

CPU JUMPER TABLE

Game	CPU* Version	ROM		Installed	Jumpers	Removed
		Location	Location			
Laser Wars	Ver 1	5C	J1b,J3,J4,J6a,J7a,&J8	J1a,J2,J5,J6,&J7b		
	Ver 2	5C	J1b,J3,J4,J5a,J6a,J7b,&J8	J1a,J2,J5,J5b,J6b,&J7a		
Secret Service	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a		
	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a		
Torpedo Alley	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a		
	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a		
Time Machine	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a		
	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a		

*Version 1 has a 2K RAM which is a 24-pin IC at location 5D.
*Version 2 has an 8K RAM which is a 28-pin IC at location 5D.

Power-up CPU Self Tests

Upon power-up, the CPU board performs a series of self tests of major components. Turn the game on while observing the LEDs on the CPU board. Tests of the PIAs, RAM, and EPROMs are performed automatically and results of the test are indicated by the PIA LED.

With all tests passed, the LEDs illuminate in the following sequence at power turn-on. The PIA and +5V LEDs illuminate immediately. Approximately 1/2-second later the PIA LED goes out and the Blanking LED illuminates; the +5V and Blanking LEDs remain illuminated until the game is turned off. Test failures are indicated with the PIA LED.

PIA LED

- Stays On
- Flashes 1 Time
- Flashes 2 Times
- Flashes 3 Times

SUSPECT COMPONENT

- One of the 6821 PIAs
- 6064 RAM at location D5.
- EPROM at location B5.
- EPROM at location C5.

QUICK REFERENCE FUSE CHART

POWER SUPPLY BOARD

- F1 5A Slo-Blo G.I. 6.3VAC
- F2 5A Slo-Blo G.I. 6.3VAC
- F3 5A Slo-Blo G.I. 6.3VAC
- F4 5A Slo-Blo G.I. 6.3VAC
- F5 5A Slo-Blo Flipper Power 48VAC
- F6 3A Slo-Blo PPB Solenoids/Flash Lamps (34VDC)
- F1 7A Slo-Blo +5VDC Regulator Input (9VAC)
- F2 7A Slo-Blo +5VDC Regulator Input (9VAC)
- F3 0.25A Slo-Blo Display Reg. Input (90VAC)
- F4 8A Slo-Blo Switched Illumination Buss (18VDC)
- F5 4A Slo-Blo Solenoid Buss (34VDC)
- F6 5A Slo-Blo Solenoid Buss (34VDC)

PPB BOARD

- Lock Ball 2
- Percent Lock Ball
- Laser Kick Scored
- Laser Kick Ball
- Left Ramp
- Right Ramp
- Mission Lit
- Mission Scored
- Pinball Lit
- Pinball Scored
- Special Scored
- Playboy 50K
- Playboy 100K
- Playboy Outlane
- Bonus Hold
- Playboy Extra Ball
- Playboy Million
- 2x Bonus
- 3x Bonus
- 4x Bonus
- 5x Bonus
- Lane Extra Ball
- 2x Scores
- 3x Scores
- 4x Scores
- 5x Scores
- Jackpot Shots
- Jackpot Average
- Ramp Average
- Drain Left
- Drain Center
- Drain Right
- Buy In Games
- Average Game Time

AUDIT FUNCTIONS

There are 69 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. Audit functions are split into two groups. There are eleven most-used audits (AU01 through AU11) in a 'quick look' group and 57 less-used audits (E AU13 through E AU69), in an 'expanded' group. The various auditing functions are summarized in the AUDITING FEATURES TABLE and, when accessed, are shown on the player score displays. The Audit Number is shown in the Player 3 Display, the Description in the Player 1 and 2 Displays, and the Audit Total in the Player 4 Display. Access and control is provided from switches located on the inside of the coin door.

To access audit functions, open the coin door and make sure that the FORWARD/REVERSE switch is in the FORWARD (up) position. Depress the STEP switch and the game name is shown in the Player 1 and 2 displays, the Player 3 display is blank, and the PROM revision level is shown in the Player 4 display. This indicates access to audit functions.

With the FORWARD/REVERSE push-button switch still in the FORWARD (up) position, depressing the STEP push-button switch advances through the audit functions one at a time. To review lower-numbered functions, set the forward/reverse push-button switch to the REVERSE (down) position and operate the STEP push-button switch.

To access expanded audits, operate the step push-button until AU12, EXPAND AUDITS is displayed. Set the choice to ON as indicated in the Player 4 display by depressing the Game Start push-button and then depress the step push-button. The request is installed and E AU13 is displayed. When you exit audits and adjustments, the AU12 setting is returned to off for the next time that a review of audits are required.

Audit totals may be reset to zero using Game Adjustment Ad17, Audits Reset. Game adjustments (Ad01 to Ad19 and E Ad20 to E Ad59) begin after the last audit function (AU12 or E AU69). Once audits functions have been recorded, and if no adjustments are required, you may return the game to the attract mode. If adjustments are required, continue pressing the STEP button until the game adjustments are reached. See Game Adjustments for details.

