

2019 south ritchey street · santa ana, california 92705 · (714) 558-8211

CAL DATA 100 ENGINE  
(P/N C81080180 AND C81080190)

DRAWING PACKAGE  
C21518035-X0

DOCUMENT C21518035  
Revision X0  
January 1975

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REVISIONS

<u>Revision</u>	<u>Date</u>	<u>Approval</u>	<u>Description</u>
X0	1-75		Release edition

# INTRODUCTION

This volume contains engineering drawings for the Cal Data 100 Engine, part numbers C81080180 and C81080190.

Table 1 lists the engineering drawings contained in this document. Material parts lists are included with each assembly drawing.

Components are identified, where applicable, by both the suggested manufacturer's part number and the Cal Data part number. In general, commercially available parts conform to specifications published by the manufacturer; however, Cal Data component specifications dictate the performance of all component parts used.

Schematics use industry standard designations where applicable (e.g., 7401, 2N5769). These designations are for convenience only and do not necessarily imply that these specific parts are used. The parts lists contain the accurate identification of individual parts.

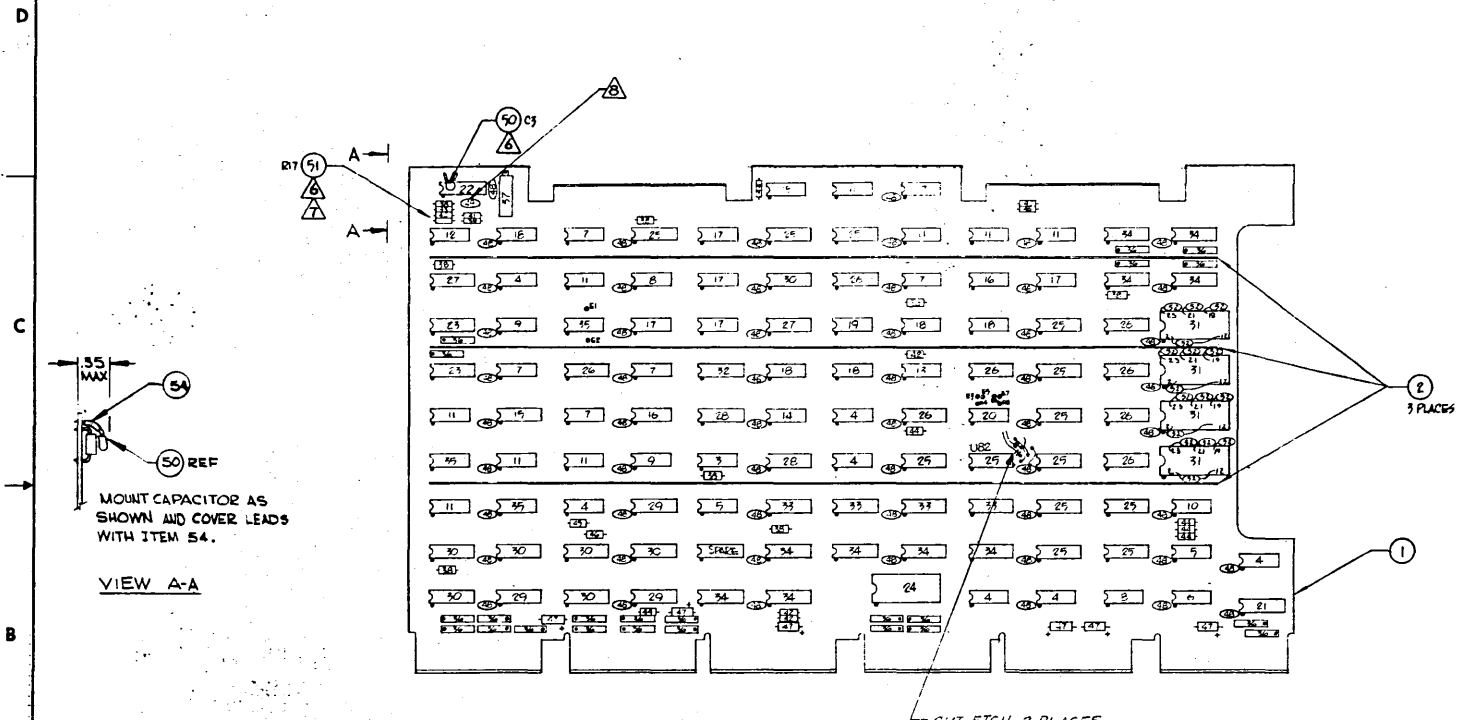
Table 1. Drawings in this Document

Number	Title
C81080180	Board Assembly, Cal Data 100 Engine 1
C21080180	Board Schematic, Cal Data 100 Engine 1
C81080190	Board Assembly, Cal Data 100 Engine 2
C21080190	Board Schematic, Cal Data 100 Engine 2



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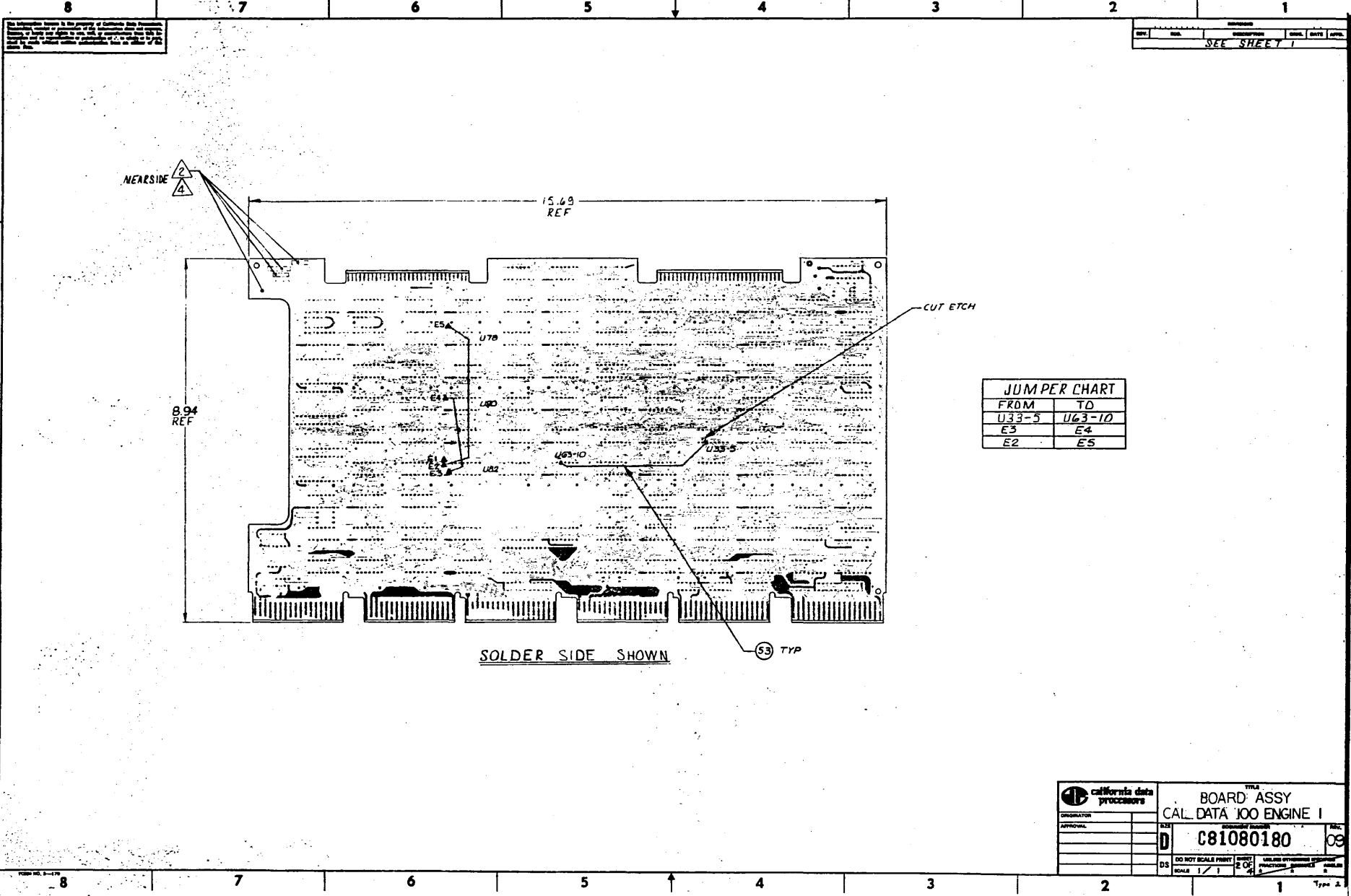
RELEASE STATUS				REVISIONS			
DEPARTMENTAL	APPROVED	DATE	REV	NO.	DESCRIPTION	CHKD	DATE
				01	DRN DS00053	RM	12/24/64
				02	DS00054-01	RM	1/17/65
				03	DS00063-01	RM	3/24/65
				04	DS00063-01	SEE ECO	11/8 5/24/65
				05	DS00110-01	SEE ECO	RM 1/17/65
				06	DS00150-01	SEE ECO	CK B.2/24/65
				07	DS00184-01	SEE ECO	G.N. 10/20/64
				08	DS00183-01	SEE ECO	G.N. 10/20/64
					REDRAWN		
				08	DS00055-01	SEE ECO	RM 7/25/65
				09	DS00277-01	SEE ECO	RM 8-11-65



- △ AS REQUIRED USE ITEM 55 IN PLACE OF ITEM 49. TO OBTAIN A MINIMUM PERIOD OF 100 $\mu$ s.
- △ INSTALL IF PULSE WIDTH IS LESS THAN 35 $\mu$ s.
- △ ITEMS CODED WITH THIS NOTE IS SELECTED IN TEST TO ACHIEVE CLOCK PULSE WIDTH 40 $\mu$ s.
- 5 REFERENCE DOCUMENTS: PRODUCT SPECIFICATION; TEST SPECIFICATION.
- △ SERIAL NUMBER TO BE PREFIXED WITH A DIVISION CODE WHICH AGREES WITH PLACE OF MANUFACTURE: DS EQUAL-SANTA ANA, DE EQUAL-EDIM.
- 3 FOR BR4FD CO-MATIC. SEE C21080189.
- △ MARK ASSEMBLY LATEST REV. LETTER TO WHICH IT WAS BUILT. ASSY SERIAL NUMBER AND EIA FOUR DIGIT DATE CODE. LETTERING TO BE 12 HIGH BLACK EPOXY PAINT, VERTICAL GOTHIC AND LOCATED APPROX. AS SHOWN.
- 1 FABRICATE PER CAL DATA SPEC C21100010.

NOTES: UNLESS OTHERWISE SPECIFIED

ITEM	PART NO.	REV.	DESCRIPTION
	california data processors		FILE
COORDINATOR: CLEVELAND 2-278			BOARD ASSEMBLY
APPROVAL: J. McQUINN 1/17/65			CAL DATA 100 ENGINE. I
APPROVAL: J. McQUINN 1/17/65			DOCUMENT NUMBER
APPROVAL: J. McQUINN 1/17/65			C81080180
APPROVAL: J. McQUINN 1/17/65			REV. 09
APPROVAL: J. McQUINN 1/17/65			DO NOT SCALE PRINT
APPROVAL: J. McQUINN 1/17/65			SCALE 1/1
APPROVAL: J. McQUINN 1/17/65			DO NOT SCALE PRINT
APPROVAL: J. McQUINN 1/17/65			SCALE 1/1



REV. NO. | REV. | DESCRIPTION | CHG. | DATE | APPR.  
SEE SHEET 1


JUMPER CHART	
FROM	TO
U33-5	U63-10
E3	E4
E2	E5

		TITLE <b>BOARD ASSY          CAL DATA 100 ENGINE I</b>	
ORIGINATOR APPROVAL	DESIGNED BY DRAWN BY	PART NO. <b>C81080180</b>	REV. <b>09</b>
DO NOT SCALE PRINT SCALE 1/1		SHEET <b>2 OF 4</b>	QUANTITY <b>1</b>
		TYPE 2	

# LIST OF MATERIALS

ITEM NO.	QTY. REQD.	REFERENCE DESIGNATION	PART NUMBER	DESCRIPTION	NOTES	VENDOR	VENDOR PART NUMBER
1	1		C66080180	PWB, ENGINE NO. 1			
2	3		C67680025	BUS BAR			
3	1	U43	C51322004	I.C. HEX INVERTER		TEX. INST.	SN7404N-00
4	7	U12, 26, U62, 63, U85, 94, U114	C51324004	↑ HEX INVERTER		↑	SN74S04N-00
5	2	U44, 112	C51324005	HEX INV. W/OC			SN74S05N-00
6	1	U113	C51322000	QUAD 2 NAND			SN7400N-00
7	5	U14, 20, U24, 32, U69	C51324000	QUAD 2 NAND			SN74S00N-00
8	2	U30, 103	C51322008	QUAD 2 NAND			SN7408N-00
9	2	U13, 34	C51322010	TRIPLE 3 NAND			SN7410N-00
10	1	U111	C51323011	TRIPLE 3 NAND			SN74H11N-00
11	9	U6, 8, 16, U21, 25, U57, 68, U77, 86	C51324011	TRIPLE 3 NAND			SN74S11N-00
12	1	U2	C51324020	DUAL 4 NAND			SN74S20N-00
13	1	U71	C51323022	DUAL 4 NAND W/OC			SN74H22N-00
14	1	U52	C51322030	8-IN-NAND			SN7430N-00
15	1	U15	C51322042	BCD TO DEC. DECODER			SN7442N-00
16	2	U78, 33	C51323051	EXPAND AND-OR-INVERT			SN74H51N-00
17	6	U31, 38, U39, 40, U87, 67	C51324064	AND-OR INV.			SN74S64N-00
18	6	U11, 47 U51, 61, U70, 79	C51324065	AND-OR INV. OC			SN74S65N-00
19	1	U60	C51324074	DUAL D F/F			SN74S74N-00
20	1	U81	C51324086	QUAD EXCL. OR/ELCU. OR/NOR			SN74S86N-00
21	1	U115	C43000036	ALU PROM, CAL DATA C5133256			MM6330
22	1	U1	C51322123	DUAL RETRIG MONO MULTUBTRF			SN74123N-00
23	2	U4, 5	C51322145	BCD TO DEC. DECODER			SN74145N-00
24	1	U76	C51322150	16 TO 1 DATA SEL MUX			SN74150N-00
25	13	U29, 48 U58, 73, U82, 88, U89 THRU U93, U101, U102	C51324151	8 TO 1 DATA SEL MUX			SN74S151N-00
26	8	U23, 59, U72, 80, U98, 99, U100, 97	C51324153	DUAL 4 TO 1 DATA SEL MUX			SN74S153N-00
27	2	U3, 50	C51324157	↑ QUAD 2 TO 1 DATA SEL MUX		↓	SN74S157N-00
28	2	U42, 53	C51322161	↑ BINARY COUNTER		↓	SN74161N-00
29	3	U19, 35, U37	C51324174	I.C. HEX D FLIP-FLOP		TEX. INST.	SN74S174N-00

