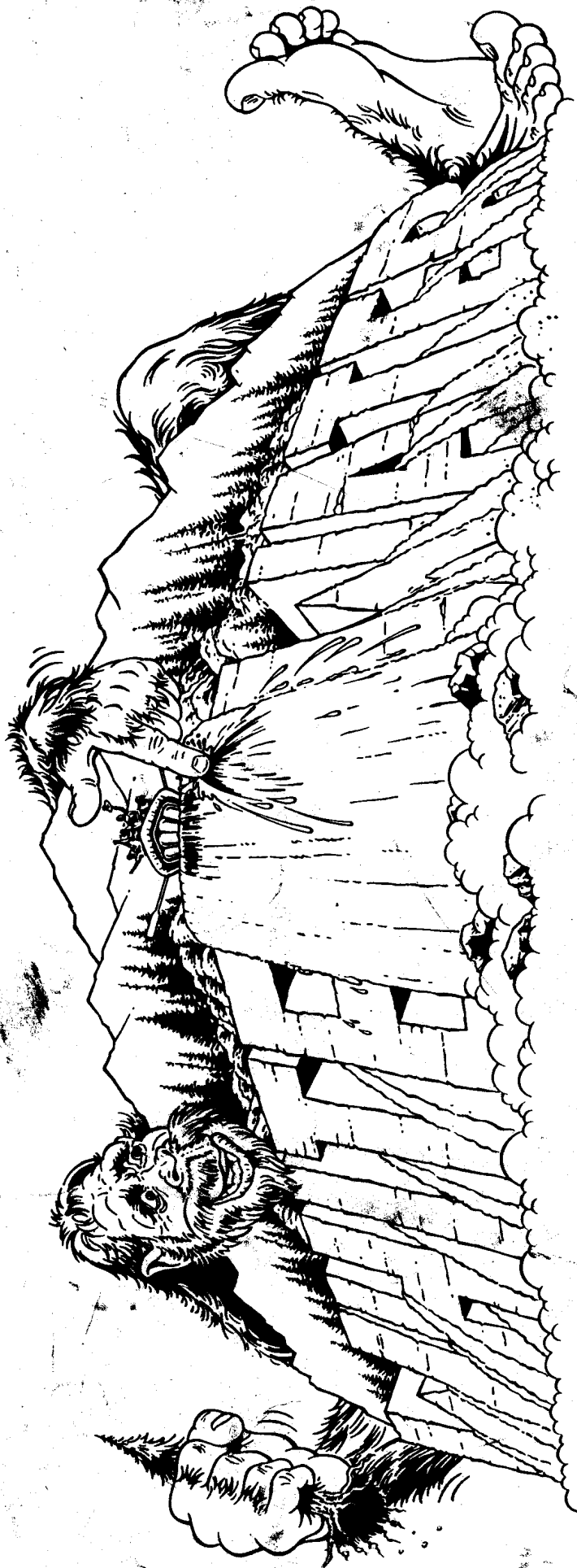




OPERATIONS MANUAL

Operations & Adjustments
Testing & Problem Diagnosis
Parts Information
Wiring Diagrams & Schematics

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Williams Electronics Games, Inc.
3401 N. California
Chicago, IL 60618

Jumper Charts

Country	W14	W15	W16	W17	W18
American	In	In	In	In	In
European	In	In	Out	In	In
French	In	In	In	Out	Out
German	In	In	In	In	Out
Spanish	In	Out	In	In	In

Display	W1	W2
1M/2M/4M ROM	In	Out
512K/1M ROM	Out	In

Solenoid/Flasher Table

Sol. No.	Function	Solenoid Type	Voltage Connections		Drive xister	Drive Connections		Drive Wire Color	Solenoid Part Number	
			Playfield	Backbox		Playfield	Backbox		Playfield	Backbox
01	Outsole	High Power	J107-3		Q82	J130-1		Vio-Brn	AE-27-1200	
02	Ball Serve	High Power	J107-3		Q80	J130-2		Vio-Red	AE-26-1200	
03	Whirlpool Popper	High Power	J107-3		Q78	J130-4		Vio-Org	AE-23-800	
04	Lockup Popper	High Power	J107-3		Q76	J130-5		Vio-Yel	AE-23-800	
05	Kickback	High Power	J107-3		Q64	J130-6		Vio-Grn	AE-23-800	
06	Ramp Diverter	High Power	J107-3		Q66	J130-7		Vio-Blu	AE-26-1200	
07	Knocker	High Power	J107-3		Q68	J130-8		Vio-Blk	AE-23-800	
08	Backglass (2)	High Power		J106-5	Q70		J131-5	Vio-Gry	(2) #906	
09	Wet Willie Head	Low Power		J106-5	Q68		J129-1	Brn-Blk	(1) #906	
10	Left Sling	Low Power	J107-2		Q56	J127-3		Brn-Red	AE-27-1200	
11	Right Sling	Low Power	J107-2		Q54	J127-4		Brn-Org	AE-27-1200	
12	Left Jet Bumper	Low Power	J107-2		Q52	J127-5		Brn-Yel	AE-26-1200	
13	Right Jet Bumper	Low Power	J107-2		Q50	J127-6		Brn-Grn	AE-26-1200	
14	Center Jet Bumper	Low Power	J107-2		Q48	J127-7		Brn-Blu	AE-26-1200	
15	Backglass Raft	Low Power		J106-5	Q46		J128-3	Brn-Vio	(2) #906	
16	Backglass Riders	Low Power		J106-5	Q44		J128-5	Brn-Gry	(2) #906	
17	Bigfoot Body	Flasher	J107-6		Q42	J126-1	J125-1	Blk-Brn	(1) #89	(1) #906
18	Right Mountains	Flasher	J107-6		Q40	J126-2	J125-2	Blk-Red	(1) #89	(1) #906
19	Left Mountains	Flasher	J107-6		Q38	J126-3		Blk-Org	(1) #89	(1) #906
20	Upper Left Playfield	Flasher	J107-6		Q36	J126-4	J125-5	Blk-Yel	(1) #89	(1) #906
21	Insanity Falls	Flasher	J107-6		Q28	J126-5		Blu-Grn	(1) #89	
22	Whirlpool Popper	Flasher	J107-6		Q30	J126-6		Blu-Blk	(1) #89	
23	Whirlpool Enter	Flasher	J107-6		Q34	J126-7		Blu-Vio	(1) #89	
24	Bigfoot Cave	Flasher	J107-6		Q32	J126-8	J125-9	Blu-Gry	(1) #89	(1) #906
25	Bigfoot Drive	Low Power	J118-2,3		Q26	J122-1		Blu-Brn	A-15680	
26	Bigfoot Enable	Low Power	J118-2,3		Q24	J122-2		Blu-Red	A-15680	
27	Chase Lamp Clock	Low Power		J105-4,5; J118-2,3	Q22		J123-4	Blu-Org	A-15761	
28	Chase Lamp Data	Low Power		J105-4,5; J118-2,3	Q20		J123-5	Blu-Yel	A-15761	
General Illumination	Playfield Upper	G.I.	Playfield	Backbox	Cabinet	Playfield	Backbox	Cabinet	Playfield	Backbox
			J120-1	J120-2	J120-3	J120-7	J120-8	J120-9	Wht-Brn	#44
01	Playfield Upper	G.I.	J120-1	J120-2	J120-3	J120-7	J120-8	J120-9	Wht-Org	#44
02	Playfield Center	G.I.	J120-2	J120-3	J120-4	J120-5	J121-9	J121-10	Wht-Yel	#555
03	Playfield Lower	G.I.	J120-3	J121-3	J121-5	J121-6	J121-11	J119-1	Wht-Grn	#555
04	Backglass Boat	G.I.		J121-5	J121-6	J119-3	J121-11	J119-1	Wht-Vio	#555
05	Backglass Sky	G.I.		J121-6	J121-7	J119-3	J121-11	J119-1	Wht-Vio	#555
Flipper Circuits	Lower Right Flipper	Flipper	Playfield	Backbox	Cabinet	Playfield	Backbox	Cabinet	Pwr	Hold
			J907-8,9 (Blu-Yel)	J907-4,5 (Blu-Yel)	J907-6,7 (Gry-Yel)	J902-11,13	J902-4,6	J902-7,9	Blu-Vio	Org-Grn
	Lower Right Flipper	Flipper	J907-8,9 (Blu-Yel)	J907-4,5 (Blu-Yel)	J907-6,7 (Gry-Yel)	J902-11,13	J902-4,6	J902-7,9	Blu-Vio	Org-Grn
	Upper Right Flipper	Flipper	J907-4,5 (Blu-Yel)	J907-6,7 (Gry-Yel)	J907-8,9 (Blu-Yel)	J902-11,13	J902-4,6	J902-7,9	Blk-Yel	Org-Vio
	Lower Left Flipper	Flipper	J907-6,7 (Gry-Yel)	J907-8,9 (Blu-Yel)	J907-4,5 (Blu-Yel)	J902-11,13	J902-4,6	J902-7,9	Blu-Gry	Org-Blu

WHITE WATER

Williams Electronics Games, Inc. reserves the rights to make modifications and improvements to its products. The specifications and parts identified in this manual are subject to change without notice.

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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

WHITE WATER RULES & SHOT MAPS

Hazards

Move raft down the river by shooting for the flashing Hazards.

Skill Shot

Shoot plunger to the upper flipper, then to "Insanity Falls".

Multi-ball

Shoot Light and Lock targets. Shoot "No Way Out" when green light is flashing to Lock. Lock 3 balls to start Multi-ball. Shoot "Insanity Falls" for multiple Jackpots.

Whirlpool

Shoot "Insanity Falls" to light Whirlpool. Shoot lit Whirlpool to earn flashing Boulder Garden feature.

Bigfoot Hot Foot

Shoot two Bigfoot Hot Foot targets to distract Bigfoot. Shoot For Bigfoot's cave for Jackpot.

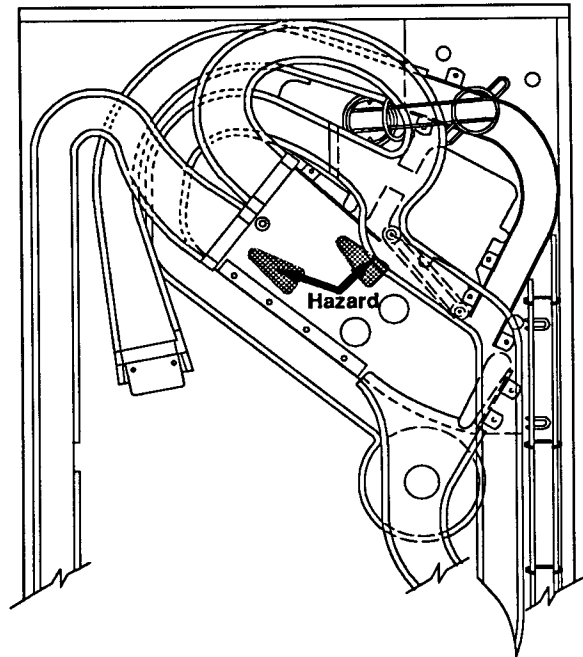
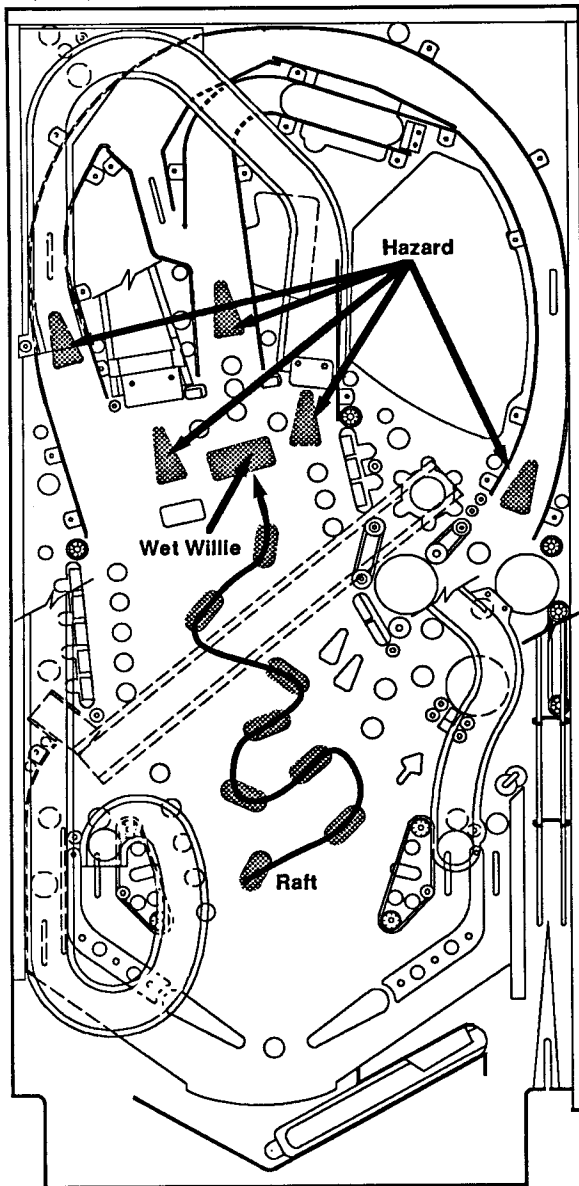
R-I-V-E-R

Completing R-I-V-E-R advances bonus multiplier and increases Hazard value.

HAZARDS

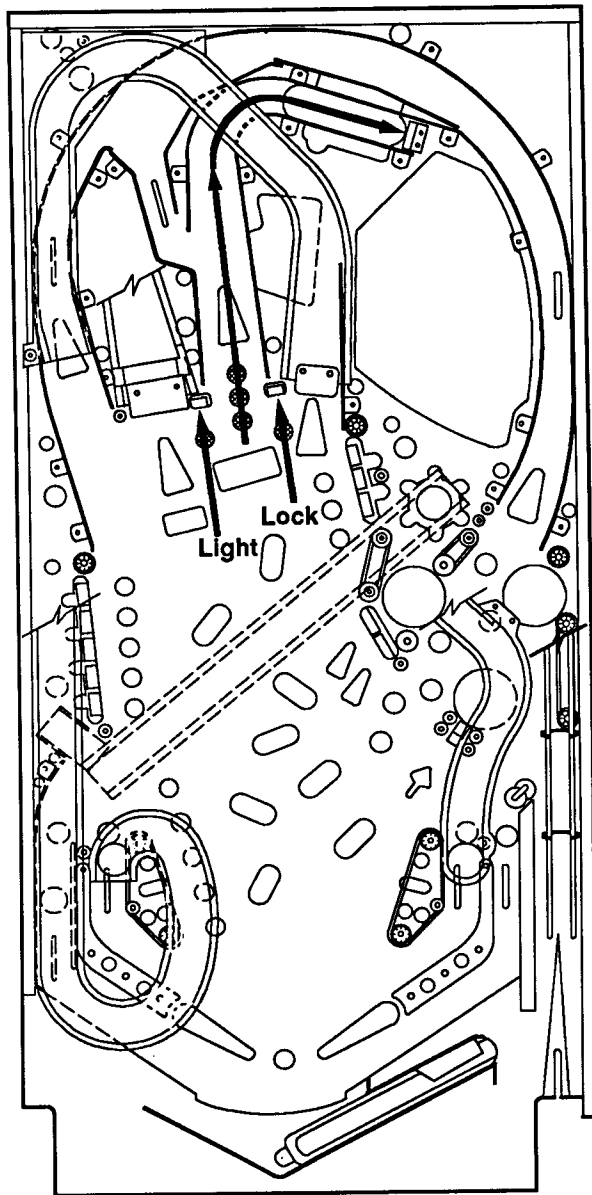
Move the raft down the river to Wet Willie's Resort by shooting for the flashing Hazards (triangle inserts). There are two Hazards on the Upper Playfield. Each raft advance adds 2 Million to the White Water (multi-ball) Jackpot.

When Wet Willie is lit, all Hazards light for 5 Million each. If a player hits all seven Hazards, one Hazard starts flashing and moves around the playfield for a timed period. Its value is 50,000,000.

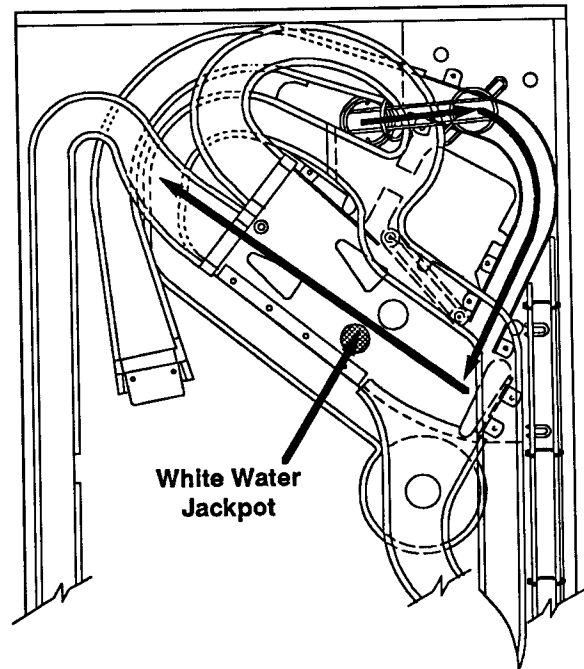


MULTI-BALL

Hit Light and Lock targets to light "Lock" in center lane shot. Locking three balls starts Multi-ball.

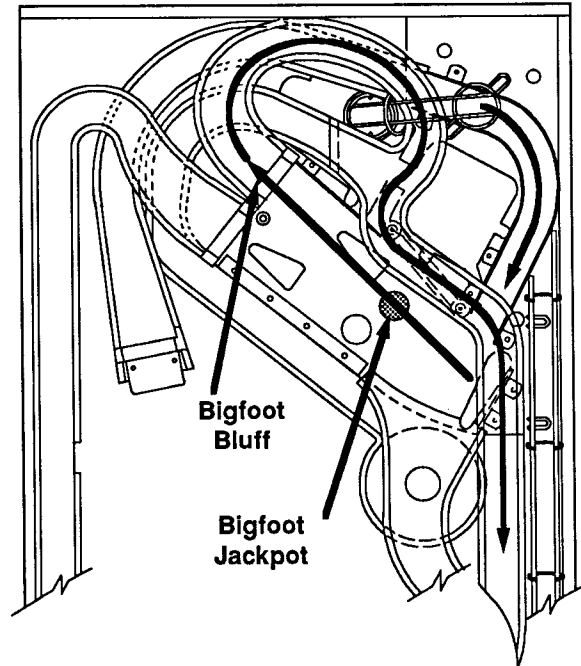
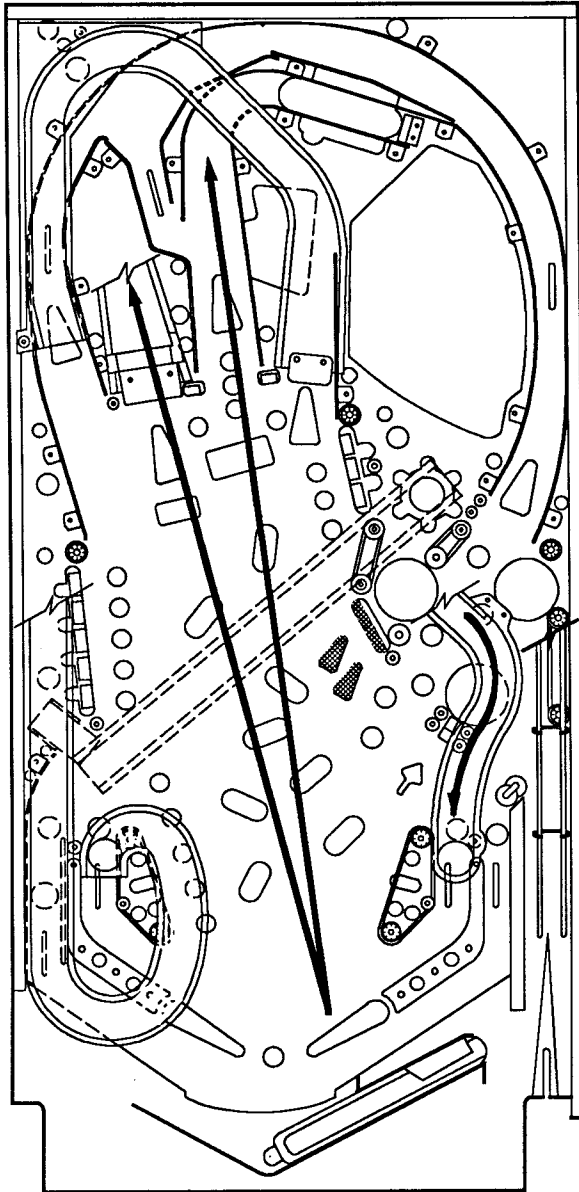


Shoot Insanity Falls for Jackpot.



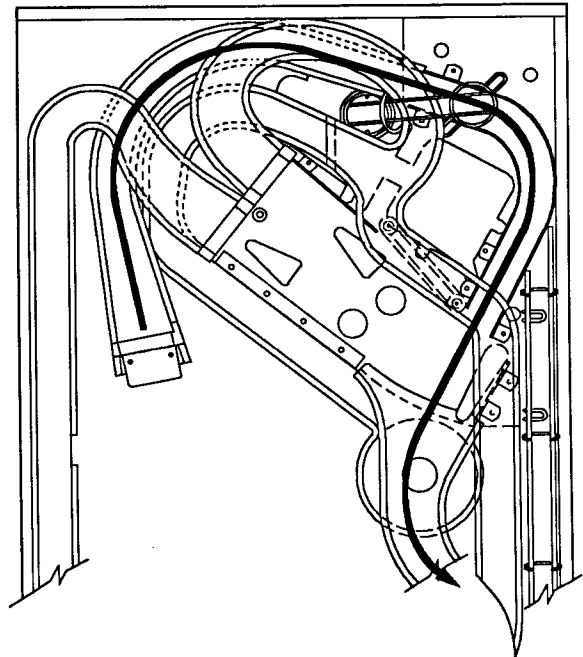
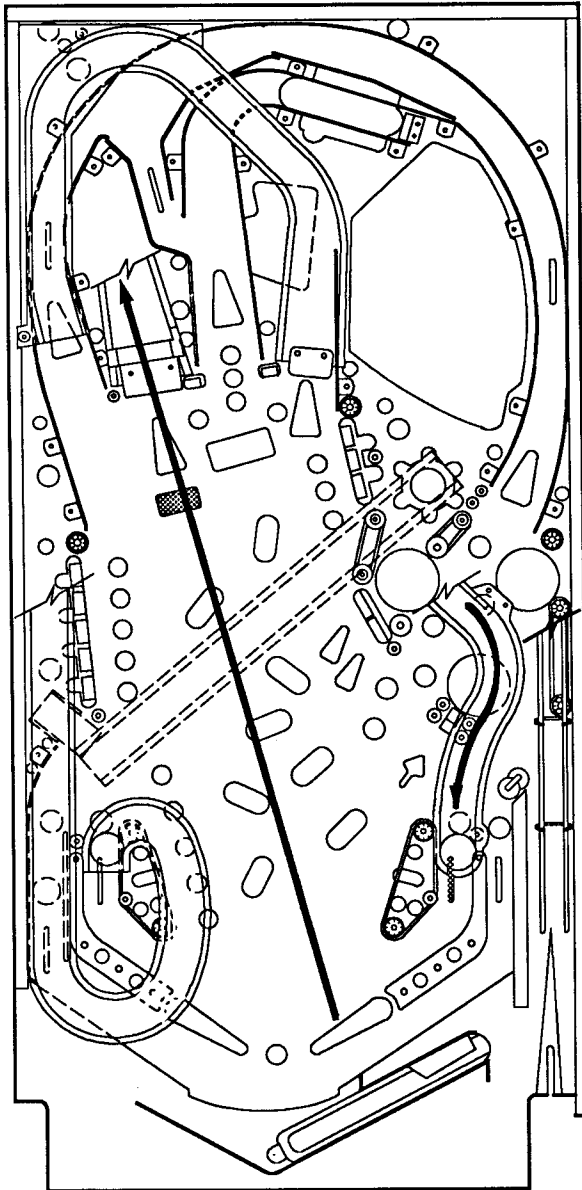
BIGFOOT HOTFOOT

Completing the two Bigfoot Hotfoot targets "X" number of times (adjustable) lights Bigfoot Bluff for Bigfoot Jackpot.



MULTI-MILLIONS

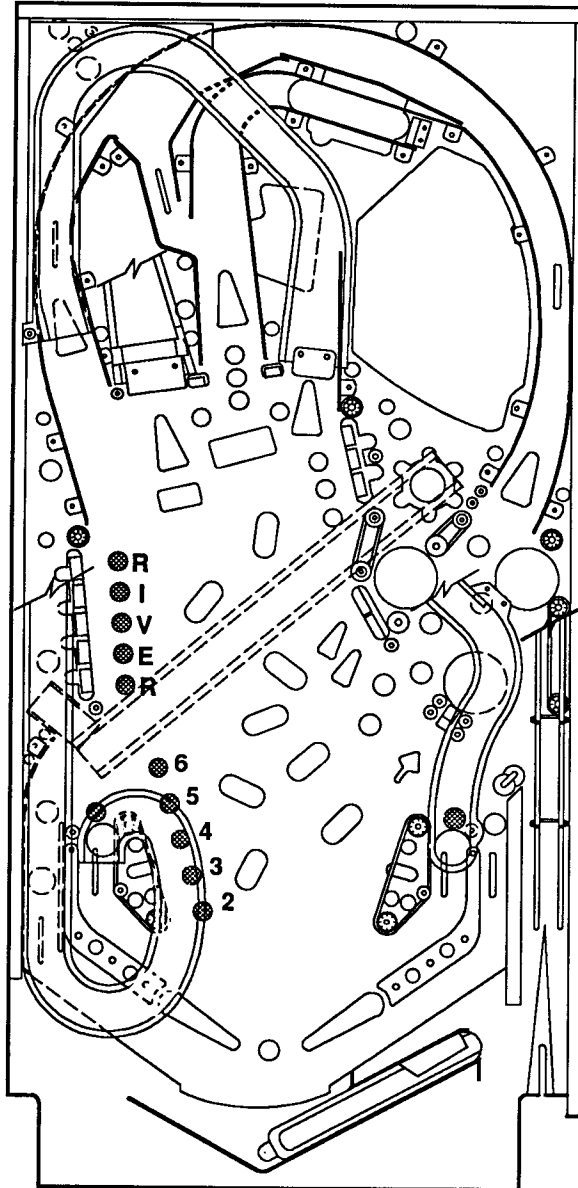
Right return lane switch lights left ramp for 1 Million points. Consecutive shots add 1 Million points up to 6 Million points.



RIVER CLASS

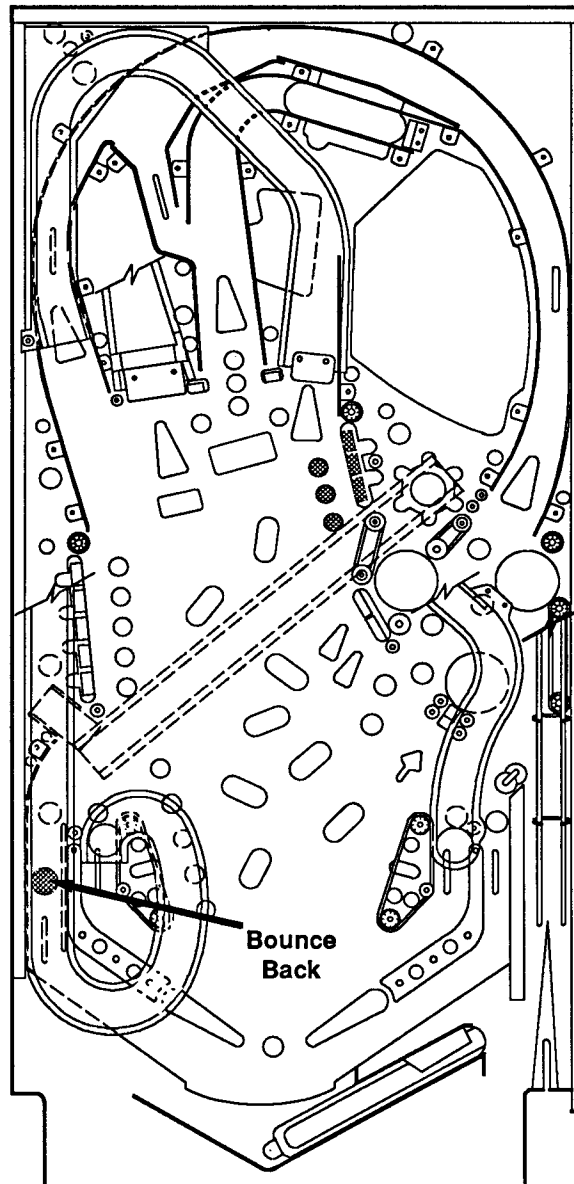
Hitting R-I-V-E-R advances Bonus Multiplier and increases Hazard value by 500,000.

Return lanes spot letters in RIVER when lit.



BOUNCE BACK

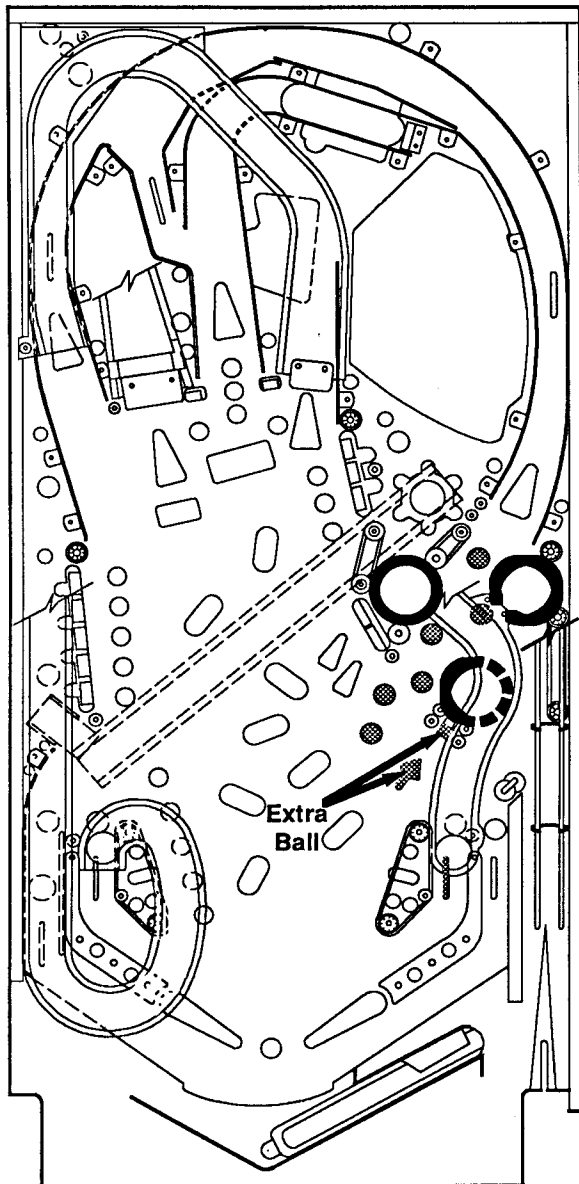
The three red targets light Bounce Back (kickback). If Bounce Back is lit, the three red targets spot a Hazard.



BOULDER GARDEN

Hitting the Jet Bumpers changes the flashing Boulder features. The six features are:

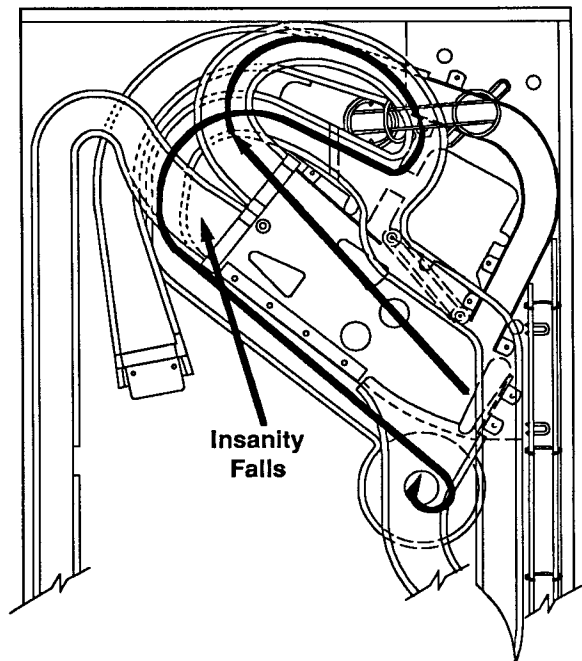
1. Whirlpool Challenge
2. Man Overboard
3. Light Extra Ball
4. Advance Raft
5. Mystery Canyon
6. 5X Playfield Values



WHIRLPOOL

Shoot Insanity Falls to light Whirlpool. Shoot Bigfoot Bluff to enter lit Whirlpool.

Shooting lit Whirlpool awards flashing Boulder Garden feature.



1. Whirlpool Challenge - Whirlpool Challenge is 2-ball Multi-ball. Keep shooting the Whirlpool. The value starts at 5 Million and increases by 2 Million for each shot made during Multi-ball.

2. Man Overboard - Jackpot starts at 15 Million and decreases. Shooting any flashing Hazard awards the Jackpot.

3. Light Extra Ball - Lights Extra Ball Target.

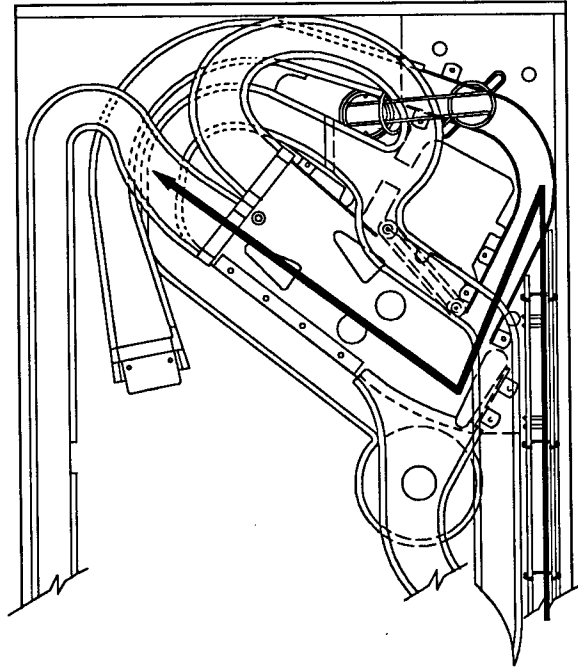
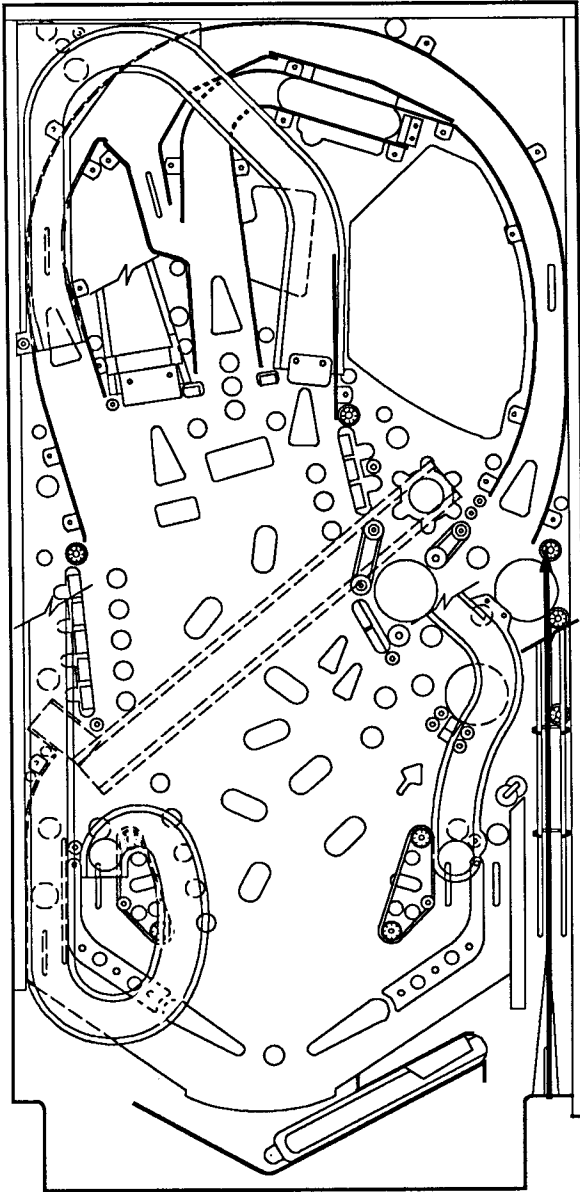
4. Advance Raft - Moves Raft down the river.

5. Mystery Canyon - Random Awards.

6. 5X Playfield Values - All playfield scores 5X including Jackpot if in Multi-ball.

SKILL SHOT

Shoot ball to upper flipper from plunger.
Shoot from upper flipper to Insanity Falls for
Skill Shot.



Section 1

Game

Operation

&

Test

Information

IC	ROM SUMMARY				Part Number
	Type	Location	Board		
Game ROM 1	27c040	U6	CPU		A-5343-50018-1
Music/Speech Masked ROM	27c040	U14	Audio		5341-13427-U14
Music/Speech ROM	27c020	U15	Audio		A-5343-50018-3
Music/Speech ROM	27c010	U18	Audio		A-5343-50018-4

PINBALL GAME ASSEMBLY INSTRUCTIONS

WHITE WATER IS A 3 BALL GAME

Power: Domestic 120V @ 60Hz
Foreign 230V @ 50Hz
Japan 100V @ 50Hz

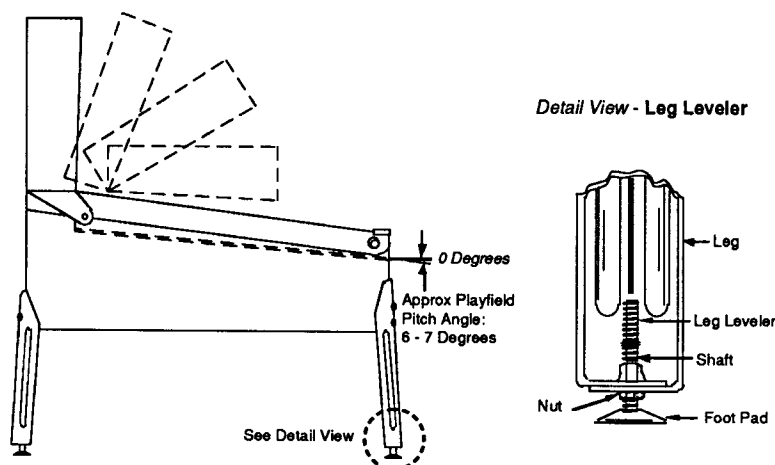
Temp: 32°F to 100° F
(0°C to 38°C)

Humidity: Not to exceed 95% relative.

Dimensions: Width: 26" approx.
Depth: 56" approx.
Height: 85" approx.

Weight: 285 lbs approx. (crated)

1. Remove all cartons, parts, and other items from the shipping container, and set them aside.
2. Place the cabinet on a support and attach rear legs using leg bolts. Leg levelers and leg bolts are provided among the parts in the cash box.
3. Attach the front legs (after installing leg levelers), using leg bolts.



Pinball Assembly, Playfield Pitch Angle, and Leg Leveler Details.

4. Reach into the cabinet and backbox and ensure that the interconnecting cables are not kinked or pinched. Be careful to avoid damaging wires at any stage of the assembly process.
5. Raise the hinged backbox upright and latch it into position. Unlock the backbox, and remove the backglass. Remove the shipping block holding the Insert Board. Unlatch and open the Insert Board. Carefully lift up the Speaker Panel and lay it down on the playfield glass. (Be careful not to damage the Dot Matrix Display/Driver.) This allows access to the bolt holes used for securing the backbox upright. To secure the backbox, install the washer-head mounting bolts through the bottom holes of the backbox into the threaded fasteners in the cabinet. Close and latch the Insert Board. Replace the Speaker Panel. Reinstall the backglass, and lock the backbox.

CAUTION

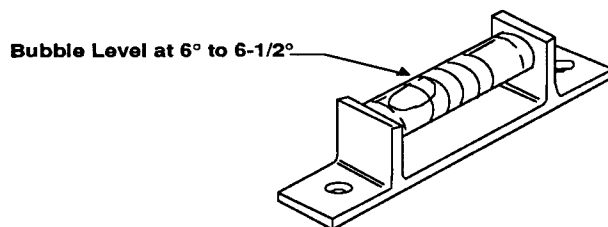
FAILURE TO INSTALL the backbox mounting hardware properly can cause personal injury.
NEVER TRANSPORT a pinball game with the hinged backbox erect. Always lower the backbox forward onto the playfield cabinet on a layer of protective material to prevent marring or damage and possible personal injury.

6. Extend each leg leveler *slightly* below the leg bottom, so that all four foot pads are extended about the same distance. Remove the cabinet from its support and place it on the floor.

7. Unlock and open the coin door. Move the molding latch lever toward the left side of the game. Lift the front molding off the playfield cover glass return the latch lever toward the right, and close the coin door. Carefully slide the glass downward, until it clears the grooves of the left and right side moldings. Lift the glass up and away from the game.

8. Place a level or an inclinometer on the playfield surface. Adjust the leg levelers for proper playfield level (side-to-side). NOTE: It is recommended that this measurement be made ON the playfield, not the cabinet nor the playfield cover glass. Tighten the nut on each leg leveler shaft to maintain this setting.

9. The TRU-PITCH™ level is located on the shooter rail. This allows the operator to accurately pitch the game - WITHOUT REMOVING THE GLASS - when it is first set in a new location. The first line on the level is approximately 6 degrees. Every line after that is approximately another 1/2 degree of pitch. We recommend you pitch the game with the NOSE of the bubble between the first and second line on the level (between 6 and 6-1/2 degrees).



! IMPORTANT !

Playfield pitch angle can affect the operation of the plumb bob tilt. The plumb bob weight is among the parts in the cash box; the operator should install the weight after setting the desired playfield pitch angle.

10. Move the game into the desired location; recheck the level and pitch angle of the playfield.

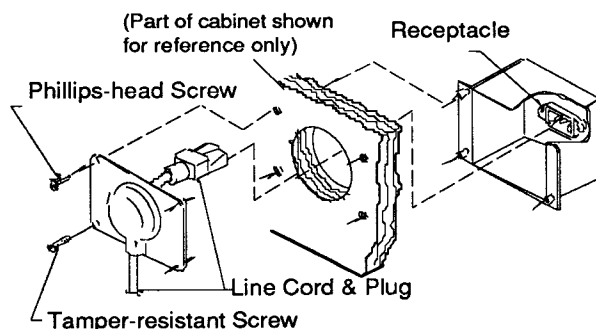
11. Be sure the **required number** of ball are installed. **WHITE WATER** uses three balls.

12. Install playfield mylars if desired.

NOTE: The **WHITE WATER** playfield is coated with a special hardcoat surface and does not require a protective mylar. However, mylars can be purchased through your local Williams Distributor. Specify part number 03-8801-1 for full playfield mylar.

13. Clean and reinstall the playfield cover glass. Prepare the game for player operation.

14. To attach the line cord, remove the envelope stapled to the inside of the cabinet (near the cashbox). Remove the four Phillips-head screws that mount to line cord cover plate to the rear cabinet. Match the prongs on the plug with the holes in the receptacle, and push the line cord securely into place. Make sure the cord is aligned with the indentation on the cover plate (indentation should point toward bottom of the cabinet). Remount line cord cover plate. If desired, four tamper resistant screws have been provided in an envelope marked "Security Screws" (located in the cashbox) to remount cover plate.



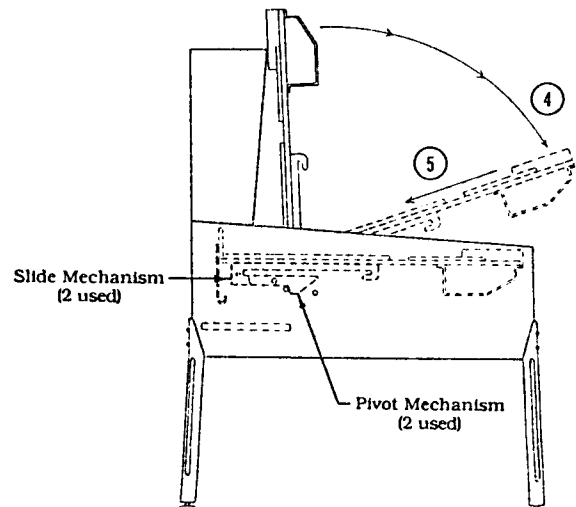
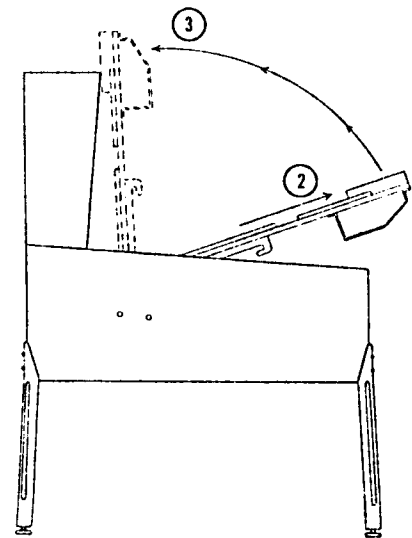
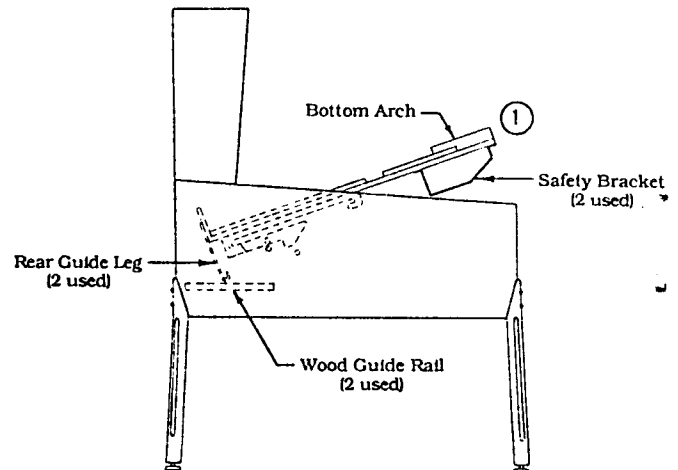
RAISING THE PLAYFIELD

CAUTION

Do not raise the playfield straight up! This game uses a slide assembly to raise and lower the playfield.

To raise playfield:

1. Grasp bottom arch and carefully lift up playfield only high enough to clear safety brackets. Rear guide legs should not hit wood guide rails or be used to slide out playfield.
2. Pull out playfield toward you until it stops (rest position) and raise approximately 3".
Be sure playfield is in locked position and does not slide back into cabinet. If it does, repeat Step 2 before proceeding to Step 3.
3. Rotate playfield to upright service position (lean on backbox) by pulling toward you and up. Listen for the sound of a click; this insures locking and pivoting sequence.



To lower playfield:

4. Rotate playfield down to rest position. This unlocks the pivoting mechanism.
5. Push back playfield into cabinet and into playing position.

GAME CONTROL LOCATIONS

Cabinet Switches

The On-Off Switch is on the bottom of the cabinet near the right front leg.

The Start Button is a pushbutton to the left of the coin door on the cabinet exterior. Press the Start button to begin a game, or during the diagnostic mode, to ask for HELP.

Coin Door Buttons

The operator controls all game adjustments, obtains bookkeeping information, and diagnoses problems, using only four pushbutton switches mounted on the inside of the coin door. The Coin Door Buttons have two modes of operation Normal Function and Test Function.

Normal Function

The Service Credits button puts credits on the game that are not included in any of the game audits.

The Volume Up (+) button raises the sound level of the game. Press and hold the button until the desired level is reached.

The Volume Down (-) button lowers the sound level of the game. Press and hold the button until the desired level is reached. See Adjustment A.1 28 to shut sound Off completely.

The Begin Test button starts the Menu System Operation and changes the Coin Door Buttons from Normal Function to Test Function.

Test Function

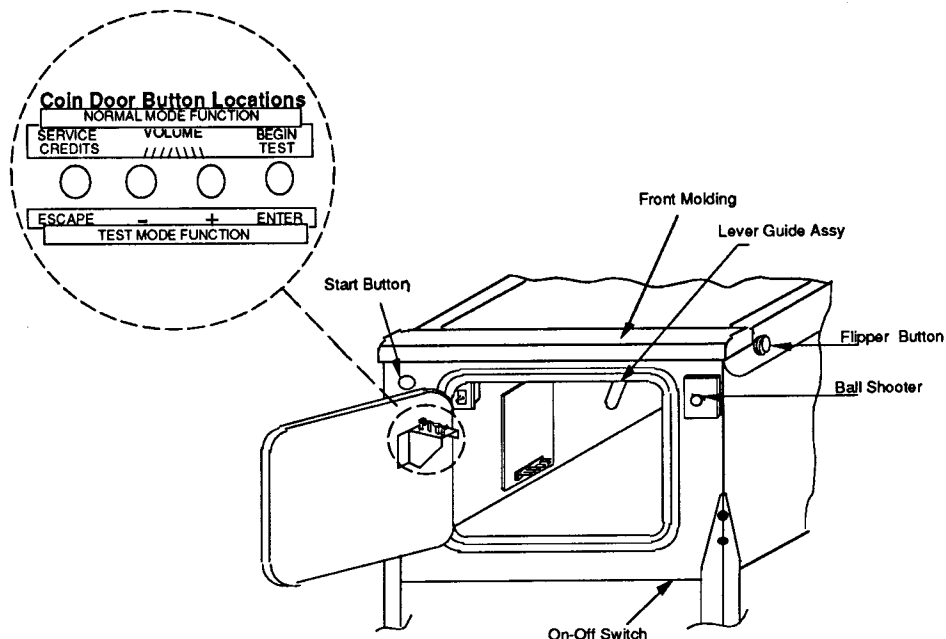
The Escape button allows you to get out of a menu selection or return to the Attract Mode.

The Up (+) button allows you to cycle forward through the menu selections or adjustment choices.

The Down (-) button allows you to cycle backward through the menu selections or adjustment choices.

The Enter button allows you to get into a menu selection or lock in an adjustment choice.

Holding the Enter button for five seconds, during the Attract Mode, resets the High Scores.



GAME OPERATION

CAUTION

After assembly and installation at its site location, this game must be plugged into a properly grounded outlet to prevent shock hazard, and to assure proper game operation. **DO NOT** use a 'cheater' plug to defeat the ground pin on the line cord. **DO NOT** cut off the ground pin.

POWERING UP With the coin door closed, plug the game in, and switch it On. In normal operation, Testing shows in the displays as the game performs Start-up Tests. Once the Start-up Tests have been successfully completed the last score is displayed. After that, the game goes into the Attract Mode.

Note: After the game has been on location for a time, the Start-up Tests may contain messages concerning game problems. The section entitled 'Error Messages' contains more details concerning messages displayed at each game turn-on.

Open the coin door and press the Begin Test switch. The display shows the game name, number, and software revision. The message changes. The display shows the sound software revision, the revision level of the system software, and the date the software was revised.

Example:

	WHITE WATER		Sound Rev. L-1
50018	Rev. L-X	SY. 0.X0	X-X-92

Press the Enter button to enter the WPC Menu System (refer to the section entitled "Menu System Operation" for more information). Perform the entire Test Menu routine to verify that the game is operating satisfactorily.

ATTRACT MODE*. After completing the Test Menu routine, press the Escape button three times to enter the Attract Mode. During the Attract Mode, the score display shows a series of messages informing the player concerning, recent highest scores*, "custom messages*", and the score to achieve to obtain a Replay award*.

CREDIT POSTING. Insert coin(s). A sound is heard for each coin, and the display shows the number of credits purchased. So long as the number of maximum allowable credits* are NOT exceeded by coin purchase or high score, credits are posted correctly.

STARTING A GAME. Press the Start button once. A startup sound plays, and the credit amount shown in the display decreases by one. The display flashes 00 (until the first playfield switch is actuated), and shows ball 1. If credits are posted, additional players may enter the game by pressing the Start button once for each player, before the end of play on the first ball.

TILTS. Actuating the Cabinet Tilt switch inside the cabinet ends the current game and then proceeds to the Game Over Mode. With the third closure* of the plumb bob tilt switch, the player loses the remaining play of that ball, but can complete the game.

END OF A GAME. All earned scores and bonuses are awarded. If a player's final score exceeds the specified value, the player receives a designated award for achieving the current highest score. A random digit set* appears in the display. Credit* may be awarded, when the last two digits of any player's score match the random digits. Match, high score, and game over sounds are made, as appropriate.

GAME OVER MODE. The Game Over display shows in the display. Then, the high scores flash. The game proceeds to the Attract Mode.

* - Operator-adjustable feature

MENU SYSTEM OPERATION

This game operates on a Menu System. The Main Menu allows you to choose from several main categories, which in turn lead to other menus to choose from. To enter the Menu System, open the coin door and press the Begin Test button. The displays show the Game I.D. Mode. Press the Enter button and the Main Menu appears. To cycle through the Main Menu, (or any other menu), selections press either the Up or Down button. Activate any selection by pressing the Enter button when the desired selection appears in the display. Return to the Attract Mode or a previous menu selection, by pressing the Escape button. Press the Start button for HELP at any time.

MAIN MENU

B. Bookkeeping Menu

- B.1 Main Audits
- B.2 Earning Audits
- B.3 Standard Audits
- B.4 Feature Audits
- B.5 Histograms
- B.6 Time-stamps

P. Printouts Menu

- P.1 Earnings Data
- P.2 Main Audits
- P.3 Standard Audits
- P.4 Feature Audits
- P.5 Score Histograms
- P.6 Time Histograms
- P.7 Time-Stamped
- P.8 All Data

T. Test Menu

- T.1 Switch Edges
- T.2 Switch Levels
- T.3 Single Switches
- T.4 Solenoid Test
- T.5 Flasher Test
- T.6 General Illumination
- T.7 Sound and Music Test
- T.8 Single Lamps
- T.9 All Lamps
- T.10 Lamp & Flasher Test
- T.11 Display Test
- T.12 Flipper Coil Test
- T.13 Ordered Lamps Test
- T.14 Bigfoot Test
- T.15 Backbox Test

U. Utilities Menu

- U.1 Clear Audits
- U.2 Clear Coins
- U.3 Reset H.S.T.D.
- U.4 Set Time & Date
- U.5 Custom Message
- U.6 Set Game I.D.
- U.7 Factory Adjustments
- U.8 Factory Resets
- U.9 Presets
- U.10 Clear Credits
- U.11 Auto Burn-in

A. Adjustments Menu

- A.1 Standard Adjustments
- A.2 Feature Adjustments
- A.3 Pricing Adjustments
- A.4 H.S.T.D. Adjustments
- A.5 Printer Adjustments

Press Escape

To move out of a menu selection.

Press Enter

To get into a menu selection.

Press Up

Increases sequence; (ex. A.1, A.2, A.3, A.4).

Press Down

Decreases sequence; (ex. A.4, A.3, A.2, A.1).

Use Up or Down to cycle through the selections in a menu.

Use Escape and Enter to move into and out of the selected menu.

Bookkeeping is the first category available from the Main Menu. Press the Enter button to activate the Bookkeeping Menu. Press the Up or Down button to cycle through the Bookkeeping Menu selections. Press the Enter button to activate a selection. Once you have activated a selection, press the Up or Down button to cycle through the available audits. Audits cannot be set, they can only be cleared by using U1 and U2 from the Utilities Menu. Press the Escape button to return to the Bookkeeping Menu. Press it again to return to the Main Menu.

B. BOOKKEEPING MENU

- B.1 Main Audits**
- B.2 Earning Audits**
- B.3 Standard Audits**
- B.4 Feature Audits**
- B.5 Histograms**
- B.6 Time-Stamped**

One Button Audit System. The Bookkeeping Menu is obtainable directly from the Attract Mode. Repeatedly pressing the Enter button, while in the Attract Mode, will cycle through all of the game audits.

