

*Bally*

January 1993  
16-20018-101

# CREATURE FROM THE BLACK LAGOON

**Operations Manual Includes**

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

**Midway Manufacturing Company  
3401 North California Avenue  
Chicago, Illinois 60618**

# JUMPER CHARTS

## Display

1MEG, 2MEG, 4 MEG EPROM	W1	W2
512K, 1 MEG EPROM	In	Out
	Out	In

Country	W14	W15	W16	W17	W18
America	In	In	In	In	In
European	In	In	Out	In	In
French	In	In	In	Out	Out
German	In	In	In	In	Out
Spain	In	Out	In	In	In

# SOLENOID/FLASHER TABLE

Sol. No.	Function	Solenoid Type	Voltage Connections		Drive Xister	Drive Connections		Solenoid Part Number	
			Playfield	Cabinet		Playfield	Cabinet		
01	Top Right Popper	High Power	J107-3		Q82	J130-1	Vio-Brn	AE-23-800	
02	Left Subway Enter, Flasher	High Power	J107-5	J106-5	Q80	J130-2	Vio-Red	#89	
03	Lower Right Popper	High Power	J107-3		Q78	J130-4	Vio-Org	AE-26-1200	
04	Trough	High Power	J107-3		Q76	J130-5	Vio-Yel	AE-26-1200	
05	Right Slingshot	High Power	J107-3		Q64	J130-6	Vio-Grn	AE-27-1200	
06	Left Slingshot	High Power	J107-3		Q66	J130-7	Vio-Blu	AE-27-1200	
07	Knocker	High Power	J107-3		Q68	J130-8	Vio-Blk	AE-23-800	
08	Bottom Right Flasher	High Power	J107-5	J106-5	Q70	J130-9	Vio-Gry	#89	
09	Back Flashers	Low Power	J107-6		Q58	J127-1	Brn-Blk	#89 (2)	
10	Bowl Flasher	Low Power	J107-6	J106-5	Q56	J127-3	Brn-Red	#89	
11	Creature Flasher	Low Power	J106-5		Q54	J129-4	Brn-Org	#906 (2)	
12	Outhole	Low Power	J107-2		Q52	J127-5	Brn-Yel	AE-27-1200	
13	Left Jet	Low Power	J107-2		Q50	J127-6	Brn-Grn	AE-26-1200	
14	Right Jet	Low Power	J107-2		Q48	J127-7	Brn-Blu	AE-26-1200	
15	Bottom Jet	Low Power	J107-2		Q46	J127-8	Brn-Vio	AE-26-1200	
16	Right Popper Flasher	Low Power	J107-5	J106-5	Q44	J127-9	Brn-Gry	#89	
17	Bottom Left Flasher	Flasher	J107-5	J106-5	Q42	J126-1	Blk-Brn	#89	
18	Right Ramp Flasher	Flasher	J107-5	J106-5	Q40	J126-2	Blk-Red	#89	
19	Left Ramp Flasher	Flasher	J107-5	J106-5	Q38	J126-3	Blk-Org	#89	
20	Sequential G.I. #1	Flasher	J118-2		Q36	J126-4	Blk-Yel	#86	
21	Hologram Push Motor (playfield)	Flasher	J104-1,2		Q28	J126-5	Blu-Grn	14-7977 48VAC	
22	Center Hole Flasher	Flasher	J107-6	J106-5	Q30	J126-6	Blu-Blk	#89	
23	Up/Down Ramp (up)	Low Power	J107-1		Q34	J126-7**	Blu-Vio	SM1-28-900-DC	
24	Sequential G.I. #2	Low Power	J118-2		Q32	J126-8	Blu-Gry	#86	
25	Start Movie Flashers	Flasher	J107-6		Q26	J122-1	Blu-Brn	#89 (2)	
26	Up/Down Ramp (down)	Flasher	J107-1		Q24	J122-2*	Blu-Red	AE-26-1200	
27	Creature Motor (mirror)	Flasher		J104-1,2	Q22	J123-4	Blu-Org	14-7977 48VAC	
28	Hologram Lamp (cabinet)	Flasher		J118-2	Q20	J123-5	Blu-Yel	#1156	
	<b>General Illumination</b>		<b>Playfield</b>	<b>Backbox</b>	<b>Cabinet</b>	<b>Playfield</b>	<b>Backbox</b>	<b>Cabinet</b>	
01	Sequential G.I. #1	G.I.	J120-1		Q18	J120-7	Whit-Brn	#86	
02	Insert/Playfield (middle)	G.I.	J120-2	J121-2	Q10	J120-8	Whit-Org	#44	#555
03	Insert/Playfield (upper)	G.I.	J120-3	J121-3	Q14	J120-9	Whit-Yel	#44	#555
04	Sequential G.I. #2	G.I.	J120-5		Q16	J120-10	Whit-Grn	#86	
05	Insert/Playfield (lower)	G.I.	J120-6	J121-6	Q12	J120-11	Whit-Vio	#44	#555
	<b>Flipper Circuits</b>		<b>Playfield</b>	<b>Power</b>	<b>Holding</b>	<b>Playfield</b>	<b>Power</b>	<b>Holding</b>	
	Lower Left Flipper	Flipper	J907-4,5	Gry-Yel	Q2	J902-7,9	Blu-Gry	Org-Blu	FL-15411
	Lower Right Flipper	Flipper	J907-1,2	Blu-Yel	Q3	J902-11,13	Blu-Vio	Org-Grn	FL-11629

\*J122-6, Violet-Green, Tieback Diode  
 \*\*J126-12, Violet-Green, Tieback Diode

J1XX = Power Driver Board, J9XX = Flipflop II Board

**CREATURE**  
**FROM THE**  
**BLACK LAGOON**

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THE SPECIFICATIONS AND PARTS IDENTIFIED IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE.



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**CREATURE**  
**FROM THE**  
**BLACK LAGOON**

**GAME RULES**  
**&**  
**PLAYFIELD SHOT MAPS**

# GAME RULES

## PLUNGER SKILL SHOTS:

1. Score flashing "P-A-I-D" rollover to complete sequence, light "L" (in "F-I-L-M"), and advance bonus multiplier.
2. Pull plunger to maximum. Time the plunger release to the "K-I-S-S" lamp sequence. Score the maximum number of letters to complete the sequence, light "F" (in "F-I-L-M"), and advance "Extra Ball" sequence.

## COMPLETE "F-I-L-M" TO START MULTIBALL SEQUENCE:

F	=	"K-I-S-S" your date;
I	=	Complete "Menu" targets (4);
L	=	Admission is "P-A-I-D";
M	=	Ride the "Slide".

## MULTIBALL:

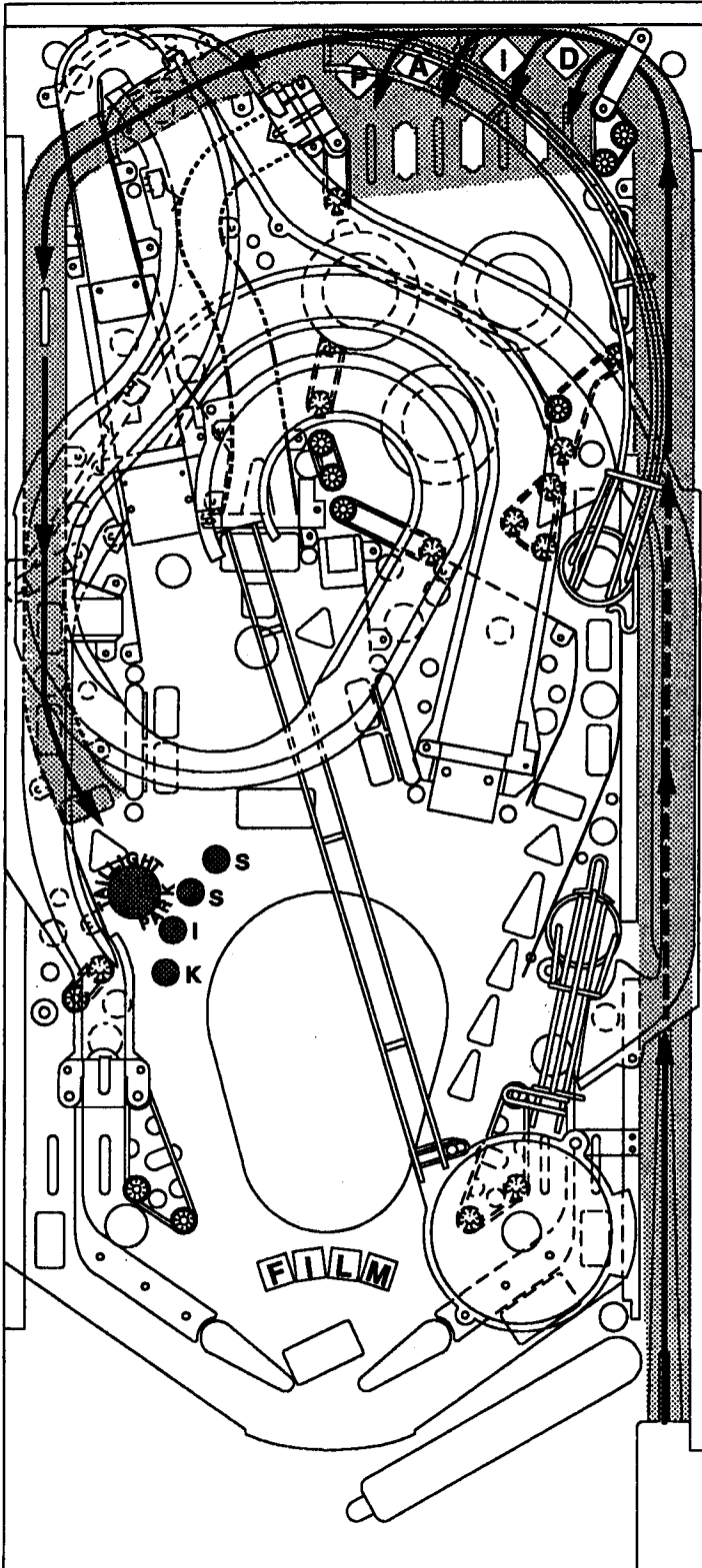
1. "Search" for the Creature at one of the three locations.
2. Once the Creature is found, "Rescue" girl at the center hole.
3. Next, score "Jackpot" at the center hole.
4. Decrease "Super Jackpot" countdown to zero in the jet bumpers.
5. Score "Super Jackpot" at the center hole.

Multiball scoring multiplier is advanced by completing "C-R-E-A-T-U-R-E" sequence in whirlpool bowl at the end of left ramp shot.

## FAST FORWARD:

End of ball bonus count may be accelerated by pressing either flipper button.

ADMIT ONE →



## PLUNGER SKILL SHOTS

A) Score flashing "P-A-I-D" lane to complete "Admit One" sequence\*,

- or -

B) Shoot top left rollover to score lit "K-I-S-S" letters. Score all letters to complete "Taillight Park" sequence\*\*.

\* "P-A-I-D" completion awards letter "L" in "F-I-L-M" sequence (multiball).

\*\* "K-I-S-S" completion awards letter "F" in "F-I-L-M" sequence (multiball).

## PLAYGROUND

A) Score "Slide" lamp when flashing to award letter "M" in "F-I-L-M" sequence (multiball).

B) Score "Start Mega Menu" when lit to start "Mega Menu" feature.

C) Score "Playground Award" when lit to award random feature.

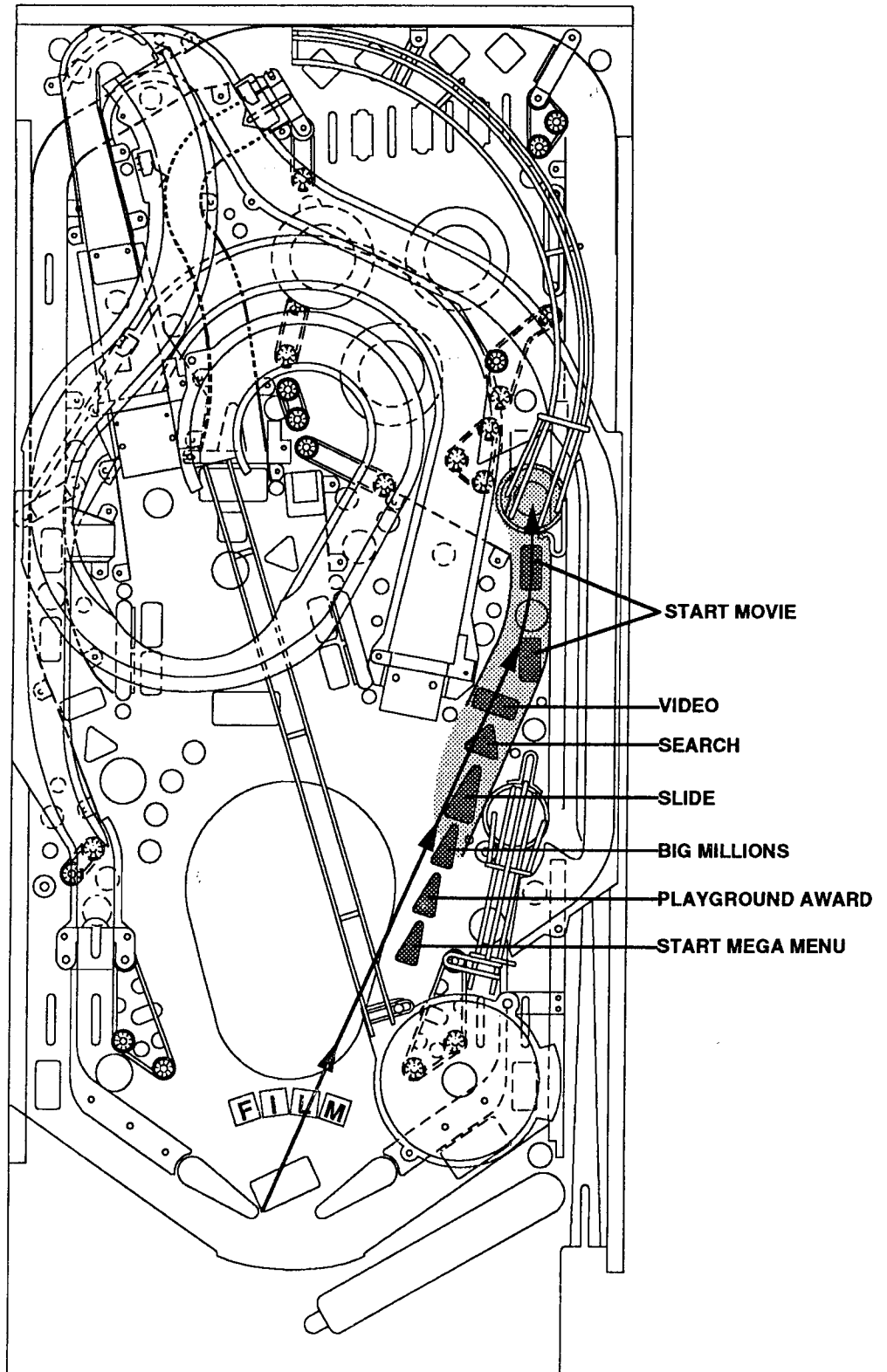
D) Score "Big Millions" when lit to start "Big Millions" ramp feature.

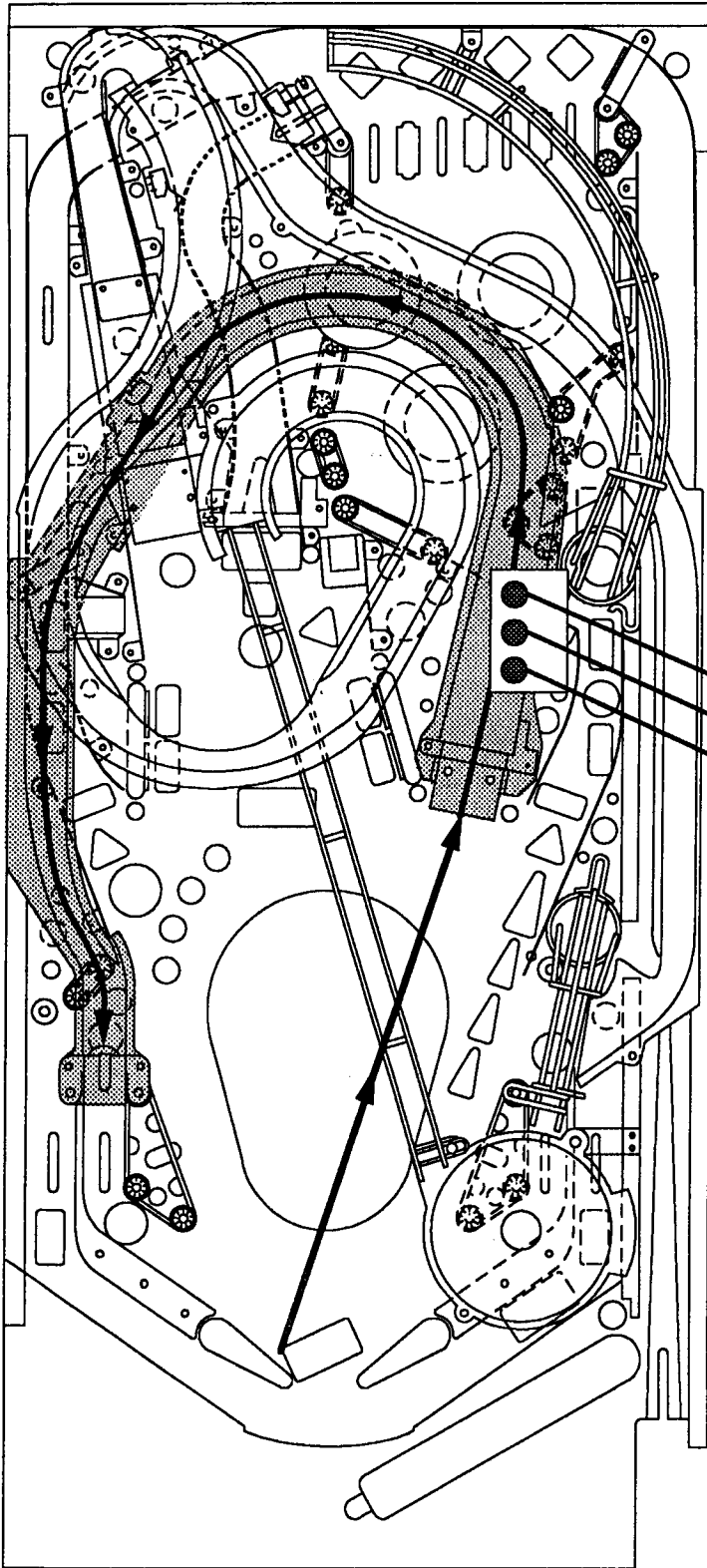
E) Score "Video" when lit to start feature.

F) Score "Start Movie" when flashing to start multiball play.

### **Multiball:**

G) Score "Search" when flashing to try to locate Creature.





## **RIGHT RAMP**

**A)** Shoot "Big Millions" when flashing to score 10 to 60 million.

**B)** Shoot lit "Snack Attack" ramp to count down for Snack Attack feature.

### **Multiball**

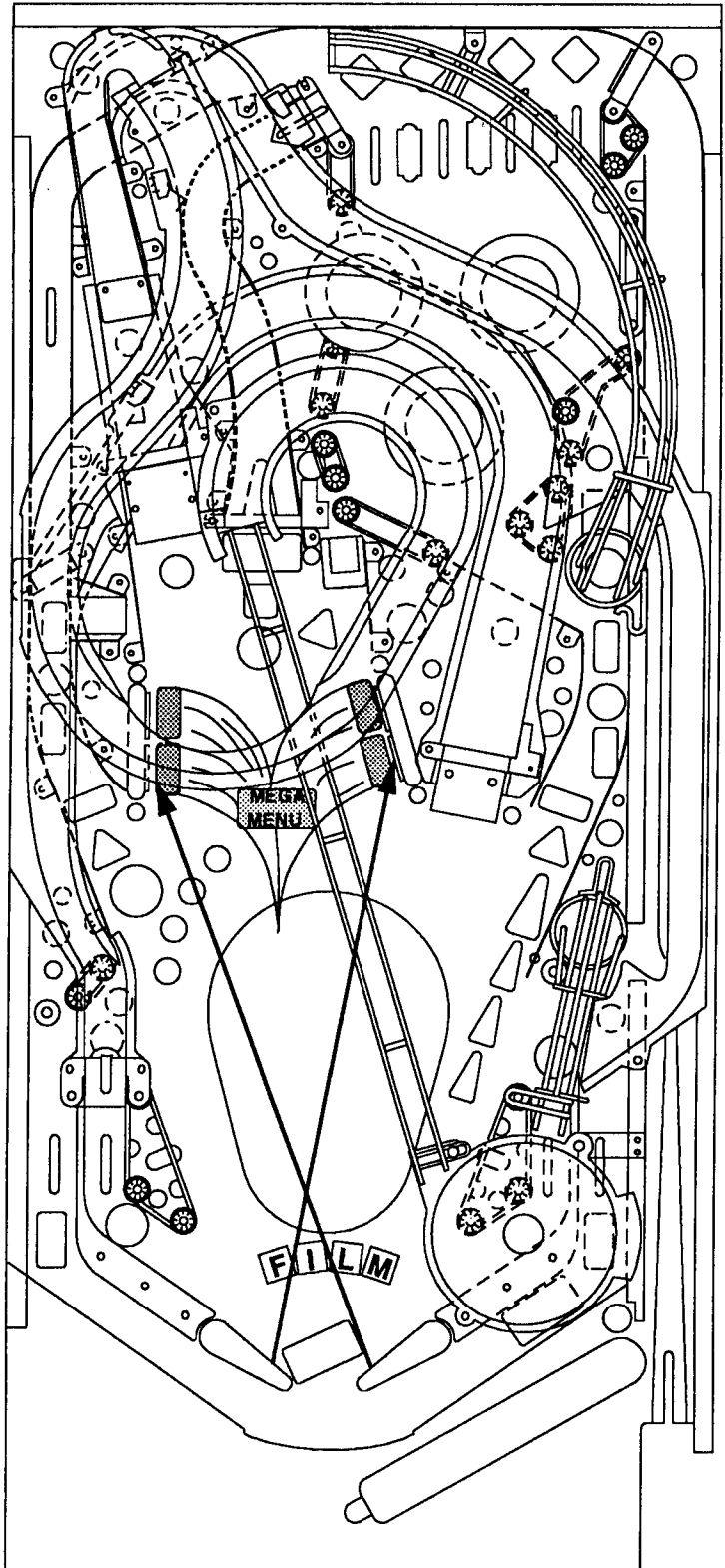
**C)** Score "Movie Madness" when lit to award big points.

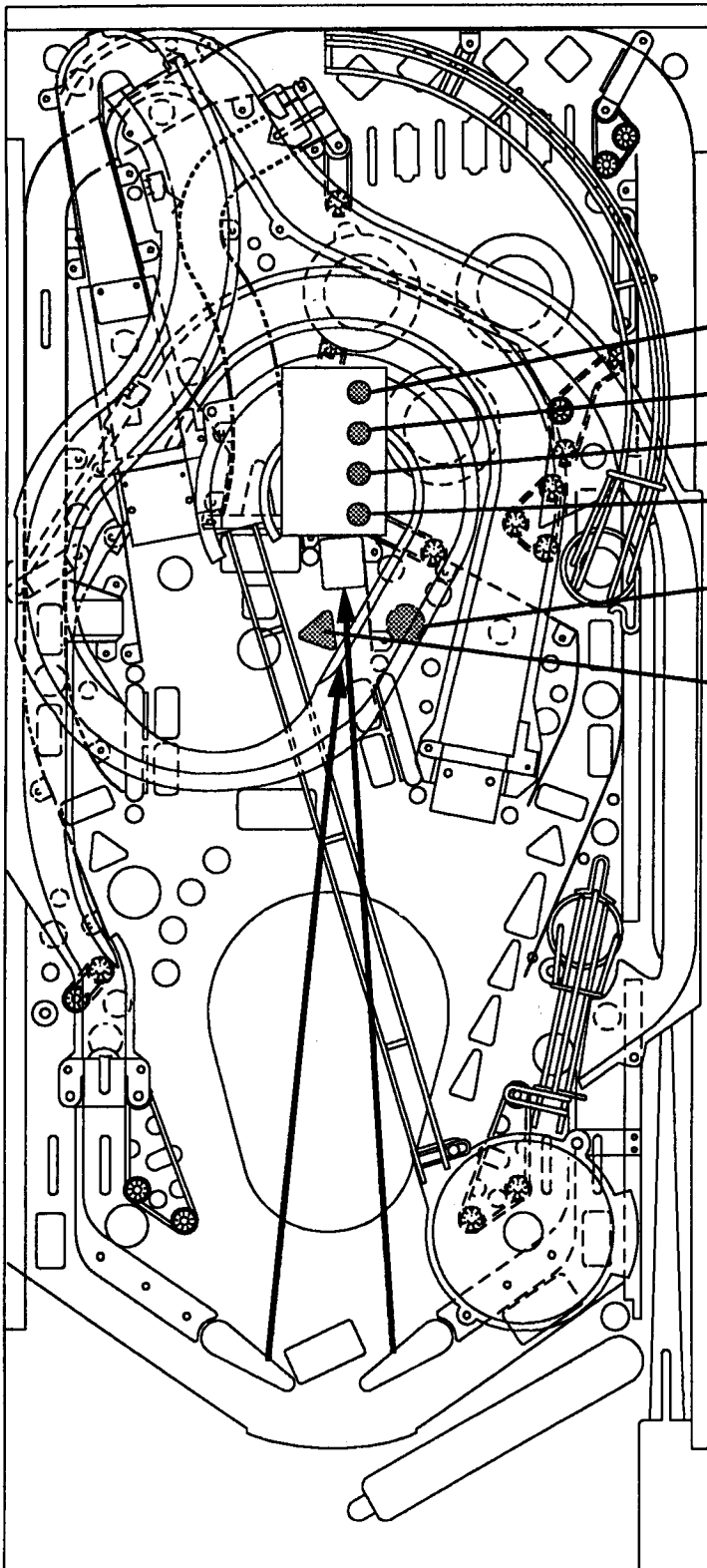
**BIG MILLIONS**  
**MOVIE MADNESS**  
**SNACK ATTACK**

## MENU TARGETS (4)

A) Shoot targets to light solid. Complete sequence to flash "Snack Bar Open" lamp and award letter "I" in "F-I-L-M" sequence (Multiball).

B) Scoring flashing menu targets while "Mega Menu" is flashing, scores 5 million points for each completed target.





## "SNACK BAR" HOLE

A) Shoot when "Snack Bar Open" is flashing to score "Snack Menu" feature.

### **Multiball:**

B) Score "Search" when flashing to try to locate Creature.

C) Score "Rescue" when flashing to retrieve girl from Creature at light "Jackpot".

D) Score "Jackpot" value when and start Super Jackpot jet bump countdown.

E) Score "Super Jackpot" value when lit and restart "Search" sequence.

F) Shoot when "Restart Multiball" flashing to return to Multiball play.

## CENTER TOP ROLLOVER

A) Score "Extra Ball" when lit.

B) Shoot when "Move Your Car" is flashing to score award and advance value of "Move Your Car".

C) Shoot when "Parking O.K." is lit to score points and count up to "Move Your Car".

D) Shoot when "Collect Combo" is lit to score "Double Feature Combo" bonus.

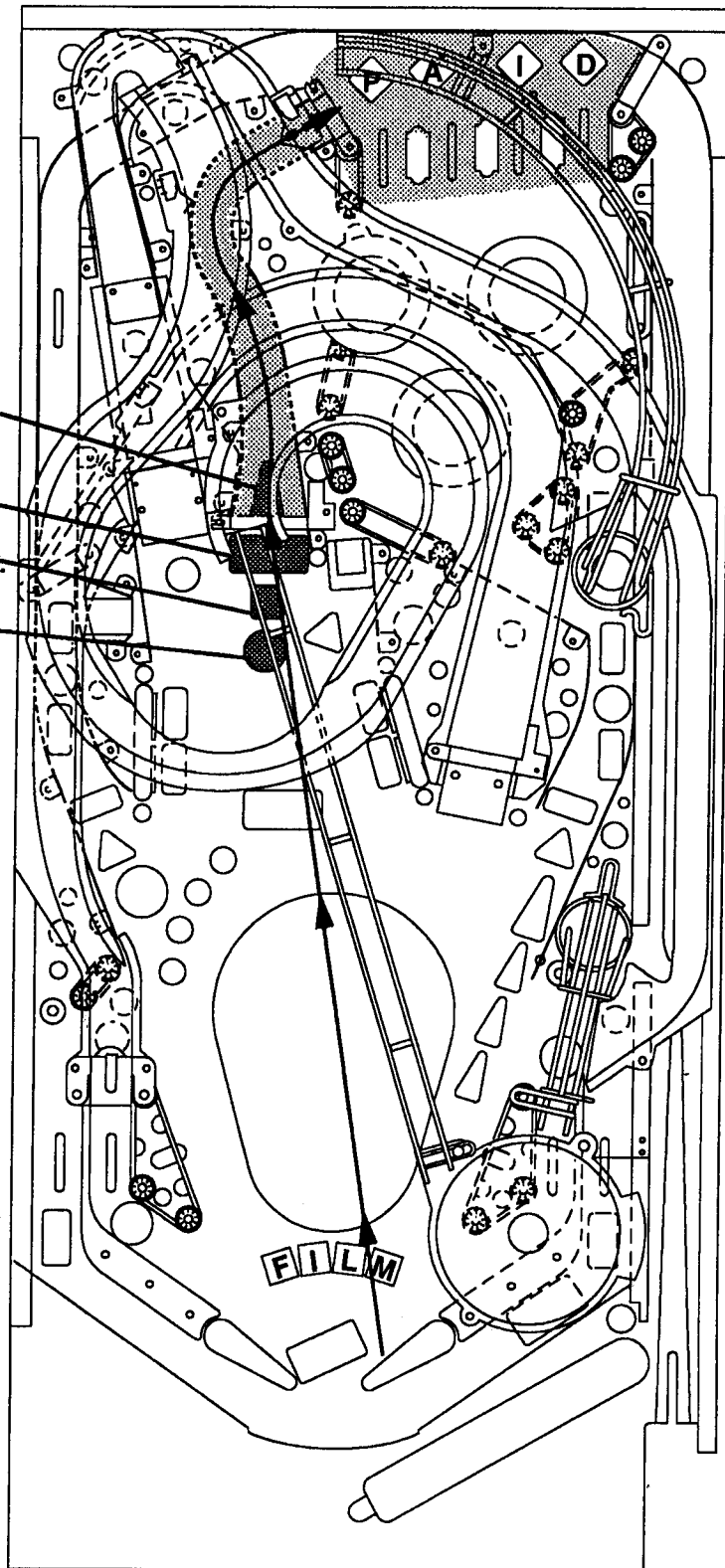
E) Shoot to access top "P-A-I-D" lanes. Completion of sequence lights "Admit One", advances bonus multiplier, and awards letter "L" in "F-I-L-M" sequence (multiball).

EXTRA BALL

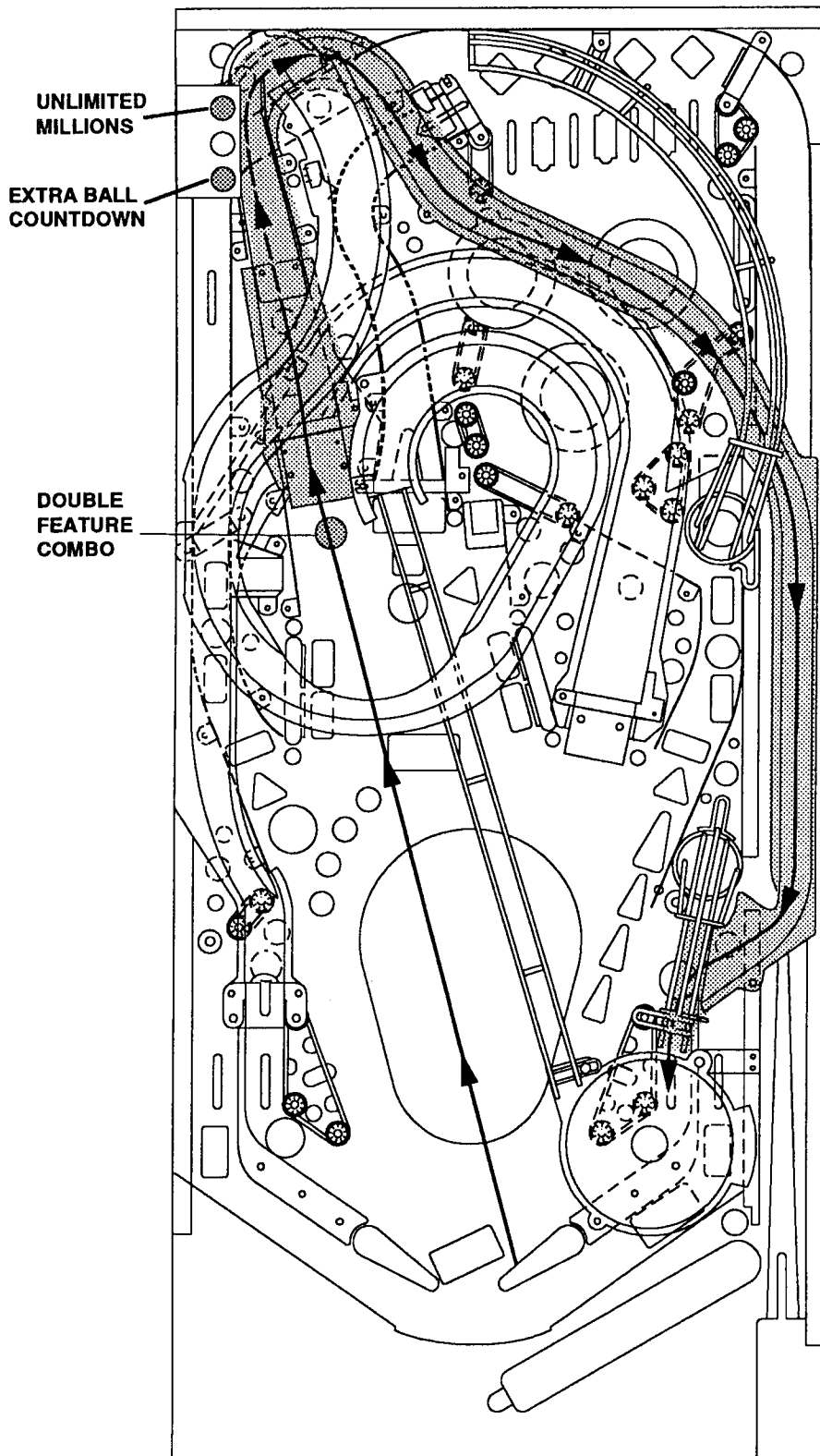
MOVE YOUR CAR

PARKING O.K.

COLLECT COMBO







## LEFT RAMP

**A)** Shoot consecutive number of shots to increase "Double Feature Combo" bonus.

**B)** Shoot consecutive shots to score "Unlimited Millions" when lit.

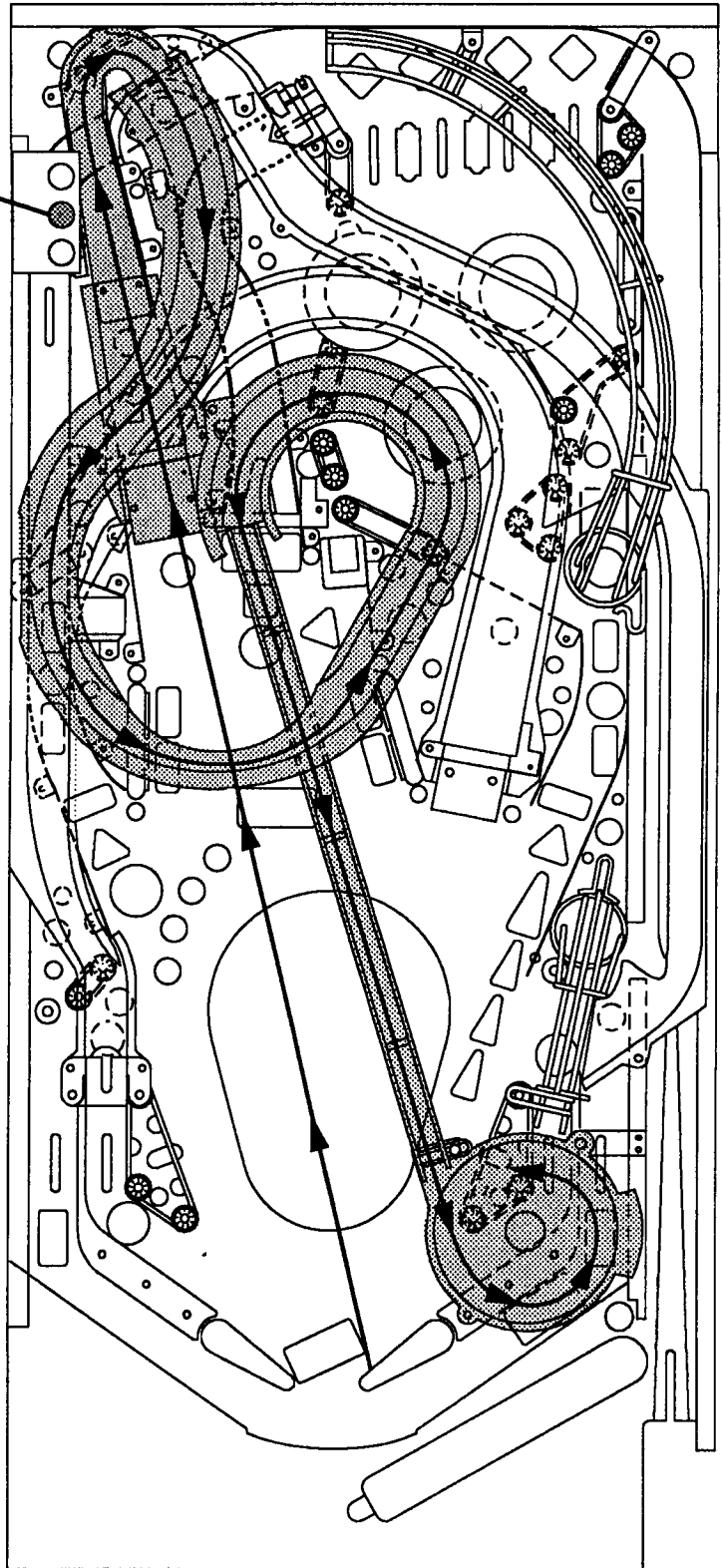
**C)** Shoot to light "Extra Ball" when "Extra Ball Countdown" is lit.

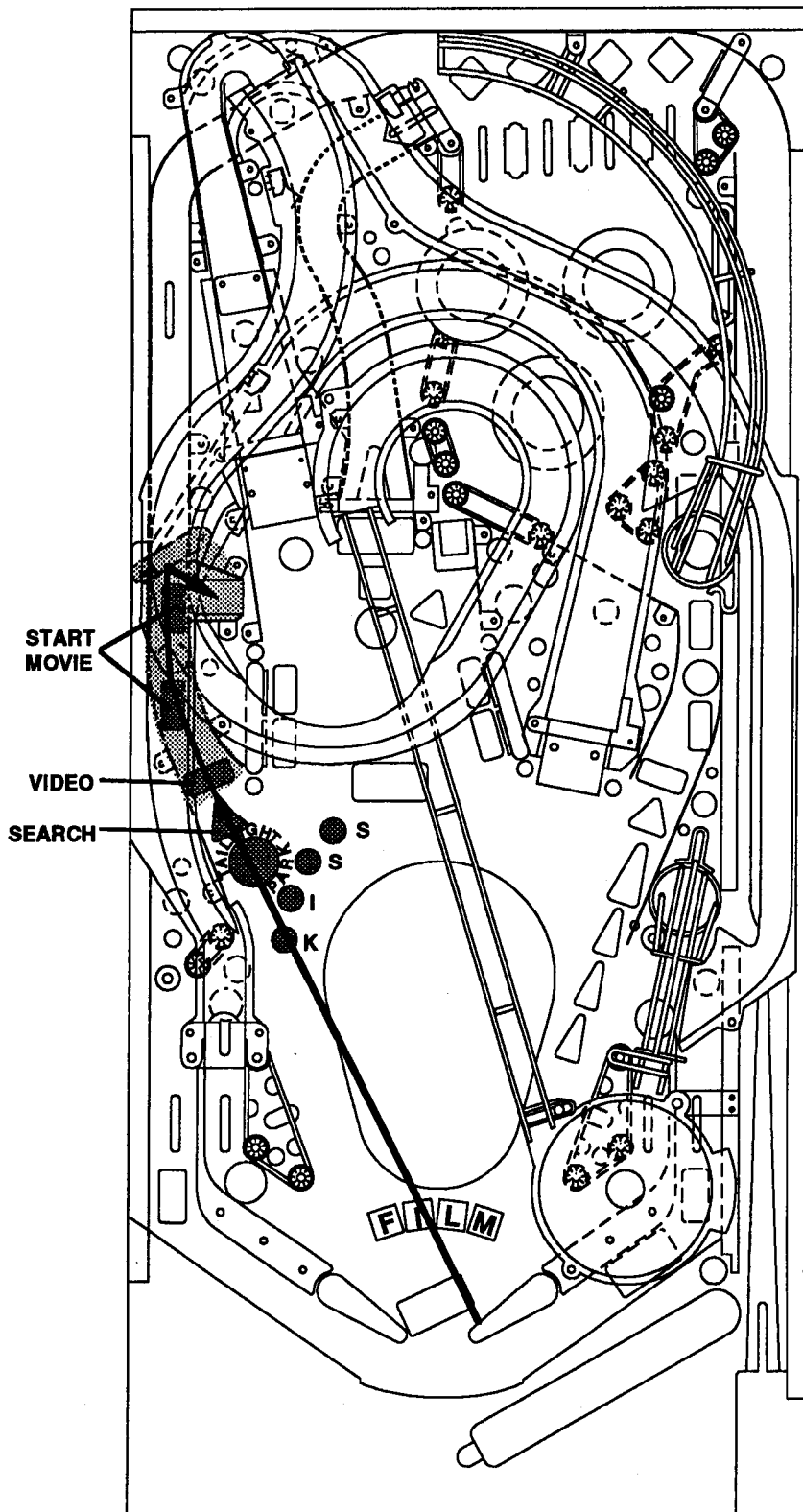
## LEFT RAMP

### **Multiball**

Shoot when "Creature Feature" is lit to access bowl return. Score 1 Million points per letter (times scoring multiplier) and advance "C-R-E-A-T-U-R-E" sequence in backbox. Each completion of "CREATURE" advances SCORING multiplier for multiball.

CREATURE  
FEATURE





## **TAILLIGHT PARK**

**A)** Shoot to score points and advance "K-I-S-S" sequence. 1st completion of "Kiss" lights "Taillight Park" lips and awards letter "F" in "F-I-L-M" sequence (multiball). Subsequent completions light "Extra Ball".

**B)** Score "Video" when lit to start feature.

**C)** Score "Start Movie" when flashing to start multiball play.

### **Multiball**

**D)** Score "Search" when flashing to try to locate Creature.



# Game Operation and Test Information

## DOCTOR WHO (System WPC) ROM Summary

IC	TYPE	BOARD	LOCATION	PART NUMBER
Game ROM 1	27020	CPU	U6	A-5343-20018-1
Music/Speech ROM 2	27040	Audio	U14	5341-13411-U14
Music/Speech ROM 3	27010	Audio	U15	5341-13411-U15
Music/Speech ROM 4	27040	Audio	U18	A-5343-20018-4

### NOTICE

Order replacement ROMs from your authorized MIDWAY MANUFACTURING CO. distributor. Specify: (1) part number (if available); (2) ROM level (number) on the label; (3) game the ROM is used in.