FORM NO. 3-172

ORIGINATOR <i>R. Smith</i>	7-17-74	 <b>california data processors</b>	TITLE BOARD ASSY, CAL DATA 100 ENGINE 1		
APPROVAL <i>[Signature]</i>	7-17-74		SIZE B	DOCUMENT NUMBER C81080180	REV. 09
<i>[Signature]</i>	7-17-74		DS	SHEET 3 OF 4	PAGE
<i>[Signature]</i>	7-17-74				

# LIST OF MATERIALS

ITEM NO.	QTY. REQD.	REFERENCE DESIGNATION	PART NUMBER	DESCRIPTION	NOTES	VENDOR	VENDOR PART NUMBER
30	7	U9, 10, U18, 28, U27, 36, U49	C51324175	I.C. QUAD D F/F		TEX. INST.	SN74S175N-00
31	4	U107, THRU U110	C51324181	ARITHMETIC LOGIC UNIT			SN74S181N-00
32	1	U41	C51324182	LK AH CARRY GEN.			SN74S182N-00
33	4	U54, 64, U74, 83	C51322194	SHIFT REGISTER			SN74194N-00
34	10	U46, 55, U56, 65, U75, 84, U95, 96, U105, 106	C51324257	QUAD 2 TO 1 SEL MUX			SN74S257N-00
35	3	U7, 17, 22	C51324010	I.C. TRIPLE 3-IN NAND		TEX. INST.	SN74S10N-00
36	23	RM1 - RM23	C54811050	RESISTOR NETWORK 560/620			54811050
37	1	R11	C54773670	VARIABLE RESISTOR 10K		BOURNS	3006P-1-103
38	8	R1, 2, 6, R8, 9,10, R12, 21	C54400285	RESISTOR 1K, 1/4 W, 5%			RC07GF102J
39	1	R13	C54400474	RESISTOR 5.1K, 1/4 W, 5%			RC07GF512J
40	1	R16	C54400481	RESISTOR 10K, 1/4 W, 5%			RC07GF103J
41	1	R15	C54400268	RESISTOR 200 $\Omega$ , 1/4 W, 5%			RC07GF201J
42	3	R18,19,27	C54400273	RESISTOR 330 $\Omega$ , 1/4 W, 5%			RC07GF331J
43	1	R14	C54400275	RESISTOR 390 $\Omega$ , 1/4 W, 5%			RC07GF391J
44	6	R3, 4, 5, R7,20,26	C54400277	RESISTOR 470 $\Omega$ , 1/4 W, 5%			RC07GF471J
45	2	R22, 24	C54400279	RESISTOR 560 $\Omega$ , 1/4 W, 5%			RC07GF561J
46	2	R23, 25	C54400280	RESISTOR 620 $\Omega$ , 1/4 W, 5%			RC07GF621J
47	6	C4 THRU C9	C52326001	CAPACITOR 4.7 $\mu$ f, 20 V, 20%		COMPONENTS INC	CCO-020-475
48	56	C1, C10-C64	C52252500	CAPACITOR .01 $\mu$ f, 100 V		ERIE	805-024-2511
49	1	C2	C52213330	CAPACITOR 33pf, 5%	⚠ 8	CDE	CD15ED330J03
50	1	C3	C52213307	CAPACITOR 5pf $\pm$ .5pf	⚠ 7	CDE	CD15CD050D03
51	1	R17	C5440XXXX	RESISTOR 18K-47K, 5%, 1/4 W	⚠ 6		RC07
52	16	C65 - C80	C52213237	CAPACITOR 180pf, 100 V, 5%		GEN. INSTR.	RDM5FA181J03
53	A/R		C37002750	WIRE, SOLID 24 AWG GRN		AMER. ENKA	T502 (1/24)
⚠ 6 ITEMS CODED WITH THIS NOTE ARE SELECTED IN TEST TO ACHIEVE CLOCK PULSE WIDTH 40 ns. ⚠ 7 INSTALL IF PULSE WIDTH IS LESS THAN 35 ns.							
54	A/R		C33122525	SLEEVING, #22 TEFLON, CLEAR		ALPHA	TFT-250/22
55	1	C2	C52213320	CAPACITOR 22pf, 5%			
⚠ 8 AS REQUIRED USE ITEM 55 IN PLACE OF 49 TO OBTAIN A MINIMUM PERIOD OF 140 ns.							

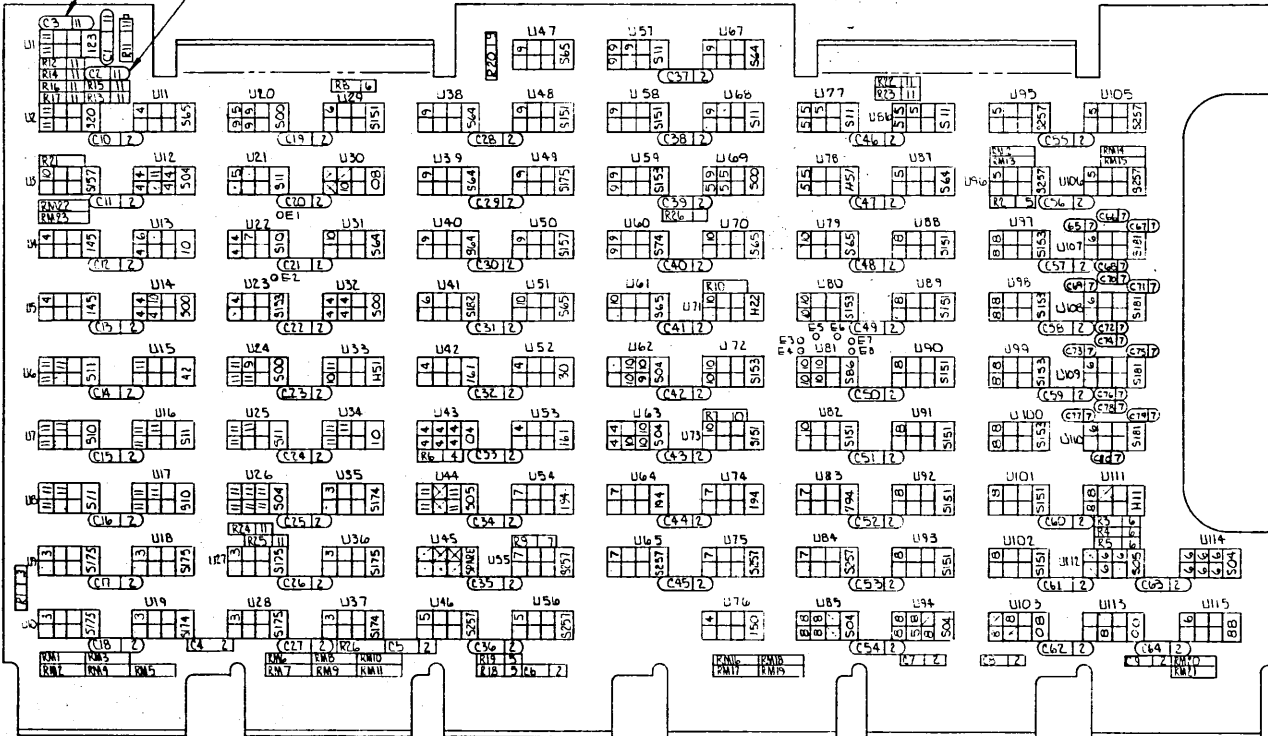
FORM NO. 3-172

ORIGINATOR		california data processors	TITLE BOARD ASSY, CAL DATA 100 ENGINE 1
APPROVAL			DOCUMENT NUMBER C81080180
		SIZE B	REV. 09
		DS SHEET 4 OF 4	PAGE



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RELEASE STATUS			REVISIONS			
RELEASE LEVEL	DES. SERVICES	DATE	ZONE/LTR	DESCRIPTION	DATE	APPROVED
EXPERIMENTAL			01	REL PER DEN D500078	7-27-74	WLB
ENGINEERING	WLB	2-22-74	02	REVISED PER ECO D50063-01 SMTS EFFECTED 123,511	5-14-74	WLB
PRODUCTION			03	REVISED PER ECO D580190-01	8-23-74	WLB
			04	REVISED PER ECO D500228-01	12-4-74	WLB
			05	REVISED PER ECO D500277-01	5-14-75	WLB



REFERENCE DESIGNATIONS		
COMPONENT	HIGHEST NUMBER	NUMBERS NOT USED
CAPACITOR	C80	
"E" POINTS	E8	
INT CIRCUIT	U115	U66, U104
RESISTOR	R27	
RES. MOD.	RM23	

- 7 INSTALL IF PULSE WIDTH IS LESS THAN 35ns
  - 6 ITEMS CODED WITH THIS NOTE IS SELECTED IN TEST TO ACHIEVE CLOCK PULSE WIDTH 40ns
  - 5 CAPACITOR C2 IS SELECTED IN TEST TO OBTAIN A MINIMUM PERIOD OF 140ns
  - 3 CAPACITOR C3 IS SELECTED IN TEST.
  - 2 REVISIONS TO THIS DOCUMENT WILL BE MAINTAINED ON A PER SHEET BASIS. FOR REVISION LOG SEE SHEET 2.
  - 1 FUNCTIONS CODED WITH THIS NOTE ARE ASSIGNED ON THE BACKPLATE AND ARE NOT USED ON THIS ASSEMBLY.
- NOTES: UNLESS OTHERWISE SPECIFIED

PART/ASSY NO. & QTY PER ASSY		NOTE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION/MATERIAL	SPEC/SOURCE	CODE NO.	FIND NO.
PART ASSY REV LTR		DO NOT SCALE DRAWING	CONTRACT NO.		1		
810800-00		SCREEN THRESHOLD PER HARDWARE MIB	DRAWN: WLB		2		
NEXT ASSY: USED ON		SCOURING AND SPONGES MUST BE USED TO REMOVE ALL SURF AND BRUSH SURF DEFECTS TO THE MAXIMUM EXTENT POSSIBLE	CHECK: WLB		3		
APPLICATION		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	ENGR: WLB		4		
		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	PROJ. ENGR: WLB		5		
		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	TECH. DIR: WLB		6		
		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	PROD. MGT: WLB		7		
		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	PRODUCTION		8		
		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	G.A. WLB		9		
		REWORKING OF INSULATING MATERIALS MUST BE PERFORMED IN THE LABORATORY	TST: WLB		10		

california data processors  
2015 South Victory Street, Santa Ana, California 92705 (714) 538-8271

DWG TITLE  
**BOARD SCHEMATIC, CAL DATA 100 ENGINE I**

SIZE: CODE IDENT NO. DWG NO.  
D C-10-0180

SCALE: NONE REV 05 SHEET 1 OF 11

F08108171

REVISIONS  
 DATE APPROVED  
 SEE SHEET 1

KEY NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01	01	01	01	01	01	01	01	01	01	01														
02	02	02	02	02	02	02	02	02	02	02														
03	03																							
04	04																							
05	05																							

PAGE NO	A	J2	B	PAGE NO
4	LDAOC-L	1		
4	BREQ-H	2	MINTP-L	4
4	BGRNT-L	3	BYTDA-L	10
4	BGEN-H	4		
4	MMINH-L	5	MARLD-H	
4	DANH-L	6	CCCN-H	11
11	SPFO-L	7	SPKIA-L	4
11	SPFOS-L	8	SPRI9-L	4
11	SPF06-L	9	SPRI9-L	4
11	SPENC-H	10	MLTPY-L	11
11	INWBF-L	11	ENSFC-H	11
11	CAAT-H	12	CROOB-H	3
11	PFALL-L	13		
6	AUCIN-L	14		
11	WRITE-L	15	FILE6-H	
11	TREED-H	16	XABIS-L	
11	INTR-H	17	XADOT-L	
11	MNCO-L	18	RSTRA-L	
11	MNCL-L	19	YELLOW-L	
11	CROOT-H	20	BYTMD-L	11
5	SLINT-H	21	M3006-H	5
11	DRWEN-L	22	REVEN-L	
11	EIA001-H	23	EIA000-H	
11	EIA003-H	24	EIA002-H	
11	EIA005-H	25	EIA004-H	
11	EIA007-H	26	EIA006-H	
11	EIA009-H	27	EIA008-H	
11	EIA011-H	28	EIA010-H	
11	EIA013-H	29	EIA012-H	
11	EIA015-H	30	EIA014-H	

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9	SKIPP-L	1	EMAO0-H	1
9	ARWEN-L	2	EMAO1-H	
9	SLWEN-L	3	EMAO2-H	
9	SSYER-H	4	EMAO3-H	
9	OSYER-H	5	EMAO4-H	
9	LDSPF-H	6	EMAO5-H	
11	FINTP-L	7	EMAO6-H	
11	SPFNC-H	8	EMAO7-H	
9	HALTP-L	9		
10	CARRY-H	10	PSSEL-L	
10		11		
10	ADERR-H	12		
10	PS003-L	13		
10		14		
10		15	XCOOT-L	
10		16	XDBIS-L	
10		17	XBBIS-L	
4	CCWEN-H	18	XBOOT-L	
10	STATIC-L	19	LITEL-L	3
10	MSYN-H	20	PLUSI-L	11
11	SPFO4-L	21	PSWEN-L	
3	BBINH-L	22	IPWEN-L	
5	BB001-H	23	BB000-H	5
5	BB003-H	24	BB002-H	5
5	BB005-H	25	BB004-H	5
5	BB007-H	26	BB006-H	5
5	BB009-H	27	BB008-H	5
5	BB011-H	28	BB010-H	5
5	BB013-H	29	BB012-H	5
5	BB015-H	30	BB014-H	5

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3	CMO28-H	A	+5V	2
3	CMO29-H	B	-15V	2
3	CMO31-H	C	GND	2
3	CMO30-H	D	CMO32-H	3
3	CMO33-H	E	CMO34-H	3
3	CMO35-H	F	DAD02-H	1
3	CMO37-H	H	CMO36-H	3
3	CMO39-H	J	CMO38-H	3
11	IRPTE-L	K	CMO40-H	3
3	CMO41-H	L	CMO42-H	3
3	CMO43-H	M	CPEH-L	1
3	CMO45-H	N	CMO44-H	3
3	CMO47-H	P	CMO46-H	3
3	DAD03-H	R	ACM9-L	1
3		S	AUX9M-L	1
2	GND	T	IRINH-L	11
11		U	IWAIT-L	11
11	SYSCK-L	V	GND	2

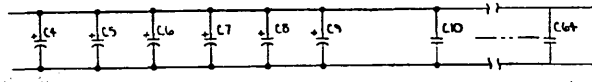
PAGE NO	1	E	2	PAGE NO
3	CMO00-H	A	+5V	2
3	CMO01-H	B	-15V	2
3	CMO02-H	C	GND	2
3	CMO03-H	D	CMO04-H	3
3	CMO05-H	E	CMO06-H	3
3	CMO07-H	F	EMINH-L	11
3	CMO09-H	H	CMO08-H	3
3	CMO11-H	J	CMO10-H	3
3	DAD00-H	K	CMO12-H	3
3	CMO13-H	L	CMO14-H	3
3	CMO15-H	M	DAD01-H	1
3	CMO17-H	N	CMO16-H	1
3	CMO19-H	P	CMO18-H	1
3	SR0-L	R	CMO20-H	3
3	CMO21-H	S	CMO22-H	3
2	GND	T	CMO24-H	3
3	CMO23-H	U	CMO26-H	3
3	CMO25-H	V	CMO27-H	3

