244	T:17E2/30H-6/74F373!
		I:19C6/26B-2/27256	I:19C4/23B-2/27256
		I:22B7/19C-7/IDT6168A_20	I:22B6/18C-7/IDT6168A_20
LUA12	9	I:22C6/22C-7/IDT6168A_20	I:22C7/23C-7/IDT6168A_20
		I:22C4/21C-7/IDT6168A_20	I:22C2/20C-7/IDT6168A_20
		I:22D7/27C-7/IDT6168A_20	I:22D4/25C-7/IDT6168A_20
		I:22D2/24C-7/IDT6168A_20	I:22F6/30C-7/IDT6168A_20
LUA2	20	I:22F7/31C-7/IDT6168A_20	I:22F4/29C-7/IDT6168A_20
		I:22F2/28C-7/IDT6168A_20	I:3A2/23A-4/74LS244
		T:17E2/30H-5/74F373!	I:17D6/11F-12/74S37
		I:17E7/31G-1/AM29841	B:18B2/15F-13/PAL16L8D!
LUA3	20	I:19C6/26B-27/27256	I:19C4/23B-27/27256
		I:36B5/14D-8/PAL16R4D	I:3A3/22A-6/74LS244
		O:17E4/31F-16/AM29841!	I:19C6/26B-6/27256
		I:19C4/23B-6/27256	I:22B7/19C-18/IDT6168A_20
LUA4	20	I:22B6/18C-18/IDT6168A_20	I:22B4/17C-18/IDT6168A_20
		I:22B2/16C-18/IDT6168A_20	I:22C6/22C-18/IDT6168A_20
		I:22C7/23C-18/IDT6168A_20	I:22C4/21C-18/IDT6168A_20
		I:22C2/20C-18/IDT6168A_20	I:22D6/26C-18/IDT6168A_20
LUA5	20	I:22D7/27C-18/IDT6168A_20	I:22D4/25C-18/IDT6168A_20
		I:22D2/24C-18/IDT6168A_20	I:22F6/30C-18/IDT6168A_20
		I:22F7/31C-18/IDT6168A_20	I:22F4/29C-18/IDT6168A_20
		I:22F2/28C-18/IDT6168A_20	I:3A3/22A-4/74LS244
LUA6	20	O:17E4/31F-17/AM29841!	I:19C6/26B-5/27256
		I:19C4/23B-5/27256	I:22B7/19C-19/IDT6168A_20
		I:22B6/18C-19/IDT6168A_20	I:22B4/17C-19/IDT6168A_20
		I:22B2/16C-19/IDT6168A_20	I:22C6/22C-19/IDT6168A_20

			I:22B6/18C-3/IDT6168A_20	I:22B4/17C-3/IDT6168A_20	I:22B2/16C-3/IDT6168A_20
			I:22C6/22C-3/IDT6168A_20	I:22C7/23C-3/IDT6168A_20	I:22C4/21C-3/IDT6168A_20
			I:22C2/20C-3/IDT6168A_20	I:22D6/26C-3/IDT6168A_20	I:22D7/27C-3/IDT6168A_20
			I:22D4/25C-3/IDT6168A_20	I:22D2/24C-3/IDT6168A_20	I:22F6/30C-3/IDT6168A_20
LUA7	20		I:22F7/31C-3/IDT6168A_20	I:22F4/29C-3/IDT6168A_20	I:22F2/28C-3/IDT6168A_20
			I:3A2/23A-13/74LS244	O:17E4/31F-21/AM29841!	
			I:19C6/26B-24/27256	I:19C4/23B-24/27256	I:22B7/19C-4/IDT6168A_20
			I:22B6/18C-4/IDT6168A_20	I:22B4/17C-4/IDT6168A_20	I:22B2/16C-4/IDT6168A_20
			I:22C6/22C-4/IDT6168A_20	I:22C7/23C-4/IDT6168A_20	I:22C4/21C-4/IDT6168A_20
			I:22C2/20C-4/IDT6168A_20	I:22D6/26C-4/IDT6168A_20	I:22D7/27C-4/IDT6168A_20
			I:22D4/25C-4/IDT6168A_20	I:22D2/24C-4/IDT6168A_20	I:22F6/30C-4/IDT6168A_20
LUA8	20		I:22F7/31C-4/IDT6168A_20	I:22F4/29C-4/IDT6168A_20	I:22F2/28C-4/IDT6168A_20
			I:3A2/23A-11/74LS244	O:17E4/31F-22/AM29841!	
			I:19C6/26B-21/27256	I:19C4/23B-21/27256	I:22B7/19C-5/IDT6168A_20
			I:22B6/18C-5/IDT6168A_20	I:22B4/17C-5/IDT6168A_20	I:22B2/16C-5/IDT6168A_20
			I:22C6/22C-5/IDT6168A_20	I:22C7/23C-5/IDT6168A_20	I:22C4/21C-5/IDT6168A_20
			I:22C2/20C-5/IDT6168A_20	I:22D6/26C-5/IDT6168A_20	I:22D7/27C-5/IDT6168A_20
			I:22D4/25C-5/IDT6168A_20	I:22D2/24C-5/IDT6168A_20	I:22F6/30C-5/IDT6168A_20
LUA9	20		I:22F7/31C-5/IDT6168A_20	I:22F4/29C-5/IDT6168A_20	I:22F2/28C-5/IDT6168A_20
			I:3A2/23A-8/74LS244	O:17E4/31F-23/AM29841!	
			I:19C6/26B-23/27256	I:19C4/23B-23/27256	I:22B7/19C-6/IDT6168A_20
			I:22B6/18C-6/IDT6168A_20	I:22B4/17C-6/IDT6168A_20	I:22B2/16C-6/IDT6168A_20
			I:22C6/22C-6/IDT6168A_20	I:22C7/23C-6/IDT6168A_20	I:22C4/21C-6/IDT6168A_20
			I:22C2/20C-6/IDT6168A_20	I:22D6/26C-6/IDT6168A_20	I:22D7/27C-6/IDT6168A_20
			I:22D4/25C-6/IDT6168A_20	I:22D2/24C-6/IDT6168A_20	I:22F6/30C-6/IDT6168A_20
			I:22F7/31C-6/IDT6168A_20	I:22F4/29C-6/IDT6168A_20	I:22F2/28C-6/IDT6168A_20
MACLK	4		I:17E4/31F-13/AM29841	I:17E5/32G-13/AM29841	
MAP~	3		I:17E2/30H-11/74F373	O:36F4/14C-11/74F00!	
			I:33B7/28F-55/ND DELILAH	B:36E5/13D-13/PAL16L8D!	
			I:36B5/14D-9/PAL16R4D		
MCL	2		I:4F6/35A-1/7406	O:39C7/34D-F12/ND DELDGA!	
MCLK	3		I:32D3/25F-13/AM29C821	I:33B7/28F-510/ND DELILAH	
			O:36F3/14C-8/74F00!		
MDLY~	#36	1	T:36B5/14D-16/PAL16R4D!		
MEM~	3		T:6D2/10D-16/PAL16R8D!	I:7D2/3A-13/74F241	
			I:7D5/8G-5/74F00		
MISO	6		T:3A7/21A-16/74LS374!	I:3C6/B-A14/	I:7D2/3A-2/74F241
			I:7C1/1F-5/74F04	I:12E4/2C-5/PAL16L8D	I:42B3/32H-12/SC2661
MIS1	3		T:3A7/21A-15/74LS374!	I:3C6/B-C14/	I:42B3/32H-10/SC2661
MOFF~	#45	5	I:45C6/6G-3/PAL16R4D	I:45C4/9G-4/PAL16R4D	
			I:45E2/7G-4/PAL16R8B	B:45A5/SW2-3/SECME090320102!	
			B:45A5/RN18-8/4610X_101_102!		
MOR25~	2		I:6D6/8D-6/PAL16L8B	O:48C7/14F-16/AM29C821!	
MOR~	5		I:3A4/16A-13/74LS244	T:7D2/3A-7/74F241!	
			O:7E1/RN13-7/4610X_101_102!	I:33B7/28F-Q11/ND DELILAH	I:48C7/14F-9/AM29C821
MREQ~	2		I:36B6/32C-1/74F32	O:39C7/34D-N7/ND DELDGA!	
MR~	13		I:6D2/10D-4/PAL16R8D	I:6D6/8D-8/PAL16L8B	
			O:8E3/4D-23/AM29C821!	I:33B7/28F-F3/ND DELILAH	I:36B5/14D-7/PAL16R4D
			I:36C6/14G-4/74F08	B:46C5/2F-13/PAL16L8B!	I:46D5/14G-12/74F08
			I:46D7/14G-10/74F08	I:47D7/4F-11/PAL16L8B	I:48E4/3F-11/PAL16L8D
			I:50B6/5F-4/PAL16R8D	I:50E6/6F-6/PAL16R8D	
MSIZE0~	#45	2	B:45C4/9G-19/PAL16R4D!	I:45E2/7G-2/PAL16R8B	
MSIZE1~	#45	2	B:45C6/6G-13/PAL16R4D!	I:45E2/7G-3/PAL16R8B	
MWRITE50~	8		B:48E4/3F-13/PAL16L8D!	O:48C7/14F-21/AM29C821!	
			I:49C3/15H-21/SIP1M9	I:49C5/15J-21/SIP1M9	I:49E3/15K-21/SIP1M9
			I:49E5/15L-21/SIP1M9	I:49G5/15N-21/SIP1M9	I:49G3/15M-21/SIP1M9
MWRITE~	6		I:12D6/1C-4/PAL16L8D	T:45C6/6G-14/PAL16R4D!	
			T:45C4/9G-14/PAL16R4D!	O:45E3/RN18-5/4610X_101_102!	I:46C5/2F-1/PAL16L8B
			I:48C7/14F-3/AM29C821		
NOWRIT~	#36	1	T:36B3/15D-17/PAL16R4D!		
NUBD	#25	2	T:25F5/18F-16/PAL16R4D!	I:25G3/21F-9/AM9150_20	
NUBI	#25	2	T:25F5/18F-17/PAL16R4D!	I:25G3/21F-8/AM9150_20	
O1P	4		I:2H4/A-A9!	B:42F3/D4-2/1N4148!	B:42F3/R6-1/1KOHM!
			B:42F2/R5-1/1KOHM!		
O2N	6		I:2H5/A-A10!	I:2H5/A-C7!	O:42E4/35G-7/75150P!
			O:42E4/35G-6/75150P!	B:42F3/R7-2/2200HM!	B:42F4/C8-1/1000pF!
OCO	5		B:2D2/RN1-3/4610X_101_102!	O:2D3/A-C6!	

OC1 4 I:38B1/10F-13/74F10 I:38B2/7F-9/74F14 B:38A1/STR19-2/STR2!
B:2D2/RN1-4/4610X 101 102! O:2D3/A-A6!
OER~ #46 3 I:38B1/10F-2/74F10 I:38B2/12F-1/74S132
O:46C5/2F-12/PAL16L8B! I:46D2/1H-1/AM29833
I:46D4/2H-1/AM29833
OET~ #46 3 B:46C5/2F-18/PAL16L8B! I:46D2/1H-14/AM29833
I:46D4/2H-14/AM29833
OPCLCS 2 T:34D4/22F-15/PAL16R4D! I:38C4/29H-13/74F32
OSC 10 I:6D2/10D-1/PAL16R8D I:6D4/5D-1/PAL16R4D
I:8C3/3D-13/AM29C821 I:8E3/4D-13/AM29C821 I:36D4/12D-1/PAL16R6D
O:38C1/11F-3/74S37! I:48C4/13F-13/AM29C821 I:48C7/14F-13/AM29C821
I:50B6/5F-1/PAL16R8D I:50E6/6F-1/PAL16R8D
OSCC~ 3 B:2D2/RN1-2/4610X 101 102! O:2D2/A-B3!
I:38B3/12F-9/74S132
OUBD #25 2 B:25F5/18F-13/PAL16R4D! O:25G3/21F-11/AM9150 20!
OUBI #25 2 B:25F5/18F-12/PAL16R4D! O:25G3/21F-10/AM9150 20!
OUTGRANT~ 2 I:4F5/C-C23! O:7E3/2B-8/74F00!
OUTIDENT~ 3 I:4F5/C-C22! O:7E1/RN3-10/4610X 101 102!
T:7D2/3A-18/74F241!
PA0 4 T:39C7/34D-L13/ND DELDGA! O:40C4/34A-7/MM58274!
I:40G4/32B-3/74LS374 B:40D7/35C-33/MC68705U3!
PA1 4 T:39C7/34D-L12/ND DELDGA! O:40C4/34A-6/MM58274!
I:40G4/32B-4/74LS374 B:40D7/35C-34/MC68705U3!
PA2 4 T:39C7/34D-K11/ND DELDGA! O:40C4/34A-5/MM58274!
I:40G4/32B-7/74LS374 B:40D7/35C-35/MC68705U3!
PA3 4 T:39C7/34D-M13/ND DELDGA! O:40C4/34A-4/MM58274!
I:40G4/32B-8/74LS374 B:40D7/35C-36/MC68705U3!
PA4 4 T:39C7/34D-L10/ND DELDGA! I:40C4/34A-12/MM58274
I:40G4/32B-13/74LS374 B:40D7/35C-37/MC68705U3!
PA5 4 T:39C7/34D-N12/ND DELDGA! I:40C4/34A-11/MM58274
I:40G4/32B-14/74LS374 B:40D7/35C-38/MC68705U3!
PA6 4 T:39C7/34D-N11/ND DELDGA! I:40C4/34A-10/MM58274
I:40G4/32B-17/74LS374 B:40D7/35C-39/MC68705U3!
PA7 4 T:39C7/34D-M10/ND DELDGA! I:40C4/34A-9/MM58274
I:40G4/32B-18/74LS374 B:40D7/35C-40/MC68705U3!
PANOSC 2 O:39C7/34D-E11/ND DELDGA! I:40D7/35C-8/MC68705U3
PAN~ 2 I:33B7/28F-R9/ND DELILAH O:39C7/34D-F13/ND DELDGA!
PARERR~ 2 B:6D6/8D-17/PAL16L8B! I:33B7/28F-S14/ND DELILAH
PA~ 4 I:6C7/12C-4/74F32 O:39C7/34D-A4/ND DELDGA!
I:46D7/14C-9/74F08 I:47D7/4F-6/PAL16L8B
PCRO 2 O:33B7/28F-Q15/ND DELILAH! I:40D7/35C-24/MC68705U3
PCR1 2 O:33B7/28F-Q17/ND DELILAH! I:40D7/35C-23/MC68705U3
PD1 16 O:2B6/13B-2/74F04! I:4C6/5C-1/74F244 I:4C6/5C-19/74F244
I:4E3/33C-1/74F244 I:4E3/33C-19/74F244 I:6D4/5D-11/PAL16R4D
I:8E3/4D-1/AM29C821 I:12E4/2C-8/PAL16L8D I:17E4/31F-1/AM29841
I:17E2/30H-1/74F373 I:32D3/25F-1/AM29C821 I:34D3/19F-11/PAL16R4D
I:34D4/22F-11/PAL16R4D I:36B5/14D-11/PAL16R4D I:36B3/15D-11/PAL16R4D
I:50B6/5F-11/PAL16R8D
PD2 3 O:2B6/13B-4/74F04! I:25F5/18F-11/PAL16R4D
I:26D4/27H-1/74PCT244
PD3 7 O:2B7/13B-6/74F04! I:6D2/10D-11/PAL16R8D
B:6D6/8D-14/PAL16L8B! I:8C3/3D-1/AM29C821 B:12D2/11D-15/PAL16L8D!
PD4 7 I:12D6/1C-9/PAL16L8D I:50E6/6F-11/PAL16R8D
O:2B7/13B-8/74F04! I:36D4/12D-11/PAL16R6D
I:44D4/5H-13/AM29861A I:45E2/7G-11/PAL16R8B I:47D7/4F-7/PAL16L8B
I:48C4/13F-1/AM29C821 I:48C7/14F-1/AM29C821
PILO 3 I:3A4/16A-2/74LS244 O:33B7/28F-A8/ND DELILAH!
I:34D6/26H-2/PAL16L8B
PIL1 3 I:3A3/22A-17/74LS244 O:33B7/28F-D9/ND DELILAH!
I:34D6/26H-3/PAL16L8B
PIL2 3 I:3A3/22A-15/74LS244 O:33B7/28F-B8/ND DELILAH!
I:34D6/26H-4/PAL16L8B
PIL3 3 I:3A3/22A-13/74LS244 O:33B7/28F-C9/ND DELILAH!
I:34D6/26H-5/PAL16L8B
PONI 4 O:33B7/28F-C8/ND DELILAH! O:39A4/RN17-3/4610X 101 103!
I:39C7/34D-E2/ND DELDGA I:40D7/35C-22/MC68705U3
POWFAIL~ 2 I:33B7/28F-P11/ND DELILAH O:39C7/34D-E12/ND DELDGA!
POWSENSE 2 O:38C6/7F-10/74F14! I:39C7/34D-A10/ND DELDGA
POWSENSE~ 5 B:4D4/C1-1/10nF! O:4C4/C-A29!! O:4C4/C-B29!!
O:4C4/C-C29!! I:38C6/7F-11/74F14
PPN10 7 I:14D5/4B-14/74PCT374 O:23D5/23H-3/74PCT244!
I:27D6/19G-17/74FCT521A B:28E5/9B-9/74PCT245! I:29F4/20G-7/IMS1403 25
B:29B6/23G-17/TMM2018D 25! I:31D5/10G-17/74PCT244
PPN11 7 I:14D5/4B-13/74PCT374 O:23D5/23H-5/74PCT244!
I:27D6/19G-15/74FCT521A B:28E5/9B-8/74PCT245! I:29F4/20G-6/IMS1403 25
B:29B6/23G-16/TMM2018D 25! I:31D5/10G-15/74PCT244
PPN12 7 I:14D5/4B-8/74PCT374 O:23D5/23H-7/74PCT244!
I:27D6/19G-13/74FCT521A B:28E5/9B-7/74PCT245! I:29F4/20G-5/IMS1403 25
B:29B6/23G-15/TMM2018D 25! I:31D5/10G-13/74PCT244
PPN13 7 I:14D5/4B-7/74PCT374 O:23D5/23H-9/74PCT244!
I:27D6/19G-11/74FCT521A B:28E5/9B-6/74PCT245! I:29F4/20G-4/IMS1403 25
B:29B6/23G-14/TMM2018D 25! I:31D5/10G-11/74PCT244
PPN14 7 I:14D5/4B-4/74PCT374 O:23D5/23H-12/74PCT244!
I:27D6/19G-8/74FCT521A B:28E5/9B-5/74PCT245! I:29F4/20G-3/IMS1403 25

PPN15 7 B:29B6/23G-13/TMM2018D 25! I:31D5/10G-8/74PCT244
I:14D5/4B-3/74PCT374 O:23D5/23H-14/74PCT244!
I:27D6/19G-6/74FCT521A B:28E5/9B-4/74PCT245! I:29F4/20G-19/IMS1403 25
B:29B6/23G-11/TMM2018D 25! I:31D5/10G-6/74PCT244
PPN16 7 I:14D3/3B-18/74PCT374 O:23D5/23H-16/74PCT244!
I:27D6/19G-4/74FCT521A B:28E5/9B-3/74PCT245! I:29F4/20G-2/IMS1403 25
B:29B6/23G-10/TMM2018D 25! I:31D5/10G-4/74PCT244
PPN17 7 I:14D3/3B-17/74PCT374 O:23D5/23H-18/74PCT244!
I:27D6/19G-2/74FCT521A B:28E5/9B-2/74PCT245! I:29F4/20G-1/IMS1403 25
B:29B6/23G-9/TMM2018D 25! I:31D5/10G-2/74PCT244
PPN18 8 I:14D3/3B-14/74PCT374 O:23D3/15G-3/74PCT244!
I:27D3/18G-17/74FCT521A B:28E3/10B-9/74PCT245! O:28B7/8B-3/74LS244!
B:29B3/22G-17/TMM2018D 25! I:29F4/20G-18/IMS1403 25 I:31D3/11G-17/74PCT244
PPN19 9 I:14D3/3B-13/74PCT374 O:23D3/15G-5/74PCT244!
I:27D3/18G-15/74FCT521A B:28E3/10B-8/74PCT245! O:28B7/8B-5/74LS244!
B:29B3/22G-16/TMM2018D 25! I:29F4/20G-17/IMS1403 25 I:31D3/11G-15/74PCT244
+
PPN20 9 I:45C4/9G-5/PAL16R4D
I:14D3/3B-8/74PCT374 O:23D3/15G-7/74PCT244!
I:27D3/18G-13/74FCT521A B:28E3/10B-7/74PCT245! O:28B7/8B-7/74LS244!
B:29B3/22G-15/TMM2018D 25! I:29F4/20G-16/IMS1403 25 I:31D3/11G-13/74PCT244
+
PPN21 9 I:45C4/9G-6/PAL16R4D
I:14D3/3B-7/74PCT374 O:23D3/15G-9/74PCT244!
I:27D3/18G-11/74FCT521A B:28E3/10B-6/74PCT245! O:28B7/8B-9/74LS244!
B:29B3/22G-14/TMM2018D 25! I:29F4/20G-15/IMS1403 25 I:31D3/11G-11/74PCT244
+
PPN22 9 I:45C4/9G-7/PAL16R4D
I:14D3/3B-4/74PCT374 O:23D3/15G-12/74PCT244!
I:27D3/18G-8/74FCT521A B:28E3/10B-5/74PCT245! O:28B7/8B-12/74LS244!
B:29B3/22G-13/TMM2018D 25! I:29F4/20G-13/IMS1403 25 I:31D3/11G-8/74PCT244
I:45C4/9G-8/PAL16R4D
PPN23 9 I:14D3/3B-3/74PCT374 O:23D3/15G-14/74PCT244!
I:27D3/18G-6/74FCT521A B:28E3/10B-4/74PCT245! O:28B7/8B-14/74LS244!
B:29B3/22G-11/TMM2018D 25! I:29F4/20G-14/IMS1403 25 I:31D3/11G-6/74PCT244
I:45C4/9G-9/PAL16R4D
PPN24 3 B:28E3/10B-3/74PCT245! O:28B7/8B-16/74LS244!
B:29B3/22G-10/TMM2018D 25!
PPN25 4 B:28E3/10B-2/74PCT245! O:28B7/8B-18/74LS244!
B:29B3/22G-9/TMM2018D 25! I:29F4/20G-12/IMS1403 25
PPOSC 2 O:38D1/13C-5/74LS393! I:42B3/32H-20/SC2661
PRES #40 2 I:40G6/33B-17/74LS244 O:40F7/13G-4/74F04!
PS 3 I:6C7/12C-1/74F32 O:39C7/34D-A7/ND DELDGA!
I:47D7/4F-4/PAL16L8B
PT0 2 B:29D6/25G-17/TMM2018D 25! B:30D5/18B-11/74PCT245!
PT1 2 B:29D6/25G-16/TMM2018D 25! B:30D5/18B-12/74PCT245!
PT10 3 B:29D3/24G-15/TMM2018D 25! B:30D3/17B-13/74PCT245!
I:33B7/28F-Q7/ND DELILAH
PT11 3 B:29D3/24G-14/TMM2018D 25! B:30D3/17B-14/74PCT245!
I:33B7/28F-R8/ND DELILAH
PT12 3 B:29D3/24G-13/TMM2018D 25! B:30D3/17B-15/74PCT245!
I:33B7/28F-R7/ND DELILAH
PT13 3 B:29D3/24G-11/TMM2018D 25! B:30D3/17B-16/74PCT245!
I:33B7/28F-S8/ND DELILAH
PT14 3 B:29D3/24G-10/TMM2018D 25! B:30D3/17B-17/74PCT245!
I:33B7/28F-P8/ND DELILAH
PT15 3 B:29D3/24G-9/TMM2018D 25! B:30D3/17B-18/74PCT245!
I:33B7/28F-S9/ND DELILAH
PT2 2 B:29D6/25G-15/TMM2018D 25! B:30D5/18B-13/74PCT245!
PT3 2 B:29D6/25G-14/TMM2018D 25! B:30D5/18B-14/74PCT245!
PT4 2 B:29D6/25G-13/TMM2018D 25! B:30D5/18B-15/74PCT245!
PT5 2 B:29D6/25G-11/TMM2018D 25! B:30D5/18B-16/74PCT245!
PT6 2 B:29D6/25G-10/TMM2018D 25! B:30D5/18B-17/74PCT245!
PT7 2 B:29D6/25G-9/TMM2018D 25! B:30D5/18B-18/74PCT245!
PT8 2 B:29D3/24G-17/TMM2018D 25! B:30D3/17B-11/74PCT245!
PT9 3 B:29D3/24G-16/TMM2018D 25! B:30D3/17B-12/74PCT245!
I:33B7/28F-S7/ND DELILAH
PWCL 2 O:38C4/29H-11/74F32! I:39C7/34D-A11/ND DELDGA
QA #50 1 T:50E6/6F-19/PAL16R8D!
QB #50 1 T:50E6/6F-18/PAL16R8D!
QC #50 1 T:50E6/6F-17/PAL16R8D!
QD #50 1 T:50E6/6F-16/PAL16R8D!
Q~0 2 T:6D4/5D-17/PAL16R4D! I:12D2/11D-1/PAL16L8D
Q~1 #6 1 T:6D4/5D-16/PAL16R4D!
Q~2 2 T:6D4/5D-15/PAL16R4D! I:12D2/11D-2/PAL16L8D
RAS 4 I:49B6/9H-1/74F00 I:49D6/9H-9/74F00 I:49F6/8G-9/74F00
T:50E6/6F-15/PAL16R8D!
RAS~0 #49 3 O:49B6/9H-3/74F00! I:49C3/15H-27/SIP1M9
I:49C5/15J-27/SIP1M9
RAS~1 #49 3 I:49E3/15K-27/SIP1M9 I:49E5/15L-27/SIP1M9
O:49D6/9H-8/74F00!
RAS~2 #49 3 I:49G5/15N-27/SIP1M9 I:49G3/15M-27/SIP1M9
O:49F6/8G-8/74F00!
RD #42 2 I:42B3/32H-3/SC2661 O:42F6/7F-4/74F14!

RDATA	4	I:46D2/1H-13/AM29833 I:46D4/2H-13/AM29833 I:47D7/4F-1/PAL16L8B O:48E4/3F-12/PAL16L8D!
READ	#40 2	I:40G6/33B-13/74LS244 B:40D7/35C-31/MC68705U3!
REF100~	#48 2	B:48E4/3F-15/PAL16L8D! O:48C7/14F-17/AM29C821!
REFRQ25~	#8 2	O:8C3/3D-22/AM29C821! I:8E3/4D-3/AM29C821
REFRQ50~	2	I:6D2/10D-6/PAL16R8D O:8E3/4D-22/AM29C821!
REFRQ~	3	I:8C3/3D-3/AM29C821 O:39C7/34D-C13/ND_DELDGA! I:45C2/2D-11/74F74
REF~	4	T:6D2/10D-15/PAL16R8D! I:7D6/7A-9/7407 I:39C7/34D-C9/ND_DELDGA I:48C7/14F-5/AM29C821
RERR~	4	B:6D6/8D-16/PAL16L8B! I:6C7/12C-2/74F32 I:6C7/12C-5/74F32 I:47D7/4F-5/PAL16L8B
RESET	#41 1	O:41E4/28A-2/74LS273!
RESTART~	2	B:4D1/RN3-3/4610X 101 102! O:4C2/C-B13/!
RFO	7	I:18D2/30B-2/74F139 I:18D2/30B-14/74F139 I:19C6/26B-10/27256 I:19C4/23B-10/27256 I:32F5/34F-23/TMM2018D_25 I:32F7/35F-23/TMM2018D_25 O:33B7/28F-K5/ND_DELILAH!
RF1	7	I:18D2/30B-3/74F139 I:18D2/30B-13/74F139 I:19C6/26B-9/27256 I:19C4/23B-9/27256 I:32F5/34F-22/TMM2018D_25 I:32F7/35F-22/TMM2018D_25 O:33B7/28F-M2/ND_DELILAH!
RGNT~	4	I:45C2/2D-13/74F74 B:48E4/3F-16/PAL16L8D! T:50B6/5F-19/PAL16R8D! I:50E6/6F-2/PAL16R8D
RINR~	3	O:39C7/34D-B5/ND_DELDGA! I:41C7/24A-1/74PCT244 I:41C7/24A-19/74PCT244
RLRQ~	2	O:45C2/2D-8/74F74! I:50B6/5F-3/PAL16R8D
RMM~	3	O:39A1/RN15-4/4610X 101 103! I:39C7/34D-L9/ND_DELDGA B:40D7/35C-28/MC68705U3!
ROCLK~	#40 2	I:40C4/34A-2/MM58274 B:40D7/35C-27/MC68705U3!
RRF~	#34 1	T:34D3/19F-17/PAL16R4D!
RTOSC	2	O:38E2/13C-8/74LS393! I:39C7/34D-C8/ND_DELDGA
RT~	5	B:12D2/11D-13/PAL16L8D! I:24A2/21G-4/PAL16L8D I:25F5/18F-3/PAL16R4D I:36B6/32C-5/74F32 O:39C7/34D-J2/ND_DELDGA!
RUART~	2	O:39C7/34D-B8/ND_DELDGA! I:42B3/32H-13/SC2661
RUN~	3	I:2H3/A-C18! O:4F7/7A-2/7407! I:4F7/C-B14!
RWCS~	3	I:18B2/15F-6/PAL16L8D T:34D4/22F-14/PAL16R4D! I:36E5/13D-8/PAL16L8D
RXD	2	O:2D3/A-C8/! B:42E6/R3-2/2.2KOHM!
SAPR	#12 1	B:12D6/1C-15/PAL16L8D!
SCONS~	#41 3	O:41E4/28A-5/74LS273! I:41F4/29A-4/74F08 I:41G3/11B-3/74LS04
SELSMS~	3	O:3A7/B-B14/! O:3A7/R4-2/1KOHM! I:39C7/34D-B9/ND_DELDGA
SEMRQ25~	#8 2	O:8C3/3D-21/AM29C821! I:8E3/4D-4/AM29C821
SEMRQ50~	3	I:6D2/10D-8/PAL16R8D O:8E3/4D-21/AM29C821! I:50B6/5F-8/PAL16R8D
SEMRQ~	3	I:4C6/5C-4/74F244 B:4A5/C-A17/! O:7E7/2A-8/7438!
SEM~	2	T:6D2/10D-19/PAL16R8D! I:7E3/2B-5/74F00
SHORT~	2	B:36D4/12D-12/PAL16R6D! O:39C7/34D-H3/ND_DELDGA!
SIOC~	2	O:39C7/34D-K2/ND_DELDGA! I:41E4/28A-11/74LS273
SLOW~	2	B:36D4/12D-19/PAL16R6D! O:39C7/34D-H2/ND_DELDGA!
SO	#42 4	O:42B3/32H-19/SC2661! I:42E4/35G-2/75150P I:42E4/35G-3/75150P I:42E4/35G-1/75150P
SPEA	4	O:6D6/8D-19/PAL16L8B! I:13C5/10A-11/74ALS534 I:13E5/8A-11/74ALS534 I:13E3/9A-11/74ALS534
SPEAL	#47 4	O:47D7/4F-12/PAL16L8B! I:47C4/3C-11/74PCT374 I:47E2/4C-11/74PCT374 I:47E4/6D-11/74PCT374
SPES	2	O:6D6/8D-12/PAL16L8B! I:13C3/12A-11/74ALS534
SPESL	#47 2	O:47D7/4F-19/PAL16L8B! I:47C2/7C-11/74PCT374
SSEMA~	3	I:7D7/9D-8/74F02 O:39C7/34D-M1/ND_DELDGA! I:50B6/5F-7/PAL16R8D
STAT0	#40 2	I:40G6/33B-2/74LS244 B:40D7/35C-9/MC68705U3!
STAT1	#40 2	I:40G6/33B-4/74LS244 B:40D7/35C-10/MC68705U3!
STAT2	#40 2	I:40G6/33B-6/74LS244 B:40D7/35C-11/MC68705U3!
STAT3	4	O:39A1/RN15-6/4610X 101 103! I:39C7/34D-D2/ND_DELDGA I:40G6/33B-8/74LS244 B:40D7/35C-29/MC68705U3!
STAT4	3	O:39A1/RN15-5/4610X 101 103! I:39C7/34D-C1/ND_DELDGA B:40D7/35C-30/MC68705U3!
STAT7	#40 3	B:40D7/35C-32/MC68705U3! I:40F7/13G-3/74F04 O:40E7/RN8-10/4610X 101 103!
STOC~	5	I:35D3/14B-1/74PCT244 I:35D3/14B-19/74PCT244 I:35D5/15B-1/74PCT244 I:35D5/15B-19/74PCT244 O:39C7/34D-H1/ND_DELDGA!
STOP~	4	B:2E2/RN1-10/4610X 101 102! O:2D4/A-C17/! I:4E3/33C-8/74F244 O:4C2/C-B16/!
STP	3	I:4F7/7A-1/7407 I:26D4/27H-2/74PCT244 O:39C7/34D-E13/ND_DELDGA!
SWDIS~	#46 3	I:46C5/2F-2/PAL16L8B B:46A4/SW4-3/SECME SPDT! O:46A4/RN14-6/4610X 101 102!
SWLD	2	O:2G3/R1-2/1KOHM! I:2H3/A-A15/
SWMCL~	4	O:2D4/A-C16/! B:2E2/RN1-6/4610X 101 102! B:2E6/SW3-1/SECME436231205! I:38B4/12F-13/74S132
TBMT~	4	I:41F5/11B-9/74LS04 O:42B3/32H-15/SC2661! O:42B5/RN7-2/4610X 101 103! I:42C6/33G-2/AM29C821
TERM~	13	I:6D4/5D-8/PAL16R4D I:12D2/11D-9/PAL16L8D I:18B2/15F-11/PAL16L8D I:24A3/17F-5/74F10 I:25F5/18F-5/PAL16R4D

