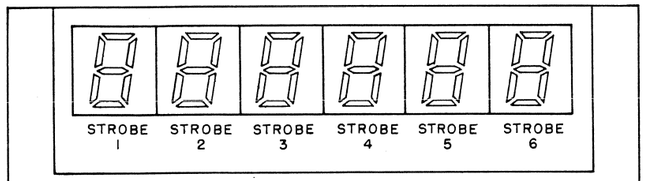
WORLD CUP
INSERT BOARD WIRING

PLAYER #1

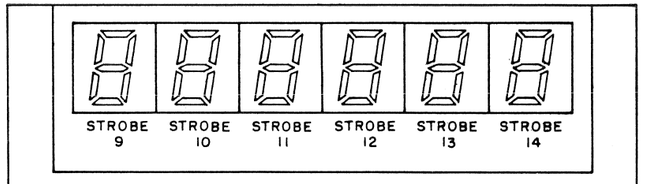


5J1

1	f
2	g
3	100,000's
4	e
5	d
6	10,000's
7	1,000's
8	N.C.
9	ANODE KEEP ALIVE
10	CATHODE KEEP ALIVE
11	100's
12	10's
13	KEY
14	c
15	UNITS
16	b
17	a
18	N.C.

(5)

PLAYER #2

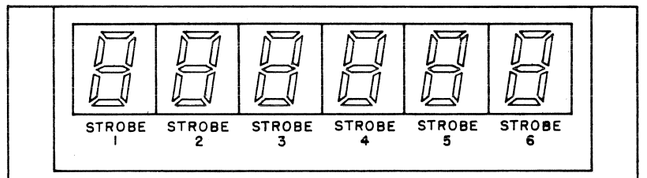


5J2

SAME CONNECTION AS 5J1

(5)

PLAYER #3

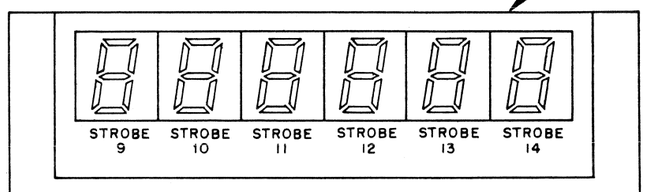


5J3

SAME CONNECTION AS 5J1

(5)

PLAYER #4



5J4

SAME CONNECTION AS 5J1

(5)

9J1

1	6.3 VAC
2	6.3 VAC
3	N.C.
4	6.3 VAC
5	6.3 VAC
6	LAMP COLUMN 7
7	LAMP COLUMN 8
8	LAMP ROW 1
9	LAMP ROW 2
10	LAMP ROW 3
11	LAMP ROW 4
12	LAMP ROW 5
13	LAMP ROW 6
14	LAMP ROW 7
15	LAMP ROW 8

- LAMP ROW 1: "PLAYER 1 UP"
- LAMP ROW 2: "1 CAN PLAY", "PLAYER 2 UP"
- LAMP ROW 3: "2 CAN PLAY", "PLAYER 3 UP"
- LAMP ROW 4: "3 CAN PLAY", "PLAYER 4 UP"
- LAMP ROW 5: "4 CAN PLAY", "TILT"
- LAMP ROW 6: "MATCH", "GAME OVER", "BALL IN PLAY"
- LAMP ROW 7: "SAME PLAYER SHOOTS"
- LAMP ROW 8: "HIGH SCORE"

4P7 / 9J2 / 9P2 / 5J1 — PLAYER #1

4P7 pin 2	BROWN-WHITE	9J2 pin 1 / 9P2	BROWN-WHITE
5J1 pin 9	PLAYER #1		

9J3 / 9P3 / 5J2 — PLAYER #2

9J3 pin 1 / 9P3	BRN-WHT	5J2 pin 9	PLAYER #2

9J4 / 9P4 / 5J3 — PLAYER #3

9J4 pin 1 / 9P4	BRN-WHT	5J3 pin 9	PLAYER #3

9J5 / 9P5 / 5J4 — PLAYER #4

9J5 pin 1 / 9P5	BRN-WHT	5J4 pin 9	PLAYER #4

(4)

4J3 — PLAYER #3

15	d — SEGMENTS
14	e — SEGMENTS
13	c — SEGMENTS
12	g — SEGMENTS
11	f — SEGMENTS
10	b — SEGMENTS
9	a — SEGMENTS
8	UNITS
7	10's
6	100,000's
5	10,000's
4	KEY
3	1,000's
2	100's
1	KEEP ALIVE

4J1 — PLAYER #1

15	KEEP ALIVE
14	d — SEGMENTS
13	e — SEGMENTS
12	c — SEGMENTS
11	g — SEGMENTS
10	f — SEGMENTS
9	b — SEGMENTS
8	a — SEGMENTS
7	100,000's
6	KEY
5	10,000's
4	1,000's
3	100's
2	10's
1	UNITS

4J2 — PLAYER #2

15	100,000's
14	10,000's
13	a — SEGMENTS
12	b — SEGMENTS
11	f — SEGMENTS
10	g — SEGMENTS
9	KEY
8	c — SEGMENTS
7	e — SEGMENTS
6	d — SEGMENTS
5	1,000's
4	100's
3	10's
2	UNITS
1	KEEP ALIVE

4J4 — PLAYER #4

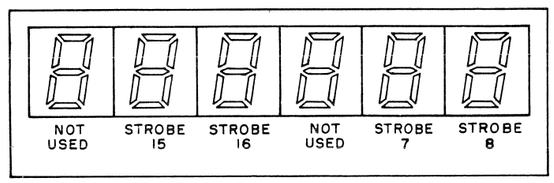
15	KEEP ALIVE
14	100,000's
13	10,000's
12	1,000's
11	KEY
10	100's
9	10's
8	UNITS
7	a — SEGMENTS
6	b — SEGMENTS
5	f — SEGMENTS
4	g — SEGMENTS
3	c — SEGMENTS
2	e — SEGMENTS
1	d — SEGMENTS

4J7 — POWER INPUTS

1	-100 VDC
2	+100 VDC
3	+5 VDC
4	N.C.
5	GROUND
6	-100 VDC

4J6 — BCD INPUTS

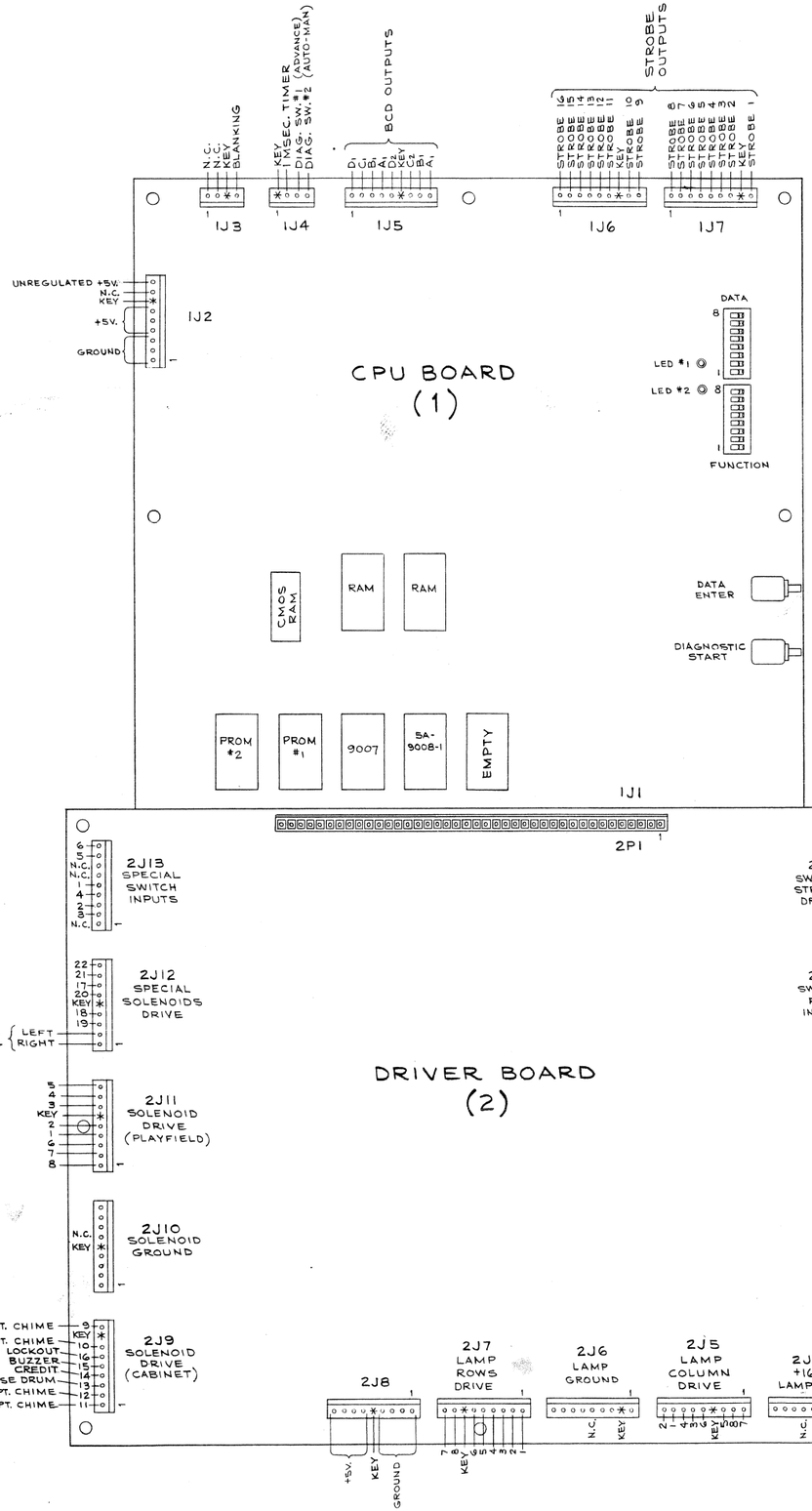
1	BI
2	CI
3	BLANKING
4	DI
5	AI
6	B2
7	C2
8	D2
9	A2