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11	PEINT-H	A	+5V	2
11	HLINT-H	B	-15V	2
11	DS14-H	C	GND	2
11	DS17-H	D	LTCI-L	1
11	WRTAD-H	E	PBBSY-L	1
11	CCO01-L	F	HALTP-L	1
11	CCO02-L	J	MSRIS-L	1
11	CCO03-L	K	PESET-L	9
11	CCO04-L	L	BG7-IN	1
11	CCO05-L	M	BG6-IN	1
11	CCO06-L	N	BG5-OUT	1
11	CCO07-L	P	BG5-IN	1
11	CCO08-L	R	BG5-OUT	1
11	CCO09-L	S	BG4-IN	1
2	GND	T	BG4-OUT	1
11	CCO10-L	U	NPG-IN	1
11	CCO11-L	V	NPG-OUT	1

PAGE NO	1	C	2	PAGE NO
8	MBO01-L	A	+5V	2
8	MBO02-L	B	-15V	2
8	MBO03-L	C	GND	2
8	MBO04-L	D	MBO04-L	8
8	MBO05-L	E	MBO06-L	8
8	MBO07-L	F	MBO08-L	8
8	MBO09-L	H	MBO10-L	8
8	MBO11-L	J	MBO12-L	8
8	MBO13-L	K	MBO14-L	8
8	MBO15-L	L	AR000-H	4
4	AB001-H	M	AR002-H	4
4	AB003-H	N	AR004-H	4
4	AB005-H	P	AR006-H	4
4	AB007-H	R	AR008-H	4
4	AB009-H	S	AR010-H	4
2	GND	T	AR011-H	4
4	AB013-H	U	AB012-H	4
4	AB015-H	V	AB014-H	4

PAGE NO	1	B	2	PAGE NO
2	BUS B66-H	A	+5V	2
2	BUS B65-H	B	GND	2
2	BUS B65-L	C	GND	2
2	GND	D	BUS B64-L	2
2	GND	E	BUS B64-H	2
1	BUS A10-L	F	BUS D10-L	1
1	BUS A01-L	H	BUS A00-L	1
1	BUS A03-L	J	BUS A02-L	1
1	BUS A05-L	K	BUS A04-L	1
1	BUS A07-L	L	BUS A06-L	1
1	BUS A09-L	M	BUS A08-L	1
1	BUS A11-L	N	BUS A10-L	1
1	BUS A13-L	P	BUS A12-L	1
1	BUS A15-L	R	BUS A14-L	1
1	BUS A17-L	S	BUS A16-L	1
2	GND	T	BUS C1-L	2
1	BUS SSYN-L	U	BUS CO-L	1
1	BUS MSYN-L	V	GND	2

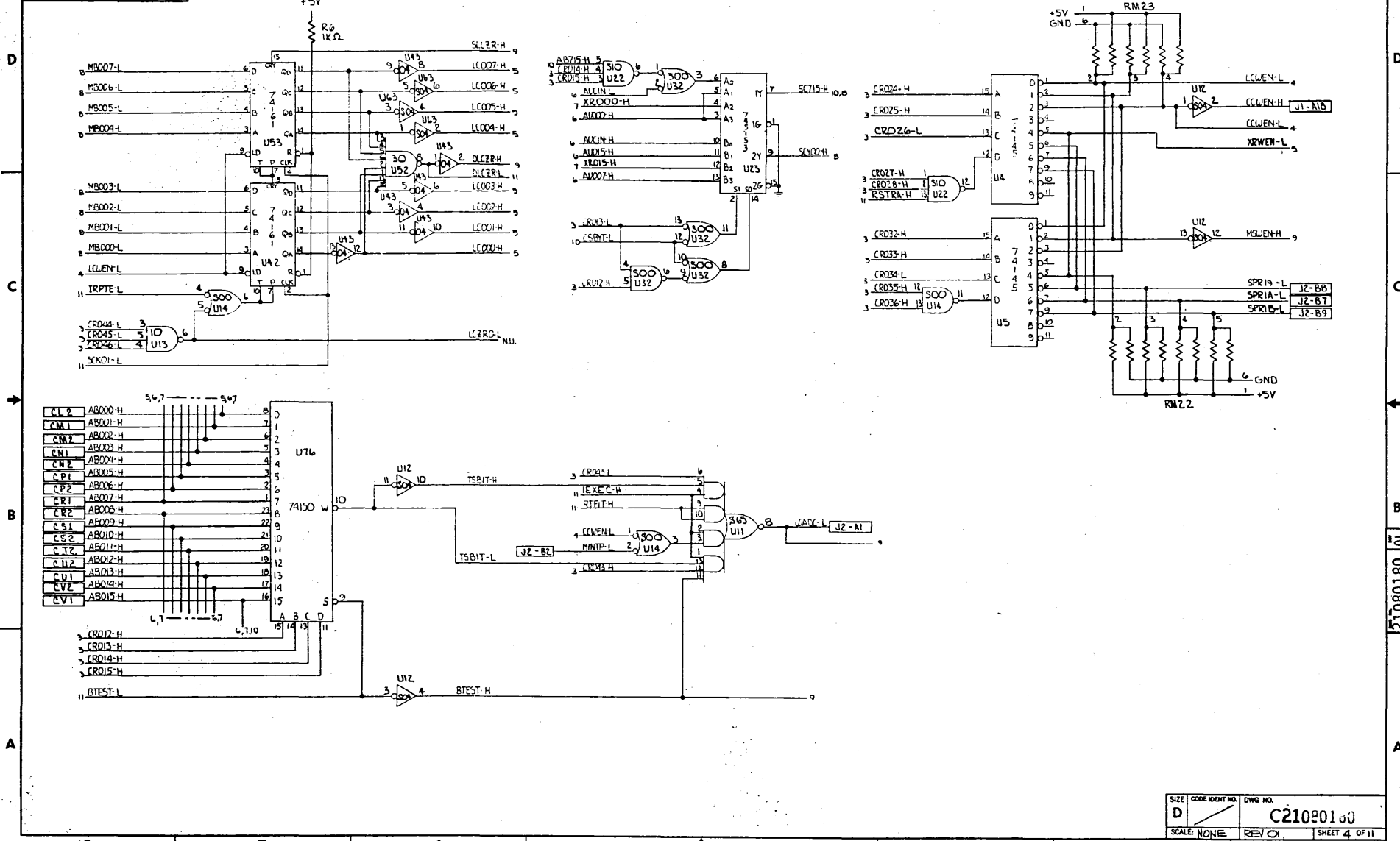
PAGE NO	1	A	2	PAGE NO
2	BUS INIT-L	A	+5V	2
2	BUS INTR-L	B	GND	2
2	BUS D00-L	C	GND	2
2	BUS D02-L	D	BUS D01-L	2
2	BUS D04-L	E	BUS D03-L	2
2	BUS D06-L	F	BUS D05-L	2
2	BUS D08-L	H	BUS D07-L	2
2	BUS D10-L	J	BUS D09-L	2
2	BUS D12-L	K	BUS D11-L	2
2	BUS D14-L	L	BUS D13-L	2
2	BUS D16-L	M	BUS D15-L	2
2	GND	N	BUS PB-L	2
2	GND	P	BUS BBSY-L	2
2	GND	R	BUS SACK-L	2
2	GND	S	BUS NPR-L	2
2	GND	T	BUS BRT-L	2
2	BUS NPG-H	U	BUS BR6-L	2
2	BUS B67-H	V	GND	2





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ZONE/LTR		REVISIONS		DATE	APPROVED
		DESCRIPTION			
		SEE SHEET 1			

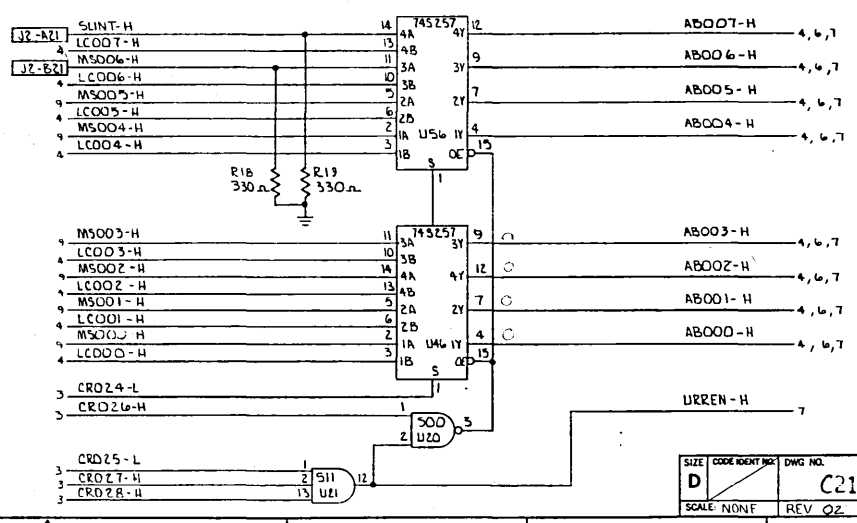
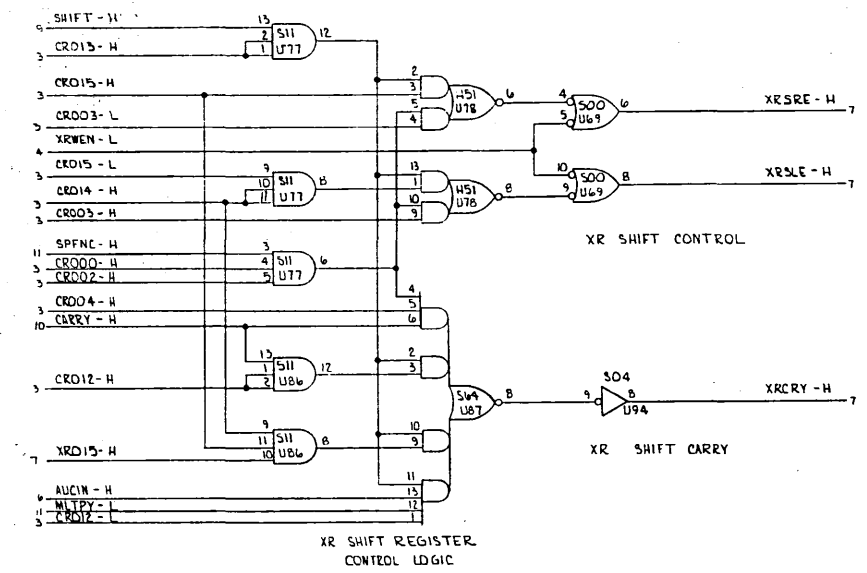
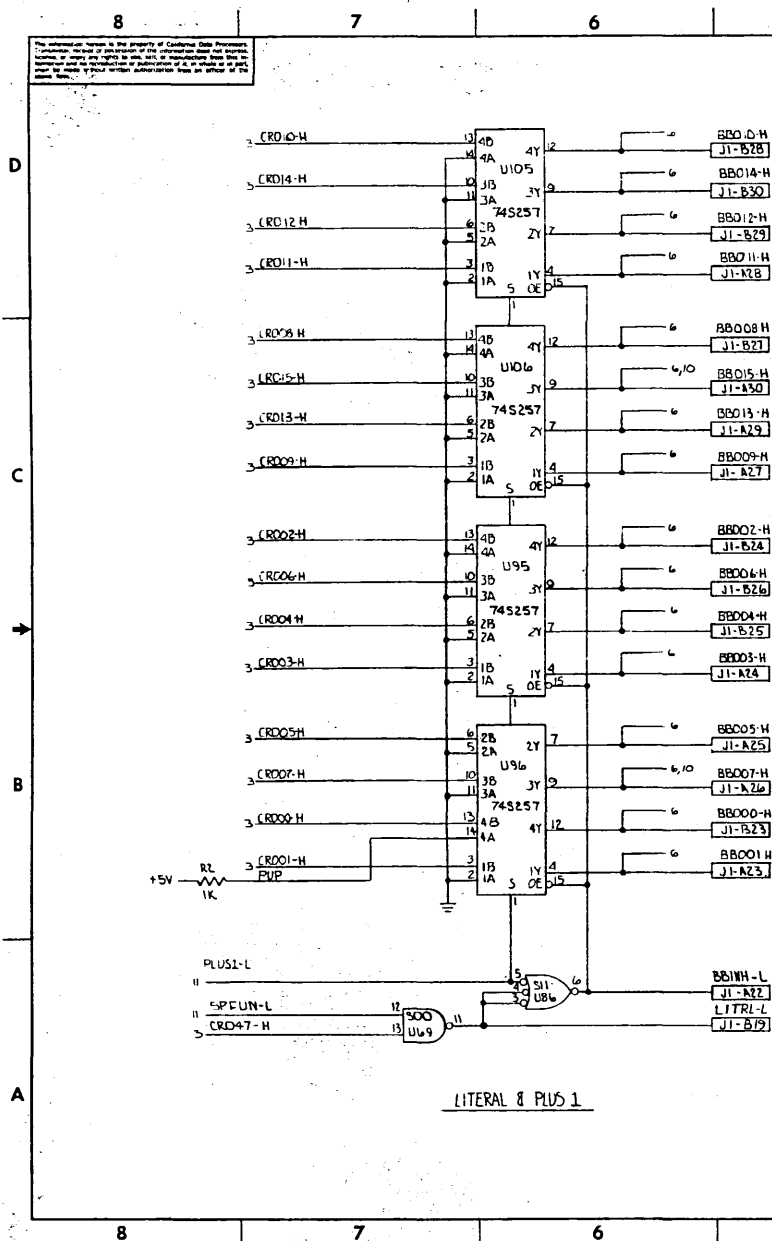


