

JOOJST

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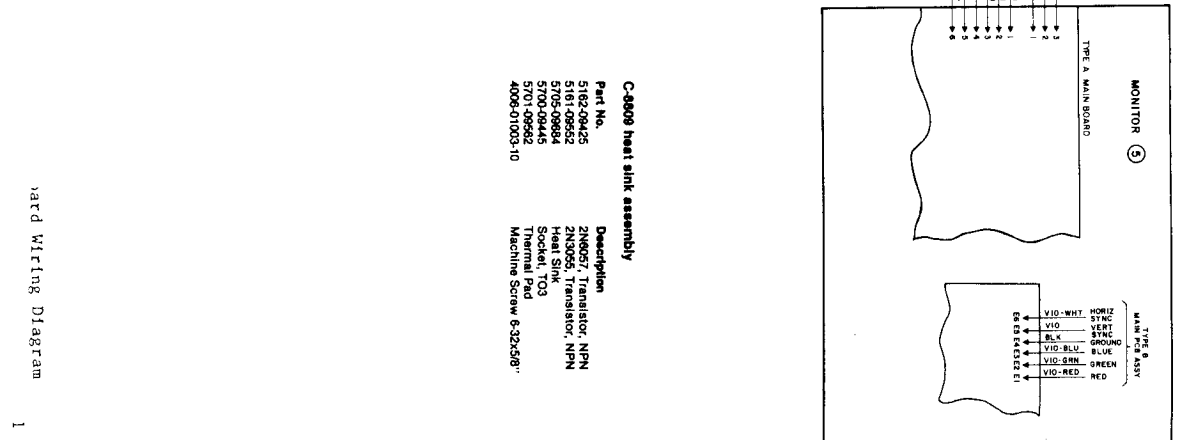
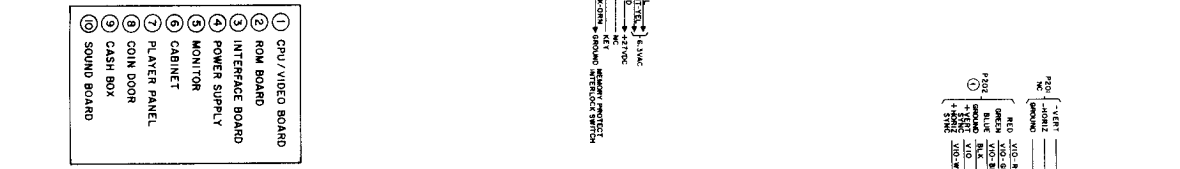
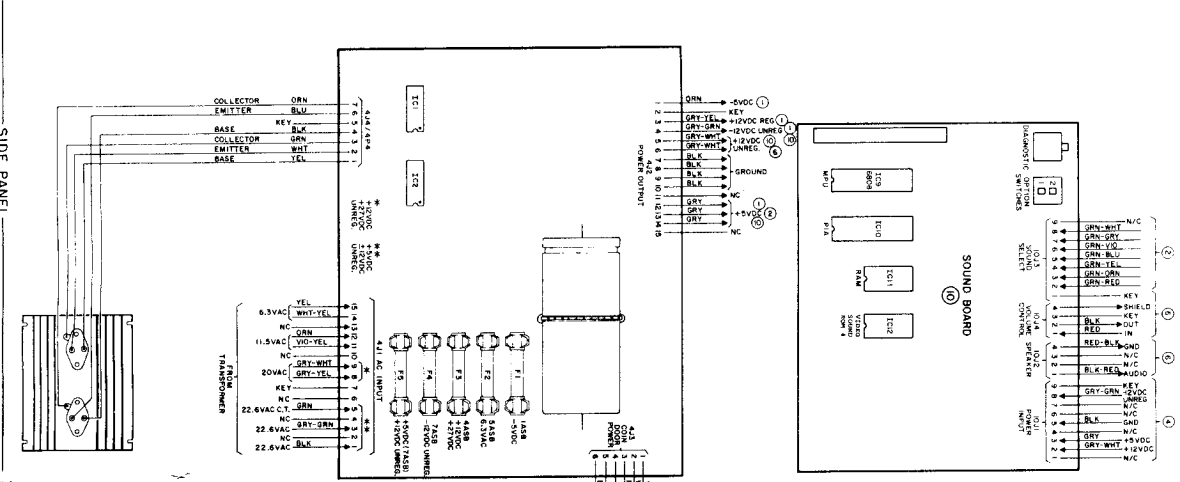
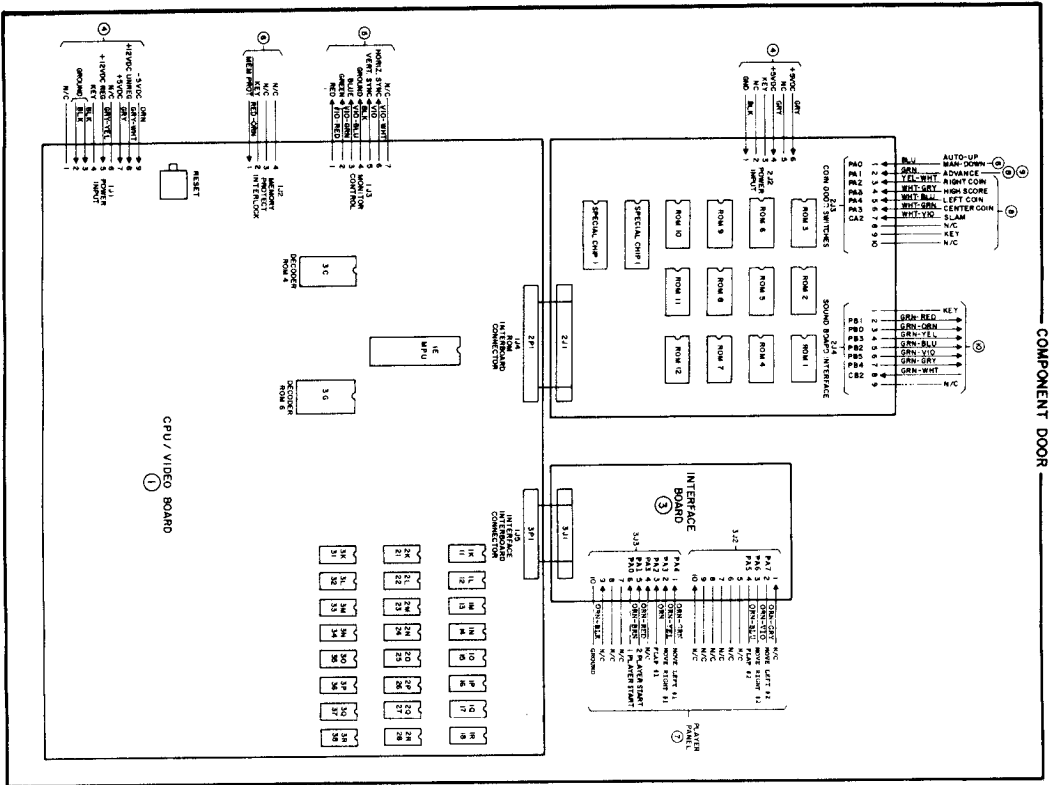
Williams® 
ELECTRONICS, INC.

