Williams®
ELECTRONICS GAMES, INC.

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INDIANA JONES

OPERATIONS MANUAL

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

Williams Electronics Games, Inc.
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Chicago, Il 60618

ROM Jumper Chart

	W1	W2
1M / 2M / 4M ROM	In	Out

Country DIP Switch Chart

	Sw4	Sw5	Sw6	Sw7	Sw8
American	On	On	On	On	On
European	On	On	Off	On	On
French	On	On	On	Off	Off
German	On	On	On	On	Off
Spanish	On	Off	On	On	On

SOLENOID / FLASHER TABLE

Sol. No.	Function	Solenoid Type	Voltage Connections			Drive xister	Drive Connections			Drive Wire Color	Solenoid Part Number Flashlamp Type	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Backbox
01	Ball Popper	High Power	J107-3			Q82	J130-1			Vio-Brn	AE-26-1200	
02	Ball Launch	High Power	J107-3			Q80	J130-2			Vio-Red	AE-23-800	
03	Totem Drop Up	High Power	J107-3			Q78	J130-4			Vio-Org	AE-26-1200	
04	Ball Release	High Power	J107-3			Q76	J130-5			Vio-Yel	AE-26-1500	
05	Center Drop Bank	High Power	J107-3			Q64	J130-6			Vio-Grn	AE-26-1200	
06	Idol Release	High Power	J107-3			Q66	J130-7			Vio-Blu	AE-26-1500	
07	Knocker	High Power	J107-3			Q68	J130-8			Vio-Blk	AE-23-800	
08	Left Eject	High Power	J107-3			Q70	J130-9			Vio-Gry	AE-26-1200	
09	Left Jet Bumper	Low Power	J107-2			Q58	J127-1			Brn-Blk	AE-26-1200	
10	Right Jet Bumper	Low Power	J107-2			Q56	J127-3			Brn-Red	AE-26-1200	
11	Bumpeur Bas	Low Power	J107-2			Q54	J127-4			Brn-Org	AE-26-1200	
12	Left Slingshot	Low Power	J107-2			Q52	J127-5			Brn-Yel	AE-27-1200	
13	Right Slingshot	Low Power	J107-2			Q50	J127-6			Brn-Grn	AE-27-1200	
14	Left Control Gate	Low Power	J107-2			Q48	J127-7			Brn-Blu	A-14406	
15	Right Control Gate	Low Power	J107-2			Q46	J127-8			Brn-Vio	A-14406	
16	Totem Drop Down	Low Power	J107-2			Q44	J127-9			Brn-Gry	SM1-26-600	
17	Eternal Life	Flasher	J107-6	J106-5		Q42	J126-1	J125-1		Blk-Brn	#906 (1)	#906 (3)
18	Light Jackpot	Flasher	J107-6			Q40	J126-2			Blk-Red	#906 (1)	
19	Super Jackpot	Flasher	J107-6			Q38	J126-3			Blk-Org	#89 (1)	
20	Jackpot	Flasher	J107-6	J106-5		Q36	J126-4	J125-5		Blk-Yel	#89 (1)	#906 (2)
21	Path Of Adventure	Flasher	J107-6	J106-5		Q28	J126-5	J125-6		Blu-Grn	#89 (1)	#906 (4)
22	Mini Motor Left	Low Power	J118-2			Q30	J126-6			Blu-Blk		
23	Mini Motor Right	Low Power	J118-2			Q34	J126-7			Blu-Vio	14-7988	
24	Plane Gun LEDS	Flasher	J118-2	J106-5		Q32	J126-8			Blu-Gry	A-16834	
25	Dogfight Hurry Up	Gen. Purpose	J107-6			Q26	J122-1			Blu-Brn	#89 (1)	
26	Right Ramp	Gen. Purpose	J107-6	J106-5		Q24	J122-2	J124-2		Blu-Red	#89 (3)	#906 (1)
27	Left Ramp	Gen. Purpose	J107-6	J106-5		Q22	J122-3	J124-3		Blu-Org	#89 (1)	#906 (1)
28	Subway Release	Gen. Purpose	J107-1			Q20	J122-4			Blu-Yel	AE-26-1500	
29-36	*See Flipper Circuits*											
37*	Left Side Flasher	Low Power	J107-6	J106-5		Q16	J4-2	J4-2		Brn-Wht	#89 (2)	#906 (1)
38*	Right Side Flasher	Low Power	J107-6	J106-5		Q15	J4-4	J4-4		Blk-Wht	#89 (2)	#906 (1)
39*	Special Flasher	Low Power	J107-6			Q14	J4-5			Org-Wht	#89 (2)	
40*	Totem Multiball	Low Power	J107-6			Q13	J4-6			Yel-Wht	#89 (1)	
41*	Jackpot Multiplier Fl.	Low Power	J107-6			Q9	J3-2			Grn-Wht	#89 (1)	
42*	Wheel Motor	Low Power	J118-2			Q10	J3-3			Blu-Wht	14-7982	

***Note: Controlled from the 8-Driver Board, not the Power Driver Board**

General Illumination

01	Top Playfield	G.I.	J121-1			Q18	J121-7			Wht-Brn	#44	
02	Bottom Playfield	G.I.	J121-2			Q10	J121-8			Wht-Org	#44	
03	Insert Top	G.I.		J120-3		Q14		J120-9		Wht-Yel		#555
04	Insert Bottom	G.I.		J120-4		Q16		J120-10		Wht-Grn		#555
05	Return Lane/Coin	G.I.	J121-6		J119-3	Q12	J121-11		J119-1	Wht-Vio	#44	

	Flipper Circuits		Voltage Connections Playfield	Drive Transistors Power	Drive Transistors Hold	Drive Connections Playfield	Drive Wire Colors Power	Drive Wire Colors Hold	Coil Part Number	Coil Colors
(29)		Lwr. Rt. Power	J907-7 (Blu-Yel)	Q4		J902-13	Blu-Vio		FL-11629	Blue
(30)	Lower Right Flipper	Lwr. Rt. Hold	J907-7 (Blu-Yel)		Q11	J902-11		Org-Grn		
(31)		Lwr. Lt. Power	J907-9 (Gry-Yel)	Q3		J902-9	Blu-Gry		FL-11629	Blue
(32)	Lower Left Flipper	Lwr. Lt. Hold	J907-9 (Gry-Yel)		Q9	J902-7		Org-Blu		
33	Diverter Power	Up Rt. Power	J907-1 (Blu-Yel)	Q2		J902-6	Blk-Yel		FL-11753-1	Yellow
34	Diverter Hold	Up Rt. Hold	J907-1 (Blu-Yel)		Q7	J902-4		Org-Vio		
35	Top Lockup Power	Up Lt. Power	J907-4 (Gry-Yel)	Q1		J902-3	Blk-Blu		A-15943	Brown
36	Top Lockup Hold	Up Lt. Hold	J907-4 (Gry-Yel)		Q5	J902-1		Org-Gry		

INDIANA JONES

The Pinball Adventure....

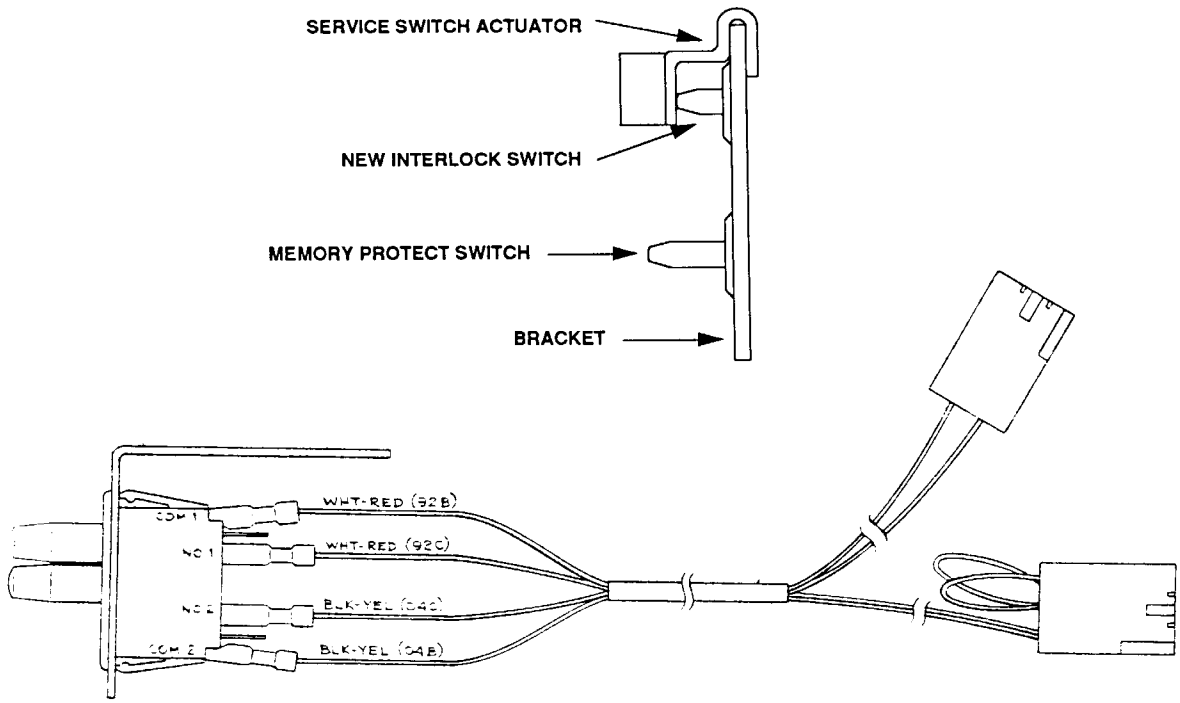
IMPORTANT NOTICE

PLEASE READ

Pinball games are now equipped with a SAFETY FEATURE to prevent shocks from the solenoid circuit when the coin door is opened. A new interlock switch assembly (part no. A-17077), located at the left of the coin door opening, has been added to the game. This assembly is a bracket containing the existing memory protect switch on the bottom and a new interlock switch on the top. When the coin door is opened, this new interlock switch opens, breaking the connection to the +50V and +20V winding of the transformer secondary.

A special tool called the Service Switch Actuator is provided for the serviceman/technician that repairs the game. This tool is painted yellow and located in a bag stapled inside the cabinet. The Service Switch Actuator slips over the interlock switch and holds it closed while the coin door is opened, allowing the serviceman to test and repair the solenoid circuit.

Hold the top interlock switch in, then slide the short end of the Service Switch Actuator over the top of the interlock switch bracket and the long end over the center of the switch plunger to hold it in.



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Section Two - Game Parts Information Continued...

Section 3 - Schematics, Wiring Diagrams & Circuit Theory

INDIANA JONES RULES

I-N-D-Y LANES:

Advance bonus "X", advance "FRIEND" lamps, then lite Extra Ball at eject.

FRIENDS JACKPOT

Lite five friends to increase loop value and lite Jackpot at right ramp.

PATH OF ADVENTURE

Complete A-D-V-E-N-T-U-R-E Targets to lite path (right ramp) Make right ramp to complete lit lanes on the TILT-A-MATIC™ playfield. Use left and right flipper buttons to move playfield.

HAND OF FAITH

Right and left return lanes lite eject for random award.

MULTIBALL

Complete 3-bank drop target to lite lock. Lock three balls in center shot to get in Idol for multiball. Shoot for left ramp to lite jackpot. Make right ramp to collect jackpot. Jackpots can be doubled or tripled at center shot.

START MODE

Make eject W/lit to start mode lit on playfield. See display for mode instructions. Complete all modes for 6-ball multiball.

LOST TREASURE

Complete the upper right single drop target to expose captive ball. Hit captive ball for instant 2-ball multiball. During this time, hitting captive ball awards lost treasure values.

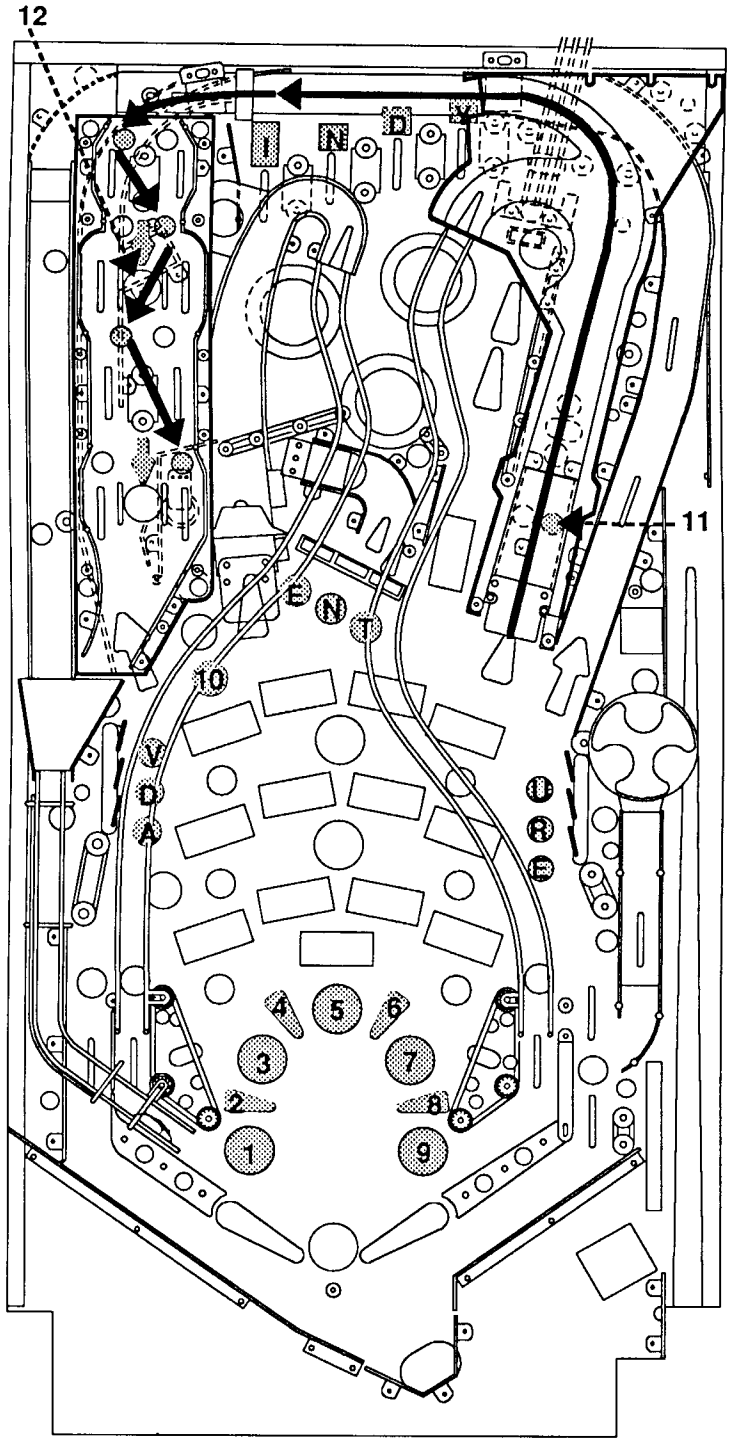
HURRY-UP

Right & left ramps lite winged lamps (6) in the middle of the playfield. Make center shot for Hurry-up score.

INDIANA JONES

The Pinball Adventure....

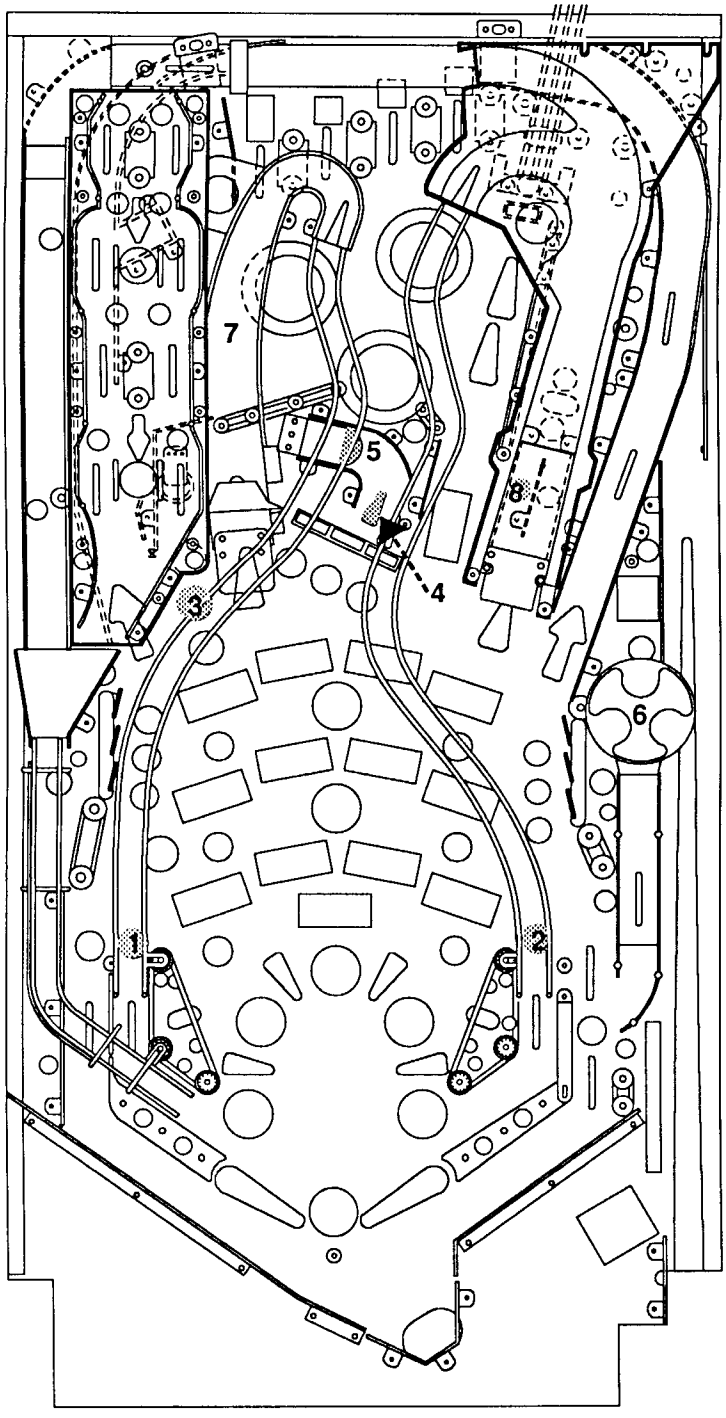
Shot Maps



I-N-D-Y Lanes:
Advance Bonus "X" and awards a Friends Lamps, then lights Extra Ball (10) at Eject.

Friends Jackpot:
After lighting all Friends Lamps and making at least 5 lit loop shots, (1-9), Jackpot (11) will be lit at the Right Ramp.

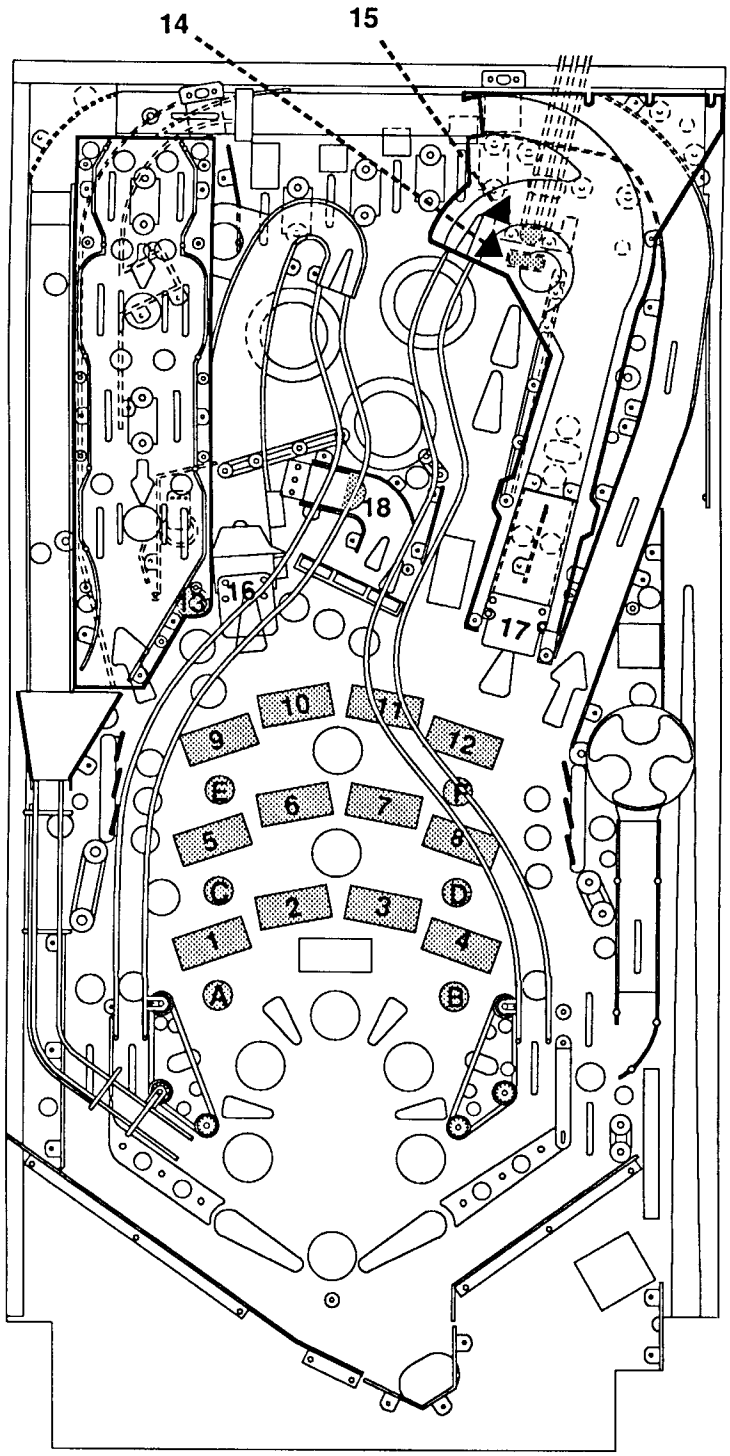
Path of Adventure:
Complete A-D-V-E-N-T-U-R-E Targets to light Path Entry at Right Ramp. Shoot the ball up th Right Ramp to holding area (top left). Ball then drops to TILT-A-MATIC™ Playfield. Use the Left and Right Flipper buttons to complete random lit lamp sequence. Complete this once and light Extra Ball. Complete this a second time to light the Pit (12).



Hand of Fate:
Left (1) and Right (2) Return Lanes light Eject (3) for Random Award (see Display).

Multiball:
Complete 3-bank Drop Target to light Lock (4). Lock three balls in the Center Hole (5) to get in the Rotating Idol (6) for Multiball play.

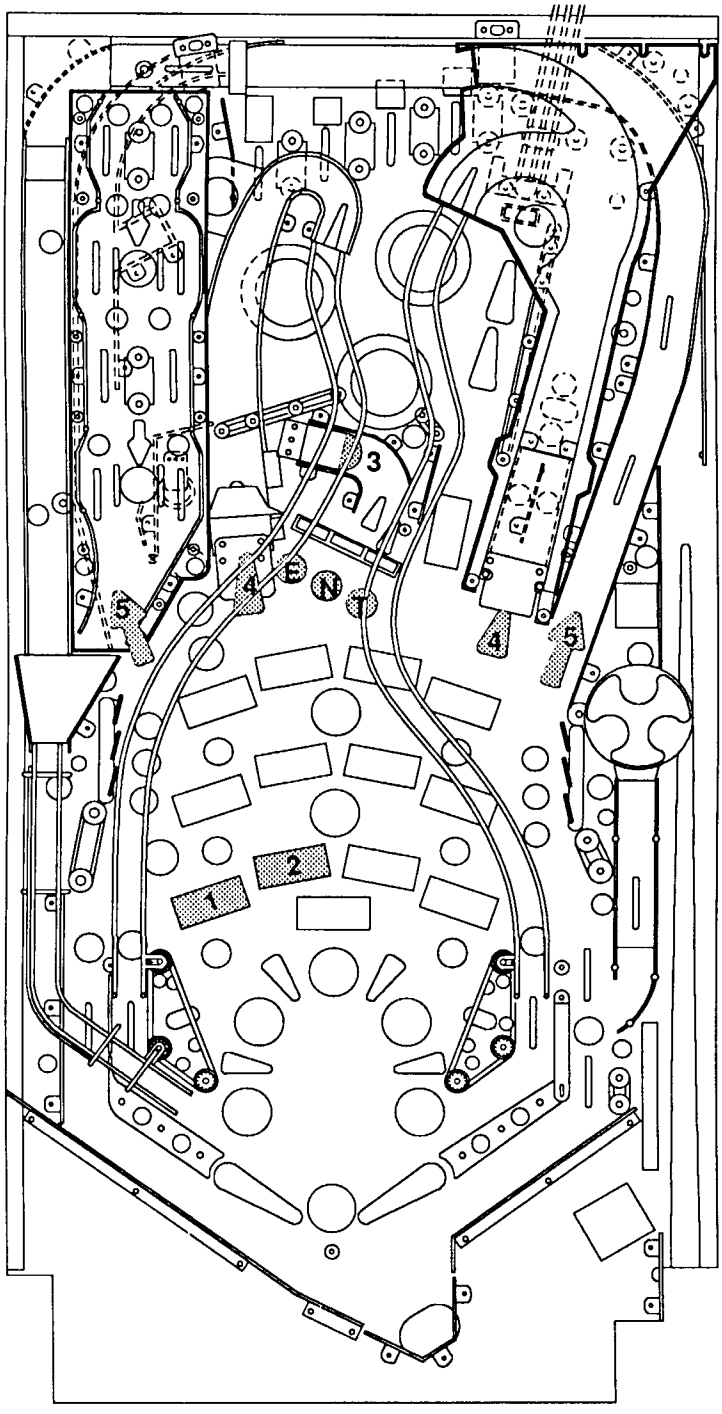
Jackpot:
During Multiball, make Left Ramp (7) to light Jackpot then make Right Ramp (8) to collect Jackpot. Make Center Hole (5) to light Jackpot and/or double then triple Jackpot.



Start Mode:
Make Left Eject (13) to enter Lit Mode. (1-12).
See display for Mode instructions.

Lost Treasure:
Complete upper right Single Drop Target (14) to expose Captive Ball (15). Hit Captive Ball for Lost Treasure award then, light Special.

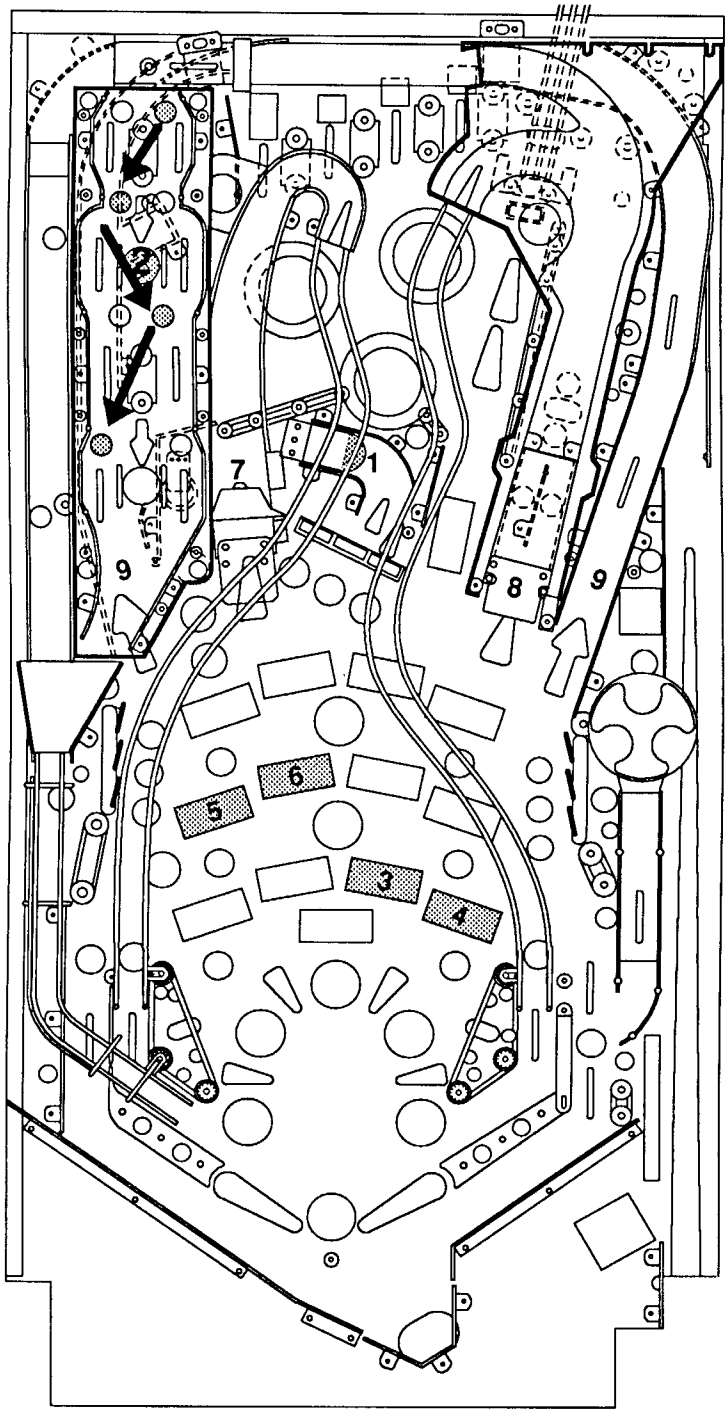
Hurry-Up (Dogfight):
Left and Right Ramps (16 & 17) advance Winged Lights (A-F) in the center of the playfield. When all winged lights are lit, make the Center Hole (18) shot to collect the Hurry-Up score.



MODE PLAY

(1) Get the Idol:
Shoot for the Center Drop Target (E-N-T) four times, then shoot for Center Hole (3) to get the Idol.

(2) Streets of Cairo:
Marion is in one of the baskets. Shoot loop (5) and ramp (4) shots that are in line with baskets to find Marion. Next, shoot mode start or pistol to shoot the bad guy with the sword.



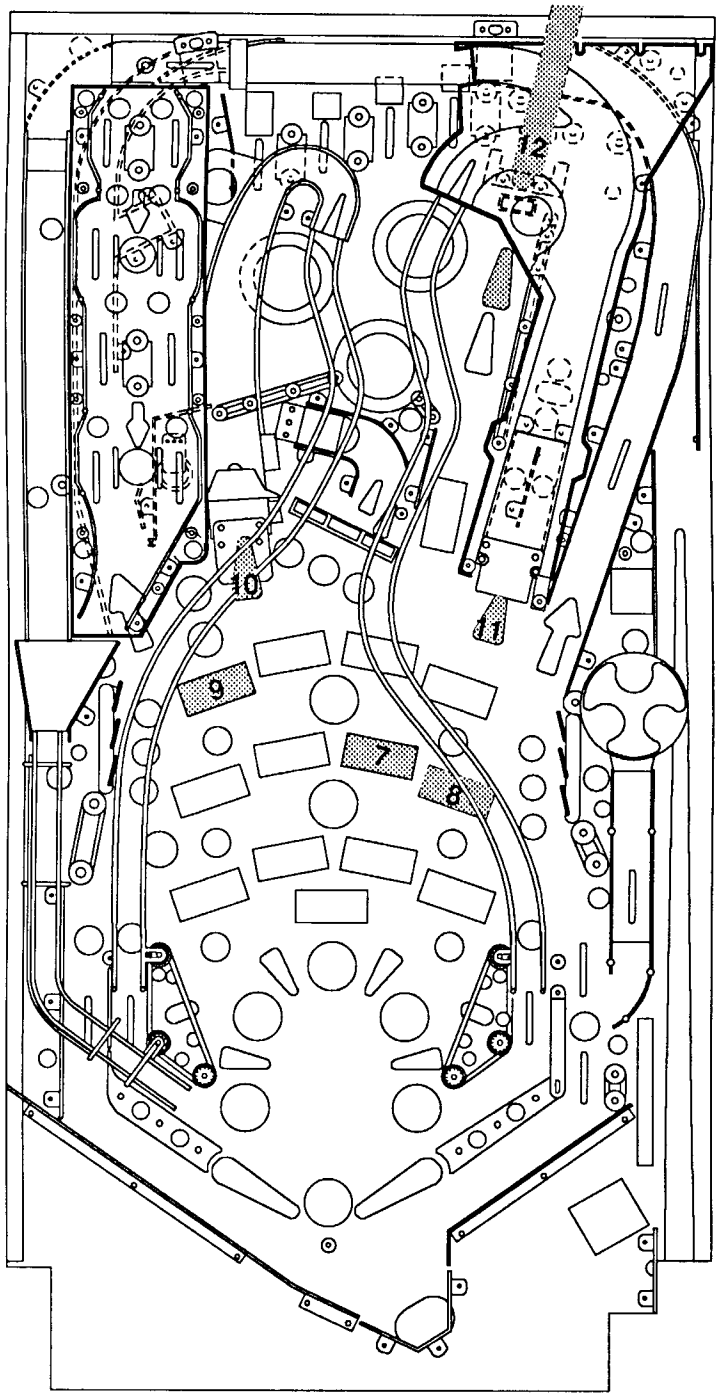
MODE PLAY CONT'D

(3) Well of Souls:
Get automatic 6-ball Multiball and shoot Center Hole (1) to kill snakes for big points.

(4) Raven Bar (Video Mode):
Use the flipper buttons to aim the pistol in the display to shoot the bad guys and to acquire the Head Piece. Gun shoots automatically.

(5) Monkey Brains:
Shoot for the Left (7) and Right (8) Ramps, and the Loop (9) shots for 8 million points per completed shot.

(6) Steal the Stones:
Control the movement of the ball, on the mini playfield, by using the Left and Right flipper buttons. The Right flipper button tilts the mini playfield (2) to the Right and the Left flipper button tilts the mini playfield to the left. Move the mini playfield to complete the lit lamp pattern.

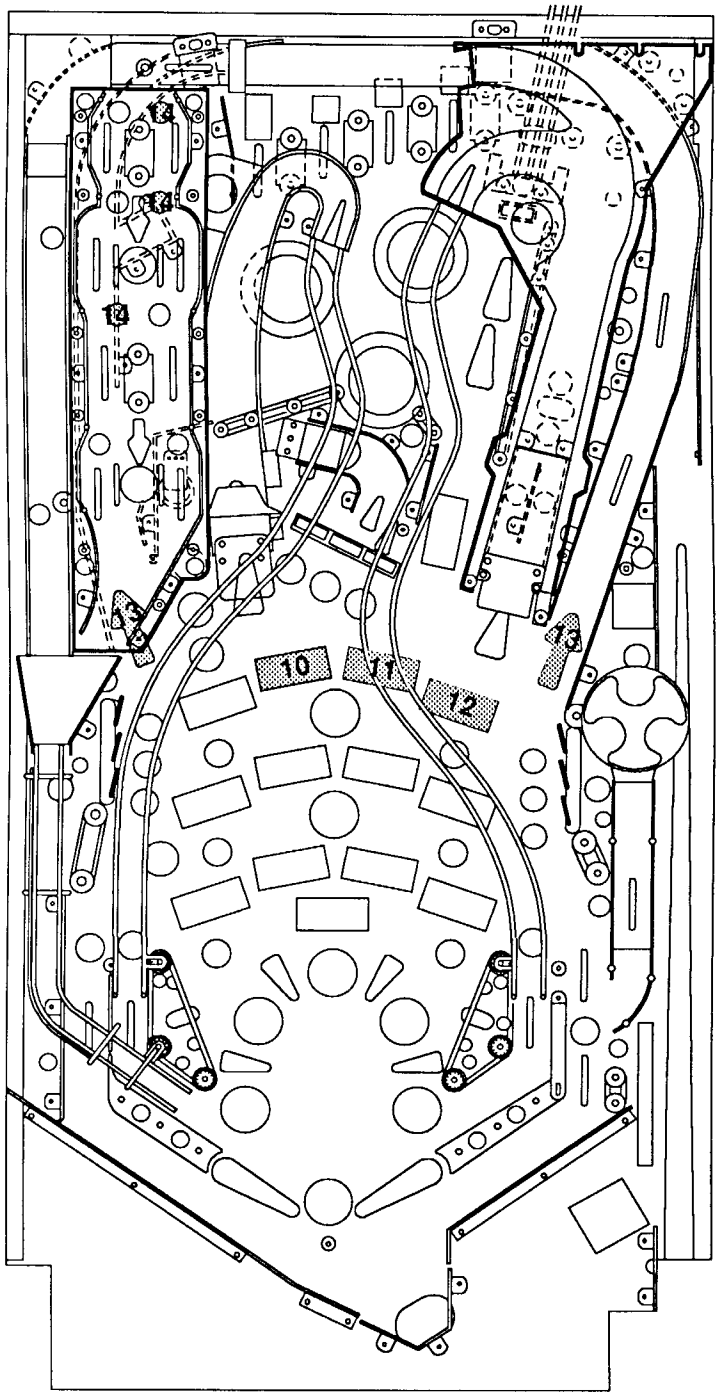


MODE PLAY CONT'D

(7) Escape in the Mine Card (Video Mode):
Use the Left and Right flippers to guide the Mine Cart down the non-barricaded paths in the Display.

(8) Survive the Rope Bridge (Video Mode):
Left (10) and Right (11) ramps move Indy across the bridge (see Display).

(9) Castle Grunwald:
Shoot for the Captive Ball (12) to rescue Dr. Jones.



MODE PLAY CONT'D

(10) Tank Chase:
Shoot for Loop shots (13) to advance Indy on horseback toward the Tank.

(11) The 3 Challenges:
Complete three lit lamp patterns (14) on the mini playfield. Use the flipper buttons to control the mini playfield movement.

(12) Choose Wisely (Video Mode):
Comparable to the age old shell game: Carefully watch as the cups move around the display. When movement stops, pick the cup you think is the right one. Select a cup with the flipper buttons and pick it up by pulling the trigger on the gun.

SECTION 1

Game Operation and Test Information

ROM SUMMARY

IC	Type	Location	Board	Part Number
Game ROM 1	27c040	U6	CPU	A-5343-50017-1
Music/Speech ROM	27c040	U2	Audio	A-5343-50017-2
Music/Speech ROM	27c040	U3	Audio	A-5343-50017-3
Music/Speech ROM	27c040	U4	Audio	A-5343-50017-4
Music/Speech ROM	27c040	U5	Audio	A-5343-50017-5
Music/Speech ROM	27c040	U6	Audio	A-5343-50017-6
Music/Speech ROM	27c040	U7	Audio	A-5343-50017-7
Music/Speech ROM	27c040	U8	Audio	A-5343-50017-8

PINBALL GAME ASSEMBLY INSTRUCTIONS

INDIANA JONES ***IS A 7 BALL GAME***

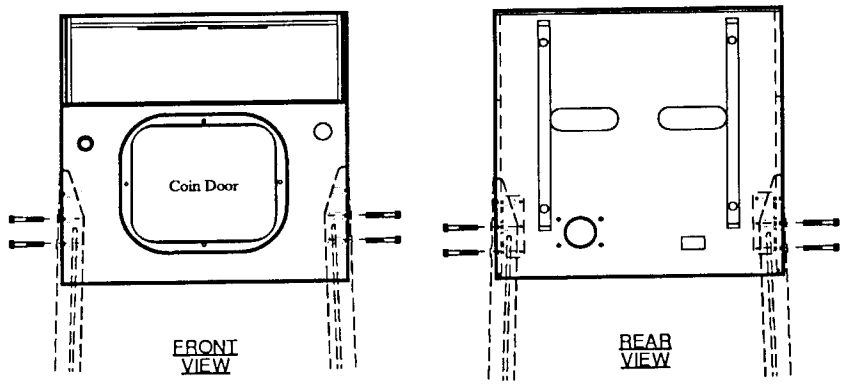
Contains six active balls and one captive ball.

Power:	Domestic 120V @ 60Hz Foreign 230V @ 50Hz Japan 100V @ 50HZ	***Dimensions:***	Width: 29" approx. Depth: 55" approx. Height: 76" approx.
Temp:	32°F to 100° F (0°C to 38°)C	***Weight:***	322 lbs approx. (crated)
Humidity:	Not to exceed 95% relative.		