B.1 Main Audits

B.1	01	Total Earnings	00
B.1	02	Recent Earnings	00
B.1	03	Free Play Percent	00
B.1	04	Average Ball Time	00
B.1	05	Average Game Time	00
B.1	06	Total Plays	00
B.1	07	Replay Awards	00
B.1	08	Percent Replays	00
B.1	09	Extra Balls	00
B.1	10	Percent Extra Ball	00

B.2 Earning Audits

B.2	01	Recent Earnings	00
B.2	02	Recent Left Slot	00
B.2	03	Recent Center Slot	00
B.2	04	Recent Right Slot	00
B.2	05	Recent 4th Slot	00
B.2	06	Recent Paid Credits	00
B.2	07	Recent Service Credits	00
B.2	08	Total Earnings*	00
B.2	09	Total Left Slot*	00
B.2	10	Total Center Slot*	00
B.2	11	Total Right Slot*	00
B.2	12	Total 4th Slot*	00
B.2	13	Total Paid Credits*	00
B.2	14	Total Service Credits*	00

* These audits are NOT resettable. They are a record of the earnings of the game since the "CLOCK 1ST SET" Time-stamp.

B.3 Standard Audits

B.3	01	Games Started	00
B.3	02	Total Plays*	00
B.3	03	Total Free Play	00
B.3	04	Free Play Percent	00
B.3	05	Replay Awards	00
B.3	06	Percent Replays	00
B.3	07	Special Awards	00
B.3	08	Percent Special	00
B.3	09	Match Awards	00
B.3	10	Percent Match	00
B.3	11	H.S.T.D. Credits	00
B.3	12	Percent H.S.T.D	00
B.3	13	Extra Ball	00
B.3	14	Percent Extra Ball	00
B.3	15	Tickets Awarded	00
B.3	16	Percent Tickets	00
B.3	17	Left Drains	00
B.3	18	Right Drains	00
B.3	19	Average Ball Time	00
B.3	20	Average Game Time	00
B.3	21	Play Time	00:00:00
B.3	22	Minutes On	00
B.3	23	Balls Played	00
B.3	24	Tilts	00
B.3	25	Replay 1 Awards	00
B.3	26	Replay 2 Awards	00
B.3	27	Replay 3 Awards	00
B.3	28	Replay 4 Awards	00
B.3	29	1 Player Games	00
B.3	30	2 Player Games	00
B.3	31	3 Player Games	00
B.3	32	4 Player Games	00
B.3	33	H.S.T.D. Reset Count	00
B.3	34	Burn-in Time†	00:00:00
B.3	35	1st Replay Level	00
B.3	36	Left Flipper	00
B.3	37	Right Flipper	00

* "Total Plays" only counts on completed games. A game is considered complete when the final ball begins. Audit information from incomplete games is ignored. Operation for test and service do not affect audits.

† This audit is not resettable.

B.4 Feature Audits

B.4	01	Two-way Combo	00%	00
B.4	02	Three-way Combo	00%	00
B.4	03	Four-way Combo	00%	00
B.4	04	Five-way Combo	00%	00
B.4	05	Skill Shots	00%	00
B.4	06	Hot Foot Started	00%	00
B.4	07	Hot Foot Jackpot	00%	00
B.4	08	Boulder Awards	00%	00
B.4	09	Boulder 5X Awards	00%	00
B.4	10	Boulder Man Over	00%	00
B.4	11	Quick Multi-ball	00%	00
B.4	12	Boulder Extra Ball Lit	00%	00
B.4	13	Boulder Advance Raft	00%	00
B.4	14	Boulder Mystery	00%	00
B.4	15	Multi-ball Plays	00%	00
B.4	16	Single Jackpot	00%	00
B.4	17	Double Jackpot	00%	00
B.4	18	Triple Jackpot	00%	00
B.4	19	5X Jackpot	00%	00
B.4	20	Ramp Extra Ball Lit	00%	00
B.4	21	Percent Extra Ball	00%	00
B.4	22	Boulder Loop	00%	00
B.4	23	Boomerang Loop	00%	00
B.4	24	Spine Chill Loop	00%	00
B.4	25	Spine Loop 5 Million	00%	00
B.4	26	Quick Jackpot	00%	00
B.4	27	Disaster Drop	00%	00
B.4	28	Insanity Falls	00%	00
B.4	29	Rematch Started	00%	00
B.4	30	Rematch Awarded	00%	00
B.4	31	Start Quick End	00%	00
B.4	32	Award Quick End	00%	00
B.4	33	Wet Willie Made	00%	00
B.4	34	Stage 2 Started	00%	00
B.4	35	Stage 2 Awarded	00%	00
B.4	36	Gold Mine Entry	00%	00
B.4	37	Gold Rush Starts	00%	00
B.4	38	Camera Pickups	00%	00
B.4	39	Picture Taken	00%	00
B.4	40	Boulder Bash	00%	00
B.4	41	Cow Pickup	00%	00
B.4	42	Secret Cow	00%	00
B.4	43	Vacation Jackpot	00%	00

B.5 Histograms

B.5	01	0-10 Million Scores	00%	00
B.5	02	10-20 Million Scores	00%	00
B.5	03	20-40 Million Scores	00%	00
B.5	04	40-50 Million Scores	00%	00
B.5	05	50-70 Million Scores	00%	00
B.5	06	70-100 Million Scores	00%	00
B.5	07	100-150 Million Scores	00%	00
B.5	08	150-200 Million Scores	00%	00
B.5	09	200-300 Million Scores	00%	00
B.5	10	300-500 Million Scores	00%	00
B.5	11	500-900 Million Scores	00%	00
B.5	12	900-1 Billion Scores	00%	00
B.5	13	Over 1 Billion Scores	00%	00
B.5	14	Game Time 0.0-1.0 Mins	00%	00
B.5	15	Game Time 1.0-1.5 Mins	00%	00
B.5	16	Game Time 1.5-2.0 Mins	00%	00
B.5	17	Game Time 2.0-2.5 Mins	00%	00
B.5	18	Game Time 2.5-3.0 Mins	00%	00
B.5	19	Game Time 3.0-3.5 Mins	00%	00
B.5	20	Game Time 3.5-4.0 Mins	00%	00
B.5	21	Game Time 4-5 Mins	00%	00
B.5	22	Game Time 5-6 Mins	00%	00
B.5	23	Game Time 6-8 Mins	00%	00
B.5	24	Game Time 8-10 Mins	00%	00
B.5	25	Game Time 10-15 Mins	00%	00
B.5	26	Game Time Over 15 Mins	00%	00

B.6 Time-Stamps

Time-Stamps Menu allows you to view dates and times that are important to game software.

B.6	01	Current Time
B.6	02	Clock 1st Set
B.6	03	Clock Last Set
B.6	04	Audits Cleared
B.6	05	Coins Cleared
B.6	06	Factory Setting
B.6	07	Last Game Start
B.6	08	Last Replay
B.6	09	Last H.S.T.D. Reset
B.6	10	Champion Reset
B.6	11	Last Printout
B.6	12	Last Service Credit

Press the Enter button to activate the Printouts Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Printouts Menu selections. Press the Enter button to activate a selection. Press the Escape button to return to the Printouts Menu. Press in again to return to the Main Menu.

P. PRINTOUTS MENU

(optional board required)

- P.1 Earnings Data**
- P.2 Main Audits**
- P.3 Standard Audits**
- P.4 Feature Audits**
- P.5 Score Histograms**
- P.6 Time Histograms**
- P.7 Time-Stamped**
- P.8 All Data**

The Printouts Menu is a combination of the other menus. This menu allows you to access and print information in the available menu selections.

If no Printer is attached the the message "Waiting for Printer" appears in the displays.

NOTE: Set the print specification from the Adjustment Menu, A.5 Printer Adjustments.

Press the Enter button to activate the Test Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Test Menu selections. Press the Enter button to activate a test. Press the Escape button to return to the Test Menu. Press it again to return to the Main Menu. **NOTE:** During any test, press the Start button to obtain the wire color, driver number, connector number and fuse location.

T. TEST MENU

- T.1 Switch Edges**
- T.2 Switch Levels**
- T.3 Single Switch**
- T.4 Solenoid Test**
- T.5 Flasher Test**
- T.6 General Illumination**
- T.7 Sound & Music Test**
- T.8 Single Lamps**
- T.9 All Lamps**
- T.10 Lamp & Flasher Tests**
- T.11 Display Test**
- T.12 Flipper Coil Test**
- T.13 Ordered Lamps Test**
- T.14 Bigfoot Test**
- T.15 Backbox Test**

The switch matrix, on the left side of the display, shows the state of all switches. A dot indicates the switch is open, a square indicates the switch is closed. The numbers assigned to each switch indicate where the switch is located in the matrix. The number on the left indicates the column, the number on the right indicates the row. Example - Switch 23 is 2nd column, 3rd row.

A short to ground - on either the row or column wire - appears as a shorted row(s). However, a column wire shorted to ground disappears when all of the indicated row switches are open. A row wire shorted to ground does not disappear.

A shorted diode in the switch matrix can cause other switches to appear closed. These "phantom" switches (though not actually closed), complete a rectangle in the switch matrix. Therefore, if two switches in the same column are closed (example; #22 and #24), and a third switch is pressed in another column but in the same row as one of the first two (example; #32), the "phantom" switch #34 is falsely indicated as closed. The switch with the shorted diode is diagonally opposite the "phantom" switch (in this case #22).

T.1 Switch Edges Press each switch one at a time. The name and number of the switch is shown in the display. If a switch other than the one pressed, or no switch at all is indicated, the system has detected a problem with the switch circuit.

T.2 Switch Levels This test automatically cycles through all switches that are detected closed. The name and number of each switch that is detected is shown in the display. A filled square indicates the switch's position in the matrix.

T.3 Single Switches The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the switch to be tested.

T.4 Solenoid Test

The Solenoid Test has three modes, Repeat, Stop, and Run. Only one solenoid should pulse at a time. The system has detected a problem if; more then one solenoid pulses, a solenoid comes On and stays On or, during the Repeat and Run mode, no solenoid pulses.

- Repeat - The Repeat mode pulses a single solenoid. After entering this test, Solenoid 1 shows in the display and the corresponding solenoid activates. Press the Up or Down button to cycle through the solenoids, one at a time. The same solenoid pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next mode.
- Stopped - The Stopped mode halts the Solenoid Test. Press Enter during the Repeat mode and the Solenoid Test stops. No solenoids should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to move to the next mode.
- Running - The Running mode cycles through the solenoids automatically. The display shows the name and number of the solenoid currently being pulsed.

T.5 Flasher Test

This tests the flashlamp part of the solenoid circuit exclusively. This, like the Solenoid Test, has three modes: Repeat, Stop, and Run. During this test, only one flashlamp circuit should pulse at a time. The system has detected a problem if more then one circuit pulses, a circuit stays On or, during the Repeat and Run mode, no circuit pulses.

- Repeat - The Repeat mode pulses a single flashlamp. After entering this test, the name and number of the first flashlamp circuit shows in the display and the corresponding bulb(s) flash. Press the Up or Down button to cycle through all of the flashlamps circuits one at a time. The same circuit pulses until press the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.
- Stopped - The Stopped mode halts the Flasher Test. No flashlamp circuit should be active during this mode. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.
- Running - The Running mode cycles through the flashlamps automatically. The display shows the name and number of the flashlamp circuit currently being pulsed, and the corresponding bulb(s) flash.

T.6 General Illumination

This test checks all of the General Illumination circuits. There are two modes of operation: Stop and Run.

- Stopped - Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number shows in the display while the corresponding lamps lights. If any other results occur the system has detected an error.
- Running - Press the Enter button any time during Stopped mode and the General Illumination. Test cycles through automatically. For each circuit shown in the display the corresponding bulbs should light. If any other results occurs the system has detected a problem.

T.7 Sound and Music Test The Sound and Music Test checks the audio circuits. This test has three modes for testing the sound and music circuits, Run, Repeat and Stop.

- Running - The Running mode steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test advances to a particular sound or tune without having to wait for the program to play all the sounds available in the test. A sound or tune should be heard for each name and number that appears in the display. Any other results indicates the system has detected a problem.
- Repeat - Press the Enter button at any time during the Running mode to cause the program to stop and repeat a particular sound/tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other results indicates the system has detected a problem.
- Stopped - Press the Enter button at any time during the Repeat mode to stop this test altogether. Nothing should be heard. Any other results indicates the system has detected a problem.

T.8 Single Lamp Test The number assigned to each lamp indicates the lamp's position in the matrix. The number on the left indicates the column. The number on the right indicates the row. Example - Lamp 23 means 2nd column, 3rd row.

This test checks each lamp circuit individually. Press the Up or Down button to cycle through this test. For each name and number that is shown in the display the corresponding lamp should light. Any other results indicates the system has detected a problem.

T.9 All Lamps Test This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other results indicates the system has detected a problem.

T.10 Lamp and Flasher Test This test causes all the flashlamps and the controlled lamps to flash at the same time. The controlled lamps blink, while the flashlamps cycle from highest to lowest. Any other results indicates the system has detected a problem.

T.11 Display Test This test automatically checks every dot in the Dot Matrix Display. A series of patterns appear in sequence. Each pattern turns On and Off a section of dots. Every dot on the matrix display should be turned On and off during this test.

T.12 Flipper Coil Test

The Flipper Coil Test has three modes, Repeat, Stop, and Run. Only one Flipper should pulse at a time. The system has detected a problem if; more then one flipper pulses, a flipper comes On and stays On or, during the Repeat and Run mode, no flipper pulses.

- Repeat - The Repeat mode pulses a single flipper. After entering this test, flipper coil 01 shows in the display and the corresponding coil activates. Press the Up or Down button to cycle through the flipper coils, one at a time. The same solenoid pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next mode.
- Stopped - The Stopped mode halts the Flipper Coil Test. Press Enter during the Repeat mode and the test stops. No coils should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to move to the next mode.
- Running - The Running mode cycles through the flippers automatically. The display shows the name and number of the flipper coil currently being pulsed.

T.13 Ordered Lamps Test

The number assigned to each lamp indicates the lamp's position in the matrix. The number on the left indicates the column. The number on the right indicates the row. Example - Lamp 23 means 2nd column, 3rd row.

This test checks each lamp circuit individually. Press the Up or Down button to cycle through the lamps. Lamps light in a clock-wise or counter clock-wise direction starting from the bottom of the playfield. Direction depends on which button, Up or Down, is pressed. For each name and number that is shown in the display the corresponding lamp should light. Any other results indicates the system has detected a problem.

T.14 Bigfoot Test

The Bigfoot Test has three options: 1) Head Motor Test; 2) Head Opto Test; 3) Head Position Test. Press the Up or Down button to select an option, (an option flashes when it is selected). Press the Enter button to begin. Press the Escape button to stop the option and return to the Bigfoot Test Menu.

- 1) Head Motor Test - The head rotates continuously. The direction CW (clock-wise) or CCW (counter clock-wise) shows on the display. Press the Up or Down button to change the direction of the head rotation.
- 2) Head Opto Test - The head rotates continuously. The display shows two boxes, one for Opto 1 and the other for Opto 2. When the switch makes, an "X" appears in the appropriate box. When the switch breaks the "X" disappears.
- 3) Head Position Test - The head turns intermittently. The display shows the position of the head.

T.15 Backbox Test

Each bulb on the top of the backbox , near the WHITE WATER sign, is turned On and Off in a sequence. In the first sequence, each bulb turns On and remains On until the last one is lit. Then, they all turn Off. In the second sequence, each bulb turns On and Off individually.

NOTE: Replace bulbs on the top of the backbox with #194 bulbs Only!
Part Number 24-8831

Press the Enter button to activate the Utilities Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Utility Menu selections. Press the Enter button to activate a selection. Use the Up or Down button to rotate the settings. Press the Enter button to lock in a setting. If a mistake is made while changing a setting, press the Escape button while "Saving Adjustment Value" is still in the display. The original setting is retained and the new setting is ignored. Press the Escape button to return to the Utilities Menu. Press it again to return to the Main Menu.

U. Utilities Menu

- U.1 Clear Audits**
- U.2 Clear Coins**
- U.3 Reset H.S.T.D.**
- U.4 Set Time & Date**
- U.5 Custom Message**
- U.6 Set Game I.D.**
- U.7 Factory Adjustments**
- U.8 Factory Resets**
- U.9 Presets**
- U.10 Clear Credits**
- U.11 Auto Burn-in**

U.1 Clear Audits Press the Enter button to clear the Standard Audits (except Burn-in Time), Feature Audits, and Histograms.

U.2 Clear Coins Press the Enter button to clear the Earnings Audits.

U.3 Reset H.S.T.D. Press the Enter button to clear the High Score to Date Table and the Grand Champion.

U.4 Set Time and Date Press the Enter button to activate the time and date. Use the Up or Down button to change the value, then press the Enter button to lock in that value. If a mistake is made press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

U.5 Custom Message Set A.1 20 to ON before trying to write a Custom Message. Press the Enter button to begin entry of the custom message. Use the Up or Down button to rotate letters. Use the Start button to rotate punctuation marks, (if desired). Press the Enter button to lock in the desired letter and punctuation. If a mistake is made, use Up and Down to select the "back-arrow" character. The "back-arrow" character is located before the space character and after the number nine. Press Enter while the back-arrow shows to erase the previously entered character. Once the message is complete, press and hold the Enter button until "Message Stored" is displayed.

Press the Escape button to cancel the new message. The message "Press Enter to Reset" appears. If Enter is pressed, the custom message is cleared and no message is displayed. If Escape is pressed, the original message remains intact.

U.6 Set Game I.D. This utility allows for the installation of a message, such as game location, that only appears on printouts. Press the Enter button to activate Set Game I.D.. Use the Up or Down button to rotate letters. Use the Start button to rotate punctuation marks, (if desired). Press the Enter button to lock in the desired letter and punctuation.

U.7 Factory Adjustment Press the Enter button to restore the adjustments to factory settings.

U.8 Factory Reset Press the Enter button to restore the adjustments to their factory setting, clear the Audits, H.S.T.D Table, and Custom Message/Game I.D.

Factory Setting Table

Adj #	Adj Description	U.S.A.	German	French	European
A.1 06	Replay Percent	10%	10%	10%	10%
A.1 13	Replay Boost	10,000,000	10,000,000	10,000,000	10,000,000
A.2 01	Extra Ball Percent	25%	25%	25%	25%
A.2 02	Ramp Extra Ball 1	8	8	8	8
A.2 03	Ramp Extra Ball 2	On	On	On	On
A.2 04	Boulder E.B. Memory	Yes	Yes	Yes	Yes
A.2 05	Ramp E.B. Memory	Yes	Yes	Yes	Yes
A.2 07	Hurry Up Start	20,000,000	20,000,000	20,000,000	20,000,000
A.2 08	Hot Foot Percent	25%	25%	25%	25%
A.2 09	Hot Foot Count	5	5	5	5
A.2 10	Kickback Memory	On	On	On	On
A.2 11	Insanity Record	12	12	12	12
A.2 12	Percent Special	5%	5%	5%	5%
A.4 10	Backup Champion	200,000,000	200,000,000	200,000,000	200,000,000
A.4 11	Backup H.S.T.D. 1	120,000,000	120,000,000	120,000,000	120,000,000
A.4 12	Backup H.S.T.D. 2	100,000,000	100,000,000	100,000,000	100,000,000
A.4 13	Backup H.S.T.D. 3	90,000,000	90,000,000	90,000,000	90,000,000
A.4 14	Backup H.S.T.D. 4	80,000,000	80,000,000	80,000,000	80,000,000

U.9 Presets Use the Up or Down buttons to cycle through the available Presets. When the desired Preset is displayed, press the Enter button to lock in that Preset. If a mistake is made, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

Game Difficulty Levels The game play difficulty adjustments can be changed to a combination that is MUCH LESS to MUCH MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the individual group.

- U.9 01 Install Extra Easy** MUCH LESS difficult than factory setting.
- U.9 02 Install Easy** Somewhat LESS difficult than factory setting.
- U.9 03 Install Medium** About the SAME as factory setting.
- U.9 04 Install Hard** Some what MORE difficult than factory setting
- U.9 05 Install Extra Hard** MUCH MORE difficult than factory setting.

Difficulty Setting Table for U.S., Canadian and French Games

Adj #	Adj Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03 (factory)	Hard U.9 04	Extra Hard U.9 05
A.2 01	Extra Ball Percent	35%	30%	25%	15%	10%
A.2 02	Ramp Extra Ball 1	10	11	12	14	15
A.2 03	Ramp Extra Ball 2	On	On	On	Off	Off
A.2 04	Boulder E.B. Memory	Yes	Yes	Yes	Yes	No
A.2 05	Ramp E.B. Memory	Yes	Yes	Yes	Yes	No
A.2 07	Hurry Up Start	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
A.2 08	Hot Foot Percent	35%	30%	25%	15%	10%
A.2 09	Hot Foot Count	3	3	4	6	8
A.2 10	Kickback Memory	Yes	Yes	No	No	No
A.2 11	Insanity Record	9	9	12	14	16
A.2 12	Percent Special	15%	10%	5%	3%	1%

Difficulty Setting Table for German and European Games

Adj #	Adj Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03 (factory)	Hard U.9 04	Extra Hard U.9 05
A.2 01	Extra Ball Percent	35%	30%	25%	15%	10%
A.2 02	Ramp Extra Ball 1	10	11	12	14	15
A.2 03	Ramp Extra Ball 2	On	On	On	Off	Off
A.2 04	Boulder E.B. Memory	Yes	Yes	Yes	Yes	No
A.2 05	Ramp E.B. Memory	Yes	Yes	Yes	Yes	No
A.2 07	Hurry Up Start	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
A.2 08	Hot Foot Percent	35%	30%	25%	15%	10%
A.2 09	Hot Foot Count	3	3	4	6	8
A.2 10	Kickback Memory	Yes	Yes	No	No	No
A.2 11	Insanity Record	9	9	12	14	16
A.2 12	Percent Special	15%	10%	5%	3%	1%

U.9 06 Install 5 Ball

U.9 07 Install 3 Ball

Adjustments U.9 06 and U.9 07 can be used to change a game to 3 or 5 ball play, including the changing of certain features to the recommended 3-and 5-ball level. The Preset Game Adjustments Table for U.S./Canadian Games lists the adjustments and settings that comprise the individual groups.

Preset Adjustments Table for U.S. and Canadian Games

Adj #	Adj Description	Install 5-ball U.9 06	Install 3-ball U.9 07
A.1 01	Balls/Game	5	3
A.2 01	Extra Ball Percent	20%	25%
A.2 02	Ramp Extra Ball 1	13	12
A.2 03	Ramp Extra Ball 2	On	On
A.2 04	Boulder Extra Ball Memory	Yes	Yes
A.2 05	Ramp Extra Ball Memory	Yes	Yes
A.2 07	Hurry Up Start	20,000,000	20,000,000
A.2 08	Hot Foot Percent	20%	25%
A.2 09	Hot Foot Count	6	4
A.2 10	Kickback Memory	Off	Off
A.2 11	Insanity Record	16	12
A.2 12	Percent Special	5%	5%

U.9 08 Install Add -A -Ball

This option deletes all Free Play awards and replaces them with Extra Ball awards. Individual adjustments are affected, as follows:

Ad	Name	New Setting
A.1 13	Replay Boost	Off
A.1 14	Replay Award	Ex. Ball
A.1 15	Special Award	Ex. Ball
A.1 17	Extra Ball Ticket	No
A.1 19	Match Feature	Off
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 08	High Score 3 Credits	00
A.4 07	High Score 4 Credits	00

U.9 09 Install Ticket

This option deletes Credit awards and replaces them with Ticket awards. Individual adjustments are affected as follows:

Ad	Name	New Setting
A.1 14	Replay Award	Ticket
A.1 15	Special Award	Ticket
A.1 16	Match Award	Ticket
A.1 17	Ex. Ball Ticket	Yes
A.1 31	Ticket Expan.Brd.	Yes
A.4 02	H.S.T.D. Award	Ticket

U.9 1 0 Install Novelty This option removes all Free Play and Extra Ball awards. Individual adjustments are affected as follows:

Ad	Name	New Setting
A.1 04	Max. Ex. Ball	Off
A.1 05	Replay System	Fixed
A.1 09	Replay Level 1	Off
A.1 10	Replay Level 2	Off
A.1 11	Replay Level 3	Off
A.1 12	Replay Level 4	Off
A.1 15	Special Award	Points
A.1 19	Match Feature	Off
A.4 01	Highest Score	On
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 07	High Score 3 Credits	00
A.4 08	High Score 4 Credits	00

U.9 1 1 Install Buy-In This option automatically sets game pricing to 1 for 50¢/2 for \$1.00 and 1 Coin Buy-in (A.3 19) to YES.

U.9 12 Not Used

U.9 13 Not Used

U.9 14 Not Used

U.9 15 Not Used

U.9 16 Not Used

- U.9 17 Install German 1 •
- U.9 18 Install German 2 •
- U.9 19 Install German 3 •
- U.9 20 Install German 4 •
- U.9 21 Install German 5 •
- U.9 22 Install German 6 •

Adjustments U.9 17 through U.9 22 are used to modify game pricing and type of game play. The Preset Game Adjustments Table for German/European Games lists the adjustments and settings that comprise the individual groups.

Preset Adjustments Table for German Games

Adj #	Adj Description	German 1 U.9 17	German 2 U.9 18	German 3 U.9 19	German 4 U.9 20	German 5 U.9 21	German 6 U.9 22
A.1 14	Replay Award	Credit	Ticket	Audit	Credit	Ticket	Audit
A.1 15	Special Award	Credit	Ex. Ball	Points	Credit	Ex. Ball	Points
A.1 16	Match Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.1 19	Match Feature	7%	7%	Off	7%	7%	Off
A.3 01	Game Pricing	6spiele/5DM	6spiele/5DM	6spiele/5DM	7spiele/5DM	7spiele/5DM	7spiele/5DM
A.4 02	H.S.T.D. Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.4 04	Champion Credits	03	03	00	03	03	00
A.4 05	H.S.T.D. 1 Credits	01	01	00	01	01	00
A.4 06	H.S.T.D. 2 Credits	00	00	00	00	00	00
A.4 07	H.S.T.D. 3 Credits	00	00	00	00	00	00
A.4 08	H.S.T.D. 4 Credits	00	00	00	00	00	00
A.4 10	Backup Champion	200,000,000	200,000,000	00	200,000,000	200,000,000	00
A.4 11	Backup H.S.T.D. 1	120,000,000	120,000,000	00	120,000,000	120,000,000	00
A.4 12	Backup H.S.T.D. 2	100,000,000	100,000,000	00	100,000,000	100,000,000	00
A.4 13	Backup H.S.T.D. 3	90,000,000	90,000,000	00	90,000,000	90,000,000	00
A.4 14	Backup H.S.T.D. 4	80,000,000	80,000,000	00	80,000,000	80,000,000	00

• For German Jumpared CPU Boards only.

German Jumpers are:

W14 W15 W16 W17 W18
In In In In Out

- U.9 23 Install French 1*
- U.9 24 Install French 2*
- U.9 25 Install French 3*
- U.9 26 Install French 4*
- U.9 27 Install French 5*
- U.9 28 Install French 6*

Adjustments U.9 23 through U.9 26 are used to modify game pricing and type of play. The preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the individual groups.

Preset Adjustments Table for French Games

Adj#	Adj Description	French 1 U.9 23	French 2 U.9 24	French 3 U.9 25	French 4 U.9 26	French 5 U.9 27	French 6 U.9 28
A.2 01	Extra Ball Percent	20%	15%	25%	25%	20%	20%

* For French Jumpared CPU Boards only.

French Jumpers are:

W14 W15 W16 W17 W18
In In In Out Out

U.10 Clear Credits Press the Enter button to clear the game Credits.

U.11 Auto Burn-in Press the Enter button to activate Auto Burn-in. This utility automatically cycles through several tests. This helps in finding intermittent problems. The tests that Auto Burn-in cycles through are: the Display Test, the Sound and Music Test, the All Lamps Test, the Solenoid Test, the Flashers Test, the General Illumination Test, and the Flipper Coil Test. All of the test run are run concurrently. The time spent on the burn-in cycle, and the total time the game has spent in burn-in are displayed.

A. ADJUSTMENTS MENU

A.1 Standard Adjustments

A.1 01 Balls Per Game
A "game" is defined by specifying the number of balls to be played.
Range: 1 to 10.

A.1 02 Tilt Warnings
The number of total actuations of the plumb bob mechanism that can occur before the game is "tilted".
Range: 1 to 10.

A.1 03 Maximum Extra Balls
The number of Extra Balls that a player may accumulate.
Range: 0 to 10.

A.1 04 Maximum Extra Balls/Ball in Play
The number of Extra Balls to be awarded per ball in play.

OFF - No maximum number of Extra Ball per ball in play.
1-10 - 1 through 10 Extra Balls per ball in play.

A.1 05 Replay System
The type of replay system to be used.

Fixed - Replay value is set and does not change during game play.
Auto%- - Replay starting value is set but changes every 50 games to comply with the percentage of replays desired.

A.1 06 Replay Percent*
The percentage of replays the players are able to earn when Auto Replay is used.
Range: 5% to 50%.

A.1 07 Replay Start*
Replay start value when Auto% Replay is used.
Range: 15,000,000 to 250,000,000.

*For Auto% Replay.

A.1 08 Replay Levels* *For Auto% Replay.
The number of replay levels used by the Auto% Replay mode. The range of this setting is 1 through 4. When two replay levels are chosen, the second replay level is automatically adjusted to twice the starting replay level. When three of four replay levels are chosen, their values are automatically adjusted to three or four times the starting replay level.

A.1 09 Replay Level 1**
A.1 10 Replay Level 2**
A.1 11 Replay Level 3**
A.1 12 Replay Level 4** ** For Fixed Replay
The value to be used for the first, second, third, and fourth Fixed Replay.
Range: 00 to 250,000,000.

A.1 13 Replay Boost
The replay score can be temporarily boosted by the selected amount EACH time the player reaches or exceeds the replay score. This temporary boost is cancelled when credits equal 0, the player inserts another coin, or when Begin Test is pressed.

ON - Score is boosted between 1,000,000 and 50,000,000 points.
OFF - Replay score is not boosted.

A.1 14 Replay Award
The form of award automatically provided when the player exceeds any replay level for either Auto% Replay or Fixed Replay.

Credit - Reaching each Replay level awards credit.
Ticket - Reaching each Replay level awards a ticket.
Ball - Reaching each Replay level awards an Extra Ball.
Audit - Reaching each Replay level awards nothing to the player; it does increase the entry value of the Audit Item(s) maintaining a tally of these awards.

A.1 15 Special Award
The award automatically provided when the player scores a special.

Credit - Scoring a Special awards a Credit.
Ticket - Scoring a Special awards a Ticket.
Ball - Scoring a Special awards an Extra Ball.
Points - Scoring a Special awards 1 Million points.

A.1 16 Match Award
The award automatically provided when the players wins a match.

Credit - Winning a Match awards a Credit.
Ticket - Winning a Match awards a Ticket.

A.1 17 Extra Ball Ticket
A Ticket is awarded when the player earns an Extra Ball.

YES - The player is awarded a Ticket in addition to an Extra Ball.
NO - The player is not awarded a Ticket

- A.1 18 Maximum Ticket/Player**
The amount of Tickets each player can earn.
Range: 00 to 100.
- A.1 19 Match Feature**
The desired percentage for the Match Feature occurring at the end of the game.
- OFF - Match Feature is not available.
1 - 50% - 1% is 'hard'; 50% is 'extremely easy'. The Match Feature selects a random two-digit number at the end of the game and compares each players score for an identical two digits in the rightmost two positions. A match of these two digit results in an award of a Credit or a Ticket.
- A.1 20 Custom Message**
The message displayed during the Attract Mode.
- YES - A message is displayed
NO - A message is not displayed.
- A.1 21 Language**
The language the game uses: English, French, or German.
- A.1 22 Clock Style**
The style of clock the game uses: A.M./P.M. or 24 Hours.
- A.1 23 Date Style**
The style of date the game uses: Month/Date/Year, or Date/Month/Year.
- A.1 24 Show Date and Time**
The date and time show in the Attract Mode.
- YES - Show the date, time in status report or in the Attract Mode.
NO - Do Not show date, time in status report or in the Attract Mode.
- A.1 25 Allow Dim Illumination**
The game program dims the General Illumination for special effects and during the Attract Mode.
- YES - Dim the General Illumination during the Attract Mode.
NO - Do Not dim the General Illumination.
- A.1 26 Tournament Play**
Equalize Multi-ball and Jackpots during multi-player games, (do not carry over to next player).
- YES - Keep Multi-ball and Jackpots equal.
NO - Do Not Keep Multi-ball and Jackpots equal.

- A.1 27 Euro. Scr. Format**
Use either commas or dots between digits when numbers are displayed.
- YES - Dots instead of commas, (example- 1.000.000).
NO - Commas instead of dots, (example- 1, 000, 000).
- A.1 28 Minimum Volume Control**
The volume can be turned Off.
- YES - Volume can be turned Off.
NO - Volume can be turned Down but not Off.
- A.1 29 General Illumination Power Saver**
This allows the general illumination and controlled lamps to be dimmed following a time interval after a game is played. Power Saver Level (A.1 30) determines how dimness of lamps Using this feature substantially increases the life of the lamps.
- Setting: - Off, 2 to 60 minutes.
- A.1 30 Power Saver Level**
When General Illumination Power Saver (A.1 29) is set to On, this controls the intensity of the G.I. and controlled lamps once the game has been idle for a specified period of time.
- Range: 4 to 7. (4=dimmiest)
- A.1 31 Ticket Expansion Board**
When a Ticket Expansion Board is connected, full control of the ticket dispenser is available. This includes a ticket low/error lamp, resume on ticket jam switch and manual ticket dispense switch.
- Yes - Ticket Expansion Board is connected.
No - Ticket Expansion Board is NOT installed in the game.
- A.1 32 No Bonus Flips**
The activation of flippers during the end of ball "bonus" sequence. Setting to "YES" may extend the life of the flipper mechanisms.
- A.1 33 Game Restart**
When the Start button is pressed during or after the 2nd ball, the game in progress will end and a new game will begin. This adjustment has three settings to determine how this is handled.
- Never - Do not allow a new game start until the current game is over.
Slow - Restart if the Start button is pressed continuously for over 1/2 second. This helps to prevent the unintended restart of game in progress.
Instantly - Restart as soon as the Start button is pressed.
- When the Start button is pressed during game over, or during the 1st ball (to add a player), it is always handled instantly.

A.2 Feature Adjustments

- A.2 01 Extra Ball Percent**
The percent of games that award an Extra Ball.
Settings: Off, 15% to 40%.
- A.2 02 Ramp Extra Ball 1**
The number of completed ramp shots needed to achieve the first Extra Ball.
Settings: Off, 4 to 12, Auto.
- A.2 03 Ramp Extra Ball 2**
Completing the ramp shots award a second Extra Ball.
Settings: On or Off.
- A.2 04 Boulder Extra Ball Memory**
Extra Ball awarded from Boulder Garden feature is retained in memory until the next ball.
Settings: Yes or No.
- A.2 05 Ramp Extra Ball Memory**
The Ramp Extra Ball position is retained in memory until the next ball.
Setting: Yes or No.
- A.2 06 Mystery Extra Ball Memory**
Extra Ball awarded from Mystery Canyon feature is retained in memory until the next ball.
Setting: Yes or No.
- A.2 07 Hurry Up Start**
Starting value player can collect during Hurry Up "Man Over Board" feature. This award starts at this value and counts down to 4, 000, 000.
Setting: 10, 000, 000 to 20, 000, 000.
- A.2 08 Hot Foot Percent**
The percent of games that award the Hot Foot.
Setting: Off, 15% to 40%.
- A.2 09 Hot Foot Count**
Amount of time the player has to complete the Hot Foot Standup Bank to start the Bigfoot Hot Foot mode.
Setting: 2 to 33.

- A.2 10 Kickback Memory**
The Kickback position is retained in memory until the next ball.
Setting: Yes or No.
- A.2 11 Insanity Record**
The default used in the Insanity Falls ramp counter. Achieve this or a higher value and the player may enter their initials.
Setting: 3 to 30.
- A.2 12 Percent Special**
The percent of specials that the Boulder Garden Mystery feature awards.
Setting: 2% to 40%.
- A.2 13 Disable Bigfoot**
Set to "yes" to disable operation of Bigfoot head.
Setting: Yes or No.
- A.2 14 Attract Sounds**
Set to "on" to enable Attract Mode sounds and music.
Setting: On or Off
- A.2 15 Flipper Sounds**
Set to "off" to disable flipper sounds during Attract Mode.
Setting: On or Off.

A. 3 Pricing Adjustments

- A.3 01 Game Pricing (if set to custom, then 02 to 09 are available)**
The cost of a game is selected from the Standard Pricing Table or by installing Custom pricing.
- A.3 02 Left Coin Units**
A.3 03 Center Coin Units
A.3 04 Right Coin Units
A.3 05 4th Slot Units
The number of coin units purchased by a coin passing through the left, center, right, or fourth coin chute.
- A.3 06 Units/Credits**
Defines the number of coin units required to obtain 1 credit. A coin unit counter in the game program totals the number of coin units purchased through all coin chutes prior to each game. If the total number of these coin units exceeds or matches the Unit per Credit value by a multiple (or more, coin units) of the specified Units per Credit value the Credits display shows the proper number of credits. The coin unit counter retains any remaining coin units, until the start of Ball 2; then the coin unit counter is cleared (its contents are zeroed).
- A.3 07 Units/Bonus**
Additional credits are to be indicated in the credits display, when a certain number of coin units are accumulated.
- A.3 08 Bonus Credits**
The number of credits that are awarded when the Units/Bonus level is achieved.
- A.3 09 Minimum Units**
No credits are to be posted (indicated in the credit display), until the credits unit counter reaches a particular value, by setting this value to 02 (or more).
- A.3 10 Coin Door Type (if set to custom, then 11 to 15 and 20 are available)**
This adjustment is used to pre-set adjustments 11 to 15 based on standard coin doors (U.S.A., German, etc.).
- A.3 11 Collection Text**
The coin system is used to display the Earning Audits.
- A.3 12 Left Slot Value**
A.3 13 Center Slot Value
A.3 14 Right Slot Value
A.3 15 4th Slot Value
The monetary value of the left, center, right, or fourth coin chute.
- A.3 16 Maximum Credits**
The maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of this setting is 5 through 10. Reaching the specified setting prevents the award of any credits.

- A.3 17 Free Play**
A player can operate the game without a coin (free play) or with a coin.
- NO - A coin is necessary for game play.
YES - Game play is free; no coin required.
- A.3 18 Hide Coin Audits**
The coin audits may, or may not, be displayed.
- YES - The coin audits are not displayed.
NO - The coin audits are displayed.
HIDE NAMES - The coin audit value is shown but not the audit name.
- A.3 19 1 Coin Buy-In**
If the game pricing is set to 1 for 50¢/2 for \$1.00 the player can be allowed to 'buy-in' a subsequent game for 1 coin. The number of games that may be purchased at this cost is determined by the number of players in the previous game; that is, if the previous game had three players, 3 Credits can be purchased at the rate of 1 coin per credit.
- YES - The player has 10 seconds to buy-in at 1 coin per game.
NO - The buy-in feature is disabled.
- A.3 20 Base Coin Size**
This number is used for ticket per coin calculations.
- A.3 21 Coin Meter Units**
It is possible to connect a coin meter to the knocker coil driver which will log all coins through all slots. This adjustment activates the use of the knocker driver for this purpose, and determines the value of each unit on the meter. For example, to show the total amount of money collected as "total quarters", set this adjustment to "0.25". To show the amount of money collected as "total dollars", set this adjustment to "1.00".
- Setting this adjustment to anything other than Off establishes the coin unit for a meter attached to the knocker driver, and overrides use of the knocker during awards.
- A.3 22 Dollar Bill Slot**
The system normally requires 150 msec between coin pulses. This is too long a delay for a fast-pulsing dollar bill validator. This adjustment may be used to tell the game that there is a fast-pulsing dollar bill validator connected to one of the coin switches.
- NONE = No validator connected.
LEFT = Validator connected to left slot.
CENTER = Validator connected to center slot.
RIGHT = Validator connected to right slot
FOURTH = Validator connected to fourth.
- A.3 23 Minimum Coin Msec.**
This is the minimum width required for coin pulses to be accepted as valid coins. This may be changed to prevent certain kinds of cheating.

Pricing Table

Country	Coin Chutes				Games/Coins	Display	Pricing Adjustments A3
	Left	Center	Right	4th Chute			02 03 04 05 06 07 08 09
USA	25¢	\$1.00*	25¢	-	1/25¢, 4/\$1 ² 1/50¢, 2/75¢, 3/\$1 ^{1,2} 1/50¢, 2/\$1 ² 1/25¢, 3/\$1 ² 1/25¢, 3/50¢, 6/\$1 1/25¢, 5/\$1	USA 4/\$1.00 50¢, 75¢, \$1.00 USA 2/\$1.00 USA 3/\$1.00 CUSTOM CUSTOM	01 04 01 00 01 02 01 00 01 00 01 00 01 04 01 00
Canada	25¢	-	\$1.00	-	1/50¢, 2/75¢, 3/\$1 ² 1/50¢, 2/\$1 ²	CANADA 1 CANADA 2	
Austria	5sch	10sch	10sch	-	1/2x5sch, 3/2x10sch ² 2/5sch, 5/10sch	AUSTRIA CUSTOM	02 00 05 00 01 00 01 00
Australia	20¢	\$1	\$1	\$2	1/\$1, 3/\$2 ²	AUSTRALIA	
U.K.	£1.00	50P	20P	10P	1/3x10P, 2/50P, 4/£1 ²	U. KINGDOM	
Switzerland	1Fr	2Fr	5Fr	-	1/1Fr, 3/2Fr, 7/5Fr ²	SWISS	
Belgium	5Fr	20Fr	50Fr	-	1/4x5Fr, 1/20Fr, 3/50Fr ²	BELGIUM	
Germany	1DM	2DM	5DM	-	1/2DM, 2/3DM, 3/4DM, 5/5DM ^{1,2} 1/1DM, 2/2DM, 5/5DM ² 1/1DM, 2/2DM, 6/5DM ^{1,2} 1/1DM, 3/2DM, 9/5DM 1/2x1DM, 1/2DM, 3/5DM 2/1DM, 5/2DM, 14/5DM	GER. 1/2DM GER. 1/1DM GER. 6/5DM CUSTOM CUSTOM CUSTOM	09 18 45 00 05 00 01 00 03 06 15 00 05 00 01 00 13 26 65 00 05 65 01 00
Holland	1G	-	1G	-	1/1G	HOLLAND	
Sweden	5Kr	5kr	5Kr	-	1/5Kr ²	SWEDEN	
France	1Fr	5Fr	10Fr	-	1/3x1Fr, 2/5Fr, 5/10Fr, 10/20Fr ^{2,3} 1/2x1Fr, 3/5Fr, 7/10Fr, 14/20Fr ^{2,3} 1/5Fr, 3/10Fr, 7/2x10Fr, 7/20Fr ^{2,3} 2/5Fr, 4/10Fr, 9/2x10Fr, 9/20Fr ^{1,2,3} 2/5Fr, 5/10Fr, 11/2x10Fr, 11/20Fr ^{2,3} 1/5Fr, 3/10Fr, 6/20Fr ^{2,3}	TARIF 1 TARIF 2 TARIF 3 TARIF 4 TARIF 5 TARIF 6	
Italy	500L	500L	500L	-	1/500L ²	ITALY	
Spain	100P	-	500P	-	1/100P, 6/500P ² 1/25P, 5/100P 1/25P, 4/100P 1/2x25P, 2/100P 1/2x25P, 3/100P	SPAIN CUSTOM CUSTOM CUSTOM CUSTOM	01 00 04 00 01 04 01 00 01 00 04 00 01 00 01 00 01 00 04 00 02 00 01 00 03 00 12 00 04 00 01 06
Japan	100¥	-	100¥	-	1/100¥ ²	JAPAN	
Chile	Token	-	Token	-	1/1Token ²	CHILE	
Denmark	1Kr	5Kr	10Kr	-	1/2x1 Kr, 3/5Kr, 7/10Kr ²	DENMARK	
Finland	1Mka	-	5Mka	-	1/2x1Mka, 3/5Mka ²	FINLAND	
New Zealand	\$2.00	-	\$1.00	-	1/\$1, 3/\$2	NEW ZEALAND	
Norway	5Kr	-	10Kr	-	1/5Kr, 2/10Kr, 5/20Kr ²	NORWAY	
Argentina	10¢	10¢	10¢	-	1/1 Token ²	ARGENTINA	
Hungary	10F	10F	20F	-	1/1x20F, 1/2x10F, 3/2x20F ²	HUNGARY	

Note: 1. Factory Default. 2. Standard Setting - Change by pressing Enter button. 3. Other functions are also affected.
 * Only if Bill Acceptor and Center Coin Chute are available.

A.4 H.S.T.D. Adjustments

A.4 01 Highest Scores

The game maintains a record of the four highest scores achieved to date.

- OFF - No high scores are recorded, or displayed.
- ON - The four highest scores are stored in memory and displayed in the Attract Mode.

A.4 02 H.S.T.D. Award

The award given for achieving the High Score To Date, or the Champion H.S.T.D.: Credit or a Ticket.

A.4 03 Champion H.S.T.D.

The "Highest" High Score can be displayed in the Attract Mode. This score is not cleared when "High Score Reset Every" occurs.

- ON - The "Highest" High Score is retained in memory and displayed.
- OFF - The "Highest" High Score is not retained.

A.4 04 Champion Credits

The number of credits or tickets awarded for a Grand Champion Score. Range: 00 to 10.

A.4 05 H.S.T.D. 1 Credits

A.4 06 H.S.T.D. 2 Credits

A.4 07 H.S.T.D. 3 Credits

A.4 08 H.S.T.D. 4 Credits

The number of credits or tickets awarded whenever a player exceeds the first, second, third, or fourth highest score. Range: 00 to 10.

A.4 09 High Score Reset Every

The number of games to be played before an automatic reset of the displayed 'Highest Score' occurs. The values provided upon reset are those selected by the operator in the Back-up High Scores. Range: OFF (disabled); 250 to 20,000.

A.4 10 Backup Champion

The Back-up Grand Champion Score. Range: 00 to 999,000,000.

A.4 11 Backup H.S.T.D. 1

A.4 12 Backup H.S.T.D. 2

A.4 13 Backup H.S.T.D. 3

A.4 14 Backup H.S.T.D. 4

The first through the fourth Back-up High Score values. The game automatically restores this value when the High Score Reset Every value is reached. Range: 00 - 999,000,000.

A.5 Printer Adjustments (optional board required)

A.5 01 Column Width

The column width to be printed. Range: 22 to 80.

A.5 02 Lines Per Page

The amount of lines per page. Range: 20 to 80.

A.5 03 Pause Every Page

Choose whether the printer pauses at the end of a page.

YES	-	The printer does pause.
NO	-	The printer doesn't pause.

A.5 04 Printer Type

Select the type of printer: Parallel, Serial or ADP.

A.5 05 Serial Baud Rate

Select which baud rate to use for serial or ADP communications (bit rate): 300, 600, 1200, 2400, 4800, or 9600.

A.5 06 Serial D.T.R. (Data Terminal Ready)

When a serial printer is used, this line may be connected to a printer output line signaling that the printer is busy.

Normal	-	Normal D.T.R. signal goes low to indicate the printer is not ready.
Inverted	-	Inverted D.T.R. (busy) signal goes high to indicate the printer is not ready.
Ignore	-	D.T.R. signal is ignored.

ERROR MESSAGES

The WPC game program has the capability to aid the operator and service personnel. At Game Turn-on, or after pressing the Begin Test switch, once the game has been operating for an extended period, the display may signal with a message, "Press ENTER for Test Report". This indicates that the game program has detected a possible problem with the game.

To obtain details of the problem, open the coin door and press the Begin Test switch. Press the Enter button to begin displaying the message(s). The following messages apply to your game.

Check Switch ##.

This message indicates that at least one switch was stuck 'On' at game turn-on or has NOT been actuated during ball play (for 90 balls or ≈ 30 games). The game program compensates the game play requirements affected by each disabled switch to allow 'nearly normal' play. This helps keep your game earning, until the service technician can repair the problem.

To verify the problem, refer to the Test Menu text describing Switch Testing, and check each reported switch using applicable switch tests. Always check switch operation using a ball, to simulate game conditions. Switch problems may often be resolved by adjusting the wire switch actuators, fixing switch circuitry problems, securing loose connectors, etc. Mechanisms using 'opto switches' (drop targets, etc.) need to be checked for proper power connections (+12V dc and ground).

Pinball Missing.

This game normally uses three balls; however, it will operate with one ball. This message announces that a ball is missing or stuck. When the ball is located, return it to the game via the Outhole. Other possibilities for this problem could be malfunctions of the Ball Trough switches or the Ball Shooter switch.

xxxxx Sw. is Stuck On.

This message indicates that a switch, which is not usually On, remains in the On position after the game is switched On. The stuck switch is essential for game play (for example, a coin chute switch, the slam tilt switch, the plumb bob tilt switch), and should be cleared to permit proper game operation.

Ground Short Row-N, Wht-xxx.

This message indicates that the switch wires being called out are touching a grounded part on the playfield or coin door. The following should be checked:

1. Slam tilt (or other coin door switch) touching the grounded coin door.
2. A leaf-type, playfield switch touching a grounded part.
3. Players poking metallic objects (wires, coat hangers, etc.) into the game
4. Switch cable insulation pierced or damaged allowing bare wire contact with a grounded part.
5. All switches in a row closing at the same time. Note: This is NOT a switch problem; however, for most games it is a very rare possibility.

U6 Checksum Error.

The game ROM checksum is invalid. If this occurs replace the game ROM.

Time and Date Not Set.

The real time clock is not running. Go to U.4 of the Utilities Menu and set the time and date.

Factory Settings Restored.

This message indicates that the CMOS RAM (U8) no longer retains any custom Pricing or Game Adjustment settings and has reverted to factory default settings. Generally, the following CPU checks will isolate the cause of the CMOS RAM memory failure. The voltage at pin 28 and pin 26 of U8 should be +5V (game turned On) and at least +4V (game turned Off). When the voltage drops below +4V, memory reset occurs. Check the batteries and battery holder. Be sure that the batteries are good and that there is no contamination on the battery holder terminals. Turn the game OFF, and use an ohmmeter to check diodes D1 and D2 on the CPU Board. D1 should read 0 ohms when forward-biased and infinite ohms when reverse-biased. D2 should read 15 ohms when forward-biased and infinite ohms when reverse-biased. (Readings taken with an analog meter.) This message can also indicate that there is an open diode on a 50V coil and noise is entering the circuit.

CPU L.E.D.'s

The CPU has three L.E.D.s located on the upper left side of the board D19, D20, and D21. On game power-up D19 and D21 turn On for a moment then, D19 turns Off and D20 starts to blink rapidly. D21 remains On. The system has detected a problem if the following happens:

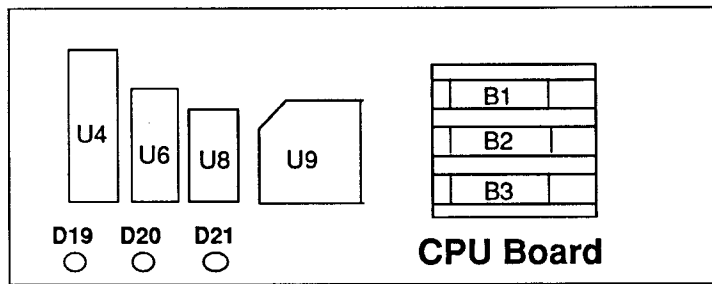
CPU Board L.E.D. Error Codes

Center L.E.D. blinks one time	-	U6 ROM Failure
Center L.E.D. blinks two times	-	U8 RAM Failure
Center L.E.D. blinks three times	-	U9 Custom Chip Failure

Sound Board Beep Error Codes **Upon Game Turn-On:**

1 Beep	=	Sound Board O.K.
2 Beeps	=	U9 Failure (RAM)
3 Beeps	=	U18 Failure (ROM)
4 Beeps	=	U15 Failure (ROM), if used
5 Beeps	=	U14 Failure(Masked ROM), if used

LED List



CPU Board

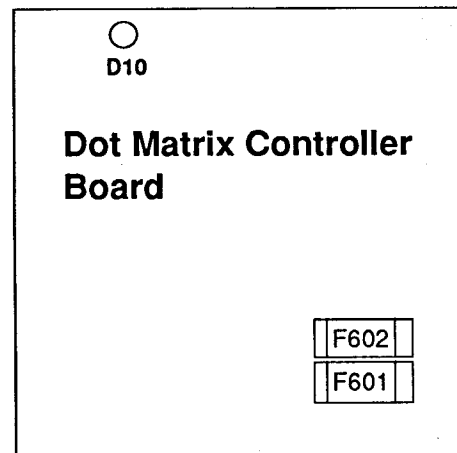
D19 , Blanking

D20, Diagnostic

D21, +5vdc

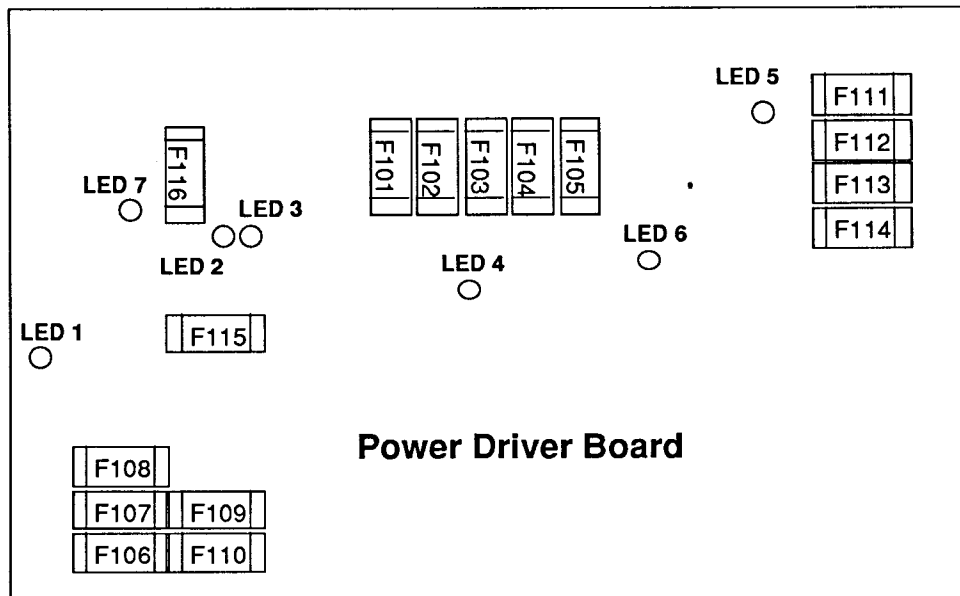
At game Turn-On = D19 & D21 On, D20 Off

During Normal Operation = D19 Off, D20 Flashing, D21 On



Dot Matrix Controller Board

D10, +5V Circuit, Normally On



Power Driver Board

LED 1, +12vdc Switch Circuit, Normally On

LED 2, High/Low Line Voltage Sensor, Normally On

LED 3, High/Low Line Voltage Sensor, Normally Off

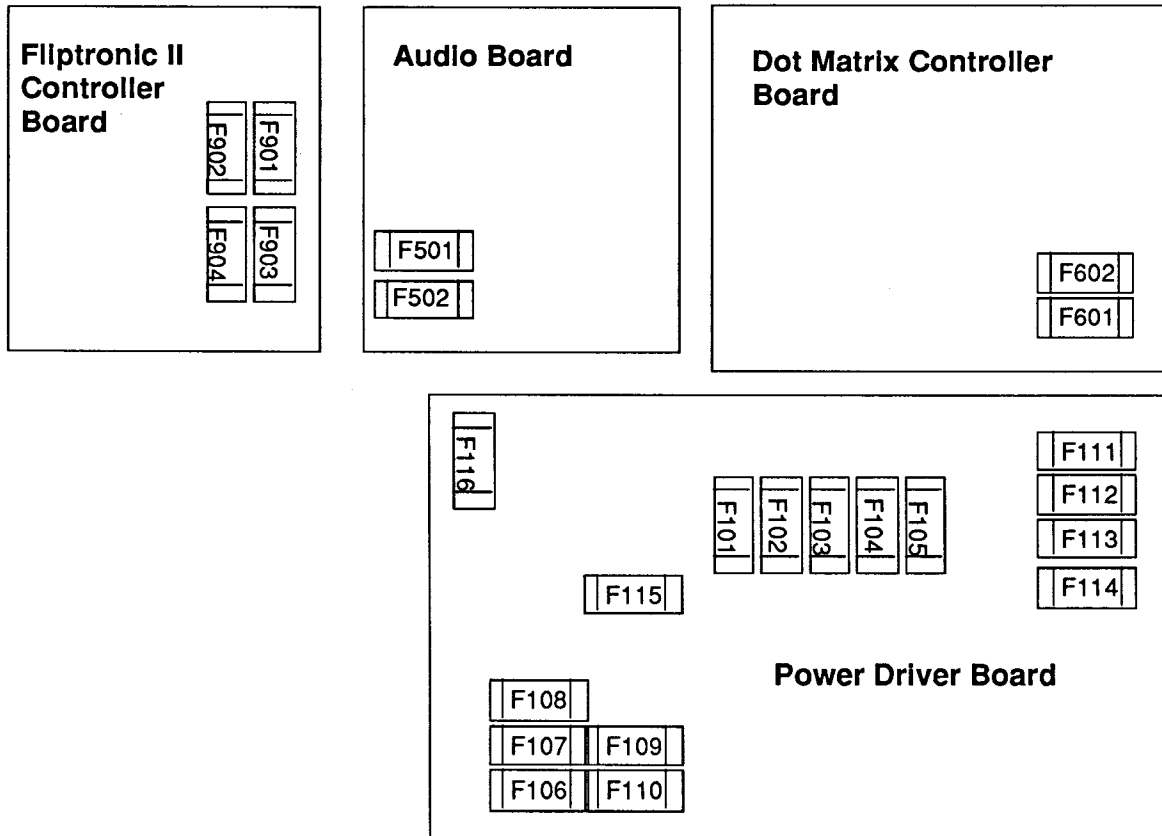
LED 4, +5vdc, Digital Circuit, Normally On

LED 5, +20vdc, Flashlamp Circuit, Normally On

LED 6, +18vdc, Lamps Circuit, Normally On

LED 7, +12vdc, Power Circuit (motors relays etc.), Normally On

Fuse List



Audio Board

F501 -25V Circuit, 3A, S.B.
F502 +25V Circuit, 3A, S.B.