3401 N. California Ave.
Chicago, IL 60618
Cable Address: WILCOIN, CHICAGO
(312) 267-2240

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INTERBOARD WIRING



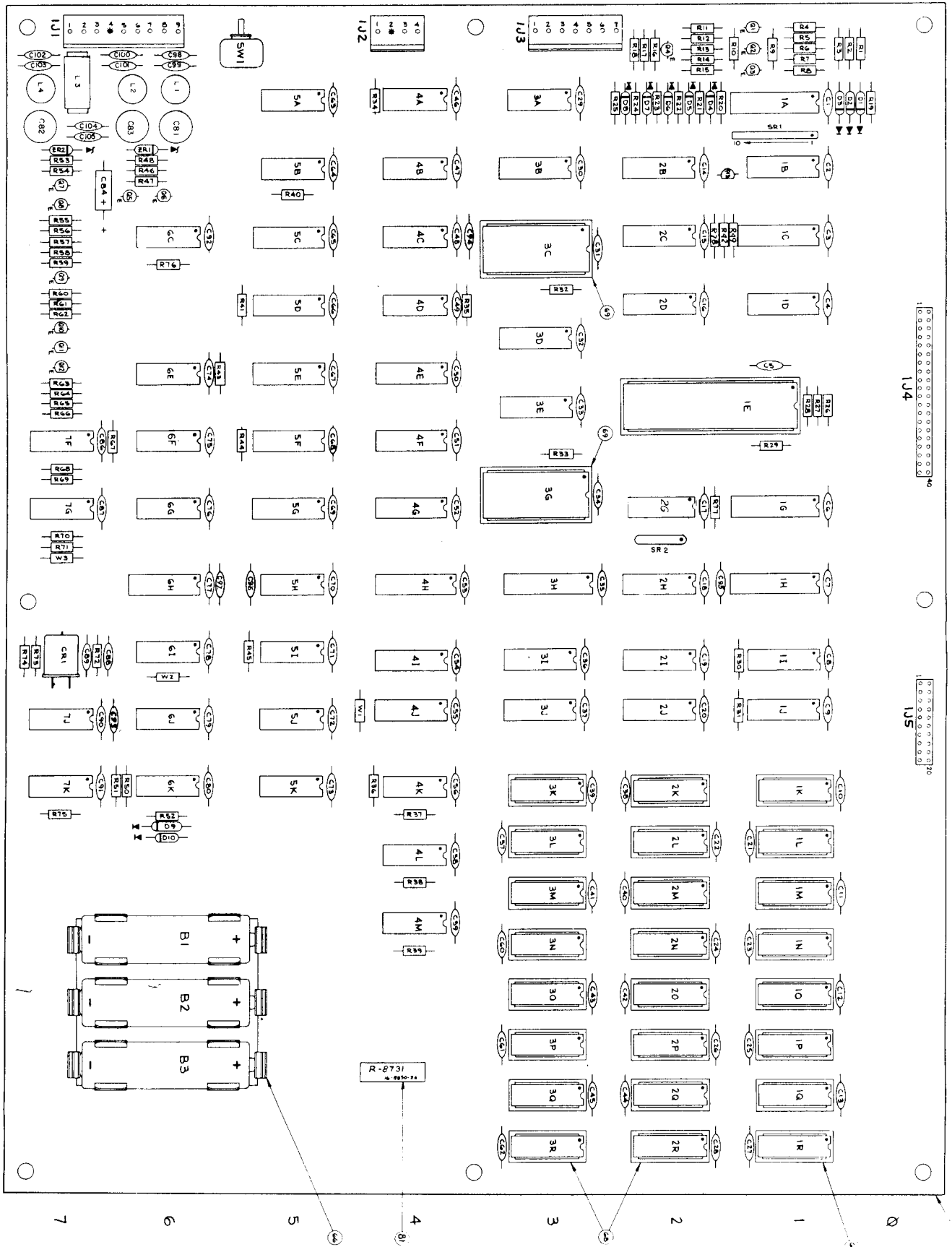
C-8808 Heat sink assembly

Part No.	Description
2N8057	Transistor, NPN
5161-09582	2N3955, Transistor, NPN
5705-08884	Heat Sink
5707-08885	Socket, Pkg
4009-01003-10	Machine Screw 8-32x3/8"

A B C D E F G H I J K L M N O P Q R

100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140

141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180



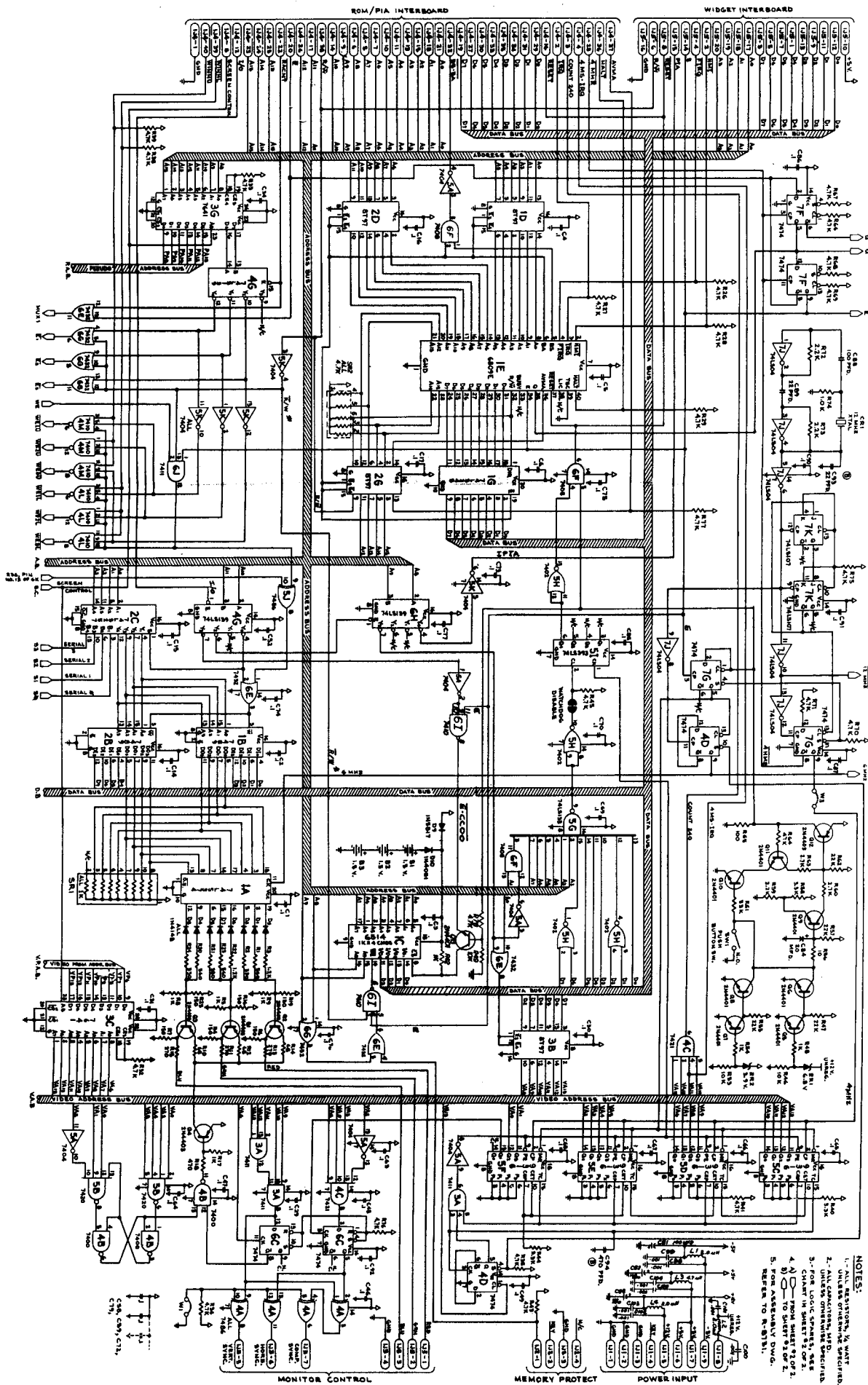
NOTE LABEL LOCATION IS PERMANENT

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
74	5791-09497-00	1J3	7 PIN HEADER 09-65-1071	1
75	5791-09027-00	1J1	9 PIN HEADER 09-65-1091	1
76	5019-09669-00	SR1	RESISTOR, 1K OHM 10 PIN SIP	1
77	5010-09534-00	W1, W2, W3	RESISTOR, C.F. 0 OHM 1/4 WATT	3
78	5340-09689-00	1C	5114 1K X 4 CMOS STATIC RAM	1
	5340-09667-00		6514 1K X 4 CMOS STATIC RAM	0
79	5281-09483-00	1B, 2B	74LS189 16 X 4 RAM	0
	5280-09625-00		7489 16 X 4 RAM	0
	5282-09716-00		74S189 16 X 4 RAM	0
	5281-09715-00		74LS289 16 X 4 RAM	2
	5282-09717-00		74S289 16 X 4 RAM	0
80	5641-09371-00	SW1	PUSH BUTTON SW. SPST	0
	5641-09312-00		PUSH BUTTON SW. DPDT MOM.	1
81	16-8850-26	---	LABEL PCB ASSY I.D.	1
82				
83	5019-09786-00	SR2	SIP 4.7KΩ 5R 6 PIN 5% 125 W/R @ 70°C	1
84	5281-09856-00	1H, 3H, 4H	OCTAL LATCH 74LS373	3
85				
47	5010-09035-00	R64	RESISTOR, C.F. 47K OHM 5% 1/4 W.	1
48	5551-09822-00	L3	COIL, 4.74H, 3A	1
49	5010-09001-00	R2, R21, R24	RESISTOR, C.F. 330 OHM 5% 1/4 W.	3
50	5010-09039-00	R56	RESISTOR, C.F. 10 OHM 5% 1/4 W.	1
51	5043-09491-00	C89, C93	CAPACITOR, AXIAL 22 PFD. 1K V. ±10%	2
52	5043-09492-00	C88	CAPACITOR, AXIAL 100 PFD. 50 V. ±10%	1
53	5040-09545-00	C84	CAPACITOR, AXIAL 22 MFD. 10 V. ±20%	1
54	5043-09065-00	C94 THRU C97	CAPACITOR, AXIAL 470 PFD. 50 V. XTR ±20%	4
55	5043-08996-00	SEE NOTE #3	CAPACITOR, AXIAL .1 MFD. 50 V. ±20%	85
56	5040-09421-00	C81, C82, C83	CAPACITOR, RADIAL 100 MFD. 25V. ±30-10%	3
57	5075-09059-00	ZR2	IN5990A 3.9V. ZENER DIODE	1
58	5075-09018-00	ZR1	IN5996A 6.8V. ZENER DIODE	1
59	5070-08919-00	D1, D2, D3, D4, D5, D6, D7, D8	IN4148 DIODE, SILICON	8
60	5070-09266-00	D9	IN5817 DIODE, SILICON	1
61	5160-08938-00	Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q13	2N4401, TO-92 TRANSISTOR, NPN	8
62	5190-09016-00	Q1, Q2, Q3, Q4, Q12	2N4403, TO-92 TRANSISTOR, PNP	5
63	5520-09495-00	CR1	12 MHZ CRYSTAL	1
64	5043-09845-00	C98-C105	CAPACITOR, AXIAL 1000 PFD 50V ±20%	8
65	5880-09022-00	B1, B2, B3	BATTERY ALKALINE 1.5V. (AA)	3
66	5881-09021-00	---	BATTERY HOLDER *171	1
67	5700-09628-00	---	14-PIN IC SOCKET	0
68	5700-09006-00	---	16-PIN IC SOCKET	24
69	5700-09004-00	---	24-PIN IC SOCKET	2
70	5700-08985-00	---	40-PIN IC SOCKET	1
71	5791-09437-00	1J5	20 PIN RIBBON CABLE HEADER	1
72	5791-09349-00	1J4	40 PIN RIBBON CABLE HEADER	1
73	5791-09028-00	1J2	4 PIN HEADER 09-65-1041	1