Audit Number (Player 3 Display)	Audit Description (Players 1 & 2 Displays; Totals in Player 4 Display)	Audit Number (Player 3 Display)	Audit Description (Players 1 & 2 Displays; Totals in Player 4 Display)
AU 01	Total Paid Credits	E AU 36	Lock Ball 2
AU 02	Free Percent	E AU 37	Percent Lock Ball
AU 03	Ball Time Average	E AU 38	Laser Kick Scored
AU 04	Coins Left	E AU 39	Laser Kick Ball
AU 05	Coins Right	E AU 40	Left Ramp
AU 06	Coins Center	E AU 41	Right Ramp
AU 07	Replay Percent	E AU 42	Mission Lit
AU 08	High Score Percent	E AU 43	Mission Scored
AU 09	Extra Ball Total	E AU 44	Pinball Lit
AU 10	Extra Ball Percent	E AU 45	Pinball Scored
AU 11	Cycles Burn In	E AU 46	Special Scored
AU 12	Expand Audits (ON/OFF)	E AU 47	Playboy 50K
AU 13	Play Total	E AU 48	Playboy 100K
AU 14	Free Total	E AU 49	Playboy Outlane
E AU 15	Replay Total	E AU 50	Bonus Hold
E AU 16	Special Total	E AU 51	Playboy Extra Ball
E AU 17	Special Percent	E AU 52	Playboy Million
E AU 18	Match Total	E AU 53	2x Bonus
E AU 19	High Score Wins	E AU 54	3x Bonus
E AU 20	Play Time (Minutes)	E AU 55	4x Bonus
E AU 21	Balls Total	E AU 56	5x Bonus
E AU 22	1 Replay Awards	E AU 57	Lane Extra Ball
E AU 23	2 Replay Awards	E AU 58	2x Scores
E AU 24	3 Replay Awards	E AU 59	3x Scores
E AU 25	4 Replay Awards	E AU 60	4x Scores
E AU 26	Games 1 Player	E AU 61	5x Scores
E AU 27	Games 2 Player	E AU 62	Jackpot Shots
E AU 28	Games 3 Player	E AU 63	Jackpot Average
E AU 29	Games 4 Player	E AU 64	Ramp Average
E AU 30	Cycles Attract Mode	E AU 65	Drain Left
E AU 31	Cycles Reset High Score	E AU 66	Drain Center
E AU 32	Enter 3 Ball	E AU 67	Drain Right
E AU 33	Unused	E AU 68	Buy In Games
E AU 34	Percent Multiball	E AU 69	Average Game Time
E AU 35	Lock Ball 1		

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GAME ADJUSTMENTS

GENERAL

There are 59 adjustable functions provided to vary difficulty of play and to periodically reset audits and the high score levels. The various game adjustments are summarized in the **Game Adjustments Table** and, when accessed, are shown on the player score displays. The **Adjustment Number** is shown in the **Player 3 Display**, the **Description** in the **Player 1 and 2 Displays**, and the setting in the **Player 4 Display**. Access and control is provided from switches located on the inside of the coin door.

Game adjustments are accessed from the audit mode. With the audits displaying game identification and the **FORWARD/REVERSE** switch in the **REVERSE (down)** position, depress the **STEP** switch and **E Ad59 (Expanded Adjustment 59)** is shown in the **Player 3 display**. **FACTORY RESET** is shown in the **Player 1 & 2 displays**, and **OFF** is shown in the **Player 4 display**. With the audits displaying **AU12 (or expanded E AU69)** and the **FORWARD/REVERSE** switch in the **FORWARD (up)** position, depress the **STEP** switch and **Ad01** is shown in the **Player 3 display**. **REPLAY MANUAL/FIXED** is shown in the **Player 1 and 2 displays**, and the setting is shown in the **Player 4 display**.