I:32E7/17F-13/74F10 I:36E5/13D-1/PAL16L8D T:36D4/12D-17/PAL16R6D!
I:36F2/14C-2/74F00 I:36F2/9D-2/74F02 I:36F5/14G-1/74F08 I:36F3/14C-9/74F00
+
I:36F4/14C-12/74F00
TEST0 #33 2 B:33E6/TP6-1/TESTPOINT! O:33B7/28F-N11/ND DELILAH!
TEST1 #33 2 B:33E5/TP5-1/TESTPOINT! O:33B7/28F-P12/ND DELILAH!
TEST2 #33 2 B:33E5/TP4-1/TESTPOINT! O:33B7/28F-Q12/ND DELILAH!
TEST3 #33 2 B:33D5/TP3-1/TESTPOINT! O:33B7/28F-R15/ND DELILAH!
TEST4 #33 2 B:33D5/TP2-1/TESTPOINT! O:33B7/28F-Q13/ND DELILAH!
TOUT 2 I:7D2/3A-19/74F241 O:39C7/34D-D12/ND DELDGA!
TRAALD~ 5 O:39C7/34D-C6/ND DELDGA! I:41C2/27A-1/74PCT244
I:41C2/27A-19/74PCT244 I:41C5/25A-1/74PCT244 I:41C5/25A-19/74PCT244
TRAP~ 2 O:33B7/28F-Q9/ND DELILAH! I:36E5/13D-9/PAL16L8D
TST~ #46 1 B:46C5/2F-15/PAL16L8B!
TWR~ #32 3 I:32F5/34F-21/TMM2018D_25 I:32F7/35F-21/TMM2018D_25
O:32E7/17F-12/74F10!
UCLK 6 I:25F5/18F-1/PAL16R4D I:26C5/24H-3/74F74
I:33B7/28F-Q8/ND DELILAH O:36F5/14G-3/74F08! O:39A1/RN15-3/4610X_101_103!
+
I:39C7/34D-N5/ND DELDGA
USED~ #25 2 B:25F5/18F-19/PAL16R4D! I:25G6/21H-1/74S260
UUA0 18 O:17E5/32G-14/AM29841! O:17E7/31G-14/AM29841!
I:21B7/19D-16/IDT6168A_20 I:21B6/18D-16/IDT6168A_20
I:21B4/17D-16/IDT6168A_20 I:21B2/16D-16/IDT6168A_20 I:21C6/22D-16/IDT6168A_20
0
I:21C7/23D-16/IDT6168A_20 I:21C4/21D-16/IDT6168A_20
I:21C2/20D-16/IDT6168A_20 I:21D6/26D-16/IDT6168A_20 I:21D7/27D-16/IDT6168A_20
0
I:21D4/25D-16/IDT6168A_20 I:21D2/24D-16/IDT6168A_20
I:21F6/30D-16/IDT6168A_20 I:21F7/31D-16/IDT6168A_20 I:21F4/29D-16/IDT6168A_20
0
I:21F2/28D-16/IDT6168A_20
UUA1 18 O:17E5/32G-15/AM29841! O:17E7/31G-15/AM29841!
I:21B7/19D-17/IDT6168A_20 I:21B6/18D-17/IDT6168A_20
I:21B4/17D-17/IDT6168A_20 I:21B2/16D-17/IDT6168A_20 I:21C6/22D-17/IDT6168A_20
0
I:21C7/23D-17/IDT6168A_20 I:21C4/21D-17/IDT6168A_20
I:21C2/20D-17/IDT6168A_20 I:21D6/26D-17/IDT6168A_20 I:21D7/27D-17/IDT6168A_20
0
I:21D4/25D-17/IDT6168A_20 I:21D2/24D-17/IDT6168A_20
I:21F6/30D-17/IDT6168A_20 I:21F7/31D-17/IDT6168A_20 I:21F4/29D-17/IDT6168A_20
0
I:21F2/28D-17/IDT6168A_20
UUA10 17 T:17E2/30H-16/74F373! I:21B7/19D-7/IDT6168A_20
I:21B6/18D-7/IDT6168A_20 I:21B4/17D-7/IDT6168A_20 I:21B2/16D-7/IDT6168A_20
I:21C6/22D-7/IDT6168A_20 I:21C7/23D-7/IDT6168A_20 I:21C4/21D-7/IDT6168A_20
I:21C2/20D-7/IDT6168A_20 I:21D6/26D-7/IDT6168A_20 I:21D7/27D-7/IDT6168A_20
I:21D4/25D-7/IDT6168A_20 I:21D2/24D-7/IDT6168A_20 I:21F6/30D-7/IDT6168A_20
I:21F7/31D-7/IDT6168A_20 I:21F4/29D-7/IDT6168A_20 I:21F2/28D-7/IDT6168A_20
+
UUA11 17 T:17E2/30H-15/74F373! I:21B7/19D-8/IDT6168A_20
I:21B6/18D-8/IDT6168A_20 I:21B4/17D-8/IDT6168A_20 I:21B2/16D-8/IDT6168A_20
I:21C6/22D-8/IDT6168A_20 I:21C7/23D-8/IDT6168A_20 I:21C4/21D-8/IDT6168A_20
I:21C2/20D-8/IDT6168A_20 I:21D6/26D-8/IDT6168A_20 I:21D7/27D-8/IDT6168A_20
I:21D4/25D-8/IDT6168A_20 I:21D2/24D-8/IDT6168A_20 I:21F6/30D-8/IDT6168A_20
I:21F7/31D-8/IDT6168A_20 I:21F4/29D-8/IDT6168A_20 I:21F2/28D-8/IDT6168A_20
+
UUA2 18 O:17E5/32G-16/AM29841! O:17E7/31G-16/AM29841!
I:21B7/19D-18/IDT6168A_20 I:21B6/18D-18/IDT6168A_20
I:21B4/17D-18/IDT6168A_20 I:21B2/16D-18/IDT6168A_20 I:21C6/22D-18/IDT6168A_20
0
I:21C7/23D-18/IDT6168A_20 I:21C4/21D-18/IDT6168A_20
I:21C2/20D-18/IDT6168A_20 I:21D6/26D-18/IDT6168A_20 I:21D7/27D-18/IDT6168A_20
0
I:21D4/25D-18/IDT6168A_20 I:21D2/24D-18/IDT6168A_20
I:21F6/30D-18/IDT6168A_20 I:21F7/31D-18/IDT6168A_20 I:21F4/29D-18/IDT6168A_20
0
I:21F2/28D-18/IDT6168A_20
UUA3 18 O:17E5/32G-17/AM29841! O:17E7/31G-17/AM29841!
I:21B7/19D-19/IDT6168A_20 I:21B6/18D-19/IDT6168A_20
I:21B4/17D-19/IDT6168A_20 I:21B2/16D-19/IDT6168A_20 I:21C6/22D-19/IDT6168A_20
0
I:21C7/23D-19/IDT6168A_20 I:21C4/21D-19/IDT6168A_20
I:21C2/20D-19/IDT6168A_20 I:21D6/26D-19/IDT6168A_20 I:21D7/27D-19/IDT6168A_20
0
I:21D4/25D-19/IDT6168A_20 I:21D2/24D-19/IDT6168A_20

			I:21F6/30D-19/IDT6168A_20	I:21F7/31D-19/IDT6168A_20	I:21F4/29D-19/IDT6168A_20
			I:21F2/28D-19/IDT6168A_20		
UUA4	18		O:17E5/32G-18/AM29841!	O:17E7/31G-18/AM29841!	
			I:21B7/19D-1/IDT6168A_20	I:21B6/18D-1/IDT6168A_20	I:21B4/17D-1/IDT6168A_20
+					
			I:21B2/16D-1/IDT6168A_20	I:21C6/22D-1/IDT6168A_20	I:21C7/23D-1/IDT6168A_20
+					
			I:21C4/21D-1/IDT6168A_20	I:21C2/20D-1/IDT6168A_20	I:21D6/26D-1/IDT6168A_20
+					
			I:21D7/27D-1/IDT6168A_20	I:21D4/25D-1/IDT6168A_20	I:21D2/24D-1/IDT6168A_20
+					
			I:21F6/30D-1/IDT6168A_20	I:21F7/31D-1/IDT6168A_20	I:21F4/29D-1/IDT6168A_20
+					
UUA5	18		I:21F2/28D-1/IDT6168A_20		
			O:17E5/32G-19/AM29841!	O:17E7/31G-19/AM29841!	
			I:21B7/19D-2/IDT6168A_20	I:21B6/18D-2/IDT6168A_20	I:21B4/17D-2/IDT6168A_20
+					
			I:21B2/16D-2/IDT6168A_20	I:21C6/22D-2/IDT6168A_20	I:21C7/23D-2/IDT6168A_20
+					
			I:21C4/21D-2/IDT6168A_20	I:21C2/20D-2/IDT6168A_20	I:21D6/26D-2/IDT6168A_20
+					
			I:21D7/27D-2/IDT6168A_20	I:21D4/25D-2/IDT6168A_20	I:21D2/24D-2/IDT6168A_20
+					
			I:21F6/30D-2/IDT6168A_20	I:21F7/31D-2/IDT6168A_20	I:21F4/29D-2/IDT6168A_20
+					
UUA6	18		I:21F2/28D-2/IDT6168A_20		
			O:17E5/32G-20/AM29841!	O:17E7/31G-20/AM29841!	
			I:21B7/19D-3/IDT6168A_20	I:21B6/18D-3/IDT6168A_20	I:21B4/17D-3/IDT6168A_20
+					
			I:21B2/16D-3/IDT6168A_20	I:21C6/22D-3/IDT6168A_20	I:21C7/23D-3/IDT6168A_20
+					
			I:21C4/21D-3/IDT6168A_20	I:21C2/20D-3/IDT6168A_20	I:21D6/26D-3/IDT6168A_20
+					
			I:21D7/27D-3/IDT6168A_20	I:21D4/25D-3/IDT6168A_20	I:21D2/24D-3/IDT6168A_20
+					
			I:21F6/30D-3/IDT6168A_20	I:21F7/31D-3/IDT6168A_20	I:21F4/29D-3/IDT6168A_20
+					
UUA7	18		I:21F2/28D-3/IDT6168A_20		
			O:17E5/32G-21/AM29841!	O:17E7/31G-21/AM29841!	
			I:21B7/19D-4/IDT6168A_20	I:21B6/18D-4/IDT6168A_20	I:21B4/17D-4/IDT6168A_20
+					
			I:21B2/16D-4/IDT6168A_20	I:21C6/22D-4/IDT6168A_20	I:21C7/23D-4/IDT6168A_20
+					
			I:21C4/21D-4/IDT6168A_20	I:21C2/20D-4/IDT6168A_20	I:21D6/26D-4/IDT6168A_20
+					
			I:21D7/27D-4/IDT6168A_20	I:21D4/25D-4/IDT6168A_20	I:21D2/24D-4/IDT6168A_20
+					
			I:21F6/30D-4/IDT6168A_20	I:21F7/31D-4/IDT6168A_20	I:21F4/29D-4/IDT6168A_20
+					
UUA8	18		I:21F2/28D-4/IDT6168A_20		
			O:17E5/32G-22/AM29841!	O:17E7/31G-22/AM29841!	
			I:21B7/19D-5/IDT6168A_20	I:21B6/18D-5/IDT6168A_20	I:21B4/17D-5/IDT6168A_20
+					
			I:21B2/16D-5/IDT6168A_20	I:21C6/22D-5/IDT6168A_20	I:21C7/23D-5/IDT6168A_20
+					
			I:21C4/21D-5/IDT6168A_20	I:21C2/20D-5/IDT6168A_20	I:21D6/26D-5/IDT6168A_20
+					
			I:21D7/27D-5/IDT6168A_20	I:21D4/25D-5/IDT6168A_20	I:21D2/24D-5/IDT6168A_20
+					
			I:21F6/30D-5/IDT6168A_20	I:21F7/31D-5/IDT6168A_20	I:21F4/29D-5/IDT6168A_20
+					
UUA9	18		I:21F2/28D-5/IDT6168A_20		
			O:17E5/32G-23/AM29841!	O:17E7/31G-23/AM29841!	
			I:21B7/19D-6/IDT6168A_20	I:21B6/18D-6/IDT6168A_20	I:21B4/17D-6/IDT6168A_20
+					
			I:21B2/16D-6/IDT6168A_20	I:21C6/22D-6/IDT6168A_20	I:21C7/23D-6/IDT6168A_20
+					
			I:21C4/21D-6/IDT6168A_20	I:21C2/20D-6/IDT6168A_20	I:21D6/26D-6/IDT6168A_20
+					
			I:21D7/27D-6/IDT6168A_20	I:21D4/25D-6/IDT6168A_20	I:21D2/24D-6/IDT6168A_20
+					
			I:21F6/30D-6/IDT6168A_20	I:21F7/31D-6/IDT6168A_20	I:21F4/29D-6/IDT6168A_20
+					
VAL	2		I:21F2/28D-6/IDT6168A_20		
VCC	157		O:39C7/34D-B4/ND DELDGA!	I:40G6/33B-11/74LS244	
			\$%OVERFLOW\$ I:3C4/RN13-1/4610X 101 102		
			I:3C6/RN13-1/4610X 101 102	B:3H1/B-A2!!	B:3H1/B-B2!!
				B:3H1/B-C2!!	
			I:3F5/RN13-1/4610X 101 102	B:3H1/B-A31!!	B:3H2/B-B31!!
				B:3H2/B-C31!!	
			B:4G3/C-A31!!	B:4G3/C-B31!!	B:4G3/C-C31!!
				B:4D1/RN3-1/4610X 101 102!	
			B:4D1/RN3-1/4610X 101 102!		
			B:4D1/RN3-1/4610X 101 102!		
			B:4D1/RN3-1/4610X 101 102!		
			B:4D1/RN3-1/4610X 101 102!		
			B:4D1/RN3-1/4610X 101 102!		
			B:4G2/C-A2!!	B:4G2/C-B2!!	B:4G3/C-C2!!
			I:7E1/RN3-1/4610X 101 102	I:7E1/RN13-1/4610X 101 102	

I:7E1/RN13-1/4610X 101 102 I:11E2/RN19-1/4610X 101 102
I:11E2/RN19-1/4610X 101 102 I:11E2/RN19-1/4610X 101 102
I:11E2/RN19-1/4610X 101 102 I:11E2/RN19-1/4610X 101 102
I:11E2/RN19-1/4610X 101 102 I:11E2/RN19-1/4610X 101 102
I:11F2/RN19-1/4610X 101 102 I:11F2/RN20-1/4610X 101 102
I:11G2/RN20-1/4610X 101 102 I:11G2/RN20-1/4610X 101 102
I:11G2/RN20-1/4610X 101 102 I:11G2/RN20-1/4610X 101 102
I:11G2/RN20-1/4610X 101 102 I:11G2/RN20-1/4610X 101 102
I:11F2/RN20-1/4610X 101 102 I:11F2/RN19-1/4610X 101 102 I:19C6/26B-1/27256
+
I:19C4/23B-1/27256 B:25F6/RN14-1/4610X 101 102 B:25F6/RN14-1/4610X 101 102
+
I:26B4/RN9-1/4610X 101 102 I:26C4/RN9-1/4610X 101 102
I:33B7/28F-B2/ND DELILAH I:33B7/28F-R2/ND DELILAH I:33B7/28F-K3/ND DELILAH
+
I:33B7/28F-B1/ND DELILAH
VEX 3 T:34D4/22F-16/PAL16R4D I:34E3/29H-10/74F32
I:36E5/13D-11/PAL16L8D
WAIT1 #36 2 I:36D4/12D-5/PAL16R6D O:36C6/14G-6/74F08
WAIT2 #36 2 I:36D4/12D-6/PAL16R6D O:36B6/25H-8/74F00
WBD 4 I:10D6/6A-3/74AS648 I:10D4/5A-3/74AS648
I:10D2/4A-3/74AS648 O:12E4/2C-19/PAL16L8D
WCA 12 B:18B2/15F-14/PAL16L8D I:24A2/21G-9/PAL16L8D
B:25F5/18F-18/PAL16R4D I:25D6/24F-21/TMM2018D 25 I:25B6/20F-21/TMM2018D 25
+
I:25B3/16F-21/TMM2018D 25 I:25G3/21F-18/AM9150 20 I:25D3/23F-21/TMM2018D 25
+
I:31D3/11G-1/74PCT244 I:31D3/11G-19/74PCT244 I:31D5/10G-1/74PCT244
I:31D5/10G-19/74PCT244
WCHIM 3 I:24A2/21G-5/PAL16L8D I:24A3/32C-9/74F32
O:39C7/34D-L1/ND DELDGA
WCINH 3 I:25E6/17F-11/74F10 I:26C5/24H-2/74F74
O:29F4/20G-8/IMS1403 25
WCLIM 2 O:24A3/32C-8/74F32 I:29F4/20G-9/IMS1403 25
WCSTB #18 2 O:18B2/15F-12/PAL16L8D I:18D2/30B-15/74F139
WCS 10 I:18B2/15F-7/PAL16L8D I:20B7/28B-1/74LS245
I:20B6/24B-1/74LS245 I:20B4/20B-1/74LS245 I:20B3/16B-1/74LS245
I:20C7/29B-1/74LS245 I:20C6/27B-1/74LS245 I:20C4/21B-1/74LS245
I:20C3/19B-1/74LS245 O:33B7/28F-P3/ND DELILAH
WICA #18 5 O:18B2/15F-19/PAL16L8D I:18E2/29J-2/74F08
I:18E2/29J-5/74F08 I:18E3/29J-10/74F08 I:18E3/29J-13/74F08
WLBD 3 I:11D5/6B-3/74AS646 I:11D4/7B-3/74AS646
O:12E4/2C-12/PAL16L8D
WMAP 5 O:24A3/17F-6/74F10 I:29B3/22G-21/TMM2018D 25
I:29D3/24G-21/TMM2018D 25 I:29B6/23G-21/TMM2018D 25
I:29D6/25G-21/TMM2018D 25
WMM #40 2 I:40G4/32B-11/74LS374 B:40D7/35C-25/MC68705U3
WRCLK #40 2 I:40C4/34A-3/MM58274 B:40D7/35C-26/MC68705U3
WRFSTB 2 I:32E7/17F-2/74F10 B:36E5/13D-18/PAL16L8D
WRITE 7 I:12E4/2C-7/PAL16L8D I:24A2/21G-2/PAL16L8D
I:24A3/17F-4/74F10 I:30D3/17B-1/74PCT245 I:30D5/18B-1/74PCT245
O:39C7/34D-N6/ND DELDGA I:45C4/9G-2/PAL16R4D
WRTRF 5 I:32F5/34F-20/TMM2018D 25 I:32F7/35F-20/TMM2018D 25
I:32E7/17F-1/74F10 O:33B7/28F-D5/ND DELILAH I:34D3/19F-7/PAL16R4D
WU 5 O:18E2/29J-3/74F08 I:21F6/30D-11/IDT6168A 20
I:21F7/31D-11/IDT6168A 20 I:21F4/29D-11/IDT6168A 20
I:21F2/28D-11/IDT6168A 20
WU 5 O:18E2/29J-6/74F08 I:21D6/26D-11/IDT6168A 20
I:21D7/27D-11/IDT6168A 20 I:21D4/25D-11/IDT6168A 20
I:21D2/24D-11/IDT6168A 20
WU 5 O:18E3/29J-8/74F08 I:21C6/22D-11/IDT6168A 20
I:21C7/23D-11/IDT6168A 20 I:21C4/21D-11/IDT6168A 20
I:21C2/20D-11/IDT6168A 20
WU 5 O:18E3/29J-11/74F08 I:21B7/19D-11/IDT6168A 20
I:21B6/18D-11/IDT6168A 20 I:21B4/17D-11/IDT6168A 20
I:21B2/16D-11/IDT6168A 20
WW 6 O:18D2/30B-12/74F139 I:18E2/29J-1/74F08
I:22F6/30C-11/IDT6168A 20 I:22F7/31C-11/IDT6168A 20
I:22F4/29C-11/IDT6168A 20 I:22F2/28C-11/IDT6168A 20
WW 6 O:18D2/30B-11/74F139 I:18E2/29J-4/74F08
I:22D6/26C-11/IDT6168A 20 I:22D7/27C-11/IDT6168A 20
I:22D4/25C-11/IDT6168A 20 I:22D2/24C-11/IDT6168A 20
WW 6 O:18D2/30B-10/74F139 I:18E3/29J-9/74F08
I:22C6/22C-11/IDT6168A 20 I:22C7/23C-11/IDT6168A 20
I:22C4/21C-11/IDT6168A 20 I:22C2/20C-11/IDT6168A 20
WW 6 O:18D2/30B-9/74F139 I:18E3/29J-12/74F08
I:22B7/19C-11/IDT6168A 20 I:22B6/18C-11/IDT6168A 20
I:22B4/17C-11/IDT6168A 20 I:22B2/16C-11/IDT6168A 20
XBGNT 2 O:3A4/16A-14/74LS244 I:3B4/B-A10
XCA0 2 I:3G4/B-A26 O:3F4/15C-3/74LS244
XCA1 2 I:3G4/B-C26 O:3F4/15C-5/74LS244
XCA2 2 I:3G4/B-A25 O:3F4/15C-7/74LS244
XCA3 2 I:3G4/B-C25 O:3F4/15C-9/74LS244
XCA4 2 I:3G4/B-A24 O:3F4/15C-12/74LS244

XCA5	2	I:3G4/B-C24/	O:3F4/15C-14/74LS244!
XCA6	2	I:3G4/B-A23/	O:3F4/15C-16/74LS244!
XCA7	2	I:3G3/B-C23/	O:3F4/15C-18/74LS244!
XCA8	2	I:3G3/B-A30/	O:3F3/16G-3/74LS244!
XCA9	2	I:3G3/B-C30/	O:3F3/16G-5/74LS244!
XCGNT~	2	O:3A4/16A-12/74LS244!	I:3C4/B-B16/
XCLK	2	O:3A4/16A-16/74LS244!	I:3C3/B-C10/
XCOMM0	2	T:3A7/21A-12/74LS374!	I:3B6/B-A13/
XCOMM1	2	T:3A7/21A-9/74LS374!	I:3C6/B-C12/
XCOMM2	2	T:3A7/21A-6/74LS374!	I:3B6/B-A11/
XCOMM3	2	T:3A7/21A-5/74LS374!	I:3C6/B-C11/
XCOMM4	2	T:3A7/21A-2/74LS374!	I:3B6/B-C13/
XIDB0	4	O:3D3/19A-3/74LS244!	O:3D6/20A-3/74LS244!
		O:3E7/4G-3/74F244!	I:3E3/B-A17/
XIDB1	4	O:3D3/19A-5/74LS244!	O:3D6/20A-5/74LS244!
		O:3E7/4G-5/74F244!	I:3E3/B-C17/
XIDB10	4	O:3D2/17A-7/74LS244!	O:3D4/18A-7/74LS244!
		O:3D7/5G-7/74F244!	I:3E1/B-A21/
XIDB11	4	O:3D2/17A-9/74LS244!	O:3D4/18A-9/74LS244!
		O:3D7/5G-9/74F244!	I:3E1/B-C21/
XIDB12	4	O:3D2/17A-12/74LS244!	O:3D4/18A-12/74LS244!
		O:3D7/5G-12/74F244!	I:3E1/B-A19/
XIDB13	4	O:3D2/17A-14/74LS244!	O:3D4/18A-14/74LS244!
		O:3D7/5G-14/74F244!	I:3E1/B-C19/
XIDB14	4	O:3D2/17A-16/74LS244!	O:3D4/18A-16/74LS244!
		O:3D7/5G-16/74F244!	I:3E1/B-A22/
XIDB15	4	O:3D2/17A-18/74LS244!	O:3D4/18A-18/74LS244!
		O:3D7/5G-18/74F244!	I:3E1/B-C22/
XIDB2	4	O:3D3/19A-7/74LS244!	O:3D6/20A-7/74LS244!
		O:3E7/4G-7/74F244!	I:3E3/B-A18/
XIDB3	4	O:3D3/19A-9/74LS244!	O:3D6/20A-9/74LS244!
		O:3E7/4G-9/74F244!	I:3E3/B-C18/
XIDB4	4	O:3D3/19A-12/74LS244!	O:3D6/20A-12/74LS244!
		O:3E7/4G-12/74F244!	I:3E2/B-C16/
XIDB5	4	O:3D3/19A-14/74LS244!	O:3D6/20A-14/74LS244!
		O:3E7/4G-14/74F244!	I:3E2/B-A16/
XIDB6	4	O:3D3/19A-16/74LS244!	O:3D6/20A-16/74LS244!
		O:3E7/4G-16/74F244!	I:3E2/B-C15/
XIDB7	4	O:3D3/19A-18/74LS244!	O:3D6/20A-18/74LS244!
		O:3E7/4G-18/74F244!	I:3E2/B-A15/
XIDB8	4	O:3D2/17A-3/74LS244!	O:3D4/18A-3/74LS244!
		O:3D7/5G-3/74F244!	I:3E2/B-C20/
XIDB9	4	O:3D2/17A-5/74LS244!	O:3D4/18A-5/74LS244!
		O:3D7/5G-5/74F244!	I:3E2/B-A20/
XLA10	2	I:3G3/B-A29/	O:3F3/16G-7/74LS244!
XLA11	2	I:3G3/B-C29/	O:3F3/16G-9/74LS244!
XLA12	2	I:3G2/B-A28/	O:3F3/16G-12/74LS244!
XLA13	2	I:3G2/B-C28/	O:3F3/16G-14/74LS244!
XLA14	2	I:3G2/B-A27/	O:3F3/16G-16/74LS244!
XLA15	2	I:3G2/B-C27/	O:3F3/16G-18/74LS244!
XLA16	2	I:3G2/B-B27/	O:3F2/17G-3/74LS244!
XLA17	2	I:3G2/B-B26/	O:3F2/17G-5/74LS244!
XLA18	2	I:3G1/B-B23/	O:3F2/17G-7/74LS244!
XLA19	2	I:3G1/B-B24/	O:3F2/17G-9/74LS244!
XLA20	2	I:3G1/B-B25/	O:3F2/17G-12/74LS244!
XLA21	2	I:3G1/B-B30/	O:3F2/17G-14/74LS244!
XLA22	2	I:3G1/B-B28/	O:3F2/17G-16/74LS244!
XLA23	2	I:3G1/B-B29/	O:3F2/17G-18/74LS244!
XLCS~	2	O:3A4/16A-9/74LS244!	I:3B4/B-A12/
XLSHADOW	2	O:3A4/16A-5/74LS244!	I:3B4/B-B21/
XLUA0	2	O:3A3/22A-9/74LS244!	I:3B3/B-C8/
XLUA1	2	O:3A3/22A-12/74LS244!	I:3C2/B-A9/
XLUA10	2	O:3A2/23A-14/74LS244!	I:3B1/B-C5/
XLUA11	2	O:3A2/23A-16/74LS244!	I:3C1/B-A6/
XLUA12	2	O:3A2/23A-18/74LS244!	I:3B1/B-A8/
XLUA2	2	O:3A3/22A-14/74LS244!	I:3B2/B-C7/
XLUA3	2	O:3A3/22A-16/74LS244!	I:3C2/B-A7/
XLUA4	2	O:3A3/22A-18/74LS244!	I:3B2/B-A3/
XLUA5	2	O:3A2/23A-3/74LS244!	I:3C2/B-C3/
XLUA6	2	O:3A2/23A-5/74LS244!	I:3B1/B-A4/
XLUA7	2	O:3A2/23A-7/74LS244!	I:3C1/B-C4/
XLUA8	2	O:3A2/23A-9/74LS244!	I:3B1/B-A5/
XLUA9	2	O:3A2/23A-12/74LS244!	I:3C1/B-C6/
XMOR~	2	O:3A4/16A-7/74LS244!	I:3C4/B-B18/
XPIL0	2	O:3A4/16A-18/74LS244!	I:3B3/B-B9/
XPIL1	2	O:3A3/22A-3/74LS244!	I:3C3/B-B10/
XPIL2	2	O:3A3/22A-5/74LS244!	I:3B3/B-B12/
XPIL3	2	O:3A3/22A-7/74LS244!	I:3C3/B-B11/
XS11#41	#41	2	B:41C5/TH1-4/217057GF! O:41C5/RN9-3/4610X 101 102!
XS116#41	#41	3	I:41C2/27A-2/74PCT244 B:41A1/STR2-2/STR2!~
			B:41A1/RN8-2/4610X 101 103!
XS117#36	#36	2	O:36B6/25H-6/74F00T I:36C6/14G-5/74F08
XS117#41	#41	3	I:41C2/27A-4/74PCT244 B:41A2/STR3-2/STR2!
			B:41B1/RN8-3/4610X 101 103!

XS118#41	#41	3	I:41C2/27A-6/74PCT244 B:41A2/STR4-2/STR2! B:41B1/RN8-4/4610X 101 103!
XS119#41	#41	3	I:41C2/27A-8/74PCT244 B:41A2/STR5-2/STR2! B:41B1/RN8-5/4610X 101 103!
XS120#41	#41	3	I:41C2/27A-11/74PCT244 B:41A2/STR6-2/STR2! B:41B1/RN8-6/4610X 101 103!
XS120#42	#42	2	B:42F3/R7-1/220OHM! B:42F3/D4-1/1N4148!
XS121#41	#41	3	I:41C2/27A-13/74PCT244 B:41A2/STR7-2/STR2! B:41B1/RN8-7/4610X 101 103!
XS122#41	#41	3	I:41C2/27A-15/74PCT244 B:41A3/STR8-2/STR2! B:41B1/RN8-8/4610X 101 103!
XS123#41	#41	3	I:41C2/27A-17/74PCT244 B:41A3/STR9-2/STR2! B:41B1/RN8-9/4610X 101 103!
XS124#36	#36	2	B:36E5/13D-15/PAL16L8D! I:36F5/14G-2/74F08
XS125#36	#36	2	I:36F2/14C-1/74F00 B:36E1/R18-2/2.2KOHM!
XS127#25	#25	2	I:25F5/18F-9/PAL16R4D O:25E6/17F-8/74F10!
XS130#42	#42	4	B:42E5/R2-1/5.6KOHM! B:42E5/D5-1/1N4148! B:42E6/R3-1/2.2KOHM! I:42F6/7F-3/74F14
XS136#41	#41	2	I:41C5/25A-6/74PCT244 B:41A4/RN7-6/4610X 101 103!
XS14#38	#38	2	O:38D1/13C-6/74LS393! I:38E2/13C-13/74LS393
XS147#40	#40	5	B:40B1/T2-3/2N2907! B:40D2/C4-1/100nF! I:40C4/34A-16/MM58274 B:40C1/D2-2/1N4148! O:40C1/R16-2/10KOHM!
XS148#25	#25	2	B:25F6/RN14-2/4610X 101 102! B:25F7/LED1-1/RED!
XS156#50	#50	2	B:50D2/R22-2/330OHM! B:50D2/LED6-1/GREEN!
XS157#50	#50	2	B:50E2/LED7-1/YELLOW! B:50E2/R23-2/330OHM!
XS16#26	#26	2	O:26B4/RN9-6/4610X 101 102! I:26C5/24H-1/74F74
XS166#50	#50	2	B:50D2/LED6-2/GREEN! O:50D3/12G-4/74LS123!
XS167#50	#50	2	B:50E2/LED7-2/YELLOW! O:50E3/12G-12/74LS123!
XS168#40	#40	2	I:40C4/34A-1/MM58274 B:40B3/T1-3/2N2222!
XS174#40	#40	3	I:40A2/T3-2/2N2907 B:40A3/D3-2/4.3V_ZENER! O:40A2/R13-2/4.7KOHM!
XS175#40	#40	2	B:40A3/D3-1/4.3V_ZENER! I:40A3/R14-1/2.2KOHM
XS176#50	#50	3	I:50D3/12G-15/74LS123 O:50D2/R24-2/180KOHM! B:50D2/C13-1/2.2uF!
XS178#40	#40	2	B:40A2/T3-3/2N2907! I:40B3/R12-1/10KOHM
XS179#50	#50	3	I:50E3/12G-7/74LS123 B:50E2/C14-1/2.2uF! O:50E2/R25-2/180KOHM!
XS18#26	#26	2	O:26C4/RN9-7/4610X 101 102! I:26C5/24H-4/74F74
XS18#36	#36	2	O:36E5/13D-19/PAL16L8D! I:36F3/14C-10/74F00
XS184#40	#40	2	O:40B3/R12-2/10KOHM! I:40B3/T1-2/2N2222
XS19#36	#36	2	O:36E5/13D-12/PAL16L8D! I:36F4/14C-13/74F00
XS195#40	#40	2	I:40C2/BATT1-2/BATT1 B:40C1/D2-1/1N4148!
XS197#40	#40	2	I:40B1/T2-2/2N2907 I:40C1/R16-1/10KOHM
XS2#7	#7	2	I:7D2/3A-4/74F241 O:7C1/1F-6/74F04!
XS200#40	#40	2	B:40E4/TP7-1/TESTPOINT! O:40C4/34A-13/MM58274!
XS21#7	#7	2	I:7D4/2A-5/7438 O:7D5/8G-6/74F00!
XS26#38	#38	2	O:38B2/12F-6/74S132! I:38C1/11F-2/74S37
XS268#33	#33	3	I:33B7/28F-S17/ND DELILAH B:33A5/RN12-4/4610X 101 103! B:33A6/STR15-2/STR2!
XS269#33	#33	3	I:33B7/28F-R14/ND DELILAH B:33A5/RN12-3/4610X 101 103! B:33A6/STR14-2/STR2!
XS27#7	#7	2	O:7D4/1F-10/74F04! I:7D4/2A-1/7438
XS270#33	#33	3	B:33A6/STR13-2/STR2! I:33B7/28F-S16/ND DELILAH B:33A5/RN12-2/4610X 101 103!
XS277#33	#33	2	I:33B7/28F-P7/ND DELILAH B:33A6/RN12-5/4610X 101 103!
XS278#33	#33	2	I:33B7/28F-S6/ND DELILAH B:33A6/RN12-6/4610X 101 103!
XS281#33	#33	2	I:33B7/28F-P13/ND DELILAH B:33A7/RN12-9/4610X 101 103!
XS295#33	#33	2	I:33B7/28F-Q5/ND DELILAH B:33A7/RN12-8/4610X 101 103!
XS3#33	#33	2	T:33A4/34G-9/74PCT374! I:33B7/28F-S13/ND DELILAH
XS3#42	#42	2	B:38B7/TH2-6/217057GF! I:42C6/33G-11/AM29C821
XS30#38	#38	5	I:38B3/12F-10/74S132 B:38A3/D1-1/3.3V_ZENER! I:38A4/R11-1/1KOHM B:38A4/C3-1/10nF! I:38B4/12F-12/74S132
XS310#48	#48	2	B:48E4/3F-18/PAL16L8D! I:48F4/7A-13/7407
XS32#40	#40	3	I:40C4/34A-15/MM58274 B:40C3/X2-1/32.768KHZ! B:40D3/C5-1/22pF!
XS321#48	#48	2	I:48C7/14F-4/AM29C821 O:48C7/14F-22/AM29C821!
XS322#48	#48	2	I:48C4/13F-3/AM29C821 O:48C4/13F-23/AM29C821!
XS323#48	#48	2	I:48C4/13F-5/AM29C821 O:48C4/13F-21/AM29C821!
XS327#48	#48	2	I:48C7/14F-6/AM29C821 O:48C7/14F-20/AM29C821!
XS328#48	#48	2	I:48C7/14F-7/AM29C821 O:48C7/14F-19/AM29C821!
XS329#48	#48	2	I:48C7/14F-8/AM29C821 O:48C7/14F-18/AM29C821!
XS33#40	#40	3	O:40C4/34A-14/MM58274 B:40C3/X2-2/32.768KHZ! B:40D3/C6-1/22pF!
XS340#45	#45	2	I:45E2/7G-1/PAL16R8B O:45C2/2D-9/74F74!
XS360#3	#3	6	I:3D6/20A-1/74LS244 I:3D6/20A-19/74LS244 I:3D4/18A-1/74LS244 I:3D4/18A-19/74LS244 B:3C5/STR17-1/STR1! O:3C4/RN13-4/4610X 101 102!
XS372#3	#3	6	I:3D7/5G-1/74F244 I:3D7/5G-19/74F244 I:3E7/4G-1/74F244 I:3E7/4G-19/74F244 B:3C7/STR18-1/STR1! O:3C6/RN13-5/4610X 101 102!
XS374#45	#45	3	O:45C1/RN18-7/4610X 101 102! I:45C2/2D-12/74F74 I:45C2/2D-10/74F74
XS375#45	#45	2	I:45E7/2D-4/74F74 O:45E6/RN18-6/4610X 101 102!
XS38#7	#7	2	I:7E7/2A-10/7438 O:7D7/9D-10/74F02!
XS382#45	#45	2	I:45G3/8K-10/HP5082_7433 O:45F2/8H-13/74LS248!