# PINBALL GAME ASSEMBLY INSTRUCTIONS

## CREATURE FROM THE BLACK LAGOON IS A 3 BALL GAME.

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

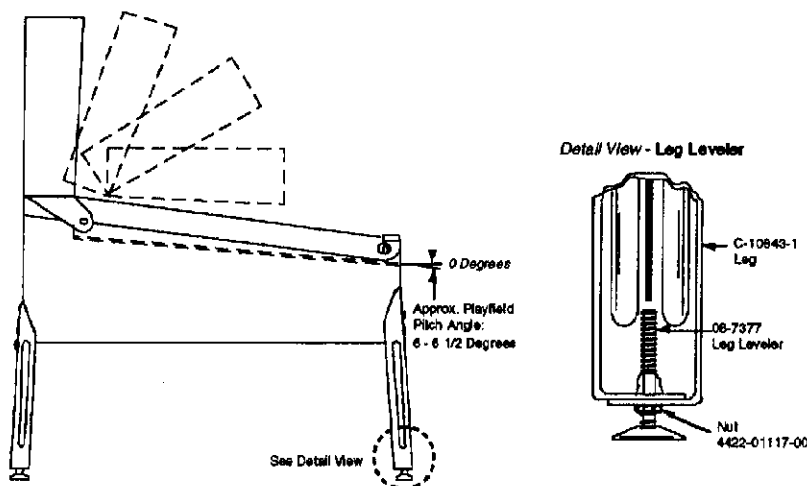
**Temp:** 32° F to 100° F  
(0° C to 38° C)

**Humidity:** Not to exceed 95% relative.

**Dimensions:** Width: 29" Approx.  
Depth: 56" Approx.  
Height: 77" Approx.

**Weight:** Approx. 286 lbs. (crated)

1. Remove all cartons, parts, and miscellaneous 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. See diagram below..



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

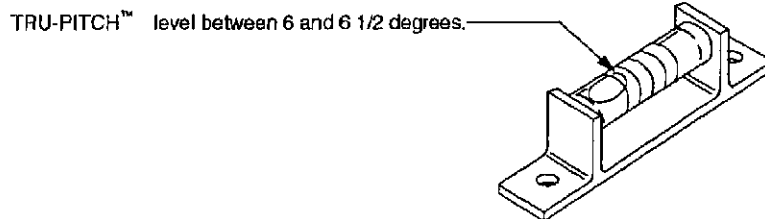
4. Reach into the cabinet and backbox and ensure that the interconnecting cables are not kinked or pinched. Be careful to avoid damaging wires at any stage of the assembly process.
5. Raise the hinged backbox upright and latch it into position. Unlock the backbox, and remove the backglass, storing it carefully to avoid scratches. Remove the shipping block holding the Insert Board. Unlatch and open the Insert Board. Carefully lift the Speaker Panel and lay it down on the playfield glass. Be careful not to damage the Dot Matrix Display/Driver Board. This allows access to the bolt holes used for securing the backbox upright. Install the washer-head mounting bolts through the bottom holes of the backbox into the threaded fasteners in the cabinet to secure the backbox. Close the Insert Board and latch it in position. 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 protrude approximately 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, to release the front molding. Lift the front molding off the playfield cover glass, return the latch lever to 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, storing it carefully to avoid breakage.
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 these measurements 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 right shooter rail. This allows the playfield pitch angle to be accurately adjusted WITHOUT REMOVING THE GLASS. The first line (closest to the front of game) on the level is approximately 6 degrees. Every line thereafter is approximately another 1/2 degree of pitch. The recommended pitch for The Creature from the Black Lagoon is between 6 and 6 1/2 degrees. The NOSE of the bubble is between the first and second line on the level (see diagram below).



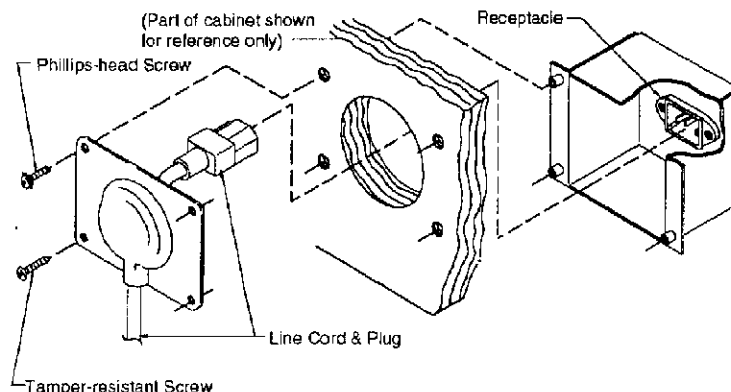
## CAUTION

Playfield pitch angle adjustments can affect the operation of the plumb bob tilt, inside the cabinet. The plumb bob weight is among the parts in the cash box; the operator should install the weight and adjust this tilt mechanism for proper operation, after completion of the desired playfield pitch angle setting.

10. Move the game into the desired location; recheck the level and pitch angle of the playfield.
11. Verify that the **required number** of balls are installed in the game. **CREATURE FROM THE BLACK LAGOON** uses 3 balls.
12. Install playfield mylars if desired.

**NOTE:** **Creature from the Black Lagoon** playfield is coated with a special hardcoat surface and does not require a protective mylar. However, playfield mylars can be purchased through your local Bally Distributor. Specify part number 03-7960-20006-1 for full playfield mylar.

13. Clean and reinstall the playfield cover glass, reversing the procedure of step 7.
14. To attach line cord, remove envelope stapled to the inside cabinet (near cashbox). Remove the four Phillips-head screws that mount the line cord cover plate to the rear cabinet. Match the prongs on the plug with the holes in the receptacle and push line cord securely into place. Make sure cord is aligned with the indentation of plate (indentation should point toward bottom of cabinet). Remount line cord cover plate. If desired, tamper resistant screws have been provided in an envelope marked "Security Screws" (located in cashbox) to remount cover plate. Prepare the game for player operation.



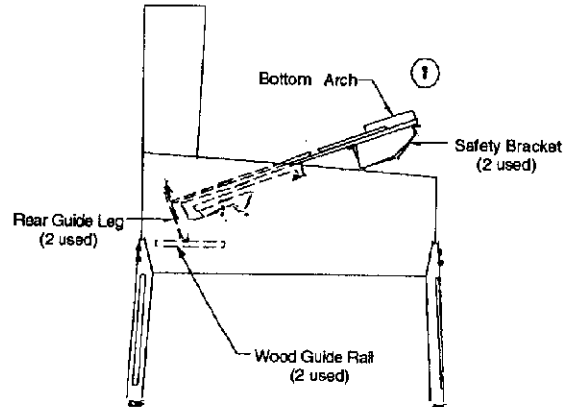
## RAISING THE PLAYFIELD

### CAUTION

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

#### To raise the playfield.

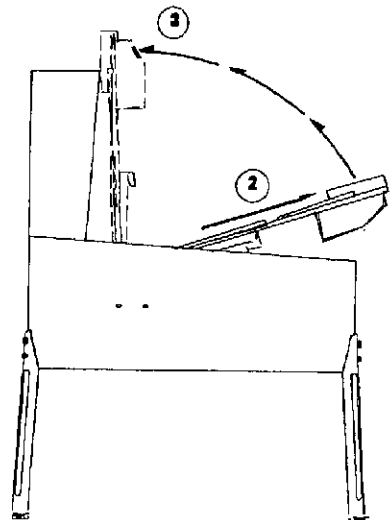
1. Grasp bottom arch and carefully lift up playfield only high enough to clear safety brackets. Rear guide legs should not hit wood guide rails or be used to slide out playfield.



2. Pull the playfield out toward you until it stops (rest position) and raise it approximately 3".

**Be sure playfield is in locked position and does not slide back into the cabinet. If it does, repeat Step 2 before proceeding to Step 3.**

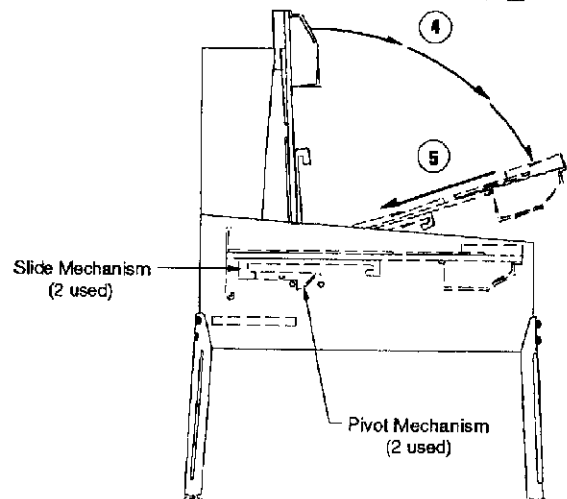
3. Rotate playfield to upright service position (lean on backbox) by pulling toward you and up. Listen for the sound of a click; this insures locking and pivoting sequence.



#### To lower the playfield.

4. Rotate the playfield to the 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 located on the bottom of the cabinet near the right front leg.

The Start Button is the 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 Switches

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 Switches 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 Switches from Normal Function to Test Function.

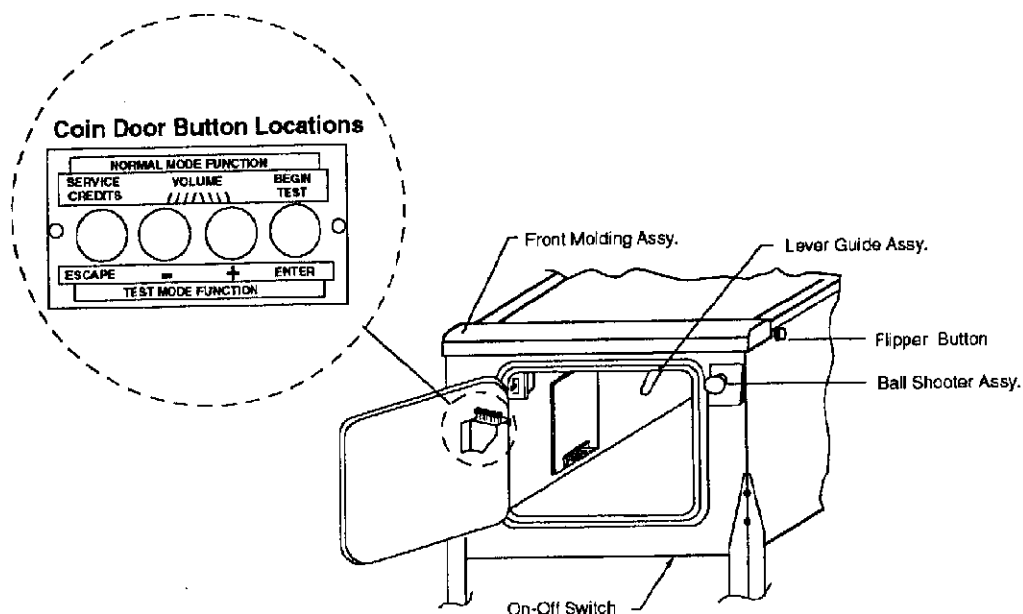
### Test Function

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.



***\*To reset High Score, hold down the Begin Test/Enter switch for 5 seconds while in the Attract Mode.***

## GAME OPERATION

### CAUTION

After assembly and installation at the 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 will show in the display as the game performs Start-Up Tests. Once the Start-Up Tests have been successfully completed the last score is displayed. Afterward, the game goes into the Attract Mode.

**Note:** After the game has been on location for a period of time, the Start-Up Tests may contain messages concerning game problems. See 'Error Messages' for more detailed information regarding messages.

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, revision level of the system software and date the game software was revised.

**Example:**

	<b>CREATURE</b>	<b>Sound Rev. P-1</b>
<b>20018</b>	<b>Rev. P-0</b>	<b>Sy. 2.38 12/9/91</b>

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 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 display shows a series of messages informing the player of the 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 Slam Tilt switch inside the cabinet ends the current game and 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 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.** Game Over will show in the display. Afterward, the high scores flash on the display. 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 selections press either the Up or Down button. Activate any selection by pressing the Enter button when the desired selection appears in the displays. Return to the Attract Mode or a previous menu selection, press the Escape button. Press the Start button for HELP at any time.

### Main Menu

<b>B. Bookkeeping Menu</b>	
	B.1 Main Audits
	B.2 Earnings Audits
	B.3 Standard Audits
	B.4 Feature Audits
	B.5 Histograms
	B.6 Time-Stamps
<b>P. Printouts Menu</b>	
	P.1 Earnings Data
	P.2 Main Audits
	P.3 Standard Audits
	P.4 Feature Audits
	P.5 Score Histograms
	P.6 Game Time Histograms
	P.7 Time-Stamps
	P.8 All Data
<b>T. Test Menu</b>	
	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 & Music Test
	T.8 Single Lamps
	T.9 All Lamps
	T.10 Lamp & Flasher Test
	T.11 Display Test
	T.12 Flipper Test
	T.13 Ordered Lamp Test
	T.14 Up/Down Ramp Test
	T.15 Ramp Lights Test
	T.16 Hologram Test
<b>U. Utilities Menu</b>	
	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 Bum-In
<b>A. Adjustments Menu</b>	
	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; Example A.1, A.2, A.3, A.4.

#### Press Down

Decreases Sequence; Example A.4, A.3, A.2, A.1.

Use Up and 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 selections. Press the Enter button to activate a selection. Once activated, 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 completed games. A game is considered complete when the final ball begins. Audit information from incomplete games is ignored, therefore test and servicing operations do not affect the Audits.

† This Audit is not resettable.

## B.4 Feature Audits

B.4	01	Balls Saved	00
B.4	02	Multiball	00
B.4	03	Multiball Restart	00
B.4	04	Extra Ball Lit	00
B.4	05	Found Creature	00
B.4	06	Rescued Woman	00
B.4	07	Lit Jackpot	00
B.4	08	Jackpot	00
B.4	09	Lit Super Jackpot	00
B.4	10	Super Jackpot	00
B.4	11	K-I-S-S Skill Shot	00
B.4	12	P-A-I-D Skill Shot	00
B.4	13	Start Mega Menu	00
B.4	14	Complete Mega Menu	00
B.4	15	Lit Video Mode	00
B.4	16	Video Mode	00
B.4	17	Knockout (video mode)	00
B.4	18	Fatality (video mode)	00
B.4	19	Started Big Millions	00
B.4	20	Lit Super Scoring	00
B.4	21	Super Scoring	00
B.4	22	Unlimited Millions	00
B.4	23	Combo Award	00
B.4	24	Super Jets	00
B.4	25	Intermission Time	00
B.4	26	Start Snack Attack	00
B.4	27	Extra Ball Countdown	00
B.4	28	Super Creature Feature	00
B.4	29	Spelled Creature	00
B.4	30	Left Ramp Made	00
B.4	31	Right Ramp Made	00
B.4	32	Spelled F-I-L-M Correctly	00
B.4	33	Lit "F" of F-I-L-M	00
B.4	34	Lit "I" of F-I-L-M	00
B.4	35	Lit "L" of F-I-L-M	00
B.4	36	Lit "M" of F-I-L-M	00
B.4	37	Sneak In	00
B.4	38	Start Move Car	00
B.4	39	Move Car Level 1	00
B.4	40	Move Car Level 2	00
B.4	41	Move Car Level 3	00
B.4	42	Move Car Level 4	00

## B.5 Histograms

B.5	01	0-1.9 Million Scores	00%	00
B.5	02	2-4.9 Million Scores	00%	00
B.5	03	5-9.9 Million Scores	00%	00
B.5	04	10-19 Million Scores	00%	00
B.5	05	20-29 Million Scores	00%	00
B.5	06	30-39 Million Scores	00%	00
B.5	07	40-49 Million Scores	00%	00
B.5	08	50-69 Million Scores	00%	00
B.5	09	70-99 Million Scores	00%	00
B.5	10	100-149 Million Scores	00%	00
B.5	11	150-199 Million Scores	00%	00
B.5	12	200-299 Million Scores	00%	00
B.5	13	Over 300 Million	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

The 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 the desired Printouts group. Press 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-Stamps**
- 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 message "Waiting for Printer" appears in the displays.  
Note: Set 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 again to return to the Main Menu. Note: During any test, press the Start button (Help) 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 Test
T.13	Up/Down Ramp Test
T.14	Ramp Lights Test
T.15	Hologram Test

The switch matrix, on the left side of the display, shows the state of all switches. A dot indicates the switch is open, and 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, and 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 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 or Run modes, 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 advance 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 advance 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. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.

**T.5 Flasher Test** This tests the flashlamp part of the solenoid circuit exclusively. This, like the Solenoid Test has three test 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 than one circuit pulses, a circuit stays On, or during the Repeat or Run modes, no circuit pulses.

- Repeat - The Repeat mode pulses a single flashlamp. After entering this test, the name and number of the first flashlamp circuit will show in the display and the corresponding bulb(s) flash. Press the Up or Down button to cycle through all of the flashlamp circuits one at a time. The same circuit 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 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 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. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.

**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 will show in the display while the corresponding lamps light. 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 displays 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 allows you to check 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/tune without having to wait for the program to play all the sounds available in the test. A sound/tune should be heard for each name and number that appears in the display. Any other results indicate 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. No sound/tune 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 indicate 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 indicate 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 lights 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 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 than one flipper pulses, a flipper comes On and stays On, or during the Repeat or Run modes, no flipper pulses.

- Repeat - The Repeat Mode pulses a single flipper. After entering this test, coil 01 shows in the display and the corresponding flipper activates. Press the Up or Down button to cycle through the flipper coils, one at a time. The same flipper coil 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 advance to the next mode.
- Stopped - The Stopped Mode halts the Flipper Coil Test. Press Enter during the Repeat mode and the Flipper Coil Test stops. No flipper coil should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to advance 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. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.

**T.13 Ordered 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 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 Up/Down Ramp Test** This test automatically raises and lowers the up/down ramp. The middle line of the Dot Matrix display identifies the status of the ramp (ie. RAMP UP / RAMP DOWN), and the mode of operation (Running, Repeat, or Stopped). The bottom line identifies whether the ramp switch is closed, open, or bad, along with the switch number. During the RAMP UP cycle, switch #38 is CLOSED and coil #23 is activated; additionally during RAMP DOWN, switch #38 is OPEN and coil #26 is activated.

- Running - The Run Mode cycles through the coils automatically. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the Repeat Mode.
- Repeat - The Repeat Mode pulses a single coil. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the Stop Mode.
- Stopped - The Stopped Mode halts the test. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the Running Mode.

**T.15 Ramp Lights Test** This test is simply used to check the light bulbs and whether the Chase Light Board is functioning. There are two modes to this test; Cycling and Stopped. When in the "Cycling" Mode, all bulbs should be lit and blinking in a circular pattern. Any bulb not lit should be replaced. If all bulbs are lit, but no motion is present, check the wire connections or check for a faulty P.C. Board.

**Cycling** - The Cycling Mode continually blinks the lights in a circular pattern. Press the Enter button to stop the test.

**Stopped** - The Stopped Mode halts the test. Press the Enter button to start the Cycling Mode.

**Note:** Lights are located on the left ramp and under the bowl on the lower right side of the playfield.

**T.16 Hologram Test** This tests the movement of the hologram and mirror motors, and lights the hologram lamp (rear cabinet). There are two modes to this test:

1. **Mirror: Stopped**  
**Lamp: Off**  
**Arm Movement: Off**

2. **Mirror: Moving**  
**Lamp: On**  
**Arm Movement: On**

Press the Enter button to start the Moving/On Mode. Press again to turn the test off.  
Press the Escape button to return to the Test Menu.

If no movement occurs when in the Moving/On Mode, check for blown fuses and/or bad wire connections.

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 YES before writing a Custom Message. Press the Enter button to begin entry of the custom message. Use the Up or Down button to cycle through letters. Use the Start button to cycle through punctuation marks. Press the Enter button to lock in the desired letter and punctuation. If you make a mistake, 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 your 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 you press Enter, 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 the operator to install 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 cycle through letters. Use the Start button to cycle through punctuation marks. 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.

**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 groups.

**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** Somewhat MORE difficult than factory setting.

**U.9 05 Install Extra Hard** MUCH MORE difficult than factory setting.

**Game Difficulty Setting Table for U.S./Canadian/French Games**

Adj. No.	Adjustment Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03	Hard U.0 04	Extra Hard U.9 05
A.2 01	Special Percent	5	4	3	2	1
A.2 02	Lite Special Percent	5	4	3	2	1
A.2 04	Extra Ball Percent	15	15	13	10	10
A.2 06	Super Jackpot Count	10	10	20	30	30
A.2 07	Ball Save Timer	8	8	6	0	0
A.2 08	Mega Menu Timer	30	25	20	15	10
A.2 09	Restart Multiball Timer	15	15	12	10	9
A.2 10	Spot Target From SnackBar	YES	YES	YES	NO	NO
A.2 11	Big Millions Mode Timer	15	12	12	8	7
A.2 13	Video Mode Timer	15	13	12	11	11
A.2 15	Reset K-I-S-S After Multiball	NO	NO	NO	YES	YES
A.2 14	Video Mode Knockout Count	10	13	17	20	20
A.2 16	Rotate Center Target Lamps	YES	YES	YES	NO	NO
A.2 18	Right Ramp Increment Count	2	3	4	4	5

**Game Difficulty Setting Table for German/European Games**

Adj. No.	Adjustment Description	Extra Easy U.9 01	Easy U.9 02	Medium U.0 03	Hard U.9 04	Extra Hard U.9 05
A.2 01	Special Percent	5	4	3	2	1
A.2 02	Lite Special Percent	5	4	3	2	1
A.2 04	Extra Ball Percent	15	15	13	10	10
A.2 06	Super Jackpot Count	10	10	20	30	30
A.2 07	Ball Save Timer	8	8	6	0	0
A.2 08	Mega Menu Timer	30	25	20	15	10
A.2 09	Restart Multiball Timer	15	15	12	10	9
A.2 10	Spot Target From SnackBar	YES	YES	YES	NO	NO
A.2 11	Big Millions Mode Timer	15	12	12	8	7
A.2 13	Video Mode Timer	15	13	12	11	11
A.2 15	Reset K-I-S-S After Multiball	NO	NO	NO	YES	YES
A.2 14	Video Mode Knockout Count	10	13	17	20	20
A.2 16	Rotate Center Target Lamps	YES	YES	YES	NO	NO
A.2 18	Right Ramp Increment Count	2	3	4	4	5



**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 Game Adjustments Table for U.S./Canadian Games**

Adjustment Number	Adjustment Description	Install 5-Ball U.9 06	Install 3 Ball U.9 07
U.9 03	Install Medium	Not Used	YES
U.9 04	Install Hard	YES	Not Used

**U.9 08 Install Add-A-Ball** This option deletes all Free Play awards and replace them with Extra Ball awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 13	Replay Boost	Off
A.1 14	Replay Award	Extra Ball
A.1 15	Special Award	Extra 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 replace them with Ticket awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 14	Replay Award	Ticket
A.1 15	Special Award	Ticket
A.1 16	Match Award	Ticket
A.1 17	Extra Ball Ticket	Yes
A.1 31	Ticket Expansion Board	Yes
A.4 02	H.S.T.D. Award	Ticket

**U.9 10 Install Novelty** This option removes all Free Play and Extra Ball awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 04	Max. Extra 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 11 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 U9 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. **NOTE:** German Replay starts at 50,000,000.

### Preset Game Adjustments Table for German/European 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	Extra Ball	Points	Credit	Extra Ball	Points
A.1 15	Match Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.1 19	Match Feature	7%	7%	Off	7%	7%	Off
A.3 01	Game Pricing	6 spiele/5 DM	6 spiele/5 DM	6 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM
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	High Score 1 Credits	01	01	00	01	01	00
A.4 06	High Score 2 Credits	00	00	00	00	00	00
A.4 07	High Score 3 Credits	00	00	00	00	00	00
A.4 08	High Score 4 Credits	00	00	00	00	00	00
A.4 10	Backup Champion	500,000,000	500,000,000	00	500,000,000	500,000,000	00
A.4 11	Backup High Score 1	450,000,000	450,000,000	00	450,000,000	450,000,000	00
A.4 12	Backup High Score 2	400,000,000	400,000,000	00	400,000,000	400,000,000	00
A.4 13	Backup High Score 3	350,000,000	350,000,000	00	350,000,000	350,000,000	00
A.4 14	Backup High Score 4	300,000,000	300,000,000	00	300,000,000	300,000,000	00

• For German Jumpered 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 Game Adjustments Table for French Games

Adj. #	Adjustment 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 04	Extra Ball Percent	13	12	13	14	10	13

\*For French Jumpered 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 will help in find intermittent problems. The tests that Auto Burn-in cycle through are: the Display Test, Sound and Music Test, All Lamps Test, Solenoid Test, Flashers Test, General Illumination Test, and the Flipper Coil Test. All of the tests are run concurrently. The time spent on the current burn-in cycle, and the total time the game has spent in burn-in are displayed.

Press the Enter button to activate the Adjustments Menu, once the menu name is shown under the Main Menu. Press the Up or Down button to cycle through the Adjustment Menu selections. Press the Enter button to activate the selection. Press the Up or Down button to cycle through the available adjustments. Press the Enter button to activate an adjustment. When an adjustment is activated, the setting value begins to flash. Use the Up or Down button to raise or lower the setting value. Press Enter to lock in the 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. Press the Enter button to return to the Adjustments Menu. Press it again to return to the Main Menu.

## 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 (optional board required)**

### **A.1 Standard Adjustments**

#### **A.1 01 Balls Per Game**

A "game" is defined by specifying the number of balls to be played.  
Range: 1-10

#### **A.1 02 Tilt Warnings**

The number of total actuations of the plumb bob mechanism that can occur before the game is "tilted".  
Range: 1-10

#### **A.1 03 Maximum Extra Balls**

The number of extra balls that a player may accumulate.  
Range: 1-10

#### **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 Balls 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 and 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: 5-50%

#### **A.1 07 Replay Start\***

The replay start value when Auto% Replay is used. The range of this setting is 1, 000, 000 to 20, 000, 000.

**A.1 08 Replay Levels\***

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

\*For Auto % Replay.

**A.1 09 Replay Level 1**

**A.1 10 Replay Level 2**

**A.1 11 Replay Level 3**

**A.1 12 Replay Level 4**

The values used for the 1st through 4th levels of Fixed Replay. Range: 00 - 25,000,000.

**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 canceled when credits equal 0, the player inserts another coin, or Begin Test is pressed.

ON - Score is boosted between 500, 000 and 5, 000, 000 points.  
OFF - Replay score is not boosted.

**A.1 14 Replay Award**

For 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 - 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 matching of these two digits 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 date and time in status report, or Attract Mode.  
NO - Do Not show date and time in status report or Attract Mode.

**A.1 25 Allow Dim Illumination**

The game program dims the General Illumination for special effects during the Attract Mode.

YES - Dim General Illumination during Attract Mode.  
NO - Do Not dim 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 will substantially increase the life of the lamps.

Setting: - Off, 2-60 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: 4-7 (4 = dimmest, 7 = brightest)

**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 this 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 3 settings to determine how this is handled.

- Never: - Do not allow a new game to 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 Special Percent**

Auto-adjust the awarding of a Special per game.

Settings: 1 - 5%

### **A.2 02 Lite Special Percent**

Auto-adjust the lighting of a Special per game.

Settings: 1 - 5%

### **A.2 03 Instant Multiball Percent**

Auto-adjust the start of instant multiball.

Settings: 10 - 50%

### **A.2 04 Extra Ball Percent**

Auto-adjust the awarding of an Extra Ball.

Settings: 3 - 20%

### **A.2 05 Allow Attract Mode Sounds**

Select whether or not the attract mode has sound to attract players to the game. The Attract Mode Sounds will begin after the game has flashed "GAME OVER" on the display. Sound plays for approximately 1 minute and 30 seconds, then shuts off, not to restart again until the next game played has ended.

Settings: OFF (default)  
ON

### **A.2 06 Super Jackpot Count**

This setting controls the difficulty of lighting Super Jackpot. After earning Jackpot this is the number of jet bumper hits needed to light Super Jackpot.

Settings: 10 - 30 Jet Hits

### **A.2 07 Ball Save Timer**

This setting controls the minimum ball time.

Settings: 0 - 8 Seconds

### **A.2 08 Mega Menu Mode Timer**

This sets the maximum time allowed for a player to hit all four center targets.

Settings: 10 - 30 Seconds

### **A.2 09 Restart Multiball Timer**

This sets the maximum time allowed for a player to continue multiball, if multiball ended without earning Jackpot.

Settings: 5 - 15 Seconds



**A.2 10 Spot Target from Snackbar**

This will award the first unit center target when Snackbar Hole is hit.

Settings: YES (default)  
NO

**A.2 11 Big Millions Mode Timer**

This sets the time limit to score Big Millions on the right ramp.

Settings: 5 - 30 Seconds

**A.2 12 Big Millions Mode Score Limit**

This sets the maximum value which can be awarded during Big Millions.

Settings: 20 - 60 Million

**A.2 13 Video Mode Timer**

The maximum time allowed for a player to complete video mode.

Settings: 10 - 17 seconds

**A.2 14 Video Mode Knockout Count**

The number of hits required to win Video Mode before the timer expires.

Settings: 10 - 20

**A.2 15 Reset K-I-S-S after Multiball**

Turn OFF all K-I-S-S lights after multiball. Resetting these lights after multiball increases the difficulty of getting the letter "F" of the F-I-L-M sequence.

Settings: YES (default)  
NO

**A.2 16 Rotate Center Target Lamps**

This allows, or disallows, the rotating of the center target lamps by hitting the jets.

Settings: YES (default)  
NO

**A.2 17 Family Mode**

This allows, or disallows, any violent shows in the game.

Settings: YES  
NO (default)

**A.2 18 Right Ramp Increment Count**

This sets the number of shots required to light the next right ramp feature.

Settings: 2 - 5 (default 3)

## **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, right, center, and fourth coin chutes.

### **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 are available)**

This adjustment is used to preset adjustments 11 through 15, based on standard coin doors (U.S.A., German, Etc.).

### **A.3 11 Collection Text**

The coin system 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, and 4th coin chutes.

### **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 99. Reaching the specified setting prevents the award of any credits. The factory default is 10.

### A.3 17 Free Play

The 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 game pricing is set to 1 for 50¢/2 for \$1.00 the player is 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

The number of 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 microseconds 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. The options are:

- 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 slot.

### A.3 23 Minimum Coin Microseconds

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 Chute				Games/Coin	Display	Pricing Adjustments A.3												
	Left	Center	Right	4th Chute			02	03	04	05	06	07	08	09					
USA	25 ¢	*\$1.00	25¢	-	1/25¢, 4/\$1 <sup>2</sup> 1/50¢, 2/75¢, 3/\$1 <sup>2</sup> 1/50¢, 2/\$1 <sup>2</sup> 1/25¢, 3/\$1 <sup>2</sup> 1/50, 2/\$1.00, 6/\$2.00 1/50, 2/\$1.00, 5/\$2.00 1/50, 2/\$1.00, 4/\$1.50, 6/\$2.00 <sup>1,2</sup> 1/25¢, 3/50¢, 6/\$1 1/25¢, 5/\$1	U.S.A. 4/\$1.00 50-75-1.00 U.S.A. 2/\$1.00 U.S.A. 3/\$1.00 U.S.A. 6/\$2.00 U.S.A. 5/\$2.00 6/\$2 4/\$1.50 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 <sup>2</sup> 1/50¢, 2/\$1 <sup>2</sup>	CANADA 1 CANADA 2													
Austria	5 Sch	10 Sch	10 Sch	-	1/2x5 Sch, 3/2x10 Sch <sup>2</sup> 2/5 Sch, 5/10 Schilling	AUSTRIA CUSTOM										02 00 05 00 01 00 01 00			
Australia	20¢	\$1	\$1	\$2	1/\$1, 3/\$2 <sup>2</sup>	AUSTRALIA													
United Kingdom	£1.00	50 P	-	20 P	1/3x10P, 2/50P, 4/£1.00, 4/5x20P	U. KINGDOM													
Switzerland	1 Fr	2 Fr	5 Fr	-	1/1 Fr, 3/2 Fr, 7/5 Franc <sup>2</sup>	SWISS													
Belgium	5 Fr	20 Fr	50 Fr	-	1/4 x 5F, 1/20 F, 3/50 Franc <sup>2</sup>	BELGIUM													
West Germany	1DM	2DM	5DM	-	1/2DM, 2/3DM, 3/4DM, 5/5DM <sup>1,2</sup> 1/1 DM, 2/2 DM, 5/5 DMark <sup>2</sup> 1/1 DM, 2/2 DM, 6/5 DM <sup>2</sup> 1/1 DM, 3/2 DM, 9/5 DM 1/2x1 DM, 1/2 DM, 3/5 DM 2/1 DM, 5/2 DM, 14/5 DM	GER. 1/2DM GER. 1/1 DM GER. 6/5 DM 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			
Netherlands	1HFI	2.5HFI	2.5HFI	-	1/1 HFI, 3/2.5 Holland Florin <sup>2</sup> 1/25¢, 5/1 Guilder 1/1 Guilder <sup>2</sup>	NETHERLAND CUSTOM HOLLAND											01 00 05 00 01 00 01 00		
Sweden	5 Kr	5 Kr	5 Kr	-	1/5 Krona <sup>2</sup>	SWEDEN													
France	1 Fr	5 Fr	10 Fr	20 Fr	1/3x1F, 2/5F, 5/10F, 10/20F <sup>2,3</sup> 1/2x1F, 3/5F, 7/10F, 14/20F <sup>2,3</sup> 1/1x5F, 3/1x10F, 7/2x10F, 7/20F <sup>1,2,3</sup> 2/1x5F, 4/1x10F, 9/2x10F, 9/20F <sup>2,3</sup> 2/1x5F, 5/1x10F, 11/2x10F, 11/20F <sup>2,3</sup> 1/5F, 3/10F, 6/20F <sup>2,3</sup>	TARIF 1 TARIF 2 TARIF 3 TARIF 4 TARIF 5 TARIF 6													
Italy	500L	500L	500L	-	1/500 Lire <sup>2</sup>	ITALY													
Spain	100 P	-	500 P	-	1/100 P, 6/500 Peseta <sup>2</sup> 1/25 P, 5/100 Peseta 1/25 P, 4/100 Peseta 1/2x25 P, 2/100 Peseta 1/25x25 P, 3/100 Peseta	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 Yen <sup>2</sup>	JAPAN													
Chile	Token	-	Token	-	1/1 Token <sup>2</sup>	CHILE													
Denmark	1 Kr	5 Kr	10 Kr	-	1/2x1 Kr, 3/5 Kr, 7/10 Krone <sup>2</sup>	DENMARK													
Finland	1Mka	-	5 Mka	-	1/2x1 Mka, 3/5 Markka <sup>2</sup>	FINLAND													
New Zealand	\$2.00	-	\$1.00	-	1/\$1.00, 3/\$2.00	NEW ZEALAND													
Norway	5 Kr	-	10 Kr	-	1/5 Kr, 2/10 Kr, 5/20 Krone <sup>2</sup>	NORWAY													
Argentina	10 ¢	10¢	10¢	-	1/1 Token <sup>2</sup>	ARGENTINA													
Greece	10 D	20 D	50 D	-	1/2x10D, 1/20D, 3/50 Drachma <sup>2</sup>	GREECE													
Hungary	10F	-	20F	-	1/1x20F, 1/2x10F, 3/2x20F <sup>2</sup>	HUNGARY													

NOTES: 1. Factory Default. 2. Standard Setting - Change by pressing Enter button. 3. Other functions are also affected.  
\* Only if center coin chute and dollar bill acceptor 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 Ticket.

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

The "Highest" High Score is 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 is displayed.
- OFF - The "Highest" High Score is not retained.

### **A.4 04 Champion Credits**

The operator chooses the number of credits or tickets awarded for a Grand Champion Score. Range: 00 - 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 to be awarded whenever a player exceeds the 1st, 2nd, 3rd, and 4th highest scores. Range: 00 - 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 - 99,900,000.

### **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 - 99,900,000.

**A.5 Printer Adjustments** (optional board required)

**A.5 01 Column Width**

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

**A.5 02 Lines Per Page**

The amount of lines per page. Range: 20 - 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 does not pause.

**A.5 04 Printer Type**

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

**A.5 05 Serial Baud Rate**

The baud rate used for Serial or ADP communications (bit rate). Choices: 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 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 the message, "Press ENTER for Test Report". This indicates 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 the 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 hanger, 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 instance is NOT a switch problem; however, for most games this 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. If this occurs go to U.4 of the Utilities Menu and set the time and date.

### Factory Settings Restored.

This message indicates that the CMOS RAM 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 +4 V, 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. Note: Readings taken from 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	-	ROM Error U6
Center L.E.D. blinks two times	-	RAM Error U8
Center L.E.D. blinks three times	-	Custom Chip Failure U9

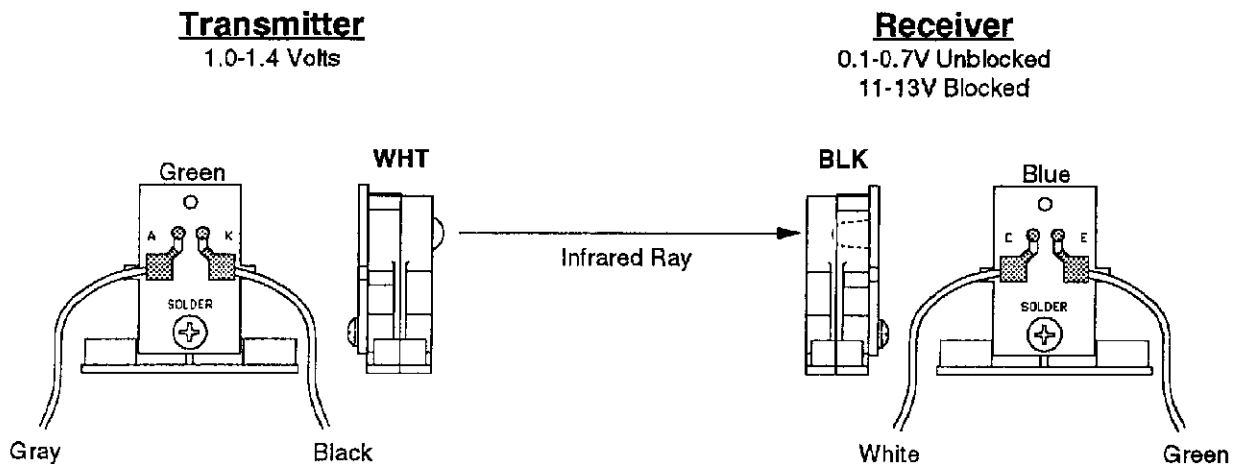
#### Sound Board Beep Error Codes

##### 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 (ROM), if used

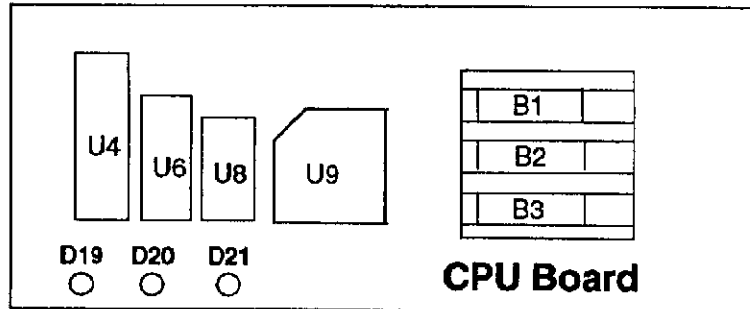
### OPTO THEORY

The opto receiver (detector) should be approximately 0.1-0.7 volts when the opto beam is unblocked and approximately 11-13 volts when the opto beam is blocked. The opto transmitter (emitter or L.E.D.) should always be approximately 1.4 volts. Note, the transmitter (L.E.D.) is larger than the receiver (it protrudes further from its case).





## LED List



### CPU Board

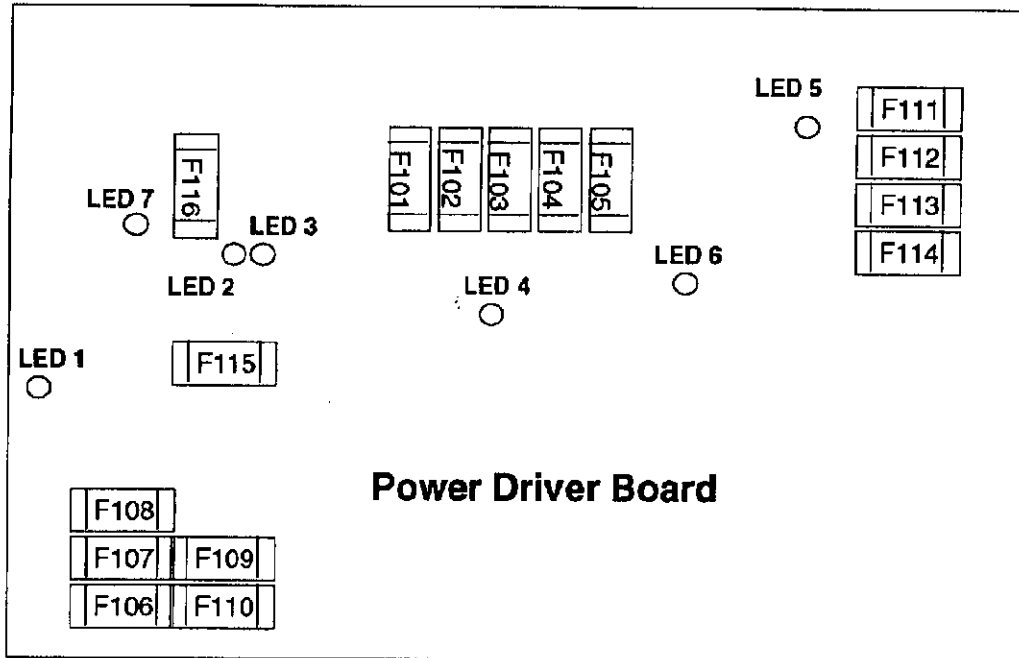
D19, Blanking

D20, Diagnostic

D21, +5vdc

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

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



### 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

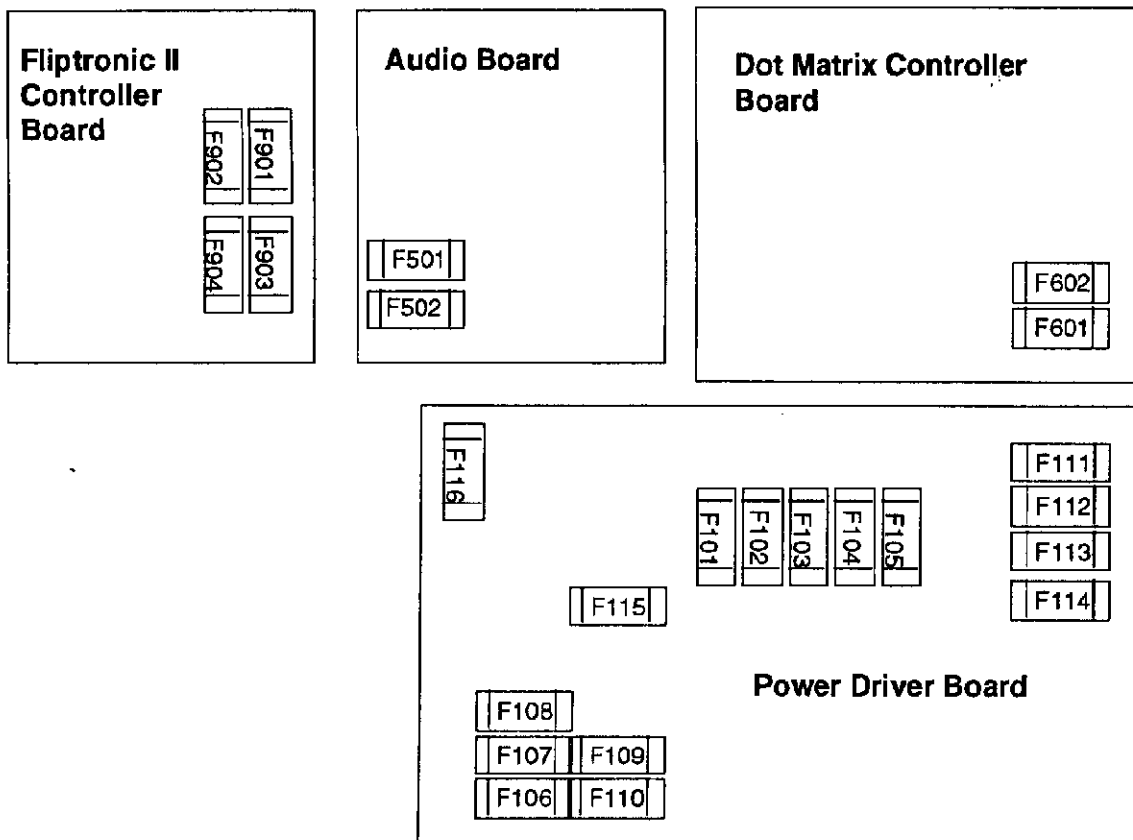
LED 4, +5vdc, Digital Circuit, Normally On

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-Gm 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  
 Foreign Game 5A, S.B.