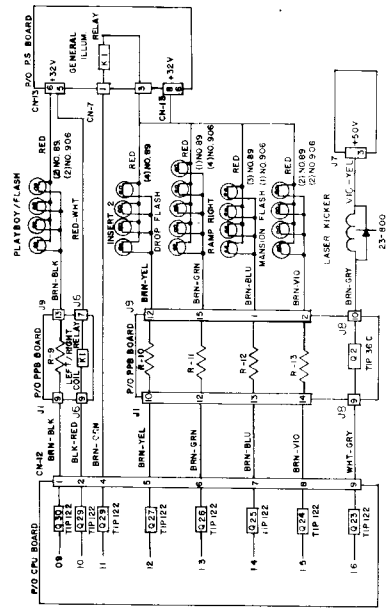
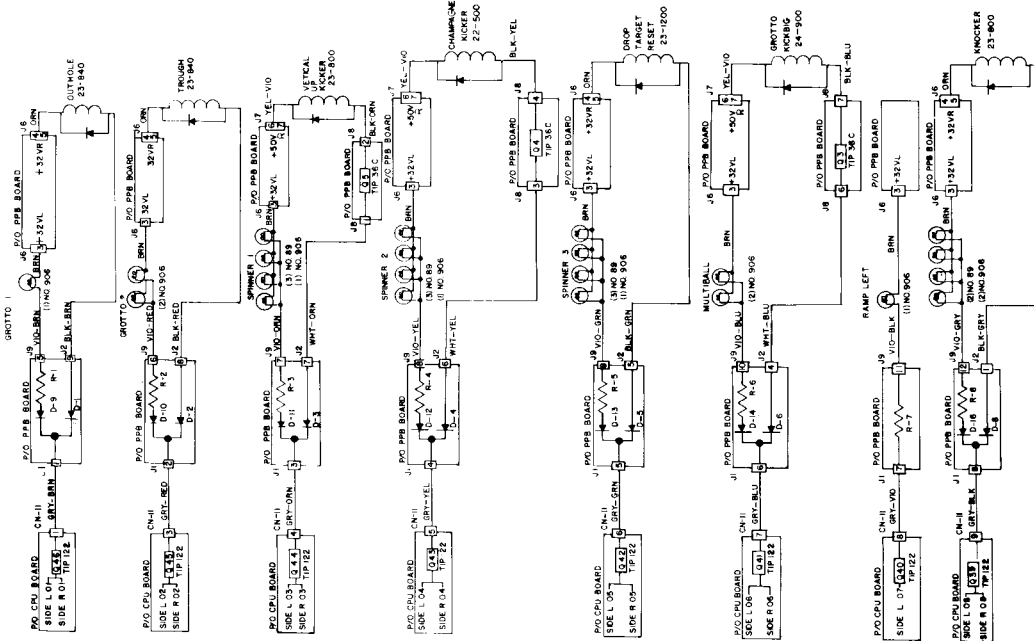
With the **FORWARD/REVERSE** switch in the **FORWARD (up)** position, depressing the **STEP** switch advances through the game adjustments one at a time. With it in the **REVERSE (down)** position, the **STEP** switch selects lower-numbered adjustments. To rapidly scroll through adjustments, hold the **STEP** switch depressed. Adjustment values are changed by operating the **GAME START** push-button. The **FORWARD/REVERSE** switch setting determines whether the values are increased or decreased. (With the **FORWARD/REVERSE** switch up, the value increases; with it down, the value decreases). When the **STEP** switch is depressed the **Player 1 and 2 displays** indicate **REQUEST INSTALLED**.

CUSTOM PRICING TABLE

Coin Mechs	Right	Center	Adjustment Numbers							
			14	19	38	39	40	41	42	
25¢	25¢	\$1.00	Plays/Coins	ON	01	01	01	04	01	02
			1/25¢ 3/50¢	Custom	ON	01	04	01	04	04
			1/25¢ 5/\$1.00	Custom	ON	05	05	20	04	20
			1/25¢/ 6/\$1.00	Custom	ON	01	02	02	02	00
5SCH	10SCH	10SCH	1/10 SCH	Custom	ON	04	08	08	06	00
			1/10 SCH 4/30SCH	Custom	ON	01	05	00	01	00
			1/20¢	Custom	ON	01	05	00	03	05
			1/60¢ 2/\$1.00	Custom	ON	01	01	05	01	05
10P	10P	50P	1/10P 6/50P	Custom	ON	01	01	05	02	05
			1/20P 3/50P	Custom	ON	01	01	05	02	05

INSTALL ADJUSTMENT TABLE

Install Adjustment	Ad 06	Ad 07	Ad 08	Ad 09	Ad 10
E Ad 47 General Scores	Extra Easy	Easy	Factory	Hard	Extra Hard
E Ad 48 General Timer	EASY	EASY	FACTORY	HARD	HARD
E Ad 49 General Memory	EASY	EASY	FACTORY	FACTORY	HARD
E Ad 50 Playbox Targets	EASY	EASY	FACTORY	HARD	HARD
E Ad 51 Extra Ball 5x	ON	ON	ON	OFF	OFF
E Ad 52 Playbox Percent	EASY	FACTORY	FACTORY	HARD	HARD
E Ad 53 Laser Kick	EASY	EASY	FACTORY	HARD	HARD
E Ad 54 Mansion Memory	PLAYER	BALL	BALL	BALL	NONE
E Ad 56 Pinball Memory	PLAYER	PLAYER	BALL	BALL	NONE



COIL TESTS

Sixteen regular (pulsed under microprocessor control) and six switch-triggered coil drivers are provided to switch ground to coils. Coil number 10 is used in conjunction with drives 8 to switch +34 volts between coils or flash lamps; these sets are termed "left" and "right". Coil number 10 is located on the PPB board which provides isolation diodes and current limiting and heater resistors. This effectively provides 23 regular coils.