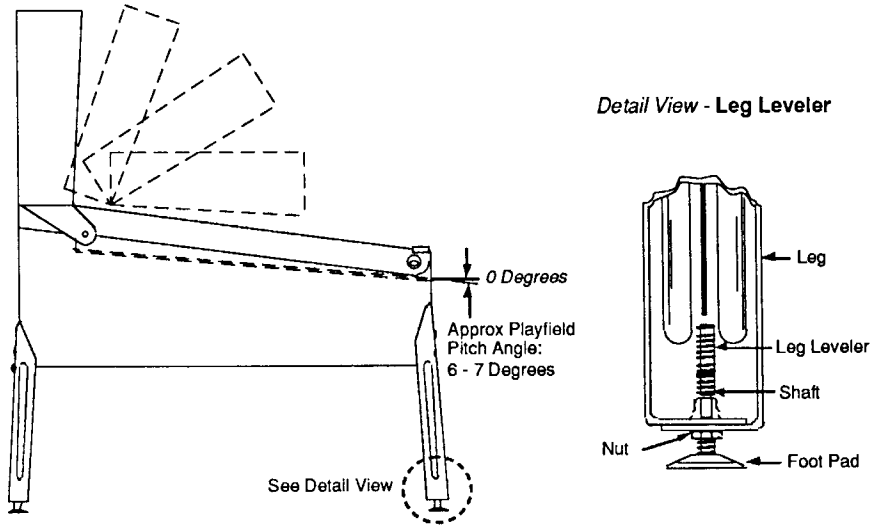
1. Remove all cartons, parts, and other items from the shipping container, and set them aside.

2. Place the cabinet on a support. Remove the leg bolts from the front and rear of the cabinet. Attach rear legs using leg bolts in the center and bottom holes. (See rear view of Leg Bolt Location diagram below.)

3. Leg levelers are among the parts in the cashbox. Install leg levelers (see Pinball Assembly, Playfield Pitch Angle, and Leg Levelers Details diagram below), and attach the front legs using leg bolts in the center and bottom holes. (See front view of Leg Bolt Location diagram below.)



Leg Bolt Location Diagram



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

4. Reach into the cabinet and backbox and ensure that the interconnecting cables are not kinked or pinched. Be careful to avoid damaging wires at any stage of the assembly process.

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

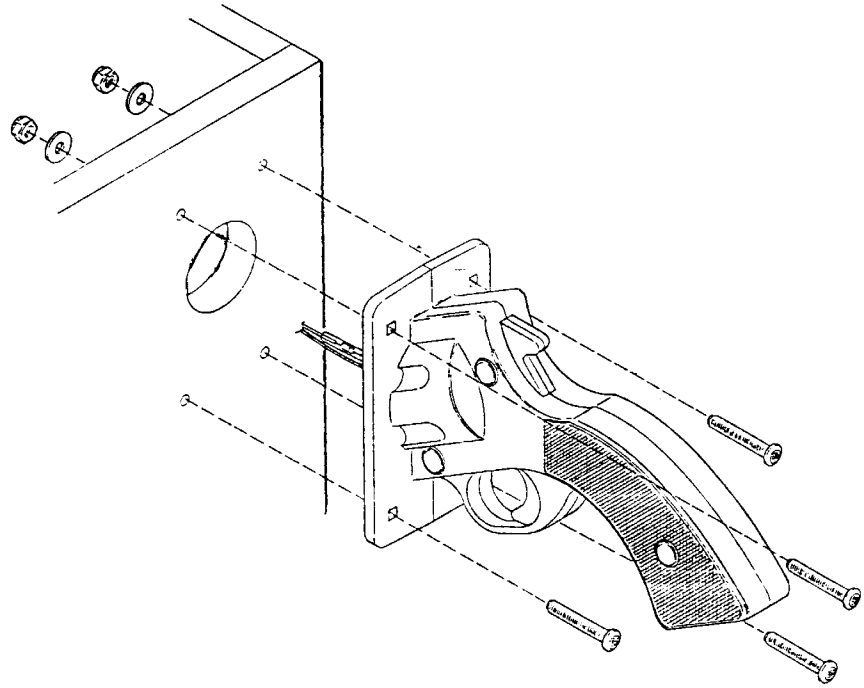
⚠ CAUTION

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

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

7. Unlock and open the coin door. Move the molding latch lever toward the left side of the game. Lift the front molding off the playfield cover glass return the latch lever toward the right, and close the coin door.Carefully slide the glass downward, until it clears the grooves of the left and right side moldings. Lift the glass up and away from the game. Raise the playfield. (See page 1-5.)

8. Install the gun handle. Remove the gun handle from the inside bottom of the cabinet. Then, using the hardware included with the gun handle plus two more 10-24 bolts, 10-24 ESN nuts and .219x.500x.063 flat washers located in the parts bag, attach the gun handle to the outside of the cabinet in the upper right corner. (See diagram below.) After the gun handle is in place, plug the connector from the handle into the matching connector from the cabinet.



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

! IMPORTANT !

Playfield pitch angle can affect the operation of the plumb bob tilt. The plumb bob weight is among the parts in the cash box; the operator should install the weight and adjust this tilt mechanism for proper operation, after completion of the desired playfield pitch angle setting. The unit is factory installed for a 6-1/2 degree angle. If an adjustment is necessary, loosen the screw at the bottom of the unit. Move the pointer, one grove at a time to the left or the right, depending on the degree desired. Hold the pointer in place and tighten screw.

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

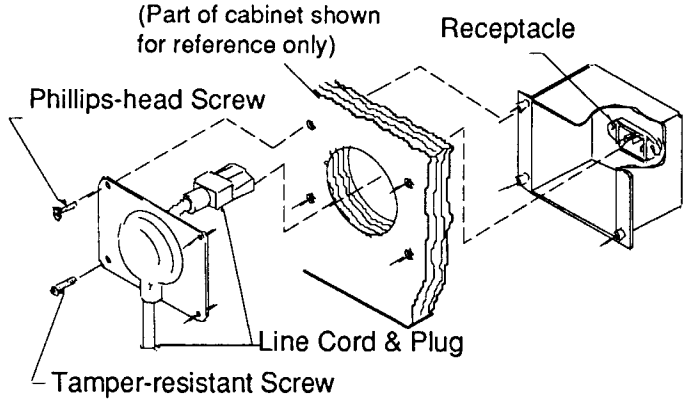
11. Be sure the ***required number*** of ball are installed. *INDIANA JONES* uses seven balls: Six active balls and one captive ball.

12. Pull the foam out from the Captive Ball feature in the upper right corner of the playfield.

13. Install playfield mylars if desired. ***NOTE:*** The *INDIANA JONES* playfield is coated with a special hardcoat surface and does not require a protective mylar. However, mylars can be purchased through your local Williams Distributor. Specify part number 03-8929-1 for full playfield mylar.

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

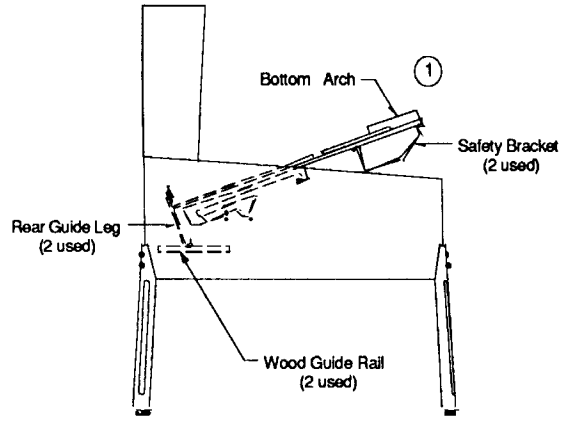
15. To attach the line cord, remove the envelope stapled to the inside of the cabinet (near the cashbox). Remove the four Phillips-head screws that mount to line cord cover plate to the rear cabinet. Match the prongs on the plug with the holes in the receptacle, and push the line cord securely into place.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



RAISING THE PLAYFIED

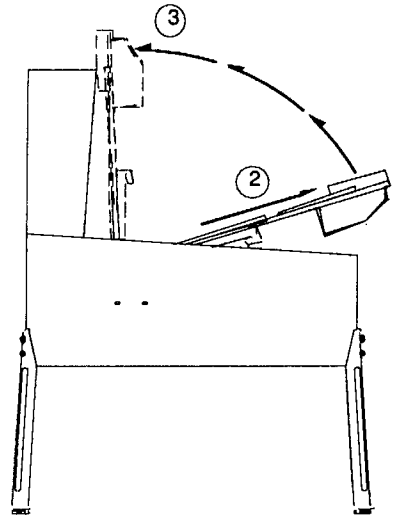
⚠ CAUTION

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



To raise the playfield.

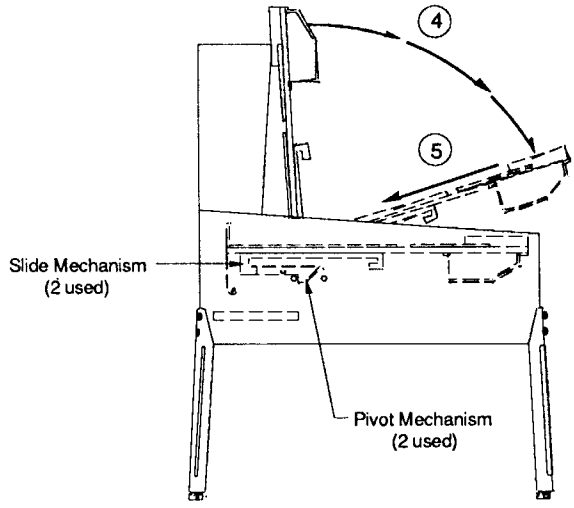
1. Grasp bottom arch and carefully lift up playfield only high enough to clear safety brackets. Rear guide legs should not hit wood guide rails or be used to slide out playfield.



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

Coin Door Buttons

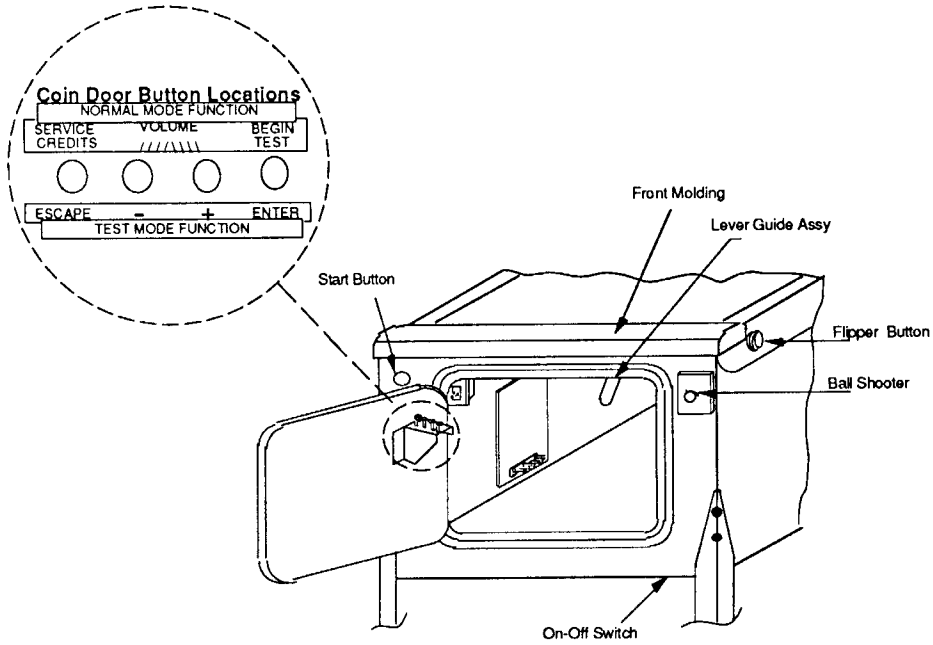
The operator controls all game adjustments, obtains bookkeeping information, and diagnoses problems, using only four pushbutton switches mounted on the inside of the coin door. The Coin Door Buttons have two modes of operation Normal Function and Test Function.

Normal Function

The Service Credits button puts credits on the game that are not included in any of the game audits.
The Volume Up (+)button raises the sound level of the game. Press and hold the button until the desired level is reached.
The Volume Down (-) button lowers the sound level of the game. Press and hold the button until the desired level is reached. See Adjustment A.1 28 to shut sound Off completely.
The Begin Test button starts the Menu System Operation and changes the Coin Door Buttons from Normal Function to Test Function.

Test Function

The Escape button allows you to get out of a menu selection or return to the Attract Mode.
The Up (+) button allows you to cycle forward through the menu selections or adjustment choices.
The Down (-) button allows you to cycle backward through the menu selections or adjustment choices.
The Enter button allows you to get into a menu selection or lock in an adjustment choice.
Holding the Enter button for five seconds, during the Attract Mode, resets the High Scores.



GAME OPERATION

⚠ CAUTION

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

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

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

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

Example:

INDIANA JONES		Sound Rev. L-1	
50017	Rev. L-X	SY. 0.X0	X-X-93

Press the Enter button to enter the WPC Menu System (refer to the section entitled "Menu System Operation" for more information). Slide the Service Switch Actuator over the top interlock switch located in the bottom left corner of the coin door opening. Perform the entire Test Menu routine to verify that the game is operating satisfactorily.

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

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

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

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

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

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

* - Operator-adjustable feature

MENU SYSTEM OPERATION

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

MAIN MENU

B. Bookkeeping Menu

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

P. Printouts Menu

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

T. Test Menu

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

U. Utilities Menu

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

A. Adjustments Menu

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

Press Escape
To move out of a menu selection.

Press Enter
To get into a menu selection.

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

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

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

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

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

B. BOOKKEEPING MENU

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

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	Time Per Credit	00
B.1	06	Total Plays	00
B.1	07	Replay Awards	00
B.1	08	Percent Replays	00
B.1	09	Extra Balls	00
B.1	10	Percent Extra Ball	00

B.2 Earning Audits

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

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

B.3 Standard Audits

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

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

† This audit is not resettable.

B.4 Feature Audits

B.4	01	Number of modes started.
B.4	02	Number of times all modes lit.
B.4	03	Number of times Get the Idol mode was started.
B.4	04	Number of Get the Idol mode shots made.
B.4	05	Number of times Get the Idol mode was finished.
B.4	06	Number of times Streets of Cairo mode was started.
B.4	07	Number of Streets of Cairo mode shots made.
B.4	08	Number of times Marion found in Streets of Cairo mode.
B.4	09	Number of gun was used to shoot guy in Streets of Cairo.
B.4	10	Number of times eject was used to shoot guy in Streets of Cairo.
B.4	11	Number of times Well of Souls mode was started.
B.4	12	Number of Wells of Souls mode shots made.
B.4	13	Number of times Raven bar mode was started.
B.4	14	Number of bad guys shot in Raven bar mode.
B.4	15	Number of times Raven bar mode was finished.
B.4	16	Number of times Monkey Brains mode was started.
B.4	17	Number of Monkey Brains mode shots made.
B.4	18	Number of times Steal the Stones mode was started.
B.4	19	Number of times Steal the Stones path of adventure was entered.
B.4	20	Number of Steal the Stones mode shots made.
B.4	21	Number of times Steal the Stones was finished.
B.4	22	Number of times Mine Cart mode was started.
B.4	23	Number of passed tunnels in Mine Cart mode.
B.4	24	Number of times Mine Cart mode was finished.
B.4	25	Number of times Rope Bridge mode was started.
B.4	26	Number of Rope Bridge mode shots made.
B.4	27	Number of times Rope Bridge mode was finished.
B.4	28	Number of times Castle Grunewald mode was started.
B.4	29	Number of Castle Grunewald mode shots made.
B.4	30	Number of times Castle Grunewald mode was finished.
B.4	31	Number of times Tank Chase mode was started.
B.4	32	Number of Tank Chase mode shots made.
B.4	33	Number of times Tank Chase mode was finished.
B.4	34	Number of times 3 Challenges mode was started.
B.4	35	Number of times 3 Challenges path of adventure was entered.
B.4	36	Number of 3 challenges mode shots made.
B.4	37	Number of times 3 Challenges was finished.
B.4	38	Number of times Choose Wisely mode was started.
B.4	39	Number of times Choose Wisely mode was won.
B.4	40	Number of times ball 1 was locks in Idol.
B.4	41	Number of times ball 2 was locks in Idol.
B.4	42	Number of times 3 ball Idol multiball was started.
B.4	43	Number of times Jackpot was lit by left ramp.
B.4	44	Number of times Jackpot was lit by center ramp.
B.4	45	Number of Ark jackpots collected.
B.4	46	Number of Stone jackpots collected.
B.4	47	Number of Grail jackpots collected.
B.4	48	Number of Super jackpots collected.
B.4	49	Number of Double jackpots lit.
B.4	50	Number of Double jackpots collected.
B.4	51	Number of Triple jackpots lit.
B.4	52	Number of Triple jackpots collected.
B.4	53	Number of times 2 ball Totem Multi was lit.
B.4	54	Number of times 2 ball Totem Multi was collected.
B.4	55	Number of times 2 ball Lost Treasures was awarded.

B.4	56	Number of times Path of Adventure was lit.
B.4	57	Number of times Path of Adventure was continued.
B.4	58	Number of times Path of Adventure entered.
B. 4	59	Number of times Path of Adventure continued was entered.
B.4	60	Number of times Path of Adventure completed.
B.4	61	Number of times Path of Adventure pit was lit.
B.4	62	Number of times Path of Adventure pit value was increased.
B.4	63	Number of times Path of Adventure pit was awarded.
B.4	64	Number of times Path of Adventure extra ball was lit.
B.4	65	Number of times Path of Adventure extra ball was awarded.
B.4	66	Number of times Hand of Fate was lit
B.4	67	Number of times Hand of Fate was collected.
B.4	68	Number of times Dogfight Hurry-up was lit.
B.4	69	Number of times Dogfight Hurry-up was awarded.
B.4	70	Number of times a lit right loop was made.
B.4	71	Number of times a lit left loop was made.
B.4	72	Number of times a lit right ramp was made.
B.4	73	Number of times a lit left ramp was made.
B.4	74	Number times Narrow Escape was started.
B.4	75	Number of times Narrow Escape was awarded.
B.4	76	Number of times an Idol lock snuck in with drop targets up.
B.4	77	Number of non-multiball Eternal Life ball saves.
B.4	78	Number of 2 ball multiball Eternal Life ball saves.
B.4	79	Number of 3 ball multiball Eternal Life ball saves.
B.4	80	Number of times 2X bonus multiplier was awarded.
B.4	81	Number of times 4X bonus multiplier was awarded.
B.4	82	Number of times 6X bonus multiplier was awarded.
B.4	83	Number of times 8X bonus multiplier /extra ball lit was awarded.
B.4	84	Number of times maximum bonus multiplier was awarded.
B.4	85	Number of times Loop jackpot was lit.
B.4	86	Number of times Loop jackpot was collected.
B.4	87	Number of games that bought an extra ball from buy-in.
B.4	88	Number of multi player games that bought extra ball from buy-in.
B.4	89	Number of balls saved on left outlane after drop targets hit.
B.4	90	Number of balls saved on right outlane after idol lock release.

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 MillionScores	00%	00
B.5	12	200-299 Million Scores	00%	00
B.5	13	Over 300 Million Scores	00%	00
B.5	14	Game Time 0.0-1.0 Mins	00%	00
B.5	15	Game Time 1.0-1.5 Mins	00%	00
B.5	16	Game Time 1.5-2.0 Mins	00%	00
B.5	17	Game Time 2.0-2.5 Mins	00%	00
B.5	18	Game Time 2.5-3.0 Mins	00%	00
B.5	19	Game Time 3.0-3.5 Mins	00%	00
B.5	20	Game Time 3.5-4.0 Mins	00%	00
B.5	21	Game Time 4-5 Mins	00%	00
B.5	22	Game Time 5-6 Mins	00%	00
B.5	23	Game Time 6-8 Mins	00%	00
B.5	24	Game Time 8-10 Mins	00%	00
B.5	25	Game Time 10-15 Mins	00%	00
B.5	26	Game Time Over 15 Mins	00%	00

B.6 Time-Stamps

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

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

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

P. PRINTOUTS MENU

(optional board required)

P.1 Earnings Data
P.2 Main Audits
P.3 Standard Audits
P.4 Feature Audits
P.5 Score Histograms
P.6 Time Histograms
P.7 Time-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 the message "Waiting for Printer" appears in the displays.
NOTE: Set the print specification from the Adjustment Menu, A.5 Printer Adjustments.

Use the Service Switch Actuator to hold in the top interlock switch located in the bottom left corner of the coin door opening. The actuator must be in place in order to activate the solenoids and flashlamps.

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

T. TEST MENU

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

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

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

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

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

T.2 Switch Levels Test 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 Test The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the switch to be tested.

T.4 Solenoid Test The Solenoid Test has three modes, Repeat, Stop, and Run. Only one solenoid should pulse at a time. The system has detected a problem if; more then one solenoid pulses, a solenoid comes On and stays On or, during the Repeat and Run mode, no solenoid pulses.

Repeat The Repeat mode pulses a single solenoid. After entering this test, Solenoid 1 shows in the display and the corresponding solenoid activates. Press the Up or Down button to cycle through the solenoids, one at a time. The same solenoid pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next mode.

Stop The Stopped mode halts the Solenoid Test. Press Enter during the Repeat mode and the Solenoid Test stops. No solenoids should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to move to the next mode.

Run The Running mode cycles through the solenoids automatically. The display shows the name and number of the solenoid currently being pulsed.

T.5 Flasher Test This tests the flashlamp part of the solenoid circuit exclusively. This, like the Solenoid Test, has three modes: Repeat, Stop, and Run. During this test, only one flashlamp circuit should pulse at a time. The system has detected a problem if more then one circuit pulses, a circuit stays On or, during the Repeat and Run mode, no circuit pulses.

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

Stop The Stopped mode halts the Flasher Test. No flashlamp circuit should be active during this mode. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.

Run The Running mode cycles through the flashlamps automatically. The display shows the name and number of the flashlamp circuit currently being pulsed, and the corresponding bulb(s) flash.

T.6 General Illumination Test This test checks all of the General Illumination circuits. There are two modes of operation: Stop and Run.

Stop Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number shows in the display while the corresponding lamps lights. If any other results occur the system has detected an error.

Run Press the Enter button any time during Stopped mode and the General Illumination. Test cycles through automatically. For each circuit shown in the display the corresponding bulbs should light. If any other results occurs the system has detected a problem.

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

Run The Running mode steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test advances to a particular sound or tune without having to wait for the program to play all the sounds available in the test. A sound or tune should be heard for each name and number that appears in the display. Any other results indicates the system has detected a problem.

Repeat Press the Enter button at any time during the Running mode to cause the program to stop and repeat a particular sound/tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other results indicates the system has detected a problem.

Stop Press the Enter button at any time during the Repeat mode to stop this test altogether. Nothing should be heard. Any other results indicates the system has detected a problem.

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

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

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

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

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

T.12 Flipper Coil Test

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

Repeat The Repeat mode pulses a single flipper. After entering this test, flipper coil 01 shows in the display and the corresponding coil activates. Press the Up or Down button to cycle through the flipper coils, one at a time. The same solenoid pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next mode.

Stop The Stopped mode halts the Flipper Coil Test. Press Enter during the Repeat mode and the test stops. No coils should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to move to the next mode.

Run The Running mode cycles through the flippers automatically. The display shows the name and number of the flipper coil currently being pulsed.

T.13 Ordered Lamps Test

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

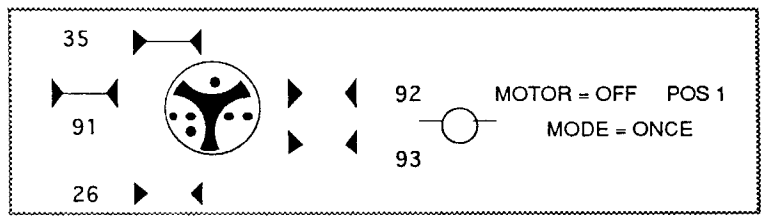
This test checks each lamp circuit individually. Press the Up or Down button to cycle through the lamps. Lamps light in a clock-wise or counter clock-wise direction starting from the bottom of the playfield. Direction depends on which button, Up or Down, is pressed. For each name and number that is shown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

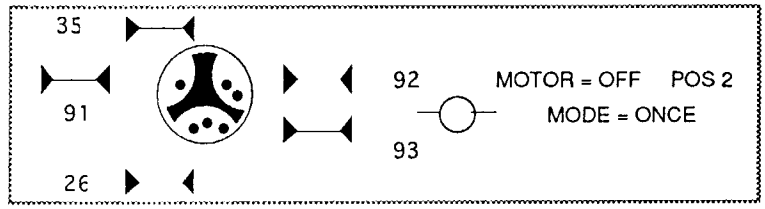
T.14 Idol Lock Test

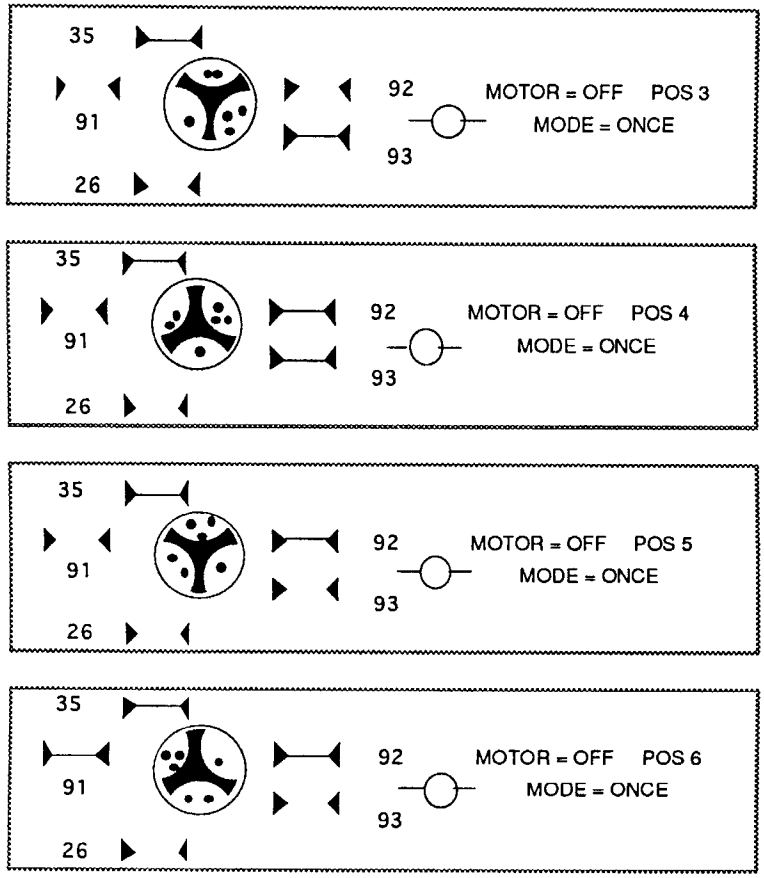
This will test the rotary idol ball lock device. It will test to see if the motor and position switches are working. When first entering this test the idol lock will be automatically checked. This will test the idol lock to see if it is functioning correctly. If it passes this test a message will appear on the screen saying so. If it fails then a message will appear showing it failed. The test will then show an error and may not work correctly until the problem is fixed.

The test switches act as following:

ESCAPE - Returns to the previous menu.
UP - Move to next valid position
DOWN - Move to last valid position
ENTER - Switch between ONCE & CONTINUOUS MODES>



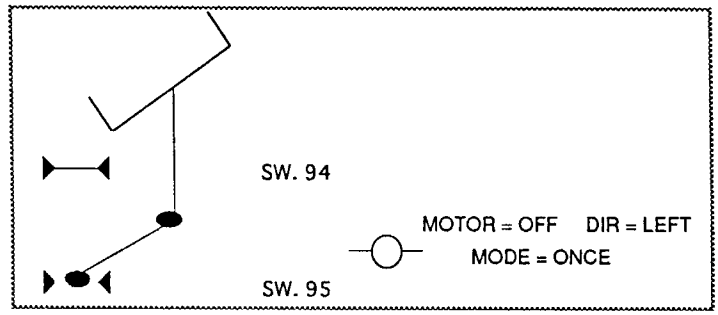


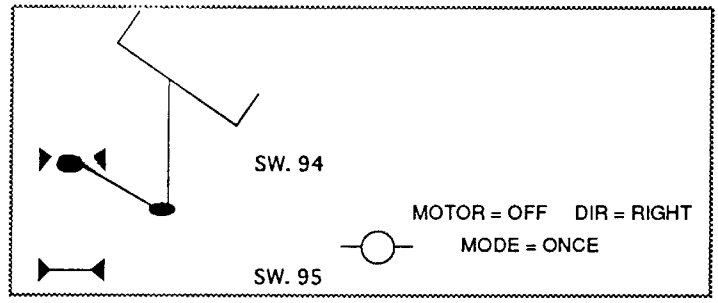

35
91
26
92
93
MOTOR = OFF POS 3
MODE = ONCE
35
91
26
92
93
MOTOR = OFF POS 4
MODE = ONCE
35
91
26
92
93
MOTOR = OFF POS 5
MODE = ONCE
35
91
26
92
93
MOTOR = OFF POS 6
MODE = ONCE

T.15 Mini Playfield Test This will test the mini playfield forward and reverse motor and the right and left limit switches. When first entering this test, the mini playfield is automatically checked. This will test the mini playfield to see if it is functioning correctly. If it passes this test, a message will appear saying so. If it fails then a message will appear showing it failed. The test will then show an error and may not work correctly until the problem is fixed.

The test switches act as follows:

ESCAPE - Returns to the previous menu
UP - Toggle ON or OFF; motor ON to the right.
DOWN - Toggle ON or OFF; motor ON to the left.
ENTER - Switch between ONCE & CONTINUOUS MODES.





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

U. Utilities Menu

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

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

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

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

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

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

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

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

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

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

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

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

U.9 0 1 Install Extra Easy
MUCH LESS difficult than factory setting.

U.9 0 2 Install Easy
Somewhat LESS difficult than factory setting.

U.9 0 3 Install Medium
About the SAME as factory setting.

U.9 0 4 Install Hard
Some what MORE difficult than factory setting.

U.9 0 5 Install Extra Hard
MUCH MORE difficult than factory setting.

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

Adj #	Adj Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03 (factory)	Hard U.9 04	Extra Hard U.9 05
A.2 03	Loop Lit Timer	20 sec	15 sec	10 sec	7 sec	5 sec
A.2 04	Ramp Lit Timer	20 sec	15 sec	8 sec	7 sec	6 sec
A.2 05	Ball Save Timer	10 sec	7 sec	5 sec	4 sec	3 sec
A.2 06	Ball Save 3 Ball Timer	15 sec	12 sec	10 sec	8 sec	7 sec
A.2 07	Ball Save 2 Ball Timer	8 sec	5 sec	3 sec	3 sec	2 sec
A.2 08	Captive Multi Start	1 hit	2 hits	3 hits	4 hits	5 hits
A.2 09	Captive Multiball Start Timer	30 sec	25 sec	20 sec	15 sec	10 sec
A.2 10	Get the Idol Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 11	Streets of Cairo Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 12	Monkey Brains Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 13	Steal the Stones Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 14	Rope Bridge Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 15	Castle Grunewald Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 16	Tank Chase Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 17	3 Challenges Timer	50 sec	40 sec	30 sec	25 sec	20 sec
A.2 18	Raven Bar Level	Level 1	Level 1	Level 1	Level 2	Level 3
A.2 19	Choose Wisely Timer	Level 1	Level 1	Level 1	Level 1	Level 2
A.2 20	Jackpot Multiplier Timer	20 sec	20 sec	15 sec	10 sec	6 sec
A.2 21	Path of Adventure Level	Level 1	Level 1	Level 1	Level 2	Level 3
A.2 22	Adventure Continue Timer	25 sec	20 sec	15 sec	10 sec	8 sec
A.2 23	Path Extra Ball Difficulty	Easy	Easy	Easy	Easy	Hard
A.2 24	Lower Extra Ball Hold	On	On	On	On	Off
A.2 25	Super Jets Start	50 hits	65 hits	75 hits	85 hits	100 hits
A.2 26	Hand of Fate Lit Difficulty	Easy	Easy	Easy	Hard	Hard
A.2 27	Hand of Fate Timer	30 sec	20 sec	10 sec	8 sec	5 sec

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

Preset Adjustments Table for U.S. and Canadian Games

Adj #	Adj Description	Install 5-ball U.9 06	Install 3-ball U.9 07
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 replaces them with Extra Ball awards. Individual adjustments are affected, as follows:

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

U.9 09 Install Ticket This option deletes Credit awards and replaces them with Ticket awards. Individual adjustments are affected as follows:

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

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

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

U.9 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 Serial Capture This sets up the Printer Adjustments for a serial transmission to a lap top computer, (9600 baud, 40 column, no page breaks, serial printer). This option requires the installation of the optional printer kit; part number 63110.

U.9 13 Not Used

U.9 14 Not Used

U.9 15 Not Used

U.9 16 Not Used

U.9 17 Install German 1 •
U.9 18 Install German 2 •
U.9 19 Install German 3 •
U.9 20 Install German 4 •
U.9 21 Install German 5 •
U.9 22 Install German 6 • Adjustments U.9 17 through U.9 22 are used to modify game pricing and type of game play. The Preset Game Adjustments Table for German/European Games lists the adjustments and settings that comprise the individual groups.

Preset Adjustments Table for German Games

Adj #	Adj Description	German 1 U.9 17	German 2 U.9 18	German 3 U.9 19	German 4 U.9 20	German 5 U.9 21	German 6 U.9 22
A.1 14	Replay Award	Credit	Ticket	Audit	Credit	Ticket	Audit
A.1 15	Special Award	Credit	Ex. Ball	Points	Credit	Ex. Ball	Points
A.1 16	Match Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.1 19	Match Feature	7%	7%	Off	7%	7%	Off
A.3 01	Game Pricing	6spiele/5DM	6spiele/5DM	6spiele/5DM	7spiele/5DM	7spiele/5DM	7spiele/5DM
A.4 02	H.S.T.D. Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.4 04	Champion Credits	03	03	00	03	03	00
A.4 05	H.S.T.D. 1 Credits	01	01	00	01	01	00
A.4 06	H.S.T.D. 2 Credits	00	00	00	00	00	00
A.4 07	H.S.T.D. 3 Credits	00	00	00	00	00	00
A.4 08	H.S.T.D. 4 Credits	00	00	00	00	00	00
A.4 10	Backup Champion	500,000,000	500,000,000	00	500,000,000	500,000,000	00
A.4 11	Backup H.S.T.D. 1	400,000,000	400,000,000	00	400,000,000	400,000,000	00
A.4 12	Backup H.S.T.D. 2	350,000,000	350,000,000	00	350,000,000	350,000,000	00
A.4 13	Backup H.S.T.D. 3	300,000,000	300,000,000	00	300,000,000	300,000,000	00
A.4 14	Backup H.S.T.D. 4	250,000,000	250,000,000	00	250,000,000	250,000,000	00

• For German CPU Boards only.

German DIP Switch settings are:

Sw4	Sw5	Sw6	Sw7	Sw8
On	On	On	On	Off

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 28 are used to modify game pricing and type of play.

*** For French CPU Boards only.**

French DIP Switch settings are:

Sw4	Sw5	Sw6	Sw7	Sw8
On	On	On	Off	Off

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

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

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

A. ADJUSTMENTS MENU

A.1 Standard Adjustments

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

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

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

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

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

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

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

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

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

*For Auto% Replay.

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

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

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

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

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

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

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

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

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

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

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

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

*For Auto% Replay; ** For Fixed Replay

A.1 18 **Maximum Ticket/Player**
The amount of Tickets each player can earn.
Range: 00 to 100.

A.1 19 **Match Feature**
The desired percentage for the Match Feature occurring at the end of the game.

OFF - Match Feature is not available.
1 - 50%- 1% is 'hard'; 50% is 'extremely easy'. The Match Feature selects a random two-digit number at the end of the game and compares each players score for an identical two digits in the rightmost two positions. A match of these two digit results in an award of a Credit or a Ticket.

A.1 20 **Custom Message**
The message displayed during the Attract Mode.

YES - A message is displayed
NO - A message is not displayed.

A.1 21 **Language**
The language the game uses: English, French, or German.

A.1 22 **Clock Style**
The style of clock the game uses: A.M./P.M. or 24 Hours.

A.1 23 **Date Style**
The style of date the game uses: Month/Date/Year, or Date/Month/Year.

A.1 24 **Show Date and Time**
The date and time show in the Attract Mode.

YES - Show the date, time in status report or in the Attract Mode.
NO - Do Not show date, time in status report or in the Attract Mode.

A.1 25 **Allow Dim Illumination**
The game program dims the General Illumination for special effects and during the Attract Mode.

YES - Dim the General Illumination during the Attract Mode.
NO - Do Not dim the General Illumination.

A.1 26 **Tournament Play**
Equalize Multi-ball and Jackpots during multi-player games, (do not carry over to next player).

YES - Keep Multi-ball and Jackpots equal.
NO - Do Not Keep Multi-ball and Jackpots equal.

A.1 27 **Euro. Scr. Format**
Use either commas or dots between digits when numbers are displayed.

YES - Dots instead of commas, (example- 1.000.000).
NO - Commas instead of dots, (example- 1, 000, 000).

A.1 28 **Minimum Volume Control**
The volume can be turned Off.

YES - Volume can be turned Off.
NO - Volume can be turned Down but not Off.

A.1 29 **General Illumination Power Saver**
This allows the general illumination and controlled lamps to be dimmed following a time interval after a game is played. Power Saver Level (A.1 30) determines how dimness of lamps Using this feature substantially increases the life of the lamps.
Setting: OFF, 2 to 60 minutes.

A.1 30 **Power Saver Level**
When General Illumination Power Saver (A.1 29) is set to On, this controls the intensity of the G.I. and controlled lamps once the game has been idle for a specified period of time.
Range: 4 to 7. (4=dimmest)

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 sequence (while the scores are being complied). Setting to "YES" may extend the life of the flipper mechanisms.

A.1 33 **Game Restart**
When the Start button is pressed during or after the 2nd ball, the game in progress will end and a new game will begin. This adjustment has three settings to determine how this is handled.

NEVER- Do not allow a new game start until the current game is over.

SLOW - Restart if the Start button is pressed continuously for over 1/2 second. This helps to prevent the unintended restart of game in progress.

INSTANTLY - Restart as soon as the Start button is pressed.

When the Start button is pressed during game over, or during the 1st ball (to add a player), it is always handled instantly.

A.2 Feature Adjustments

A.2 01 Timed Plunger
This is the time allowed for a player to hit the plunger switch (or the "launch ball" switch) to start a ball. When this time is exceeded, the ball is automatically launched.

Settings: OFF = Do not automatically launch the ball.
5-120 seconds - Time allowed before the ball is launched automatically.

A.2 02 Flipper Plunger
If the "launch ball' switch is malfunctioning, set this adjustment to "YES" to use the left flipper to fire the plunger. Normally, the software tries to detect a malfunctioning "launch ball" switch and will automatically use the left flipper to launch a ball. Also, the plumb-bob tilts' first switch hit will also launch a ball.

Setting: NO = Do not use the left flipper to launch a ball.
YES = Use the left flipper to launch a ball.

A.2 03 Loop Lit Timer
The time that a loop will remain lit once started.

Settings: 1-120 seconds.

A.2 04 Ramp Lit Timer
The time that the left and/or right ramp will remain lit once started.

Settings: 1-120 seconds.

A.2 05 Ball Saver Timer
This is the amount of time, after ball start, that the "ETERNAL LIFE" ball saver lamp is lit. It allows players who drains within this time to be served another ball. This adjustment only applies when a player is not in a multiball.

Settings: OFF = Ball save is not enabled.
1-60 seconds = Minimum amount of time the ball is on the playfield.

A.2 06 Ball Saver Timer - 3 Ball Multiball.
This is the amount of time, after multiball start, that the "ETERNAL LIFE" ball saver lamp is lit. It allows players who drain within this time to be served another ball. This adjustment only applies when a player is in an Idol lock 3 ball multiball.

Settings: OFF = Ball save is not enabled.
1-60 seconds = Minimum amount of time the ball is on the playfield.

A.2 07 Ball Save Timer - 2 Ball Multiball
This is the amount of time, after multiball start, that the "ETERNAL LIFE" ball saver lamp is lit. It allows a player who drains within this time to be served another ball. This adjustment only applies when a player is in an Idol lock 2 ball multiball.

Settings: OFF = Ball save is not enabled.
1-60 seconds = Minimum amount of time the ball is on the playfield.

A.2 08 **Captive Multiball Start**
This determines the number of hits needed on a single drop target to light 2 ball multiball.

Settings: 1-25 hits.

A.2 09 **Captive Multiball Start Timer**
This determines the amount of time that captive 2 ball multiball is lit.

Settings: 5-120 seconds.