Dot Matrix Controller Board

F601 +62V Circuit, 3/8A, S.B.
F602 -113V and -125V Circuits, 3/8A, S.B.

Power Driver Board

F101 Left Flipper, 3A, S.B. Not Used
F102 Right Flipper, 3A, S.B. Not Used
F103 Solenoid #25-#28, 3A, S.B.
F104 Solenoid #9-#16, 3A, S.B.
F105 Solenoid #1-#8, 3A, S.B.
F106 G.I. #5 Wht-Vio, 5A, S.B.
F107 G.I. #4 Wht-Grn, 5A, S.B.
F108 G.I. #3 Wht-Yel, 5A, S.B.
F109 G.I. #2 Wht-Org, 5A, S.B.
F110 G.I. #1 Wht-Brn, 5A, S.B.
F111 Flasher Secondary, 5A, S.B.
F112 Solenoid Secondary, 7A, S.B.
F113 +5V Logic, 5A, S.B.
F114 +18V Lamp Matrix, 8A, N.B.
F115 +12V Switch Matrix, 3/4A, S.B.
F116 +12V Secondary, 3A, S.B.

Fliptronic II Controller Board

F901 Upper Left Flipper, 3A, S.B.
F902 Upper Right Flipper, 3A, S.B.
F903 Lower Left Flipper, 3A, S.B.
F904 Lower Right Flipper, 3A, S.B.

Line Filter

Domestic Game 8A, N.B.
Foreign Game 5A, S.B.

MAINTENANCE INFORMATION

LUBRICATION

The two main lubrication points of the Ball Release mechanism are the pivots for the arm. The mechanisms of other playfield devices are somewhat similar to the Ball Release device, and have the same lubrication requirements. A medium viscosity oil (switch target grease) is satisfactory for these devices.

Because of the functional design (arm-actuated via solenoid plunger operation), the pivot points of the Left and Right Kickers ("Slingshots") all require lubrication as a regular servicing procedure.

Lubrication to ensure proper operation also applies to the target blades of the Drop Targets. MBI Instrument Grease, also known as Drop Target Switch Lubricant, with a Williams' part number of EI165, is a recommended lubricant.

SWITCH CONTACTS

Playfield Switches

For proper game operation, switch contacts should be free of dust, dirt, contamination, and corrosion. Blade switch contacts are plated to resist corrosion. Cleaning blade switch contacts requires gentle closing of the contacts on a clean business card or piece of paper, and then pulling the paper about 2 inches, which should restore the clean contact surface. Adjust the switch contacts to a 1/16-inch gap.

Flipper Switches

This game uses the new Fliptronic II Electronic Flipper System. The End-of-Stroke switches are NORMALLY OPEN. The switch should close when the flipper is energized. All E.O.S. switches and flipper button cabinet switches are gold flashed computer grade leaf switches. Only low computer current is carried through these switches. DO NOT FILE or abrasively clean these switches! DO NOT REPLACE these switches with the old style tungsten high current type switches as intermittent operation could occur. **Note:** Unlike the old style of flipper, an E.O.S. switch failure does not harm the flipper. The game notifies the operator of the switch being mis-adjusted in the test report, but continues to play. The E.O.S. switches are a means by which the new electronic flippers feel and play with all of the subtleties of the old flippers.

CLEANING

Good game action and extended playfield life are the results of regular playfield cleaning. During each collection stop, the playfield glass should be removed and thoroughly cleaned and the playfield should be wiped off with a clean, lint-free cloth. The game balls should be cleaned and inspected for any chips, nicks, or pits. Replace any damaged balls to prevent playfield damage.

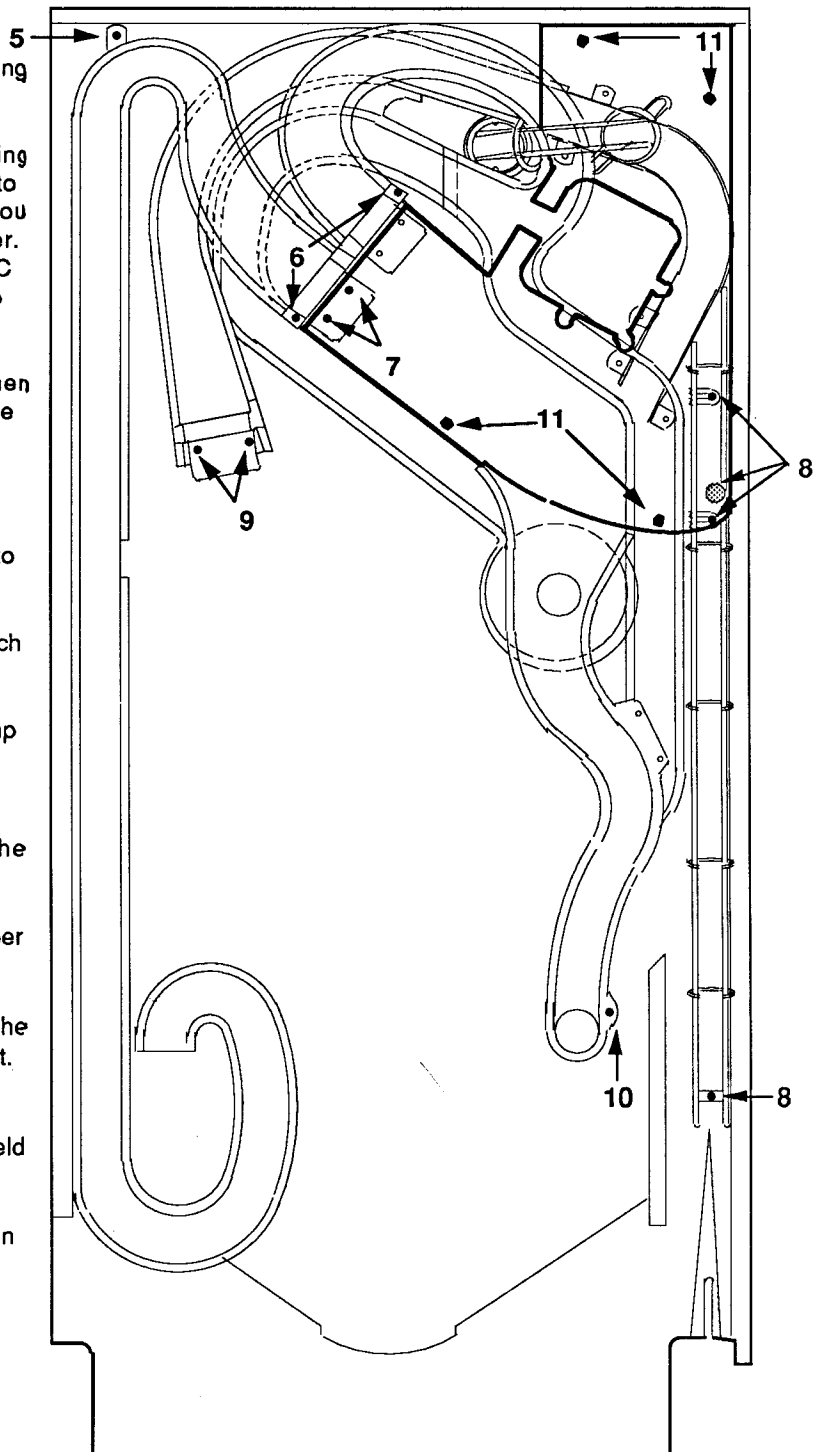
Regular, more extensive, playfield cleaning is recommended. However, avoid excessive use of water and caustic or abrasive cleaners because they tend to damage the playfield surface. Playfield wax (or any carnauba based wax), or polish may be used sparingly, to prevent a buildup on the playfield surface. Do not use cleaners containing petroleum distillates on any playfield plastics because they may dissolve the plastic material or damage the artwork.

CHANGING BACKBOX DOME BULBS

The bulbs located on the top of the backbox can be changed without removing the dome. Turn off power to the game. Remove the three tamper proof screws from the front of the dome, (the long arm key needed to do this is located in the cashbox). Carefully lift the dome enough to get your hand under it. Pull the burnt-out bulb out of its socket and replace it with a new one. Replace the tamper proof screws and turn the game back on. **NOTE:** Replace with #194 bulbs only. Part Number 24-8831.

REMOVING MINI PLAYFIELD

1. Turn Off power to the game.
2. Unlock the coin door, remove the front molding and carefully remove the playfield glass.
3. Lift the playfield. Unplug the following connectors relating to the Mini Playfield. Be sure to label both ends of these connectors as you remove them, this makes re-installation easier. The connectors are for the G.I., flashlamp, PC board, motor, flipper/E.O.S. switch, and the lamp matrix. Lower the playfield.
- Note: To ensure proper connections. when re-installing the Mini Playfield, be sure to match the wire colors as well as the labels
4. Remove the top rear mountains.
5. Remove the screw holding the Waterfall Ramp to the playfield backboard. (see diagram)
6. Remove the two screws holding the Dual Switch Gate Assembly. (see diagram)
7. Remove the screws holding the Waterfall Ramp to the Mini Playfield. The Waterfall Ramp is now loose enough to move. (see diagram)
8. Remove the wire Shooter Ramp and the flashlamp next to the ramp. (see diagram)
9. Remove the screws securing the Lower to Upper Ramp to the Main playfield. (see diagram)
10. Remove screws holding the lower end of the Upper to Lower Ramp from the Main Playfield post. (see diagram)
11. Remove the four nuts holding the Mini Playfield in place. (see diagram)
12. Carefully, lift the Mini Playfield off the Main Playfield.



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

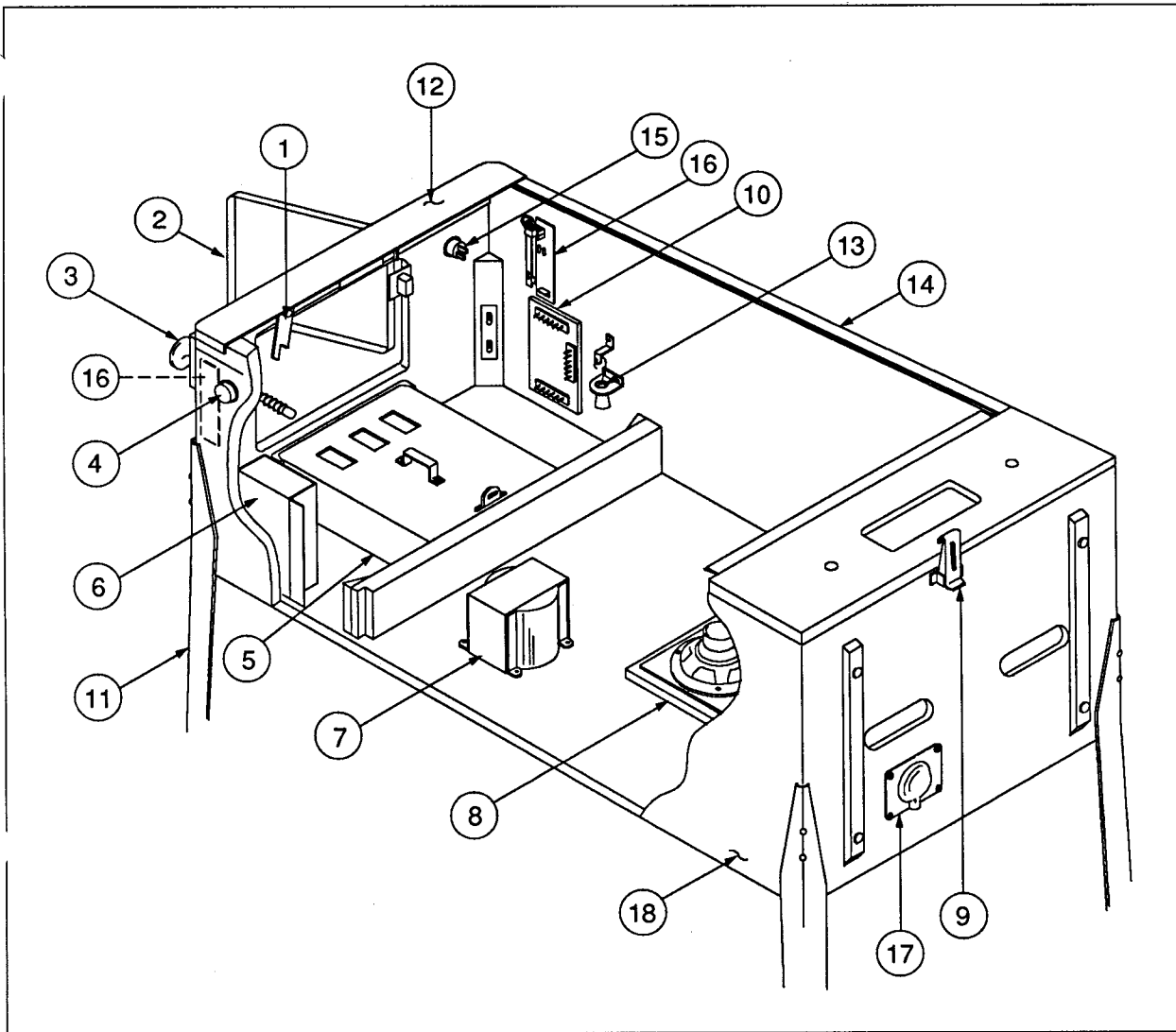
Section 2

Parts Information

Line Filter/Cordset Application Chart

COUNTRY	LINE FILTER ASSY.			CORDSET								
	A-15707-120V	A-15707-230V		5850-13271-00	5850-13272-00	5850-13273-00	5850-13274-00	5850-13275-00	5850-13276-00	5850-13277-00	5850-13278-00	H-15756
UNITED STATES	●			●								
CANADA	●			●								
TAIWAN	●			●								
MEXICO	●			●								
CENTRAL AMERICA	●			●								
SOUTH KOREA	●			●								
PUERTO RICO	●			●								
AUSTRIA		●			●							
BELGIUM		●			●							
FINLAND		●			●							
FRANCE		●			●							
GREECE		●			●							
HOLLAND		●			●							
HUNGARY		●			●							
NETHERLANDS		●			●							
NETH. ANTILLES		●			●							
NORWAY		●			●							
POLAND		●			●							
PORTUGAL		●			●							
SPAIN		●			●							
SWEDEN		●			●							
TURKEY		●			●							
WEST GERMANY		●			●							
UNITED KINGDOM		●				●						
IRELAND		●				●						
HONG KONG		●				●						
DENMARK		●					●					
ITALY		●						●				
CHILE		●						●				
PEOPLE'S REP. OF CHINA		●						●				
SWITZERLAND		●							●			
AUSTRALIA		●								●		
NEW ZEALAND		●								●		
ARGENTINA		●								●		
JAPAN	●										●	●

Cabinet Parts



Cabinet Parts

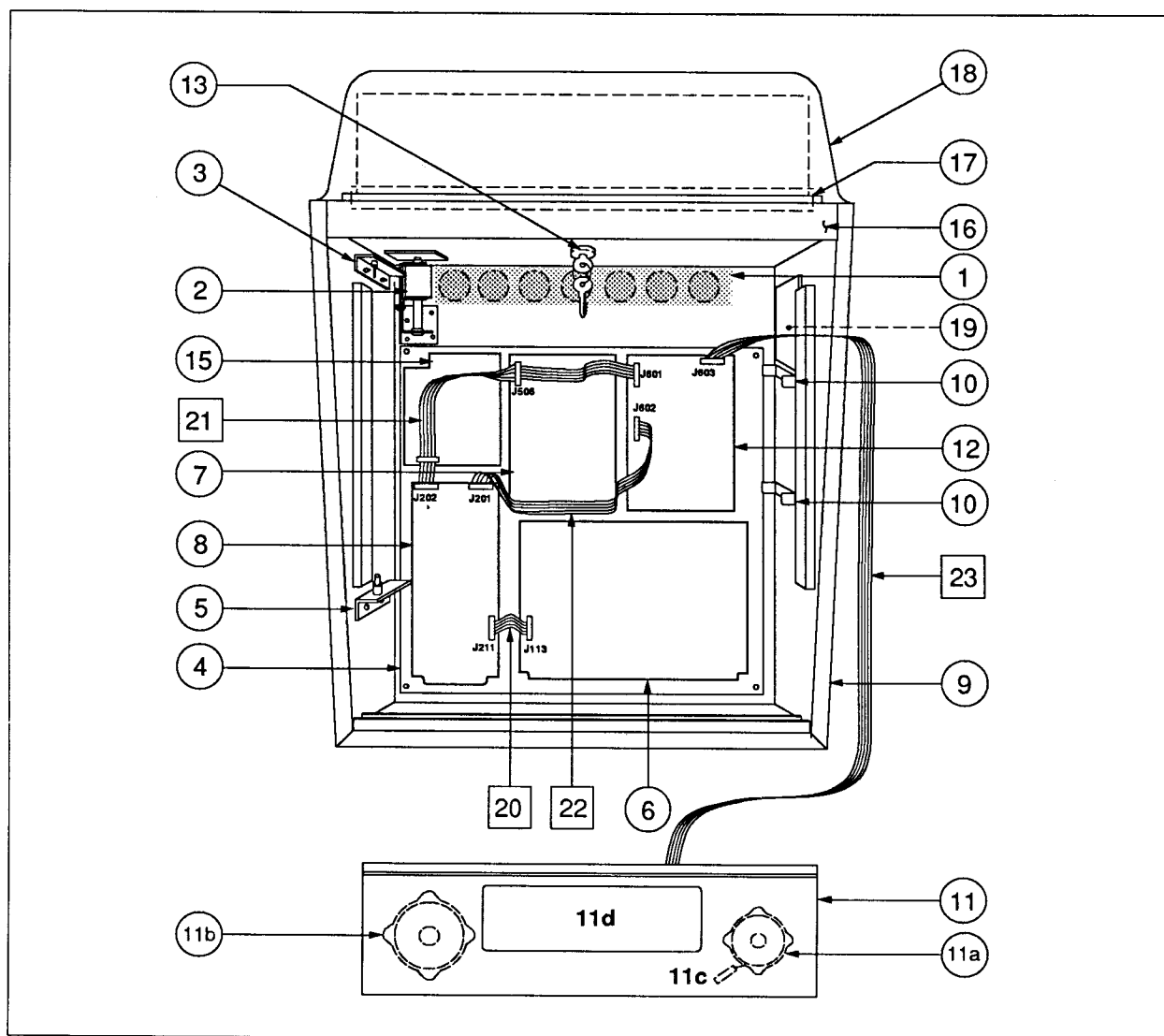
Item	Part Number	Description	Item	Part Number	Description
1.	D-9174-3	Lever Guide Assembly	14.	A-12359-3	Side Molding Assembly
2.	A-14148-1	Coin Door - 2 Slot	15.	20-9663-1	Start Button
3.	B-12445-1	Ball Shooter Assembly	16.	A-15878	Double Opto Assy. (2 Used)
a)	10-149	Rod Spring	17.	01-10714	Line Cord Cover
b)	10-148-1	Shooter Spring	18.	11-1067-50018	WHITE WATER Wood Cabinet
4.	B-12273-4	Flipper Button - Red (2 Used)	19.	*	Cordset
5.	A-15852-1	Cashbox Assembly			
6.	*	Line Filter Assembly			
7.	5610-12835-00	WPC Transformer, 115/230v			
8.	5555-12929-00	Speaker, 4Ω, 6", 25w			
9.	20-9347	Toggle Latch			
10.	A-14689	WPC Coin Door Interface Bd.			
11.	C-10843	Metal Leg Assembly			
12.	D-12615	Front Molding Assembly			
13.	20-6502-A	Plum Bob			

Miscellaneous Parts

08-7028-T	Tempered Playfield Glass: 21" x 43"
20-6500	Steel Ball, 1-1/16" (3)

* See Application Chart (p.2-2).

Backbox Assembly



Item	Part Number	Description
1.	01-6645	Venting Screen
2.	B-10686-1	Knocker & Bracket Assy.
3.	A-12497	Upper Insert Bd Hinge Assy.
4.	A-14092-3	Mounting Plate Assembly
5.	A-12498	Lower Insert Bd Hinge Assy.
6.	A-12697-1	Power Driver Assembly
7.	A-12738-50018	WPC Sound Board
8.	A-12742-50018	WPC CPU Board
9.	A-15803-50018	Backbox Assembly
10.	01-9047	Insert Stop Bracket
11.	A-15757	Speaker / Display Assy.
a)	5555-12924-00	Speaker, 4Ω, 15w
b)	5555-12856-00	Speaker, 5-1/4", 4Ω, 25w
c)	5045-12914-00	Cap., 10μfd., 50v, (±20%)
d)	5901-12784-00	Dot Matrix Display/Driver Bd.
12.	A-14039	Dot Matrix Contoller Board
13.	A-13379	Lock & Plate Assembly
a)	20-9637	Lock & Cam Kit
14.	50018-IN	Insert Board
15.	A-15472	Fliptronic II Board

Item	Part Number	Description
16.	01-10889	Waterfall Light Shield
17.	A-15765	8-Lamp Board Assembly
18.	A-15812	Support & Waterfall Assy.
19.	A-15761	Chase Light PC Board

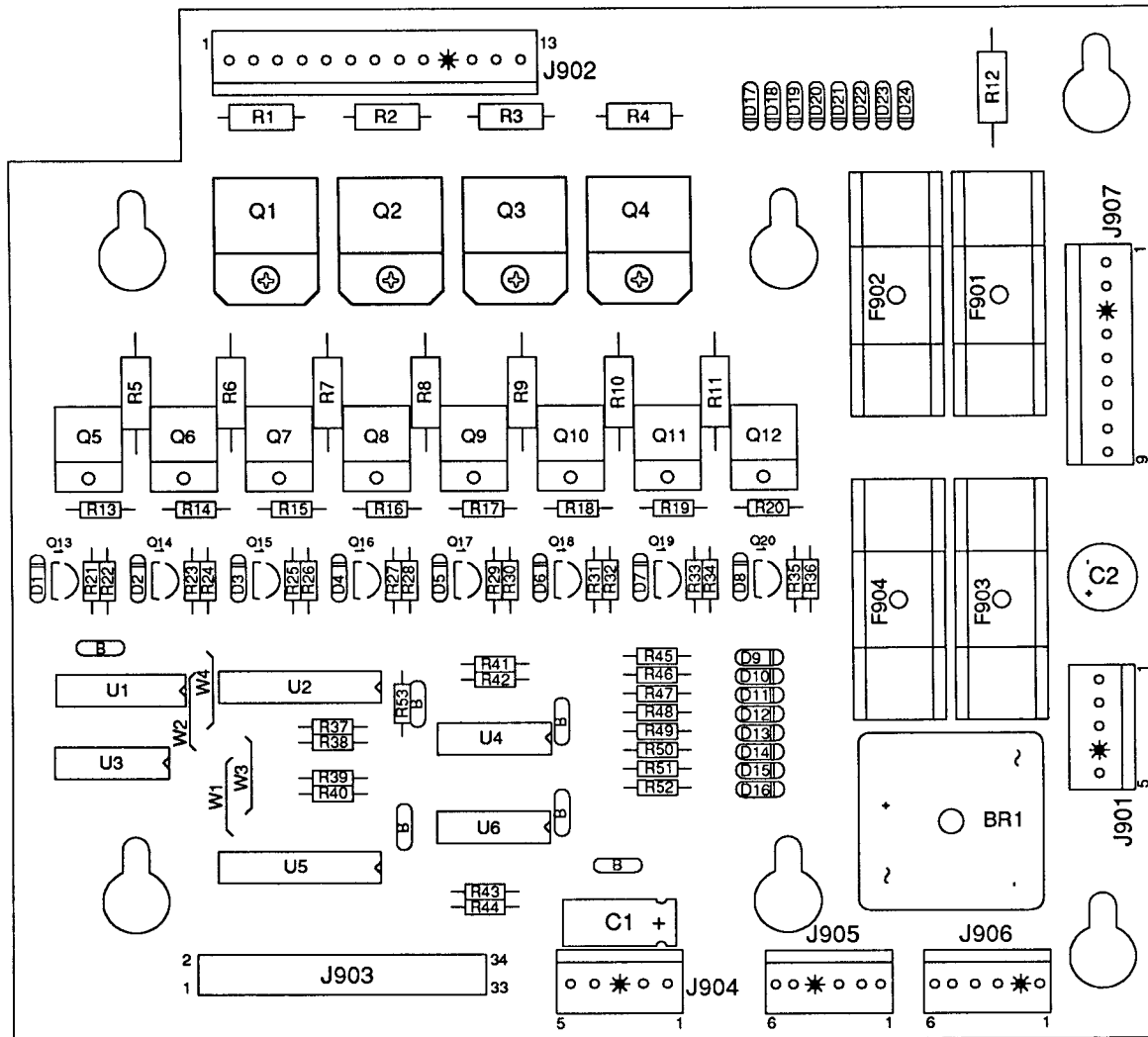
Ribbon Cables:

20.	5795-12653-03	Ribbon Cable, 3"
21.	5795-13018-00	Ribbon Cable, 22"
22.	5795-10938-14	Ribbon Cable, 14"
23.	5795-12838-30	Ribbon Cable, 30"

Miscellaneous Parts:

A-8552-50018	Tempered Backglass Assy.
08-7456	Backbox Glass: 27" x 18-7/8"
31-1357-50018	Screened Translight
03-8228-2	Glass Channel Top (1)
03-8228-3	Glass Channel Edge (2)
03-8229-1	Glass Lift Channel (1)

A-15472 Fliptronic II Board



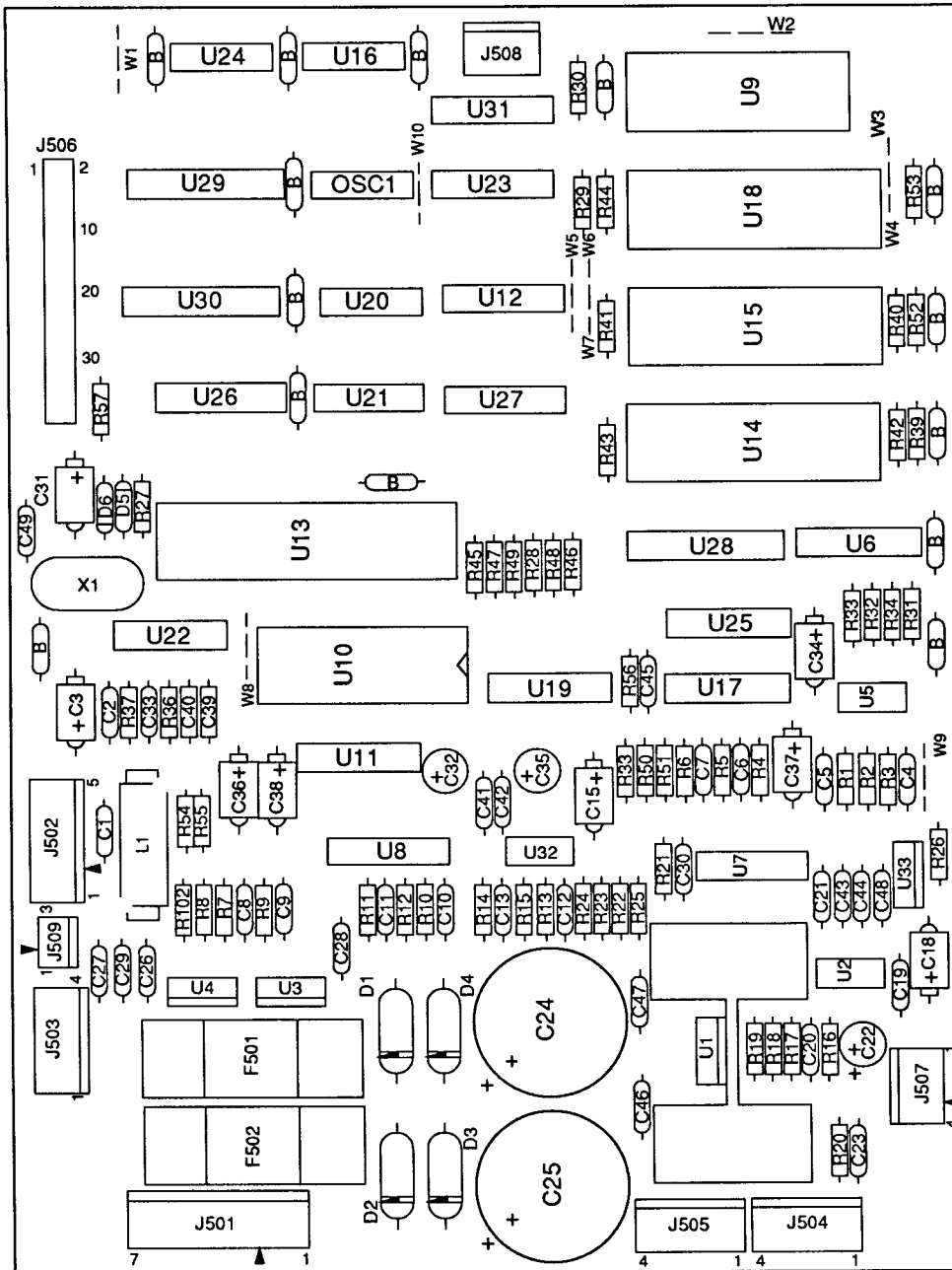
Part Number	Designator	Description	Part Number	Designator	Description
01-10572	Q1-Q4	Heatsink	5070-09054-00	D1 - D24	Diode 1N4004
20-9684	Q5-Q12	Fastener Snap	5162-12635-00	Q5-Q12	Transistor TIP102 NPN
4006-01003-08	Q1-Q4	Mach. Screw, 6-32	5190-09016-00	Q13 - Q20	Transistor 2N4403 PNP
4406-01128-00	Q1-Q4	Nut 6-32 KEPS	5191-12179-00	Q1-Q4	Transistor TIP36C PNP
5010-09034-00	R37 - R44, R53	Resistor, 10KΩ, 1/4w, 5%	5315-12009-00	U2	IC 74HCT374
5010-09358-00	R22, R24, R26, R28, R30, R32, R34, R36, R45 - R52	Resistor, 1KΩ, 1/4w, 5%	5315-12031-00	U5	IC 74HCT244
5010-09361-00	R1 - R4	Resistor, 220Ω, 1/2w, 5%	5315-12812-00	U1	IC 74HCT138
5010-09416-00	R21, R23, R25, R27, R29, R31, R33, R35	Resistor, 470Ω, 1/4w, 5%	5315-12951-00	U3	IC 74HCT00
5010-09534-00	W3, W4	Resistor, 0Ω	5370-12272-00	U4, U6	IC LM339 QUAD COMP
5010-10171-00	R13 - R20	Resistor, 56Ω, 1/4w, 5%	5791-10862-09	J907	Connector, 9-pin Header Sq. Pin
5011-12956-00	R5 - R12	Resistor, 2.7KΩ, 1w, 5%	5791-10862-05	J901, J904	Connector, 5-pin Header Sq. Pin
5040-08986-00	C1	Capacitor, 100M, 10v	5791-10862-13	J902	Connector, 13-pin Header Sq. Pin
5043-08980-00	B	Capacitor, .01μF, 50v	5791-12461-06	J905, J906	Connector, Str Sq. Pin Header .100
5040-09537-00	C2	Capacitor, 100μF, 100v	5791-12516-00	J903	34 HEN 2x17 STR
			5100-09690-00	BR1	Bridge Rectifier
			5731-10356-00	F901 - F904	Fuse S-B, 3A., 250v
			5733-12060-01	-	Fuse Holder (F901-F904)

A-12738-50018

WPC Audio Board

Part No.	Designator	Description	Part No.	Designator	Description
01-9980		Shield: Wire Protector	5070-08919-00	D5, D6	Diode, 1N4148
4004-01005-06	U1	Mach. Screw, 4-40 x 3/8	5070-09045-00	D1-D4	Diode MR501, 3.0A
4104-01012-04	U1	Sh. Mach. Screw, #4 x 1/4	5250-10495-00	U3	Reg. 7912 1.0A -12v.
4404-01119-00	U1	Nut, 4-40 SNUT	5281-09215-00	U22	IC, 74LS04 Hex INV
5010-08772-00	R21	Resistor, 15K Ω , 1/4w, 5%	5281-09246-00	U12	IC, 74LS139 2-4 Dec.
5010-12065-00	R22, R25	Resistor, 120K Ω , 1/4w, 5%	5281-09486-00	U28-U30	IC, 74LS374 8 Dual Flipflop
5010-08991-00	R51	Resistor, 4.7K Ω , 1/4w, 5%	5281-09487-00	U6, U23-U25	IC, 74LS74 Dual Flipflop
5010-10987-00	R23, R24	Resistor, 56K Ω , 1/4w, 5%	5281-09500-00	U31	IC, 74LS32
5010-09034-00	R13, R14, R29-R31, R33, R34, R50, R45-R49	Resistor, 10K Ω , 1/4w, 5%	5281-09745-00	U26, U27	IC, 74LS138 DMLTPX
5010-09035-00	R4	Resistor, 47K Ω , 1/4w, 5%	5281-09850-00	U20	IC, 74LS11 Tripple AND
5010-09036-00	R35	Resistor, 100 Ω , 1/4w, 5%	5281-10577-00	U16	IC, 74LS125 Q/B Bfr
5010-09134-00	R1, R2, R6, R8, R9, R11, R12	Resistor, 150K Ω , 1/4w, 5%	5370-11086-00	U10	IC, YM2151 Sound
5010-09162-00	R26, R102	Resistor, 100K Ω , 1/4w, 5%	5371-11087-00	U11	IC, YM3012 D/A
5010-08774-00	R3, R5, R17, R19	Resistor, 22K, 1/4w, 5%	5400-10320-00	U13	IC, MPU 68B09E
5010-09269-00	R15	Resistor, 12K Ω , 1/4w, 5%	5284-12651-00	U21	IC 4584
5010-09358-00	R18, R32	Resistor, 1K Ω , 1/4w, 5%	5340-12278-00	U9	S/Ram 2064
5010-09416-00	R28, R36, R37, R39-R44	Resistor, 470 Ω , 1/4w, 5%	5370-09691-00	U17	IC, 55536 CVSD
5010-09534-00	W3, W5, W7-W10	Resistor, 0 Ω	5370-12260-00	U2	IC, 3340 Elec Atten
5010-10171-00	R38, R56	Resistor, 56 Ω , 1/4w, 5%	5370-12728-00	U1	IC, Audio Amp LM1875
5010-10258-00	R16	Resistor, 1M, 1/4w, 5%	5370-12730-00	U7, U8	IC, Op Amp TL084
5010-10650-00	R7, R10	Resistor, 62K, 1/4w, 5%	5370-12742-00	U32	IC, Op Amp TL082
5010-10989-00	R54, R55, R27	Resistor, 470K, 1/4w, 5%	5371-12727-00	U19	Dac AD7524
5010-12752-00	R20	Resistor, 1 Ω , 1/4w, 5%	5432-12726-00	U5	EE Prom Pot X9503
5040-08986-00	C3	Capacitor, 100M, 10v ($\pm$ 20%)	5460-12423-00	U4	IC, LM7812
5040-09332-00	C15, C18, C34, C36, C38	Capacitor, 47 μ fd., 25v, Axial	5460-12743-00	U33	LM7809 TO-220
5040-11036-00	C32, C35	Capacitor, 47 μ fd., 16v, Rad	5520-09020-00	X1	Crystal, 3.58 MHz.
5040-12729-00	C24, C25	Capacitor, 4700 μ fd., 35v.	5521-10931-00	OSC1	Oscillator, 8.0 MHz.
5040-12750-00	C22	Capacitor, 22 μ fd., 35v, Rad.	5551-09822-00	L1	Ind, 4.7UH 3.0A.
5041-09031-00	C26-C29, C37, C46-C48	Capacitor, 1 μ fd. TANT	5700-08985-00	U13	Socket, IC 40-pin, .6"
5041-09243-00	C20, C21	Capacitor, 10 μ fd. TANT	5700-09004-00	U10	Socket, IC 24-pin, .6"
5043-08980-00	C41-C44, B(15)	Capacitor, .01M, 50v, (+80, -20)	5700-09006-00	U11	Socket, IC 16-pin, .3"
5043-08996-00	C1, C2	Capacitor, .1 μ fd., 50v, 10%	5341-13427-U14	U14	IC, Audio ROM
5048-11027-00	C8, C10	Capacitor, 33pfd., 50v, 10%	A-5343-50018-3	U15	IC, Audio ROM
5048-11028-00	C45	Capacitor, 22pfd., 50V, Axial	A-5343-50018-4	U18	IC, Audio ROM
5048-11029-00	C33, C49	Capacitor, 100pfd., 50v	5700-12088-00	U1	Socket, IC 32-pin (U15, U18)
5048-11030-00	C12	Capacitor, 470pfd., 50v	5705-12755-00		Heatsink 5299B-220
5048-11031-00	C19, C31	Capacitor, .001 μ fd., 50v, 10%	5731-10356-00	F501, F502	Fuse, 3A, S-B, 250v
5048-11065-00	C13	Capacitor, .0022 μ fd., 50v, 10%, Ax.	5733-12060-01		Fuse Holder (F501, F502)
5048-11072-00	C39, C40	Capacitor, .0033 μ fd.	5791-10862-04	J504, J505	Connector, 4-pin Header Sq. .156
5048-12036-00	C23	Capacitor, .22 μ fd., 10v, Ceramic	5791-10862-05	J502	Connector, 5-pin Header Sq. .156
5048-12745-00	C4, C6	Capacitor, 1800pfd., 50V, 10%	5791-10862-07	J501	Connector, 7-pin Header Sq. .156
5048-12746-00	C5, C7	Capacitor, 330pfd., 50V	5791-12462-03	J509	Connector, 3-pin Header Sq. .100
5048-12748-00	C9, C11, C30	Capacitor, 220pfd., 50V	5791-12462-04	J508	Connector, 4-pin Header Sq. .100
			5791-12516-00	J506	34 Hen 2x17 STR

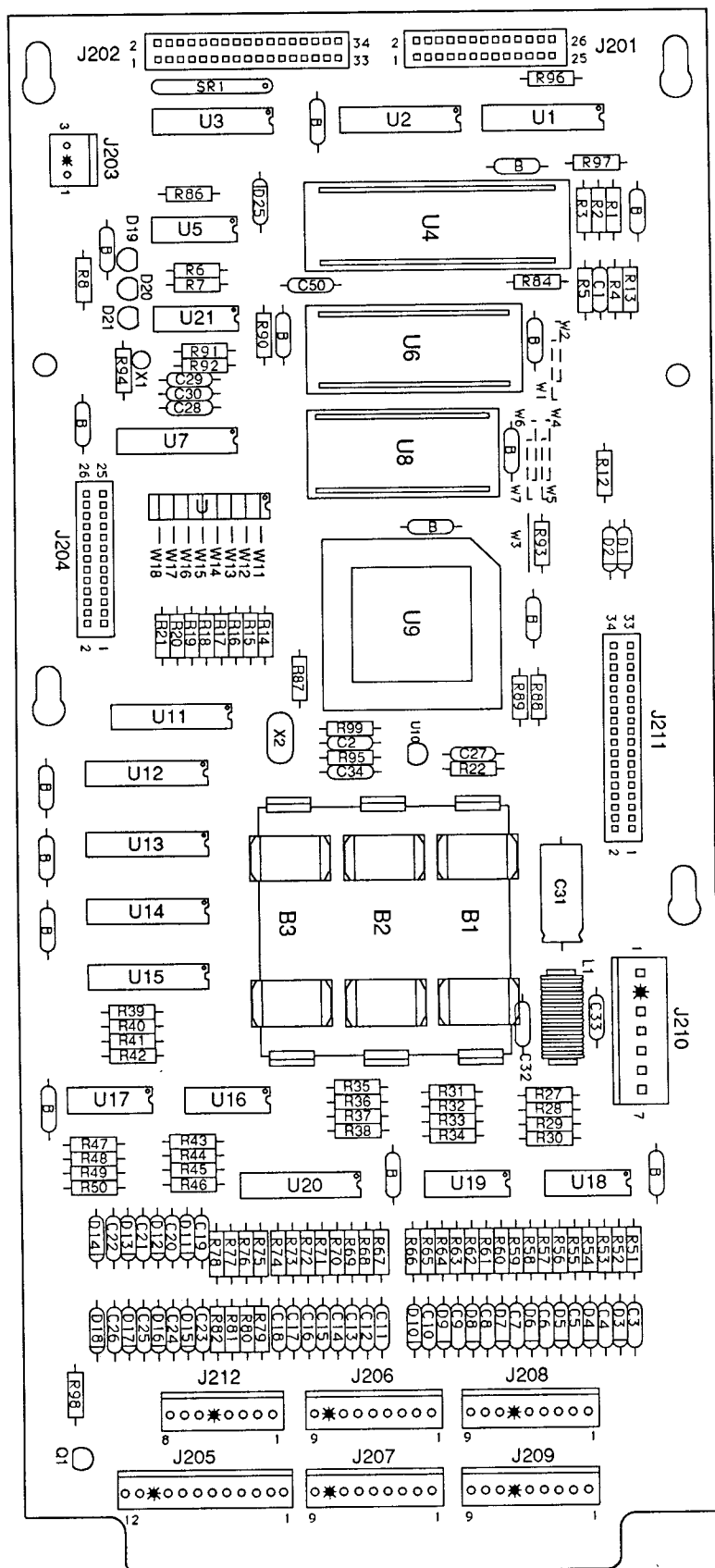
A-12738-50018 WPC Audio Board



A-12742-50018 WPC CPU Board

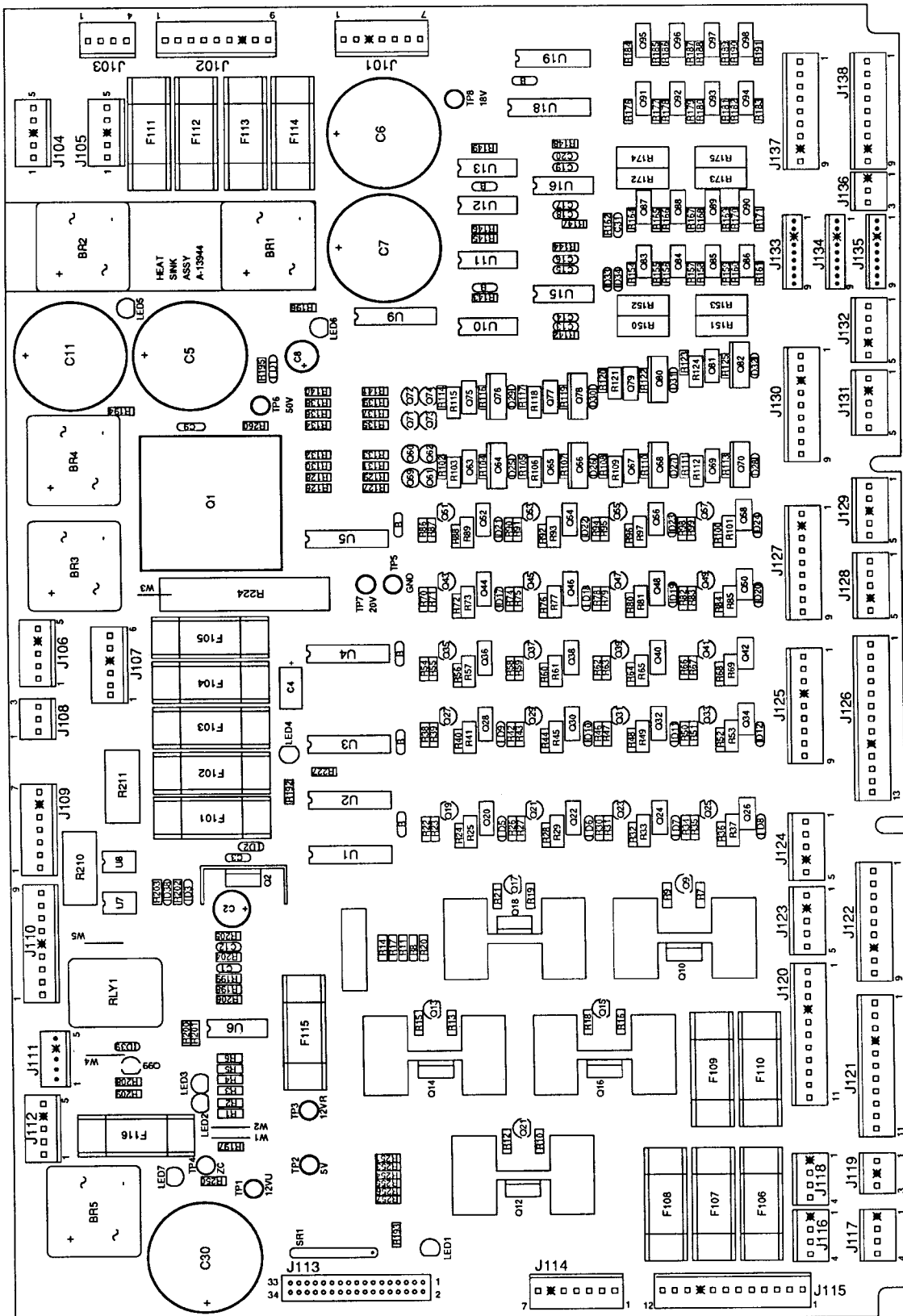
Part Number	Designator	Description
5010-09034-00	R14-R22, R27-R42, R86, R90, R94, R98	Resistor, 10K Ω , 1/4w, 5%
5010-09085-00	R1, R2, R4, R93, R96, R97	Resistor, 1.5K Ω , 1/4w, 5%
5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Resistor, 1.2K Ω , 1/4w, 5%
5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84	Resistor, 1K Ω , 1/4w, 5%
5010-09416-00	R5-R8, R12, R13, R87-R89	Resistor, 470 Ω , 1/4w, 5%
5010-09534-00	W1, W4, W7, W13 - W18	Resistor, 0 Ω
5010-10258-00	R95, R99	Resistor, .01 μ fd Ω , 1/4w, 5%
5010-10989-00	R92	Resistor, 470K Ω , 1/4w, 5%
5010-12104-00	R91	Resistor, 22 μ fd, 1/4w, 5%
5019-09362-00	SIP 1	SIP, 9R, 10-pin, 4.7K Ω , 5%
5040-08986-00	C31	Capacitor, 100 μ fd, 10v ($\pm$ 20%)
5043-08980-00	B	Capacitor, .01 μ fd, 50v, (+80, -20%)
5043-09030-00	C27	Capacitor, 0.047 μ fd, 50v ($\pm$ 20%)
5043-09065-00	C3 - C26	Capacitor, 470pfd, 50v ($\pm$ 20%)
5043-09491-00	C2, C29, C30, C34	Capacitor, 22pfd, 1KV, ($\pm$ 10%)
5043-09492-00	C28	Capacitor, 100pfd, 50v, ($\pm$ 10%)
5043-09845-00	C32, C33	Capacitor, 1KP, 50v, ($\pm$ 20%)
5070-08919-00	D2 - D18	Diode, 1N4148, 150MA
5070-09266-00	D1, D25	Diode, 1N5817, 1.0A.
5160-10269-00	Q1	Transistor, 2N3904, NPN
5162-12422-00	U20	IC, ULN, 2803A
5281-09308-00	U3	IC, 74LS245, Octal Bus Trncv
5281-09486-00	U14	IC, 74LS374, 8D F/F
5281-09851-00	U5	IC, 74LS14, SMT/TRG
5281-09867-00	U1, U2, U7	IC, Octal Buffer, 74LS244
5281-10182-00	U11, U12, U13, U15	IC, 74LS240 Driver.
5284-12651-00	U21	IC, 4584
5340-12278-00	U8	S/RAM 2064
5370-12272-00	U16 - U19	IC, LM339, Quad. Comp
5370-12687-00	U10	MC, 34064 Reset Chip
5520-10438-00	X2	Crystal, 8.0MHz.
5520-12084-00	X1	Crystal 32.768 KHz
5551-09822-00	L1	ILN, 4.7 UH 3A
5671-09019-00	D19 - D21	DSPL LED RED
5700-08985-00	U4	Socket, IC 40P, .6"
5700-12088-00	U6	Socket, IC 32P, .6"
5700-12424-00	U9	Socket, 84 Pin PLCC
5791-10850-00	J201, J204	Connector, 26-pin Header Str Sq.
5791-10862-07	J210	Connector, 7-pin Header Str Sq.
5791-12461-08	J212	Connector, 8-pin Header Str Sq.
5791-12461-09	J206 - J209	Connector, 9-pin Header Sq. pin
5791-12461-12	J205	Connector, 12-pin Header Sq. pin
5791-12516-00	J202, J211	34 Hen 2x17 STR
5881-09021-00	B1 - B3	Battery Holder "AA"
5048-11033-00	C50	Capacitor, 0.022 μ f, 10v
A-5343-50018-1	U6	Game PROM Assembly
5410-12426-00	U9	WPC-89 ASIC
5400-10320-00	U4	IC MPU 68B09E
5880-09022-00	B1 - B3	Battery, Alkaline, 1.5v ("AA")