4J5 — STROBE INPUTS

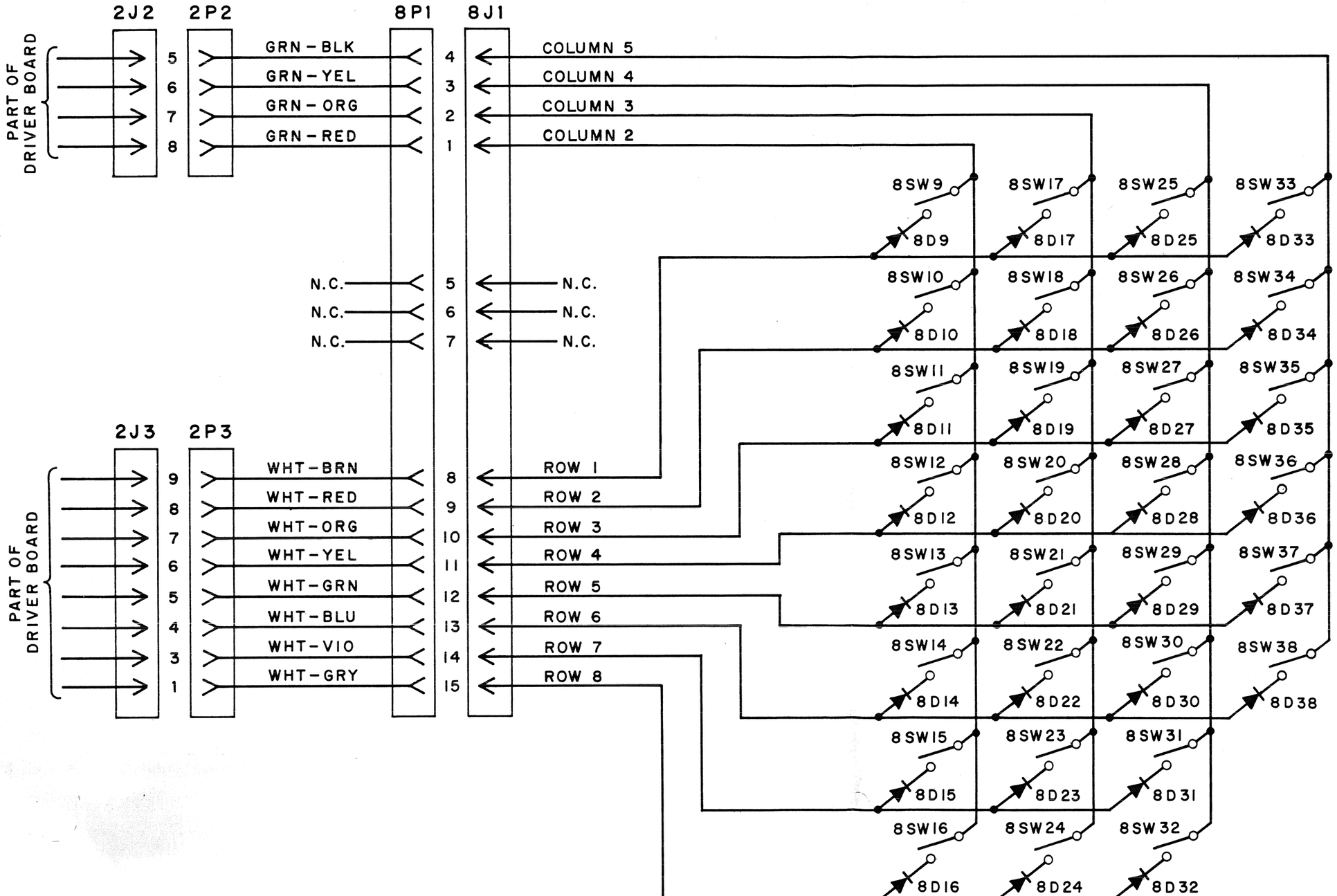
18	N.C.
17	STROBE 12
16	STROBE 13
15	STROBE 9
14	STROBE 14
13	STROBE 11
12	STROBE 10
11	STROBE 6
10	STROBE 5
9	STROBE 4
8	STROBE 3
7	STROBE 2
6	STROBE 1
5	STROBE 15
4	STROBE 16
3	STROBE 7
2	STROBE 8
1	N.C.

MASTER DISPLAY P.C. BOARD



WORLD CUP
BACK BOX
CONNECTOR IDENTIFICATION

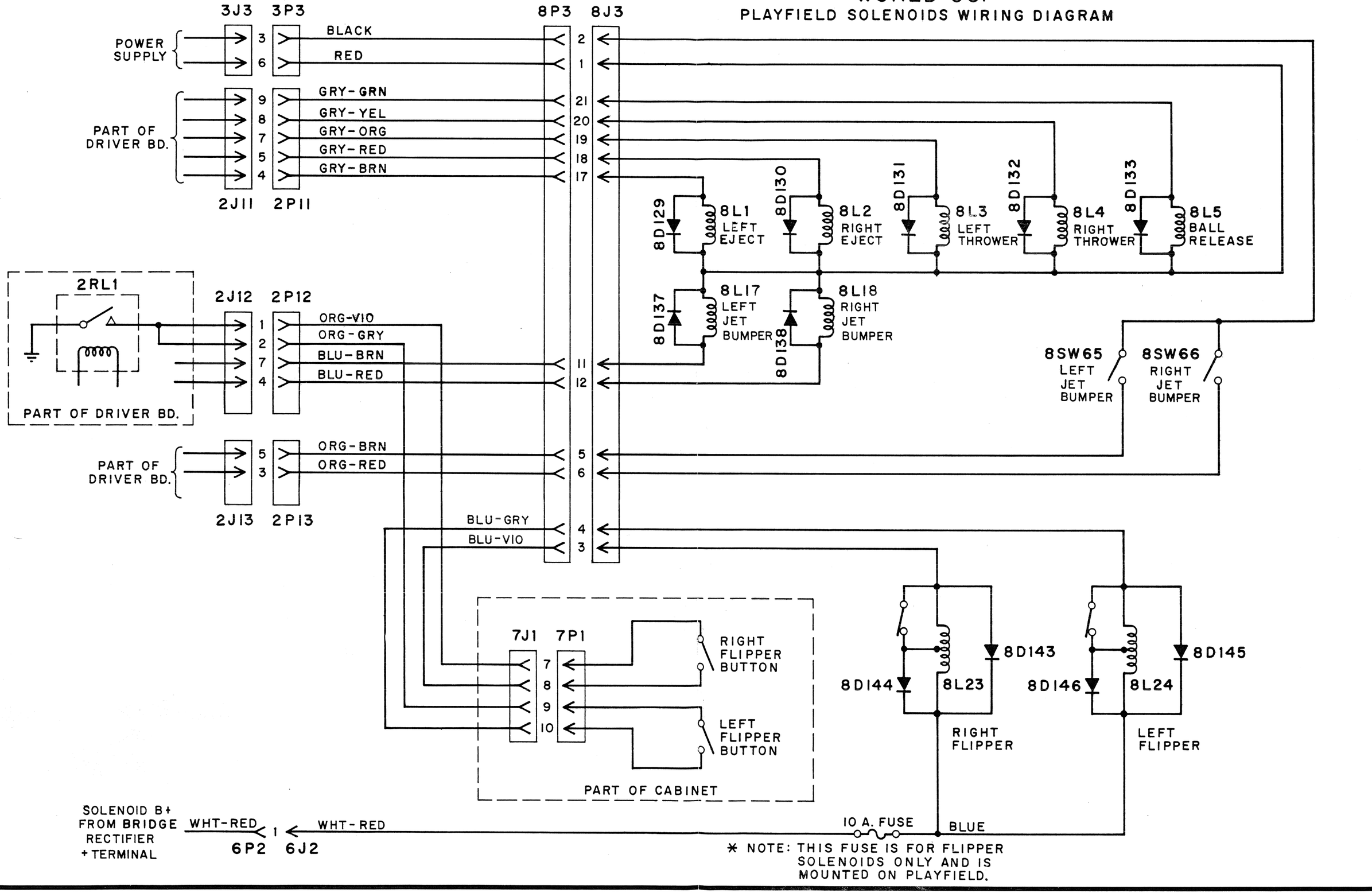
WORLD CUP
PLAYFIELD SWITCH WIRING DIAGRAM



WORLD CUP

SWITCH NO.	FUNCTION
9	Left Eject
10	Left Standup (50 pt)
11	Left Special
12	Left Standup (10 pt)
13	Left Ball Thrower ("T")
14	Outhole
15	Playfield Tilt
16	Right Ball Thrower ("A")
17	Right Standup (10 pt)
18	Right Special
19	Right Standup (50 pt)
20	Right Eject
21	Ball Advance 1
22	Ball Advance 2
23	Ball Advance 3
24	Ball Advance 4
25	Spinner
26	Super Ball Advance
27	"R" Target
28	Right Super Ball Advance
29	Top Right Standup (10 pt)
30	Top Right Rollover (A/R)
31	Top Center Rollover
32	Top Left Rollover (S/T)
33	Top Left Standup (10 pt)
34	"S" Target
35	Left Super Ball Advance
36	Left Inside Ball Advance
37	Left Jet Bumper
38	Right Jet Bumper

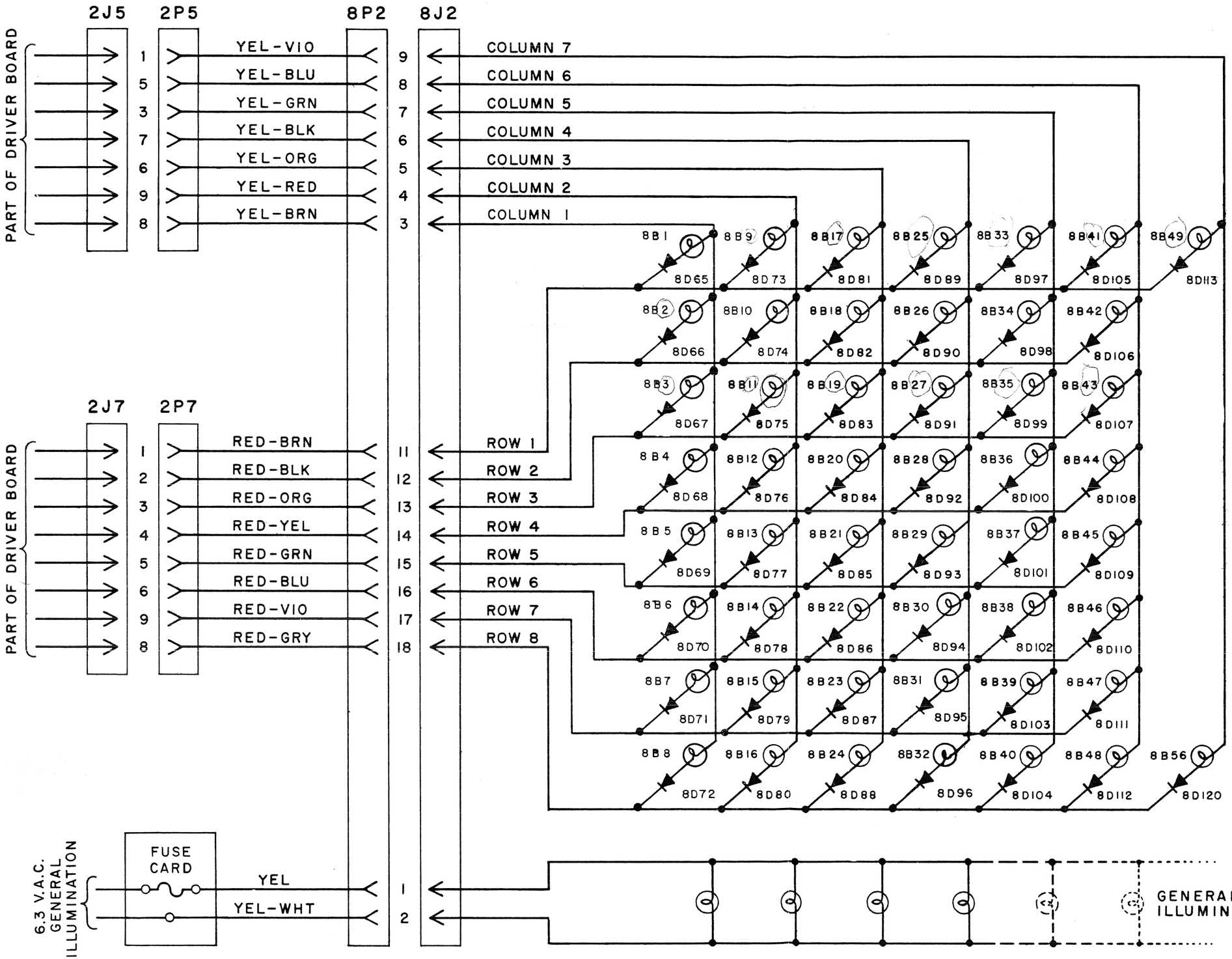
WORLD CUP
PLAYFIELD SOLENOIDS WIRING DIAGRAM



* NOTE: THIS FUSE IS FOR FLIPPER SOLENOIDS ONLY AND IS MOUNTED ON PLAYFIELD.