NOTES:

- 411G: 1K, 1L, 1M, 1N, 1O, 1P, 1Q, 1R, 2K, 2L, 2M, 2N, 2O, 2P, 2Q, 2R, 3K, 3L, 3M, 3N, 3O, 3P, 3Q, 3R
- 4.7K Ω RESISTOR:
R26, R27, R28, R29, R32, R33, R35, R36, R37, R38, R39, R41, R43, R45, R50, R51, R52, R66, R67, R68, R69, R70, R71, R75, R34, R76, R77, R78
- .1 MFD. CAPACITORS:
C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C86, C87, C90, C91, C92
- FOR SCHEMATIC REFER TO 16-8809

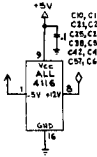
BILL OF MATERIAL				
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	5770-09656-00		BARE P.C. BOARD REV. 0	1
2	5280-09073-00	4B	7400 QUAD 2-INPUT NAND	1
3	5280-08948-00	5H	7402 QUAD 2-INPUT NOR	1
4	5281-09215-00	7J	74LS04 HEX. INVERTER	1
5	5280-09013-00	5A, 5K	7404 HEX. INVERTER	2
6	5280-08973-00	6F	7408 QUAD AND	1
7	5280-09011-00	4L, 4M, 6I	7410 TRIPLE 3-INPUT NAND	3
8	5280-09475-00	3A, 6J	7411 TRIPLE 3-INPUT AND	2
9	5280-09530-00	5B	7420 DUAL 4-INPUT NAND	1
10	5280-09476-00	4C	7421 DUAL 4-INPUT AND	1
11	5280-09477-00	6E, 6G	7432 QUAD 2-INPUT OR	2
12	5280-09478-00	4D, 4K, 4K, 6C, 7F, 7G	7474 DUAL-D TYPE FLIP-FLOP	6
13	5280-09479-00	4A, 5J	7486 QUAD 2-INPUT EX-OR	2
14	5281-09480-00	7K	74LS107 DUAL J-K FLIP-FLOP	1
15	5281-09532-00	5G	74LS133 13-INPUT NAND	1
16	5281-09246-00	4G, 6H	74LS139 DUAL 2 to 4 LINE DECODER	2
17	5280-09481-00	3D, 3E, 4E, 4F	74LS53 DUAL 4 to 1 DATA INVERT	4
18	5280-09668-00	1I, 1J, 2I, 2J, 3I, 3J, 4I, 4J	74166 8-BIT SHIFT REGISTER	8
19				
20	5281-09308-00	1G	74LS245 OCTAL BUSTRANSCEIVER	1
21	5281-09485-00	2C, 2H	74LS257 QUAD DATA MUX	2
22	5370-08989-00	1D, 2D, 2G, 3B	8T97 HEX. TS BUFFER	0
	5281-09385-00		74LS367 HEX BUS DRIVER	4
23	5281-09486-00	1A,	74LS374 OCTAL D-TYPE FLIP-FLOP	1
24	A-5342-09821	3C	UNIVERSAL VERT. DECODER ROM 4	1
25	A-5342-0969A	3G	UNIVERSAL HORIZ. DECODER ROM 4	1
26	5551-09848-00	L1, L2, L4	COIL, 204H, 1.5A	3
27	5281-09533-00	5I	74LS393 DUAL 4-BIT BIN. COUNTER	1
28	5340-09488-00	SEE NOTE #1	411G (450 ns ACCESS) 16K X 1 DYNAMIC RAM	24
29	5070-06258-00	D10	1N4001 DIODE	1
30	5280-09489-00	5C, 5D, 5E, 5F	9316 4-BIT BIN. COUNTER	4
31	5400-09490-00	1E	6809E MICROPROCESSOR	1
32	5010-09548-00	R10, R12, R14	RESISTOR, C.F. 68 OHM 2% 1/4 W.	3
33	5010-09036-00	R65	RESISTOR, C.F. 100 OHM 5% 1/4 W.	1
34	5010-09187-00	R4, R6, R7, R16, R19, R25	RESISTOR, C.F. 150 OHM 5% 1/4 W.	6
35	5010-09508-00	R11, R13, R15	RESISTOR, C.F. 270 OHM 2% 1/4 W.	3
36	5010-09416-00	R18	RESISTOR, C.F. 470 OHM 5% 1/4 W.	1
37	5010-08992-00	R1, R20, R23	RESISTOR, C.F. 560 OHM 5% 1/4 W.	3
38	5010-09358-00	R42, R5, R9, R7, R48, R54, R74	RESISTOR, C.F. 1K OHM 5% 1/4 W.	8
39	5010-09314-00	R3, R22	RESISTOR, C.F. 1.2 K OHM 5% 1/4 W.	2
40	5010-08998-00	R59, R72, R73	RESISTOR, C.F. 2.2 K OHM 5% 1/4 W.	3
41	5010-08997-00	R60, R63	RESISTOR, C.F. 2.7 K OHM 5% 1/4 W.	2
42	5010-08983-00	R30, R31, R40, R44, R58	RESISTOR, C.F. 3.3 K OHM 5% 1/4 W.	5
43	5010-08991-00	SEE NOTE #2	RESISTOR, C.F. 4.7 K OHM 5% 1/4 W.	1
44	5010-09034-00	R49, R46, R53	RESISTOR, C.F. 10 K OHM 5% 1/4 W.	3
45	5010-08774-00	R47, R55, R57, R62	RESISTOR, C.F. 22K OHM 5% 1/4 W.	4
46	5010-09113-00	R61	RESISTOR, C.F. 33K OHM 5% 1/4 W.	1



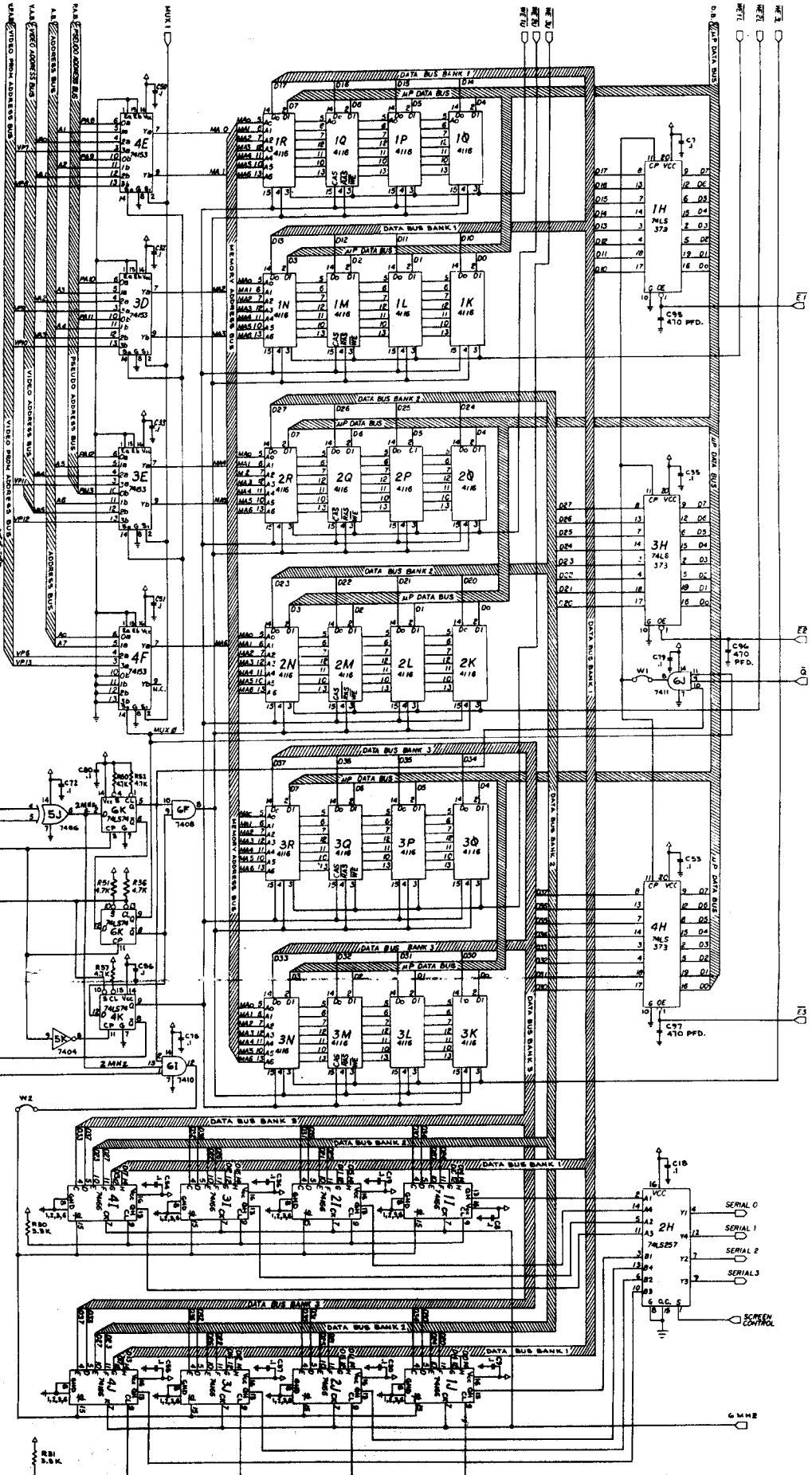
- NOTES:
1. ALL RESISTORS, % WATT UNLESS OTHERWISE SPECIFIED.
 2. UNLESS OTHERWISE SPECIFIED.
 3. FOR LOGIC SYMBOLS, SEE CHART IN SHEET 2 OF 2.
 4. FROM SHEET 2 OF 2.
 5. ASSEMBLY DWG.
 6. REFER TO R-8751/C.