A.2 10 **Get the Idol Timer**
This determines the amount of time that the *Get the Idol* mode is active, once started.

Settings: 5-120 seconds.

A.2 11 **Streets of Cairo Timer**
This determines the amount of time that the *Streets of Cairo* mode is active, once started.

Settings: 5-120 seconds

A.2 12 **Monkey Brains Timer**
This determines the amount of time that the *Monkey Brains* mode is active, once started.

Settings: 5-120 seconds.

A.2 13 **Steal the Stones Timer**
This determines the amount of time that the *Steal the Stones* mode is active, once started.

Settings: 5-120 seconds.

A.2 14 **Rope Bridge Timer**
This determines the amount of time that the *Rope Bridge* mode is active, once started.

Settings: 5-120 seconds.

A.2 15 **Castle Grunewald Timer**
This determines the amount of time that the *Castle Grunewald* mode is active, once started.

Settings: 5-120 seconds.

A.2 16 **Tank Chase Timer**
This determines the amount of time that the *Tank Chase* mode is active, once started.

Settings: 5-120 seconds.

A.2 17 **The 3 Challenges Timer**
This determines the amount of time that the *3 Challenges* mode is active, once started.

Settings: 5-120 seconds.

A.2 18 **Raven Bar Level Started**
This determines the level of difficulty that the *Raven Bar* video mode starts at. Level 1 is the easiest and level 4 is the hardest.

Settings: Level 1-Level 4.

A.2 19 **Choose Wisely Level Start**
This determines the level of difficulty that the *Choose Wisely* video mode starts at. Level 1 is the easiest and level 2 is the hardest.

Settings: Level 1 and Level 2.

A.2 20 **Jackpot Multiplier Timer**
This determines the amount of time that the balls remain held in Idol lock during 3 ball multiball.

Settings: 5-120 seconds.

A.2 21 **Path of Adventure Start Level**
This determines the starting level of difficulty, (which is the number of lights needed to complete the path), for the *Path of Adventure.*

Settings: 1-4 (1 is easiest: 4 is hardest).

A.2 22 **Adventure Continue Timer**
This determines the amount of time that the player has to continue the Path of Adventure feature once they have collected.

Settings: OFF = No Path of Adventure continue.
1-120 seconds = Time Path of Adventure continue is lit.

A.2 23 **Path of Adventure Extra Ball/Pit Lit Difficulty**
This determines the difficulty of collecting an extra ball to the pit on the Path of Adventure, once it is lit.

Settings: EASY = Path extra ball /pit remains lit for the remainder of the game until it is collected.
HARD = Path extra ball/pit remains lit for the remainder of the ball until it is collected.

A.2 24 **Lower Playfield Extra Ball Lit Hold**
This determines whether or not the lower playfield extra ball remains lit from ball to ball.

Settings: ON = Lower extra ball stays lit until the end of the game or collected.
OFF = Lower extra ball stays lit until the end of the ball or collected.

A.2 25 **Super Jets Start**
This determines the number of jet bumper hits are needed to start the *Super Jet Mode.*

Settings: 10-255 hits.

A.2 26 **Hand of Fate Lit Difficulty**
This determines the difficulty level of lighting the *Hand of Fate* feature.

Settings: EASY = Light Hand of Fate, (return lanes), lit at game start.
HARD = Light Hand of Fate, (return lanes), NOT lit at game start. Bonus multiplier lights Hand of Fate Lit.

A.2 27 **Hand of Fate Timer**
This determines the amount of time the player has to collect the *Hand of Fate* feature, once it is lit.

Settings: STAYS ON = Hand of Fate lights and then does not time down.
1-120 seconds = The time Hand of Fate remains lit.

A.2 28 **Hold Idol Locks at Game Over**
This determines whether or not the player can have balls left in the Idol lock at game over. A player must still "earn" their Idol locks.

Settings: YES = Keep ball locked between games.
NO = Unlock any locked balls at game over.

A.2 29 **Attract Mode Sounds**
This determines whether or not the attract mode has sound on the flipper and gun buttons to attract players.

Settings: ON = The attract mode does have sound on the buttons.
OFF = The attract mode does not have sound on the buttons.

A.2 30 **Attract Mode Music**
This determines whether or not the attract mode plays music to attract players.

Settings: ON = The attract mode does have music.
OFF = The attract mode does not have music.

A.2 31 **Buy Extra Ball - Buy-In Feature**
This determines whether or not each player may buy 1 extra ball for 1 credit at the end of the game.

Settings: 1 CREDIT
OFF

A.2 32 **Buy-in Ball Saver Timer**

After the player has bought an extra ball (see above adjustment, A.2 31 Buy Extra Ball), this is the amount of time that the "ETERNAL LIFE" ball saver lamp is lit. It allows players who drain within this time to be served another ball. This adjustment only applies for a buy in extra ball.

Settings: OFF = No ball save is enabled.
1-60 seconds = Minimum amount of time ball is on playfield.

A.2 33 **Gun Trigger During Buy-in**

This determines how the gun trigger works during the *Extra Ball Buy-in* feature.

Settings: EXTRA BALL = This causes an extra ball to be bought, (if the player has enough credits), when the gun trigger is activated.
CANCEL = This cancels the Buy-in feature when the gun trigger is activated during Buy-in.
NOTHING = This does nothing when the gun trigger is activated during Buy-in.

A.2 34 **Outlane Ball Save from Idol Lock or Center Drop Targets**

The operator selects whether or not the outlanes will allow ball save when: 1) A ball is released from the idol lock the right outlane will allow a ball save for about 2 seconds; 2) The center drop target bank is hit the left outlane will allow a ball save for about 2 seconds.

Settings: YES = Allow special outlane ball save.
NO = Do not allow special Outlane ball save.

A. 3 Pricing Adjustments

A.3 01 **Game Pricing (If set to custom, then 02 to 09 are available)**
The cost of a game is selected from the Standard Pricing Table or by installing Custom pricing.

A.3 02 **Left Coin Units**
A.3 03 **Center Coin Units**
A.3 04 **Right Coin Units**
A.3 05 **4th Slot Units**
The number of coin units purchased by a coin passing through the left, center, right, or fourth coin chute.

A.3 06 **Units/Credits**
Defines the number of coin units required to obtain 1 credit. A coin unit counter in the game program totals the number of coin units purchased through all coin chutes prior to each game. If the total number of these coin units exceeds or matches the Unit per Credit value by a multiple (or more, coin units) of the specified Units per Credit value the Credits display shows the proper number of credits. The coin unit counter retains any remaining coin units, until the start of Ball 2; then the coin unit counter is cleared (its contents are zeroed).

A.3 07 **Units/Bonus**
Additional credits are to be indicated in the credits display, when a certain number of coin units are accumulated.

A.3 08 **Bonus Credits**
The number of credits that are awarded when the Units/Bonus level is achieved.

A.3 09 **Minimum Units**
No credits are to be posted (indicated in the credit display), until the credits unit counter reaches a particular value, by setting this value to 02 (or more).

A.3 10 **Coin Door Type (If set to custom, then 11 to 15 and 20 are available)**
This adjustment is used to pre-set adjustments 11 to 15 based on standard coin doors (U.S.A., German, etc.).

A.3 11 **Collection Text**
The coin system is used to display the Earning Audits.

A.3 12 **Left Slot Value**
A.3 13 **Center Slot Value**
A.3 14 **Right Slot Value**
A.3 15 **4th Slot Value**
The monetary value of the left, center, right, or fourth coin chute.

A.3 16 **Maximum Credits**
The maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of this setting is 5 through 99. Reaching the specified setting prevents the award of any credits.

A.3 17 **Free Play**

A player can operate the game without a coin (free play) or with a coin.

NO - A coin is necessary for game play.
YES - Game play is free; no coin required.

A.3 18 **Hide Coin Audits**

The coin audits may, or may not, be displayed.

YES - The coin audits are not displayed.
NO - The coin audits are displayed.
HIDE NAMES - The coin audit value is shown but not the audit name.

A.3 19 **1 Coin Buy-in**

If the game pricing is set to1 for 50¢/2 for $1.00 the player can be allowed to 'buy-in' a subsequent game for 1 coin. The number of games that may be purchased at this cost is determined by the number of players in the previous game; that is, if the previous game had three players, 3 Credits can be purchased at the rate of 1 coin per credit.

YES - The player has 10 seconds to buy-in at 1 coin per game.
NO - The buy-in feature is disabled.

A.3 20 **Base Coin Size**

This number is used for ticket per coin calculations.

A.3 21 **Coin Meter Units**

It is possible to connect a coin meter to the knocker coil driver which will log all coins through all slots. This adjustment activates the use of the knocker driver for this purpose, and determines the value of each unit on the meter. For example, to show the total amount of money collected as "total quarters", set this adjustment to "0.25". To show the amount of money collected as "total dollars", set this adjustment to "1.00".

Setting this adjustment to anything other than Off establishes the coin unit for a meter attached to the knocker driver, and overrides use of the knocker during awards.

A.3 22 **Dollar Bill Slot**

The system normally requires 150 msec between coin pulses. This is too long a delay for a fast-pulsing dollar bill validator. This adjustment may be used to tell the game that there is a fast-pulsing dollar bill validator connected to one of the coin switches.

NONE = No validator connected.
LEFT = Validator connected to left slot.
CENTER = Validator connected to center slot.
RIGHT = Validator connected to right slot
FOURTH = Validator connected to fourth.

A.3 23 **Minimum Coin Msec.**

This is the minimum width required for coin pulses to be accepted as valid coins. This may be changed to prevent certain kinds of cheating.

Pricing Table

Country	Coin Chutes Left	Center	Right	4th	Games/Coins	Display	Pricing Adjustments A3 02 03 04 05 06 07 08 09
USA	25¢	$1.00*	25¢	-	1/25¢, 4/$1 [2]	USA 4/$1.00	
					1/50¢, 2/75¢, 3/$1 [2]	50¢, 75¢, $1.00	
					1/50¢, 2/$1 [2]	USA 2/$1.00	
					1/50¢, 3/$1 2	USA 3/$1.00	
					1/50, 2/$1.00, 6/$2.00	USA 6/$2.00	
					1/50, 2/$1.00. 5/$2.00	USA 5/$2.00	
					1/50, 2/$1.00, 4/$150, 6/$2.00 [1, 2]	6/$2 00 4/$1.50	
					1/25¢, 3/50¢, 6/$1	CUSTOM	01 04 01 00 01 02 01 00
					1/25¢, 5/$1	CUSTOM	01 00 01 00 01 04 01 00
Canada	25¢	-	$1.00	-	1/50¢, 2/75¢, 3/$1 [2]	CANADA 1	
					1/50¢, 2/$1 [2]	CANADA 2	
Austria	5sch	10sch	10sch	-	1/2x5sch, 3/2x10sch 2	AUSTRIA	
	5sch	-	10sch	-	2/5sch, 5/10sch	CUSTOM	02 00 05 00 01 00 01 00
Australia	20¢	$1	$1	$2	1/$1, 2/$2 [2]	AUSTRALIA	
U.K.	£1.00	50P	20P	10P	1/3x10P, 2/50P, 4/£1 [2]	U. KINGDOM	
Switzerland	1Fr	2Fr	5Fr	-	1/1Fr, 3/2Fr, 7/5Fr [2]	SWISS 1	
	1Fr	2Fr	5Fr	-	1/2Fr, 2/3Fr, 3/4Fr, 5/5Fr	SWISS 2	
Belgium	5Fr	20Fr	50Fr	-	1/4x5Fr, 1/20Fr , 3/50Fr [2]	BELGIUM	
Germany	1DM	2DM	5DM	-	1/2DM, 2/3DM, 3/4DM, 5/5DM [1,2]	GER. 1/2DM	
					1/1DM, 2/2DM, 5/5DM [2]	GER. 1/1DM	
					1/1DM, 2/2DM, 6/5DM [1,2]	GER. 6/5DM	
					1/1DM, 3/2DM, 9/5DM	CUSTOM	09 18 45 00 05 00 01 00
					1/2x1DM, 1/2DM, 3/5DM	CUSTOM	03 06 15 00 05 00 01 00
					2/1DM, 5/2DM, 14/5DM	CUSTOM	13 26 65 00 05 65 01 00
Holland	1G	-	1G	-	1/1G	HOLLAND	
Sweden	1Kr	5Kr	10Kr	-	1/5x1Kr, 1/5kr, 2/10Kr [1,2]	SWEDEN 1	
	5Kr	5kr	5Kr	-	1/5Kr [2]	SWEDEN 2	
France	1Fr	5Fr	10Fr	20Fr	1/3x1Fr, 2/5Fr, 5/10Fr , 10/20Fr [2, 3]	TARIF 1	
	1Fr	5Fr	10Fr	20Fr	1/2x1Fr, 3/5Fr, 7/10Fr ,14/20Fr [2, 3]	TARIF 2	
	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr, 7/2x10Fr , 7/20Fr [1,2, 3]	TARIF 3	
	1Fr	5Fr	10Fr	20Fr	2/5Fr, 4/10Fr,9/2x10Fr , 9/20Fr [2,3]	TARIF 4	
	1Fr	5Fr	10Fr	20Fr	2/5Fr, 5/10Fr, 11/2x10Fr , 11/20Fr [2,3]	TARIF 5	
	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr , 6/20Fr [2, 3]	TARIF 6	
	1Fr	5Fr	20Fr	20Fr			
Italy	500L	500L	500L	-	1/500L [2]	ITALY 1	
	500L	-	500L	-	1/2x500L, 3/4x500L [1,2]	ITALY 2	
Spain	100P	-	500P	-	1/100P, 6/500P [2]	SPAIN	
	25P	-	100P	-	1/25P, 5/100P	CUSTOM	01 00 04 00 01 04 01 00
	25P	-	100P	-	1/25P, 4/100P	CUSTOM	01 00 04 00 01 00 01 00
	25P	-	100P	-	1/2x25P, 2/100P	CUSTOM	01 00 04 00 02 00 01 00
	25P	-	100P	-	1/2x25P, 3/100P	CUSTOM	03 00 12 00 04 00 01 06
Japan	100¥	-	100¥	-	1/100¥ [2]	JAPAN	
Chile	Token	-	Token	-	1/1Token [2]	CHILE	
Denmark	1Kr	5Kr	10Kr	-	1/2x1 Kr, 3/5Kr, 7/10Kr [2]	DENMARK	
Finland	1Mka	-	5Mka	-	1/3x1Mka, 2/5Mka [2]	FINLAND	
New Zealand	$2.00	-	$1.00	-	1/$1, 3/$2	NEW ZEALAND	
Norway	5Kr	-	10Kr	-	1/5Kr, 2/10Kr, 5/20Kr [2]	NORWAY	
Argentina	10¢	10¢	10¢	-	1/1 Token [2]	ARGENTINA	
Hungary	10F	10F	20F	-	1/1x20F, 1/2x10F, 3/2x20F [2]	HUNGARY	

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

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

A.4 01 **Highest Scores**
The game maintains a record of the four highest scores achieved to date.

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

A.4 02 **H.S.T.D. Award**
The award given for achieving the High Score To Date, or the Champion H.S.T.D.: Credit or a Ticket.

A.4 03 **Champion H.S.T.D.**
The "Highest" High Score can be displayed in the Attract Mode. This score is not cleared when "High Score Reset Every" occurs.

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

A.4 04 **Champion Credits**
The number of credits or tickets awarded for a Grand Champion Score.
Range: 00 to 10.

A.4 05 **H.S.T.D. 1 Credits**
A.4 06 **H.S.T.D. 2 Credits**
A.4 07 **H.S.T.D. 3 Credits**
A.4 08 **H.S.T.D. 4 Credits**
The number of credits or tickets awarded whenever a player exceeds the first, second, third, or fourth highest score.
Range: 00 to 10.

A.4 09 **High Score Reset Every**
The number of games to be played before an automatic reset of the displayed 'Highest Score: occurs. The values provided upon reset are those selected by the operator in the Back-up High Scores.
Range: OFF (disabled); 250 to 20,000.

A.4 10 **Backup Champion**
The Back-up Grand Champion Score.
Range: 00 to 999,000,000.

A.4 11 **Backup H.S.T.D. 1**
A.4 12 **Backup H.S.T.D. 2**
A.4 13 **Backup H.S.T.D. 3**
A.4 14 **Backup H.S.T.D. 4**
The first through the fourth Back-up High Score values. The game automatically restores this value when the High Score Reset Every value is reached.
Range: 00 - 999,000,000.

A.5 Printer Adjustments (optional board required)

A.5 01 **Column Width**
The column width to be printed.
Range: 22 to 80.

A.5 02 **Lines Per Page**
The amount of lines per page.
Range: 20 to 80.

A.5 03 **Pause Every Page**
Choose whether the printer pauses at the end of a page.

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

A.5 04 **Printer Type**
Select the type of printer: Parallel, Serial, ADP, Mini-Drucker, or NSM.

A.5 05 **Serial Baud Rate**
Select which baud rate to use for serial or ADP communications (bit rate): 300, 600, 1200, 2400, 4800, or 9600.

A.5 06 **Serial D.T.R. (Data Terminal Ready)**
When a serial printer is used, this line may be connected to a printer output line signaling that the printer is busy.

NORMAL -Normal D.T.R. signal goes low to indicate the printer is not ready.

INVERTED - Inverted D.T.R. (busy) signal goes high to indicate the printer is not ready.

IGNORE -D.T.R. signal is ignored.

ERROR MESSAGES

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

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

Check Switch ##.

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

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

Pinball Missing.

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

xxxxx Sw. Is Stuck On.

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

Ground Short Row-N, Wht-xxx.

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

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

U6 Checksum Error.

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

Time and Date Not Set.

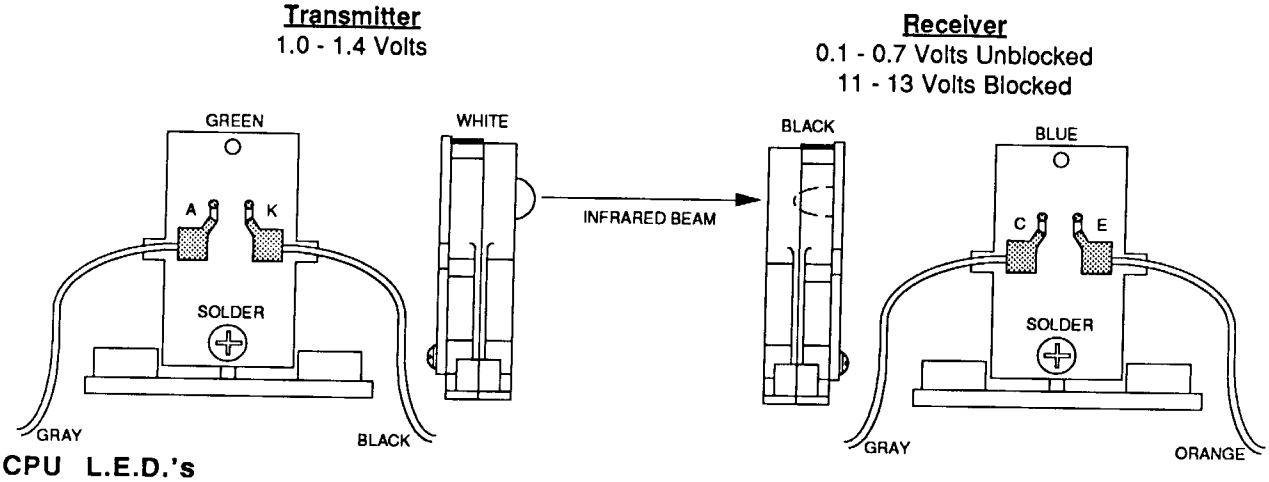
The real time clock is not running. Go to U.4 of the Utilities Menu and set the time and date.

Factory Settings Restored.

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

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 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).



CPU L.E.D.'s

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

CPU Board L.E.D. Error Codes

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

Sound Board Beep Error Codes Upon Game Turn-On:

1 Beep	=	Sound Board O.K.
2 Beeps	=	U2 Failure
3 Beeps	=	U3 Failure
4 Beeps	=	U4 Failure
5 Beeps	=	U5 Failure
6 Beeps	=	U6 Failure
7 Beeps	=	U7 Failure
8 Beeps	=	U8 Failure
9 Beeps	=	U9 Failure

ERR. MINI PFD. BAD
CHK. SWITCHES/MTR.

This is saying the mini playfield is not working correctly. Check the mini playfield motor, (sol. #22, mini motor left and sol. #23, mini motor right), the Bridge Driver board, Power Driver board, and the two mini playfield limit switches (sw #94, mini playfield right and sw. #95, mini playfield left).

ERROR IDOL BAD
CHK. SWITCHES/MTR.

This is saying that the idol rotary lock mechanism is not functioning correctly. Check the idol motor (sol. #42), the Motor EMI board, 8-driver board, power Driver board, the Idol Release coil (sol. #6), the Ball Popper coil (sol. #1), the Top Idol Enter switch (sw. #33), and the 3 idol position switches(sw. #91, Wheel Position 1; sw. #92, Wheel Position 2 and sw. #93, Wheel Position 3).

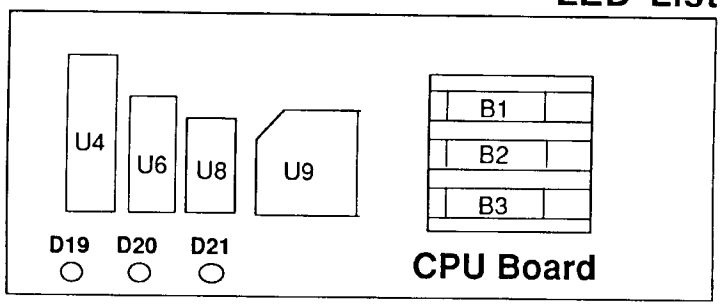
ERR. DROP BNK BAD
CHK. SWITCH/COIL

This is saying the center 3-bank Drop Targets are not functioning properly. Check the Center Drop Bank coil (sol. #5) and the three drop target switches.

ER. SNGLE DRP. BAD
CHK. SWITCH/COIL

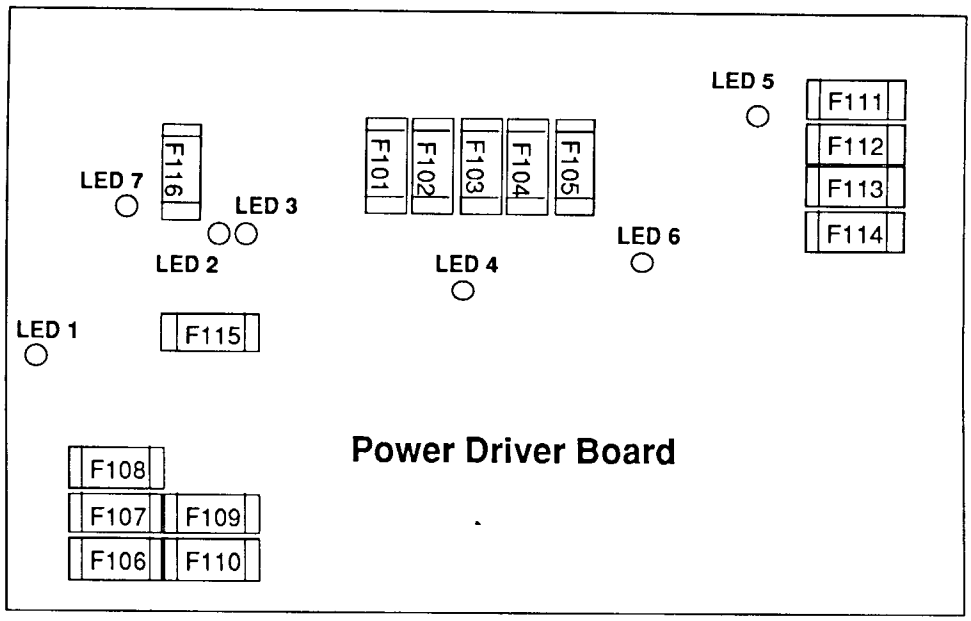
This is saying the Single Drop Target is not functioning properly. Check the Single Drop Up coil (sol. #3), the Single Drop Down coil (sol. #6), and the Single Drop switch (sw. #11)

LED List



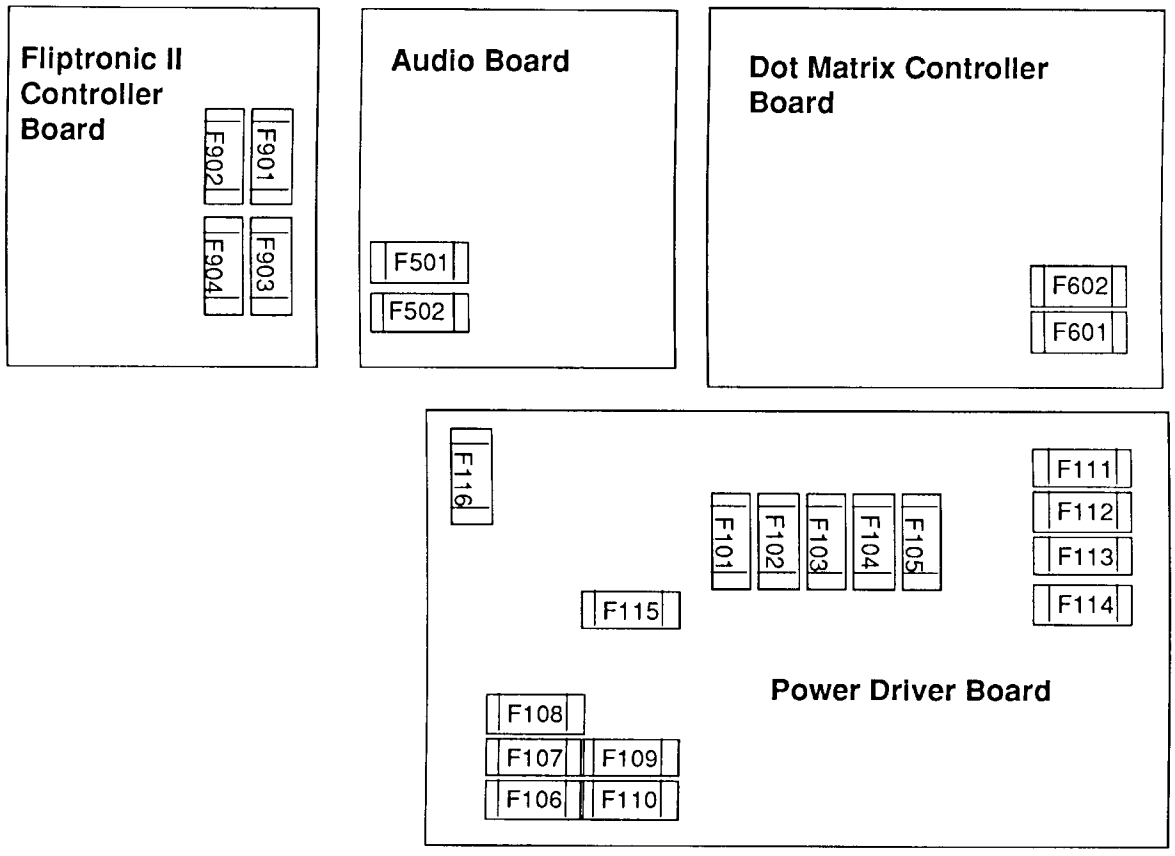
CPU Board
D19 , Blanking
D20, Diagnostic
D21, +5vdc
At game Turn-On = D19 & D21 On, D20 Off
During Normal Operation = D19 Off, D20 Flashing, D21 On

Dot Matrix Controller Board
D10, +5V Circuit, Normallly On



Power Driver Board
LED 1, +12vdc Switch Circuit, Normally On
LED 2, High/Low Line Voltage Sensor, Normally On
LED 3, High/Low Line Voltage Sensor, Normally Off
LED 4, +5vdc, Digital Circuit, Normally On
LED 5, +20vdc, Flashlamp Circuit, Normally On
LED 6, +18vdc, Lamps Circuit, Normally On
LED 7, +12vdc, Power Circuit (motors relays etc.), Normally On

Fuse List



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

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

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

Fliptronic II Controller Board
F901 Upper Right Flipper, 3A, S.B.
F902 Upper Left Flipper, 3A, S.B.
F903 Lower Right Flipper, 3A, S.B.
F904 Lower Left Flipper, 3A, S.B.

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

MAINTENANCE INFORMATION

LUBRICATION

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

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

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

SWITCH CONTACTS

Playfield Switches

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

Flipper Switches

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

CLEANING

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

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

MINI-PLAYFIELD REMOVAL INSTRUCTIONS

1. Turn off power to the game. Open the coin door slide the latch handle toward the left and lift the front molding off the game. Carefully, slide the playfield glass down and off of the game. Lift the playfield and rest it on it's support legs on the front of the cabinet.

2. Disconnect the mini-playfield cables from the underside of the playfield. Be sure to match up the wire colors when reconnecting the cables.

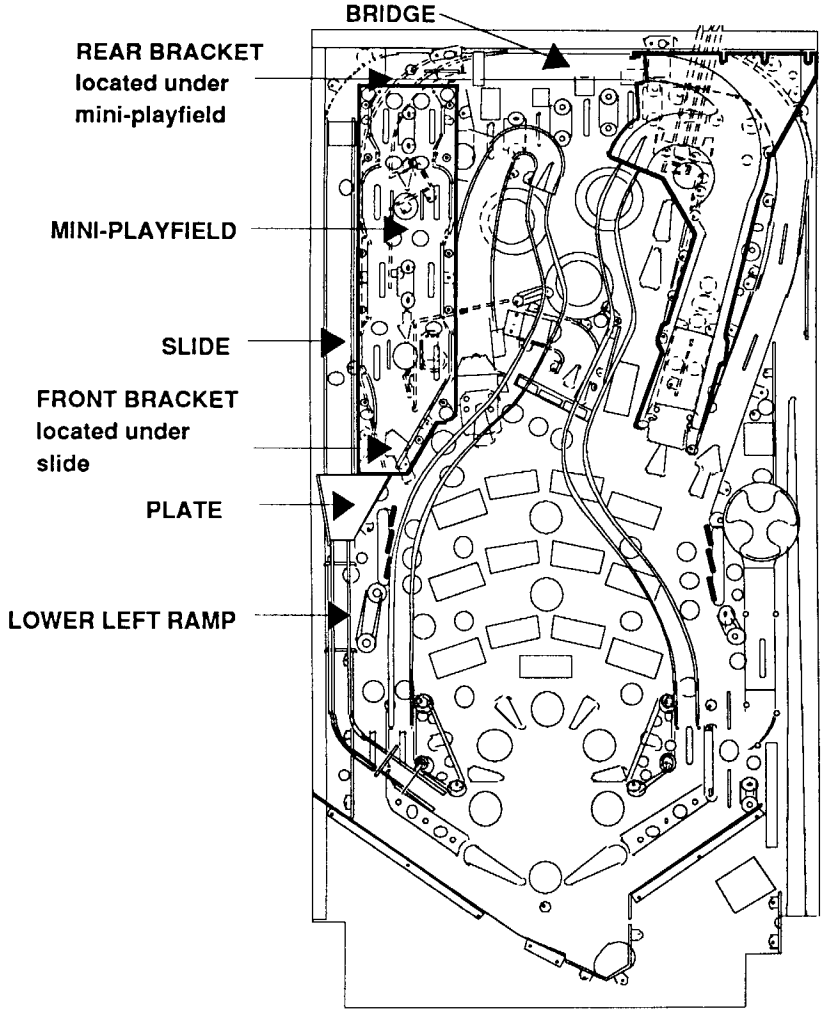
3. Several devices must be removed before the mini-playfield is accessible. Start by removing the bridge above the mini-playfield. There are three screws (#8), two on the top and one on the bottom.

4. Now remove the lower left ramp. There is one nut (#8 ESN) holding the ramp to a plastic piece. Unscrew the nut and slide the ramp out of the plate.

5. Remove the plate and the slide. There are two screws (#8) holding the plate and two screws (#6) holding the slide. Remove the screws and lift these devices off of the game.

6. Loosen the set screw from the motor shaft at the rear of the mini-playfield.

7. Next, remove the two screws (#8) holding the mini-playfield front bracket. DO NOT LET THE MINI-PLAYFIELD DROP. IF THIS HAPPENS, THE REAR BRACKET CAN BE DAMAGED. Slide the mini-playfield straight forward, off of the game.



IDOL ASSEMBLY REMOVAL INSTRUCTIONS

1. Open the coin door, slide the latch handle toward the left and lift the front molding off the game. Carefully slide the playfield glass down and off of the game. Install the Service Switch Actuator.

2. Enter the Idol Lock Test. Move the Idol Assembly until the set screw, located on the shaft under the plastic idol, is facing the plastic orange door. Turn off power to the game.

3. Hold the plastic orange door down and loosen the set screw.

4. Lift the idol assembly off of the game.

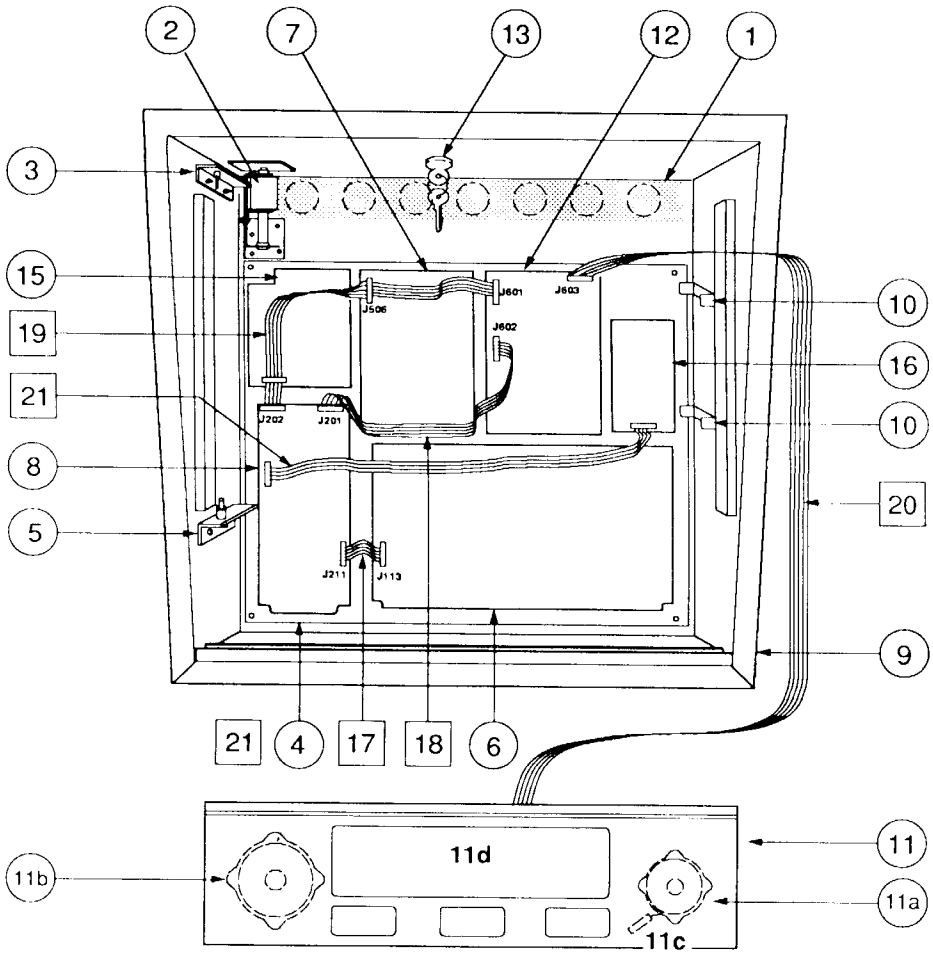
5. Raise the playfield. Unscrew the three plain hex head sems screws. Unplug the connector to the left of the motor.