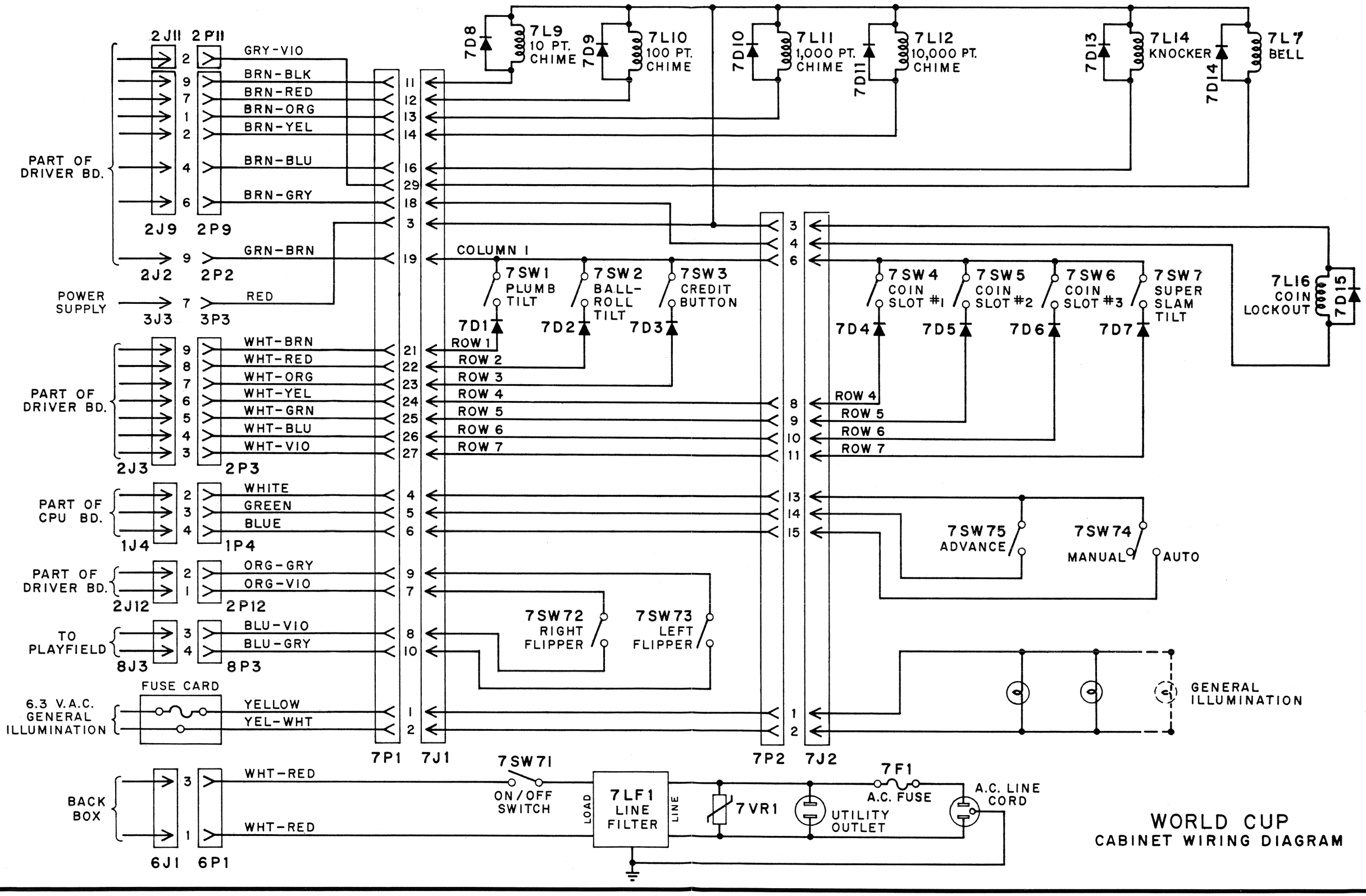
WORLD CUP

PLAYFIELD LAMP WIRING DIAGRAM

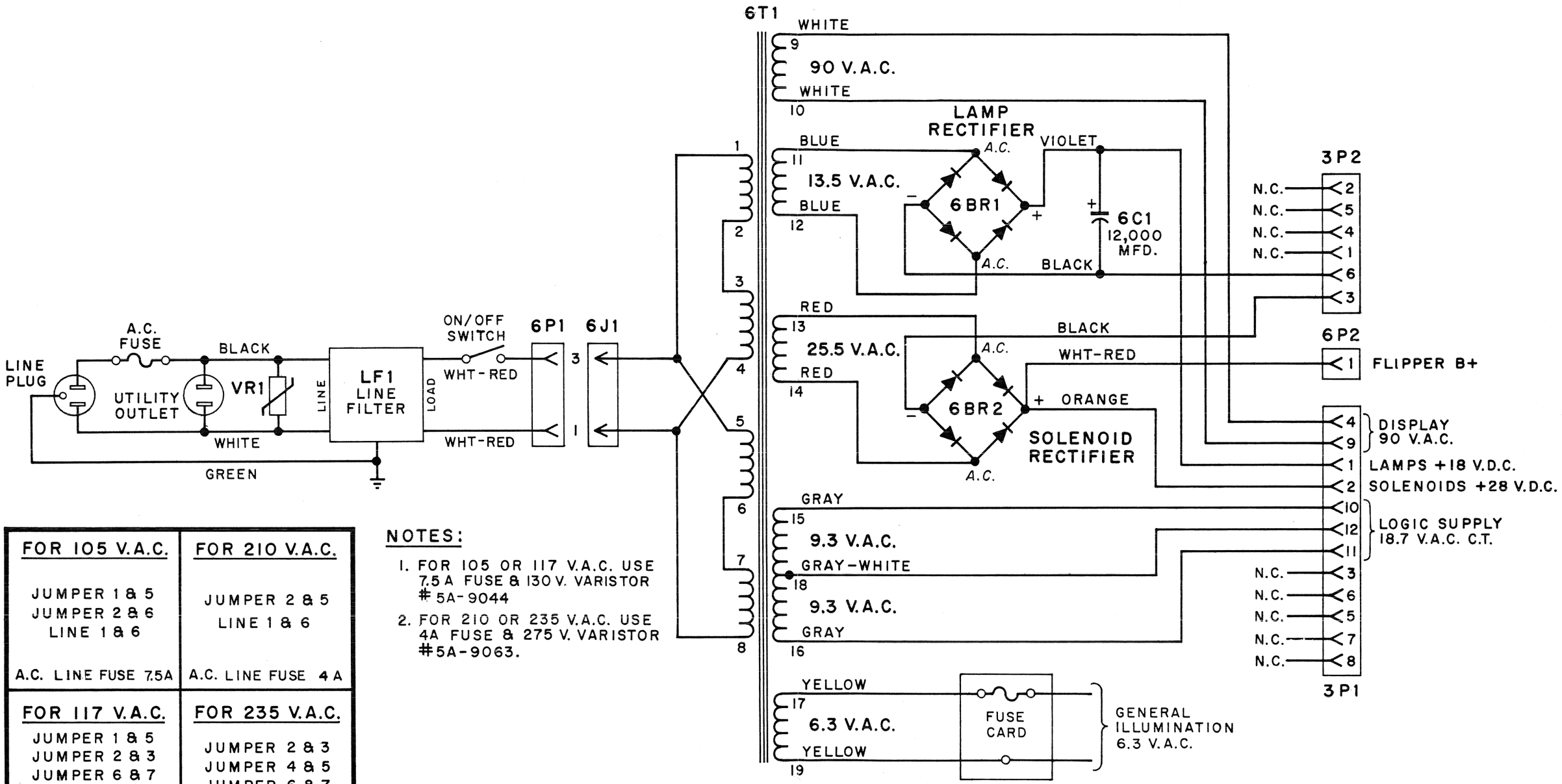


WORLD CUP

BULB NO.	FUNCTION
1	Ball Advance 1 (X2)
2	Ball Advance 2 (X2)
3	Ball Advance 3 (X2)
4	Ball Advance 4 (X2)
5	Goal When Lit (X2)
6	Left Special
7	Right Special
8	Same Player Shoots
9	Top "S"
10	Top "T"
11	Top "A"
12	Top "R"
13	"S"
14	"T"
15	"A"
16	"R"
17	Top Goal When Lit
18	Extra Ball When Lit
19	Spinner 100 When Lit
20	Bronze Star
21	Silver Star
22	Gold Star
23	Gold Cup
24	Super Star
25	2 Goals
26	4 Goals
27	6 Goals
28	1 Goal
29	3 Goals
30	5 Goals
31	7 Goals
32	Bonus 1
33	Bonus 2
34	Bonus 3
35	Bonus 4
36	Bonus 5
37	Bonus 6
38	Bonus 7
39	Bonus 8
40	Bonus 9
41	Bonus 10
42	Bonus 11
43	Bonus 12
44	Bonus 13
45	Bonus 14
46	Bonus 15
47	Bonus 16
48	Bonus 17
49	Bonus 18
56	Credits



WORLD CUP
CABINET WIRING DIAGRAM



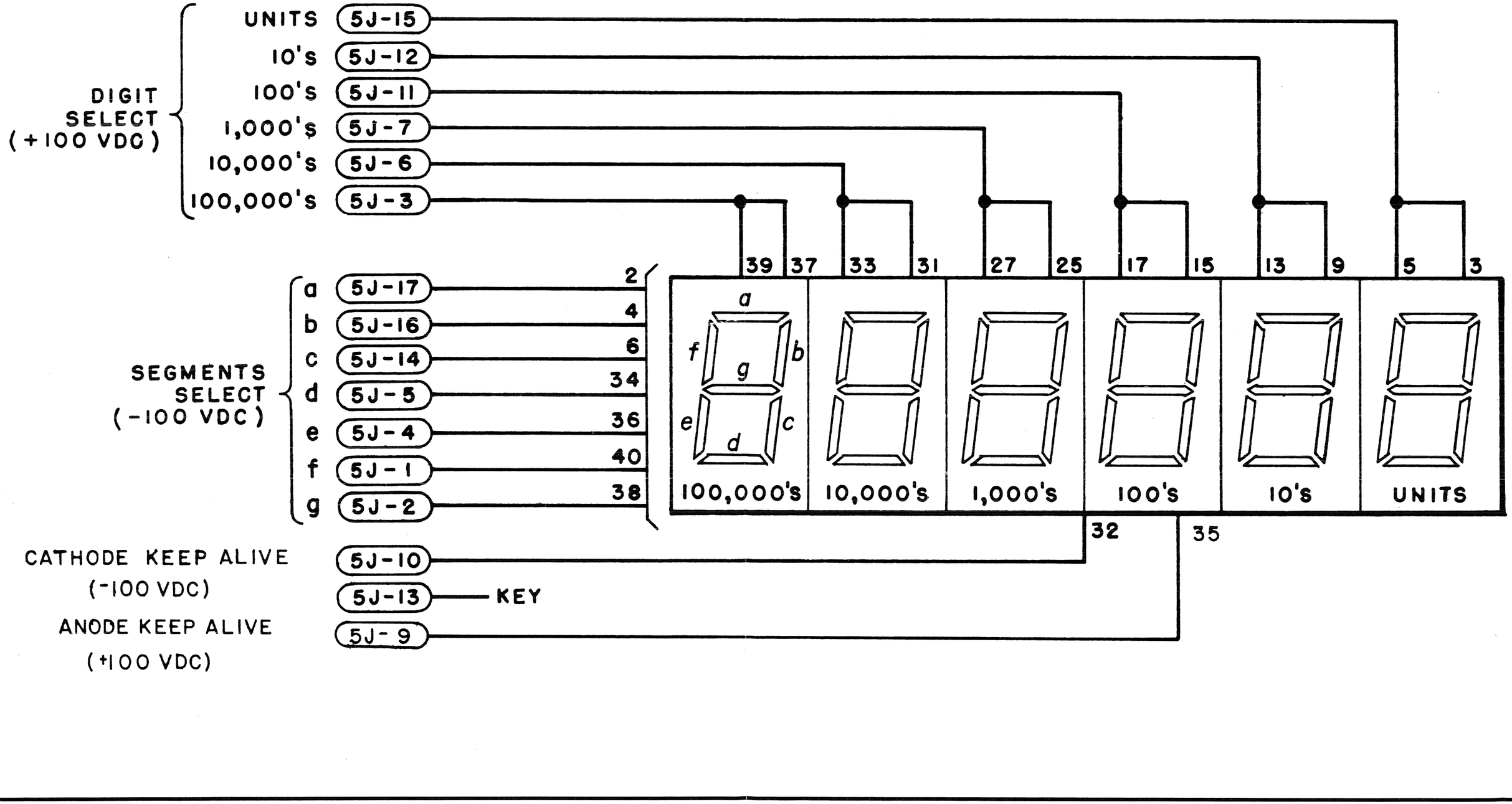
FOR 105 V.A.C.	FOR 210 V.A.C.
JUMPER 1 & 5 JUMPER 2 & 6 LINE 1 & 6	JUMPER 2 & 5 LINE 1 & 6
A.C. LINE FUSE 7.5A	A.C. LINE FUSE 4 A
FOR 117 V.A.C.	**FOR 235 V.A.C.**
JUMPER 1 & 5 JUMPER 2 & 3 JUMPER 6 & 7 JUMPER 4 & 8 LINE 5 & 8	JUMPER 2 & 3 JUMPER 4 & 5 JUMPER 6 & 7 LINE 1 & 8
A.C. LINE FUSE 7.5 A	A.C. LINE FUSE 4 A

NOTES:

1. FOR 105 OR 117 V.A.C. USE 7.5 A FUSE & 130 V. VARISTOR #5A-9044
2. FOR 210 OR 235 V.A.C. USE 4A FUSE & 275 V. VARISTOR #5A-9063.