R-8751 CPU Board Logic Diagram
(Sheet 1 of 2)

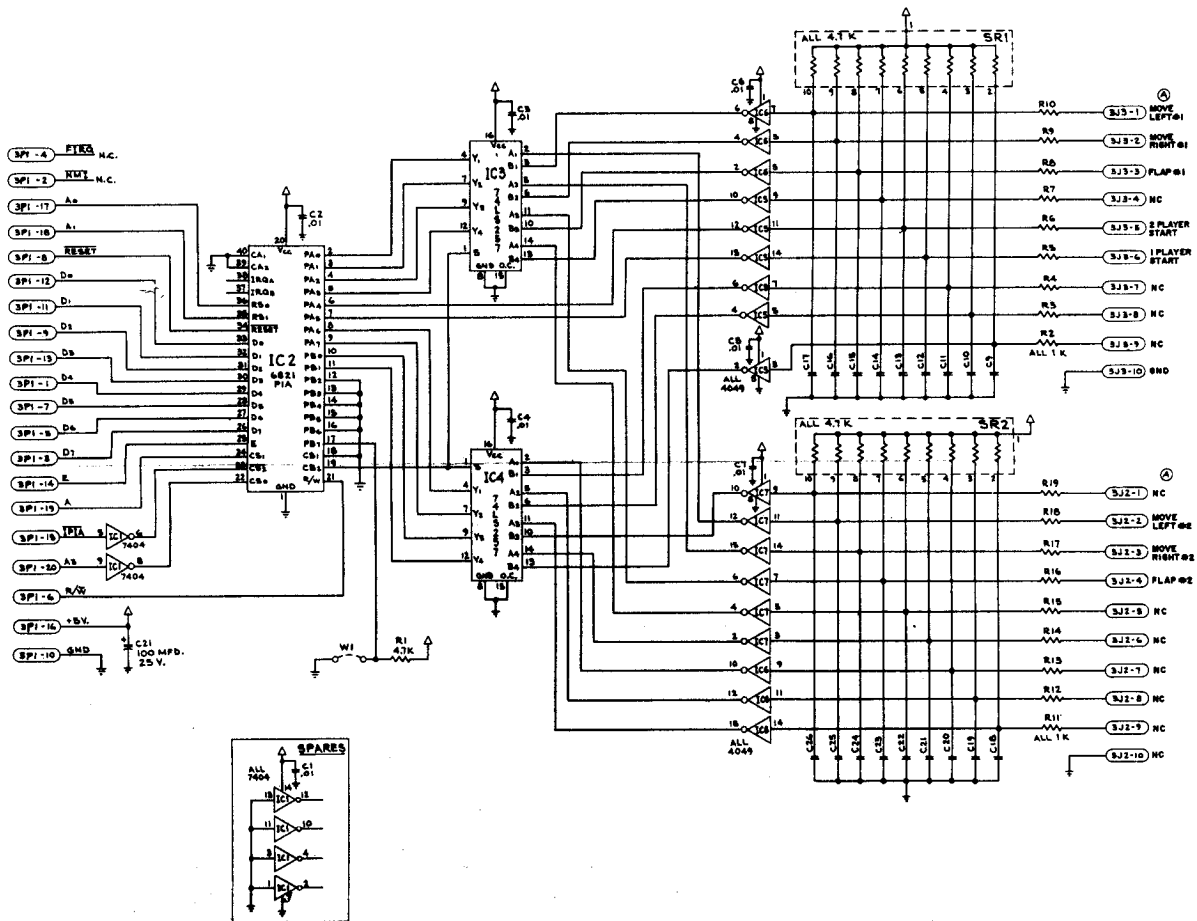
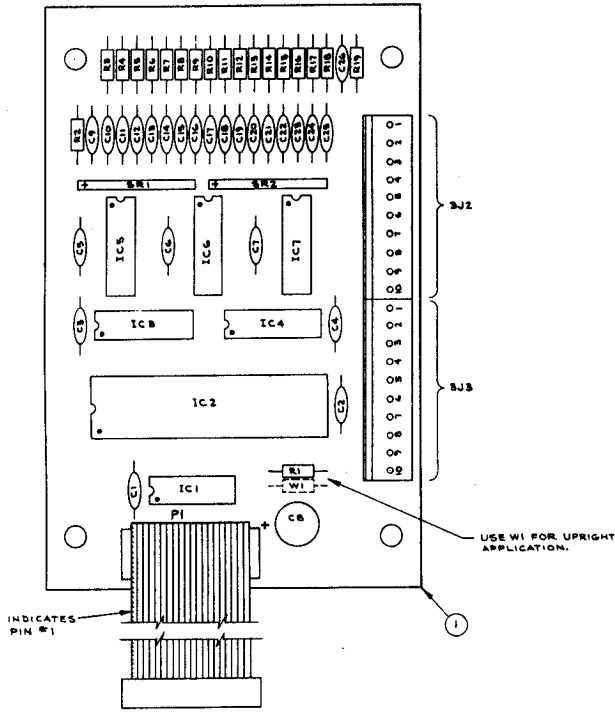
SPARE		
LOC.	LOGIC	QTY.
4B	7400	1
4K	74LS74	1
5I	74LS99B	1
5J	7486	2
6D	4011	2
6H	74LS199	1
6I	7410	2



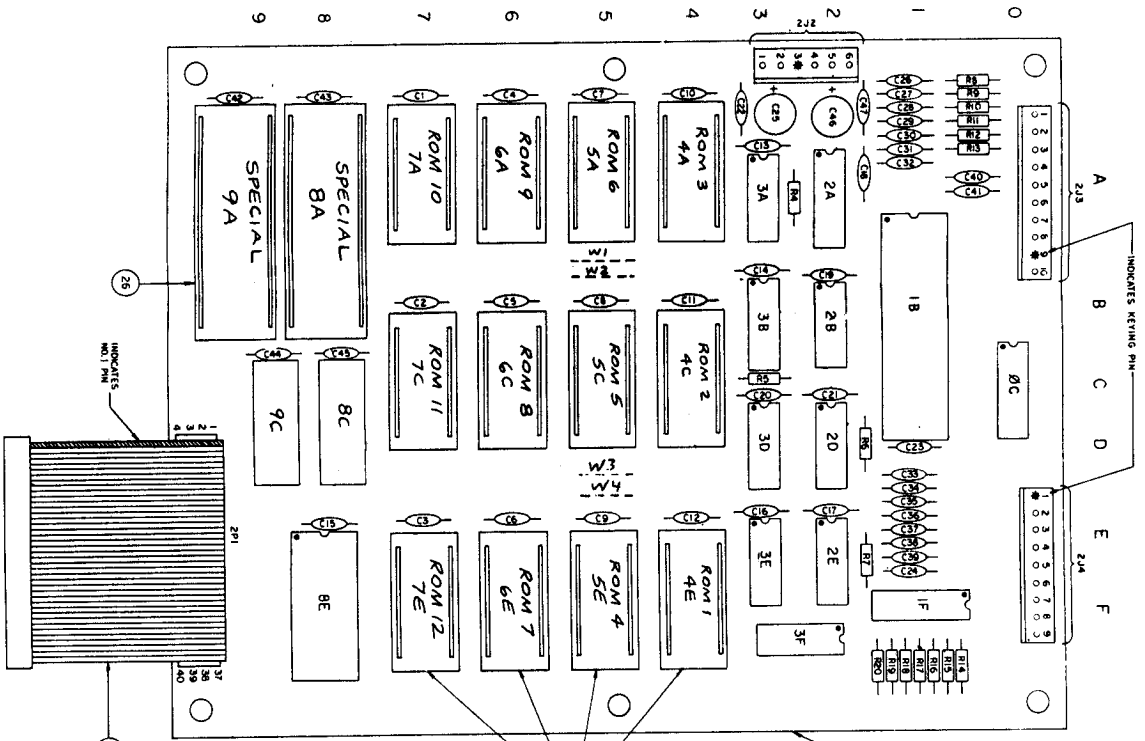
R-8731 CPU Board Logic Diagram (Sheet 2 of 2)