## **MAINTENANCE INFORMATION**

### **LUBRICATION**

The two main lubrication points of the Ball Shooter Lane Feeder mechanism are the pivots for the arm. The mechanism of other playfield devices are somewhat similar 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 Drop Targets. MBI Instrument Grease, also known as Drop Target Switch Lubricant, (Bally part number of EI 165), 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 and should close when the flipper is energized. All end-of-stroke 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. Please note that unlike the old style of flipper, an end-of-stroke switch failure will not harm the flipper. The game will notify the operator of a switch being mis-adjusted in the test report, but will continue to play. The end-of-stroke 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.

## *Notes...*

A series of horizontal dotted lines for writing notes.

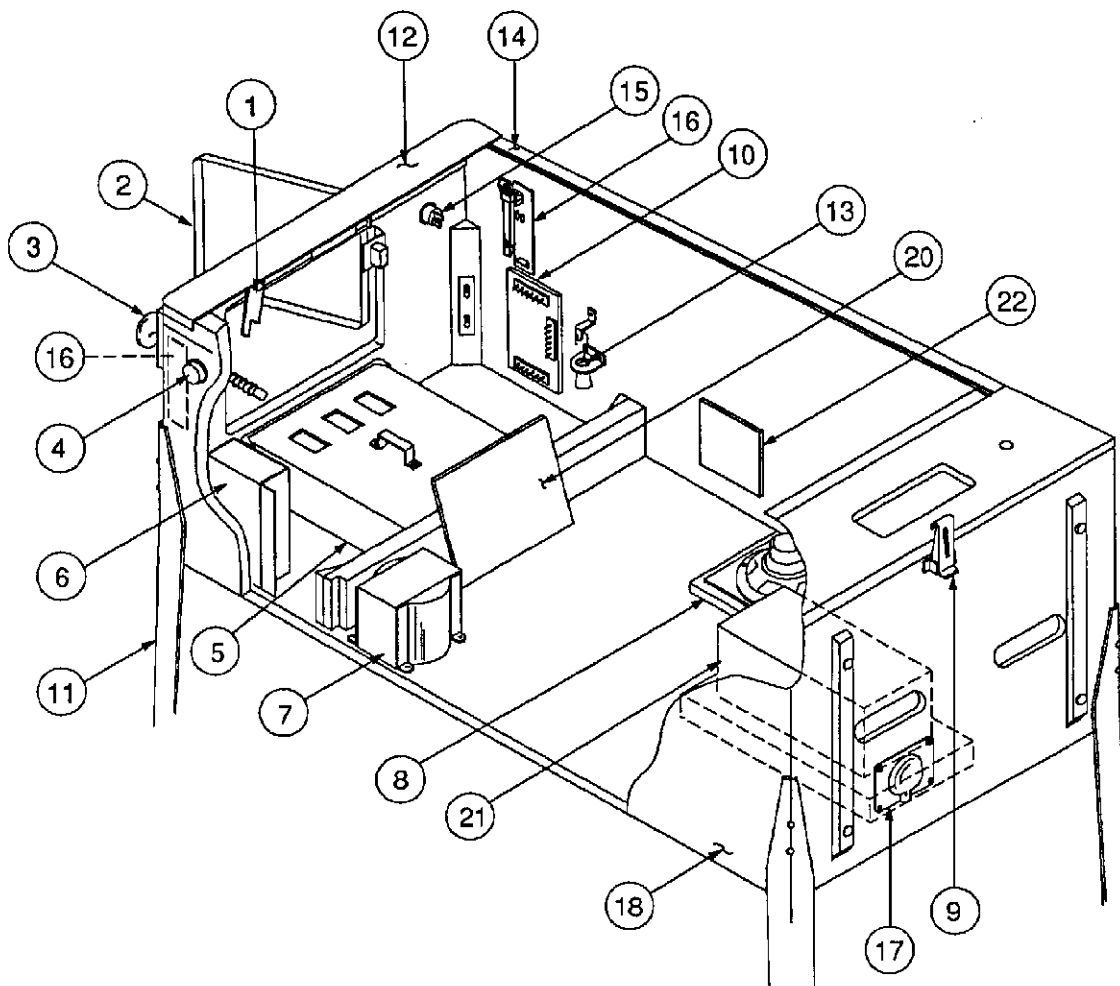
# **SECTION TWO**

## **Game 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

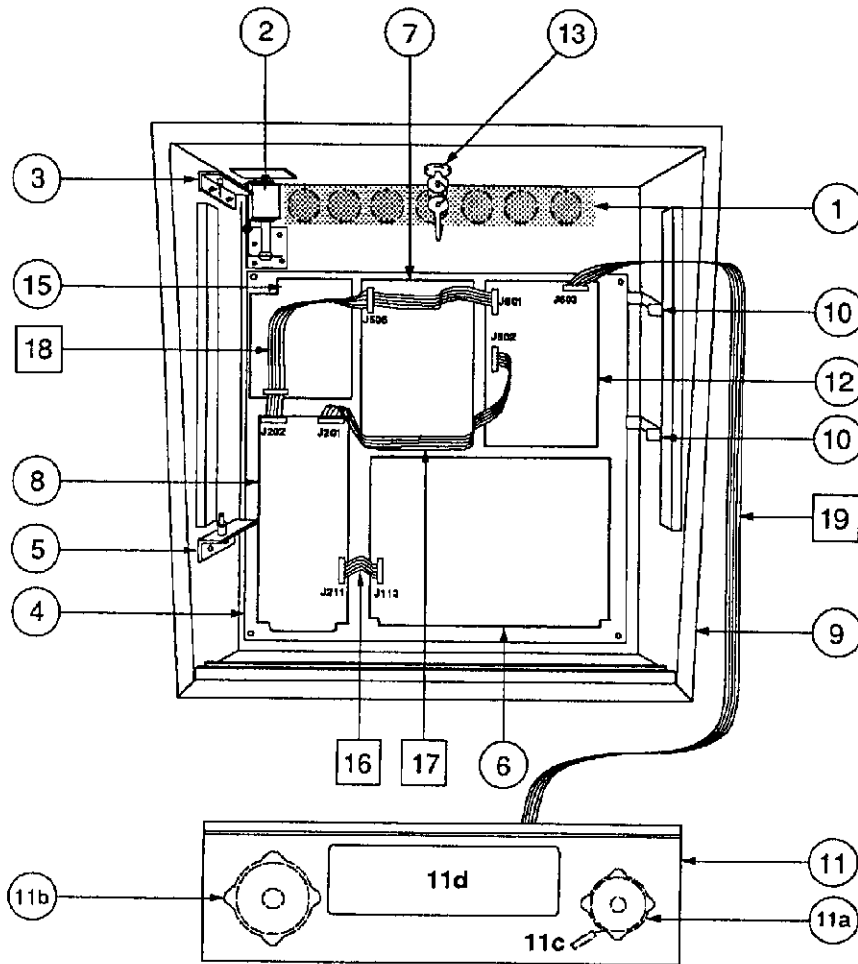
Item	Part Number	Description	Item	Part Number	Description
1.	D-9174-3	Lever Guide Assembly	14.	A-12359-3	Side Molding Assembly
2.	A-14148-1	Coin Door - 2 Slot	15.	20-9663-1	Start Button
3.	B-12445-4	Ball Shooter Assembly	16.	A-15878	Double Opto Assy. (2 Used)
a)	10-149	Rod Spring	17.	01-10714	Line Cord Cover
b)	10-148-4	Shooter Spring	18.	11-1092-20018	Wood Cabinet
4.	B-12273-6	Flipper Button - Yellow (2 Used)	19.	*	Cordset
5.	A-15941-1	Cashbox Assembly	20.	A-15958	Motor & Mirror Assembly
6.	*	Line Filter Assembly	21.	A-15986	Reflector Assembly
7.	5610-12835-00	WPC Transformer, 115/230v	22.	A-13088-2	Triac Driver Board
8.	5555-12929-00	Speaker, 4Ω, 6", 25w			
9.	20-9347	Toggle Latch			
10.	A-14689	WPC Coin Door Interface Bd.			
11.	C-10843-1	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-12738-20018	WPC Sound Board
8.	A-12742-20018	WPC CPU Board
9.	A-14376-20018	Backbox Assembly
10.	01-9047	Insert Stop Bracket
11.	A-16002	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 Controller Board
13.	A-13379	Lock & Plate Assembly
a)	20-9637	Lock & Cam Kit

Item	Part Number	Description
14.	20018-IN	Insert Board
15.	A-15472	Fliptronic II Board

### Ribbon Cables:

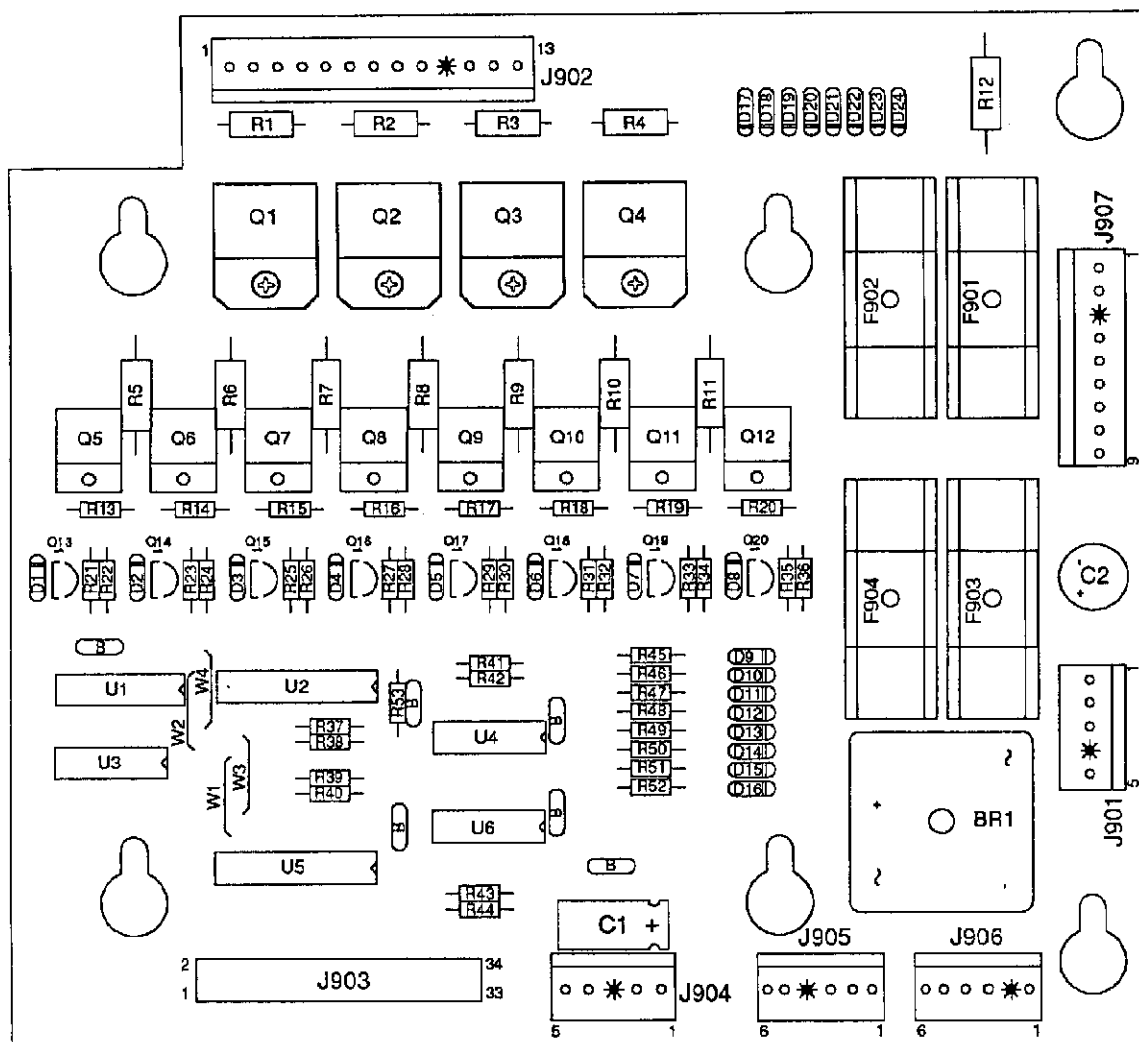
16.	5795-12653-03	Ribbon Cable, 3"
17.	5795-13018-00	Ribbon Cable, 22"
18.	5795-10938-14	Ribbon Cable, 14"
19.	5795-12838-30	Ribbon Cable, 30"

### Miscellaneous Parts:

A-8552-20018	Tempered Backglass Assy.
08-7456	Backbox Glass: 27" x 18-7/8"
31-1357-20018	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	5190-09016-005	Q13 - Q20	Transistor 2N4403 PNP
4406-01128-00	Q1-Q4	Nut 6-32 KEPS	191-12179-00	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-8, 3A., 250v
			5733-12060-01		Fuse Holder (F901-F904)

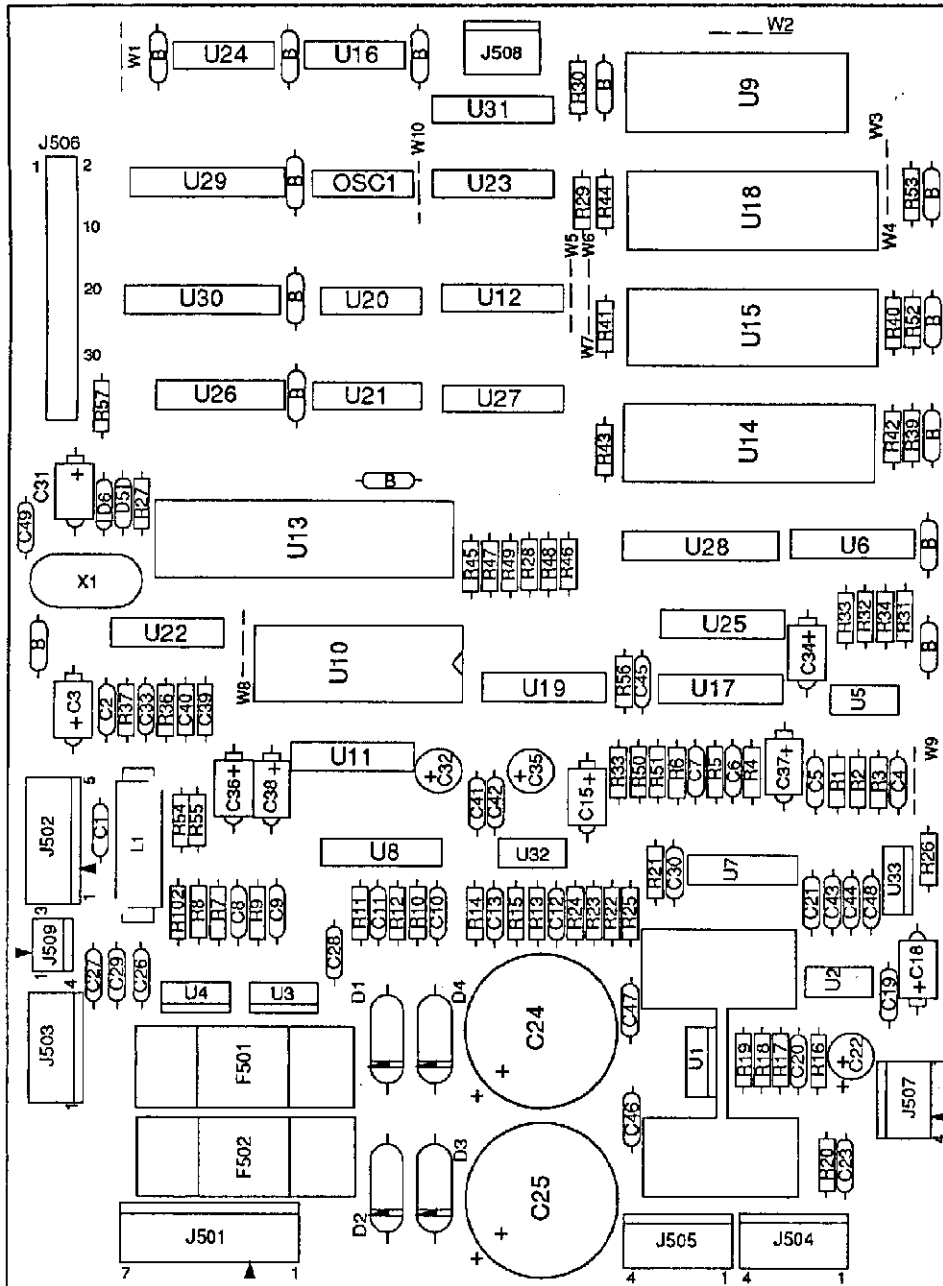
# A-12738-20018

# WPC Audio Board

Part No.	Designator	Description
01-9980		Shield: Wire Protector
4004-01005-08	U1	Mach. Screw, 4-40 x 3/8
4104-01012-04	U1	Sh. Mach. Screw, #4 x 1/4
4404-01119-00	U1	Nut, 4-40 SNUT
5010-08772-00	R21	Resistor, 15K $\Omega$ , 1/4w, 5%
5010-12065-00	R22, R25	Resistor, 120K $\Omega$ , 1/4w, 5%
5010-08991-00	R51	Resistor, 4.7K $\Omega$ , 1/4w, 5%
5010-10987-00	R23, R24	Resistor, 56K $\Omega$ , 1/4w, 5%
5010-09034-00	R13, R14, R29-R31, R33, R34, R50, R45-R49	Resistor, 10K $\Omega$ , 1/4w, 5%
5010-09035-00	R4	Resistor, 47K $\Omega$ , 1/4w, 5%
5010-09036-00	R35	Resistor, 100 $\Omega$ , 1/4w, 5%
5010-09134-00	R1, R2, R6, R8, R9, R11, R12	Resistor, 150K $\Omega$ , 1/4w, 5%
5010-09162-00	R26, R102	Resistor, 100K $\Omega$ , 1/4w, 5%
5010-08774-00	R3, R5, R17, R19	Resistor, 22K, 1/4w, 5%
5010-09269-00	R15	Resistor, 12K $\Omega$ , 1/4w, 5%
5010-09358-00	R18, R32	Resistor, 1K $\Omega$ , 1/4w, 5%
5010-09416-00	R28, R36, R37, R39-R44, R52, R53, R57	Resistor, 470 $\Omega$ , 1/4w, 5%
5010-09534-00	W3, W5, W7-W10	Resistor, 0 $\Omega$
5010-10171-00	R38, R56	Resistor, 56 $\Omega$ , 1/4w, 5%
5010-10258-00	R16	Resistor, 1M, 1/4w, 5%
5010-10650-00	R7, R10	Resistor, 62K, 1/4w, 5%
5010-10989-00	R54, R55, R27	Resistor, 470K, 1/4w, 5%
5010-12752-00	R20	Resistor, 1 $\Omega$ , 1/4w, 5%
5040-08986-00	C3	Capacitor, 100M, 10v ( $\pm 20\%$ )
5040-09332-00	C15, C18, C34, C36, C38	Capacitor, 47 $\mu$ fd., 25v, Axial
5040-11036-00	C32, C35	Capacitor, 47 $\mu$ fd., 16v, Rad
5040-12729-00	C24, C25	Capacitor, 4700 $\mu$ fd., 35v.
5040-12750-00	C22	Capacitor, 22 $\mu$ fd., 35v, Rad.
5041-09031-00	C26-C29, C37, C46-C48	Capacitor, 1 $\mu$ fd. TANT
5041-09243-00	C20, C21	Capacitor, 10 $\mu$ fd. TANT
5043-08980-00	C41-C44, B(15)	Capacitor, .01M, 50v, (+80, -20)
5043-08996-00	C1, C2	Capacitor, .1 $\mu$ fd., 50v, 10%
5048-11027-00	C8, C10	Capacitor, 33pfd., 50v, 10%
5048-11028-00	C45	Capacitor, 22pfd., 50V, Axial
5048-11029-00	C33, C49	Capacitor, 100pfd., 50v
5048-11030-00	C12	Capacitor, 470pfd., 50v
5048-11031-00	C19, C31	Capacitor, .001 $\mu$ fd., 50v, 10%
5048-11065-00	C13	Capacitor, .0022 $\mu$ fd., 50v, 10%, Ax.
5048-11072-00	C39, C40	Capacitor, .0033 $\mu$ fd.
5048-12036-00	C23	Capacitor, .22 $\mu$ fd., 10v, Ceramic
5048-12745-00	C4, C6	Capacitor, 1800pfd., 50V, 10%
5048-12746-00	C5, C7	Capacitor, 330pfd., 50V
5048-12748-00	C9, C11, C30	Capacitor, 220pfd., 50V

Part No.	Designator	Description
5070-08919-00	D5, D6	Diode, 1N4148
5070-09045-00	D1-D4	Diode MR501, 3.0A
5250-10495-00	U3	Reg. 7912 1.0A -12v.
5281-09215-00	U22	IC, 74LS04 Hex INV
5281-09246-00	U12	IC, 74LS139 2-4 Dec.
5281-09486-00	U28-U30	IC, 74LS374 8 Dual Flipflop
5281-09487-00	U6, U23-U25	IC, 74LS74 Dual Flipflop
5281-09500-00	U31	IC, 74LS32
5281-09745-00	U26, U27	IC, 74LS138 DMLTPX
5281-09850-00	U20	IC, 74LS11 Tripple AND
5281-10577-00	U16	IC, 74LS125 Q/B Bfr
5370-11086-00	U10	IC, YM2151 Sound
5371-11087-00	U11	IC, YM3012 D/A
5400-10320-00	U13	IC, MPU 68B09E
5284-12651-00	U21	IC 4584
5340-12278-00	U9	S/Ram 2064
5370-09691-00	U17	IC, 55536 CVSD
5370-12260-00	U2	IC, 3340 Elec Atten
5370-12726-00	U1	IC, Audio Amp LM1875
5370-12730-00	U7, U8	IC, Op Amp TL084
5370-12742-00	U32	IC, Op Amp TL082
5371-12727-00	U19	Dac AD7524
5432-12726-00	U5	EE Prom Pot X9503
5460-12423-00	U4	IC, LM7812
5460-12743-00	U33	LM7809 TO-220
5520-09020-00	X1	Crystal, 3.58 MHz.
5521-10931-00	OSC1	Oscillator, 8.0 MHz.
5551-09822-00	L1	Ind, 4.7UH 3.0A.
5700-08985-00	U13	Socket, IC 40-pin, .6"
5700-09004-00	U10	Socket, IC 24-pin, .6"
5700-09006-00	U11	Socket, IC 16-pin, .3"
A-5343-20018-2	U14	IC, Audio ROM
A-5343-20018-3	U15	IC, Audio ROM
A-5343-20018-4	U18	IC, Audio ROM
5700-12088-00	U1	Socket, IC 32-pin (U15, U18)
5705-12755-00		Heatsink 5299B-220
5731-10356-00	F501, F502	Fuse, 3A, S-B, 250v
5733-12060-01		Fuse Holder (F501, F502)
5791-10862-04	J504, J505	Connector, 4-pin Header Sq. .156
5791-10862-05	J502	Connector, 5-pin Header Sq. .156
5791-10862-07	J501	Connector, 7-pin Header Sq. .156
5791-12462-03	J509	Connector, 3-pin Header Sq. .100
5791-12462-04	J508	Connector, 4-pin Header Sq. .100
5791-12516-00	J506	34 Hen 2x17 STR

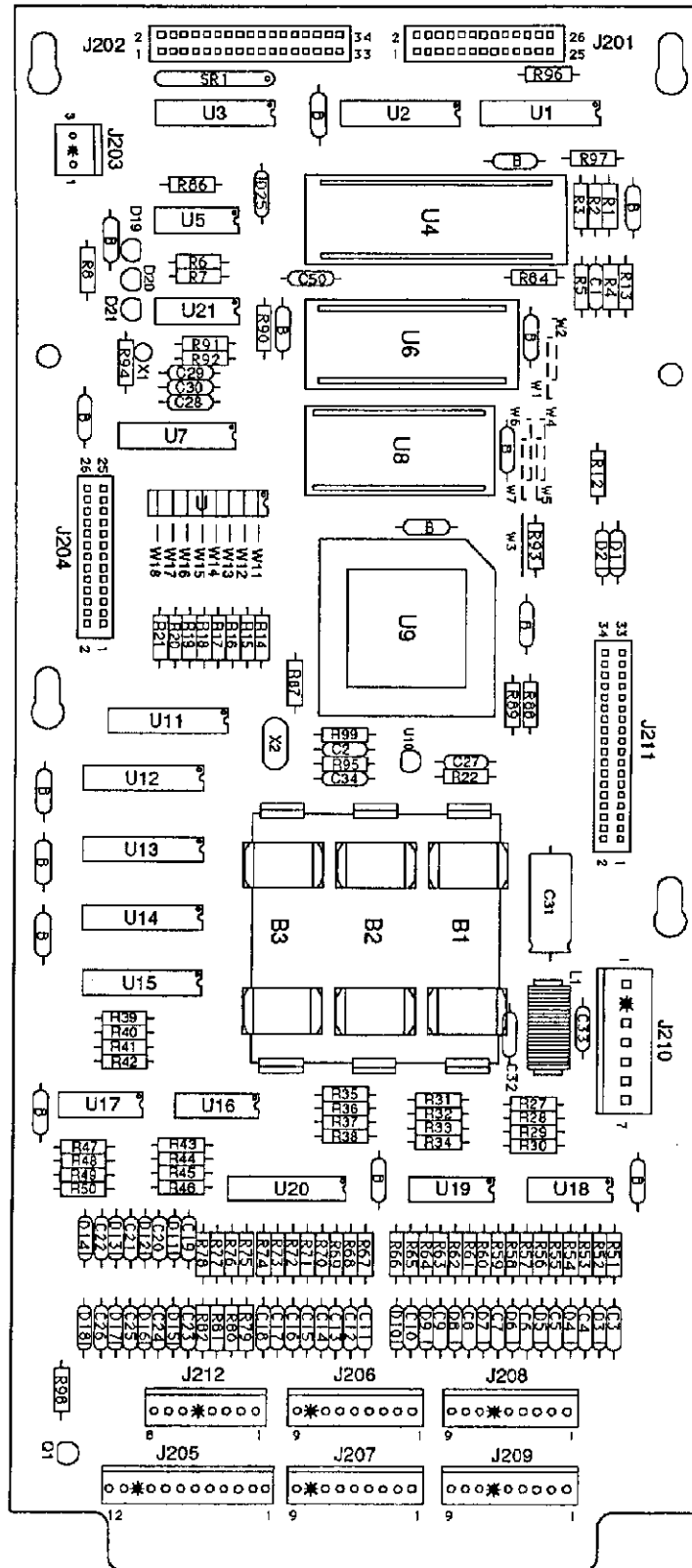
# A-12738-20018 WPC Audio Board



## A-12742-20018 WPC CPU Board

<u>Part Number</u>	<u>Designator</u>	<u>Description</u>
5010-09034-00	R14-R22, R27-R42, R86, R90, R94, R98	Resistor, 10K $\Omega$ , 1/4w, 5%
5010-09085-00	R1, R2, R4, R93, R96, R97	Resistor, 1.5K $\Omega$ , 1/4w, 5%
5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Resistor, 1.2K $\Omega$ , 1/4w, 5%
5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84	Resistor, 1K $\Omega$ , 1/4w, 5%
5010-09416-00	R5-R8, R12, R13, R87-R89	Resistor, 470 $\Omega$ , 1/4w, 5%
5010-09534-00	W1, W4, W7, W13 - W18	Resistor, 0 $\Omega$
5010-10258-00	R95, R99	Resistor, .01 $\mu$ fd $\Omega$ , 1/4w, 5%
5010-10989-00	R92	Resistor, 470K $\Omega$ , 1/4w, 5%
5010-12104-00	R91	Resistor, 22 $\mu$ fd, 1/4w, 5%
5019-09362-00	SIP 1	SIP, 9P, 10-pin, 4.7K $\Omega$ , 5%
5040-08986-00	C31	Capacitor, 100 $\mu$ fd, 10v ( $\pm$ 20%)
5043-08980-00	B	Capacitor, .01 $\mu$ fd, 50v, (+80, -20%)
5043-09030-00	C27	Capacitor, 0.047 $\mu$ 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 $\mu$ f, 10v
A-5343-20018-1	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-12742-20018 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	5043-08845-00	C1, C12	Capacitor, 1,000µfd, 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 SNUJT	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	5100-06690-00	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, 1/4w, 5%	38	5131-12725-00	Q10, Q12, Q14, Q16, Q18	Triac, BT136E
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, R106, R108, R111, R114, R117, R120, R123, R195	Resistor, 2.7KΩ, 1/4w, 5%	41	5184-09055-00	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, R158, R161, R165, R167, R169, R171	Resistor, 2.2KΩ, 1/4w, 5%	42	5191-12179-00	Q64, Q66, Q68, Q70, Q76, Q78, Q80, Q82	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, R206	Resistor, 1.2KΩ, 1/4w, 5%	47	5281-10182-00	U9	IC, 74LS240, LUDrvr
17	5010-09324-00	R164, R166, R168, R170, R182, R193, R199, R200, R250	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, R168, R170, R182, R193, R199, R200, R250	Resistor, 1KΩ, 1/4w, 5%	49	5480-12423-00	Q2	IC, LM 7812
19	5010-09361-00	R104, R107, R110, R113, R116, R119, R122, R125, R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R96, R127, R129, R131, R133, R135, R137, R139, R141	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, R96, 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, J138	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, J139	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, 8-pin Header STR Sq.
				71	5791-12516-00	J113	34 HEN 2x17 STR
				72	5824-09248-00	TP1-TP8	Test Point #1502-1
				73	5041-09183-00	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	5730-09707-00	F115	Fuse, S-B, 3/4A., 250v
				109	5705-12698-00		Heatsink #82365
				110	4010-01006-00		Mach. Screw, 10-32 x 5/8



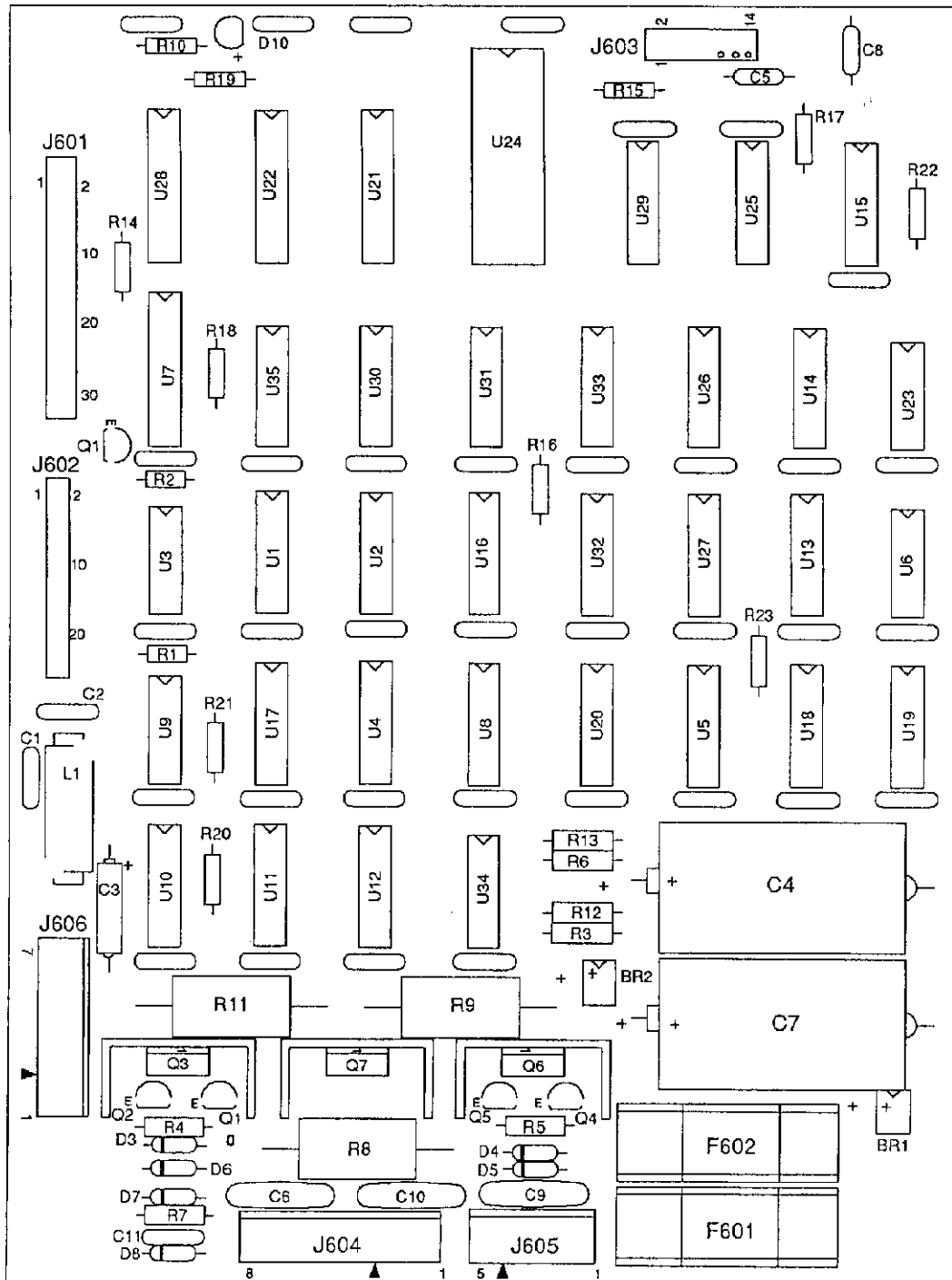
## A-14039

## Dot Matrix Controller Assembly

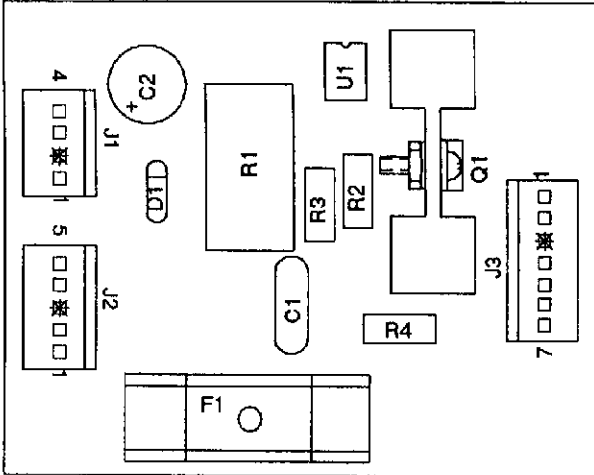
<u>Part Number</u>	<u>Ckt Designator</u>	<u>Description</u>
5010-08991-00	R1	Resistor, 4.7K $\Omega$ , 1/4w, 5%
5010-09224-00	R10	Resistor, 270 $\Omega$ , 1/4w, 5%
5010-12832-00	R3, R6, R12, R13	Resistor, 47K $\Omega$ , 1/2w, 5%
5010-12841-00	R4, R5	Resistor, 120 $\Omega$ , 1/2w, 5%
5012-12830-00	R9	Resistor, 1.8K $\Omega$ , 5w, 5%
5012-12842-00	R11	Resistor, 120 $\Omega$ , 5w, 5%
5012-12843-00	R8	Resistor, 4.7K, 5w, 5%
5010-10171-00	R7	Resistor, 56 $\Omega$ , 1/4w, 5%
5040-08986-00	C3	Capacitor, 100 $\mu$ fd., 10v, ( $\pm$ 20%)
5040-12324-00	C4, C7	Capacitor, 150 $\mu$ fd., 160v, ( $\pm$ 50%)
5043-08980-00	BYPASS	Capacitor, .01 $\mu$ fd., 50v, (+80, -20%)
5043-09072-00	C6, C9, C10	Capacitor, .1 $\mu$ 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 $\mu$ 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 $\Omega$ , 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-14039 Dot Matrix Controller Assembly

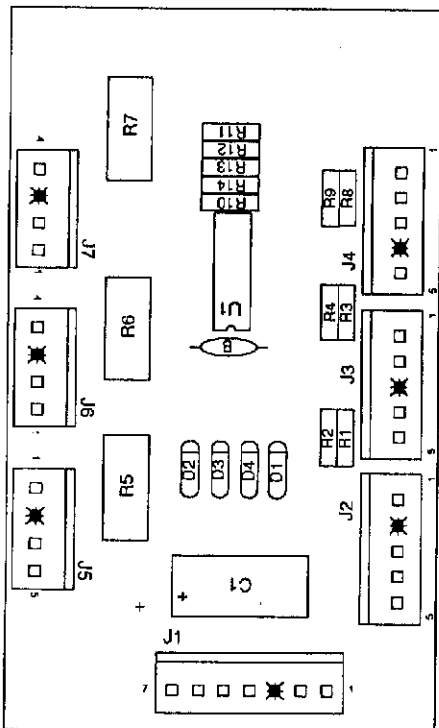


## A-13088-2 Triac Driver Assembly



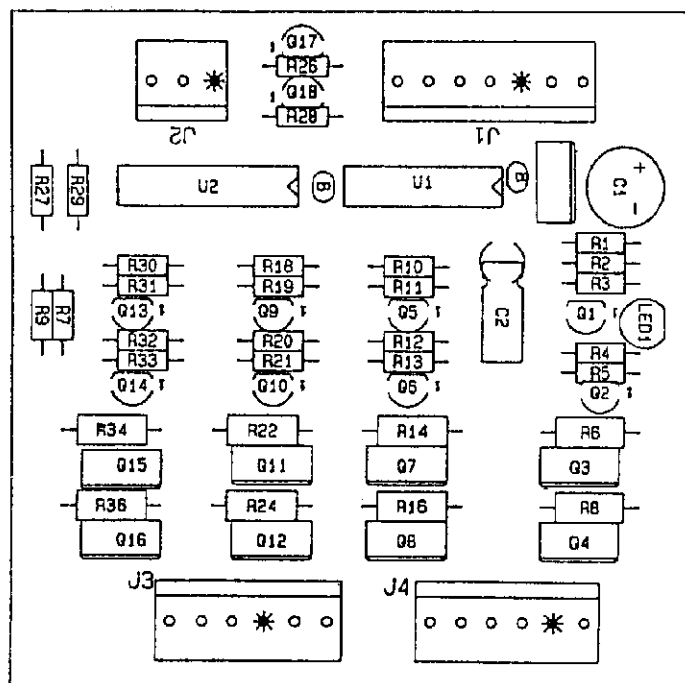
Part Number	Designator	Description
5791-10862-04	J1	Connector, 4-pin Hdr, Sq Pin
5791-10862-05	J2	Connector, 5-pin Hdr, Sq Pin
5791-10862-07	J3	Connector, 7-pin Hdr, Sq Pin
5733-12060-01	-	Fuse Holder (F1)
5731-09651-00	F1	Fuse, 5A, S-B, 250v
5131-12543-00	Q1	Triac ISL, 400V, 10A.
5705-12464-00	-	Heatsink
5010-09200-00	R1	Resistor, 330Ω, 2w, 5%
5010-08930-00	R2	Resistor, 470Ω, 1/2w, 5%
5010-09441-00	R3	Resistor, 100Ω, 1/2w, 5%
5010-09789-00	R4	Resistor, 39Ω, 1/2w, 5%
5045-09795-00	C1	Capacitor, .01μfd, 400V (±10%) Metalized Poly
5040-09537-00	C2	Capacitor, 100μfd, 100V (±20%)
5070-09054-00	D1	Diode, 1N4004, 1.0A.
5490-09805-00	U1	IC, 3030 Triac Driver
4004-01005-06		Mach. Screw, 4-40 x 3/8
4404-01117-00		Nut, 4-40 Hex.
4703-00015-00		Lockwasher, #4 External
03-8022-1		Spacer

## A-13901-1 Opto Ramp Switch Assembly



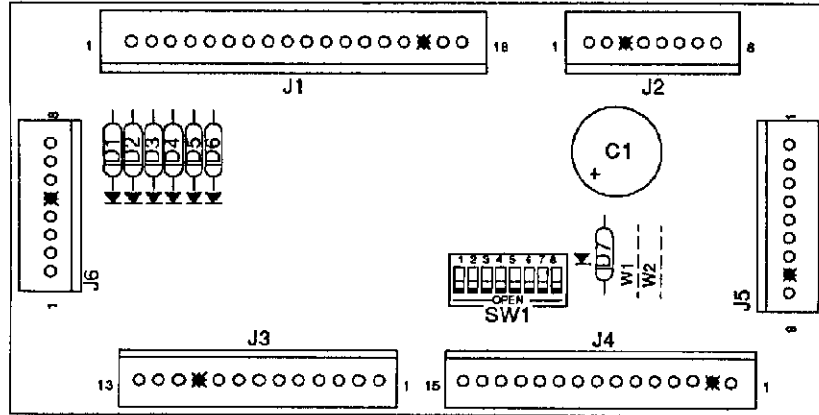
Part Number	Designator	Description
5010-08774-00	R10, R13	Resistor, 220K, 1/4w, 5%
5010-09034-00	R14	Resistor, 10KΩ, 1/4w, 5%
5010-09162-00	R11, R12	Resistor, 100KΩ, 1/4w, 5%
5010-09999-00	R1 - R4, R8, R9	Resistor, 2KΩ, 1/4w, 5%
5010-12733-00	R5 - R7	Resistor, 220Ω, 1w, 5%
5040-12298-00	C1	Capacitor, 100μfd., 40v (+50, -10%)
5043-08980-00	B	Capacitor, .01μfd., 50v (+80, -20%)
5070-09054-00	D1 - D4	Diode, 1N4004
5370-12272-00	U1	IC, LM339 Quad.
5791-12273-05	J2, J3	Connector, 5-pin Header Sq.
5791-12273-07	J1	Connector, 7-pin Header Sq.

## A-15541 Chase Light II PCB Assembly



<u>Part Number</u>	<u>Designator</u>	<u>Description</u>
5281-09246-00	U1	I.C. 74LS139 2-4 Dec.
5162-12422-00	U2	I.C. ULN2803A
5250-09157-00	-	Reg. 7805 1.0A., 5v
5671-09019-00	LED1	Display Red LED
5040-09421-00	C1	Capacitor, .100 $\mu$ fd, 25v(+50, -10%)
5040-09365-00	C2	Capacitor, 1 $\mu$ fd, 63v(+50, -10%)
5043-08980-00	B	Capacitor, .01 $\mu$ fd, 50v(+80, -20%)
5010-09224-00	R1	Resistor, 270 $\Omega$ , 1/4w, 5%
5010-08991-00	R7, R9	Resistor, 4.7K $\Omega$ , 1/4w, 5%
5010-09160-00	R26, R28	Resistor, 220 $\Omega$ , 1/4w, 5%
5010-09416-00	R27, R29	Resistor, 470 $\Omega$ , 1/4w, 5%
5010-09034-00	R3, R5, R11, R13, R19, R21 R31, R33	Resistor, 10K $\Omega$ , 1/4w, 5%
5010-09999-00	R2, R4, R10, R12, R18, R20, R30, R32	Resistor, 2K $\Omega$ , 1/4w, 5%
5190-09016-00	Q1, Q2, Q5, Q6, Q9, Q10, Q13, Q14, Q17, Q18	Trans. 2N4403 PNP
5010-08930-00	R6, R8, R14, R16, R22, R24, R34, R36	Resistor, 470 $\Omega$ , 11/2w, 5%
5131-12725-00	Q3, Q4, Q7, Q8, Q11, Q12, Q15, Q16	Triac BT138E
5791-10862-06	J3, J4	Connector, 6-pin Header STR Sq.
5791-10862-07	J1	Connector, 7-pin Header STR Sq.
5791-10862-03	J2	Connector, 3-pin Header STR Sq.