WORLD CUP
POWER WIRING

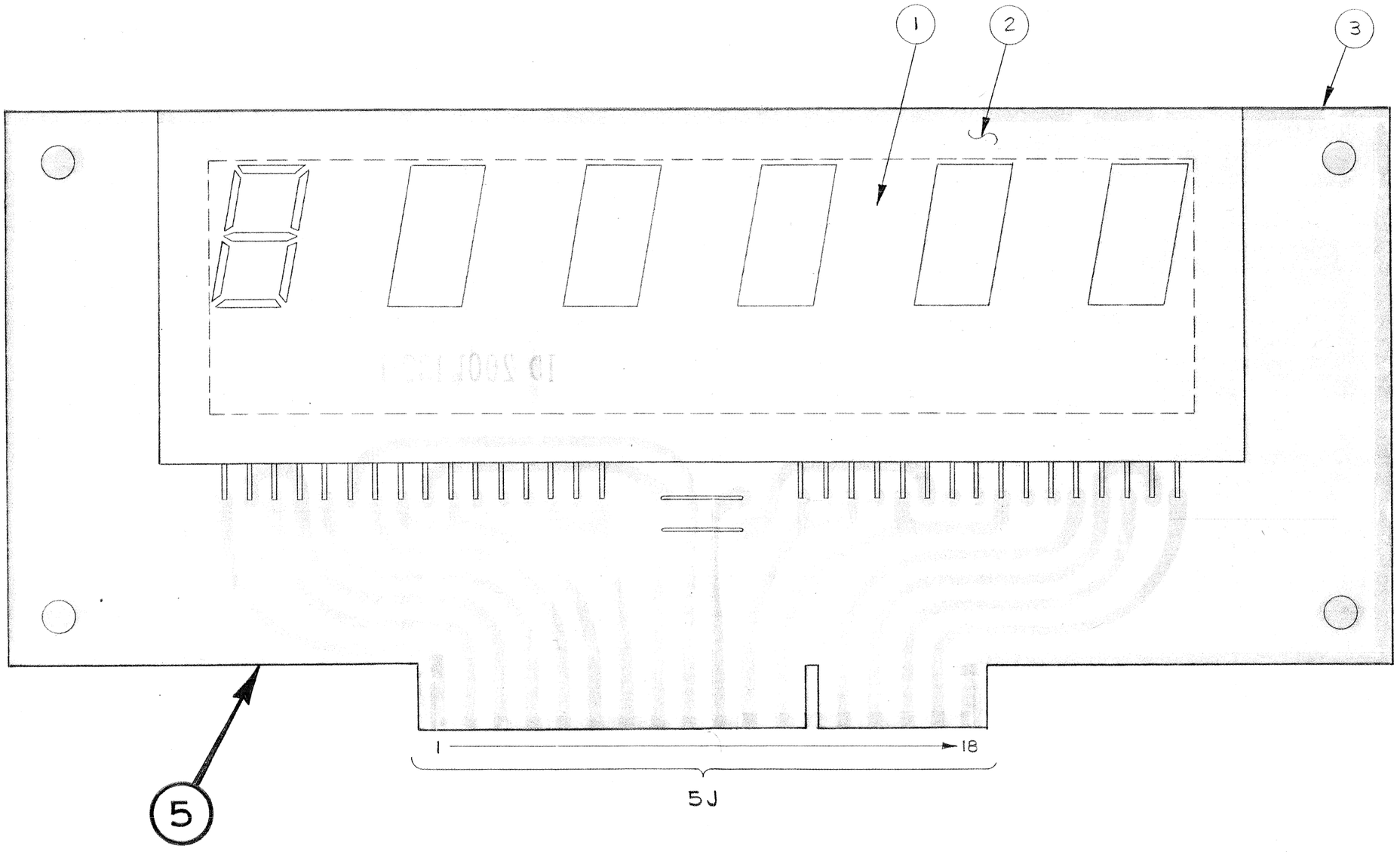
SLAVE DISPLAY BOARD



C-8019

DOCUMENT #1

BILL OF MATERIAL				
ITEM	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D.
1	5A-8966	I1	6 DIGIT DISPLAY	1
2	23A-6534	F1	DISPLAY MTG. ADHESIVE FOAM	1
3	ID-2001-132		SLAVE DISPLAY P.C. BOARD	1



D-7997

DOCUMENT #2

SOLENOID 1 DRIVE

SOLENOID 2 DRIVE

SOLENOID 3 DRIVE

SOLENOID 4 DRIVE

SOLENOID 5 DRIVE

SOLENOID 6 DRIVE

SOLENOID 7 DRIVE

SOLENOID 8 DRIVE

SOLENOID 9 DRIVE

SOLENOID 10 DRIVE

SOLENOID 11 DRIVE

SOLENOID 12 DRIVE

SOLENOID 13 DRIVE

SOLENOID 14 DRIVE

SOLENOID 15 DRIVE

COIN LOCKOUT SOLENOID DRIVE

LAMP & SOLENOID GROUND

5V B+

GND.

+5V.

BLANKING

TO/FROM SHEET 1

SWITCH SOLENOID 1 TRIGGER

SWITCH TRIGGERED SOLENOID 1 DRIVE

SWITCH TRIGGERED SOLENOID 2 DRIVE

SWITCH SOLENOID 2 TRIGGER

SWITCH SOLENOID 3 TRIGGER

SWITCH TRIGGERED SOLENOID 3 DRIVE

SWITCH TRIGGERED SOLENOID 4 DRIVE

SWITCH SOLENOID 4 TRIGGER

SWITCH SOLENOID 5 TRIGGER

SWITCH TRIGGERED SOLENOID 5 DRIVE

SWITCH TRIGGERED SOLENOID 6 DRIVE

SWITCH SOLENOID 6 DRIVE

FLIPPER GROUND RETURNS

REVISION LETTER	REVISION	BY
B	2J8's WAS G's, 2J9's WAS H's, 2J10's WAS J's, 2J11 WAS K's, 2J12 WAS L's 2J13's WAS M's & ADDED "TO/FROM SHEET 1" & CIRCLES TO ALL 2N4401 TRANSISTORS	R. GAT 10-28-77
A 9-24-77	REVISION "A"	

SHEET 2 OF 2

TOLERANCES UNLESS OTHERWISE SPECIFIED	WILLIAMS ELECTRONIC MFG. CORP. SUBSIDIARY OF THE RESBURG CORP.	Q'TY	ASSEMBLE ON
FRACTIONS ± 1/64	3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-2240		
DECIMALS ± .005	NAME SCHEMATIC, DRIVER BOARD		
HOLES + .002 − .000	MATERIAL	HEAT TREATMENT	FINISH
ANGULAR ± 1/2°	DWN. W/HB DATE 10-5-77 APP'D.	SCALE	D-7997

D-7997

DOCUMENT #2

SWITCH MATRIX INPUTS 1-8

SWITCH MATRIX DRIVE S 1-8

ADDRESS BUS 0-15

DATA BUS 0-7

ADDRESS BUS

DATA BUS

RESET

R/W

VMA

A13·VMA

E/W

BLANKING

ST1 ST2 ST3 ST4 ST5 ST6

IC10 P1A III ADDR. 2400-2408

IC11 P1A II LOC. 3000-3005

VOLT LAMP Vcc

LAMP STROBE 1

LAMP STROBE 2

LAMP STROBE 3

LAMP STROBE 4

LAMP STROBE 5

LAMP STROBE 6

LAMP STROBE 7

LAMP STROBE 8

LAMP ROW 1

LAMP ROW 2

LAMP ROW 3

LAMP ROW 4

LAMP ROW 5

LAMP ROW 6

LAMP ROW 7

LAMP ROW 8

LAMP GND RETURN

TO/FROM SHEET 2

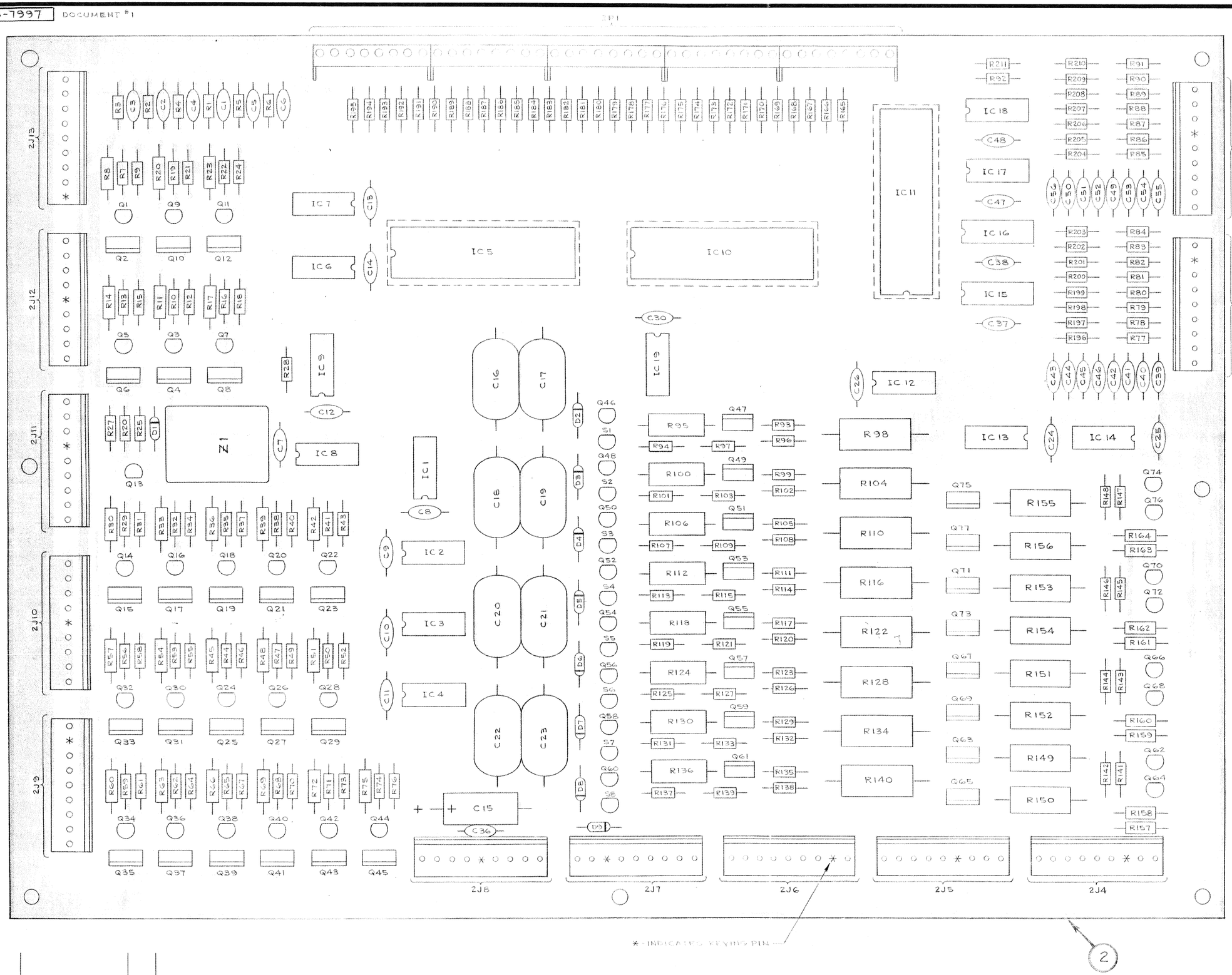
SHEET 1 OF 2

REVISION LETTER	REVISION	BY
C 10-28-77	2P1's WAS P's, 2J2's WAS A's, 2J3's WAS B's, 2J4's WAS C's, 2J5's WAS D's, 2J6's WAS E's 2J7's WAS F's, & ADDED CIRCLES TO ALL 2N6122 & TIP42 TRANSISTOR & "TO/FROM SHEET 2"	R. GAF
B 8-25-77	DELETED +5V LEAD & ADDED VOLT LAMP Vcc LEAD TO R93-R95, R99-R101, R106-R107, R111-R113, R117-R119, R123-R125, R129-R131 & R135-R137	R GAF
A 8-16-77	REDUCE POWER SUPPLY CURRENT	D.L.P