BILL OF MATERIAL				
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	NO. REQ'D.
1	5772-09480-00		BARE P.C. BOARD	1
2	5430-08972-00	IC2	6871 PIA	1
3	5310-08918-00	IC8, IC6, IC7	4049 CMOS HEX INVERTOR	3
4	5280-09018-00	IC1	7404 HEX INVERTER	1
5	4281-09486-00	IC3, IC4	74LS257 QUAD DATA MULTIPLEXER	2
6	5019-09463-00	SR1, SR2	4.7K OHM 5 RES. 10 PIN SIP	2
7	5010-09386-00	R2 THRU R19	RESISTOR, C.F. 1K OHM 5% 1/4 WATT	18
8	5010-08991-00	R1	RESISTOR, C.F. 4.7K OHM 5% 1/4 WATT	1
9	5010-09384-00	W1	RESISTOR, C.F. 0 OHM 1/4 WATT	1
10	5043-09065-00	C9 THRU C26	CAPACITOR, CERAMIC DISC 470 PFD. 50 V. XTR 220%	18
11	5040-09421-00	CB	CAPACITOR, ELECT. RADIAL, 100 MFD. 25 VOLT. +50-10%	1
12	5045-08950-00	C1 THRU C7	CAPACITOR, CERAMIC DISC, 01 MFD. 50 V. +50-20%	7
13	5775-09540-00	P1	20 PIN RIBBON CABLE ASSY	1
14	5781-09444-00	SJ2, SJ3	10 PIN HEADER 09-65-1101	2



C-8783 Interface Board Assembly and Logic Diagram

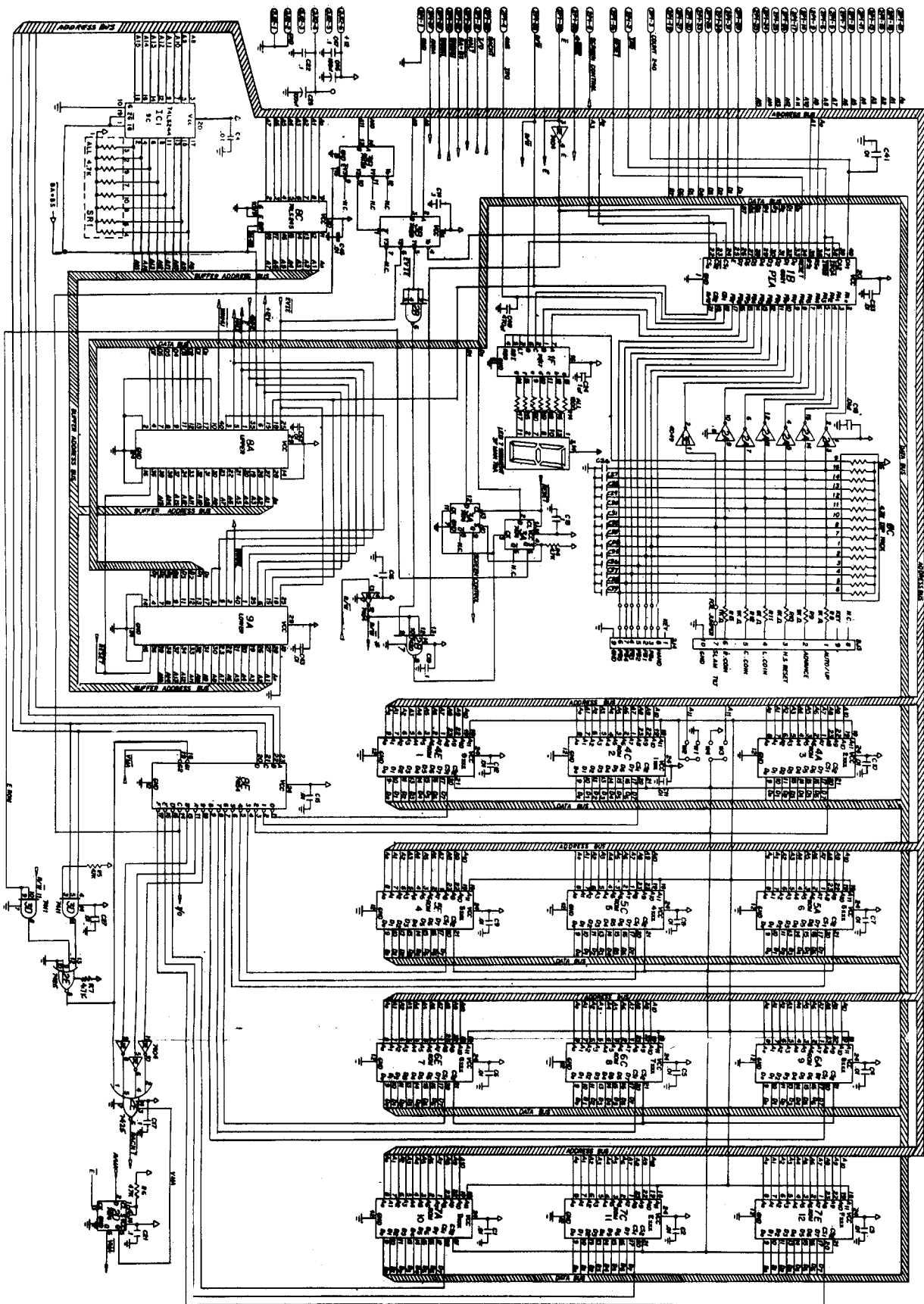


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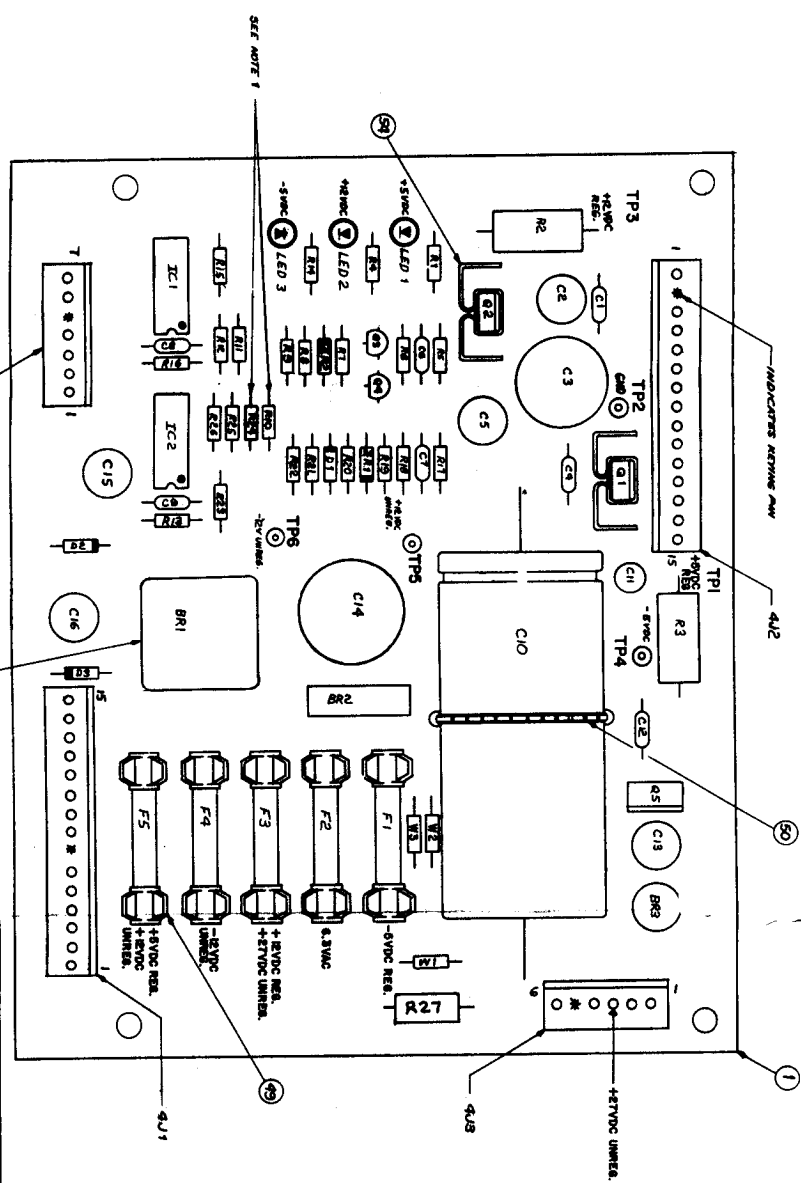
CHIP CODE	ROM #	PART #
4E	ROM 1	A-5343-09962A
4C	ROM 2	A-5343-09962A
4A	ROM 3	A-5343-09962A
5E	ROM 4	A-5343-09965A
5C	ROM 5	A-5343-09965A
5A	ROM 6	A-5343-09965A
6E	ROM 7	A-5343-09967A
6C	ROM 8	A-5343-09967A
6A	ROM 9	A-5343-09967A
7A	ROM 10	A-5343-09970A
7C	ROM 11	A-5343-09972A
7E	ROM 12	A-5343-09972A
		W2, W4