Automatic Test

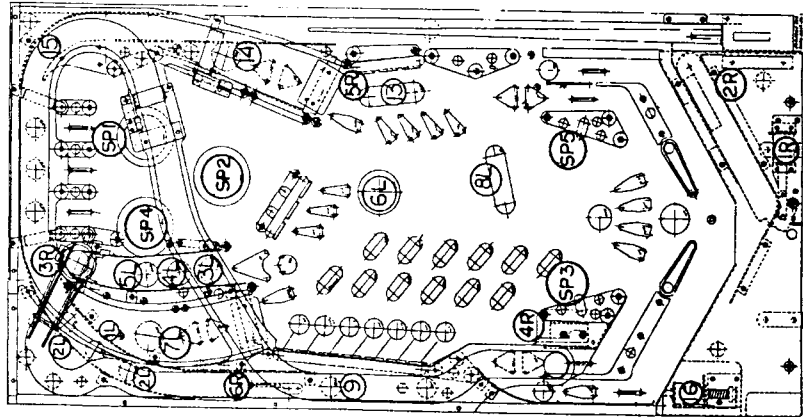
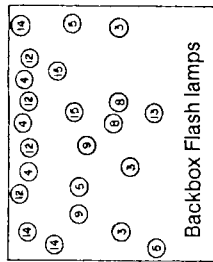
From the Discrete Lamps test, depress the STEP push-button switch. Player 1 and 2 displays indicate COIL TEST. The test pulses each regular solenoid or flash lamp sequentially with the coil/flash lamp name indicated in the Player 1 and 2 displays and the drive number in the Player 4 display.

Select Coil

From the Coil Test, depress the STEP push-button switch. Player 1 and 2 displays indicate SELECT COIL and then the name of drive 1L, the drive number is indicated in the Player 4 display. Operate the Game Start push-button switch to select the coil or flash lamp to be tested. With the desired drive number indicated in the Player 4 display, depress the STEP push-button switch to cause it to be pulsed repeatedly.

RETURN TO GAME OVER

From the Select Coil test, depress the STEP push-button switch one time if a selected coil is pulsing or two times none is pulsing. The game returns to the game-over mode.



SWITCH TRIGGERED SOLENOIDS

Coil Number	Description	Control Line (CPU to Coil)	Power Line (PS to Coil)	Trigger Line (CPU to Coil)	Drive Type (TRIP/ST)	Coil Type
SP1	Center Pop Bumper	BLU/ORN	RED	ORN-BLK	OR	22-800
SP2	Right Pop Bumper	CPU CN18-3	PS CN3-6	CPU CN 18-2	OR	22-800
SP3	Left Singanet	BLU/RED	RED	ORN-RED	OR	22-800
SP4	Left Pop Bumper	BLU/YEL	PS CN3-8	CPU CN 18-3	O10	22-800
SP5	Right Singanet	CPU CN18-4	RED	ORN-YEL	O11	22-800
SP6	Right Pop Bumper	CPU CN18-7	PS CN3-6	CPU CN 18-4	O12	22-800
	NOT USED	BLU/ORN	RED	ORN-GRN	O13	-
		CPU CN18-8	PS CN3-8	CPU CN 18-8		

FLIPPER SOLENOIDS

Coil Description	Flipper GND (CPU to Coil)	Power Lines (PPB & PS to Coil)	Coil Type
Left Flipper	ORN-GRY	GRY-YEL	22-800
Right Flipper	CPU CN19-2	PPB J7-4	22-800
	ORN-VIO	GRY-GRN	
	CPU CN19-1	PPB J7-1,2	
		PS CN1-10	
		PS CN1-10	
		PS CN1-10	
		PS CN1-10	

PLAYBOY COIL PART NUMBER CHART

QUANTITY USED	COIL TYPE	DATA PART NUMBER
0	22-800	000-5001-00
1	22-800	000-5001-00
2	22-800	000-5002-00
1	12-1200	000-5003-00
1	22-500	000-5017-00
2	22-800	000-5020-21