TOLERANCES UNLESS OTHERWISE SPECIFIED		WILLIAMS ELECTRONIC MFG. CORP. SUBSIDIARY OF THE BEBURNE CORP.	
FRACTIONS	± 1/64	3401 N. CALIFORNIA CHICAGO 18, ILL.	CORNELIA 7-2240
DECIMALS	± .005	NAME SCHEMATIC, DRIVER BOARD	
HOLES	+ .002 − .000	MATERIAL	HEAT TREATMENT / FINISH
ANGULAR	± 1/2°	DWN. WJE	DATE 11-77 APP'D.
		SCALE	D-7997

Q'TY | ASSEMBLE ON

D-7997 DOCUMENT #1



BILL OF MATERIAL

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
1	IP-7001-131		P.C. DRIVER BOARD	1
2	5A-8948	IC9, IC0	N7402 QUADRUPLE 2 INPUT POSITIVE NOR GATE	2
3	5A-8974	IC12, IC17 IC18, IC19	N7406 HEX. INVERTER BUFFER DRIVERS W/OPEN COLLECTOR HIGH VOLTAGE OUTPUTS	4
4	5A-8975	IC1 THRU IC4, IC6, IC7, IC13, IC14	N7408 QUADRUPLE 2 INPUT POSITIVE AND GATE	8
5	5A-8975	IC15, IC16	MC14049 INVERTING HEX. BUFFER	2
6	5A-8972	IC5, IC10, IC11	MC6820 PERIPHERAL INTERFACE ADAPTER	3
7	5A-8938	Q1, Q3, Q5, Q7, Q9, Q11, Q13, Q14, Q15, Q16, Q20, Q27, Q29, Q26, Q28, Q30, Q32, Q34, Q36, Q38, Q40, Q42, Q44	2N4401 NPN TRANSISTOR	23
8	5A-8976	Q46, Q48, Q50, Q52, Q54, Q56, Q58, Q60, Q62, Q64, Q66, Q68, Q70, Q72, Q74, Q76	2N6427 DARLINGTON NPN TRANSISTOR	16
9	5A-8977	Q2, Q4, Q6, Q8, Q10, Q12, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45	TIP120 DARLINGTON NPN POWER TRANSISTOR	22
10	5A-8978	Q63, Q65, Q67, Q69, Q71, Q73, Q75, Q77	TIP42 PNP POWER TRANSISTOR	8
11	5A-8979	Q47, Q49, Q51, Q53, Q55, Q57, Q59, Q61	2N6122 NPN POWER TRANSISTOR	8
12	5A-6258	D1	IN4001 DIODE	1
13	5A-8913	D2 THRU D9	IN4148 DIODE	8
14	5A-9014	S1 THRU S8	2N5060 SCR	8
15	5A-8980	C1 THRU C14, C24 THRU C26, C30, C32, C35, C47, C48	.01 MFD. (+80-20%) CERAMIC CAPACITOR (50V.)	22
16	5A-8995	C16 THRU C23	.1 MFD. (10%) POLYESTER FILM CAPACITOR	18
17	5A-9065	C39 THRU C46, C49 THRU C56	470 PFD. (20%) CERAMIC CAPACITOR 50 V.	16
18	5A-8986	C15	100 MFD. ELECTROLYTIC CAPACITOR (10 V.)	1
19	5A-8996	C36	.1 MFD. (+80-20%) CERAMIC CAPACITOR (50 V.)	1
20	5A-8991	R1 THRU R6, R27, R37 THRU R92, R157 THRU R195	4.7K OHM RESISTOR 10% 1/4 WATT	62
21	5A-8983	R28	3.3K OHM RESISTOR 10% 1/4 WATT	1
22	5A-8984	R93, R97, R102, R103, R108, R109, R114, R115, R120, R121, R126, R127, R132, R133, R138, R139, R196 THRU R211	1K OHM RESISTOR 10% 1/4 WATT	32
23	5A-8992	R7, R10, R13, R16, R19, R22, R29, R32, R35, R38, R41, R44, R47, R50, R53, R56, R59, R62, R65, R68, R71, R74	560 OHM RESISTOR 10% 1/4 WATT	22
24	5A-8993	R8, R11, R14, R17, R20, R23, R30, R33, R36, R39, R42, R45, R48, R51, R54, R57, R60, R63, R66, R69, R72, R75.	68 OHM RESISTOR 10% 1/2 WATT	22
25	5A-8987	R9, R12, R15, R18, R21, R24, R25, R31, R34, R37, R40, R43, R46, R49, R52, R55, R58, R61, R64, R67, R70, R73, R76	2.7 K OHM RESISTOR 10% 1/4 WATT	23
26	5A-8817	R26	10 K OHM RESISTOR 10% 1/4 WATT	1
27	5A-8998	R141 THRU R148	2.2K OHM RESISTOR 10% 1/4 WATT	8
28	5A-8999	R149 THRU R156	27 OHM RESISTOR 10% 2 WATT	8
29	5A-9084	R95, R100, R106, R112, R118, R124, R130, R136	100 OHM RESISTOR 10% 3 WATT	8
30	5A-9085	R94, R99, R105, R111, R117, R123, R129, R135	1.5 K OHM RESISTOR 10% 1/4 WATT	8
31	5A-9087	R98, R104, R110, R116, R122, R128, R134, R140	.4 OHM WIREWOUND RESISTOR, 10% 3 WATT	8
32	5A-8994	Z1	RELAY - 4 POLE - 5 AMP. CONTACTS 6 V.D.C. 40 OHM COIL	1
33	5A-9066	PR1 THRU PR5	8 PIN RECEPTACLE	5
34	5A-9067	PH1 THRU PH12	9 PIN HEADER	12
35	5A-8985	PS1 THRU PS3	40 PIN I.C. SOCKET	3
36	5A-9086	R94, R101, R107, R113, R119, R125, R131, R137	6.8 K OHM RESISTOR 10% 1/4 WATT	8

REVISION LETTER	REVISION	BY

QTY	ASSEMBLE ON

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/64
DECIMALS ± .005
HOLES + .002 − .000
ANGULAR ± 1/2°

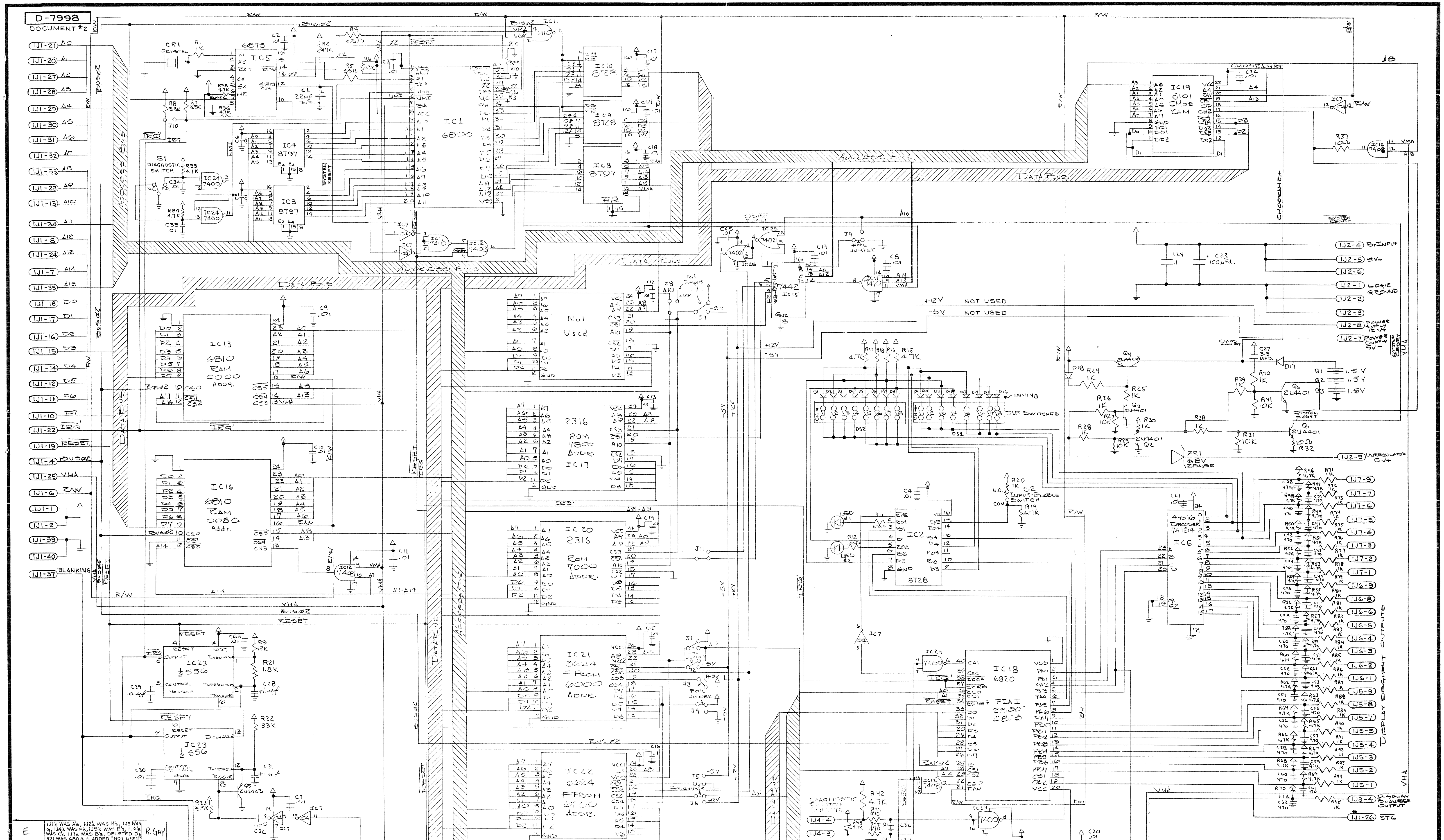
WILLIAMS ELECTRONIC MFG. CORP.
SUBSIDIARY OF THE BALLY MFG. CORP.
3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-2240