SIZE	CODE IDENT NO.	DWG NO.
D		C21080180
SCALE: NONE	REV: 01	SHEET 4 OF 11

21080180 01

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REVISIONS			
ZONE/LTR	DESCRIPTION	DATE	APPROVED
	SEE SHT 1		



SIZE	CODE IDENT NO.	DWG NO.
D		C21090180
SCALE	NONF	REV 02
		SHEET 5 OF 11

1010810817

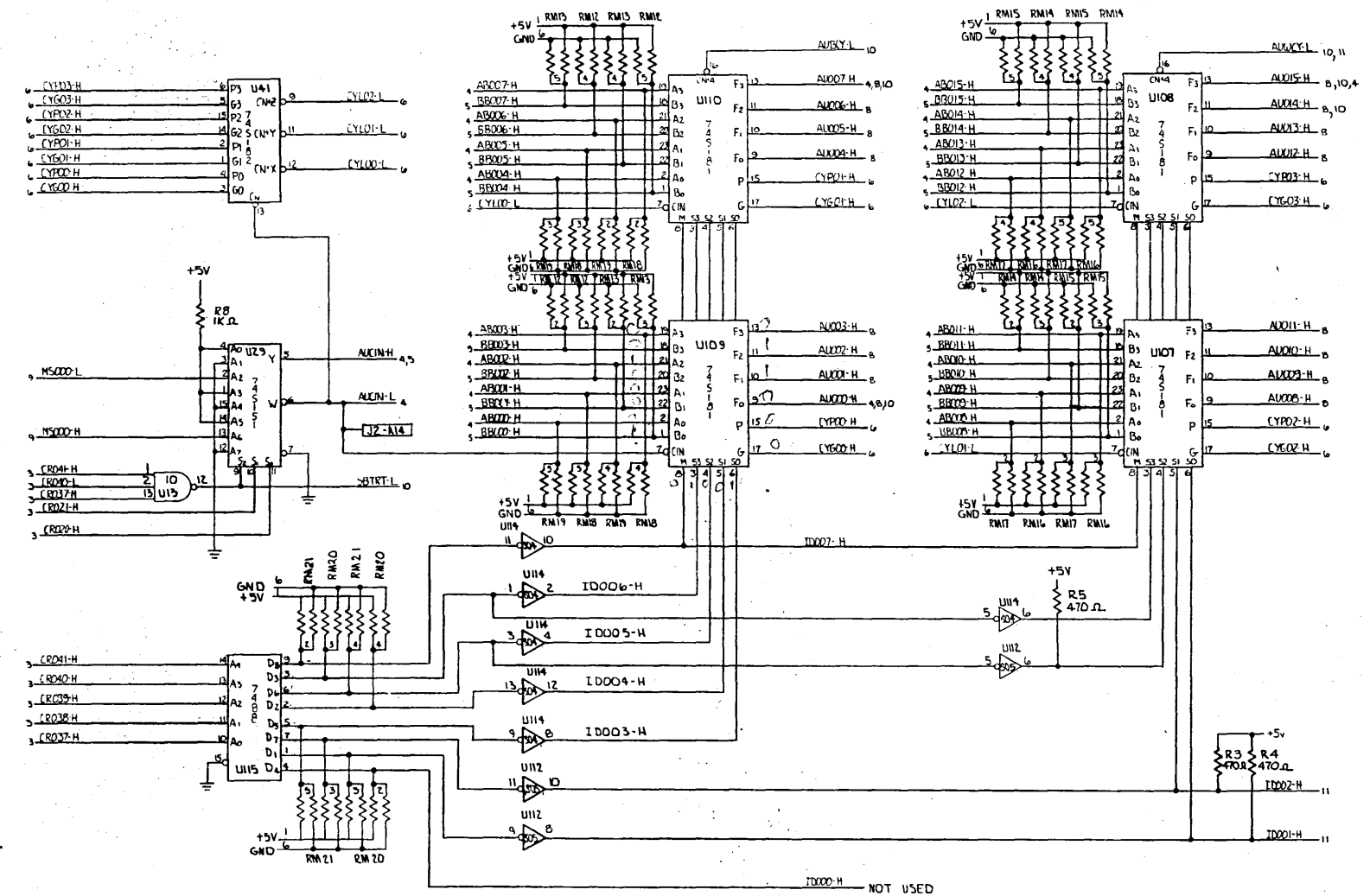
8 7 6 5 4 3 2 1

REVISIONS			
ZONE(LTR)	DESCRIPTION	DATE	APPROVED
	SEE SHEET 1		

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D  
C  
B  
A

D  
C  
B  
A



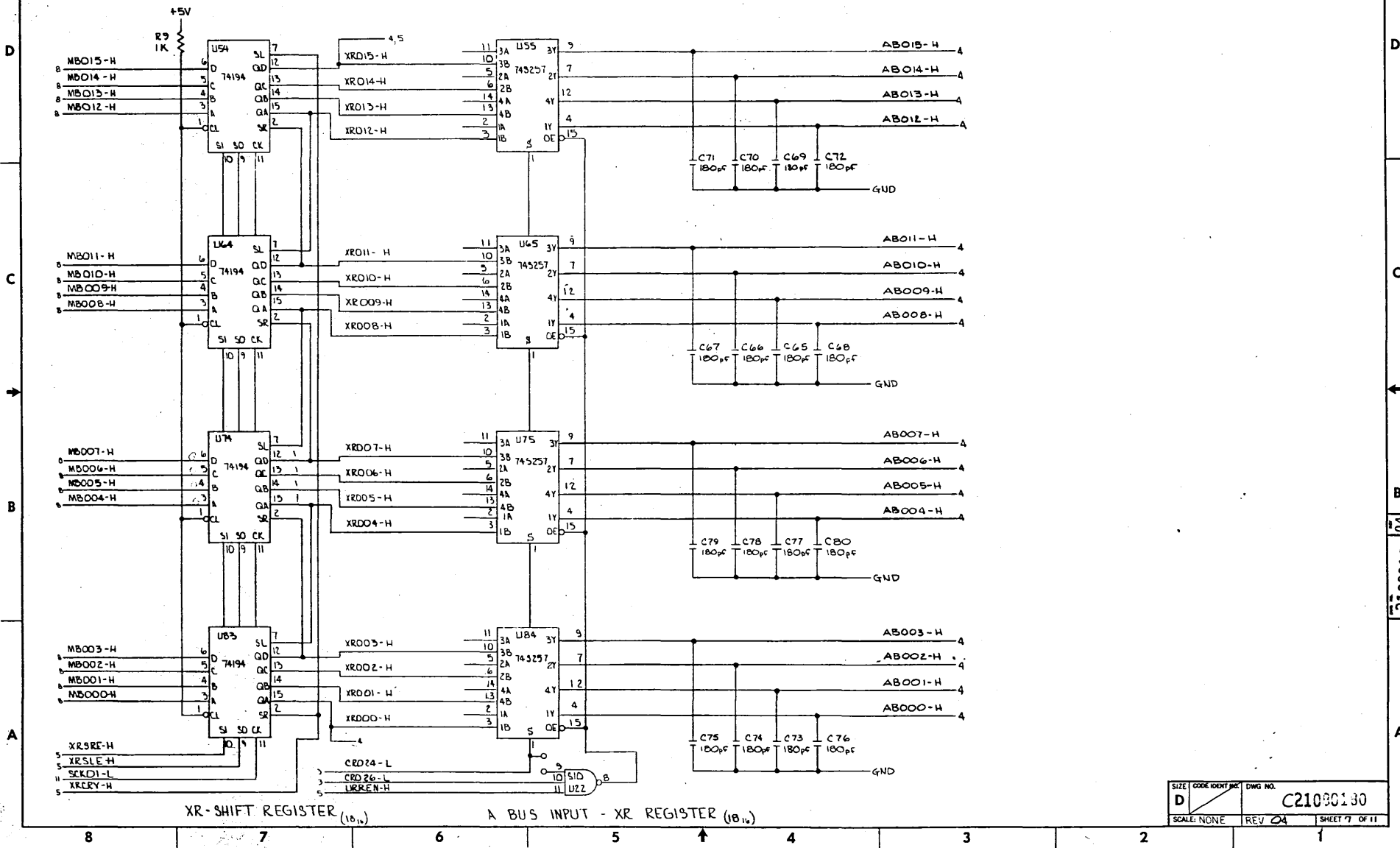
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SIZE	CODE IDENT NO.	DWG NO.
D		C21080180
SCALE: NONE	REV: Q1	SHEET 6 OF 11

8 7 6 5 4 3 2 1

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REVISIONS				
ZONE	TR	DESCRIPTION	DATE	APPROVED
		SEE SHT 1		



XR-SHIFT REGISTER (10<sub>11</sub>)

A BUS INPUT - XR REGISTER (10<sub>11</sub>)

SIZE	CODE IDENT. NO.	DWG. NO.
D		C21030130
SCALE: NONE	REV 04	SHEET 7 OF 11

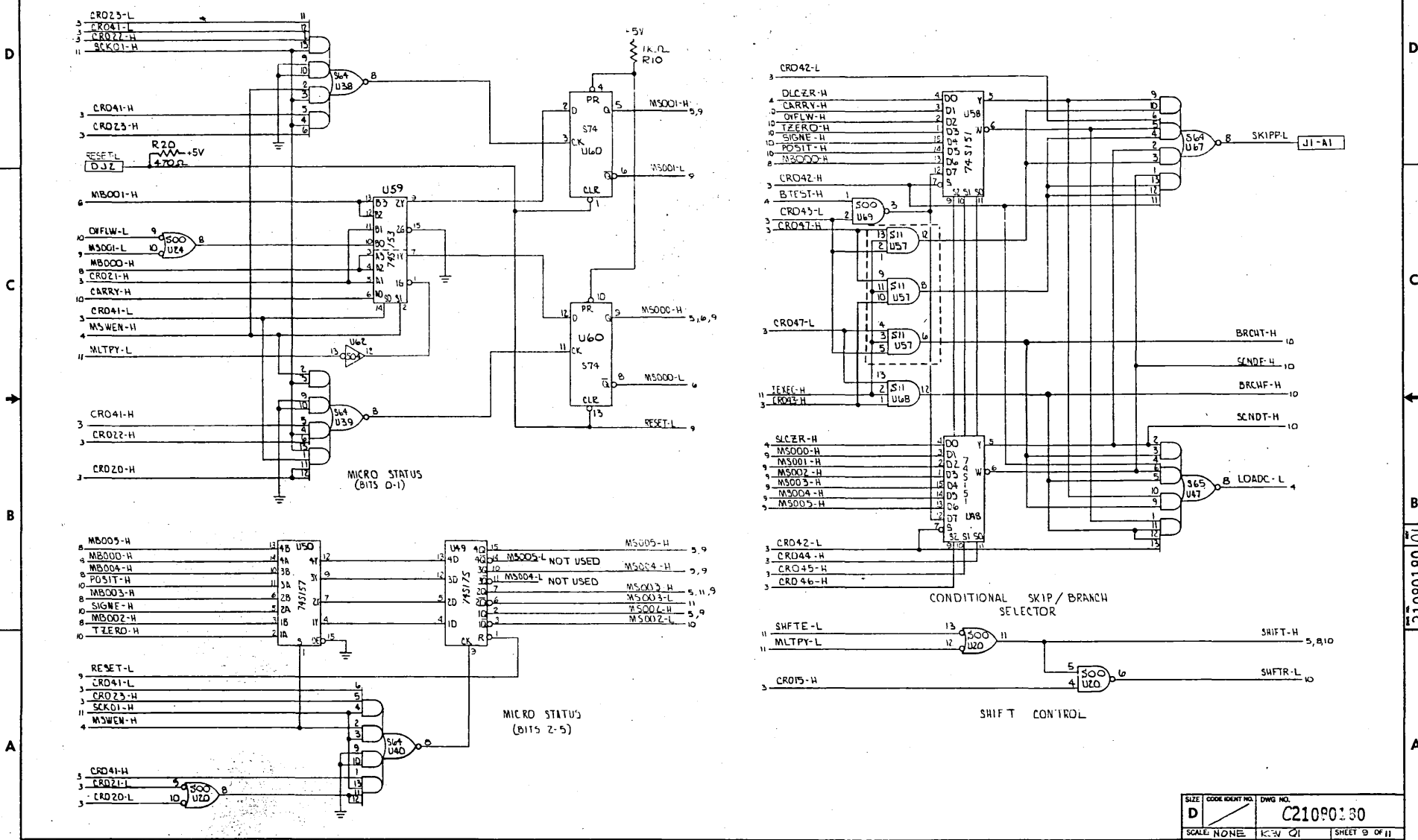
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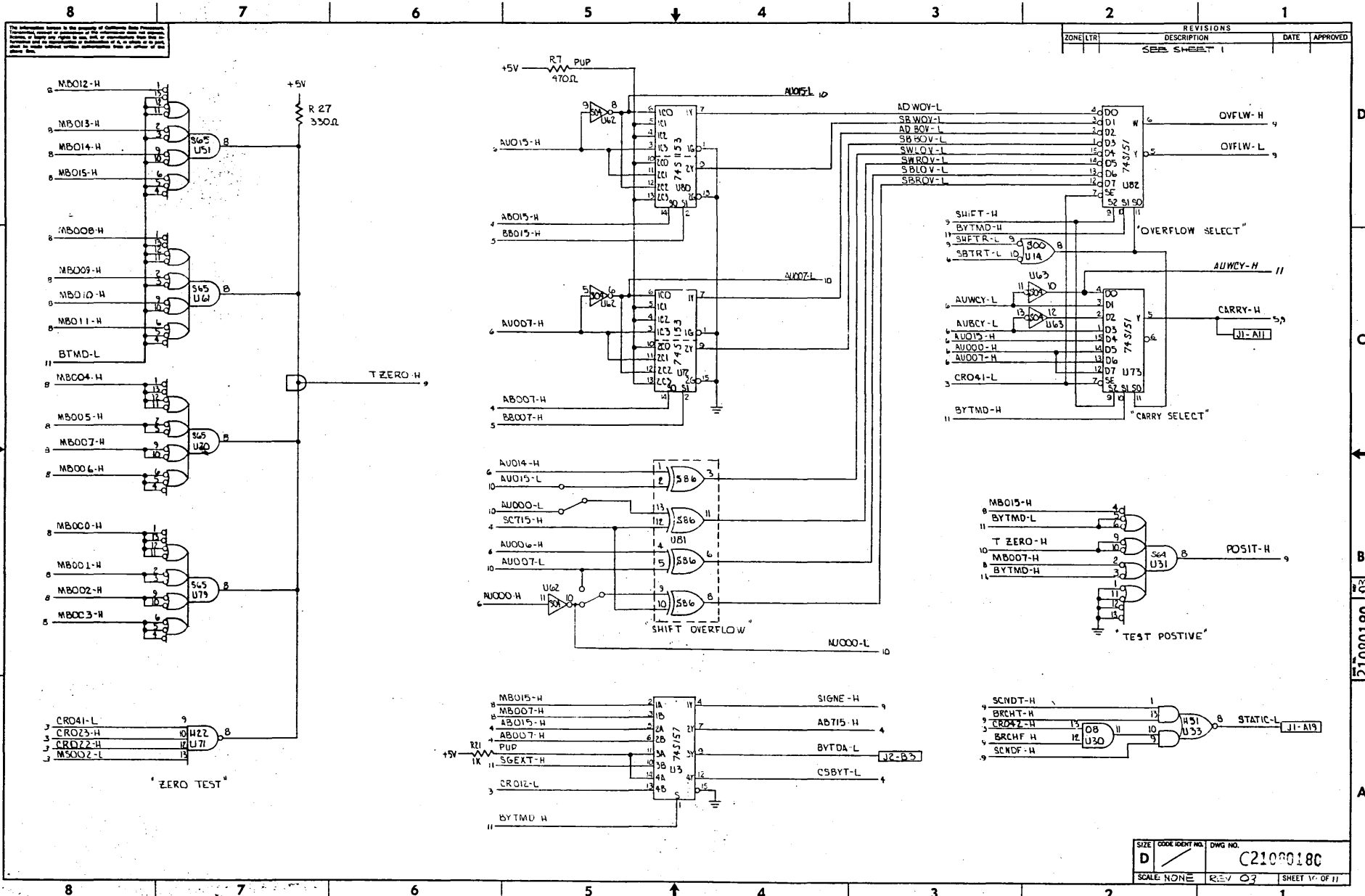