A-12742-50018 WPC CPU Board



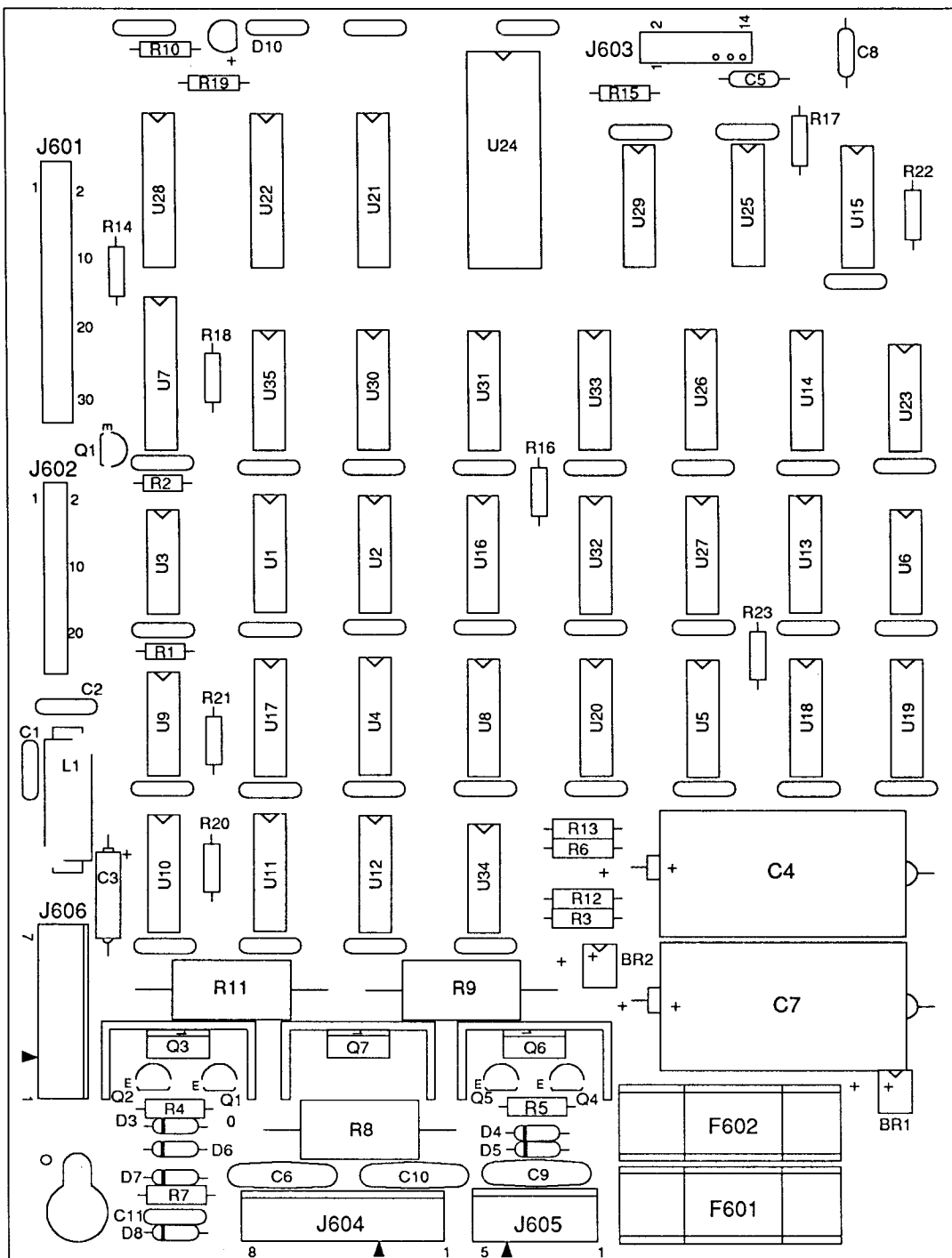
A-12697-1 WPC Power Driver Assembly

Item	Part Number	Ckt Designator	Description	Item	Part Number	Ckt Designator	Description
1	Not Used			32	5043-08996-00	C13-C20, C31	Capacitor, .1µfd, 50v (±20%)
2	4006-01005-06	Q1, Q2	Mach. Screw, 6-32 x 3/8	33	5043-09845-00	C1, C12	Capacitor, 1,000pfd, 50v (±20%)
3	4406-01128-00	Q1, Q2	Nut, 6-32 KEPS	34	5048-10994-00	C3	Capacitor, .33µfd, 50v (±20%) Ax.
4	4004-01005-06	Q10, Q12, Q14, Q16, Q18	Mach. Screw, 4-40 x 3/8	35	5070-08919-00	D33, D34	Diode, 1N4148, 150MA.
5	4404-01119-00	Q10, Q12, Q14, Q16, Q18	Nut, 4-40 SNUT	36	5070-09054-00	D1-D3, D5-D12, D17-D32, D38, D39	Diode, 1N4004, 1.0A.
6	5010-08981-00	R260	Resistor, 10KΩ, 1/2w, 5%	37	5100-09690-00	BR1-BR5	Bridge Rectifier, 35A., 200v
7	5010-08991-00	R9, R12, R15, R18, R21, R23, R27, R31, R35, R39, R43, R47, R51, R55, R59, R63, R67, R71, R75, R79, R83, R87, R91, R95, R99, R126, R128, R130, R132, R134, R136, R138, R140, R209, R227	Resistor, 4.7KΩ, 14w, 5%	38	5131-12725-00	Q10, Q12, Q14, Q16, Q18	Triac, BT138E
8	5010-08992-00	R8, R11, R14, R17, R20, R177, R179, R181, R183, R185, R187, R189, R191	Resistor, 560Ω, 1/4w, 5%	39	5162-12422-00	U19	IC, ULN 2803
9	5010-08993-00	R25, R29, R33, R37, R41, R45, R49, R53, R57, R61, R65, R69, R73, R77, R81, R85, R89, R93, R97, R101, R103, R106, R109, R112, R115, R118, R121, R124	Resistor, 68Ω, 1/4w, 5%	40	5162-12635-00	Q20, Q22, Q24, Q26, Q28, Q30, Q32, Q34, Q36, Q38, Q40, Q42, Q44, Q46, Q48, Q50, Q52, Q54, Q56, Q58, Q63, Q65, Q67, Q69, Q75, Q77, Q79, Q81, Q83 - Q90	Transistor, TIP 102
10	5010-08997-00	R24, R28, R32, R36, R40, R44, R48, R52, R56, R60, R64, R68, R72, R76, R80, R84, R88, R92, R96, R100, R102, R105, R108, R111, R114, R117, R120, R123, R195	Resistor, 2.7KΩ, 1/4w, 5%	41	5194-09055-00	Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74, Q99	Transistor, 2N5401 PNP
11	5010-08998-00	R155, R157, R159, R161, R165, R167, R169, R171	Resistor, 2.2KΩ, 1/4w, 5%	42	5191-12179-00	Q64, Q66, Q68, Q70, Q76	Transistor, TIP36C PNP
12	5010-09034-00	R3, R4, R6, R142-R149, R197-R198	Resistor, 10KΩ, 1/4w, 5%	43	5192-12428-00	Q91-Q98	Transistor, TIP 107
13	5010-09085-00	R194, R196, R251, R253-R257	Resistor, 1.5KΩ, 1/4w, 5%	44	5250-12634-00	Q1	Reg LM 323 5v
14	5010-09086-00	R252	Resistor, 6.8KΩ, 1/4w, 5%	45	5281-09486-00	U1-U5, U18	IC, 74LS374 8 Dual D Flipflop
15	5010-09224-00	R1, R2, R192, R201- R205, R208	Resistor, 270Ω, 1/4w, 5%	46	5281-09487-00	U10-U13	IC, 74LS74 Dual D Flipflop
16	5010-09314-00	R176, R178, R180, R182, R184, R186, R188, R190	Resistor, 1.2KΩ, 1/4w, 5%	47	5281-10182-00	U9	IC, 74LS240, L/Drv
17	5010-09324-00	R206	Resistor, 27KΩ, 1/4w, 5%	48	5370-12272-00	U6, U15, U16	IC, LM339 Quad. Comp
18	5010-09358-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200, R250	Resistor, 1KΩ, 1/4w, 5%	49	5460-12423-00	Q2	IC, LM 7812
19	5010-09361-00	R104, R107, R110, R113, R116, R119, R122, R125	Resistor, 220Ω, 1/4w, 5%	50	5490-10892-00	U7, U8	Opto Isolator, 4N25
20	5010-09416-00	R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 470Ω, 1/4w, 5%	51	5580-08994-01	RLY 1	Relay 4PDT 6VDC5A VS
21	5010-09534-00	W1, W2	Resistor, 0Ω	52	5671-09019-00	LED1 - LED7	Display LED Red
22	5010-11079-00	R7, R10, R13, R16, R19	Resistor, 51Ω, 1/4w, 5%	53	5701-09652-00	Q1	Thermal Pad TO-3
23	5010-12427-00	R150-R153, R172-R175	Resistor, .22Ω, 1w, 5%	54	5705-09199-00	Q2	Heatsink, #6030B
24	5012-12632-00	R224	Resistor, .12Ω, 10w, 5%	55	Not Used		
25	5012-12238-00	R210, R211	Resistor, 3.3KΩ, 5w, 10%	56	5705-12637-00	Q1	Heatsink 5054
26	5019-10143-00	SR1	SiP, 9R, 10 pin, 470Ω, 5%	57	5705-12638-00	Q10, Q12, Q14, Q16, Q18	Heatsink 5298B
27	5040-08986-00	C4	Capacitor, 100µfd, 10v (±20%)	58	5733-12060-01		Fuse Holder, F101-F116
28	5040-09421-00	C2	Capacitor, 100µfd, 25v (+50, -10%)	59	Not Used		
29	5040-09537-00	C8	Capacitor, 100µfd, 100v (±20%)	60	5791-10862-03	J108, J119, J136	Connector, 3-pin Header STR Sq.
30	5040-12313-00	C5, C6, C7, C11, C30	Capacitor, 15,000µfd, 25v (±20%)	61	5791-10862-04	J103, J116-J118	Connector, 4-pin Header STR Sq.
31	5043-08980-00	B-BYPASS	Capacitor, .01µfd, 50v (+80, -20%)	62	5791-10862-05	J112, J104-J106, J123, J124, J128, J129, J131, J132	Connector, 5-pin Header STR Sq.
				63	5791-10862-06	J107	Connector, 6-pin Header STR Sq.
				64	5791-10862-07	J101, J109, J114	Connector, 7-pin Header STR Sq.
				65	5791-10862-09	J102, J110, J122, J125, J127, J130, J137, J138	Connector, 9-pin Header STR Sq.
				66	5791-10862-11	J120, J121	Connector, 11-pin Header STR Sq.
				67	5791-10862-12	J115	Connector, 12-pin Header STR Sq.
				68	5791-10862-13	J126	Connector, 13-pin Header STR Sq.
				69	5791-12461-05	J111	Connector, 5-pin Header STR Sq.
				70	5791-12461-09	J133-J135	Connector, 9-pin Header STR Sq.
				71	5791-12516-00	J113	34 HEN 2x17 STR
				72	5824-09248-00	TP1-TP8	Test Point #1502-1
				73	5041-09163-00	C9	Capacitor, 2.2µfd TANT
				74-100	Not Used		
				101	Not Used		
				102	5730-09071-00	F114	Fuse, 8A, 32v
				103	Not Used		
				104	5731-09432-00	F112	Fuse, S-B, 7A., 250v
				105	5731-09651-00	F106 - F111, F113	Fuse, S-B, 5A., 250v
				106	Not Used		
				107	5731-10356-00	F101 - F105, F116	Fuse, S-B, 3A., 250v
				108	5730-09797-00	F115	Fuse, S-B, 3/4A., 250v
				109	5705-12698-00		Heatsink #62365
				110	4010-01006-00		Mach. Screw, 10-32 x 5/8

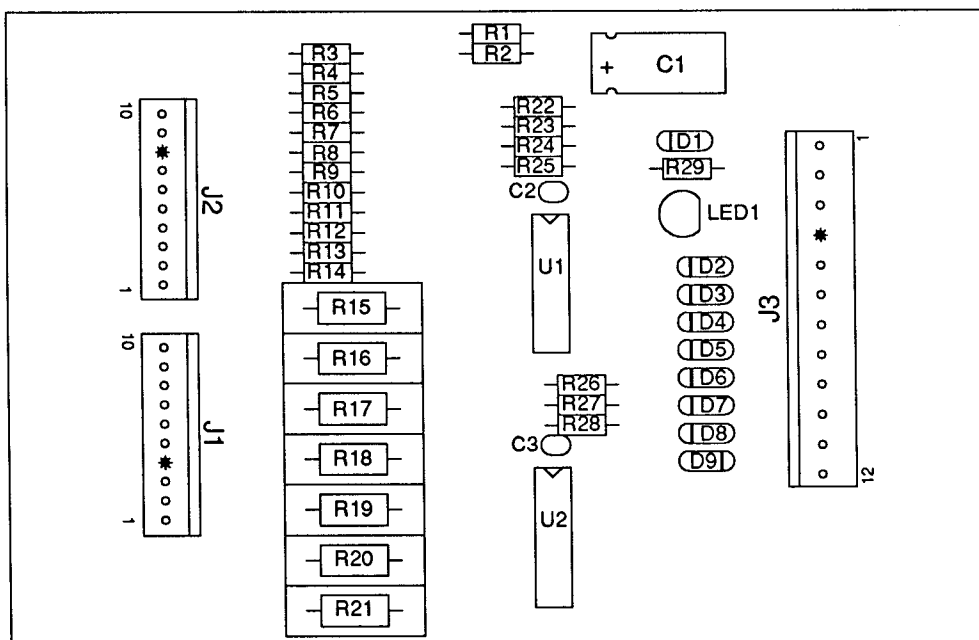


A-14039**Dot Matrix Controller Assembly**

Part Number	Ckt Designator	Description
5010-08991-00	R1	Resistor, 4.7K Ω , 1/4w, 5%
5010-09224-00	R10	Resistor, 270 Ω , 1/4w, 5%
5010-12832-00	R3, R6, R12, R13	Resistor, 47K Ω , 1/2w, 5%
5010-12841-00	R4, R5	Resistor, 120 Ω , 1/2w, 5%
5012-12830-00	R9	Resistor, 1.8K Ω , 5w, 5%
5012-12842-00	R11	Resistor, 120 Ω , 5w, 5%
5012-12843-00	R8	Resistor, 4.7K, 5w, 5%
5010-10171-00	R7	Resistor, 56 Ω , 1/4w, 5%
5040-08986-00	C3	Capacitor, 100 μ fd., 10v, ($\pm$ 20%)
5040-12324-00	C4, C7	Capacitor, 150 μ fd., 160v, ($\pm$ 50%)
5043-08980-00	BYPASS	Capacitor, .01 μ fd., 50v, (+80, -20%)
5043-09072-00	C6, C9, C10	Capacitor, .1 μ fd., 500v, (+80, -20%)
5043-09845-00	C1, C2, C11	Capacitor, 1KP, 50v, ($\pm$ 20%)
5043-09492-00	C5, C8	Capacitor, 100P, 50v, ($\pm$ 10%)
5070-09054-00	D7	Diode, 1N4004, 1.0A.
5075-12824-00	D6, D8	Zener, 1N4742A, 12v
5075-12823-00	D4, D5	Zener, 1N4758A, 62v
5075-12826-00	D3	Zener, 1N4759A, 62v
5100-12833-00	BR1, BR2	Bridge, 400v, 1A.
5160-10269-00	Q1	Transistor, 2N3904 NPN
5164-09056-00	Q2, Q10	Transistor, MPSD02, NPN
5164-12154-00	Q3, Q7	Transistor, MJE15030 NPN
5194-09055-00	Q4, Q5	Transistor, MPSD52 PNP
5194-12155-00	Q6	Transistor, MJE15031 PNP
5281-09738-00	U16, U25 - U27	IC, 74LS157
5281-10033-00	U3	IC, 74LS30
5281-10043-00	U31 - U33, U35	IC, 74LS175
5311-10946-00	U4, U5, U17, U18, U20	IC, 74HC74
5311-10947-00	U9	IC, 74HC125
5311-10951-00	U10, U11	IC, 74HC161
5311-10977-00	U6	IC, 74HC04
5311-12817-00	U29	IC, 74HC165
5311-12819-00	U21	IC, 74HC688
5311-12820-00	U23	IC, 74HC27
5311-12822-00	U13 - U15	IC, 74HC193
5315-12009-00	U22	IC, 74HCT374
5315-12812-00	U1, U2, U30	IC, 74HCT138
5281-09308-00	U28	IC, 74HCT245
5315-12815-00	U8, U34	IC, 74HCT08
5315-12816-00	U19	IC, 74HCT32
5315-12821-00	U7	IC, 74HCT240
5340-12278-00	U24	S/RAM 2064 150NS
5551-09822-00	L1	IND 4.7 μ H, 3.0A.
5671-09019-00	D10	Display LED Red
5705-09199-00	Q3, Q6, Q7	Heatsink 6030B
5731-12328-00	F601, F602	Fuse, 3/8A., SB, 250v
5733-12060-00		Fuse Holder (F601, F602)
5791-10850-00	J602	Connector, 26-pin STR Sq.
5791-10862-05	J605	Connector, 5-pin Header Sq.
5791-10862-07	J606	Connector, 7-pin Header Sq.
5791-10862-08	J604	Connector, 8-pin Header Sq.
5791-12516-00	J601	34 Hen 17x2 STR
5791-12827-00	J603	14 Hen 7x2 STR
5010-09036-00	R14-R23	Resistor, 100 Ω , 1/4w, 5%
4006-01003-06	Q3, Q6, Q7	Mach. Screw, 6-32 x 3/8
4406-01128-00	Q3, Q6, Q7	Nut, 6-32 KEPS

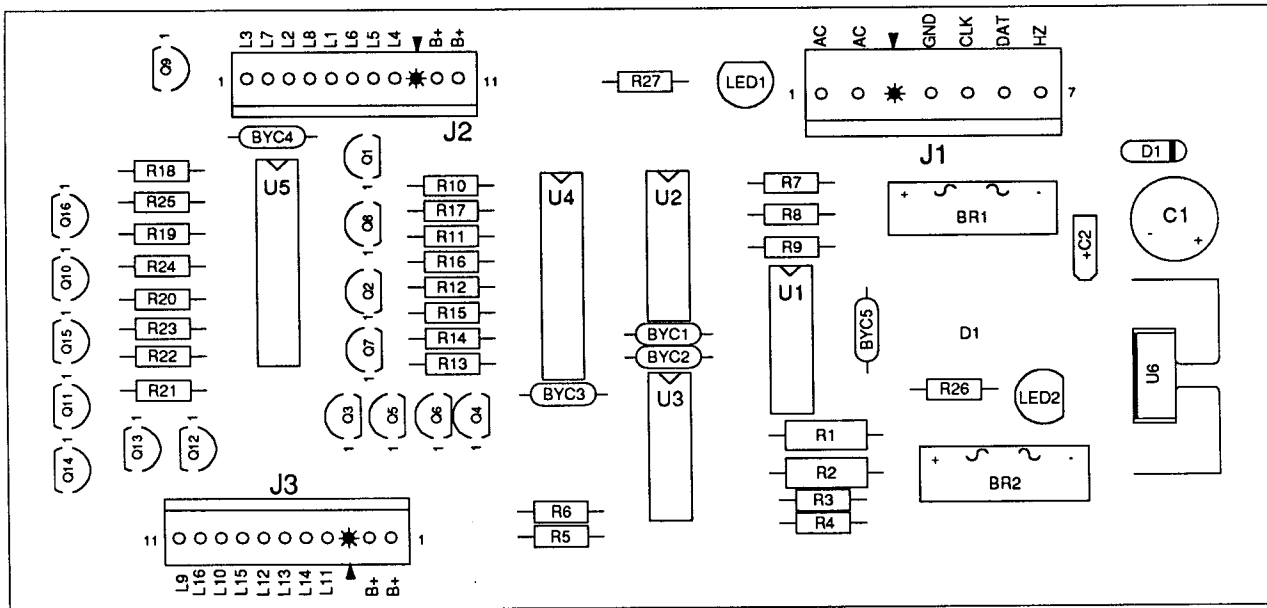


A-15576 7-Switch Opto PCB Assembly

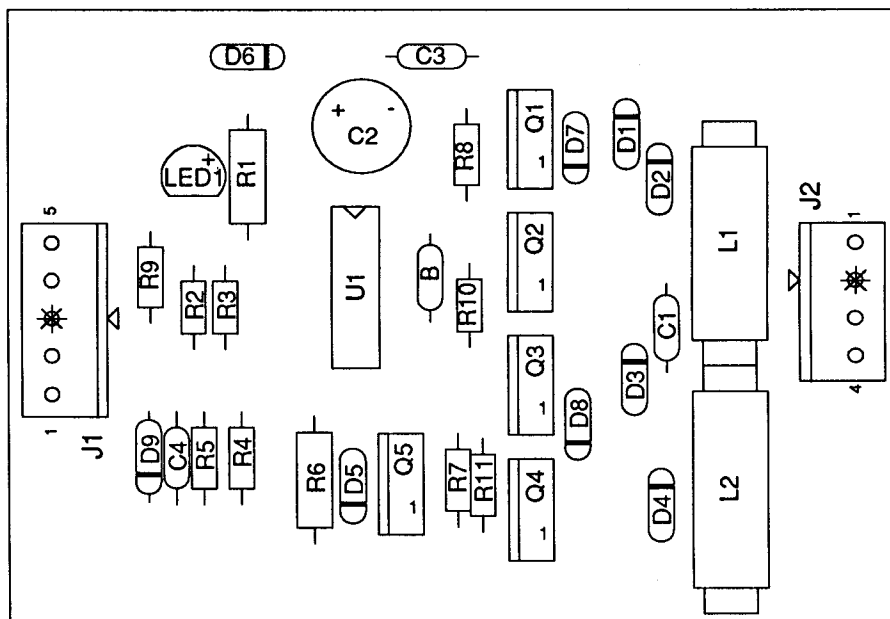


Part Number	Description	Description
5040-12298-00	C1	Capacitor, 100μfd, 40v (±50%)
5043-08980-00	C2, C3	Capacitor, .01 M 50v
5671-09019-00	LED 1	Display LED Red
5370-12272-00	U1, U2	IC LM339 Quad.
5070-09054-00	D1 - D9	Diode 1N4004 1.0A.
5010-12928-00	R15 - R21	Resistor, 270KΩ, 2w, 5%
5010-09999-00	R1 - R14	Resistor, 2KΩ, 2w, 5%
5010-10631-00	R29	Resistor, 1.2KΩ, 2w, 5%
5010-09162-00	R23, R25, R26	Resistor, 100KΩ, 2w, 5%
5010-08774-00	R22, R24	Resistor, 22KΩ, 1/4w, 5%
5010-09034-00	R28	Resistor, 10KΩ, 1/4w, 5%
5791-10862-12	J3	Connector, 12-pin Header Str Sq. Lock .100
5791-12462-10	J1, J2	Connector, 10-pin Header Str Sq. Lock .100

A-15761 Chase Light PCB Assembly

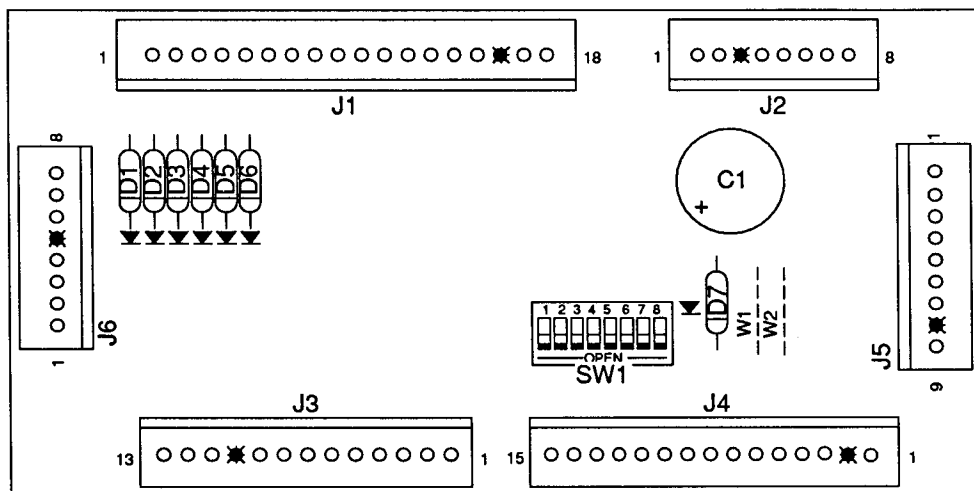


Part Number	Designator	Description
5162-08976-00	Q1-Q16	Transistor 2N6427 NPN
5010-08997-00	R10-R25	Resistor, 2.7KΩ, 1/4w, 5%
5010-08991-00	R7 - R9	Resistor, 4.7KΩ, 1/4w, 5%
5010-09358-00	R3, R4	Resistor, 1KΩ, 1/4w, 5%
5010-09162-00	R5	Resistor, 100KΩ, 1/4w, 5%
5010-09113-00	R6	Resistor, 33KΩ, 1/4w, 5%
5010-08930-00	R1, R2	Resistor, 470Ω, 1/2w, 5%
5041-09031-00	C2	Capacitor, 1μfd, 25v (±20%)
5040-09421-00	C1	Capacitor, 100μfd, 25v, (+50, -10%)
5043-08980-00	BYC1 - BYC5	Capacitor, .01M, 50v, (+80, -20%)
5370-12272-00	U1	IC LM339 Quad. Comp.
5250-09157-00	U6	Reg. 7805 1A, 5v
5010-09085-00	R26, R27	Resistor, 1.5KΩ, 1/4w, 5%
5070-09054-00	D1	Diode 1N4004, 1.0A.
5671-09019-00	LED1, LED2	Display Red LED
5100-09513-00	BR1, BR2	Bridge Rectifier, 4A, 50v
5791-10862-07	J1	Connector, 7-pin Header STR Sq. pin .156
5591-12462-11	J2, J3	Connector, 11-pin Header STR Sq. pin .100
5705-09663-00	U6	Heatsink AAVID 5741
5281-09867-00	U4, U5	IC 74LS244
5281-10447-00	U2, U3	IC 74LS164



Part Number	Designator	Description
5162-12635-00	Q1, Q3, Q5	Transistor TIP 102 NPN
5192-12428-00	Q2, Q4	Transistor TIP 107 PNP
5370-12272-00	U1	I.C. LM339 Quad Comp
5551-09822-00	L1,L2	Ind. 4.7 $\mu\Omega$
5791-12273-04	J2	Connector, 4-pin Header Str Sq. LCK .156
5791-12273-05	J1	Connector, 5-pin Header Str Sq. LCK .156
5070-09054-00	D1 - D9	Diode 1N4004, 1.0A.
5043-08996-00	C1	Capacitor, 0.1 μ fd ($\pm$ 20%)
5040-10974-00	C2	Capacitor, 100 μ fd, 35v (+80, -20%)
5043-08980-00	C3, B, C4	Capacitor, 0.01 μ fd, 50v (+1, -20%)
5010-09085-00	R2, R3, R9	Resistor, 1.5K Ω , 1/4w, 5%
5010-09034-00	R4, R5	Resistor, 10K Ω , 1/4w, 5%
5010-08991-00	R7, R8, R10, R11	Resistor, 4.7K Ω , 1/4w, 5%
5010-09061-00	R1, R6	Resistor, 680 Ω , 1/2w, 5%
5671-09019-00	LED1	Display LED Red

A-14689 WPC Coin Door Interface Board

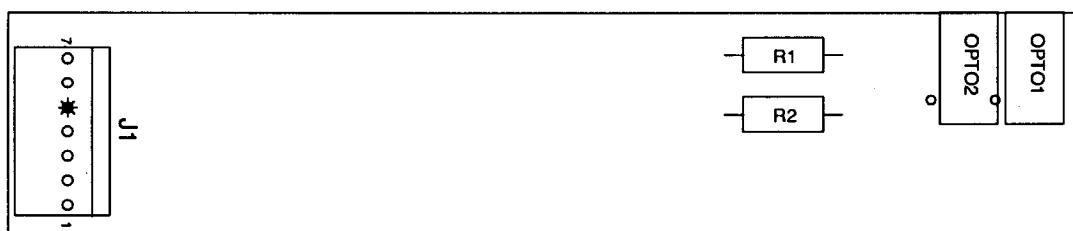


Part Number	Designator	Description
5070-09054-00	D1-D7	Diode, 1N4004, 1.0A.
5791-10862-18	J1	Connector, 18-pin Header Str Sq.
5791-10862-08	J2, J6	Connector, 8-pin Header Str Sq.
5791-10862-13	J3	Connector, 13-pin Header Str Sq.
* 5791-10862-15	J4	Connector, 15-pin Header Str Sq.
* 5791-10862-09	J5	Connector, 9-pin Header Str Sq.
* 5645-09025-00	SW1	Switch DIP 8-Position

Notes:

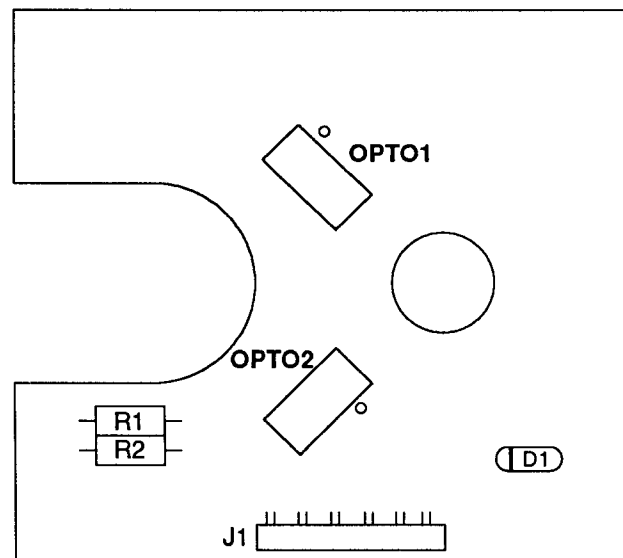
1. For Belgium, France, Finland, Sweden and England use A-14689-1 Coin Door Interface Board.
2. * = Used on Electronic Coin Door only.

A-15894 Flipper Opto Board



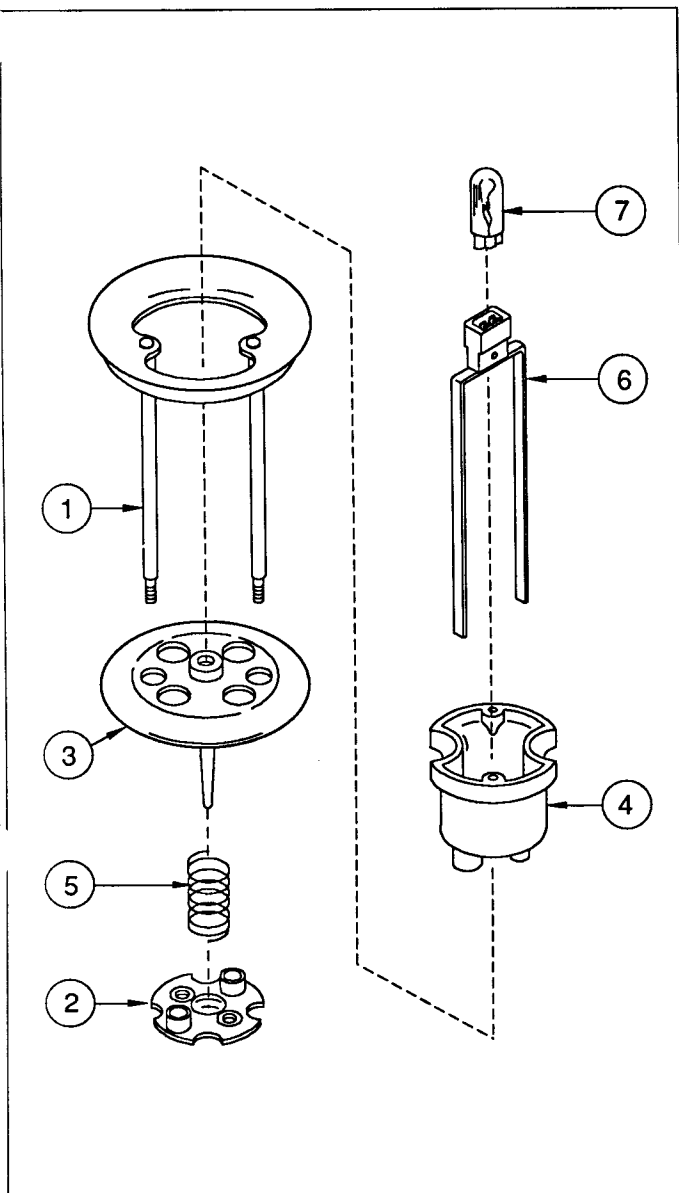
Part Number	Designator	Description
5010-08930-00	R1, R2	Resistor 470Ω, 1/2w, 5%
5490-12451-00	OPTO1, OPTO2	Opto Inter Lg. 10ma.
5791-12273-07	J1	Connector, 7-pin Header

A-15668 2-Switch Opto PCB Assembly



Part Number	Designator	Description
5791-10871-06	J1	Connector, 6-Pin Header Sq. Pin .156
5490-12451-00	OPTO1, OPTO2	Opto Inter Long 10MA
5010-08930-00	R1, R2	Resistor, 470Ω, 1/2w, 5%
5070-09054-00	D1	Diode 1N4004, 1.0A.

B-9414 Jet Bumper Assembly

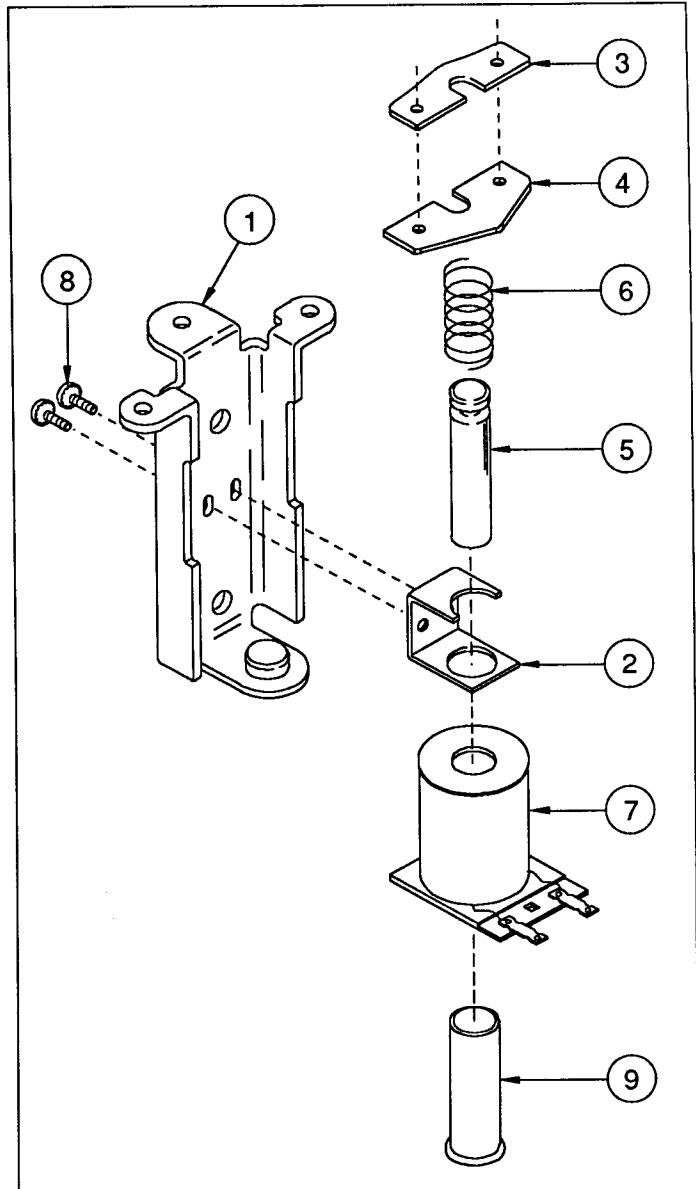


Item	Part Number	Description
1.	A-4754	Bumper Ring Assembly
2.	03-6009-A5	Bumper Base, White
3.	03-6035-5	Bumper Wafer, White
4.	03-7443-5	Bumper Body, White
5.	10-7	Spring
6.	24-8776	Socket - Wedge Base
7.	24-8768	Bulb #555 (6.3V., 0.25A.)

Associated Parts:

8.	A-16413	Mountain, Jet Bumper #1
	03-8790	Mountain, Jet Bumper #2
	03-8791	Mountain, Jet Bumper #3

A-9415-2 Jet Bumper Coil Assembly



Item	Part Number	Description
1.	B-7417	Bracket & Stop Assembly
2.	01-1747	Coil Retaining Bracket
3.	01-5492	Armature Link, Steel
4.	01-5493	Armature Link, Bakelite
5.	02-3406-1	Coil Plunger
6.	10-326	Armature Spring
7.	AE-26-1200	Coil Assembly
8.	4006-01017-04	Mach. Screw, 6-32 x 1/4"
9.	03-7066	Coil Tubing

A-15205-R-2 Fliptronic II Flipper Assy.
A-15205-L-4 Fliptronic II Flipper Assy.

Item	Part Number	Description
1.	B-13104-R	Flipper Base Assy, Right
	* B-13104-L	Flipper Base Assy, Left
2.	SW-1A-193	Switch Assembly
3.	4701-00002-00	Lockwasher, #6 Split
4.	4105-01019-10	Sh. Metal Screw, #5 x 5/8 P-RH-A
5.	4008-01079-05	Mach. Screw, 8-32 x 5/16 H-SOC
6.	4701-00003-00	Lockwasher, #8 Split
7.	01-9375	Switch Mounting Bracket
8.	20-6516	Speednut, Tinnerman
9.	4010-01066-06	Cap Screw, 10-32 x 3/8, SH
10.	4701-00004-00	Lockwasher, #10 Split
11.	A-12111	Flipper Stop Assembly
12.	FL-11629	Flipper Coil (Blue)
a)	03-7066-5	Coil Tubing
	* FL-15411	Flipper Coil (Orange)
13.	01-7695	Solenoid Bracket
14.	4006-01017-04	Mach. Screw, 6-32 x 1/4 P-RH-S
15.	10-364	Spring
16.	B-13882-R	Crank Link Assembly, Right
	* B-13882-L	Crank Link Assembly, Left
a)	B-13884-R	Flipper Crank Assembly, Right
	* B-13884-L	Flipper Crank Assembly, Left
b)	A-10656	Flipper Link Assembly
c)	02-4179	Link Spacer Bushing
d)	4010-01086-14	Cap Screw, 10-32 x 7/8 SH
e)	4700-00023-00	Flatwasher, 5/8 x 13/64 x 16ga.
f)	4701-00004-00	Lockwasher #10 Split
g)	4410-01132-00	Nut, 10-32 ESN
17.	23-6577	Bumper Plug, 5/8"
18.	03-7568	Flipper Bushing
19.	4006-01005-06	Mach. Screw, 6-32 x 3/8 P-PH
20.	4406-01117-00	Nut, 6-32 Hex.

Associated Parts for Left & Right Flippers:

21.	23-6535	Flipper Rubber (Black)
22.	20-9250-5	Flipper & Shaft (White)

A-15843 Electronic Flipper Assy.
(Parts listed replace same items of A-15205-R)

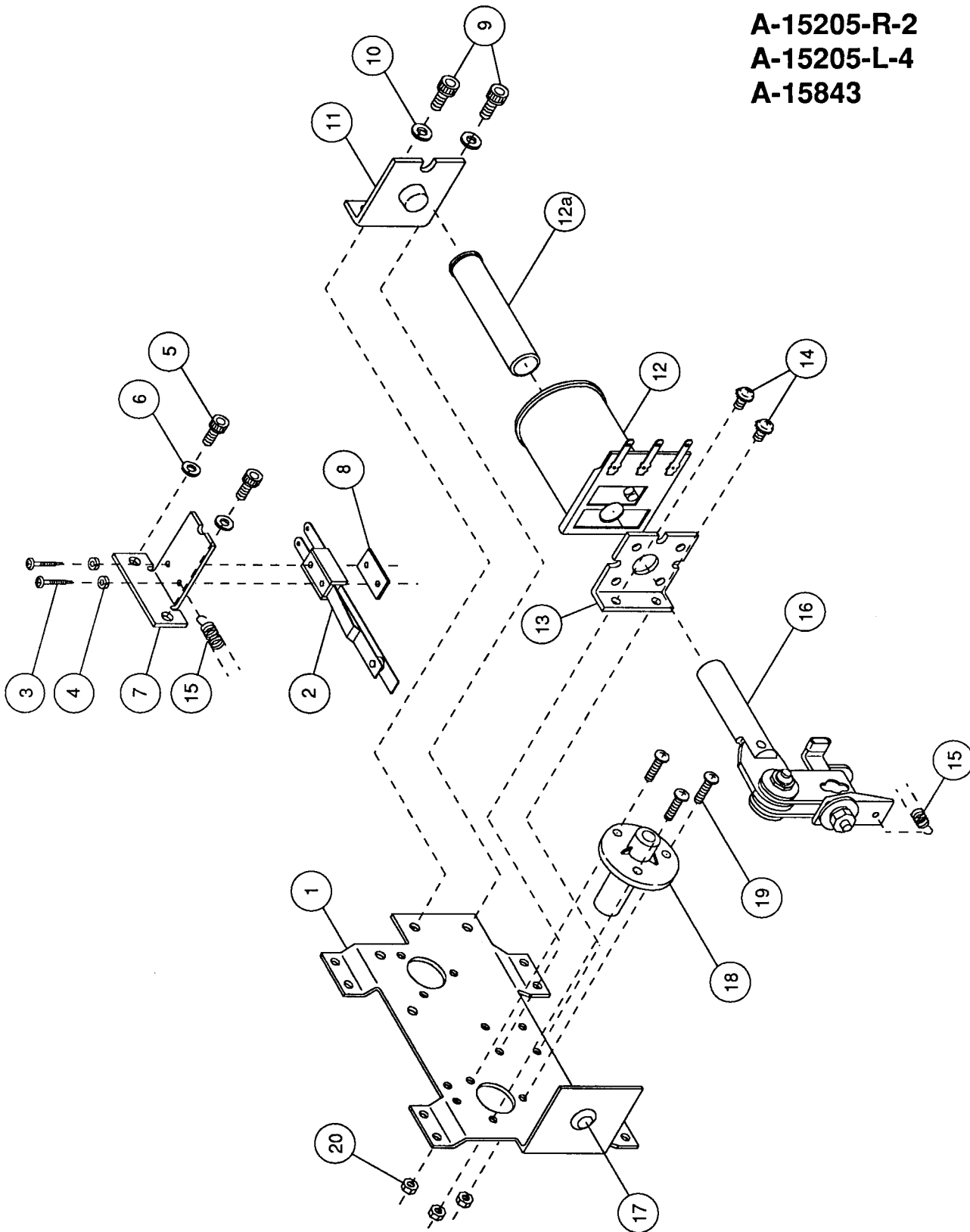
Item	Part Number	Description
1.	B-13104-R	Flipper Base Assy, Right
15.	Not Used	
16.	B-10655-R	Crank Link Assembly, Right
a)	B-10657-R	Flipper Crank Assembly
23.	**10-376	Spring

Flipper Notes:

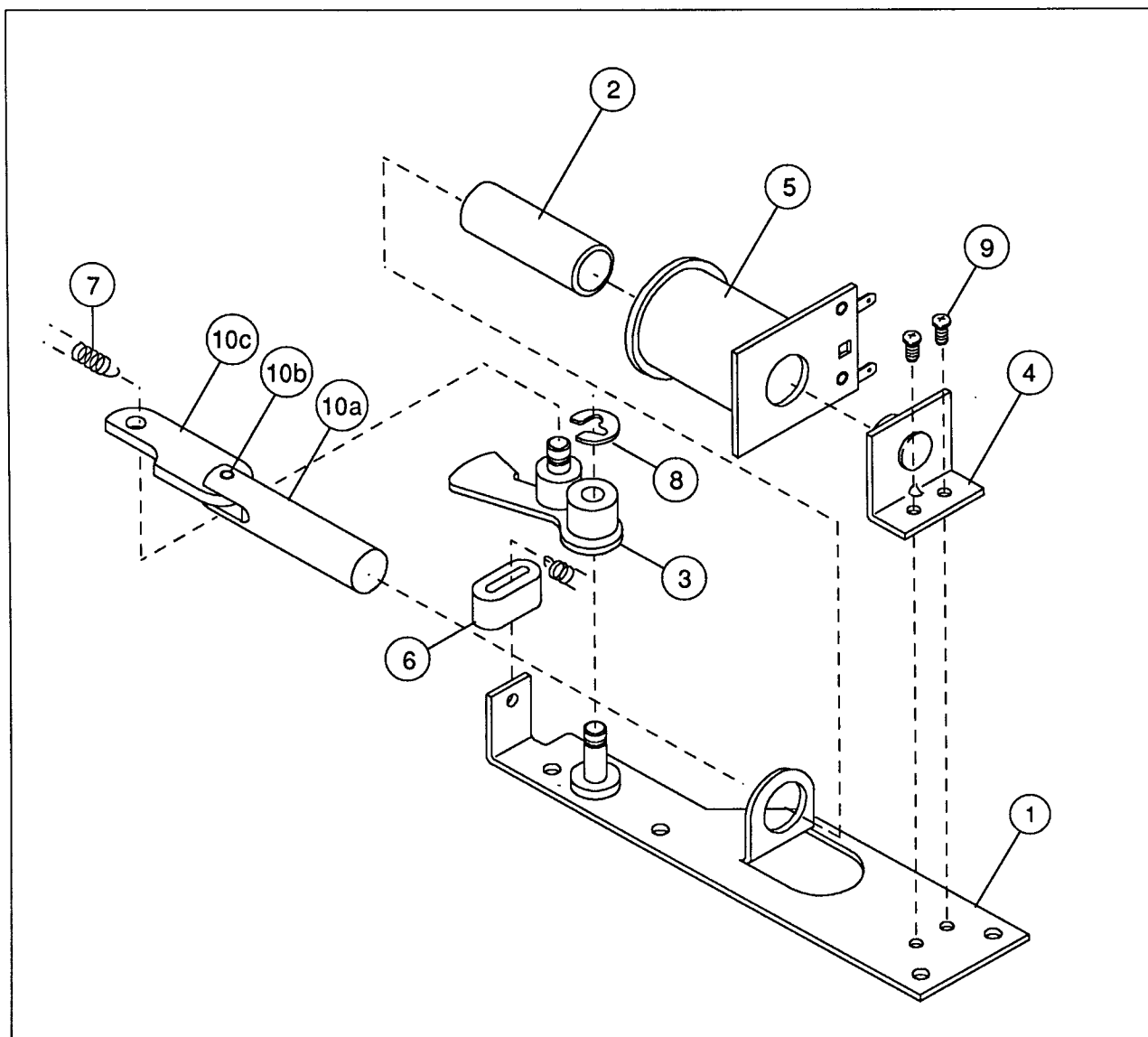
1. * Items for Left Flipper Assembly ONLY.
2. ** Not Shown.
3. Each Flipper Assembly is mounted beneath the playfield, in conjunction with the Plastic Flipper & Shaft, and Flipper Rubber on the upper side of the playfield.
4. With the flipper, in the non-activated position, the E.O.S. Switch contacts must have a gap of .062 (± 0.015) inch. When flipper is activated switch must close.
5. Any adjustment of the E.O.S. Switch must be made at a minimum distance of 0.25 inch from the switch body.
6. Longer blade of E.O.S. Switch must be straight. Gap adjustment is done by adjusting shorter blade.
7. All moving elements of the assembly must operate freely without any evidence of binding.
8. Apply Loctite™ 242 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.

Fliptronic II Flipper Assembly

A-15205-R-2
A-15205-L-4
A-15843

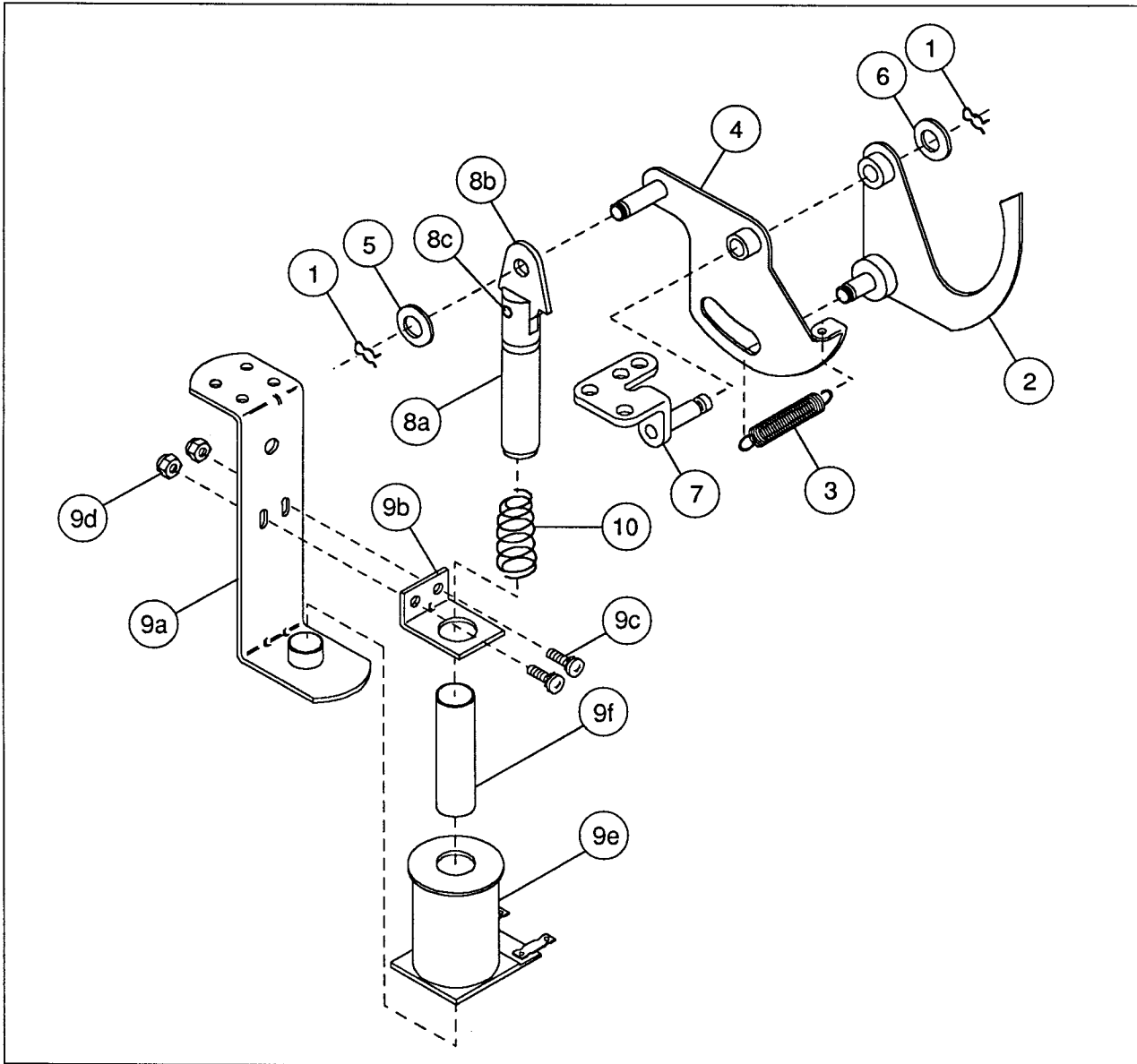


A-8039-3 Outhole Kicker Assembly



Item	Part Number	Description
1.	A-6378	Mounting Plate Assembly
2.	03-7066	Coil Tubing
3.	A-6889	Kicker Lever Assembly
4.	A-8038	Coil Stop Assembly
5.	AE-27-1200	Coil Assembly
6.	03-7176-1	Striker Ring
7.	10-101-4	Spring-Reset
8.	20-8712-25	"E" Ring, 1/4" Shaft
9.	4006-01003-03	Mach. Screw, 6-32 x 3/16"
10.	A-8335	Coil Plunger Assembly
a)	02-2364	Coil Plunger
b)	20-8716-5	Roll Pin, 1/8 x 7/16"
c)	01-4251	Ball Return Link

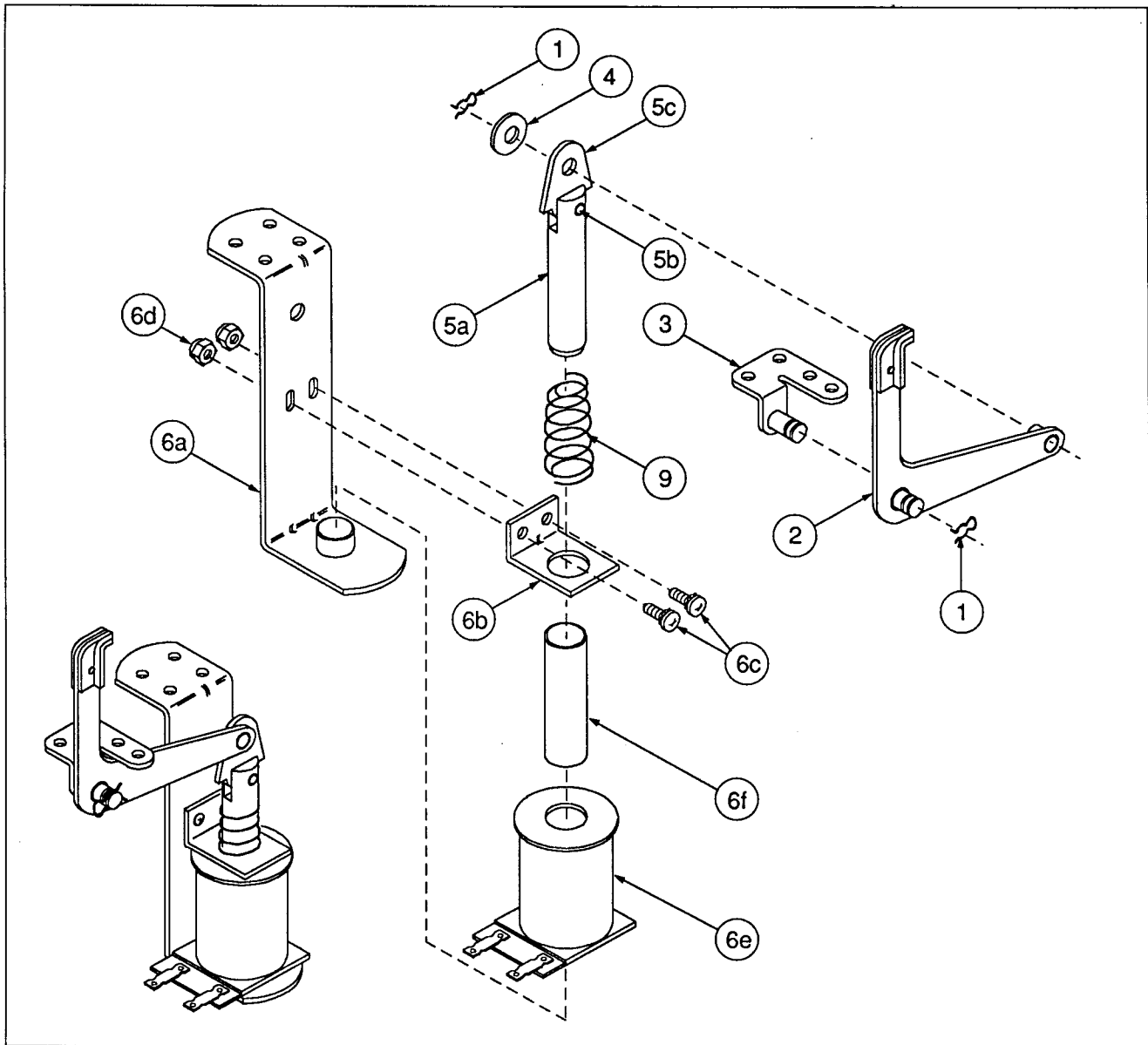
C-9638 Ball Shooter Lane Feeder Assembly



Associated Parts:

Item	Part Number	Description	Item	Part Number	Description
1.	12-6227	Hairpin Clip	9.	B-9362-R-3	Coil & Bracket Assembly
2.	A-8247	Eject Cam Assembly	a)	B-7572-1	Bracket & Stop Assembly
3.	10-362	Ejector Spring (Plain)	b)	01-8-508-S	Coil Retaining Bracket
4.	A-6949-L	Spring Plate Assembly	c)	4006-01017-06	Mach. Screw, 6-32 x 3/8
5.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.	d)	4406-01119-00	Nut, 6-32 ESN
6.	4700-00103-00	Flatwasher, 17/64 x 1/2 x 28ga.	e)	AE-26-1200	Coil Assembly
7.	A-8268	Mounting Bracket Assembly	f)	03-7066	Coil Tubing
8.	A-8050-1	Coil Plunger Assembly	10.	10-128	Spring
a)	02-3407-2	Coil Plunger Assy, 2-1/8"			
b)	03-8085	Armature Link			
c)	20-8716-5	Roll Pin, 1/8 x 7/16"			

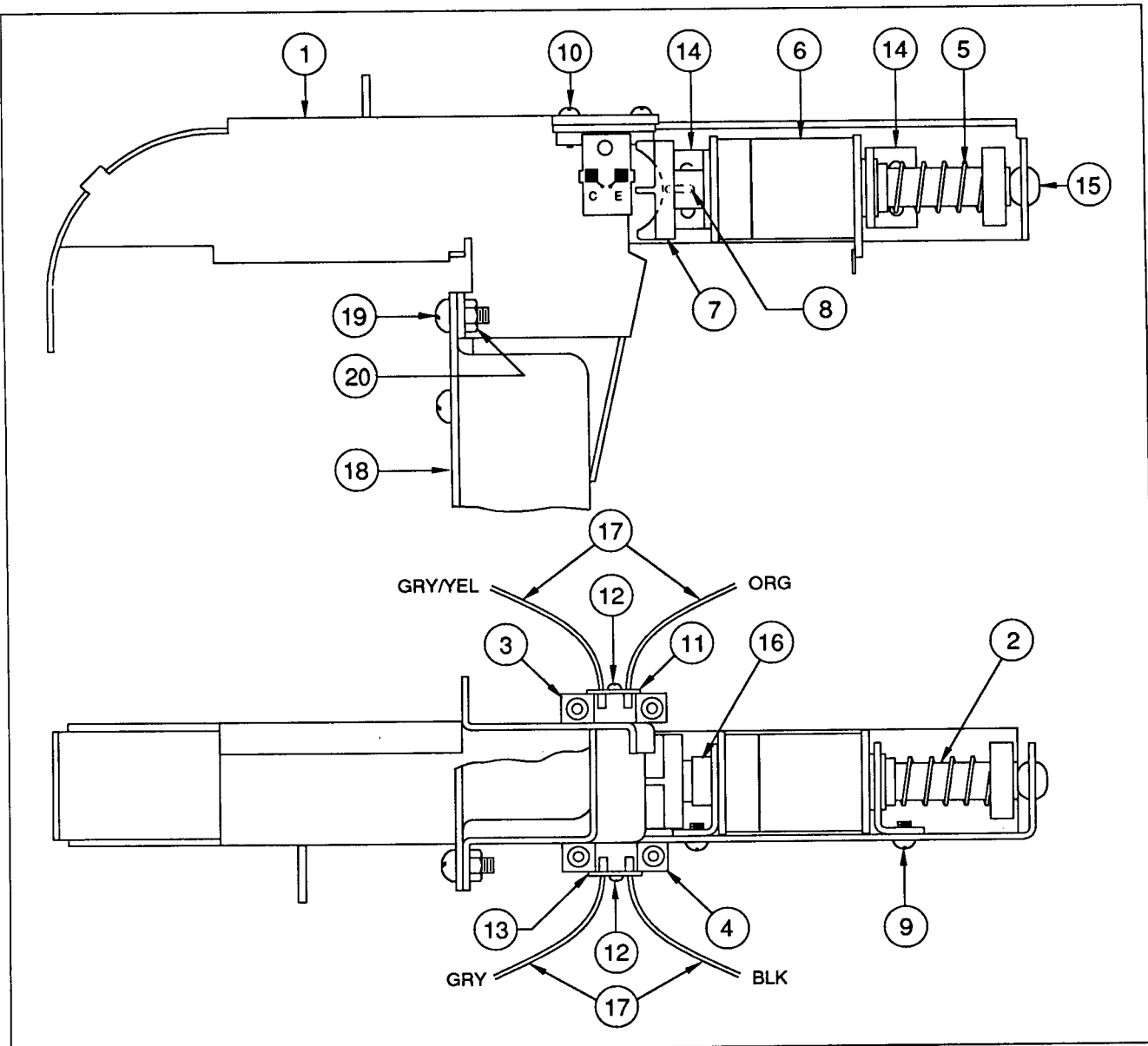
B-12665 Kicker Arm (Slingshot) Assembly



Associated Parts for Right & Left Kickers:

