FIREPOWER

CPU Board Assembly Drawing (System 6)

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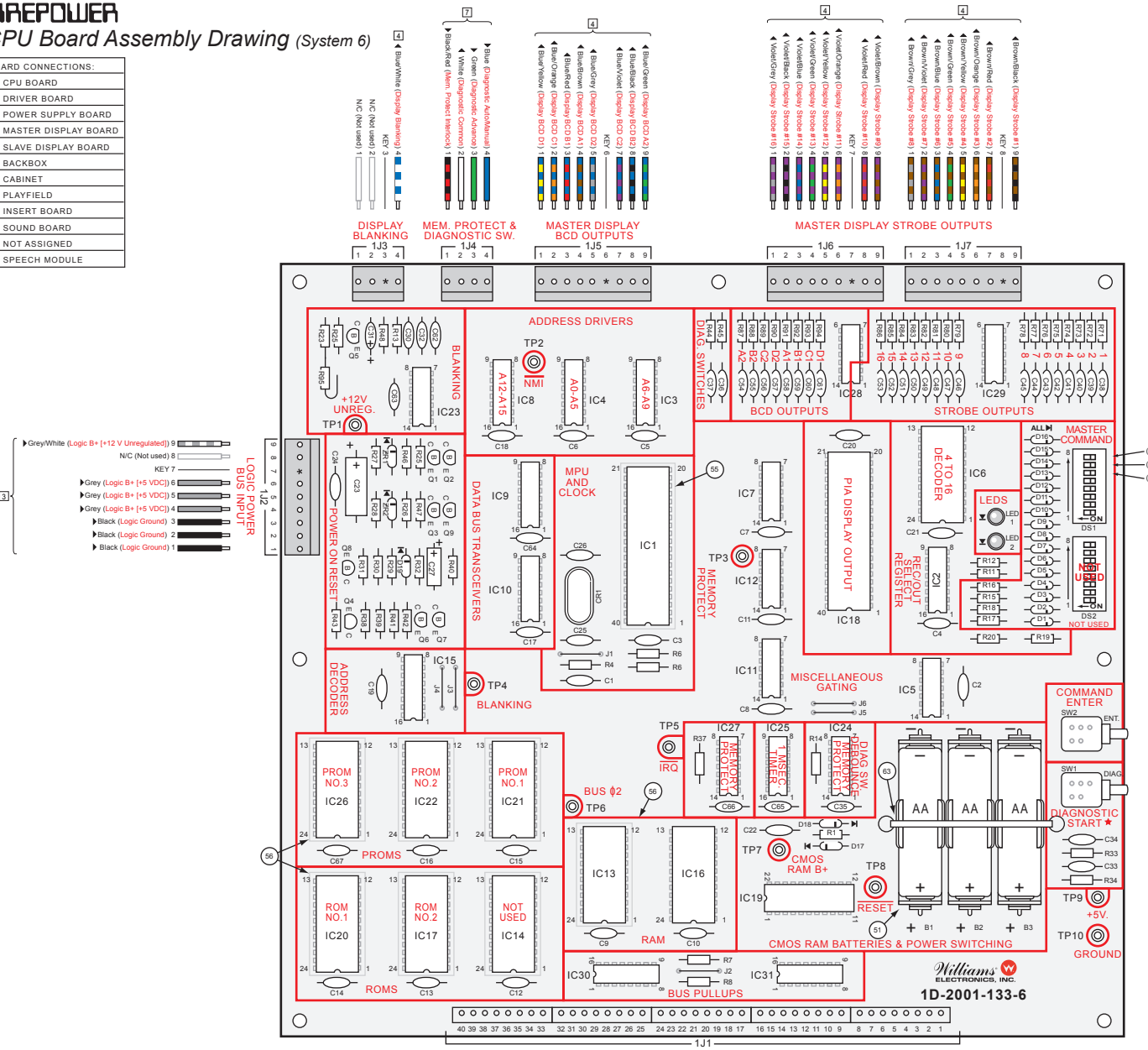
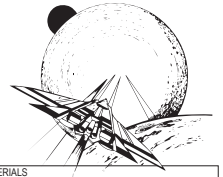
BOARD CONNECTIONS:
1 CPU BOARD
2 DRIVER BOARD
3 POWER SUPPLY BOARD
4 MASTER DISPLAY BOARD
5 SLAVE DISPLAY BOARD
6 BACKBOX
7 CABINET
8 PLAYFIELD
9 INSERT BOARD
10 SOUND BOARD
11 NOT ASSIGNED
12 SPEECH MODULE