## A-14689 WPC Coin Door Interface Board

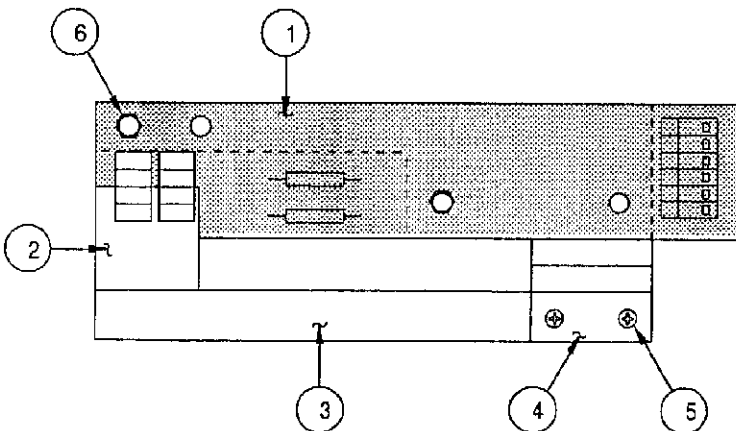


Part Number	Designator	Description
5070-09054-00	D1-D7	Diode, 1N4004, 1.0A.
5791-10862-18	J1	Connector, 18-pin Header Str Sq.
5791-10862-08	J2, J6	Connector, 8-pin Header Str Sq.
5791-10862-13	J3	Connector, 13-pin Header Str Sq.
* 5791-10862-15	J4	Connector, 15-pin Header Str Sq.
* 5791-10862-09	J5	Connector,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

**Notes:**

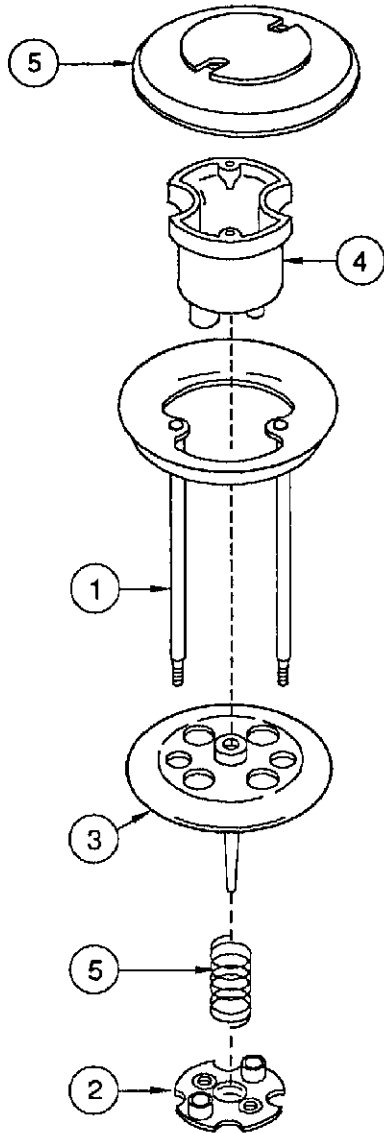
1. For Belgium, France, Finland, Sweden and England use A-14689-1 Coin Door Interface Board.
2. \* = Used on Electronic Coin Door only.

## A-15878 Double Flipper Opto Assembly

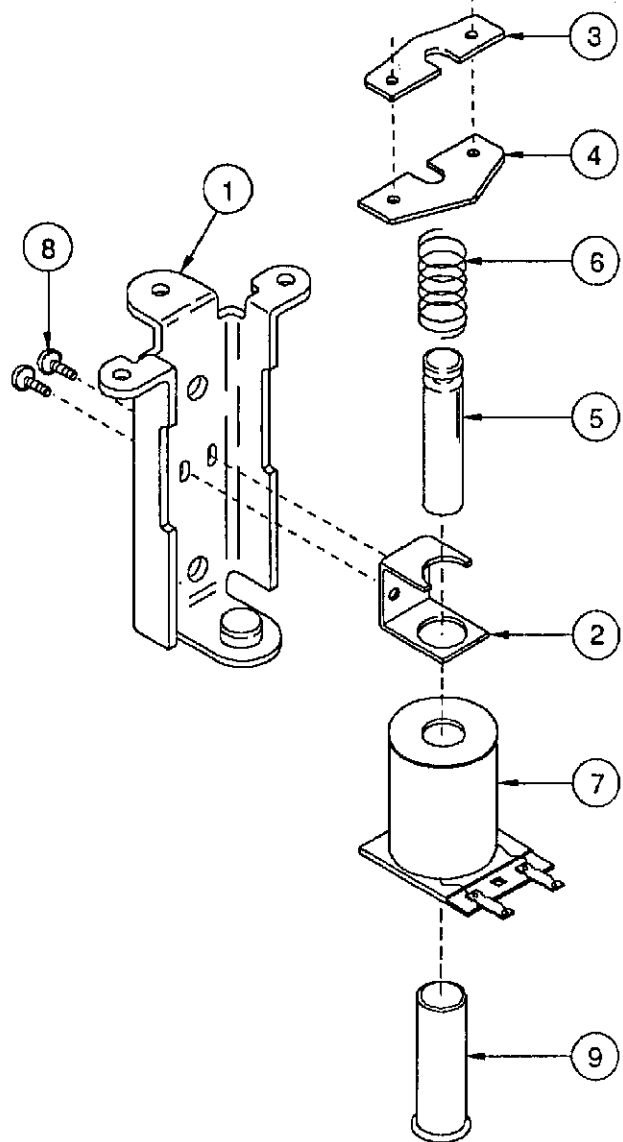


Item	Part Number	Description
1.	A-15894	PC Board Assembly
	5010-08930-00	Resistor 470Ω, 1/2w, 5%
	5490-12451-00	Opto Inter Lg. 10ma.
	5791-12273-07	Connector, 7-pin Header
2.	01-10939	Interrupter Opto
3.	06-86	Back Up Blade (2)
4.	A-15893	Opto Board Mtg. Bracket
5.	4006-01003-04	MS 6-32 x 1/4 P-PH (2)
6.	4406-01119-00	Nut #6 ESN (2)

## A-15545-3 Jet Bumper Assembly



## A-9415-2 Jet Bumper Coil Assembly



<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1.	A-4754	Bumper Ring Assembly
2.	03-6009-A5	Bumper Base, White
3.	03-6035-4	Bumper Wafer, Red
4.	03-7443-5	Bumper Body, White
5.	10-7	Spring

**Associated Parts:**

5.	03-8254-9	Jet Bumper Cap, Transparent Red (3 Used)
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<u>Item</u>	<u>Part Number</u>	<u>Description</u>
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 & A-15205-L-4

## Fliptronic II Flipper Assembly

<u>Item</u>	<u>Part Number</u>	<u>Description</u>
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)
	* FL-15411	Flipper Coil (Orange)
a)	03-7066-5	Coil Tubing
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.

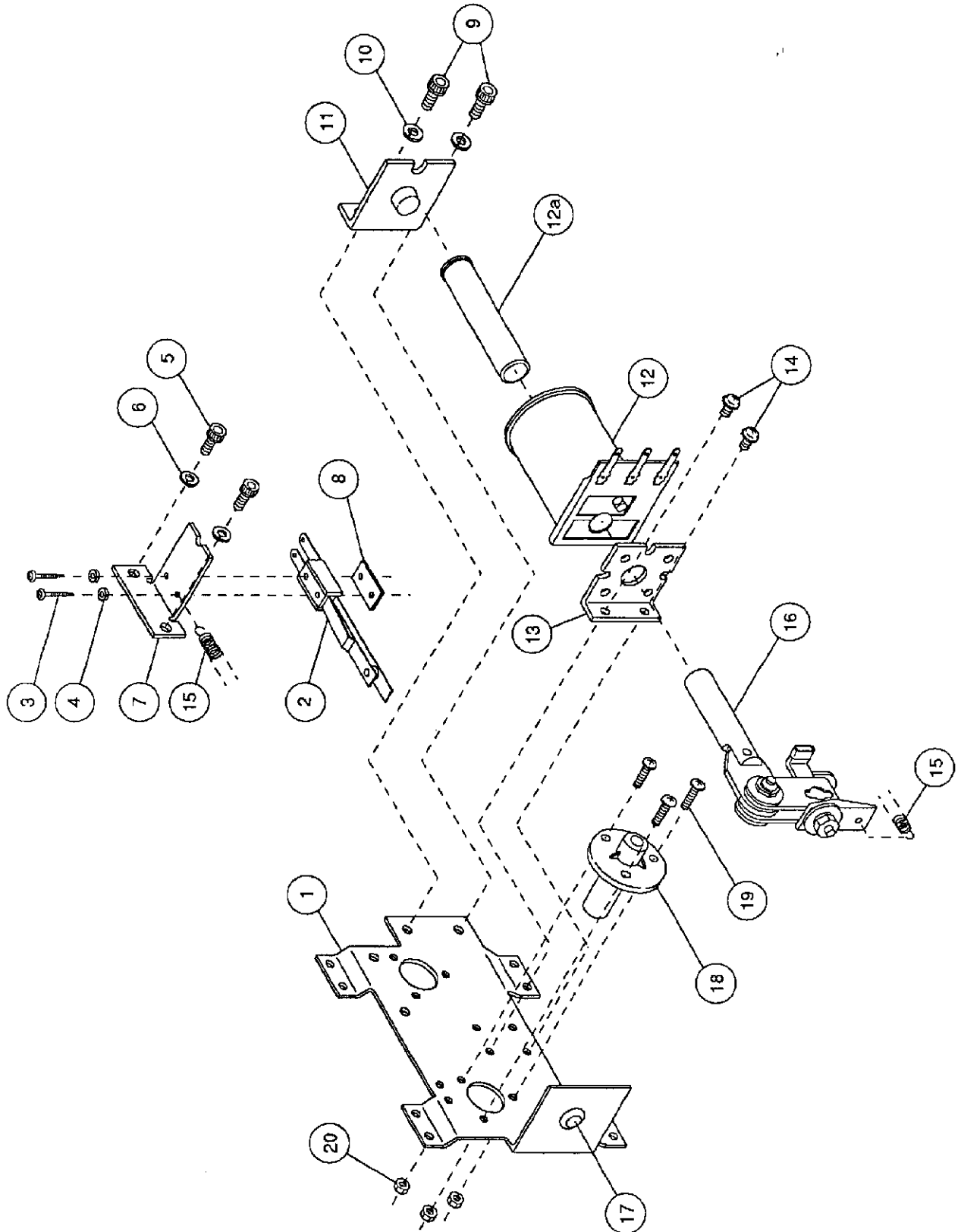
### Flipper Notes:

- \* Items for Left Flipper Assembly ONLY.
- 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.
- With the flipper, in the non-activated position, the E.O.S. Switch contacts must have a gap of .062 (±.015) inch. When flipper is activated switch must close.
- Any adjustment of the E.O.S. Switch must be made at a minimum distance of 0.25 inch from the switch body.
- Longer blade of E.O.S. Switch must be straight. Gap adjustment is done by adjusting shorter blade.
- All moving elements of the assembly must operate freely without any evidence of binding.
- Apply Loctite™ 242 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.

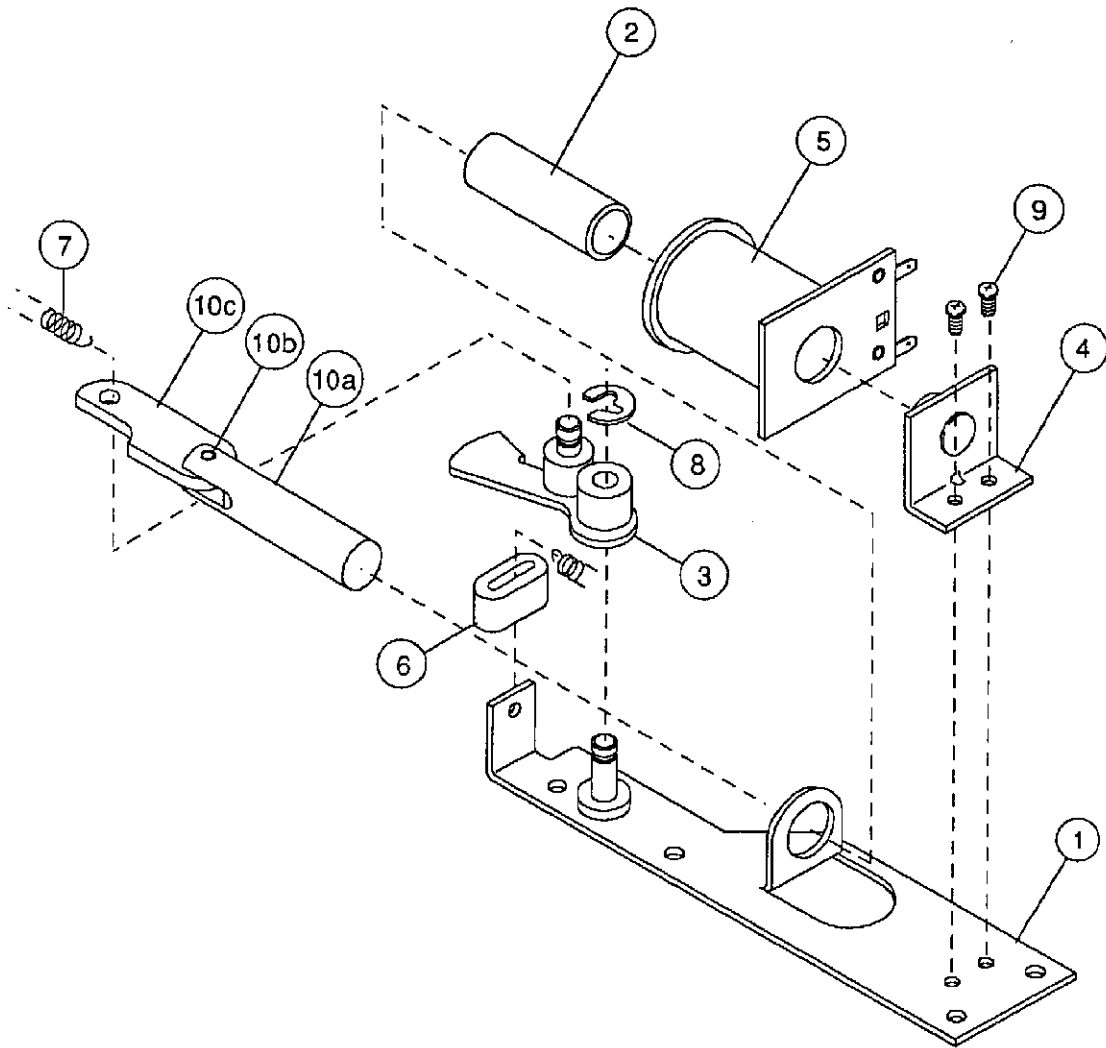
### Associated Parts for Left & Right Flippers:

21.	23-6519-6	Flipper Rubber (Yellow)
22.	20-9250-6	Flipper & Shaft (Yellow)

# A-15205-R-2 & A-15205-L-4 Fliptronic II Flipper Assembly



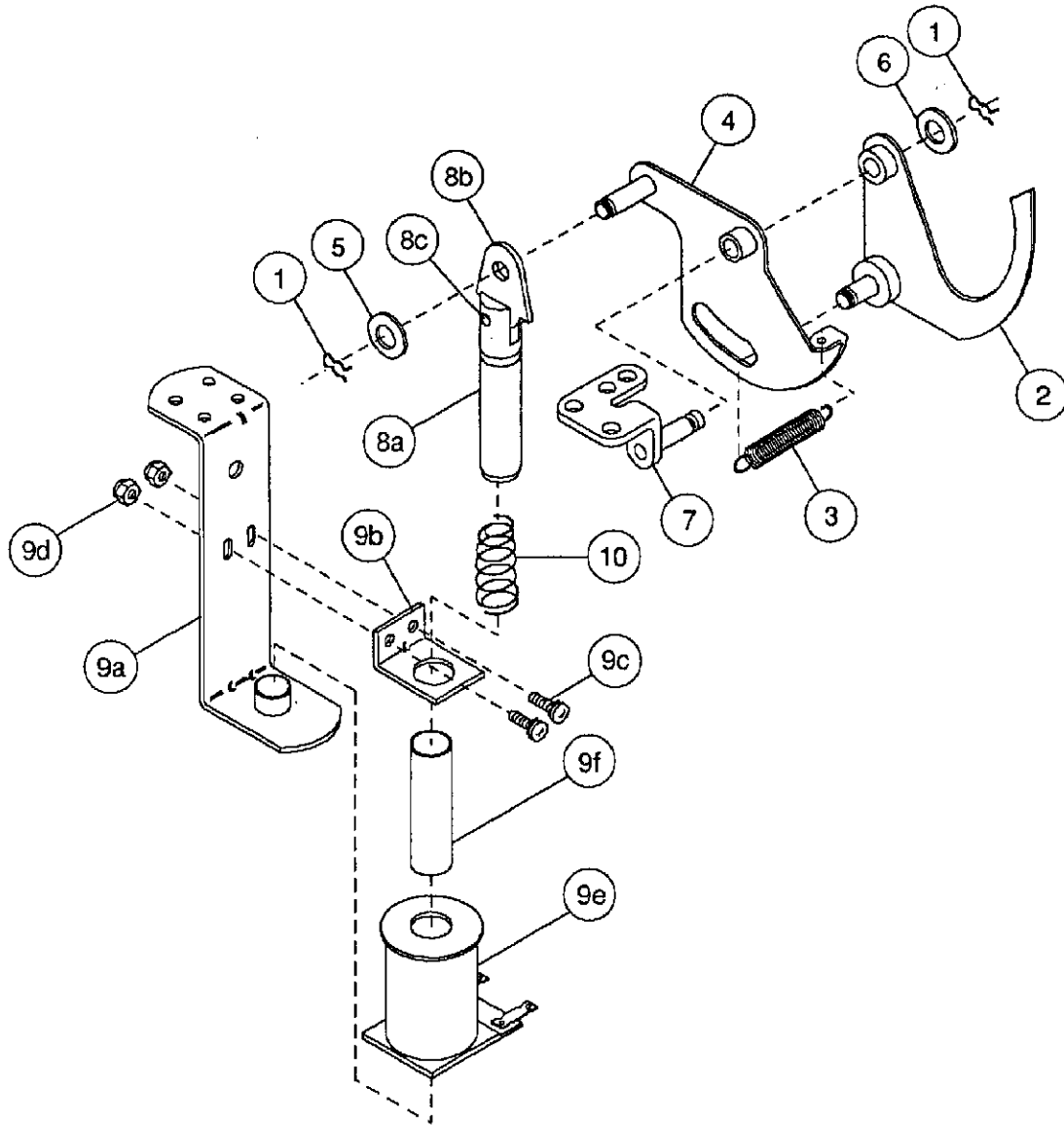
## A-8039-3 Outhole Kicker Assembly



<u>Item</u>	<u>Part Number</u>	<u>Description</u>
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



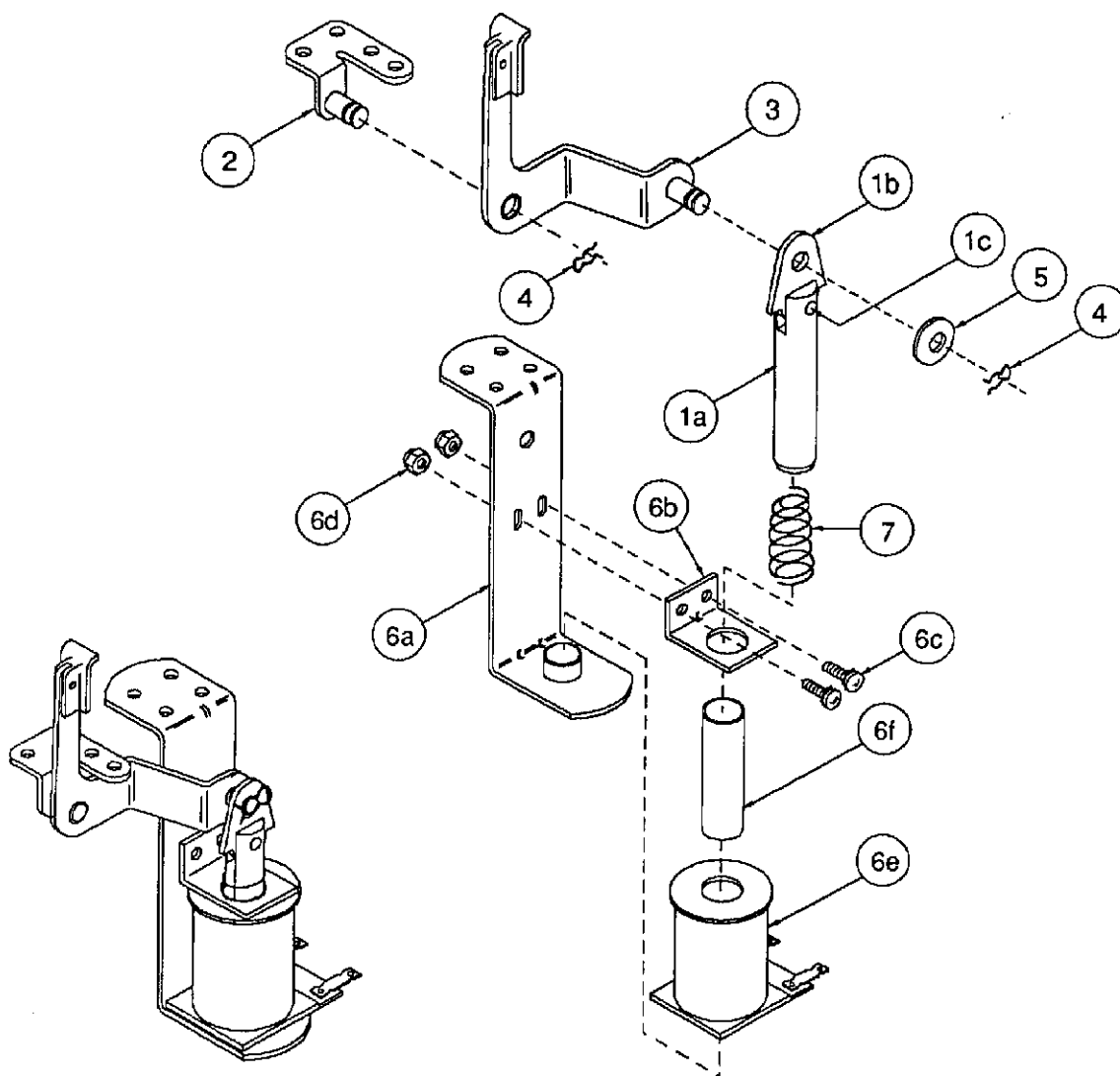
## C-9638 Ball Shooter Lane Feeder Assembly



### Associated Parts:

Item	Part Number	Description	Item	Part Number	Description
1.	12-6227	Hairpin Clip	9.	<b>A-9362-L-2</b>	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"			

## Kicker Arm (Slingshot) Assembly



### A-14875-1 Kicker Arm Assembly - Left

Item	Part Number	Description
1.	A-15103	Coil Plunger Assembly
a)	02-2364	Coil Plunger
b)	03-8085	Armature Link
c)	20-8716-5	Roll Pin, 1/8 x 7/16"
2.	A-5653	Mounting Bracket Assembly
3.	A-14872-2	Crank Assembly
4.	12-6227	Hairpin Clip
5.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.

### Associated Parts for Left & Right Kickers:

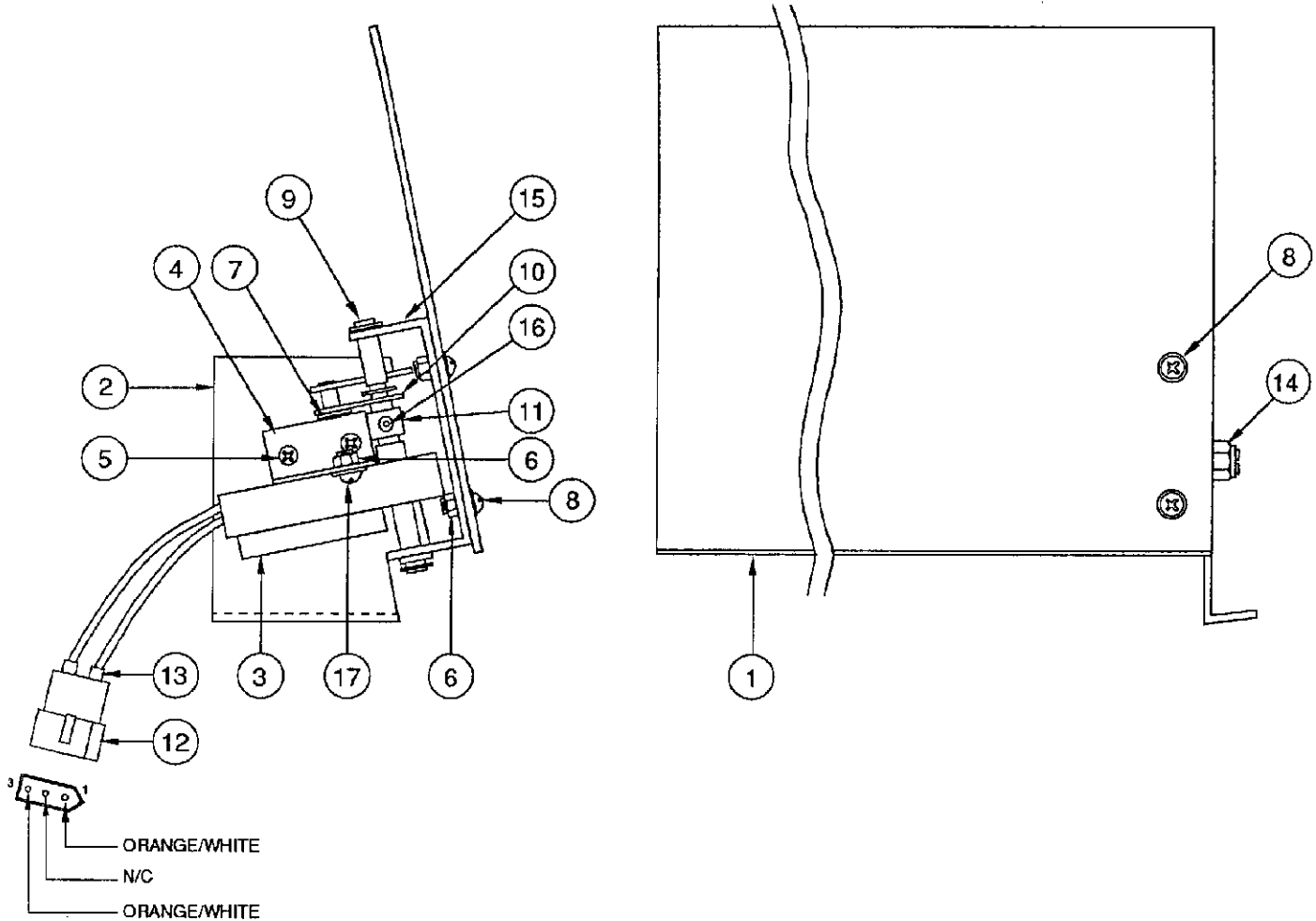
Item	Part Number	Description
6.	A-14369-R	Coil & Bracket Assy., Right
	A-14369-L	Coil & Bracket Assy., Left
a)	B-7572-1	Bracket & Stop Assembly
b)	01-8-508-S	Coil Retaining Bracket
c)	4006-01017-06	Mach. Screw, 6-32 x 3/8
d)	4406-01119-00	Nut, 6-32 ESN
e)	AE-27-1200	Coil Assembly
f)	03-7066	Coil Tubing
7.	10-128	Spring

### A-14875-2 Kicker Arm Assembly - Right

(Parts listed replace some items of A-14875-1)

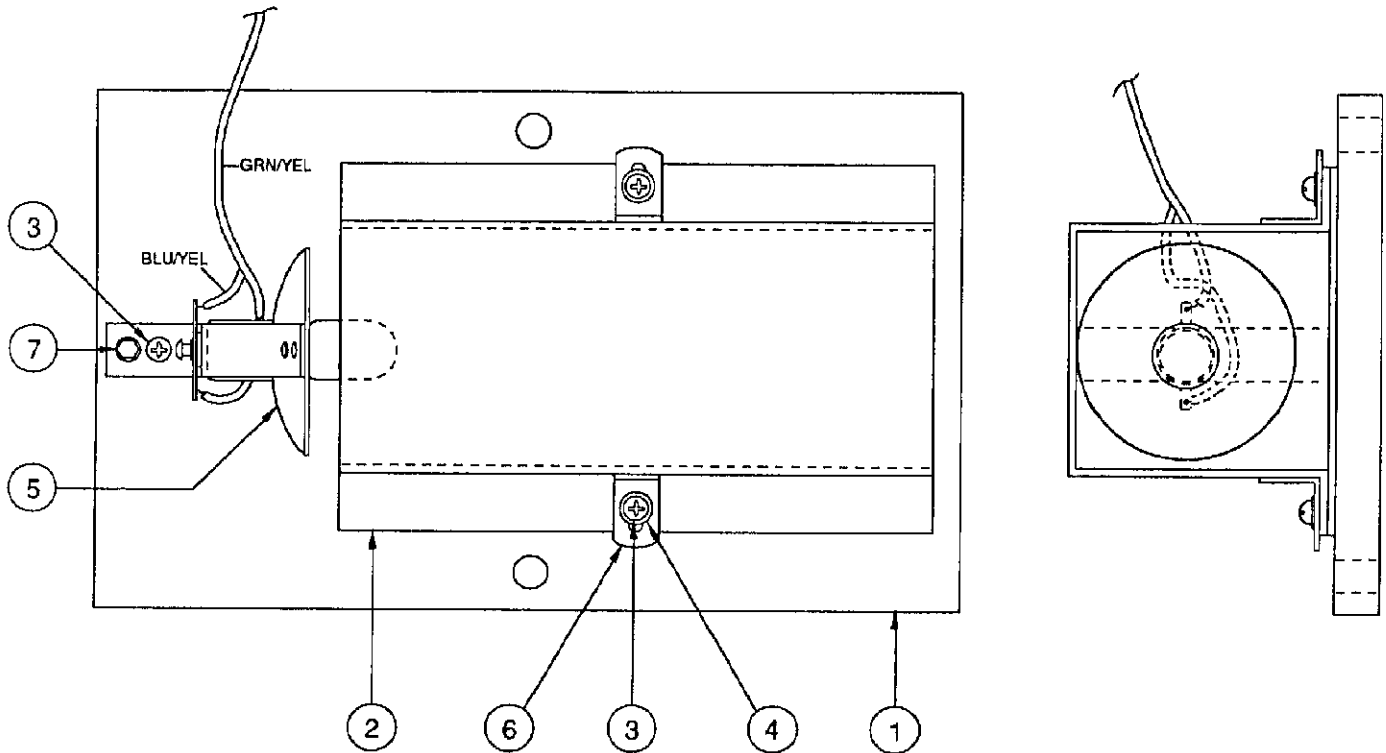
3.	A-14872-1	Crank Assembly
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## A-15958 Motor & Mirror Assembly



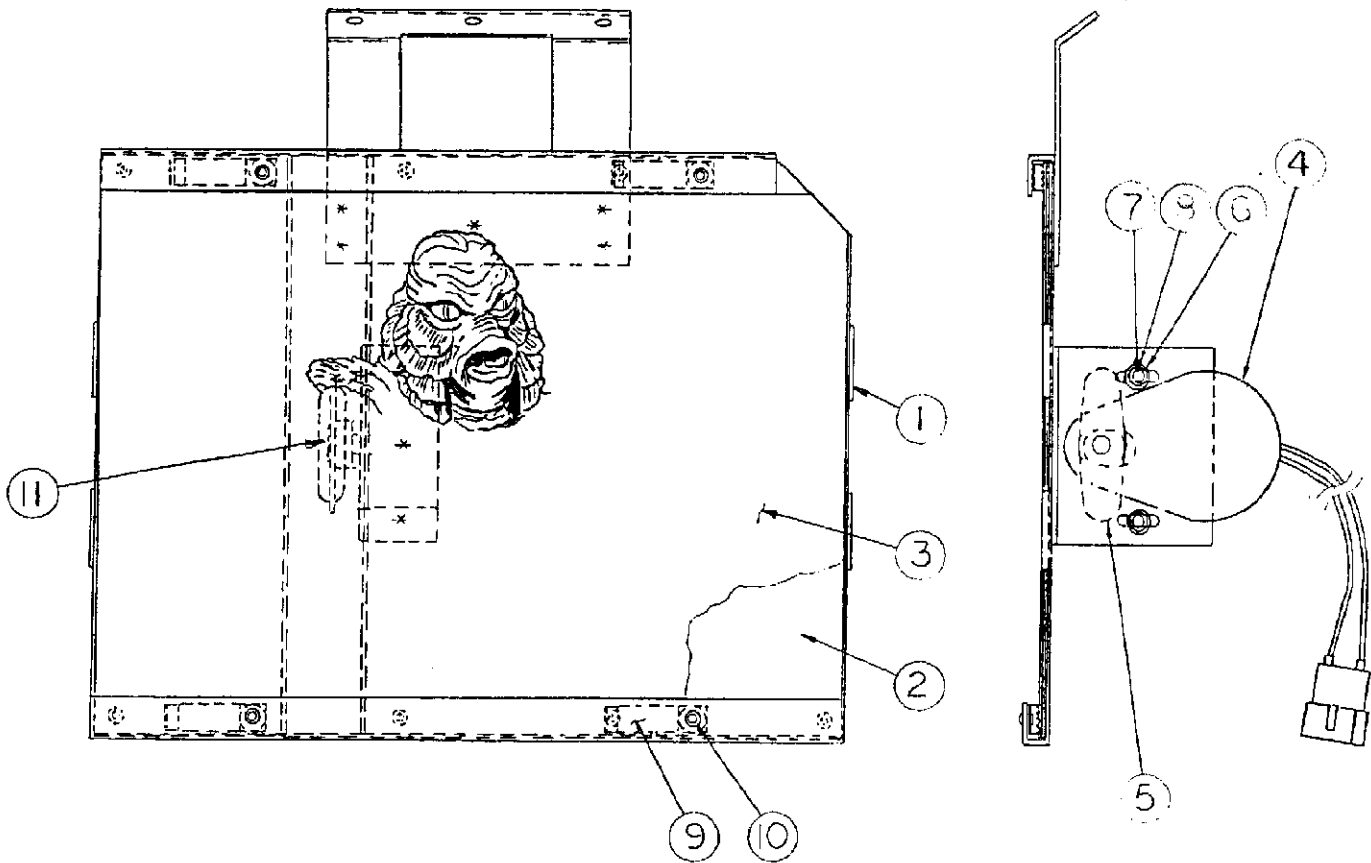
Item	Part Number	Description	Item	Part Number	Description
1.	20-9733	Mirror	10.	01-10970	Link
2.	01-10967	Bracket	11.	02-4685	Eccentric
3.	A-15988	Motor, 10RPM, 50VAC	12.	5791-09111-00	3P1396 03-09-2032
4.	01-10966	Motor Mounting Bracket	13.	5820-09080-00	PM1190 02-09-2101
5.	4008-01017-08	Mach. Screw, #8-32 x 1/2"	14.	4408-01119-00	Nut #8-32 ESN
6.	4406-01119-00	Nut #6-32 ESN	15.	A-15947	Bracket & Stud Assembly
7.	20-8712-18	"E"-Ring, 3/16" Shaft	16.	4008-01076-02	Set Screw #8-32 x 1/8"
8.	4006-01017-06	Mach. Screw, 6-32 x 3/8"	17.	4006-01017-02	Mach. Screw #6-32
9.	02-4683	Shaft			

## A-15986 Reflector Assembly



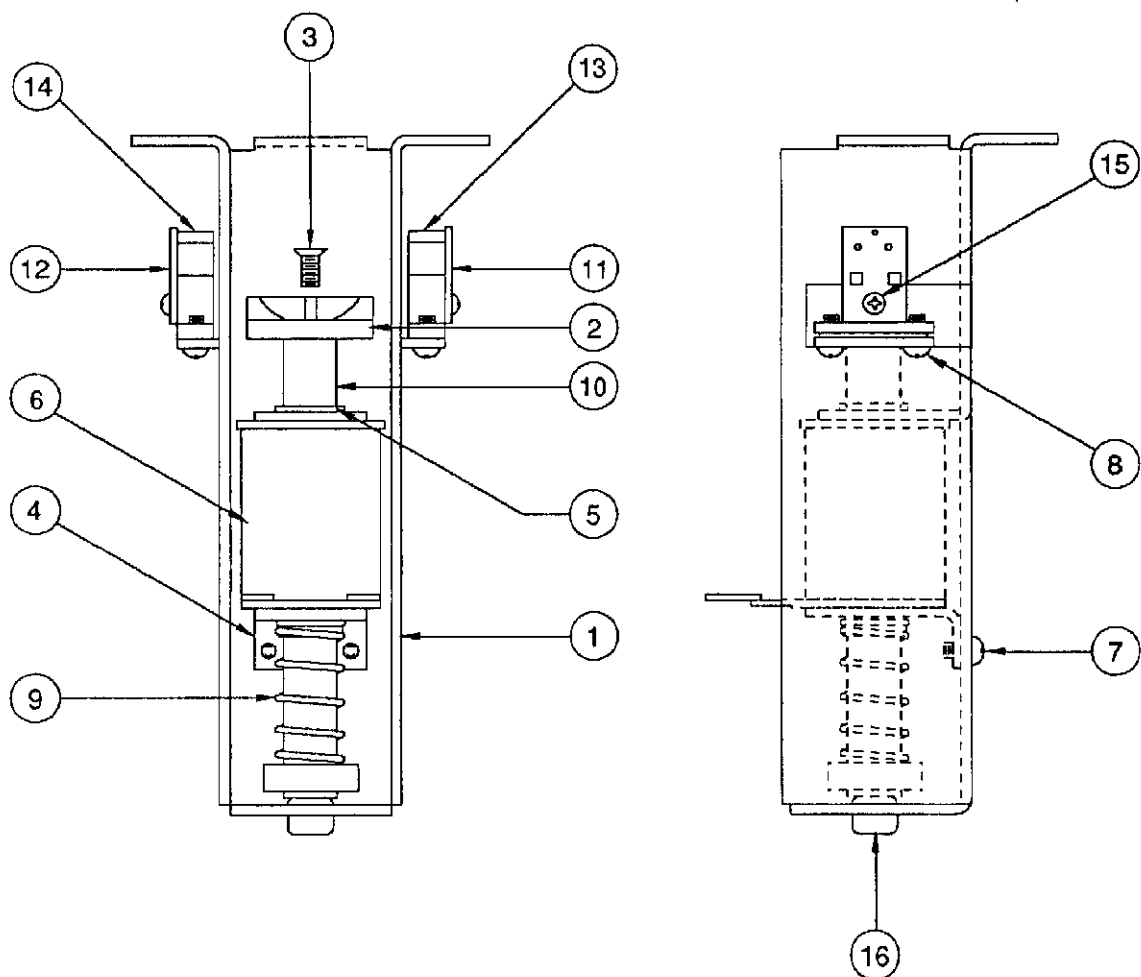
<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1.	A-15984	Board Assembly
2.	A-15985	Shield Assembly
3.	4006-01003-10	Mach. Screw, 6-32 x 5/8 P-PH-S
4.	4700-00090-00	Flatwasher, 5/32 x 3/8 x 21ga.
5.	A-15857	Reflector Assembly
6.	01-6932	Adjustment Clip
7.	4106-01114-08	Sh. Metal Screw, #6 x 1/2 PH

## A-15950 Hologram Assembly



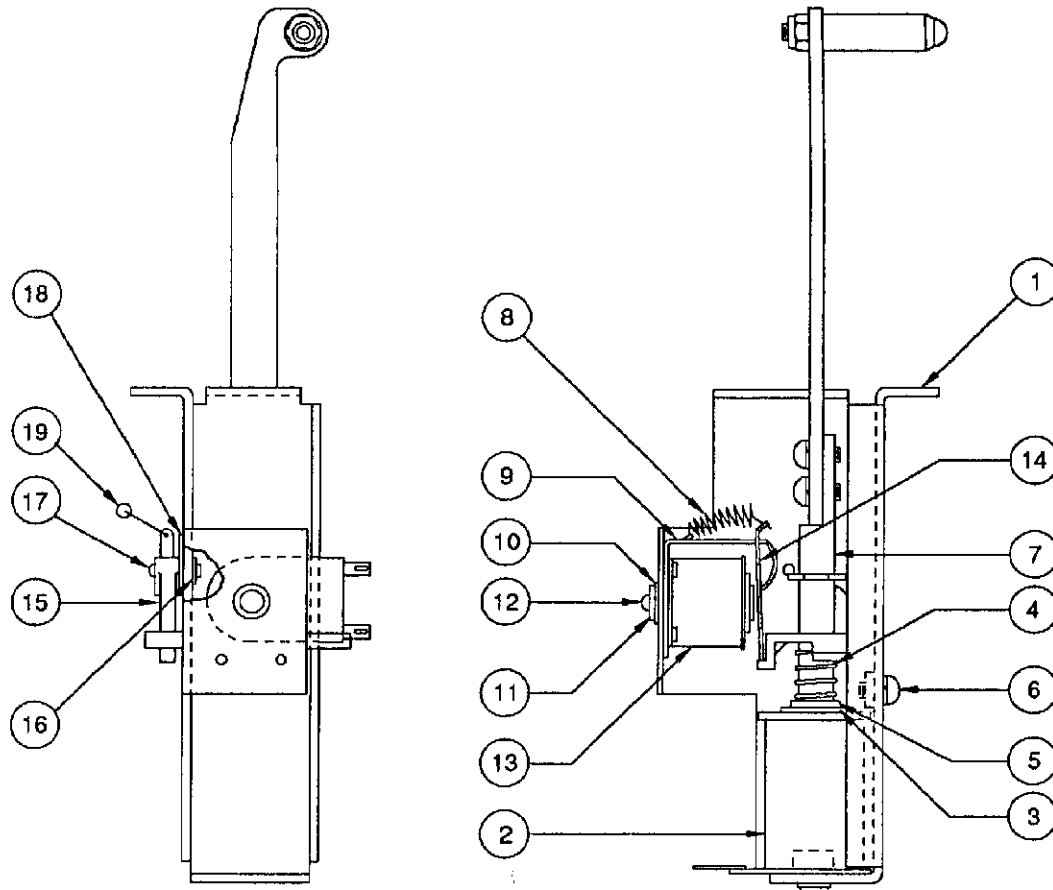
<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1.	A-15949	Bracket Assembly
2.	A-15953	Carrier
3.	20-9726	Hologram
4.	A-15988	Motor & Cable Assembly
5.	A-15948	Cam Assembly
6.	4700-00012-00	Flatwasher, 11/64 x 3/8 x 21ga.
7.	4006-01017-06	Mach. Screw #6-32 x 3/8"
8.	4406-01119-00	Nut 6-32 ESN
9.	01-10971	Clip
10.	07-6688-16N	Rivet, 1/8 x 1/8" Nickel

## A-15842 Ball Popper Assembly



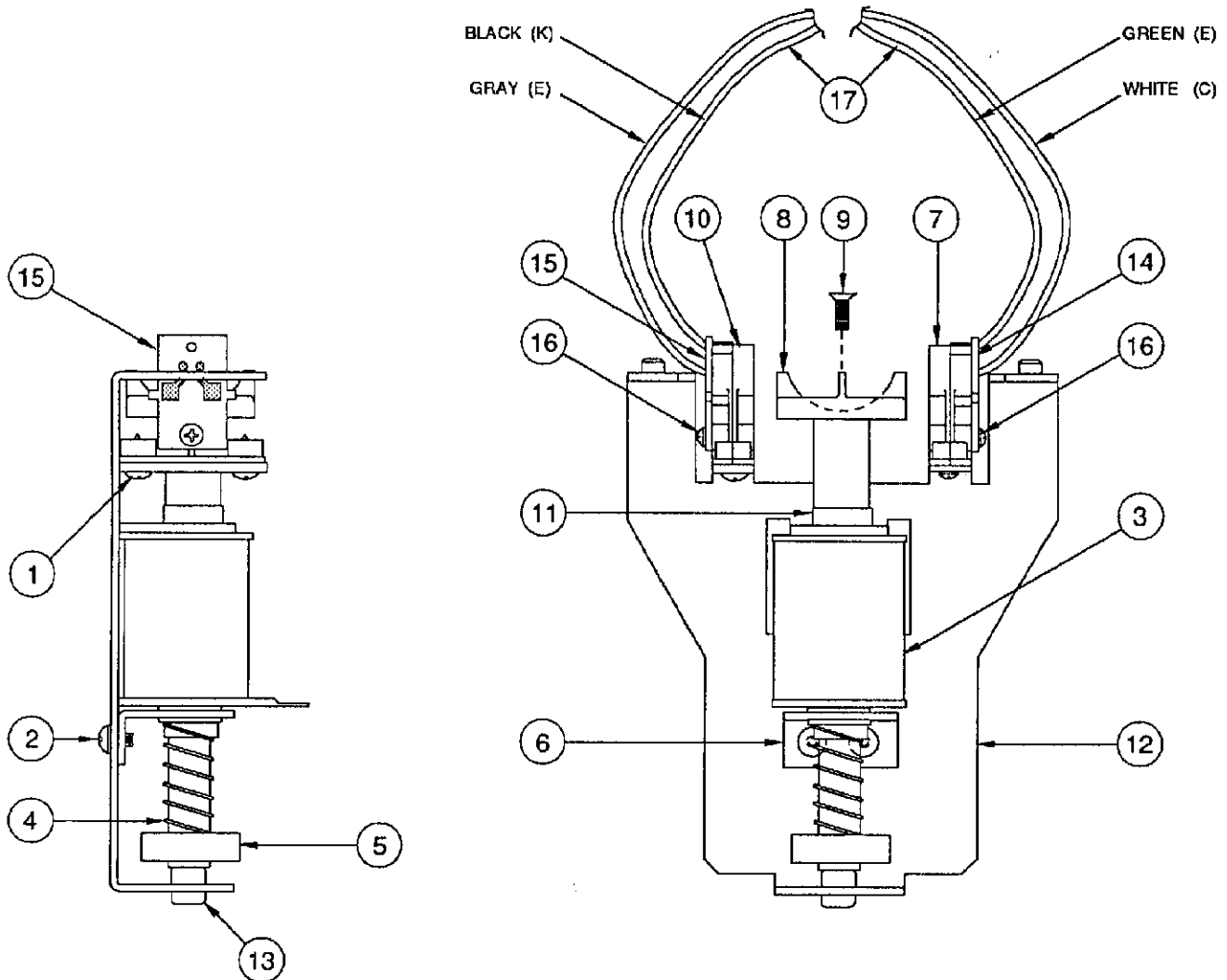
Item	Part Number	Description	Item	Part Number	Description
1.	01-10907	Bracket	9.	10-135	Plunger Spring
2.	03-8561	Ball Popper Cup	10.	A-14585	Armature & Extension Assy.
3.	4106-01152-06	Sh. Metal Screw, #6 x 3/8	11.	A-14231	LED Assembly
4.	01-9794	Mounting Bracket	12.	A-14232	Photo Transistor Assembly
5.	03-7067	Coil Tubing	13.	03-8506-1	Opto Mounting Base, White
6.	AE-26-1200	Coil Assembly	14.	03-8506	Opto Mounting Base, Black
7.	4008-01017-04	Mach. Screw #8-32 x 1/4	15.	4104-01001-06	Sh. Metal Screw #4 x 3/8 P-PH
8.	4106-01019-06	Sh. Metal Screw, #6 x 3/8	16.	23-6420	Rubber Grommet

## A-16042 Lift Ramp Assembly



<u>Item</u>	<u>Part Number</u>	<u>Description</u>	<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1.	A-16043	Lift Bracket	11.	4701-00003-00	Lockwasher #8 Split
2.	AE-26-1200	Coil Assembly	12.	4008-01021-06	Mach. Screw 8-32 x 3/8 P-RH-BR
3.	01-9794	Coil Retaining Bracket	13.	SM1-28-900-DC	Coil Assembly
4.	10-437	Spring	14.	A-15821	Armature Sub- Assembly
5.	03-7066	Coil Tubing	15.	5647-12693-21	Mini Micro Switch
6.	4008-01017-05	Sh. Metal Screw, #8-32 x 5/16	16.	01-8240	Nut Plate #2-56
7.	A-16044	Plunger Post Assembly	17.	4002-01105-08	Mach. Screw, 2-56 x 1/2 P-PH
8.	10-96	Spring	18.	01-8600	Insulator
9.	A-6892	Frame & Eyelet Assembly	19.	5070-09054-00	Diode 1N4001, 1.0A.
10.	4700-00089-00	Flatwasher, 11/64 x 7/16 x 16ga.			