XS383#45	#45	2	I:45G3/8K-8/HP5082 7433	O:45F2/8H-12/74LS248!
XS384#45	#45	2	I:45G3/8K-5/HP5082 7433	O:45F2/8H-11/74LS248!
XS385#45	#45	2	I:45G3/8K-3/HP5082 7433	O:45F2/8H-10/74LS248!
XS386#45	#45	2	I:45G3/8K-2/HP5082 7433	O:45F2/8H-9/74LS248!
XS387#45	#45	2	I:45G3/8K-11/HP5082 7433	O:45F2/8H-15/74LS248!
XS388#45	#45	2	I:45G3/8K-9/HP5082 7433	O:45F2/8H-14/74LS248!
XS4#26	#26	2	I:26D4/27H-17/74PCT244	O:26C5/24H-6/74F74!
XS4#33	#33	2	T:33A4/34G-12/74PCT374!	I:33B7/28F-R12/ND DELILAH
XS4#42	#42	2	B:42B7/TH2-2/217057GF!	I:42C6/33G-10/AM29C821
XS428#47	#47	2	I:47C2/7C-8/74PCT374	B:47B1/RN4-4/4610X 101 222!
XS429#47	#47	2	I:47C2/7C-13/74PCT374	B:47B1/RN4-3/4610X 101 222!
XS44#41	#41	2	B:41E2/LED2-1/RED!	O:41E2/RN14-4/4610X 101 102!
XS45#41	#41	2	B:41E2/LED3-1/GREEN!	O:41E2/RN14-5/4610X 101 102!
XS453#3	#3	6	I:3D2/17A-1/74LS244	I:3D2/17A-19/74LS244
			I:3D3/19A-1/74LS244	I:3D3/19A-19/74LS244
			B:3C2/STR16-1/STR1!	
			O:3C2/RN13-3/4610X 101 102!	
XS48#41	#41	2	O:41F4/29A-6/74F08!	I:41F4/14A-1/74LS38
XS48#7	#7	2	O:7D3/2B-3/74F00!	I:7E3/2B-4/74F00
XS5#33	#33	2	T:33A4/34G-15/74PCT374!	I:33B7/28F-N10/ND DELILAH
XS5#38	#38	2	O:38B2/12F-3/74S132!	I:38B2/12F-5/74S132
XS5#42	#42	2	B:42B7/TH2-5/217057GF!	I:42C6/33G-9/AM29C821
XS5#47	#7	2	I:7E3/2B-9/74F00	O:7E3/2B-6/74F00!
XS52#7	#7	2	I:7E3/2B-10/74F00	O:7E3/1F-8/74F04!
XS56#7	#7	2	I:7D5/8G-4/74F00	O:7C5/8G-3/74F00!
XS57#7	#7	2	I:7C5/8G-1/74F00	O:7C4/1F-12/74F04!
XS58#11	#11	3	I:11D5/6B-22/74AS646	I:11D4/7B-22/74AS646
			O:11F2/RN19-10/4610X 101 102!	
XS58#41	#41	2	O:41E4/28A-9/74LS273!	B:41E2/LED3-2/GREEN!
XS6#33	#33	2	T:33A4/34G-16/74PCT374!	I:33B7/28F-S12/ND DELILAH
XS6#38	#38	2	O:38B2/7F-8/74F14!	I:38B2/12F-4/74S132
XS6#41	#41	2	B:41C5/TH1-3/217057GF!	I:41C5/25A-11/74PCT244
XS6#42	#42	2	B:42B7/TH2-3/217057GF!	I:42C6/33G-8/AM29C821
XS611#44	#44	3	O:44B5/4H-14/AM29C821!	O:44B2/3H-14/AM29C821!
			B:44D4/5H-11/AM29861A!	
XS612#44	#44	3	O:44B5/4H-15/AM29C821!	O:44B2/3H-15/AM29C821!
			B:44D4/5H-10/AM29861A!	
XS613#44	#44	3	O:44B5/4H-16/AM29C821!	O:44B2/3H-16/AM29C821!
			B:44D4/5H-9/AM29861A!	
XS614#44	#44	3	O:44B5/4H-17/AM29C821!	O:44B2/3H-17/AM29C821!
			B:44D4/5H-8/AM29861A!	
XS615#44	#44	3	O:44B5/4H-18/AM29C821!	O:44B2/3H-18/AM29C821!
			B:44D4/5H-7/AM29861A!	
XS616#44	#44	3	O:44B5/4H-19/AM29C821!	O:44B2/3H-19/AM29C821!
			B:44D4/5H-6/AM29861A!	
XS617#44	#44	3	O:44B5/4H-20/AM29C821!	O:44B2/3H-20/AM29C821!
			B:44D4/5H-5/AM29861A!	
XS618#44	#44	3	O:44B5/4H-21/AM29C821!	O:44B2/3H-21/AM29C821!
			B:44D4/5H-4/AM29861A!	
XS619#44	#44	3	O:44B5/4H-22/AM29C821!	O:44B2/3H-22/AM29C821!
			B:44D4/5H-3/AM29861A!	
XS62#40	#40	2	B:40D7/X3-2/4MHZ!	I:40D7/35C-6/MC68705U3
XS620#44	#44	3	O:44B5/4H-23/AM29C821!	O:44B2/3H-23/AM29C821!
			B:44D4/5H-2/AM29861A!	
XS622#44	#44	2	I:44D4/5H-1/AM29861A	B:44D2/R15-2/2.2KOHM!
XS63#40	#40	3	B:40D7/X3-1/4MHZ!	B:40D7/C7-1/22pF!
			I:40D7/35C-5/MC68705U3	
XS65#41	#41	2	I:41F4/14A-2/74LS38	O:41F4/11B-6/74LS04!
XS69#41	#41	2	I:41F5/14A-10/74LS38	O:41F5/11B-8/74LS04!
XS7#33	#33	2	T:33A4/34G-19/74PCT374!	I:33B7/28F-Q10/ND DELILAH
XS7#41	#41	2	B:41C5/TH1-5/217057GF!	I:41C5/25A-13/74PCT244
XS72#2	#2	5	I:2B6/13B-1/74F04	I:2B6/13B-3/74F04
			I:2B7/13B-9/74F04	O:2A5/R8-2/1KOHM!
XS73#38	#38	2	O:38B4/12F-11/74S132!	I:38C4/29H-12/74F32
XS76#36	#36	2	I:36B6/25H-10/74F00	O:36B6/32C-6/74F32!
XS768#46	#46	2	I:46E5/8J-15/74LS112	O:46D5/14G-11/74F08!
XS77#36	#36	2	I:36B6/25H-4/74F00	O:36B6/32C-3/74F32!
XS786#46	#46	2	I:46E7/8J-14/74LS112	O:46D7/14G-8/74F08!
XS790#46	#46	5	I:46E5/8J-3/74LS112	I:46E5/8J-4/74LS112
			I:46E7/8J-11/74LS112	I:46E7/8J-10/74LS112
			O:46E4/RN14-8/4610X 101 102!	
XS792#46	#46	2	O:46E5/8J-6/74LS112!	B:46F5/LED4-2/RED!
XS793#46	#46	2	B:46D5/LED5-1/RED!	O:46D5/RN14-7/4610X 101 102!
XS795#46	#46	2	B:46F5/LED4-1/RED!	O:46F4/RN14-9/4610X 101 102!
XS8#33	#33	2	I:33A4/34G-11/74PCT374	O:33A5/7F-6/74F14!
XS8#38	#38	2	O:38B1/10F-12/74F10!	I:38C1/11F-1/74S37
XS8#41	#41	2	B:41C5/TH1-2/217057GF!	I:41C5/25A-15/74PCT244
XS80#42	#42	2	B:42B7/TH2-4/217057GF!	O:42B6/RN9-2/4610X 101 102!
XS83#17	#17	4	I:17E5/32G-1/AM29841	I:17D2/29H-5/74F32
			I:17D1/29H-2/74F32	O:17D6/11F-11/74S37!
XS85#42	#42	2	O:42C5/RN7-4/4610X 101 103!	I:42C6/33G-7/AM29C821
XS87#17	#17	2	O:17D1/29H-3/74F32!	I:17E2/30H-14/74F373
XS88#17	#17	2	O:17D2/29H-6/74F32!	I:17E2/30H-17/74F373
XS9#41	#41	2	B:41C5/TH1-6/217057GF!	I:41C5/25A-17/74PCT244
XS91#42	#42	2	I:42B3/32H-21/SC2661	O:42A1/11B-2/74LS04!
XS92#41	#41	3	O:41G3/11B-4/74LS04!	I:41G3/2A-12/7438

I:41G3/2A-13/7438
XS93#36 #36 2 O:36F2/9D-4/74F02! I:36F2/9D-3/74F02
XTAL1 #38 3 I:38D1/13C-1/74LS393 O:38A1/X4-3/39.3216MHZ!
I:38B1/10F-1/74F10
XTAL2 #38 2 O:38A2/X1-3/35MHZ! I:38B2/12F-2/74S132
XTR 5 B:2E2/RN1-5/4610X 101 102! O:2D3/A-B4/! O:2D3/A-C23/!
B:42B3/32H-25/SC2661! B:42B3/32H-9/SC2661!

SIGNAL TYPE: " " HIERARCHICAL BETWEEN BLOCKS
----- "+n" INTERPAGE ONLY ON BLOCK NO. n
"##m" INTRAPAGE ONLY ON PAGE NO.

♀ SITE
MODS

Printed by:	Chris-Cherring	Date:	1987-09-08
Subject:	REGISTER FILE MARGINALITIES		
Document name:	REGISTER FILE MARG-7277457:TEXT		
Letter created:	1987-09-08 15:05:33		
Sent by:	Lasse-Bockelie		
Address :	HQRD-BOA		

Hi Chris!

The problem encountered on almost all of the C-print is when IDBS,REG is used in combination with CONDENABLE in the following cycle providing the test condition is a result of the ALU operation. These cycles must be 100ns.

This occurs at least 44 times in the microcode (I gave up!!). Hence the probability of oversight is too high, and we may face a performance decrease if we insert dummy cycles, or use 175ns cycles (COMM,SLOW).

I have however another solution:

Connect ^{19F17}~~17F19~~ to 15D19 (RRF~)
 Connect 15D13 to 14D13 (SLCOND~)

Replace 44403~~B~~ with 44403^C
 Replace 44404~~B~~ with 44404^C

The pals are on KAA, and include only additions, ie. we can reblow the same devices.

The equations are:

SLCOND = ACOND * CSECOND	ALU CONDITION USED IN THE NEXT CYCLE FOR
+ ACOND * CSLOOP	MICROCODE SEQUENCING.

This is then added to DLY1 in 44404 like this:

DLY1 = previous equations
 + RRF * SLCOND

The cycle time will be 75ns if SLCOND is active (terms also included in DLY0), and 100ns if IDBS=REG in combination with this.

Lasse.

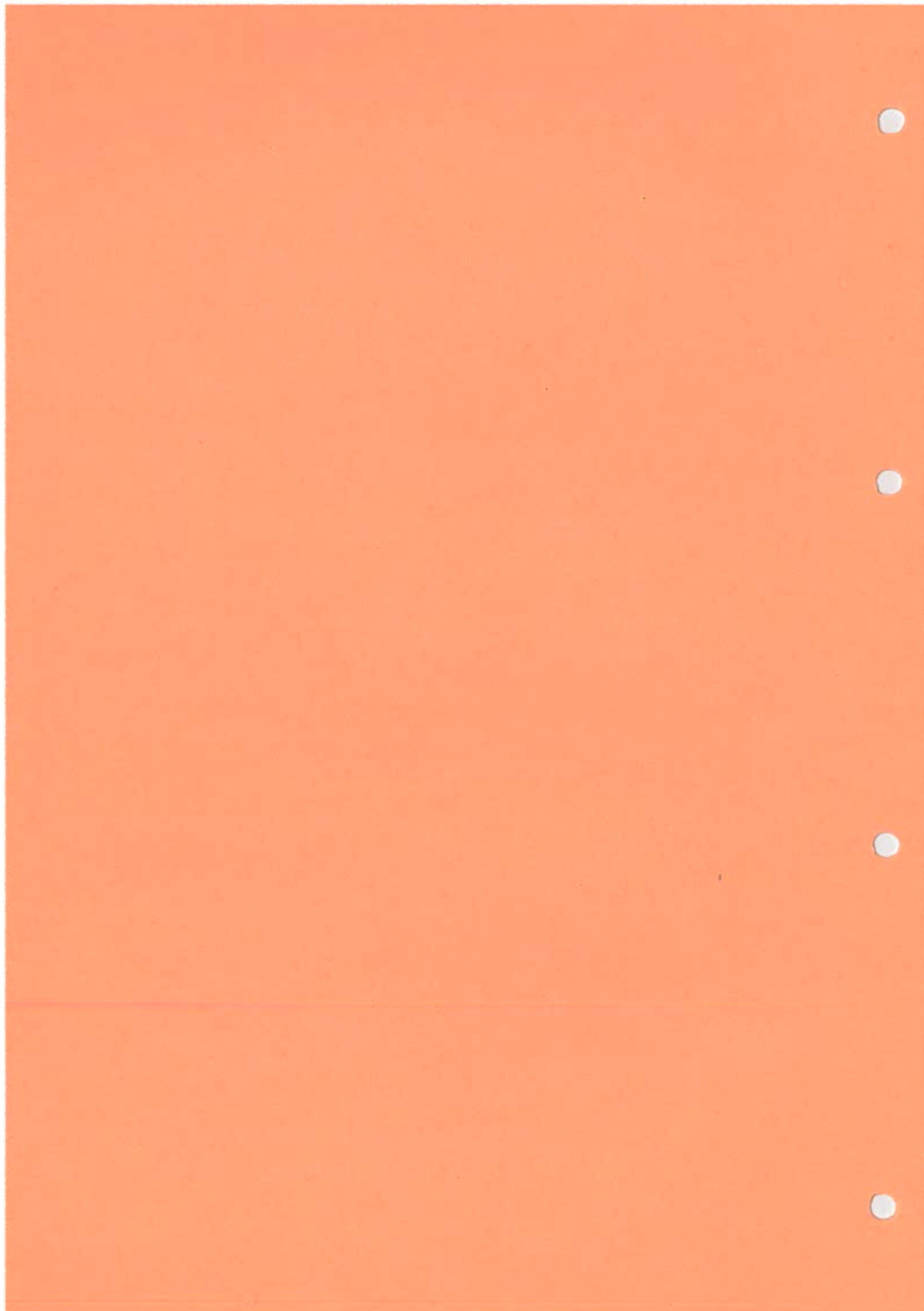
Printed by:	Chris-Cherring	Date: 1987-09-04
Subject:	CONTROL STORE WRITE	
Document name:	CONTROL STORE WRIT-21133265:TEXT	
Letter created:	1987-09-03 13:05:05	
Sent by:	Lasse-Bockelie	
Address :	HQRD-BOA	

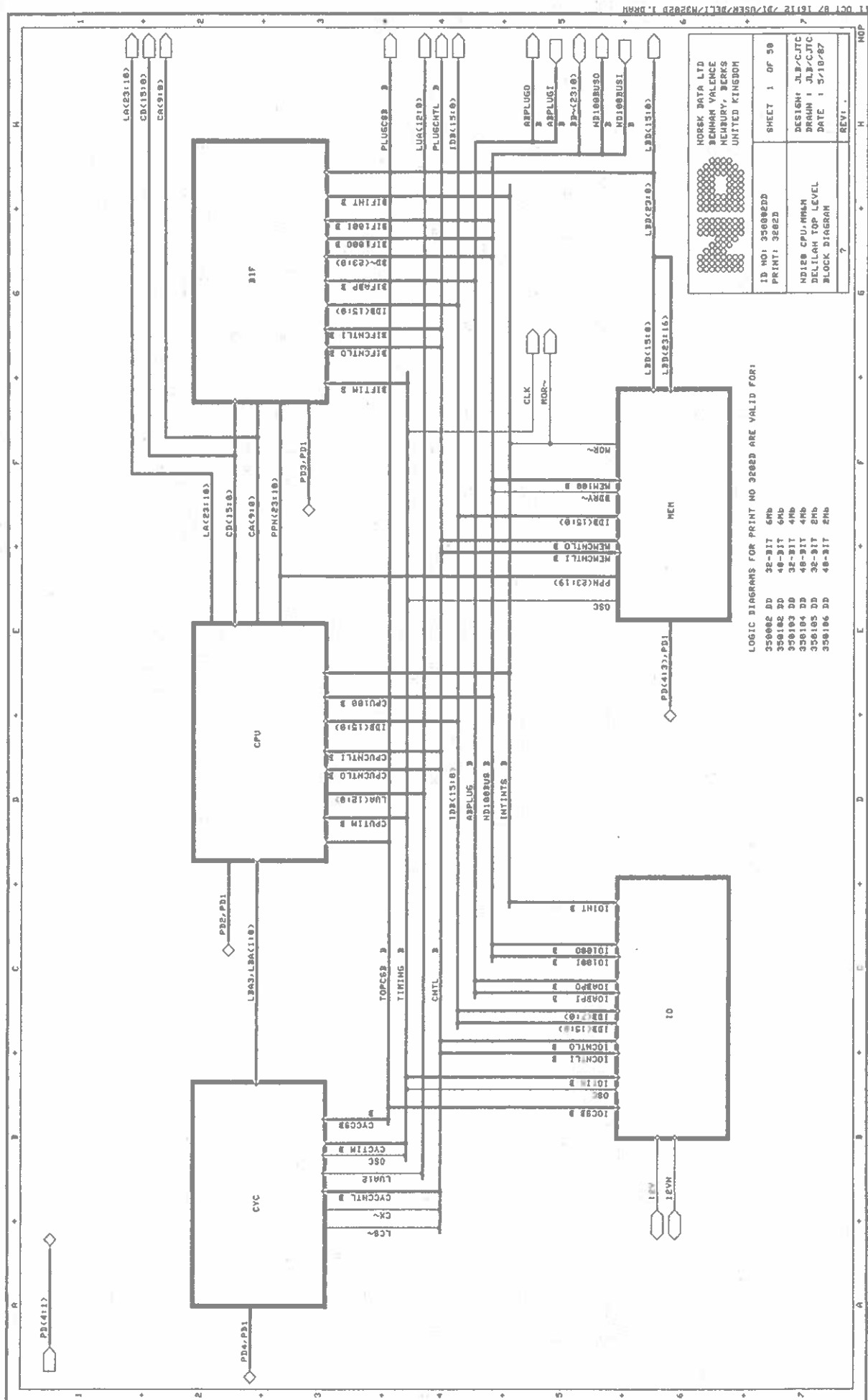
Hi Chris!

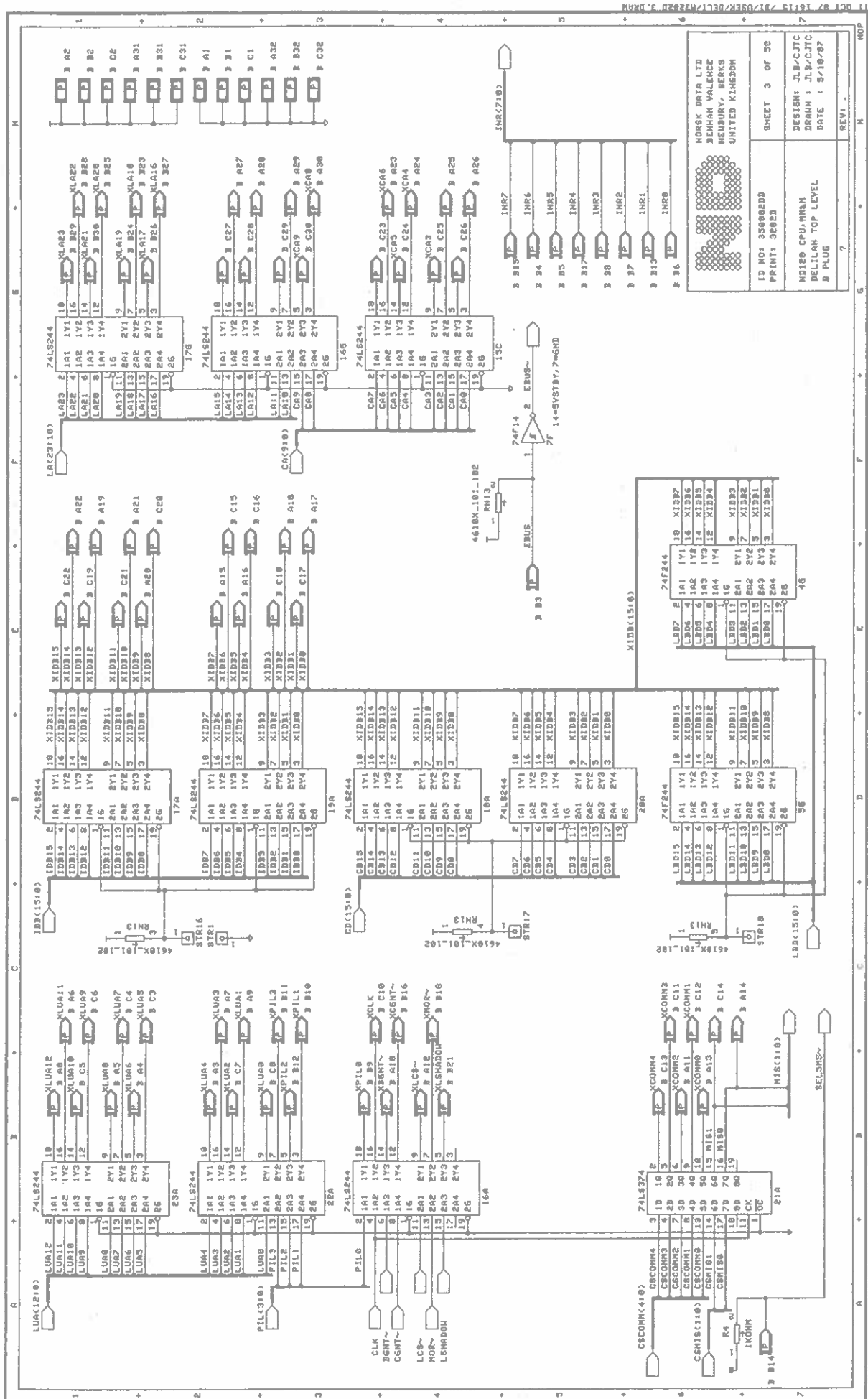
The solution to the write control store problem is a new pal 44305D on the DELILAH user on KAA.

The problem was that the write pulse WCSTB starts before EL0W has gone inactive, and in some cases we are writing in both the upper and the lower CS.

Lasse



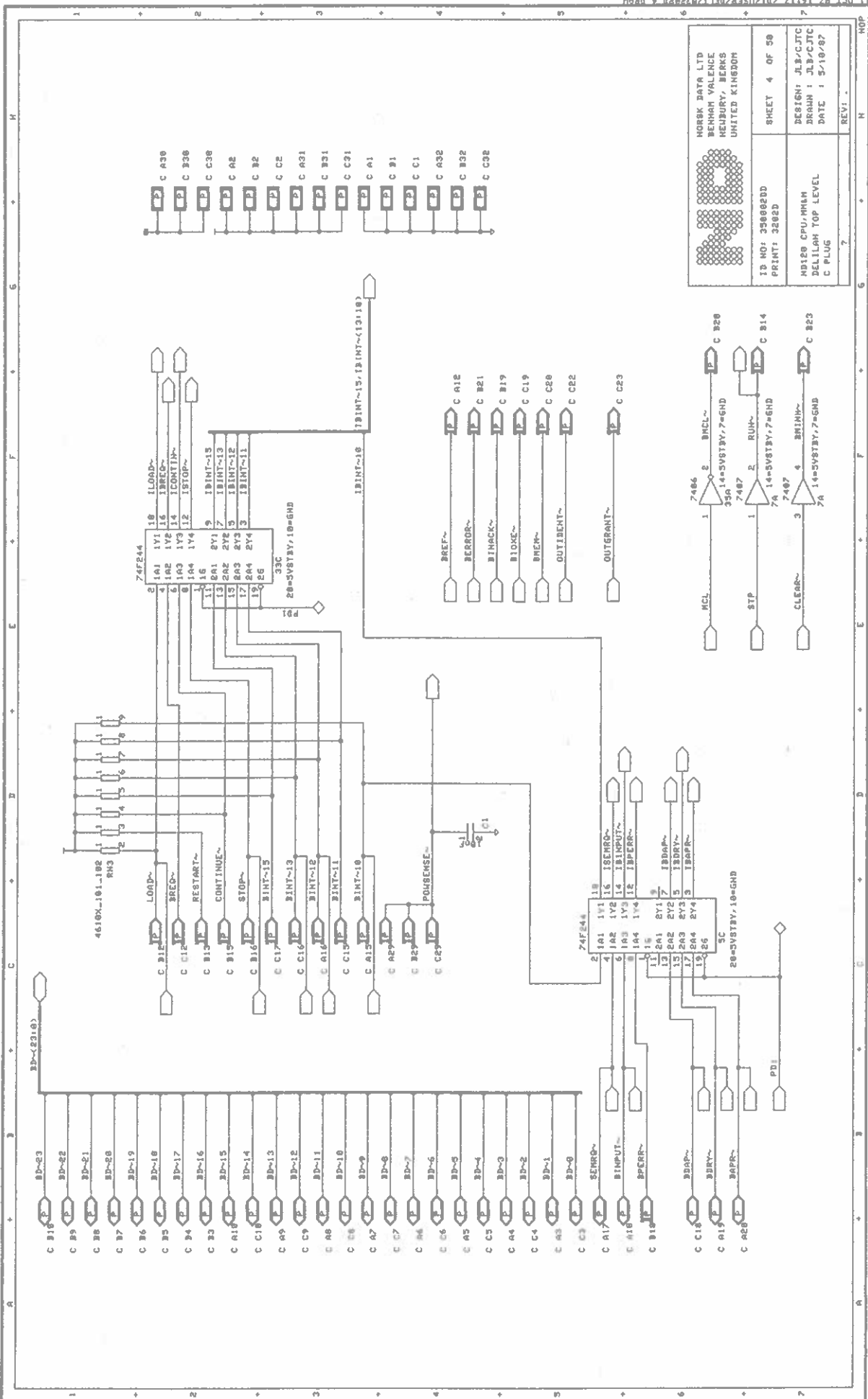




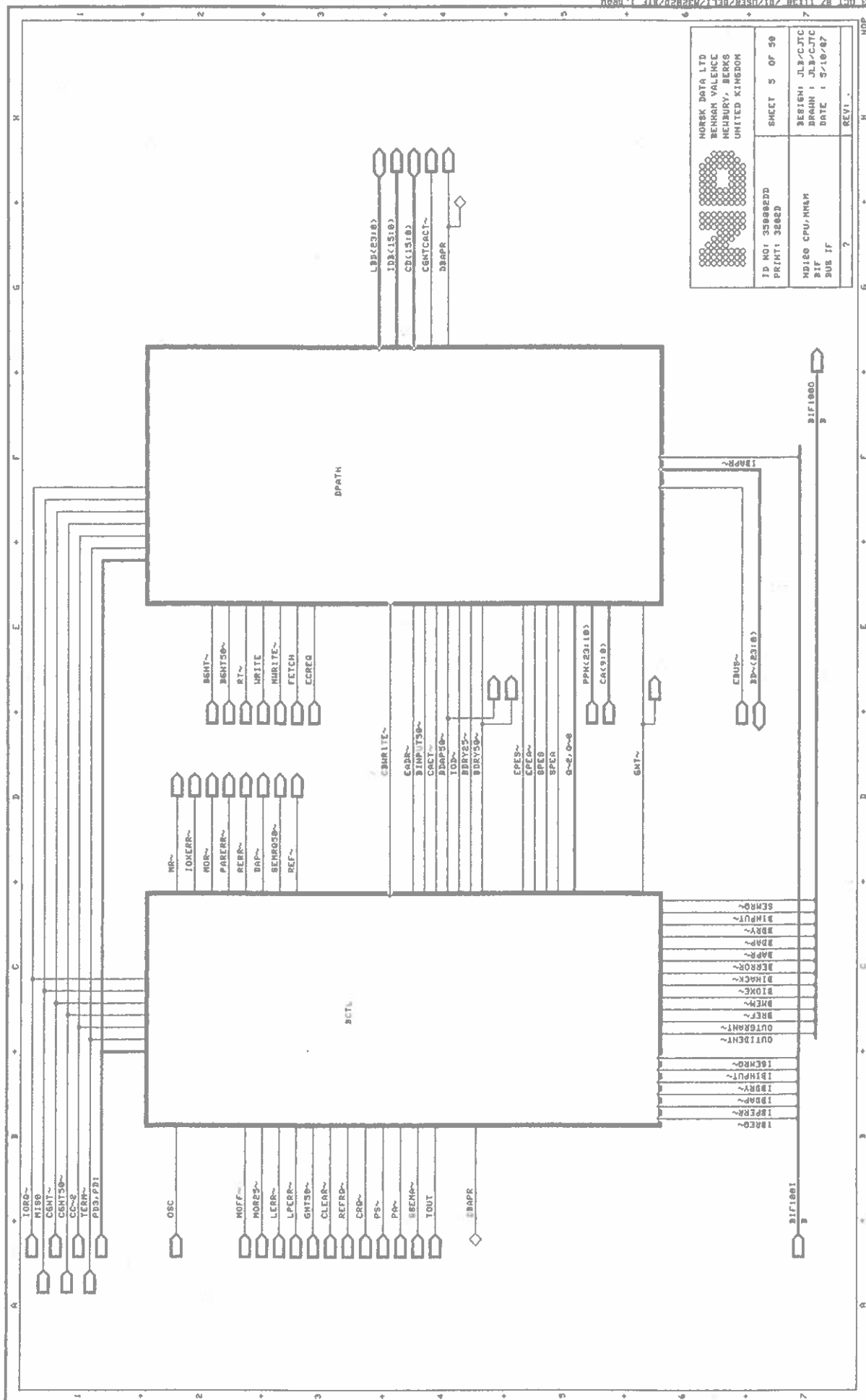
MORSE DATA LTD
JENNAN VALENCE
WENDURY, BERKS
UNITED KINGDOM

ID NO: 350002DD PRINT: 3202D	SHEET 3 OF 50
MD100 CPU-MMH DELIAH TOP LEVEL S PLUG	DESIGN: JL-B/CJTC DRAWN: JL-B/CJTC DATE: 5/10/87
?	REVI: -