Game Adjustment Table

Adjustment Number (Player 3)	Description (Players 1 & 2)	Factory Setting (Player 4)
AD 01	Replay/Manual	10%
AD 02	Start Replay/Level 1 Replay	2,300,000
AD 03	Levels Replay/Level 2 Replay	01
AD 04	Level 3 Replay	-
AD 05	Level 4 Replay	-
AD 06	Extra Easy Rules	OFF
AD 07	Easy Rules	OFF
AD 08	Factory Rules	OFF
AD 09	Hard Rules	OFF
AD 10	Extra Hard Rules	OFF
AD 11	Novelty Rules	OFF
AD 12	5 Ball Rules	OFF
AD 13	Addball Rules	OFF
AD 14	Standard/Custom Pricing	USA 1
AD 15	Time Setting	ON
AD 16	Coin Reset	OFF
AD 17	Audits Reset	OFF
AD 18	Restore Hiscr	OFF
AD 19	Expand Adjustments	OFF
E Ad 20	Awards Replay	CREDITS
E Ad 21	Awards Special	CREDITS
E Ad 22	Match Feature	03
E Ad 23	Balls/Game	03
E Ad 24	Warning Tilt	01
E Ad 25	Maximum Extra Balls	30
E Ad 26	Credits Limit	03
E Ad 27	Scores Highest	00
E Ad 28	Credits High Score 1	00
E Ad 29	Credits High Score 2	00
E Ad 30	Credits High Score 3	00
E Ad 31	Credits High Score 4	00
E Ad 32	High Score 1 Backup	5,000,000
E Ad 33	High Score 2 Backup	4,000,000
E Ad 34	High Score 3 Backup	3,000,000
E Ad 35	High Score 4 Backup	2,500,000
E Ad 36	High Score Reset Every	700
E Ad 37	Free Play	OFF
E Ad 38	Left Coin Pulses	-
E Ad 39	Right Coin Pulses	-
E Ad 40	Center Coin Pulses	-
E Ad 41	Pulses For Credit	-
E Ad 42	Pulses For Bonus Credit	-
E Ad 43	Message Custom	-
E Ad 44	Text	-
E Ad 45	Attract Mode Music	ON
E Ad 46	Lights	ENGLISH
E Ad 47	General Scores	FACTORY
E Ad 48	General Timer	FACTORY
E Ad 49	General Memory	FACTORY
E Ad 50	Playboy Targets	HARD
E Ad 51	Extra Ball Ex	ON
E Ad 52	Playboy Percent	FACTORY
E Ad 53	Laser Kick	FACTORY
E Ad 54	Knocker Alarm	ON
E Ad 55	Mansion Memory	ON
E Ad 56	Pinball Memory	BALL
E Ad 57	Auto Special	ON
E Ad 58	Risque Sound	ON
E Ad 59	Factory Restore	OFF

GAME DIAGNOSTICS

The Data East Pinball system provides tests for sounds, digital displays, lamps, switches, and solenoids. Each feature may be tested manually or automatically using the STEP and FORWARD/REVERSE push-button switches inside the coin door and the Game Start push-button switch on the front of the cabinet. The automatic tests may be used for a quick verification of automatic test functions and the manual tests, for troubleshooting.

ENTERING DIAGNOSTICS

With the game in the game-over mode, open the coin door and make sure that the FORWARD/REVERSE push-button switch is set to REVERSE (down) and depress the STEP push-button switch. The Player displays will show the tollfree Customer Service number 1-800-KICKERS, that is 1-800-542-5377 (outside Illinois) and the toll number (312) 345-7700 (inside Illinois). This indicates entry into game diagnostics.

SOUND TESTS

The Data East Pinball sound system produces true digital stereo sound on left and right speakers and mono on a center speaker. During Sound tests, the Player 1 and 2 displays show the sound board circuit under test and the corresponding sounds are produced. Refer to the Sound Test Chart for the sound circuits displayed and the sounds produced.

The sine wave functions allow verification that all channels are functioning properly and that the speaker connections are correct. Speaker Phase Testing procedures follow for checking speaker connections.

SOUND TEST CHART

Auto/Manual Tests (Player 1 & 2)	Sounds Produced
LEFT SINE CENTER SINE RIGHT SINE VOICE ROM1 (Loc F6) VOICE ROM2 (Loc F4) MUSIC TEST (Sound ROM Loc F7)	60 CYCLE TONE (Left Speaker Only) 60 CYCLE TONE (All Speakers) 60 CYCLE TONE (Right Speaker Only) "THAT'S BEAUTIFUL", "OOHI", HORN BLAST "MMM..!" CHIMPANZEE SOUNDS BIRD CALL, "OOHI", "CAIO BABY" HORN BLAST. MUSIC

Automatic Test

With Customer Service telephone numbers displayed, depress the STEP push-button switch. Player 1 and 2 displays indicate SOUNDS AUTO and the system sequences through the test producing the sounds indicated in the Sound Test Chart.

Manual Test

Operate the STEP push-button switch during the Automatic tests until SOUNDS MANUAL is indicated in the Player 1 and 2 displays. Depressing the Game Start push-button switch allows you to advance through each sound function.

LAMP MATRIX CHART

Column (*)	Row (*)	1	2	3	4	5	6	7	8
YEL-BRN (41) Q71	YEL-RED (42) Q70	Miss July 50k	Miss Aug. 100k	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
1 RED-BRN (21) Q72	1 RED-BRN (21) Q72	Playboy	Playboy	Photo Shoot 1	Photo Shoot 2	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
2 RED-BLK (20) Q73	2 RED-BLK (20) Q73	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
3 RED-ORN (23) Q74	3 RED-ORN (23) Q74	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
4 RED-YEL (24) Q75	4 RED-YEL (24) Q75	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
5 RED-GRN (25) Q76	5 RED-GRN (25) Q76	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
6 RED-BLU (26) Q77	6 RED-BLU (26) Q77	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
7 RED-VIO (27) Q78	7 RED-VIO (27) Q78	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6
8 RED-GRY (28) Q79	8 RED-GRY (28) Q79	Playboy	Playboy	Photo Shoot 2	Photo Shoot 1	Photo Shoot 3	Photo Shoot 4	Photo Shoot 5	Photo Shoot 6

(*) 2 DIGIT NUMBER IN PARENTHESES INDICATES RESISTOR WIRE COLOR CODE NUMBER DISPLAYED DURING DIAGNOSTICS.