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REVISIONS			
ZONE/LTR	DESCRIPTION	DATE	APPROVED
	SEE SHEET 1		



SIZE	CODE IDENT NO.	DRWG NO.
D		C21090130
SCALE	NONE	SHEET 9 OF 11



REVISIONS			
ZONE/LTR	DESCRIPTION	DATE	APPROVED
	SEE SHEET 1		

SIZE	CODE IDENT NO.	DWG NO.
D		C21000180
SCALE NONE	REV 03	SHEET 11 OF 11

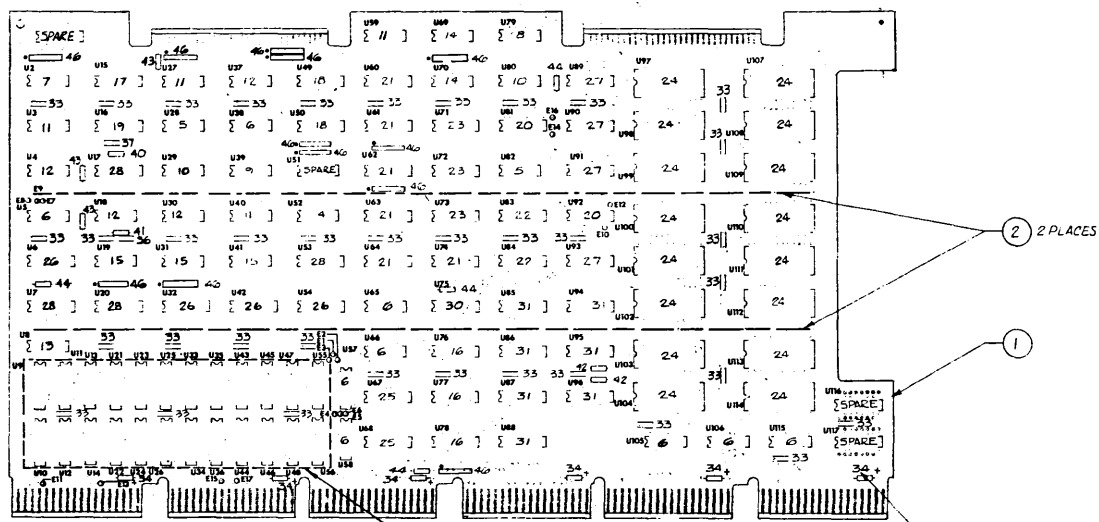
21000180 03





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RELEASE STATUS				REVISIONS				
RELEASE LEVEL	APPROVED	DATE	REV	ECO	DESCRIPTION	DRG	DATE	APP.
EXPERIMENTAL			01		REVISED	22	11/21/74	
ENGINEERING			02	01000020	SEE ECO	21	11/21/74	
PRODUCTION			03	01000030	SEE ECO	21	11/21/74	
			04	01000040	SEE ECO	21	11/21/74	
			05	01000050	SEE ECO	21	11/21/74	
			06	01000060	SEE ECO	21	11/21/74	
			07	01000070	SEE ECO	21	11/21/74	
			08		REDRAWN	21	11/21/74	
			09	01000090	SEE ECO	21	11/21/74	
			10	01000100	SEE ECO	21	11/21/74	



2 2 PLACES

1

FIND NUMBER PER LIST OF MATERIALS TYPICAL

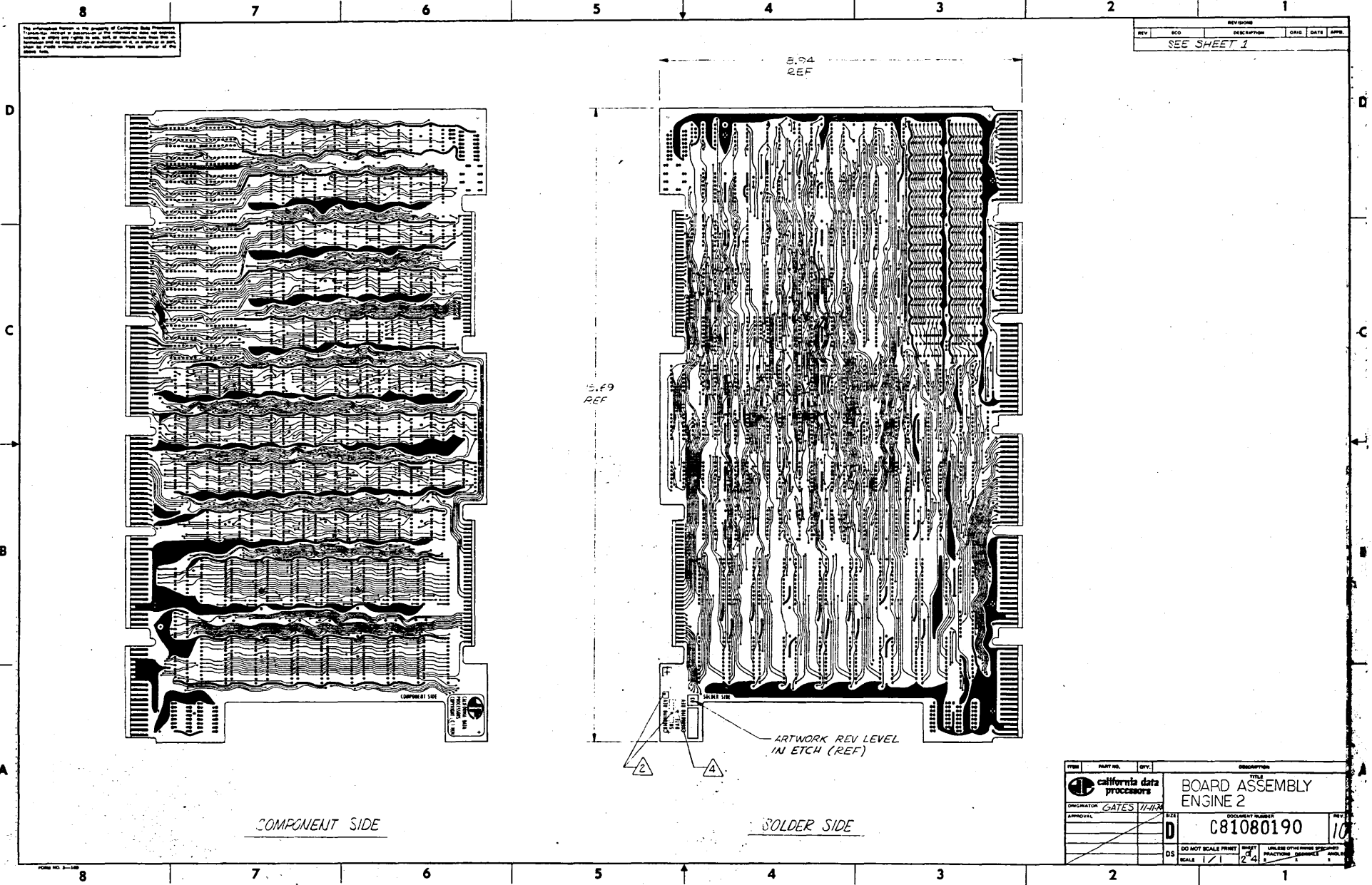
- 1. THE R.O.M. SET IS SELECTED AND INSTALLED TO AGREE WITH SALES ORDER MARKETING CODE AS DEFINED BY CONFIGURATION SPECIFICATION C22285009.
- 2. REFERENCE DOCUMENTS: PRODUCT SPECIFICATION: C22410010; TEST SPECIFICATION: C22413014.
- 3. SERIAL NUMBER TO BE PREFIXED WITH A DIVISION CODE WHICH AGREE WITH PLACE OF MANUFACTURE: DS EQUAL, SANTA ANA - DE EQUAL, EDINA.
- 4. FOR BOARD SCHEMATIC, SEE C21080190.
- 5. MKKK ASSEMBLY LATEST REV LETTER TO WHICH IT WAS BUILT. ASSY SERIAL NO. AND EIA FOUR DIGIT DATE CODE, LETTERING TO BE .12 HIGH BLACK EPOXY PAINT, VERTICAL AND GOTHIC AND LOCATED APPROX. AS SHOWN.
- 6. FABRICATE PER CAL DATA SPEC C21100010

NOTES: UNLESS OTHERWISE SPECIFIED

ITEM	PART NO.	QTY.	DESCRIPTION
OPERATOR GATES 11/4/74			TITLE BOARD ASSEMBLY ENGINE 2, 100
			DATE 11/20/74
			ORDER NUMBER <b>C81080190</b>
DO NOT SCALE PRINT SCALE 1/1			PART NUMBER DRAWING NUMBER SHEET 10

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REVISIONS				
REV	ECO	DESCRIPTION	ORIG	DATE
SEE SHEET 1				



COMPONENT SIDE


SOLDER SIDE

ITEM	PART NO.	QTY.	DESCRIPTION
			TITLE
ORIGINATOR <i>GATES 71-113</i>			BOARD ASSEMBLY ENGINE 2
APPROVAL	SIZE	DOCUMENT NUMBER	REV
	<b>D</b>	<b>C81080190</b>	<b>10</b>
DS	DO NOT SCALE PRINT	SHEET	UNLESS OTHERWISE SPECIFIED
	SCALE 1/1	24	FRACTIONS DENOMINATOR ANGLES

# LIST OF MATERIALS

ITEM NO.	QTY. REQD.	REFERENCE DESIGNATION	PART NUMBER	DESCRIPTION	NOTES	FOR REFERENCE ONLY	
						VENDOR	VENDOR PART NUMBER
1	1		C66080190	PRINTED WIRING BOARD ENG. 2			
2	2		C67680025	BUS BAR			
3							
4	1	U52	C51323000	INTEGRATED CKT. QUAD 2 NAND		TEX. INST.	SN74H00N-00
5	2	U28, U82	C51324000	QUAD 2 NAND			SN74S00N-00
6	9	U5, 38, U57, 58, U65, 66, U105, 106, U115	C51324004	HEX INV.			SN74S04N-00
7	1	U2	C51324005	HEX INV. W/OC			SN74S05N-00
8	1	U79	C51322008	QUAD 2 AND			SN7408N-00
9	1	U39	C51322010	TRIPLE 3 NAND			SN7410N-00
10	2	U29, U80	C51323010	TRIPLE 3 NAND			SN74H10N-00
11	4	U3, 27, U40, 59	C51324010	TRIPLE 3 NAND			SN74S10N-00
12	4	U4, 18 U30, 37	C51324011	TRIPLE 3 AND			SN74S11N-00
13	1	U8	C51323020	DUAL 4 NAND			SN74H20N-00
14	2	U69, 70	C51324020	DUAL 4 NAND			SN74S20N-00
15	3	U19, 31, U41	C51322038	QUAD 2 NAND W/OC		TEX. INST.	SN7438N-00
16	3	U76, 77, U78	C51335164	64-BIT R/W MEMORY		SIGNETICS	8225N
17	1	U15	C51324112	DUAL J-K F/F		TEX. INST.	SN74S112N-00
18	2	U49, 50	C51322145	BCD TO DEC DECODER			SN74145N-00
19	1	U16	C51324151	8 DATA SEL. MUX.			SN74S151N-00
20	2	U81, U92	C51322153	DUAL 4 TO 1 DATA SEL. MUX.			SN74153N-00
21	6	U60, 61, U62, 63, U64, 74	C51324153	DUAL 4 TO 1 DATA SEL. MUX.			SN74S153N-00
22	2	U83, 84	C51322157	QUAD 2 to 1 DATA SEL. MUX.			SN74157N-00
23	3	U71, 72, U73	C51322161	BINARY COUNTER			SN74161N-00
24	16	U97, 98, U99, U100, U101, 102, U103, 104, U107, 108, U109, 110, U111, 112, U113, 114	C51322172	16-BIT MULTI-IN REG FILE			SN74172N-00
25	2	U67, 68	C51322174	HEX D FLIP-FLOP			SN74174N-00
26	4	U6, 32, 42, 54	C51324174	HEX D FLIP-FLOP			SN74S174N-00
27	4	U89, 90, U91, 93	C51322175	QUAD D FLIP-FLOP			SN74175N-00
28	4	U7, 17, U20, 53	C51304175	INTEGRATED CKT. QUAD D FLIP-FLOP		TEX. INST.	SN74S175N-00


FORM NO. 3-11Z

ORIGINATOR <i>W. S. G. W.</i>	18 Feb. '74	 <b>california data processors</b>	TITLE BOARD ASSEMBLY - ENGINE NO. 2, 100	
APPROVAL <i>[Signature]</i>	3-6-74		SIZE <b>B</b>	DOCUMENT NUMBER C81080190
<i>[Signature]</i>	3/6/74			
<i>[Signature]</i>	3/6/74			
<i>[Signature]</i>	3/6/74			
			SHEET <b>3</b> OF <b>4</b>	PAGE

# LIST OF MATERIALS

ITEM NO.	QTY. RECD.	REFERENCE DESIGNATION	PART NUMBER	DESCRIPTION	NOTES	FOR REFERENCE ONLY	
						VENDOR	VENDOR PART NUMBER
29							
30	1	U75	C51322193	INTEGRATED CKT. BINARY COUNTER		TEX. INST.	SN74193N-00
31	7	U85, 86, U87, 88, U94, 95, U96	C51324257	INTEGRATED CKT. QUAD 2 TO 1 DATA SEL. MUX.		TEX. INST.	SN74S257N-00
32							
33	37	C7 - C43	C52252500	CAPACITOR .01 uf, 100 V		ERIE	805-024-250-.01-20%-100
34	6	C1 - C6	C52326001	CAPACITOR 4.7 uf, 20 V		COMPONENTS INC	CCD-020-475
35							
36	1	C45	C52213336	CAPACITOR 47 pf, 5%		CDE	CD15ED470 J03
37	1	C44	C52213356	CAPACITOR 150 pf, 5%		CDE	CD15FD151 J03
38							
39							
40	1	R4	C54400265	RESISTOR 150 $\Omega$ , 1/4W, 5%			RC07GF 151J
41	1	R5	C54400269	RESISTOR 220 $\Omega$ , 1/4W, 5%			RC07GF 221J
42	2	R9, 10	C54400273	RESISTOR 330 $\Omega$ , 1/4W, 5%			RC07GF 331J
43	3	R1, 3, 8	C54400277	RESISTOR 470 $\Omega$ , 1/4W, 5%			RC07GF 471J
44	4	R2, 6, 7, R11	C54400285	RESISTOR 1K, 1/4W, 5%			RC07GF 102J
45							
46	12	RM1 - RM12	C54811050	RESISTOR NETWORK 560/620		CTS	54811050
47							
48	AR	<del>XXXXXXXXXX</del>	<del>XXXXXXXXXX</del>	ROM SET	⚠		
49							