52

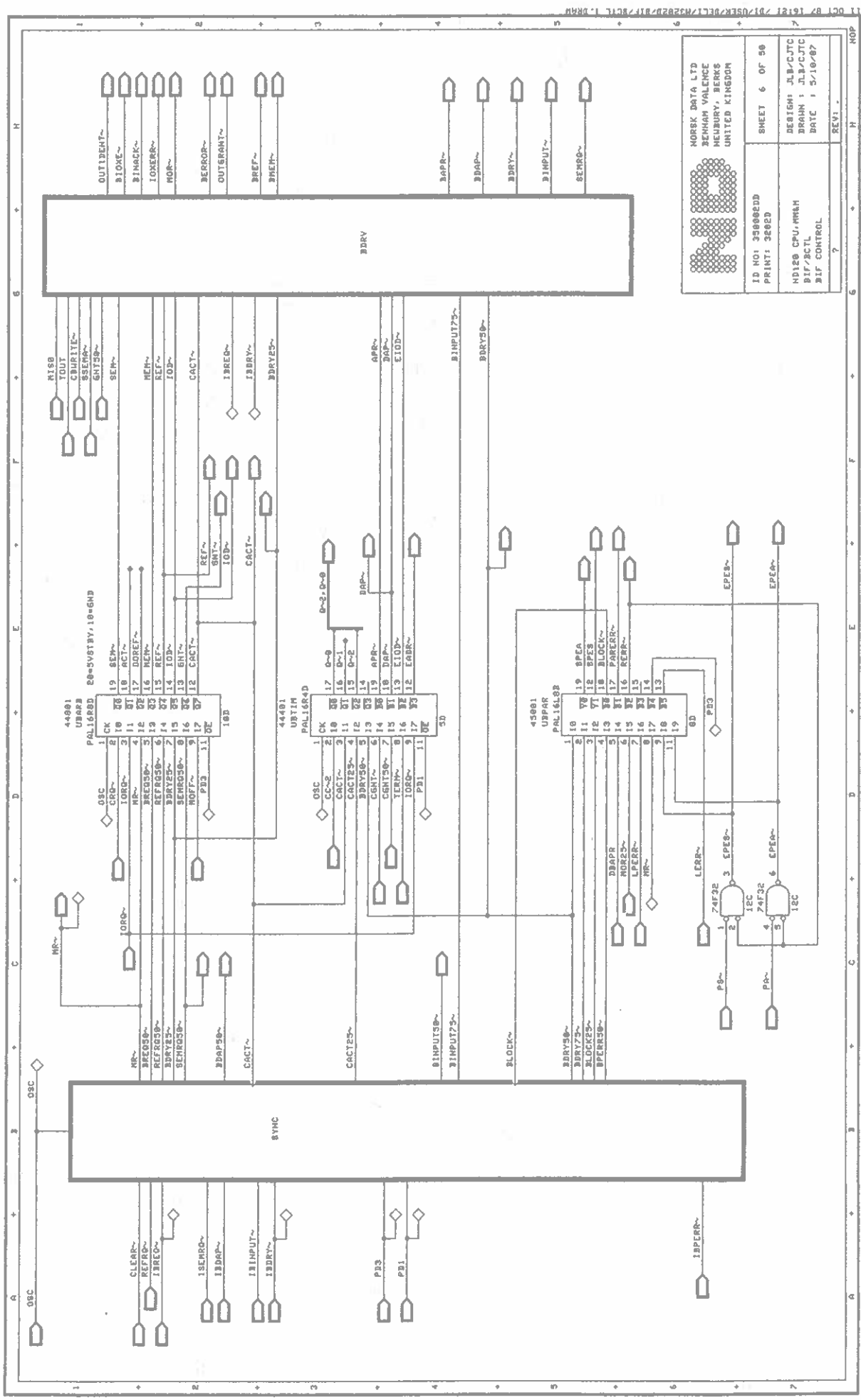


NORSK DATA LTD BENNAH VALENCE HEBURY, BERNES UNITED KINGDOM		DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 15/10/87	
13 NO: 330020D PRINT: 3202D		SHEET 4 OF 50	
ND120 CPU/MHLM DELLAH TOP LEVEL C PLUG		REV: -	



MORSE DATA LTD BENHAM VALENTINE MEUBURY, BERKS UNITED KINGDOM		SHEET 5 OF 50	
TD NO: 35982DD PRINT: 35982D	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 15/10/87	BUS IF	REV: 7

19 OCT 87 11:38 / B1/05EN/DEL1/H2222D/BIF 1.DRAW



NORSK DATA LTD
ZENHAM VALENCIE
NEUBURY, BERKS
UNITED KINGDOM

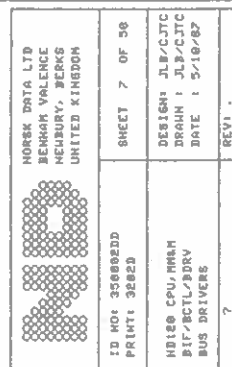
DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 15/10/87
REV: -

ID NO: 358882DD
PRINT: 3802D

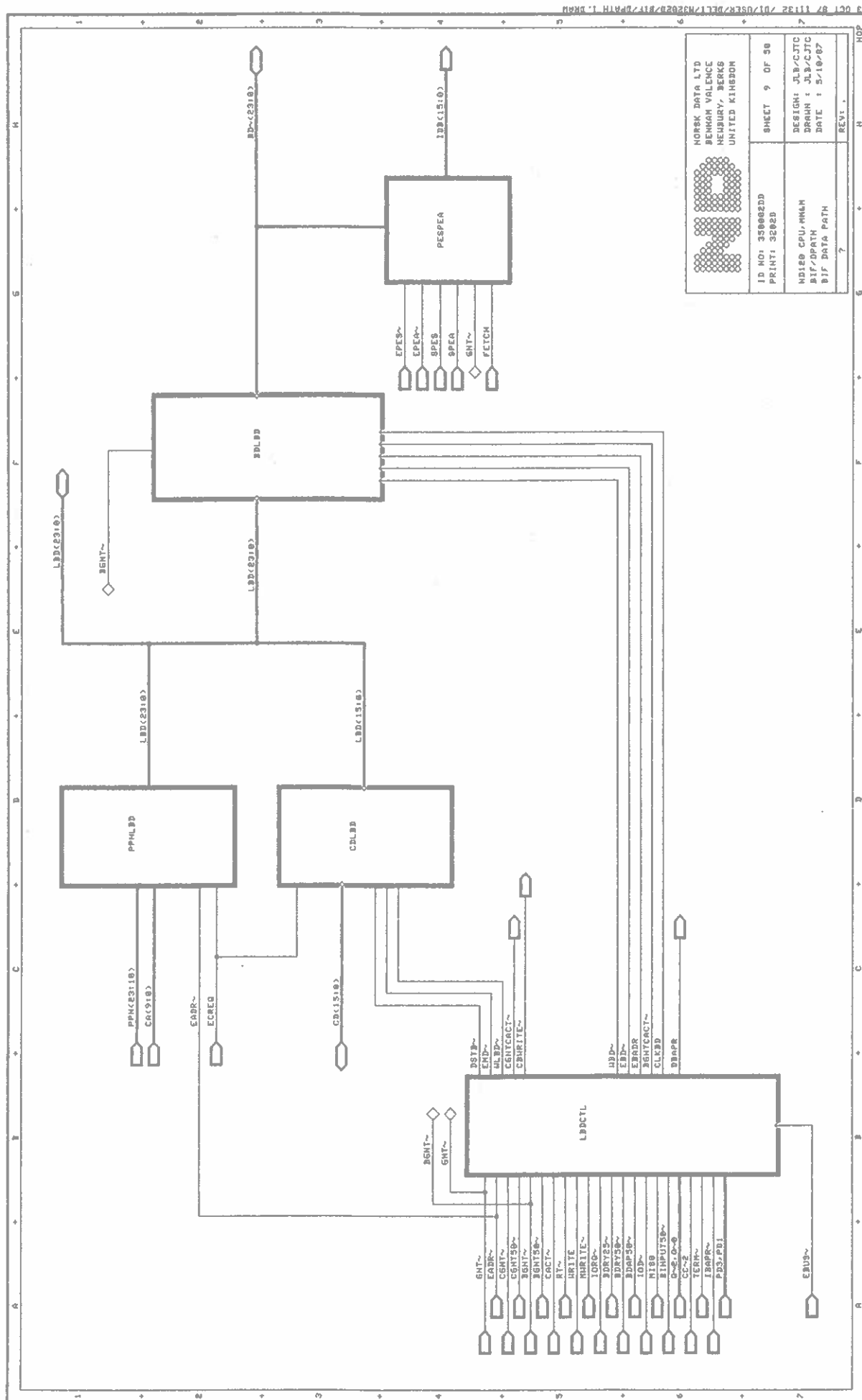
SHEET 6 OF 50

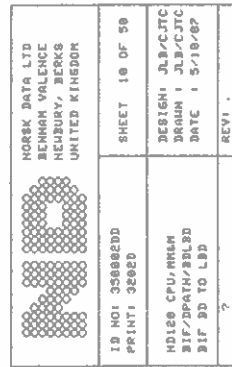
ND128 CPU MMH
BIF/BCIL
BIF CONTROL

1 OCT 87 16:21 / D1/05K/BCIL/M382D/BIF/BCIL I.BKAD

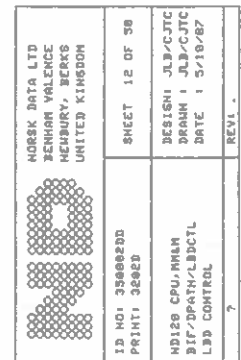


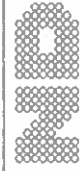
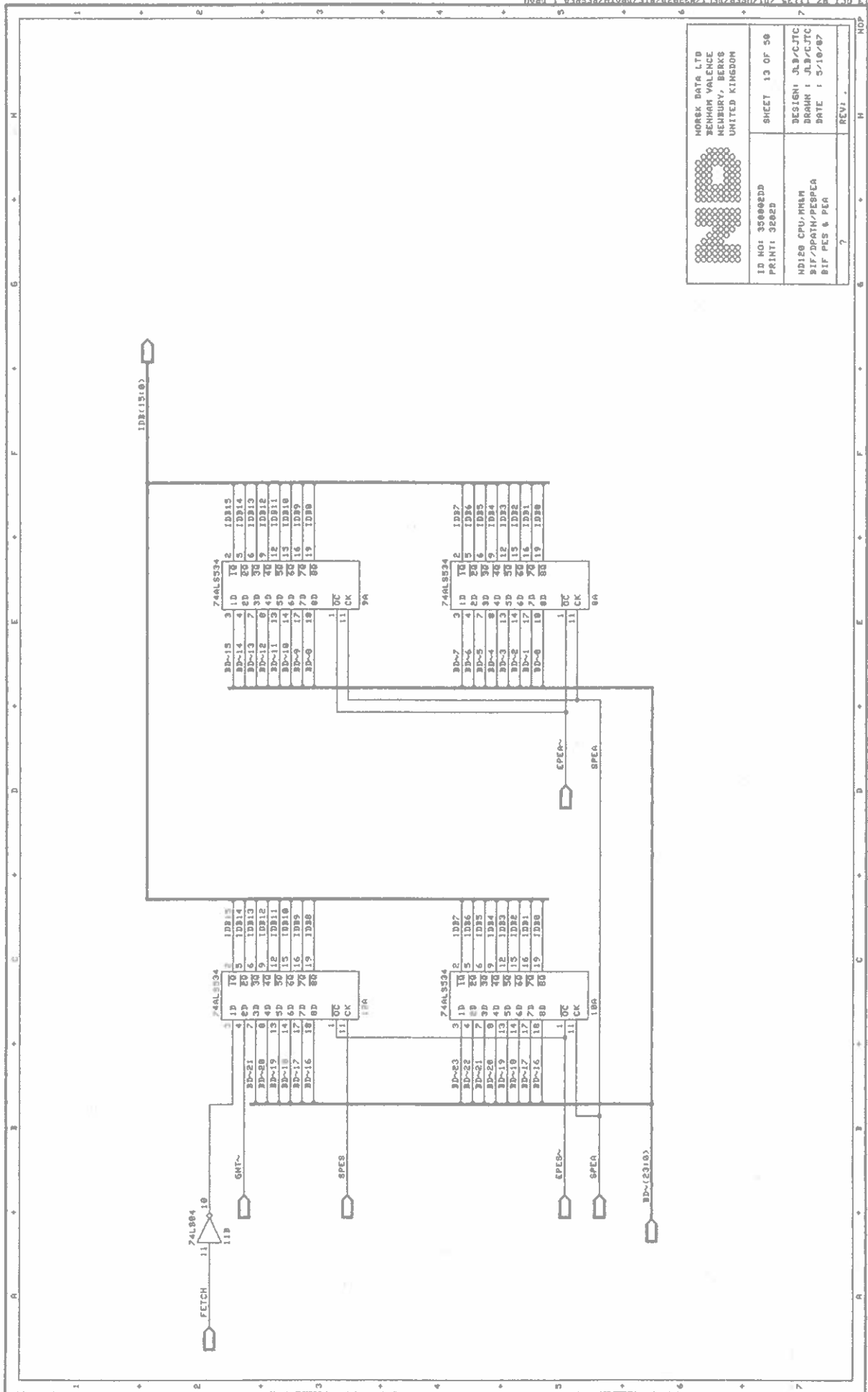

$$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow F \rightarrow G \rightarrow H \rightarrow I \rightarrow J \rightarrow K \rightarrow L \rightarrow M \rightarrow N \rightarrow O \rightarrow P \rightarrow Q \rightarrow R \rightarrow S \rightarrow T \rightarrow U \rightarrow V \rightarrow W \rightarrow X \rightarrow Y \rightarrow Z$$





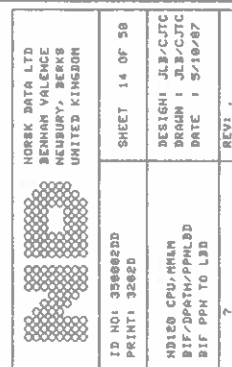


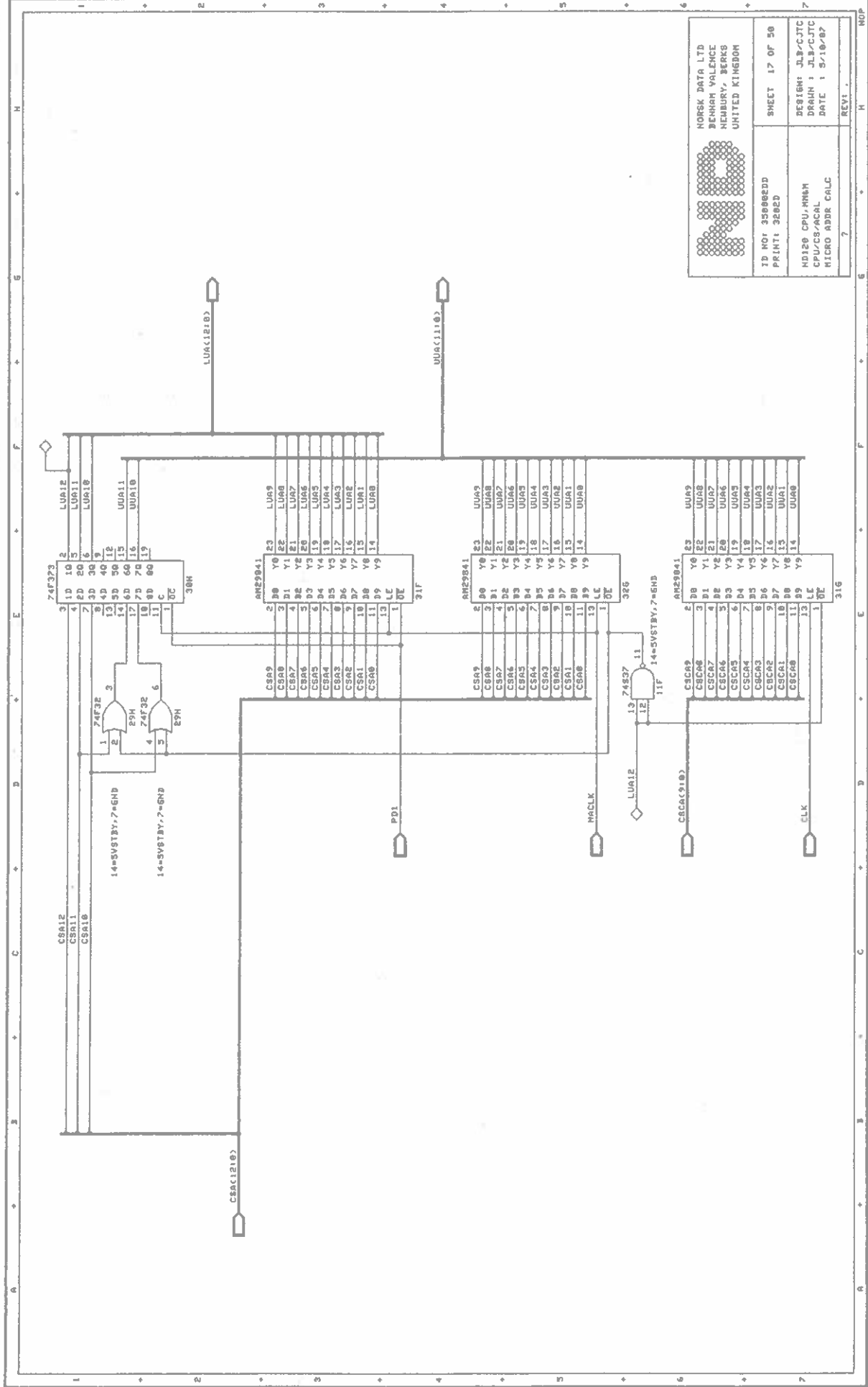




MOREK DATA LTD
ZENHAK VALENCE
NEUBURY, BERKS
UNITED KINGDOM

ID NO: 356002D PRINT: 3202D	SHEET 13 OF 50
HD180 CPU/MEM BIF/SPATH/PES/PEA BIF PES & PEA	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/10/87
7	REV: .

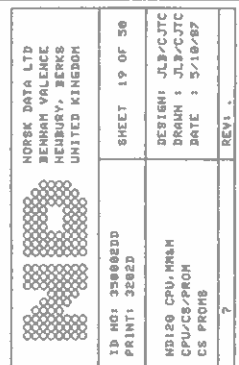


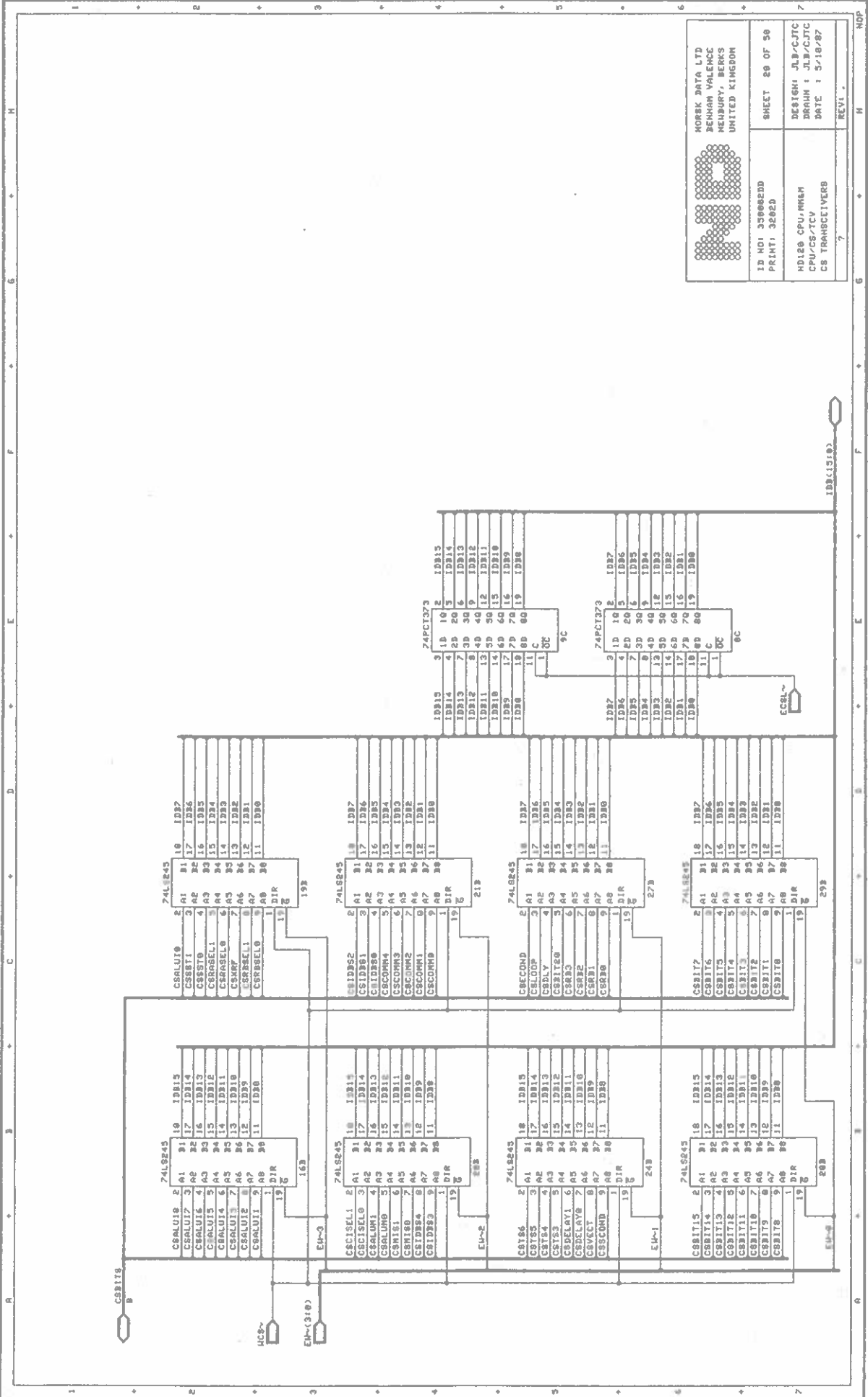


	NORSK DATA LTD BERNHARD VALENCE HEMURBY, BERKS UNITED KINGDOM
	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 15/10/87
7D NOT 358082D PRINT: 3282D	SHEET 17 OF 50
MD120 CPU-MM6M CPU/CS/ACAL MICRO ADDR CALC	REVI: .



	NORSK DATA LTD BENHAM VALEANCE NEWBURY, BERKS UNITED KINGDOM	SHEET 18 OF 38
ID NO: 350802DD PRINT: 388D	DESIGNS: J.B./CJC DRAWN: J.B./CJC DATE: 1.5.18/87	REV:
18 CPU-MEM CPU/C5/CTL C5 CONTROL	?	







NORSE DATA LTD
ZENHAM VALENCE
HENDURY, BERKS
UNITED KINGDOM

DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 5/18/87

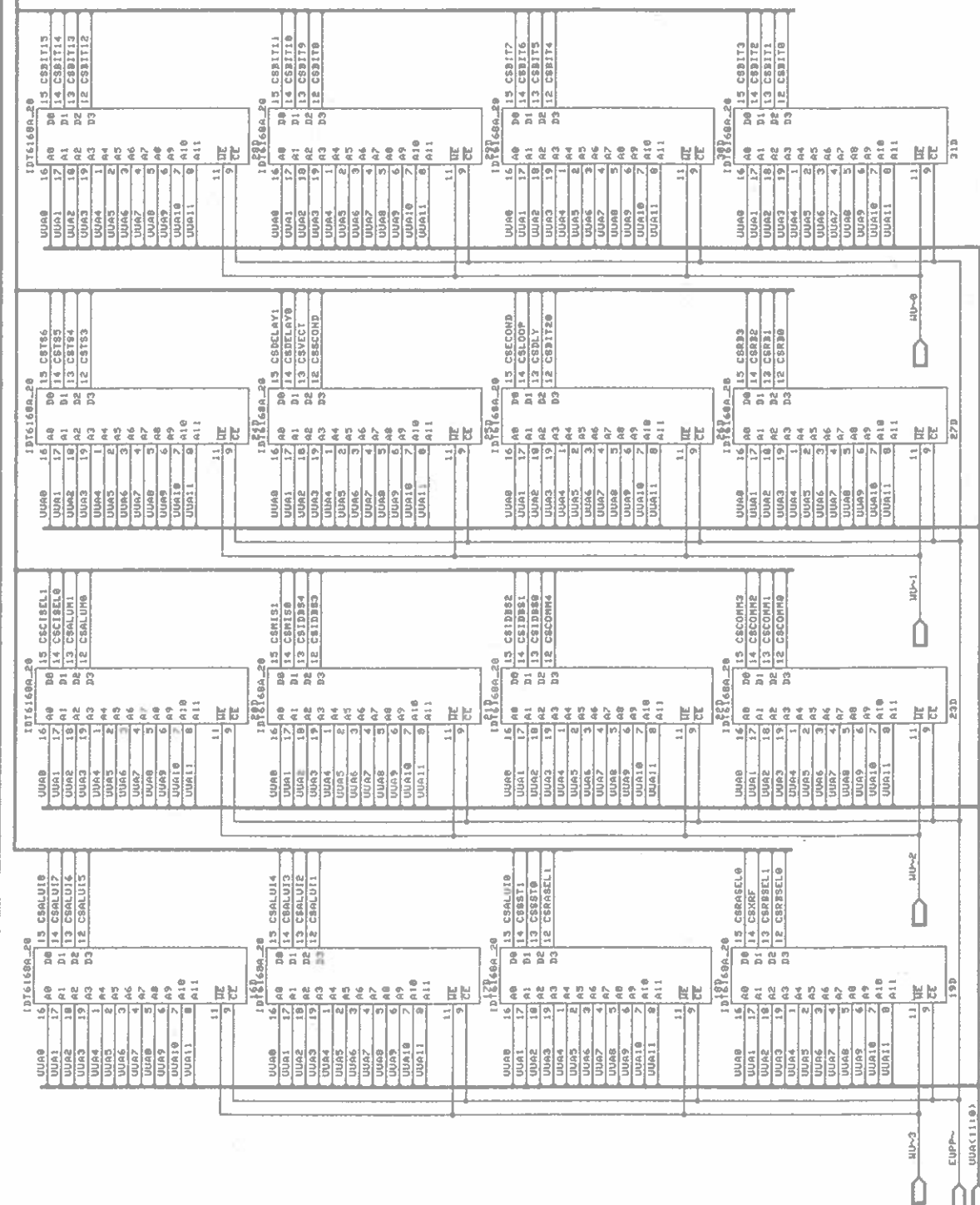
13 NO1 336082DD
PRINT: 3202D

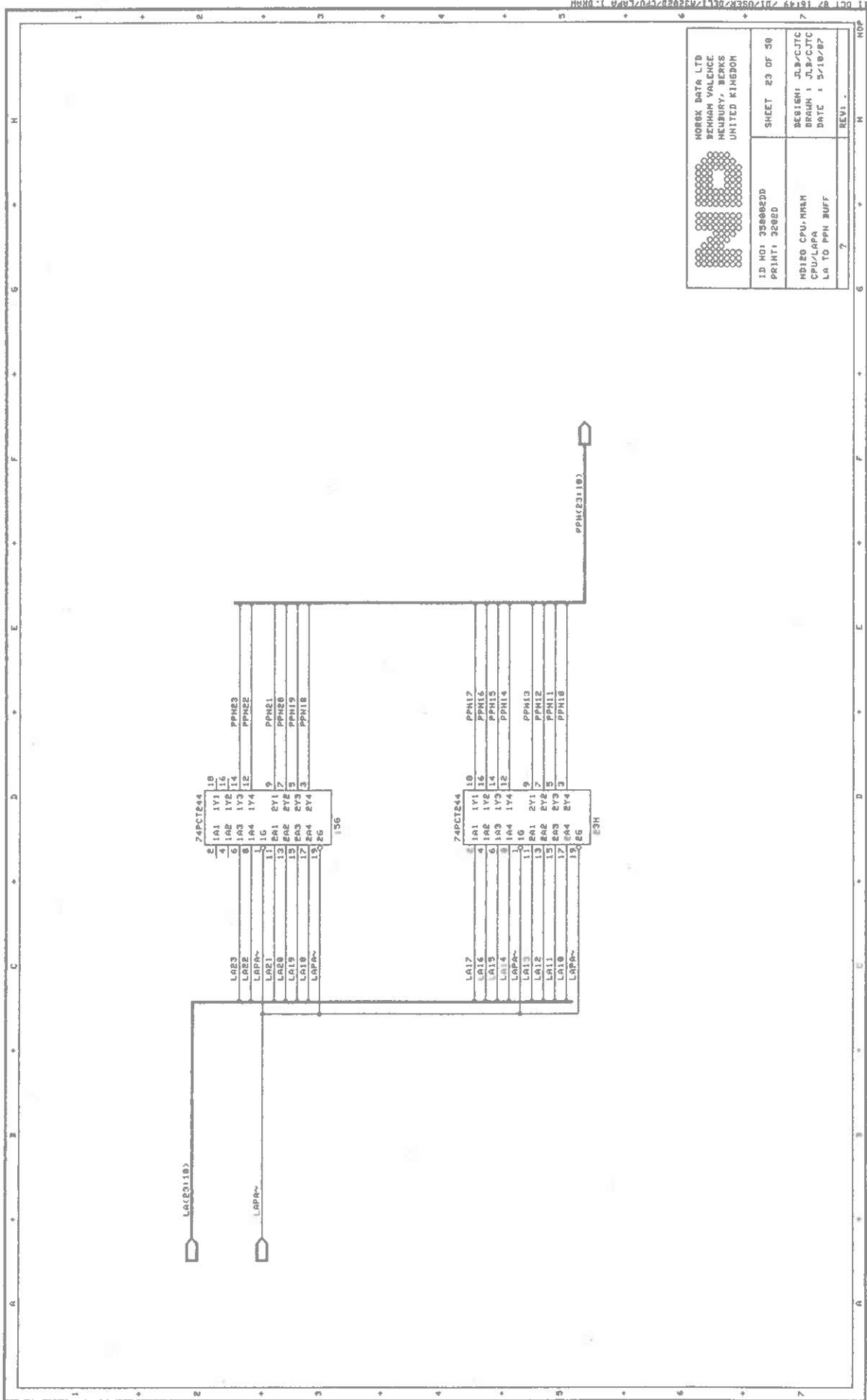
SHEET 29 OF 50

NO126 CPU/MEM
CPU/CS/TCV
CS TRANSCEIVERS

REV: 1

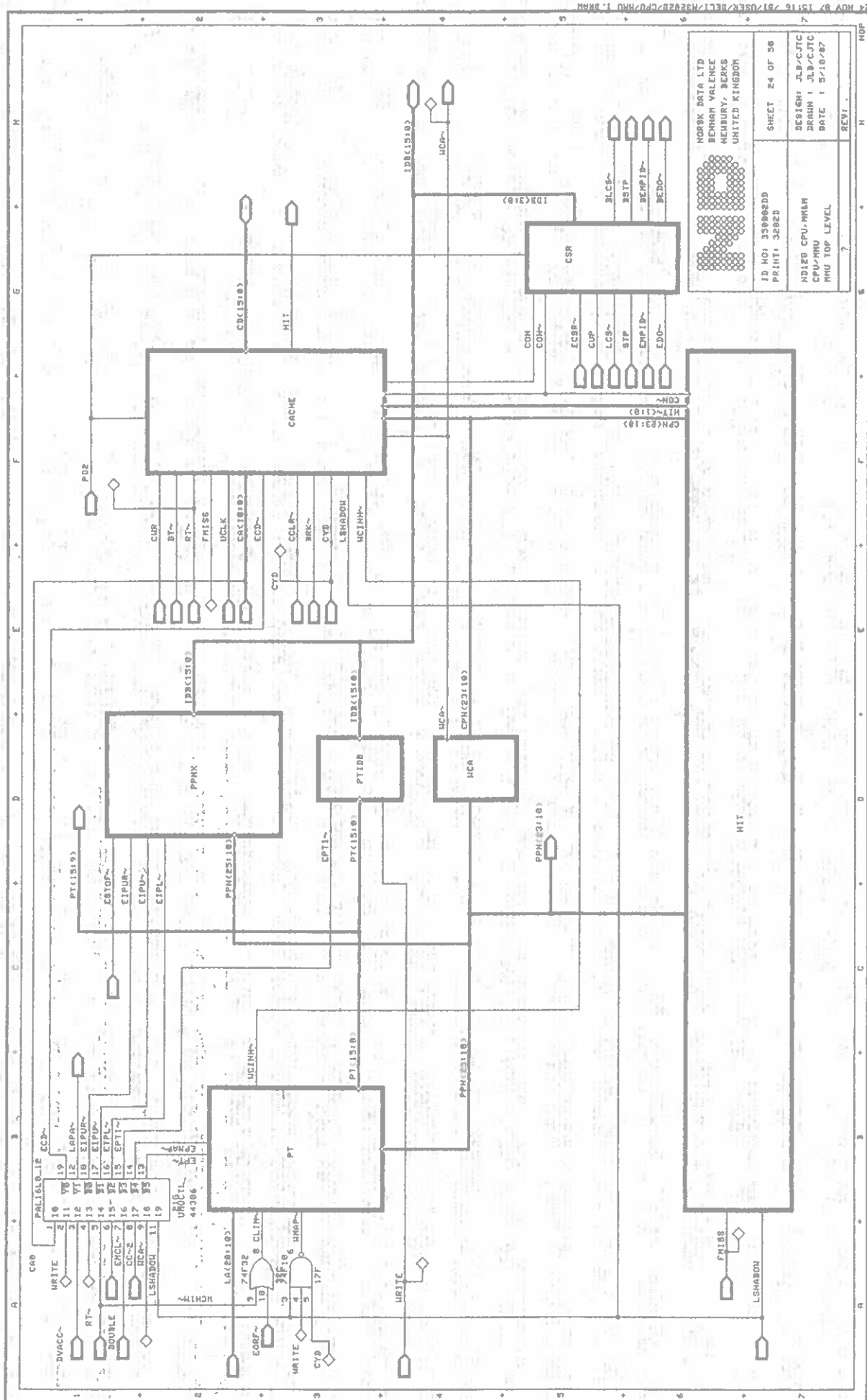
11 OCT 87 16:43 /J1/USK/DELI/MS02D/CP/CS/TCV 1.DRAW



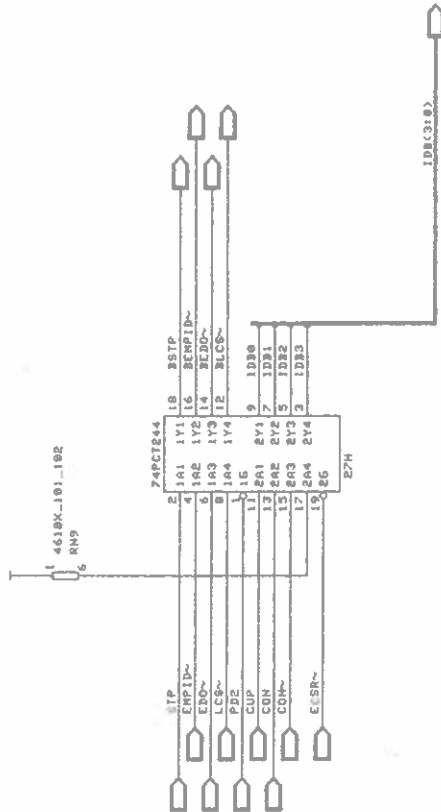


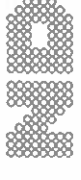

HOREX DATA LTD
 22, HAM VALENCE
 NEWBURY, BERKS
 UNITED KINGDOM

ID NO: 358082DD PRINT: 3202D	SHEET 23 OF 50
MD120 CPU, MMH CPU/LAPA LA TO PPN BUFF	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/18/87
7	REV: -



	
NORSE DATA LTD BENHAM VALENCE NEUBURY, BERKS UNITED KINGDOM	
ID NO: 350802DD PRINT: 3502D	SHEET 26 OF 30
ND120 CPU/HM&M CPU/HMU/CSR CACHE STATUS REG	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/18/87
REVI: 1	





NORSK DATA LTD
BENHAM VALENCE
NEWBURY, BERKS
UNITED KINGDOM

ID NO: 35882DD
PRINT: 382D

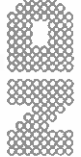
DESIGN: JLB/CJTC
DRAIN: JLB/CJTC
DATE: 5/10/87

SHEET 27 OF 58

REVI: .