DIGITAL DISPLAY TEST

Digital displays are driven by digit and segment driver circuits. Digit drivers sequentially select individual character positions (Player 1 and 2 displays) and digit positions (Player 3 and 4 displays). Segment drivers (16 for Player 1 and 2 characters; 7 for Player 3 and 4 digits) select the individual segments of each position.

Automatic Test

To enter DISPLAY tests, operate the STEP push-button switch from the Sound Manual test. Player 1 and 2 displays indicate DISPLAY AUTO. The displays will sequence from all ZEROS to all nines in the four displays. Next all segments are lit for each digit position in sequence.

Manual Test

Operate the TEST push-button switch from the automatic test; Player 1 and 2 displays indicate DISPLAY MANUAL and then display ZEROS in all positions. Operate the Game Start push-button switch to cycle through each portion of the test.

Switches

Switches are configured in an 8 x 8 matrix of columns (switch drives) and rows (switch returns) with up to 64 switches possible. The switch tests include three parts; switch test, active switches, and bad switches. Row and column wire colors are indicated in each test using corresponding resistor color code numbers.

- 0 = Black
- 1 = Brown
- 2 = Red
- 3 = Orange
- 4 = Yellow
- 5 = Green
- 6 = Blue
- 7 = Violet
- 8 = Grey
- 9 = White

LAMP TESTS

Controlled lamps are configured in an 8 x 8 matrix of columns (lamp drives) and rows (lamp returns) with up to 64 lamps possible. The lamp tests include four parts; all lamps, lamp return (row), lamp drive (column), and discrete (individual) lamps. Row and column wire colors are indicated in the discrete lamp test using corresponding resistor color code numbers.

All Lamps

From the Bad Switch test, operate the STEP push-button switch. Player 1 and 2 displays indicate ALL LAMPS and all controlled lamps will light.

Lamp Returns

From the ALL LAMPS test, depress the STEP push-button switch. Player 1 and 2 displays indicate LAMP ROWS and the Player 4 display indicates 01 for row 1. All controlled lamps in row 1 should be lit. Operating the Game Start push-button switch cycles through each of the rows separately.

Lamp Drives

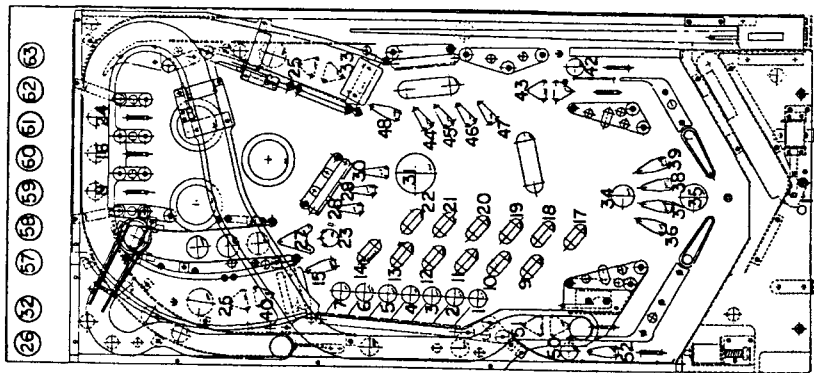
From the LAMP ROWS test, depress the STEP push-button switch. Player 1 and 2 displays indicate LAMP COLUMNS and the Player 4 display indicates 01 for column 1. All controlled lamps in column 1 should be lit. Operating the Game Start push-button switch cycles through each of the columns separately.

Discrete Lamp

From the LAMP COLUMNS test, depress the STEP push-button switch. Player 1 and 2 displays indicate LAMP TEST and then the name assigned to lamp 01; the Player 1 and 2 displays indicate the lamp name, the Player 3 display indicates the row and column wire colors, and the Player 4 display indicates 01. Lamp 01 should light. With the FORWARD/REVERSE push-button switch in the FORWARD (up) position, operating the Game Start push-button switch selects higher-numbered lamps; with it in the REVERSE (down) position, Game Start selects lower-numbered lamps.