6. Pull the idol motor off of the playfield.

SECTION 2

Parts Information

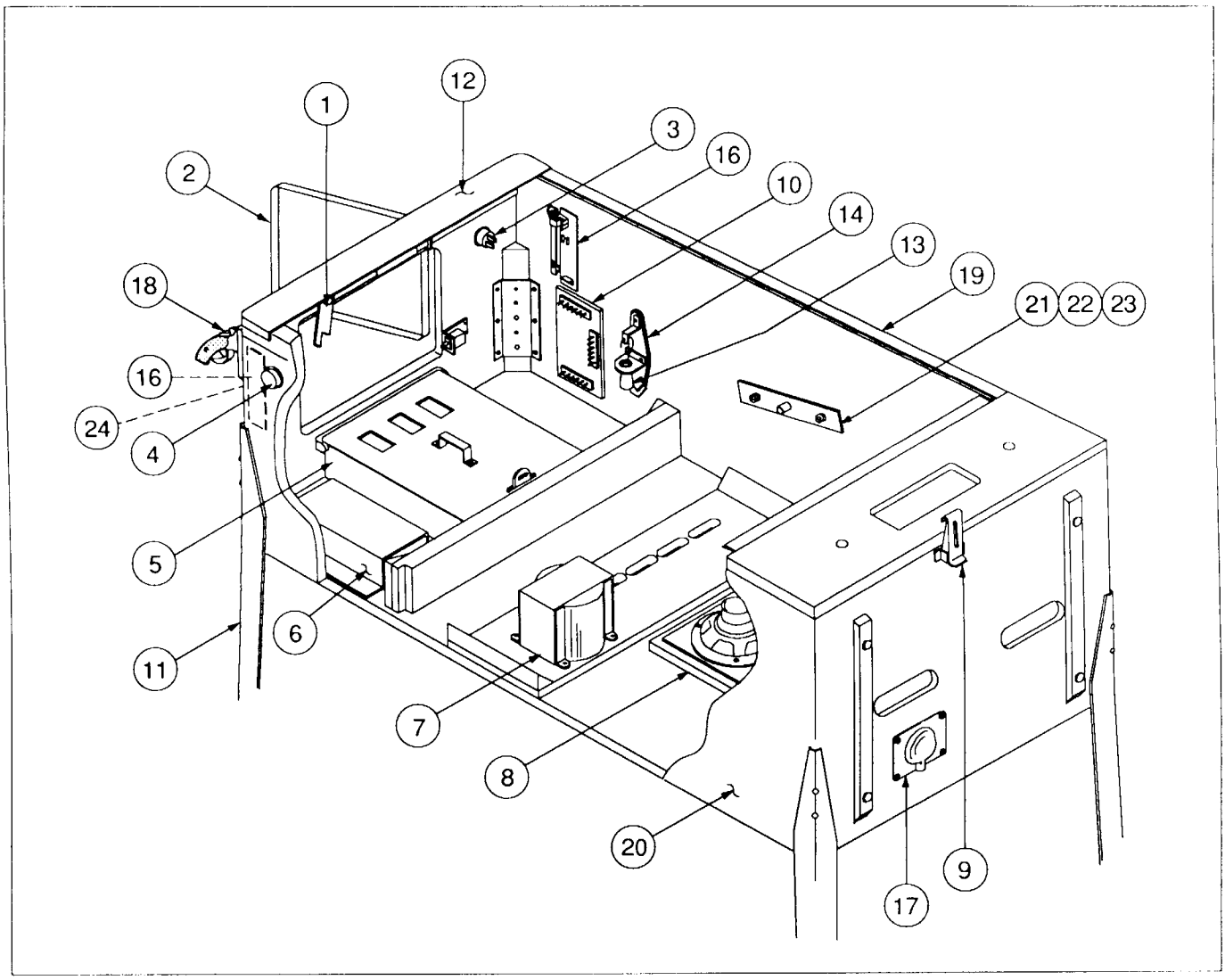
Backbox Assembly



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-14092-5	Mounting Plate Assembly
5.	A-12498	Lower Insert Bd Hinge Assy.
6.	A-12697-3	Power Driver Assembly
7.	A-16917-50017	WPC Sound Board
8.	A-12742-50017	WPC CPU Board
9.	A-16123-50017	Backbox Assembly
10.	01-9047	Insert Stop Bracket
11.	A-16576	Speaker / Display Assy.
a)	5555-12924-00	Speaker, 4Ω, 15w
b)	5555-12856-00	Speaker, 5-1/4", 4Ω, 25w
c)	5045-12914-00	Cap., 10μfd., 50v, (±20%)
d)	5901-12784-00	Dot Matrix Display/Driver Bd.
12.	A-14039	Dot Matrix Contoller Board
13.	A-13379	Lock & Plate Assembly
a)	20-9637	Lock & Cam Kit
14.	50017-IN	Insert Board
15.	A-15472-1	Fliptronic II Board

Item	Part Number	Description
16.	A-16100	8-Driver PCB Assembly
■ Ribbon Cables:		
17.	5795-12653-03	Ribbon Cable, 3"
18.	5795-13018-01	Ribbon Cable, 9.5"
19.	5795-10938-14	Ribbon Cable, 14"
20.	5795-12838-30	Ribbon Cable, 30"
21.	5795-10938-32	Ribbon Cable, 32"
■ Miscellaneous Parts:		
	A-8552-50017	Tempered Backglass Assy.
	08-7456	Backbox Glass: 27" x 18-7/8"
	31-1357-50017	Screened Translight
	03-8228-2	Glass Channel Top (1)
	03-8228-3	Glass Channel Edge (2)
	03-8229-1	Glass Lift Channel (1)

Cabinet Assembly



Item	Part Number	Description
1.	A-9174-4	Lever Guide Assembly
2.	09-23002-USA	Coin Door - 2 Slot
3.	20-9663-11	Start Button, Clear
4.	A-16883-4	Flipper Button - Red (2 Used)
5.	A-16828-1	Cashbox Assembly
6.	*	Line Filter Assembly
7.	5610-13491-00	WPC Transformer, 115/230v
8.	5555-12929-00	Speaker, 4Ω, 6", 25w
9.	20-9347	Toggle Latch
10.	A-14689	WPC Coin Door Interface Bd.
11.	C-10843-BR	Metal Leg Assembly
12.	A-16055	Front Molding Assembly
13.	20-6502-A	Plum Bob
14.	A-15361	Tilt Switch Assembly
15.	*	Cordset
16.	A-16384-1	Opto Flipper Assembly (2 Used)
17.	01-10714	Line Cord Cover

Item	Part Number	Description
18.	A-16113	Gun Handle Assembly
19.	A-12359-3	Side Molding Assembly
20.	11-1102	Wood Cabinet
21.	01-11408	Spacer (2 Used)
22.	02-4329-01	Pivot Nut, 7/8" (4 Used)
23.	02-4352	Pivot Bushing (2 Used)
24.	A-17205	Switch & Cable Assembly
a)	20-9663-12	Extra Ball Push Button

■ Miscellaneous Parts:

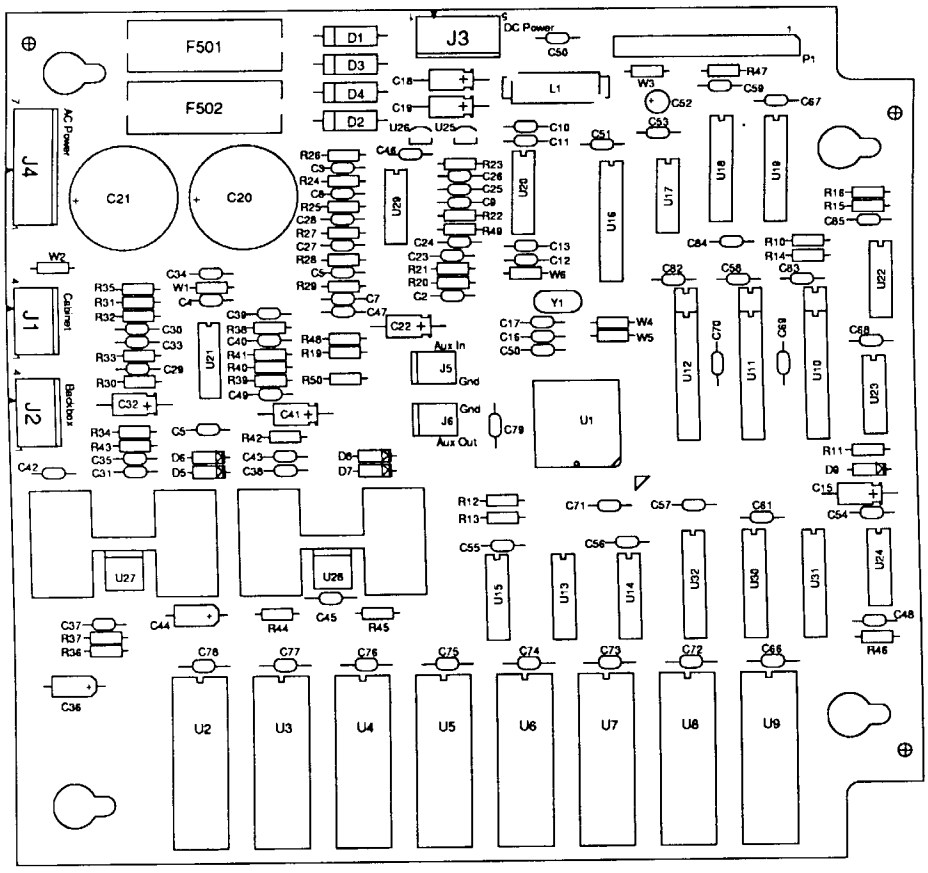
08-7028-1	Tempered Playfield Glass, Wide Body: 23.75" x 43"
20-6500	Steel Ball, 1-1/16" (6)
01-10797	Playfield Support Bar, 18" Long
01-5148	Clip Bracket
08-7377	Leg Adjuster, 3"

* See Application Chart (p.2-4).

Line Filter/Cordset Application Chart

COUNTRY	LINE FILTER ASSY.			CORDSET								
	A-16970-120V	A-16970-230V		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	√										√	√

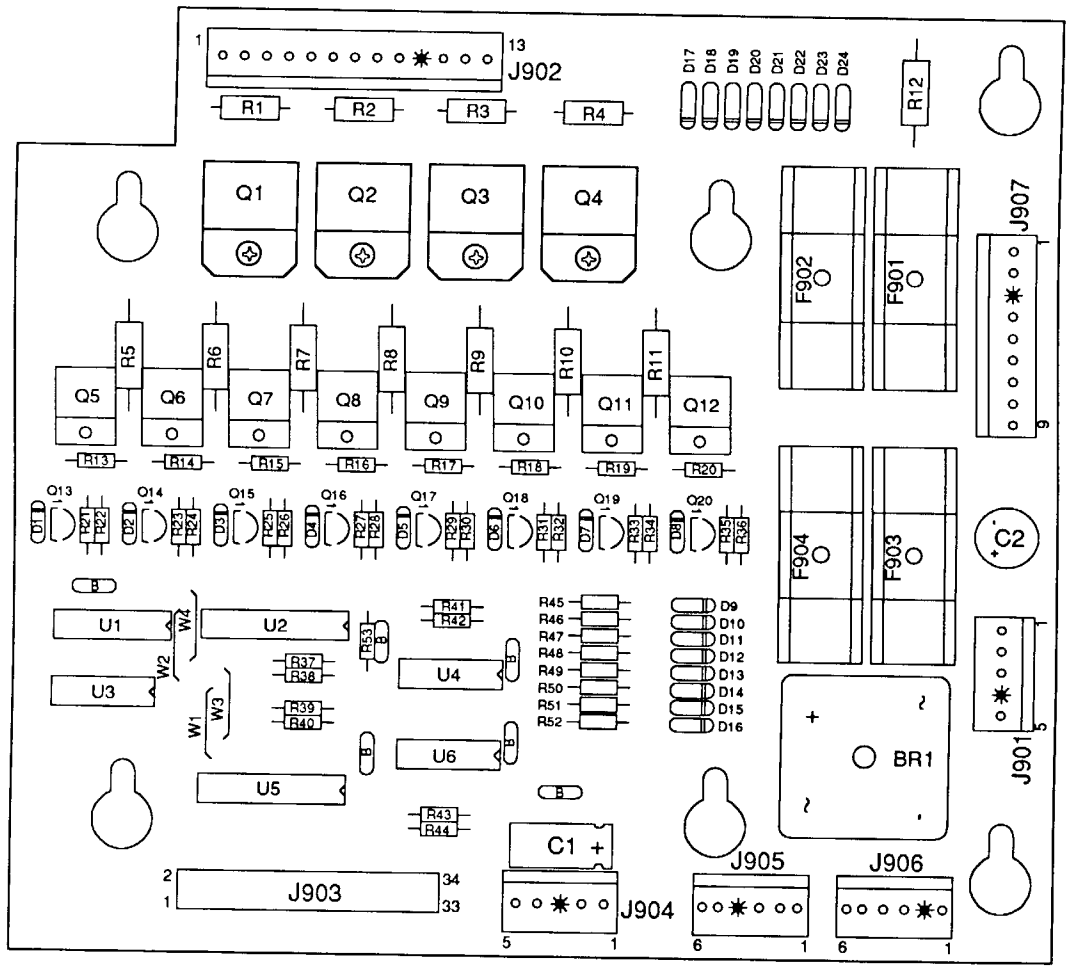
A-16917-50017 Sound Board Assembly



Part No.	Designator	Description
4004-01005-06	U27, U28	Mach. Screw, 4-40 x 3/8"
4404-01119-00	U27, U28	Nut, 4-40
5010-08772-00	R39, R41	Resistor, 15KΩ, 1/4W, 5%
5010-08774-00	R30, R34, R37, R42, R45	Resistor, 22KΩ, 1/4W, 5%
5010-08991-00	R10, R12 -R16	Resistor, 4.7KΩ, 1/4W, 5%
5010-09034-00	R47	Resistor, 10KΩ, 1/4W, 5%
5010-09035-00	R11, R19, R33, R40	Resistor, 47KΩ, 1/4W, 5%
5010-09036-00	R46	Resistor, 100Ω, 1/4W, 5%
5010-09219-00	R31, R32, R38	Resistor, 8.2KΩ, 1/4W, 5%
5010-09358-00	R50	Resistor, 1KΩ, 1/4W, 5%
5010-09534-00	W4, W6	Resistor, 0Ω (Jumper)
5010-13420-00	R36, R44	Resistor, 680Ω, 1/4w, 5%
5010-13607-00	R20-R29, R48, R49	Resistor, 6.2KΩ, 1/4w, 5%
5010-13517-00	R35, R43	Resistor, 15Ω, 1/4w, 5%
5040-09365-00	C15, C18, C19, C32, C41	Capacitor, 1 µF, 63V, Alum Axial
5040-09421-00	C52	Capacitor, 100µF, 25V, Alum Radial
5040-13417-00	C20, C21	Capacitor, 10,000µF, 35V, Alum Rad.
5041-09009-00	C36, C44	Capacitor, 22µF, 10V, Tant Axial
5041-13187-00	C22	Capacitor, 4.7µF Tant Axial
5043-08996-00	C4, C5, C10-C13, C31, C35, C38, C43,C46, C47, C50 -C79	Capacitor, 0.10µF, Cer Axial
5043-10267-00	C37, C45	Capacitor, 150pF, Cer Axial
5048-11028-00	C16, C17	Capacitor, 22pF, Cer Axial
5048-11029-00	C48	Capacitor, 100pF, Cer Axial
5048-11030-00	C49	Capacitor, 470pF, Cer Axial
5048-11033-00	C33	Capacitor, 0.022µF, 5%, Cer Axial
5048-12036-00	C34, C42	Capacitor, 0.22µF, Cer Axial
5048-13418-00	C30, C39, C40	Capacitor, .047µF, 5%, Cer Axial
5048-13608-00	C8	Capacitor, 6800 pF, 50V, Cer Axial
5048-13609-00	C7, C24, C26	Capacitor, 3900 pF, 50V, Cer Axial
5048-13610-00	C2, C3, C9, C27, C29	Capacitor, 1000 pF, 50V, Cer Axial
5048-13611-00	C6, C23, C25, C28	Capacitor, 680 pF, 50V, Cer Axial
5070-09045-00	D1 - D4	MR-501 Rectifier Diode

Part No.	Designator	Description
5070-09054-00	D5 - D9	1N4004 Signal Diode
5250-13302-00	U25	78L05 Pos 5 Volt Reg TO-92
5250-13303-00	U26	79L05 Neg 5 Volt Reg TO-92
5283-10551-00	U17	IC74F00 Fast Quad NAND Gate
5311-10946-00	U22	IC74HC74 Dual D Flip Flop
5311-10947-00	U23	IC74HC125 quad Tri-State Buffer
5311-10948-00	U15	IC74HC138 1 of 8 Decoder
5311-10954-00	U18, U19	IC74HCT374 Octal D Flip Flop
5311-12043-00	U13, U14	IC74HC174 Hex D Flip Flop
5311-12538-00	U24	IC74HC14 Hex Schmitt Inverter
5311-12287-00	U30 - U32	IC74HC541 Octal Bus Driver
5340-13304-00	U10 - U12	ICSRAM 2Kx8 35ns .300DIP
5370-12730-00	U21, U29	ICTL084 Quad op Amp
5370-13419-00	U27, U28	Audio Power Amp TDA2030AV
5371-13299-00	U20	ICDAC AD-1851 16 bit
5520-13301-00	Y1	Crystal 10MHz Parallel Resonant
5551-09822-00	L1	Inductor, 4.7µH, 3Amp
5700-12047-00	U16	IC socket 24 pin 0.300 DIP
5700-12088-00	U2 - U9	IC socket 32 pin 0.600 DIP
5705-12638-00	U27, U28	Heatsink 5298-B
5733-12060-01		Fuse Holder MT3AG(F501, F502)
5791-10862-04	J1, J2	Connector, 4-pin Header
5791-10862-05	J3	Connector, 5-pin Header
5791-10862-07	J4	Connector, 7-pin Header
5791-12516-00	P1	Connector, 34 Hen 2 x 17 Str .100
A-17002	U16	PAL Sub-Assembly
A-5343-50017-2	U2	EPROM Sub-Assembly
A-5343-50017-3	U3	EPROM Sub-Assembly
A-5343-50017-4	U4	EPROM Sub-Assembly
A-5343-50017-5	U5	EPROM Sub-Assembly
A-5343-50017-6	U6	EPROM Sub-Assembly
A-5343-50017-7	U7	EPROM Sub-Assembly
A-5343-50017-8	U8	EPROM Sub-Assembly
5731-10356-00	F501, F502	Fuse, 3Amp, 250V, Slow Blow

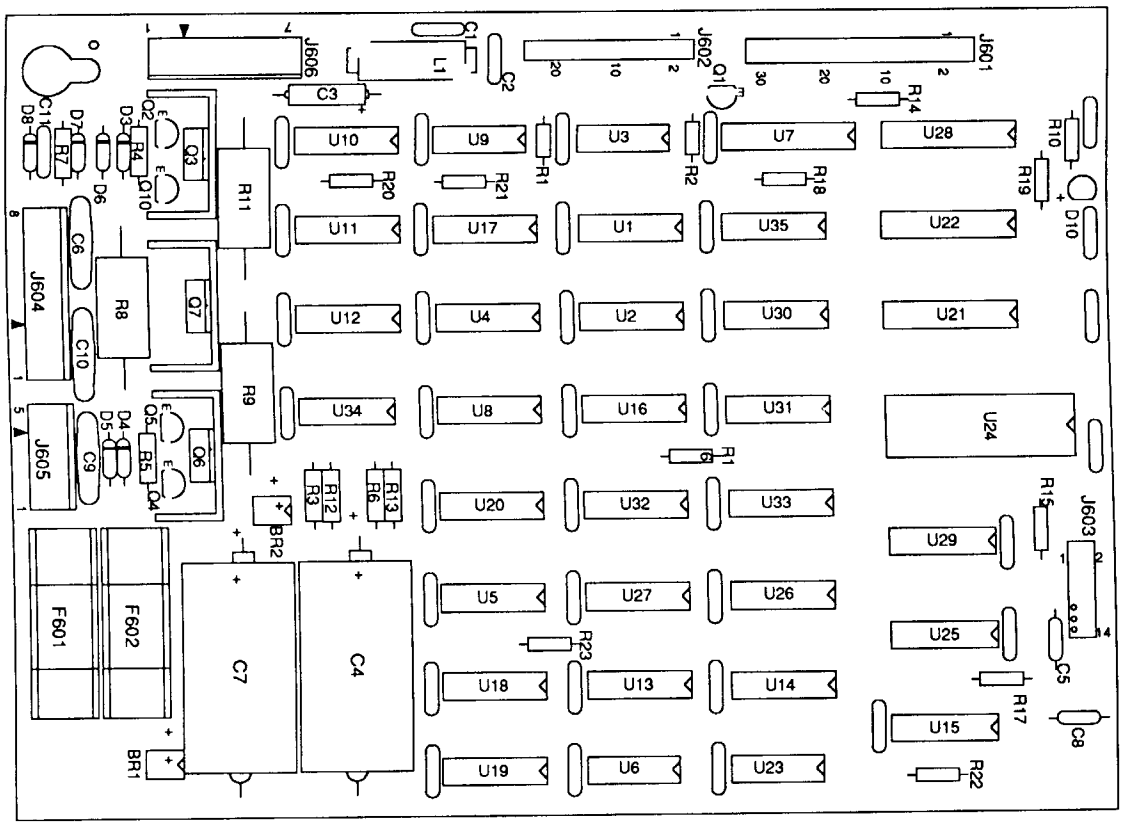
A-15472-1 Fliptronic II Board



Part Number	Designator	Description
01-10572	Q1-Q4	Heatsink
20-9684	Q5-Q12	Fastener Snap
4006-01003-08	Q1-Q4	Mach. Screw, 6-32
4406-01128-00	Q1-Q4	Nut 6-32 KEPS
5010-09034-00	R37 - R44, R53	Resistor, 10KΩ, 1/4w, 5%
5010-09358-00	R22, R24, R26, R28, R30, R32, R34, R36, R45 - R52	Resistor, 1KΩ, 1/4w, 5%
5010-09361-00	R1 - R4	Resistor, 220Ω, 1/2w, 5%
5010-09416-00	R21, R23, R25, R27, R29, R31, R33, R35	Resistor, 470Ω, 1/4w, 5%
5010-09534-00	W3, W4	Resistor, 0Ω
5010-10171-00	R13 - R20	Resistor, 56Ω, 1/4w, 5%
5011-12956-00	R5 - R12	Resistor, 2.7KΩ, 1w, 5%
5040-08986-00	C1	Capacitor, 100M, 10v
5043-08980-00	B	Capacitor, .01μF, 50v

Part Number	Designator	Description
5070-09054-00	D1 - D24	Diode1N4004
5162-12635-00	Q5-Q12	Transistor TIP102 NPN
5190-09016-005	Q13 - Q20	Transistor 2N4403 PNP
191-12179-00	Q1-Q4	Transistor TIP36C PNP
5315-12009-00	U2	IC 74HCT374
5315-12031-00	U5	IC 74HCT244
5315-12812-00	U1	IC 74HCT138
5315-12951-00	U3	IC 74HCT00
5370-12272-00	U4, U6	IC LM339 QUAD COMP
5791-10862-09	J907	Connector, 9-pin Header Sq. Pin
5791-10862-05	J901, J904	Connector, 5-pin Header Sq. Pin
5791-10862-13	J902	Connector, 13-pin Header Sq. Pin
5791-12461-06	J905, J906	Connector, Str Sq. Pin Header .100
5791-12516-00	J903	34 HEN 2x17 STR
5100-09690-00	BR1	Bridge Rectifier
5731-10356-00	F901 - F904	Fuse S-B, 3A., 250v
5733-12060-01	-	Fuse Holder (F901-F904)

A-14039 Dot Matrix Controller Assembly



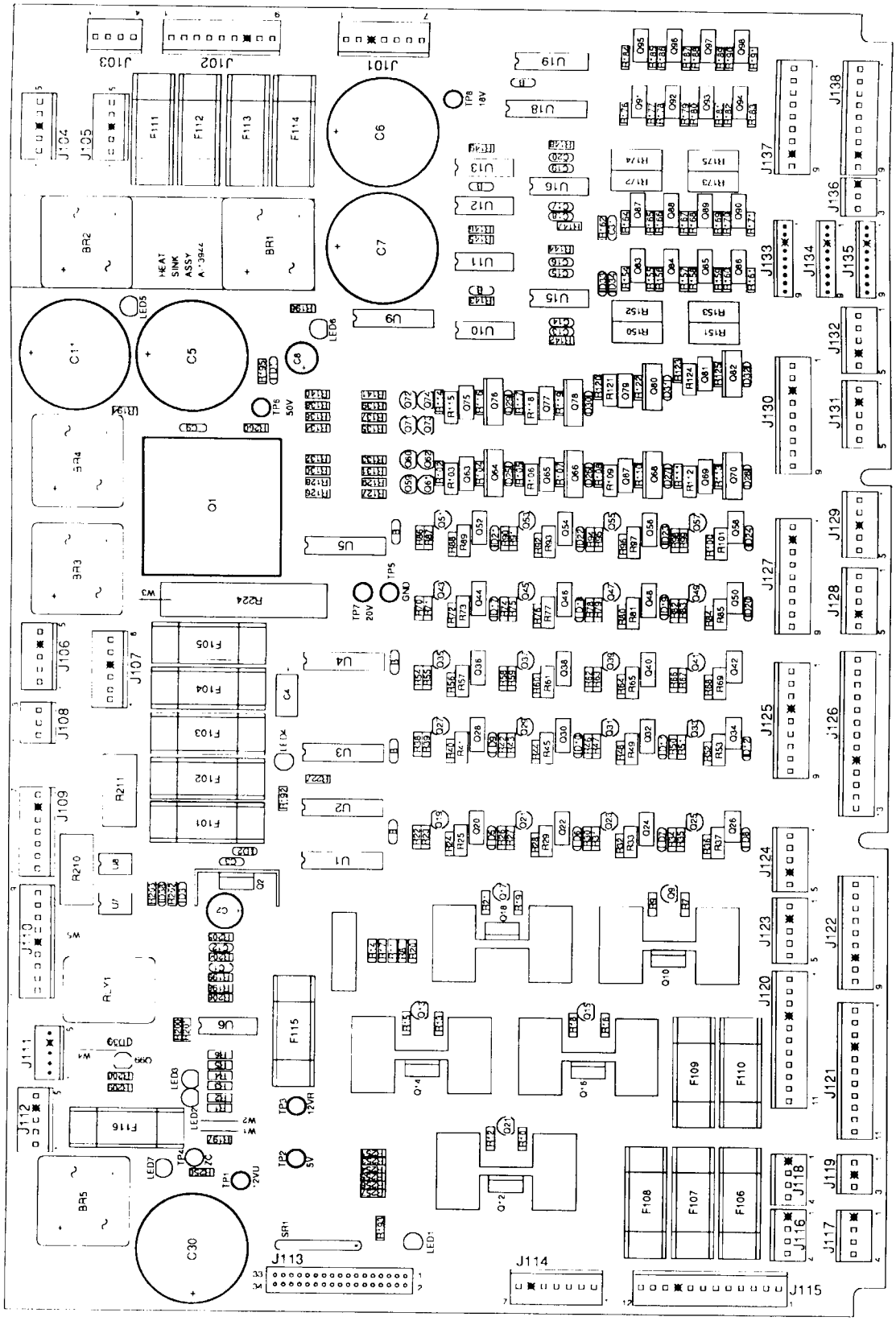
Part Number	Ckt Designator	Description
5010-08991-00	R1	Resistor, 4.7KΩ, 1/4w, 5%
5010-09224-00	R10	Resistor, 270Ω, 1/4w, 5%
5010-12832-00	R3, R6, R12, R13	Resistor, 47KΩ, 1/2w, 5%
5010-12841-00	R4, R5	Resistor, 120Ω, 1/2w, 5%
5012-12830-00	R9	Resistor, 1.8KΩ, 5w, 5%
5012-12842-00	R11	Resistor, 120Ω, 5w, 5%
5012-12843-00	R8	Resistor, 4.7K, 5w, 5%
5010-10171-00	R7	Resistor, 56Ω, 1/4w, 5%
5040-08986-00	C3	Capacitor, 100µfd., 10v, (±20%)
5040-12324-00	C4, C7	Capacitor, 150µfd., 160v, (±50%)
5043-08980-00	BYPASS	Capacitor, .01µfd., 50v, (+80, -20%)
5043-09072-00	C6, C9, C10	Capacitor, .1µfd., 500v, (+80, -20%)
5043-09845-00	C1, C2, C11	Capacitor, 1KP, 50v, (±20%)
5043-09492-00	C5, C8	Capacitor, 100P, 50v, (±10%)
5070-09054-00	D7	Diode, 1N4004, 1.0A.
5075-12824-00	D6, D8	Zener, 1N4742A, 12v
5075-12823-00	D4, D5	Zener, 1N4758A, 56v
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

Part Number	Ckt Designator	Description
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 4.7µH, 3.0A.
5671-13732-00	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, 100Ω, 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

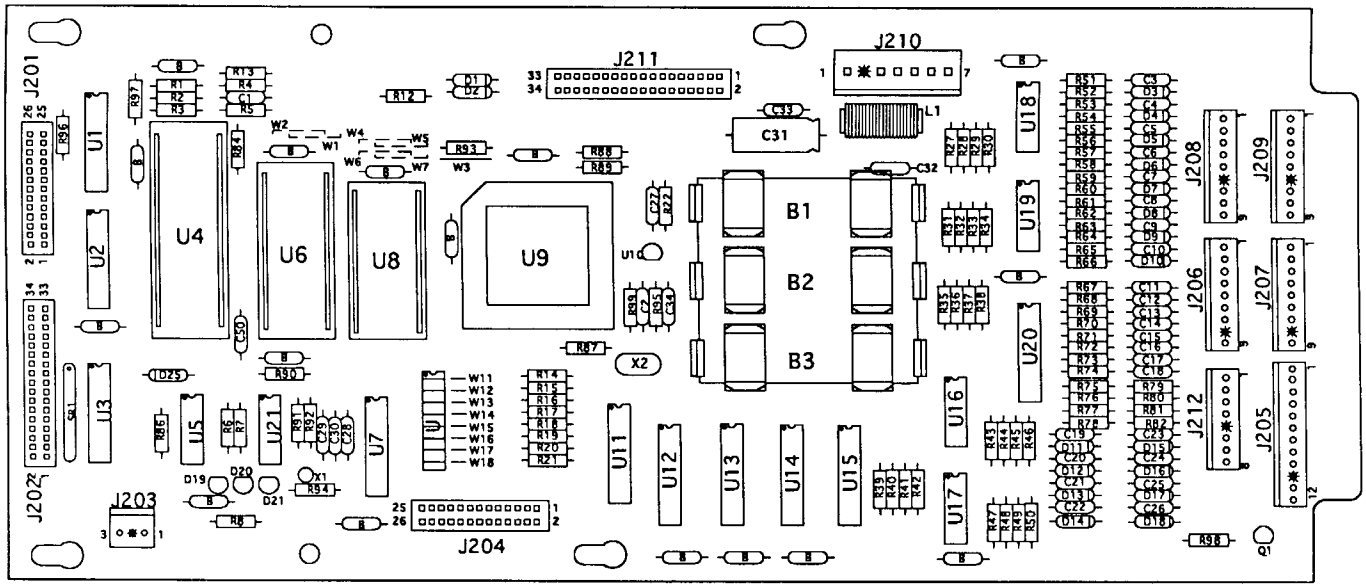
A-12697-3 WPC Power Driver Assembly

Item	Part Number	Ckt Designator	Description
1	Not Used		
2	4006-01005-06	Q1, Q2	Mach. Screw, 6-32 x 3/8
3	4406-01128-00	Q1, Q2	Nut, 6-32 KEPS
4	4004-01005-06	Q10, Q12, Q14, Q16, Q18	Mach. Screw, 4-40 x 3/8
5	4404-01119-00	Q10, Q12, Q14, Q16, Q18	Nut, 4-40 SNUT
6	5010-08981-00	R260	Resistor, 10KΩ, 1/2w, 5%
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, R227	Resistor, 4.7KΩ, 14w, 5%
8	5010-08992-00	R8, R11, R14, R17, R20, R177, R179, R181, R183, R185, R187, R189, R191	Resistor, 560Ω, 1/4w, 5%
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%
10	5010-08997-00	R24, R28, R32, R36, R40, R44, R48, R52, R56, R60, R64, R68, R72, R76, R80, R84, R88, R92, R96, R100, R102, R105, R108, R111, R114, R117, R120, R123, R195	Resistor, 2.7KΩ, 1/4w, 5%
11	5010-08998-00	R155, R157, R159, R161, R165, R167, R169, R171	Resistor, 2.2KΩ, 1/4w, 5%
12	5010-09034-00	R3, R4, R6, R142-R149, R197, R198	Resistor, 10KΩ, 1/4w, 5%
13	5010-09085-00	R194, R196, R251, R253-R257	Resistor, 1.5KΩ, 1/4w, 5%
14	5010-09086-00	R252	Resistor, 6.8KΩ, 1/4w, 5%
15	5010-09224-00	R1, R2, R192, R201, R205, R208	Ressistor, 270Ω, 1/4w, 5%
16	5010-09314-00	R176, R178, R180, R182 R184, R186, R188, R190	Resistor, 1.2KΩ, 1/4w, 5%
17	5010-09324-00	R206	Resistor, 27KΩ, 1/4w, 5%
18	5010-09358-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200 R250	Resistor, 1KΩ, 1/4w, 5%
19	5010-09361-00	R104, R107, R110, R113 R116, R119, R122, R125	Resistor, 220Ω, 1/4w, 5%
20	5010-09416-00	R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 470Ω, 1/4w, 5%
21	5010-09534-00	W1, W2	Resistor, 0Ω
22	5010-11079-00	R7, R10, R13, R16, R19	Resistor, 51Ω, 1/4w, 5%
23	5010-12427-00	R150-R153, R172-R175	Resistor, .22Ω, 1w, 5%
24	5012-12632-00	R224	Resistor, .12Ω, 10w, 5%
25	Not Used		
26	5019-10143-00	SR1	SIP, 9R, 10 pin, 470Ω, 5%
27	5040-08986-00	C4	Capacitor, 100µfd, 10v (±20%)
28	5040-09421-00	C2	Capacitor, 100µfd, 25v (+50, -10%)
29	5040-09537-00	C8	Capacitor, 100µfd, 100v (±20%)
30	5040-12313-00	C5, C6, C7, C11, C30	Capacitor, 15,000µfd, 25v (±20%)
31	5043-08980-00	B-BYPASS	Capacitor, .01µfd, 50v (+80, -20%)
32	5043-08996-00	C13-C20, C31	Capacitor, .1µfd, 50v (±20%)
33	5043-09845-00	C1, C12	Capacitor, 1,000pfd, 50v (±20%)
34	5048-10994-00	C3	Capacitor, .33µfd, 50v (±20%) Ax.
35	5070-08919-00	D33, D34	Diode, 1N4148, 150MA.
36	5070-09054-00	D1-D3, D5-D12, D17-D32, D38	Diode, 1N4004, 1.0A.
37	5100-09690-00	BR1-BR5	Bridge Rectifier, 35A., 200v
38	5131-12725-00	Q10, Q12, Q14, Q16, Q18	Triac, BT138E
39	5162-12422-00	U19	IC, ULN 2803
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
41	5194-09055-00	Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74	Transistor, 2N5401 PNP
42	5191-12179-00	Q64, Q66, Q68, Q70, Q76 Q78, Q80, Q82	Transistor, TIP36C PNP
43	5192-12428-00	Q91-Q98	Transistor, TIP 107
44	5250-12634-00	Q1	Reg LM 323 5v
45	5281-09486-00	U1-U5, U18	IC, 74LS374 8 Dual D Flipflop
46	5281-09487-00	U10-U13	IC, 74LS74 Dual D flipflop
47	5281-10182-00	U9	IC, 74LS240, L/Drvr
48	5370-12272-00	U6, U15, U16	IC, LM339 Quad. Comp
49	5460-12423-00	Q2	IC, LM 7812
50	Not Used		
51	5671-13732-00	LED1 - LED7	Display LED Red
52	Not Used		
53	5701-09652-00	Q1	Thermal Pad TO-3
54	5705-09199-00	Q2	Heatsink, #6030B
55	Not Used		
56	5705-12637-00	Q1	Heatsink 5054
57	5705-12638-00	Q10, Q12, Q14, Q16, Q18	Heatsink 5298B
58	5733-12060-01		Fuse Holder, F101-F116
59	Not Used		
60	5791-10862-03	J108, J119, J136	Connector, 3-pin Header STR Sq.
61	5791-10862-04	J103, J116-J118	Connector, 4-pin Header STR Sq.
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, J122, J125, J127, J130, J137, J138	Connector, 9-pin Header STR Sq.
66	5791-10862-11	J120, J121	Connector, 11-pin Header STR Sq.
67	5791-10862-12	J115	Connector, 12-pin Header STR Sq.
68	5791-10862-13	J126	Connector, 13-pin Header STR Sq.
69	5791-12461-05	J111	Connector, 5-pin Header STR Sq.
70	5791-12461-09	J133-J135	Connector, 9-pin Header STR Sq.
71	5791-12516-00	J113	34 HEN 2x17 STR
72	5824-09248-00	TP1-TP8	Test Point #1502-1
73	5041-09163-00	C9	Capacitor, 2.2µfd TANT
74-100	Not Used		
101	Not Used		
102	5730-09071-00	F114	Fuse, 8A, 32v
103	Not Used		
104	5731-09432-00	F112	Fuse, S-B, 7A., 250v
105	5731-09651-00	F106 - F111, F113	Fuse, S-B, 5A., 250v
106	Not Used		
107	5731-10356-00	F101 - F105, F116	Fuse, S-B, 3A., 250v
108	5730-09797-00	F115	Fuse, S-B, 3/4A., 250v
109	5705-12698-00		Heatsink #62365
110	4010-01006-00		Mach. Screw, 10-32 x 5/8

A-12697-3 WPC Power Driver Assembly



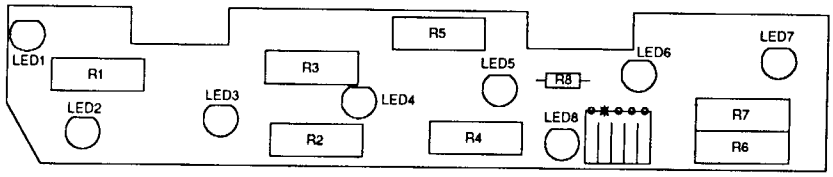
A-12742-50017 WPC CPU Board Assembly



Part Number	Designator	Description
5010-09034-00	R14-R22, R27-R42, R86, R90, R94, R98	Resistor, 10KΩ, 1/4w, 5%
5010-09085-00	R1, R2, R4, R96, R97	Resistor, 1.5KΩ, 1/4w, 5%
5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Resistor, 1.2KΩ, 1/4w, 5%
5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84	Resistor, 1KΩ, 1/4w, 5%
5010-09416-00	R5-R8, R12, R13, R87-R89	Resistor, 470Ω, 1/4w, 5%
5010-09534-00	W1, W3, W4, W7	Resistor, 0Ω
5010-10258-00	R95, R99	Resistor, .01µfdΩ, 1/4w, 5%
5010-10989-00	R92	Resistor, 470KΩ, 1/4w, 5%
5010-12104-00	R91	Resistor, 22µfd, 1/4w, 5%
5019-09362-00	SIP 1	SIP, 9R, 10-pin, 4.7KΩ, 5%
5040-08986-00	C31	Capacitor, 100µfd, 10v (±20%)
5043-08980-00	B	Capacitor, .01µfd, 50v, (+80, -20%)
5043-09030-00	C27	Capacitor, 0.047µfd, 50v (±20%)
5043-09065-00	C3 - C26	Capacitor, 470pfd, 50v (±20%)
5043-09491-00	C2, C29, C30, C34	Capacitor, 22pfd, 1KV, (±10%)
5043-09492-00	C28	Capacitor, 100pfd, 50v, (±10%)
5043-09845-00	C32, C33	Capacitor, 1KP, 50v, (±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

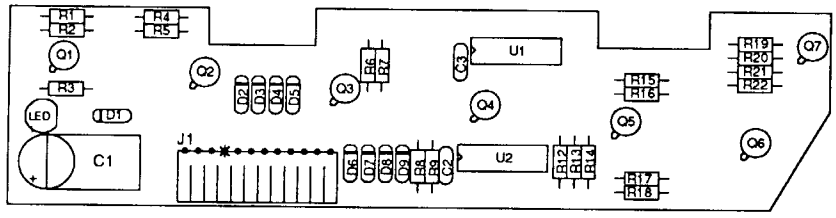
Part Number	Designator	Description
5281-09851-00	U5	IC, 74LS14, SMT/TRG
5281-09867-00	U1, U2, U7	IC, Octal Buffer, 74LS244
5281-10182-00	U11, U12, U13, U15	IC, 74LS240 Driver
5284-12651-00	U21	IC, 4584
5340-13062-00	U8	IC/RAM 32K x 8
5370-12272-00	U16 - U19	IC, LM339, Quad. Comp
5370-12687-00	U10	MC, 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
A-15814	B1 - B3	Battery Holder "AA"
5048-11033-00	C50	Capacitor, 0.022µf, 10v
A-5343-50017-1	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")
5645-09025-00	W11 - W18	Switch Dip 8 Pos

A-16927 LED 7 Ball Trough Assembly



Part Number	Designator	Description
5791-12548-05	J1	Connector, 5-pin Header
5671-12731-00	LED1 - LED7	Diode-Infra Red
5010-12928-00	R1 -R7	Resistor, 270Ω, 2W, 5%
5671-09019-00	LED8	Display LED Red
5010-10631-00	R8	Resistor, 1.2KΩ, 1/4W, 5%

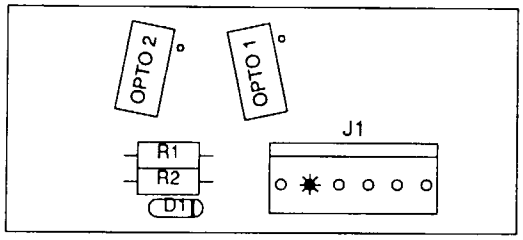
A-16926 OPTO 7 Ball Trough Assembly



Part Number	Designator	Description
5163-12732-00	Q1 - Q7	Photo Transistor
5791-12548-12	J1	Connector, 12-pin Header
5010-09999-00	R1, R2, R4-R7, R10, R11, R15, R16, R19-R22	Resistor, 2KΩ, 1/4W, 5%
5010-10631-00	R3	Resistor, 1.2KΩ, 1/4W, 5%
5010-09162-00	R18, R8, R13	Resistor, 100KΩ, 1/4W, 5%

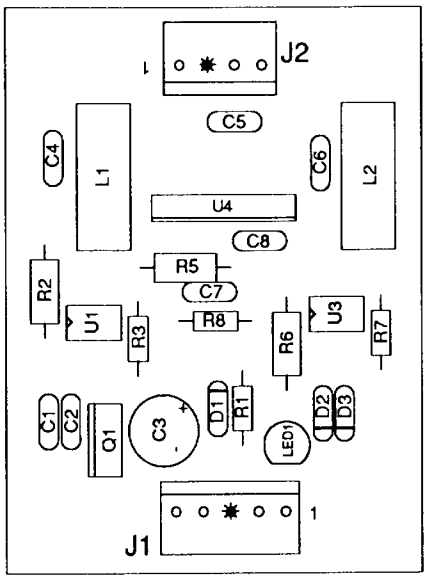
Part Number	Designator	Description
5010-08774-00	R9, R17	Resistor, 22KΩ, 1/4W, 5%
5010-09034-00	R12	Resistor, 10KΩ, 1/4W, 5%
5070-09054-00	D1 - D9	Diode 1N4004, 1.0A
5370-12272-00	U1, U2	ICLM339 Quad
5671-09019-00	LED1	Display LED Red
5043-08980-00	C2, C3	Capacitor, 0.01μF, 50V
5040-12298-00	C1	Capacitor, 100μFd, 40V (±50%)

A-16657 Motor Opto Switch Board



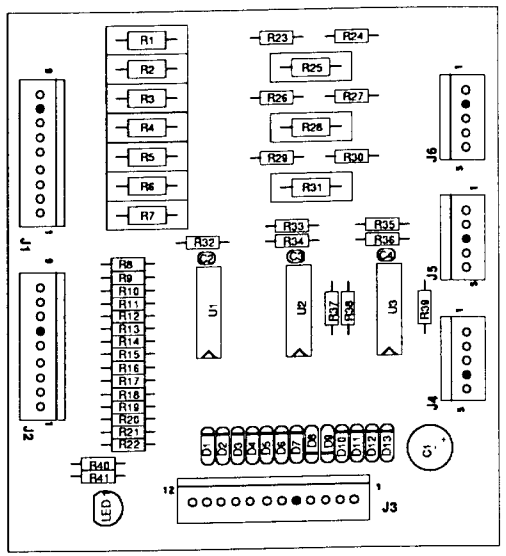
Part Number	Designator	Description
5791-10862-06	J1	Connector, 6-pin Header Str. Sq.
5010-08930-00	R1, R2	Resistor, 470Ω, 1/2w, 5%
5070-09054-00	D1	Diode 1N4004 1.0A.
5490-12451-00	OPTO1, OPTO2	Opto Inter Long 10mA