TP1	+12V. UNREG	
TP2	NMI	+5V. / 0V. / DIAGNOSTIC SWITCH DEPRESSED
TP3	MEMORY PROTECT	+5V. / 0V. / INTERLOCK CLOSED / INTERLOCK OPEN
TP4	BLANKING	+5V. / 0V. / NORMAL OPERATION / BLANKING
TP5	IRQ	+5V. / 0V. / 30µS / 1MS / DIAGNOSTIC SWITCH DEPRESSED
TP6	BUS 02	+5V. / 0V. / 1.1µS
TP7	CMOS RAM B+	POWER ON 4.3V. POWER OFF 3.9V.
TP8	RESET	1MS / POWER TURN ON / +5V. / 0V.
TP9	+5V.	
TP10	GND	

With 6802 for IC1, IC13 may be removed and MPU internal RAM enabled by adding R4 and removing Jumper J1.

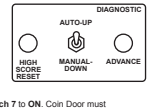
When IC14 game ROM is used in place of PROMs, Jumper J3 must be connected and J4 removed (IC14 address 6000_{16}). When IC14 game ROM and PROMs are used Jumper J4 must be connected and J3 removed (IC14 address 6800_{16}).

BILL OF MATERIALS

ITEM NO.	PART No.	PART DESIGATION	DESCRIPTION	REQ'D NO.
1	1-B-2001-133-6		BARE P.C. BOARD	1
2	5A-8990	IC2, IC9, IC10	8T28 QUAD BUFFER/RECEIVER	3
3	5A-8989	IC3, IC4, IC8	8T97 HEX. TS BUFFER	3
4	5A-9010	IC6	74154 4 TO 16 DECODER	1
5	5A-9013	IC7	7404 HEX INVERTER	1
6	5A-9235	IC11	74LS10 TRIPLE 3 INPUT NAND	1
7	5A-8973	IC12	7408 QUAD AND	1
8	5A-9003	IC13, IC16	MC6810 RAM	2
9	5A-9246	IC15	74LS139 DUAL 2 TO 4 DECODER	1
10	5A-____	IC17	ROM 2K x 8 LOWER	1
11	5A-8972	IC18	MC 6820 (6821) PIA	1
12	5A-9017	IC19	CMOS RAM 5101	1
13	5A-____	IC20	ROW 2 K x 8 UPPER	1
14	5C-9002	IC23	MC3456/556 DUAL TIMER	1
15	5A-9073	IC24	7400 QUAD INPUT NAND	1
16	5A-9236	IC25	4020 CMOS 14 BIT COUNTER	1
17	5A-9237	IC27	4071 CMOS QUAD 2INPUT OR	1
18	5A-9247	IC5	74LS02 QUAD 2 INPUT NOR GATE	1
19	5A-9238	IC28, IC29	13 DIP RESISTOR/PACK, 4.7 K OHM	2
20	5A-9239	IC30, IC31	15 DIP RESISTOR/PACK, 4.7 K OHM	2
21	5B-9025	DS1, DS2	8 STN. DIP SWITCH	2
22	5A-9018	ZR1	1N5996 ZENER DIODE	1
23	5A-9240	ZR2	1N5990 ZENER DIODE	1
24	5A-8919	D1 THRU D17, D19	1N4148 DIODE, SILICON	19
25	5C-8938	Q1, Q2, Q3, Q6 THRU Q9	2N4401 TRANSISTOR	9
26	5C-9016	Q4, Q5	2N4403 TRANSISTOR	2