BILL OF MATERIALS

ITEM NO.	PART NO.	PART DESCRIPTION	QTY
1	5271	BASE PCB BOARD	1
2	5280-00	144TRC TO TSEG LED DISPLAY	1
3	09407-00	IF	1
4	5280-00	20 3A	1
5	09476-00	7A4 TALSING DIODE 2 TO 4	1
6	5280-00	3B	1
7	09476-00	7A4 TALSING DIODE 2 TO 4	1
8	5280-00	2B	1
9	09476-00	7A4 TALSING DIODE 2 TO 4	1
10	09476-00	3B	1
11	09476-00	7A4 TALSING DIODE 2 TO 4	1
12	09476-00	3B	1
13	09476-00	7A4 TALSING DIODE 2 TO 4	1
14	09476-00	3B	1
15	09476-00	7A4 TALSING DIODE 2 TO 4	1
16	09476-00	3B	1
17	09476-00	7A4 TALSING DIODE 2 TO 4	1
18	09476-00	3B	1
19	09476-00	7A4 TALSING DIODE 2 TO 4	1
20	09476-00	3B	1
21	09476-00	7A4 TALSING DIODE 2 TO 4	1
22	09476-00	3B	1
23	09476-00	7A4 TALSING DIODE 2 TO 4	1
24	09476-00	3B	1
25	09476-00	7A4 TALSING DIODE 2 TO 4	1
26	09476-00	3B	1
27	09476-00	7A4 TALSING DIODE 2 TO 4	1
28	09476-00	3B	1
29	09476-00	7A4 TALSING DIODE 2 TO 4	1
30	09476-00	3B	1
31	09476-00	7A4 TALSING DIODE 2 TO 4	1
32	09476-00	3B	1



D-9144 ROM Board Logic Diagram

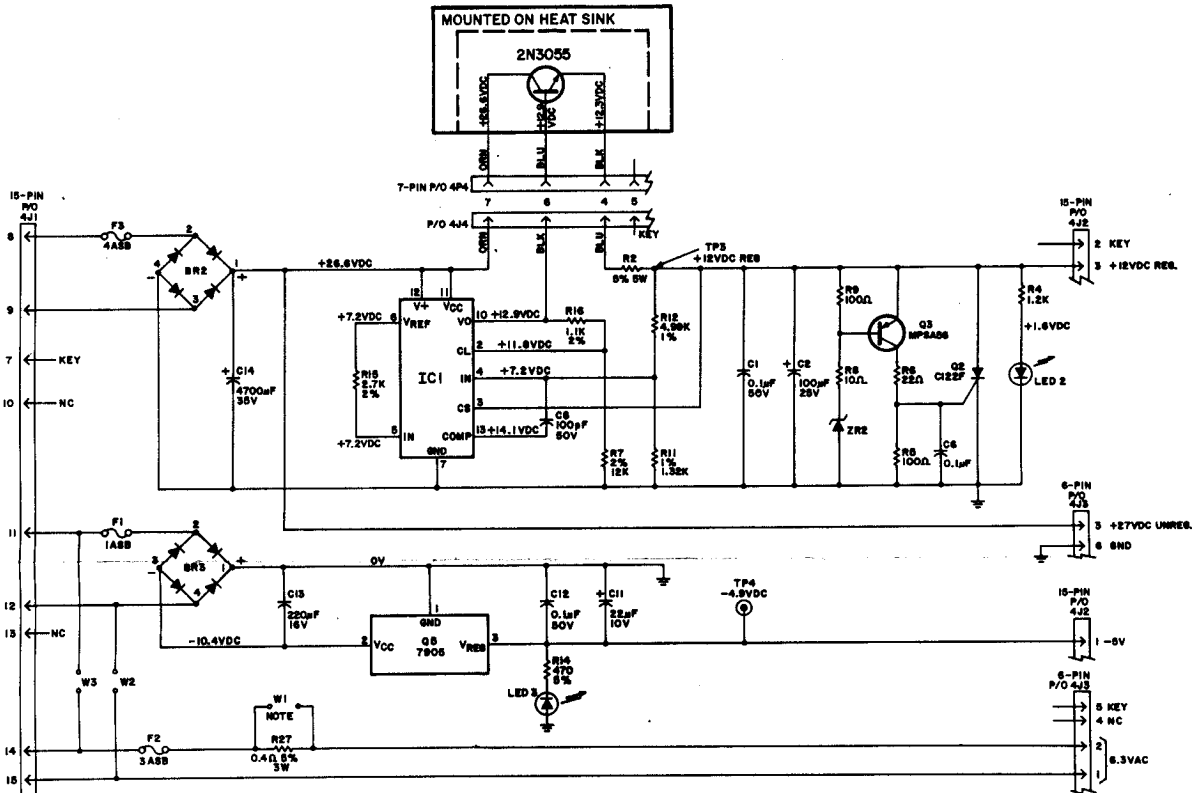
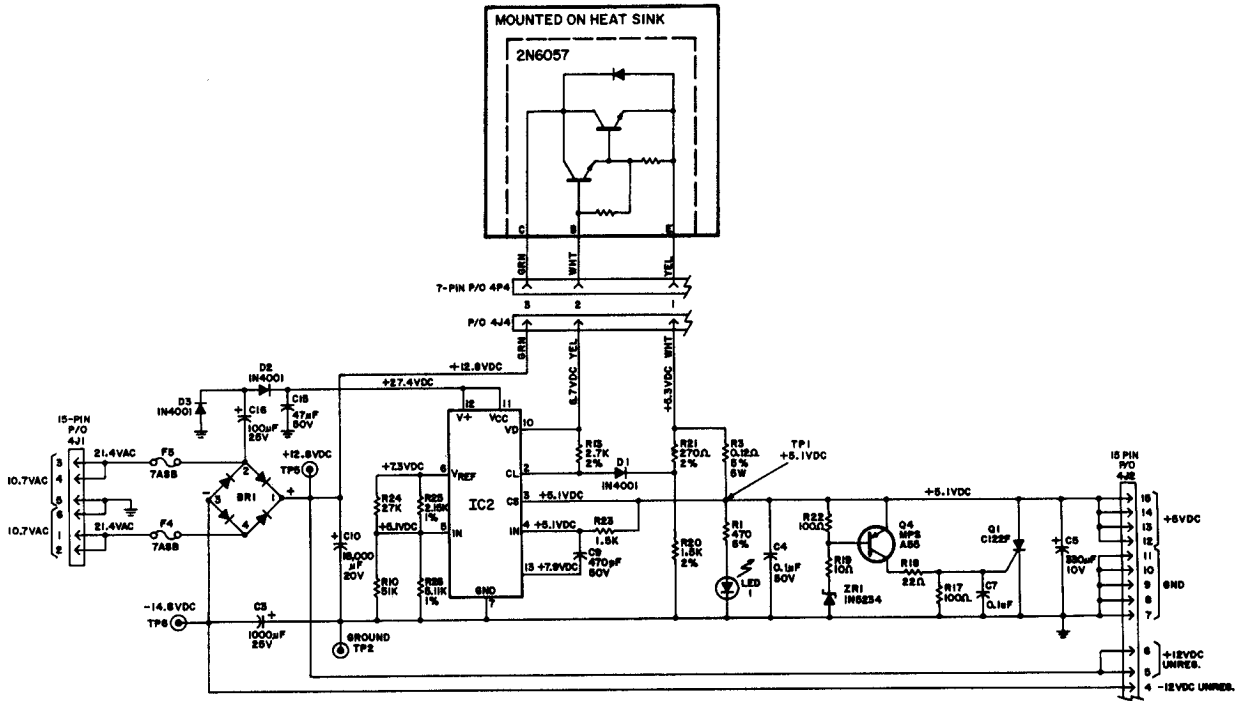


NOTES:
 1. REMOVE R24 IF +5VDC IS GREATER THAN 5.25 VDC,
 REMOVE R10 IF +5VDC IS LESS THAN 4.75 VDC.
 2. BR1 MUST BE MOUNTED 1/8" ABOVE SURFACE OF
 BOARD.
 3. FOR SCHEMATIC REFER TO 16-8011.