A-15946
Bridge Driver Assembly



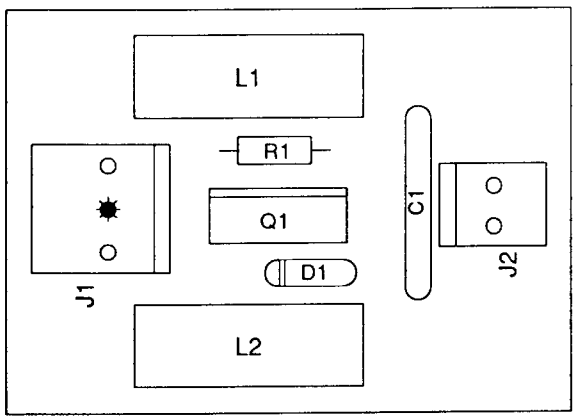
Part Number	Designator	Description
5791-12273-04	J2	Connector, 4-pin Header Str Sq.
5791-12273-05	J1	Connector, 5-pin Header Str Sq.
5671-09019-00	LED1	Display LED Red
5070-09054-00	D1-D3	Diode 1N4004, 1.0A.
5551-09822-00	L1,L2	Ind. 4.7µΩ, 3.0A.
5010-09061-00	R2, R6	Resistor, 680Ω, 1/2w, 5%
5010-10255-00	R5	Resistor, 10Ω, 1/2w, 5%
5010-09085-00	R1	Resistor, 1.5KΩ, 1/4w, 5%
5010-08997-00	R3, R7, R8	Resistor, 2.7KΩ, 1/4w, 5%
5040-10974-00	C3	Capacitor, 100µfd, 35v RAD
5370-13342-00	U4	I.C. 3A DMOS Bridge Driver
5490-10892-00	U1, U3	Opto Isolator 4N25
5250-09157-00	Q1	Reg 7805 1.A, 5V
5043-08980-00	C2, C4, C6-C8	Capacitor, 0.01µfd, 50v (+80, -20%)
5043-08996-00	C5	Capacitor, 0.1µfd, 50v (±20%)
5041-09031-00	C1	Capacitor, 1µfd, 25v (±20%) Axial

A-15430
10-Switch Opto Assembly



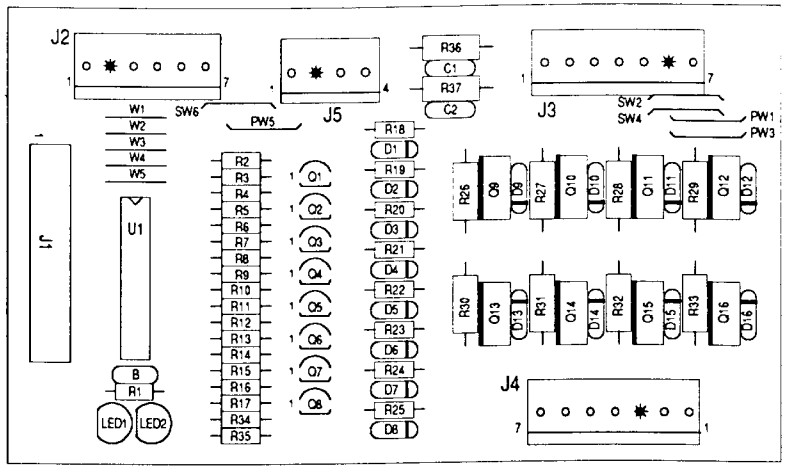
Part Number	Designator	Description
5040-10974-00	C1	Capacitor, 100µfd, 35v (+80, -20%)
5043-08980-00	C2 - C4	Capacitor, 0.01µfd, 50v (+1, -20%)
5671-09019-00	LED1	Display LED 1 Red
5370-12272-00	U1 - U3	IC LM339 Quad
5070-09054-00	D1 - D13	Diode 1N4004 1.0A.
5010-12928-00	R1- R7. R25, R28, R31	Resistor, 270Ω, 2w, 5%
5010-09999-00	R8 - R21, R23, R24, R26 R27, R29, R30	Resistor, 2KΩ, 1/4w, 5%
5010-09314-00	R22	Resistor, 1.2KΩ, 1/4w, 5%
5010-09162-00	R32, R35, R39, R40, R41	Resistor, 100KΩ, 1/4w, 5%
5010-08774-00	R33, R34, R36	Resistor, 22KΩ, 1/4w, 5%
5010-09034-00	R37, R38	Resistor, 10KΩ, 1/4w, 5%
5791-10862-12	J3	Connector, 12-pin Header STR Sq. Pin
5791-10862-09	J1, J2	Connector, 9-pin Header STR Sq. Pin
5791-10862-05	J4 - J6	Connector, 5-pin Header STR Sq. Pin

A-15340
Motor EMI Board



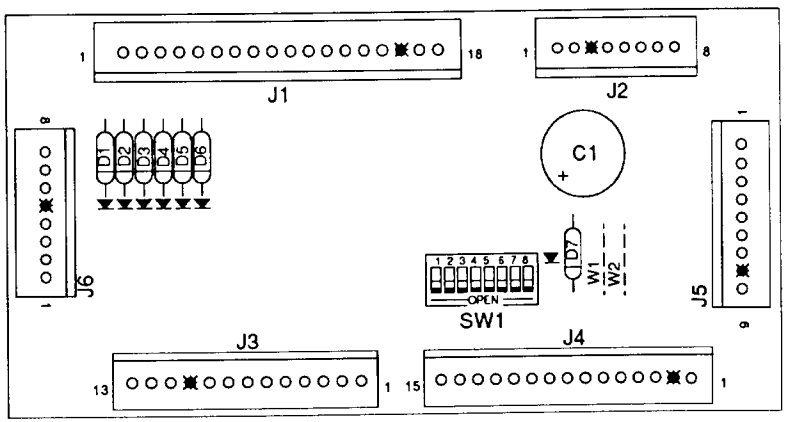
Part Number	Designator	Description
5551-09822-00	L1, L2	Ind. 4.7MH3AMP
5791-12273-03	J1	Connector, 3-pin Header Sq.
5791-12273-02	J2	Connector, 2-pin Header Sq.
5010-08998-00	R1	Resistor, 2.2KΩ, 1/4w, 5%
5070-09054-00	D1	Diode 1N4004, 1.0A.
5162-12635-00	Q1	Transistor TIP 102

A-16100
8-Driver PCB Assembly



Part Number	Designator	Description
5317-13400-00	U1	IC74ALS576 O/F-F
5190-09016-00	Q1 - Q8	Trans. 2N4403 PNP
5162-12635-00	Q9 -Q16	Trans. TIP 102NPN
5070-09054-00	D1- D16	Diode, 1N4004, 1.0A.
5010-08991-00	R1, R2, R4, R6, R8, R10, R12, R14, R16	Resistor, 4.7KΩ, 1/4w, 5%
5010-09416-00	R3, R5, R7, R9, R11, R13, R15, R17	Resistor, 470Ω, 1/4w, 5%
5043-08980-00	B	Capacitor, .01µF, 50v(+80, -20%)
5010-10171-00	R18 - R25	Resistor, 56Ω, 1/4w, 5%
5011-12956-00	R26 - R33	Resistor, 2.7KΩ, 1/4w, 5%
5010-09314-00	R35	Resistor, 1.2KΩ, 1/4w, 5%
5010-09224-00	R34	Resistor, 270Ω, 1/4w, 5%
5671-09019-00	LED1, LED2	Disp. Red LED
5010-08930-00	R37	Resistor, 470Ω, 1/2w, 5%
5043-09065-00	C2	Capacitor, 470PF, 50v(±20%)
5010-09534-00	W4, SW2, SW4, SW6	Resistor, 0Ω (Jumper)
5791-10850-00	J1	Connector, 26-pin Header Str Sq.100
5791-10862-06	J2	Connector, 6-pin Header Str Sq.100
5791-10862-07	J3, J4	Connector, 7-pin Header Str Sq.100
5791-10862-04	J5	Connector, 4-pin Header Str Sq.100

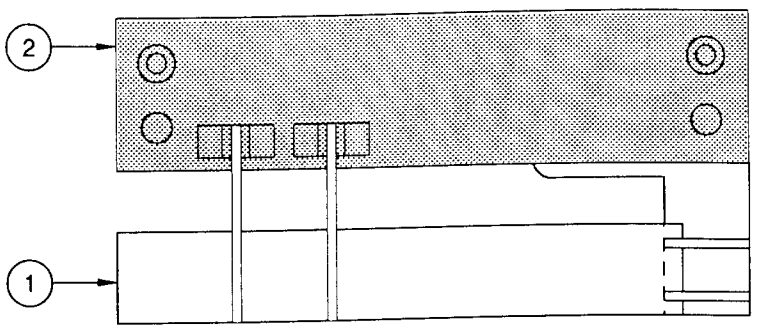
A-14689
WPC Coin Door Interface Board



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

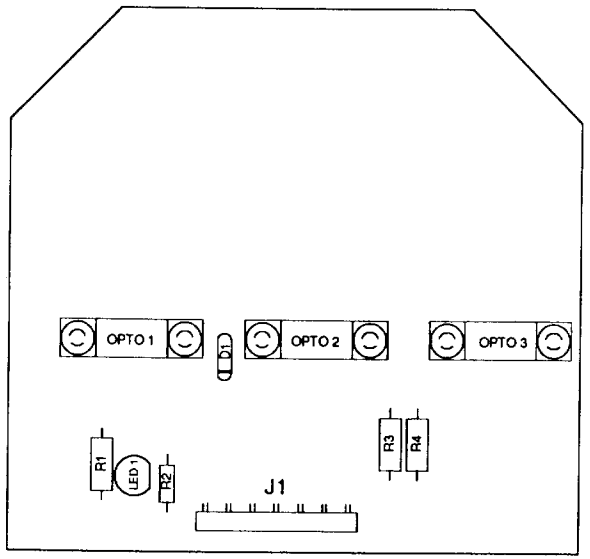
Notes:
1. For Belgium, France, Finland, Sweden and England use A-14689-1 Coin Door Interface Board.
2. * = Used on Electronic Coin Door only.

A-16384-1
Flipper Opto Assembly



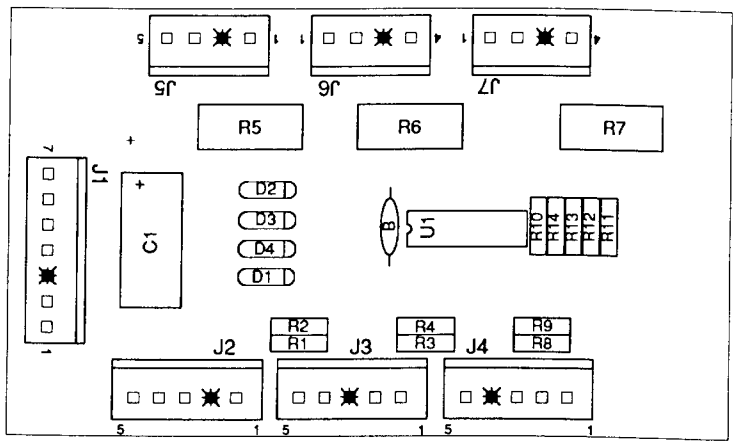
Item	Part Number	Description
1.	03-8795	Interrupter Flip/Opto
2.	A-16384	Flipper Opto Switch Assy.
	5010-08930-00	Resistor, 470Ω, 1/2W, 5%
	5490-12451-00	Opto Inter Lg. 10mA.
	5791-12462-07	Connector, 7-pin Header

A-13609
3-Bank Drop Target Opto Board



Part Number	Designator	Designator
5490-13341-00	OPTO 1 - OPTO 3	Opto Inter w/Tab 10MA.
5010-08930-00	R1, R3, R4	Resistor, 470Ω, 1/2w, 5%
5010-09314-00	R2	Resistor, 1.2KΩ, 1/4w, 5%
5070-09054-00	D1	Diode 1N4004 1.0A.
5671-09019-00	LED 1	Disp. LED Red
5791-10869-07	J1	Connector, 7-pin Header R/A Sq.
20-9864	OPTO 1 - OPTO 3	Eyelet, 1/8 x 7/32" Lg.

A-13901-2
Opto Ramp Switch Board



Part Number	Designator	Description
5010-08774-00	R10, R13	Resistor, 22ΩK, 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, J4	Connector, 5-pin Header Sq.
5791-12273-07	J1	Connector, 7-pin Header Sq.

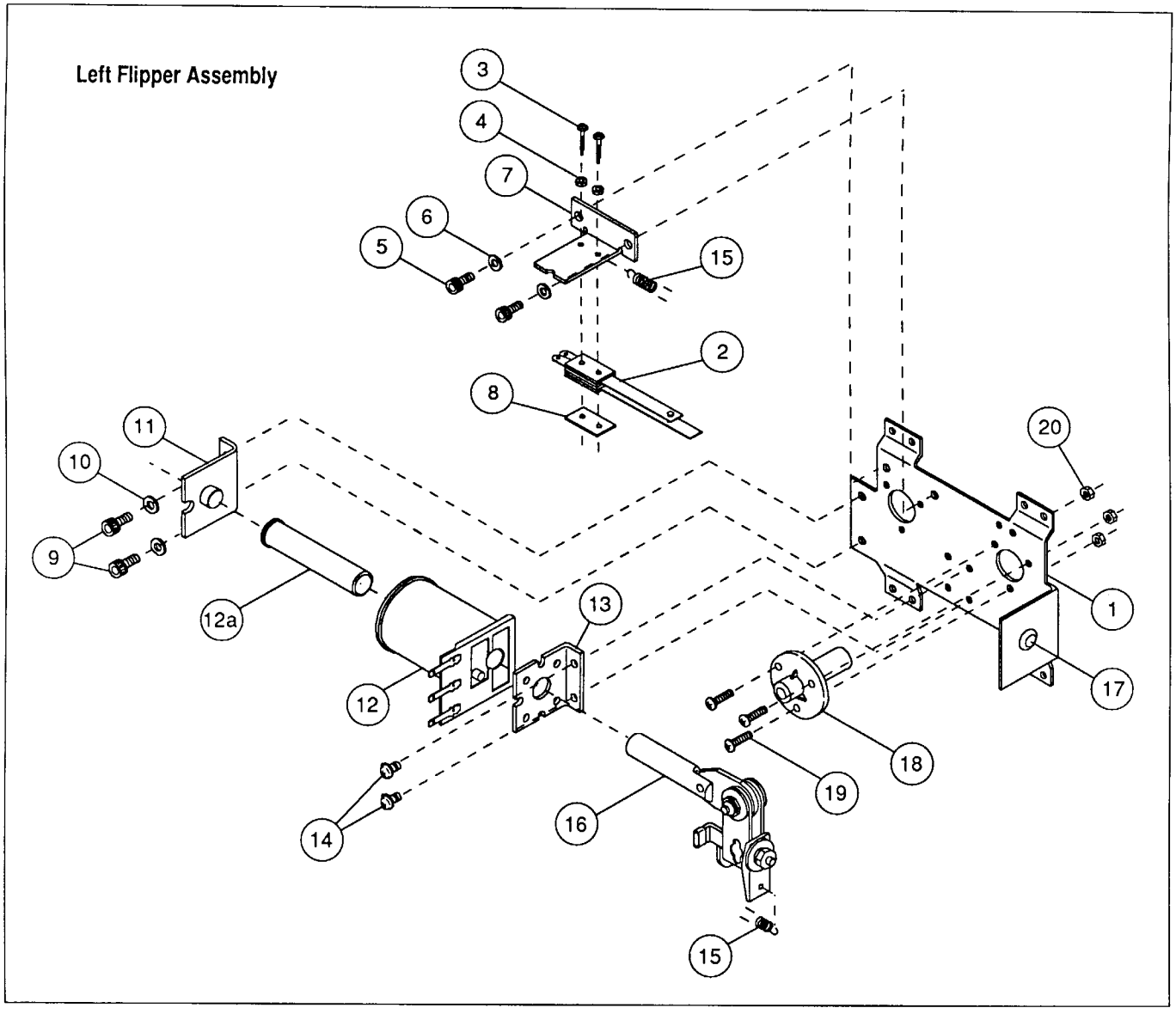
A-15205-L-2 & A-15205-R-2 Fliptronic II Flipper Assembly

Item	Part Number	Description
1.	B-13104-R	Flipper Base Assy., Right
	B-13104-L	**Flipper Base Assy., Left**
2.	SW-1A-194	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-12390	Flipper Stop Assembly
12.	FL-11629	Flipper Coil (Blue)
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

■ **Associated Parts for Left & Right Flippers:**

21.	23-6695	Flipper Rubber Ring, 1-1/2" dia. (Black)
22.	20-9250-5	Flipper & Shaft (White)

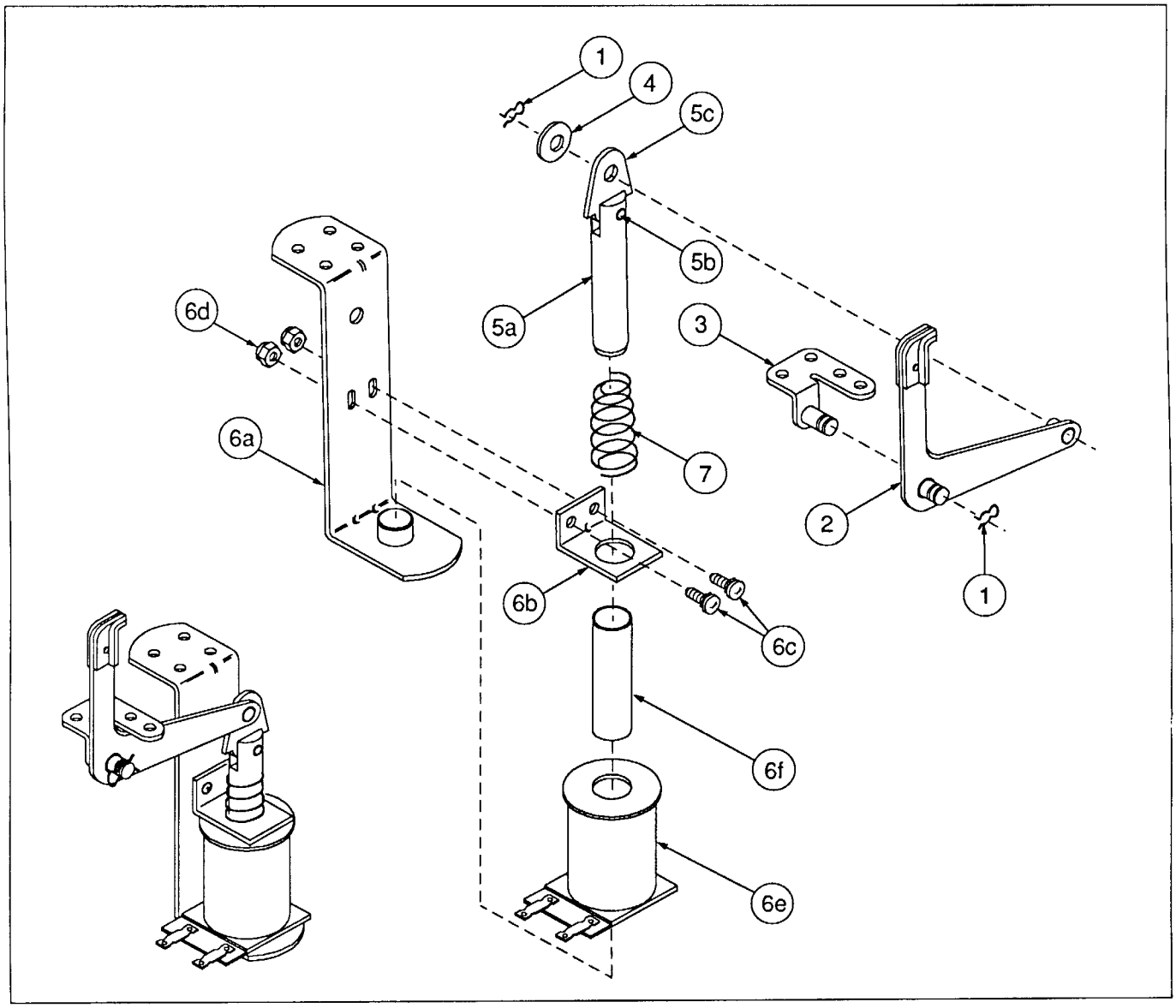
A-15205-L-2 & A-15205-R-2 Fliptronic II Flipper Assembly



■ Flipper Notes:

1. Each Flipper Assembly is mounted beneath the playfield, in conjuction with the Plastic Flipper & Shaft, and Flipper Rubber on the upper side of the playfield.
2. 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.
3. Any adjustment of the E.O.S. Switch must be made at a minimum distance of 0.25 inch from the switch body.
4. Longer blade of E.O.S. Switch must be straight. Gap adjustment is done by adjusting shorter blade.
5. All moving elements of the assembly must operate freely without any evidence of binding.
6. Apply Loctite™ 245 when reataching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.

B-12665 Kicker Arm (Slingshot) Assembly

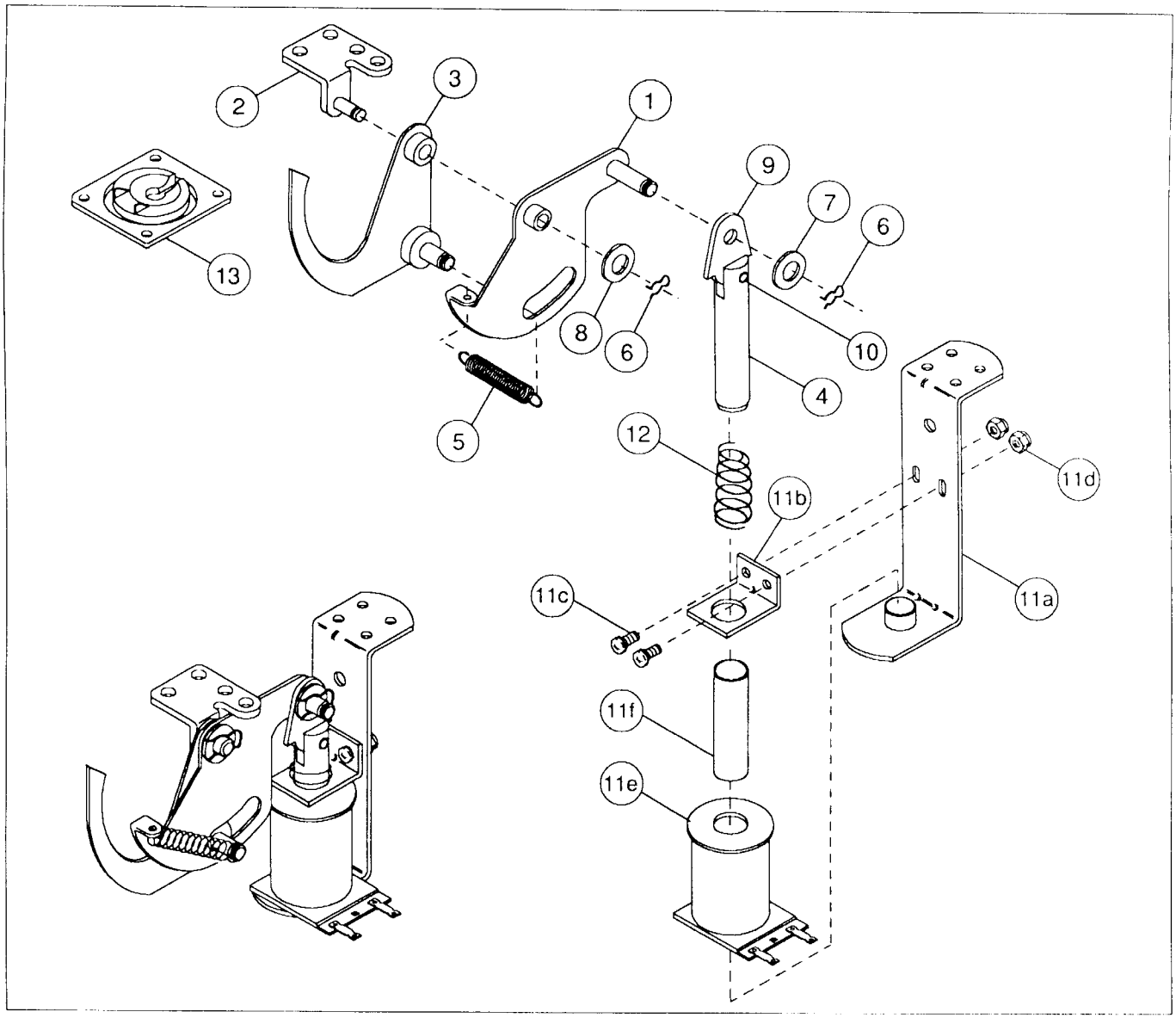


Item	Part Number	Description
1.	12-6227	Hairpin Clip
2.	A-12664	Kicker Crank Assembly
3.	A-5653	Mounting Bracket Assembly
4.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
5.	A-5103	Coil Plunger Assembly
a)	02-2364	Coil Plunger
b)	03-8085	Armature Link
c)	20-8716-5	Roll Pin, 1/8 x 7/16"

Associated Parts for **Right & Left 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-17073 Ball Eject Assembly - Special

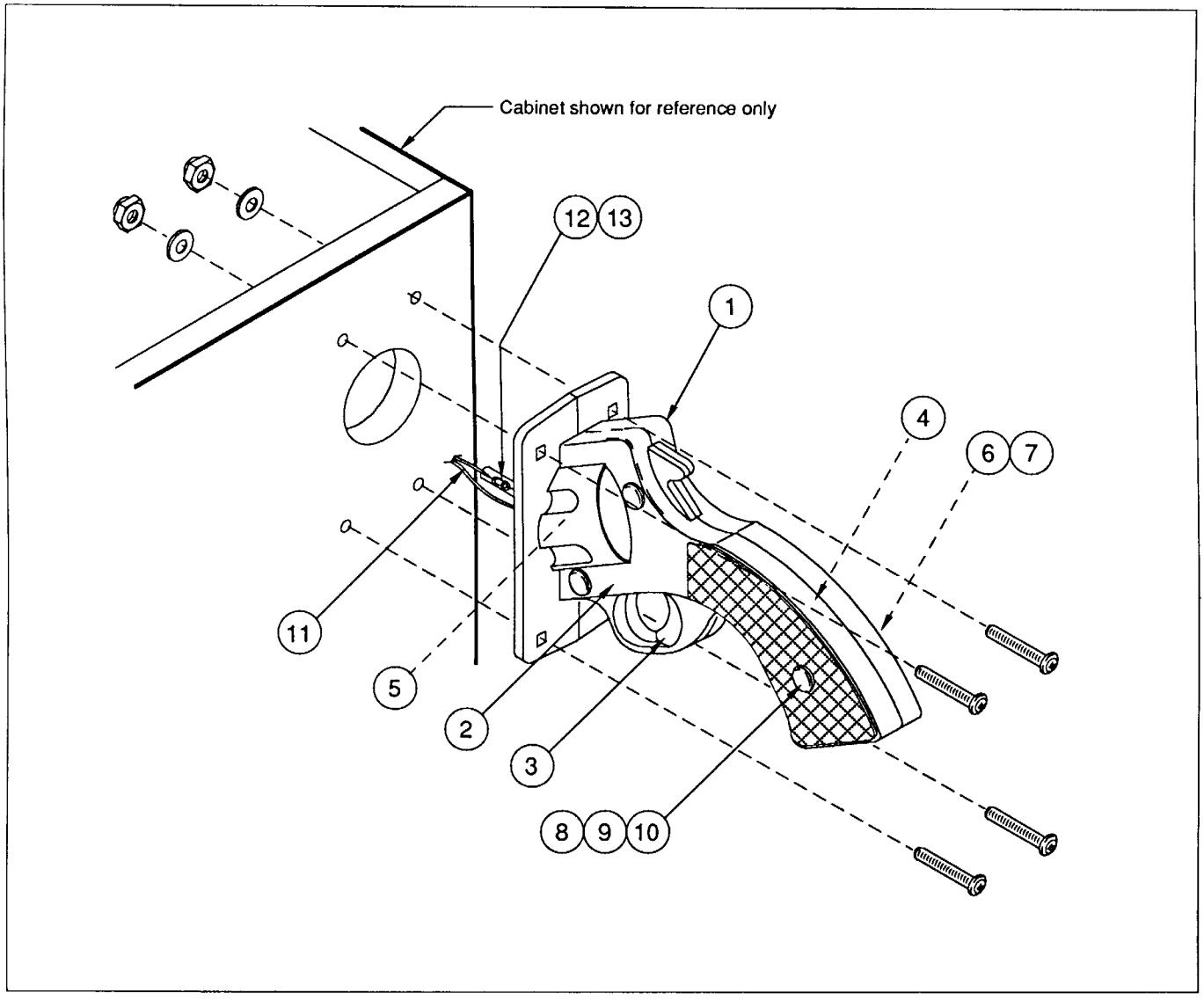


■ Associated Parts:

Item	Part Number	Description
1.	A-6949-R	Spring Plate Assembly
2.	A-8268	Mounting Bracket Assembly
3.	A-7471-R	Eject Cam Assembly
4.	02-2364	Plunger Coil
5.	10-320	Spring - Eject
6.	12-6227	Hair Pin Clip (2)
7.	4700-00030-00	Flatwasher, 17/64 x1/2 x 15ga.
8.	4700-00103-00	Flatwasher, 17/64 x1/2 x 28ga.
9.	03-8085	Armature Link
10.	20-8716-5	Roll Pin, 1/8 x 7/16"

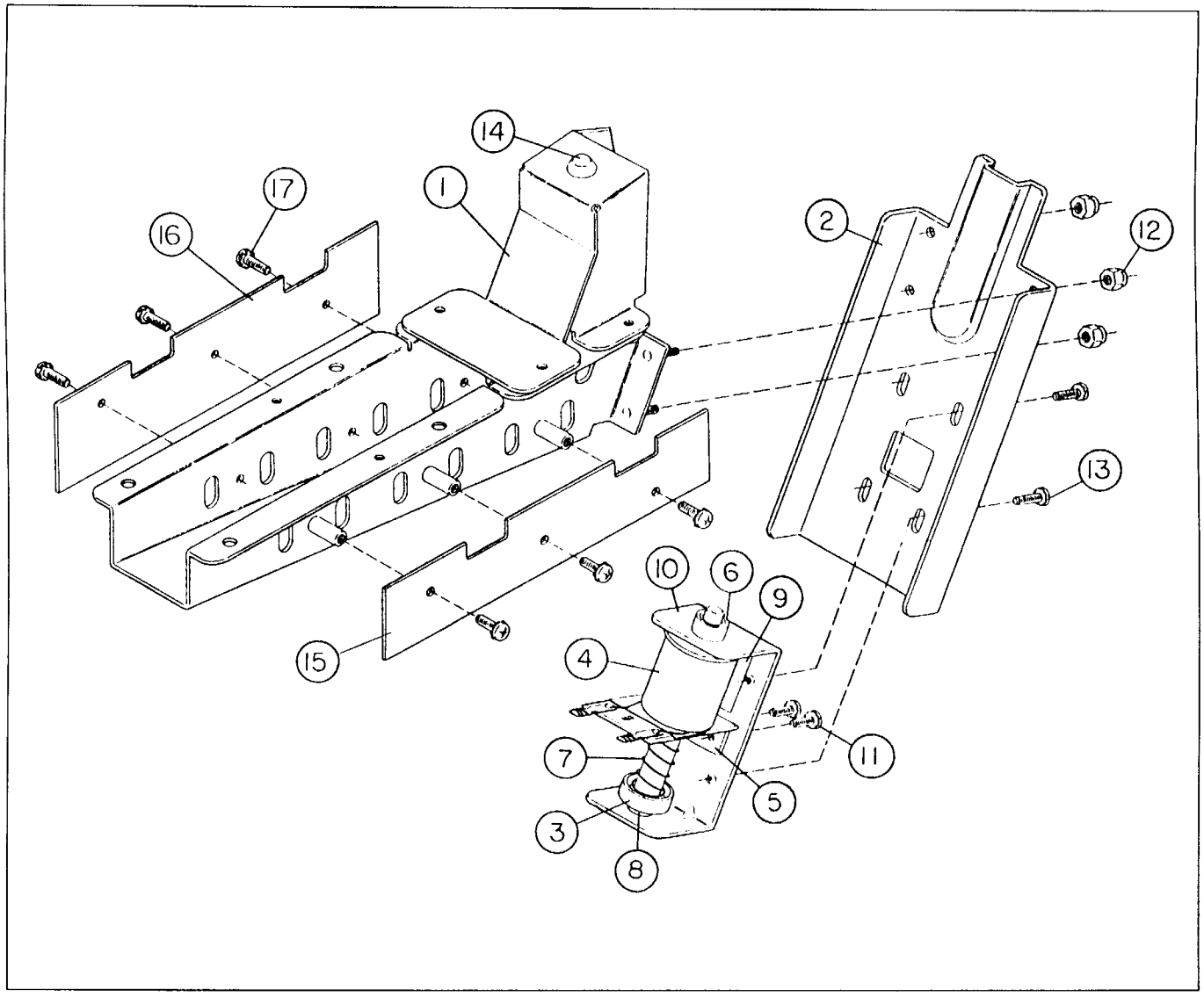
Item	Part Number	Description
11	**B-9362-L-2**	Coil & Bracket Assembly
a)	B-7572-1	Bracket & Stop Assembly
b)	01-8-508-S	Coil Retaining Bracket
c)	4006-01017-06	Mach. Screw, 6-32 x 3/8
d)	4406-01119-00	Nut, 6-32 ESN
e)	AE-26-1200	Coil Assembly
f)	03-7066	Coil Tubing
12.	10-128	Spring
13.	03-7351-1-9	Eject Shield

A-16113 Gun Handle Assembly



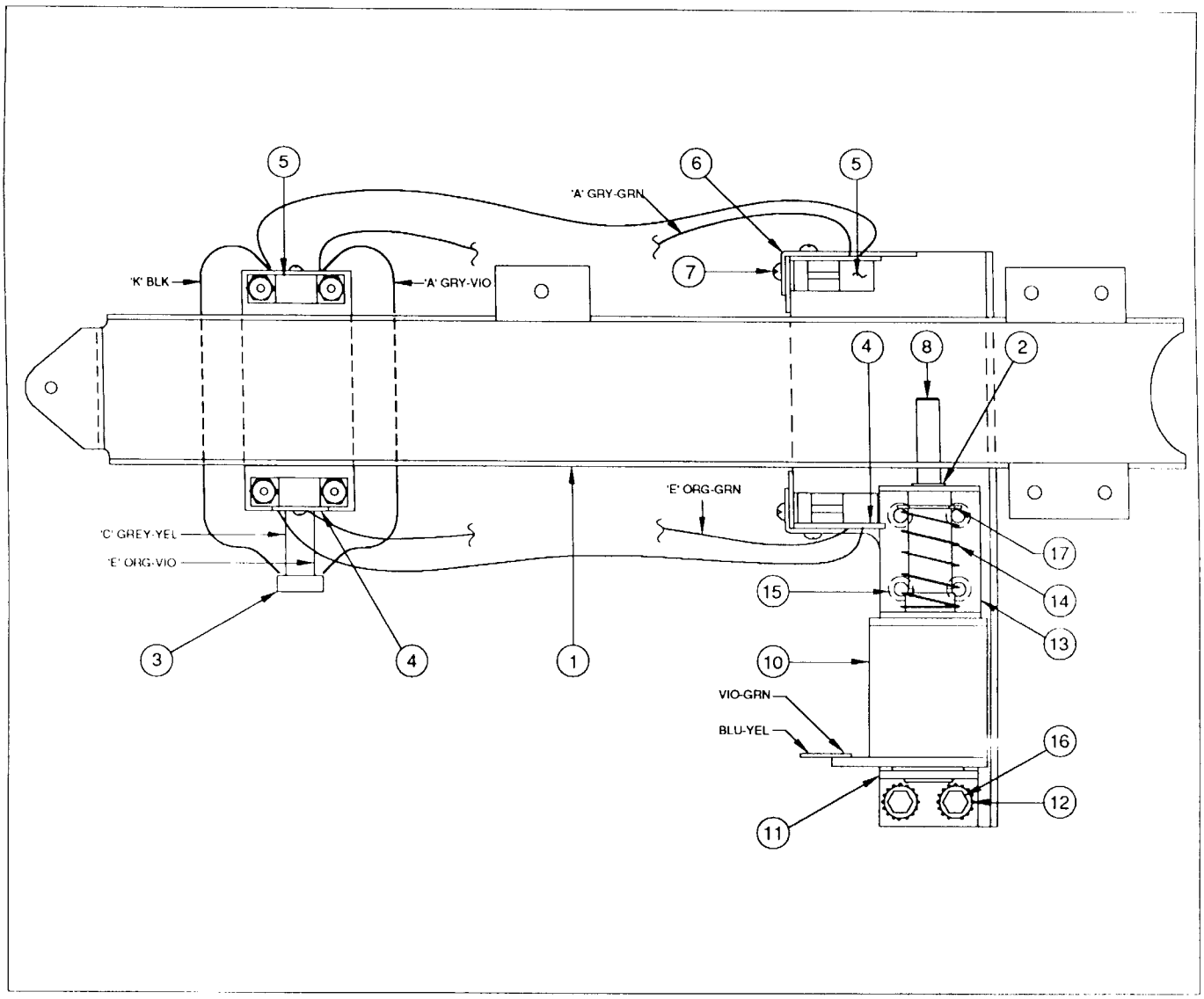
Item	Part Number	Description
1.	21-6692-1	Gun Handle, Right
2.	21-6692-2	Gun Handle, Left
3.	01-11066	Trigger
4.	10-320	Extension Spring (Red)
5.	5647-12133-12	Miniature Switch
6.	02-4547	Fastner
7.	4702-00014-00B	Lockwasher #1/4, Int. Tooth (Black)
8.	4700-00129-00B	Flatwasher, 13/64 x 15/32 x 22ga.
9.	4702-00013-00B	Lockwasher #10, Int. Tooth (Black)
10.	4010-01097-06B	Mach. Screw, #10-32 x 3/8 TR-BH
11.	H-16871	Cable Assembly
12.	RM-21-03	Tubing #10
13.	5070-09054-00	Diode 1N4004

A-16765 Ball Trough Assembly - Complete



Item	Part Number	Description	Item	Part Number	Description
1.	A-16809	Ball Trough Welded Assy.	10.	01-11586	Coil Mtg. Bracket (Bell)
2.	01-11587	Ball Trough Front	11.	4008-01017-05	Mach. Screw, 8-32x5/16 P-RH SEMS
3.	A-6306-2	Bell Armature Assembly	12.	4408-01119-00	Nut 8-32 ESN
4.	AE-26-1500	Coil Assembly	13.	4008-01017-06	Mach. Screw, 8-32x3/8 P-RH SEMS
5.	01-8-508-T	Solenoid Bracket	14.	23-6702	Bumper Plug
6.	03-7067-5	Coil Tubing	15.	A-16927	LED 7 Ball Trough Assembly
7.	10-135	Solenoid Spring	16.	A-16926	OPTO 7 Ball Trough Assembly
8.	23-6420	Rubber Grommet	17.	4006-01017-06	Mach. Screw, 6-32x3/8 P-RH SEMS
9.	03-8523	Insulator			