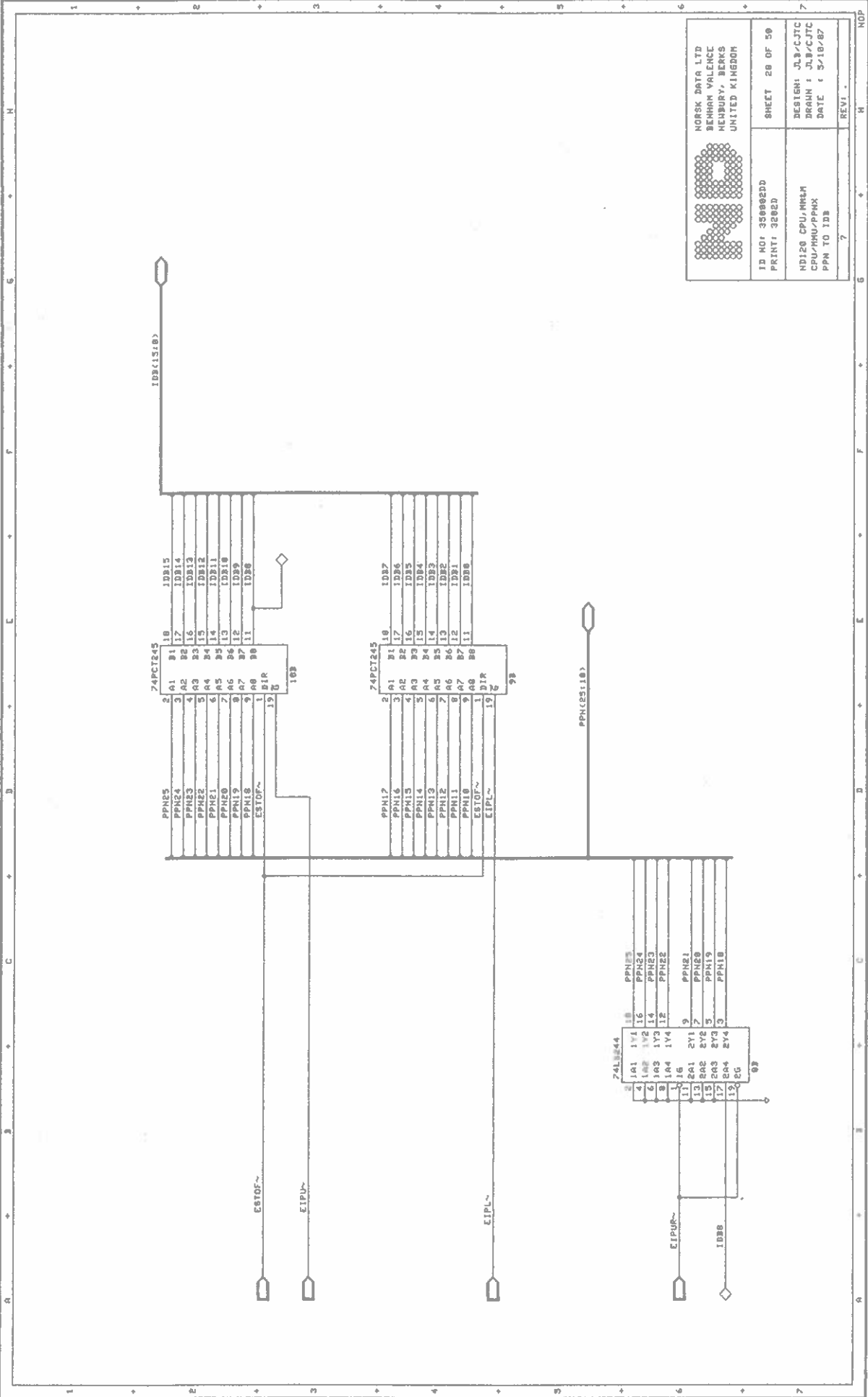
Diagram showing two 74FCT321A chips. The left chip has inputs PPH(2318), CPH(2318), LSHADD, and FMISS connected to its pins 2, 3, 4, and 1 respectively. Its output pin 156 is connected to a square wave symbol. The right chip has inputs PPH17, CPH16, CPH15, CPH14, CPH13, CPH12, CPH11, CPH10, and CPH9 connected to its pins 2 through 10 respectively. Its output pin 156 is connected to a square wave symbol. Both chips have pins 19 and 20 connected to a common line labeled HIT-1.

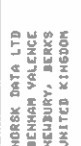
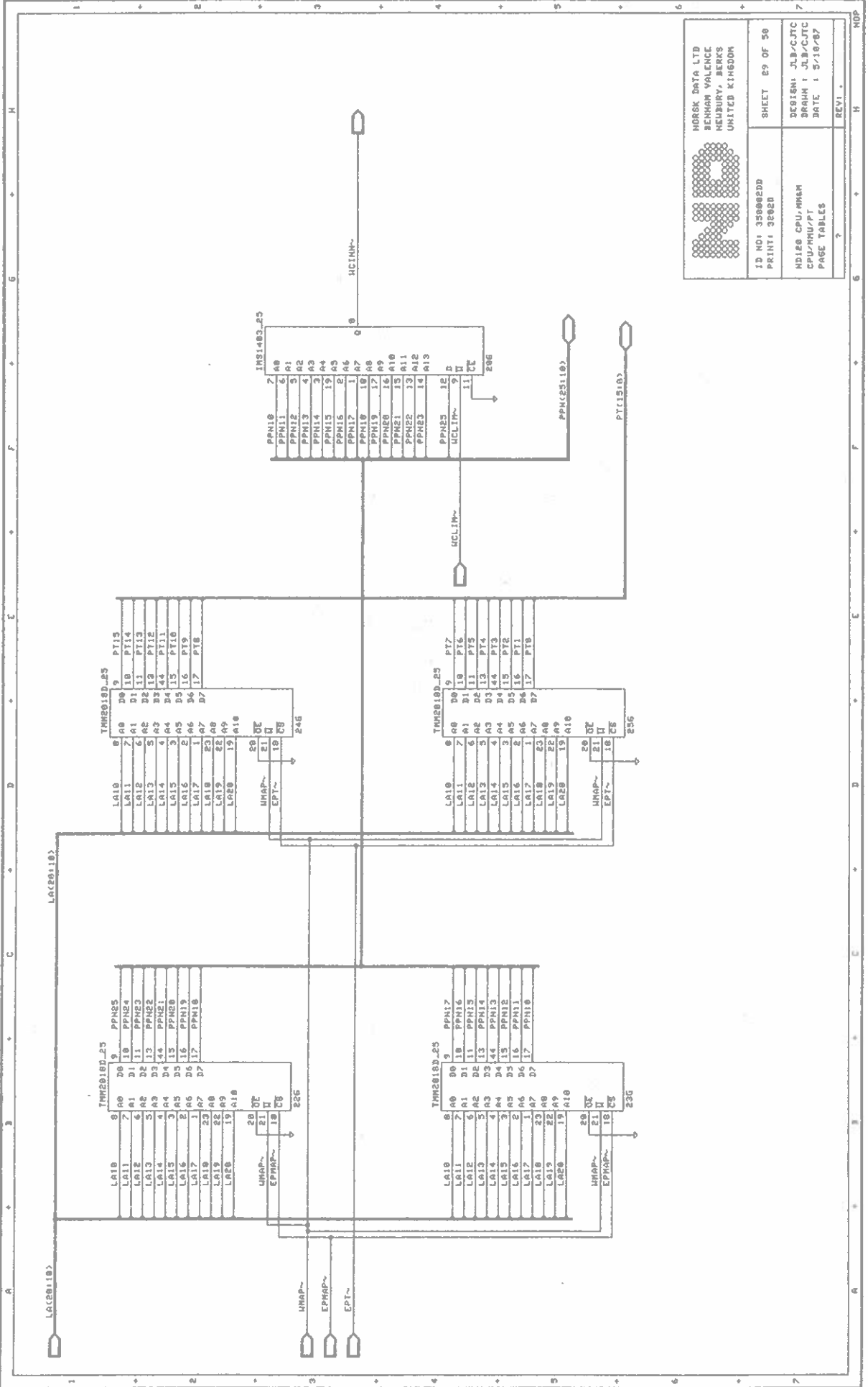
MOP



NORSK DATA LTD
BENHAM VALENCE
HENBURY, BERKS
UNITED KINGDOM

ID NO: 350902DD PRINT: 3202D	SHEET 29 OF 50
ND120 CPU,MMtM CPU/HMU/PPHX PPN TO IDB	DESIGN: JLB/CJTC DRAIN: JLB/CJTC DATE: 5/18/87 SEV: -





HOREK DATA LTD
BENHAM VALENCE
NEUBURY, BERKS
UNITED KINGDOM

ID NO: 35982DD PRINT: 3020	SHEET 29 OF 50
ND18 CPU/MH/PT PAGE TABLES	DESIGN: JLB/CJC SPRM: JLB/CJC DATE: 5/10/87
?	REVI: .

18 OCT 87 16:23 / D1/08K/DEL1/M3282D/CPU/MH/PT 1. DRAM



11 OCT 87 1709 /DL/USBR/DEL1/H3202D/CPU/KMD/PT108 1.00AM

11 OCT 87 17:01 / J1/05EN/DEL1/M302D/CPU/MNO/MCA 1. DRAM



NORSEX DATA LTD

TRINCOM VALENCIA

MEMBERSHIP, SERVICES

UNITED KINGDOM

1D NO1 326062D3

PRINT: 3202D

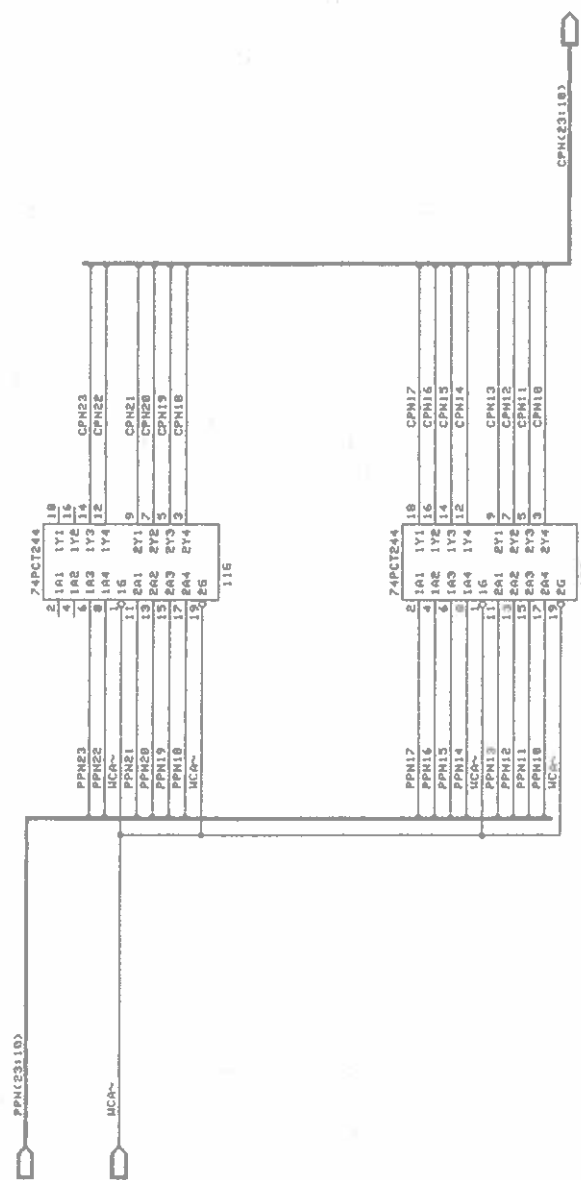
SHEET 31 OF 50

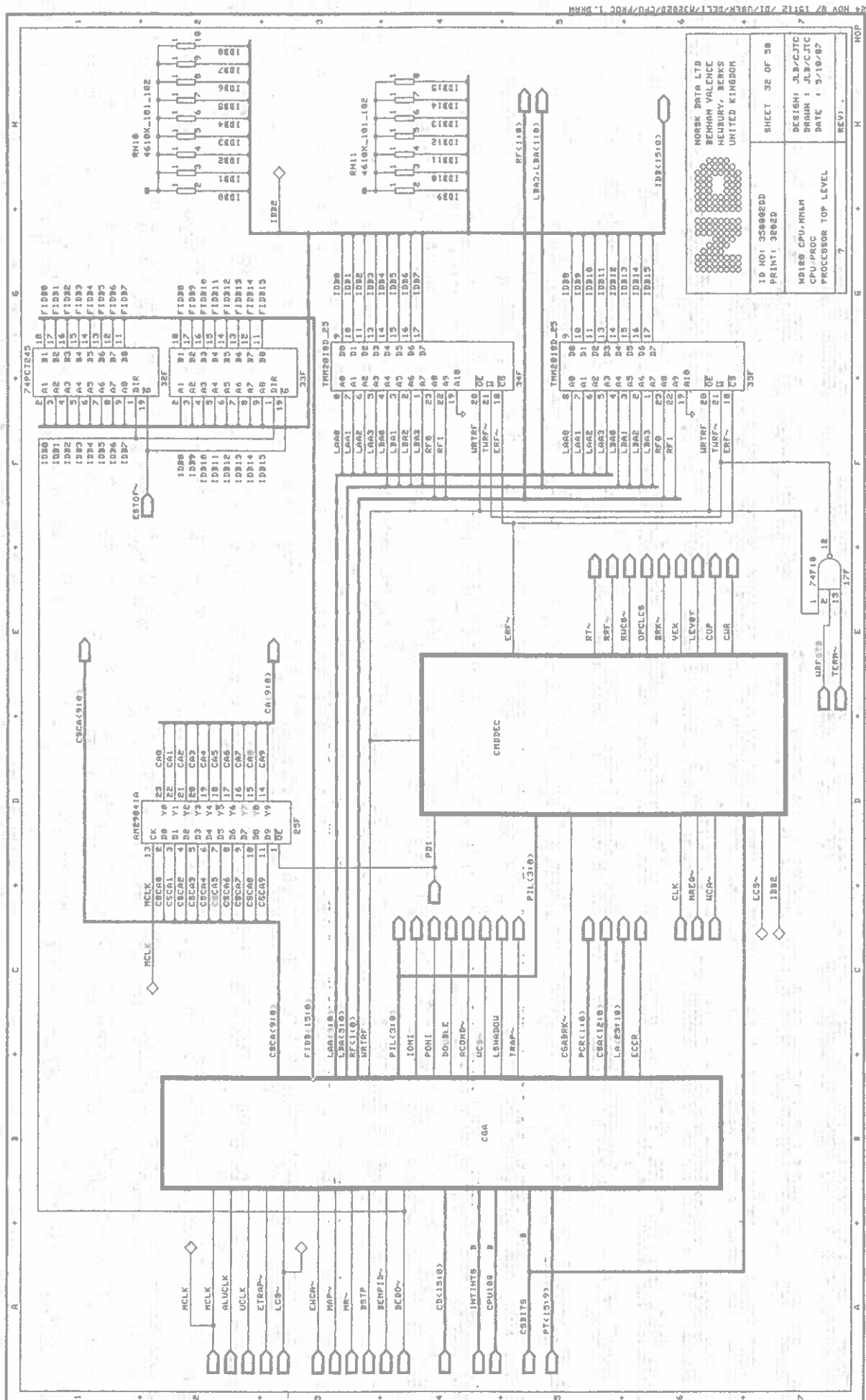
DESIGN: JL3/CJTC

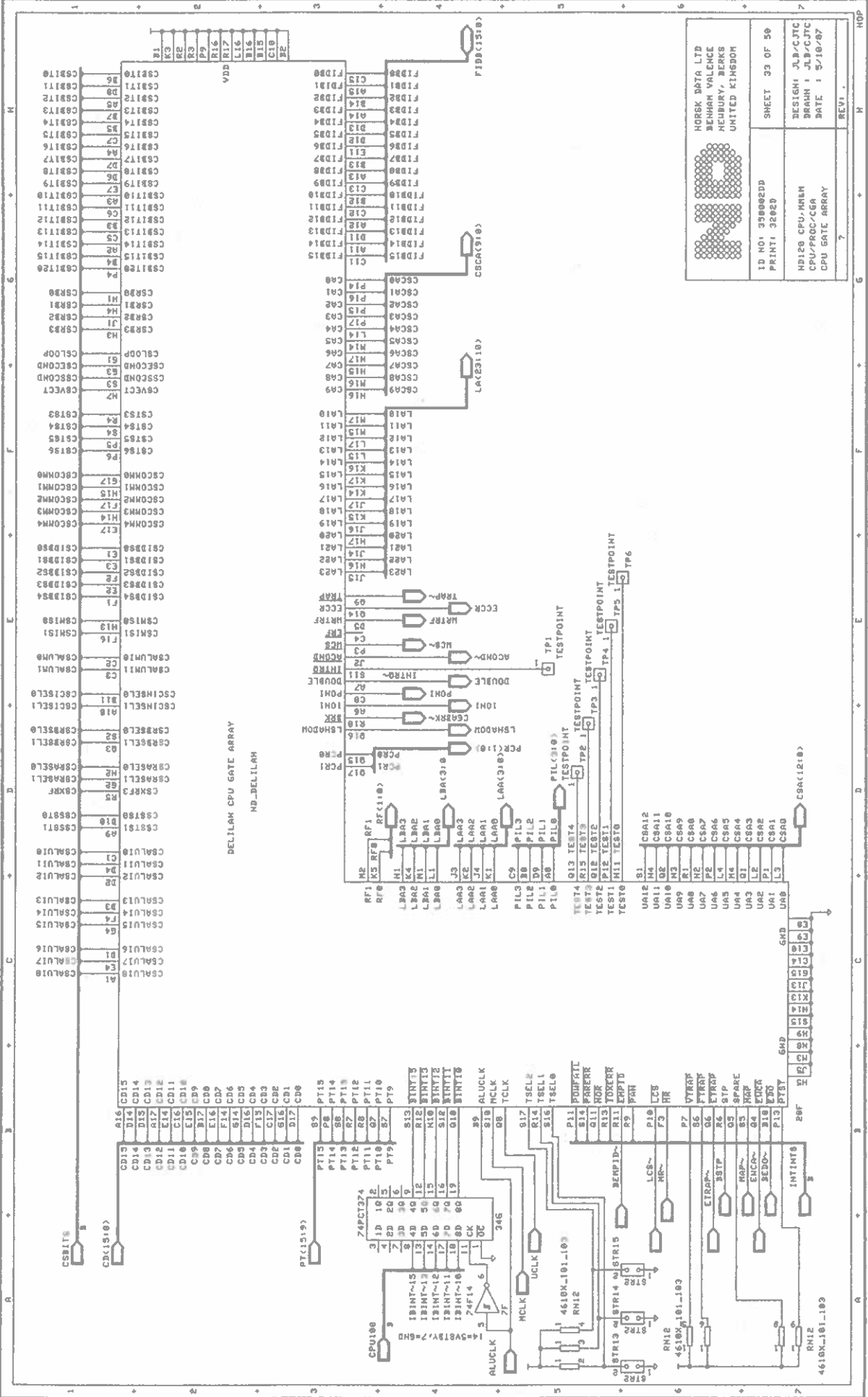
DRAWN: JL3/CJTC

DATE: 15/10/87

REVI: 7







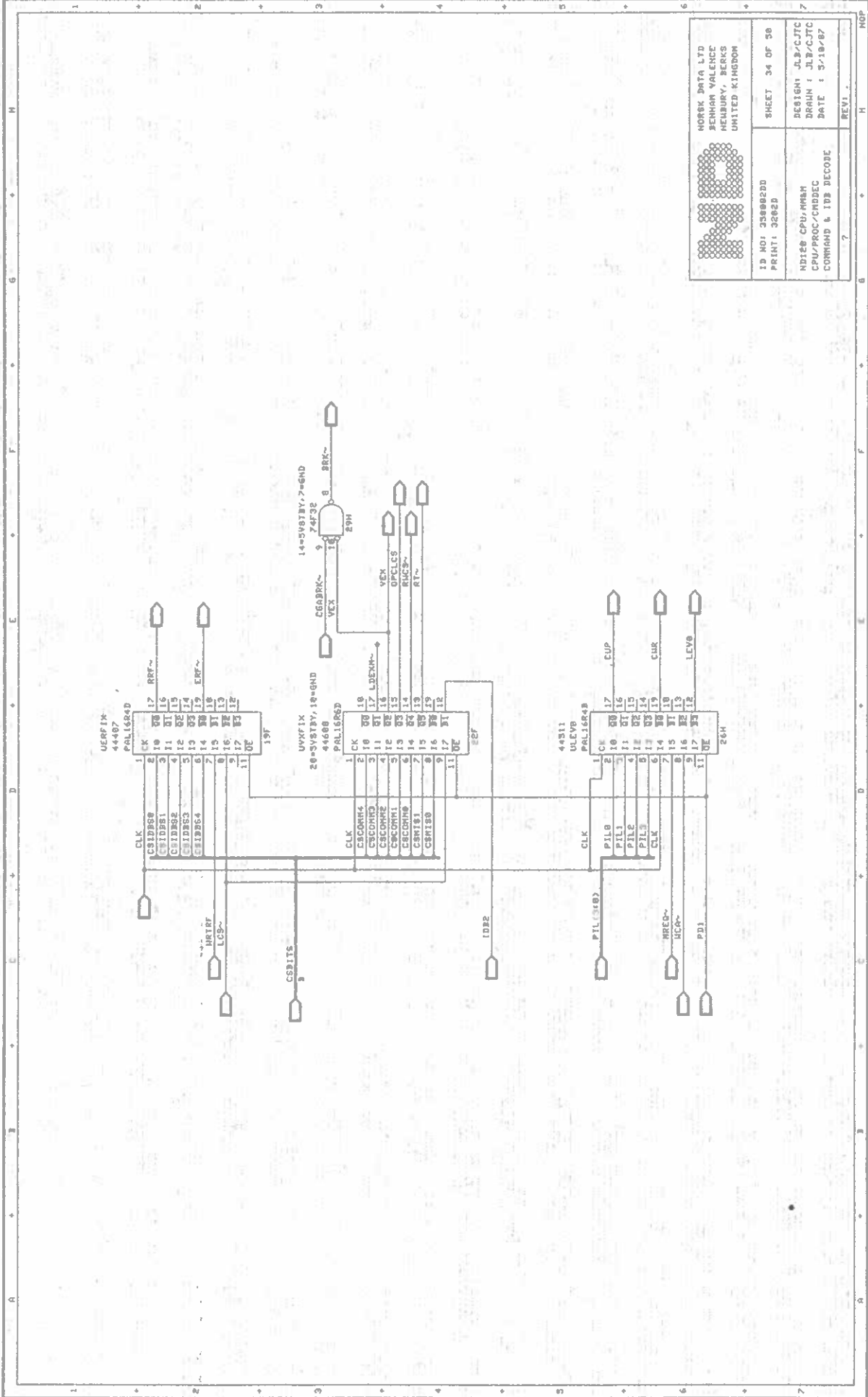
DELILAH

DESIGN: JLB/CJTC
DRAWN: JLB/CJTC
DATE: 15/10/87

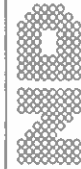
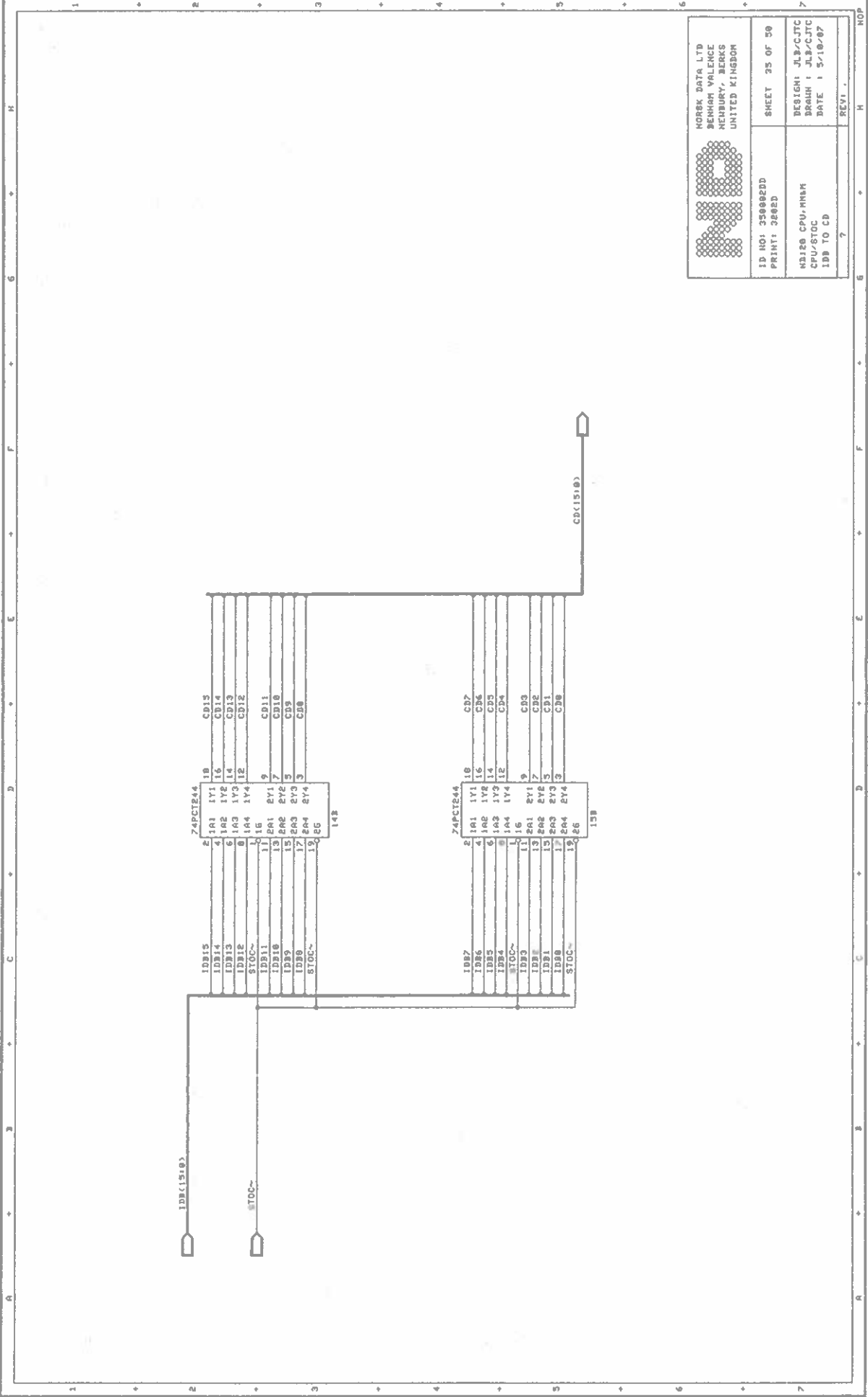
1D NO: 358082DD
PRINT: 382D

SHEET 33 OF 59

HOREX DATA LTD
BENHAM VALENCE
MEGBURY, BERKS
UNITED KINGDOM



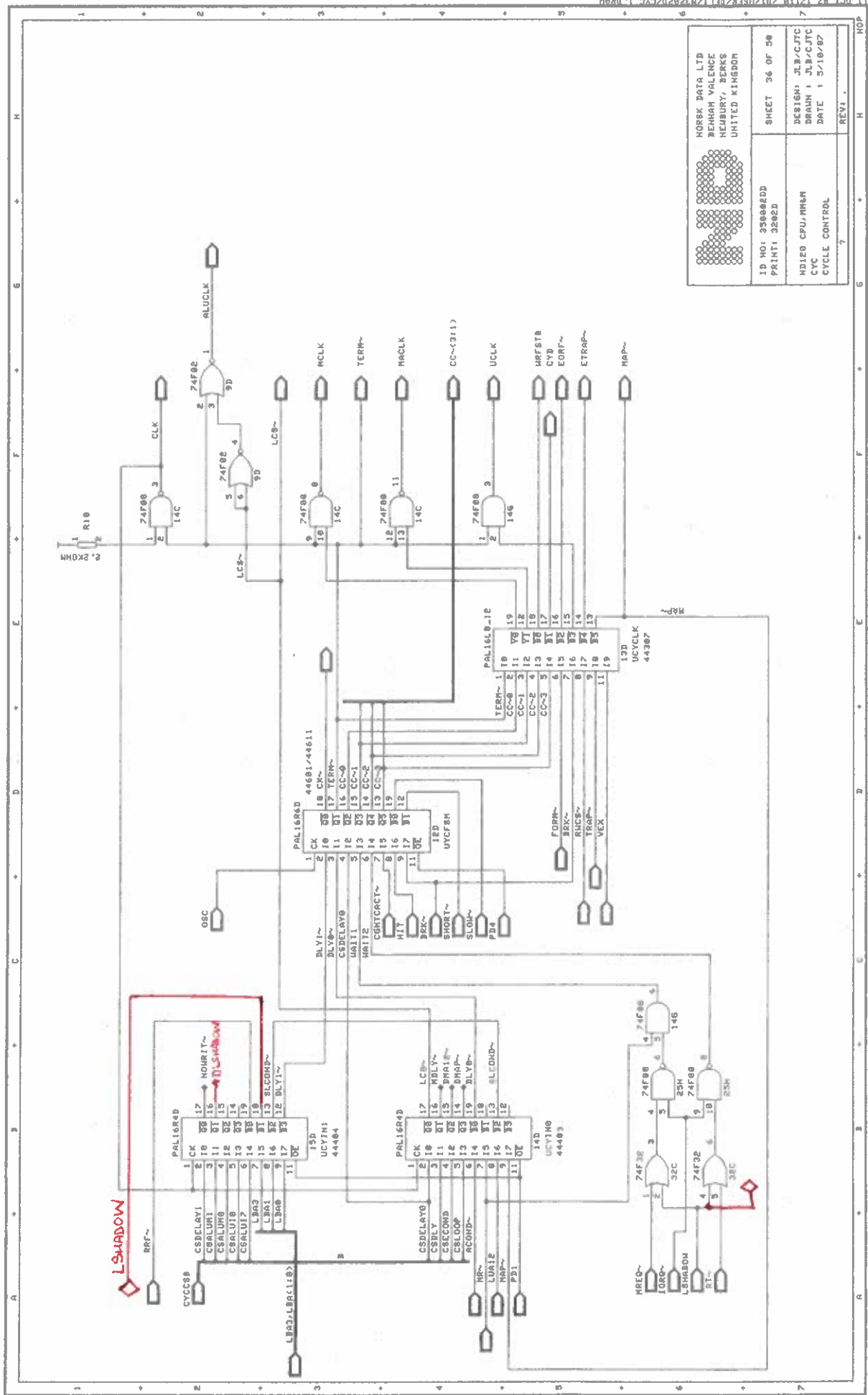
		NORISK DATA LTD BENHAR VALENCE HENBURY, BERKS UNITED KINGDOM	
ID NO: 358002DD PRINT: 3282D	SHEET 34 OF 38	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 3/10/87	
ND128 CPU/MM6 CPU/PROC/CMDEC COMMAND & ID3 DECODE	7	REV:	