NAME DRIVER BOARD ASSEMBLY

MATERIAL	HEAT TREATMENT	FINISH

DWN.	DATE	APP'D.	SCALE	
	8-16-77		2:1	D-7997

D-7998
DOCUMENT #2



REVISION LETTER	REVISION	BY
E	1J1's WAS A's, 1J2's WAS H's, 1J3 WAS G, 1J4's WAS F's, 1J5's WAS E's, 1J6's WAS C's 1J7's WAS B's, DELETED D's R21 WAS 680Ω & ADDED "NOT USED" TO +12V. & -5V. DELETE C25, C26	R. GAY
D	R22 WAS 10K 9-7-77	R. GAY
C	REVISED WIRE LEAD TO #21 OF IC6 & #4 OF IC 18, WAS #23 OF IC6 & #2 OF IC 18. 9-6-77	R. GAY
B	ADDED C65 & IC25 8-25-77	R. GAY
A 8-24-77	REVISION "A"	

Q'T'Y	ASSEMBLE ON

TOLERANCES
UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/64
DECIMALS ± .005
HOLES + .002 − .000
ANGULAR ± 1/2°

WILLIAMS ELECTRONIC MFG. CORP.
SUBSIDIARY OF THE SEEBURG CORP
3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-2240

NAME SCHEMATIC, CPU BOARD

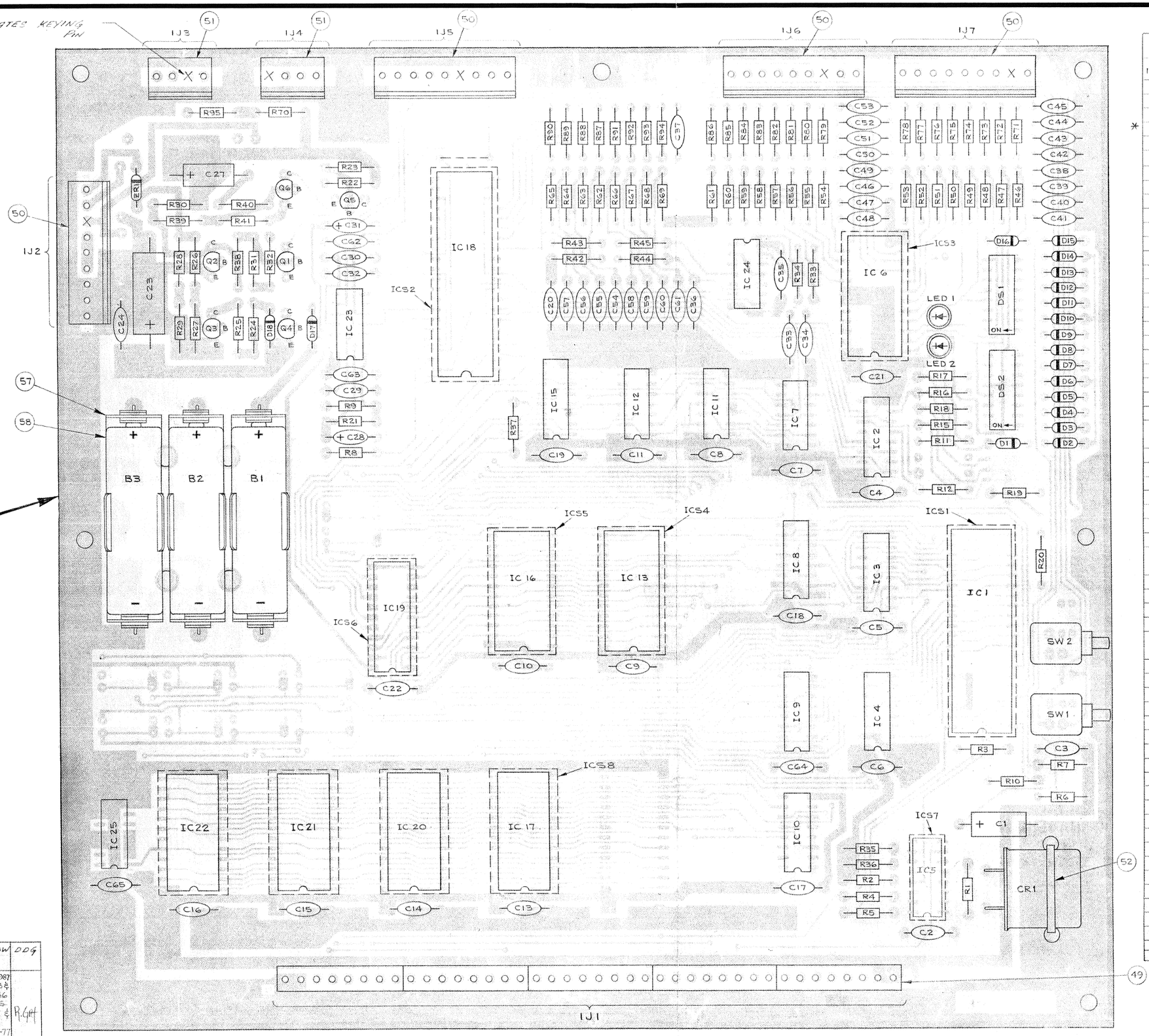
MATERIAL | HEAT TREATMENT | FINISH

DWN. WJB | DATE 7-8-77 | APP'D. | SCALE | D-7998

A-8017

DOCUMENT #1

X INDICATES KEYING PIN



REVISION LETTER	REVISION	BY
B	ADD IC1, IC5, SHOW KEYING PINS. REMOVE C25, C26.	DDG
A	DELETED ITEM #1, PT. # 5A-8987 & ITEM #4 PT. # 5A-8988 & ADDED ITEMS #55, #56 & #57, ITEM #15 WAS 7400 QUAD 2 INP. NOR & ITEM #30 WAS CAP. TANT. .1 MFD. 25 V. 10-25-77	R.GM

BILL OF MATERIAL

ITEM NO	PART NO.	PART DESIGNATION	DESCRIPTION
1			
2	5A-8990	IC2, IC9, IC10	8T28 QUAD BUFFER/REC'V'R.
3	5A-8989	IC3, IC4, IC8	8T97 HEX. TS BUFFER
4	5A-9015	IC21, IC22	PROM 512 X 8 7641/6341
5	5A-9010	IC6	74154 4 TO 16 DECODER
6	5A-9013	IC7	7404 HEX. INVERTER
7	5A-9011	IC11	7410 TRIPLE 3 INP. NAND
8	5A-8973	IC12	7408 QUAD AND
9	5A-9003	IC13, IC16	MC6810 RAM
10	5A-9012	IC15	7442 BCD-DEC DECODER
11	5A-8972	IC18	MC6820 PIA
12	5A-9017	IC19	CMOS RAM 5101
13	5A-9002	IC23	MC3456/556 DUAL TIMER
14	5A-9073	IC24	7400 QUAD 2 INP. NAND
15	5A-	IC25	7402 QUAD 2 INP. NOR
16	5A-9018	ZR1	IN5996 ZENER DIODE
17	5A-8919	D1 THRU D18	IN4148 DIODE, SILICON
18	5A-8938	Q1, Q2, Q3, Q6	2N4401 TRANSISTOR
19	5A-9016	Q4, Q5	2N4403 TRANSISTOR, PNP
20	5A-9025	DS1, DS2	8 STN DIP SWTCH
21	5A-9019	LED1, LED2	LED, RED
22	5A-9024	SW1, SW2	SWITCH, SPDT MOMENTARY
23	5A-9020	CR1	CRYSTAL, 3.58 MHZ
24	5A-9009	C1	CAP, TANT., 22 MFD. 10% 10V.
25	5A-8980	C2-C11, C13-C22, C29, C30, C33-C37, C63-C65	CAP., CERAMIC, .01 MFD. 50 V.
26	5A-8986	C23	CAP, ELECT., 100 MFD. 10 V.
27	5A-8996	C24	CAP, CERAMIC, .1 MFD. 50 V.
28	5A-9023	C27	CAP, TANT., 3.3 MFD. 10 V.
29	5A-9029	C28	CAP, TANT., .1 MFD. 10 V.
30	5A-9031	C31	CAP., TANT., 1 MFD. 25 V.
31	5A-9030	C32	CAP, CERAMIC, .047 MFD. 50V.
32	5A-9065	C38 THRU C62	CAP., CERAMIC, 470 PFD. 50V.
33	5A-8984	R1, R20, R24-R26, R28, R30, R38-R40, R71-R95	RES., FC, 1K 10% ¼ W.
34	5A-9035	R2	RES., FC, 47K 10% ¼ W.
35	5A-9040	R3, R4, R5	RES., FC, 33 OHM. 10% ¼ W.
36	5A-8983	R6-R8, R10, R23	RES., FC, 3.3K 10% ¼ W.
37	5A-9036	R11, R12	RES., FC, 100 OHM. 10% ¼ W.
38	5A-8991	R15-R19, R33-R36, R42, R43, R46-R70	RES., FC, 4.7K 10% ¼ W.
39	5A-9111	R21	RES., FC, 1.8K 2% ¼ W.
40	5A-9034	R27, R29, R31, R41	RES., FC, 10K 5% ¼ W.
41	5A-9032	R9	RES., FC, 12K 2% ¼ W.
42	5A-9039	R32, R37	RES., FC, 10 OHM. 10% ¼ W.
43	5A-9083	R44, R45	RES., FC, 470 OHM. 10% ¼ W.
44	5A-	R22	RES., FC, 33K 5% ¼ W.
45	5A-8985	ICS1, ICS2	40 PIN IC SOCKET
46	5A-9004	ICS3, ICS4, ICS5	24 PIN IC SOCKET
47	5A-9005	ICS6	22 PIN IC SOCKET
48	5A-9006	ICS7	16 PIN IC SOCKET
49	5A-9026	5-REQ'D.	HEADER 09-64-1088
50	5A-9027	4-REQ'D.	HEADER 09-65-1091
51	5A-9028	2-REQ'D.	HEADER 09-65-1041
52	5A	1-REQ'D.	TIE WRAP
53	18-2001-133-1		P.C. BOARD
54	5A-9004	ICS8 (QTY:4)	24 PIN IC SOCKET
55	5A-9008	IC17	ROM 2K X 8 UPPER
56	5A-9007	IC20	ROM 2K X 8 LOWER
57	5A-9021	QTY. -1	BATTERY HOLDER #171
58	5A-9022	B1, B2, B3	BATTERY, ALKALINE, 1.5 V.
59	5A-8987	IC-1	MC6800 MPU
60	5A-8988	IC-5	MC6875 CLOCK CHIP