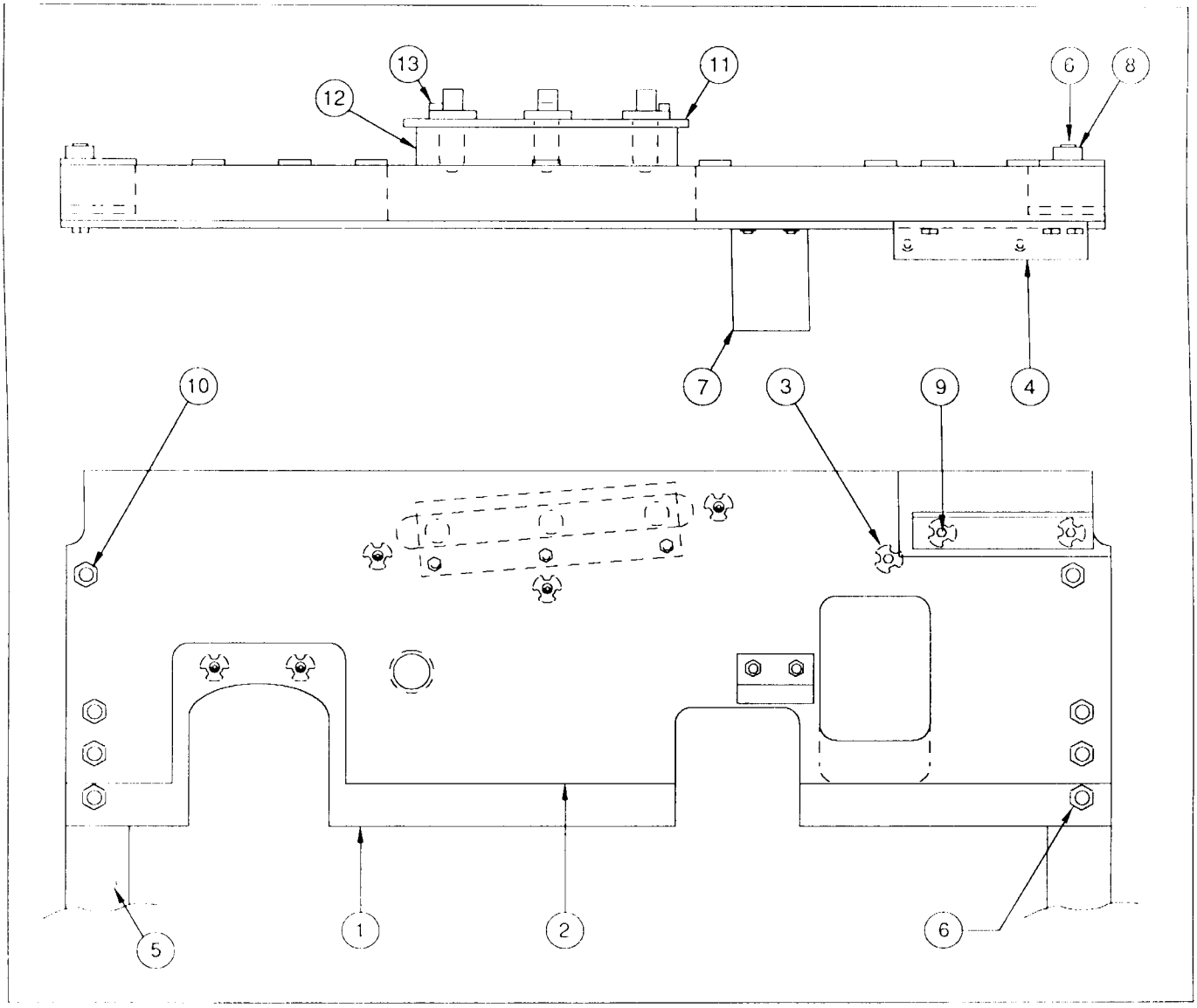
A-16317 Ball Trough Assembly



Item	Part Number	Description
1.	01-11178	Bracket - Ball Trough
2.	20-8790	Nylined Bearing
3.	H-16873	Cable Assembly
4.	A-16909	Photo Transistor Assembly
5.	A-16908	LED Assembly
6.	01-11062	Shield Insulator
7.	4106-01013-06	Sh. Metal Screw, #6 x 3/8 P-PH
8.	02-4791	Plunger-Trough Coil
9.	03-7066-3	Coil Tubing, 1-7/8" Long

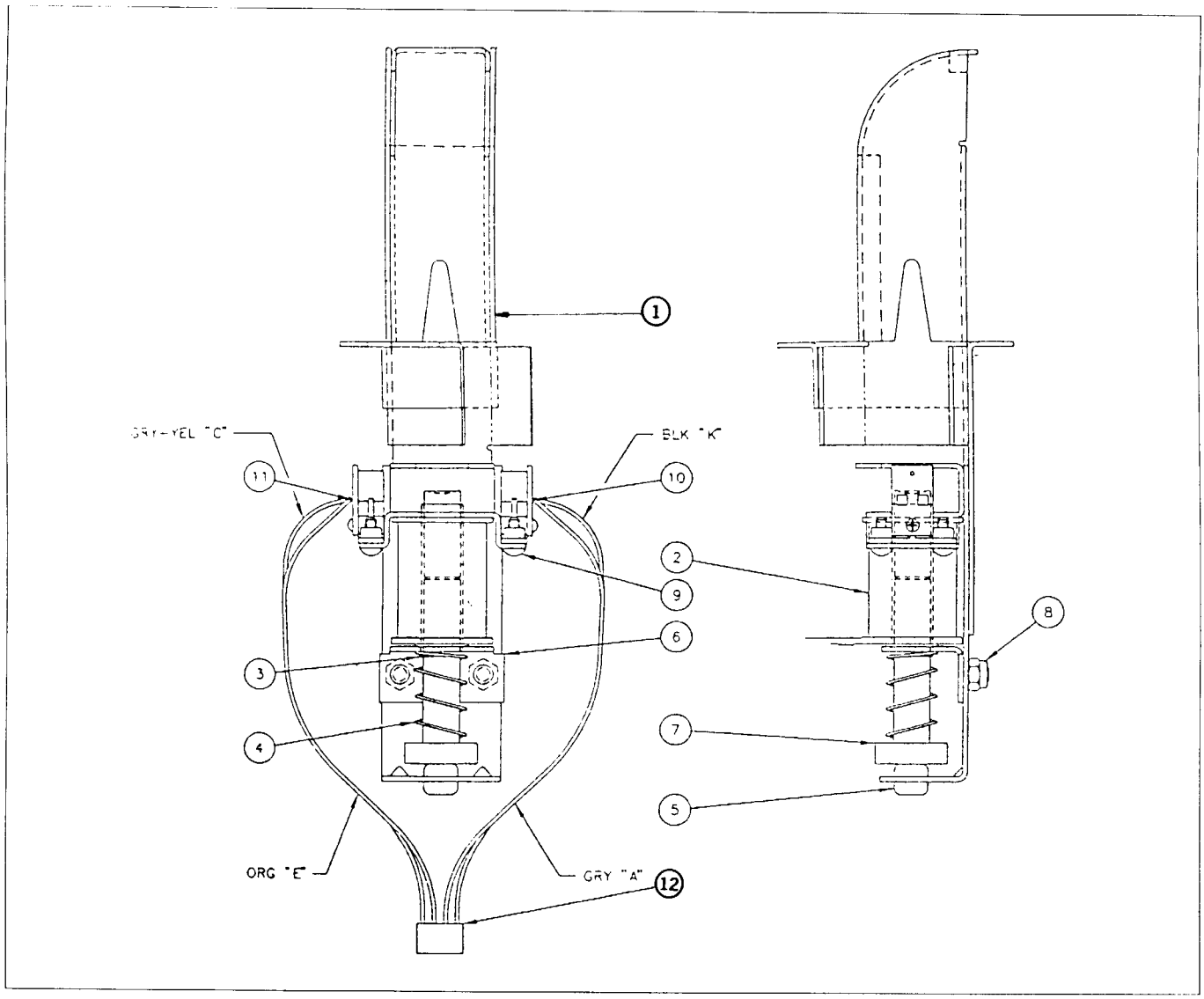
Item	Part Number	Description
10.	AE-26-1500	Coil Assembly
11.	A-16575	Stop Bracket Assembly
12.	4010-01006-08	Mach. Screw, #10-32 x 1/2 P-PH-S
13.	01-11393	Bracket - Plunger Guide
14.	10-135	Spring
15.	4006-01003-04	Mach. Screw, #6-32 x 1/4 P-PH-S
16.	4410-01132-01	Nut #10-32 ESN
17.	20-8712-43	"E"-Ring, 7/16 " Shaft

A-16578 Back Panel Assembly



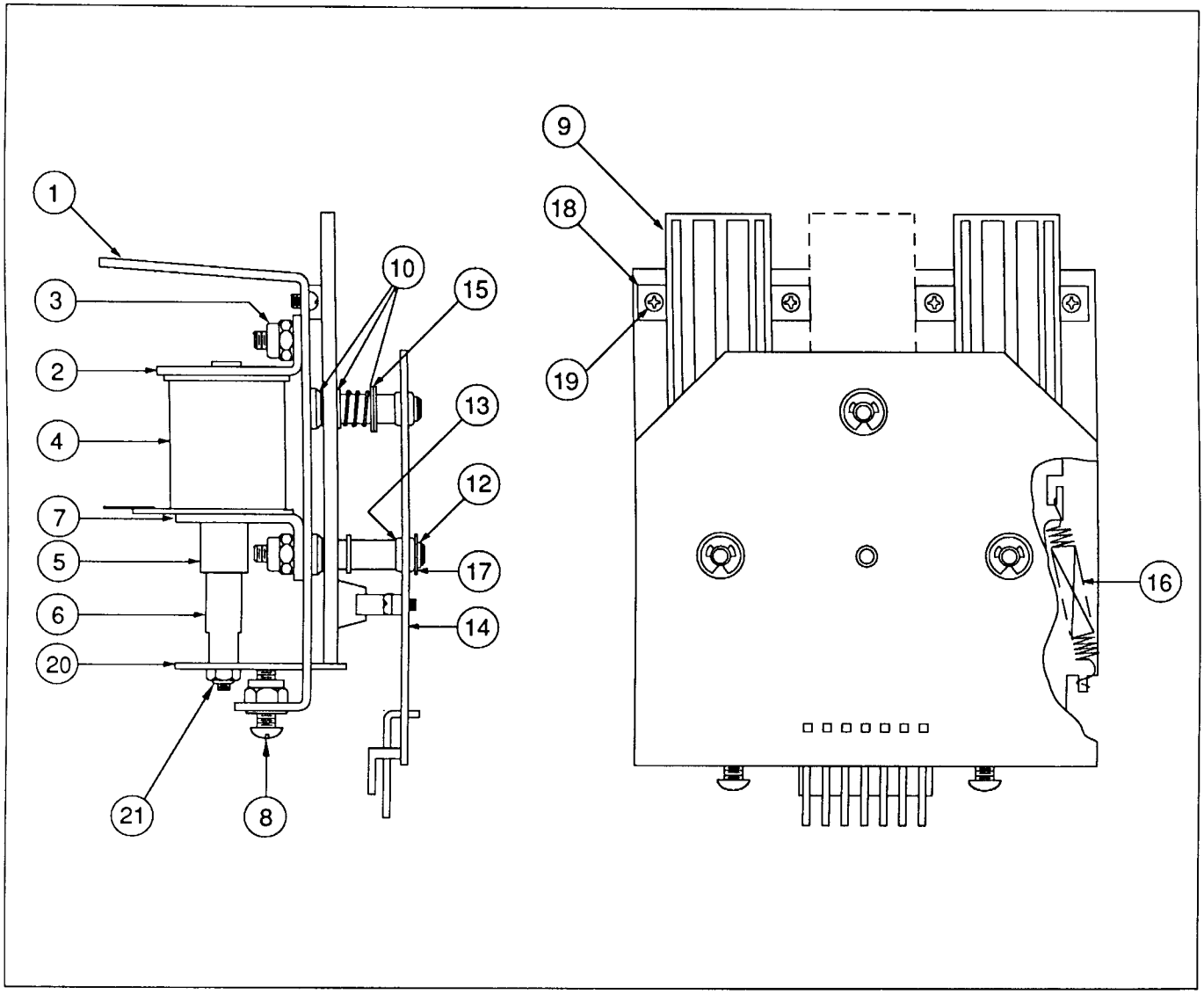
Item	Part Number	Description
1.	11-831-50017	Back Panel, Wood
2.	31-1773A-1	Playfield Plastic
3.	01-11668	Ball Deflect Bracket
4.	01-11391	Rt. Ramp Mounting Bracket
5.	01-10726	Leg, Rear Guide
6.	4506-01106-16B	SSS, 6-32 x 1" Long
7.	4408-01118-00	Tee Nut, 8-32
8.	4406-01128-00	Nut #6-32 KEPS
9.	4008-01168-16	Mach. Screw, #8-32 x 1"\PL-HH-S
10.	4106-01114-08	Sh. Metal Screw, #6 x 1/2 PL-HWH
11.	A-16930	Circuit Board Assembly
12.	03-8022-1	Spacer, .541"
13.	4106-01115016	Sh. Metal Screw, #6 x 1" PL-HWH

A-16231 Rotor Lock Ball Popper Unit Assembly



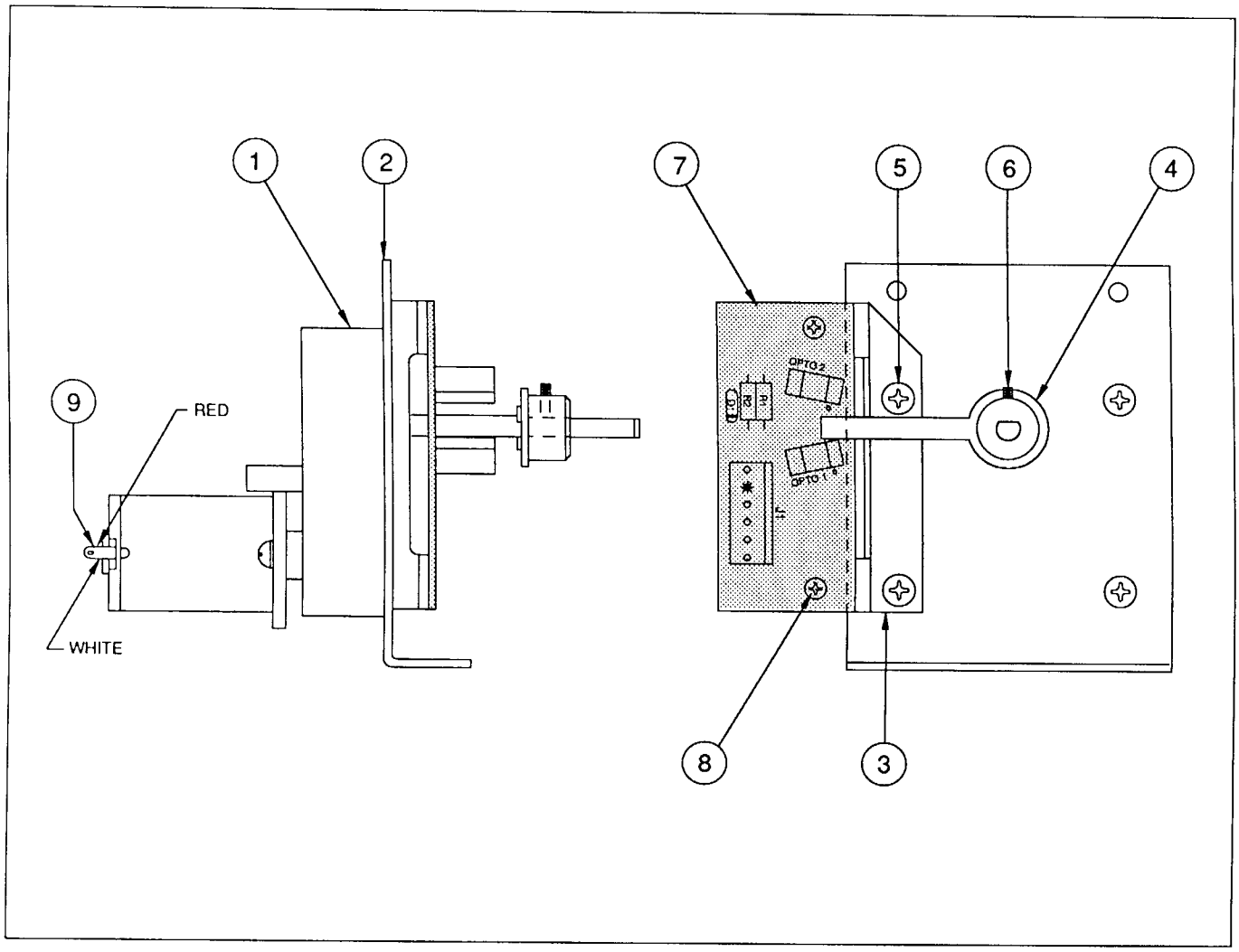
Item	Part Number	Description
1.	A-16230	Ball Popper Sub-Assembly
2.	AE-26-1200	Coil Assembly
3.	03-7067	Tubing Coil
4.	10-135	Solenoid Spring
5.	23-6420	Rubber Grommet
6.	A-16858	Mounting Bracket
7.	A-13270	Bell Armature Assembly
8.	4408-01119-00	Nut, 8-32 ESN
9.	4106-01013-06	Sh. Metal Screw, #6x3/8 P-PH Type 25
10.	A-16808	LED Assembly, RTV
11.	A-16809	Photo Trans. Assembly, RTV
12.	H-16229	Cable Assembly

A-16032-2 3-Bank Drop Target Assembly



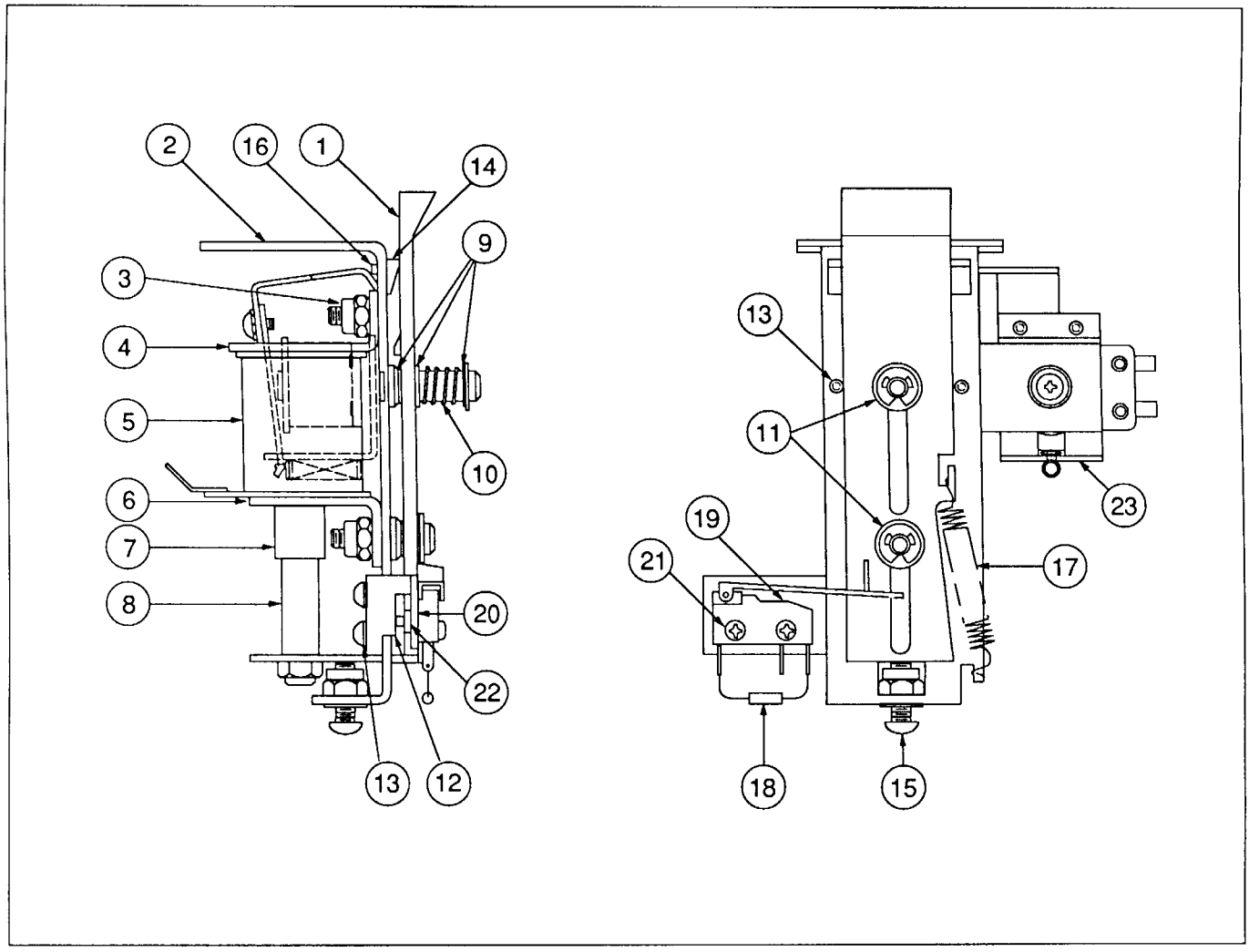
Item	Part Number	Description	Item	Part Number	Description
1.	A-17045	3-Bank Brkt. & Stud Assembly	12.	20-8712-18	Retaining Clip
2.	A-11397	Stop Bracket Assembly	13.	23-6626	Rubber Grommet
3.	4408-01119-00	Nut 8-32 ESNA	14.	A-13609	3-Bank Opto Board
4.	AE-26-1200	Coil Assembly	15.	20-8712-25	Retaining Clip
5.	03-7066-4	Coil Tubing	16.	10-364	Extension Spring
6.	01-3972-1	Plunger	17.	4700-00016-00	Flatwasher, 3/16 x 7/16 x 21ga.
7.	01-8413-1	Coil Mounting Bracket	18.	03-8334-3	Stop Target, 3-15/16"
8.	4010-01025-14	Mach. Screw, 10-32 x 7/8"	19.	4004-01005-04	Mach. Screw, 4-40 x 1/4"
9.	03-8750	Target	20.	01-11769	Reset Plate
10.	4700-00072-00	Flatwasher, 17/64 x 1/2 x 21ga.	21.	4410-01132-00	Nut #10 ESNA
11.	10-392	Compression Spring	22.	23-6622	Foam Taple, Double-Sided

A-16738 Motor Pivot/Drive Unit Assembly



Item	Part Number	Description
1.	14-7988	Motor, 12VDC
2.	01-11535	Mounting Bracket
3.	01-11536	Motor Opto Bracket
4.	A-16733	Interrupter Bush Assembly
5.	4008-01003-12	Mach. Screw, #8-32 x 3/4 P-PH-S
6.	4008-01083-04	Sh. Metal Screw, #8-32 x 1/4" Long
7.	A-16657	Circuit Board Assembly
8.	4006-01003-04	Mach. Screw, #6-32 x 1/4 P-PH-S
9.	H-16893	Cable Assembly

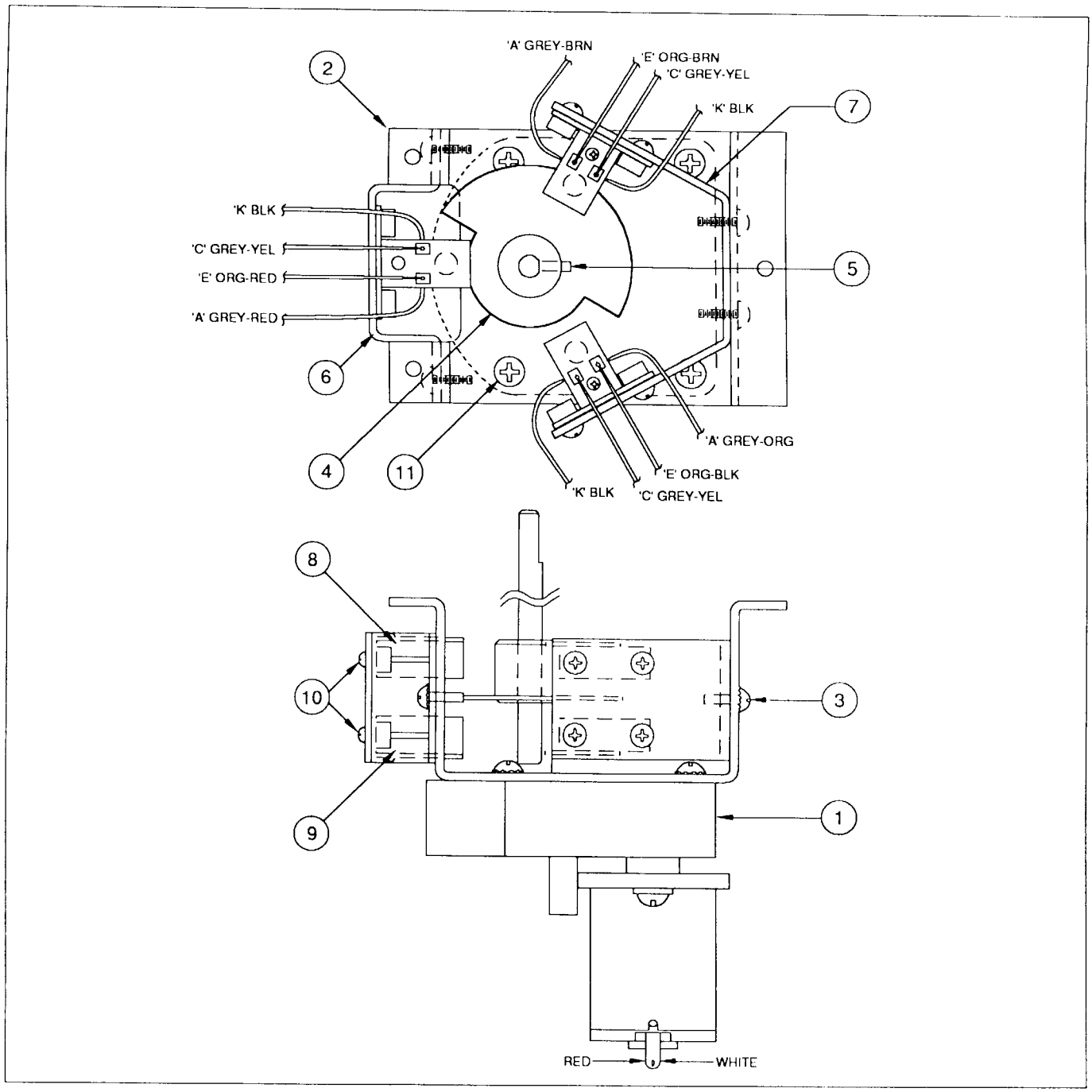
A-14615 1-Bank Drop Target Assembly



Item	Part Number	Description
1.	03-8033	Target - Flush
2.	A-14617	Bracket & Post Assy.
3.	4408-0119-00	Nut 8-32 ESNA
4.	A-11397	Stop Bracket Assembly
5.	AE-26-1200	Coil Assembly
6.	01-8413	Coil Mounting Bracket
7.	03-7066-4	Tubing
8.	A-11388-2	Plate & Reset Assy.
9.	4700-00072-00	Flatwasher, 17/64 x 1/2"
10.	10-392	Spring
11.	20-8712-25	"E"-Ring
12.	01-10183	Switch Bracket
13.	4006-01003-03	Mach. Screw, 6-32 x 3/16"

Item	Part Number	Description
14.	03-8034	Single Stop Target
15.	4010-01025-14	Mach. Screw, 10-32 x 7/8"
16.	07-6688-17N	Rivet, 5/32 x 7/32
17.	10-433	Spring Extension
18.	5070-09054-00	Diode 1N4001
19.	5647-12693-31	Switch
20.	01-8600	Switch Insulator
21.	4002-01105-08	Mach. Screw, 2-56 x 1/2
22.	01-8240	Nut Plate
23.	A-14908	Target Knock Down Assembly
a)	01-8647-L	Actuator
b)	A-14913	Frame & Eyelet Assembly
c)	SM1-26-600	Coil Assembly

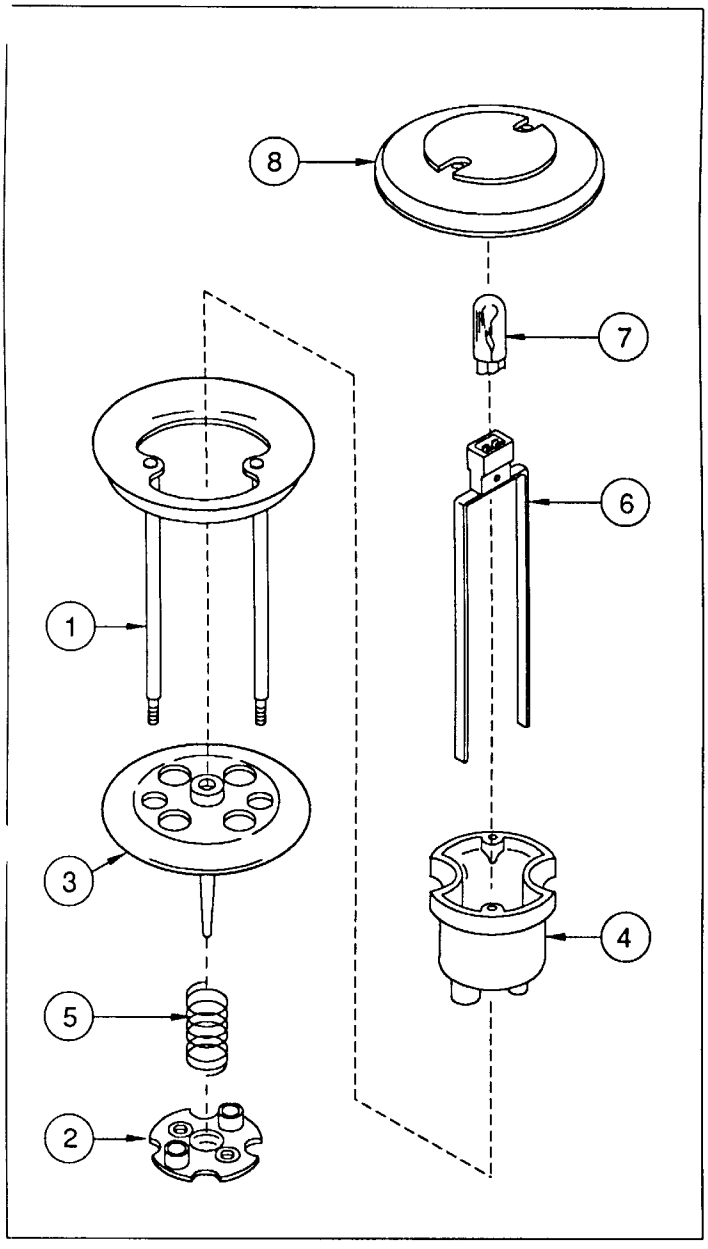
A-16228 Rotor Lock Motor Unit



Item	Part Number	Description
1.	14-7982	Motor
2.	01-11176	Opto Mounting Bracket
3.	4006-01003-06	Mach. Screw, #6-32 x 3/8 P-PH-S
4.	A-16225	Opto Interrupt Plate Assembly
5.	4008-01083-04	Set Screw, #8-32 x 1/4" Long
6.	01-11174	Bracket - Single Opto

Item	Part Number	Description
7.	01-11175	Bracket - Double Opto
8.	A-16909	Photo Transistor Assembly
9.	A-16908	LED Assembly
10.	4106-01013-06	Sh. Metal Screw, #6 x 3/8 P-PH
11.	4008-01003-12	Mach. Scew, #8-32 x 3/4 P-PH-S
12.	H-16872	Cable Assembly

B-9414-3
Jet Bumper Assembly

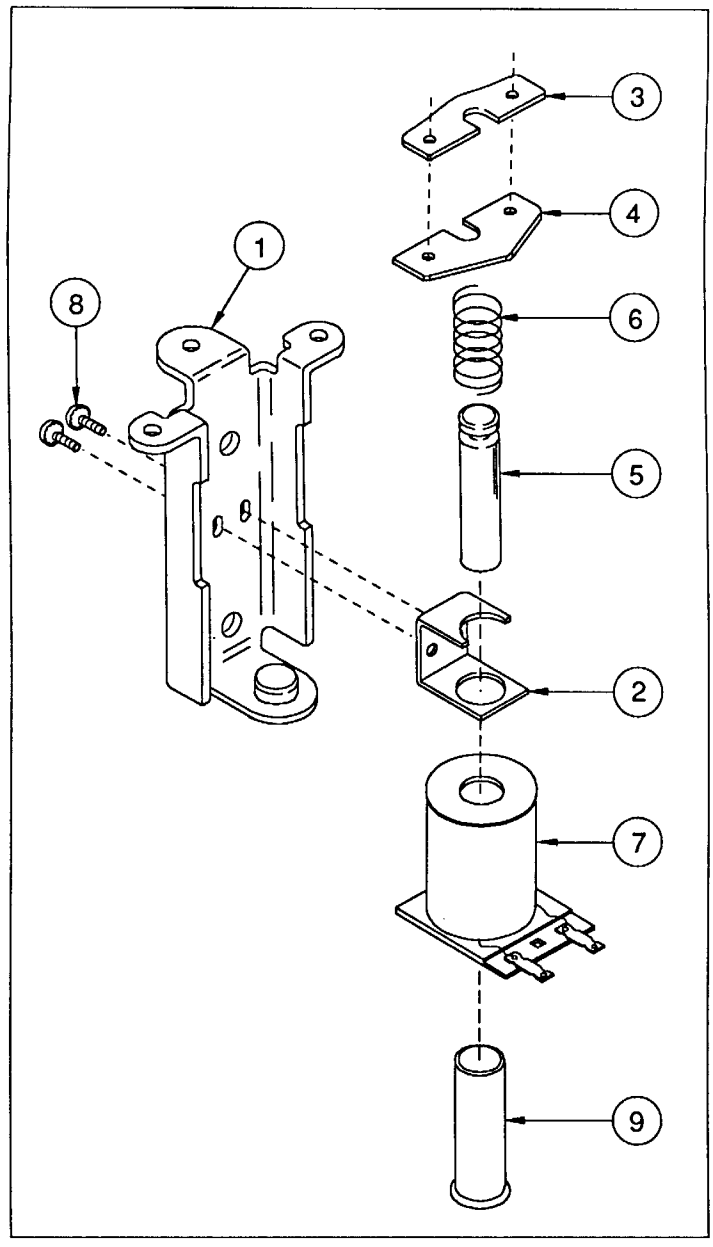


Item	Part Number	Description
1.	A-4754	Bumper Ring Assembly
2.	03-6009-A5	Bumper Base, White
3.	03-6035-4	Bumper Wafer, Red
4.	03-7443-5	Bumper Body, White
5.	10-7	Spring
6.	24-8776	Socket - Wedge Base
7.	24-8768	Bulb #555 (6.3V., 0.25A.)

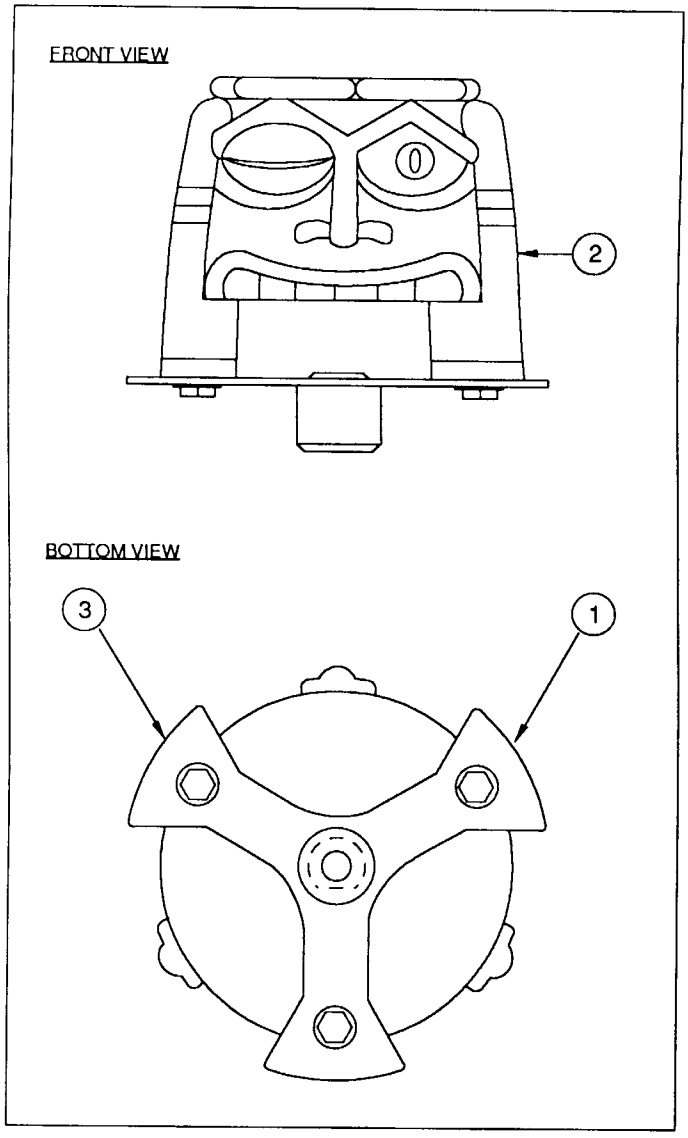
Associated Parts:

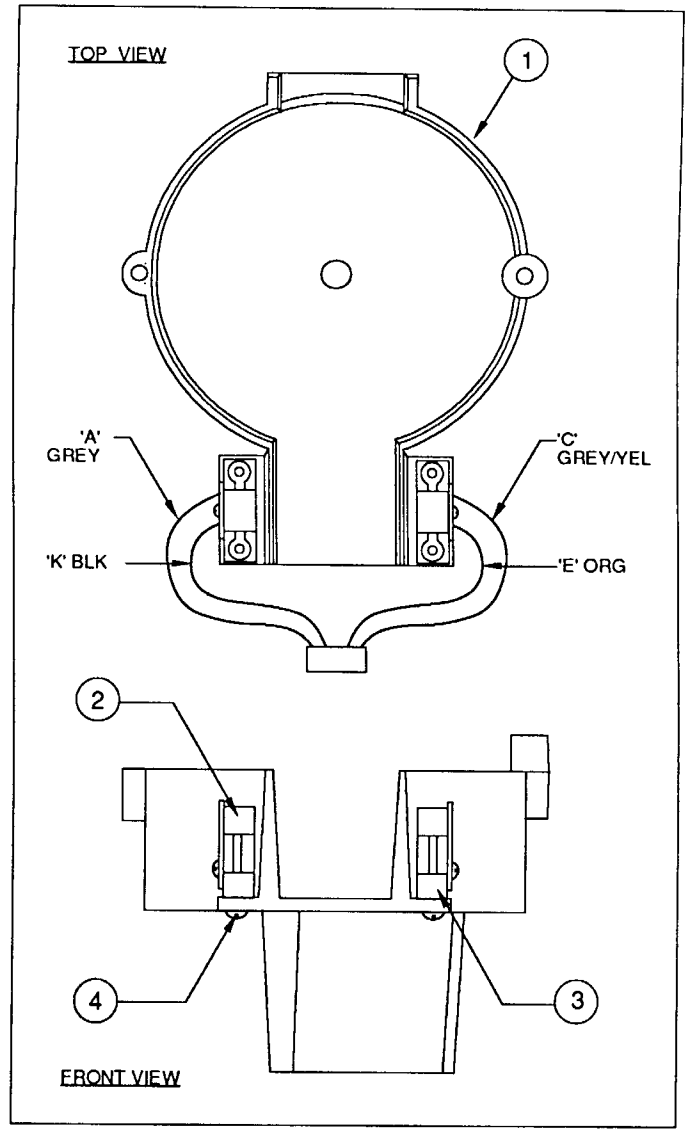
8.	03-8254-9	Jet Bumper Cap (Tr. Red)