27	5A-9020	CR1	CRYSTAL, 3.58 MHZ	1
28	5B-8984	R20, R25, R26, R48, R71 THRU R94	RESISTOR, FC, 1 K OHM 10% ¼ W.	28
29	5B-8983	R2, R6, R7, R8, R23, R30	RESISTOR, FC, 3.3 K OHM 10% ¼ W.	6
30	5B-8991	R4, R13 THRU R19, R33, R34, R41	RESISTOR, FC, 4.7 K OHM 10% ¼ W.	11
31	5A-9033	R1	RESISTOR, FC, 680 OHM 5% ¼ W.	1
32	5B-9036	R11, R12, R42	RESISTOR, FC, 100 OHM 10% ¼ W.	3
33	5B-9113	R22, R40	RESISTOR, FC, 33 K OHM 5% ¼ W.	2
34	5B-9034	R27, R28	RESISTOR, FC, 10 K OHM 10% ¼ W.	2
35	5A-9241	R29, R38, R46, R47	RESISTOR, FC, 22 K OHM 10% ¼ W.	4
36	5A-8998	R31	RESISTOR, FC, 2.2 K OHM 10% ¼ W.	1
37	5A-9093	R32	RESISTOR, FC, 10 OHM 10% ¼ W.	1
38	5A-9242	R37	RESISTOR, FC, 300 K OHM 10% ¼ W.	1
39	5A-8997	R39, R43	RESISTOR, FC, 2.7 K OHM 10% ¼ W.	2
40	5B-9083	R44, R45	RESISTOR, FC, 470 OHM 10% ¼ W.	2
41	5A-8980	C1 THRU C21, C30, C33 THRU C37, C63 THRU C67	CAPACITOR, CERAMIC, .01 MFD. 50V.	30
42	5A-8986	C23	CAPACITOR, ELECT., 100 MFD. 10V.	1
43	5A-8996	C22, C24	CAPACITOR, CERAMIC, .1 MFD. 50V.	2
44	5A-9169	C25, C26	CAPACITOR, CERAMIC, 27 PFD. 1K V.	2
45	5A-9243	C27	CAPACITOR, TANT., 10 MFD. 10V.	1
46	5A-9031	C31	CAPACITOR, TANT., 1 MFD. 25V.	1
47	5A-9030	C32	CAPACITOR, CERAMIC, .047 MFD. 50V.	1
48	5A-9065	C38 THRU C62	CAPACITOR, CERAMIC, 470 PFD. 50V.	25
49	5A-9019	LED1, LED2	LED, RED	2
50	5A-9024	SW1, SW2	SWITCH, SPOT MOMENTARY	2
51	5A-9021		BATTERY HOLDER #171	1
52	5A-9026	1J1	HEADR 09-64-1083	5
53	5A-9028	1J3, 1J4	HEADER 09-65-1041	2
54	5A-9027	1J2, 1J5, 1J6, 1J7	HEADER 09-65-1091	4
55	5A-8985		40 PIN IC SOCKET	1
56	5A-9004		24 PIN IC SOCKET	7
57		J1 THRU J6	WIRE JUMPER 22 GRADE WIRE WITH INSULATION	6
58		TP1 THRU TP10	TERMINAL #1502-1	10
59	5A-9250	IC1	MC6808 MICROPROCESSOR	1
60	**5A-9366**	**IC14**	**FIREPOWER GAME ROM**	**1**
61	5A-9015	IC21, IC22	PROM 512 x 8 7641/6341	2 / 3
62	5A-9022	B1, B2, B3	BATTERY, ALKALINE, 1.5V.	3
63	5A-7520-1		TIE WRAP	1
64	5A-9266	D18	IN5817 DIODE	1
65	5A-9086	R95	RESISTOR, FC, 6.8 K OHM 10% ¼ W.	1