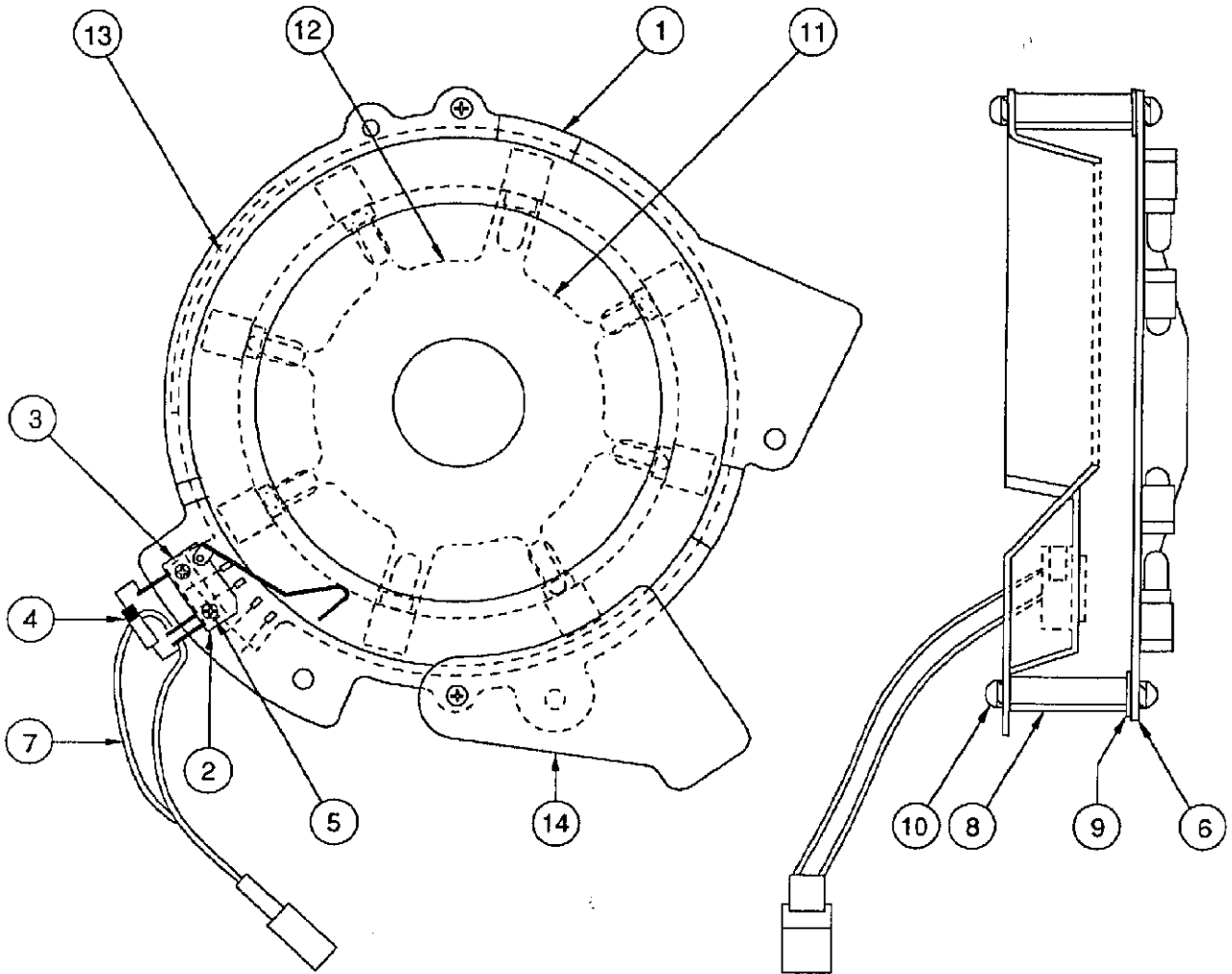
## A-15769-1 Ball Popper & Opto Assembly



Item	Part Number	Description	Item	Part Number	Description
1.	4106-01019-06	Sh. Metal Screw, #6 x 3/8"	10.	03-8506-1	Opto Mounting Base, White
2.	4008-01017-04	Mach. Screw, 8-32 x 1/4"	11.	03-7067-5	Coil Tubing
3.	AE-23-800	Coil Assembly	12.	A-15914	Bracket, Ball Popper
4.	10-135	Spring	13.	23-6420	Rubber Grommet
5.	02-4668	Armature Assembly	14.	A-14232	Photo Transistor Assembly
6.	01-9794	Mounting Bracket	15.	A-14231	LED Assembly
7.	03-8506	Opto Mounting Base, Black	16.	4104-01001-06	Sh. Metal Screw, #4 x 3/8"
8.	03-8561	Ball Popper Cup	17.	H-16423	Opto Switch Cable
9.	4106-01152-06	Sh. Metal Scw, #6-32 x 3/8"			



## A-15993 Bowl Assembly

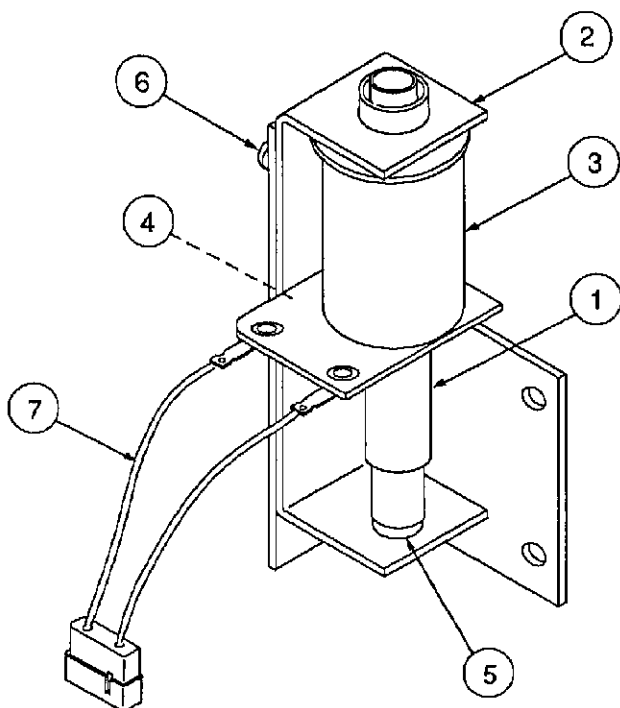


Item	Part Number	Description
1.	03-8676	Bowl
2.	5647-12693-21	Mini-Micro Switch
3.	01-8240	Nut Plate #2-56
4.	5070-09054-00	Diode 1N4001, 1.0A.
5.	4002-01105-08	Mach. Screw, 2-56 x 1/2 P-PH-S
6.	A-15672	8-Lamp Board Assy.
7.	H-15870	Cable Assembly
8.	02-4252-19	F-F Spacer #6-32 x 1-3/16"
9.	4700-00090-00	Flatwasher, 5/32 x 3/8 x 21ga.
10.	4006-01017-06	Mach. Screw, 6-32 x 3/8 P-RH-S
11.	* 31-1711-3	Decal, Bottom
12.	* 31-1711-4	Decal, Bottom
13.	* 31-1713-7	Decal, Top
14.	* 31-1698B-2	Playfield Plastic

\* Not available for individual sale. Order Decal Set 31-1711 & 31-1713 respectively.

## B-10686-1 Knocker Assembly

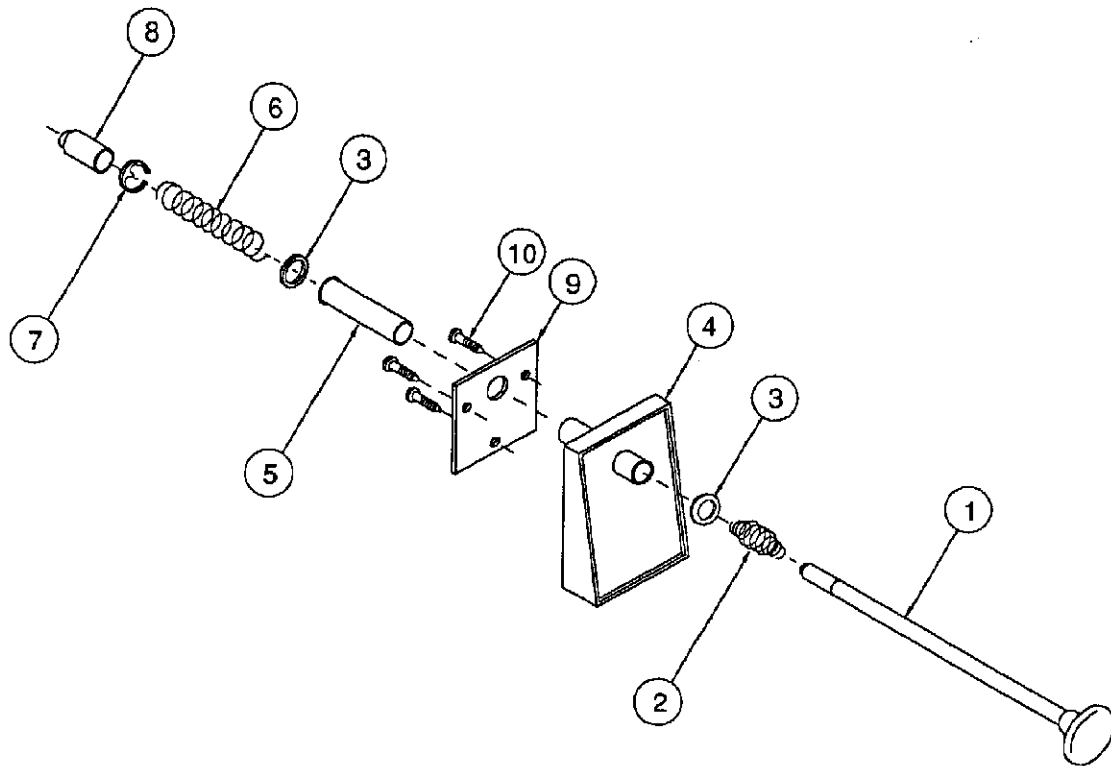
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<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1.	A-5387	Coil Plunger Assembly
2.	B-7409-2	Mounting Bracket Assembly
3.	AE-23-800	Coil Sub-Assembly
4.	01-8-508-T	Coil Retaining Bracket
5.	23-6420	Rubber Grommet
6.	4008-01017-06	Mach. Screw, 8/32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

## B-12445-4 Ball Shooter Assembly



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

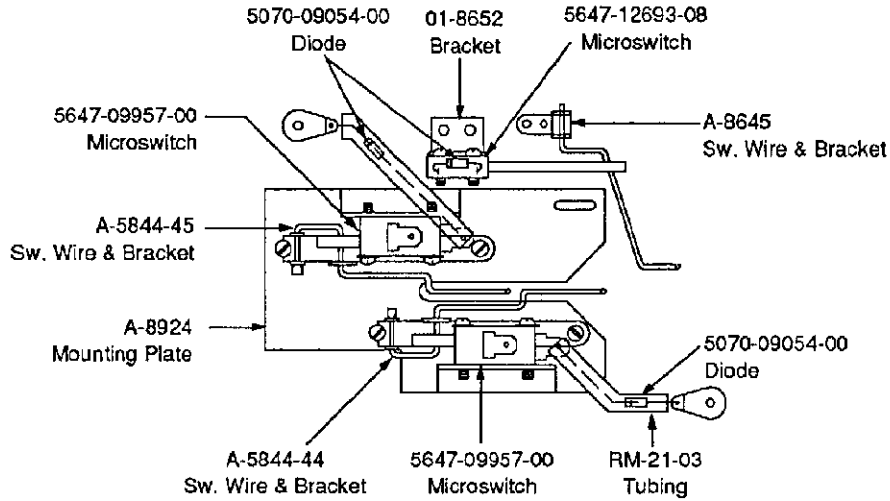
### Associated Parts:

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

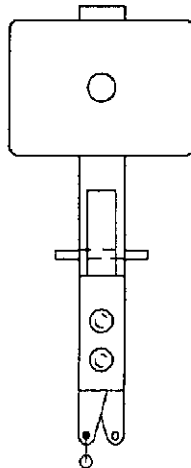
## Ball Trough Switches

(Viewed from underside of playfield to show locations)

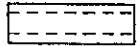
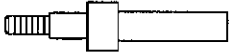
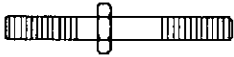
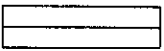
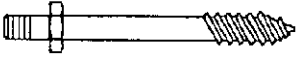
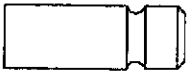
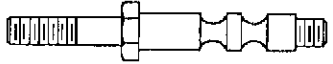
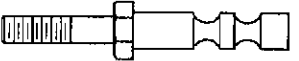
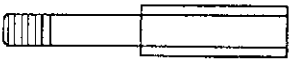
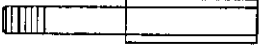
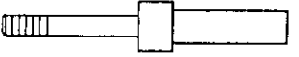
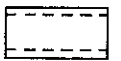

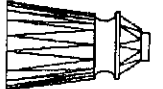
### B-8925 Ball Trough Switch Plate Assy.



### A-16206-2 Standup Target (Green)



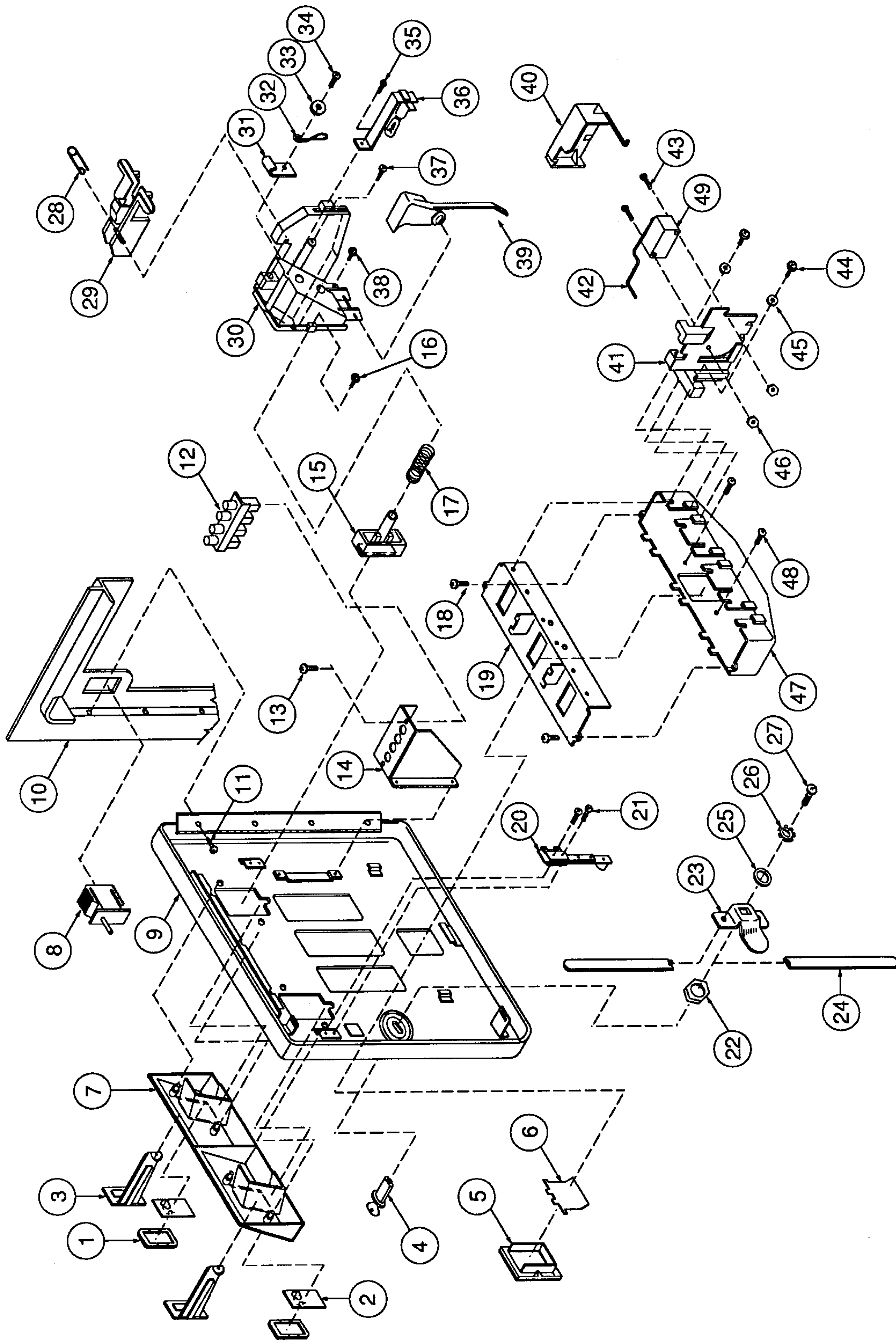
## Metal & Plastic Posts

	<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
	02-4020	Support Post	2
	02-4036	Mini Post	2
	02-4424-1	Spring Post, 6-32 x 8-32	10
	02-4252-18	F-F Spacer, 6-32 x 1-1/8"	2
	02-4252-26	F-F Spacer, 6-32 x 1-5/8"	5
	02-4252-65	F-F Spacer, 6-32 x 3-1/16"	1
	02-4426-1	Post, #6-32 / #8 SMS	10
	02-4426-2	Post, #6-32 / #8 SMS	3
	02-4434	Post, #8 x 1"	4
	02-4493	Double Bumper Post (Hex)	1
	02-4608	Double Bumper Post	2
	02-4643-1	F-F Spacer, 8-32 x 3-1/4"	2
	02-4643-3	F-F Spacer, 8-32 x 4-3/4"	1
	02-4643-4	F-F Spacer, 8-32 x 4-5/16"	1
	02-4644-1	F-F Spacer, 6-32 x 1-7/8"	1
	02-4659	Mini Post	10
	02-4735	Support Post	2
	03-8365-13	Post 3/8 x 1-3/16", Clear	10
	03-8319-9	Star Post #8	15

**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)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>	<u>Quantity</u>
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

<u>Part Number</u>	<u>Description</u>	<u>Part Number</u>	<u>Description</u>
A-12738-20018	WPC Sound Board Assembly	01-10706	Deflector
A-12742-20018	WPC CPU Board Assembly	01-10707	Deflector
A-13204-20018	Bottom Arch Assembly	01-10708-1	Scoop #1
A-13769-20018	Playfield & Insert Assembly	01-10708-2	Scoop #2
A-14376-20018	Backbox Assembly	01-10760	Ball Guide
A-15541	Chase Light Assembly	01-10761	Ball Guide
A-15610	Wall Ramp Assembly	01-10763	Ball Guide
A-15616	Flipper Ball Guide Assy., Left	01-10764-1	Flipper Ball Guide, Right
A-15617	Flipper Ball Guide Assy., Right	01-107764-2	Flipper Ball Guide, Left
A-15619	Trough Assembly	01-10766	Ball Guide
A-15620	Ramp Assembly	01-10767	Ball Guide
A-15621	Ramp Assembly	01-10768	Ball Guide
A-15622	Ramp Assembly	01-10770	Ball Guide
A-15661	Gate Assembly	01-10771	Ball Guide
A-15662	Gate Assembly	01-10772	Ball Guide
A-15663	Gate Assembly	01-10773	Ball Guide
A-15665	Bracket & Board Assembly	01-10774	Ball Guide
A-15666	Bracket & Board Assembly	01-10775	Ball Guide
A-15667	Bracket & Board Assembly	01-10822	Ramp Wall
A-15672	8-Lamp Board Assembly		
A-15727	3-Lamp Board Assembly	02-4252-19	F-F Spacer, 6-32 x 1-3/16"
A-15728	3-Lamp Board Assembly	02-4466-7	F-F Spacer, 8-32 x 1-1/16"
A-15730	4-Lamp Board Assembly	02-4642-1	F-F Spacer, 1-1/2"
A-15731	4-Lamp Board Assembly	02-4642-2	F-F Spacer, 2"
A-15732	4-Lamp Board Assembly	02-4643-1	F-M Spacer, 8-32 x 3-1/4"
A-15733	4-Lamp Board Assembly	02-4643-3	F-M Spacer, 8-32 x 4-3/4"
A-15734	6-Lamp Board Assembly	02-4643-4	F-M Spacer, 8-32 x 4-5/16"
A-15842	Ball Popper Assembly	02-4644-1	F-M Spacer, 6-32 x 1-7/8"
A-15857	Reflector Assembly	02-4705	Post
A-15941-1	Cashbox Assembly		
A-15950	Hologram Assembly	03-7960-20018-2	Playfield Mylar, Jet Bumper
A-15958	Motor & Mirror Assembly	03-7960-20018-3	Playfield Mylar
A-15984	Board Reflector Assy.	03-7960-20018-4	Playfield Mylar
A-15985	Shield Assembly	03-7960-20018-5	Playfield Mylar
A-15989-1	Playfield Plastic Assembly		
A-15989-2	Playfield Plastic Assembly	12-7036	Wire Ramp
A-15989-3	Playfield Plastic Assembly	12-7037	Wire Ramp
A-15993	Bowl Assembly	12-7038	Wire Ramp
A-16002	Speak/Display Assembly		
A-16003	Back Panel Bottom Assy.	31-1002-20018	Screened Playfield
A-16042	Lift Ramp Assembly	31-1008-20018	Screened Bottom Arch
A-16045	Triac Driver Assy. w/Spacers	31-1009-20018	Screened Shooter Guage
A-16087	8-Lamp Chase Light Assy.	31-1357-20018	Screened Translite
A-16088	8-Lamp Chase Light Assy.	31-1420-20018	Screened Speaker Panel Cover
A-16089	8-Lamp Chase Light Assy.	31-1698-	Playfield Plastic Set
A-16104	Playfield Window & Decal Assy.	31-1698A-1, -2	Playfield Plastic
A-16206-2	Standup Target Assy., (Op. Green)	31-1698B-1, -2	Playfield Plastic
A-5343-20018-1	Game ROM Assembly	31-1711-1 → -6	Decal, Bottom
A-5343-20018-2	Music/Speech ROM	31-1712	Decal, Top
A-5343-20018-3	Music/Speech ROM	31-1713-1 → -8	Decal, Top
A-5343-20018-4	Music/Speech ROM	31-1722-1	Screened Speaker Grill, Right
A-8552-20018	Back Glass Assembly	31-1722-2	Screened Speaker Grill, Left



## Cable List

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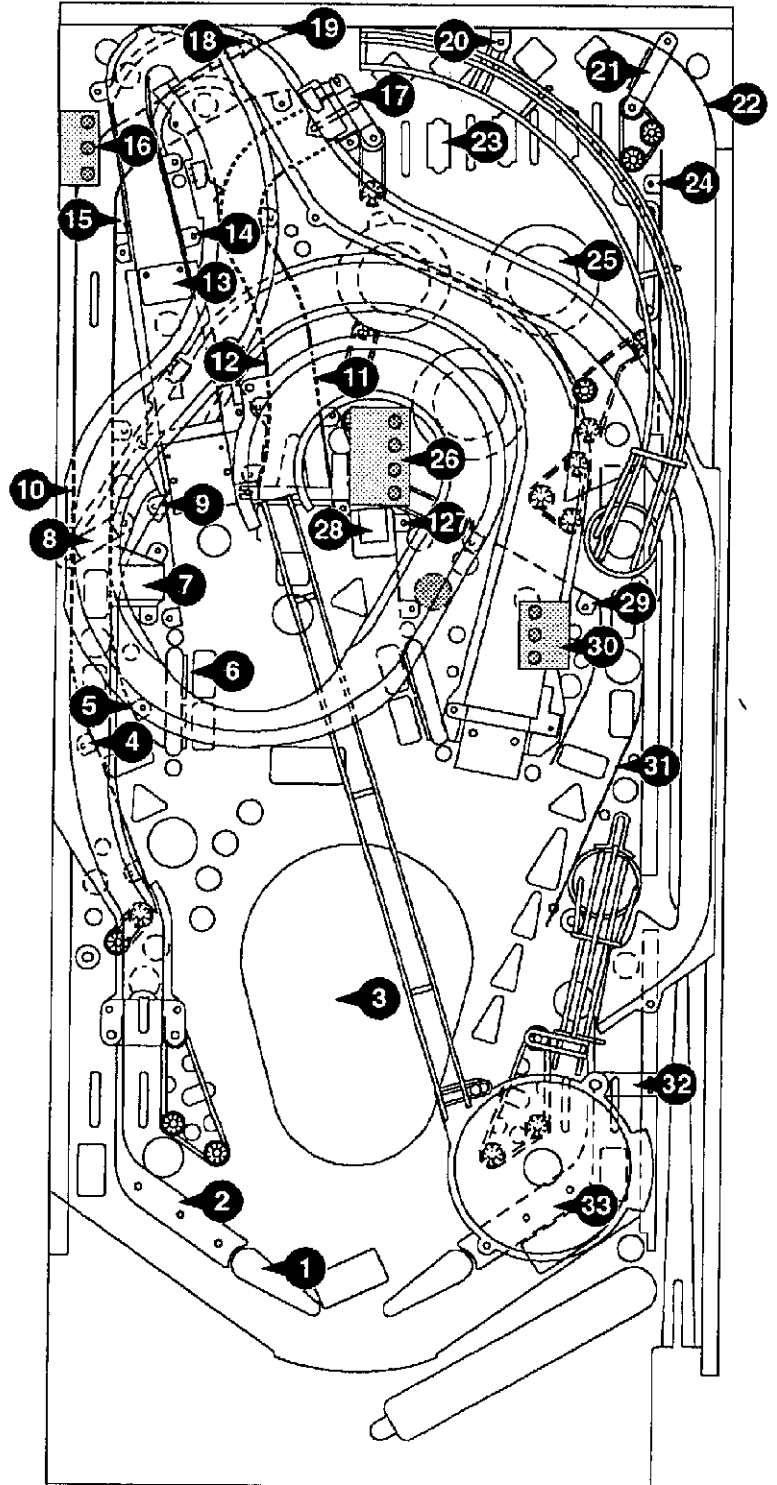
<u>Part Number</u>	<u>Description</u>
H-15860	Playfield Switch Cable
H-15861	Playfield Lamp Cable
H-15962	Playfield Solenoid Cable
H-15863	Cabinet Cable
H-15864	Insert Cable
H-15865	Hologram Cable
H-15866	Ramp Switch Cable
H-15867	Left Ramp Switch Cable
H-15868	Billboard Cable
H-15869	Billboard Lamp Cable
H-15870	Bowl Lamp Cable
H-15871	Chase Light Cable
H-15872	Reflector Cable
H-16037	Motor Cable
H-16115	Right Billboard Cable
H-16213	Front Chase Light Cable
H-16214	Center Chase Light Cable
H-16236	Back Panel Cable

## UPPER PLAYFIELD PARTS LOCATIONS

Item	Part Number	Description
1	20-9250-6	Yellow Flipper & Shaft
2	A-15616	Right Flipper Ball Guide
3	A-16104	Playfield Window
4	A-15548	8-32 Stud Plate
5	01-10768	Ball Guide
6	01-10760	Ball Guide
7	A-16206-2	Stationary Target (4)
8	01-10706	Deflector
9	A-15661	Gate Assembly
10	01-10772	Ball Guide
11	01-10905	Bracket
12	01-10763	Ball Guide
13	01-10761	Ball Guide
14	A-15609	Ramp Wall Left
15	01-10822	Ball Guide
16	01-10771	Ball Guide
17	A-15666	Bracket & Board Assy.
18	A-15662	Gate Assembly
19	01-10774	Ball Guide
20	01-11072	Deflector Bracket
21	01-10710	Bracket
22	A-15663	Gate Assembly
23	01-10770	Ball Guide
24	03-8318-12	Light Hood
25	01-10767	Ball Guide
26	B-9414-3	Jet Bumper Assembly
27	03-8254-9	Jet Bumper Cap, Red
28	A-15665	Bracket & Board Assy.
29	01-10773	Ball Guide
30	01-10707	Deflector Bracket
31	01-10766	Ball Guide
32	A-15667	Bracket & Board Assy.
33	01-10775	Ball Guide
34	A-15615	Ramp Bracket Assembly
35	A-15617	Left Flipper Ball Guide

**Not Shown:**

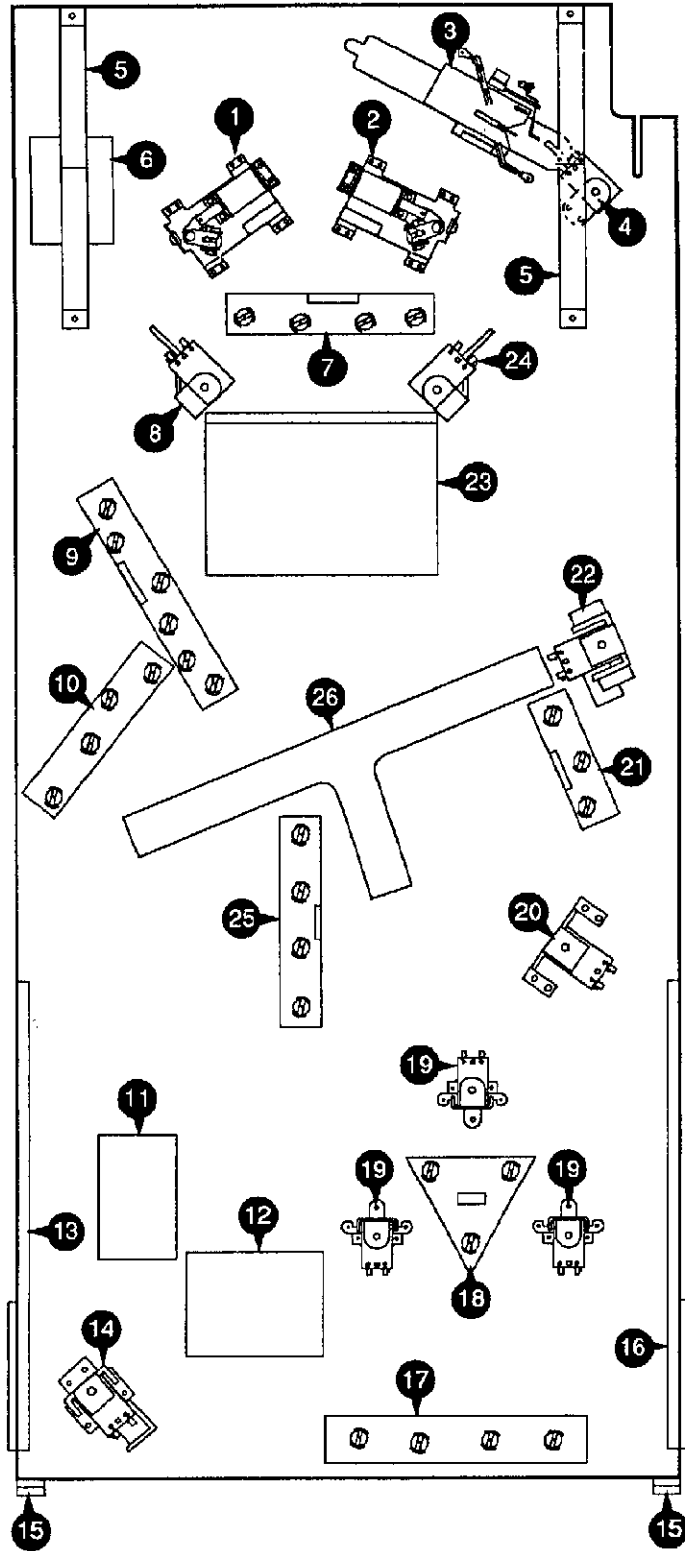
01-10599	Runway Ball Guide
01-10621	Strike Plate
01-3569-1	Ball Return Runway
01-5575	Bottom Arch Mounting Brkt.
01-8419	Playfield Hanger Bracket
01-9510	#8 Post Adjustment Plate
03-8063-1	Light Bulb Sleeve (Blue)
03-8063-2	Light Bulb Sleeve (Green)
03-8063-4	Light Bulb Sleeve (Red)
03-8063-5	Light Bulb Sleeve (White)
03-8063-6	Light Bulb Sleeve (Yellow)
03-7960-20018-2	Jet Area Mylar
03-7960-20018-3	Top Drop Mylar
03-7960-20018-4	Left Return Lane Mylar
03-7960-20018-5	Right Return Lane Mylar
03-8633	Level Mount
12-6542	Runway Gate Wire
20-9691	Level
A-13204-20018	Bottom Arch Assembly
A-13769-20018	Screened Playfield
A-8039-3	Ball Release Assembly
A-8645	Wire Form & Bracket
B-8623	Runway Ball Guide



\* Creature from the Black Lagoon has a special hardcoat playfield and does not require a full mylar. However, mylars can be purchased through your local Bally Distributor (ref. #03-7960-20018-1).

## LOWER PLAYFIELD PARTS LOCATION

Item	Part Number	Part Number
1.	A-15205-L-4	Lower Left Flipper Assembly
2.	A-15205-R-2	Lower Right Flipper assembly
3.	B-8925	Micro-Switch Plate Assembly
4.	C-9638	Multiball Eject Assembly
	10-128	Spring
	B-9362-L-2	Coil & Bracket Assembly
5.	01-10721	Safety Bracket (2 Used)
6.	A-13088-2	Triac Board
7.	A-15732	4-Lamp Board
8.	A-14875-1	Kicker Arm (Slingshot) Assy., Left
	A-14369-L	Coil & Bracket Assembly
9.	A-15734	6-Lamp Board
10.	A-15730	4-Lamp Board
11.	A-13901-1	Opto Ramp PC Board
12.	A-15441	Chase Light II PC Board
13.	A-15421-1	Playfield Slide Assembly, Left
14.	A-16042	Lift Ramp Assembly
15.	01-10726	Rear Guide Leg (2 Used)
16.	A-15421-2	Playfield Slide Assembly, Right
17.	A-15731	4-Lamp Board
18.	A-15727	3-Lamp Board
19.	A-9415-2	Jet Bumper Coil Assembly (3)
	B-12030-2	Switch & Diode Assembly (3)
20.	A-15769-1	Ball Popper & Opto Assembly
21.	A-15728	3- Lamp Board
22.	A-15842	Ball Popper Assembly
23.	A-15950	Hologram Assembly
24.	A-14875-2	Kicker Arm (Slingshot) Assy., Right
	A-14369-R	Coil & Bracket Assembly
25.	A-15733	4-lamp Board
26.	A-15619	Trough Assembly

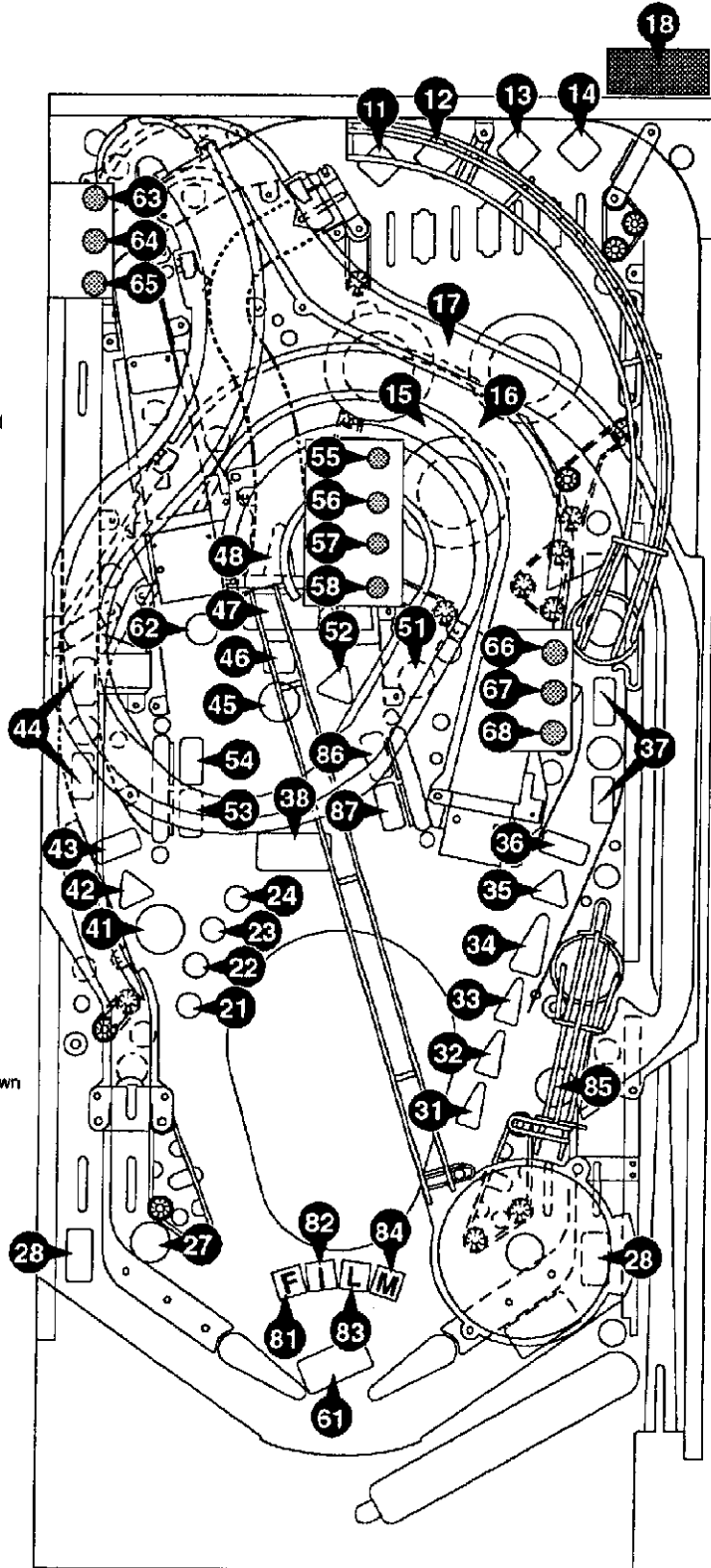


Underside of Playfield, Viewed In Raised Position

# LAMP LOCATIONS

Item No.	Bulb No.	Lamp Assy. No.	Description
11	24-8768	A-15731	(P)-A-I-D
12	24-8768	A-15731	P-(A)-I-D
13	24-8768	A-15731	P-A-(I)-D
14	24-8768	A-15731	P-A-I-(D)
15	24-8768	A-15727	Left Jet
16	24-8768	A-15727	Right Jet
17	24-8768	A-15727	Bottom Jet
18	24-6549	A-11754	Admit One
21	24-8768	A-15734	(K)-I-S-S
22	24-8768	A-15734	K-(I)-S-S
23	24-8768	A-15734	K-I-(S)-S
24	24-8768	A-15734	K-I-S-(S)
25	24-8768	A-15734	10 Million
26	24-8768	A-15734	20 Million
27	24-6549	A-11271	30 Million
28	24-6549	A-11271	Specials
31	24-6549	A-11754	Start Mega Menu
32	24-6549	A-8882	Playground Award
33	24-6549	A-11754	Lite Big Millions
34	24-6549	A-8882	Slide
35	24-8768	A-15728	Right Search
36	24-8768	A-15728	Right Video
37	24-8768	A-15728	Right Start Movie
38	24-6549	A-11271	Mega Menu
41	24-8768	A-15730	Lips
42	24-8768	A-15730	Left Search
43	24-8768	A-15730	Left Video
44	24-8768	A-15730	Left Start Movie
45	24-8768	A-11271	Combo Award
46	24-8768	A-15733	Parking O.K.
47	24-8768	A-15733	Move Your Car
48	24-8768	A-15733	Extra Ball
51	24-6549	A-11733	Snack Bar
52	24-6549	A-11754	Center Search
53	24-6549	A-11754	Cola
54	24-6549	A-11754	Hotdog
55	24-8768	A-14305	Super Jackpot
56	24-8768	A-14305	Jackpot
57	24-8768	A-14305	Rescue
58	24-8768	A-14305	Multiball Restart
61	24-6549	A-11754	Free Pass
62	24-6549	A-11271	Build Combo
63	24-8768	C-12709	Unlimited Millions
64	24-8768	C-12709	Creature Feature
65	24-8768	C-12709	Extra Ball Countdown
66	24-8768	C-12709	Big Millions
67	24-8768	C-12709	Movie Madness
68	24-8768	C-12709	Snack Attack
71	24-8768	---	*C
72	24-8768	---	*R
73	24-8768	---	*E
74	24-8768	---	*A
75	24-8768	---	*T
76	24-8768	---	*U
77	24-8768	---	*R
78	24-8768	---	*E
81	24-8768	A-15732	(F)-I-L-M
82	24-8768	A-15732	F-(I)-L-M
83	24-8768	A-15732	F-I-(L)-M
84	24-8768	A-15732	F-I-L-(M)
85	24-6549	A-11271	Start Combo
86	24-6549	A-11754	Popcorn
87	24-6549	A-11754	Ice Cream
88	---	20-9663-1	Start Button