A-9415-2
Jet Bumper Coil Assembly



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



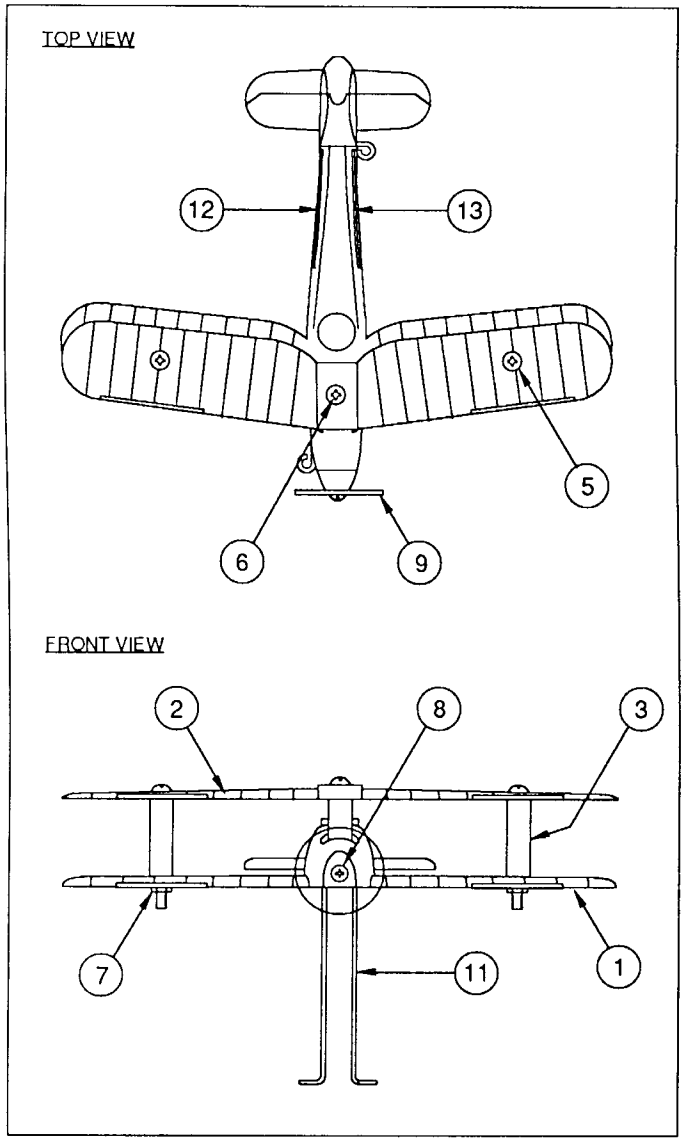


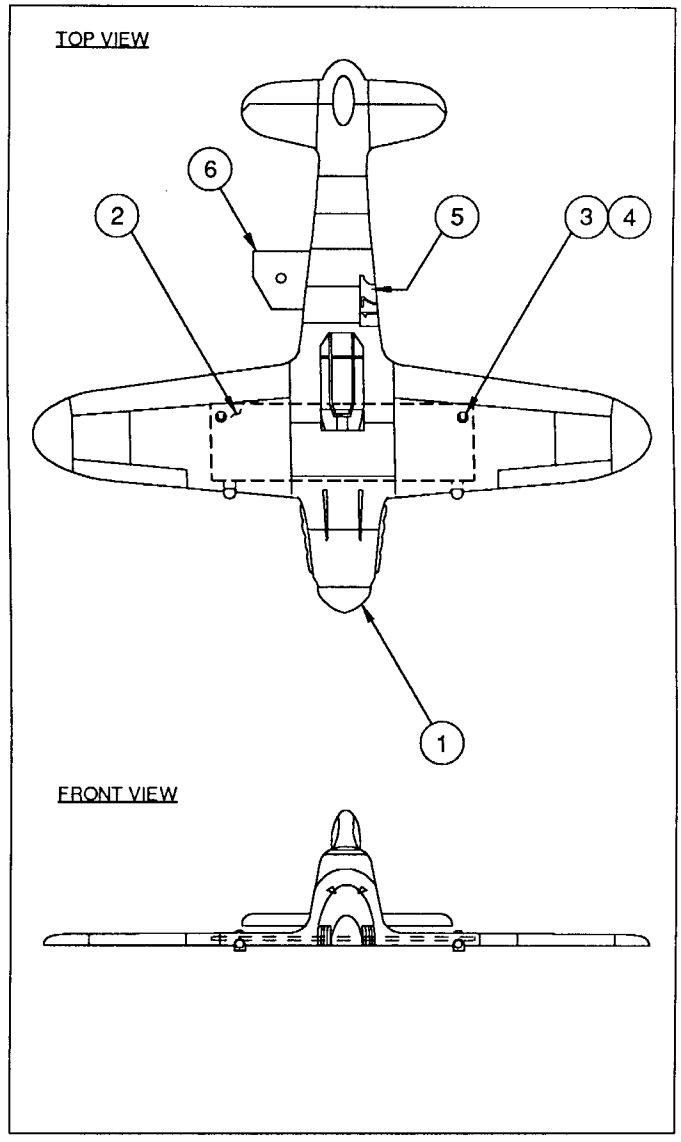
A-16708
Idol Assembly

Item	Part Number	Description
1.	A-16224	Ball Plate Assembly
2.	03-8907	Idol
3.	4608-01081-07	Hi-Fast #8 x 7/16 PL-HWH

A-16227
Rotor Lock/Opto Assembly

Item	Part Number	Description
1.	03-8843	Rotor Lock
2.	A-16098	LED Assembly, RTV
3.	A-16909	Photo Transistor Assy., RTV
4.	4106-01013-06	Sh. Metal Screw, #6 x 3/8"
5.	H-16335	Cable Assembly





A-16709
Biplane Assembly

Item	Part Number	Description
1.	03-8903	Fuselage, Biplane
2.	03-8904	Wing, Biplane
3.	03-6047-15	Spacer, 1" Long
4.	03-6047	Spacer, 9/16" Long
5.	4006-01005-24	Mach. Screw, #6-32 x 1-1/2"
6.	4006-01005-16	Mach. Screw, #6-32 x 1"
7.	4406-01119-00	Nut, #6-32 Hex. ESN
8.	4006-01005-06	Mach. Screw, #6-32 x 3/8"
* 9.	31-1773-22	Playfield Plastic
10.	4700-00004-00	Flatwasher, 9/64 x 3/8 x 21ga.
11.	12-7128	WireForm, Biplane
*12.	31-1786-7	Decal, Plane
*13.	31-1786-8	Decal, Plane

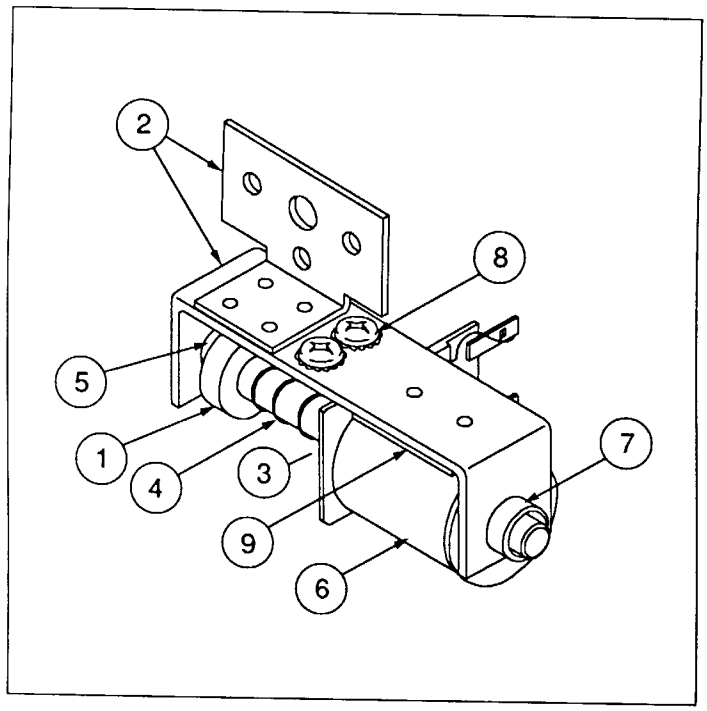
A-16707
Fighter Plane Assembly

Item	Part Number	Description
1.	03-8902	Fighter Plane
2.	A-16834-1	2 LED Flasher Assembly
3.	07-6688-20N	Rivet, 1/8 x 1/4"
4.	4700-00003-00	Flatwasher, 1/8x 9/32 x 21ga.
* 5.	31-1786-9	Decal, Plane

■ Associated Part:

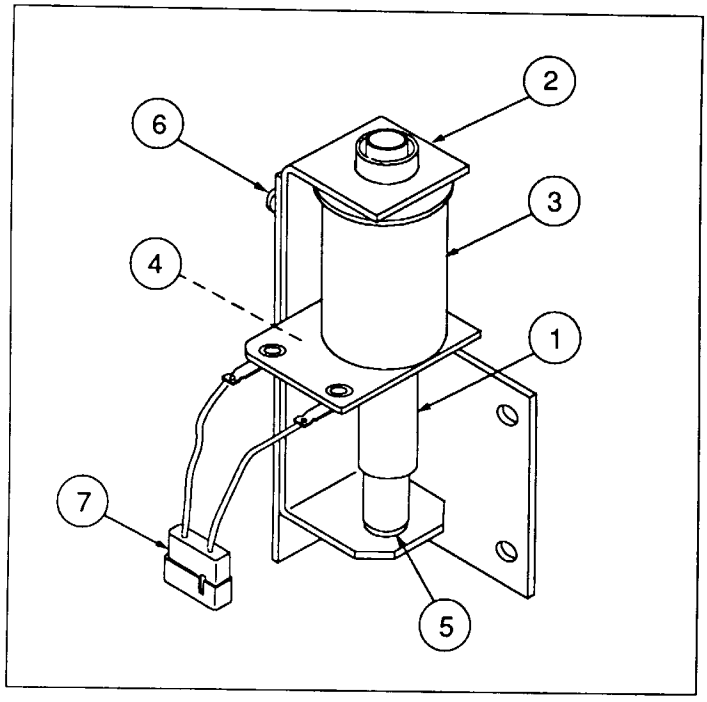
6.	01-11665	Mtg. Bracket - Fighter Plane

* Not available for individual sale. Order Decal Set 31-1786.



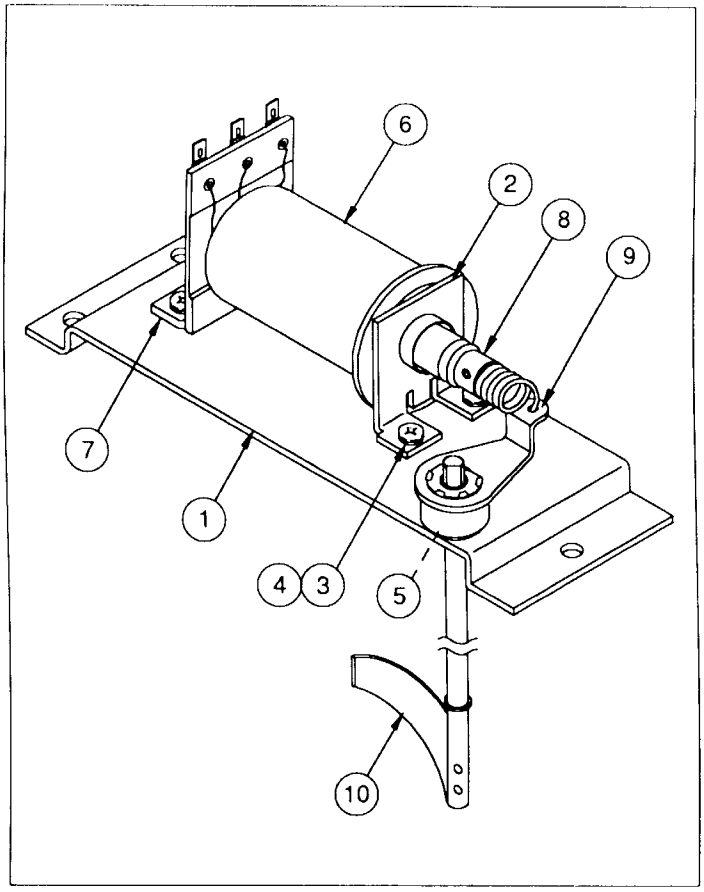
A-14525
Kicker Bracket Assembly

Item	Part Number	Description
1.	A-6306-2	Bell Armature Assembly
2.	A-14526	Mounting Bracket Assembly
3.	01-8-508-T	Solenoid Bracket
4.	10-135	Solenoid Spring
5.	23-6420	Rubber Grommet
6.	AE-23-800	Coil Assembly
7.	03-7067-5	Coil Tubing
8.	4008-01017-04	Mach. Screw, #8-32 x 5/16 P-RH
9.	03-8523	Insulator



B-10686-1
Knocker Assembly

Item	Part Number	Description
1.	A-5387	Coil Plunger Assembly
2.	01-11273	Mtg. Bracket Assembly
3.	AE-23-800	Coil Sub-Assembly
4.	01-8-508-T	Coil Retaining Bracket
5.	23-6420	Rubber Grommet
6.	4008-01017-04	Mach. Screw, 8/32 x 1/4"
7.	H-11835	Knocker Cable
8.	03-7067-5	Coil Tubing

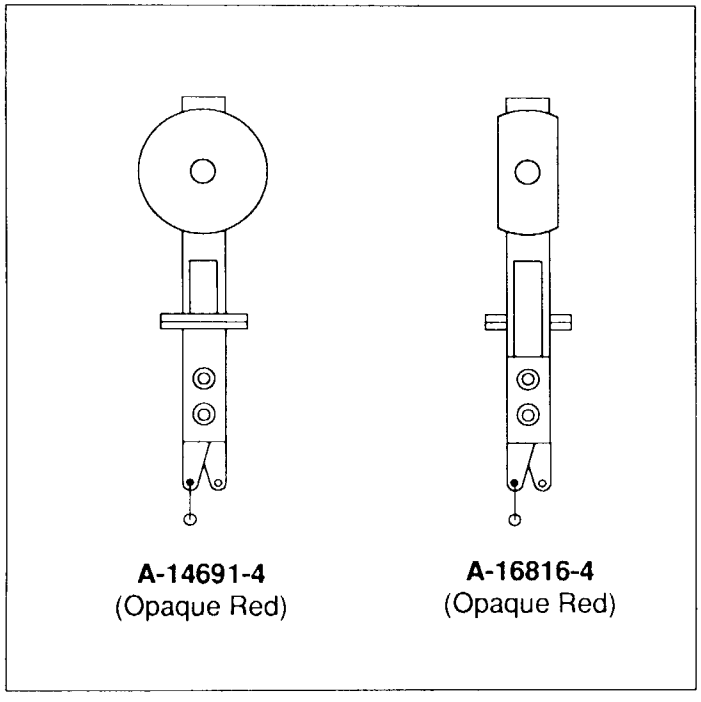


A-16301
Diverter Assembly

Item	Part Number	Description
1.	01-11202	Bracket- Diverter
2.	01-8413-1	Coil Mounting Bracket
3.	4701-00004-00	Lockwasher, #10 Split
4.	4010-01008-06	Mach. Screw, 10-32 x 3/8" P-PH
5.	20-8790	Nylined Bearing
6.	FL-11753-1	Coil Assembly
7.	A-10821	Flipper Stop Assembly

■ **Associated Parts:**

8.	A-16636	Diverter Plunger
9.	A-14185	Drive Arm Assembly
10.	A-16302	Shaft Ball Guide Assembly

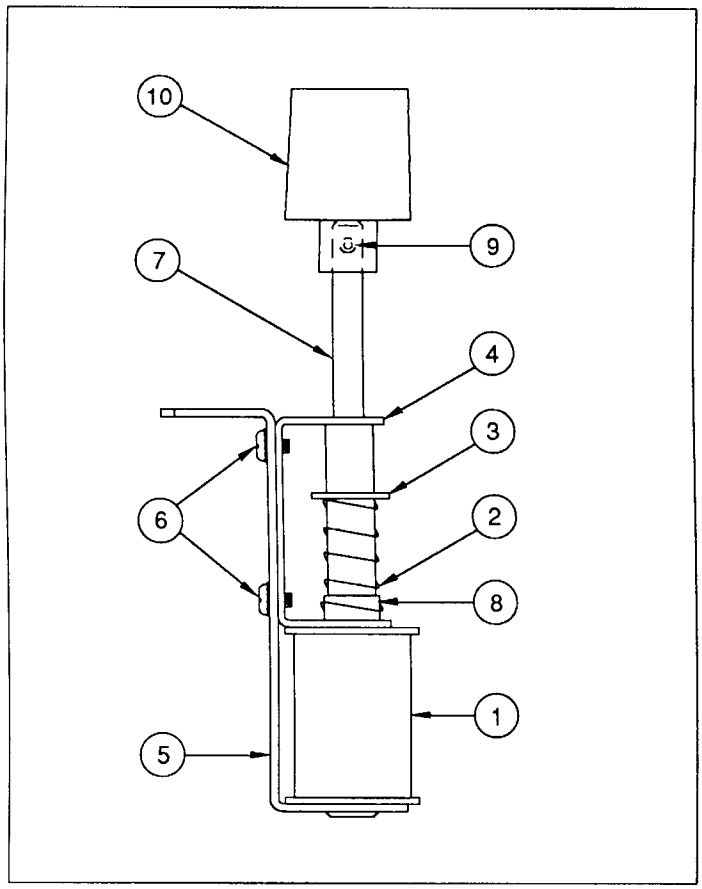


A-14691-4
(Opaque Red)

A-16816-4
(Opaque Red)

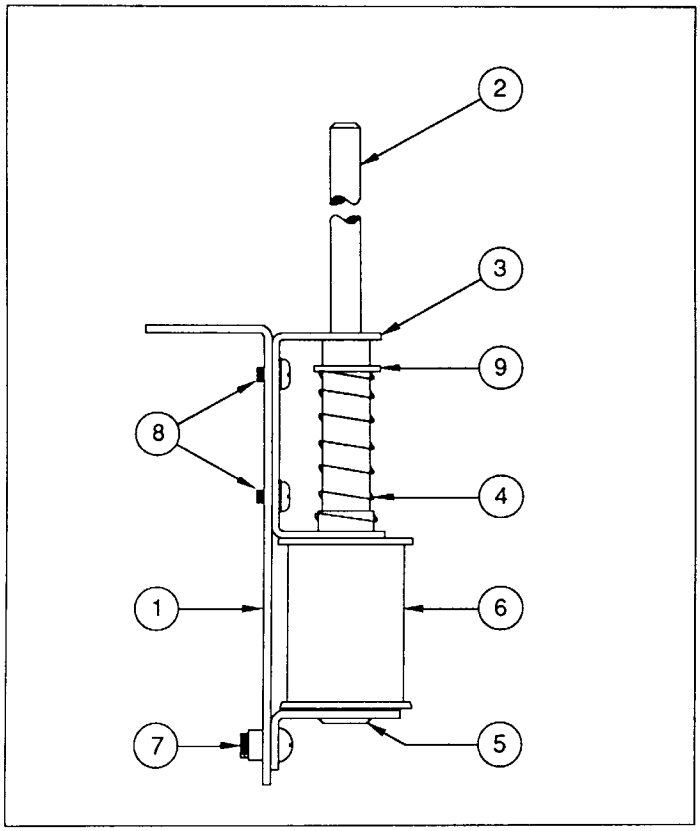
Standup Traget Assemblies

Item	Part Number	Description
1.	A-16816-4	Oblong Standup Target
2.	A-14691-4	Stationary Target Assy. (7 Used)



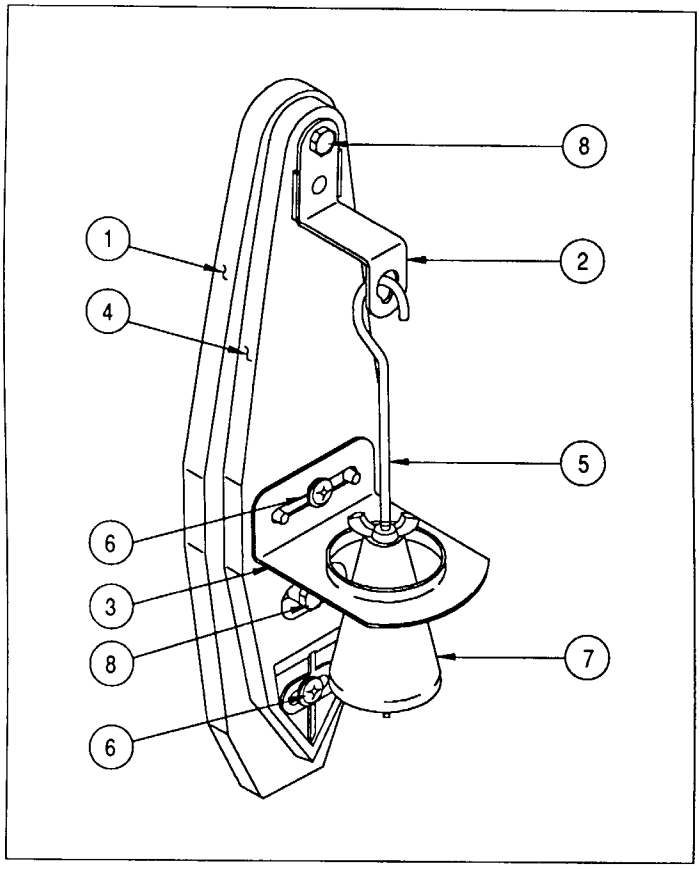
A-16226
Rotor Lock Door Unit Assembly

Item	Part Number	Description
1.	AE-26-1500	Coil Assembly
2.	10-135	Spring
3.	20-8712-43	"E" Ring, 7/16 Shaft
4.	01-10008	Coil Stop Bracket
5.	B-7572-1	Bracket & Stop Assembly
6.	4006-01003-04	Mach. Screw, #6-32 x 1/4 P-PH-S
7.	02-4738	Plunger
8.	03-7066-3	Coil Tubing, 1-7/8" Long
9.	20-8716-1	Roll Pin, 3/32 x 1/2"
10.	03-8844	Rotor Lock Door



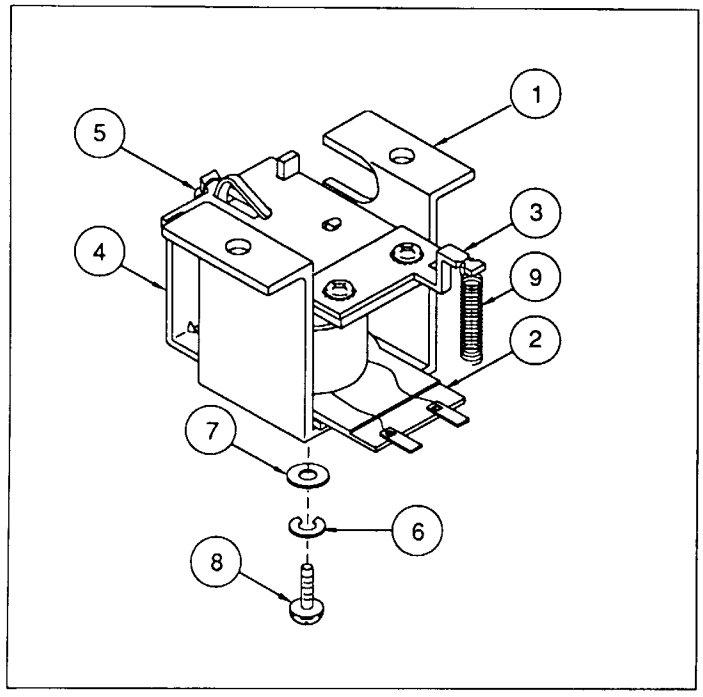
A-16656
Up/Down Post Unit Assembly

Item	Part Number	Description
1.	01-11471	Mtg. Bracket - Up/Down Post
2.	A-16655	Plunger & Rod Assembly
3.	01-11470	Plunger Guide Bracket
4.	10-128	Spring
5.	A-10821	Flipper Stop Bracket Assy.
6.	A-15943	Coil Assembly
7.	4010-01008-06	Mach. Screw, #10-32 x 3/8 P-PH
8.	4008-01003-04	Mach. Screw, #8-32 x 1/4 P-PH-S
9.	20-8712-43	"E"-Ring, 7/16" Shaft



A-15361
Tilt Mechanism Assembly

Item	Part Number	Description
1.	A-15360	Mount Plate, Tilt Mech.
2.	01-3444	Bracket, Tilt Upper
3.	01-3445	Bracket, Tilt Lower
4.	03-8668	Pendulum, Tilt Mech.
5.	12-6231	Wire, Plum Bob
6.	4006-01113-06	MS, 6-32 x 3/8 PL-HEX-WHD
Associated Parts		
7.	20-6502-A	Plum Bob
8.	4406-01120-00	Wing Nut (2)



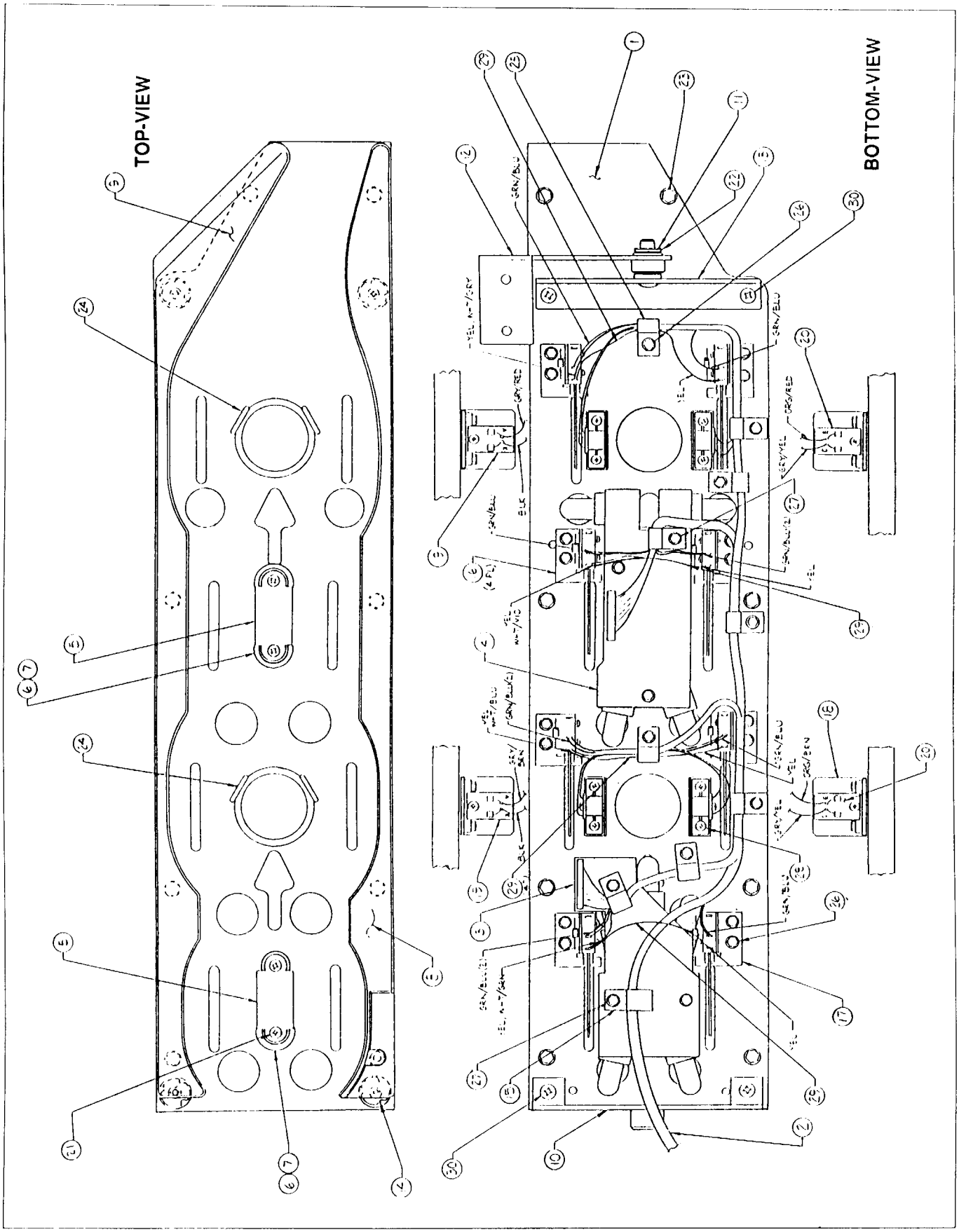
A-14422
Actuator Assembly

Item	Part Number	Description
1.	01-8111	Ball Gate Coil Bracket
2.	A-14406	Coil Assembly
3.	A-11146	Armature Assembly
4.	A-6892	Frame & Eyelet Assembly
5.	10-120	Spring
6.	4701-00003-00	Lockwasher #8 Split
7.	4700-00089-00	Flatwasher, 11/64 x 7/16 x 16ga.
8.	4008-01021-07	Mach. Screw, 8-32 x 7/16"
9.	10-194	Extension Spring

A-17168 Mini-Playfield Assembly

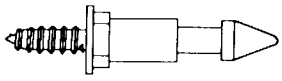
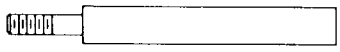
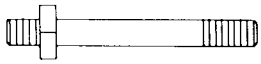
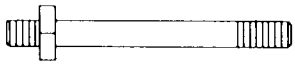
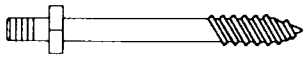
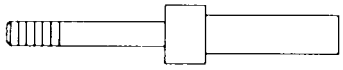
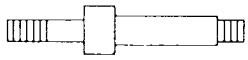
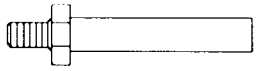
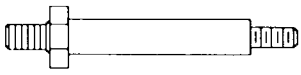
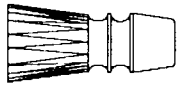
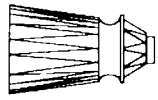
Item	Part Number	Description
1.	36-50017-2	Mini-Playfield Hard Coat
2.	H-16868	Cable, Mini-Playfiled
3.	A-16746	6-Lamp & G.I. PCB
4.	A-16747	6-Lamp & G.I. PCB
5.	03-8318-9	Light Hood Dbl Side Stripple (Red)
6.	03-8319-16	Star Post (Trans. Yellow)
7.	23-6300	Rubber Ring, 5/16"
8.	03-8938	Ball Guide - Left
9.	03-8937	Ball Guide - Right
10.	A-16734	Drive Bracket Assembly
11.	20-8712-25	"E" Ring, 1/4" Shaft
12.	A-16736	Front Pivot Mounting Assembly
13.	A-16735	Pivot Bracket/Shaft Assembly
14.	4408-01118-00	T-Nut, 8-32
15.	03-7655	Cable Clamp, 1/2"
16.	A-12688	Rollover Switch Assembly
17.	A-12688-1	Rollover Switch Assembly
18.	01-11654	Opto Guard Bracket
19.	A-16908	LED Assembly-RTV
20.	A-16909	Photo Transistor Assembly-RTV
21.	4108-01001-26	Sh. Metal Screw, 8 x 1-5/8" P-PW
22.	4700-00072-00	Flatwasher, 17/64 x 1/2 x 21ga.
23.	4108-01170-16	PLS No. 8x 1" HWH, Trilobular
24.	12-6466-2	Wire Ball Guide, 1/2"
25.	03-7655-4	Cable Clamp, 1/4"
26.	4106-01114-08	Sh. Metal Screw, #6x1/2" PLHWH-A
27.	4106-01115-16	Sh. Metal Screw, #6 x 1" PLHWH-A
28.	4104-01001-10	Sh. Metal Screw, #4 x 5/8" PPH
29.	17-1116-4	Wire, 22AWG (Yellow)
30.	4008-01017-10	Mach. Screw, 8-32 x 5/8 PRH-S

A-17168 Mini-Playfield Assembly



Notes

Metal & Plastic Posts

	02-3905	Bumper Post #8 WS	(2)
	02-4176-52	M-F Spacer 8-32 x 3.25"	(1)
	02-4252-20 02-4252-32 02-4252-56	Spacer 6-32 x 1-1/4" Spacer 6-32 x 2" Spacer 6-32 x 3-1/2"	(2) (1) (1)
	02-4424-1	Post 8-32/ #8-32 2-1/32"	(9)
	02-4425-1	Post 8-32/ #8-32 2-3/8"	(3)
	02-4426-1	Post #6-32 /8 1-29/32"	(10)
	02-4434	Post, #8 x 1"	(16)
	02-4659-1	Mini Post	(7)
	02-4679	Bumper Post #10	(1)
	02-4842	Bumper Post #10	(2)
	02-4843	Bumper Post	(2)
	03-8130-13	Double Star Post, Crystal Clear	(2)
	03-8319-16	Star Post #8	(27)

Cable List

Part Number	Description
H-11835	Knocker Cable
H-13870	Black Jumper Cable
H-14584	Dot Matrix Display
H-14790	A.C. Cable
H-14792-1	A.C. Jumper Cable
H-14792-2	A.C. Jumper Cable
H-15476	Logic Power cable
H-15478	Tilt Switch Cable
H-15736	Secondary Cable
H-16229	Playfield Opto Cable
H-16288	General Switch
H-16335	Plfd. Opto Cable
H-16437	Mini-Switch Cable
H-16505	Extended Driver Assembly
H-16727	Plfd. Switch Cable
H-16728	Plfd. Lamp Cable
H-16729	Plfd. Solenoid Cable
H-16730	Cabinet Cable
H-16731-1	Plfd. Opto Cable
H-16868	Mini-Playfield Cable
H-16869	Mini Playfield Cable
H-16870	Flash Lamp Cable
H-16871	Gun Cable
H-16872	Wheel Lock-Up Cable
H-16873	Subway Cable
H-16884	Speaker Panel Cable
H-16893	Mini-Playfield Cable
H-16894	Ramp Cable
H-16954	Back Panel G. I. Cable

Unique Parts List

Part Number	Description
A-12742-50017	WPC CPU Assembly
A-13204-50017	Bottom Arch Assembly
A-13609	3-Bank Opto Board
A-13769-50017	Playfield & Insert
A-13769-50017	Playfield & Insert
A-14092-5	WPC Mounting Plate Assembly
A-15473-1	IEC Power Input Box Assembly
A-16032-2	3-Bank Drop Target Assembly
A-16113	Gun Handle Assembly
A-16123-500017	Backbox Assembly
A-16226	Rotor Lock Door Unit Assembly
A-16231	Rotor Lock Ball Popper Assembly
A-16301	Diverter Assembly
A-16302	Diverter Ball Guide Assembly
A-16317	Ball Trough Assembly
A-16319	Ramp Assembly - Right
A-16384-1	Opto Flipper Assembly
A-16418	Captive Ball Assembly
A-16487	Ball Guide Assembly
A-16488	Ball Guide Assembly
A-16489	Ball Guide Assembly
A-16491	Ball Guide Assembly
A-16492	Ball Guide Assembly
A-16493	Ball Guide Assembly
A-16494	Ball Guide Assembly
A-16576	Speaker/Display Assembly
A-16578	Back Panel Assembly
A-16596-1	Special Ball Gate Assy.-Left
A-16596-2	Special Ball Gate Assy.-Right
A-16636	Diverter Plunger Assembly
A-16641	Ball Guide Unit
A-16654	Opto Plate Assembly
A-16656	Up/Down Post Unit Assembly
A-16706	Metal Ramp Assembly
A-16707	Plane Assembly
A-16708	Idol Assembly
A-16709	Biplane Assembly
A-16710	Right Ruin Assembly
A-16716	39-Lamp Combo PCB Assy.
A-16716-2	38-Lamp Combo PCB Assy.
A-16737	Mini-Playfield Assembly
A-16738	Motor Pivot/Drive Unit
A-16739-1	U-4 Lamp & Spacer Assembly
A-16747	6-PCB Lamp & G.I.
A-16765	Outhole Ball Trough Assembly
A-16783-01	50017 Envelope Assembly - USA
A-16816-4	Oblong Standup Target Assy., Red
A-16823-1	U-3 Lamp PCB Assembly
A-16824	Jackpot Light Assembly
A-16828-1	Cashbox Assembly
A-16834-1	2 LED & Cable Assembly
A-16861	Single Flash Lamp Assembly
A-16863	Metal Bridge Ramp Assembly
A-16883-4	Button Assembly, w/Spring (Red)
A-16892	Unique Parts Assembly
A-16911-1	Flipper Ball Guide Assembly
A-16911-2	Flipper Ball Guide Assembly
A-16912-1, -5	Playfield Plastic Assembly
A-16917-50017	Sound Board Assembly
A-16918	Ball Gate Assembly
A-16921-1	3-Bank Target w/Decal
A-16931	Ball Guide Assembly
A-17040	Opto Switch PCB - w/Spacers
A-17073	Ball Eject Assembly
A-17153	1-Bank Drop Target w/Decal
A-17153	P/B Switch & Cable Assembly
A-8552-50017	Back Glass Assembly
01-11307	Ball Guide
01-11308	Ball Guide
01-11310	Ball Guide
01-11384	Ball Guide
01-11385	Ball Guide Arch
01-11386	Ball Guide Arch
01-11387	Ball Guide Arch
01-11519	Ball Guide
01-11520	Ball Guide
01-11533	Guard - Right Ramp
01-11534	Guard - Left Ramp
01-11541	Straight Metal Ramp
01-11542	Chute - Metal
01-11653	Bracket - Fence
01-11665	Mtg. Bracket, Fight Plate
01-11757	Ball Guide
01-11768	Ball Guide
01-11781	Support Bracket
02-4842	Bumper Post
02-4843	Bumper Post
03-8906	Ruins, Left
11-1102	Cabinet
11-1109-A	Rail, 1/2 x 1-1/8 x 41
11-1109-B	Rail, 1/2 x 1-1/8 x 41
11-1109-C	Rail, 1/2 x 1-1/8 x 5
11-50017-IN	Wood Insert Panel
12-7069	Wire Ramp - Left
12-7070	Wire Ramp - Right
12-7080	Wire Ramp Bottom
12-7107	Wire Ball Guide
12-7108	Wire Ball Guide
31-1002-50017	Screened Playfield
31-1002A-50017	Screened Playfield
31-1008-50017	Bottom Arch Screened
31-1357-50017	Backglass
31-1420-50017	Speaker Panel Cover, Screened
31-1769	Speaker Grill
31-1773-	Playfield Plastic Set
5795-10938-32	Ribbon Cable, 32"
5795-13018-01	Ribbon Cable, 9.5"

UPPER PLAYFIELD PARTS LIST

Item	Part Number	Description
1	A-14525	Shooter
2	A-16765	Ball Trough
3	A-15205-R-2	Flipper Assembly
3a)	20-9250-5	Flipper Paddle & Shaft
4	A-16911-1	Flipper Ball Guide
5	A-16918	Ball Gate Assembly
6	A-14369-R	Right Slingshot
6a)	B-12665	Nylon Kicker
7	12-6466-6	Wire Guide
8	A-16641	Ball Guide
9	12-7070	Wire Ramp-Right
10	A-16418	Standup Target
11	A-16228	Rotor Lock Unit
11a)	14-7982	Motor
11b)	A-16225	Opto Interrupter Plate
11c)	A-16226	Rotor Lock Door Unit
11d)	A-16227	Rotor Lock Opto Assembly
11e)	A-16708	Idol Assembly
12	A-16231	Ball Popper
13	01-11533	Right Ramp Guard
14	01-11534	Left Ramp Guard
15	A-16707	Plane
16	A-14615	Single Drop Target
17	A-16654	Opto Plate Assembly
18	A-16302	Diverter Ball Guide
19	A-16301	Diverter Assembly
19a)	A-16636	Diverter Plunger
19b)	A-14185	Drive Arm Assembly
20	A-16319	Right Ramp Assembly
21	A-16418	Captive Ball Wireform
22	A-16596-2	Ball Gate Assembly
22a)	A-14422	Coil & Bracket Assembly
23	A-16863	Metal Bridge Ramp
24	A-16596-1	Ball Gate Assembly
24a)	A-14422	Coil & Bracket Assembly
25	A-16738	Motor Drive Unit
25a)	A-16657	Motor Opto Switch Assembly
26	A-16656	Up/Down Post Assembly
27	A-16706	Metal Ramp
28	A-17168	Mini Playfield Assembly
28a)	12-6466-5	Wire Guide 1-1/4
28b)	12-6466-2	Wire Guide 1/2
28c)	A-16735	Pivot Bracket/Shaft Assembly
29	A-16709	Bi-Plane Assembly
30	A-16824	Jackpot Light Assembly
31	A-16816-4	Oblong Standup Target
32	01-11541	Straight Metal Ramp
33	01-11542	Metal Chute
34	A-16032-2	3-bank Drop Target
35	12-7080	Wire Ramp-Bottom
36	12-7069	Wire Ramp-Left
37	12-6466-1	Wire Guide
38	A-14369-L	Left Slingshot
39	A-16911-2	Flipper Ball Guide

Item	Part Number	Description
40	A-15205-L-2	Flipper Assembly
40a)	20-9250-5	Flipper Paddle & Shaft
41	A-9415-2	Jet Bumper Assembly
42	A-17073	Ball Eject Assembly
42a)	A-9381-L	Micro Switch Eject Assembly
43	A-16710	Right Ruins
44	A-13204-50017	Bottom Arch Assembly