ITEM NO.	QTY	PART NO.	DESCRIPTION	UNIT
55	1	5000-	RESISTOR C.T.	1
56	1	5012-00	RESISTOR C.T.	1
57	1	5013-00	RESISTOR C.T.	1
58	1	5014-00	RESISTOR C.T.	1
59	1	5015-00	RESISTOR C.T.	1
60	1	5016-00	RESISTOR C.T.	1
61	1	5017-00	RESISTOR C.T.	1
62	1	5018-00	RESISTOR C.T.	1
63	1	5019-00	RESISTOR C.T.	1
64	1	5020-00	RESISTOR C.T.	1
65	1	5021-00	RESISTOR C.T.	1
66	1	5022-00	RESISTOR C.T.	1
67	1	5023-00	RESISTOR C.T.	1
68	1	5024-00	RESISTOR C.T.	1
69	1	5025-00	RESISTOR C.T.	1
70	1	5026-00	RESISTOR C.T.	1
71	1	5027-00	RESISTOR C.T.	1
72	1	5028-00	RESISTOR C.T.	1
73	1	5029-00	RESISTOR C.T.	1
74	1	5030-00	RESISTOR C.T.	1
75	1	5031-00	RESISTOR C.T.	1
76	1	5032-00	RESISTOR C.T.	1
77	1	5033-00	RESISTOR C.T.	1
78	1	5034-00	RESISTOR C.T.	1
79	1	5035-00	RESISTOR C.T.	1
80	1	5036-00	RESISTOR C.T.	1
81	1	5037-00	RESISTOR C.T.	1
82	1	5038-00	RESISTOR C.T.	1
83	1	5039-00	RESISTOR C.T.	1
84	1	5040-00	RESISTOR C.T.	1
85	1	5041-00	RESISTOR C.T.	1
86	1	5042-00	RESISTOR C.T.	1
87	1	5043-00	RESISTOR C.T.	1
88	1	5044-00	RESISTOR C.T.	1
89	1	5045-00	RESISTOR C.T.	1
90	1	5046-00	RESISTOR C.T.	1
91	1	5047-00	RESISTOR C.T.	1
92	1	5048-00	RESISTOR C.T.	1
93	1	5049-00	RESISTOR C.T.	1
94	1	5050-00	RESISTOR C.T.	1
95	1	5051-00	RESISTOR C.T.	1
96	1	5052-00	RESISTOR C.T.	1
97	1	5053-00	RESISTOR C.T.	1
98	1	5054-00	RESISTOR C.T.	1
99	1	5055-00	RESISTOR C.T.	1
100	1	5056-00	RESISTOR C.T.	1

BILL OF MATERIAL

ITEM NO.	QTY	PART NO.	DESCRIPTION	UNIT
1	1	5000-	RESISTOR C.T.	1
2	1	5012-00	RESISTOR C.T.	1
3	1	5013-00	RESISTOR C.T.	1
4	1	5014-00	RESISTOR C.T.	1
5	1	5015-00	RESISTOR C.T.	1
6	1	5016-00	RESISTOR C.T.	1
7	1	5017-00	RESISTOR C.T.	1
8	1	5018-00	RESISTOR C.T.	1
9	1	5019-00	RESISTOR C.T.	1
10	1	5020-00	RESISTOR C.T.	1
11	1	5021-00	RESISTOR C.T.	1
12	1	5022-00	RESISTOR C.T.	1
13	1	5023-00	RESISTOR C.T.	1
14	1	5024-00	RESISTOR C.T.	1
15	1	5025-00	RESISTOR C.T.	1
16	1	5026-00	RESISTOR C.T.	1
17	1	5027-00	RESISTOR C.T.	1
18	1	5028-00	RESISTOR C.T.	1
19	1	5029-00	RESISTOR C.T.	1
20	1	5030-00	RESISTOR C.T.	1
21	1	5031-00	RESISTOR C.T.	1
22	1	5032-00	RESISTOR C.T.	1
23	1	5033-00	RESISTOR C.T.	1
24	1	5034-00	RESISTOR C.T.	1
25	1	5035-00	RESISTOR C.T.	1
26	1	5036-00	RESISTOR C.T.	1
27	1	5037-00	RESISTOR C.T.	1
28	1	5038-00	RESISTOR C.T.	1
29	1	5039-00	RESISTOR C.T.	1
30	1	5040-00	RESISTOR C.T.	1
31	1	5041-00	RESISTOR C.T.	1
32	1	5042-00	RESISTOR C.T.	1
33	1	5043-00	RESISTOR C.T.	1
34	1	5044-00	RESISTOR C.T.	1
35	1	5045-00	RESISTOR C.T.	1
36	1	5046-00	RESISTOR C.T.	1
37	1	5047-00	RESISTOR C.T.	1
38	1	5048-00	RESISTOR C.T.	1
39	1	5049-00	RESISTOR C.T.	1
40	1	5050-00	RESISTOR C.T.	1
41	1	5051-00	RESISTOR C.T.	1
42	1	5052-00	RESISTOR C.T.	1
43	1	5053-00	RESISTOR C.T.	1
44	1	5054-00	RESISTOR C.T.	1
45	1	5055-00	RESISTOR C.T.	1
46	1	5056-00	RESISTOR C.T.	1
47	1	5057-00	RESISTOR C.T.	1
48	1	5058-00	RESISTOR C.T.	1
49	1	5059-00	RESISTOR C.T.	1
50	1	5060-00	RESISTOR C.T.	1

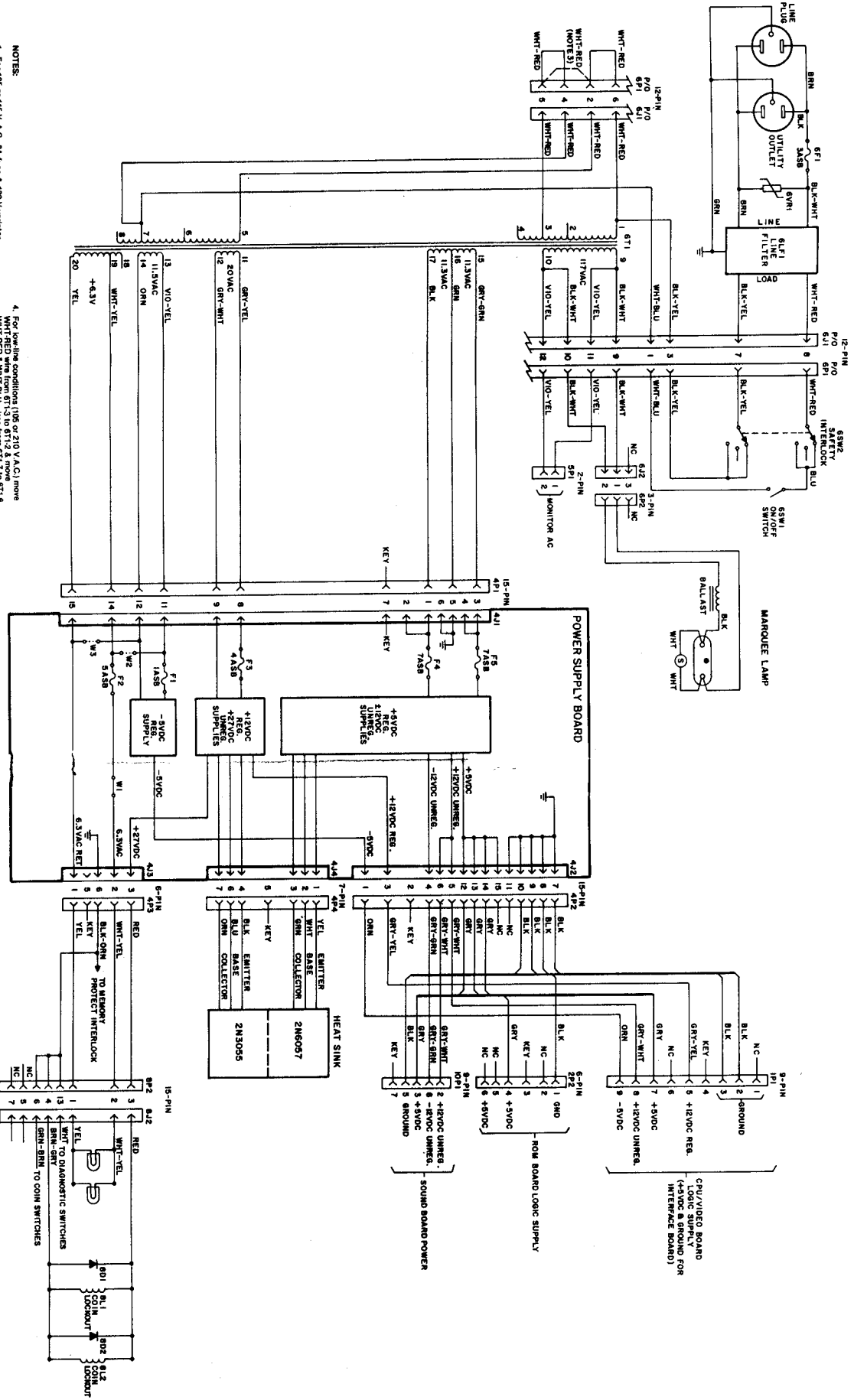


NOTE: JUMPERS W1, W2 & W3 ARE ALL N.C. IN JOUST-UPRIGHT GAMES. THESE GAMES USE POWER TRANSFORMER 60S-C-0985 WITH A 12.5VCT SECONDARY, ALLOWING 6.5V FOR GENERAL ILLUMINATION.