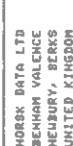
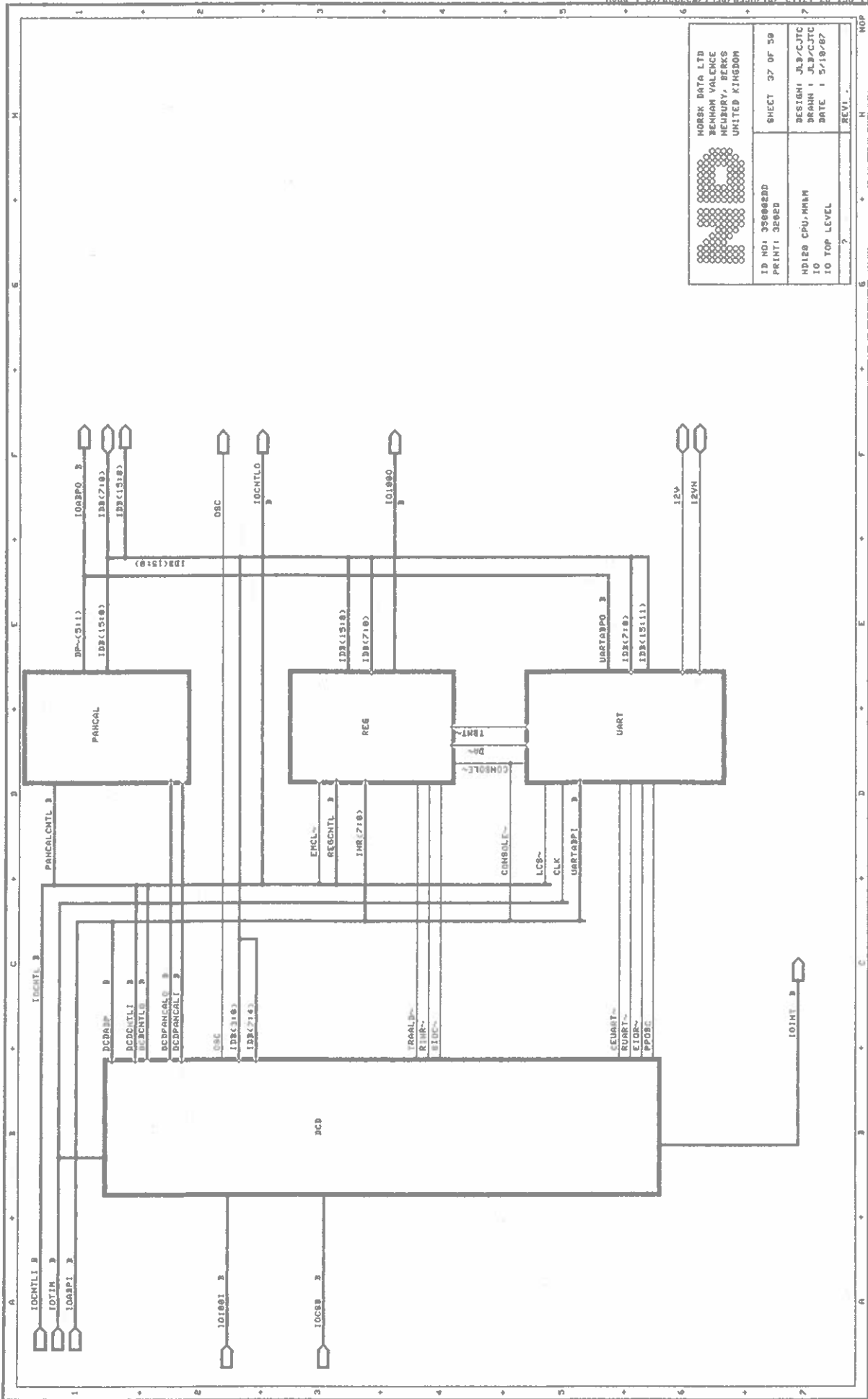
HOREK DATA LTD
BENHAM VALENCE
HENBURY, BERKS
UNITED KINGDOM

ID NO: 3500820D PRINT: 3882D	SHEET 25 OF 50
ND120 CPU-MMH CPU-STOC IDB TO CD	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 15/10/87
7	REV: .

11 OCT 87 17:18 / D1/USLR/DELI/M3020/CPU-STOC 1-DRAW

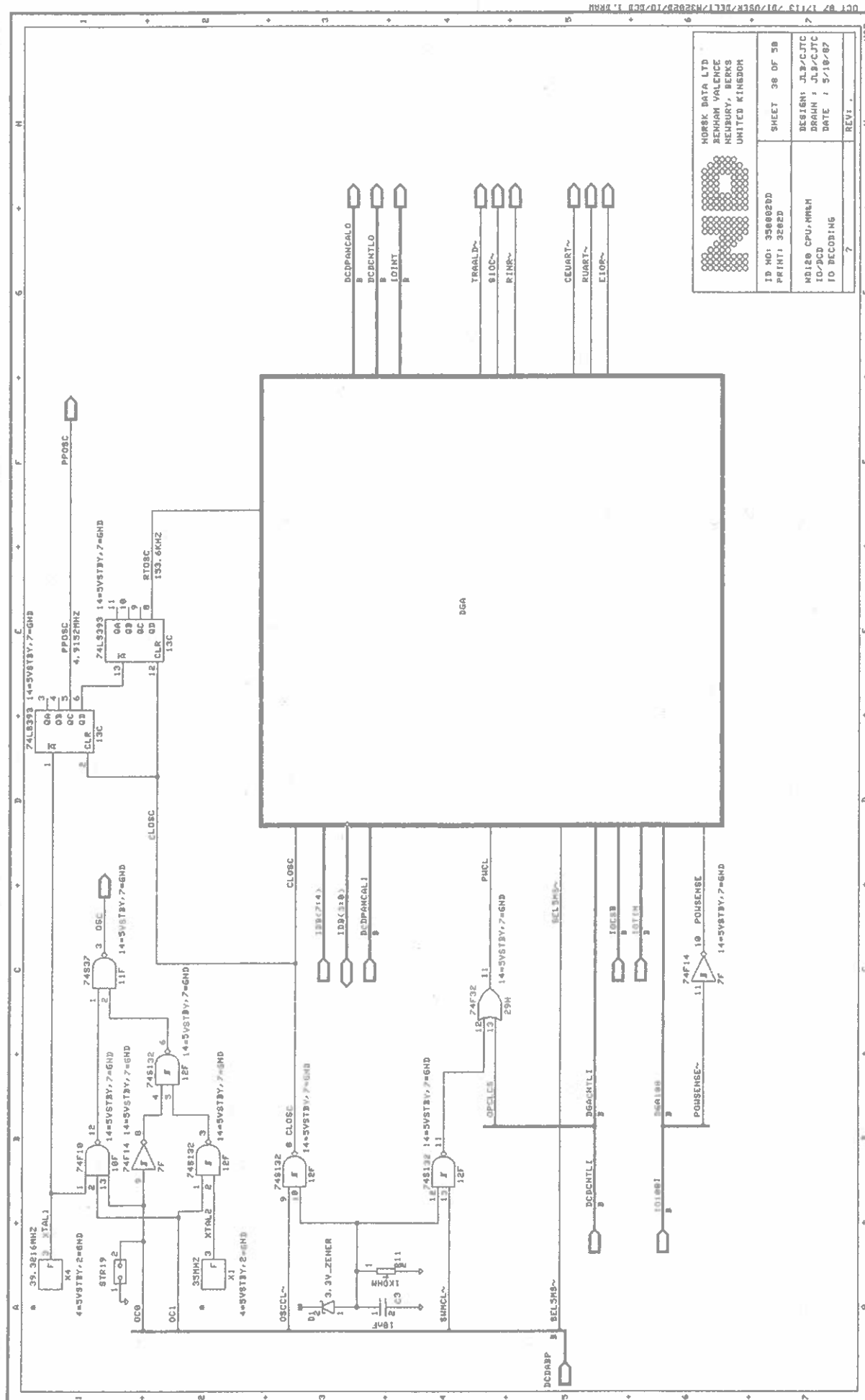


NORSEK DATA LTD BERNARD VALENCE NEWBURY, BERKS UNITED KINGDOM	
ID NO: 356882DD PRINT: 3282D	SHEET 36 OF 58
MD128 CPU,MMEM CYC CYCLE CONTROL	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/10/87
?	REV: 1



HORSK DATA LTD
BENHAM VALENCE
HEMBURY, BERKS
UNITED KINGDOM

ID NO: 350802DD PRINT: 3202D	SHEET 37 OF 59
ND120 CPU, MMW IO IO TOP LEVEL	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 15/10/87
?	REV: -

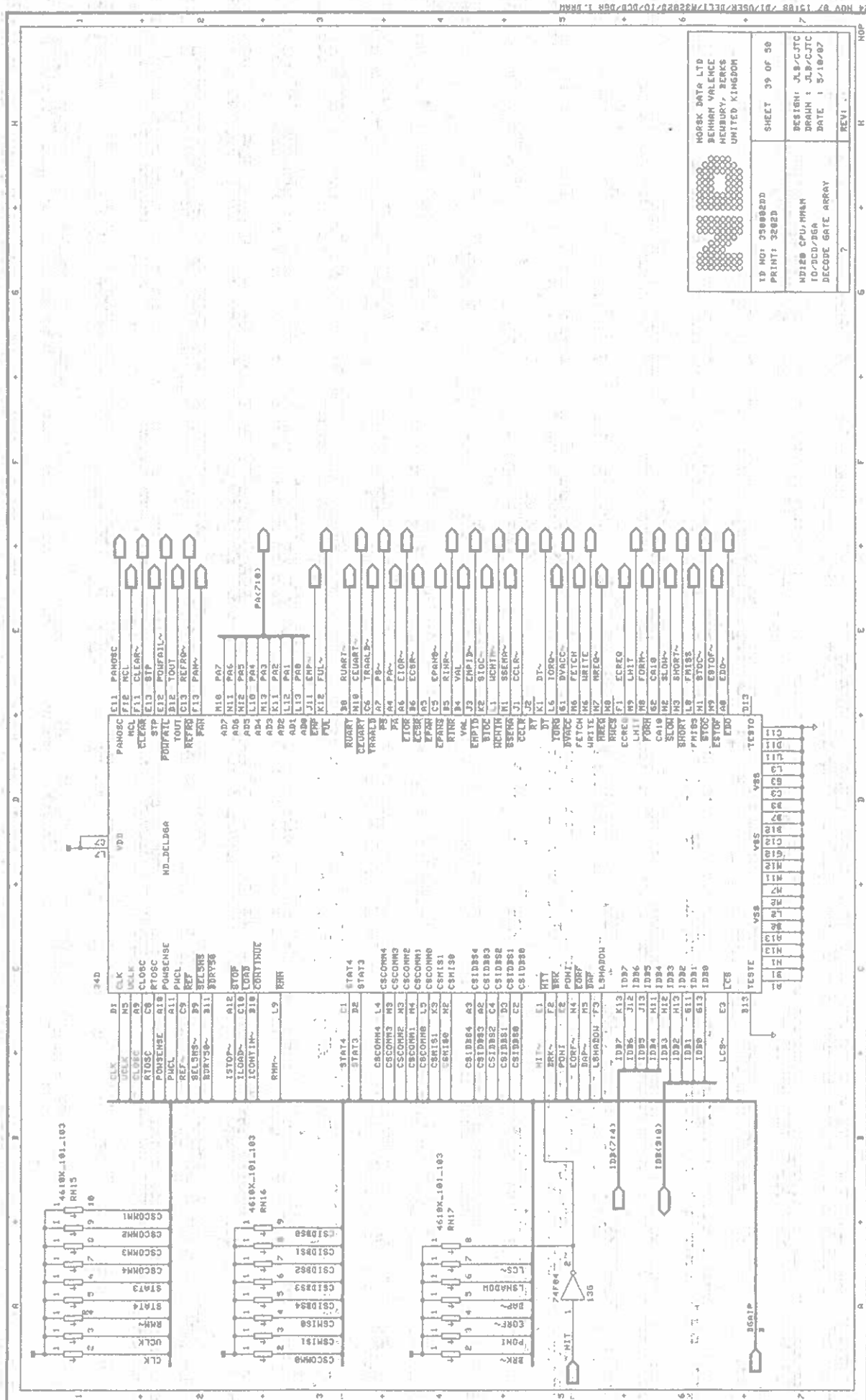


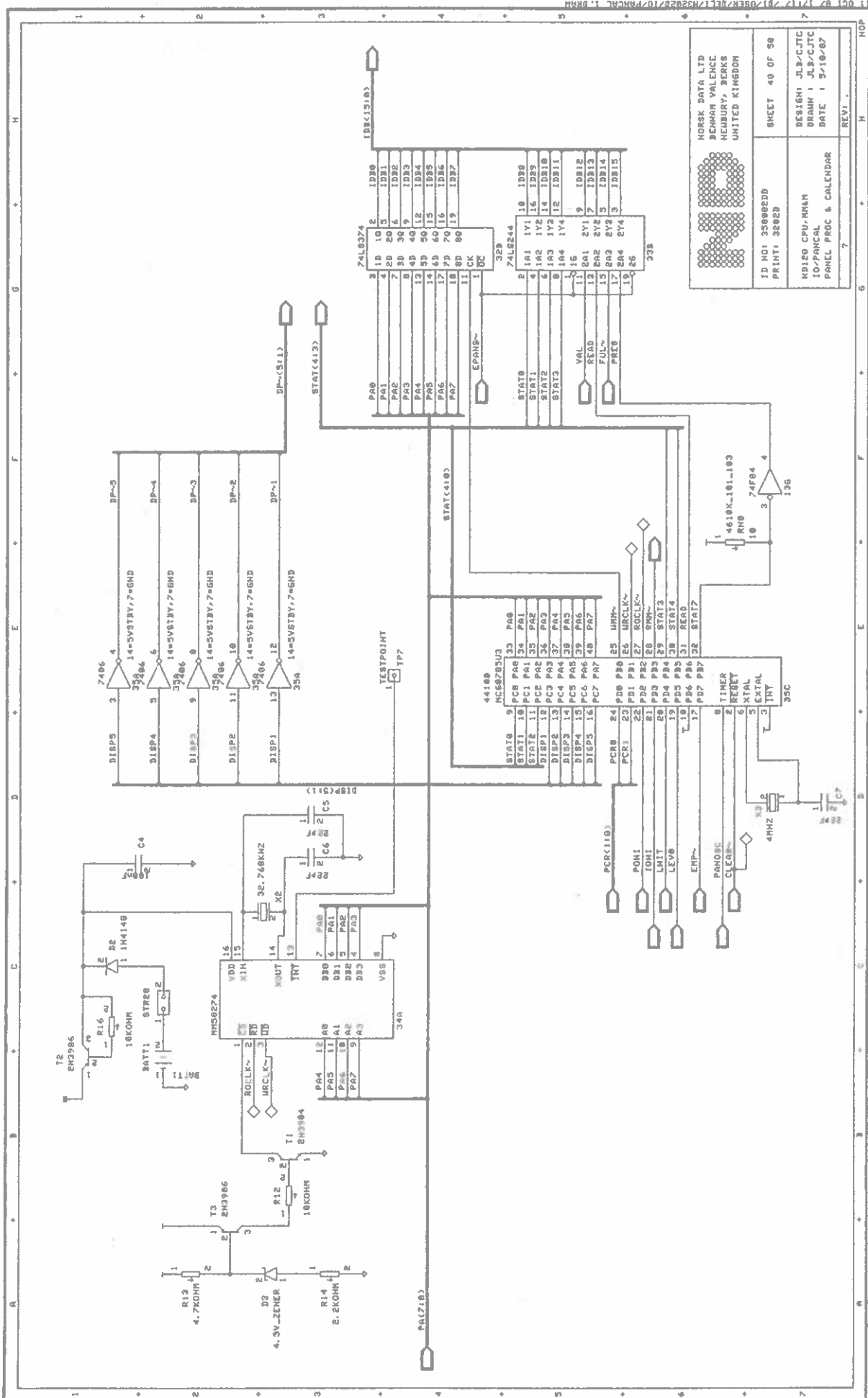
WORSK DATA LTD
BENHAM VALENCE
WENBURY, BERKS
UNITED KINGDOM

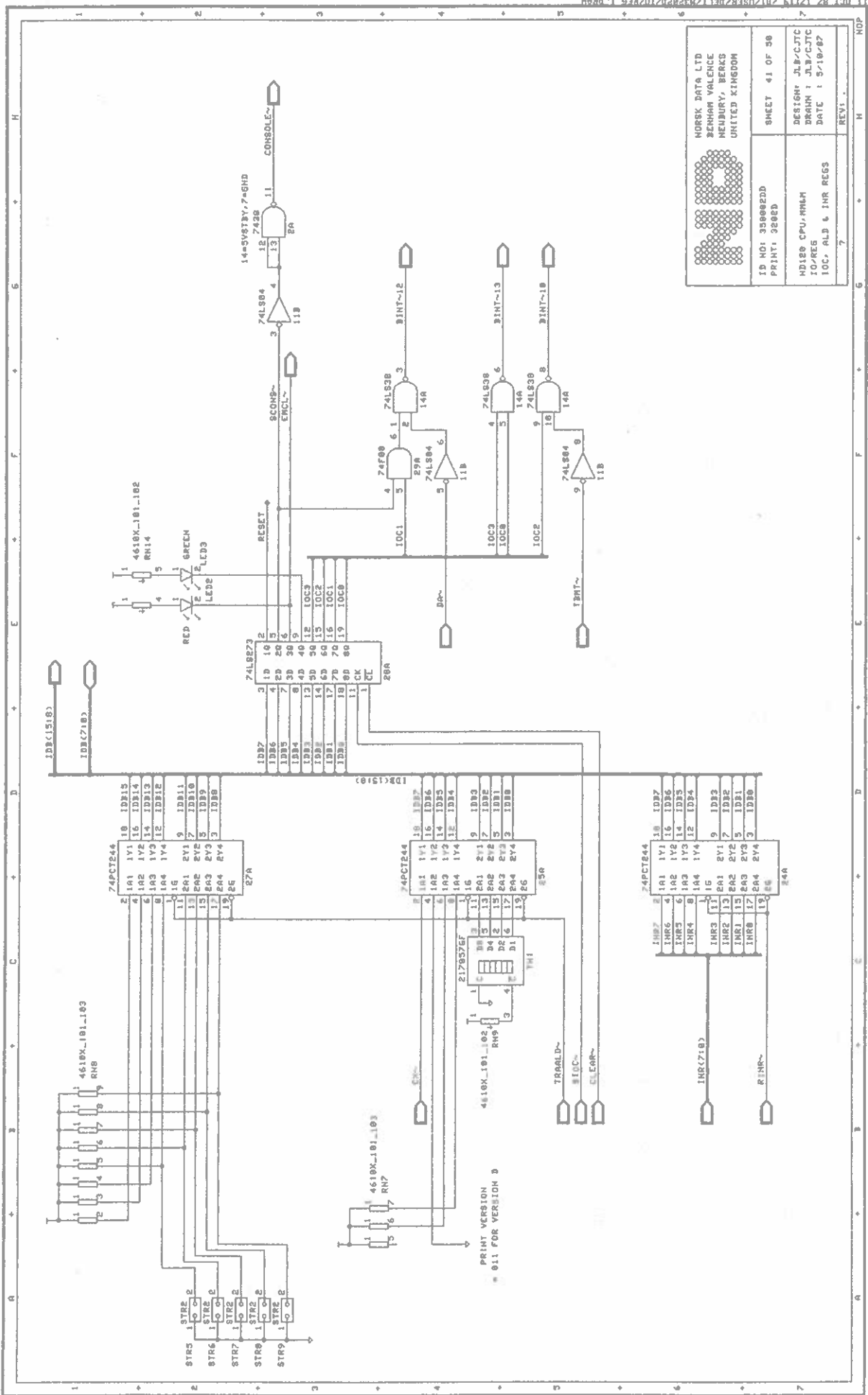
ID NO: 35000200 SHEET 38 OF 50

WD120 CPU,MM2M	DESIGN: JL3/CJTC
IO/DCD	DRAWN: JL3/CJTC
NO DECORATIVE	DATE: 5/10/87

REVZ

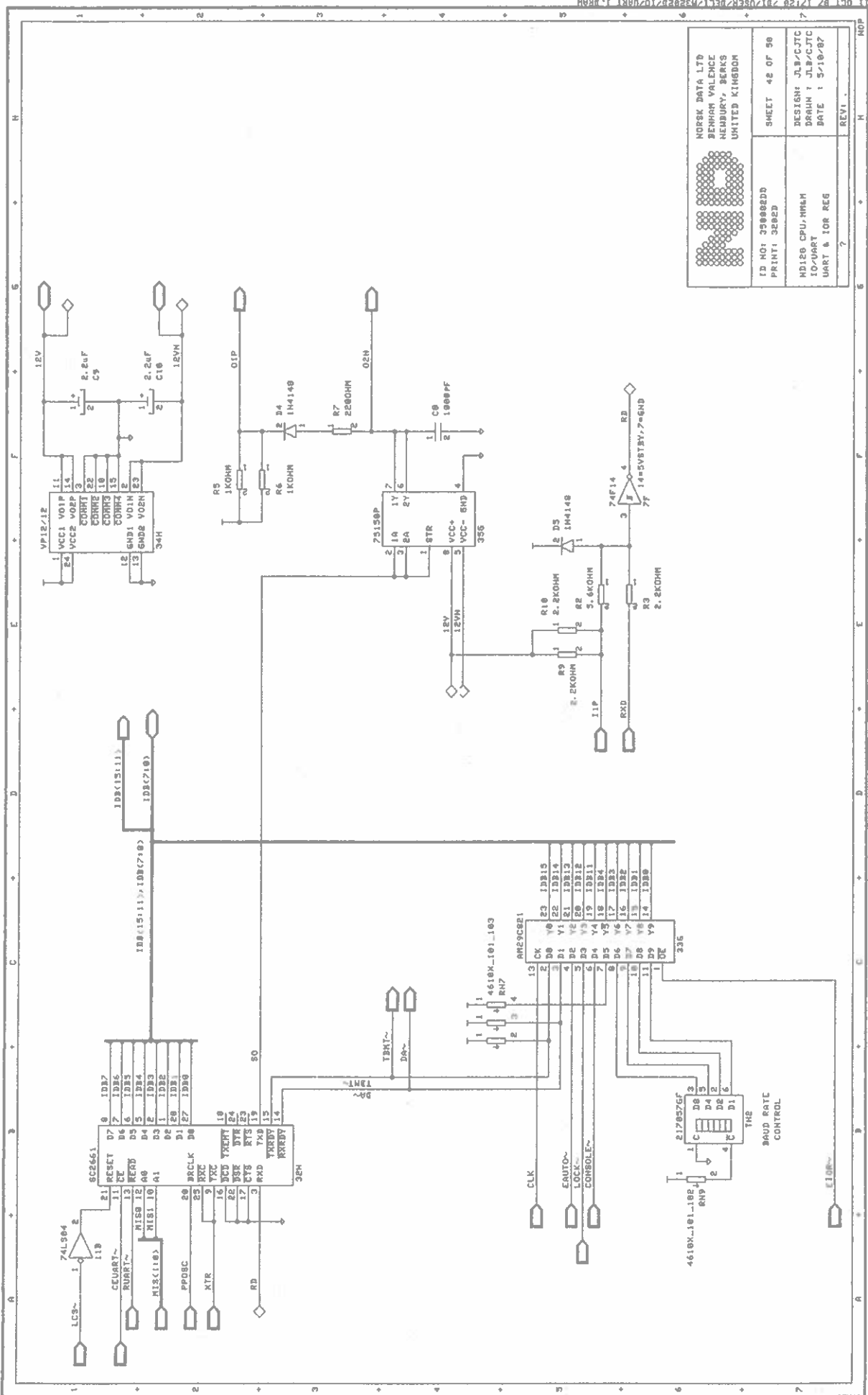






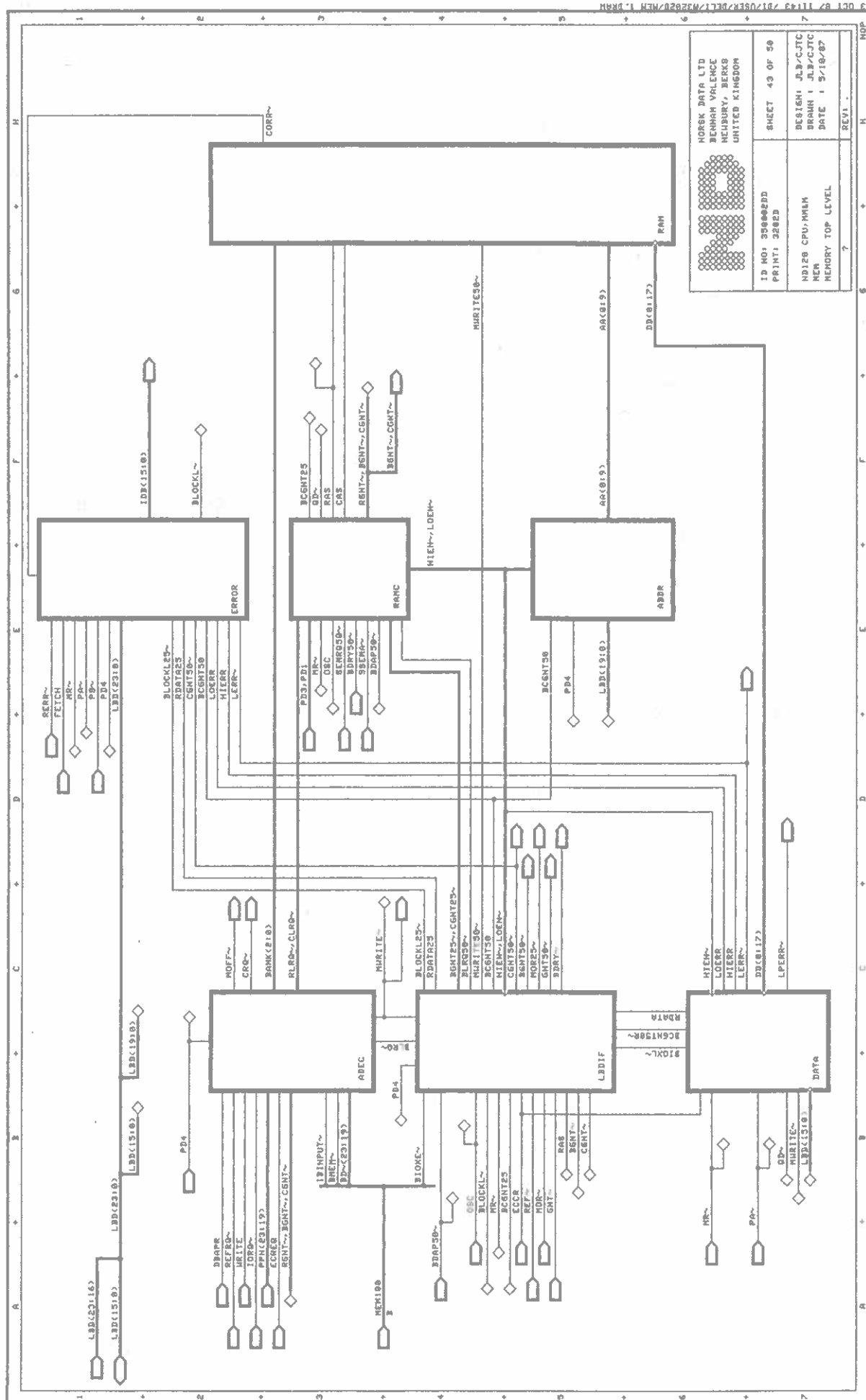
NORSK DATA LTD SENHAM VALENCE NEUBURY, BERKS UNITED KINGDOM		ID NO: 35882DD PRINT: 388D		SHEET 41 OF 58	
DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/18/87		MD180 CPU, RMLH IO/REG 6 INR REGS IO, ALD 6 INR REGS		REVI: .	

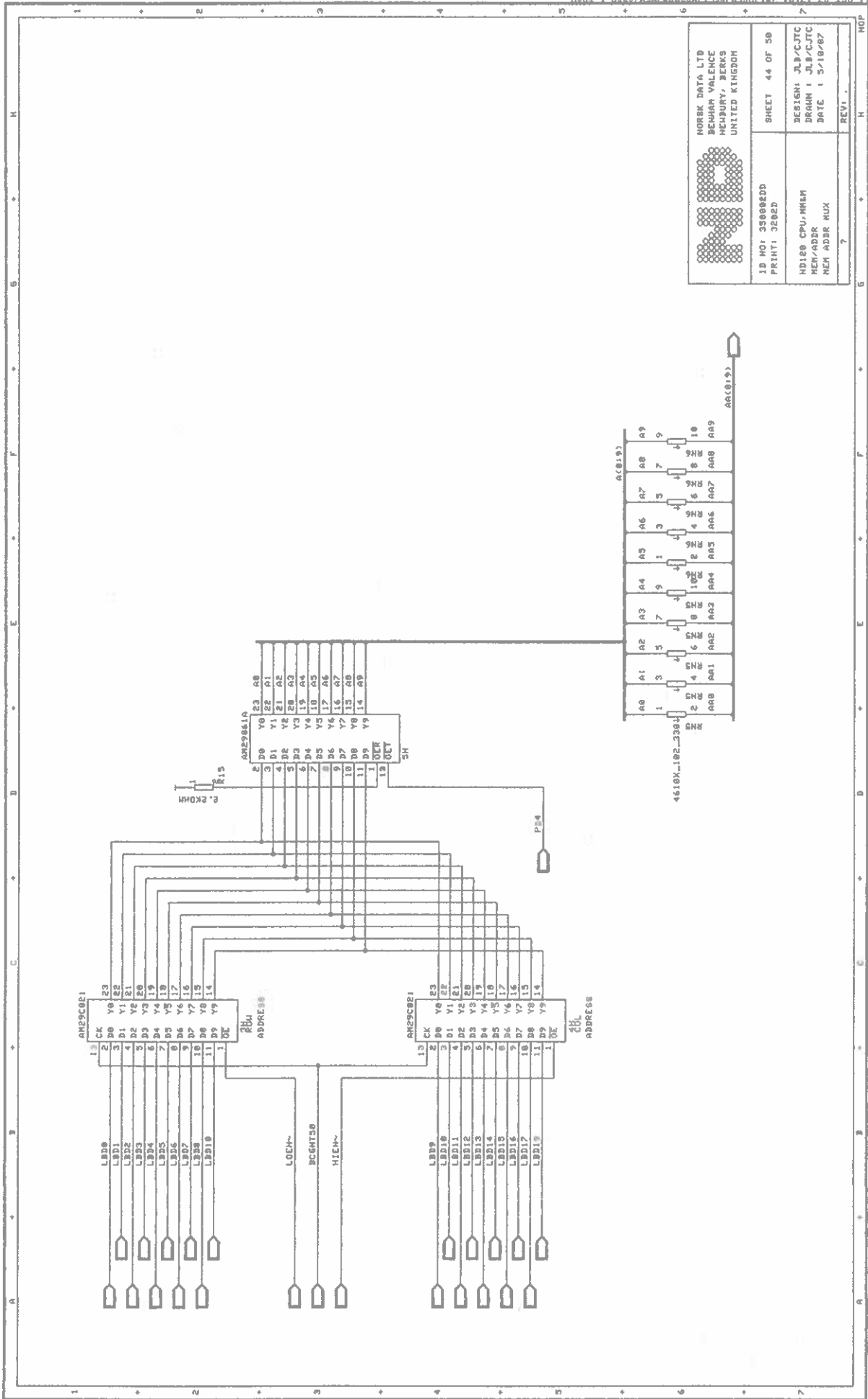
11 OCT 87 17:19 JBI/USER/DELTA/MS2002/10/REG 1.DRAW



NORSK DATA LTD BENHAM VALENCE HEMBURY, BERKS UNITED KINGDOM		DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/10/87	
13 NO: 35882DD PRINT: 3582D	ND126 CPU, MMH IO-UART UART & IOR REG	SHEET 42 OF 50	REVI: .