* FOR INFO ONLY, NOT PART OF ASSEMBLY

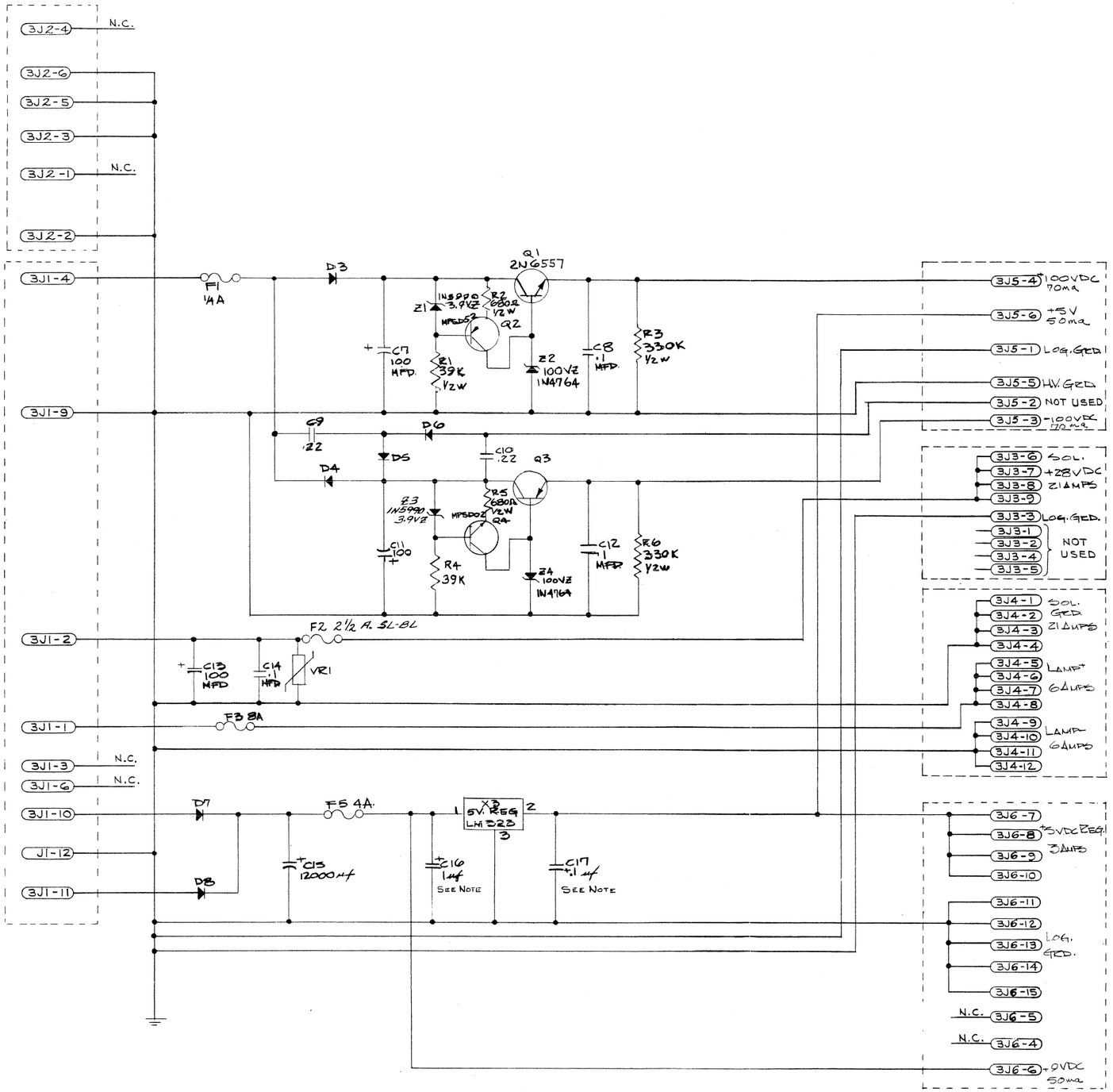
QTY	ASSEMBLE ON

TOLERANCES UNLESS OTHERWISE SPECIFIED	WILLIAMS ELECTRONIC MFG. CORP. SUBSIDIARY OF THE SEEBURG CORP.	
FRACTIONS ± 1/64	3401 N. CALIFORNIA CHICAGO 18, ILL.	CORNELIA 7-2240
DECIMALS ± .005	NAME C.P.U. ASSEMBLY	
± .002	MATERIAL	HEAT TREATMENT / FINISH
HOLES - .000		
ANGULAR ± 1/2°	DWN. R.GM DATE 9-16-77 APP'D.	SCALE 2:1 D-7998

D-7999
DOCUMENT #2

3J2 6 PIN
GRID HEADER

3J1 12 PIN
GRID HEADER



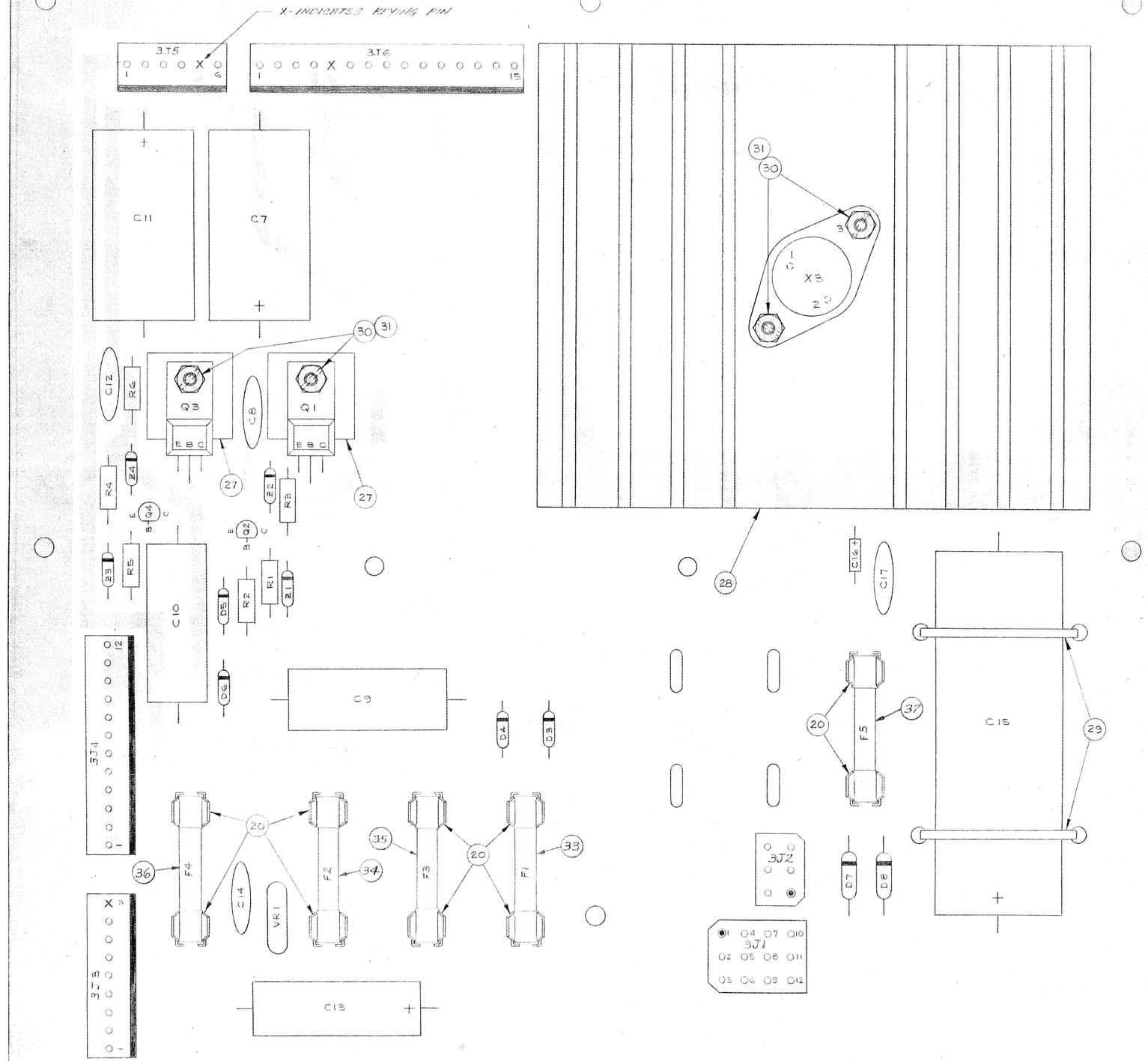
NOTE
1. C-16 AND C17 MUST BE LOCATED AS CLOSE TO REGULATOR AS POSSIBLE.

REVISION LETTER	REVISION	BY
E	DELETED F4 15A & G.3 RET. LEAD FROM 3J1-3 TO 3J3-4,5, 6.3 VAC 2 AMP LEAD FROM 3J1-6 TO 3J3-1, 2 & IN 3J5-2 "NOT USED" WAS -300 VDC.	R. GAT 4-13-78
D	3J5 WAS 3J2, 3J6 WAS 3J5, 3J2 WAS 3J6 AND CHANGED F2 FROM 10A. TO 2½ A SL-BL	D.D.G 11-18-77
C	3J1's WAS J1's, 3J2's WAS J2's, 3J3's WAS J3's, 3J4's WAS J4's, 3J5's WAS J5's 3J6's WAS J6's & DELETED C1-500 µf, C2-100 µf, C3-.1 µf, C4-500 µf, C5 100µf, C6.1 µf, D1, D2, F6-¾ A. F7-¾ A. MC7812 & MC7905	R. GAT 10-28-77
B	IN J6, *4 WAS *3, *6 WAS *1 *5 WAS *2, *3 WAS *4, *1 WAS *6 & *2 WAS *5 & IN J3 *2 WAS *12 & *5 WAS *15 9-14-77	R.G.
8-17-77	IDENTIFY PROTO SECT	DRP

TOLERANCES UNLESS OTHERWISE SPECIFIED		WILLIAMS ELECTRONIC MFG. CORP. SUBSIDIARY OF THE SEEBURG CORP.		QTY	ASSEMBLE ON
FRACTIONS	± 1/64	3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-2240			
DECIMALS	± .005	NAME SCHEMATIC, POWER SUPPLY BOARD			
HOLES	+ .002 − .000	MATERIAL	HEAT TREATMENT	FINISH	
ANGULAR	± 1/2°	DWN. WVR	DATE 12-4-77 APP'D.	SCALE	D-7999

D7990

DOCUMENT #1



BILL OF MATERIAL

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION
1	5A-9049	X3	3 AMP. 5 VOLT POSITIVE VOLTAGE REGULATOR
2	5A-9057	Q1	TRANSISTOR NPN TO202
3	5A-9055	Q2	TRANSISTOR PNP MPSD52
4	5A-9058	Q3	TRANSISTOR PNP TO202
5	5A-9056	Q4	TRANSISTOR NPN MPSD02
6	5A-9054	D3 THRU D6	DIODE IN4004
7	5A-9045	D7, D8	DIODE MR500
8	5A-9059	Z1, Z3	ZENER DIODE IN5990
9	5A-9060	Z2, Z4	ZENER DIODE IN4764
10	5A-9064	VR1	VARISTOR
11	5A-9062	R1, R4	RESISTOR 39 K Ω 1/2 W.
12	5A-9061	R2, R5	RESISTOR 680 Ω 1/2 W.
13	5A-9069	R3, R6	RESISTOR 330 K Ω 1/2 W.
14	5A-9053	C7, C11	CAPACITOR 100 MFD. 150 VDC.
15	5A-9070	C13	CAPACITOR 100 MFD. 100 VDC.
16	5A-9046	C15	CAPACITOR 12,000 MFD. 16 VDC.
17	5A-9072	C8, C12, C14, C17	CAPACITOR .1 MFD. 500 VDC.
18	5A-9047	C9, C10	CAPACITOR .22 MFD. 400 VDC.
19	5A-9031	C16	CAPACITOR 1 MFD 25 VDC.
20	5A-9052	10-REQ'D.	FUSEHOLDER
21	5A-9068	J1	12 PIN CONNECTOR
22	5A-9038	J2	6 PIN HEADER CONNECTOR
23	5A-9027	J3	9 PIN HEADER CONNECTOR
24	5A-9043	J4	12 PIN HEADER CONNECTOR
25	5A-9074	J5	15 PIN HEADER CONNECTOR
26	5A-9067	J6	6 PIN CIRCUIT CONNECTOR
27	5A-9042	2-REQ'D.	HEAT SINK
28	5A-9041	1-REQ'D.	4" X 4 1/2 HEAT SINK
29		2-REQ'D.	TIE WRAP
30		4-REQ'D.	5-40 X 7/16 R.H. MECH. SCREW
31		4-REQ'D.	5-40 HEX. NUT
32	ID-2001-134	1-REQ'D.	P.C. BOARD
33	5A-6761	F1	S.B. FUSE 1/4 AMP.
34	5A-9128	F2	S.B. FUSE 2 1/2 AMP.
35	5A-9071	F3	FUSE 8 AMP
36	5A-6567	F4	FUSE 15 AMP.
37	5A-6314	F5	S.B. FUSE 4 AMP.