Lamp Number	Description	Lamp Number	Description	Lamp Number	Description
11	Miss September Lives Out-lane 50k	21	Photo Shoot 5	31	Play Again
12	Miss October 50k Bonus Hold Over	22	Photo Shoot Special	32	2x
13	Miss November Extra Ball	23	Spinner Extra Ball	33	3x
14	Miss December 1,000,000	24	Right "H" Lane	34	4x
15	Top Left Bunny Hop	25	Upper Left and Right Release Ball	35	5x
16	Center "H" Lane	26	Lock Ball #1	36	6x
17	Photo Shoot 1	27	Lock Ball (Big arrow)	37	7x
18	Photo Shoot 2	28	Left Green Arrow Target	38	8x
19	Photo Shoot 3	29	Center Green Arrow Target	39	9x
20	Photo Shoot 4	30	Right Green Arrow Target	40	Upper Left Mansion Party
21	Photo Shoot 5	31	Upper Left Scores	41	"P" in Ball
22	Photo Shoot Special	32	Upper Right Scores	42	Right Peacock
23	Spinner Extra Ball	33	Upper Right Mansion Party	43	Drop Target 100k
24	Right "H" Lane	34	Bonus Holdover	44	Drop Target 75k
25	Upper Left and Right Release Ball	35	Play Again	45	Drop Target 50k
26	Lock Ball #1	36	2x	46	Drop Target 25k
27	Lock Ball (Big arrow)	37	3x	47	Upper Right Bunny Hop
28	Left Green Arrow Target	38	4x	48	Upper Right Peacock Value
29	Center Green Arrow Target	39	5x	49	Upper Left Peacock Value
30	Right Green Arrow Target	40	Upper Left Mansion Party	50	Drop Target 100k
31	Upper Left Scores	41	"P" in Ball	51	Drop Target 75k
32	Upper Right Scores	42	Right Peacock	52	Drop Target 50k
33	Upper Right Mansion Party	43	Drop Target 100k	53	Upper Right Peacock Value
34	Bonus Holdover	44	Drop Target 75k	54	Upper Left Peacock Value
35	Play Again	45	Drop Target 50k	55	Lower Left Peacock Value
36	2x	46	Drop Target 25k	56	pinB all
37	3x	47	Upper Right Bunny Hop	57	pinA all
38	4x	48	Upper Right Peacock Value	58	pinB L1
39	5x	49	Upper Left Peacock Value	59	pinA L1
40	Upper Left Mansion Party	50	Drop Target 100k	60	mansion
41	"P" in Ball	51	Drop Target 75k	61	mansion
42	Right Peacock	52	Drop Target 50k	62	mansion
43	Drop Target 100k	53	Upper Right Peacock Value	63	mansion
44	Drop Target 75k	54	Upper Left Peacock Value	64	pinB L1
45	Drop Target 50k	55	Lower Left Peacock Value		
46	Drop Target 25k	56	pinB all		
47	Upper Right Bunny Hop	57	pinA all		
48	Upper Right Peacock Value	58	pinB L1		
49	Upper Left Peacock Value	59	pinA L1		
50	Drop Target 100k	60	mansion		
51	Drop Target 75k	61	mansion		
52	Drop Target 50k	62	mansion		
53	Upper Right Peacock Value	63	mansion		
54	Upper Left Peacock Value	64	pinB L1		
55	Lower Left Peacock Value				
56	pinB all				
57	pinA all				
58	pinB L1				
59	pinA L1				
60	mansion				
61	mansion				
62	mansion				
63	mansion				
64	pinB L1				

*Indicates Insert Lamp



Switch Test

From the Display Manual test, operate STEP push-button switch. Player 1 and 2 displays indicate SWITCH TEST. Close each switch and observe the displays. The Player 1 and 2 displays will indicate the switch name, the Player 3 display indicates the row and column wire colors, and the Player 4 display indicates the switch number. When a switch is released, the name and number disappear until another switch is closed or the test is exited.

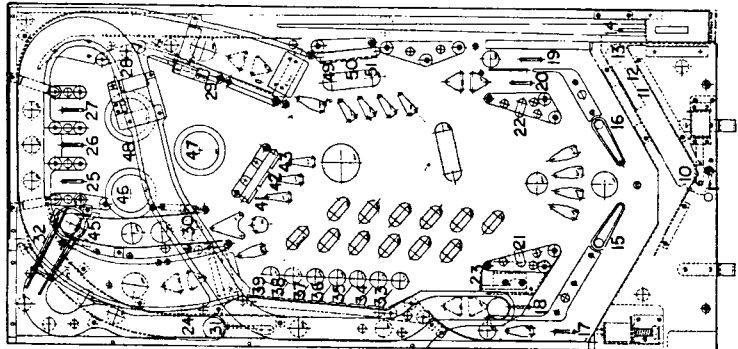
Active Switches

Operate the STEP push-button switch from the Switch Test. Player 1 and 2 Displays indicate ACTIVE SWITCHES. If any switches are stuck closed (or made from the presence of a ball), the Player 1 and 2 displays sequence through switch names, the Player 3 display indicates the row and column wire colors, and the switch numbers are indicated in the Player 4 display. This cycle continues until all switches are cleared or until the STEP push-button switch is depressed.

Bad Switches

Operate the STEP push-button switch from the Switch Test. Player 1 and 2 Displays indicate BAD SWITCHES. During game play, the system keeps track of the last game in which each switch was made. Should a switch not be made for 100 games, it is considered to be bad. If there are any, the Player 1 and 2 displays sequence through switch names, the Player 3 display indicates the row and column wire colors, and the switch numbers are indicated in the Player 4 display. This cycle continues until the STEP push-button switch is depressed.