★ RESETTING AUDIT TOTALS AND ADJUSTMENTS; INITIATING AUTO-CYCLE MODE

1. In game over mode, set the alternate-action switch to **MANUAL-DOWN** and momentarily depress the **ADVANCE** pushbutton. All displays should go blank.
2. Remove the backglass and unlatch and open the insert door.
3. Set all switches on the **COMMAND ENTER** (**MASTER COMMAND**) slide switch (**DS1**) to **OFF** (move to the right).
4. Set switch on **COMMAND ENTER** switch to **ON** (move left):
   a. To zero audit totals (Functions 01-11) set **Switch 8** to **ON**.
   b. To restore factory settings and zero audit totals, set **Switch 7** to **ON**. Coin Door must remain open to restore factory settings.
   c. For Auto-Cycle Mode set **Switch 6** to **ON**.
5. Momentarily depress **COMMAND ENTER** pushbutton. The **LEDs** should blink once.
6. a. After zeroing audit totals turn game **OFF** and **ON** to return to game over mode.
   b. After restoring factory settings, turn game **OFF** and **ON** twice to return to game over mode.
   c. To initiate Auto-Cycle Mode, set alternate-action switch to **AUTO-UP** (out) and momentarily depress the **ADVANCE** pushbutton. Each cycle of this mode sequences through display digits test, flashes all multiplexed lamps 64 times and pulses each solenoid. To terminate the Auto-Cycle mode and go to game over, turn the game **OFF** and **ON**.



★ CPU BOARD SELF TEST

Successful completion of the test is indicated by the LEDs blinking twice.
Failure of a test is indicated by one or both of the LEDs lighting and staying lit.

1. With the game turned **ON** and the Coin Door **OPEN**, locate the **DIAGNOSTIC** pushbutton (**SW1**) on the right side of the CPU board. *NOTE:Should this step be performed with the coin door closed, both* **LEDs** *will stay on. This results in audit totals being zeroed, and, unless the following action is taken, game adjustments will revert to factory settings. Turn the game* **OFF** *and* **ON** *twice. Next, open the coin door and proceed with step 2.*
2. Momentarily depress the **DIAGNOSTIC** pushbutton. The **LEDs** should blink twice and all displays should go blank.
3. For the following indications of the **LEDs**, proceed as follows:
   OFF / ON — Indicates **ROM/PROM** failure; one or more of **IC17**, **IC20**, **IC21**, **IC22**, and **IC26** are faulty.
   ON / OFF — Indicates **RAM** failure (**IC13** or **IC16**).
   ON / ON — Indicates **CMOS RAM** (**IC19**) failure.
4. **If the LEDs** come on and stay on when the game is first turned **ON** or the **LEDs** remain off when the **DIAGNOSTIC** pushbutton is depressed, refer to the troubleshooting information that follows.

CPU BOARD SELF TEST *(continued)*

5. ***TROUBLESHOOTING: LEDs REMAIN ON AFTER POWER TURN-ON***
   a) Check **+5 VDC** and **Unregulated Logic B+** on CPU and Power Supply boards. If low:
      i) Check **AC input** from transformer.
      ii) Check wiring from transformer to **3P1** (Power Bus Inputs) **-10**, **-11** and **-12**.
      iii) Check **3D6** and **3D7**.
      iv) Replace Power Supply Board
   b) Turn game **OFF** and completely remove Driver Board from the backbox. Reapply power and depress the **DIAGNOSTIC** pushbutton on the CPU board. If the **LEDs** blink twice and then remain OFF, replace the Driver Board. Otherwise, replace the CPU board.
6. ***TROUBLESHOOTING: LEDs DO NOT FLASH AND REMAIN OFF WHEN DIAGNOSTIC SWITCH DEPRESSED***
   a) Turn game **OFF** and back **ON**.
   b) If problems persist, check **+5 VDC** from power supply, if ok, replace the CPU board.
7. ***TROUBLESHOOTING: INTERMITTENT OPERATION***
   a) Make checks described in number 5 above (for **LEDs** remaining on after power turn-on).
   b) Replace CPU board.
8. ***TROUBLESHOOTING: GAME COMES UP IN TEST 04 WHEN TURNED ON***
   a) Check battery voltage from the Anode of **1D17** to ground, if less than 3.9 VDC, replace batteries.
   b) Check battery voltage from Cathode of **1D17** to ground, if less than 3.2 VDC, replace diode.