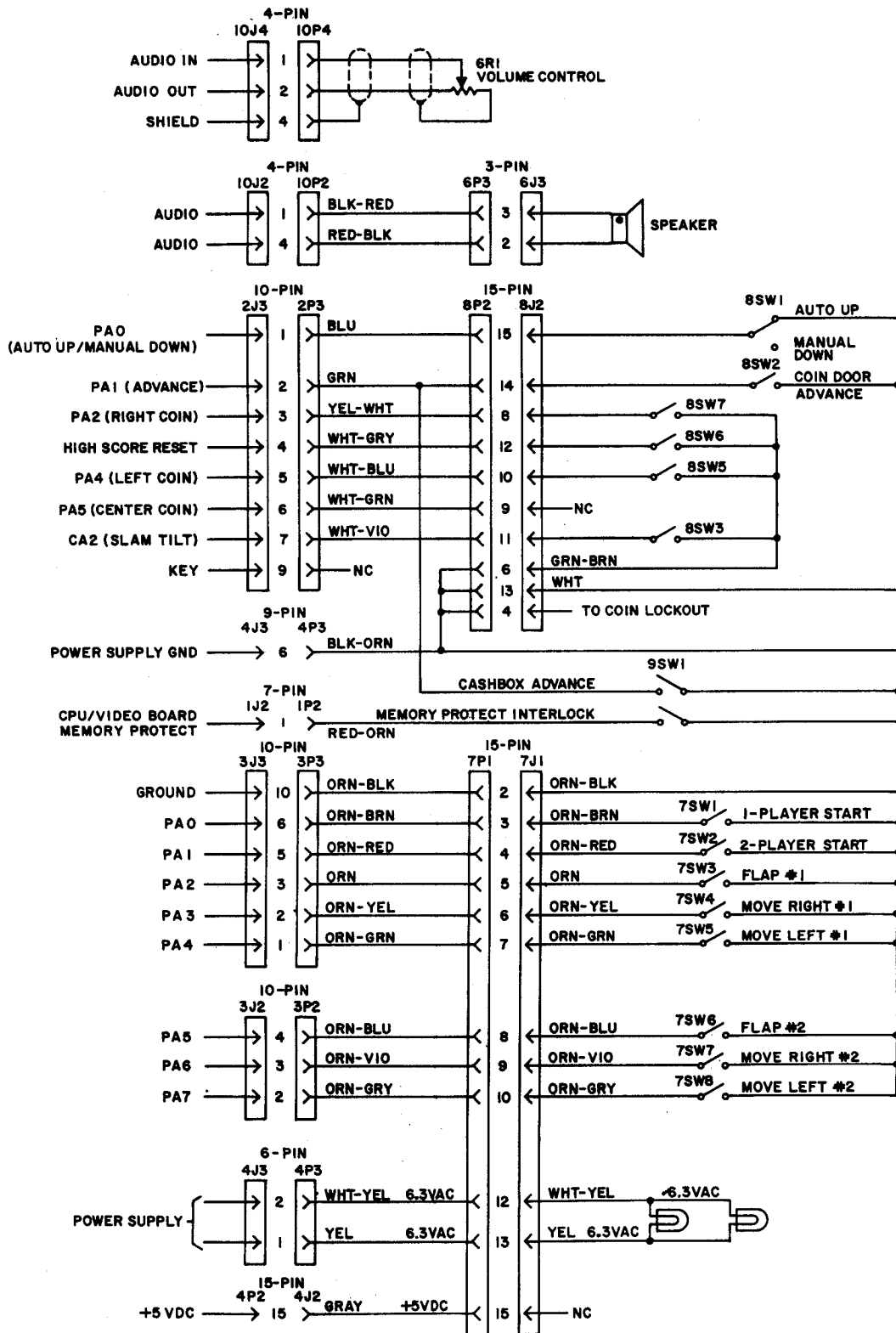
D-8784 Power Supply Board Schematic Diagram

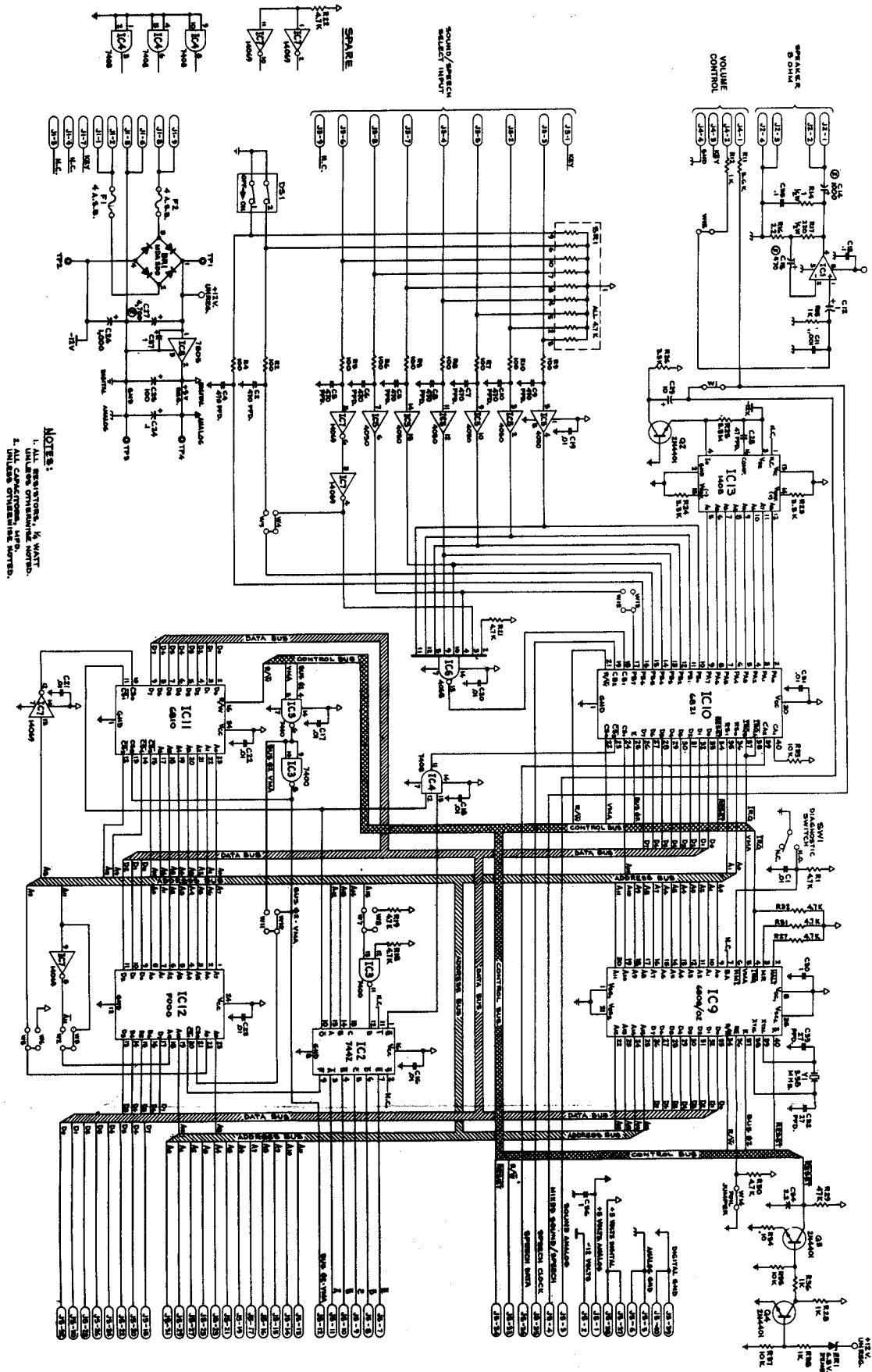
- NOTES:
1. For 105 or 115 V. A.C., 3A fuse & 130 V variator
 2. For 210 or 235 V. A.C., 1A fuse & 275V variator
 3. Jumper wires on 8P1 shown with solid lines are connected for 17V A.C. operation. Only the one wire indicated by dashed line is connected for 230 V.A.C. operation.

4. For lowline conditions (105 or 210 V.A.C.) move WHT-RED wire from 8T-3 to 8T-2 & move WHT-RED & WHT-BLU wires from 8T-7 to 8T-6
5. For high line conditions (135 or 240 V.A.C.) move WHT-RED wire from 8T-3 to 8T-4 and move WHT-RED & WHT-BLU wires from 8T-7 to 8T-6



CABINET WIRING





NOTES:
 1. ALL RESISTORS, $\frac{1}{2}$ WATT.
 2. ALL CAPACITORS, MFD.
 3. UNLESS OTHERWISE NOTED.
 4. UNLESS OTHERWISE NOTED.