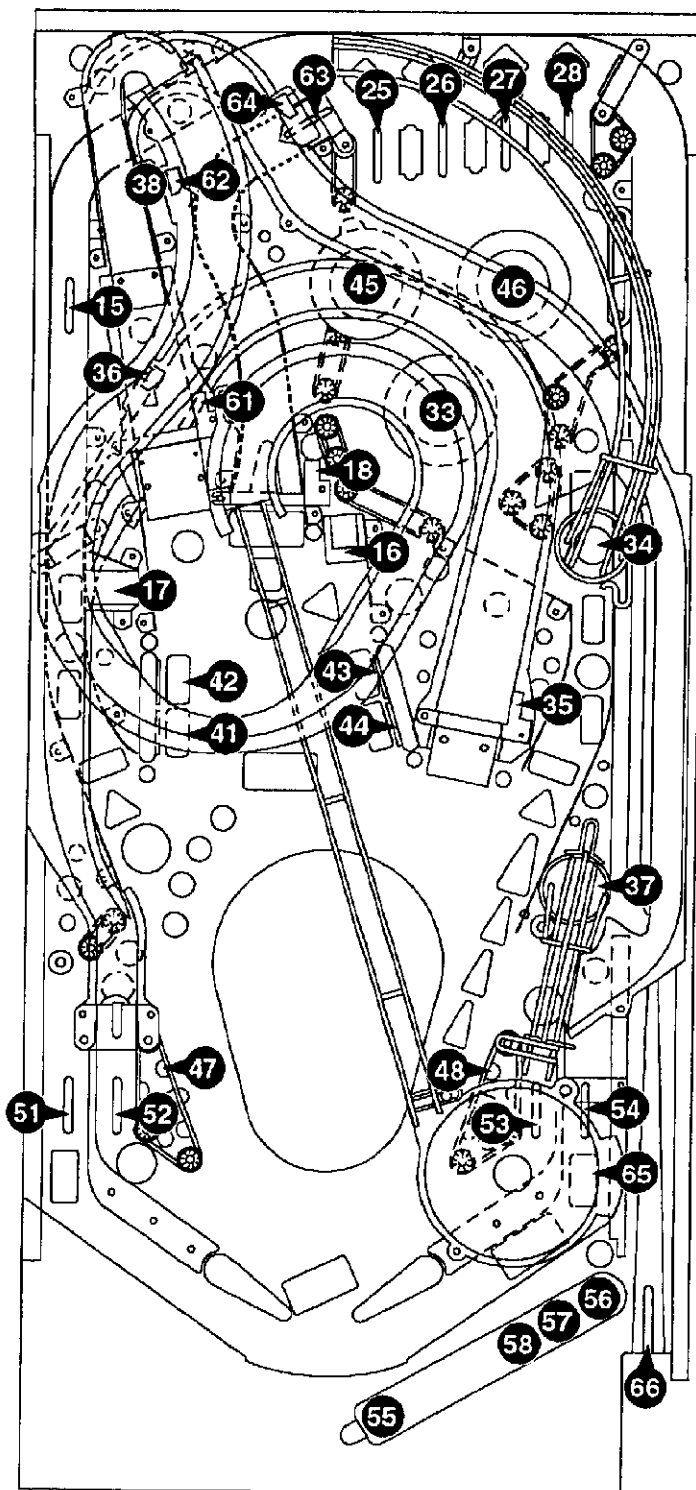
\*Located on backbox insert



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# SWITCH LOCATIONS

Item	Switch Number	Where Used
F1	SW-1A-193	*Right Flipper EOS
F2	A-15894	*Right Flipper Opto Board
F3	SW-1A-193	*Left Flipper EOS
F4	A-15894	*Left Flipper Opto Board
11-12	---	Not Used
13	20-9663-1	Credit/Start Button
14	20-6502-A	*Plumb Bob Tilt
15	5647-12693-19	Top Left Rollover
16	5647-12693-21	† Left Subway
17	5647-12693-21	† Center Subway
18	5647-12693-36	Center Shot
21	27-1066	*Slam Tilt
22	5643-09288-00	*Coin Door
23-24	---	Not Used
25	5647-12693-19	P of P-A-I-D
26	5647-12693-19	A of P-A-I-D
27	5647-12693-19	I of P-A-I-D
28	5647-12693-19	D of P-A-I-D
31-32	---	Not Used
33	SW-11A-37	Bottom Jet
34	A-14231 (LED) A-14232 (Trans.)	Right Popper
35	5647-12693-26	Right Ramp Enter
36	5647-12693-21	Left Ramp Enter
37	A-14231 (LED) A-14232 (Trans.)	Lower Right Popper
38	5647-12693-11	† Ramp Up/Down
41	A-16206-2	Cola
42	A-16206-2	Hot Dog
43	A-16206-2	Popcorn
44	A-16206-2	Ice Cream
45	SW-11A-37	Left Jet
46	SW-11A-37	Right Jet
47	SW-1A-114	Left Slingshot
48	SW-1A-114	Right Slingshot
51	5647-12693-19	Left Out Lane
52	5647-12693-19	Left Return Lane
53	5647-12693-19	Start Combo
54	5647-12693-19	Right Out Lane
55	5647-12133-12	Outhole
56	5647-12693-08	Right Trough
57	5647-09957-00	Center Trough
58	5647-09957-00	Left Trough
61	5647-12693-36	Right Ramp Exit
62	5647-12693-21	Left Ramp Exit (lower)
63	5647-12693-19	Center Lane Exit
64	5647-12693-21	Upper Ramp
65	5647-12693-21	Bowl
66	5647-12693-04	Shooter
67-88	---	Not Used



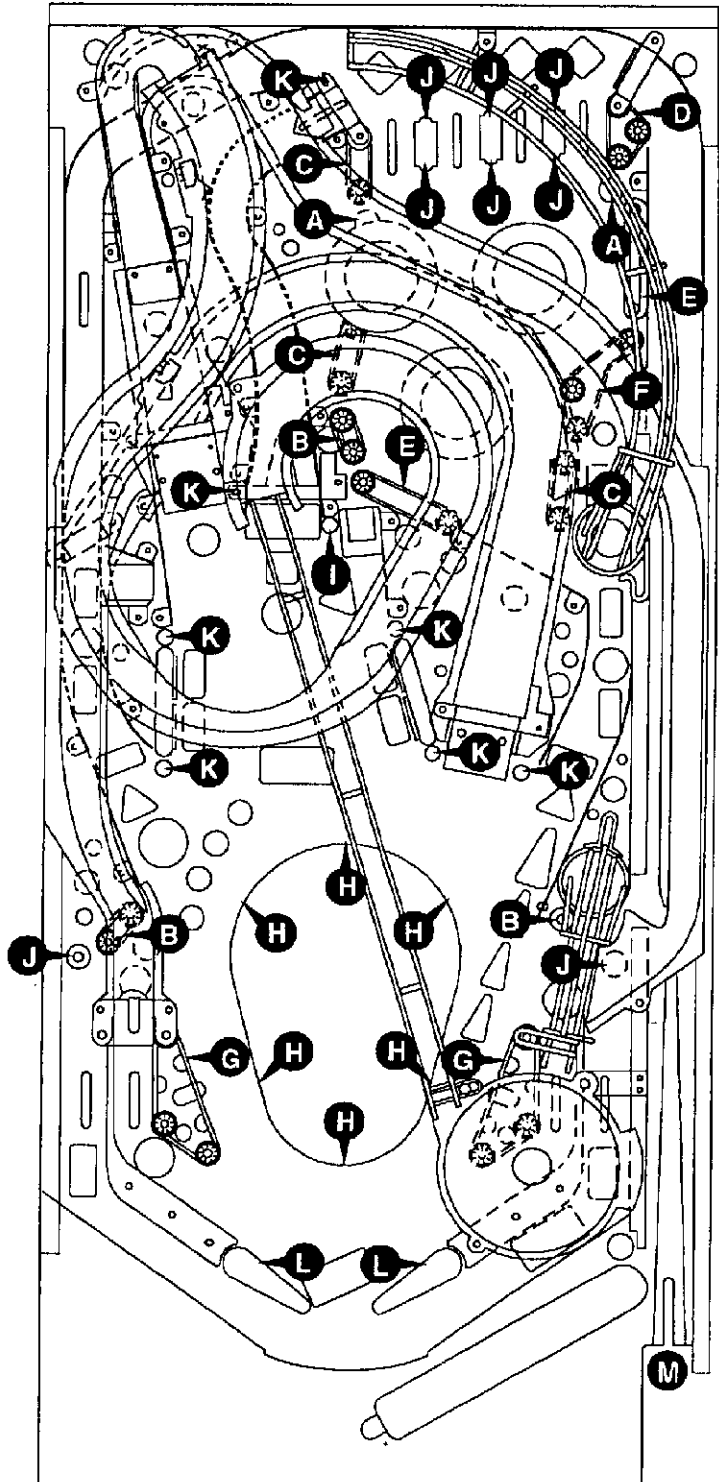
\* Not shown.

† Located on underside of playfield.

## RUBBER PARTS LOCATIONS

ITEM	PART NO.	QTY	DESCRIPTION
A.	23-6300	2	5/16" Rubber Ring
B.	23-6301	3	3/4" Rubber Ring
C.	23-6302	4	1" Rubber Ring
D.	23-6303	1	1 1/4" Rubber Ring
E.	23-6304	4	1 1/2" Rubber Ring
F.	23-6305	2	2" Rubber Ring
G.	23-6306	2	2 1/2" Rubber Ring
H.	23-6535	6	*Bumper
I.	23-6632	1	3/4" Tapered Bumper
J.	23-6641-1	8	Rubber Ring
K.	23-6556	7	Rubber Sleeve, Black
L.	23-6695	2	Flipper Rubber, Black
M.	23-6327	1	Shooter Tip

\*Located under playfield.



# SOLENOID/FLASHER LOCATIONS

Item	Coil/Flasher Number	Assembly Number	Description
01	AE-23-800	A-15769	Top Right Popper
02	24-8704	A-8798	Left Subway Enter Flasher (Playfield)
	24-8802 (2)	---	Left Subway Enter Flasher (Insert)
03	AE-26-1200	A-15842	Bottom Right Popper
04	AE-26-1200	B-9362-L-2	Ball Release
05	AE-27-1200	A-14369-R	Right Slingshot
06	AE-27-1200	A-14369-L	Left Slingshot
07	AE-23-800	B-10686-1	*Knocker
08	24-8704	A-8798	Bottom Right Flasher (Playfield)
	24-8802 (2)	---	Bottom Right Flasher (Insert)
09	24-8704 (2)	A-8798	Top Left & Right Flashers
10	24-8704	A-9359	Bowl Flasher(Playfield)
	24-8802 (2)	---	Bowl Flasher (Insert)
11	24-8802 (2)	---	Hologram Creature Flasher (Insert)
12	AE-27-1200	A-8039-3	Outhole
13	AE-26-1200	A-9415-2	Top Left Jet
14	AE-26-1200	A-9415-2	Top Right Jet
15	AE-26-1200	A-9415-2	Bottom Jet
16	24-8704	A-8798	Right Popper Slide Flasher (Playfield)
	24-8802 (2)	---	Right Popper Slide Flasher (Insert)
17	24-8704	A-8798	Bottom Left Flasher (Playfield)
	24-8802	---	Bottom Left Flasher (Insert)
18	24-8704	A-8798	Right Ramp Flasher (Playfield)
	24-8802 (2)	---	Right Ramp Flasher (Insert)
19	24-8704	A-8798	Left Ramp Pasher (Playfield)
	24-8802 (2)	---	Left Ramp Pasher (Insert)
20	---	A-15541	†Sequential G.I. #1
21	14-7977	A-15988	†Hologram Push Motor 48VAC
22	24-8704	A-8798	Center Hole Flasher (Playfield)
	24-8802 (2)	---	Center Hole Flasher (Insert)
23	SM1-28-900-DC	A-16042	†Up/Down Ramp (up)
24	---	A-15541	†Sequential G.I. #2
25	24-8704 (2)	A-9302	Left & Right Start Movie Flashers
26	AE-26-1200	A-16042	†Up/Down Ramp (down)
27	14-7977	A-15988	ΔCreature Mirror Motor 48VAC
28	24-8826	A-15857	ΔHologram Light

## General Illumination Circuits

*01	24-8829 (#86)	Sequential G.I. #1
*02	24-8768 #555, 24-6549 #44	Insert/Playfield Middle
*03	24-8768 #555, 24-6549 #44	Insert/Playfield Upper
*04	24-8829 (#86)	Sequential G.I. #2
*05	24-8768 #555, 24-6549 #44	Insert/Playfield Lower

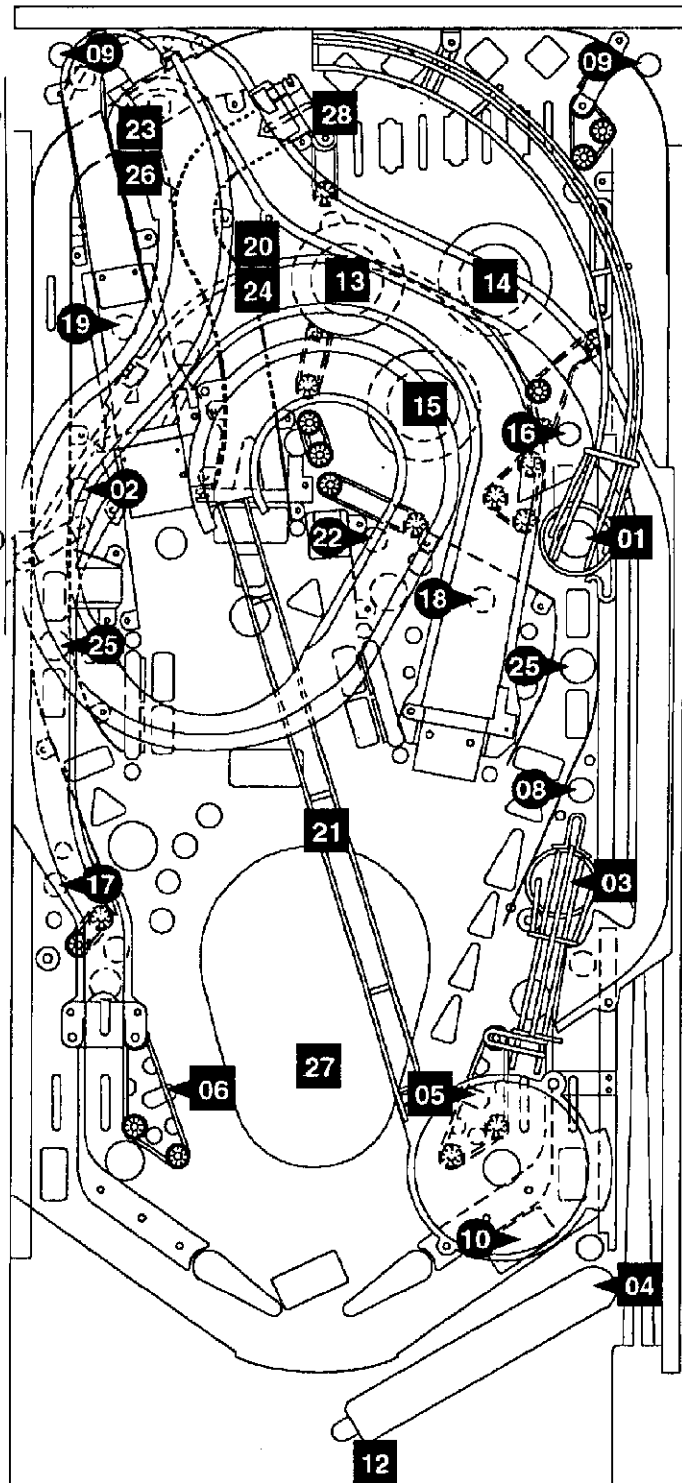
## Flipper Coils

Flipper Coils	Assembly	Description
* FL-15411 (Orange)	A-15205-L-4	Lower Left Flipper
* FL-11629 (Blue)	A-15205-R-2	Lower Right Flipper

\* Not shown

† Located under playfield

Δ Located in cabinet bottom

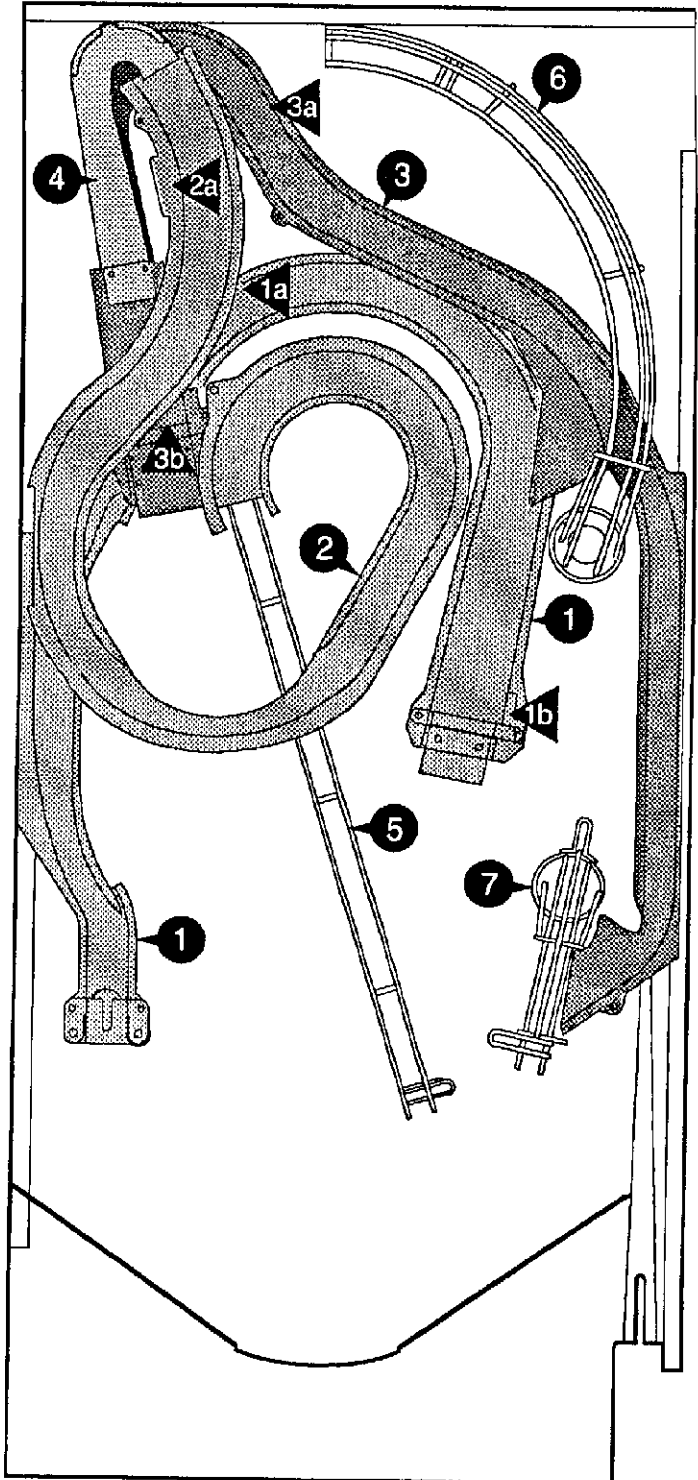


■ Square indicates coil or P.C.B.

● Circle indicates flasher

## RAMPS LOCATIONS

<u>Item</u>	<u>Part Number</u>	<u>Description</u>
1.	A-15620	Ramp Assembly
a)	5647-12693-21	Sub-Mini Switch
b)	5647-12693-36	Sub-Mini Switch
2.	A-15621	Ramp Assembly
a)	5647-12693-21	Sub-Mini Switch
b)	5647-12693-36	Sub-Mini Switch
3.	A-15622	Ramp Assembly
a)	5647-12693-21	Sub-Mini Switch
b)	5647-12693-36	Sub-Mini Switch
4.	A-15609	Wall Ramp Assy., Left
5.	12-7036	Wire Ramp
6.	12-7037	Wire Ramp
7.	12-7038	Wire Ramp





## Game Wiring and Schematics

### 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 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

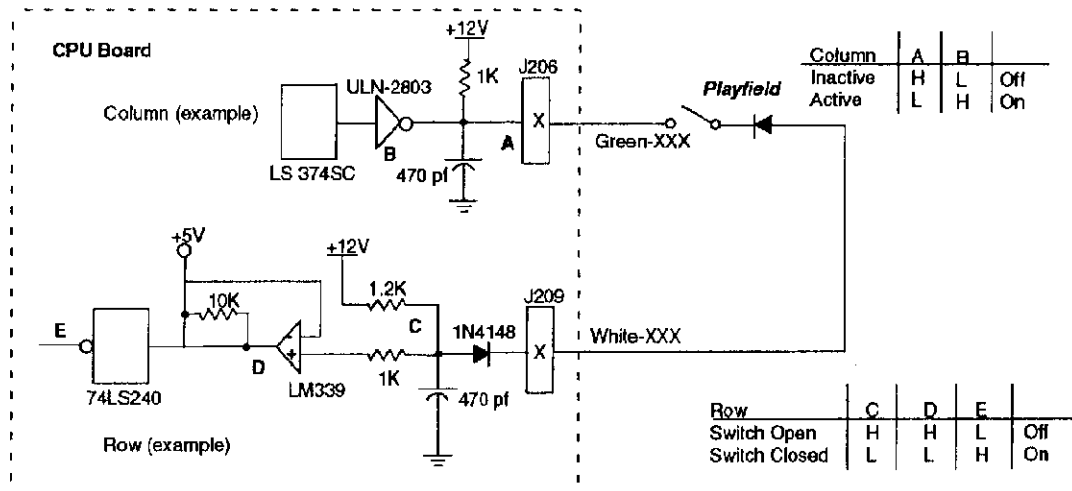
**Schematics for standard WPC backbox boards are found in the WPC Schematics Manual. Playfield, cabinet, and all other backbox board schematics are found in this section.**

# SWITCHES

Dedicated Grounded Switches	Column Row	1	2	3	4	5	6	7	8	Flipper Grounded Switches
		Green-Brown J206-1 U20-18	Green-Red J206-2 U20-17	Green-Orange J206-3 U20-16	Green-Yellow J206-4 U20-15	Green-Black J206-5 U20-14	Green-Blue J206-6 U20-13	Green-Violet J206-7 U20-12	Green-Gray J206-9 U20-11	
Orange-Brown (1) J205-1 Left Coin Chute D1	1 White-Brown J208-1 U18-11	Not Used	Slam Tilt	Not Used	Cola	Left Out Lane	Right Ramp Exit	Not Used	Not Used	Black-Green J906-1 Right Flipper End of Stroke F1
Orange-Red (2) J205-2 Center Coin Chute D2	2 White-Red J208-2 U18-9	Not Used	Coin Door	Not Used	Hot Dog	Left Return Lane	Left Ramp Exit	Not Used	Not Used	Blue-Violet J905-1 Right Flipper Opto F2
Orange-Black (3) J205-3 Right Coin Chute D3	3 White-Orange J208-3 U18-5	Credit/Start Button	Not Used	Bottom Jet	Popcorn	Start Combo	Center Lane Exit	Not Used	Not Used	Black-Blue J906-3 Left Flipper End of Stroke F3
Orange-Yellow (4) J205-4 4th Coin Chute D4	4 White-Yellow J208-4 U18-7	Plumb Bob Tilt	Not Used	Right Popper	Ice Cream	Right Out Lane	Upper Ramp	Not Used	Not Used	Blue-Gray J905-2 Left Flipper Opto F4
Orange-Green (5) J205-6 Normal Function Credits   Test Function Escape D5	5 White-Green J208-5 U19-11	Top Left Rollover	P of P-A-I-D	Right Ramp Enter	Left Jet	Outhole	Bowl	Not Used	Not Used	Black-Violet J906-4 Upper Right Flipper End of Stroke F5
Orange-Blue (6) J205-7 Normal Function Volume Down   Test Function Down D6	6 White-Blue J208-7 U19-9	Left Subway	A of P-A-I-D	Left Ramp Enter	Right Jet	Right Trough	Shooter	Not Used	Not Used	Black-Yellow J905-3 Upper Right Flipper Opto F6
Orange-Violet (7) J205-8 Normal Function Volume Up   Test Function Up D7	7 White-Violet J208-8 U19-5	Center Subway	I of P-A-I-D	Lower Right Popper	Left Slingshot	Center Trough	Not Used	Not Used	Not Used	Black-Gray J906-5 Upper Left Flipper End of Stroke F7
Orange-Gray (8) J205-9 Normal Function Begin Test   Test Function Enter D8	8 White-Gray J208-9 U19-7	Center Shot	D of P-A-I-D	Ramp Up/Down	Right Slingshot	Left Trough	Not Used	Not Used	Not Used	Black-Blue J905-5 Upper Left Flipper Opto F8

J2XX = CPU Board, J9XX = Fliptron II Board

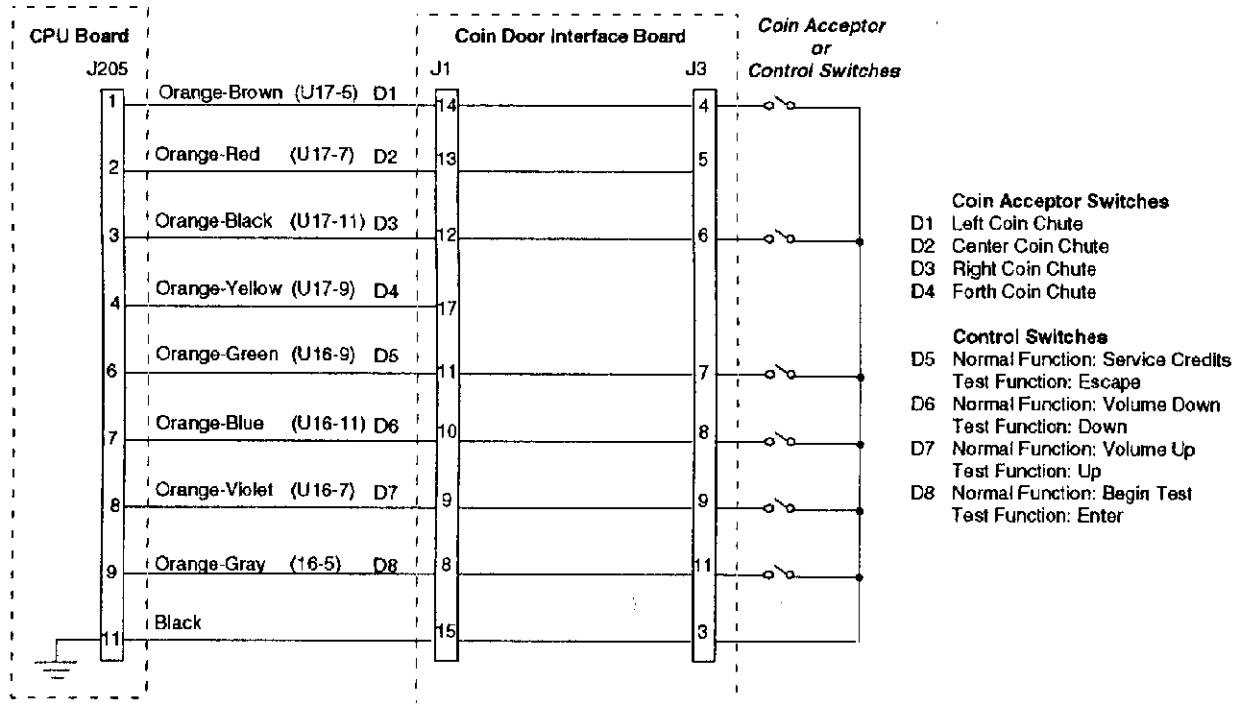
## SWITCH MATRIX CIRCUIT



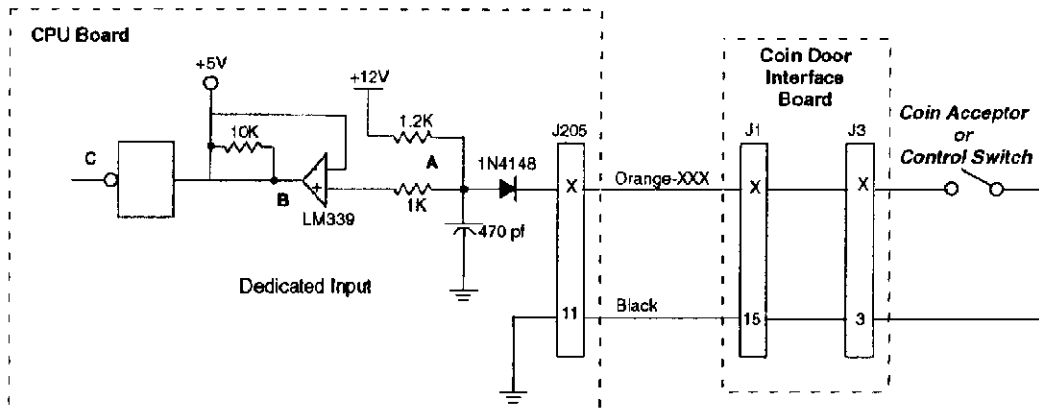
The microprocessor is constantly strobing the column side of the switch. When point "A" on the column circuit toggles low the column side is active.

When a switch closes, the row side of the circuit activates. The "+" input to the LM339 drops below +5V causing its output to go 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



Switch	A	B	C	
Open	H	H	L	Off
Closed	L	L	H	On

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 causing its output to go 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.

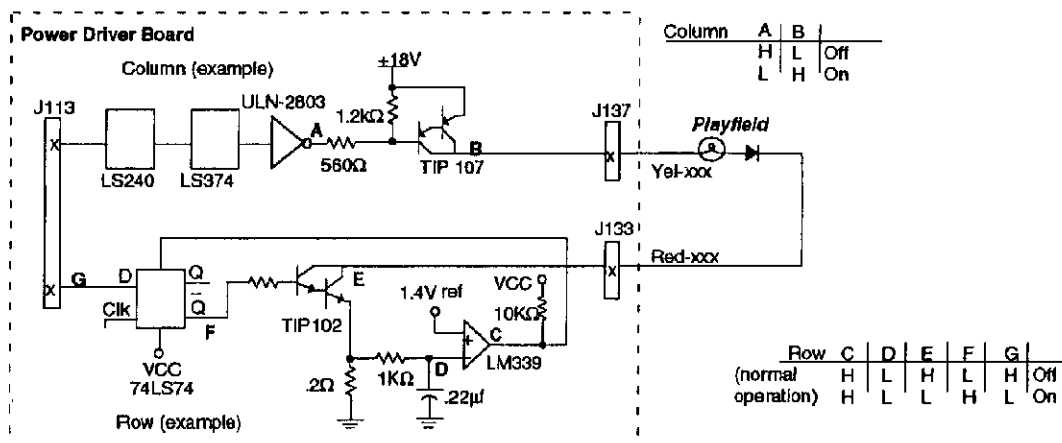
# LAMPS

Yellow (B+) Red

Column \ Row	1 Yellow-Brown J137-1 Q99	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 J138-7 Q92	8 Yellow-Gray J138-9 Q91
1 Red-Brown J133-1 Q90	(P)-A-I-D 11	(K)-I-S-S 21	Start Mega Menu 31	Lips 41	Snack Bar 51	Free Pass 61	C 71	(F)-I-L-M 81
2 Red-Black J133-2 Q89	P-(A)-I-D 12	K-(I)-S-S 22	Playground Award 32	Left Search 42	Center Search 52	Build Combo 62	R 72	F-(I)-L-M 82
3 Red-Orange J133-4 Q88	P-A-(I)-D 13	K-I-(S)-S 23	Lite Big Millions 33	Left Video 43	Cola 53	Unlimited Millions 63	E 73	F-I-(L)-M 83
4 Red-Yellow J133-5 Q87	P-A-I-(D) 14	K-I-S-(S) 24	Slide 34	Left Start Movie 44	Hotdog 54	Creature Feature 64	A 74	F-I-L-(M) 84
5 Red-Green J133-6 Q86	Left Jet 15	10 Million 25	Right Search 35	Combo Award 45	Super Jackpot 55	Extra Ball Countdown 65	T 75	Start Combo 85
6 Red-Blue J133-7 Q85	Right Jet 16	20 Million 26	Right Video 36	Parking O.K. 46	Jackpot 56	Big Millions 66	U 76	Popcorn 86
7 Red-Violet J133-8 Q84	Bottom Jet 17	30 Million 27	Right Start Movie 37	Move Your Car 47	Rescue 57	Movie Madness 67	R 77	Ice Cream 87
8 Red-Gray J133-9 Q83	Admit One 18	Specials 28	Mega Menu 38	Extra Ball 48	Multiball Restart 58	Snack Attack 68	E 78	Start Button 88

J1XX = Power Driver Board

## LAMP MATRIX CIRCUIT



The processor sends a signal to the column circuit, causing the output of the UNL-2803 to toggle. When point 'A' drops low, the TIP107 transistor conducts and point 'B' changes to a high state. At the same time the processor drives the input of the 74LS74 low, causing a high at output 'F'. A high state at the base of TIP102 causes the transistor to conduct, bringing the row circuit to ground and turning the lamp On.

The processor changes the input of the 74LS74 to a high state to turn the lamp Off.

In overcurrent conditions the lamp is shut Off through the comparator. If the voltage at the negative input of the LM339 rises above 1.4V the output changes to a low, which is fed back to the 74LS74 and shuts the row circuit Off.

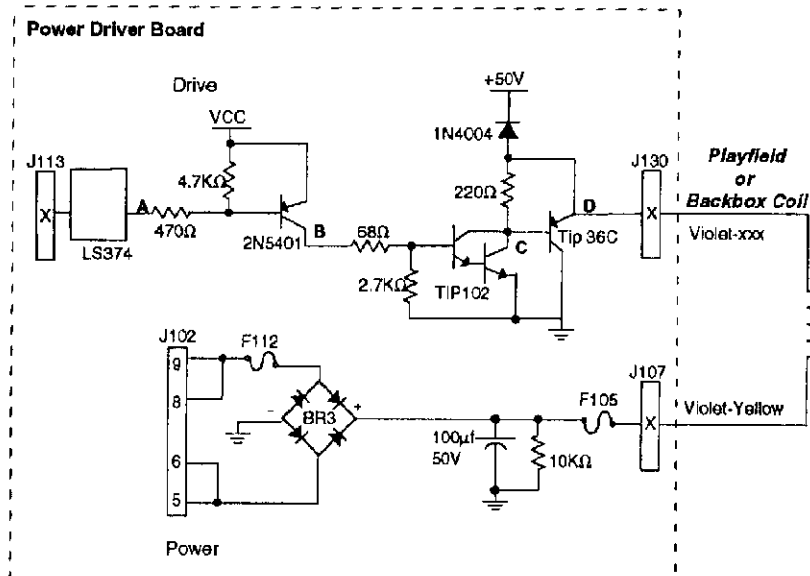
## SOLENOID/FLASHER TABLE

Sol. No.	Function	Solenoid Type	Voltage Connections			Drive Xster	Drive Connections			Drive Wire Color	Solenoid Part Number Flashlamp Type	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Backbox
01	Top Right Popper	High Power	J107-3			Q82	J130-1			Vio-Brn	AE-23-800	
02	Left Subway Enter, Flasher	High Power	J107-5	J106-5		Q80	J130-2	J132-2		Vio-Red	#89	#906 (2)
03	Lower Right Popper	High Power	J107-3			Q78	J130-4			Vio-Org	AE-26-1200	
04	Trough	High Power	J107-3			Q76	J130-5			Vio-Yel	AE-26-1200	
05	Right Slingshot	High Power	J107-3			Q64	J130-6			Vio-Grn	AE-27-1200	
06	Left Slingshot	High Power	J107-3			Q66	J130-7			Vio-Blu	AE-27-1200	
07	Knocker	High Power	J107-3			Q68	J130-8			Vio-Blk	AE-23-800	
08	Bottom Right Flasher	High Power	J107-5	J106-5		Q70	J130-9	J131-5		Vio-Gry	#89	#906 (2)
09	Back Flashers	Low Power	J107-6			Q58	J127-1			Brn-Blk	#89 (2)	
10	Bowl Flasher	Low Power	J107-6	J106-5		Q56	J127-3	J129-2		Brn-Red	#89	#906 (2)
11	Creature Flasher	Low Power	J107-6	J106-5		Q54	J127-4	J129-4		Brn-Org		#906 (2)
12	Out Hole	Low Power	J107-2			Q82	J127-5			Brn-Yel	AE-27-1200	
13	Left Jet	Low Power	J107-2			Q60	J127-6			Brn-Gin	AE-26-1200	
14	Right Jet	Low Power	J107-2			Q48	J127-7			Brn-Blu	AE-26-1200	
15	Bottom Jet	Low Power	J107-2			Q46	J127-8			Brn-Vio	AE-26-1200	
16	Right Popper Flasher	Low Power	J107-5	J106-5		Q44	J127-9	J128-5		Brn-Gry	#89	#906 (2)
17	Bottom Left Flasher	Flasher	J107-5	J106-5		Q42	J126-1	J125-1		Blk-Brn	#89	#906 (1)
18	Right Ramp Flasher	Flasher	J107-5	J106-5		Q40	J126-2	J125-2		Blk-Red	#89	#906 (2)
19	Left Ramp Flasher	Flasher	J107-5	J106-5		Q38	J126-3	J125-3		Blk-Org	#89	#906 (2)
20	Sequential G.I. #1	Flasher	J118-2			Q36	J126-4			Blk-Yel	#86	
21	Hologram Push Motor (playfield)	Flasher	J104-1,2			Q28	J126-5			Blu-Gin	14-7977 48VAC	
22	Center Hole Flasher	Flasher	J107-6	J106-5		Q30	J126-6	J125-7		Blu-Blk	#89	#906 (2)
23	Up/Down Ramp (up)	Low Power	J107-1			Q34	J126-7**			Blu-Vio	SM1-28-800-DC	
24	Sequential G.I. #2	Low Power	J118-2			Q32	J126-8			Blu-Gry	#86	
25	Start Movie Flashers	Flasher	J107-6			Q26	J122-1			Blu-Brn	#89 (2)	
26	Up/Down Ramp (down)	Flasher	J107-1			Q24	J122-2*			Blu-Red	AE-26-1200	
27	Creature Motor (mirror)	Flasher			J104-1,2	Q22			J123-4	Blu-Org	14-7977 48VAC	
28	Hologram Lamp (cabinet)	Flasher			J118-2	Q20			J123-5	Blu-Yel	#1156	
<b>General Illumination</b>			<b>Playfield</b>	<b>Backbox</b>	<b>Cabinet</b>		<b>Playfield</b>	<b>Backbox</b>	<b>Cabinet</b>			
01	Sequential G.I. #1	G.I.	J120-1			Q18	J120-7			Wht-Brn	#86	
02	Insert/Playfield (middle)	G.I.	J120-2	J121-2		Q10	J120-8	J121-8		Wht-Org	#44	#555
03	Insert/Playfield (upper)	G.I.	J120-3	J121-3		Q14	J120-9	J121-9		Wht-Yel	#44	#555
04	Sequential G.I. #2	G.I.	J120-5			Q16	J120-10			Wht-Gin	#86	
05	Insert/Playfield (lower)	G.I.	J120-6	J121-6		Q12	J120-11	J121-11		Wht-Vio	#44	#555
<b>Flipper Circuits</b>			<b>Playfield</b>		<b>Power</b>	<b>Holding</b>	<b>Playfield</b>		<b>Power</b>	<b>Holding</b>		
	Lower Left Flipper	Flipper	J907-4,5	Gry-Yel	Q2	Q7	J902-7,9		Blu-Gry	Org-Blu	FL-15411	ORG
	Lower Right Flipper	Flipper	J907-1,2	Blu-Yel	Q3	Q8	J902-11,13		Blu-Vio	Org-Grn	FL-11629	BLU

\*J122-6, Violet-Green, Tieback Diode  
 \*\*J126-12, Violet-Green, Tieback Diode

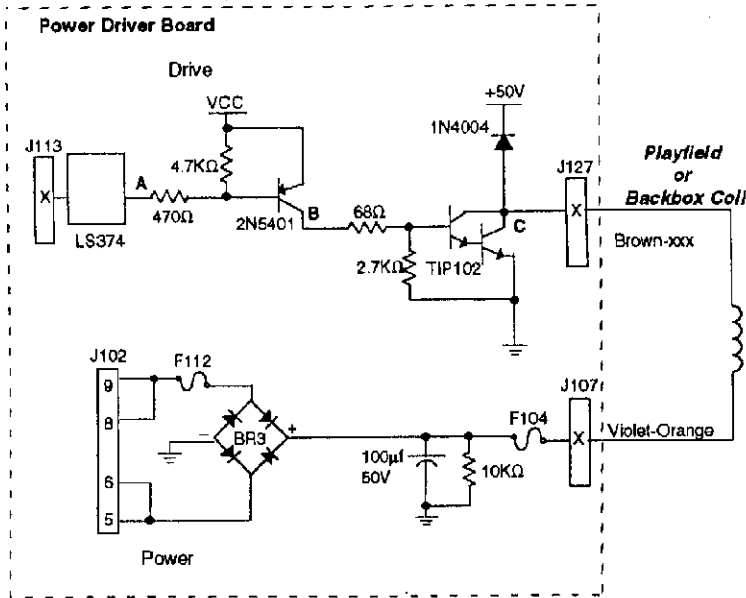
J1XX = Power Driver Board, J8XX = Fliptronic II Board

### High Power Solenoid Circuit



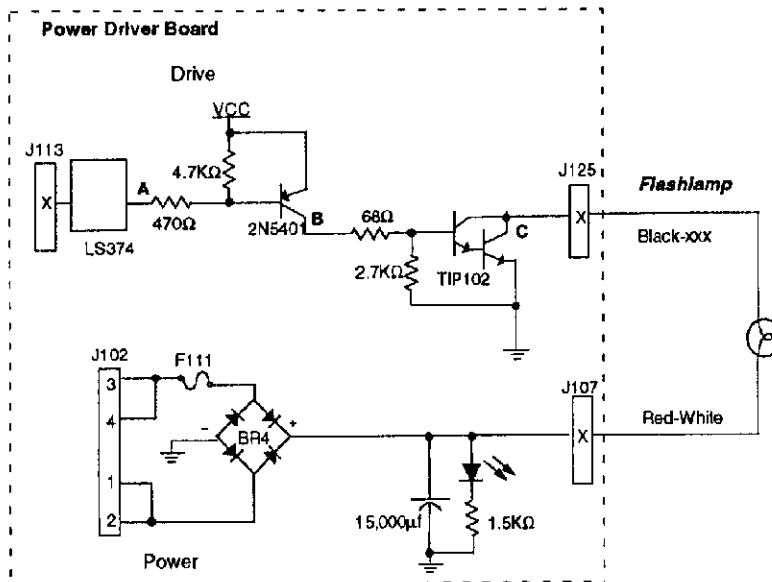
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" the collector of the 2N5401 transistor is high. A high at point "B" causes point "C" the collector of the TIP102 transistor, and point "D" the emitter of the TIP36 transistor to drop low. When point "D" is low the coil is grounded through the transistor and the coil turns On. The coil shuts Off when point "A" toggles high.

### Low Power Solenoid Circuit



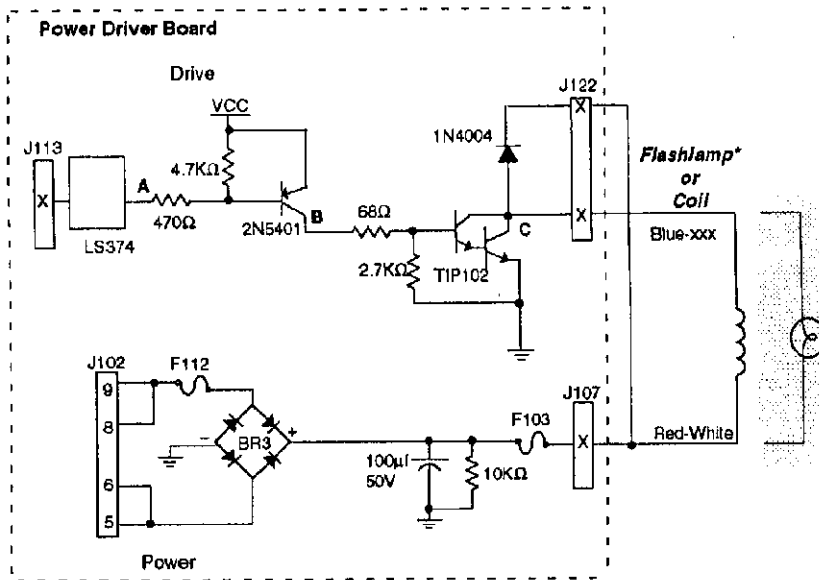
The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor is driven high. A high at point "B" turns On the TIP102 transistor and causes point "C" to drop low. When point "C" is low the coil is grounded through the transistor and the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

### Flashlamp Solenoid 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.

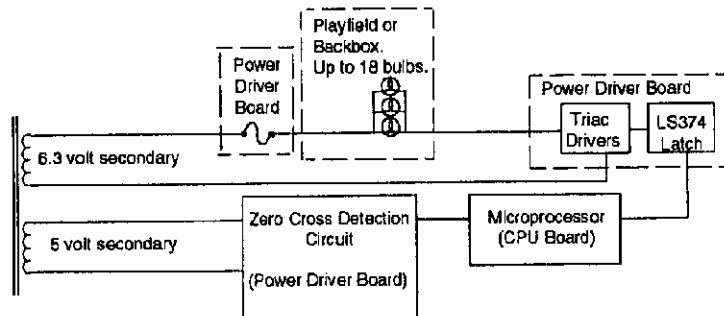
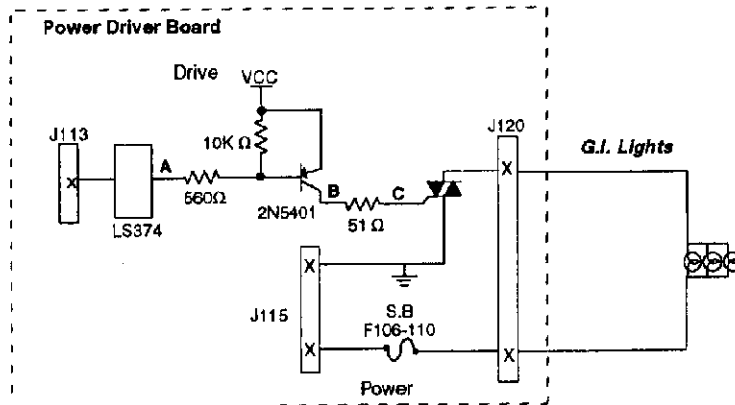
### Special (General Purpose) Solenoid Circuit



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.