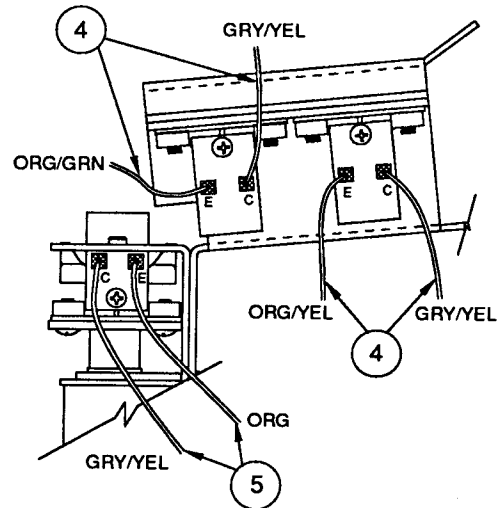
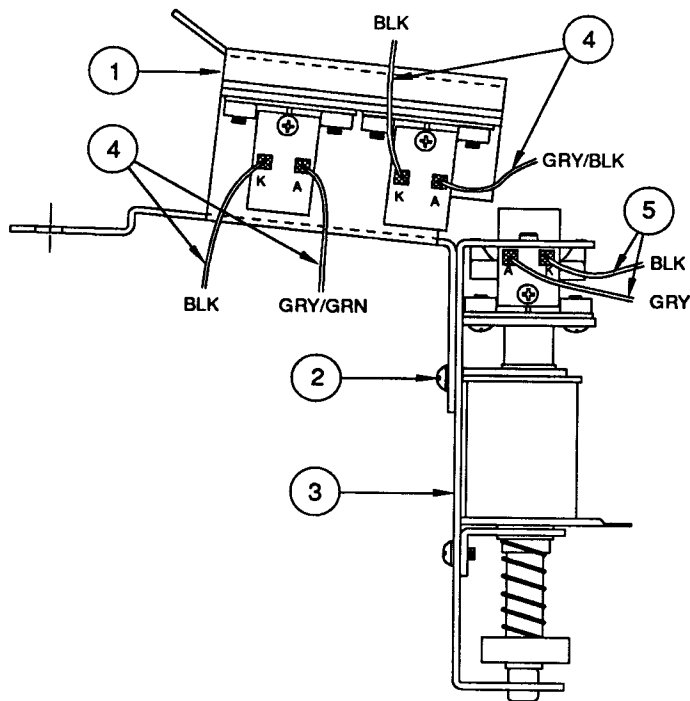
Item	Part Number	Description	Item	Part Number	Description
1.	12-6227	Hairpin Clip	6.	A-14369-R	Coil & Bracket Assy., Right
2.	A-12664	Kicker Crank Assembly		A-15749	Coil & Bracket Assy., Left
3.	A-5653	Mounting Bracket Assembly	a)	B-7572-1	Bracket & Stop Assembly
4.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.	b)	01-8-508-S	Coil Retaining Bracket
5.	A-5103	Coil Plunger Assembly	c)	4006-01017-06	Mach. Screw, 6-32 x 3/8
a)	02-2364	Coil Plunger	d)	4406-01119-00	Nut, 6-32 ESN
b)	03-8085	Armature Link	e)	AE-27-1200	Coil Assembly
c)	20-8716-5	Roll Pin, 1/8 x 7/16"	f)	03-7066	Coil Tubing
			7.	10-128	Spring

A-15758 Whirlpool Eject Assembly



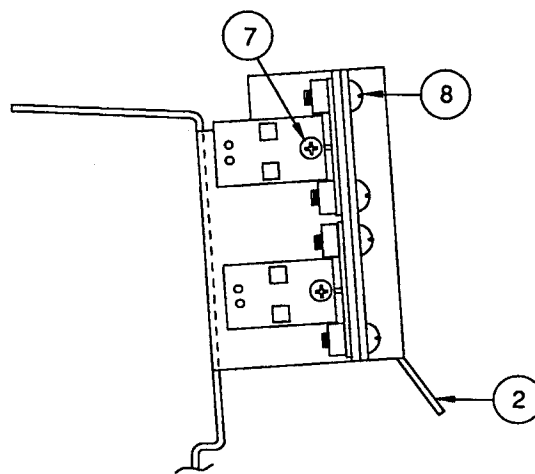
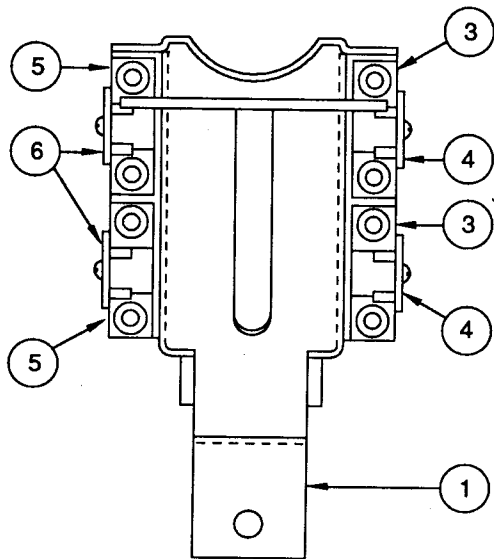
Item	Part Number	Description	Item	Part Number	Description
1.	01-10896	House Whirlpool Assembly	11.	A-14232	Photo Trans. Assembly
2.	02-4672	Armature Assembly	12.	4104-01001-06	Sh. Metal Screw, #4 x 3/8 P-PH
3.	01-8506	Base Opto Mounting - Black	13.	A-14231	LED Assembly
4.	03-8506-1	Base Opto Mounting - White	14.	01-9794	Coil Mounting Bracket
5.	10-135	Spring	15.	23-6420	Rubber Grommet
6.	AE-23-800	Coil Assembly	16.	03-7067-5	Coil Tubing
7.	03-8561	Ball Popper Cup	17.	H-16229	Opto Cable
8.	4106-01152-06	Sh. Metal Screw, #6-32 x 3/8"	18.	03-8694	Under Playfield Ramp
9.	4008-01017-04	Mach. Screw, 8-32 x 1/4 P-RH-S	19.	4006-01027-06	Mach. Screw, 6-32 x 3/8P-RWH
10.	4106-01019-06	Sh. Metal Screw, #6 x 3/8"	20.	4406-01128-00	Nut 6-32 KEPS

A-15926 Ball Popper & Multiball Assembly

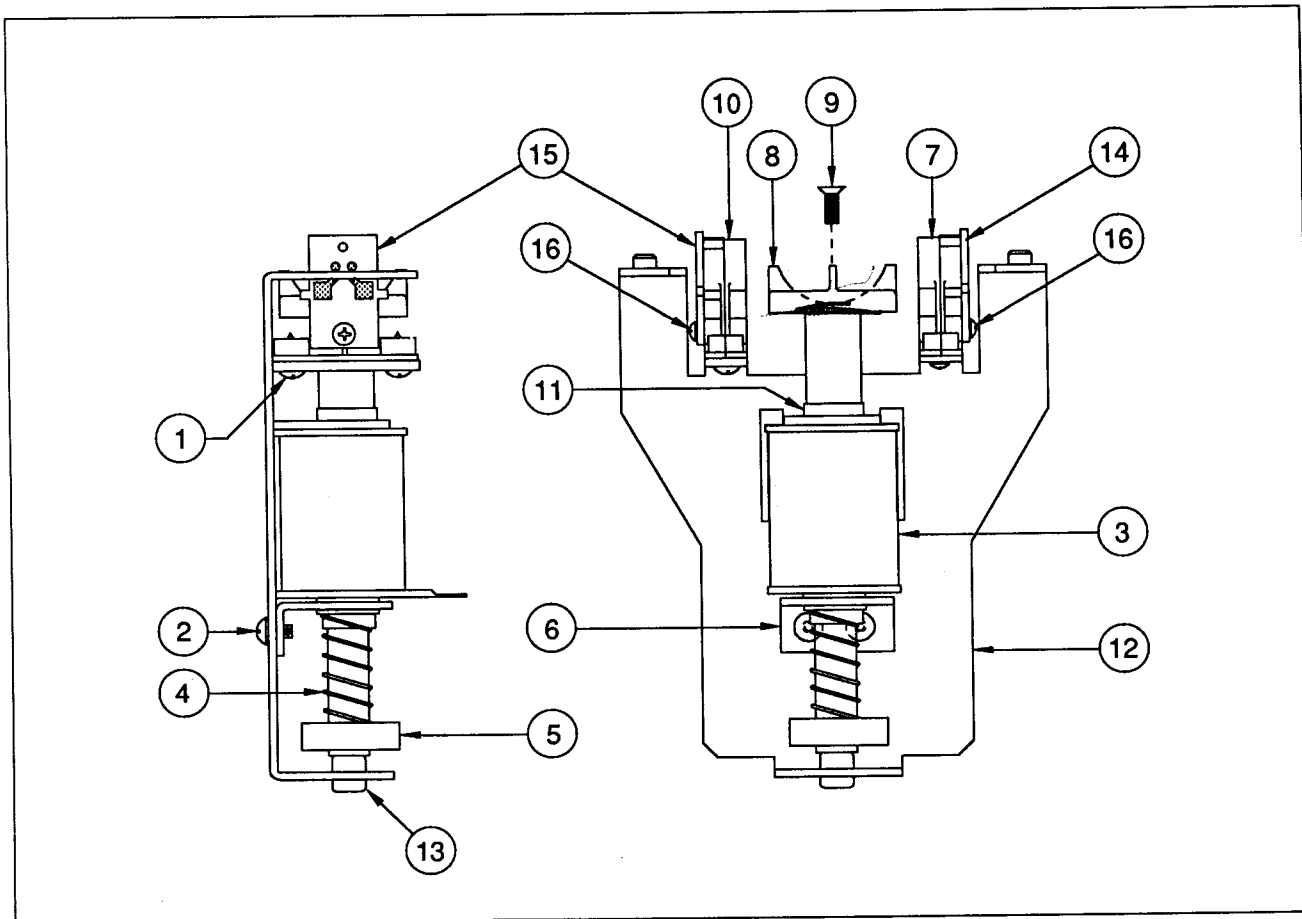


Item	Part Number	Description
1.	A-15927	Multiball Trough Assembly
2.	4006-01017-06	Mach. Screw, 6-32 x 3/8"
3.	A-15769	Ball Popper & Opto Assy.
4.	H-15769	Cable
5.	H-16229	Opto Cable

A-15927 Multiball Trough Assembly



Item	Part Number	Description
1.	01-10959	Ball Trough
2.	01-10960	Cover
3.	03-8506-1	Opto Base, White
4.	A-14231	LED Assembly
5.	03-8506	Opto Base, Black
6.	A-14232	Photo Transistor Assy.
7.	4104-01001-06	Sh. Metal Screw #4 x 3/8"
8.	4106-01019-08	Sh. Metal Screw #6 x 1/2"

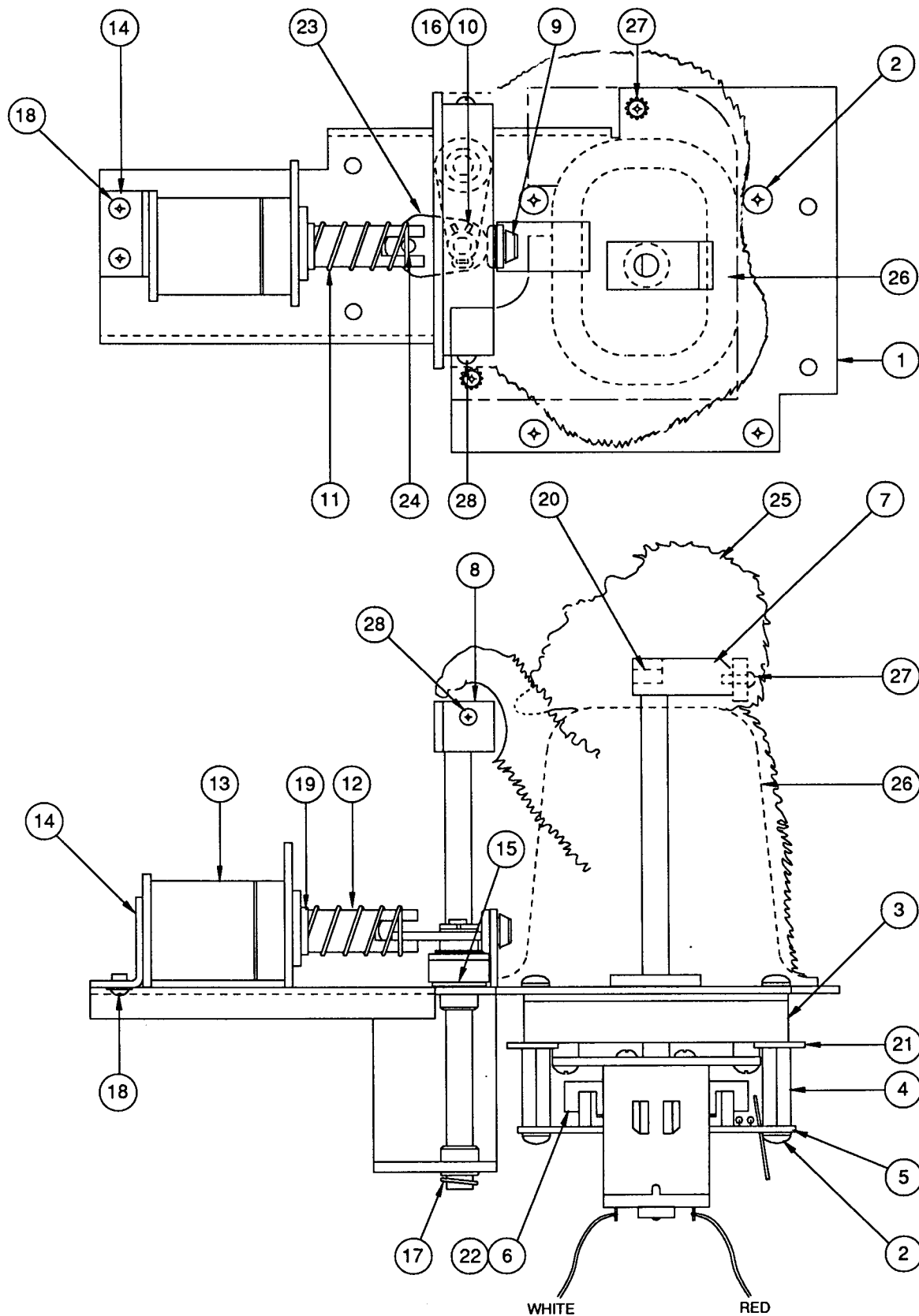


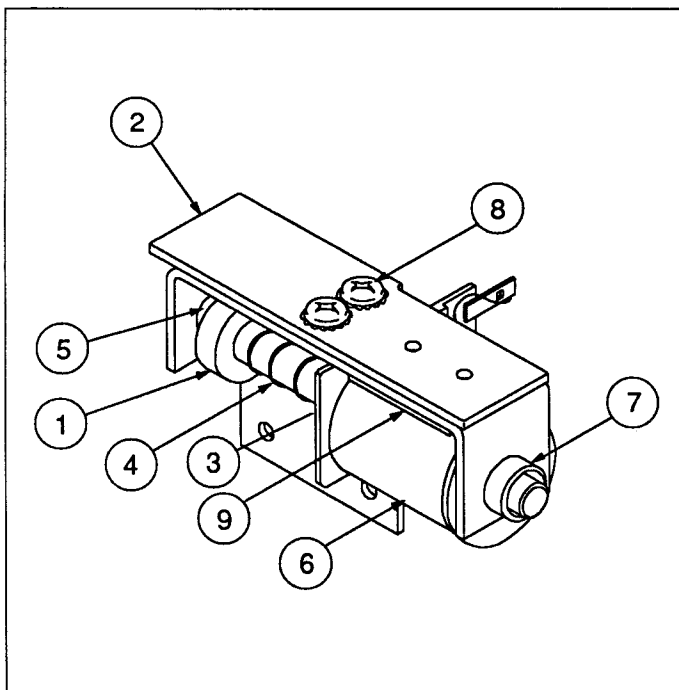
Item	Part Number	Description	Item	Part Number	Description
1.	4106-01019-06	Sh. Metal Screw, #6 x 3/8"	9.	4106-01152-06	Sh. Metal Scw, #6-32 x 3/8"
2.	4008-01017-04	Mach. Screw, 8-32 x 1/4"	10.	03-8506-1	Opto Mounting Base, White
3.	AE-23-800	Coil Assembly	11.	03-7067-5	Coil Tubing
4.	10-135	Spring	12.	A-15914	Bracket, Ball Popper
5.	02-4668	Armature Assembly	13.	23-6420	Rubber Grommet
6.	01-9794	Mounting Bracket	14.	A-14316	Photo Transistor Assembly
7.	03-8506	Opto Mounting Base, Black	15.	A-14315	LED Assembly
8.	03-8561	Ball Popper Cup	16.	4104-01001-06	Sh. Metal Screw, #4 x 3/8"

A-15573 Big Foot Mech. Assembly

Item	Part Number	Description
1.	01-10746	Base Bracket
2.	4010-01006-04	Mach. Screw, 10-32 x 1/4 P-PH-S
3.	14-7973	Gear Motor
4.	02-4564	Standoff
5.	A-15668	2-Switch Opto PC Board (See p.2-18)
6.	03-8698	Actuator Opto Switch
7.	02-4666	Mounting Block
8.	A-16243	Diverter Shaft Assembly
9.	23-6577	Bumper Plug
10.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
11.	10-399	Compression Spring
12.	02-3407-2	Coil Plunger, 2-1/8"
13.	AE-26-1200	Coil Assembly
14.	01-10892	Mounting Bracket
15.	4700-00104-00	Flatwasher, 23/64 x 1/2 x 16ga.
16.	12-6227	Hairpin Clip
17.	20-8712-31	"E"-Ring, 5/16" Shaft
18.	4008-01003-05	Mach. Screw, 8-32 x 5/16 PH-PHD
19.	03-7066	Coil Tubing
20.	4008-01076-04	Set Screw, 6-32 x 1/4 SH-CP
21.	4700-00060-00	Flatwasher, 7/32 x 1/2 x 16ga.
22.	4408-01128-00	Nut 8-32 KEPS
23.	03-8085	Armature Link
24.	20-8716-5	Roll Pin, 1/8 x 7/16"
25.	A-16046	Head Assembly
26.	A-16047	Body & Log Assembly
27.	4006-01017-06	Mach. Screw, 6-32 x 3/8 P-PH SEMS
28.	4106-01033-08B	Sh. Metal Screw, #6 x 1/2 P-TH-BLK

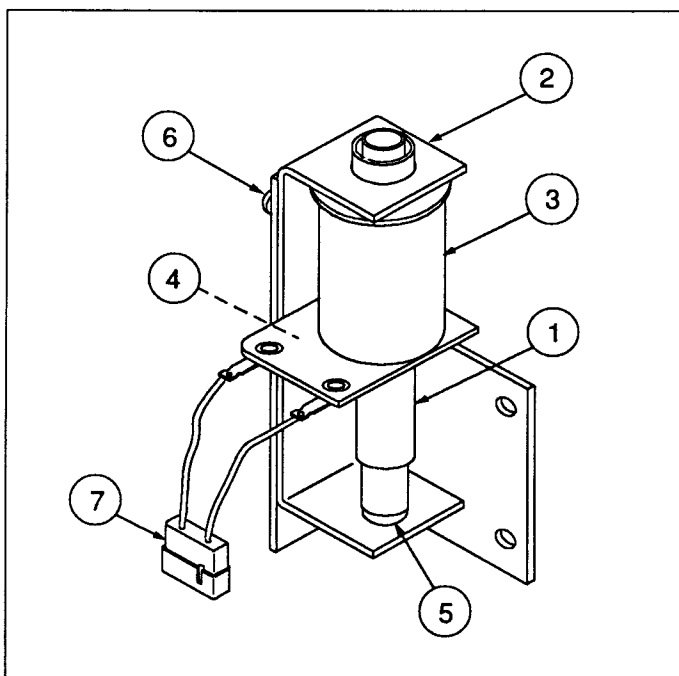
A-15573 Big Foot Mech. Assembly





B-11873-2 Bottom Arch Kicker Assembly

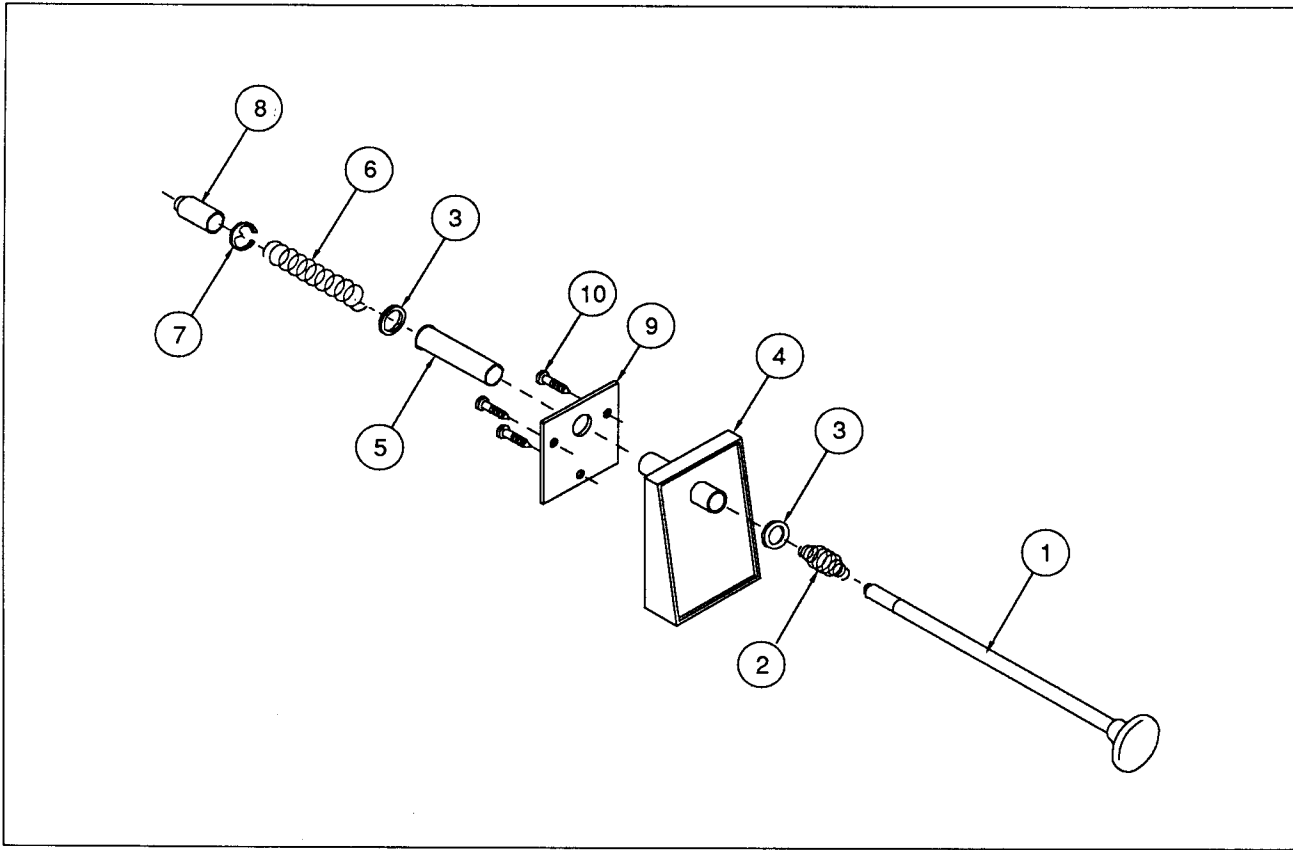
Item	Part Number	Description
1.	A-13270	Bell Armature Assembly
2.	B-7409-2	Mounting Bracket Assembly
3.	01-8-508-T	Solenoid Bracket
4.	10-135	Solenoid Spring
5.	23-6420	Rubber Grommet
6.	AE-23-800	Coil Assembly
7.	03-7067-5	Coil Tubing
8.	4008-01017-05	Mach. Screw, #8-32 x 5/16 P-RH
9.	03-8523	Insulator



B-10686-1 Knocker Assembly

Item	Part Number	Description
1.	A-5387	Coil Plunger Assembly
2.	B-7409-2	Mtg. Bracket Assembly
3.	AE-23-800	Coil Sub-Assembly
4.	01-8-508-T	Coil Retaining Bracket
5.	23-6420	Rubber Grommet
6.	4008-01017-06	Mach. Screw, 8/32 x 3/8
7.	H-11835	Knocker Cable
8.	03-7067-5	Coil Tubing

B-12445-1 Ball Shooter Assembly



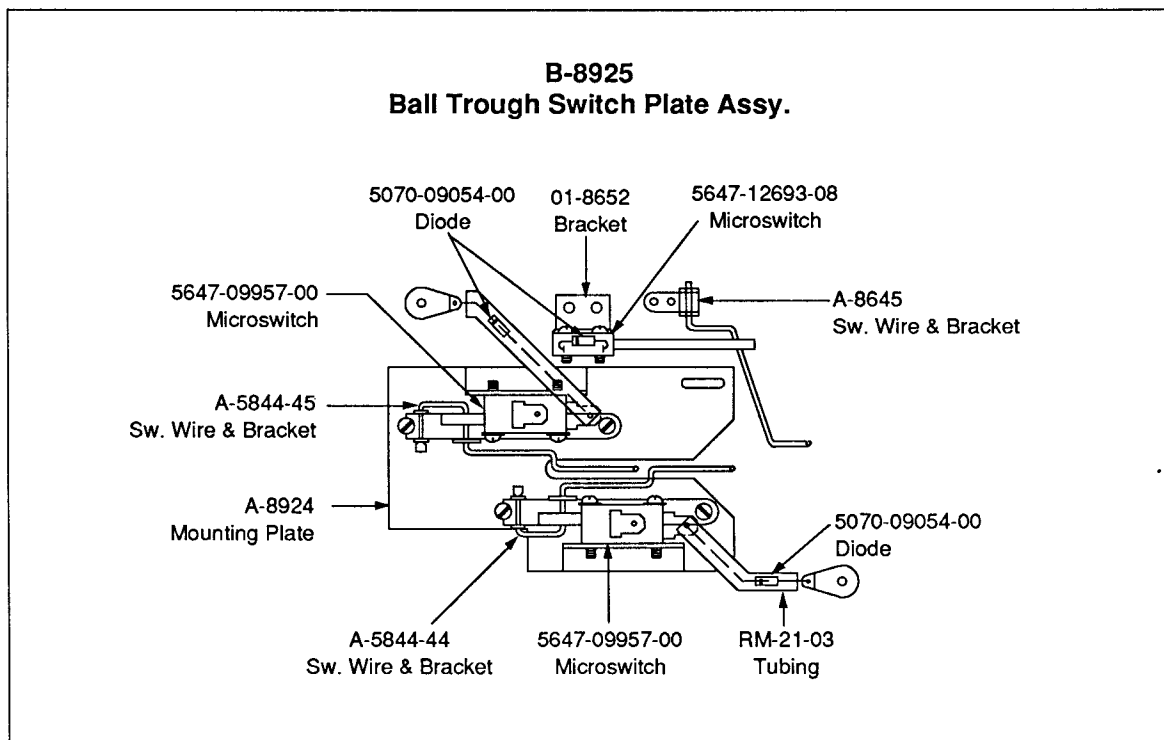
Item	Part Number	Description
1.	20-9253-7	Rod Assembly
2.	10-149	Rod Spring
3.	4700-00051-00	FW, 25/64 x 5/8 x 16ga.
4.	21-6645-1	Ball Shooter Housing
5.	03-7357	Shooter Sleeve
6.	10-148-1	Shooter Spring
7.	20-8718-1	"C" Retaining Ring
8.	23-6327	Rubber Shooter Tip

Associated Parts

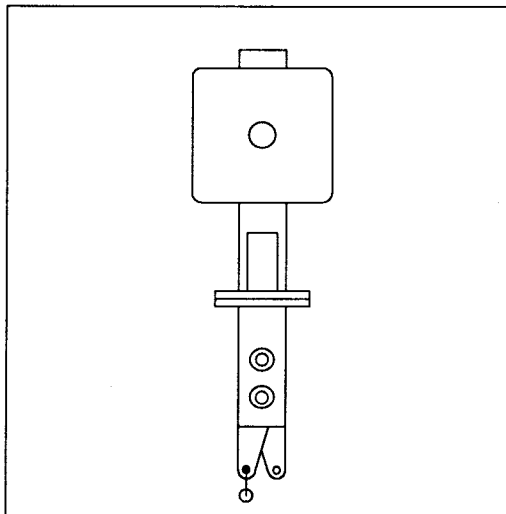
9.	01-3535	Mounting Plate
10.	4010-01006-10	MS, #10-32 x 5/8

Ball Trough Switches

(Viewed from underside of playfield to show locations)



B-12912 Standup Target

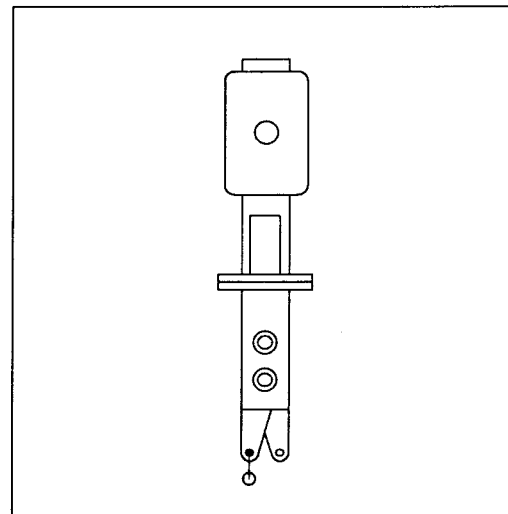


B-12912-10
Standup Target Assy.- Blue (5)

B-12912-23
Standup Target Assy.- Red (3)

B-12912-24
Standup Target Assy.- White (2)

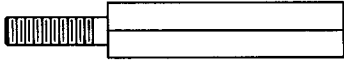
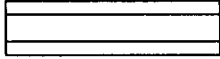
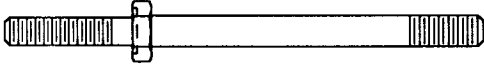
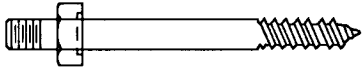
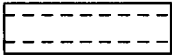
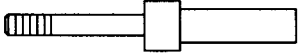
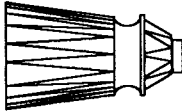
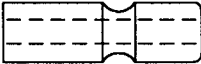
A-14604 Standup Target



A-14604-11
Standup Target Assy.- Green (2)

A-14604-12
Standup Target Assy.- Orange (1)

Metal & Plastic Posts

	<u>Part Number</u>	<u>Description</u>	<u>Qty.</u>
	02-4250-21	M-F Spacer, #6-32 x 1-5/16"	1
	02-4252-18	M-F Spacer, #6-32 x 1-1/8"	1
	02-4436-21	M-F Spacer, #8-32 x 11/16"	1
	02-4436-22	M-F Spacer, #8-32 x 2-1/16"	1
	02-4436-23	M-F Spacer, #8-32 x 2-9/32"	1
	02-4424-1	Post 6-32/8-32 2-1/32"	6
	02-4426-1	Post 6-32/8 1-29/32"	2
	02-4020	Support Post	2
	02-4434	Post, #8 x 1"	3
	02-4677	Mini Post	4
	02-4659	Mini Post	10
	03-8319-13	Star Post, Clear	12
	03-8365-13	Post, Clear	5

Coin Door Assembly

A-14148-1 U.S.A. Door with Decals

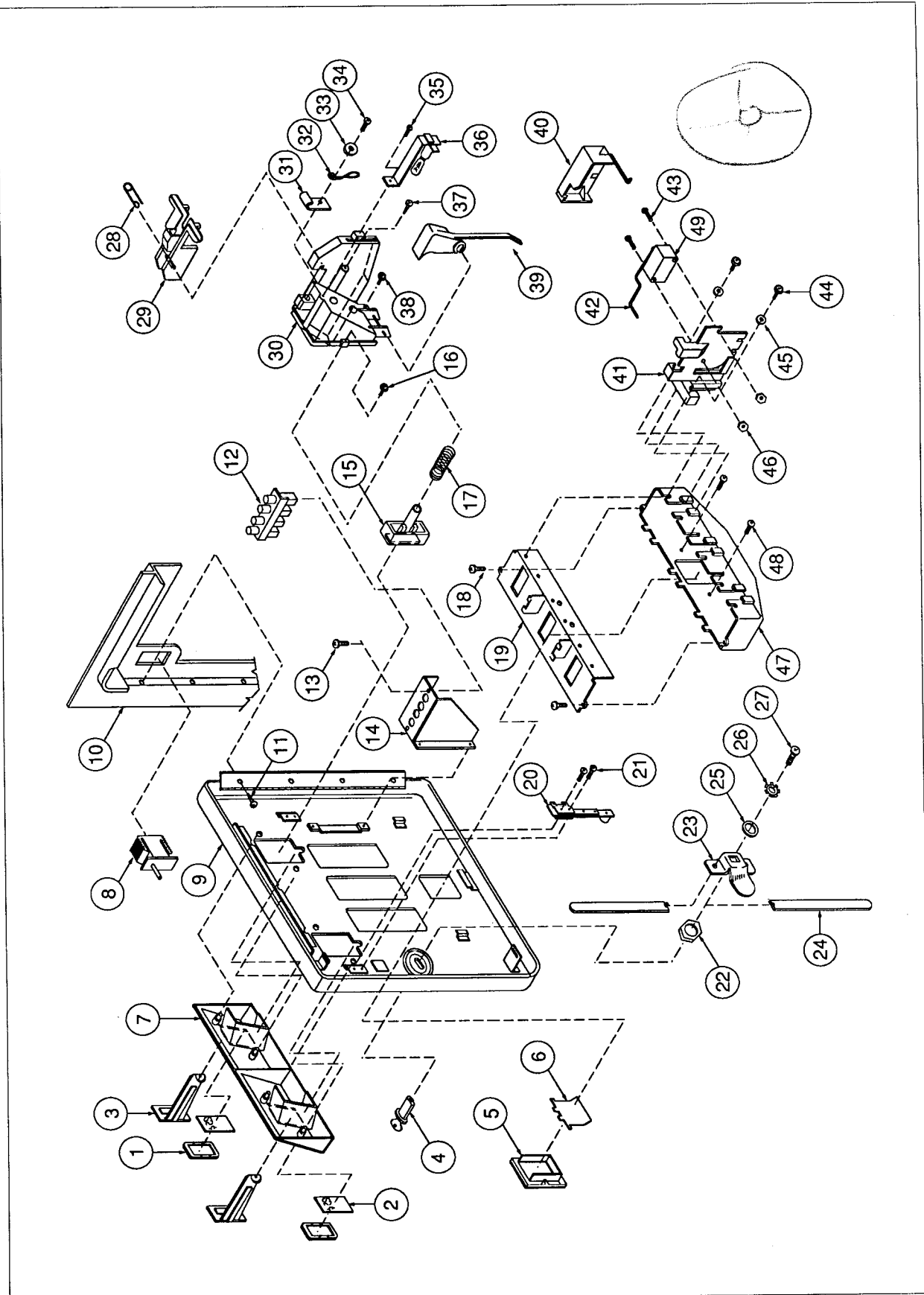
09-17002-x 2-Chute Door

09-17003-x 3-Chute Door

("x" is the country designator)

Item	Part No.	Description	Quantity
1	27-1038	Button Cover	2 or 3
2	27-1041-1→ 58	Price Panel	2 or 3
3	27-1026-1→ 17	Coin Entry Plate	2 or 3
4	27-1016	Lock Assembly	1
5	27-1061-1	Coin Return - Bezel	1
6	27-1062	Coin Return Flap	1
7	27-1021	Button Housing - 2-slot	1
	27-1022	Button Housing - 3-slot	1
8	27-1111	Interlock Switch	1
9	27-1006-1	Coin Door , 2-Slot	1
	27-1007-1	Coin Door , 3-Slot	1
10	27-1005	Coin Door Frame	1
11	27-1003	M/C Screw, 6-32 x 3/16	4
12	5641-12724-00	Diagnostic Switch	1
13	27-1101	M/C Screw, 4-40 x 1/4	2
14	01-9885	Bracket, Diagnostic Switch	1
15	27-1037	Plastic Button	1
16	27-1078	M/C Screw, 6-32 x 3/8	2 or 3
17	27-1039	Conical Spring	2 or 3
18	27-1079	Self-tapping Screw, #6 x 1/4	2
19	27-1077-1	Coinbox Cover	1
20	27-1066	Slam Switch	1
21	27-1067	M/C Screw, 4-40 x 1/2	2
22	27-1017	Nut (key)	1
23	27-1012	Locking Cam	1
24	27-1011	Locking Arm	2
25	27-1020	Washer	1
26	27-1018	Star Washer	1
27	27-1019	M/C Screw, 1/4-28 x 5/16	1
28	27-1089	R-Ring	1
29	27-1083	Retainer	1
30	27-1081	Coin Inlet Chute	2 or 3
31	27-1088	Cable Clamp	2 or 3
32	27-1025	Key Hook	1
33	27-1086	Washer, #6	2 or 3
34	27-1078	M/C Screw, 6-32 x 3/8	1 or 2
	27-1113	M/C Screw, 6-32 x 7/16	1
35	27-1079	Self-tapping Screw, #6 x 1/4	2 or 3
36	27-1084	Lamp Socket	2 or 3
	27-1085	Lamp	2 or 3
37	27-1096	Self-tapping Screw, #5 x 3/8	2 or 3
38	27-1087	M/C Screw, 6-32 x 5/8	2 or 3
39	27-1082	Lever Arm	2 or 3
40	27-1097	Switch Cover	2 or 3
41	27-1091-1	Coin Accept Chute	2 or 3
42	27-1075	Wire Form (Small)	2 or 3
	or		
	27-1093	Wire Form (Large)	
43	27-1094	M/C Screw, 4-40 x 7/8	4 or 6
44	27-1087	M/C Screw, 6-32 x 5/8	4 or 6
45	27-1086	Washer, #6	4 or 6
46	27-1095	Nut, 4-40 ESNA	4 or 6
47	27-1076-1	Coin Return Box	1
48	27-1078	M/C Screw, 6-32 x 3/8	2
49	27-1092	Microswitch	2 or 3

Coin Door Assembly



Unique Parts List

Part Number	Description	Part Number	Description
A-12738-50018	WPC Sound Board Assembly	A-16030	Sign Assembly
A-12742-50018	WPC CPU Board Assembly	A-16082-1	Playfield Plastic Assembly
A-13204-50018	Bottom Arch Assembly	A-16086	Ball Guide Assembly
A-13769-50018	Plfd. & Insert Assembly	A-16099	Dual Gate Assembly
A-13769A-50018	Mini-Playfield & Insert Assy.	A-8552-50018	Backglass Assembly
A-14604-11	Oblong Target Assy. Trp. Green		
A-14604-12	Oblong Target Assy. Trp. Orange	02-4250-21	M-F Spacer, 6-32 x 1-5/16
A-15573	Big Foot Mech. Assembly	02-4436-22	F-F Spacer, 8-32 x 2-1/16
A-15668	2-Switch Opto PC Board	02-4436-23	F-F Spacer, 8-32 x 2-9/32
A-15757	Speaker/Display Assembly	02-4629-1	Standoff, 10-32 x 3/8
A-15758	Whirlpool Eject Assembly	02-4680	Mini-Post #10
A-15761	Chase Light PC Board		
A-15761-1	Chase Ligth PC Bd./w Spacers	03-8801-	Playfield Mylar Set
A-15763	5-Lamp Board		
A-15764	11-Lamp Board	11-1067-50018	Wood Cabinet
A-15765	8-Lamp Board	11-50018-IN	Insert Panel
A-15766	3-Lamp Board		
A-15767	12-Lamp Board	24-8831	Bulb #194 (14v., .27A.)
A-15768	8-Lamp Board		
A-15769	Ball Popper & Opto Assembly	31-1002-50018	Screened Playfield
A-15772	Upper Mini-Playfield Assy.	31-1002A-50018	Screened Mini-Playfield
A-15803-50018	Backbox Assembly	31-1008-50018	Bottom Arch Screened
A-15812	Support & Waterfall Assembly	31-1009-50018	Screened Shooter Plate
A-15813	Deflector Assembly	31-1357-50018	Backglass
A-15830	Lower to Upper Ramp Assy.	31-1420-50018	Screened Speaker Panel
A-15833	Back Panel Assembly	31-1710	Waterfall Header Screened
A-15837	Big Foot Ramp Assy.	31-1726-1 → -7	Playfield Plastics Set
A-15838	Waterfall Ramp Assembly	31-1727-1 → -7	Decal Set (Bottom)
A-15840	Suicide Canyon Ramp Assy.	31-1728-1 → -5	Decal Set (Top)
A-15843	Electronic Flipper Assembly		
A-15852-1	Cashbox Assembly	36-50018	Playfield Hardcoat
A-15926	Ball Popper & Multiball Trough	36-50018-1	Mini-Playfield Hardcoat
A-15927	Multiball Trough Assembly		

Cable List

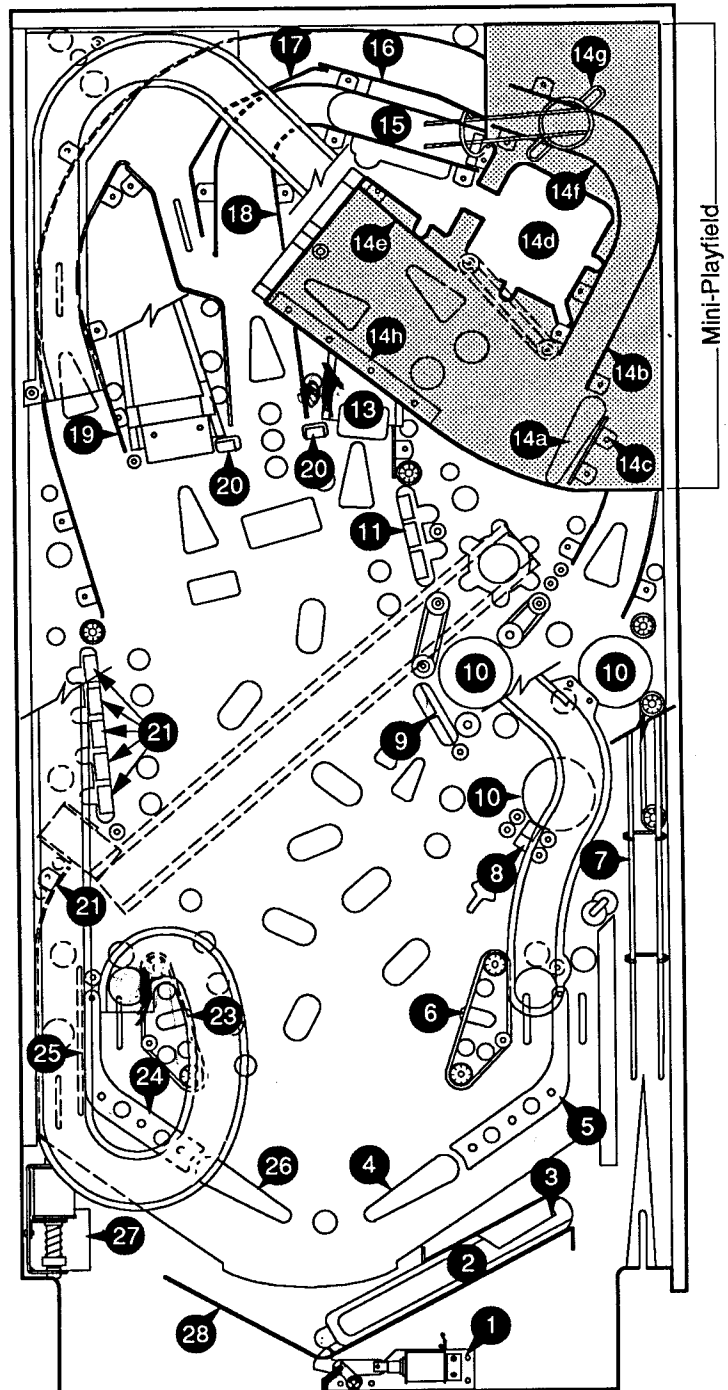
Part Number	Description
H-11835	Knocker Cable
H-13870	Black Jumper Cable
H-14584	Dot Matrix Display Cable
H-14790	A.C. Cable
H-14792-1	A.C. Jumper Cable
H-14792-2	A.C. Jumper Cable
H-15011	Speaker Panel Cable
H-15476	Logic Power Cable
H-15478	Tilt Switch Cable
H-15736	Secondary Cable
H-15788	Playfield Switch Cable
H-15789	Playfield Lamp Cable
H-15790	Playfield Solenoid Cable
H-15791	Cabinet Cable
H-15792	Insert Cable
H-15793	Ball Popper Opto Cable
H-15794	Ramp Switch Cable
H-15795	Upper Playfield Lamp
H-15796	Upper Playfield Solenoid
H-15797	Big Foot Cable
H-15882	Upper Playfield Flipper
H-15885	Upper Playfield Flipper
H-15886	Chase Light Power cable
H-15887	Chase Light Cable
H-15994	Double Ramp Switch
H-15995	Flash Lamp Cable
H-15996	General Switch
H-15997	Ramp Enter Opto

Upper Playfield Parts Locations

Item	Part Number	Description
1	A-8039-3	Outhole
2	B-8925	Microswitch Plate
3	B-9362-R-3	Coil & Bracket Assembly
4	20-9250-5	Flipper Paddle & Shaft
5	A-16082-1	Right Flipper Ball Guide
6	A-14369-R	Coil & Bracket Assembly
7	12-7044	Wire Ramp Shoot
8	A-14604-12	Oblong Target, Orange
9	B-12912-24	Oblong Target, White
10	B-9414	Jet Bumper Assembly
10a)	A-9415-2	Coil & Bracket Assembly
11	B-12912-23	Standup Target, Red
12	01-10901	Ball Guide
13	01-10906	Ramp Flap
14	A-15772	Upper Mini Playfield
14a)	20-9250-5	Flipper Shaft & Paddle
14b)	01-10855	Ball Guide
14c)	01-10844	Upper Ball Guide
14d)	A-15573	Bigfoot Mech. Assembly
14e)	01-10843	Bigfoot Ball Guide
14f)	01-10841	Ball Guide
14g)	12-7049	Ball Guide
14h)	01-10842	Fence Ball Guide
15	A-15926	Ball Popper & Multi Ball Trough
15a)	A-15927	Multi Ball Trough
16	12-7052	Boomarang Wire
17	12-7051	Boulder Wire
18	01-10852	Ball Guide
19	01-10850	Ball Guide
20	A-14604-11	Standup Target Green
21	B-12912-10	Standup Target Blue
22	01-10845	Bottom Ball Guide
23	A-15749	Coil & Bracket Assembly
24	B-12919	Left Flipper Guide
25	12-6466-45	Wireform
26	20-9250-5	Flipper Shaft & Paddle
27	B-11873	Bottom Arch Kicker
28	12-7063	Wireform

NOT SHOWN

Part Number	Description
A-13204-50018	Bottom Arch Assembly
16-50018-1	Instruction Card
20-9041	Tinnerman Speednut
20-9045	Instruction Card Cover
23-6313-1	Rubber Grommet
31-1008-50018	Screened Bottom Arch
A-15878	Flipper Cabinet Switch
01-3569-1	Ball Return Runway
03-8801-1*	Full Lower Playfield Mylar
03-8801-2	Jet Bumper Mylar
03-8801-3	Full Upper Playfield Mylar
03-8801-4	Upper Ball Popper Mylar
03-8801-5	Right Return Lane Mylar
03-8801-6	Left Return Lane Mylar
20-6500	Steel Ball



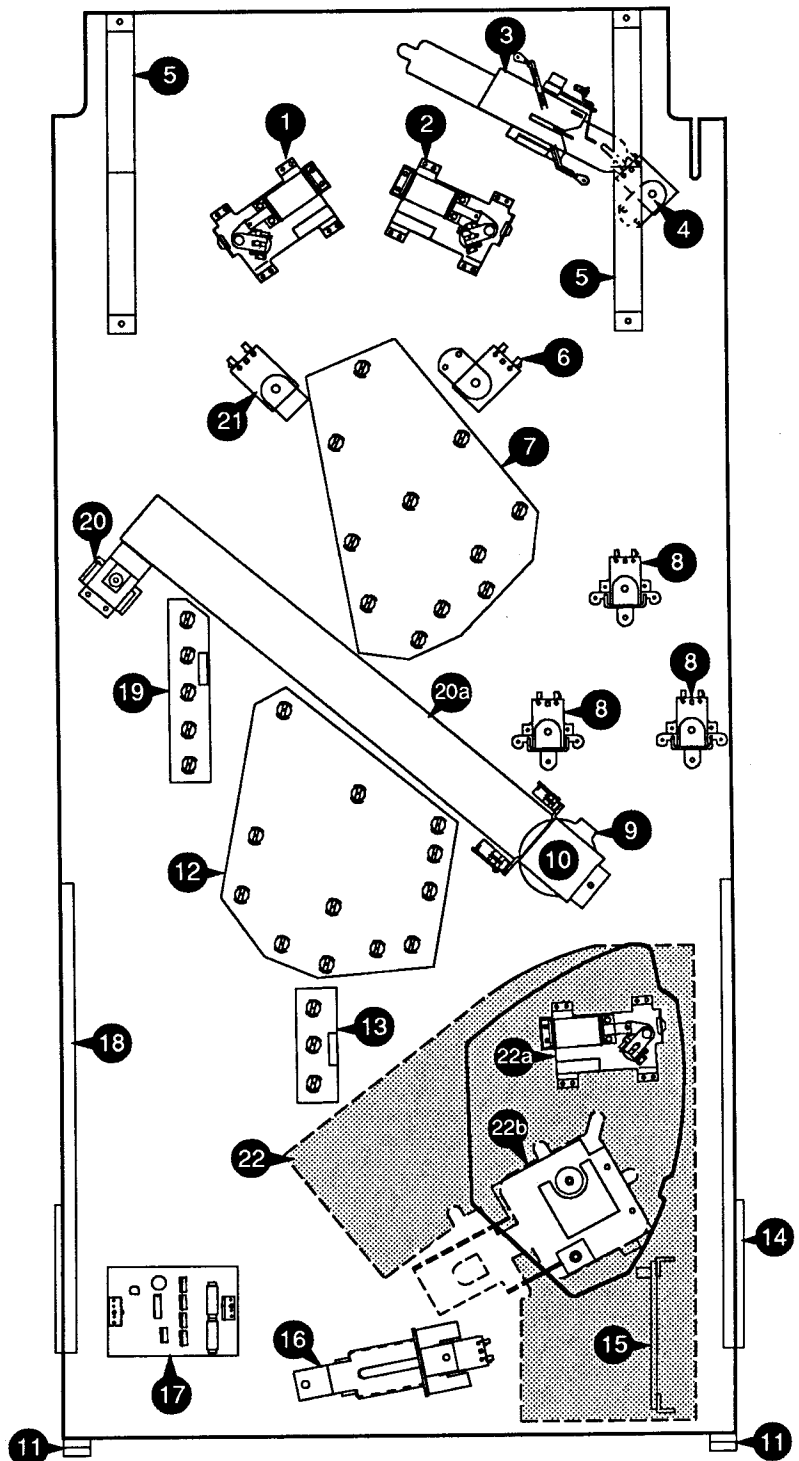
* The White Water hardcoat playfield does not require a full mylar. However, mylars can be purchased through your local Williams Distributor.