Number Description	Part No.	Number Description	Part No.
01* Plumb Tilt	500-5023-00	Out Hole	180-5011-00
02 Not Used		Trough #1	180-5009-00
03 Credit Button	500-5097-00	Trough #2	180-5009-00
04* Right Coin	180-5024-00	Trough #3	180-5010-00
05* Center Coin	180-5024-00	Shooter Lane	500-5142-00
06* Left Coin	180-5024-00	Left Flip, Instant Info.	180-5026-00
07* Slam Tilt	180-5022-00	Left EOS	180-5018-00
08 Not Used		Right EOS	180-5018-00
		Left Outlane	500-5143-00
		Left Return Lane	180-5003-00
		Right Outlane	515-5138-00
		Right Return Lane	180-5003-00
		Left Slingshot Trigger Sw.	180-5054-00
		Left Slingshot Point Sw.	180-5055-00
		Right Slingshot Trigger Sw.	180-5054-00
		Right Slingshot Point Sw.	180-5055-00
		Champagne Kicker	180-5040-00
		Grotto 1	180-5028-00
		Left Top Lane	515-5138-00
		Center Top Lane	515-5138-00
		Right Top Lane	515-5138-00
		Ramp Center	180-5010-00
		Ramp Right	180-5010-00
		Left Spinnner	180-5004-00
		Grotto 2	180-5040-00
		Ramp Left	180-5034-00
		P-Target	515-5124-18
		L-Target	515-5124-08
		A-Target	515-5124-18
		B-Target	515-5124-18
		O-Target	515-5124-18
		2nd Y-Target	515-5124-18
		Not Used	
		Center 3 Bank Left	515-5124-18
		Center 3 Bank Middle	515-5124-18
		Center 3 Bank Right	515-5124-18
		Not Used	
		VUK	180-5041-00
		Left Pop Bumper	180-5036-00
		Center Pop Bumper	180-5036-00
		Right Pop Bumper	180-5036-00
		Drop 1 (Top)	180-5025-01
		Drop 2 (Center)	180-5025-01
		Drop 3 (Bottom)	180-5025-01
		Not Used Thru 64	



*INDICATES CABINET SWITCHES.

SWITCH MATRIX CHART

Column Row (*)	1	2	3	4	5	6	7	8
1	1 WHT-BRN (91)	2 WHT-RED (92)	3 WHT-ORN (93)	4 WHT-YEL (94)	5 WHT-GRN (95)	6 WHT-BLU (96)	7 WHT-VIO (97)	8 WHT-GRY (98)
2	Plumb Tilt Used	Out Hole Not Used	Credit Button Used	Right Trough #1 Used	Center Trough #2 Used	Shooter Lane Used	Left EOS Used	Right EOS Used
3	Left Outlane Not	Left Return Lane Not	Right Outlane Not	Right Return Lane Not	Left Slingshot Trigger Sw. Not	Left Slingshot Point Sw. Not	Right Slingshot Trigger Sw. Not	Right Slingshot Point Sw. Not
4	Left Top Lane (50) Q52	Center Top Lane (50) Q51	Right Top Lane (50) Q51	Left Flip, Instant Info. (50) Q52	Left EOS (50) Q52	Left EOS (50) Q52	Left EOS (50) Q52	Left EOS (50) Q52
5	Left Outlane (50) Q52	Left Return Lane (50) Q51	Right Outlane (50) Q51	Right Return Lane (50) Q51	Left Slingshot Trigger Sw. (50) Q52	Left Slingshot Point Sw. (50) Q51	Right Slingshot Trigger Sw. (50) Q52	Right Slingshot Point Sw. (50) Q51
6	Champagne Kicker (50) Q52	Grotto 1 (50) Q52	Left Top Lane (50) Q52	Center Top Lane (50) Q51	Right Top Lane (50) Q51	Left Flip, Instant Info. (50) Q52	Left EOS (50) Q52	Right EOS (50) Q52
7	Left Spinnner (50) Q52	Grotto 2 (50) Q52	Ramp Left (50) Q52	P-Target (50) Q52	L-Target (50) Q52	A-Target (50) Q52	B-Target (50) Q52	O-Target (50) Q52
8	2nd Y-Target (50) Q52	Not Used (50) Q52	Center 3 Bank Left (50) Q52	Center 3 Bank Middle (50) Q52	Center 3 Bank Right (50) Q52	Not Used (50) Q52	VUK (50) Q52	Left Pop Bumper (50) Q52
9	Center Pop Bumper (50) Q52	Right Pop Bumper (50) Q52	Drop 1 (Top) (50) Q52	Drop 2 (Center) (50) Q52	Drop 3 (Bottom) (50) Q52	Not Used Thru 64 (50) Q52		

(*) 2 DIGIT NUMBER IN PARENTHESES INDICATES RESISTOR WIRE COLOR CODE NUMBER DISPLAYED DURING DIAGNOSTICS.