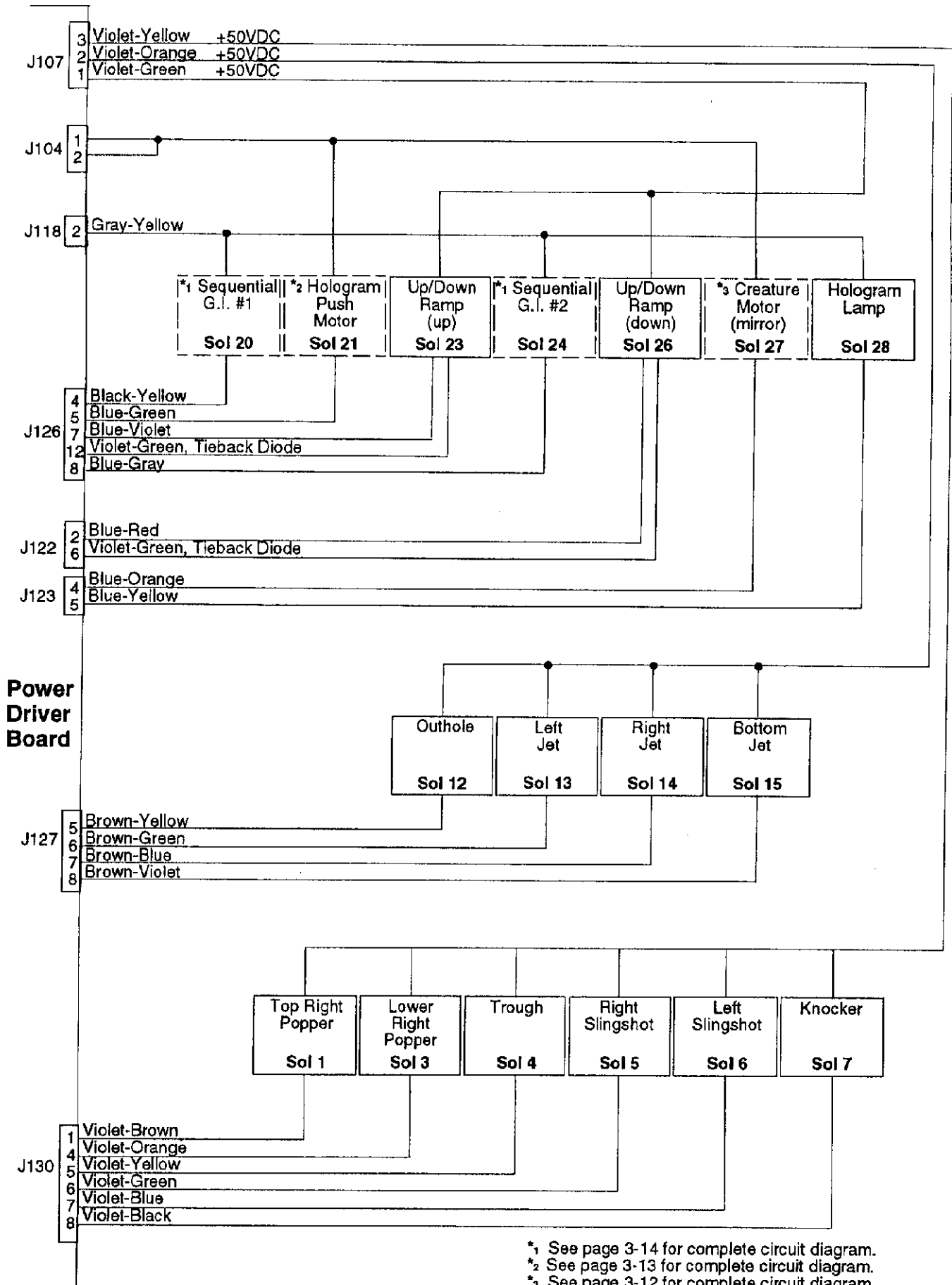
\* Tieback Diode Is not used for flashlamp circuit.

### General Illumination Circuit



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

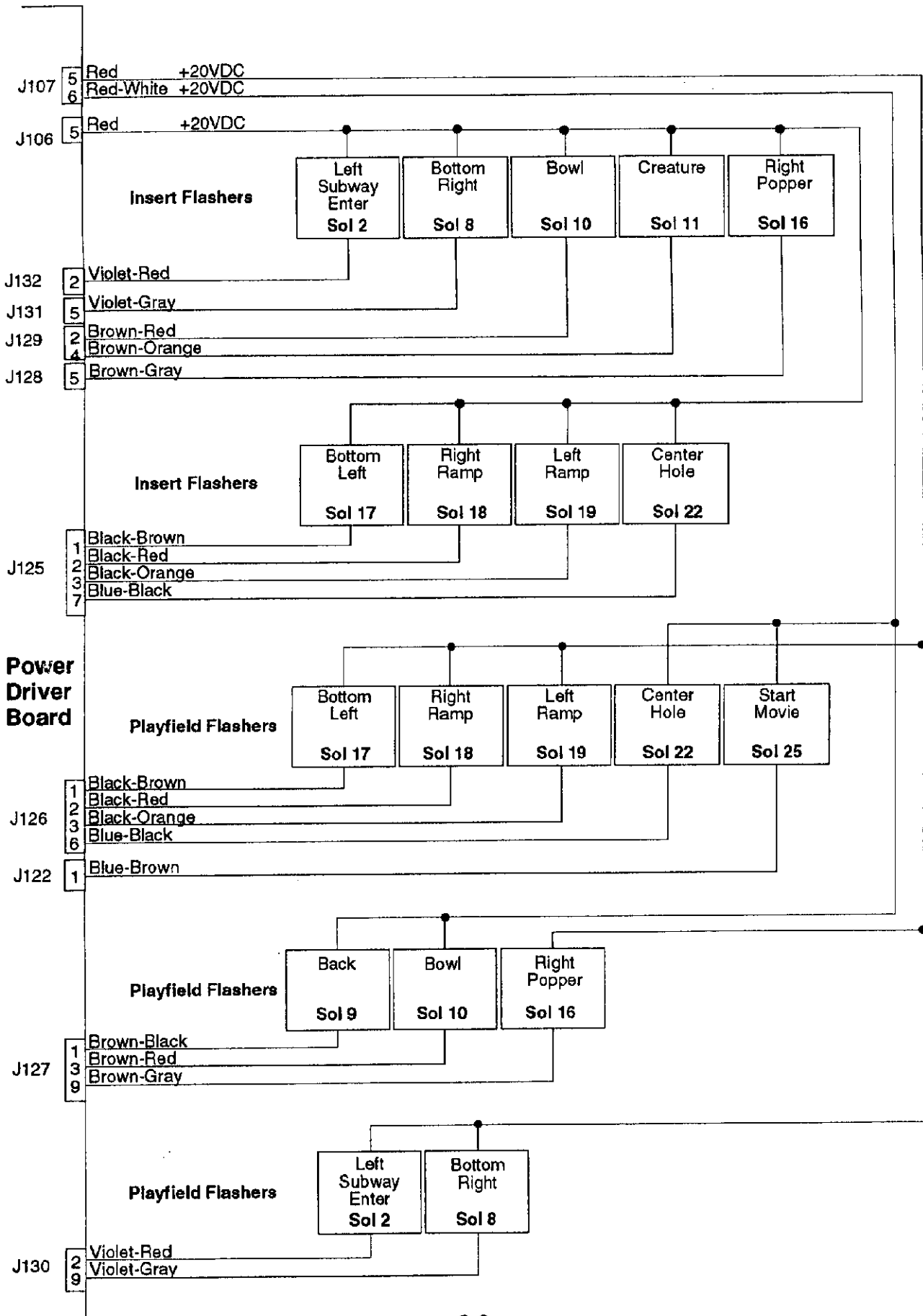
# SOLENOID WIRING



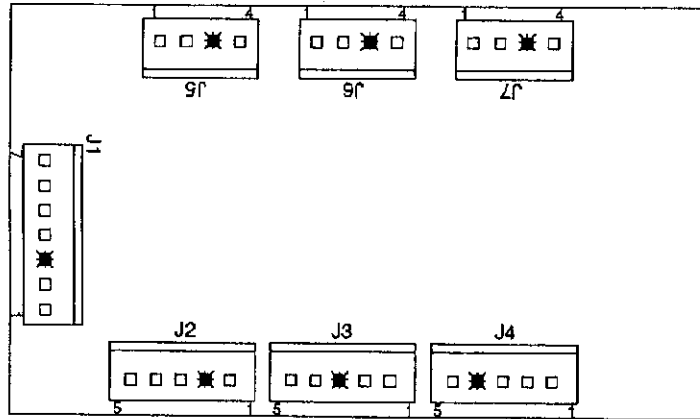
\*<sub>1</sub> See page 3-14 for complete circuit diagram.  
 \*<sub>2</sub> See page 3-13 for complete circuit diagram.  
 \*<sub>3</sub> See page 3-12 for complete circuit diagram.



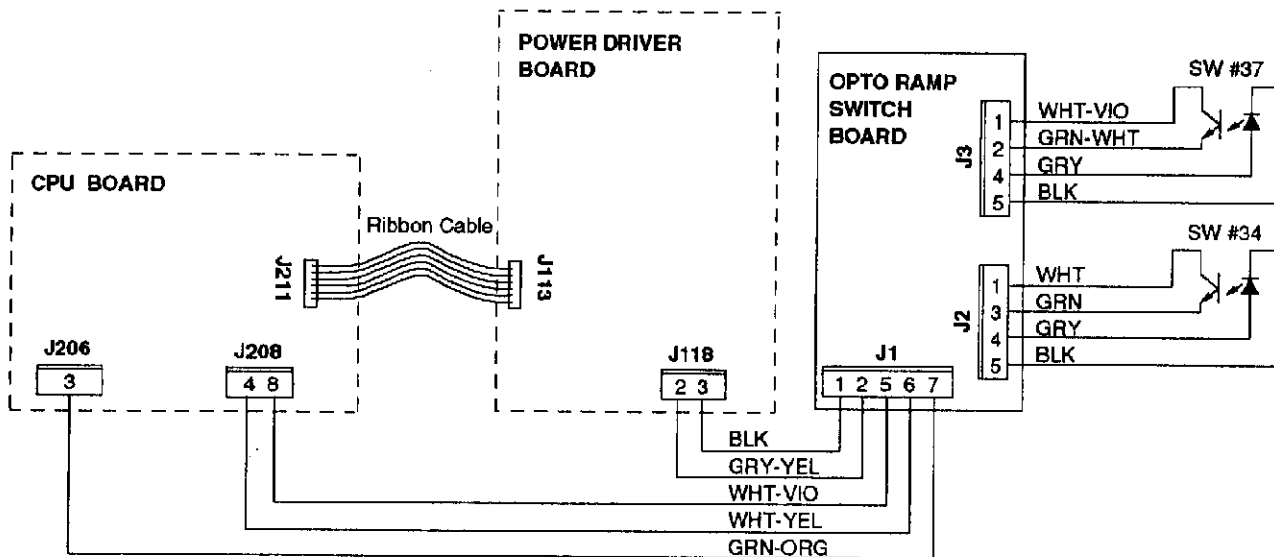
# FLASHER WIRING



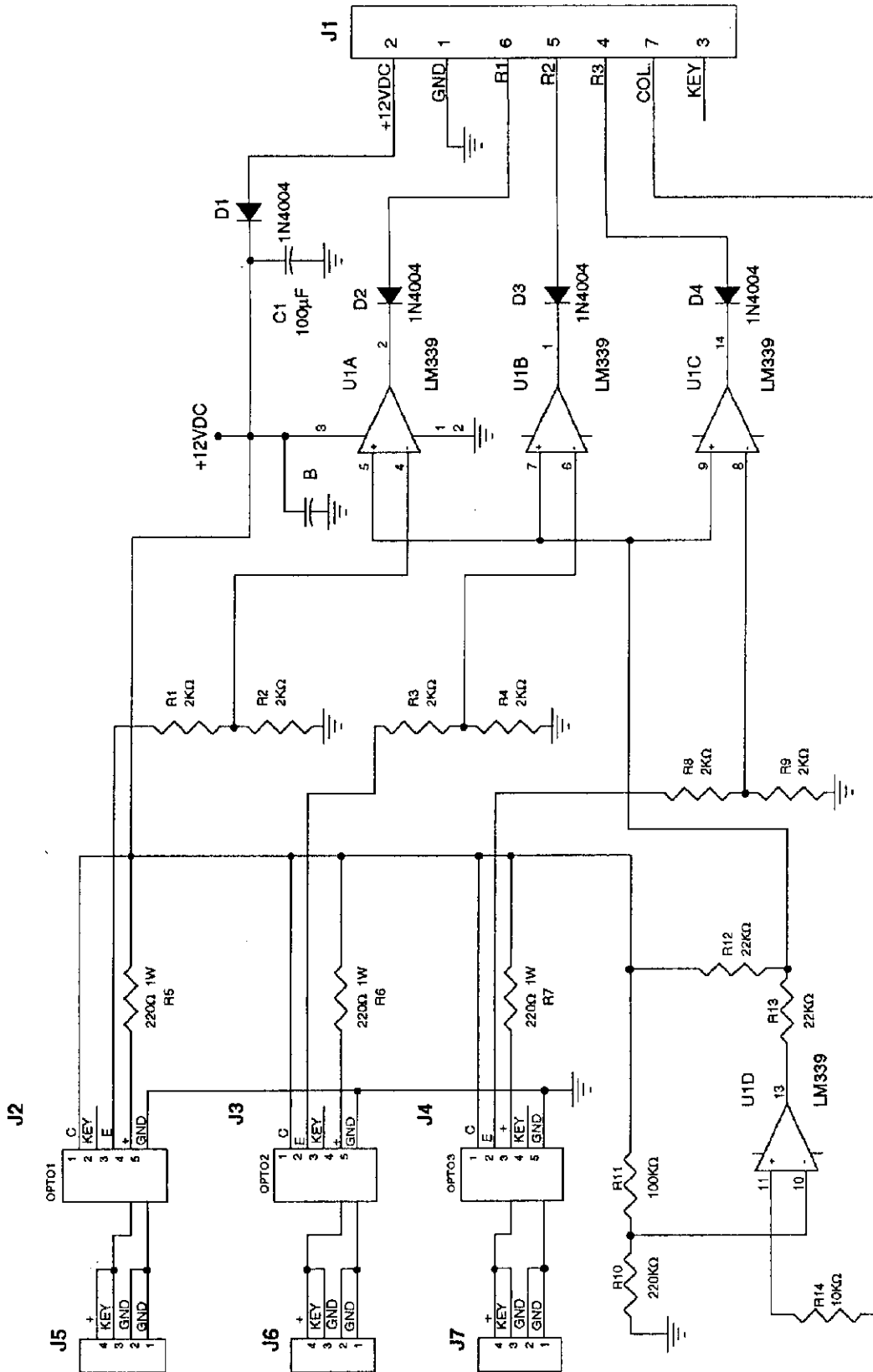
## Opto Ramp Switch Board Assembly A-13901-1



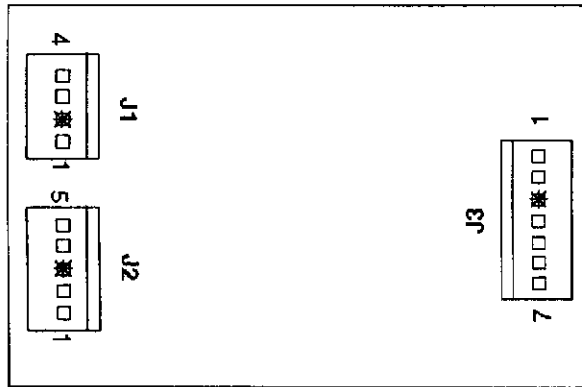
- |   |  |
|---|--|
| J1 - 1 Black (Ground) from J118-3               | J3 - 1 White-Violet to Sw #37, Opto Photo Transistor |
| J1 - 2 Gray-Yellow (+12V) from J118-2           | J3 - 2 Green-White to Sw #37, Opto Photo Transistor  |
| J1 - 3 Key                                      | J3 - 3 Key   |
| J1 - 4 N/C                                      | J3 - 4 Gray, +5VDC to Sw #37, Opto LED               |
| J1 - 5 White-Violet switch row 7 from J208-8    | J3 - 5 Black, Ground to Sw #37, Opto LED             |
| J1 - 6 White-Yellow switch row 4 from J208-4    | J4 through J7 are Not Used                           |
| J1 - 7 Green-Orange switch column 3 from J206-3 |  |
- 
- |   |
|---|
| J2 - 1 White to Sw #34, Opto Photo Transistor |
| J2 - 2 Key                                    |
| J2 - 3 Green to Sw #34, Opto Photo Transistor |
| J2 - 4 Gray, +5VDC to Sw #34, Opto LED        |
| J2 - 5 Black, Ground to Sw #34, Opto LED      |



# Opto Ramp Switch Board Schematic



## Triac Driver Board Assembly A-13088-2

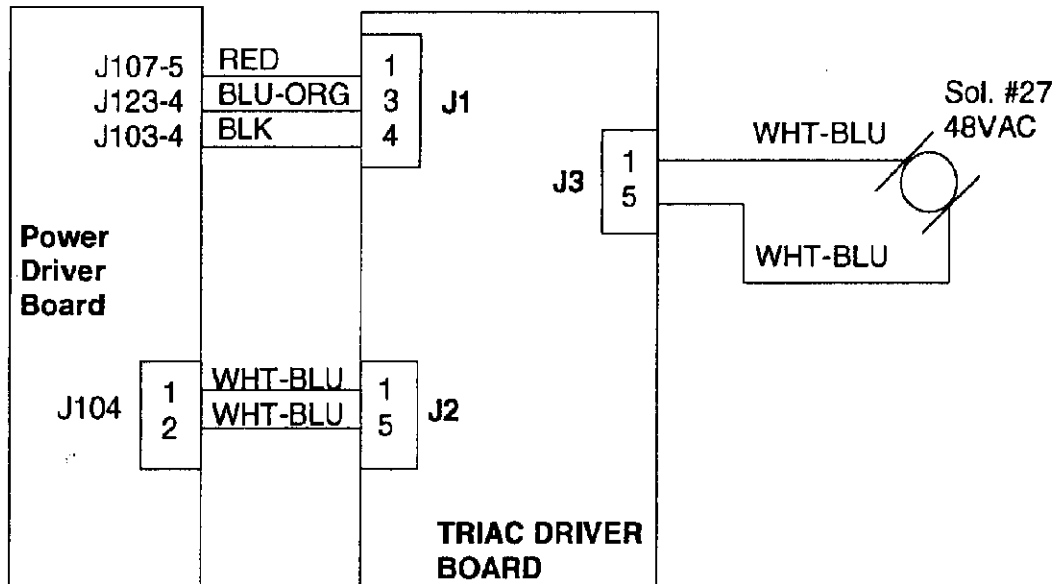


### Mirror Motor Wiring

J1-1 Red from J107-5  
 J1-2 Key  
 J1-3 Blue-Orange from J123-4  
 J1-4 Black from J103-4  
  
 J2-1 White-Blue from J104-1  
 J2-2 Not Used  
 J2-3 Key  
 J2-4 Not Used  
 J2-5 White-Blue from J104-2

J3-1 White-Blue to Motor  
 J3-2 Not Used  
 J3-3 Key  
 J3-4 Not Used  
 J3-5 White-Blue to Motor  
 J3-6 Not Used  
 J3-7 Not Used

### Mirror Motor Circuit



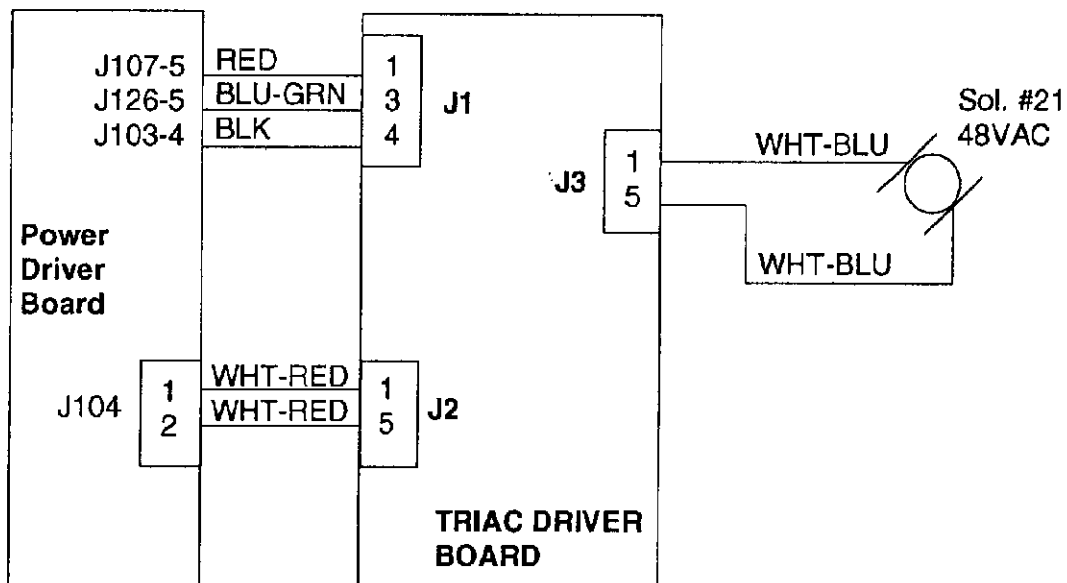
## Hologram Motor Wiring

J1-1 Red from J107-5  
 J1-2 Key  
 J1-3 Blue-Green from J126-5  
 J1-4 Black from J103-4

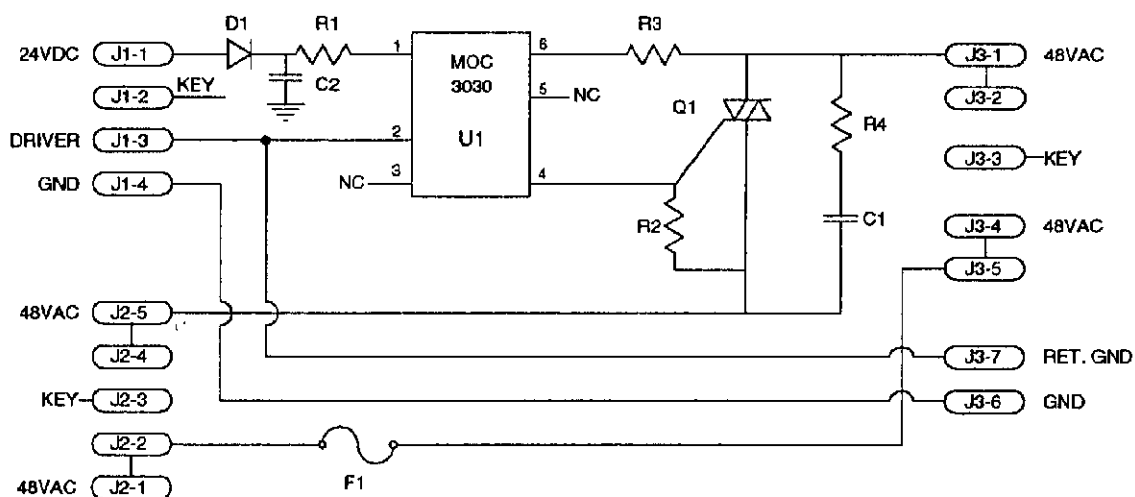
J2-1 White-Red from J104-1  
 J2-2 Not Used  
 J2-3 Key  
 J2-4 Not Used  
 J2-5 White-Red from J104-2

J3-1 White-Blue to Motor  
 J3-2 Not Used  
 J3-3 Key  
 J3-4 Not Used  
 J3-5 White-Blue to Motor  
 J3-6 Not Used  
 J3-7 Not Used

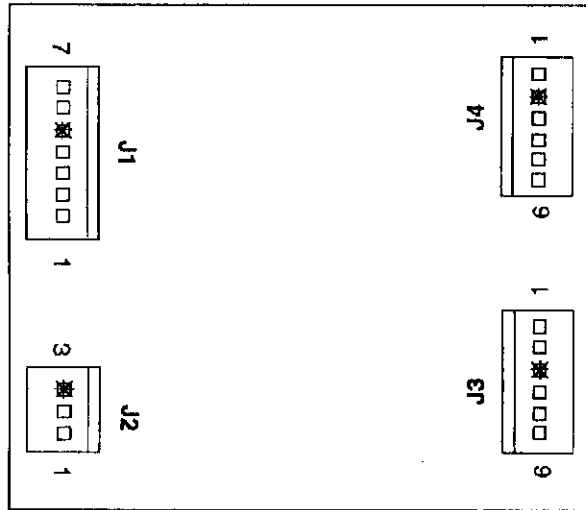
## Hologram Motor Circuit



## Triac Driver Board Schematic



## Chase Light II P.C. Board Assembly A-15541

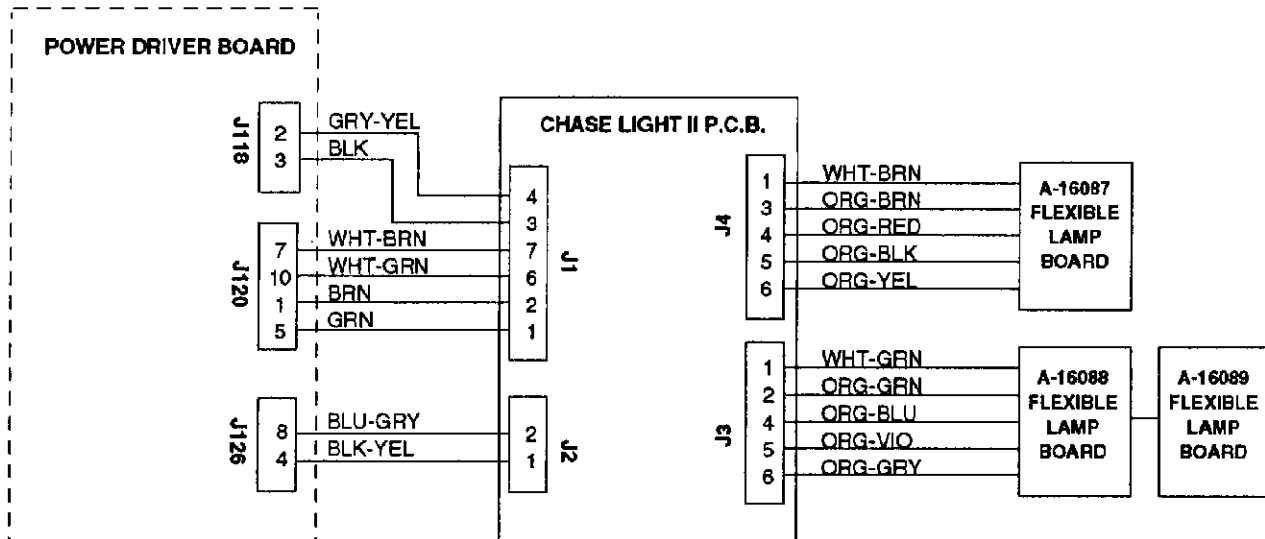


J1-1 Green from J120-5  
 J1-2 Brown from J120-1  
 J1-3 Black, Ground from J118-3  
 J1-4 Gray-Yellow, +12VDC from J118-2  
 J1-5 Key  
 J1-6 White-Green from J120-10  
 J1-7 White-Brown from J120-7

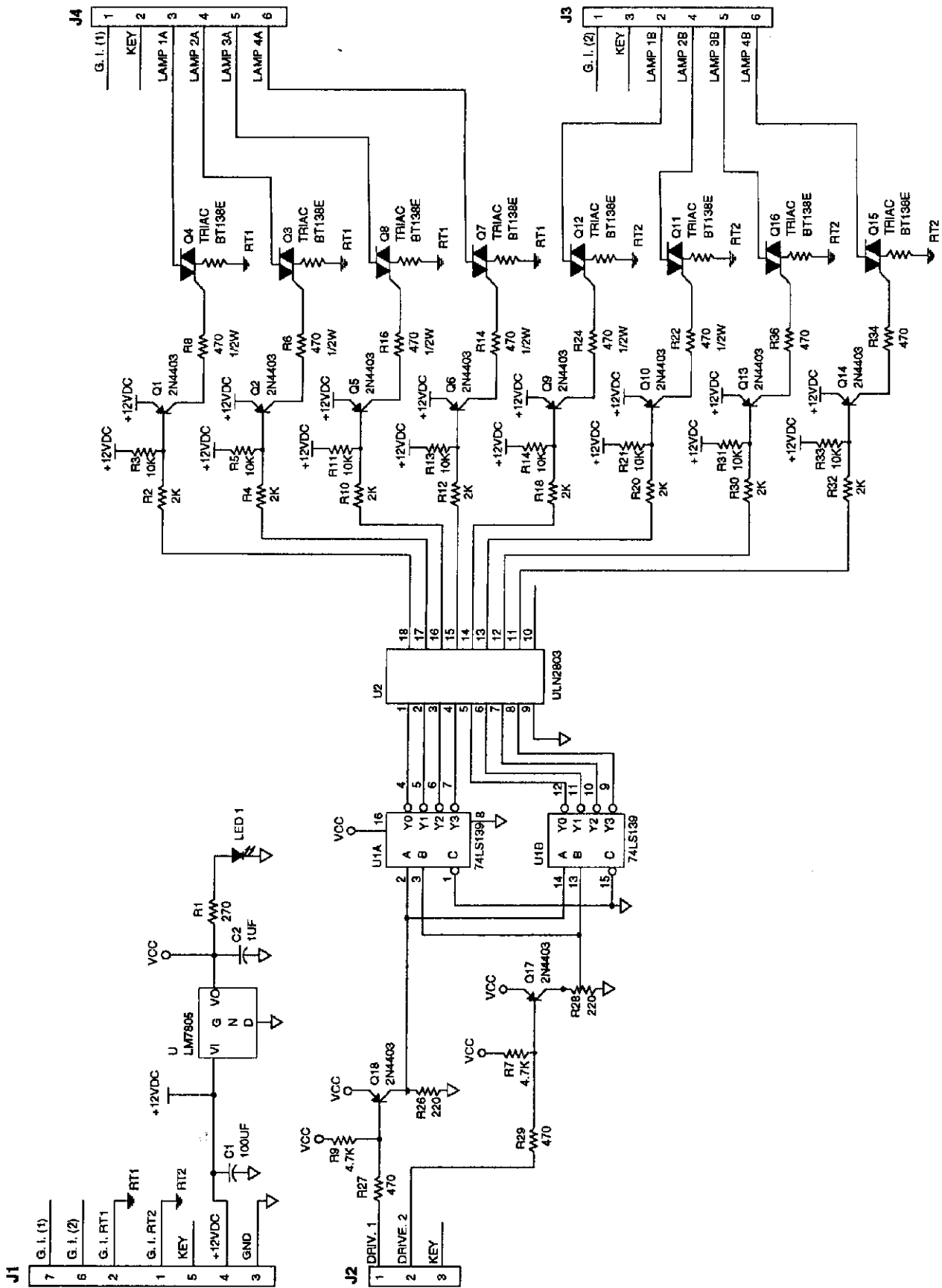
J2-1 Black-Yellow from J126-8  
 J2-2 Blue-Gray from J126-4  
 J2-3 Key

J3-1 White-Green to chase lights  
 J3-2 Orange-Green to chase lights  
 J3-3 Key  
 J3-4 Orange-Blue to chase lights  
 J3-5 Orange-Violet to chase lights  
 J3-6 Orange-Gray to chase lights

J4-1 White-Brown to chase lights  
 J4-2 Key  
 J4-3 Orange-Brown to chase lights  
 J4-4 Orange-Red to chase lights  
 J4-5 Orange-Black to chase lights  
 J4-6 Orange-Yellow to chase lights



# Chase Light II Schematic



# Flipper Opto Switch Board A-15894

## Left Side Flipper Opto Switch Board

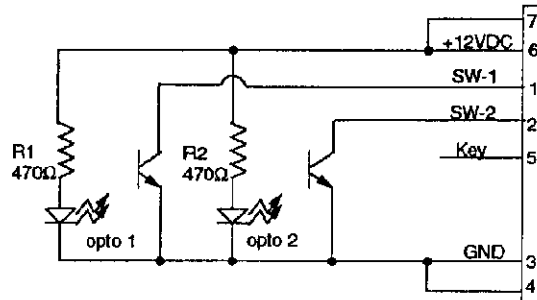
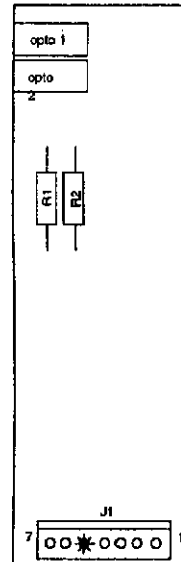
- J1 - 1 Blue-Gray (lower flipper) from Fliptronic II Board J905-2
- J1 - 2 Black-Blue (upper flipper) from Fliptronic II Board J905-5
- J1 - 3 Orange (Switch Grd) from Fliptronic II Board J906-6
- J1 - 4 Orange (Switch Grd) loop from J1-3
- J1 - 5 Key
- J1 - 6 Gray-Yellow (+12V) from Power Driver Board J116-2
- J1 - 7 Gray-Yellow (+12V) loop from J1-6

## Right Side Flipper Opto Switch Board

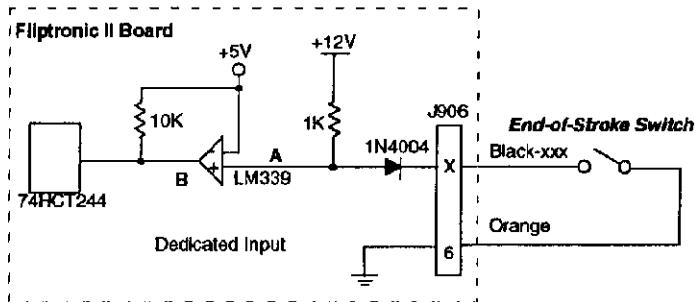
- J1 - 1 Blue-Violet (lower flipper) from Fliptronic II Board J905-1
- J1 - 2 Black-Yellow (upper flipper) from Fliptronic II Board J905-3
- J1 - 3 Orange ((Switch Grd) loop from Left Side Opto Board J1-4
- J1 - 4 N/C
- J1 - 5 Key
- J1 - 6 Gray-Yellow (+12V) from Power Driver Board J116-2
- J1 - 7 Gray-Yellow (+12V) loop from J1-6

### Please Note:

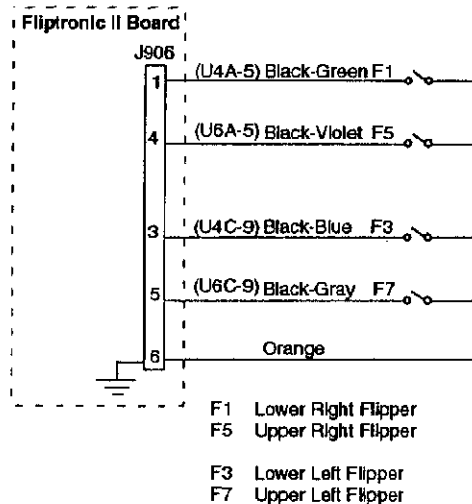
The Left Flipper Opto Switch Board must be connected in order for the Right Flipper Opto Switch Board to operate because power and ground are connected through the printed circuit board.



## FLIPTRONIC II FLIPPER END-OF-STROKE SWITCHES



Switch	A	B	
Open	H	H	Off
Closed	L	L	On



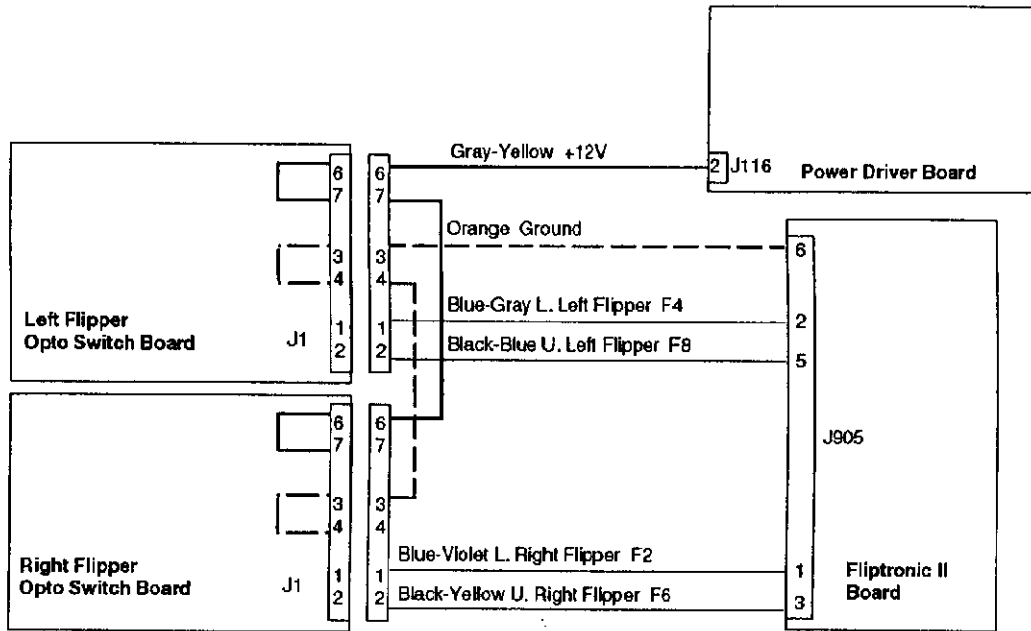
- F1 Lower Right Flipper
- F5 Upper Right Flipper
- F3 Lower Left Flipper
- F7 Upper Left Flipper

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

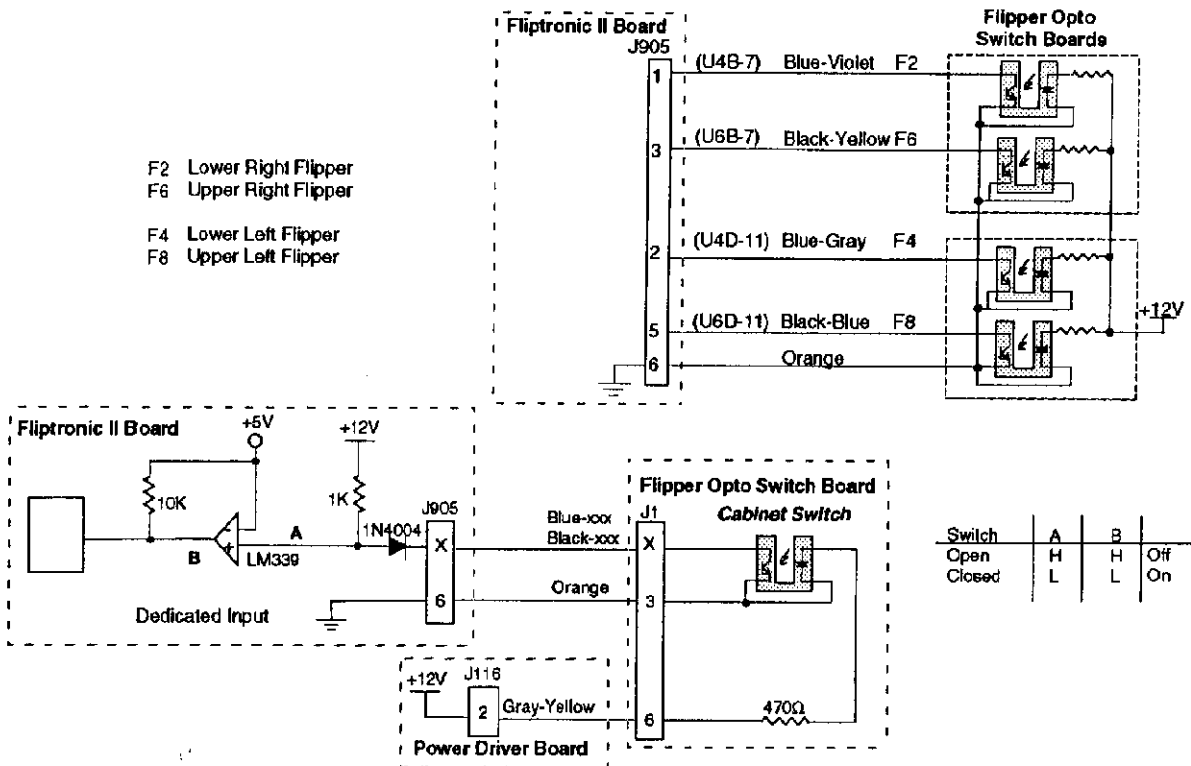
When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V causing its output to go low. Since the row (dedicated input) circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the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

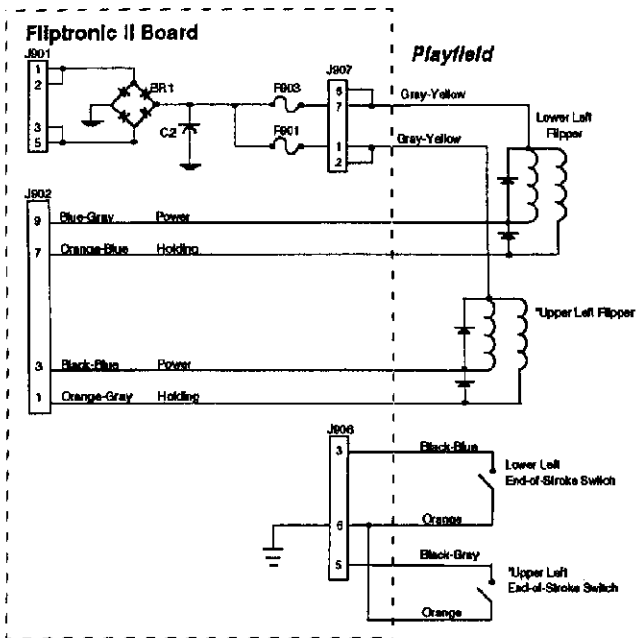


The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

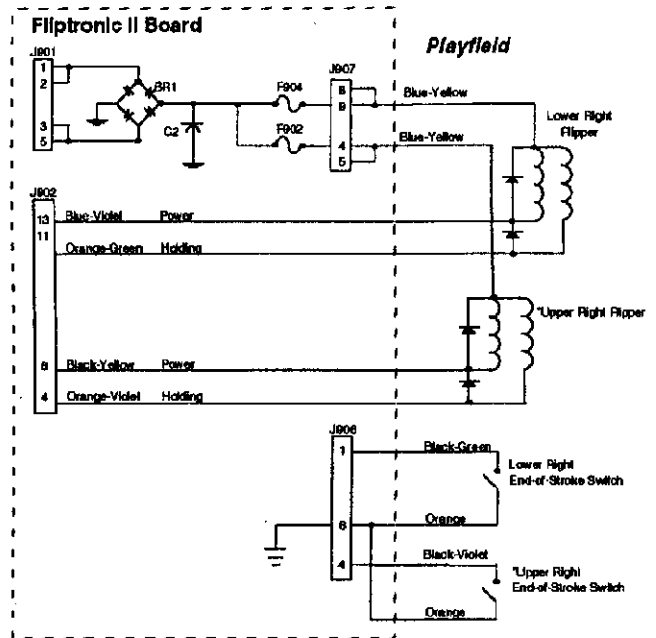
When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V causing its output to go low. Since the row (dedicated input) circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the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