Lower Playfield Parts

Item	Part Number	Description
1.	A-15205-L	Lower Left Flipper Assembly
2.	A-15205-R	Lower Right Flipper Assembly
3.	B-8925	Micro Switch Plate Assembly
4.	C-9638	Multiball Eject Assembly
a)	10-128	Spring
b)	B-9362-R-3	Coil & Bracket Assembly
5.	01-10721	Safety Bracket (2 Used)
6.	B-12665	Kicker Arm (Slingshot) Assy. - R.
a)	A-14369-R	Coil & Bracket Assembly
b)	10-128	Spring
c)	B-8284-1	Kicker Switch Assembly
7.	A-15764	11-Lamp Board Assembly
8.	A-9415-2	Jet Bumper Coil Assy. (3 Used)
a)	B-12030-2	Switch & Diode Assy. (3 Used)
9.	A-15768	8-Lamp Board
10.	A-15829	Whirlpool Opto Assembly
11.	01-10726	Rear Guide Leg (2 Used)
12.	A-15767	12-Lamp Board
13.	A-15766	3-Lamp Board
14.	A-15421-2	Playfield Slide Assy., Right
15.	A-15595	7-Opto Switch Board
16.	A-15926	Ball Popper & Multiball Assy.
a)	A-15769	Ball Popper & Opto Assy.
b)	A-15927	Multiball Trough Assembly
17.	A-15782	Bi-Directional Board
18.	A-15421-1	Playfield Slide Assy., Left
19.	A-15763	5-Lamp Board
20.	A-15758	Whirlpool Eject Assembly
a)	03-8694	Under Ramp
21.	B-12665	Kicker Arm (Slingshot) Assy., L.
a)	A-15749	Coil & Bracket Assembly
b)	10-128	Spring
c)	B-8284-1	Kicker Switch Assembly

Mini-Playfield Lower Parts:

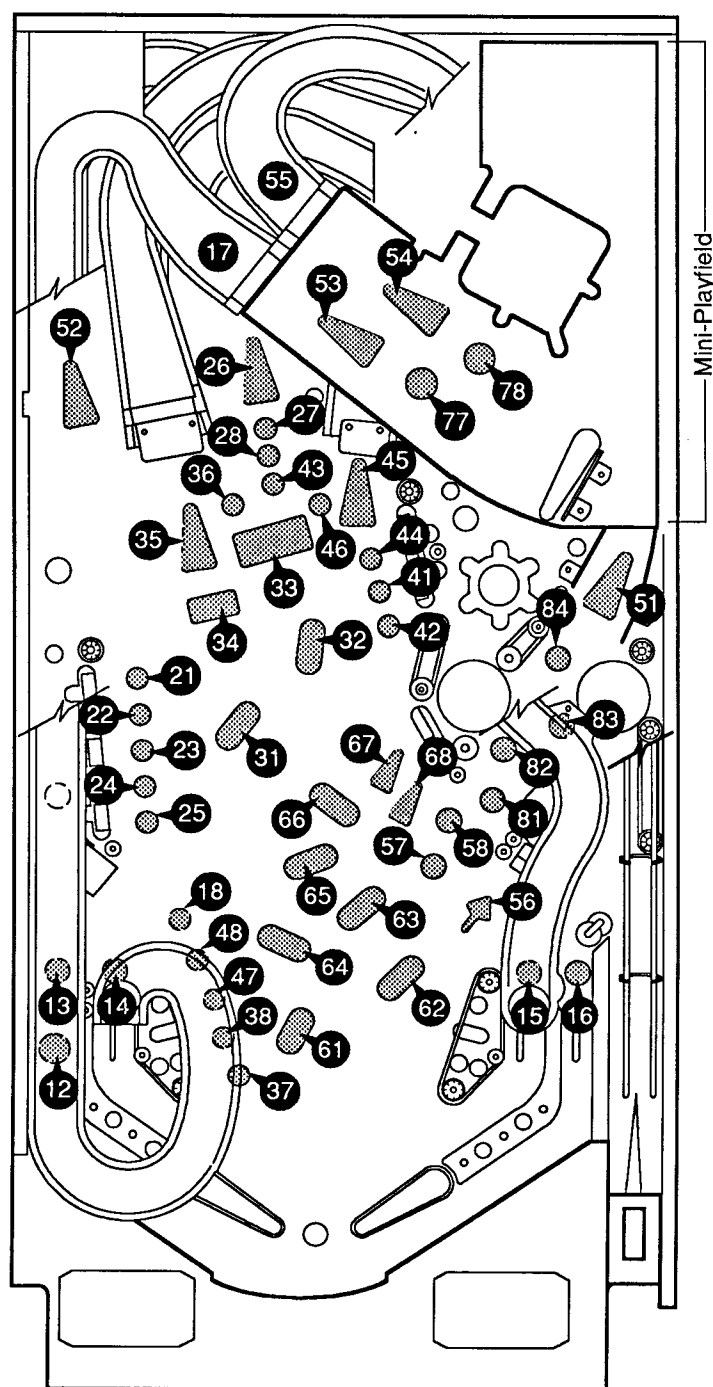
22.	A-15772	Upper Mini-Playfield
a)	A-15843	Electronic Flipper Assembly
b)	A-15573	Big Foot Mech. Assembly



Underside of Playfield, Viewed in Raised Position

Lamp Locations

<u>Item No.</u>	<u>Bulb No.</u>	<u>Lamp Assy No.</u>	<u>Description</u>
11	24-6549	A-11754	Shoot Again #44
12	24-6549	A-11754	Kickback #44
13	24-6549	A-11271	Left Outlane #44
14	24-6549	A-11271	Left Flipper Lane #44
15	24-6549	A-11754	Right Flipper Lane #44
16	24-6549	A-11754	Right Outlane #44
17			Not Used
18	24-6549	A-11754	6X Multiplier #44
21	24-8768	A-15763	River "R1" #555
22	24-8768	A-15763	River "I" #555
23	24-8768	A-15763	River "V" #555
24	24-8768	A-15763	River "E" #555
25	24-8768	A-15763	River "R2" #555
26	24-8768	A-15766	Hazzard 3 #555
27	24-8768	A-15766	Lock 1 #555
28	24-8768	A-15766	Lock 2 #555
31	24-8768	A-15767	Raft 7 #555
32	24-8768	A-15767	Raft 8 #555
33	24-8768	A-15767	Wet Willie #555
34	24-8768	A-15767	Ramps Millions #555
35	24-8768	A-15767	Hazzard 4 #555
36	24-8768	A-15767	Left Light Lock #555
37	24-6549	A-11271	2X Multiplier #44
38	24-6549	A-11754	3X Multiplier #44
41	24-8768	A-15767	3-bank Center #555
42	24-8768	A-15767	3-bank Lower #555
43	24-8768	A-15767	Lock Release #555
44	24-8768	A-15767	3-bank Top #555
45	24-8768	A-15767	Hazzard 4 #555
46	24-8768	A-15767	Right Light Lock #555
47	24-6549	A-11754	4X Multiplier #44
48	24-6549	A-11271	5X Multiplier #44
51	24-6549	A-11271	Hazzard 1 #44
52	24-6549	A-11271	Hazzard 5 #44
53	24-6549	A-11905	Hazzard 6 #44
54	24-6549	A-11905	Hazzard 7 #44
55			Not Used
56	24-8768	A-15764	Extra Ball #555
57	24-8768	A-15764	Whirl Challenge #555
58	24-8768	A-15764	Boulder Man Over #555
61	24-8768	A-15764	Raft 1 #555
62	24-8768	A-15764	Raft 2 #555
63	24-8768	A-15764	Raft 3 #555
64	24-8768	A-15764	Raft 4 #555
65	24-8768	A-15764	Raft 5 #555
66	24-8768	A-15764	Raft 6 #555
67	24-8768	A-15764	2-bank Upper #555
68	24-8768	A-15764	2-bank Lower #555
71	24-8768	A-15768	Whirlpool 1 #555
72	24-8768	A-15768	Whirlpool 2 #555
73	24-8768	A-15768	Whirlpool 3 #555
74	24-8768	A-15768	Whirlpool 4 #555
75	24-8768	A-15768	Whirlpool 5 #555
76	24-8768	A-15768	Whirlpool 6 #555
77	24-6549	A-11905	Multi Jackpot #44
78	24-6549	A-11905	Bigfoot Jackpot #44
81	24-6549	A-11271	Light Extra Ball #44
82	24-6549	A-11754	Advance Raft #44
83	24-6549	A-11754	Mystery #44



<u>Item No.</u>	<u>Bulb No.</u>	<u>Lamp Assy No.</u>	<u>Description</u>
84	24-6549	A-11271	Boulder 5X Award #44
85 to 87			Not Used
88	—	20-9663-1	Start Button

Solenoid/Flasher Locations

<u>Item No.</u>	<u>Coil/Flasher No.</u>	<u>Assy No.</u>	<u>Description</u>
01	AE-27-1200	A-8039-3	Outhole
02	AE-26-1200	B-9362-R-3	Ball Serve
03	AE-23-800	A-15758	Whirlpool Popper
04	AE-23-800	A-15769	Lockup Popper
05	AE-23-800	B-11873	Kickback
06	AE-26-1200	A-15573	Ramp Diverter
07	AE-23-800	B-10686-1	*Knocker
08	24-8802	—	Backglass Flasher #906
09	24-8802	—	Wet Willie Head Flasher #906
10	AE-27-1200	A-15749	Left Sling
11	AE-27-1200	A-14369-R	Right Sling
12	AE-26-1200	A-9415-2	Left Jet Bumper
13	AE-26-1200	A-9415-2	Right Jet Bumper
14	AE-26-1200	A-9415-2	Center Jet Bumper
15	24-8802	—	Backglass Raft Flasher #906
16	24-8802	—	Backglass Riders Flasher #906
17	24-8704	A-14342	Bigfoot Body Flasher #89
	24-8802	—	Insert Flasher #906
18	24-8704	A-11541	Right Mountains Flasher #89
	24-8802	—	Insert Flashers #906
19	24-8704	A-8798	Left Mountains Flasher #89
20	24-8704	A-8798	Upper Lt. Plfd Flasher #89
	24-8802	—	Insert Flasher #906
21	24-8704	A-11541	Insanity Falls Flasher #89
22	24-8704	A-11541	Whirlpool Popper Flasher #89
23	24-8704	A-8798	Whirlpool Enter Flasher #89
24	24-8704	A-8798	Bigfoot Cave Flasher #89
	24-8802	—	Insert Flasher #906
25	A-15680	—	Bigfoot Drive
26	A-15680	—	Bigfoot Enable
27	A-15761	—	Chase Lamp Clock
28	A-15761	—	Chase Lamp Data

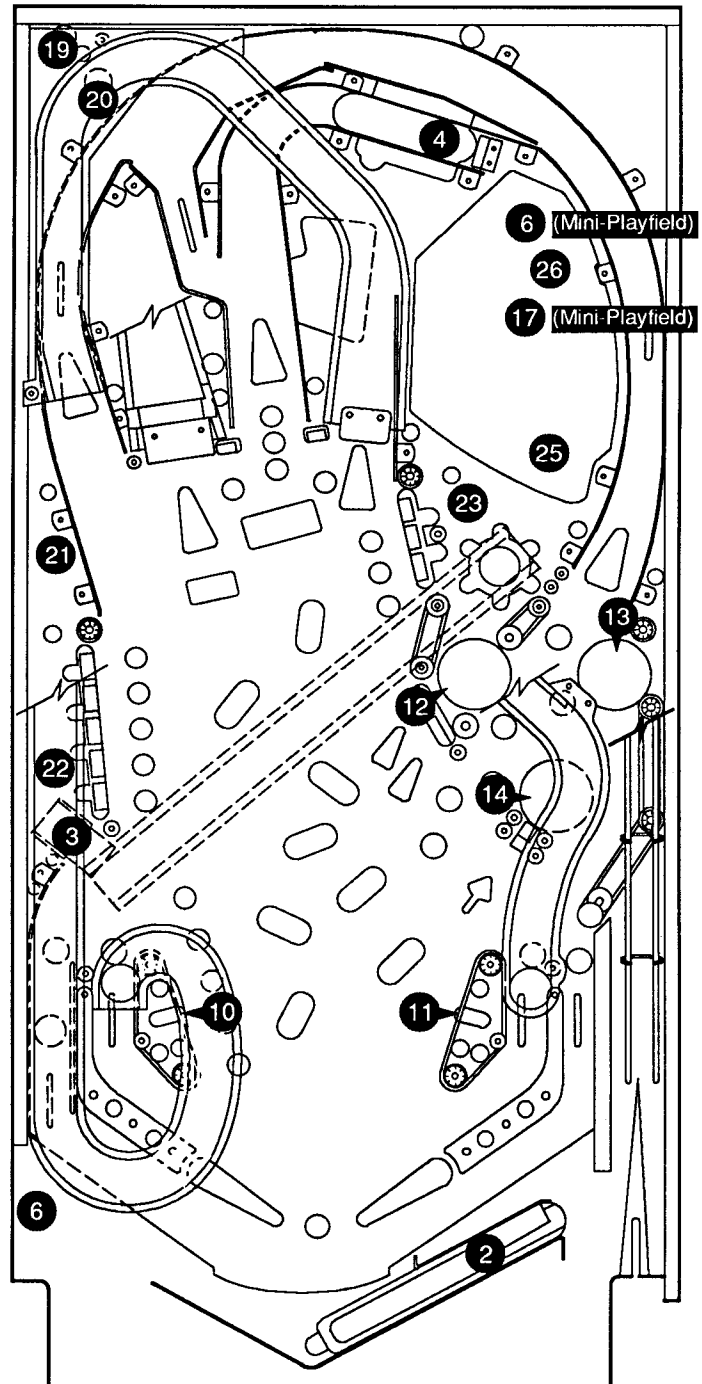
General Illumination

01	24-6549	—	*Upper Playfield G.I. #44
02	24-6549	—	*Center Playfield G.I. #44
03	24-6549	—	*Lower Playfield G.I. #44
	24-8768	—	*Lower Playfield G.I. #555
04	24-8768	—	*Backglass Boat G.I. #555
05	24-8768	—	*Backglass Sky G.I. #44

Flippers

FL-11629	A-15205-R-2	*Lower Right Flipper
FL-11629	A-15205-L-2	*Lower Left Flipper
FL-11630	A-15843	* Upper Right Flipper

* Not Shown



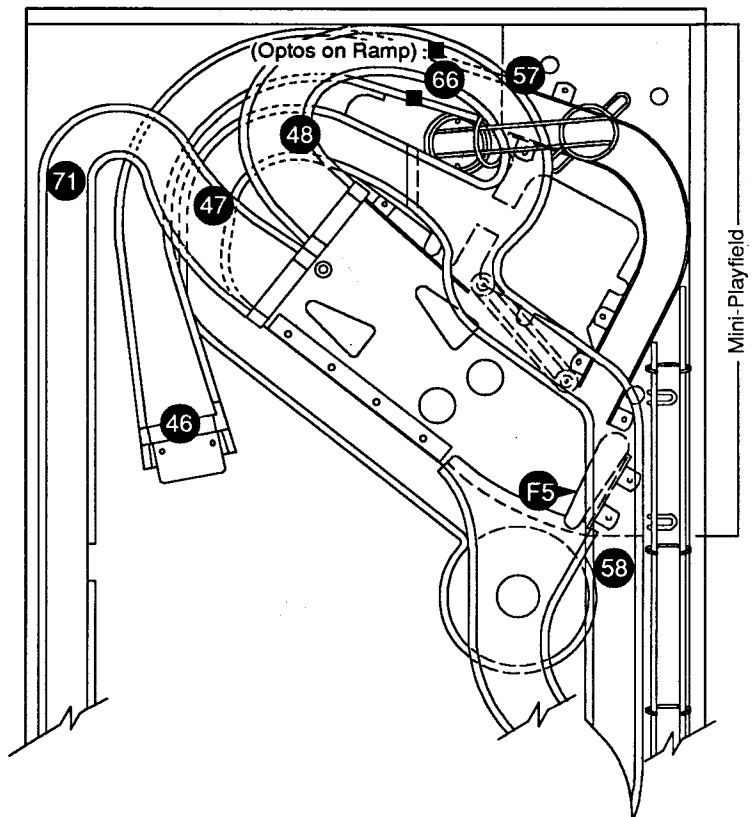
Switch Locations

<u>Item No.</u>	<u>Switch No.</u>	<u>Where Used</u>
F1	SW-1A-193	Lwr Rt. Flipper EOS
F2	5490-12451-00	Lwr Rt. Flipper Cab.
F3	SW-1A-193	Lwr Lt. Flipper EOS
F4	5490-12451-00	Lwr Lt. Flipper Cab.
F5	SW-1A-193	Uppr. Rt. Flipper EOS
F6	5490-12451-00	Uppr. Rt. Flipper Cab.
13	20-9663-1	Start Button
14	20-6502-A	†Plumb Bob Tilt
15	5647-12133-12	Outhole
16	SW-11A-37	Left Jet Bumper
17	SW-11A-37	Right Jet Bumper
18	SW-11A-37	Center Jet Bumper
21	SW-1A-117	†Slam Tilt
22	5643-09288-00	†Coin Door Closed
23	Not Used	†Ticket Opto
24	A-8630	†Always Closed
25	5647-12693-19	Left Outlane
26	5647-12693-19	Left Flipper Lane
27	5647-12693-19	Right Flipper Lane
28	5647-12693-19	Right Outlane
31	B-12912-10	River "R2"
32	B-12912-10	River "E"
33	B-12912-10	River "V"
34	B-12912-10	River "I"
35	B-12912-10	River "R1"
36	B-12912-23	3-bank Top
37	B-12912-23	3-bank Center
38	B-12912-23	3-bank Lower
41	A-14604-11	Light Lock Left
42	A-14604-11	Light Lock Right
43	5647-12693-19	Left Loop
44	5647-12693-19	Right Loop
45	5647-12693-19	Secret Passage
46	5647-12693-11	Left Ramp Enter
47	5647-12693-11	Rapids Enter
48	5647-12693-11	Canyon Entrance
51	SW-1A-114 (kick)	Left Sling
	SW-1A-120 (*score)	
52	SW-1A-114 (kick)	Right Sling
	SW-1A-120 (*score)	
53	5647-12693-04	Ball Shooter
54	SW-1A-120	Lower Jet Arena
55	SW-1A-120	Right Jet Arena
56	A-14604-12	Extra Ball
57	5647-12693-21	Canyon Main
58	5647-12693-13	Bigfoot Cave
61	A-14315 (LED)	Whirlpool Popper
	A-14316 (Trans)	
62	A-14315 (LED)	Whirlpool Exit
	A-14316 (Trans)	
63	A-14315 (LED)	Lockup Right
	A-14316 (Trans)	
64	A-14315 (LED)	Lockup Center
	A-14316 (Trans)	
65	A-14315 (LED)	Lockup Left
	A-14316 (Trans)	
66	A-14315 (LED)	Left Ramp Main
	A-14316 (Trans)	
67		Not Used

<u>Item No.</u>	<u>Switch No.</u>	<u>Where Used</u>
68	A-14315 (LED)	Disas. Drop Enter
	A-14316 (Trans)	
71	5647-12693-21	Rapids Ramp Main
72		Not Used
73	B-12912-24	Hot Foot Upper
74	B-12912-24	Hot Foot Lower
75	5647-12693-21	Disas. Drop Main
76	5647-12693-08	Right Trough
77	5647-09957-00	Center Trough
78	5647-09957-00	Left Trough
81 to 85		Not Used
86	5490-12451-00	Bigfoot Opto 1
87	5490-12451-00	Bigfoot Opto 2
88		Not Used

* The Score slingshot switches have diodes across them.
†Not Shown

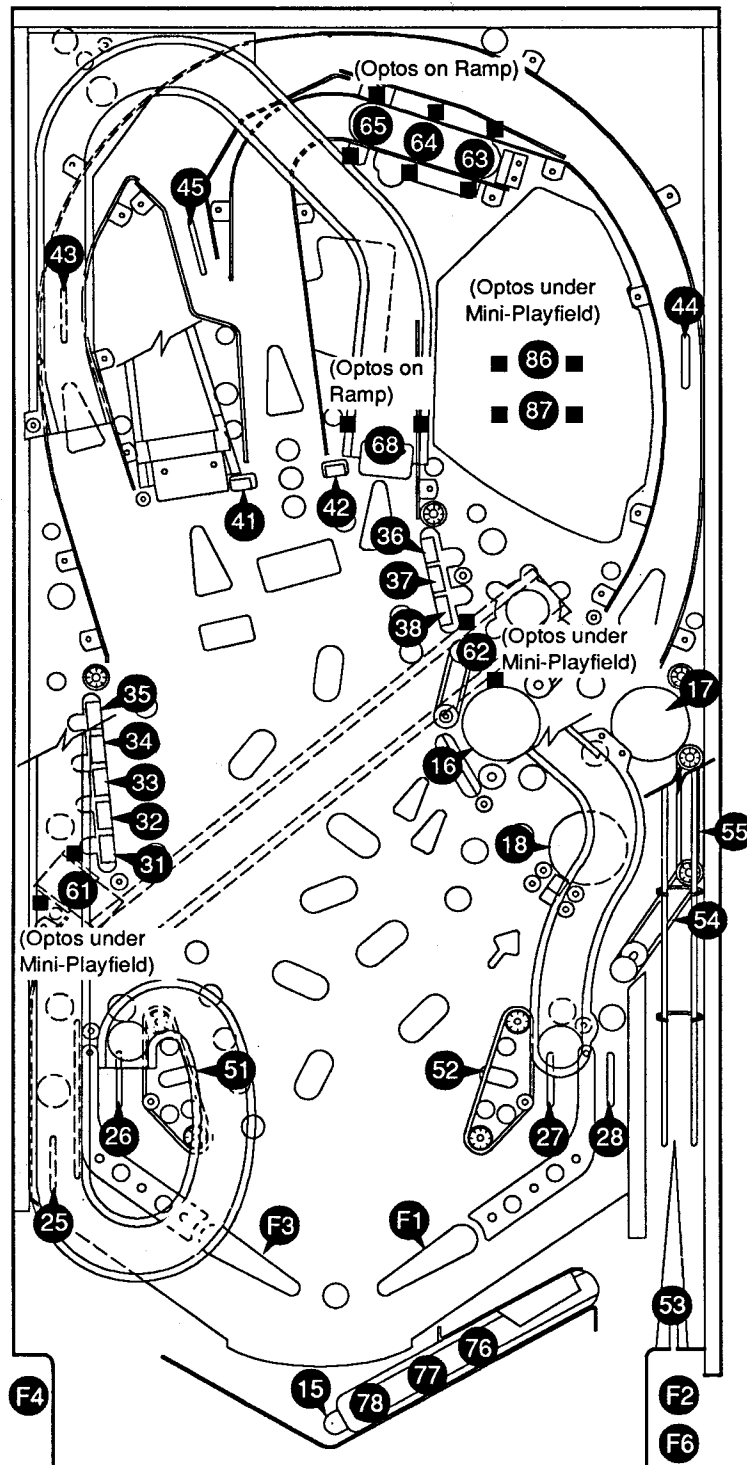
UPPER PLAYFIELD



154
245
74

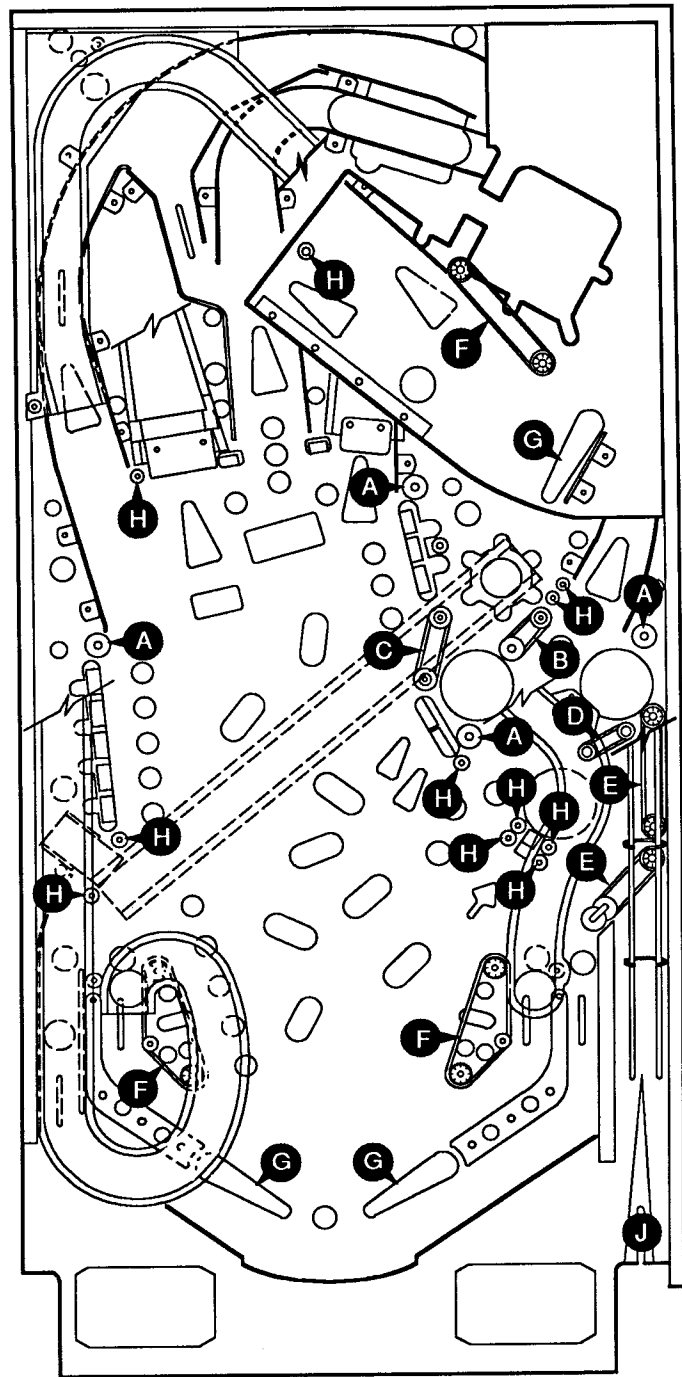
Switch Locations

MAIN PLAYFIELD



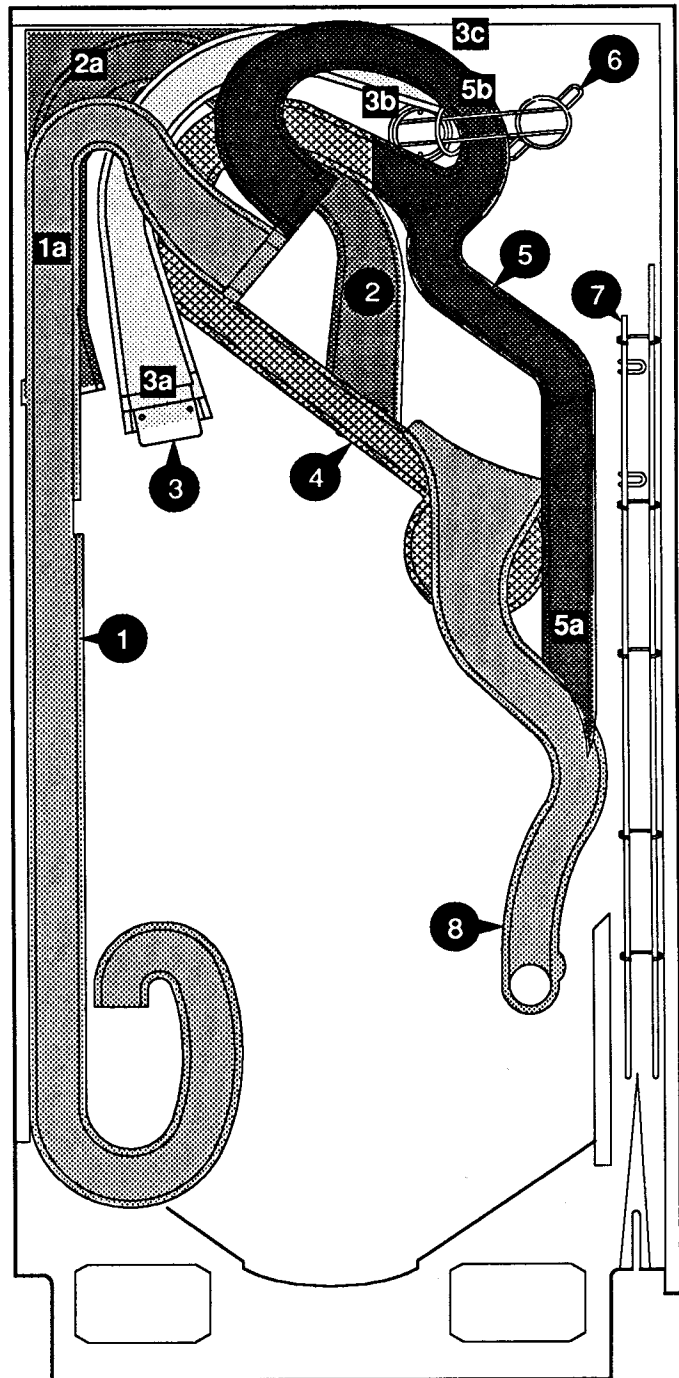
Rubber Parts

<u>Item</u>	<u>Part Number</u>	<u>Qty</u>	<u>Description</u>
A	23-6300	4	5/16" Rubber Ring
B	23-6301	1	3/4" Rubber Ring
C	23-6302	1	1" Rubber Ring
D	23-6303	1	1-1/4" Rubber Ring
E	23-6304	2	1-1/2" Rubber Ring
F	23-6305	2	2" Rubber Ring
G	23-6535	3	Rubber Bumper
H	23-6556	9	Black Sleeve
J	23-6327	1	Rubber Shooter Tip



Ramps

Item	Part Number	Description
1.	A-15838	Waterfall Ramp Assembly
a)	5647-12693-21	Mini-Micro Switch
2.	A-15840	Suicide Canyon Ramp Assy.
a)	5647-12693-21	Mini-Micro Switch
3.	A-15830	Lower-to-Upper Ramp Assy.
a)	5647-12693-11	Mini-Micro Switch
b)	A-14316	Photo Transistor Assembly
c)	A-14315	LED Assembly
4.	03-8693	Whirlpool Ramp Assembly
5.	A-15837	Big Foot Ramp Assembly
a)	5647-12693-13	Mini-Micro Switch
b)	5647-12693-21	Mini-Micro Switch
6.	12-7049	Wire Ramp
7.	12-7044	Wire Ramp
8.	03-8691	Upper-to-Lower Ramp



Notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

Section 3

Schematics, Wiring Diagrams, and Circuit Theory

CONNECTOR & COMPONENT IDENTIFICATION

Each plug or jack receives a number that identifies the circuit board and position on that board that it connects to. J-designations refer to the male part of a connector. P-designations refer to the female part of a connector. For example, J101 designates jack 1 of board 1 (a Power Driver Board jack); P206 designates plug 6 of board 2 (a CPU Board plug). Identifying the specific pin number of a connector involves a hyphen, which separates the pin number from the plug or jack designation. For example, J101-3 refers to pin 3 of jack 1 on board 1.

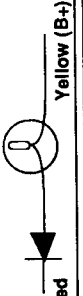
Other game components may also have similar numbers to clarify their locations or related circuits. For example, F501 refers to a fuse located on the Sound Board.

Prefix numbers for the WPC circuit boards are listed below.

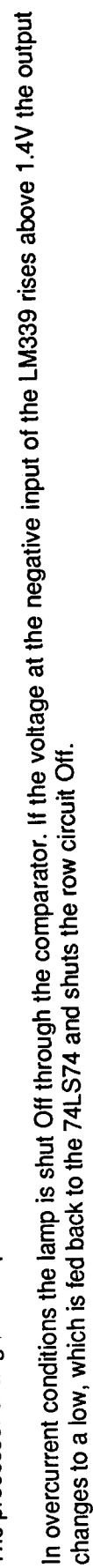
- 1- Power Driver Board
- 2- CPU Board
- 5- Sound Board
- 6- Dot Matrix Controller
- Dot Matrix Display/Driver Board
- 9-Fliptronic II Controller Board

Schematics for standard WPC backbox boards are found in the WPC Schematics Manual. Playfield, cabinet and all other backbox board schematics are found in this section.

Lamps

Lamp Matrix								
								
Column Row	1	2	3	4	5	6	7	8
Red-Brown J137-1 Q98	Yellow-Brown J137-1 Q98	Yellow-Red J137-2 Q97	Yellow-Orange J137-3 Q96	Yellow-Black J137-4 Q95	Yellow-Green J137-5 Q94	Yellow-Blue J137-6 Q93	Yellow-Violet J137-7 Q92	Yellow-Gray J137-9 Q91
1 Red-Brown J133-1 Q90	Shoot Again 11	River "R1" 21	Raft 7 31	3-Bank Center 41	Hazzard 1 51	Raft 1 61	Whirlpool 1 71	Light Extra Ball 81
2 Red-Black J133-2 Q89	Kickback 12	River "I" 22	Raft 8 32	3-Bank Lower 42	Hazzard 5 52	Raft 2 62	Whirlpool 2 72	Advance Raft 82
3 Red-Orange J133-4 Q88	Left Outlane 13	River "V" 23	Wet Willie 33	Lock Release 43	Hazzard 6 53	Raft 3 63	Whirlpool 3 73	Mystery 83
4 Red-Yellow J133-5 Q87	Left Flipper Lane 14	River "E" 24	Ramp Millions 34	3-Bank Top 44	Hazzard 7 54	Raft 4 64	Whirlpool 4 74	Boulder 5X Award 84
5 Red-Green J133-6 Q86	Right Flipper Lane 15	River "R2" 25	Hazzard 4 35	Hazzard 4 45	Whirlpool Lit 55	Raft 5 65	Whirlpool 5 75	Not Used 85
6 Red-Blue J133-7 Q85	Right Outlane 16	Hazzard 3 26	Left Light Lock 36	Right Light Lock 46	Extra Ball 56	Raft 6 66	Whirlpool 6 76	Not Used 86
7 Red-Violet J133-8 Q84	Lights Whirlpool 17	Lock 1 27	2X Multiplier 37	4X Multiplier 47	Whirl Challenge 57	2-Bank Upper 67	Multi Jackpot 77	Not Used 87
8 Red-Gray J133-9 Q83	6X Multiplier 18	Lock 2 28	3X Multiplier 38	5X Multiplier 48	Boulder Man Over 58	2-Bank Lower 68	Bigfoot Jackpot 78	Start Button 88

WHITE WATER 3-3

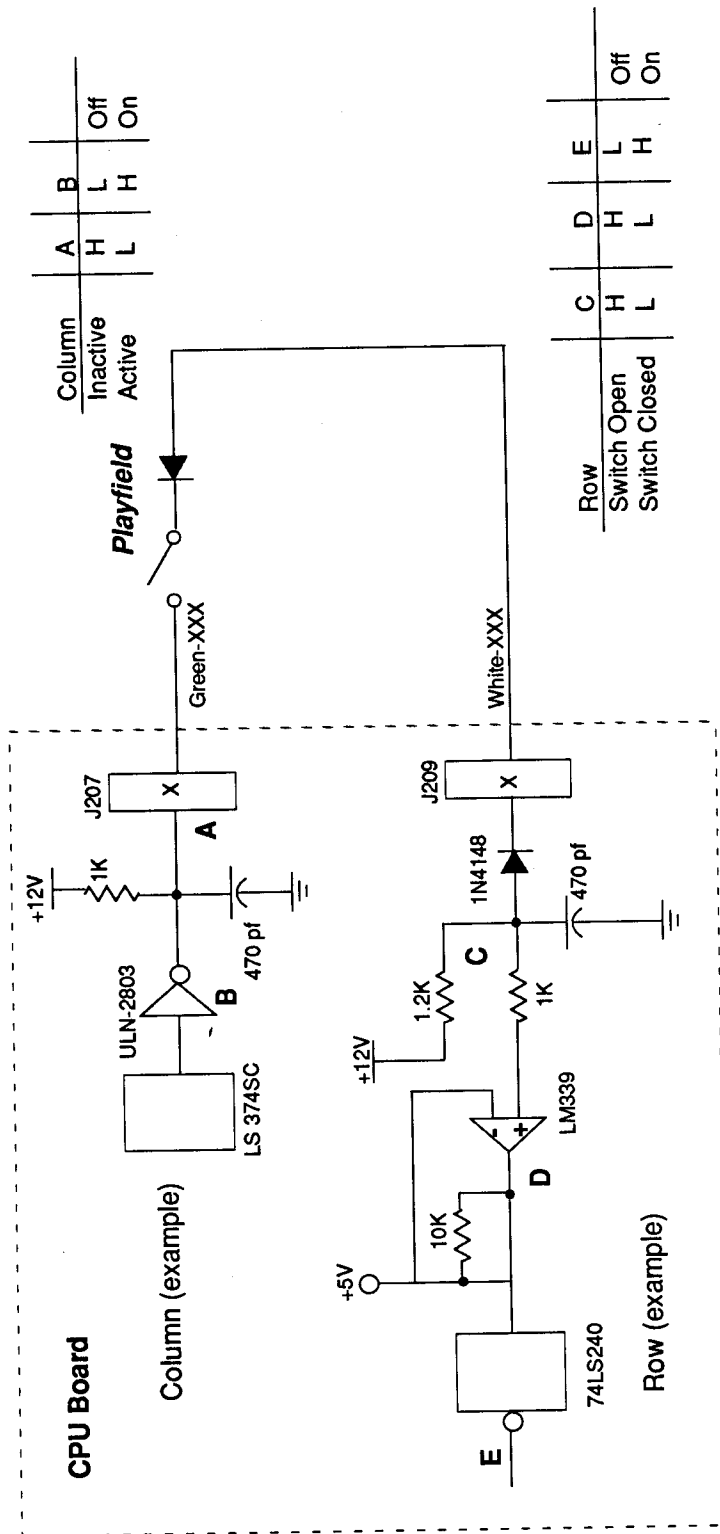


Switches

Switch Matrix									
White Green									
Column Row	1	2	3	4	5	6	7	8	
1	Green-Brown J207-1 U20-18	Green-Red J207-2 U20-17	Green-Orange J207-3 U20-16	Green-Yellow J207-4 U20-15	Green-Black J207-5 U20-14	Green-Blue J207-6 U20-13	Green-Violet J207-7 U20-12	Green-Gray J207-9 U20-11	Flipper Grounded Switches
2	White-Brown J209-1 U18-11	Not Used 11	Slam Tilt 21	River "R2" 31	Light Lock Left 41	Left Sling 51	Whirlpool Popper 61	Rapids Ramp Main 71	Not Used 81
3	White-Red J209-2 U18-9	Not Used 12	Coin Door Closed 22	River "E" 32	Light Lock Right 42	Right Sling 52	Whirlpool Exit 62	Not Used 72	Not Used 82
4	White-Orange J209-3 U18-5	Start Button 13	Ticket Opto. 23	River "V" 33	Left Loop 43	Ball Shooter 53	Lockup Right 63	Hot Foot Upper 73	Not Used 83
5	White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	River "I" 34	Right Loop 44	Lower Jet Arena 54	Lockup Center 64	Hot Foot Lower 74	Not Used 84
6	White-Green J209-5 U19-11	Outhole 15	Left Outlane 25	River "R1" 35	Secret Passage 45	Right Jet Arena 55	Lockup Left 65	Disaster Drop Main 75	Not Used 85
7	White-Blue J209-7 U19-9	Left Jet Bumper 16	Left Flipper Lane 26	3-bank Top 36	Left Ramp Enter 46	Extra Ball 56	Left Ramp Main 66	Right Trough 76	Bigfoot Opto 1 86
8	White-Violet J209-8 U19-5	Right Jet Bumper 17	Right Flipper Lane 27	3-bank Center 37	Rapids Enter 47	Canyon Main 57	Not Used 67	Center Trough 77	Bigfoot Opto 2 87
9	White-Gray J209-9 U19-7	Center Jet Bumper 18	Right Outlane 28	3-bank Lower 38	Canyon Entrance 48	Bigfoot Cave 58	Disaster Drop Enter 68	Left Trough 78	Not Used 88

Dedicated Grounded Switches	
Orange-Brown J205-1 Left Coin Chute	D1
Orange-Red J205-2 Center Coin Chute	D2
Orange-Black J205-3 Right Coin Chute	D3
Orange-Yellow J205-4 Fourth Coin Chute	D4
Orange-Green J205-6 Normal Function Test Service Escape Credits	D5
Orange-Blue J205-7 Normal Function Test Volume Down Down	D6
Orange-Violet J205-8 Normal Function Test Volume Up Up	D7
Orange-Gray J205-9 Normal Function Test Begin Enter Test	D8

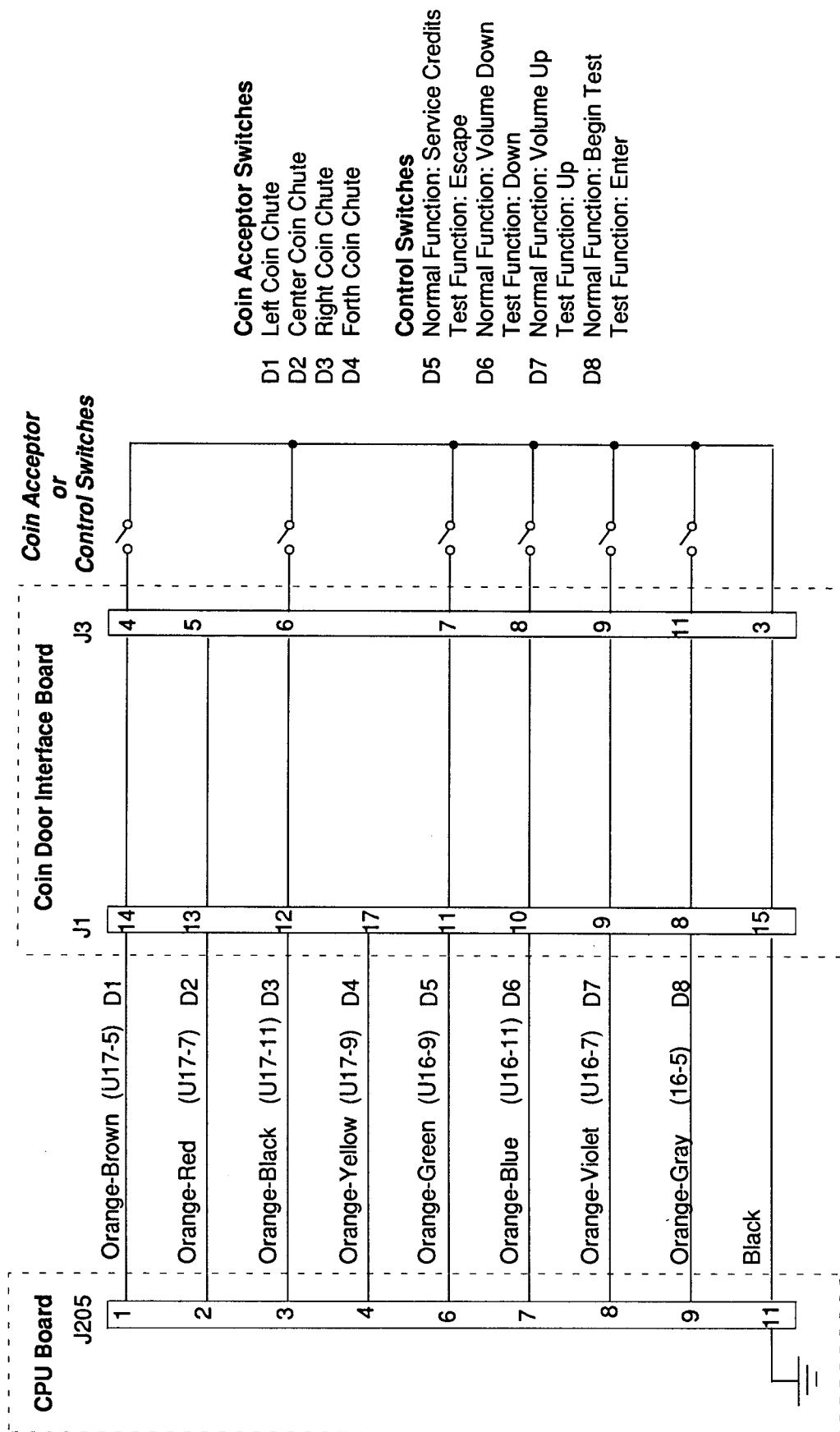
Switch Matrix Circuit



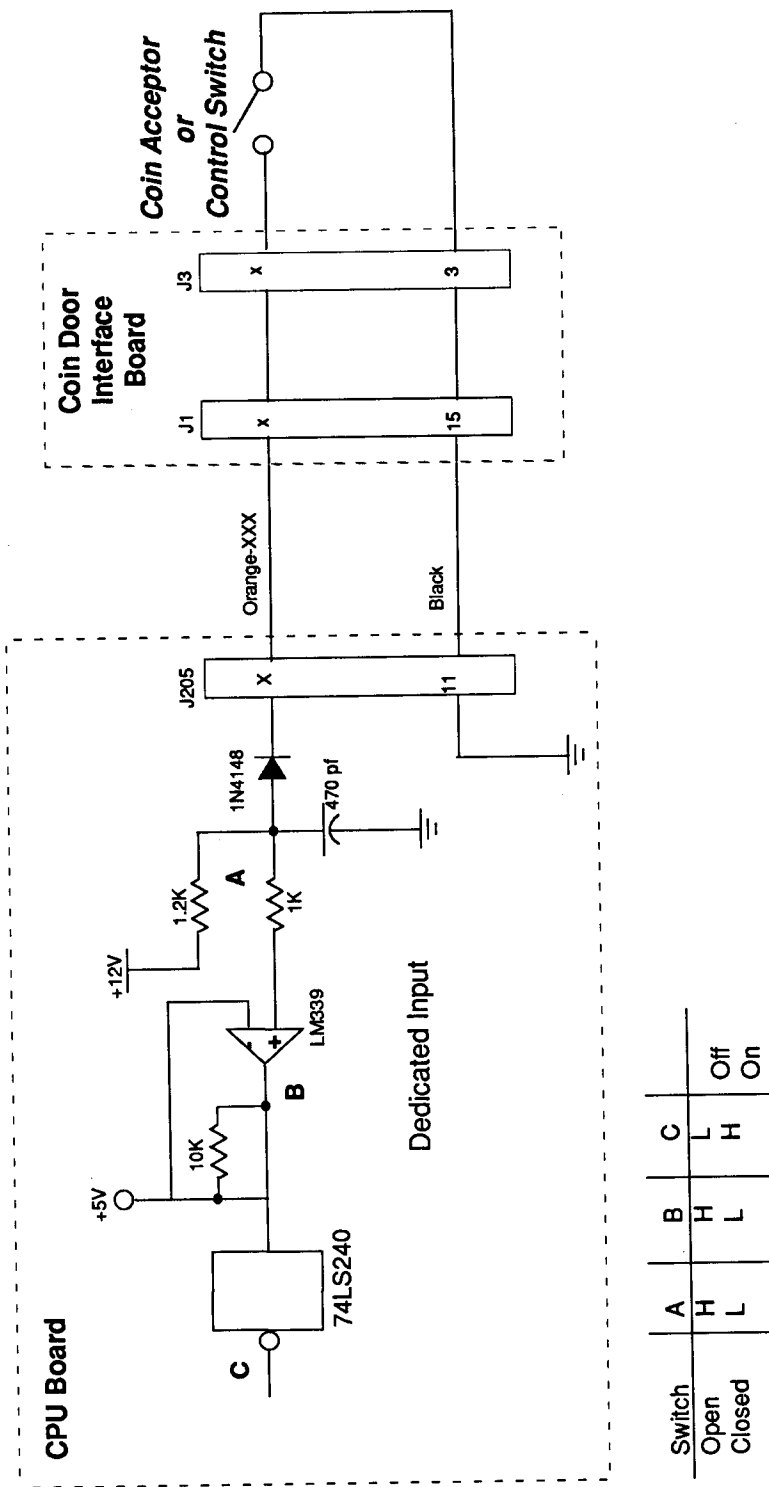
The microprocessor is constantly strobing the column side of the switch. When point "A" on the column circuit toggles low the column side is active.

When a switch closes the row side of the circuit activates. The "+" input to the LM339 drops below +5V therefore its output is low. Corresponding row and column switches must be low at the same time, for the switch to be considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row is inactive.

Dedicated Switches



Dedicated Switch Circuit



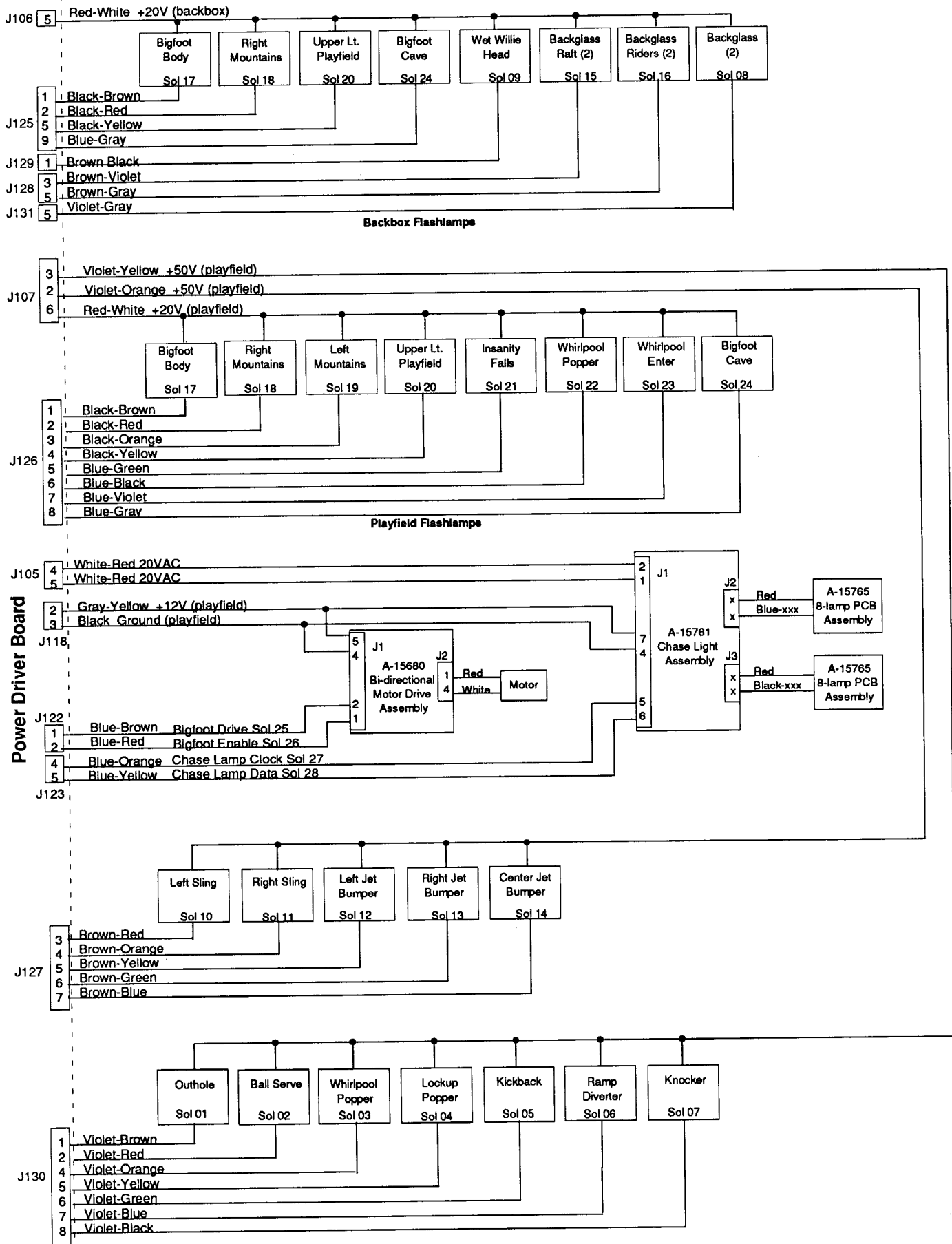
The dedicated switches operate similar to switches in the matrix except that instead of a column circuit there is a direct tie to ground. Therefore, the column side is constantly active (low).

When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V therefore its output is low. Since the row circuit (dedicated input) is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row is inactive.

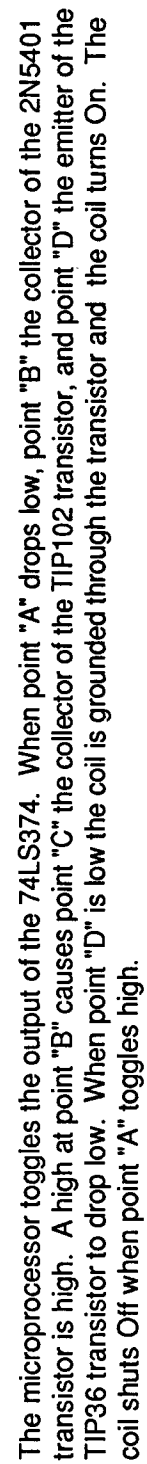
Solenoid/Flasher Table

Sol. No.	Function	Solenoid Type	Voltage Connections			Drive xister	Drive Connections			Drive Wire Color	Solenoid Part Number Flashlamp Type	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Backbox
01	Outhole	High Power	J107-3			Q82	J130-1			Vio-Brn	AE-27-1200	
02	Ball Serve	High Power	J107-3			Q80	J130-2			Vio-Red	AE-26-1200	
03	Whirlpool Popper	High Power	J107-3			Q78	J130-4			Vio-Org	AE-23-800	
04	Lockup Popper	High Power	J107-3			Q76	J130-5			Vio-Yel	AE-23-800	
05	Kickback	High Power	J107-3			Q64	J130-6			Vio-Grn	AE-23-800	
06	Ramp Diverter	High Power	J107-3			Q66	J130-7			Vio-Blu	AE-26-1200	
07	Knocker	High Power	J107-3			Q68	J130-8			Vio-Blk	AE-23-800	(2) #906
08	Backglass (2)	High Power		J106-5		Q70		J131-5		Vio-Gry		(1) #906
09	Wet Willie Head	Low Power		J106-5		Q58		J129-1		Brn-Blk		
10	Left Sling	Low Power	J107-2			Q56	J127-3			Brn-Red	AE-27-1200	
11	Right Sling	Low Power	J107-2			Q54	J127-4			Brn-Org	AE-27-1200	
12	Left Jet Bumper	Low Power	J107-2			Q52	J127-5			Brn-Yel	AE-26-1200	
13	Right Jet Bumper	Low Power	J107-2			Q50	J127-6			Brn-Grn	AE-26-1200	
14	Center Jet Bumper	Low Power	J107-2			Q48	J127-7			Brn-Blu	AE-26-1200	(2) #906
15	Backglass Raft	Low Power		J106-5		Q46		J128-3		Brn-Vio		(2) #906
16	Backglass Riders	Low Power		J106-5		Q44		J128-5		Brn-Gry		(2) #906
17	Bigfoot Body	Flasher	J107-6	J106-5		Q42	J126-1	J125-1		Blk-Brn	(1) #89	(1) #906
18	Right Mountains	Flasher	J107-6	J106-5		Q40	J126-2	J125-2		Blk-Red	(1) #89	(1) #906
19	Left Mountains	Flasher	J107-6			Q38	J126-3			Blk-Org	(1) #89	
20	Upper Left Playfield	Flasher	J107-6	J106-5		Q36	J126-4	J125-5		Blk-Yel	(1) #89	(1) #906
21	Insanity Falls	Flasher	J107-6			Q28	J126-5			Blu-Grn	(1) #89	
22	Whirlpool Popper	Flasher	J107-6			Q30	J126-6			Blu-Blk	(1) #89	
23	Whirlpool Enter	Flasher	J107-6			Q34	J126-7			Blu-Vio	(1) #89	
24	Bigfoot Cave	Flasher	J107-6	J106-5		Q32	J126-8	J125-9		Blu-Gry	(1) #89	(1) #906
25	Bigfoot Drive	Low Power	J118-2,3			Q26	J122-1			Blu-Brn	A-15680	
26	Bigfoot Enable	Low Power	J118-2,3			Q24	J122-2			Blu-Red	A-15680	
27	Chase Lamp Clock	Low Power		J105-4,5; J118-2,3		Q22		J123-4		Blu-Org	A-15761	
28	Chase Lamp Data	Low Power		J105-4,5; J118-2,3		Q20		J123-5		Blu-Yel	A-15761	
01	General Illumination	G.I.	Playfield	Backbox	Cabinet	Q18	Playfield	Backbox	Cabinet	Wht-Brn	Playfield	Backbox
			J120-1				J120-7				#44	
			J120-2				J120-8				#44	
			J120-3	J121-3			J120-9	J121-9			#44	#555
				J121-5				J121-10				#555
05	Backglass Sky	G.I.		J121-6	J119-3	Q12		J121-11	J119-1	Wht-Vio		#555
	Flipper Circuits	Flipper	Playfield		Pwr	Hold	Playfield		Pwr	Hold		
			J907-8,9 (Blu-Yel)		Q4		J902-11,13		Blu-Vio			
			J907-4,5 (Blu-Yel)		Q2		J902-4,6		Blk-Yel			
	Upper Right Flipper	Flipper	J907-6,7 (Gry-Yel)		Q3	Q9	J902-7,9		Blu-Gry	Org-Blu	FL-11629	

Solenoid Wiring



Power Driver Board



Power Driver Board

The schematic diagram illustrates the internal circuitry of the Power Driver Board, divided into two main functional areas: **Drive** and **Power**.

Drive Section:

- Input:** A 50V source is connected to the board via a connector labeled **J113**.
- Transistor Stage:** The signal path begins with a 470Ω resistor (labeled **A**) leading to the base of a 2N5401 transistor. The base is also connected to a 4.7KΩ resistor and a VCC supply.
- Output Stage:** The emitter of the 2N5401 transistor is connected to the base of a TIP102 transistor. The base of the TIP102 is also connected to a 68Ω resistor and a 2.7KΩ resistor to ground.
- Diode Protection:** A 1N4004 diode is connected in series with the output line, with its cathode towards the output.
- Output Connector:** The output of the drive section is connected to a connector labeled **J127**.