REVISION LETTER	REVISION	BY
G	ADD FUSES, CHANGE CONNECTOR NUMBERS	D.D.G
F	INTERCHANGED ITEMS #30 & #31, ADDED "MPSD52" TO ITEM #3, "MPSD02" TO ITEM #5, "IN4004" TO ITEM #6 "MR500 TO ITEM #7 "IN5990 TO ITEM #8 & "IN4164 TO ITEM #9, ITEM #11 WAS 39 Ω 1/2 W. SPELLED "CAPACITOR CORRECTLY. 10-24-77	R.G.M
E	REVISED TO CALLOUT 110's. PROPERLY 9-14-77	R.G.M
D	REDRAWN & REVISED E/M. 9-13-77	R.G.M

Q'TY	ASSEMBLE ON

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/64
DECIMALS ± .005
HOLES + .002 - .000
ANGULAR ± 1/2°

WILLIAMS ELECTRONIC MFG. CORP.
SUBSIDIARY OF THE SEEBURG CORP.
3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-22

NAME POWER SUPPLY ASSEMBLY

MATERIAL | HEAT TREATMENT | FINISH

DWN. D.D.G | DATE 9-15-77 | APP'D. | SCALE 2:1

D-7999

D-8000
DOCUMENT #2

STROBE 8 — 4J5-2
STROBE 7 — 4J5-3
STROBE 14 — 4J5-14
STROBE 13 — 4J5-16
STROBE 12 — 4J5-17
STROBE 11 — 4J5-13
STROBE 10 — 4J5-12
STROBE 9 — 4J5-15
STROBE 16 — 4J5-4
STROBE 15 — 4J5-5
STROBE 6 — 4J5-11
STROBE 5 — 4J5-10
STROBE 4 — 4J5-9
STROBE 3 — 4J5-8
STROBE 2 — 4J5-7
STROBE 1 — 4J5-6
4J5-1 N.C.
4J5-18 N.C.

IC1, IC2, IC3 — 14069 — C5, C6, C7 .01

* USE EITHER IC6 & IC7 OR IC5 & IC8 (DO NOT INTERMIX OR USE ALL FOUR AT THE SAME TIME).

IC5 MC14543 — C1 .01
IC6 MC14558 — C2 .01
IC7 MC14558 — C3 .01
IC8 MC14543 — C4 .01

4J7-1 CATHODE KEEP ALIVE (-100 V.D.C.)
4J7-2 +100 V.
4J7-3 +5 V.D.C.
4J7-4 N.C.
4J7-5 GND
4J7-6 -100 V.

BCD SEG. DATA
A1 — 4J6-5
B1 — 4J6-1
C1 — 4J6-2
D1 — 4J6-4
A2 — 4J6-9
B2 — 4J6-6
C2 — 4J6-7
D2 — 4J6-8
BLANKING — 4J6-3

IC1 14069

IC4 6184 — NE585 — +100V.
IC13 6184 — NE585 — +100V.
IC12 6184 — NE585 — +100V.
IC11 6184 — NE585 — +100V.

ZR1 — R22 270K

GD1 — NOT USED — 31/33 — 25/27 — NOT USED — 9/13 — 3/5
R15 3 MEG.

IC9 7180 — IC10 7180 — -100 V.
R1 R2 R3 R4 R5 R6 R7 — ALL 10K
R20 91K — R21 91K — NE584

R16 3 MEG. — R17 3 MEG. — R18 3 MEG. — R19 3 MEG.

4J4-5 UNITS
4J4-9 10's
4J4-10 100's
4J4-12 1,000's
4J4-13 10,000's
4J4-14 100,000's
PLAYER #4
4J4-7 a
4J4-6 b
4J4-3 c
4J4-1 d
4J4-2 e
4J4-5 f
4J4-4 g
SEGMENTS
4J4-15 CATHODE KEEP ALIVE
4J4-11 KEY

4J3-8 UNITS
4J3-7 10's
4J3-2 100's
4J3-3 1,000's
4J3-5 10,000's
4J3-6 100,000's
PLAYER #3
4J3-9 a
4J3-10 b
4J3-13 c
4J3-15 d
4J3-14 e
4J3-11 f
4J3-12 g
SEGMENTS
4J3-1 CATHODE KEEP ALIVE
4J3-4 KEY

4J2-2 UNITS
4J2-3 10's
4J2-4 100's
4J2-5 1,000's
4J2-14 10,000's
4J2-15 100,000's
PLAYER #2
4J2-13 a
4J2-12 b
4J2-8 c
4J2-6 d
4J2-7 e
4J2-11 f
4J2-10 g
SEGMENTS
4J2-1 CATHODE KEEP ALIVE
4J2-9 KEY

4J1-1 UNITS
4J1-2 10's
4J1-3 100's
4J1-4 1,000's
4J1-5 10,000's
4J1-7 100,000's
PLAYER #1
4J1-8 a
4J1-9 b
4J1-12 c
4J1-14 d
4J1-13 e
4J1-10 f
4J1-11 g
SEGMENTS
4J1-15 CATHODE KEEP ALIVE
4J1-6 KEY

REVISION LETTER	REVISION	BY
F	4J1-15, 4J2-1, 4J3-1 4J4-15 & 4J7-1 WAS "KEEP ALIVE (-100 V.D.C."	R.GAY
E	REVISED STROBE CONNECTOR	R.G.
D	CHANGE CONNECTOR DESIGNATIONS	DDG
C	4J1's WAS A's, 4J2's WAS B's 4J3's WAS C's, 4J4's WAS D's, 4J5's WAS E's, 4J6's WAS F's, 4J7's WAS G's, IN PLAYERS #1 THRU #4, UNITS WAS 100,000's, 10's WAS 10,000's, 100's WAS 1,000's, 1,000's WAS 100's, 10,000's WAS 10's & 100,000's WAS UNITS, ADDED "A" EACH DIGIT & "NOT USED" & DELETED "BLANK" 10-28-77	R.GAY
B	REDRAWN & REVISED 8-24-77	R.GAY

Q'TY	ASSEMBLE ON

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/64
DECIMALS ± .005
+ .002
HOLES — .000
ANGULAR ± 1/2°

WILLIAMS ELECTRONIC MFG. CORP.
SUBSIDIARY OF THE BEEBURG CORP.
3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-2240

NAME SCHEMATIC, MASTER DISPLAY BD.
MATERIAL — HEAT TREATMENT — FINISH

DWN. R.GAY — DATE 9-26-77 — APP'D. — SCALE — D-8000

DOCUMENT #1

NOTES:

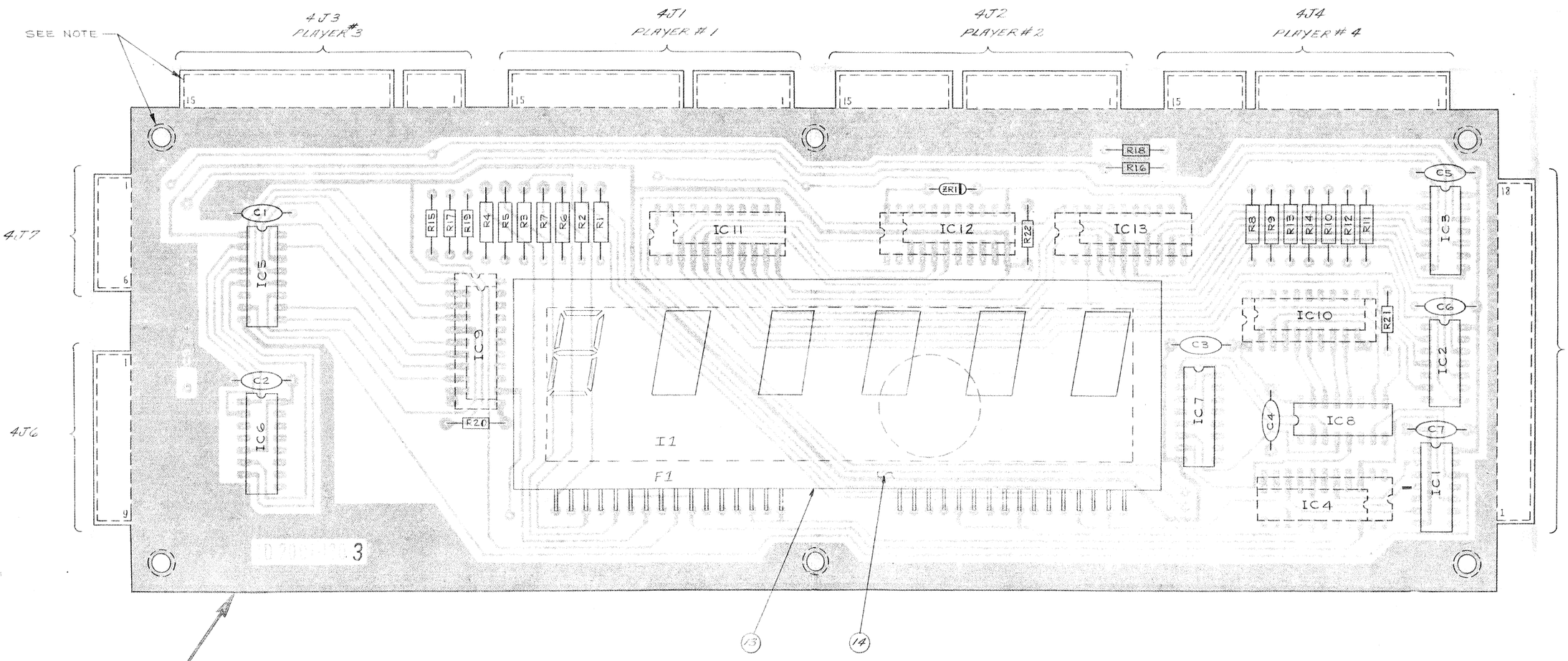
DASHED LINES DENOTE EDGE CONNECTORS AND MOUNTING HOLES TO BE PROTECTED DURING SOLDERING.

*-USE EITHER ITEM #3 (IC5 & IC8) OR ITEM #4 (IC6 & IC7).

**-FOR CAPACITORS C1 THRU C4, USE EITHER C1 AND C4 WITH IC5 & IC8 OR C2 AND C3 WITH IC6 & IC7.

BILL OF MATERIAL

	ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION
	1	10-2001-130	PC1	MASTER DISPLAY P.C. BOARD
	2	5A-8971	IC1, IC2, IC3	MC14069 HEX. INVERTER
*	3	5A-8970	IC5, IC8	MC14543 BCD TO SEVEN SEGMENT LATCH/DECODER/DRIVER
*	4		IC6, IC7	MC14558 BCD TO SEVEN SEGMENT DECODER
	5	5A-8969	IC9, IC10	UDN-7180 OR NE584 GAS DISCHARGE DISPLAY SEGMENT DRIVERS
	6	5A-8968	IC4, IC11 IC12, IC13	UDN-6184 OR NE585 GAS DISCHARGE DISPLAY DIGIT DRIVERS
	7	5A-8981	R1 THRU R14	RES., FC., 10 K OHM. ±10% ½ W.
	8	5A-8982	R15 THRU R19	RES., FC., 3 MEG OHM. ±10% ¼ W.
	9	5A-9119	R20, R21	RES., FC., 91K OHM. ±10% ¼ W.
	10	5A-9120	R22	RES., FC., 270 K OHM. ±10% ¼ W.
	11	5A-9118	ZR1	IN6000 ZENER DIODE 10V-5%
**	12	5A-8980	C1 THRU C7	CAP., CERAMIC, .01 MFD. +80-20%
	13	5A-8966	I1	6 DIGIT DISPLAY
	14	23A-6534	F1	DISPLAY MTG. ADHESIVE FOAM



REVISION LETTER	REVISION	BY
A	CORRECT CONNECTOR DESIGNATIONS, ADD:- DISPLAY AND FOAM TAPE TO B/M	D.D.G

TOLERANCES UNLESS OTHERWISE SPECIFIED		Q'TY	ASSEMBLE ON
FRACTIONS	± 1/64		
DECIMALS	± .005		
	+ .002		
HOLES	- .000		
ANGULAR	± 1/2°		

WILLIAMS ELECTRONIC MFG. CORP.
SUBSIDIARY OF THE SEEBURG CORP.
3401 N. CALIFORNIA CHICAGO 18, ILL. CORNELIA 7-2240

NAME MASTER DISPLAY ASSEMBLY

MATERIAL | HEAT TREATMENT | FINISH

DWN. R.G.H | DATE 9-27-77 | APP'D. | SCALE 2:1 | D-8000