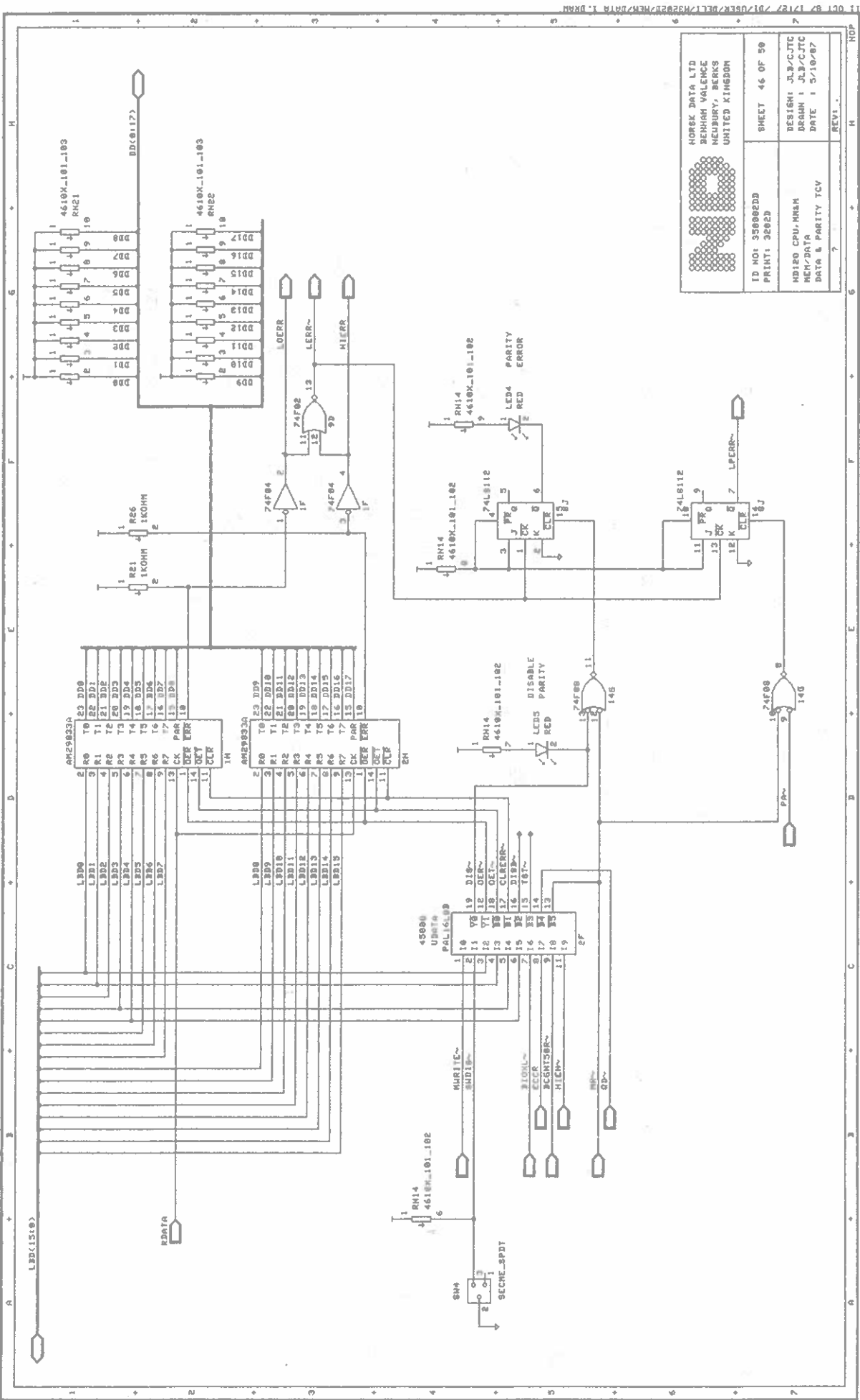
11 OCT 87 17:28 21/08/87 DELTA/MS202/10/UART 1.DRAW





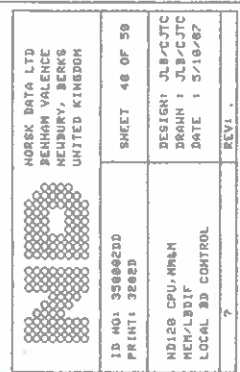
HOREK DATA LTD
BERNARD VALENCE
HEADQUARTERS, BERKS
UNITED KINGDOM

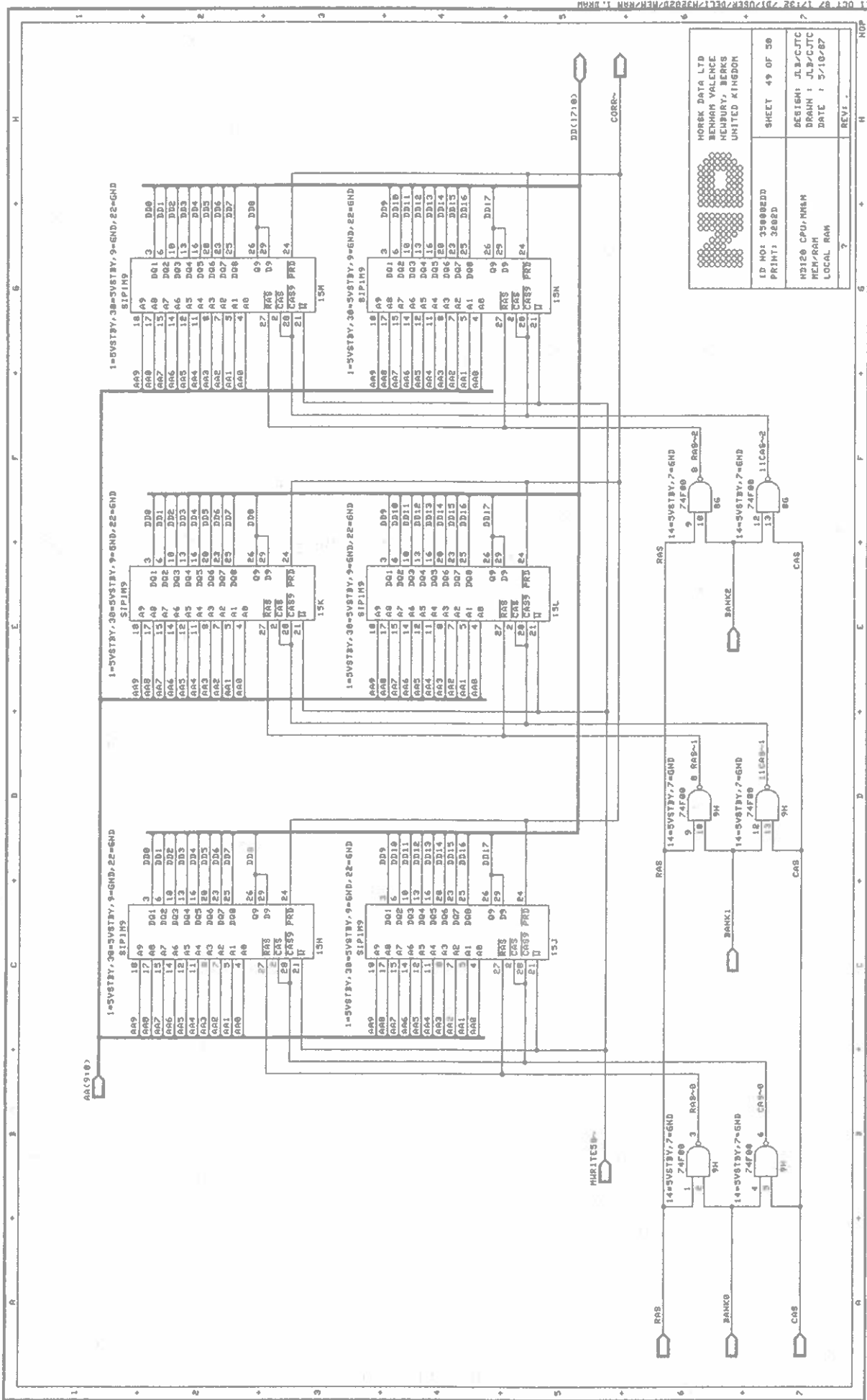
ID NO: 350082D PRINT: 3202D	SHEET 44 OF 50
HD100 CPU, MM/M MEM/ADDR RUX	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 15/10/87
7	REVI: .



		HOREX DATA LTD BEHRIAR VALENCE NEJOURY, BEKES UNITED KINGDOM	
ID NO: 358002D	PRINT: 3282D	SHEET 46 OF 59	
MD120 CPU, MM4M	MEM/DATA	DESIGN: JLB/CJT/C	
DATA & PARITY TCV		DRAWN: JLB/CJT/C	
		DATE: 15/10/87	
		REV: 1	

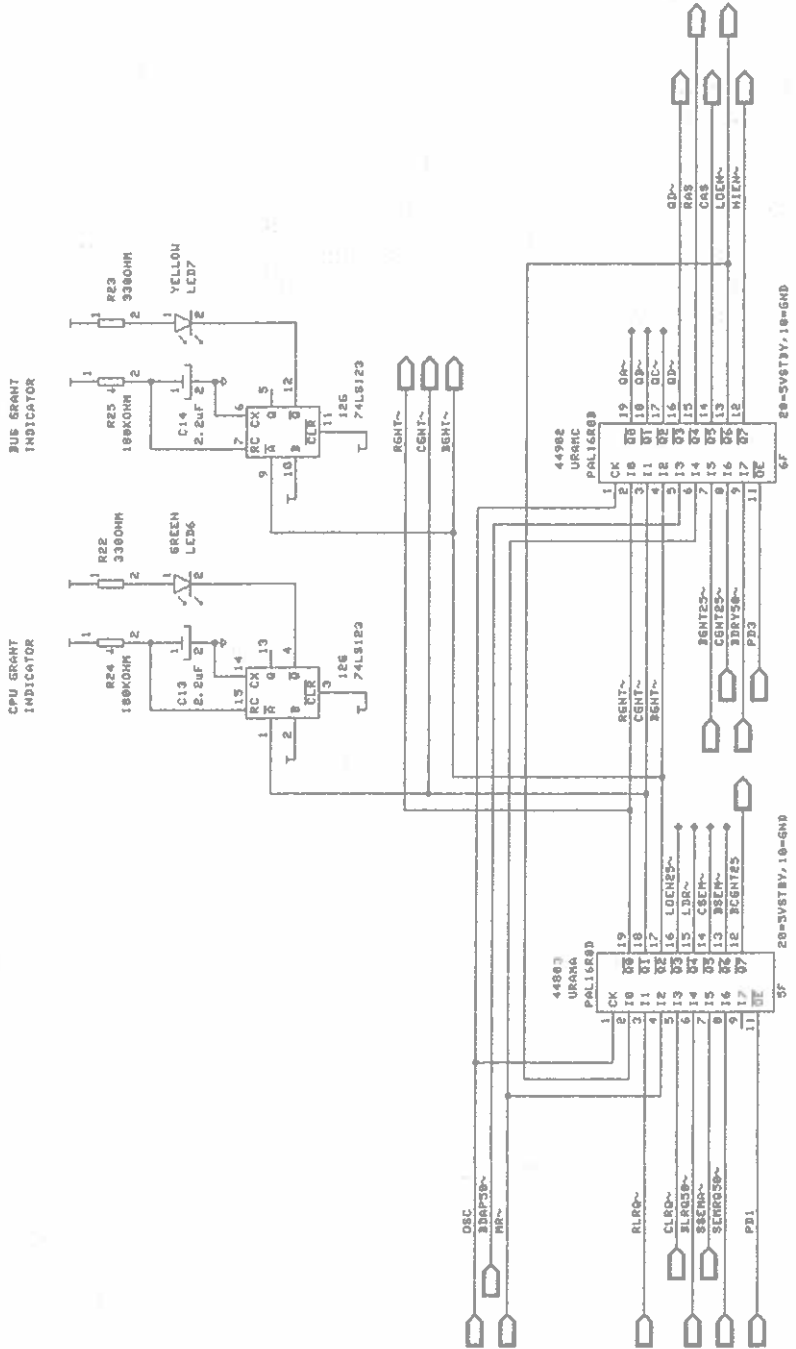
11 OCT 87 17:12 / 701 USER/ELL/M302D/HEM/DATA 1.DRAW





HOREK DATA LTD BENHAM VALENT NEWBURY, BERKS UNITED KINGDOM	
ID NO: 35888DD PRINT: 3888D	SHEET 49 OF 50
H0120 CPU/MEM MEM/RAH LOCAL RAM	DESIGN: JLB/CJC DRAWN: JLB/CJC DATE: 3/10/87
REV: 7	

1 OCT 87 17:32 / D:\USER\DEL\H0120\MEM\RAH 1.BRM



NORSK DATA LTD BENHAM VALENT NEWBURY, BERKS UNITED KINGDOM	
NOI 35002DD PRINT 3202D	SHEET 50 OF 50
HD120 CPU/MEM NEW/RMHC LOCAL RM CONTROL	DESIGN: JLB/CJTC DRAWN: JLB/CJTC DATE: 5/10/87
7	REV1

PAL16R8

SIZEIND CJTC:8/4/87

CLK /SO /S1 ~~DBIT~~ NC5 NC6 NC7 NC8 NC9 GND
/OE /EHI /EMID /ELOW ~~/CSEG /ADSEG /ESEG /FSEG /GSEG~~ VCC

DBIT CBIT BBIT ABIT
; MEMORY SIZE INDICATOR FOR 0, 2, 4 OR 6 MB MEMORY ARRAYS

EHI := EMID + ELOW * EHI + /ELOW * /EHI ; ENABLE DIGIT 3

EMID := ELOW * /EMID * /EHI ; ENABLE DIGIT 2

ELOW := /ELOW * /EMID * EHI ; ENABLE DIGIT 1

~~ADSEG := /S1 * S0 * EMID ; A & D SEGMENTS OFF~~

~~CSEG := S1 * /S0 * EMID ; C SEGMENT OFF~~

~~ESEG := S0 * EMID ; E SEGMENT OFF~~

~~FSEG := S1 * EMID + S0 * EMID ; F SEGMENT OFF~~

~~GSEG := /S1 * EMID + EHI + ELOW ; G SEGMENT OFF~~

DESCRIPTION

MEMORY SIZE		S1	S0
2Mb	MOFF	F	F
4Mb	2MB	F	T
6Mb	4MB	T	F
space	6MB	T	T

LO → MID → HI

/ABIT := MOFF + /MSIZE1.MSIZE0.EMID + EHI + ELOW

/BBIT := MOFF + /MSIZE1.MSIZE0.EMID + EHI + ELOW

/CBIT := VCC

/DBIT := VCC

*entered
12/1/87.*

PCB V2

PAL16L8
JLB/CJTC 14AUG86
44302D,LBC1

1Q2 1Q0 NC6 NC7
(~~/BDY50 /CC2 /BDY25 /EMD /RT /IORQ /DSTB /BGNT /EMD /BGNTCACT VCC~~
~~/CGNT /CGNTCACT /CGNT50 /RT /IORQ /DSTB /BGNT /EMD /BGNTCACT VCC~~)

; 060387 JLB: EMD WAS HOLDING IN ADDRESS PART OF IOX CYCLES AFTER
; BUFFERED WRITE CYCLES.
; EMD - ENABLE DATA PATH BETWEEN CD AND LBD
; 270387 CJTC: NEW SIGNAL DSTB TO SAMPLE DATA AT LBD/CD BUFFERS ON
; CPU FROM BUS READ, AT BDY.
; 040487 JLB: DSTB MUST NOT CLOCK DATA BEFORE CACT GOES OFF IN IOXES.
; (NEGATIVE SETUP OF DATA IN BUS SPECS.)

IF (VCC) EMD = Q2 * Q0 * CACT ; CPU CYCLE TO BUS SET
+ EMD * CACT ; " HOLD
+ CGNT * CGNT50 ; CPU CYCLE TO MEM SET
+ EMD * RT * CC2 * /TERM ;) HOLD TERMS FOR
+ EMD * IORQ * CC2 * /TERM ;) CPU READ, FETCH AND
;) MAP CYCLES

IF (VCC) CGNTCACT = CGNT + CACT

IF (VCC) BGNTCACT = BGNT + CACT

IF (VCC) DSTB = CGNT + CACT * /BDY50 * /BDY25 * /IORQ
+ CACT * IORQ * CC2 ; IOX CYCLE

DESCRIPTION

pinout:

*1Q0 1Q2 /CC2 /BDY25 /BDY50 /CGNT /CGNT50 /CACT /TERM GND
/BGNT /CGNTCACT /RT /IORQ NC15 NC16 ~~NC17~~ /EMD /BGNTCACT VCC
/DSTB*

Version E
18/5/87

PCB v2

PAL16L8
JLB/CJTC 15AUG86
44303A,LBC2 - LOCAL DATA BUS CONTROL PAL

/CACT /CGNT /EADR /BINPUT50 MISO /IOD WRITE NC8 NC9 GND
/BACT /WLBD NC13 NC14 NC15 NC16 /CMWRITE /CBWRITE /WBD VCC

; LBD TO BD TRANSCEIVER
; -----

; WBD - DIRECTION FROM LBD TO BD

IF (VCC) WBD = EADR ; ADDRESS FROM CPU TO BUS
+ CBWRITE ; CPU WRITE CYCLE TO BUS
+ IOD * MISO * /BINPUT50 ; OUTPUT PART OF IOX
+ BACT ; DMA OUTPUT CYCLE

; (CBWRITE) - CPU TO BUS WRITE. STARTS ONLY WHEN THE BUS IS GRANTED.
; LASTS UNTIL THE END OF THE BUS CYCLE.

IF (VCC) CBWRITE = WRITE * CACT
+ CBWRITE * CACT

; CD TO LBD TRANSCEIVER
; -----

; WLBD - DIRECTION FROM CD TO LBD

IF (VCC) WLBD = CBWRITE ; CPU WRITE CYCLE TO BUS
+ CMWRITE ; CPU WRITE CYCLE TO LOCAL MEMORY
+ IOD * MISO * /BINPUT50 ; OUTPUT PART OF IOX

; (CMWRITE) - CPU WRITE TO LOCAL MEMORY. LASTS UNTIL END OF MEMORY CYCLE
; ON BUFFERED WRITE.

IF (VCC) CMWRITE = WRITE * CGNT
+ CMWRITE * CGNT

DESCRIPTION

no change
44303A

PCB V2.

PAL16L8
CJTC 02SEP86
44304E,LBC3 - LOCAL DATA BUS CONTROL PAL /IBAPR

NC12
DBAPR
DBAPR
(~~/CGNT /BGNT /BGNT50 /MWRITE /BDAP50 /EBUS /BAPR /GNT NC9 GND~~
~~NC11 DONTUSE2 /EBD FAPR SAPR EBADR APR /BACT DONTUSE VCC~~)

; 200387 CJTC: NEED TO SLOW DOWN APR TO AS648 BUS TCVRs. PUT IT
; THROUGH THIS PAL INSTEAD OF F04
; 200387 JLB: EBADR COMES ON AT BAPR TO AVOID SPIKE ON LBD.
; NEW INPUT CGNT~
; 230387 JLB: APR DELAYED 3XPAL DELAY
; 240387 JLB: EBD MUST NOT CHANGE WHEN DATA IS CLOCKED IN.

; BACT - BUS ACTIVITY. LASTS FOR COMPLETE DMA TO LOCAL MEMORY
; CYCLE (ONLY ON MEMORY READ)

IF (VCC) BACT = BGNT50 * /MWRITE ; ENABLE FOR DATA ONLY AFTER ADDRESS
+ BACT * BDAP50 ; HOLD AFTER BDAP FINISHED

; EBD - ENABLE BUS DATA. ENABLE LBD TO BD TRANSCEIVER
; SHOULD BE DISABLED DURING CGNT * /BACT, IE DISABLE WHEN CPU
; IS ACCESSING LOCAL MEMORY, EXCEPT WHEN TRANSCEIVER IS BEING USED
; AS A REGISTER TO HOLD DATA FROM A PREVIOUS DMA MEMORY READ.

IF (VCC) EBD = EBUS * /CGNT * /GNT
+ EBUS * GNT * BGNT
+ EBUS * BACT

; EBADR - ENABLE ADDRESS FROM BUS TO LOCAL MEMORY

IF (VCC) /EBADR = /BAPR * BGNT50 ; TURN ON AT BAPR WITH GNT
+ /BAPR * /EBADR ; HOLD UNTIL BGNT50 OR IN
+ /GNT ; W.C. UNTIL GNT GOES OFF.

; PIN CALLED DONTUSE - USED TO BE EBADR, BUT NEEDED TO BE FEEDBACK
; TERM IN MOD. SHIFTED TO PIN EBADR TO PIN 16 - DONT USE PIN 19 !!!

; SLOW INVERSION

IF (VCC) /FAPR = ~~/BAPR~~
IF (VCC) /SAPR = /FAPR
IF (VCC) ~~/BAPR~~ = /SAPR
/DBAPR

DESCRIPTION

PIN LIST

/IBAPR /CGNT /BGNT /BGNT50 /MWRITE /BDAP50 /EBUS /IBAPR
/GNT NC9 GND

NC11 /EBD NC13 SAPR FAPR EBADR /BACT
NC12 /EBD DBAPR VCC

44304F
18/3/87

PCB V2

OK.

PAL16L8
JLB 26NOV86
44305B,CSCTL

/FORM /CC1 /CC2 /CC3 /LCS /RWCS /WCS FETCH /BRK GND
/TERM /WCSTB LUA12 /WCA /ELOW /EUPP /EWCA /ECSL /WICA VCC

; 130387 JLB: ELOW ALWAYS ENABLED ON TERM IF LUA12 IS LOW.
; MAY SPEED UP NON FETCH CYCLES.

; CONTROL STORE CONTROL

IF (VCC) WICA = WCA * FETCH * /TERM ;WRITE PULSE TO MICROINSTRUCTION CACHE
IF (VCC) WCSTB = /CC3 * CC1 * WCS * RWCS ;WRITE PULSE TO WRITEABLE CONTROL STORE
+ CC3 * CC2 * CC1 * LCS ;WRITE PULSE DURING LOAD CONTROL STORE
IF (VCC) ECSL = RWCS * /WCS * CC3 * /TERM ;READ CONTROL STORE HOLD
IF (VCC) EWCA = RWCS * /CC3 * /TERM ;ENABLE WCA REG. IN MIC ONTO MA
IF (VCC) EUPP = LUA12 ;NORMAL ADDRESSING
+ WCA * FETCH ;WRITE INTO MICROINSTRUCTION CACHE
+ FETCH * /CC1 * /CC2 * /CC3 * /TERM;
IF (VCC) ELOW = /LUA12 * /FETCH ;NORMAL ADDRESSING. ON FETCH EITHER MICROI
+ /LUA12 * TERM ;ENABLE ACCORDING TO LUA12 BEFORE FETCH V
+ FORM * /BRK * CC2 * /TERM ;OR A MAP IS USED.
+ FORM * /BRK * CC3 * /TERM ;DO A MAP
+ /LUA12 * BRK * CC2 * /TERM ;ON BRK: USE BANK SELECTED BY LUA12.
+ /LUA12 * BRK * CC3 * /TERM ;

DESCRIPTION

44305B.
18/5/87
NO CHANGE.

PCB V2

OK

44306 B
18/5/87
No change

PAL16L8
JLB 26NOV86
44306B,MMUCTL

CAO WRITE /DVACC /RT /WCHIM DOUBLE /EMCL /CC2 /WCA GND
LSHADOW /LAPA /EPT /EPMAP /EPTI /EIPL /EIPU /EIPUR /ECD VCC

; 25/2/87 JLB EQUATION FOR EPT MISSING

; MEMORY MANAGEMENT CONTROL

IF (VCC) ECD = WCA * /LSHADOW ;DISABLE CACHE ON SHADOW ACCESSES
+ RT * /LSHADOW * /CC2 ;ENABLE WHEN WRITING IN CACHE
;ENABLE IN THE FIRST PART OF READ/FETCH CYC

IF (VCC) LAPA = DVACC * /LSHADOW * /WCHIM ;LA TO PPN WHEN VIRTUAL ACCESSES ARE DISA
;WE ARE NOT ACCESSING SHADOW MEMORY OR WR
;CACHE INHIBIT MAP

IF (VCC) EIPUR = /DOUBLE * LSHADOW * WRITE ;WRITING IN SHADOW IN REX MODE WILL MASK
;THE PROTECT BITS

IF (VCC) EIPU = WCHIM ;PASS PAGE NUMBER TO BE INHIBITED FROM ID
+ DOUBLE * LSHADOW * CAO ;SHADOW ACCESSES IN SEX MODE
+ DOUBLE * LSHADOW * WRITE ;WRITING IN SHADOW IN SEX MODE WILL WRITE
;BIT PAGE NUMBER

IF (VCC) EIPL = WCHIM ;PASS PAGE NUMBER TO BE INHIBITED FROM ID
+ DOUBLE * LSHADOW * CAO ;SHADOW ACCESSES IN SEX MODE
+ LSHADOW * WRITE ;WRITING LOWER BYTE (SAME FOR REX AND SEX

IF (VCC) EPTI = LSHADOW * /EMCL * WRITE ;DISABLE DURING EMCL TO AVOID JAMMING THE
+ LSHADOW * /EMCL * /DOUBLE ;ENABLE ONLY WHEN IN SHADOW
+ LSHADOW * /EMCL * /CAO ;DISABLE WHEN IN SEX MODE WE ARE READ/FET

;ADDRESSES. (USE OTHER SRAM BLOCK).
IF (VCC) EPMAP = /WCHIM * /DVACC * /WRITE ;DISABLE WHEN WRITING THE CACHE INHIBIT
+ /WCHIM * /DVACC * /LSHADOW ;DISABLE WHEN VIRTUAL ACCESS IS DISABLE
+ /WCHIM * /DVACC * /DOUBLE ;ACCESSING SHADOW MEMORY EITHER.
+ /WCHIM * /DVACC * CAO ;DISABLE ON SHADOW MEMORY WRITE IN SEX
+ /WCHIM * LSHADOW * /WRITE ;ADRESSES.
+ /WCHIM * LSHADOW * /DOUBLE
+ /WCHIM * LSHADOW * CAO

IF (VCC) EPT = /WRITE * /EMCL ;DISBALE ON EMCL OR
+ /LSHADOW * /EMCL ;WRITING IN OTHER HALF
+ /DOUBLE * /EMCL ;WHEN IN SEX MODE
+ /CAO * /EMCL

PCB V2. [44307H] 2/4/87

/ETRAP

PAL16L8
JLB 26NOV86
44307G,CYCLK

/TERM /CC0 /CC1 /CC2 /CC3 /FORM /BRK /RWCS /TRAP GND
VEX /MACLK /MAP /ETRAP UCLK /EORF /CYD WRFSTB /MCLK VCC

; CYCLE CONTROL CLOCK GENERATOR.

;280287 JLB: ECREQ TO LOCAL MEMORY GIVES TWO CGNTS. A SHORTER EORF,
; I.E. ONLY ON e AND NOT ON f, WILL MAKE ECREQ GO OFF 25NS SOONER
;AND HOPEFULLY CURE THIS.

;010387 JLB: ETRAP NEW OUTPUT. WILL DISABLE TRAP ON t AND a.

;080387 JLB: REMOVED UCLK ON CACHE HIT CYCLES.

;160387 JLB: REMOVED TERM IN MCLK AND MACLK TO PROVIDE SYMMETRICAL
; CLOCKS IN 50 NS CYCLES.

;170387 JLB/CJTC: REMOVED MREQ - NEEDED THE INPUT FOR NEW SIGNAL VEX.
; VEX SHOULD DISABLE TRAPS.

;180387 JLB: EORF ON d ONLY. MACLK ON e + f ON MAP.

IF (VCC) MCLK = RWCS * /CC3 ;BECAUSE THE CONTROL STORE ADDRESS
+ RWCS * CC2 ;IN PRESENTED ONTO MA. THEN THE ADD
;STORE LOCATION TO BE EXECUTED IS P

IF (VCC) /WRFSTB = CC3 ;b ON 75NS CYCLES TO PROVIDE A WRIT
+ CC2
+ CC1
+ /CC0
+ TERM

IF (VCC) CYD = /CC3 * /CC2 * CC1 * /CC0 * /TERM ;d USED TO START WRITE PULSE TO

IF (VCC) EORF = /CC3 * /CC2 * CC1 * /CC0 * /TERM ;d MISC WRITE PULSE.

IF (VCC) /UCLK = CC3 ;ON c ON ALL MEMORY REQUESTS.
+ CC2 ;USED TO UPDATE USED BITS AND CLOCK
+ /CC1
+ /CC0
+ TERM ;EXPERIMENT TO SEE IF UCLK ON TERM WAS DANGEROUS.

IF (VCC) MAP = FORM * /BRK * CC2 * /TERM ;MUST NOT COME BEFORE ALL SHORT CYC

IF (VCC) MACLK = MAP * /CC3 * CC2 * CC1 ;e+f CAPTURE CD FROM MEMORY THROU
+ TRAP * /CC3 * CC1 * /CC0 ;d+e CAPTURE TRAP VECTOR
+ RWCS * /CC3 ; CAPTURE MICROADDRESS AFTER E
+ RWCS * CC2 * /CC1 ; TURNED OFF

IF (VCC) /ETRAP = TERM ;t UNSTABLE TRAP IN THIS
+ /CC3 * /CC2 * /CC1 * /CC0 ;a PERIOD CAN DESTROY MA !
+ VEX ; DISBALE TRAPS DURING
ETRAP = TERM . NEX. (CC3 + CC2 + CC1 + CC0) ; VIRTUAL EXAMINES

DESCRIPTION

PCB V2

PAL16L8

ADGD 12AUG86

~~44309A~~, ERROR

45009C

50

NC7 /LERR

NC9

RDATA /BLOCKL25 BCGNT²⁵ /PS /RERR /PA ~~/MOR~~ /PERR0 /PERR1 GND

/MR SPEAL /NC13 /NC14 /NC15 /BLOCKL /EPEAL /EPESL SPESL VCC

; 2/1-87JLB: RDATA PIN 1.

IF (VCC) /SPESL = /RDATA + BLOCKL25 + EPEAL + EPESL + MR ; RDATA USED AS WRITE
; PULSE WHEN NOT BLOCK

IF (VCC) /SPEAL = /BCGNT²⁵ + BLOCKL²⁵ + EPEAL + MR ; BCGNT USED AS WRITE
; PULSE

IF (VCC) EPESL = PS * /RERR ; ENABLE IF NOT ERROR IN REMOTE MEMORY

IF (VCC) EPEAL = PA * /RERR

IF (VCC) BLOCKL = ~~RDATA * /EPEAL * /EPESL * MOR * /MR~~ ; LOCKS AT AN ERROR
+ RDATA * /EPEAL * /EPESL * ~~PERR0~~ * /MR ; SET UNTIL PEA IS REA

~~+ RDATA * /EPEAL * /EPESL * PERR1 * /MR~~
+ BLOCKL * ~~/EPEAL~~ * /MR

↑
/PA

DESCRIPTION

45009D
18/5/87

PCB V2

PAL16L8
ADGD 13/8/86
44310B,LBDIF

/HIEN /BGNT /CGNT /LOEN /CGNT50 ECCR /BGNT50 /BGNT75 /BDAP GND
/MR RDATA /MWRITE50 /BIOXE /REF100 /RGNT /BIOXL /BDRY /BCGNT50R VCC
;280287 JLB: ECCR WRONG POLARITY, RESPONDS WITH BDRY TO ALL NON-
;EXISTING IOX-ES.
;280287 JLB: NEW INPUT REF~, TO GENERATE A REF PULSE OF 175-200NS
;DURATION BY GENERATING BDRY~.

IF (VCC) BCGNT50R = /MWRITE50 * BGNT * BGNT50 ;FROM 50NS AFTER GNT ON RE
+ /MWRITE50 * CGNT * CGNT50 ;LASTS FOR THE REST OF THE

IF (VCC) BDRY = /MWRITE50 * BDAP * /BGNT50 * BGNT75 ;BUS READ FROM LOCAL MEM.
+ MWRITE50 * BGNT * BDAP * /LOEN * /HIEN ;BUS WRITE TO LOCAL MEMORY
+ BIOXL * ECCR ;IOX=ECCR
+ /MR * BDRY * BDAP ;HOLD TERM FOR MEMORY CYCL
+ /MR * BDRY * BIOXE ;HOLD TERM FOR IOX CYCLE
+ REF100

IF (VCC) BIOXL = BIOXE * /BGNT * /CGNT

IF (VCC) /RDATA = MWRITE50 ;INDICATES DATA READY ON READ CYCLES
+ LOEN
+ HIEN
+ RGNT

DESCRIPTION

44310B
18/5/87
no change

PCB V2.