Power Section:

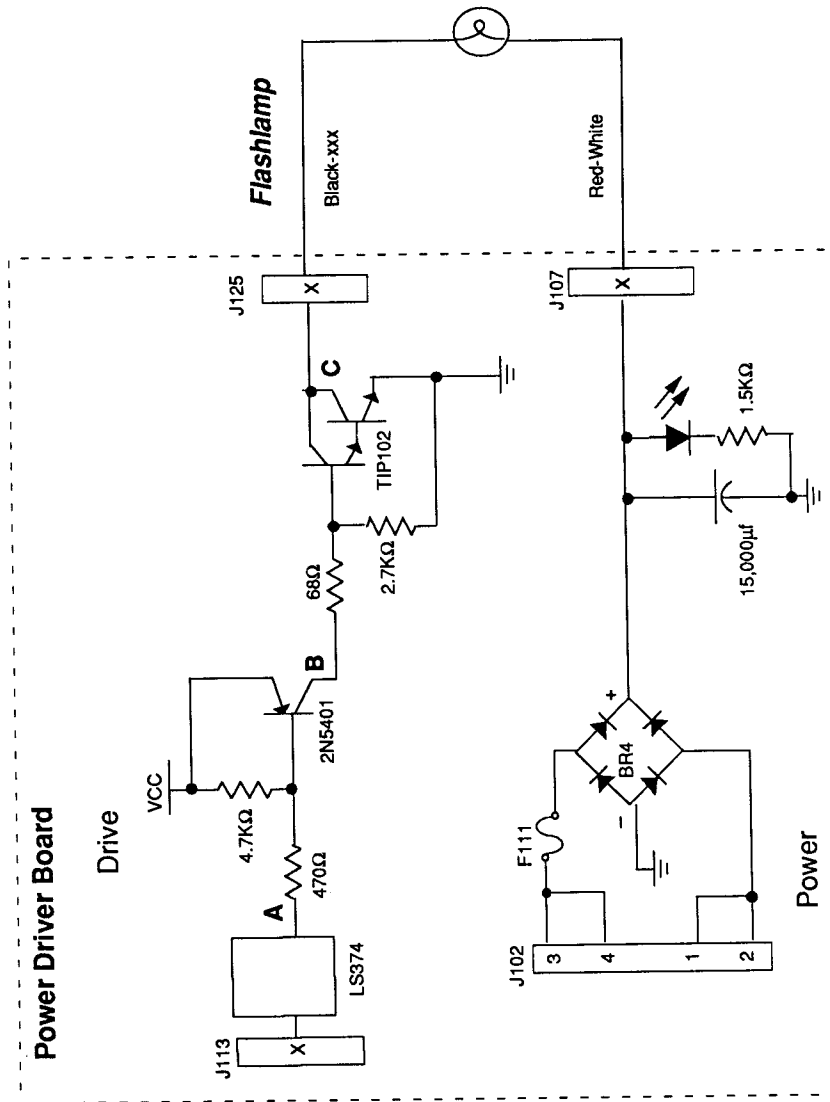
- Input:** A 50V source is connected to the board via a connector labeled **J107**.
- Rectification:** The input is connected to a bridge rectifier (BR3) through a 100µF 50V capacitor and a 10KΩ resistor to ground.
- Output:** The output of the rectifier is connected to a connector labeled **J102**.

External Connections:

- The output of the Drive section (**J127**) is connected to the **Backbox Coil** (BROWN-xxx).
- The output of the Power section (**J102**) is connected to the **Playfield or Backbox Coil** (Violet-Orange).

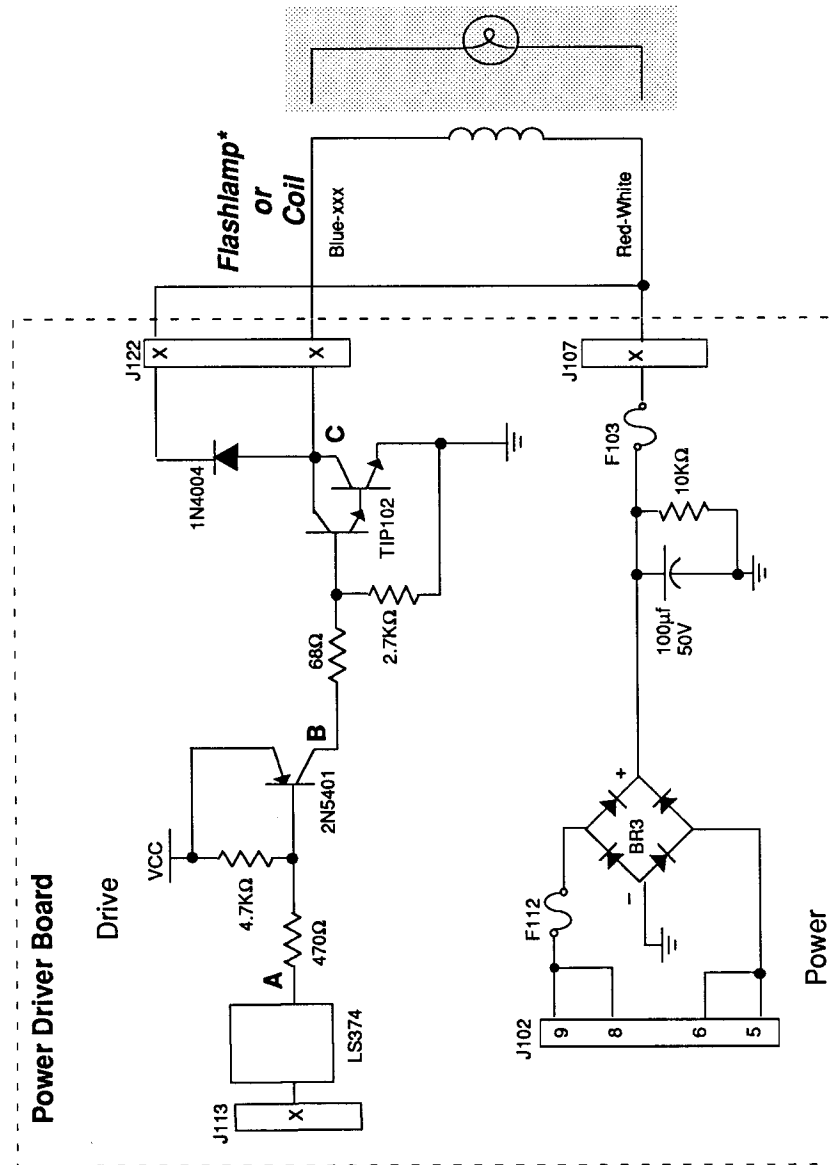
The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor is driven high. A high at point "B" turns On the TIP102 transistor and causes point "C" to drop low. When point "C" is low the coil is grounded through the transistor and the coil turns On. The coil shuts Off when point "A" toggles high.

Flashlamp Circuit



The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor is high. Once point "B" is high, point "C" the collector of the TIP102 transistor is low. When Point "C" is low the flashlamp is grounded through the transistor and the flashlamp turns On. When point "A" toggles high the circuit shuts Off.

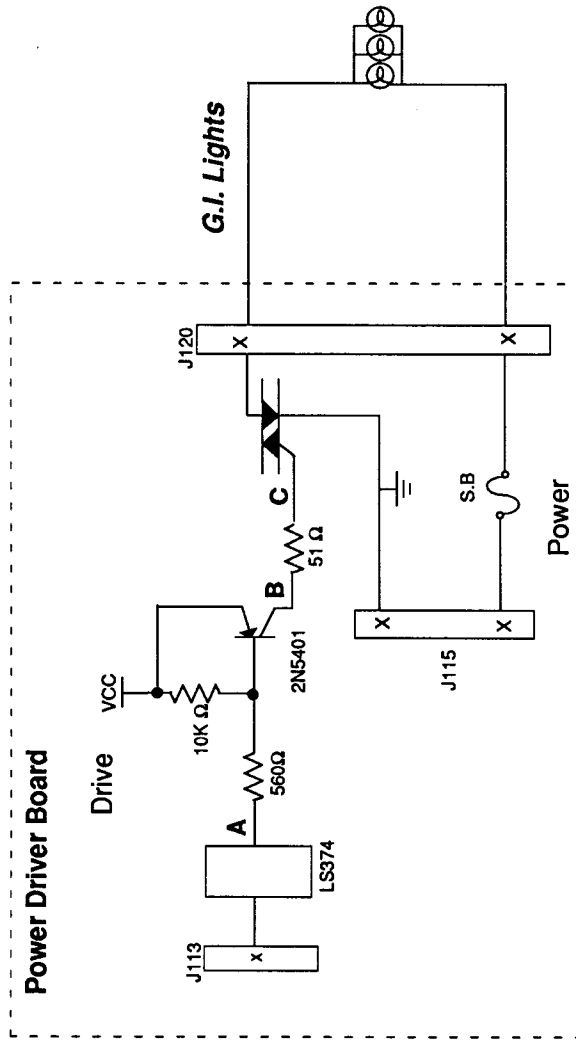
Special (General Purpose) Solenoid Circuit



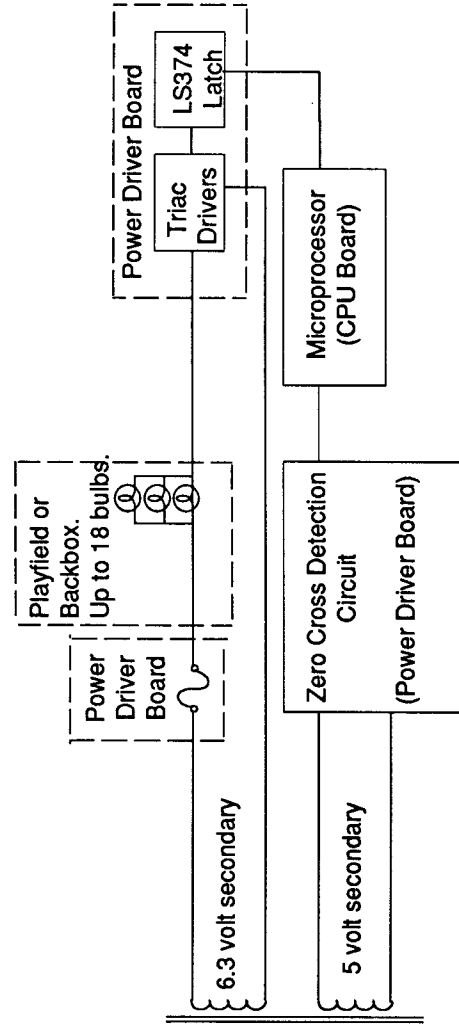
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" is high. A high at point "B" causes a low at point "C". When point "C" is low the coil/flashlamp is grounded through the transistor and the coil/flashlamp turns On. When point "A" toggles high the coil/flashlamp turns Off.

* Tieback Diode is not used for flashlamp circuit.

General Illumination Circuit

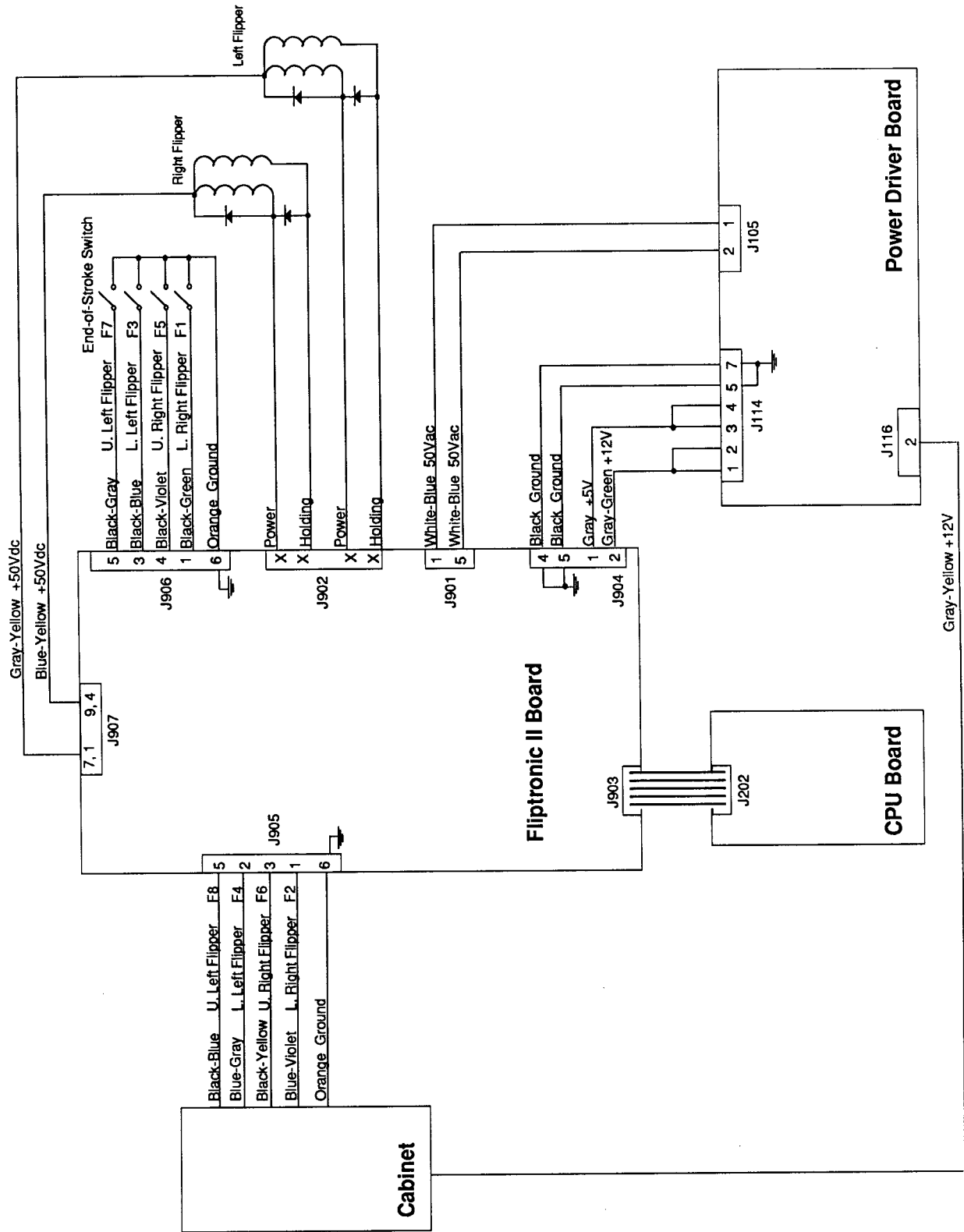


Block Diagram of General Illumination Circuit



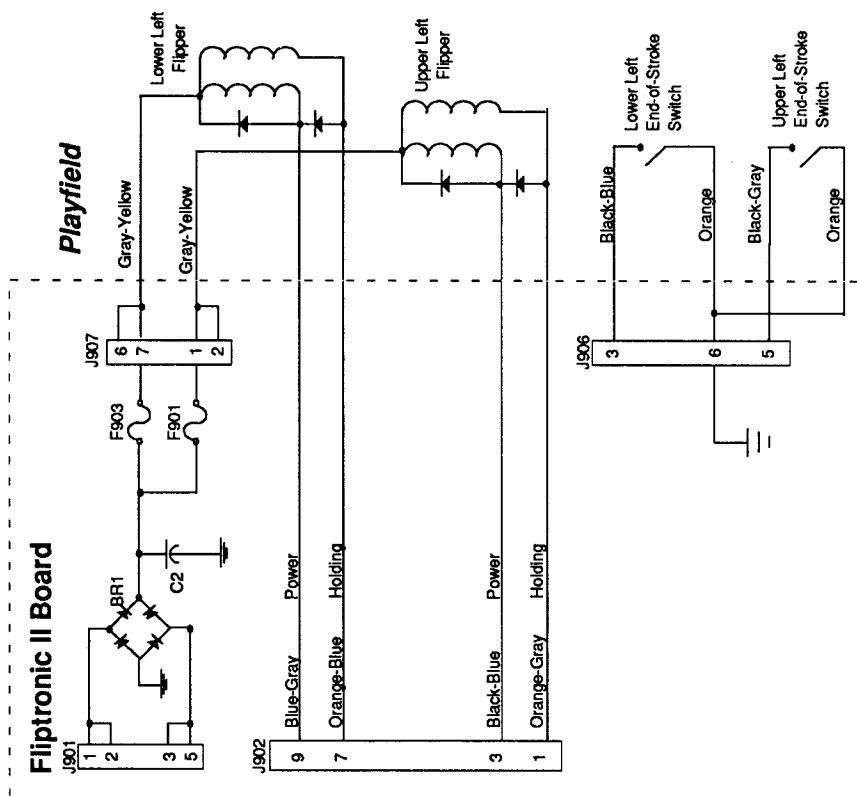
When point "A" toggles low, then points "B" and "C" are high. This turns On the triac and the desired General Illumination string lights.

Fliptronic II Flipper Circuit Diagram

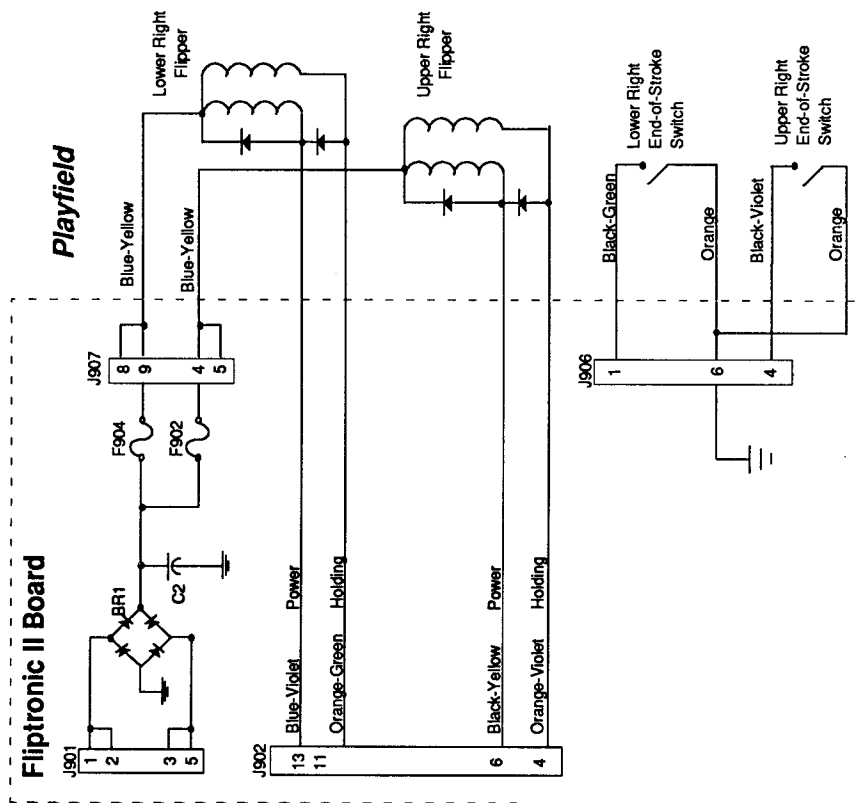


Fliptronic II Flipper Circuits

Left Flipper Circuit



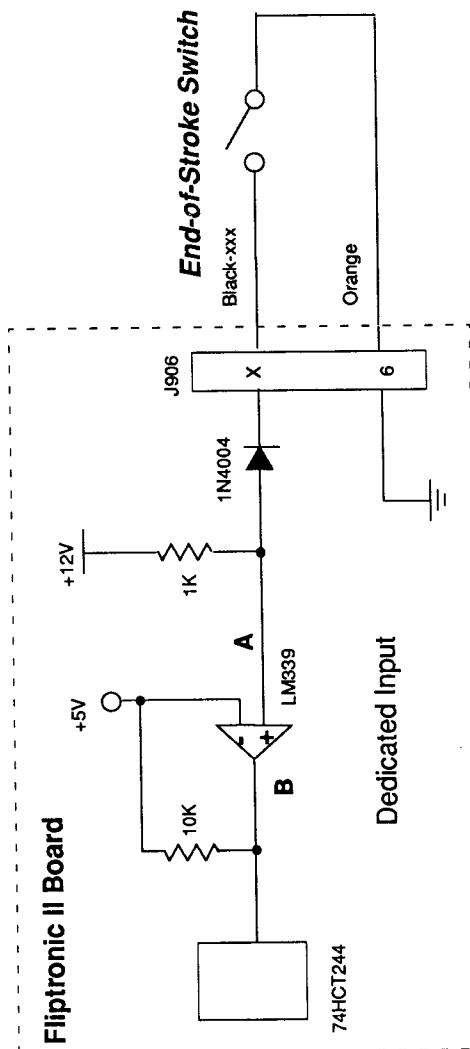
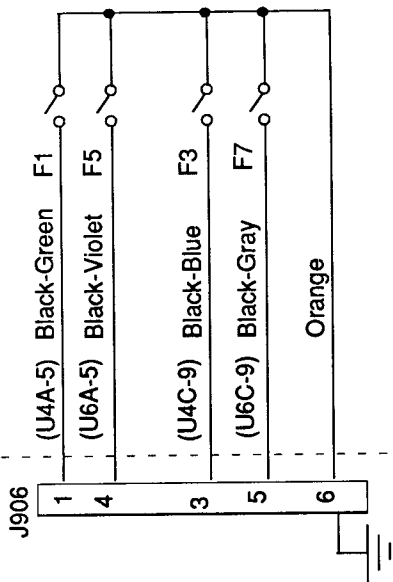
Right Flipper Circuit



Fliptronic II Flipper End-of-Stroke Switches

- F1 Lower Right Flipper
- F5 Upper Right Flipper
- F3 Lower Left Flipper
- F7 Upper Left Flipper

Fliptronic II Board

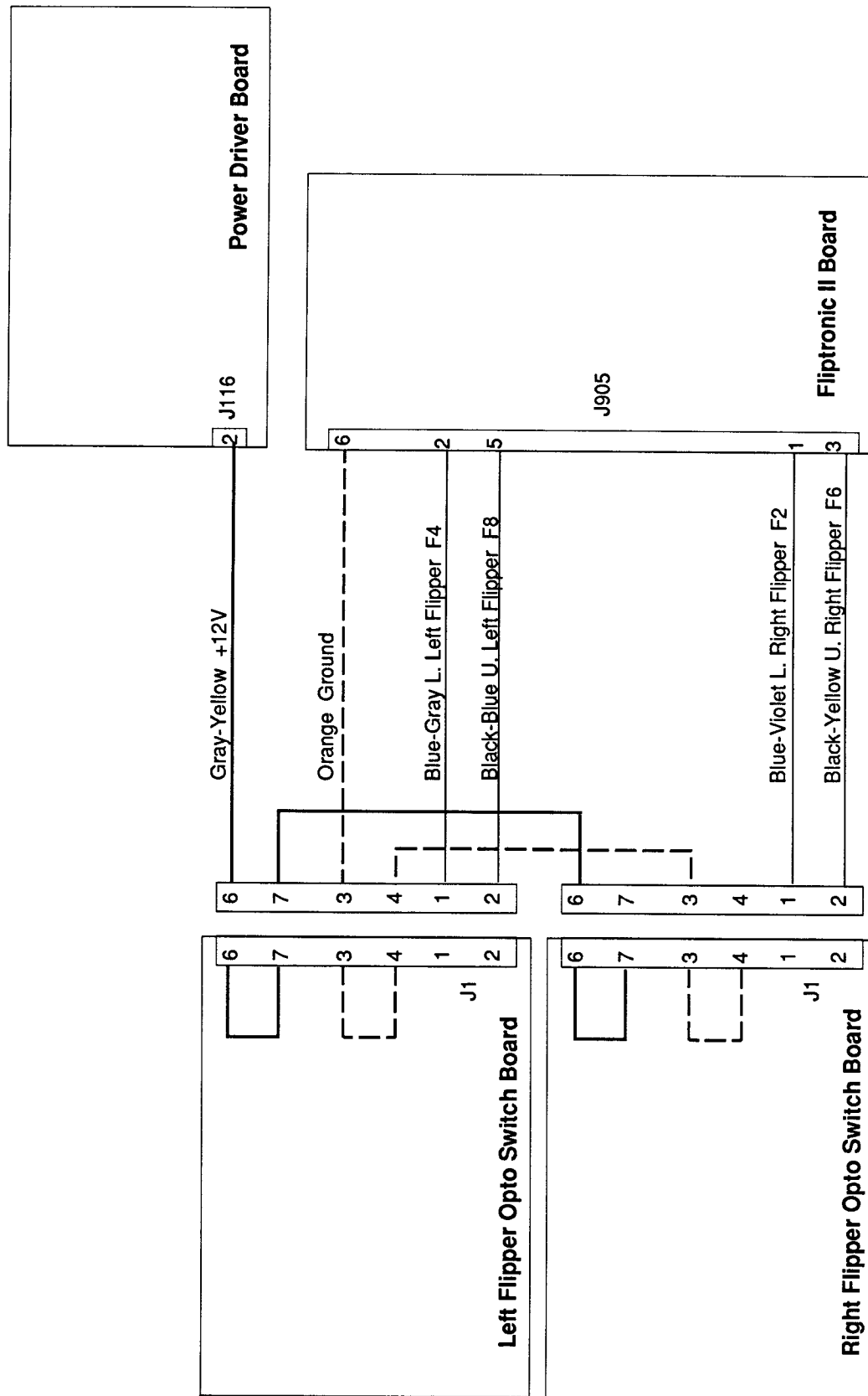


Switch	A	B	
Open	H	H	Off
Closed	L	L	On

The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

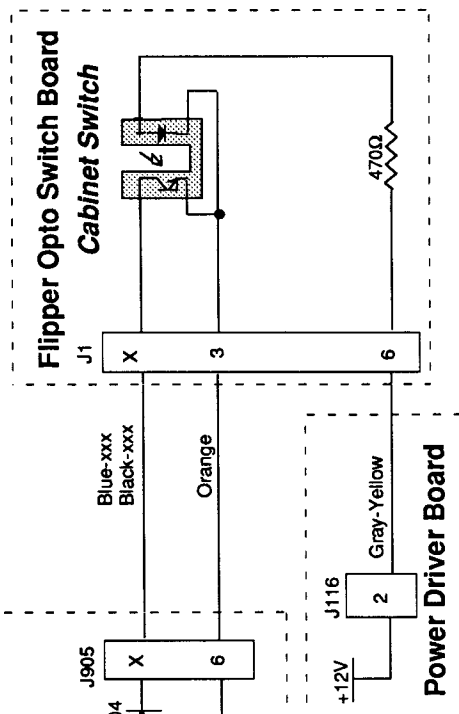
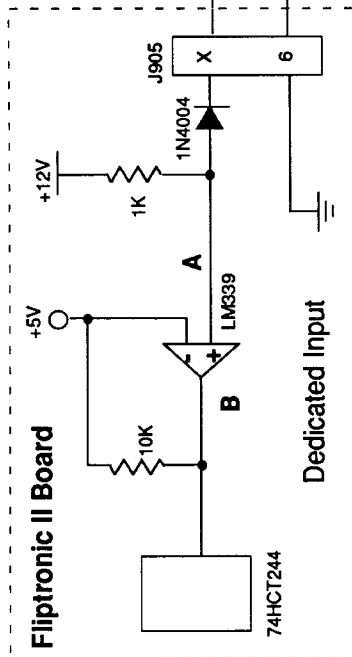
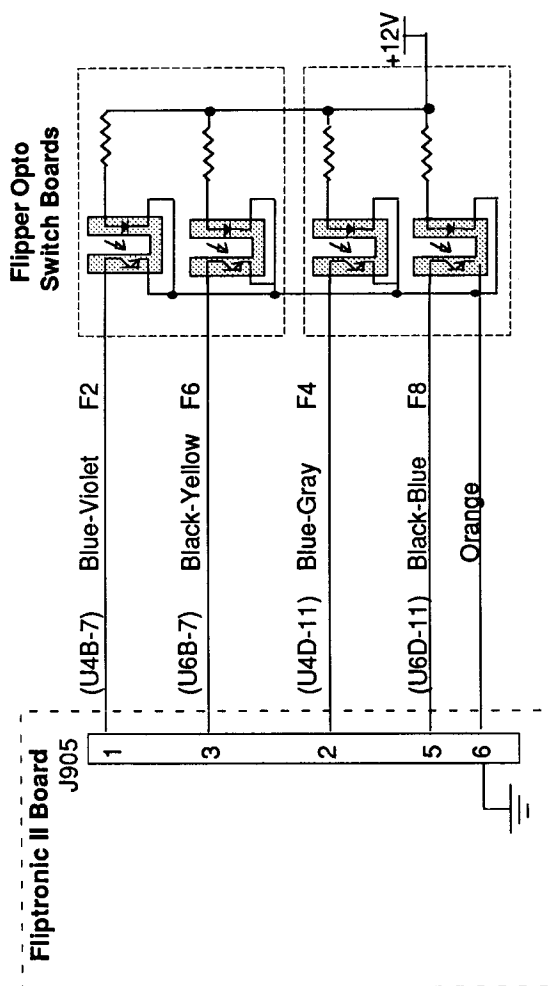
When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V therefore its output is low. Since the row (dedicated input) circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row (dedicated input) is inactive.

Fliptronic II Flipper Cabinet Switch Circuit Diagram



Fliptronic II Flipper Cabinet Switches

- F2 Lower Right Flipper
- F6 Upper Right Flipper
- F4 Lower Left Flipper
- F8 Upper Left Flipper



Switch	A	B	
Open	H	H	Off
Closed	L	L	On

The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

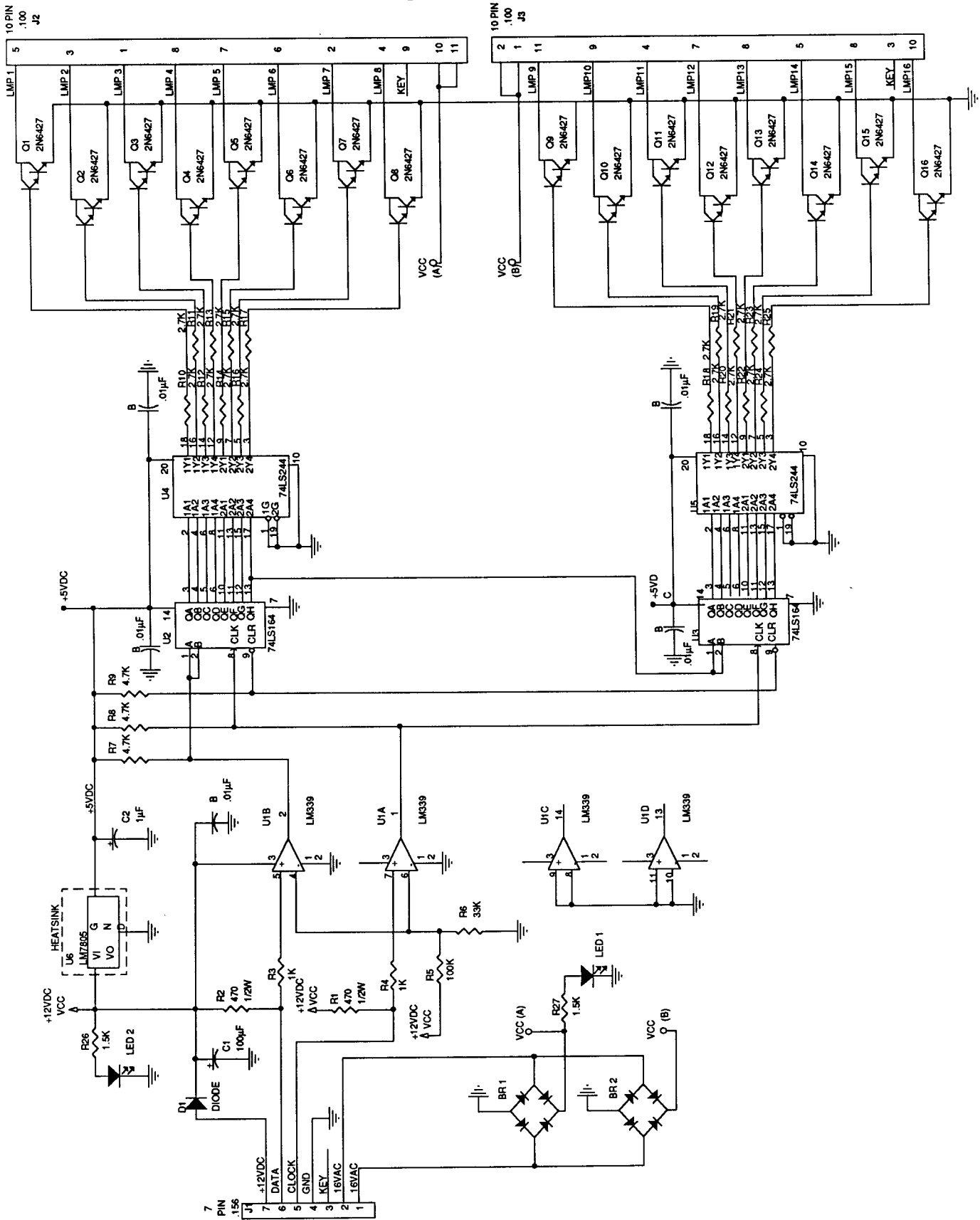
When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V therefore its output is low. Since the row (dedicated input) circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row (dedicated input) is inactive.



- J3 - 1** Red to right 8-lamp Board J1-2
J3 - 2 Red to right 8-lamp Board J1-1
J3 - 3 N/C
J3 - 4 Black-Orange to right 8-lamp Board J1-5
J3 - 5 Black-Blue to right 8-lamp Board J1-11
J3 - 6 Black-Green to right 8-lamp Board J1-8
J3 - 7 Black-Yellow to right 8-lamp Board J1-4
J3 - 8 Black-Violet to right 8-lamp Board J1-10
J3 - 9 Black-Red to right 8-lamp Board J1-6
J3 - 10 Black-Gray to right 8-lamp Board J1-9
J3 - 11 Black-Brown to right 8-lamp Board J1-7

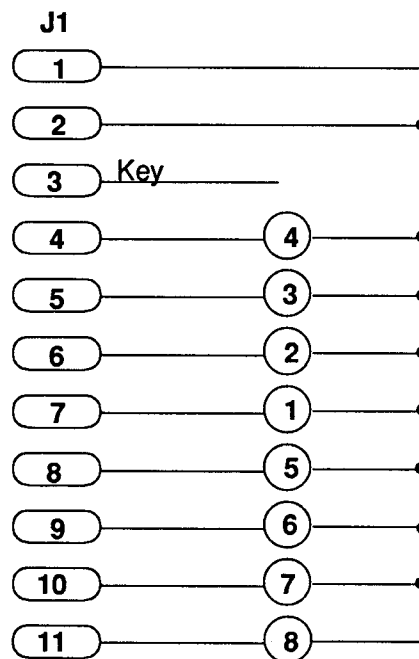
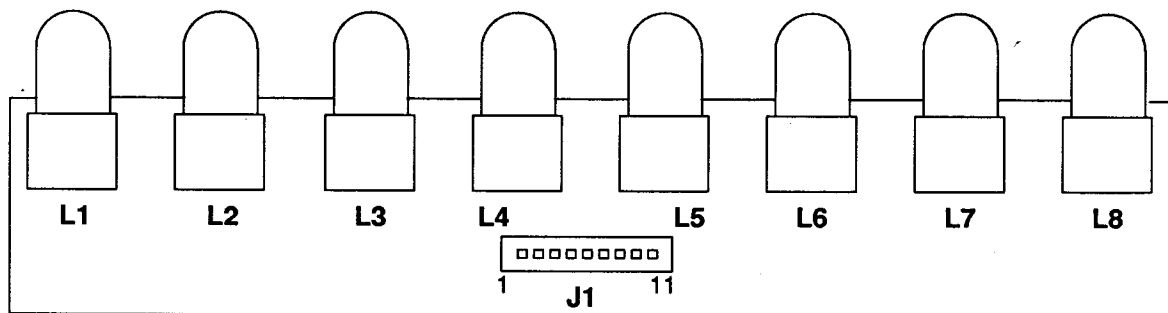
- 5

Chase Light Board Schematic



WHITE WATER 3-21

A-15765
8-lamp Board Assembly & Schematic
NOTE: Use #194 Bulbs ONLY.



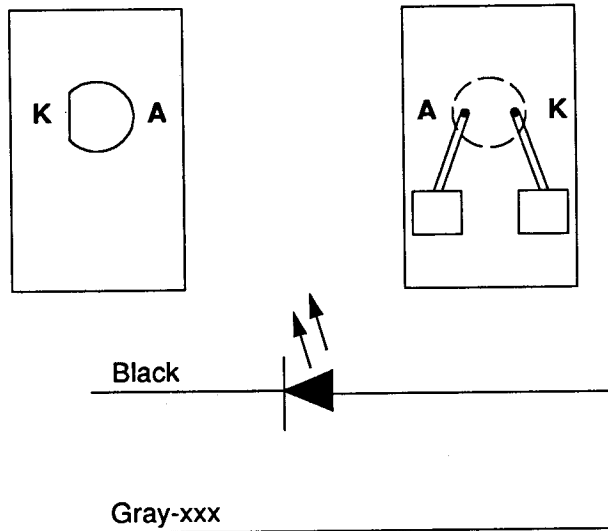
Left Side

J1 - 1 Red from Chase Lamp Board J2-11
 J1 - 2 Red from Chase Lamp Board J2-10
 J1 - 3 N/C
 J1 - 4 Blue-Yellow from Chase Lamp Board J2-8
 J1 - 5 Blue-Orange from Chase Lamp Board J2-1
 J1 - 6 Blue-Red from Chase Lamp Board J2-3
 J1 - 7 Blue-Brown from Chase Lamp Board J2-5
 J1 - 8 Blue-Green from Chase Lamp Board J2-7
 J1 - 9 Blue-Gray from Chase Lamp Board J2-4
 J1 - 10 Blue-Violet from Chase Lamp Board J2-2
 J1 - 11 Blue-Black from Chase Lamp Board J2-6

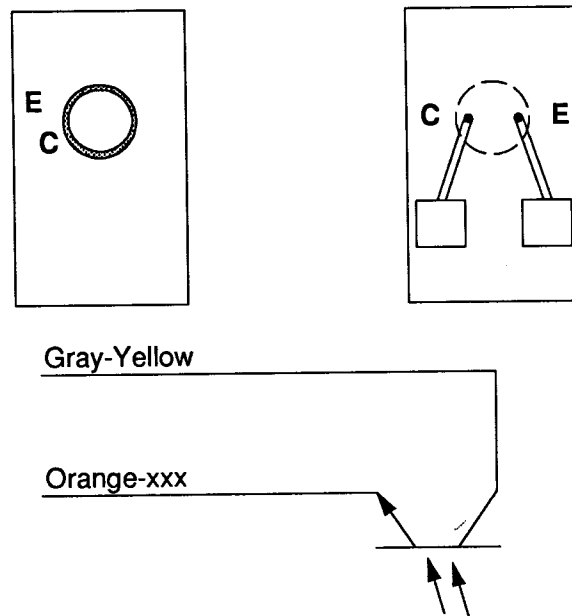
Right Side

J1 - 1 Red from Chase Lamp Board J3-2
 J1 - 2 Red from Chase Lamp Board J3-1
 J1 - 3 N/C
 J1 - 4 Black-Yellow from Chase Lamp Board J3-7
 J1 - 5 Black-Orange from Chase Lamp Board J3-4
 J1 - 6 Black-Red from Chase Lamp Board J3-9
 J1 - 7 Black-Brown from Chase Lamp Board J3-11
 J1 - 8 Black-Green from Chase Lamp Board J3-6
 J1 - 9 Black-Gray from Chase Lamp Board J3-10
 J1 - 10 Black-Violet from Chase Lamp Board J3-8
 J1 - 11 Black-Blue from Chase Lamp Board J3-5

A-14315
LED Board Assembly
(green mask)

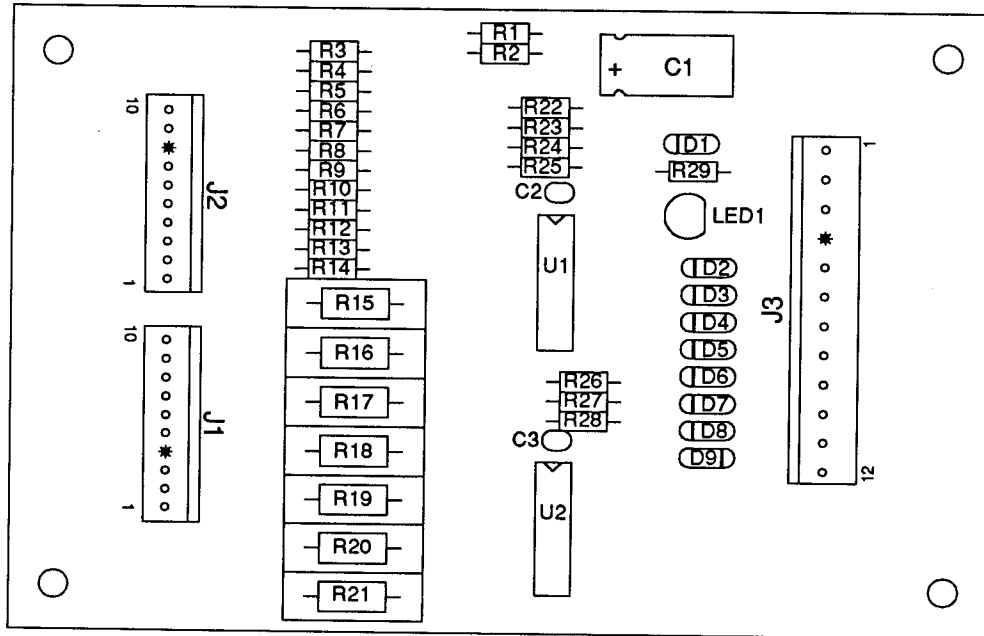


A-14316
Photo Transistor Board Assembly
(blue mask)



A-15576

7-Opto Switch Board Assembly

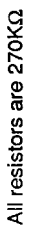


J1 - 1 Gray-Violet (switch #68) to Disas. Drop Enter Opto LED Brd.
 J1 - 2 Gray-Blue (switch #66) to Left Ramp Main Opto LED Brd.
 J1 - 3 Gray-Green (switch #65) to Left Lock-up Opto LED Brd.
 J1 - 4 Key
 J1 - 5 Gray-Black (switch #64) to Center Lock-up Opto LED Brd.
 J1 - 6 Gray-Orange (switch #63) to Right Lock-up Opto LED Brd.
 J1 - 7 Gray-Red (switch #62) to Whirlpool Exit Opto LED Brd.
 J1 - 8 Gray-Brown (switch #61) to Whirlpool Popper Opto LED Brd.
 J1 - 9 Black (ground) loop from J1-10
 J1 - 10 Black (ground) to Opto LED Brds.

J2 - 1 Orange-Violet (switch #68) to Disas. Drop Enter Photo Trans Brd.
 J2 - 2 Orange-Blue (switch #66) to Left Main Ramp Photo Trans Brd.
 J2 - 3 Orange-Green (switch #65) to Left Lock-up Photo Trans Brd.
 J2 - 4 Orange-Yellow (switch #64) to Center Lock-up Photo Trans Brd.
 J2 - 5 Orange-Black (switch #63) to Right Lock-up Photo Trans Brd.
 J2 - 6 Orange-Red (switch #62) to Whirlpool Exit Photo Trans Brd.
 J2 - 7 Orange-Brown (switch #61) to Whirlpool Popper Photo Trans Brd.
 J2 - 8 Key
 J2 - 9 Gray-Yellow (+12V) loop from J2-10
 J2 - 10 Gray-Yellow (+12V) to Photo Trans Brds.

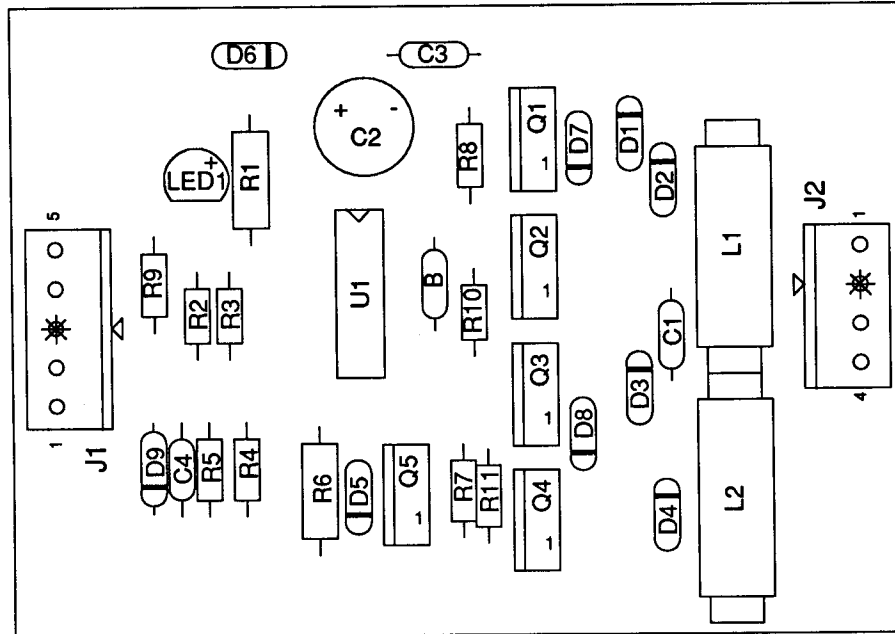
J3 - 1 Gray-Yellow (+12V) from Power Driver Board J118-2
 J3 - 2 Gray-Yellow (+12V) loop from J3-1
 J3 - 3 Black (ground) from Power Driver Board J118-3
 J3 - 4 Key
 J3 - 5 White-Brown (switch row 1) from CPU J209-1
 J3 - 6 White-Red (switch row 2) from CPU J209-2
 J3 - 7 White-Orange (switch row 3) from CPU J209-3
 J3 - 8 White-Yellow (switch row 4) from CPU J209-4
 J3 - 9 White-Green (switch row 5) from CPU J209-5
 J3 - 10 White-Blue (switch row 6) from CPU J209-7
 J3 - 11 White-Gray (switch row 8) from CPU J209-9
 J3 - 12 Green-Blue (switch column 6) from CPU J207-6

7-Opto Switch Board Schematic



WHITE WATER 3-25

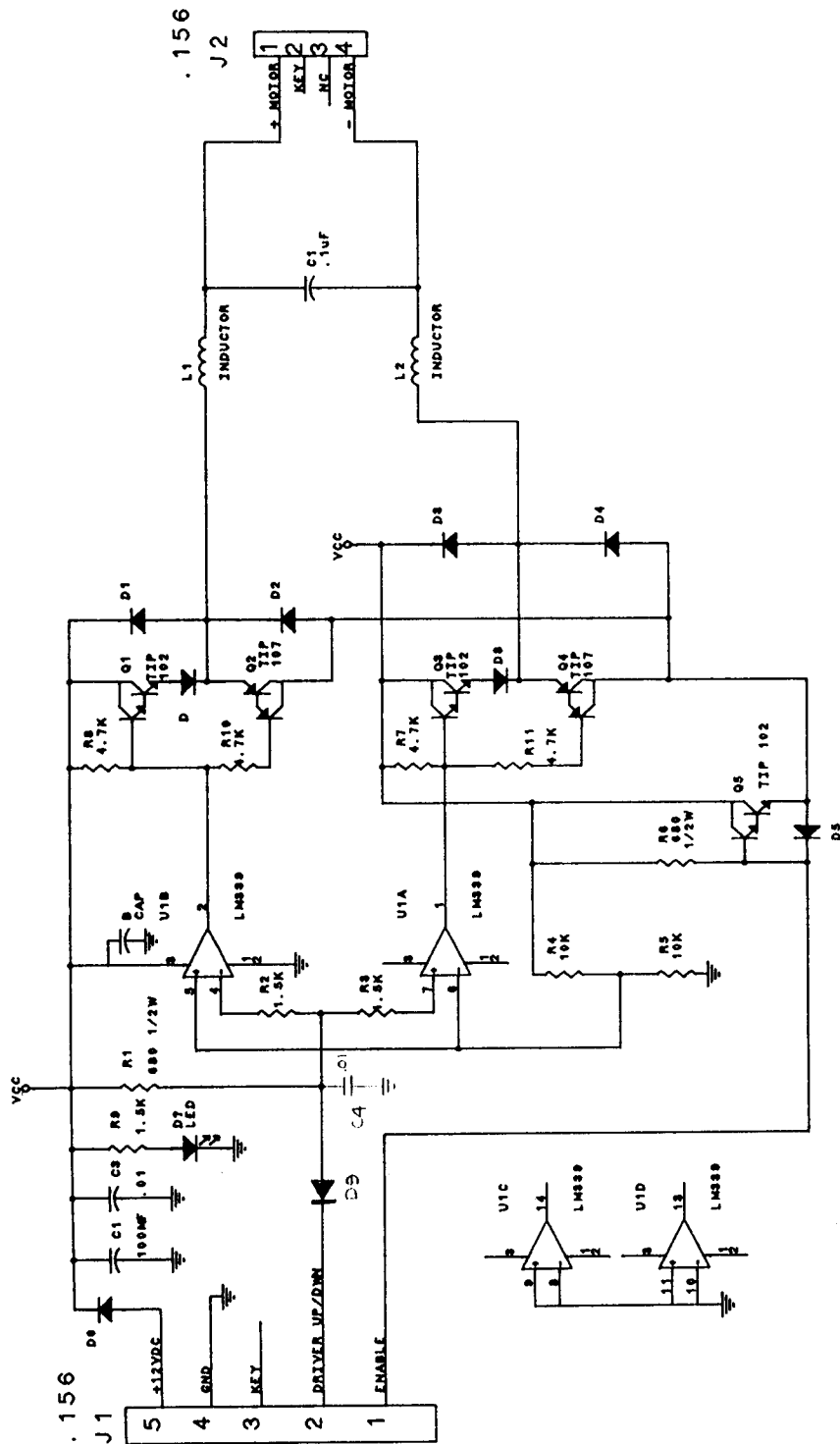
A-15680 **Bi-directional Motor Board Assembly**



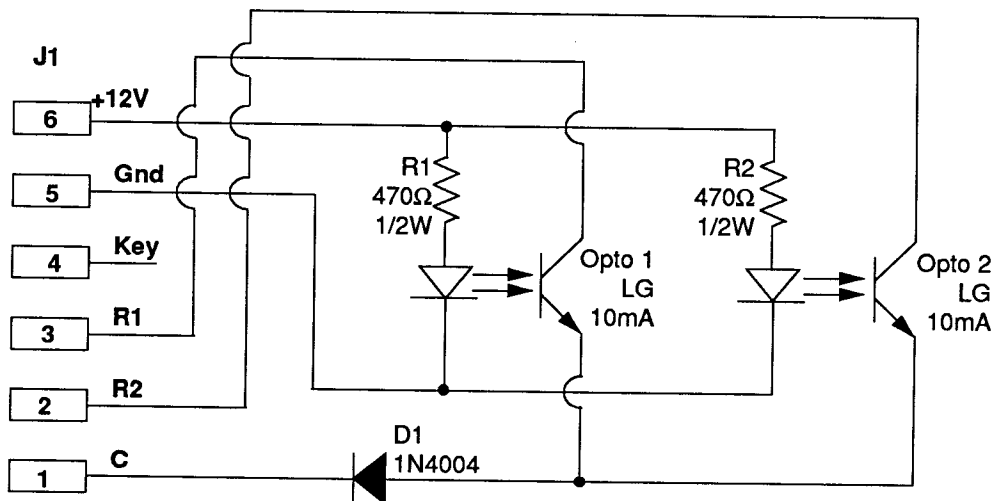
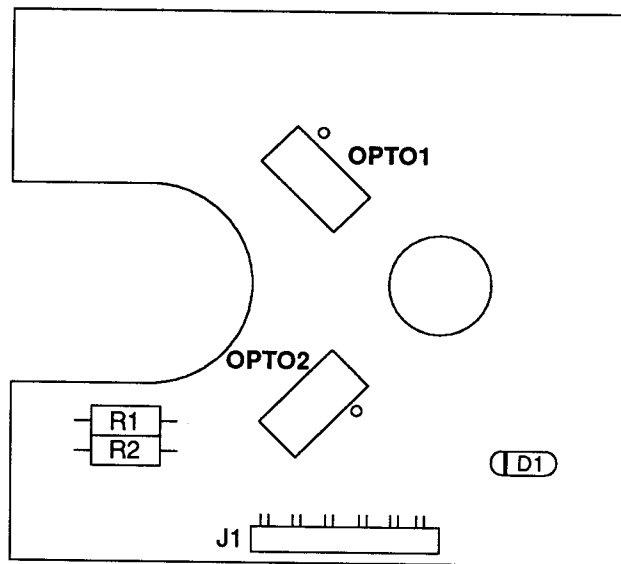
J1 - 1 Blue-Red (sol. #26 driver) from Power Driver Board J122-2
J1 - 2 Blue-Brown (sol. #25 driver) from Power Driver Board J122-1
J1 - 3 Key
J1 - 4 Black (ground) from Power Driver Board J118-3
J1 - 5 Gray-Yellow (+12V) from Power Driver Board J118-2

J2 - 1 Red to Motor
J2 - 2 Key
J2 - 3 N/C
J2 - 4 White to Motor

A-15680 **Bi-directional Motor Board Schematic**

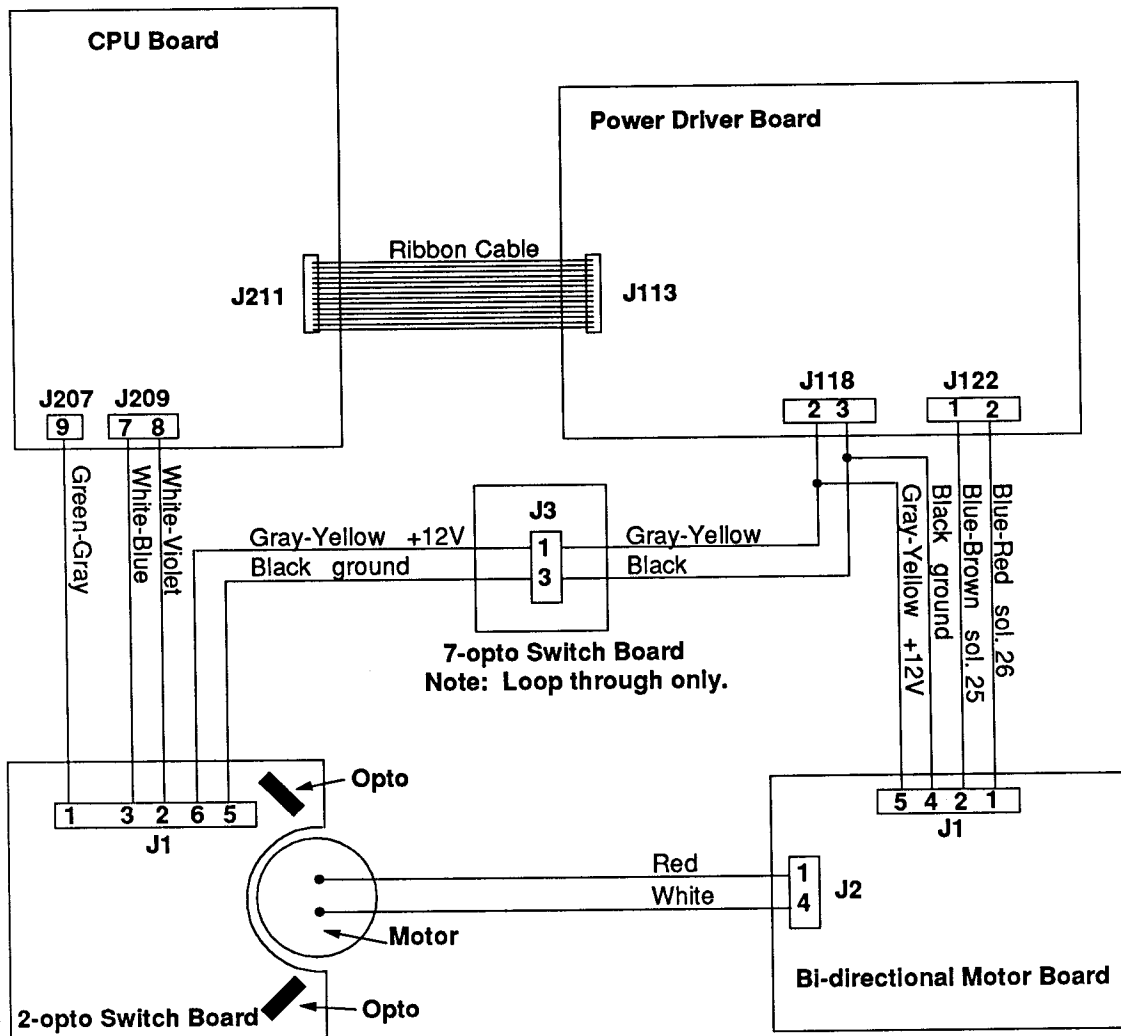


A-15668 2-opto Switch Board & Schematic

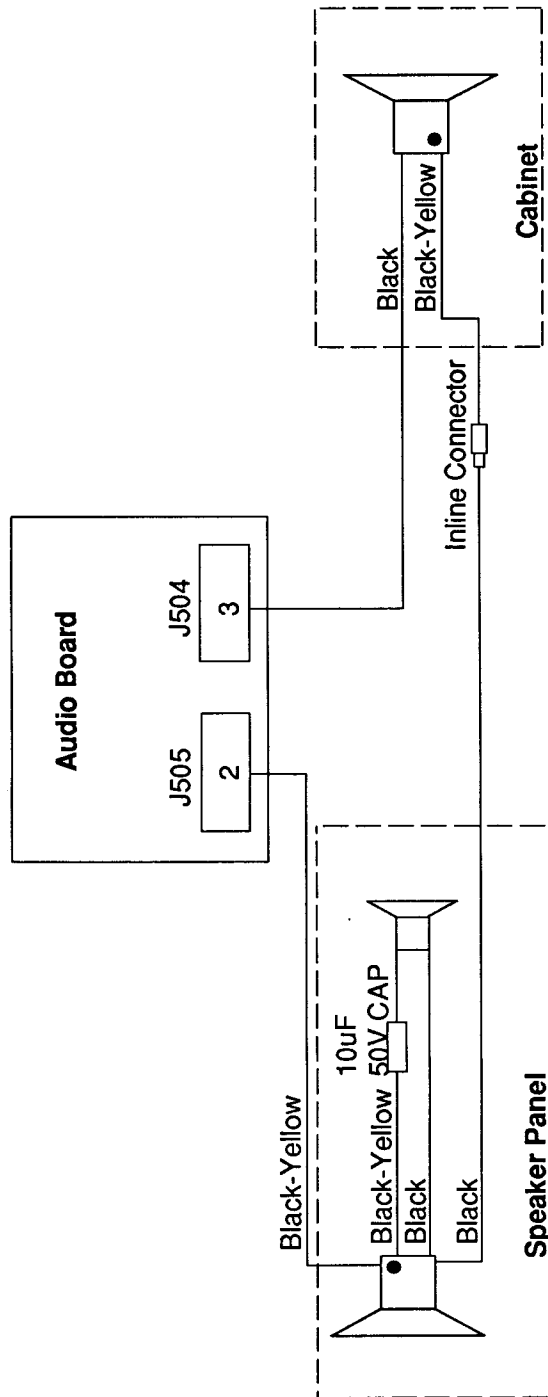


- J1 - 1 Green-Gray (switch column 8) from CPU Board J207-9
- J1 - 2 White-Violet (switch row 7) from CPU Board J209-8
- J1 - 3 White-Blue (switch row 6) from CPU Board J209-7
- J1 - 4 Key
- J1 - 5 Black (ground) from Power Driver Board J118-3; loop through 7-opto Switch Board J3-3
- J1 - 6 Gray-Yellow (+12V) from Power Driver Board J118-2; loop through 7-opto Switch Board J3 -1