## FLIPTRONIC II FLIPPER CIRCUITS

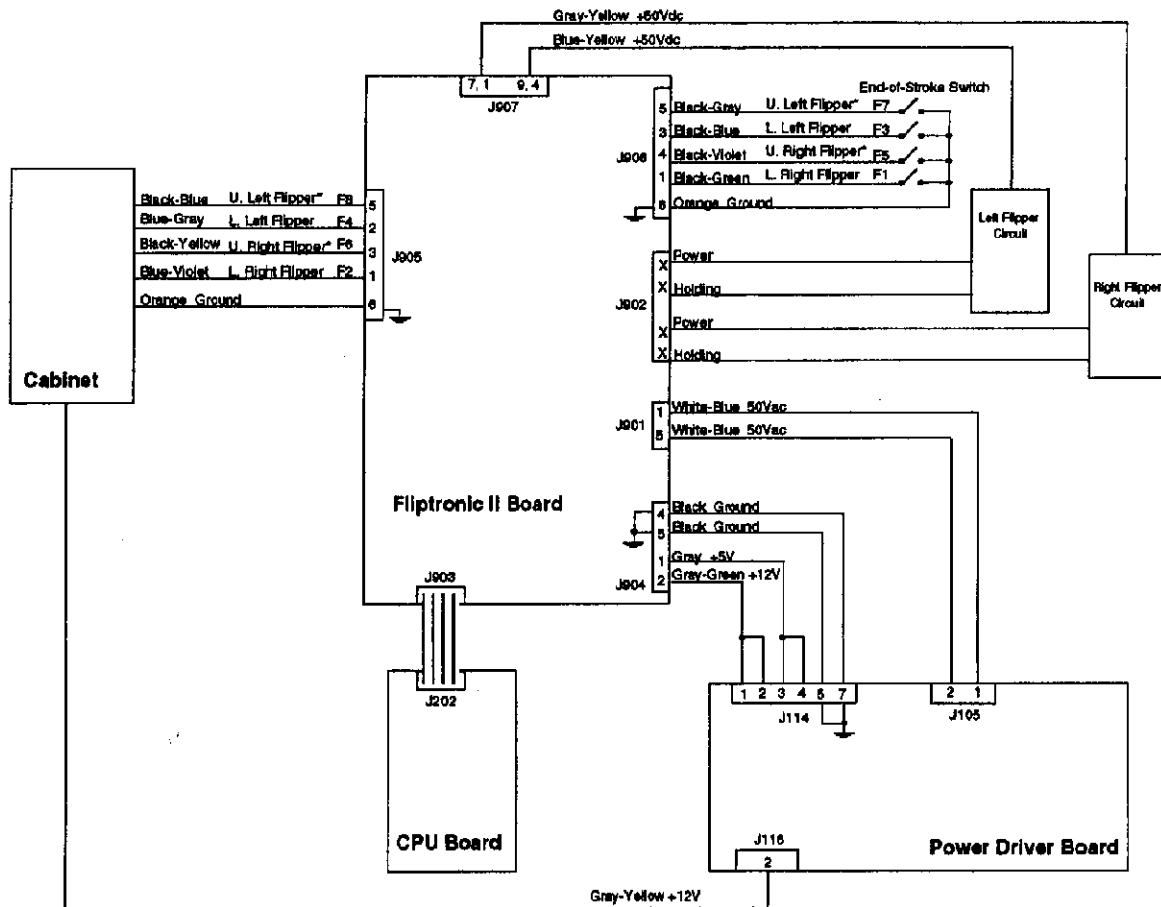
**Left Flipper Circuit**



**Right Flipper Circuit**

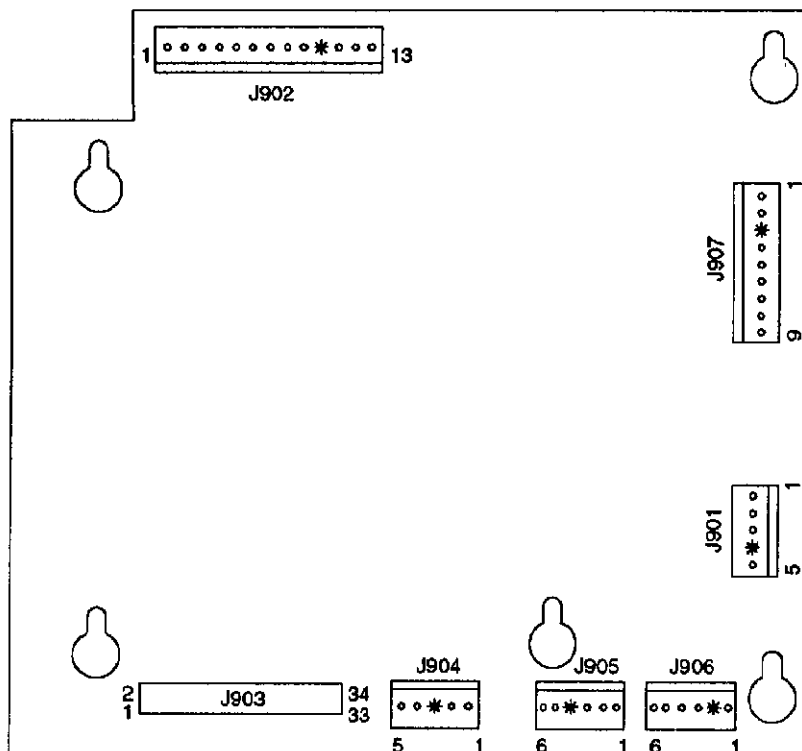


## FLIPTRONIC II FLIPPER CIRCUIT DIAGRAM



\*If Used

## FLIPTRONIC II BOARD A-15472



J901-1 White-Blue, 50VAC loop from J105-1  
 J901-2 White-Blue, loop from J901-1  
 J901-3 White-Blue, 50VAC loop, from J105-2  
 J901-4 Key  
 J901-5 White-Blue, loop from J901-3

J902-1 Orange-Gray, to insert flashers  
 J902-2 Not Used  
 J902-3 Black-Blue, to insert flashers  
 J902-4 Orange-Violet, to insert flashers  
 J902-5 Not Used  
 J902-6 Black-Yellow, to insert flashers  
 J902-7 Orange-Blue, holding to lower left flipper  
 J902-8 Not Used  
 J902-9 Blue-Gray, power to lower left flipper  
 J902-10 Key  
 J902-11 Orange-Green, holding to lower right flipper  
 J902-12 Not Used  
 J902-13 Blue-Violet, power to lower right flipper

J903 Ribbon Cable, data to/from J202; J506; J601

J904-1 Gray, +5V from J114-4  
 J904-2 Gray-Green, +12V from J114-2  
 J904-3 Key  
 J904-4 Black, Ground from J114-7  
 J904-5 Black, Ground from J114-5

J905-1 Blue-Violet, to right flipper opto  
 J905-2 Blue-Gray, to left flipper opto  
 J905-3 Black-Yellow, to right flipper opto  
 J905-4 Key  
 J905-5 Black-Blue, to left flipper opto  
 J905-6 Orange, Switch Ground

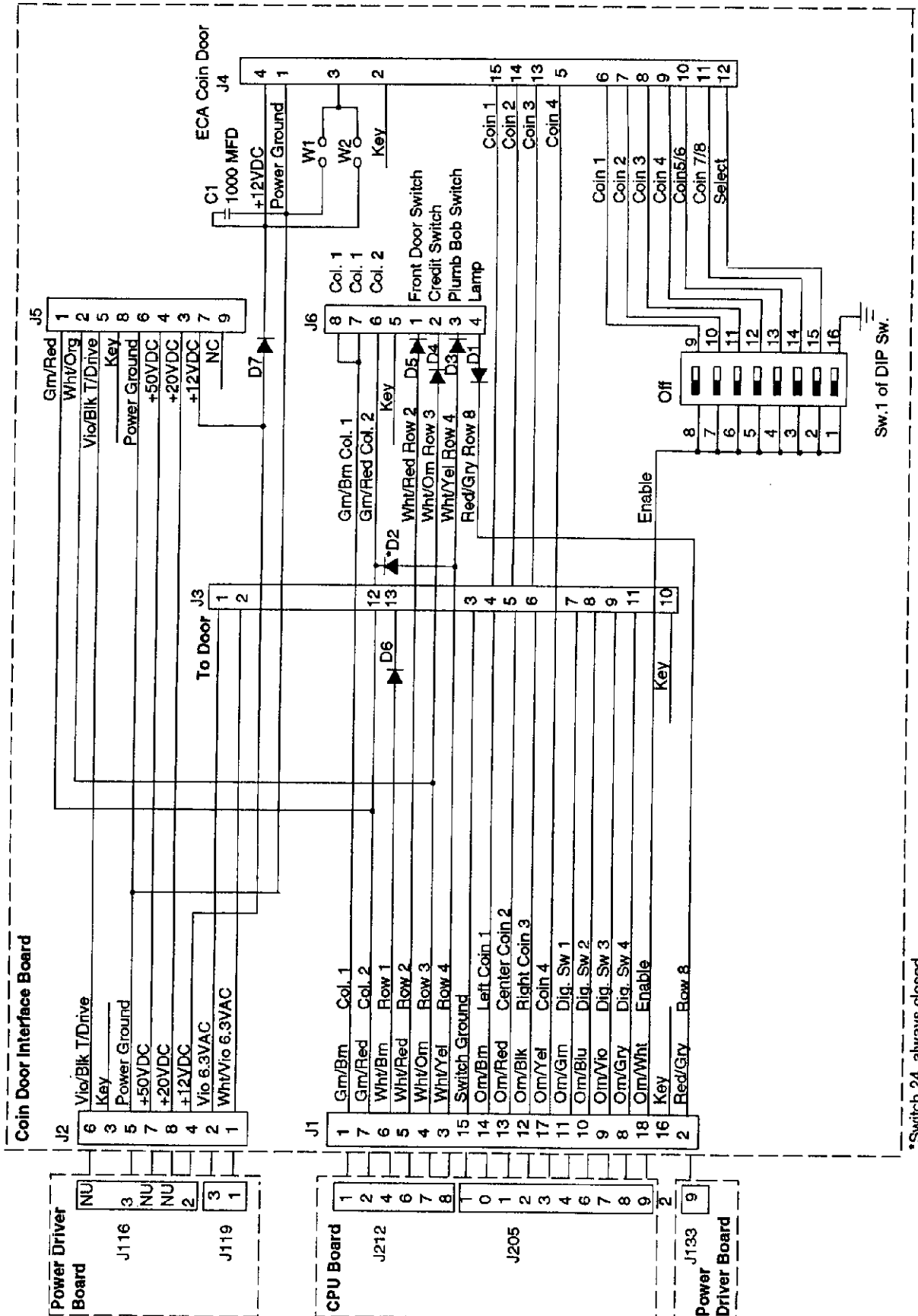
J906-1 Black-Green, to lower right end-of-stroke switch  
 J906-2 Key  
 J906-3 Black-Blue, to lower left end-of-stroke switch  
 J906-4 Not Used  
 J906-5 Black-Gray, to upper left end-of-stroke switch  
 J906-6 Orange, Switch Ground

J907-1 Blue-Yellow, +50V to lower right flipper  
 J907-2 Blue-Yellow, loop from J907-1  
 J907-3 Key  
 J907-4 Gray-Yellow, +50V to lower left flipper  
 J907-5 Gray-Yellow, loop from J907-4  
 J907-6 Not Used  
 J907-7 Not Used  
 J907-8 Gray-Yellow, loop from J907-9  
 J907-9 Gray-Yellow, +50V to upper left flipper

### P.C. Board Legend

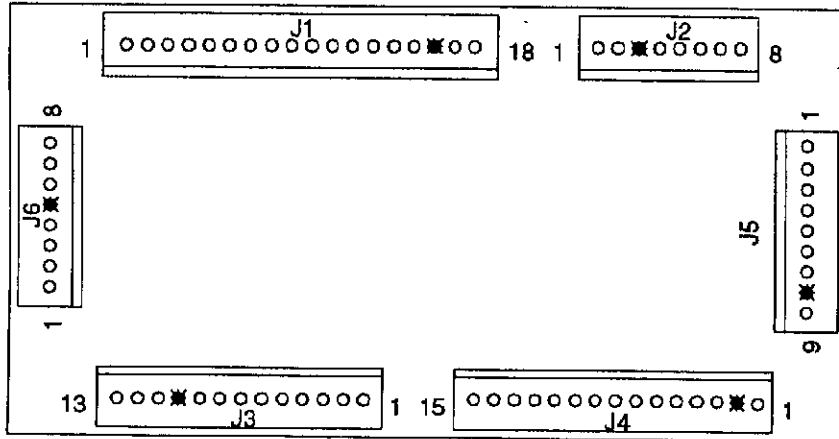
J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Fliptronic II Board

# Coin Door Interface Board Schematic A-14689



\*Switch 24, always closed

## COIN DOOR INTERFACE BOARD A-14689



- J1-1 Green-Brown, switch column 1 from J212-1
- J1-2 Red-Gray, lamp row 8 from J134-9
- J1-3 White-Yellow, switch row 4 from J212-8
- J1-4 White-Orange, switch row 3 from J212-7
- J1-5 White-Red, switch row 2 from J212-6
- J1-6 White-Brown, switch row 1 from J212-4
- J1-7 Green-Red, switch column 2 from J212-2
- J1-8 Orange-Gray, dedicated switch row 8 from J205-9
- J1-9 Orange-Violet, dedicated switch row 7 from J205-8
- J1-10 Orange-Blue, dedicated switch row 6 from J205-7
- J1-11 Orange-Green, dedicated switch row 5 from J205-6
- J1-12 Orange-Black, dedicated switch row 3 from J205-3
- J1-13 Orange-Red, dedicated switch row 2 from J205-2
- J1-14 Orange-Brown, dedicated switch row 1 from J205-1
- J1-15 Black, Ground from J205-10
- J1-16 Key
- J1-17 Orange-Yellow, dedicated switch row 4 from J205-4
- J1-18 Orange-White, switch enable from J205-12

J4 Not Used

J5 Not Used

- J6-1 White-Red, switch row 2 to cabinet
- J6-2 White-Orange, switch row 3 to cabinet
- J6-3 White-Yellow, switch row 4 to cabinet
- J6-4 Red-Gray, lamp row 8 to cabinet
- J6-5 Key
- J6-6 Green-Red, switch column 2 to cabinet
- J6-7 Green-Brown, switch column 1 to cabinet
- J6-8 Green-Brown, switch column 1 to cabinet

- J2-1 Violet, G.I. return from J119-3
- J2-2 White-Violet, G.I. 6.8VAC from J119-1
- J2-3 Key
- J2-4 Gray-Yellow, +12V from J116-2
- J2-5 Black, Ground from J116-3
- J2-6 Not Used
- J2-7 Not Used
- J2-8 Not Used

- J3-1 Violet, G.I. return to coin door
- J3-2 White-Violet, G.I. 6.8VAC to coin door
- J3-3 Black, Ground to coin door
- J3-4 Orange-Brown, dedicated switch row 1 to coin door
- J3-5 Not Used
- J3-6 Orange-Black, dedicated switch row 3 to coin door
- J3-7 Orange-Green, dedicated switch row 4 to coin door
- J3-8 Orange-Blue, dedicated switch row 6 to coin door
- J3-9 Orange-Violet, dedicated switch row 7 to coin door
- J3-10 Key
- J3-11 Orange-Gray, dedicated switch row 8 to coin door
- J3-12 Green-Red, switch column 8 to coin door
- J3-13 White-Brown, switch row 1 to coin door

### P.C. Board Legend

J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Fliptronic II Board

## POWER DRIVER BOARD A-12697-1

J101-1 Red, 9VAC from transformer secondary  
 J101-2 Red, 9VAC from transformer secondary  
 J101-3 Key  
 J101-4 Blue-White, 13VAC from transformer secondary  
 J101-5 Blue-White, loop from J101-4  
 J101-6 Blue-White, 13VAC from transformer secondary  
 J101-7 Blue-White, loop from J101-6

J102-1 White-Red, loop from J102-2  
 J102-2 White-Red, 16VAC from transformer secondary  
 J102-3 White-Red, loop from J102-4  
 J102-4 White-Red, 16VAC from transformer secondary  
 J102-5 Black-Yellow, loop from J102-6  
 J102-6 Black-Yellow, 16VAC from transformer secondary  
 J102-7 Key  
 J102-8 Black-Yellow, loop from J102-9  
 J102-9 Black-Yellow, 16VAC from transformer secondary

J103-1 Not Used  
 J103-2 Not Used  
 J103-3 Not Used  
 J103-4 Black, Motor Ground

J104-1 White-Red, 20VAC to Triac Driver J2-1  
 J104-2 White-Red, 20VAC to Triac Driver J2-5  
 J104-3 Key  
 J104-4 Not Used  
 J104-5 Not Used

J105-1 White-Blue, 50VAC to J901-1  
 J105-2 White-Blue, 50VAC to J901-3  
 J105-3 Key  
 J105-4 Not Used  
 J105-5 Not Used

J106-1 Not Used  
 J106-2 Not Used  
 J106-3 Not Used  
 J106-4 Key  
 J106-5 Red, +20V to insert flashlamps

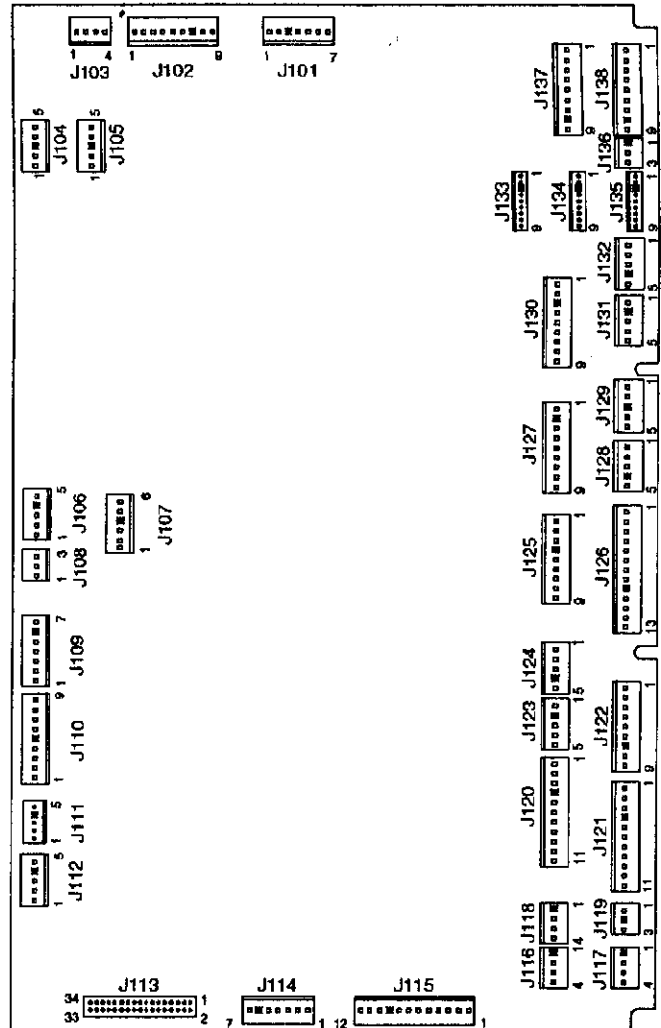
J107-1 Violet-Green, 50V to playfield coils  
 J107-2 Violet-Orange, 50V to playfield coils  
 J107-3 Violet-Yellow, 50V to playfield coils  
 J107-4 Key  
 J107-5 Red, +20V to playfield flashlamps  
 J107-6 Red-White, +20V to playfield flashlamps

J108 Not Used

J109 Not Used

J110 Not Used

J111 Not Used



J112-1 White-Green, 9.8VAC from transformer secondary  
 J112-2 White-Green, loop from J112-1  
 J112-3 White-Green, 9.8VAC from transformer secondary  
 J112-4 Key  
 J112-5 White-Green, loop from J112-3

J113 Ribbon Cable, Data to/from J211

J114-1 Gray/Green, +12VDC to J210-7  
 J114-2 Gray/Green, +12VDC to J210-6; J904-2  
 J114-3 Gray, +5VDC to J210-5; J502-3  
 J114-4 Gray, +5VDC to J210-4; J502-1; J904-1  
 J114-5 Black, Ground to J210-3; J502-5; J904-5  
 J114-6 Key  
 J114-7 Black, Ground to J210-1; J502-4; J904-4

P.C. Board Legend	
J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Flitronic II Board

## POWER DRIVER BOARD CONTINUED...

J115-1 Yellow-White, 6.8VAC from transformer secondary  
 J115-2 White-Brown, 6.8VAC from transformer secondary  
 J115-3 White-Brown, loop from J115-2  
 J115-4 White-Orange, 6.8VAC from transformer secondary  
 J115-5 White-Yellow, loop from J115-6  
 J115-6 White-Yellow, 6.8VAC from transformer secondary  
 J115-7 Orange, 6.8VAC from transformer secondary  
 J115-8 Orange, 6.8VAC loop from J115-7  
 J115-9 Key  
 J115-10 Green, 6.8VAC from transformer secondary  
 J115-11 Brown, 6.8VAC from transformer secondary  
 J115-12 Brown, 6.8VAC loop from J115-11

J116-1 Key  
 J116-2 Gray-Yellow, +12VDC to coin door; J2-4  
 J116-3 Black, Ground to coin door; J2-5  
 J116-4 Not Used

J117-1 Key  
 J117-2 Gray-Yellow, +12VDC to J606-7  
 J117-3 Black, Ground to J606-3  
 J117-4 Gray, +5VDC to J606-5

J118-1 Key  
 J118-2 Gray-Yellow, +12VDC playfield/cabinet  
 J118-3 Black, Ground  
 J118-4 Not Used

J119-1 White-Violet, 6.8VAC G.I. to coin door; J2-2  
 J119-2 Key  
 J119-3 Violet, Return G.I. to coin door; J2-1

J120-1 Brown, Return G.I. to playfield  
 J120-2 Orange, Return G.I. to playfield  
 J120-3 Yellow, Return G.I. to playfield  
 J120-4 Key  
 J120-5 Green, Return G.I. to playfield  
 J120-6 Violet, Return G.I. to playfield  
 J120-7 White-Brown, 6.8VAC to playfield  
 J120-8 White-Orange, 6.8VAC to playfield  
 J120-9 White-Yellow, 6.8VAC to playfield  
 J120-10 White-Green, 6.8VAC to playfield  
 J120-11 White-Violet, 6.8VAC to playfield

J121-1 Not Used  
 J121-2 Orange, Return G.I. to insert  
 J121-3 Yellow, Return G.I. to insert  
 J121-4 Key  
 J121-5 Not Used  
 J121-6 Violet, Return G.I. to insert  
 J121-7 Not Used  
 J121-8 White-Orange, 6.8VAC to insert  
 J121-9 White-Yellow, 6.8VAC to insert  
 J121-10 Not Used  
 J121-11 White-Violet, 6.8VAC to insert

J122-1 Blue-Brown, Sol 25 to playfield flasher  
 J122-2 Blue-Red, Sol 26 to playfield coil  
 J122-3 Not Used  
 J122-4 Not Used  
 J122-5 Not Used  
 J122-6 Violet-Green, Sol 26 to Tieback Diode  
 J122-7 Key  
 J122-8 Not Used  
 J122-9 Not Used

J123-1 Not Used  
 J123-2 Key  
 J123-3 Not Used  
 J123-4 Blue-Orange, Sol 27 to cabinet motor  
 J123-5 Blue-Yellow, Sol 28 to cabinet flasher

J124 Not Used

J125-1 Black-Brown, Sol 17 to insert flasher  
 J125-2 Black-Red, Sol 18 to insert flasher  
 J125-3 Black-Orange, Sol 19 to insert flasher  
 J125-4 Key  
 J125-5 Not Used  
 J125-6 Not Used  
 J125-7 Blue-Black, Sol 22 to insert flasher  
 J125-8 Not Used  
 J125-9 Not Used

J126-1 Black-Brown, Sol 17 to playfield flasher  
 J126-2 Black-Red, Sol 18 to playfield flasher  
 J126-3 Black-Orange, Sol 19 to playfield flasher  
 J126-4 Black-Yellow, Sol 20 to Chase Light II P.C. J2-2  
 J126-5 Blue-Green, Sol 21 to playfield motor  
 J126-6 Blue-Black, Sol 22 to playfield flasher  
 J126-7 Blue-Violet, Sol 23 to playfield motor  
 J126-8 Blue-Gray, Sol 24 to Chase Light II P.C. J2-1  
 J126-9 Key  
 J126-10 Not Used  
 J126-11 Not Used  
 J126-12 Violet-Green, Sol 22 to Tieback Diode  
 J126-13 Not Used

J127-1 Brown-Black, Sol 9 to playfield flasher  
 J127-2 Key  
 J127-3 Brown-Red, Sol 10 to playfield flasher  
 J127-4 Not Used  
 J127-5 Brown-Yellow, Sol 12 to playfield coil  
 J127-6 Brown-Green, Sol 13 to playfield coil  
 J127-7 Brown-Blue, Sol 14 to playfield coil  
 J127-8 Brown-Violet, Sol 15 to playfield coil  
 J127-9 Brown-Gray, Sol 16 to playfield flasher

### P.C. Board Legend

J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Flitronic II Board

## POWER DRIVER BOARD CONTINUED...

J128-1 Not Used  
 J128-2 Not Used  
 J128-3 Not Used  
 J128-4 Key  
 J128-5 Brown-Gray, Sol 16 to insert flasher  
  
 J129-1 Not Used  
 J129-2 Brown-Red, Sol 10 to insert flasher  
 J129-3 Key  
 J129-4 Brown-Orange, Sol 11 to insert flasher  
 J129-5 Not Used  
  
 J130-1 Violet-Brown, Sol 1 to playfield coil  
 J130-2 Violet-Red, Sol 2 to playfield flasher  
 J130-3 Key  
 J130-4 Violet-Orange, Sol 3 to playfield coil  
 J130-5 Violet-Yellow, Sol 4 to playfield coil  
 J130-6 Violet-Green, Sol 5 to playfield coil  
 J130-7 Violet-Blue, Sol 6 to playfield coil  
 J130-8 Violet-Black, Sol 7 to playfield coil  
 J130-9 Violet-Gray, Sol 8 to playfield flasher  
  
 J131-1 Not Used  
 J131-2 Key  
 J131-3 Not Used  
 J131-4 Not Used  
 J131-5 Violet-Gray, to insert flasher  
  
 J132-1 Not Used  
 J132-2 Violet-Red, to insert flasher  
 J132-3 Not Used  
 J132-4 Key  
 J132-5 Not Used  
  
 J133-1 Red-Brown, Row 1 to playfield lamps  
 J133-2 Red-Black, Row 2 to playfield lamps  
 J133-3 Key  
 J133-4 Red-Orange, Row 3 to playfield lamps  
 J133-5 Red-Yellow, Row 4 to playfield lamps  
 J133-6 Red-Green, Row 5 to playfield lamps  
 J133-7 Red-Blue, Row 6 to playfield lamps  
 J133-8 Red-Violet, Row 7 to playfield lamps  
 J133-9 Red-Gray, Row 8 to playfield lamps  
  
 J134-1 Not Used  
 J134-2 Not Used  
 J134-3 Key  
 J134-4 Not Used  
 J134-5 Not Used  
 J134-6 Not Used  
 J134-7 Not Used  
 J134-8 Not Used  
 J134-9 Red-Gray, Row 8 to cabinet lamp

J135-1 Red-Brown, Row 1 to insert lamps  
 J135-2 Red-Black, Row 2 to insert lamps  
 J135-3 Key  
 J135-4 Red-Orange, Row 3 to insert lamps  
 J135-5 Red-Yellow, Row 3 to insert lamps  
 J135-6 Red-Green, Row 3 to insert lamps  
 J135-7 Red-Blue, Row 6 to insert lamps  
 J135-8 Red-Violet, Row 7 to insert lamps  
 J135-9 Red-Gray, Row 8 to insert lamps  
  
 J136-1 Key  
 J136-2 Not Used  
 J136-3 Yellow/Gray, Col 8 to cabinet lamp  
  
 J137-1 Yellow-Brown, Col 1 to playfield lamps  
 J137-2 Yellow-Red, Col 2 to playfield lamps  
 J137-3 Yellow-Orange, Col 3 to playfield lamps  
 J137-4 Yellow-Black, Col 4 to playfield lamps  
 J137-5 Yellow-Green, Col 5 to playfield lamps  
 J137-6 Yellow-Blue, Col 6 to playfield lamps  
 J137-7 Not Used  
 J137-8 Key  
 J137-9 Yellow-Gray, Col 8 to playfield lamps  
  
 J138-1 Not Used  
 J138-2 Not Used  
 J138-3 Not Used  
 J138-4 Not Used  
 J138-5 Not Used  
 J138-6 Not Used  
 J138-7 Yellow-Violet, Col 7 to insert lamps  
 J138-8 Key  
 J138-9 Not Used

### P.C. Board Legend

J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Fliptronic II Board



## CPU BOARD A-12742-20018

J201 Ribbon Cable, Data to J602

J202 Ribbon Cable, Data to J903; J506; J601

J203 Not Used

J204 Not Used

J205-1 Orange-Brown, Dir Sw 1, Left Coin to J1-14

J205-2 Orange-Red, Dir Sw 2, Center Coin to J1-13

J205-3 Orange-Black, Dir Sw 3, Right Coin to J1-12

J205-4 Orange-Yellow, Dir Sw 4, 4th Coin J1-17

J205-5 Key

J205-6 Orange-Green, Dir Sw 5, Escape/Service to J1-11

J205-7 Orange-Blue, Dir Sw 6, Down/Volume Down to J1-10

J205-8 Orange-Violet, Dir Sw 7, Up/Volume Up to J1-9

J205-9 Orange-Gray, Dir Sw 8, Enter/Test to J1-8

J205-10 Black, Ground to J1-15

J205-11 Not Used

J205-12 Orange-White, Enable to J1-18

J206-1 Green-Brown, Sw Col 1 to Playfield Switches

J206-2 Green-Red, Sw Col 2 to Playfield Switches

J206-3 Green-Orange, Sw Col 3 to Playfield Switches

J206-4 Green-Yellow, Sw Col 4 to Playfield Switches

J206-5 Green-Black, Sw Col 5 to Playfield Switches

J206-6 Green-Blue, Sw Col 6 to Playfield Switches

J206-7 Not Used

J206-8 Key

J206-9 Not Used

J207 Not Used

J208-1 White-Brown, Sw Row 1 to Playfield Switches

J208-2 White-Red, Sw Row 2 to Playfield Switches

J208-3 White-Orange, Sw Row 3 to Playfield Switches

J208-4 White-Yellow, Sw Row 4 to Playfield Switches

J208-5 White-Green, Sw Row 5 to Playfield Switches

J208-6 Key

J208-7 White-Blue, Sw Row 6 to Playfield Switches

J208-8 White-Violet, Sw Row 7 to Playfield Switches

J208-9 White-Gray, Sw Row 8 to Playfield Switches

J209 Not Used

J210-1 Black, Ground from J114-7

J210-2 Key

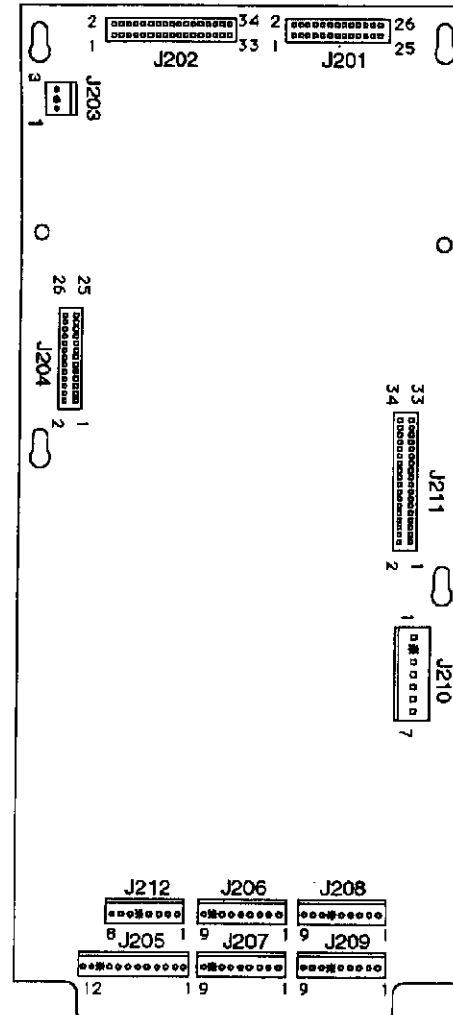
J210-3 Black, Ground from J114-5

J210-4 Gray, +5VDC from J114-4

J210-5 Gray, +5VDC from J114-3

J210-6 Gray-Green, +12VDC from J114-2

J210-7 Gray-Green, +12VDC from J114-1



J211 Ribbon Cable, Data from J113

J212-1 Green-Brown, Sw Col 1 to J1-1

J212-2 Green-Red, Sw Col 2 to J1-7

J212-3 Not Used

J212-4 White-Brown, Sw Row 1 to J1-6

J212-5 Key

J212-6 White-Red, Sw Row 2 to J1-5

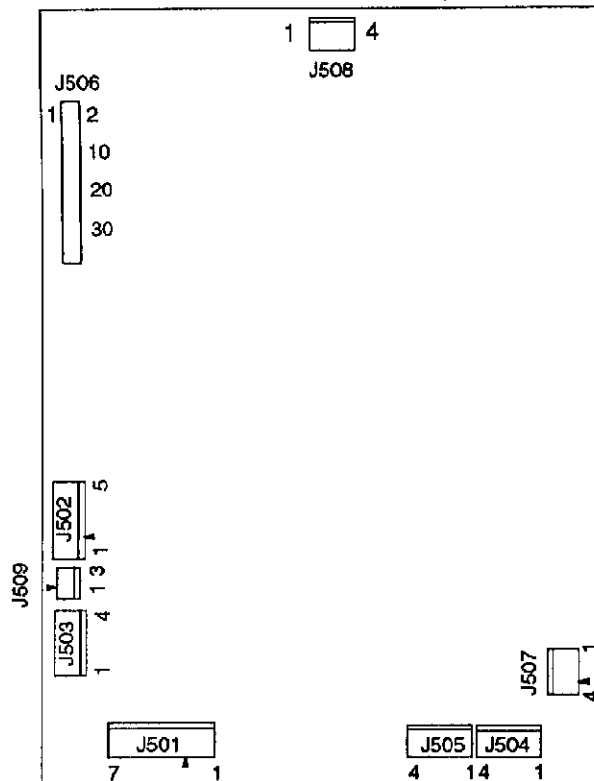
J212-7 White-Orange, Sw Row 3 to J1-4

J212-8 White-Yellow, Sw Row 4 to J1-3

### P.C. Board Legend

J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Filptronic II Board

## AUDIO BOARD A-12738-20018



J501-1 Gray-Green, 20VAC from transformer secondary  
 J501-2 Gray-Green, loop from J501-1  
 J501-3 Key  
 J501-4 Gray, 20VAC from transformer secondary  
 J501-5 Gray, 20VAC loop from J501-4  
 J501-6 Gray-White, 20VAC loop from transformer secondary  
 J501-7 Gray-White, 20VAC loop from J501-6

J502-1 Gray, +5VDC from J114-4  
 J502-2 Key  
 J502-3 Gray, +5VDC from J114-3  
 J502-4 Black, Ground from J114-7  
 J502-5 Black, Ground from J114-5

J503 Not Used

J504-1 Not Used  
 J504-2 Not Used  
 J504-3 Black, Signal to speaker  
 J504-4 Not Used

J505-1 Black-Yellow, Signal to speaker  
 J505-2 Not Used  
 J505-3 Not Used  
 J505-4 Not Used

J506 Ribbon Cable, Data to/from J601; J903; J202

J507 Not Used

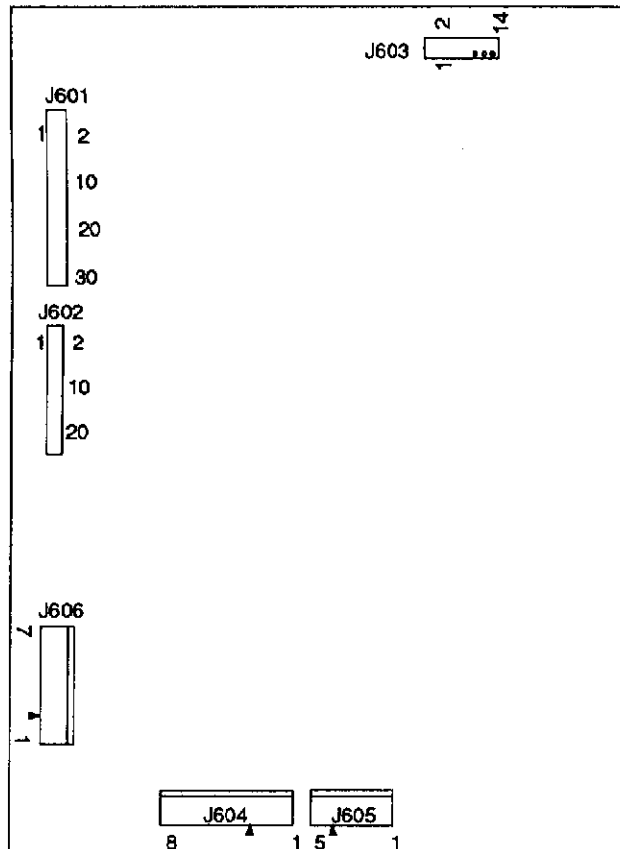
J508 Not Used

J509 Not Used

### P.C. Board Legend

J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Fliptronic II Board

## DOT MATRIX CONTROLLER BOARD A-14039



J601 Ribbon Cable, Data to/from J202; J903; J506

J602 Ribbon Cable, Data from J201

J603 Ribbon Cable, Data to Dot Matrix Display Driver

J604-1 Orange, -125V to Dot Matrix Display Driver Pin 1

J604-2 Blue, -113V to Dot Matrix Display Driver Pin 2

J604-3 Key

J604-4 Black, Ground to Dot Matrix Display Driver Pin 4

J604-5 Black, Ground to Dot Matrix Display Driver Pin 5

J604-6 Gray, +5V to Dot Matrix Display Driver Pin 6

J604-7 Gray-Yellow, +12V to Dot Matrix Display Driver Pin 7

J604-8 Brown, +62 to Dot Matrix Display Driver Pin 8

J605-1 White, 80VAC from transformer secondary

J605-2 White, 80VAC from transformer secondary

J605-3 Violet, 100VAC from transformer secondary

J605-4 Key

J605-5 Violet, 100VAC from transformer secondary

J606-1 Black, Ground loop from J606-3

J606-2 Key

J606-3 Black, Ground from J117-3

J606-4 Gray, +5V loop from J606-5

J606-5 Gray, +5V from J117-4

J606-6 Gray-Yellow, +12V loop from J606-7

J606-7 Gray-Yellow, +12V from J117-2

### P.C. Board Legend

J1-J6	Coin Door Interface Board
J1xx	Power Driver Board
J2xx	CPU Board
J5xx	Audio Board
J6xx	Dot Matrix Controller Board
J9xx	Fliptronic II Board

## Notes...

A series of 20 horizontal dotted lines for writing notes.

# LAMPS

Yellow (B+) Red

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 J138-7 Q92	8 Yellow-Gray J138-9 Q91
1 Red-Brown J133-1 Q90	(P)-A-I-D 11	(K)-I-S-S 21	Start Mega Menu 31	Lips 41	Snack Bar 51	Free Pass 61	C 71	(F)-I-L-M 81
2 Red-Black J133-2 Q89	P-(A)-I-D 12	K-(I)-S-S 22	Playground Award 32	Left Search 42	Center Search 52	Build Combo 62	R 72	F-(I)-L-M 82
3 Red-Orange J133-4 Q88	P-A-(I)-D 13	K-I-(S)-S 23	Lite Big Millions 33	Left Video 43	Cola 53	Unlimited Millions 63	E 73	F-I-(L)-M 83
4 Red-Yellow J133-5 Q87	P-A-I-(D) 14	K-I-S-(S) 24	Slide 34	Left Start Movie 44	Hotdog 54	Creature Feature 64	A 74	F-I-L-(M) 84
5 Red-Green J133-6 Q86	Left Jet 15	10 Million 25	Right Search 35	Combo Award 45	Super Jackpot 55	Extra Ball Countdown 65	T 75	Start Combo 85
6 Red-Blue J133-7 Q85	Right Jet 16	20 Million 26	Right Video 36	Parking O.K. 46	Jackpot 56	Big Millions 66	U 76	Popcorn 86
7 Red-Violet J133-8 Q84	Bottom Jet 17	30 Million 27	Right Start Movie 37	Move Your Car 47	Rescue 57	Movie Madness 67	R 77	Ice Cream 87
8 Red-Gray J133-9 Q83	Admit One 18	Specials 28	Mega Menu 38	Extra Ball 48	Multiball Restart 58	Snack Attack 68	E 78	Start Button 88

J100X = Power Driver Board

# SWITCHES

White Green

Dedicated Grounded Switches	Column \ Row	1 Green-Brown J206-1 U20-18	2 Green-Red J206-2 U20-17	3 Green-Orange J206-3 U20-16	4 Green-Yellow J206-4 U20-15	5 Green-Black J206-5 U20-14	6 Green-Blue J206-6 U20-13	7 Green-Violet J206-7 U20-12	8 Green-Gray J206-9 U20-11	Flipper Grounded Switches
Orange-Brown (1) J205-1 Left Coin Chute D1	1 White-Brown J208-1 U18-11	Not Used 11	Slam Tilt 21	Not Used 31	Cola 41	Left Out Lane 51	Right Ramp Exit 61	Not Used 71	Not Used 81	Black-Green J906-1 Right Flipper End of Stroke F1
Orange-Red (2) J205-2 Center Coin Chute D2	2 White-Red J208-2 U18-9	Not Used 12	Coin Door 22	Not Used 32	Hot Dog 42	Left Return Lane 52	Left Ramp Exit 62	Not Used 72	Not Used 82	Blue-Violet J905-1 Right Flipper Opto F2
Orange-Black (3) J205-3 Right Coin Chute D3	3 White-Orange J208-3 U18-5	Credit/Start Button 13	Not Used 23	Bottom Jet 33	Popcorn 43	Start Combo 53	Center Lane Exit 63	Not Used 73	Not Used 83	Black-Blue J906-3 Left Flipper End of Stroke F3
Orange-Yellow (4) J205-4 4th Coin Chute D4	4 White-Yellow J208-4 U18-7	Plumb Bob Tilt 14	Not Used 24	Right Popper 34	Ice Cream 44	Right Out Lane 54	Upper Ramp 64	Not Used 74	Not Used 84	Blue-Gray J905-2 Left Flipper Opto F4
Orange-Green (5) J205-6 Normal Function Service Credits   Test Function Escape D5	5 White-Green J208-5 U19-11	Top Left Rollover 15	P of P-A-I-D 25	Right Ramp Enter 35	Left Jet 45	Out Hole 55	Bowl 65	Not Used 75	Not Used 85	Black-Violet J906-4 Upper Right Flipper End of Stroke F5
Orange-Blue (6) J205-7 Normal Function Volume Down   Test Function Down D6	6 White-Blue J208-7 U19-9	Left Subway 16	A of P-A-I-D 26	Left Ramp Enter 36	Right Jet 46	Right Trough 56	Shooter 66	Not Used 76	Not Used 86	Black-Yellow J905-3 Upper Right Flipper Opto F6
Orange-Violet (7) J205-8 Normal Function Volume Up   Test Function Up D7	7 White-Violet J208-8 U19-5	Center Subway 17	I of P-A-I-D 27	Lower Right Popper 37	Left Slingshot 47	Center Trough 57	Not Used 67	Not Used 77	Not Used 87	Black-Gray J906-5 Upper Left Flipper End of Stroke F7
Orange-Gray (8) J205-9 Normal Function Begin Test   Test Function Enter D8	8 White-Gray J208-9 U19-7	Center Shot 18	D of P-A-I-D 28	Ramp Up/Down 38	Right Slingshot 48	Left Trough 58	Not Used 68	Not Used 78	Not Used 88	Black-Blue J905-5 Upper Left Flipper Opto F8

J2XX = CPU Board, J9XX = Flipper/I/O Board

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