PAL16R4
JLB 12AUG86 BTIM.PAL
44401D,BTIM

OSC /CC2 /CACT /CACT25 /BDY50 /CGNT /CGNT50 /TERM /IORQ GND
/OE /EADR /EIOD /NC14 /Q2 /Q1 /Q0 /DAP /APR VCC

; 010387 JLB: EIOD TOO SOON, ONLY 15NS SETUP FOR BD BEFORE BIOXE.
; WOULD NOT LOAD FROM FLOPPY. EIOD FRONT FLANK DELAYED 25NS.
; SAME WITH DAP. DAP HELD FOR THE REST OF THE CYCLE UNTIL TERM
; ON IORQ.
; 060387 JLB: DAP HELD INTO ADDRESS PART OF IOX CYCLES AFTER A
; BUFFERED WRITE CYCLE. SWAPPED IOD FOR IORQ IN EIOD.
; USING CC2 (NEW INPUT) TO QUALIFY DAP AND EIOD
; STATE MACHINE

Q0 := CACT * /Q2 * /Q1 * /Q0 * /CACT25
+ /Q2 * /Q1 * Q0
+ Q2 * Q1

Q1 := /Q2 * Q0
+ Q1 * /Q0

Q2 := Q1 * /Q0
+ Q2 * Q0

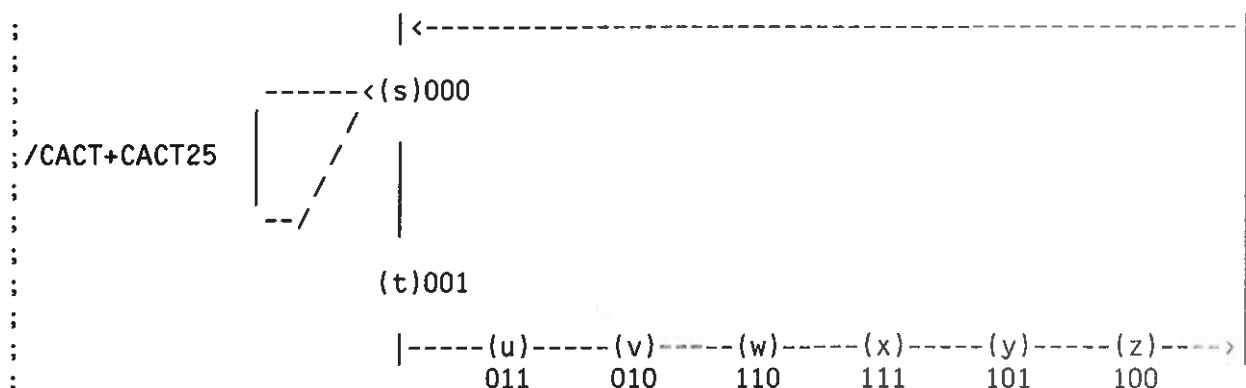
IF (VCC) APR = /Q2 * Q1 * CACT

IF (VCC) EADR = /Q2 * Q0 * CACT ; t + u
+ /Q2 * Q1 * CACT ; u + v
+ Q1 * /Q0 * CACT ; v + w
+ /Q2 * /Q1 * /Q0 * CACT * /CACT25 ; s
+ CGNT * /CGNT50 ; address part for CPU cyc

IF (VCC) DAP = /Q2 * /Q1 * /Q0 * CACT * CACT25
+ DAP * /TERM * IORQ * CC2

IF (VCC) EIOD = IORQ * /Q2 * /Q1 * /Q0 * CACT * CACT25 * /BDY50 * CC2
; STARTS WHEN THE s STATE HAS BEEN REACHED AFTER COMPLETING THE LOOP.

DESCRIPTION



PCB V2.

44403A

27/4/87.

PAL16R4
JLB 26NOV86
44403A,CYINO

OK.

CLK CSDelay0 CSDLY CSECOND CSLOOP /ACOND /MR LUA12 /MAP GND
/OE /NC12 /NC13 /DMAP /DMA12 ~~/MDLY~~ /LCS /NC18 /DLY0 VCC

; CYCLE CONTROL INPUT GENERATOR. PART 0.

IF (VCC) DLY0 = MDLY ;25NS DELAY ON MICROCODE REQUEST
+ CSDelay0 ;25NS DELAY OF PREVIOUS CYCLE ON MICROCODE REQUE

+ ACOND * CSECOND ;CONDITIONAL MICROSEQUENCING
+ ACOND * CSLOOP ;USING ALU RESULT
+ LUA12 * /DMA12 ;
+ /LUA12 * DMA12 ;CHANGING FROM LOWER TO UPPER CONTROL STORE AND

+ DMAP * LUA12 ;

LCS := MR
+ /DMA12 * /LUA12 * LCS ;LCS FROM MR AND UNTIL MA12 HAS GONE HIGH AND T

+ DMA12 * LUA12 * LCS ;I.E. LMA COUNTED FROM 0 TO 8K.
+ /DMA12 * LUA12 * LCS

MDLY := CSDLY

DMA12 := LUA12

DMAP := MAP

DESCRIPTION

PCB r2

PAL16R4
JLB 26NOV86

OK.

44404B
18/5/87

44404A, CYIN1

CLK CSDELAY1 CSALUM1 CSALUMO CSALUI8 CSALUI7 LBA3 LBA1 LBA0 GND

/OE /DLY1 /DLY2 /NC14 /NC15 /NC16 /NOWRIT /NC18 /NC19 VCC

~~/DLY2~~ /NC13

/DLY1

; CYCLE CONTROL INPUT GENERATOR. PART 1.

IF (VCC) DLY1 = CSDELAY1 * /LBA3 * LBA1 * LBA0 * /NOWRIT ; 25NS DELAY OF PREVIOUS CYC

; ON MICROCODE REQUEST IN A

; DLY0. NB.! MUST ALSO HAVE

; OF LONG COMPUTATION TIME.

; THIS DELAY IS ONLY USED W

; IS WRITTEN INTO AND ONE 0

; FOR ADDRESS COMPUTATION I

NOWRIT := /CSALUM1 * /CSALUI8 * /CSALUI7
+ /CSALUMO * /CSALUI8 * /CSALUI7

DESCRIPTION

can be changed to 16RG if needed.

PCB V2

PAL16R4
JLB 25.FEB87 ERFFIX.PAL
44407A,ERFFIX.PAL

CLK IDBS0 IDBS1 IDBS2 IDBS3 IDBS4 WRTRF /LCS NC9 GND
/OE /NC12 /NC13 /NC14 /NC15 /NC16 /RRF /NC18 /ERF VCC

; IDBS = REG FILE = 5

RRF := /LCS * /IDBS4 * /IDBS3 * IDBS2 * /IDBS1 * IDBS0

; ERF

IF (VCC) ERF = RRF
+ WRTRF

DESCRIPTION

44407A
18/6/87
no change

PCB V2

PAL16R4
JLB/CJTC 8AUG86
44412D,UBITS

UCLK /DT /RT LSHADOW /TERM /CYD /HITO /HIT1 /EWC GND
/OE OUBI OUBD /IHIT ~~CUP~~ NUBD NUBI /WCA /USED VCC
;B 050387 JLB: USED BITS INVERTED TO ACTIVE HIGH.
;C 060387 JLB: SHOULD NOT PRODUCE WCA WHEN IN SHADOW.
;D 120387 JLB: HIT PATH IMPROVED
; CACHE USED BIT CONTROL

NCIS

IHIT := HIT1 * HITO * OUBI * RT * /DT * /WCA ;FETCH
+ HIT1 * HITO * OUBD * RT * DT * /WCA ;READ

IF (VCC) USED = OUBI * RT * /DT * /WCA ;FETCH
+ OUBD * RT * DT * /WCA ;READ

IF (VCC) WCA = /RT * DT * EWC * CYD * /TERM * /LSHADOW ;WRITE OUTSIDE SHADOW
+ RT * /IHIT * EWC * CYD * /TERM * /LSHADOW ;FETCH/READ WITHOUT HIT
+ WCA * /TERM ;OUTSIDE SHADOW

~~/CUP := GND~~

~~;CACHE UPDATED ALWAYS~~

/NUBI := DT * /OUBI ; READ OR WRITE KEEP OLD VALUE
+ /RT * DT * HITO * HIT1 ; CLEAR IF WRITE WITH HIT

/NUBD := RT * /DT * /OUBD ; IF FETCH KEEP OLD VALUE

DESCRIPTION

44412E
18/5/87

PCB V2

PAL16R4
ADGD 18/8/86
44425B, CADEC
CPU ADDRESS DECODER FOR 2MB MEMORY
CK WRITE /IORQ /MOFF ~~NC5~~ PPN20 PPN21 PPN22 PPN23 GND ~~/MSIZE0~~
/CGNT ECREQ /CRQ /MWRITE ~~MA20~~ /NC16 /NC17 /CLRQ /NC19 VCC
; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.
; 150387 JLB: WRITE WAS WRONG POLARITY.
; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.

~~/MA20 := /PPN20~~

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ;EACH LI

;TO ALLO

;IN THE

;THE 4MB

;NEED NO

IF (VCC) CRQ = ECREQ * IORQ ;ECREQ WILL HOLD

+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21
+ ECREQ * PPN20

DESCRIPTION

BANK0 := /PPN21 * /PPN20
BANK1 := /PPN21 * PPN20
BANK2 := PPN21 * /PPN20

For 2Mb : MSIZE0 = ~~MA0FF~~ GND

44425C
18/5/87

PCB V2.

PAL16R4
ADGD 18/8/86
44426B,BADEC

DMA ADDRESS DECODE FOR 2MB MEMORY

~~APR /BINPUT /BMEM /MOFF NC5 /BD20 /BD21 /BD22 /BD23 GND~~
~~/BGNT /BGNT APR /MWRITE (MA20 /NC16 /NC17 DDAPR AOK VCC~~

BANK0 BANK1 BANK2

~~/BANK0 /BANK1 /BANK2~~
; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED
; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.
; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !
; CHANGED TO AOK

~~/MA20 := /BD20~~

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + BD20 + MOFF ; 2 MB

IF (VCC) /DDAPR = /APR

DESCRIPTION

$$\begin{pmatrix} \text{BANK0} := /BD21 * /BD20 \\ \text{BANK1} := /BD21 * BD20 \\ \text{BANK2} := BD21 * /BD20 \end{pmatrix}$$

(2Mb:) MSIZE1 = GND

PIN LIST BAPR BAPR /MOFF /BINPUT /BMEM /BD20 /BD21 /BD22 /BD23 ~~GM~~

/BGNT ~~BD19~~ /MSIZE1 ~~BD19~~ BANK0 BANK1 BANK2 DDAPR AOK VCC
/BD19 /MWRITE

PCB V2

44445C
18/5/87

PAL16R4
ADGD 18/8/86
44445B, CADEC

PPN19

BANK0 BANK1 BANK2

CPU ADDRESS DECODER FOR 4MB MEMORY

CK WRITE /IORQ /MOFF ~~NC5~~ PPN20 PPN21 PPN22 PPN23 GND

/CGNT ECREQ /CRQ /MWRITE ~~MA20~~ ~~NC16~~ ~~NC17~~ /CLRQ ~~NC19~~ VCC

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, PPN18 AND PPN19 REMOVED.

; 150387 JLB: WRITE WAS WRONG POLARITY.

; 150387 JLB: SPIKE GENERATOR REMOVED FROM CRQ.

~~/MA20 := /PPN20~~

MWRITE := WRITE

IF (VCC) CLRQ = ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * /PPN20 * /MOFF ; EACH LI

; TO ALLO

+ ECREQ * /IORQ * /PPN23 * /PPN22 * /PPN21 * PPN20 * /MOFF ; IN THE

; THE 4MB

; NEED NO

IF (VCC) CRQ = ECREQ * IORQ

; ECREQ WILL HOLD

+ ECREQ * MOFF
+ ECREQ * PPN23
+ ECREQ * PPN22
+ ECREQ * PPN21

DESCRIPTION

(
BANK0 := /PPN21 * /PPN20
BANK1 := /PPN21 + PPN20
BANK2 := PPN21 * /PPN20
)

For 4Mb:

~~MSIZE = GND~~

MSIZE0 = ~~VCC~~ VCC

For 6Mb ; 44465B

44465C
18/5/87

CLRQ =

+
+ ECREQ . /IORQ . /PPN23 /PPN22 . PPN21 . /PPN20 . /MOFF

CRQ = ECREQ . IORQ
+ ECREQ . MOFF

+ ECREQ . PPN23

+ ECREQ . PPN22

+ ECREQ . PPN21 . PPN20

6Mb:

~~MSIZE = /MOFF~~

MSIZE0 = ~~VCC~~ GND

PCB V2

4446C
18/5/87.

PAL16R4

ADGD 18/8/86

44446B,BADEC

DMA ADDRESS DECODE FOR 4MB MEMORY

~~APR /BINPUT /BMEM /MOFF NC5 /BD20 /BD21 /BD22 /BD23 GND~~

~~/BGNT /BGNT APR /MWRITE MA20 /NC16 /NC17 DDAPR AOK VCC~~

~~BANK0 /BANK1 /BANK2~~

BANK0 BANK1 BANK2

} PIN LIST AS PER
44426B

; 2/1-86JLB: BOTH SIDES OF MWRITE EQUATION INVERTED

; 8/1-87JLB: NEW INPUT /MOFF TO DISBLE THE WHOLE MEMORY, BD18 AND BD19 REMOVED.

; 300387 JLB: BLRQ ASSUMED DATA HOLD TIME AFTER TRAILING EDGE OF BAPR !

; CHANGED TO AOK

~~/MA20 := /BD20~~

MWRITE := BINPUT

IF (VCC) /AOK = /BMEM + BD23 + BD22 + BD21 + MOFF ; 4 MB

IF (VCC) /DDAPR = /APR

DESCRIPTION

$$\left(\begin{array}{lcl} \text{BANK0} & := & /BD21 * /BD20 \\ \text{BANK1} & := & /BD21 * BD20 \\ \text{BANK2} & := & BD21 * /BD20 \end{array} \right)$$

MSIZE1 = ~~/MOFF~~ GND

R 6MB

44466B

44466C
18/5/87.

IF (VCC) /AOK = /BMEM + BD23 + BD22
+ (BD21 * BD20) + MOFF ; 6MB.

MSIZE1 = ~~/MOFF~~ VCC

PCB V2.

44601K

OSC /DLY1 /DLY0 CSDELAY0 WAIT1 WAIT2 /CGNTCACT HIT /BRK GND
/OE /SHORT /CC3 /CC2 /CC1 /CC0 /TERM /CX /SLOW VCC

PAL16R6
JLB 26NOV86
44601K,CYCFSM

CLK /DLY1 /DLY0 /SHORT WAIT1 WAIT2 /CGNTCACT /SLOW /BRK GND
~~/OE HIT /CC3 /CC2 /CC1 /CC0 /TERM /NC18 CSDELAY0 VCC~~

; CYCLE CONTROL STATE COUNTER. FAST VERSION.

; 060387 JLB: MOD'S FROM SLOW VERSION IMPLEMENTED.
; 060387 JLB: 100 NS CYCLE MIN. NO BUFFERED WRITE.
; 070387 JLB: 75 NS CYCLE MIN. NO BUFFERED WRITE.
; 120387 JLB: IMPROVED HIT PATH. FORM~ REMOVED. HIT INPUT ON PIN 12.
; SHORT IN ON PIN 4.
; 120387 JLB: 50 NS CYCLE ON SHORT
; 180387 JLB: MR GATED WITH WAIT1 OUTSIDE. NEW INPUT CSDELAY0.
; 180387 JLB: BUFFERED WRITE.
; 180387 JLB: 175NS SLOW & BRK CYCLES.
; 210387 JLB: 200NS SLOW CYCLES, 175NS BRK CYCLES.

TERM := /CC3 * /CC2 * /CC1 * /CC0 * SHORT * /TERM * /DLY0 * /CSDELAY0 ;50NS CYCLE
+ /CC3 * /CC2 * /CC1 * CC0 * SHORT * /BRK * /DLY1 * /TERM ;75NS CYCLE
+ /CC3 * /CC2 * /CC1 * CC0 * HIT * /BRK * /DLY1 * /TERM ;75NS CYCLE
+ /CC3 * /CC2 * CC1 * CC0 * SHORT * /BRK * /TERM ;100NS CYCLE
+ /CC3 * /CC2 * CC1 * CC0 * HIT * /BRK * /TERM ;100NS CYCLE
+ /CC3 * CC2 * CC1 * CC0 * BRK * /TERM ;BRK CYCLE
+ /CC3 * CC2 * /CC1 * CC0 * SLOW * /TERM ;SLOW CYCLES INCL
+ CC3 * /CC2 * /CC1 * /CC0 * /TERM ;UART,LCS,RWCS CY

CC3 := CC2 * /CC1 * /CC0 * /TERM ;h+i+j+k+l+m+n+o
+ CC3 * CC1 * /TERM
+ CC3 * CC0 * /TERM

CC2 := /CC3 * CC2 * CC1 * /TERM ;e+f+g+h+i+j+k
+ CC2 * /CC1 * /TERM
+ CC2 * CC0 * /TERM
+ /CC3 * /CC2 * CC1 * /CC0 * CGNTCACT * /TERM ;d WAIT FOR BUS IF
+ /CC3 * /CC2 * CC1 * /CC0 * /WAIT1 * /TERM ;d WAIT1 AND NOT
+ /CC3 * /CC2 * CC1 * /CC0 * BRK * /TERM ;d BRK

CC1 := /CC3 * /CC2 * CC0 * /TERM ;b+c+d+e+j+k+l+m
+ CC3 * CC2 * CC0 * /TERM
+ CC1 * /CC0 * /TERM

CC0 := /CC3 * /CC2 * /CC1 * /TERM ;a+b+f+i+j+m+n
+ /CC3 * CC2 * CC1 * CC0 * /TERM
+ CC3 * CC2 * /CC1 * /TERM
+ CC3 * /CC2 * CC1 * /TERM
+ /CC3 * CC2 * CC1 * /CC0 * /CGNTCACT * /TERM ;e WAIT FOR BUS OR LOC
+ /CC3 * CC2 * CC1 * /CC0 * BRK * /TERM ;e MEM CYCLE TO FINISH
+ /CC3 * CC2 * CC1 * /CC0 * /WAIT2 * /TERM ;e IF WAIT2 AND NOT BR
+ /CC3 * /CC2 * CC1 * CC0 * CGNTCACT * /BRK * /TERM ;c PREV WRITE.

DESCRIPTION

Modified 27/6/87

PCB V2

PAL16R4
JLB/CJTC 17MAR87
44701B, VEXFIX

44701B
18/5/87

CLK C4 C3 C2 C1 C0 M1 M0 /LCS GND
/OE IDB2 NC13 NC14 ~~MAC~~ VEX /LDEXM NC18 NC19 VCC

;090487 JLB: VEX INVERTED TO FIX TRAP BUG IN CGA

; TO FIX VIRTUAL EXAMINE BUG IN CGA

LDEXM := C4 * /C3 * /C2 * /C1 * C0 * M1 * M0 * /LCS ; COMMAND 21.3

{ VEX := LDEXM * IDB2 * /LCS ; SET
+ /LDEXM * VEX * /LCS ; HOLD }

~~/MAC~~ := /C4 + /C3 + /C2 + /C1 + C0 + /M1 + M0 + LCS ; COMMAND 36.2

~~/OPLCS~~

DESCRIPTION

/VEX := LDEXM . /IDB2 .
+ /LDEXM . /VEX
+ LCS.

PCB V2.

44801B

18/5/87.

PAL16R8
JLB/CJTC 11AUG86
44801A, BARB

25

OSC /CRQ /IORQ /MR /BRQ50 /REFRQ50 /BDY25 /SEMRQ50 NC7 GND
/OE /CACT /GNT /IOD /REF /MEM /DOREF /ACT /SEM VCC

; 26/2-87JLB: WRONG HOLD TERM IN IOD.

; PRIORITY:

- ; 1. REFRESH
- ; 2. CPU REQUEST AFTER A REFRESH
- ; 3. BUS REQUEST
- ; 4. CPU REQUEST

; CACT - CPU IS ACTIVE ON THE ND100 BUS

CACT := CRQ * /REFRQ50 * /BRQ50 * /REF * /GNT * /SEM * /BDY25 * /MR ; 4
+ CRQ * /REFRQ50 * DOREF * /REF * /GNT * /SEM * /BDY25 * /MR ; 2
+ CACT * /BDY25 * /MR ; HOLD
+ CRQ * SEM * /GNT * /BDY25 * /MR ; SEMAPHORE

; REF - REFRESH GRANT ON ND100 BUS

REF := REFRQ50 * /CACT * /GNT * /SEM * /BDY25 ; 1
+ REF * /BDY25 ; HOLD
+ REFRQ50 * MR ; ALWAYS GRANT REFRESH DURING MR

; GNT - GRANT ND100 BUS TO A DMA DEVICE OR EXTERNAL BUS CONTROLLER

GNT := BRQ50 * /REFRQ50 * /CRQ * /REF * /CACT * /SEM * /BDY25 * /MR ; 3
+ BRQ50 * /REFRQ50 * /DOREF * /REF * /CACT * /SEM * /BDY25 * /MR ; 3
+ GNT * /BDY25 * /MR ; HOLD
+ BRQ50 * SEM * GNT * /MR ; SEMAPHORE

; IOD - IO SIGNAL TO LAST FOR THE ENTIRE BUS CYCLE

IOD := IORQ * CRQ * /REFRQ50 * /BRQ50 * /REF * /GNT * /SEM * /BDY25 * /MR ; 4
+ IORQ * CRQ * /REFRQ50 * DOREF * /REF * /GNT * /SEM * /BDY25 * /MR ; 2
+ IOD * /BDY25 * /MR ; HOLD
+ IORQ * CRQ * SEM * /GNT * /BDY25 * /MR ; SEMAPHORE

; MEM - MEM SIGNAL TO LAST FOR ENTIRE BUS CYCLE

; GENERATES BMEM WHICH IS PRESENT ON REFRESH, CPU MEMORY AND DMA CYCLES

MEM := BRQ50 * /IORQ * /IOD * /BDY25 * /MR
+ BRQ50 * /CRQ * /IOD * /BDY25 * /MR
+ BRQ50 * /DOREF * /IOD * /BDY25 * /MR
+ CRQ * /IORQ * /IOD * /BDY25 * /MR
+ REFRQ50 * /IOD * /BDY25
+ REFRQ50 * MR
+ MEM * /BDY25 * /MR

; SEM - SEMAPHORE GRANT SIGNAL

SEM := SEMRQ50 * /MR * BDRY²⁵
+ SEM * /MR * /ACT

; ACT - BUS IS ACTIVE

ACT := CACT * /BDRY²⁵ * /MR
+ GNT * /BDRY²⁵ * /MR
+ REF * /BDRY²⁵ * /MR

; DOREF - INDICATES THAT LAST BUS CYCLE WAS A REFRESH

DOREF := REF * /MR * BDRY²⁵
+ DOREF * /MR * /CACT * /GNT * /REF

DESCRIPTION

PCB V2

44802F
18/5/87

PAL16R8
ADGD 13/8/86
44802E, RAMC

1MR

OSC /RGNT /CGNT /BGNT /BDAP50 /BGNT25 /CGNT25 /BDRY50 ~~MR~~ GND
/OE /HIEN /LOEN CAS RAS /QD /QC /QB /QA VCC

;190387 JLB: RAS & CAS INVERTED.
;190387 JLB: BGNT25 NEW INPUT. USED TO DELAY STATE MACHINE TURN ON 25NS ON
; BUS CYCLES.
;230387 CJTC: CGNT25 NEW INPUT. USED TO DELAY STATE MACHINE TURN ON 25NS ON
; CPU CYCLES.
; 020487 JLB: BDRY50 WILL GET US OUT OF THE WAIT STATE ON TIMEOUT.

QA := /QD * /QC * /QB
+ QD * /QC * QB

;0)1110 IDLE UNIT NEXT GNT OF ANY TYPE
;1)1010
;2)1011 PAUSE UNTIL BDAP OCCURS (ONLY ON BG
;
; NO WAIT STATE ON CPU TO MEMORY WRIT

QB := QC
+ QB * /QA
+ /QD * QA
+ QB * BGNT25 * /BDAP50 * /MR * /BDRY50

;3)1001
;4)1000
;5)0000
;6)0001
;7)0011
;8)0010

QC := /QD * QC
+ QC * /QB

;OTHER STATES WILL GO TO IDLE AFTER 1 0S

+ QC * QA
+ /QD * QB * /QA
+ QC * /RGNT * /CGNT25 * /BGNT25

QD := QC
+ QB * /QA
+ QD * QA

/RAS := QC
+ /QD * QA
+ /QD * QB

;RAS=1,2,3,4,5,6

LOEN := /QC * /QB * /QA
+ QD * /QC * QA

;LOEN=3,4,5,6

HIEN := QD * QB * /QA
+ /QD * /QC * QB

;HIEN=0,1,2,8

/CAS := QB * /QA * /RGNT
+ QD * QB * /RGNT
+ QC * /QB
+ QC * QA
+ /QD * RGNT

;CAS=4,5,6,7,8
;CAS ON REFRESH=1,2,3,4,5

DESCRIPTION

PCB V2.

44803D

18/5/87

PAL16R8
ADGD/13/8/86
44803C, RAMA

OSC /LOEN /RLRQ /MR /CLRQ /BLRQ50 /SSEMA /SEMRQ50 ~~MCL~~ GND
/OE BCGNT25 /BSEM /CSEM /LDR /LOEN25 /BGNT /CGNT /RGNT VCC

; 270387 CJTC: INCREASE PERIOD BETWEEN SUCCESSIVE GRANTS BY 25NS BY
; INTRODUCING NEW SIGNAL MFREE25~ AND NOT GRANTING ANYTHING UNTIL
; THIS IS TRUE
; 020487 JLB: MFREE NOT NEEDED, BUT TO AVOID POWER UP PROBLEMS MCL~ ADDED.

RGNT := RLRQ * /CSEM * /BSEM * /RGNT * /CGNT * /BGNT ;RLRQ HIGHEST PRIORITY
+ RGNT * /LOEN * /LOEN25 ;HOLD TO END OF DRAM CYCLE
+ RGNT * LOEN * LOEN25
+ RGNT * LOEN * /LOEN25

CGNT := ~~/MCL~~ ^{MR} * /CSEM * /BSEM * CLRQ * /BLRQ50 * /RLRQ * /RGNT * /CGNT * /BGNT ;CLRQ ALONE
+ ~~/MCL~~ ^{MR} * /CSEM * /BSEM * LDR * /RLRQ * CLRQ * /RGNT * /CGNT * /BGNT ;CLRQ * LAST DONE
+ ~~/MCL~~ ^{MR} * CSEM * /BSEM * CLRQ * /RGNT * /CGNT * /BGNT ;CLRQ WITH SEM
+ CGNT * /LOEN * /LOEN25 * ~~/MCL~~ ^{MR}
+ CGNT * LOEN * LOEN25 * ~~/MCL~~ ^{MR}
+ CGNT * LOEN * /LOEN25 * ~~/MCL~~ ^{MR}

BGNT := ~~/MCL~~ ^{MR} * /CSEM * /BSEM * /RLRQ * /CLRQ * BLRQ50 * /RGNT * /CGNT * /BGNT ;BLR
+ ~~/MCL~~ ^{MR} * /CSEM * /BSEM * /LDR * /RLRQ * BLRQ50 * /RGNT * /CGNT * /BGNT ;BLR
+ ~~/MCL~~ ^{MR} * /CSEM * BSEM * BLRQ50 * /RGNT * /CGNT * /BGNT ;BLRQ
+ BGNT * /LOEN * /LOEN25 * ~~/MCL~~ ^{MR}
+ BGNT * LOEN * LOEN25 * ~~/MCL~~ ^{MR}
+ BGNT * LOEN * /LOEN25 * ~~/MCL~~ ^{MR}

LDR := RGNT ;SET ON REFRESH
+ LDR * /CGNT * /BGNT ;HOLD UNTIL NEXT B OR C-GNT

CSEM := ~~/MCL~~ ^{MR} * SSEMA * CGNT ;SET ON SSEMA * CGNT
+ ~~/MCL~~ ^{MR} * CSEM * LOEN25 * LOEN ;HOLD UNTIL END OF 2ND. CGNT
+ ~~/MCL~~ ^{MR} * CSEM * LOEN25 * /LOEN
+ ~~/MCL~~ ^{MR} * CSEM * /LOEN25 * /LOEN

BSEM := ~~/MCL~~ ^{MR} * SEMRQ50 * BGNT ;SET IN SEMRQ50 * BGNT
+ ~~/MCL~~ ^{MR} * BSEM * LOEN25 * LOEN ;HOLD UNTIL END OF 2ND. BGNT
+ ~~/MCL~~ ^{MR} * BSEM * LOEN25 * /LOEN
+ ~~/MCL~~ ^{MR} * BSEM * /LOEN25 * /LOEN

LOEN25 := LOEN

/BCGNT25 := /BGNT * /CGNT

use MR instead of
MCL throughout.

DESCRIPTION

PRIORITY: 1. REFRESH
2. CPU * LAST DONE REFRESH
3. BUS
4. CPU

PCB V2.

45001B.

18/5/87.

PAL16L8
JLB 7JAN87
45001A,LEVO

NC1 PILO PIL1 PIL2 PIL3 ~~NC3~~ NC6 NC7 NC8 NC9 GND
/NC11 ~~/NC12~~ ~~LEVO~~ /NC14 /NC15 /NC16 /NC17 /NC18 /NC19 VCC
LEVO /NC13

; LEVEL ZERO

IF (VCC) /LEVO = PIL3
+ PIL2
+ PIL1
+ PILO

DESCRIPTION

PCB V2

PAL16L8
JLB/CJTC 11AUG86
45002D, BPAR

/LERR
(P-13)

/MOR25

/MR

/BDY50 /BDY75 /BLOCK25 /BPERR50 DBAPR ~~BDATA~~ /LPERR /PERR1 /EPES GND
/EPEA SPES ~~MR~~ ~~NC15~~ /RERR /PARERR /BLOCK SPEA VCC

; 260387 CJTC: NEED TO USE DELAYED BAPR (DBAPR) INSTEAD OF BAPR~ IN
; PRODUCING SPEA. POLARITY CHANGE.
; 260387 JLB: BLOCK SIGNAL MUST NOT BE PRODUCED ON LOCAL MEMORY ERROR.
; IT WILL ONLY BE UNLOCKED ON PEA READ FROM REMOTE ERROR PEA.
; 260387 JLB: PERR HANDLING CHANGED.
; 070487 JLB: RERR MUST LATCH UP ON MOR ALSO.

; STROBE PARITY ERROR STATUS WORD

IF (VCC) /SPES = /BDY50 * /BDY75
+ BDRY50 * BDRY75
+ /BDY50 * BDRY75
+ BLOCK25
+ EPEA
+ EPES
+ MR

; STROBE PARITY ERROR ADDRESS

IF (VCC) /SPEA = /DBAPR + BLOCK25 + EPEA + MR

; BLOCK SIGNAL FOR PES AND PEA STROBE - BLOCK ON ERROR, RELEASE ON PEA READ

IF (VCC) BLOCK = BDRY50 * /BDY75 * /EPEA * /EPES * MOR²⁵ * /MR
+ BDRY50 * /BDY75 * /EPEA * /EPES * BPERR50 * /MR
+ BLOCK * /EPEA * /MR

; PARITY ERROR SIGNALS FROM BUS AND LOCAL MEMORY

IF ~~(BDY50 * /BDY75 * BPERR50)~~ ^{VCC} PARERR = BDRY50 * /BDY75 * BPERR50 * /MR
+ LERR

; REMOTE ERROR - LAST ERROR WAS FROM MEMORY ATTACHED TO THE ND100 BUS
; WILL BE OVERRIDEN BY AN ERROR FROM LOCAL MEMORY (PERR1 AND PERR0)

IF (VCC) RERR = BPERR50 * /MR ; SET REMOTE ERROR ON BUS PARITY
+ RERR * /LPERR * /MR ; HOLD UNTIL A LOCAL MEMORY ERRO
+ MOR²⁵ * /MR ; => LOCAL ERROR HAS PRIORITY

DESCRIPTION

45002E
18/5/87

PCB V2.

45008D

18/5/87.

PAL16L8
ADGD 18/8/86
45008C, DATA

~~/EPEAL~~ ^{/SWDIS} LBD0 LBD1 LBD3 LBD4 /BIOXL ECCR /BCGNT50R GND
/HIEN /OER /MR ~~/RGNT~~ /TST /DISB /CLRERR /OET ~~/NC19~~ VCC
^{/DIS}

; 200387 CJTC: LOGICAL ERRORS IN EQUATIONS FOR DISB AND TST
; 260387 CJTC: CHANGED PIN 2 /EPESL TO /EPEAL - CIRCUIT CHANGE ONLY!!!
; 260387 JLB: CLRERR COMES IMMEDIATELY TO MAKE PERRO&1 PULSES ONLY!!!

IF (VCC) OET = MWRITE

;ON WRITE TO MEMORY

IF (VCC) OER = BCGNT50R

;ON READ FROM MEMORY AFTER THE ADDRES

+ TST * MWRITE

;ON WRITE IN TEST MODE BOTH OER AND O

IF (VCC) CLRERR = MR

;CLEAR PARITY ERROR ON MR, READING EP

+ SWDIS
+ /BCGNT50R
+ DISB

IF (VCC) DISB = LBD3 * BIOXL * ECCR
+ /MR * DISB * /BIOXL
+ /MR * DISB * /ECCR

;SET IF LDB3=1 AND IOX=ECCR
;HOLD UNTIL NEXT IOX=ECCR

IF (VCC) TST = LBD0 * BIOXL * ECCR
+ LBD1 * BIOXL * ECCR
+ LBD4 * BIOXL * ECCR
+ /MR * TST * /BIOXL
+ /MR * TST * /ECCR

;SET IF ANY OF LBD0,1,4 AND IOX=ECCR
;HOLD UNTIL IOX=ECCR

IF(VCC) DIS = DISB + SWDIS
DESCRIPTION