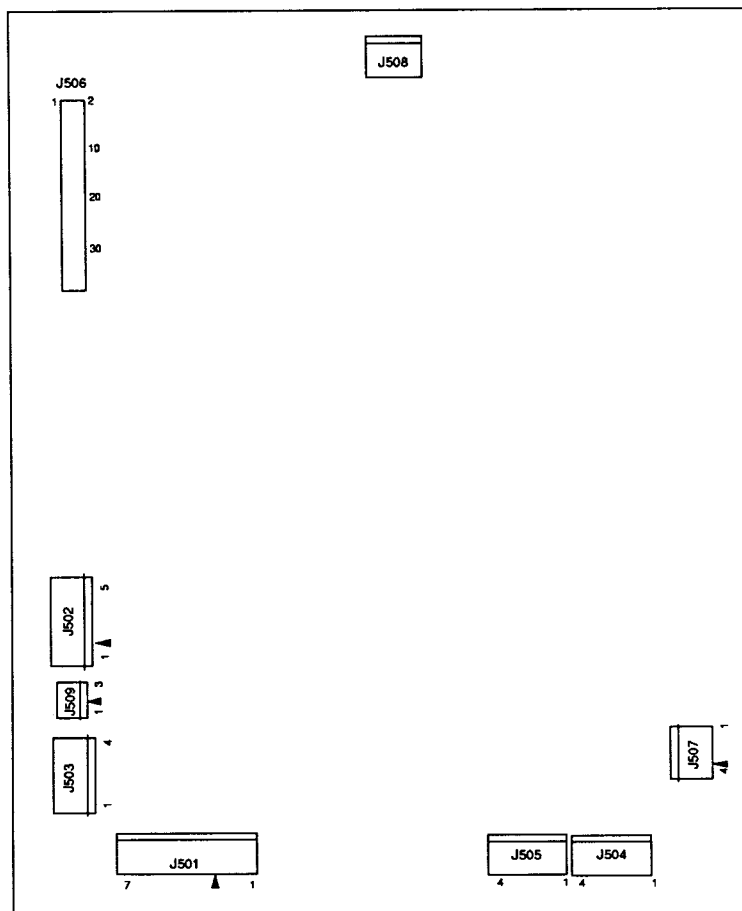
Motor Circuit



Speaker Wiring Diagram



A-12738-50018 **Audio Board** **Interboard Wiring**



J501 - 1 Gray-Green (18VAC) from xformer secondary
J501 - 2 Gray-Green (18VAC) loop from J501-1
J501 - 3 N/C
J501 - 4 Gray (18VAC) from xformer secondary
J501 - 5 Gray (18VAC) loop from J501-4
J501 - 6 Gray-White (18VAC) from xformer secondary
J501 - 7 Gray-White (18VAC) loop from J501-6

J502 - 1 Gray (+5V) from Power Driver Board J114-3,4
J502 - 2 N/C
J502 - 3 Gray (+5V) from Power Driver Board J114-3,4
J502 - 4 Black (Grd) from Power Driver Board J114-5,7
J502 - 5 Black (Grd) from Power Driver Board J114-5,7

J503 - Not Used

J504 - 1 N/C
J504 - 2 N/C
J504 - 3 Black (signal) to speaker
J504 - 4 N/C

J505 - 1 N/C
J505 - 2 Black-Yellow (signal) to speaker
J505 - 3 N/C
J505 - 4 N/C

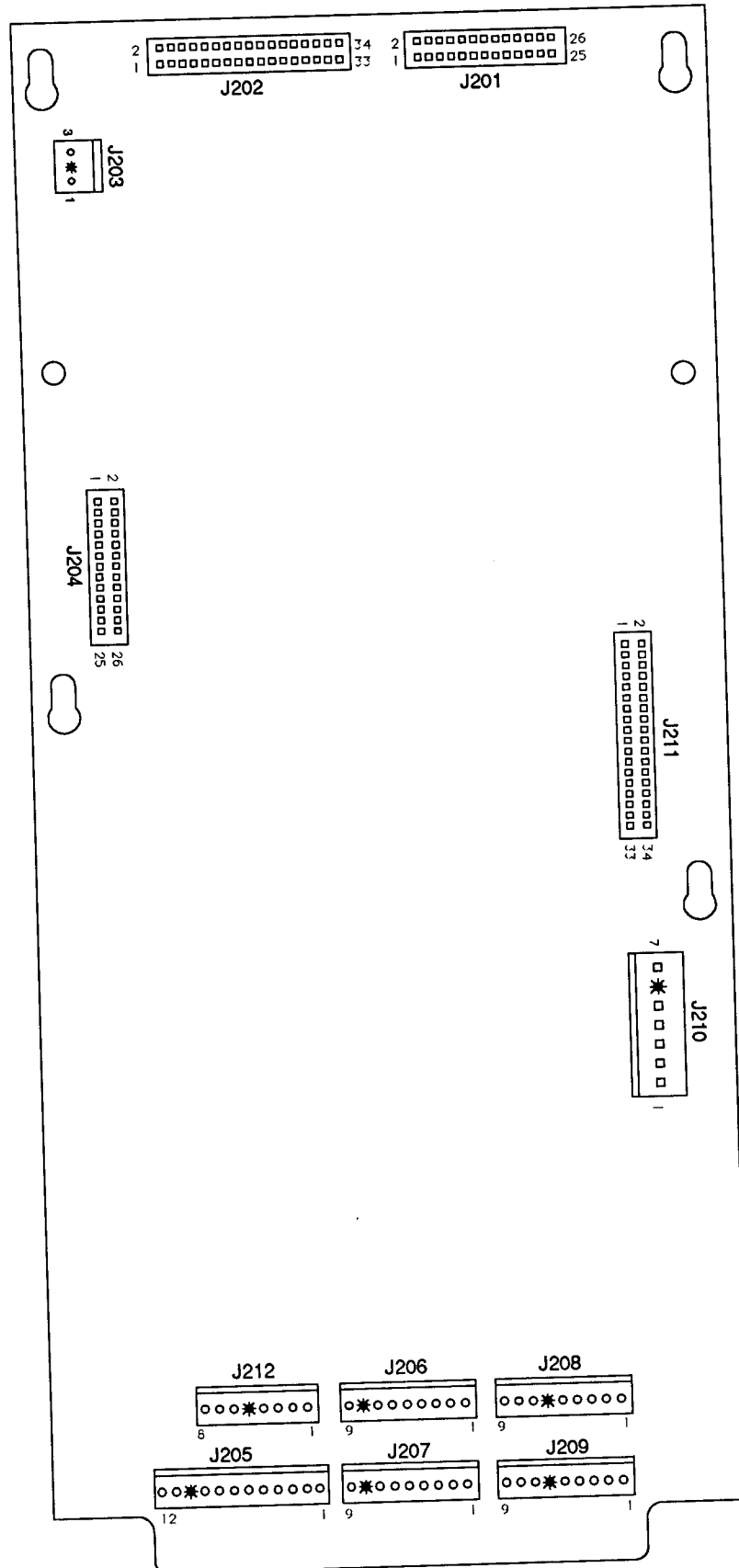
J506, 4-pin Ribbon Cable(data) To/from J601; J903; J202

J507 - Not Used

J508 - 1 N/C
J508 - 2 N/C
J508 - 3 N/C
J508 - 4 N/C

J509 - 1 N/C
J509 - 2 N/C
J509 - 3 N/C

A-12742-50018
CPU Board



CPU Board Interboard Wiring

J201, 26-pin Ribbon Cable (data) To/from J602

J202, 34-pin Ribbon Cable (data) To/from J903; J506; J601

J203 - Not Used

J204 - Not Used

J205 - 1 Orange-Brown (ded. sw. row 1) to Coin Door Brd J1-14
J205 - 2 Orange-Red (ded. sw. row 2) to Coin Door Brd J1-13
J205 - 3 Orange-Black (ded. sw. row 3) to Coin Door Brd J1-12
J205 - 4 Orange-Yellow (ded. sw. row 4) to Coin Door J1-17
J205 - 5 N/C
J205 - 6 Orange-Green (ded. sw. row 5) to Coin Door Brd J1-11
J205 - 7 Orange-Blue (ded. sw. row 6) to Coin Door Brd J1-10
J205 - 8 Orange-Violet (ded. sw. row 7) to Coin Door Brd J1-9
J205 - 9 Orange-Gray (ded. sw. row 8) to Coin Door Brd J1-8
J205 - 10 Black (Grd) to Coin Door Brd J1-15
J205 - 11 N/C
J205 - 12 Orange-White (sw. enable) to Coin Door Brd J1-18

J206 - 1 N/C
J206 - 2 N/C
J206 - 3 N/C
J206 - 4 N/C
J206 - 5 N/C
J206 - 6 N/C
J206 - 7 N/C
J206 - 8 N/C
J206 - 9 N/C

J207 - 1 Green-Brown (sw. col. 1) to playfield switches
J207 - 2 Green-Red (sw. col. 2) to playfield/cabinet switches
J207 - 3 Green-Orange (sw. col. 3) to playfield switches
J207 - 4 Green-Yellow (sw. col. 4) to playfield switches
J207 - 5 Green-Black (sw. col. 5) to playfield switches
J207 - 6 Green-Blue (sw. col. 6) to playfield switches
J207 - 7 Green-Violet (sw. col. 7) to playfield switches
J207 - 8 N/C
J207 - 9 Green-Gray (sw. col. 8) to playfield switches

J208 - 1 N/C
J208 - 2 N/C
J208 - 3 N/C
J208 - 4 N/C
J208 - 5 N/C
J208 - 6 N/C
J208 - 7 N/C
J208 - 8 N/C
J208 - 9 N/C

J209 - 1 White-Brown (sw. row 1) to playfield switches
J209 - 2 White-Red (sw. row 2) to playfield switches
J209 - 3 White-Orange (sw. row 3) to playfield switches
J209 - 4 White-Yellow (sw. row 4) to playfield switches
J209 - 5 White-Green (sw. row 5) to playfield switches
J209 - 6 N/C
J209 - 7 White-Blue (sw. row 6) to playfield switches
J209 - 8 White-Violet (sw. row 7) to playfield switches
J209 - 9 White-Gray (sw. row 8) to playfield switches

J210 - 1 Black (Grd) from Power Driver Brd J114-5,7
J210 - 2 N/C
J210 - 3 Black (Grd) from Power Driver Brd J114-5,7
J210 - 4 Gray (+5V) from Power Driver Brd J114-3,4
J210 - 5 Gray (+5V) from Power Driver Brd J114-3,4
J210 - 6 Gray-Green (+12V) from Power Driver Brd J114-1,2
J210 - 7 Gray-Green (+12V) from Power Driver Brd J114-1,2

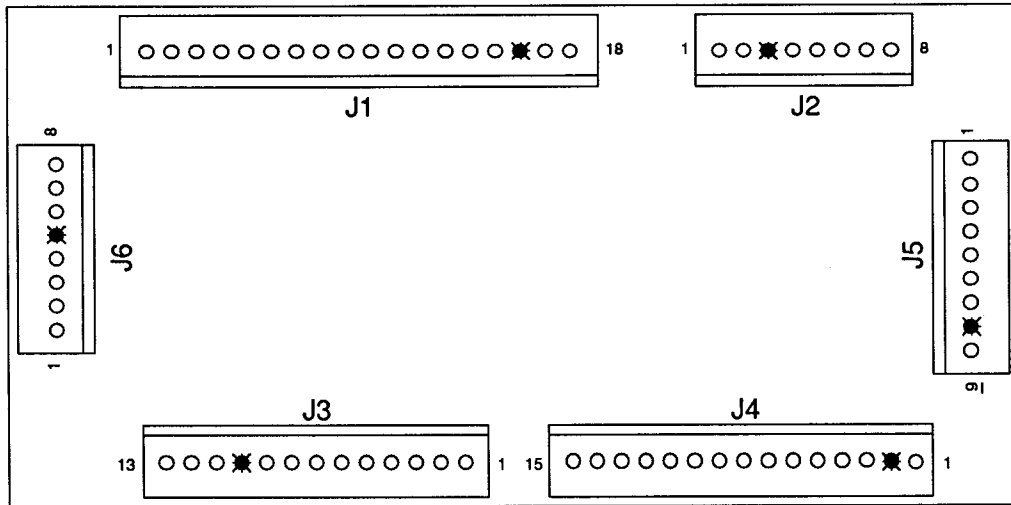
J211, 34-pin Ribbon Cable (data) To/from J113

J212 - 1 Green-Brown (sw. col. 1) to Coin Door Brd J1-1
J212 - 2 Green-Red (sw. col. 2) to Coin Door J1-7
J212 - 3 N/C
J212 - 4 White-Brown (sw. row 1) to Coin Door Brd J1-6
J212 - 5 N/C
J212 - 6 White-Red (sw. row 2) to Coin Door Brd J1-5
J212 - 7 White-Orange (sw. row 3) Coin Door Brd J1-4
J212 - 8 White-Yellow (sw. row 4) to Coin Door Brd J1-3

A-14689

Coin Door Interface Board

Interboard Wiring



- J1 - 1 Green-Brown (sw. col. 1) from CPU J212-1
- J1 - 2 Red-Gray (lamp row 8) from Power Driver Brd J134-9
- J1 - 3 White-Yellow (sw. row 4) from CPU J212-8
- J1 - 4 White-Orange (sw. row 3) from CPU J212-7
- J1 - 5 White-Red (sw. row 2) from CPU J212-6
- J1 - 6 White-Brown (sw. row 1) from CPU J212-4
- J1 - 7 Green-Red (sw. col. 2) from CPU J212-2
- J1 - 8 Orange-Gray (dedicated sw. row 8) from CPU J205-9
- J1 - 9 Orange-Violet (dedicated sw. row 7) from CPU J205-8
- J1 - 10 Orange-Blue (dedicated sw. row 6) from CPU J205-7
- J1 - 11 Orange-Green (dedicated sw. row 5) from CPU J205-6
- J1 - 12 Orange-Black (dedicated sw. row 3) from CPU J205-3
- J1 - 13 Orange-Red (dedicated sw. row 2) from CPU J205-2
- J1 - 14 Orange-Brown (dedicated sw. row 1) from CPU J205-1
- J1 - 15 Black (Grd) from CPU J205-10
- J1 - 16 N/C
- J1 - 17 Orange-Yellow (dedicated sw. row 4) from CPU J205-4
- J1 - 18 Orange-White (sw. enable) from CPU J205-12

- J3 - 1 Violet (G.I. return) to coin door
- J3 - 2 White-Violet (G.I. 6.8VAC) to coin door
- J3 - 3 Black (Grd) to Door
- J3 - 4 Orange-Brown (dedicated sw. row 1) to coin door
- J3 - 5 N/C
- J3 - 6 Orange-Black (dedicated sw. row 3) to coin door
- J3 - 7 Orange-Green (dedicated sw. row 4) to coin door
- J3 - 8 Orange-Blue (dedicated sw. row 6) to coin door
- J3 - 9 Orange-Violet (dedicated sw. row 7) to coin door
- J3 - 10 N/C
- J3 - 11 Orange -Gray (dedicated sw. row 8) to coin door
- J3 - 12 Green-Red (sw. col. 2) to coin door
- J3 - 13 White-Brown (sw. row 1) to coin door

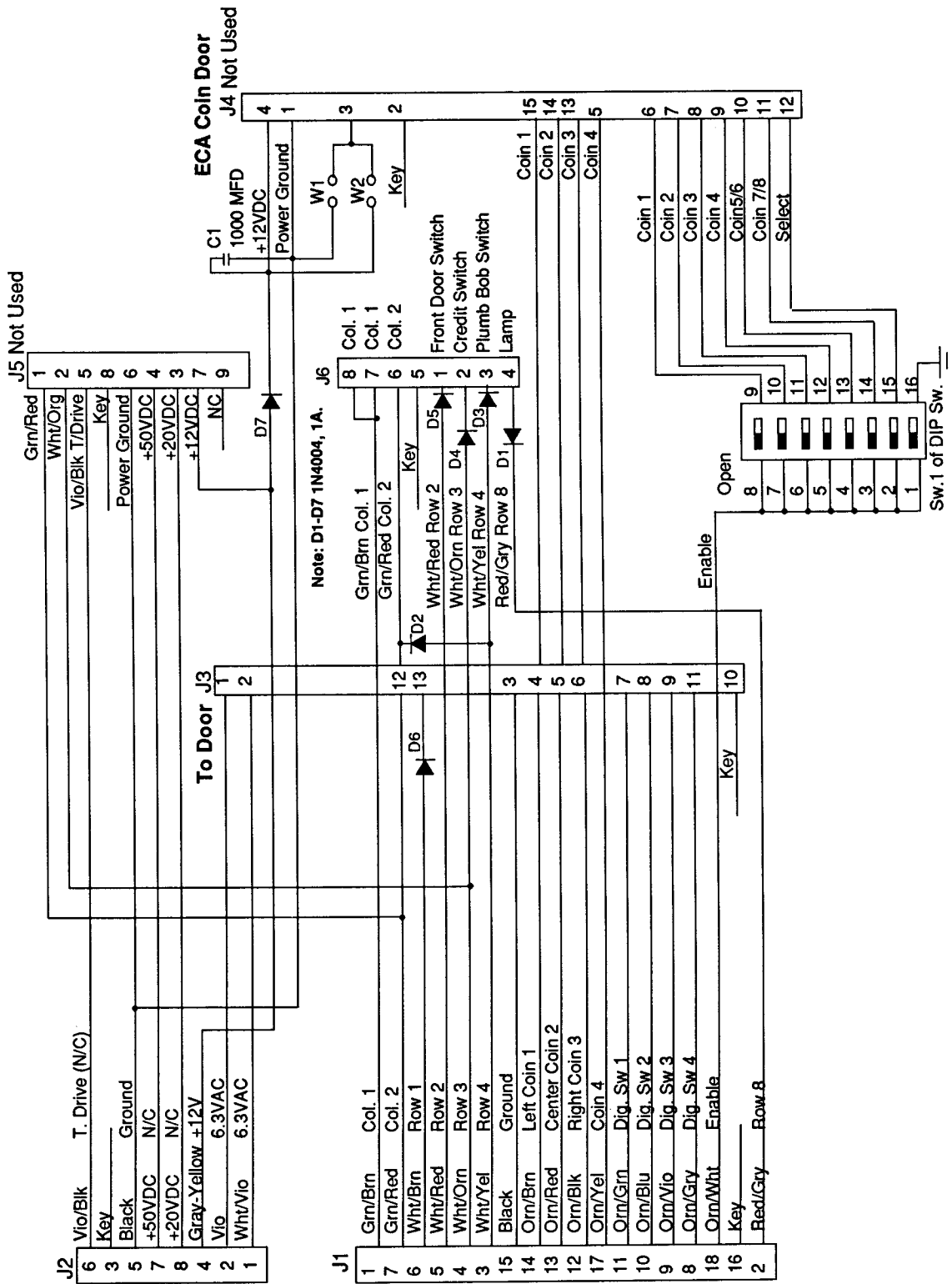
J4 - Not Used

J5 - Not Used

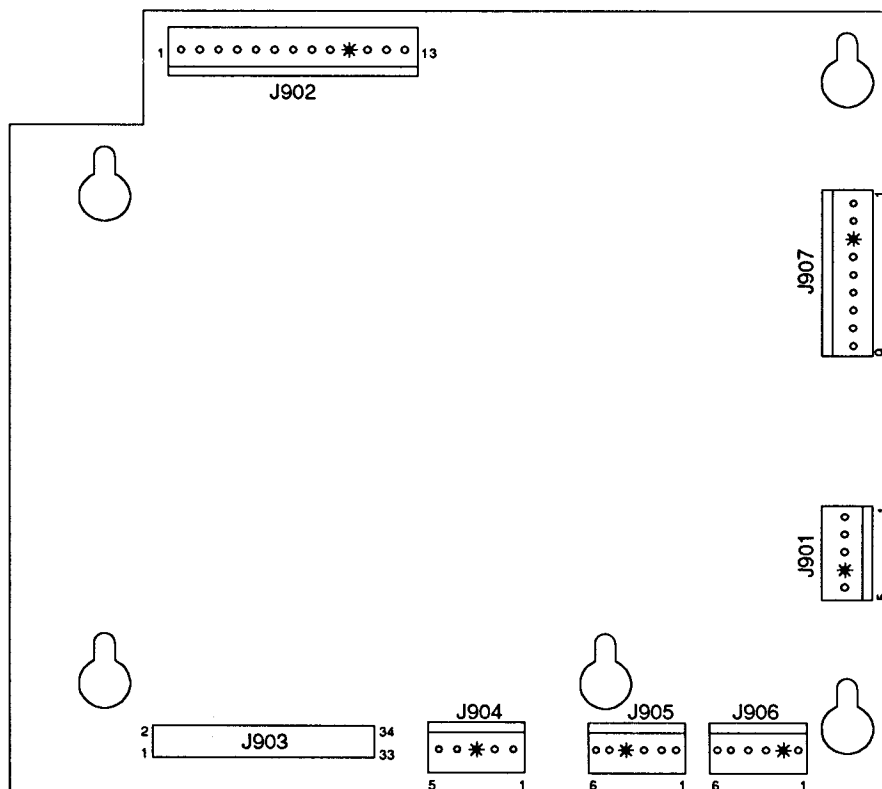
- J2 - 1 Violet (G.I. return) from Power Driver Board J119-3
- J2 - 2 Violet-White (G.I. 6.8VAC) from Power Driver Board J119-1
- J2 - 3 N/C
- J2 - 4 Gray-Yellow (+12V) from Power Driver Board J116-2
- J2 - 5 Black (Grd) from Power Driver Board J116-3
- J2 - 6 N/C
- J2 - 7 N/C
- J2 - 8 N/C

- J6 - 1 White-Red (sw. row 2) to cabinet
- J6 - 2 White-Orange (sw. row 3) to cabinet
- J6 - 3 White-Yellow (sw. row 3) to cabinet
- J6 - 4 Red-Gray (lamp row 8) to cabinet
- J6 - 5 N/C
- J6 - 6 Green-Red (sw. col 2) to cabinet
- J6 - 7 Green-Brown (sw. col 1) to cabinet
- J6 - 8 Green-Brown (sw. col. 1) to cabinet

A-14689 **Coin Door Interface Board Schematic**



A-15472 **Fliptronic II Board** **Interboard Wiring**



J901 - 1 White-Blue (50VAC) from Power Driver Board J104-2
 J901 - 2 White-Blue (50VAC) loop from J901-1
 J901 - 3 White-Blue (50VAC) from Power Driver Board J104-1
 J901 - 4 N/C
 J901 - 5 White-Blue (50VAC) loop from J901-3

J902 - 1 N/C
 J902 - 2 N/C
 J902 - 3 N/C
 J902 - 4 Orange-Violet (holding) upper right flipper coil
 J902 - 5 N/C
 J902 - 6 Black-Yellow (power) upper right flipper coil
 J902 - 7 Orange-Blue (holding) lower left flipper coil
 J902 - 8 N/C
 J902 - 9 Blue-Gray (power) lower left flipper coil
 J902 - 10 N/C
 J902 - 11 Orange-Green (holding) lower right flipper coil
 J902 - 12 N/C
 J902 - 13 Blue-Violet (power) lower right flipper coil

J903, 34-pin Ribbon Cable (data) To/from J202; J601; J506

J904 - 1 Gray (+5V) from Power Driver Board J114-3,4
 J904 - 2 Gray-Green (+12V) from Power Driver Board J114-1,2
 J904 - 3 N/C
 J904 - 4 Black (Grd) from Power Driver Board J114-5,7
 J904 - 5 Black (Grd) from Power Driver Board J114-5,7

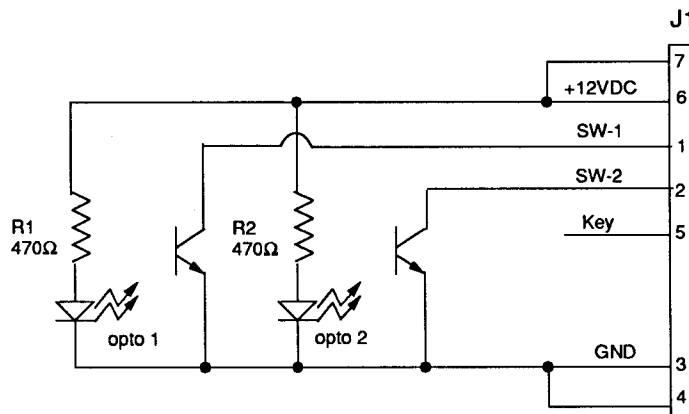
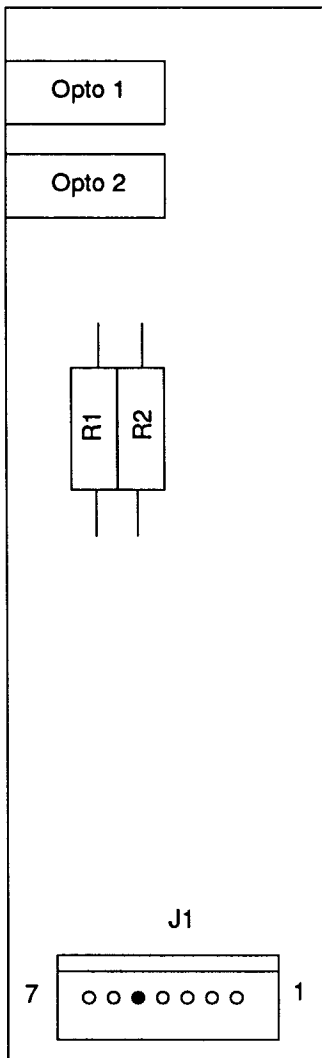
J905 - 1 Blue-Violet to right opto switch board J1-1
 J905 - 2 Blue-Gray to left opto switch board J1-1
 J905 - 3 Black-Yellow to right opto switch board J1-2
 J905 - 4 N/C
 J905 - 5 Black-Blue to left opto switch board J1-2
 J905 - 6 Orange (Grd) to left opto switch board J1-3

J906 - 1 Black-Green to lower right EOS switch
 J906 - 2 N/C
 J906 - 3 Black-Blue to lower left EOS switch
 J906 - 4 Black-Violet to upper right EOS switch
 J906 - 5 N/C
 J906 - 6 Orange (Grd) to EOS switches

J907 - 1 N/C
 J907 - 2 N/C
 J907 - 3 N/C
 J907 - 4 Blue-Yellow (+50V) to upper right flipper coil
 J907 - 5 Blue-Yellow (+50V) loop from J907-4
 J907 - 6 Gray-Yellow (+50V) to lower left flipper coil
 J907 - 7 Gray-Yellow (+50V) loop from J907-6
 J907 - 8 Blue-Yellow (+50V) to lower right flipper coil
 J907 - 9 Blue-Yellow (+50V) loop from J907-8

A-15894

Flipper Cabinet Opto Switch Board & Schematic



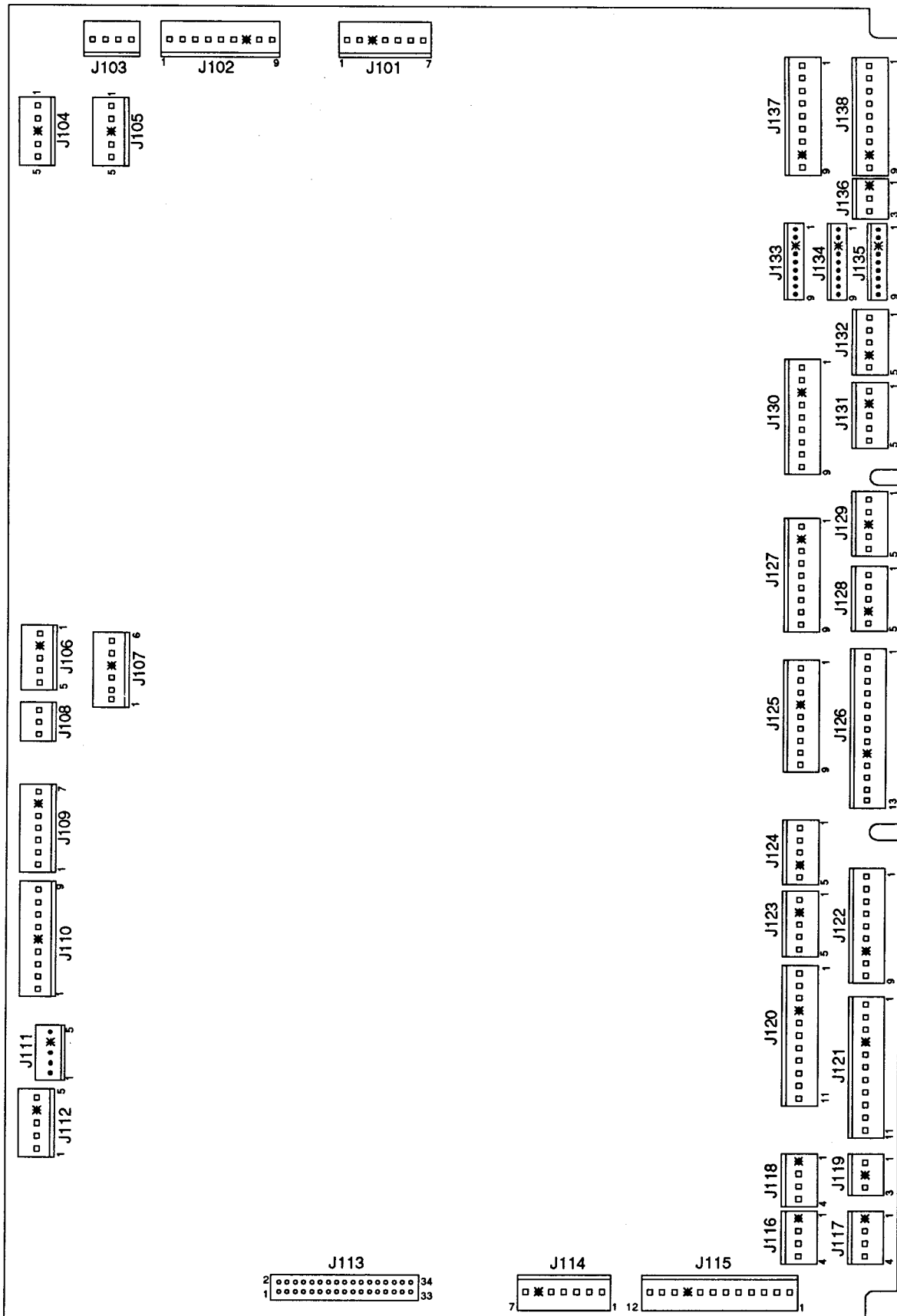
Left Side Flipper Cabinet Opto Switch Board

J1 - 1 Blue-Gray from Fliptronic II Board J905-2
 J1 - 2 Black-Blue from Fliptronic II Board J905-5
 J1 - 3 Orange from Fliptronic II Board J905-6
 J1 - 4 N/C
 J1 - 5 N/C
 J1 - 6 Gray-Yellow from Fliptronic II Board J904-2
 J1 - 7 N/C

Right Side Flipper Cabinet Opto Switch Board

J1 - 1 Blue-Violet from Fliptronic II Board J905-1
 J1 - 2 Black-Yellow from Fliptronic II Board J905-3
 J1 - 3 Orange from Fliptronic II Board J905-6
 J1 - 4 Orange from Left Side Flipper Cabinet Opto Switch Brd J1-3
 J1 - 5 N/C
 J1 - 6 N/C
 J1 - 7 Gray-Yellow from Left Side Flipper Cabinet Opto Switch Brd J1-6

A-12697-1 Power Driver Board



Power Driver Board Interboard Wiring

J101 - 1 Red (9VAC) from xformer secondary	J109 - 1 N/C
J101 - 2 Red (9VAC) from xformer secondary	J109 - 2 N/C
J101 - 3 N/C	J109 - 3 N/C
J101 - 4 Blue-White (13VAC) from xformer secondary	J109 - 4 N/C
J101 - 5 Blue-White (13VAC) loop from J101-4	J109 - 5 N/C
J101 - 6 Blue-White (13VAC) from xformer secondary	J109 - 6 N/C
J101 - 7 Blue-White (13VAC) loop from J101-6	J109 - 7 N/C
J102 - 1 White-Red (16VAC) loop from J102-2	J110 - 1 N/C
J102 - 2 White-Red (16VAC) from xformer secondary	J110 - 2 N/C
J102 - 3 White-Red (16VAC) loop from J102-4	J110 - 3 N/C
J102 - 4 White-Red (16VAC) from xformer secondary	J110 - 4 N/C
J102 - 5 Black-Yellow (51VAC) loop from J102-6	J110 - 5 N/C
J102 - 6 Black-Yellow (51VAC) from xformer secondary	J110 - 6 N/C
J102 - 7 N/C	J110 - 7 N/C
J102 - 8 Black-Yellow (51VAC) loop from J102-9	J110 - 8 N/C
J102 - 9 Black-Yellow (51VAC) from xformer secondary	J110 - 9 N/C
J103 - 1 N/C	J111 - 1 N/C
J103 - 2 N/C	J111 - 2 N/C
J103 - 3 N/C	J111 - 3 N/C
J103 - 4 N/C	J111 - 4 N/C
	J111 - 5 N/C
J104 - 1 White-Blue (50VAC) to Fliptronic II Board J901-3	J112 - 1 White-Green (9.8VAC) from xformer secondary
J104 - 2 White-Blue (50VAC) to Fliptronic II Board J901-1	J112 - 2 White-Green (9.8VAC) loop from J112-1
J104 - 3 N/C	J112 - 3 White-Green (9.8VAC) from xformer secondary
J104 - 4 N/C	J112 - 4 N/C
J104 - 5 N/C	J112 - 5 White-Green (9.8VAC) loop from J112-3
J105 - 1 N/C	J113, 34-pin Ribbon Cable (data) To/from CPU J211
J105 - 2 N/C	
J105 - 3 N/C	
J105 - 4 White-Red (20VAC) to Chase Lamp Board J1-2	
J105 - 5 White-Red (20VAC) to Chase Lamp Board J1-1	
J106 - 1 N/C	J114 - 1 Gray-Green (+12V) to J210-6,7; J904-2
J106 - 2 N/C	J114 - 2 Gray-Green (+12V) to J210-6,7; J904-2
J106 - 3 N/C	J114 - 3 Gray (+5V) to J210-4,5; J502-1,3; J904-1
J106 - 4 N/C	J114 - 4 Gray (+5V) to J210-4,5; J502-1,3; J904-1
J106 - 5 Red-White (+20V) to backbox flashlamps	J114 - 5 Black (Grd) to J210-1,3; J502-4,5; J904-4,5
	J114 - 6 N/C
	J114 - 7 Black (Grd) to J210-1,3; J502-4,5; J904-4,5
J107 - 1 N/C	J115 - 1 Yellow-White (6.8VAC) from xformer secondary
J107 - 2 Violet-Orange (+50V) to coils	J115 - 2 Yellow (6.8VAC) from xformer secondary
J107 - 3 Violet-Yellow (+50V) to coils	J115 - 3 Yellow (6.8VAC) loop from J115-2
J107 - 4 N/C	J115 - 4 Yellow (6.8VAC) from xformer secondary
J107 - 5 N/C	J115 - 5 Yellow (6.8VAC) loop from J115-4
J107 - 6 Red-White (+20V) to playfield flashlamps	J115 - 6 Yellow (6.8VAC) from xformer secondary
	J115 - 7 Yellow-White (6.8VAC) from xformer secondary
	J115 - 8 Yellow-White (6.8VAC) loop from J115-7
	J115 - 9 N/C
	J115 - 10 Yellow-White (6.8VAC) from xformer secondary
	J115 - 11 Yellow-White (6.8VAC) loop from J115-10
	J115 - 12 Yellow-White (6.8VAC) from xformer secondary

Power Driver Board Interboard Wiring Continued...

J116 - 1 N/C	J123 - 1 N/C
J116 - 2 Gray-Yellow (+12V) to Coin Door J2-4	J123 - 2 N/C
J116 - 3 Black (Grd) to Coin Door J2-5	J123 - 3 N/C
J116 - 4 N/C	J123 - 4 Blue-Orange (sol. 27 drive) to Chase Lamp Brd J1-5
	J123 - 5 Blue-Yellow (sol. 28 drive) to Chase Lamp Brd J1-6
J117 - 1 N/C	J124 - 1 N/C
J117 - 2 Gray-Yellow (+12V) to Dot Matrix Controller J606-7	J124 - 2 N/C
J117 - 3 Black (Grd) to Dot Matrix Controller J606-3	J124 - 3 N/C
J117 - 4 Gray (+5V) to Dot Matrix Controller J606-5	J124 - 4 N/C
	J124 - 5 N/C
J118 - 1 N/C	
J118 - 2 Gray-Yellow (+12V) to Chase Lamp Brd J1-7, to 7-opto Switch Brd J1-1, to 2-opto Switch Brd J1-6, to Motor Drive Brd J1-5	J125 - 1 Black-Brown (sol. 17 drive) to backbox flashlamp
J118 - 3 Black (Grd) to Chase Lamp Brd J1-4, to 7-opto Switch Brd J1-3, to 2-opto Switch Brd J1-5, to Motor Drive Brd J1-4	J125 - 2 Black-Red (sol. 18 drive) to backbox flashlamp
J118 - 4 N/C	J125 - 3 N/C
	J125 - 4 N/C
J119 - 1 White-Violet (6.8VAC) G.I. to Coin Door Brd J2-2	J125 - 5 Black-Yellow (sol. 20 drive) to backbox flashlamp
J119 - 2 N/C	J125 - 6 N/C
J119 - 3 Violet (return) G.I. to Coin Door Brd J2-1	J125 - 7 N/C
	J125 - 8 N/C
J120 - 1 Brown (return) G.I. to playfield	J125 - 9 Blue-Gray (sol. 24 drive) to backbox flashlamp
J120 - 2 Orange (return) G.I. to playfield	
J120 - 3 Yellow (return) G.I. to playfield	J126 - 1 Black-Brown (sol. 17 drive) to playfield flashlamp
J120 - 4 N/C	J126 - 2 Black-Red (sol. 18 drive) to playfield flashlamp
J120 - 5 N/C	J126 - 3 Black-Orange (sol. 19 drive) to playfield flashlamp
J120 - 6 N/C	J126 - 4 Black-Yellow (sol. 20 drive) to playfield flashlamp
J120 - 7 White-Brown (6.8VAC) to playfield	J126 - 5 Blue-Green (sol. 21 drive) to playfield flashlamp
J120 - 8 White-Orange (6.8VAC) to playfield	J126 - 6 Blue-Black (sol. 22 drive) to playfield flashlamp
J120 - 9 White-Yellow (6.8VAC) to playfield	J126 - 7 Blue-Violet (sol. 23 drive) to playfield flashlamp
J120 - 10 N/C	J126 - 8 Blue-Gray (sol. 24 drive) to playfield flashlamp
J120 - 11 N/C	J126 - 9 N/C
	J126 - 10 N/C
J121 - 1 N/C	J126 - 11 N/C
J121 - 2 N/C	J126 - 12 N/C
J121 - 3 Yellow (return) G.I. to backbox	J126 - 13 N/C
J121 - 4 N/C	
J121 - 5 Green (return) G.I. to backbox	J127 - 1 N/C
J121 - 6 Violet (return) G.I. to backbox	J127 - 2 N/C
J121 - 7 N/C	J127 - 3 Brown-Red (sol. 10 drive) to playfield coil
J121 - 8 N/C	J127 - 4 Brown-Orange (sol. 11 drive) to playfield coil
J121 - 9 White-Yellow (6.8VAC) to backbox	J127 - 5 Brown-Yellow (sol. 12 drive) to playfield coil
J121 - 10 White-Green (6.8VAC) to backbox	J127 - 6 Brown-Green (sol. 13 drive) to playfield coil
J121 - 11 White-Violet (6.8VAC) to backbox	J127 - 7 Brown-Blue (sol. 14 drive) to playfield coil
	J127 - 8 N/C
J122 - 1 Blue-Brown (sol. 25 drive) to Motor Drive Brd J1-2	J127 - 9 N/C
J122 - 2 Blue-Red (sol. 26 drive) to Motor Drive Brd J1-1	
J122 - 3 N/C	J128 - 1 N/C
J122 - 4 N/C	J128 - 2 N/C
J122 - 5 N/C	J128 - 3 Brown-Violet (sol. 15 drive) to backbox flashlamps
J122 - 6 N/C	J128 - 4 N/C
J122 - 7 N/C	J128 - 5 Brown-Gray (sol. 16 drive) to backbox flashlamps
J122 - 8 N/C	
J122 - 9 N/C	

Power Driver Board Interboard Wiring Continued...

J129 - 1 Brown-Black (sol 9 drive) to backbox flashlamp
J129 - 2 N/C
J129 - 3 N/C
J129 - 4 N/C
J129 - 5 N/C

J130 - 1 Violet-Brown (sol. 1 drive) to playfield coil
J130 - 2 Violet-Red (sol. 2 drive) to playfield coil
J130 - 3 N/C
J130 - 4 Violet-Orange (sol. 3 drive) to playfield coil
J130 - 5 Violet-Yellow (sol. 4 drive) to playfield coil
J130 - 6 Violet-Green (sol. 5 drive) to playfield coil
J130 - 7 Violet-Blue (sol. 6 drive) to playfield coil
J130 - 8 Violet-Black (sol. 7 drive) to backbox coil
J130 - 9 N/C

J131 - 1 N/C
J131 - 2 N/C
J131 - 3 N/C
J131 - 4 N/C
J131 - 5 Violet-Gray (sol. 8 drive) to backbox flashlamps

J132 - 1 N/C
J132 - 2 N/C
J132 - 3 N/C
J132 - 4 N/C
J132 - 5 N/C

J133 - 1 Red-Brown (lamp row 1) to playfield lamps
J133 - 2 Red-Black (lamp row 2) to playfield lamps
J133 - 3 N/C
J133 - 4 Red-Orange (lamp row 3) to playfield lamps
J133 - 5 Red-Yellow (lamp row 4) to playfield lamps
J133 - 6 Red-Green (lamp row 5) to playfield lamps
J133 - 7 Red-Blue (lamp row 6) to playfield lamps
J133 - 8 Red-Violet (lamp row 7) to playfield lamps
J133 - 9 Red-Gray (lamp row 8) to playfield lamps

J134 - 1 N/C
J134 - 2 N/C
J134 - 3 N/C
J134 - 4 N/C
J134 - 5 N/C
J134 - 6 N/C
J134 - 7 N/C
J134 - 8 N/C
J134 - 9 Red-Gray (lamp row 8) to Coin Door Brd J1-2

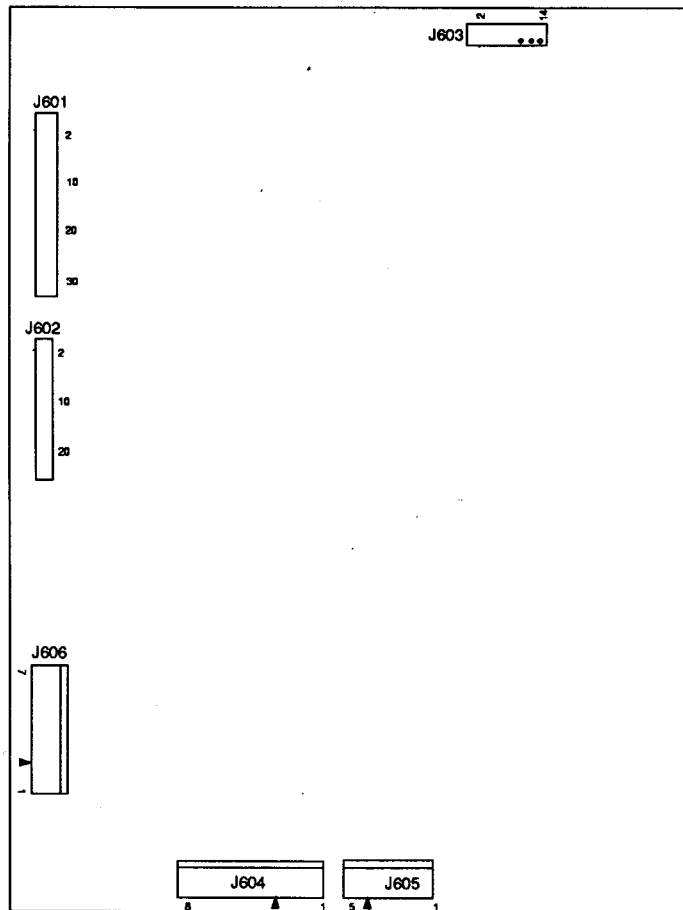
J135 - 1 N/C
J135 - 2 N/C
J135 - 3 N/C
J135 - 4 N/C
J135 - 5 N/C
J135 - 6 N/C
J135 - 7 N/C
J135 - 8 N/C
J135 - 9 N/C

J136 - 1 N/C
J136 - 2 N/C
J136 - 3 Yellow-Gray (lamp col. 8) to cabinet lamp

J137 - 1 Yellow-Brown (lamp col. 1) to playfield lamps
J137 - 2 Yellow-Red (lamp col. 2) to playfield lamps
J137 - 3 Yellow-Orange (lamp col. 3) to playfield lamps
J137 - 4 Yellow-Black (lamp col. 4) to playfield lamps
J137 - 5 Yellow-Green (lamp col. 5) to playfield lamps
J137 - 6 Yellow-Blue (lamp col. 6) to playfield lamps
J137 - 7 Yellow-Violet (lamp col. 7) to playfield lamps
J137 - 8 N/C
J137 - 9 Yellow-Gray (lamp col. 8) to playfield lamps

J138 - 1 N/C
J138 - 2 N/C
J138 - 3 N/C
J138 - 4 N/C
J138 - 5 N/C
J138 - 6 N/C
J138 - 7 N/C
J138 - 8 N/C
J138 - 9 N/C

A-14039 **Dot Matrix Controller Board** **Interboard Wiring**



J601, 34-pin Ribbon Cable (data) To/from J202; J903; J506

J602, 26-pin Ribbon Cable (data) To/from J201

J603, 14-pin Ribbon Cable (data) To/from Dot Matrix Display/Driver

J604 - 1 Orange (-125V) to Display/Driver pin 1

J604 - 2 Blue (-113V) to Display/Driver pin 2

J604 - 3 N/C

J604 - 4 Black (Grd) to Display/Driver pin 4

J604 - 5 Black (Grd) to Display/Driver pin 5

J604 - 6 Gray (+5V) to Display/Driver pin 6

J604 - 7 Gray-Yellow (+12V) to Display/Driver pin 7

J604 - 8 Brown (+62V) to Display/Driver pin 8

J605 - 1 White (80VAC) from xformer secondary

J605 - 2 White (80VAC) from xformer secondary

J605 - 3 Violet (100VAC) from xformer secondary

J605 - 4 N/C

J605 - 5 Violet (100VAC) from xformer secondary

J606 - 1 Black (Grd) loop from J606-3

J606 - 2 N/C

J606 - 3 Black (Grd) from Power Driver Brd J117-3

J606 - 4 Gray (+5V) loop from J606-5

J606 - 5 Gray (+5V) from Power Driver Brd J117-4

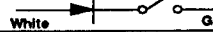
J606 - 6 Gray-Yellow (+12V) loop from J606-7

J606 - 7 Gray-Yellow (+12V) from Power Driver Brd J117-2

Lamps

Lamp Matrix								
								
Column Row	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J137-7 Q92	8 Yellow-Gray J137-8 Q91
1 Red-Brown J133-1 Q90	Shoot Again 11	River "R1" 21	Raft 7 31	3-Bank Center 41	Hazzard 1 51	Raft 1 61	Whirlpool 1 71	Light Extra Ball 81
2 Red-Black J133-2 Q89	Kickback 12	River "I" 22	Raft 8 32	3-Bank Lower 42	Hazzard 5 52	Raft 2 62	Whirlpool 2 72	Advance Raft 82
3 Red-Orange J133-4 Q88	Left Outlane 13	River "V" 23	Wet Willie 33	Lock Release 43	Hazzard 6 53	Raft 3 63	Whirlpool 3 73	Mystery 83
4 Red-Yellow J133-5 Q87	Left Flipper Lane 14	River "E" 24	Ramp Millions 34	3-Bank Top 44	Hazzard 7 54	Raft 4 64	Whirlpool 4 74	Boulder 5X Award 84
5 Red-Green J133-6 Q86	Right Flipper Lane 15	River "R2" 25	Hazzard 4 35	Hazzard 4 45	Not Used 55	Raft 5 65	Whirlpool 5 75	Not Used 85
6 Red-Blue J133-7 Q85	Right Outlane 16	Hazzard 3 26	Left Light Lock 36	Right Light Lock 46	Extra Ball 56	Raft 6 66	Whirlpool 6 76	Not Used 86
7 Red-Violet J133-8 Q84	Not Used 17	Lock 1 27	2X Multiplier 37	4X Multiplier 47	Whirl Challenge 57	2-Bank Upper 67	Multi Jackpot 77	Not Used 87
8 Red-Gray J133-9 Q83	6X Multiplier 18	Lock 2 28	3X Multiplier 38	5X Multiplier 48	Boulder Man Over 58	2-Bank Lower 68	Bigfoot Jackpot 78	Start Button 88

Switches

Switch Matrix									
									
Column Row	1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-8 U20-11	
D1 Orange-Brown J205-1 Left Coin Chute	White-Brown J209-1 U18-11	Not Used 11	River "R2" 21	Light Lock Left 41	Left Sling 51	Whirlpool Popper 61	Rapids Ramp Main 71	Not Used 81	F1 Black-Green J906-1 Lower Right E.O.S. Switch
D2 Orange-Red J209-2 Center Coin Chute	White-Red J209-2 U18-9	Not Used 12	Coin Door Closed 22	Light Lock Right 42	Right Sling 52	Whirlpool Exit 62	Not Used 72	Not Used 82	F2 Blue-Violet J905-1 Lower Right Flipper Button
D3 Orange-Black J205-3 Right Coin Chute	White-Orange J209-3 U18-5	Start Button 13	Ticket Opto. 23	River "V" 33	Ball Shooter 53	Lockup Right 63	Hot Foot Upper 73	Not Used 83	F3 Black-Blue J906-3 Lower Left E.O.S. Switch
D4 Orange-Yellow J205-4 Fourth Coin Chute	White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	River "I" 34	Lower Jet Arena 54	Lockup Center 64	Hot Foot Lower 74	Not Used 84	F4 Blue-Gray J905-2 Lower Left Flipper Button
D5 Orange-Green J205-6 Normal Function Service Credits	White-Green J209-5 U18-11	Outhole 15	Left Outlane 25	River "R1" 35	Secret Passage 45	Right Jet Arena 55	Lockup Left 65	Disas. Drop Main 75	F5 Black-Violet J906-4 Upper Right E.O.S. Switch
D6 Orange-Blue J205-7 Normal Function Volume Down	White-Blue J209-7 U18-9	Left Jet Bumper 16	Left Flipper Lane 26	3-Bank Top 36	Left Ramp Enter 46	Extra Ball 56	Left Ramp Main 66	Right Trough 76	F6 Black-Yellow J905-3 Upper Right Flipper Button
D7 Orange-Violet J205-8 Normal Function Volume Up	White-Violet J209-8 U18-5	Right Jet Bumper 17	Right Flipper Lane 27	3-Bank Center 37	Rapids Enter 47	Canyon Main 57	Not Used 67	Center Trough 77	F7 Black-Gray J906-5 Upper Left E.O.S. Switch
D8 Orange-Gray J205-9 Normal Function Begin Test	White-Gray J209-9 U18-7	Center Jet Bumper 18	Right Outlane 28	3-Bank Lower 38	Canyon Entrance 48	Bigfoot Cave 58	Disas. Drop Enter 68	Left Trough 78	F8 Black-Blue J905-5 Upper Left Flipper Button

WARNINGS & NOTICES

WARNING

FOR SAFETY AND RELIABILITY, substitute parts and equipment modifications are not recommended. Use of Non-WILLIAMS parts or modifications of game circuitry, may adversely affect game play, or may cause injuries.

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RF Interference Notice

CABLE HARNESS PLACEMENTS and ground strap routing on this game have been designed to keep RF radiation and conduction within levels accepted by the FCC Rules.

TO MAINTAIN THESE LEVELS, reposition harnesses and reconnect ground straps to their original placements, if they become disconnected during maintenance.

FCC STICKER. Check the back of your game to verify that an FCC-certification sticker was attached to your game at the factory. All games that leave the WILLIAMS plant have been tested and found to comply with FCC Rules. Because the sticker is proof of this fact, legal repercussions to the owner and distributor may result, if the sticker is missing. If you receive a game, manufactured after December 1982, that has no FCC sticker, call WILLIAMS for advice or write us a note on your Game Registration Card. Be sure that the card bears your game's serial number.



CAUTION

**Transport this game ONLY
with hinged backbox DOWN!**

FOR SERVICE... CALL your authorized WILLIAMS Distributor.