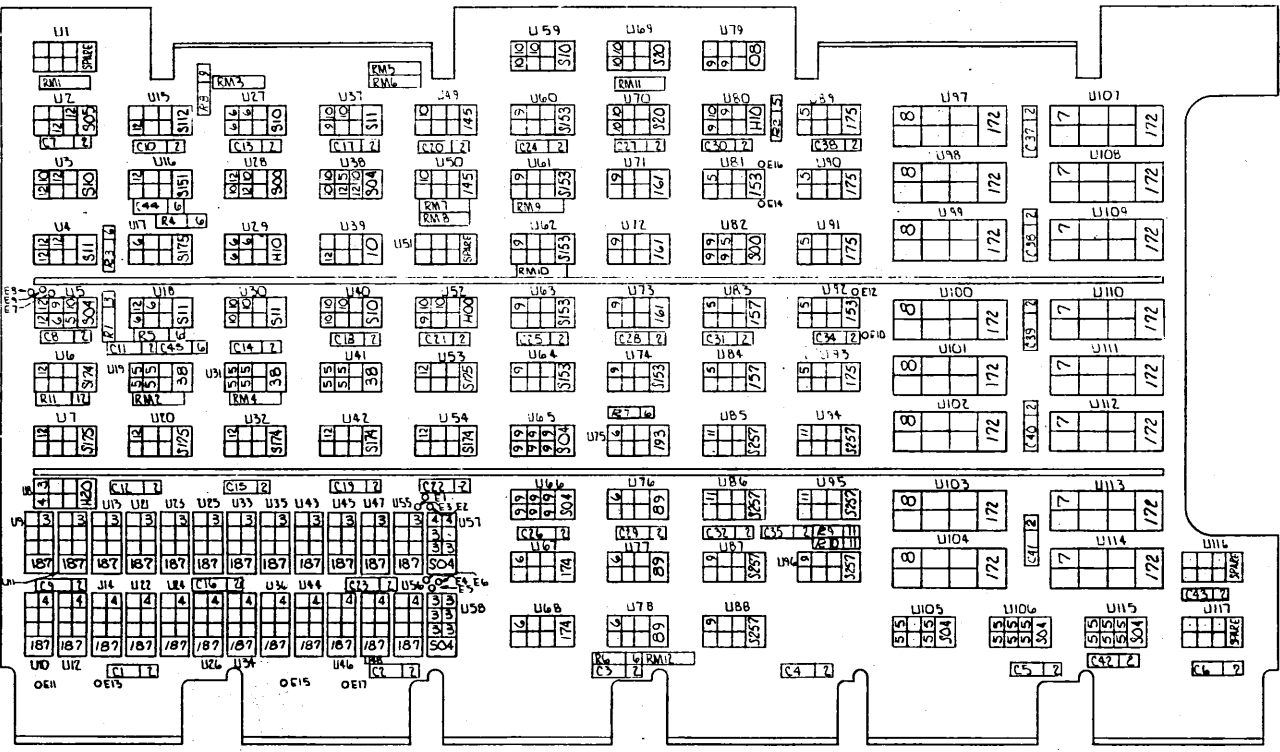
FORM NO. 3-172

ORIGINATOR <i>W.C. DODD</i>	18 FEB 74	 <b>california data processors</b>	TITLE BOARD ASSEMBLY - ENGINE NO. 2, 100
APPROVAL <i>[Signature]</i>	3-6-74		SIZE <b>B</b>
<i>[Signature]</i>	3-6-74		REV. <b>10</b>
<i>[Signature]</i>	3/6/74		SHEET <b>4</b> OF <b>4</b> PAGE



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RELEASE STATUS			REVISIONS			
RELEASE LEVEL	REV. NO.	DATE	ZONE/LTR	DESCRIPTION	DATE	APPROVED
EXPERIMENTAL			01	REL PER PRN D5003028	2-22-74	[Signature]
ENGINEERING			02	REVISED PER ECO D500643-01	6-14-74	[Signature]
PRODUCTION			03	REVISED PER ECO D500168-01	4-14-75	[Signature]
			04	REVISED PER ECO D500268-01	4-14-75	[Signature]
			05	REVISED PER ECO D500301-01	4-14-75	[Signature]



REFERENCE DESIGNATIONS		
COMPONENT	HIGHEST NUMBER	NUMBERS NOT USED
CAPACITOR	C45	
"E" POINT	E17	
INT. CIRCUIT	U117	
RESISTOR	R11	
RES. MOD	RM12	

2. REVISIONS TO THIS DOCUMENT WILL BE MAINTAINED ON A PER SHEET BASIS. FOR REVISION LOG SEE SHEET 2.

FUNCTIONS CODED WITH THIS NOTE ARE ASSIGNED ON THE BACKPLANE AND ARE NOT USED ON THIS ASSEMBLY.

NOTES: UNLESS OTHERWISE SPECIFIED

PART/ASSY NO. & QTY PER ASSY		NOTE: PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION / MATERIAL	SPEC/SOURCE	CODE	FIND IDENT. NO.
PART/ASSY REV LTR <td colspan="5">PARTS LIST</td>		PARTS LIST				
BIOB0190		DO NOT SCALE DRAWING				
NEXT ASSY USED ON		CONTRACT NO.				
APPLICATION		DRAWN BY: [Signature]				
		CHECKED BY: [Signature]				
		ENGR. [Signature]				
		PROJ. ENGR. [Signature]				
		TECH. DIR. [Signature]				
		PROD. MGT. [Signature]				
		PRODUCTION				
		G.A. [Signature]				
		DATE: 2-25-75				

**california data processors**  
 2019 South Victory Street - Santa Ana, California 92705 - (714) 958-8211

DWG TITLE  
**BOARD SCHEMATIC,  
 ENGINE NO 2, 100**

SIZE: CODE IDENT NO. DWG NO.  
**D C21080190**

SCALE: NONE REV. 03 SHEET 1 OF 12

C21080190 03

The manufacturer's name and the quantity of units of each component should be indicated on the drawing. This information is required for the identification of the components and for the procurement of the parts.

ZONE/LTR		DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01	01	01	01	01	01	01	01	01	01	01														
02	02							02																
03	03								03															

SYSTEM LEVEL

PAGE NO	A	J2	B	PAGE NO
6	LDADC-L	1		
	BREQ-H	2	MINTP-L	9
	BGRNT-L	3	BYTDA-L	10
	BGEN-H	4		
	MMINH-L	5	MARLD-H	
	DAINH-L	6	CCEN-H	9
	SPF05-L	7	SPRIA-L	
	SPF05-L	8	SPRIA-L	
	SPF06-L	9	SPR1B-L	
	SPENC-H	10	MLTPY-L	
	INWBF-L	11	ENS3FC-H	
9	EMLAT-H	12	CROOB-H	
	PFMIL-L	13		
	AUCIN-L	14		
	WRITE-L	15	FILE6-H	10
	IRERD-H	16	XABIS-L	10
	INTR-H	17	XA007-L	10
	NMCO-L	18	ESTRA-L	10
	NMCI-L	19	YELLOW-L	
12	CROD7-H	20	BYTMD-L	
	SLINT-H	21	M5006-H	
10	DRWEN-L	22	RWEN-L	10
9	EIA001-H	23	EIA000-H	9
9	EIA003-H	24	EIA002-H	9
9	EIA005-H	25	EIA004-H	9
9	EIA007-H	26	EIA006-H	9
9	EIA009-H	27	EIA008-H	9
	EIA011-H	28	EIA010-H	
	EIA013-H	29	EIA012-H	
	EIA015-H	30	EIA014-H	

PAGE NO	A	J1	B	PAGE NO
12	SKIPP-L	1	EMAO0-H	
10	ARWEN-L	2	EMAO1-H	
10	SLWEN-L	3	EMAO2-H	
	SSYER-H	4	EMAO3-H	
	DSYER-H	5	EMAO4-H	
	LDSPF-H	6	EMAO5-H	
6	FINTP-L	7	EMAO6-H	
6	SPENC-H	8	EMAO7-H	
	NALTP-L	9		
		10	PSSEL-L	
	CARRY-H	11		
		12		
	ADEREZ-H	13		
	PSO03-L	14		
		15	XD007-L	10
		16	XD015-L	10
		17	XB015-L	10
9	CCWEN-H	18	XB007-L	10
9	STATIC-L	19	LITR5-L	10
	MSYN-H	20	PLUS1-L	10
	SPF04-L	21	PSWEN-L	10
	BBIN-H	22	IRWEN-L	10
7	BB001-H	23	BB000-H	7
7	BB003-H	24	BB002-H	7
7	BB005-H	25	BB004-H	7
7	BB007-H	26	BB006-H	7
7	BB009-H	27	BB008-H	7
7	BB011-H	28	BB010-H	7
7	BB013-H	29	BB012-H	7
7	BB015-H	30	BB014-H	7

PAGE NO	1	F	2	PAGE NO
3	CMO28-H	A	+5V	2
3	CMO29-H	B	-15V	2
3	CMO31-H	C	GND	2
3	CMO30-H	D	CMO32-H	3
3	CMO33-H	E	CMO34-H	3
3	CMO35-H	F	DADO2-H	3
3	CMO37-H	H	CMO36-H	3
3	CMO39-H	J	CMO38-H	3
12	IRPTE-L	K	CMO40-H	3
3	CMO41-H	L	CMO42-H	3
3	CMO43-H	M	CPEN-L	3
3	CMO45-H	N	CMO44-H	3
3	CMO47-H	P	CMO46-H	3
5	DADO3-H	R	ACMSL-L	3
		S	AUX2M-L	3
2	GND	T	IRINH-L	12
		U	IWAIT-L	12
12	SY5CK-L	V	GND	2

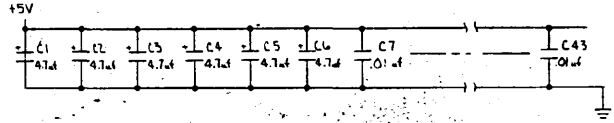
PAGE NO	1	E	2	PAGE NO
3	CMO00-H	A	+5V	2
3	CMO01-H	B	-15V	2
3	CMO02-H	C	GND	2
3	CMO03-H	D	CMO04-H	3
3	CMO05-H	E	CMO06-H	3
3	CMO07-H	F	EMINH-L	3
3	CMO09-H	H	CMO08-H	3
3	CMO11-H	J	CMO10-H	3
5	DADO4-H	K	CMO12-H	3
3	CMO13-H	L	CMO14-H	3
3	CMO15-H	M	DADO1-H	5
3	CMO17-H	N	CMO16-H	3
3	CMO19-H	P	CMO18-H	3
3	CMO21-H	S	CMO20-H	3
2	GND	T	CMO24-H	3
3	CMO23-H	U	CMO26-H	3
3	CMO25-H	V	CMO27-H	3

PAGE NO	1	D	2	PAGE NO
11	PFINT-H	A	+5V	2
11	HLINT-H	B	-15V	2
	DSIG-H	C	GND	2
	DSIT-H	D	LTCL-L	
	VITRO-H	E	PEBSY-L	
9	CC000-L	F	HRTPL-L	
9	CC001-L	H	MSRIS-L	
9	CC002-L	J	RESET-L	6
9	CC003-L	K	BG7-IN	
9	CC004-L	L	BG7-OUT	
9	CC005-L	M	BG6-IN	
9	CC006-L	N	BG6-OUT	
9	CC007-L	P	BG5-IN	
9	CC008-L	R	BG5-OUT	
9	CC009-L	S	BG4-IN	
2	GND	T	BG4-OUT	
9	CC010-L	U	NP6-IN	
9	CC011-L	V	NP6-OUT	

PAGE NO	1	C	2	PAGE NO
5	MB000-L	A	+5V	2
5	MB001-L	B	-15V	2
5	MB002-L	C	GND	2
5	MB003-L	D	MB004-L	5
5	MB005-L	F	MB006-L	5
5	MB007-L	F	MB008-L	5
5	MB009-L	H	MB010-L	5
5	MB011-L	J	MB012-L	5
5	MB013-L	K	MB014-L	5
5	MB015-L	L	AB000-H	7
7	AB001-H	M	AB002-H	7
7	AB003-H	N	AB004-H	7
7	AB005-H	P	AB006-H	7
7	AB007-H	R	AB008-H	7
7	AB009-H	S	AB010-H	7
2	GND	T	AB011-H	7
7	AB013-H	U	AB012-H	7
7	AB015-H	V	AB014-H	7

PAGE NO	1	B	2	PAGE NO
	BUS BG6-H	A	+5V	2
	BUS BG5-H	B	GND	2
	BUS BR5-L	C	GND	2
2	GND	D	BUS BR4-L	
2	GND	E	BUS BG4-L	
	BUS ACLO-L	F	BUS DELO-L	
	BUS AD1-L	H	BUS ADO-L	
	BUS AD3-L	J	BUS A02-L	
	BUS AD5-L	K	BUS AO4-L	
	BUS AD7-L	L	BUS AO6-L	
	BUS AD9-L	M	BUS AO8-L	
	BUS AD11-L	N	BUS AD10-L	
	BUS AD13-L	P	BUS AD12-L	
	BUS AD15-L	R	BUS AD14-L	
	BUS AD17-L	S	BUS AD16-L	
2	GND	T	BUS AD18-L	
	BUS SSYN-H	U	BUS CD-L	
	BUS MSYN-L	V	GND	2

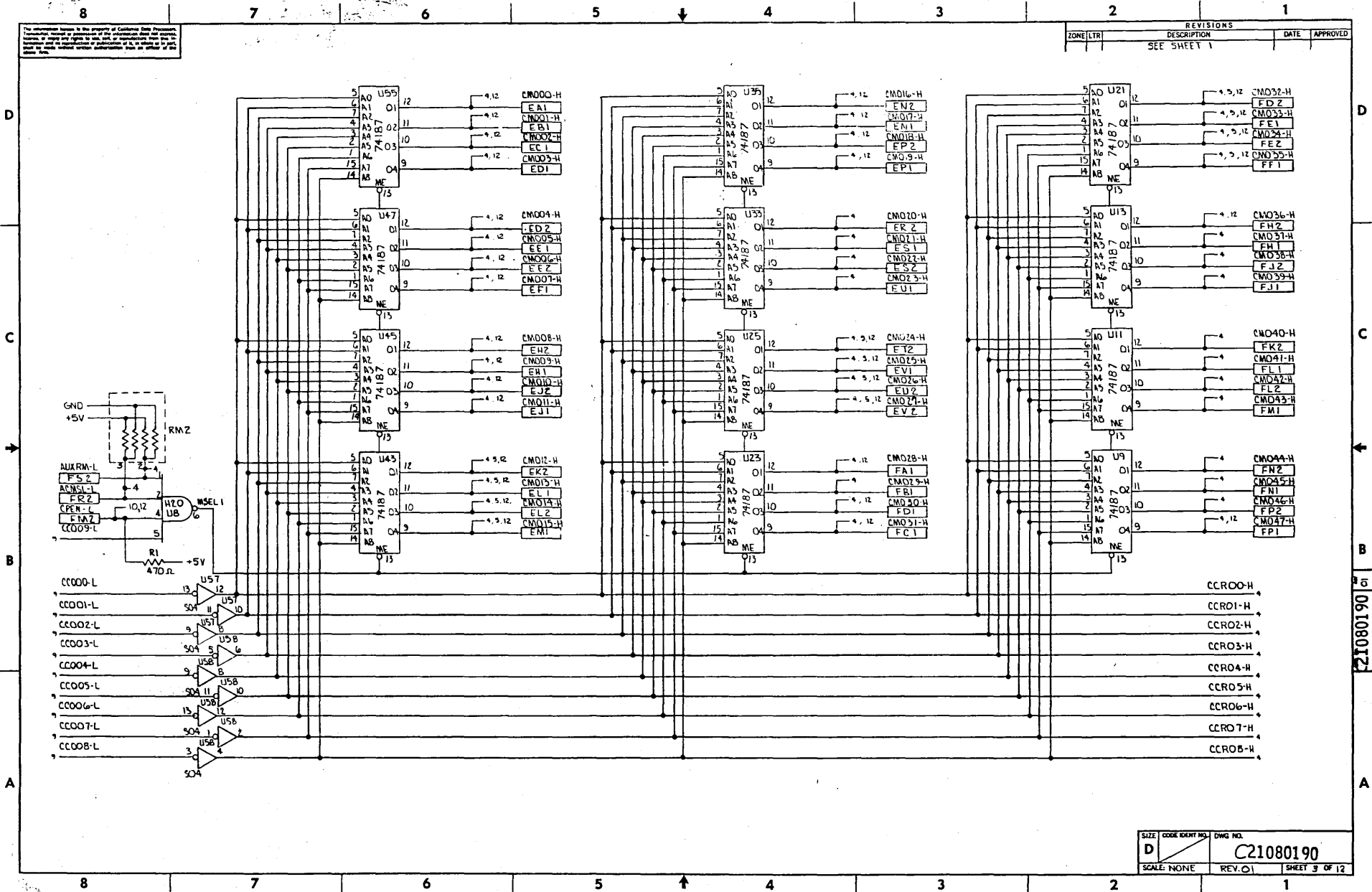
PAGE NO	1	A	2	PAGE NO
	BUS INT2-A	A	+5V	
	BUS INT4-B	B	GND	
	BUS D00-L	C	GND	
	BUS D02-L	D	BUS D01-L	
	BUS D04-L	E	BUS D03-L	
	BUS D06-L	F	BUS D05-L	
	BUS D08-L	H	BUS D07-L	
	BUS D10-L	J	BUS D09-L	
	BUS D12-L	K	BUS D11-L	
	BUS D14-L	L	BUS D13-L	
	BUS PA-L	M	BUS D15-L	
2	GND	N	BUS PB-L	
2	GND	P	BUS BBSY-L	
2	GND	R	BUS SACK-L	
2	GND	S	BUS NPR-L	
2	GND	T	BUS BR7-L	
	BUS NPG-H	U	BUS BR6-L	
	BUS BG7-H	V	GND	2



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SCALE: NONE	REV 03	SHEET 2 OF 12

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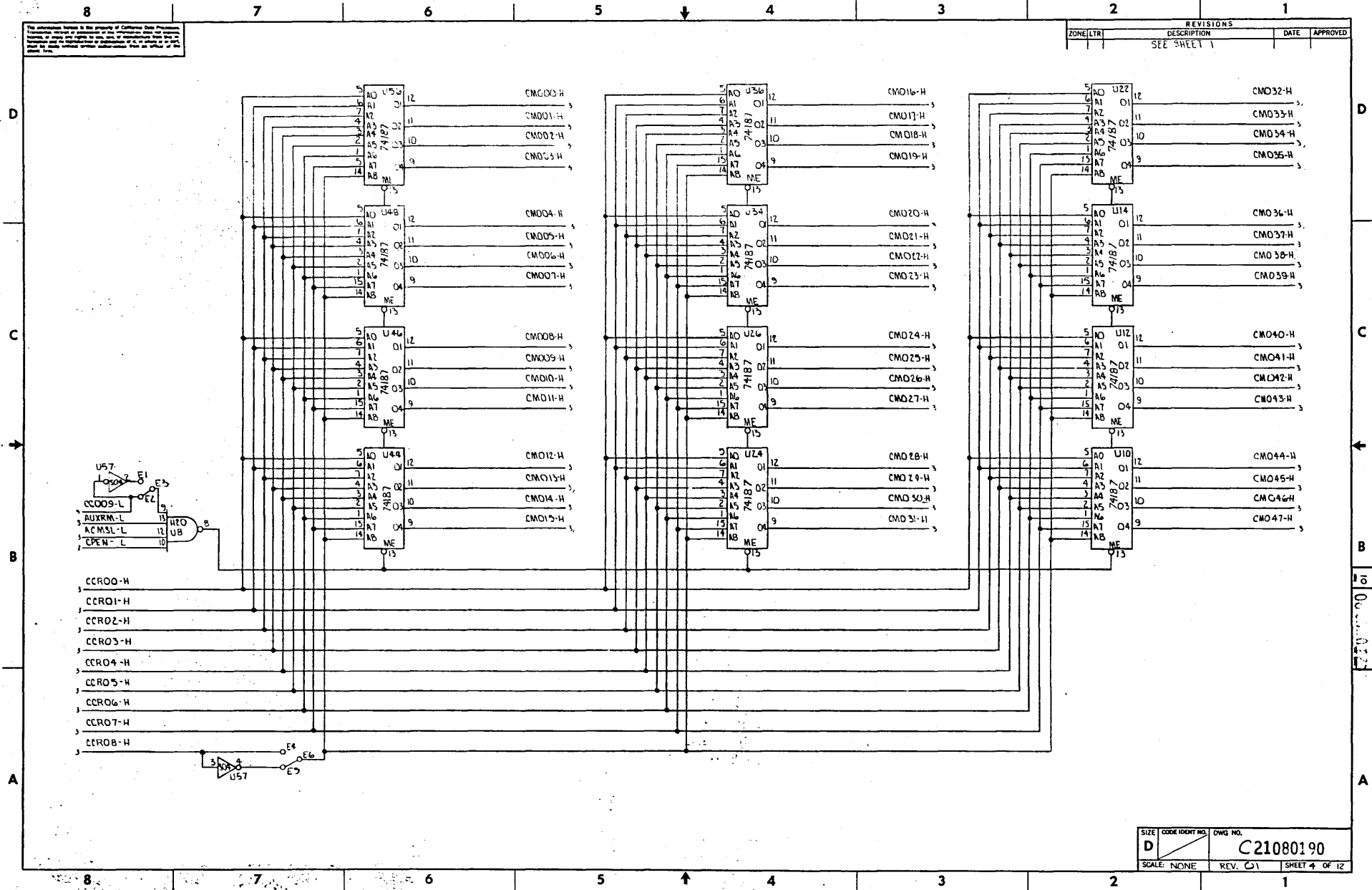


SIZE	CODE IDENT NO.	DWG NO.
D		C21080190
SCALE: NONE	REV. 01	SHEET 3 OF 12

21080190

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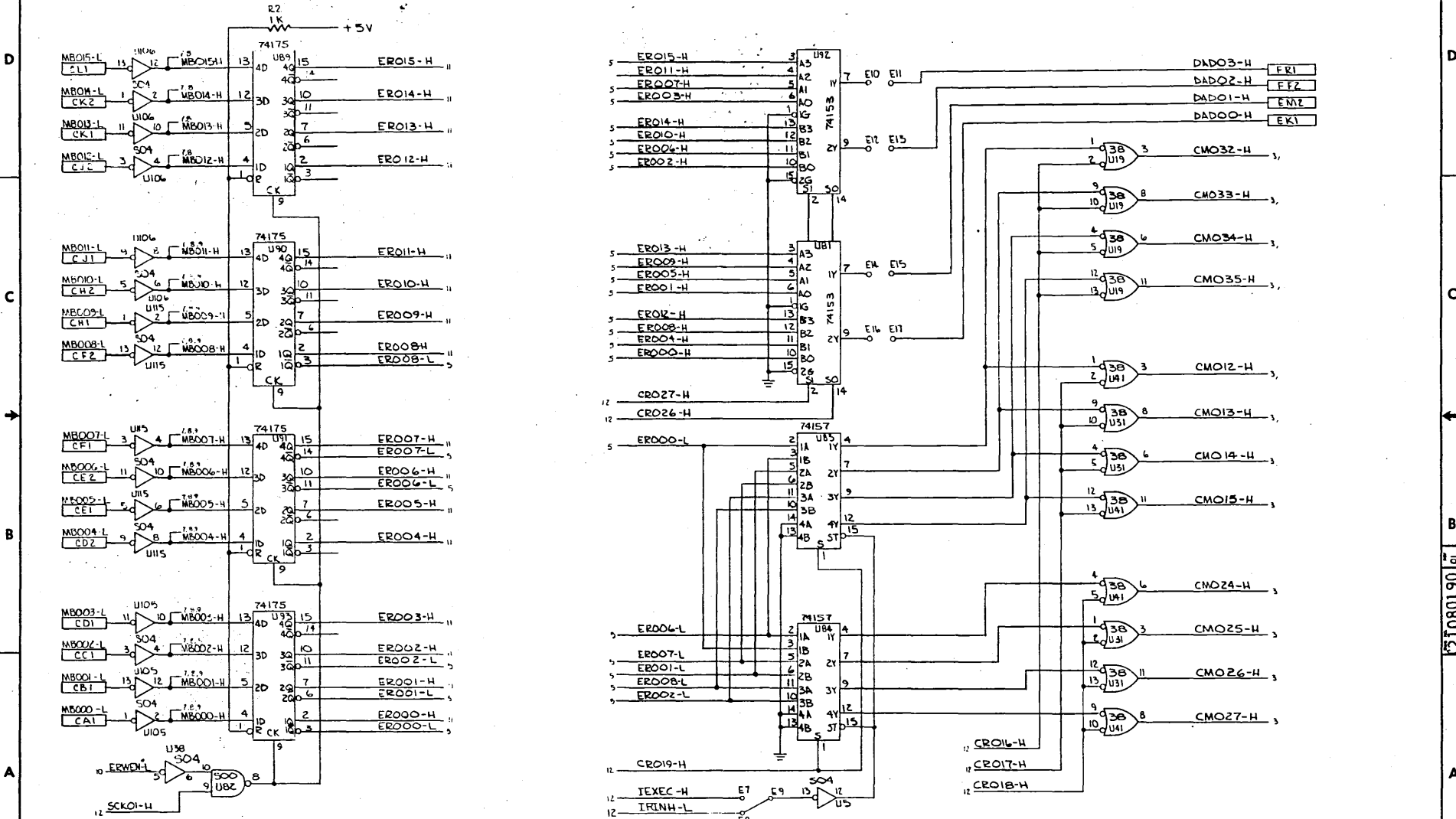
REVISIONS			
ZONE/LTR	DESCRIPTION	DATE	APPROVED
	SEE SHEET 1		



SIZE <b>D</b>	CODE IDENT NO.	DWG NO. <b>C21080190</b>
SCALE: NONE	REV. <b>C1</b>	SHEET <b>4</b> OF <b>12</b>

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	SEE SHEET 1		



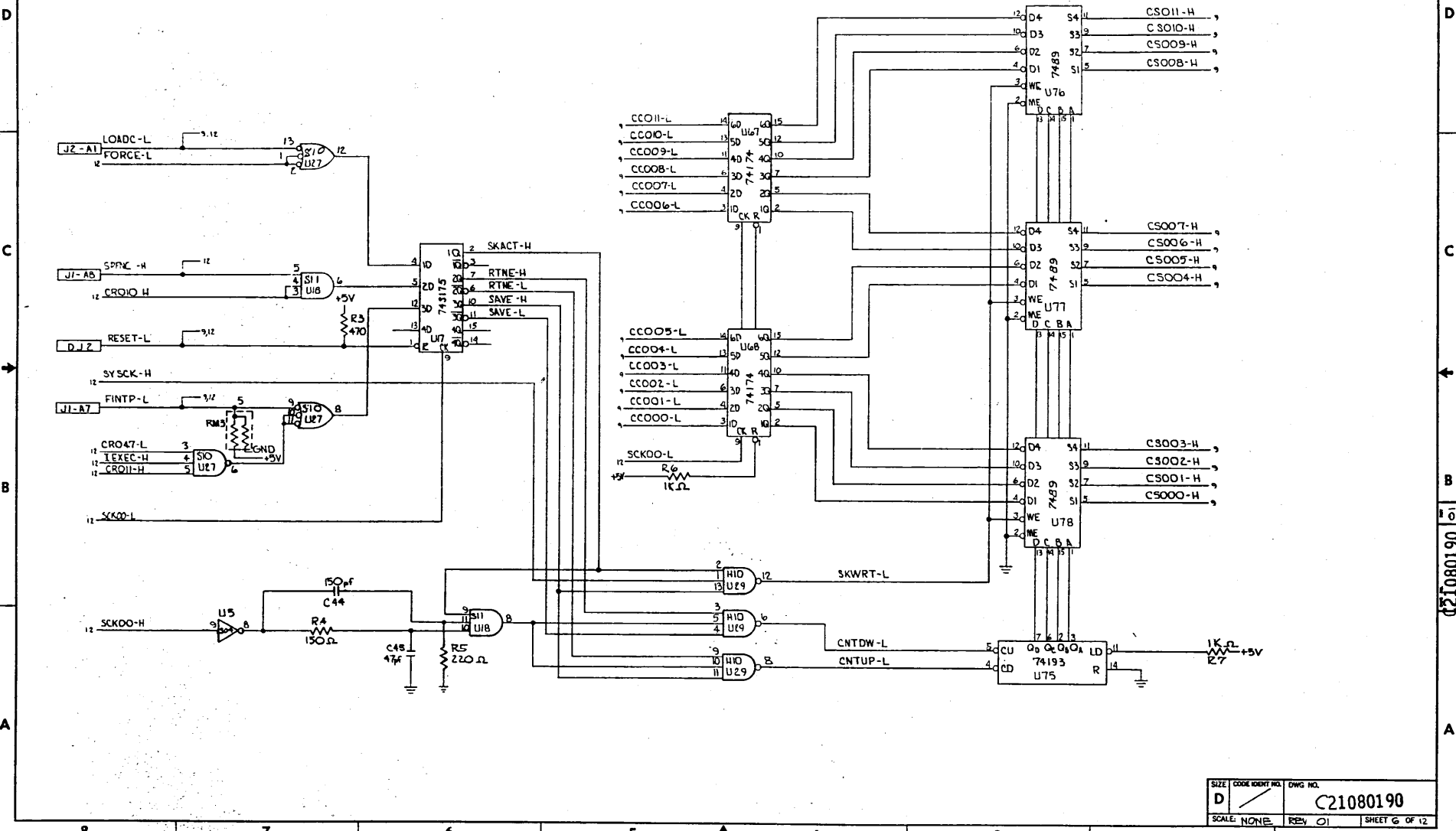
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D		C21080190
SCALE: NONE	REV. 01	SHEET 5 OF 12

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	SEE SHEET 1		



SIZE	CODE IDENT NO.	DWG NO.
D		C21080190
SCALE: NONE	REV: 01	SHEET 6 OF 12

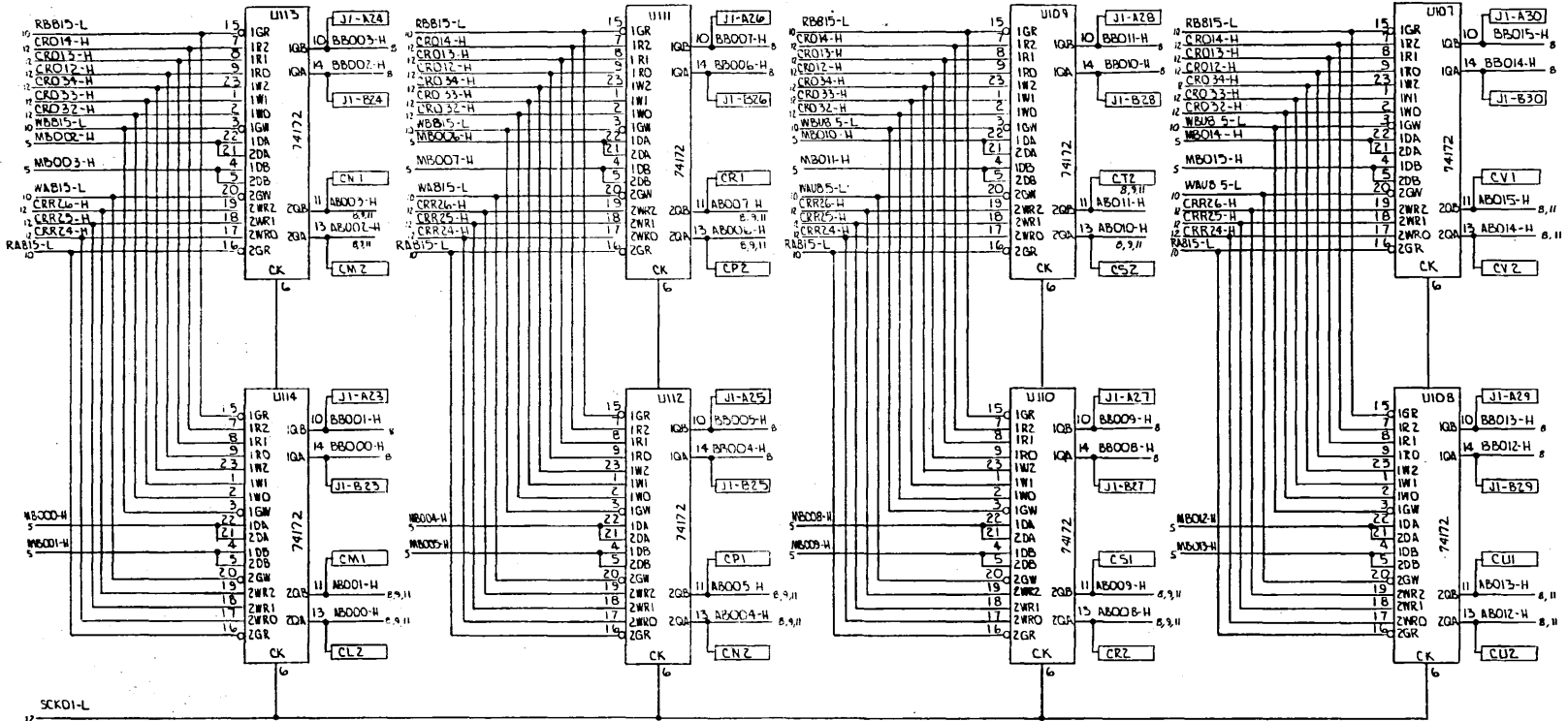
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	SEE SHEET 1		

D  
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A



GENERAL PURPOSE FILES (8-15)

LOWER BYTE - LOWER NIBBLE

LOWER BYTE - UPPER NIBBLE

UPPER BYTE - LOWER NIBBLE

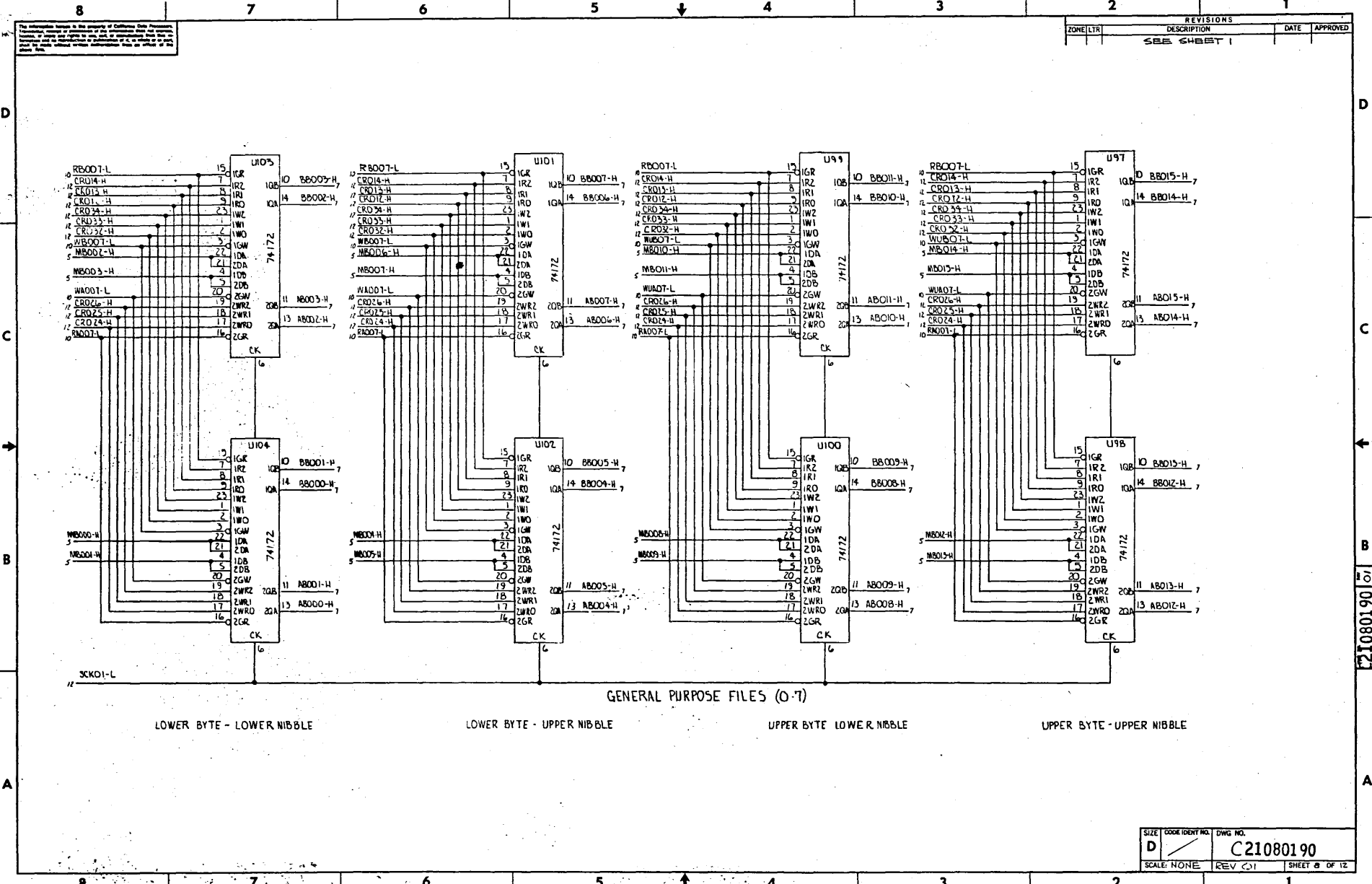
UPPER BYTE - UPPER NIBBLE

SIZE D	CODE IDENT NO.	DWG NO. C21080190
SCALE: NONE	REV 01	SHEET 7 OF 12

C21080190

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GENERAL PURPOSE FILES (0-7)

LOWER BYTE - LOWER NIBBLE

LOWER BYTE - UPPER NIBBLE

UPPER BYTE - LOWER NIBBLE

UPPER BYTE - UPPER NIBBLE

SIZE	CODE IDENT NO.	DWG NO.
D		C21080190
SCALE: NONE	REV C1	SHEET 8 OF 12

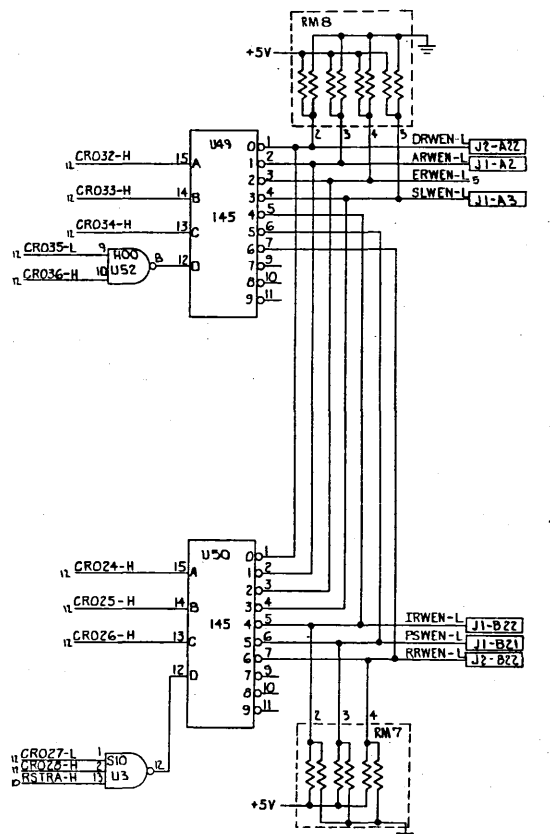
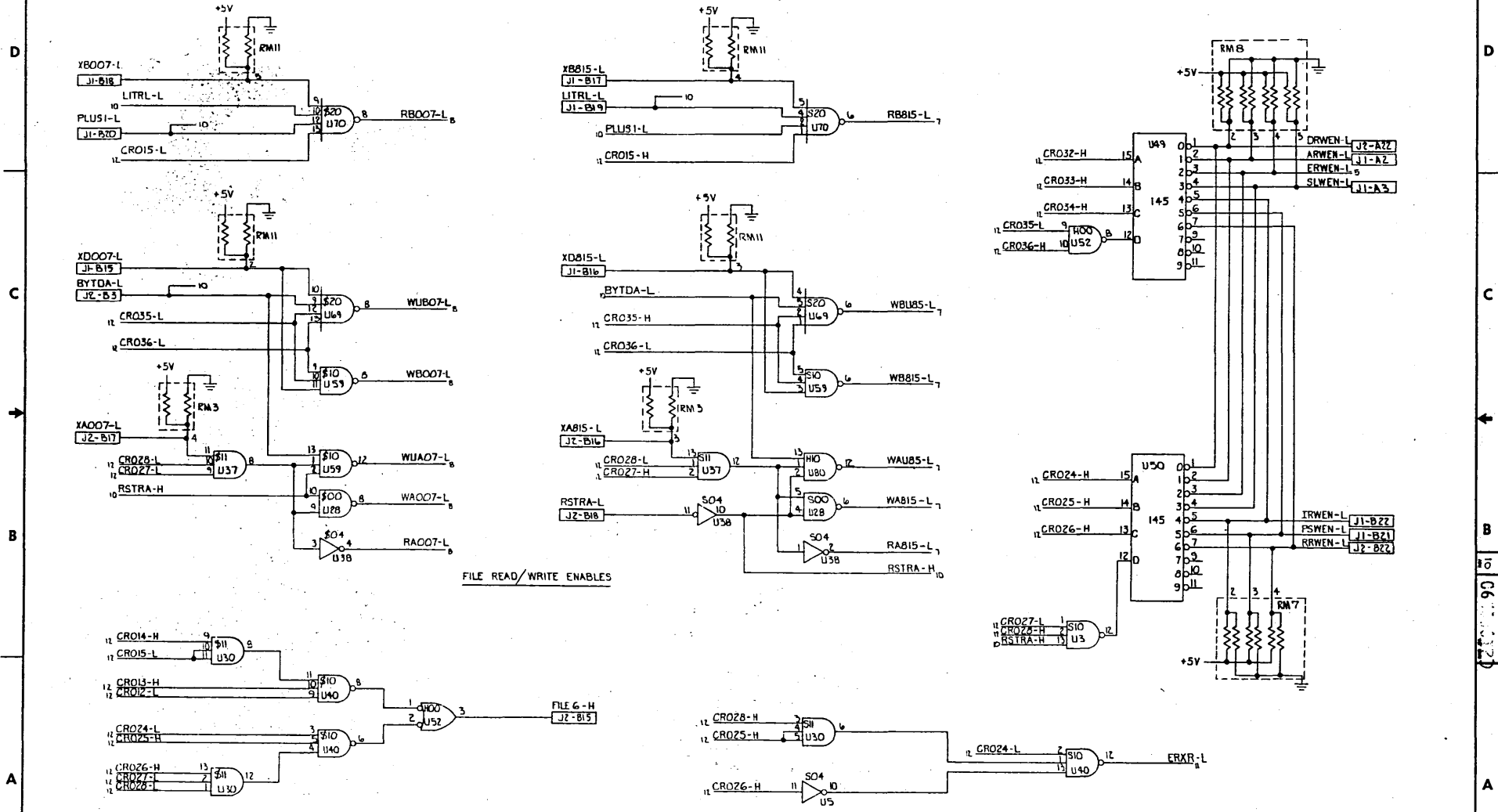
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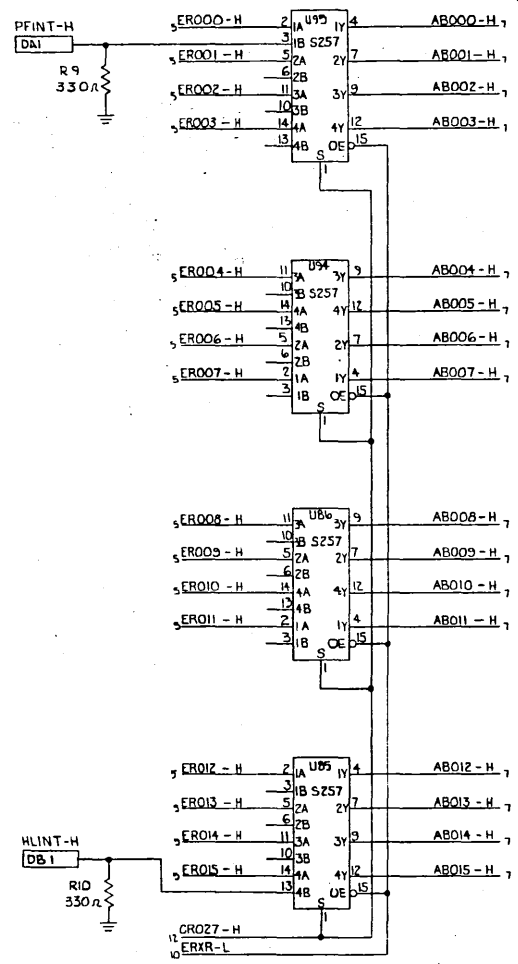
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SIZE	CODE IDENT NO.	DWG NO.
D		C21080190
SCALE: NONE	REV. 02	SHEET 11 OF 12

C21080190