Parts Under Bottom Arch

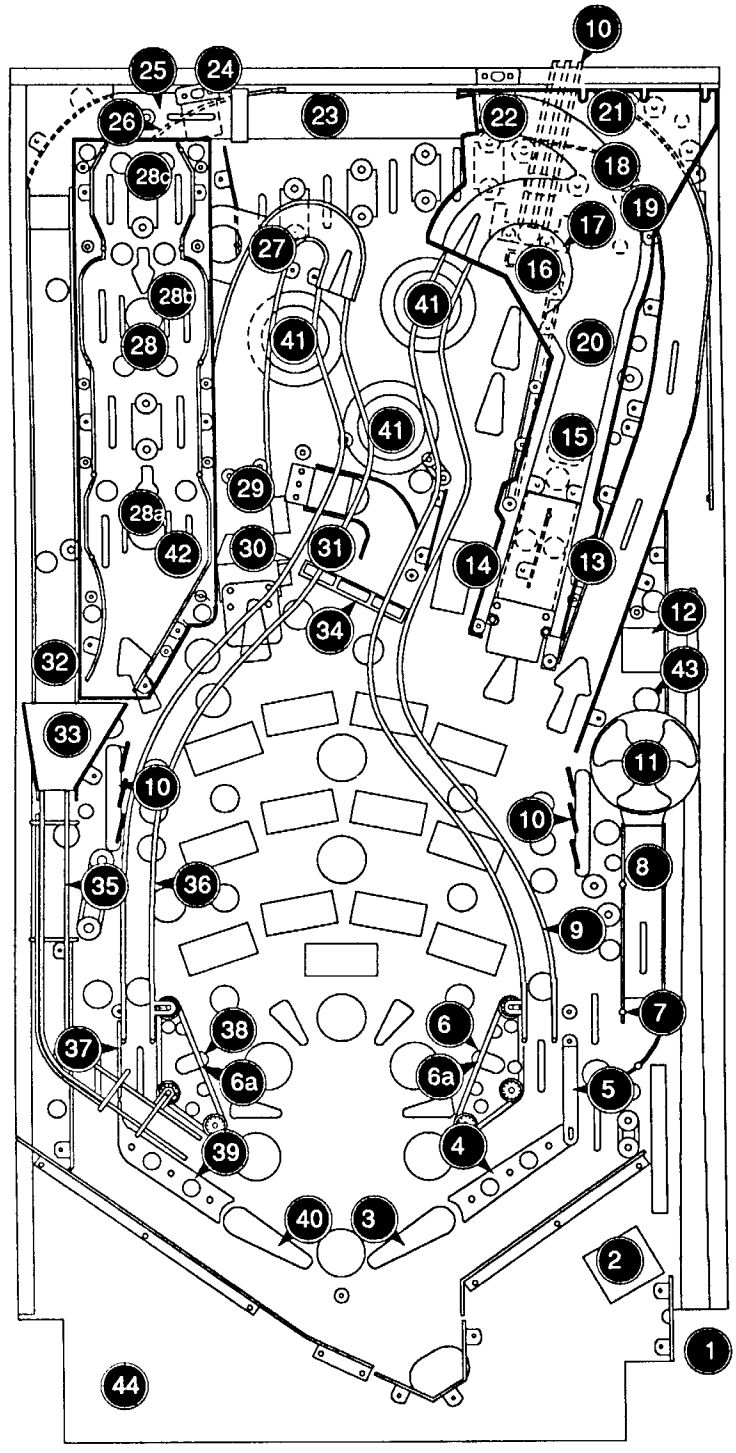
Part Number	Description
31-1008-50017	Screened Bottom Arch
12-7090	Wire Fence
20-9041	Tinnerman Speednut
20-9601	#8-32 Nut Retainer

Not Shown

Part Number	Description
A-16765	Ball Trough Assembly Complete
03-8929-1	*Full Playfield Mylar
16-50017-1	Instruction Card
20-6500	Steel Ball

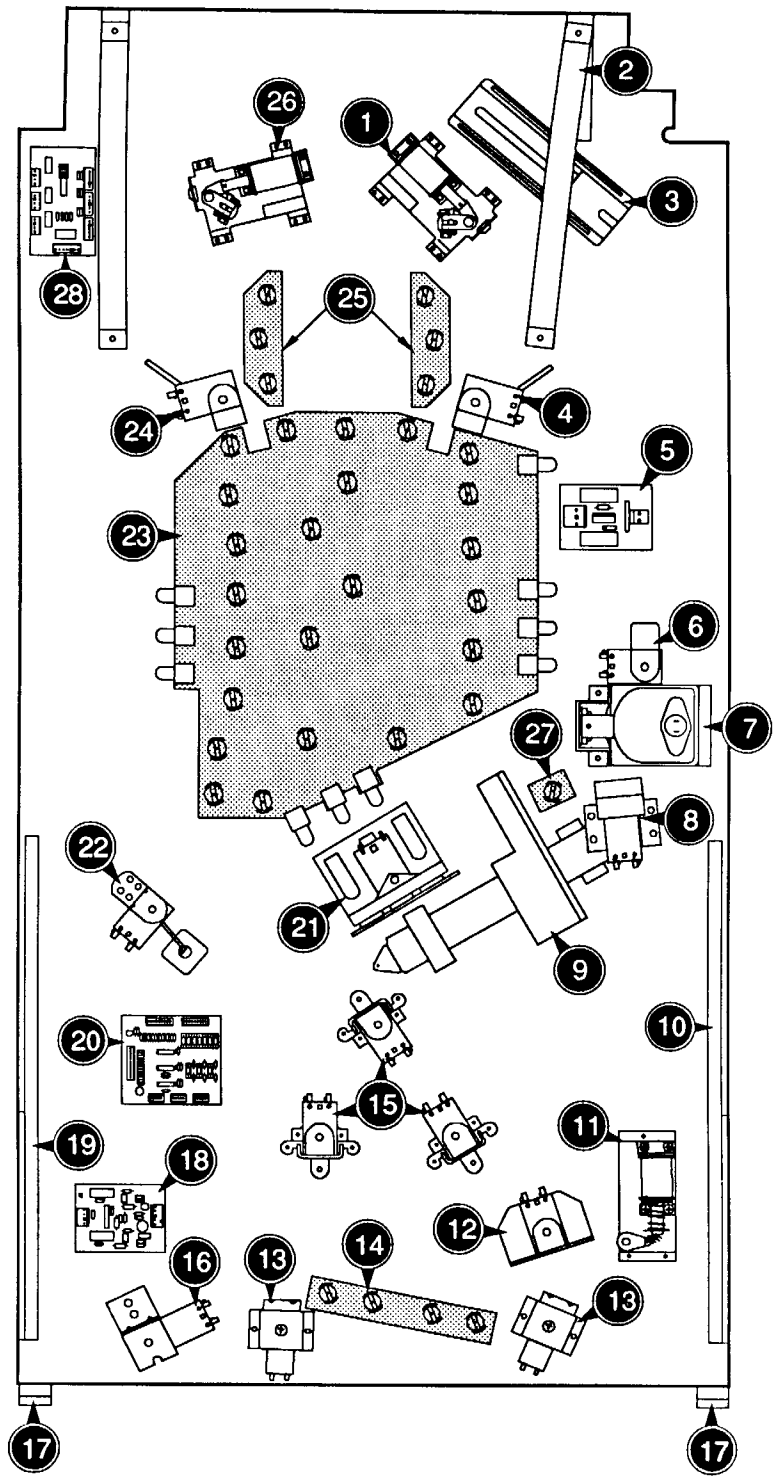
***The *INDIANA JONES* hardcoat playfield does not require a full mylar. However Mylars can be purchased through your local Williams Distributor.**

UPPER PLAYFIELD PARTS LOCATIONS



LOWER PLAYFIELD PARTS

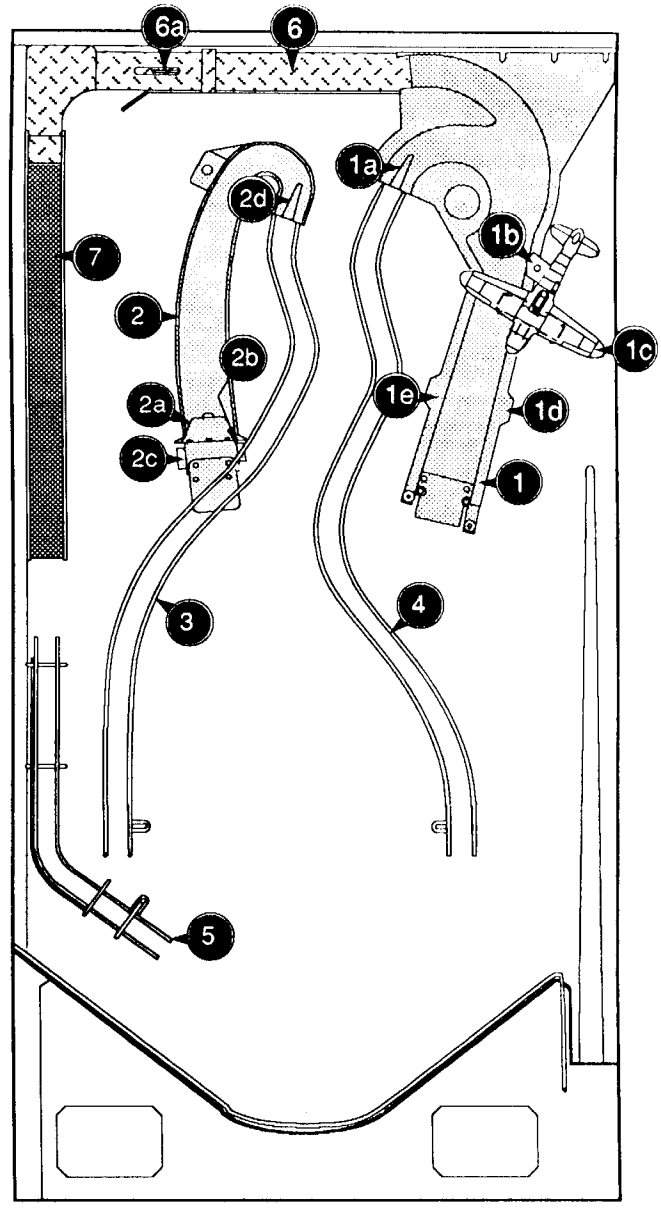
Item	Part Number	Description
1.	A-15205-R-2	Lower Right Flipper Assembly
2.	01-11781	Support Bracket (2 Used)
3.	A-16765	Outhole Ball Trough Assembly
4.	B-12665	Kicker Arm (Slingshot) Assy., Right
a)	A-14369-R	Coil & Bracket Assembly
b)	10-128	Spring
c)	B-8284-1	Kicker Switch Assembly
5.	A-15340	Motor EMI Board
6.	A-16226	Rotor Lock Door Unit Assy.
7.	A-16228	Rotor Lock Unit assembly
8.	A-16231	Rotor Ball Popper Assembly
9.	A-16317	Ball Trough Assembly
10.	A-16637-2	Plfd. Slide Mechanism, Right
11.	A-16301	Diverter Assembly
12.	A-14615	1-Bank Drop Target Assembly
13.	A-14522	Actuator Assembly (2 Used)
14.	A-16739	4-Lamp PC Board
15.	A-9415-2	Jet Bumper Coil Assembly
16.	B-12030-2	Switch & Diode Assembly (3 Used)
17.	01-10726	Rear Guide Leg (2 Used)
18.	A-15946	Bridge Driver PC Board
19.	A-16637-1	Plfd. Slide Mechanism, Left
20.	A-15430	10-Switch Opto Assembly
21.	A-16929-1	3-Bank Drop Target Assembly
22.	A-17073	Ball Eject Assembly
23.	A-16716-2	38-Lamp Combo Assembly
24.	B-12665	Kicker Arm (Slingshot) Assy., Left
a)	A-14369-L	Coil & Bracket Assembly
b)	10-128	Spring
c)	B-8284-1	Kicker Switch Assembly
25.	A-16823	3-Lamp Board (2 Used)
26.	A-15205-L-2	Lower Left Playfield Assembly
27.	B-12224	Single Lamp Board
28.	A-13901-2	Opto Ramp Switch Board



Underside of Playfield, Viewed In Raised Position

RAMPS LOCATIONS

Item	Part Number	Description
1.	**A-16319**	**Rt. Plastic Ramp Assembly**
a)	5647-12693-21	Sub-miniature Switch
b)	01-11665	Mounting Bracket-Fighter Plane
c)	A-16707	Fighter Plane
d)	A-16909	Photo Transistor Assy.,-RTV
e)	A-16908	LED Assembly, RTV
2.	**A-16706**	**Metal Ramp Assembly**
a)	A-16824	Jackpot Light Assembly
b)	A-16909	Photo Transistor Assy., RTV
c)	A-16908	LED Assembly, RTV
d)	5647-12693-21	Sub-miniature Switch
3.	12-7069	Wire Ramp - Left
4.	12-7070	Wire Ramp - Right
5.	12-7080	Wire Ramp - Bottom
6.	A-16863	Bridge Ramp Assembly
7.	01-11541	Straight Metal Ramp



SWITCHES

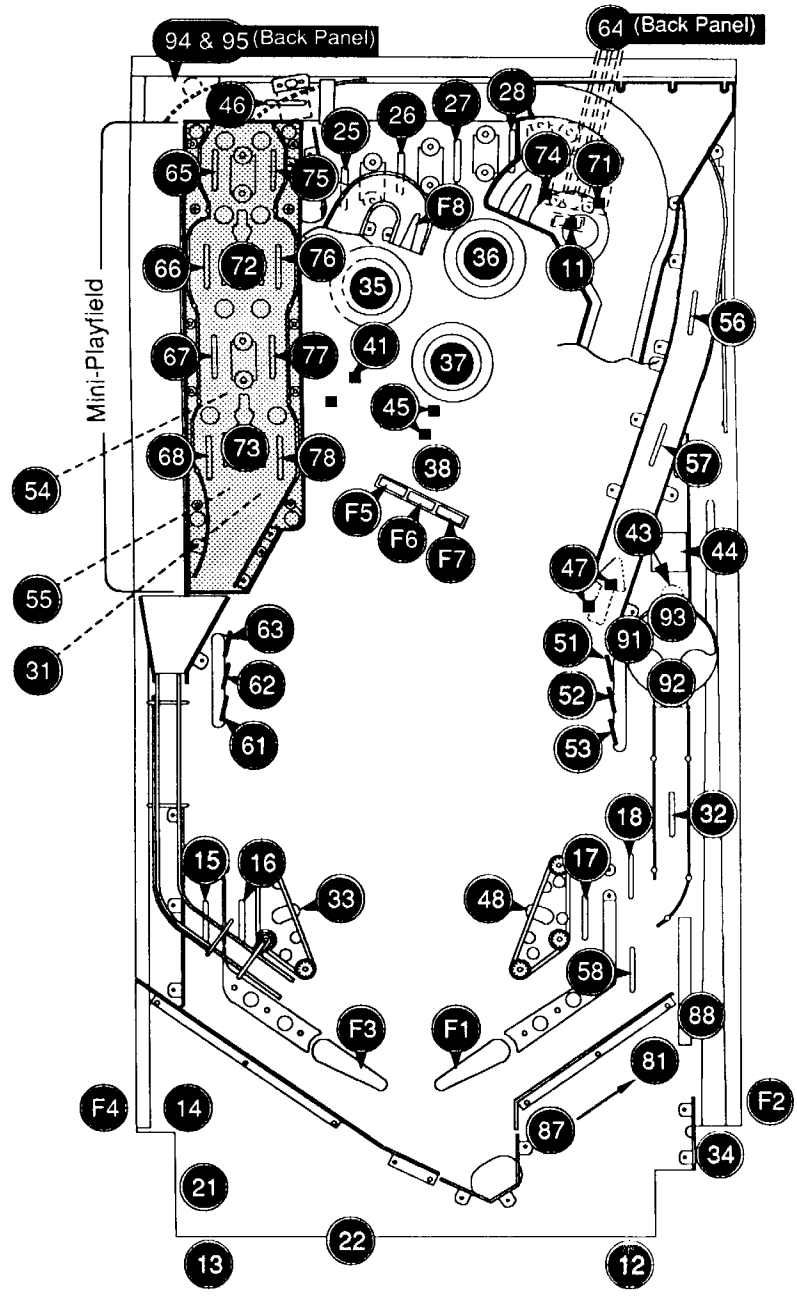
Green ⟶ White

Dedicated Grounded Switches	Row \ Column	1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-9 U20-11	9 Violet-White Q11 J5-4	Flipper Grounded Switches
Orange-Brown J205-1 Left Coin Chute D1	White-Brown J209-1 U18-11 1	Single Drop Top 11	Slam Tilt 21	Left Eject 31	Left Ramp Enter 41	Advent(u)re Tgt. 51	(A)dventure Tgt. 61	Captive Ball Frt. 71	Trough 6 81	Wheel Position 1 91	Black-Green J906-1 Lower Right E.O.S. F1
Orange-Red J205-2 Center Coin Chute D2	White-Red J209-2 U18-9 2	Buy-in Button 12	Coin Door Closed 22	Exit Idol 32	Right Ramp Enter 42	Adventu(r)e Tgt. 52	A(d)venture Tgt. 62	Mini Top Hole 72	Trough 5 82	Wheel Position 2 92	Blue-Violet J905-1 Lower Right Opto F2
Orange-Black J205-3 Right Coin Chute D3	White-Orange J209-3 U18-5 3	Start Button 13	Ticket Opto 23	Left Slingshot 33	Top Idol Enter 43	Adventur(e) Tgt. 53	Ad(v)enture Tgt. 63	Mini Bottom Hole 73	Trough 4 83	Wheel Position 3 93	Black-Blue J906-3 Lower Left E.O.S. F3
Orange-Yellow J205-4 4th Coin Chute D4	White-Yellow J209-4 U18-7 4	Plumb Bob Tilt 14	Always Closed 24	Gun Trigger 34	Right Popper 44	Left Loop Top 54	Captive Ball Back 64	Right Ramp Made 74	Trough 3 84	Mini Playfield Left Limit 94	Blue-Gray J905-2 Lower Left Opto F4
Orange-Green J205-6 Normal Function / Service Credits / Test Function / Escape D5	White-Green J209-5 U19-11 5	Left Outlane 15	(I)ndy Lane 25	Left Jet 35	Center Enter 45	Left Loop Bottom 55	Mini Top Left 65	Mini Top Right 75	Trough 2 85	Mini Playfield Right Limit 95	Black-Violet J906-4 *Center Drop Bank Left F5
Orange-Blue J205-7 Normal Function / Volume Down / Test Function / Down D6	White-Blue J209-7 U19-9 6	Left Return Lane 16	I(n)dy Lane 26	Right Jet 36	Top Post 46	Right Loop Top 56	Mini Middle Top Left 66	Mini Middle Top Right 76	Trough 1 86		Black-Yellow J905-3 *Center Drop Bank Middle F6
Orange-Violet J205-8 Normal Function / Volume Up / Test Function / Up D7	White-Violet J209-8 U19-5 7	Right Return Lane 17	In(d)y Lane 27	Bottom Jet 37	Subway Lockup 47	Right Loop Bottom 57	Mini Middle Bottom Left 67	Mini Middle Bottom Right 77	Top Trough 87		Black-Gray J906-5 *Center Drop Bank Right F7
Orange-Gray J205-9 Normal Function / Begin Test / Test Function / Enter D8	White-Gray J209-9 U19-7 8	Right Outlane Top 18	Ind(y) Lane 28	Center Standup 38	Right Slingshot 48	Right Outlane Bottom 58	Mini Bottom Left 68	Mini Bottom Right 78	Shooter 88		Black-Blue J905-5 *Left Ramp Made F8

Note; Used as switches other than flipper switches in this game.

SWITCH LOCATIONS

Item	Switch No.	Where Used
F1	SW-1A-194	Lwr Rt. Flipper EOS
F2	A-16384-1	Lwr Rt. Flipper Cab.
F3	SW-1A-194	Lwr Lt. Flipper EOS
F4	A-16384-1	Lwr Lt. Flipper Cab.
F5	A-13609	Center Drop Bank Left
F6	A-13609	Center Drop Bank Mid.
F7	A-13609	Center Drop Bank Right
F8	5647-12693-21	Left Ramp Made
11	5647-12693-31	Single Drop Target
12	20-9663-12	Buy-in Button
13	20-9663-11	Start Button
14	A-6502-A	Plumb Bob Tilt
15	A-12688	Left Outlane
16	A-12688	Left Return Lane
17	A-12688	Right Return Lane
18	A-12688-1	Right Outlane Top
21	SW-1A-117	Slam Tilt
22	5643-09288-00	Coin Door Closed
23		Not Used
24	5643-09288-00	†Always Closed
25	A-12688	(I)ndy Lane
26	A-12688	I(n)dy Lane
27	A-12688	In(d)y Lane
28	A-12688	Ind(y) Lane
31	5647-12133-11	Left Eject
32	5647-12693-25	Exit Idol
33	SW-1A-114 (kick) SW-1A-120 (score*)	Left Slingshot
34	5647-12133-12	Gun Trigger
35	SW-11A-37	Left Jet Bumper
35	SW-11A-37	Right Jet Bumper
37	SW-11A-37	Bottom Jet Bumper
38	A-16816-4	Center Standup Target
41	A-16908 (LED) A-16909 (trans.)	Left Ramp Enter
42	A-14231 (LED) A-14232 (trans.)	Right Ramp Enter
43	A-14231 (LED) A-14232 (trans.)	Top Idol Enter
44	A-14231 (LED) A-14232 (trans.)	Right Popper
45	A-14231 (LED) A-14232 (trans.)	Center Enter
46	5647-12693-56	TopPost
47	A-14231 (LED) A-14232 (trans.)	Subway Lockup
48	SW-1A-114 (kick) SW-1A-120 (score*)	Right Slingshot
51	A-14691-4	Advent(u)re Target
52	A-14691-4	Adventu(r)e Target
53	A-14691-4	Adventur(e) Target
54	A-12688	Left Loop Top
55	A-12688	Left Loop Bottom
56	A-12688	Right Loop Top
57	A-12688	Right Loop Bottom
58	A-12688	Right Outlane Bottom
61	A-14691-4	(A)dventure Target
62	A-14691-4	A(d)venture Target
63	A-14691-4	Ad(v) enture Target
64	A-16418	Captive Ball Back
65	A-12688	Mini Top Left
66	A-12688	Mini Mid. Top Left
67	A-12688	Mini Mid. Bottom Left
68	A-12688	Mini Bottom Left
71	A-14231 (LED) A-14232 (trans.)	Captive Ball Front
72	A-16908 (LED) A-16909 (trans)	Mini Top Hole
73	A-16908 (LED) A-16909 (trans.)	Mini Bottom Hole
74	5647-12693-21	Right Ramp Made
75	A-12688-1	Mini Top Right
76	A-12688-1	Mini Mid. Top Right
77	A-12688-1	Mini Mid. Bot. Right
78	A-12688-1	Mini Bottom Right
81	A-16927 (LED) A-16926 (trans.)	Trough 6
82	A-16927 (LED) A-16926 (trans.)	Trough 5
83	A-16927 (LED) A-16926 (trans.)	Trough 4
84	A-16927 (LED) A-16926 (trans.)	Trough 3

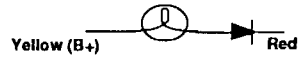


Item	Switch No.	Where Used
85	A-16927 (LED) A-16926 (trans.)	Trough 2
86	A-16927 (LED) A-16926 (trans.)	Trough 1
87	A-16927 (LED) A-16926 (trans.)	Trough Top
88	A-12688	Shooter
91	A-14231 (LED) A-14232 (trans.)	Wheel Position 1
92	A-14231 (LED) A-14232 (trans.)	Wheel Position 2
93	A-14231 (LED) A-14232 (trans.)	Wheel Position 3
94	A-16657	Mini Plfd Right Limit
95	A-16657	Mini Plfd Left Limit

† Not Shown

* The Score slingshot switches have diodes across them.

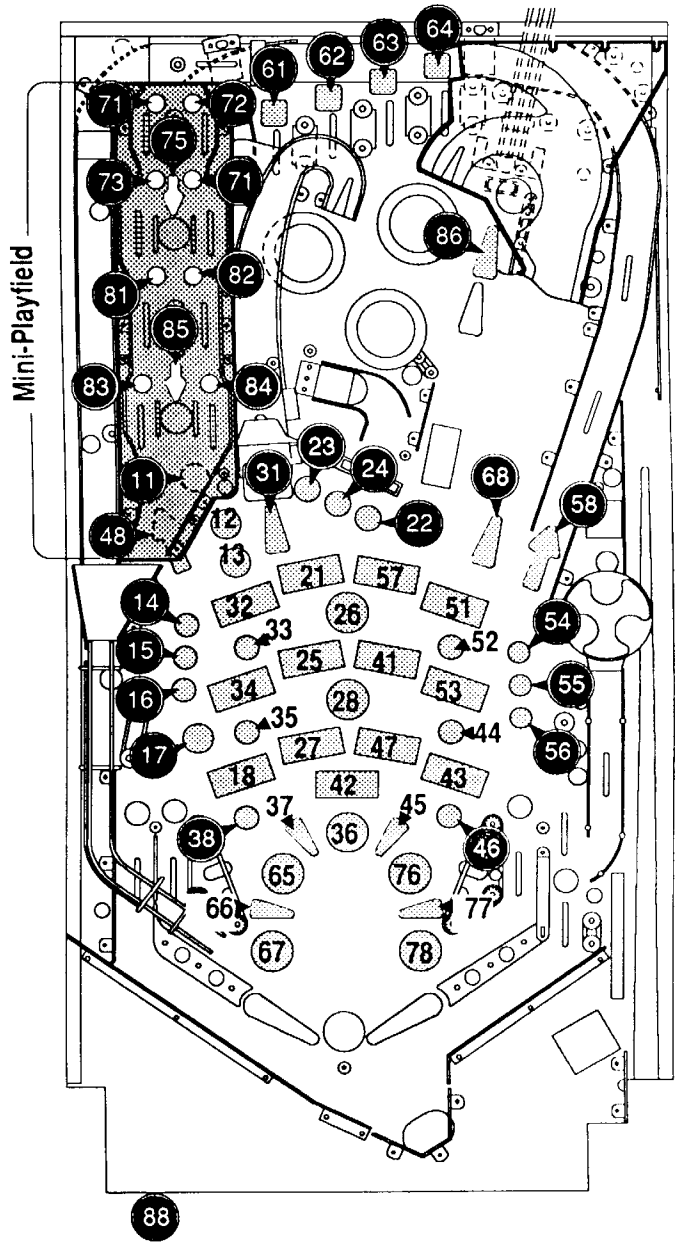
LAMPS



Column / Row	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J137-7 Q92	8 Yellow-Gray J137-9 Q91
Red-Brown J133-1 Q90 — 1	Mode Start 11	Tank Chase 21	Left Ramp Arrow 31	Mine Cart 41	Choose Wisely 51	(I)ndy 61	Mini Top Left 71	Mini Middle Bottom Left 81
Red-Black J133-2 Q89 — 2	Hand of Fate 12	Adven(t)ure Light 22	Castle Grunewald 32	Ark Jackpot 42	Right Plane Top 52	I(n)dy 62	Mini Top Right 72	Mini Middle Bottom Right 82
Red-Orange J133-4 Q88 — 3	Eject Extra Ball 13	Adv(e)ture Light 23	Left Plane Top 33	Raven Bar 43	Rope Bridge 53	In(d)y 63	Mini Middle Top Left 73	Mini Bottom Left 83
Red-Yellow J133-5 Q87 — 4	Ad(v)enture Light 14	Adve(n)ture Light 24	Monkey Brains 34	Right Plane Middle 44	Advent(u)re Light 54	Ind(y) 64	Mini Middle Top Right 74	Mini Bottom Right 84
Red-Green J133-6 Q86 — 5	A(d)venture Light 15	Steal The Stones 25	Left Plane Middle 35	Bonus 6X 45	Adventu(r)e Light 55	Willie 65	Mini Top Arrow 75	Mini Bottom Arrow 85
Red-Blue J133-7 Q85 — 6	(A)dventure Light 16	Grail Jackpot 26	Sallah 36	Right Plane Bottom 46	Adventur(e) Light 56	Bouns 2X 66	Marion 76	Totem Top Arrow 86
Red-Violet J133-8 Q84 — 7	Shoot Again 17	Streets Of Cairo 27	Bonus 4X 37	Well Of Souls 47	The 3 Challenges 57	Shorty 67	Bonus 8X 77	Center Lock 87
Red-Gray J133-9 Q83 — 8	Get The Idol 18	Stones Jackpot 28	Left Plane Bottom 38	Left Loop 48	Right Loop 58	Right Ramp Arrow 68	Dr. Jones 78	Start Button 88

LAMPS LOCATIONS

Item	Bulb No.	Lamp Assy No.	Description
11	24-8768	A-16716-2	Mode Start #555
12	24-8768	A-16716-2	Hand of Fate #555
13	24-8768	A-16716-2	Eject Extra Ball #555
14	24-8768	A-16716-2	Ad(v)enture Light #555
15	24-8768	A-16716-2	A(d)venture Light #555
16	24-8768	A-16716-2	(A)dventure Light #555
17	24-8768	A-16716-2	Shoot Again #555
18	24-8768	A-16716-2	Get the Idol #555
21	24-8768	A-16716-2	Tank Chase #555
22	24-8758	A-16716-2	Adven(t)ure Light #555
23	24-8768	A-16716-2	Adv(e)nture Light #555
24	24-8768	A-16716-2	Adve(n)ture Light #555
25	24-8768	A-16716-2	Steal the Stones #555
26	24-8768	A-16716-2	Grail Jackpot #555
27	24-8768	A-16716-2	Street of Cairo #555
28	24-8768	A-16716-2	Stones Jackpot #555
31	24-8768	A-16716-2	Left Ramp Arrow #555
32	24-8768	A-16716-2	Castle Grunewald #555
33	24-8768	A-16716-2	Left Plane Top #555
34	24-8768	A-16716-2	Monkey Brains #555
35	24-8768	A-16716-2	Left Plane Middle #555
36	24-8768	A-16716-2	Sallah #555
37	24-8768	A-16716-2	Bonus 4X #555
38	24-8768	A-16716-2	Left Plane Bottom #555
41	24-8768	A-16716-2	Mine Cart #555
42	24-8768	A-16716-2	Ark Jackpot #555
43	24-8768	A-16716-2	Raven Bar #555
44	24-8768	A-16716-2	Right Plane Middle #555
45	24-8768	A-16716-2	Bonus 6X #555
46	24-8768	A-16716-2	Right Plane Bottom #555
47	24-8768	A-16716-2	Well of Souls #555
48	24-6549	A-11754	Left Loop #44
51	24-8768	A-16716-2	Choose Wisely #555
52	24-8768	A-16716-2	Right Plane Top #555
53	24-8768	A-16716-2	Rope Bridge #555
54	24-8768	A-16716-2	Advent(u)re Light #555
55	24-8768	A-16716-2	Adventu(r)e Light #555
56	24-8768	A-16716-2	Adventur(e) Light #555
57	24-8768	A-16716-2	The 3 Challenges #555
58	24-8768	B-15648	Right Loop #555
61	24-8768	A-16739	(I)-N-D-Y #555
62	24-8768	A-16739	I-(N)-D-Y #555
63	24-8768	A-16739	I-N-(D)-Y #555
64	24-8768	A-16739	I-N-D-(Y) #555
65	24-8768	A-16823	Willie #555
66	24-8768	A-16823	Bonus 2X #555
67	24-8768	A-16823	Shorty #555
68	24-6549	A-11754	Right Ramp Arrow #44
71	24-8768	A-16746	Mini Top Left #555
72	24-8768	A-16746	Mini Top Right #555
73	24-8768	A-16746	Mini Mid. Top Left #555
74	24-8768	A-16746	Mini Mid. Top Right #555
75	24-8768	A-16746	Mini Top Arrow #555
76	24-8768	A-16823	Marion #555
77	24-8768	A-16823	Bonus 8X #555
78	24-8768	A-16823	Dr. Jones #555



Item	Bulb No.	Lamp Assy No.	Description
81	24-8768	A-16747	Mini Mid. Bot. Left #555
82	24-8768	A-16747	Mini Mid. Bot. Right #555
83	24-8768	A-16747	Mini Bottom Left #555
84	24-8768	A-16747	Mini Bottom Right #555
85	24-8768	A-16747	Mini Bottom Arrow #555
86	24-6549	A-11754	Totem Top Arrow #44
87	24-6549	A-11754	Center Lock #44
88	------	20-9663-11	Start Button

SOLENOID / FLASHER TABLE

Sol. No.	Function	Solenoid Type	Voltage Connections			Drive xister	Drive Connections			Drive Wire Color	Solenoid Part Number Flashlamp Type	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Backbox
01	Ball Popper	High Power	J107-3			Q82	J130-1			Vio-Brn	AE-26-1200	
02	Ball Launch	High Power	J107-3			Q80	J130-2			Vio-Red	AE-23-800	
03	Totem Drop Up	High Power	J107-3			Q78	J130-4			Vio-Org	AE-26-1200	
04	Ball Release	High Power	J107-3			Q76	J130-5			Vio-Yel	AE-26-1500	
05	Center Drop Bank	High Power	J107-3			Q64	J130-6			Vio-Grn	AE-26-1200	
06	Idol Release	High Power	J107-3			Q66	J130-7			Vio-Blu	AE-26-1500	
07	Knocker	High Power	J107-3			Q68	J130-8			Vio-Blk	AE-23-800	
08	Left Eject	High Power	J107-3			Q70	J130-9			Vio-Gry	AE-26-1200	
09	Left Jet Bumper	Low Power	J107-2			Q58	J127-1			Brn-Blk	AE-26-1200	
10	Right Jet Bumper	Low Power	J107-2			Q56	J127-3			Brn-Red	AE-26-1200	
11	Bumpeur Bas	Low Power	J107-2			Q54	J127-4			Brn-Org	AE-26-1200	
12	Left Slingshot	Low Power	J107-2			Q52	J127-5			Brn-Yel	AE-27-1200	
13	Right Slingshot	Low Power	J107-2			Q50	J127-6			Brn-Grn	AE-27-1200	
14	Left Control Gate	Low Power	J107-2			Q48	J127-7			Brn-Blu	A-14406	
15	Right Control Gate	Low Power	J107-2			Q46	J127-8			Brn-Vio	A-14406	
16	Totem Drop Down	Low Power	J107-2			Q44	J127-9			Brn-Gry	SM1-26-600	
17	Eternal Life	Flasher	J107-6	J106-5		Q42	J126-1	J125-1		Blk-Brn	#906 (1)	#906 (3)
18	Light Jackpot	Flasher	J107-6			Q40	J126-2			Blk-Red	#906 (1)	
19	Super Jackpot	Flasher	J107-6			Q38	J126-3			Blk-Org	#89 (1)	
20	Jackpot	Flasher	J107-6	J106-5		Q36	J126-4	J125-5		Blk-Yel	#89 (1)	#906 (2)
21	Path Of Adventure	Flasher	J107-6	J106-5		Q28	J126-5	J125-6		Blu-Grn	#89 (1)	#906 (4)
22	Mini Motor Left	Low Power	J118-2			Q30	J126-6			Blu-Blk		
23	Mini Motor Right	Low Power	J118-2			Q34	J126-7			Blu-Vio	14-7988	
24	Plane Gun LEDS	Flasher	J118-2	J106-5		Q32	J126-8	J125-9		Blu-Gry	A-16834	
25	Dogfight Hurry Up	Gen. Purpose	J107-6			Q26	J122-1			Blu-Brn	#89 (1)	
26	Right Ramp	Gen. Purpose	J107-6	J106-5		Q24	J122-2	J124-2		Blu-Red	#89 (3)	#906 (1)
27	Left Ramp	Gen. Purpose	J107-6	J106-5		Q22	J122-3	J124-3		Blu-Org	#89 (1)	#906 (1)
28	Subway Release	Gen. Purpose	J107-1			Q20	J122-4			Blu-Yel	AE-26-1500	
29-36	*See Flipper Circuits*											
37*	Left Side Flasher	Low Power	J107-6	J106-5		Q16	J4-2	J4-2		Brn-Wht	#89 (2)	#906 (1)
38*	Right Side Flasher	Low Power	J107-6	J106-5		Q15	J4-4	J4-4		Blk-Wht	#89 (2)	#906 (1)
39*	Special Flasher	Low Power	J107-6			Q14	J4-5			Org-Wht	#89 (2)	
40*	Totem Mutilball	Low Power	J107-6			Q13	J4-6			Yel-Wht	#89 (1)	
41*	Jackpot Multiplier Fl.	Low Power	J107-6			Q9	J3-2			Grn-Wht	#89 (1)	
42*	Wheel Motor	Low Power	J118-2			Q10	J3-3			Blu-Wht	14-7982	

***Note: Controlled from the 8-Driver Board, not the Power Driver Board**

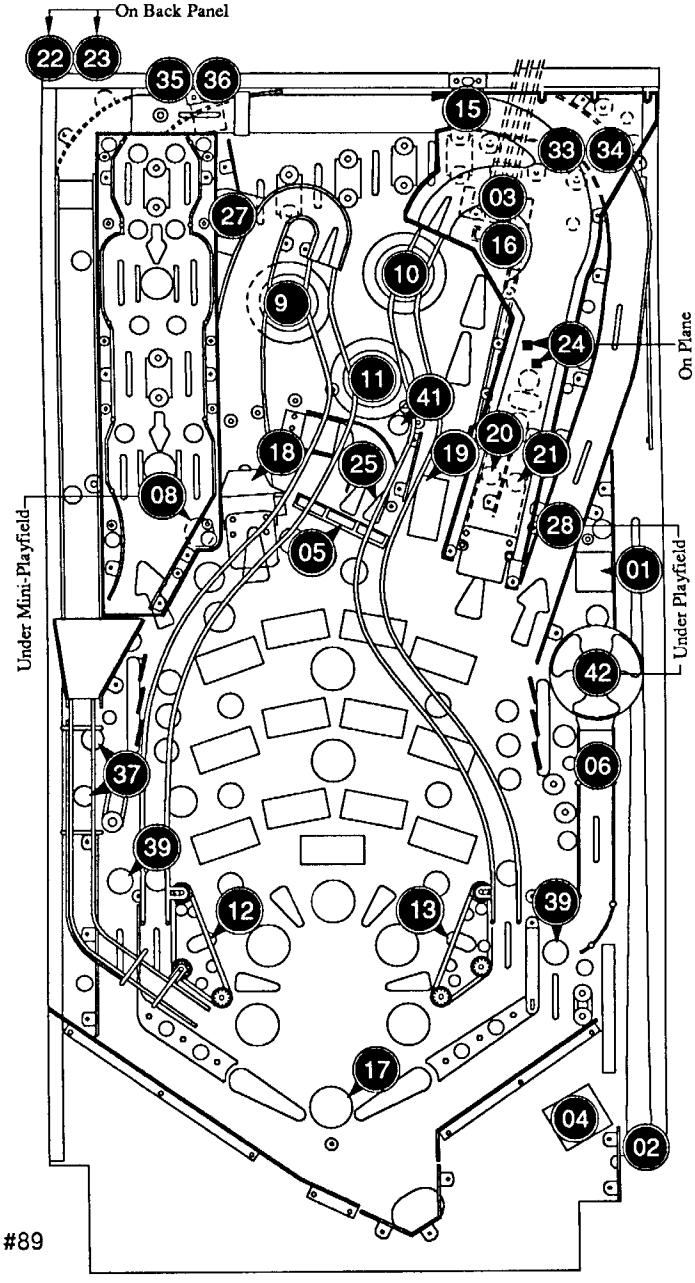
General Illumination

01	Top Playfield	G.I.	J121-1			Q18	J121-7			Wht-Brn	#44	
02	Bottom Playfield	G.I.	J121-2			Q10	J121-8			Wht-Org	#44	
03	Insert Top	G.I.		J120-3		Q14		J120-9		Wht-Yel		#555
04	Insert Bottom	G.I.		J120-4		Q16		J120-10		Wht-Grn		#555
05	Return Lane/Coin	G.I.	J121-6		J119-3	Q12	J121-11		J119-1	Wht-Vio	#44	

	Flipper Circuits		Voltage Connections Playfield	Drive Transistors Power	Drive Transistors Hold	Drive Connections Playfield	Drive Wire Colors Power	Drive Wire Colors Hold	Coil Part Number	Coil Colors
(29)		Lwr. Rt. Power	J907-7 (Blu-Yel)	Q4		J902-13	Blu-Vio			
(30)	Lower Right Flipper	Lwr. Rt. Hold	J907-7 (Blu-Yel)		Q11	J902-11		Org-Grn	FL-11629	Blue
(31)		Lwr. Lt. Power	J907-9 (Gry-Yel)	Q3		J902-9	Blu-Gry			
(32)	Lower Left Flipper	Lwr. Lt. Hold	J907-9 (Gry-Yel)		Q9	J902-7		Org-Blu	FL-11629	Blue
33	Diverter Power	Up Rt. Power	J907-1 (Blu-Yel)	Q2		J902-6	Blk-Yel			
34	Diverter Hold	Up Rt. Hold	J907-1 (Blu-Yel)		Q7	J902-4		Org-Vio	FL-11753-1	Brown
35	Top Lockup Power	Up Lt. Power	J907-4 (Gry-Yel)	Q1		J902-3	Blk-Blu			
36	Top Lockup Hold	Up Lt. Hold	J907-4 (Gry-Yel)		Q5	J902-1		Org-Gry	A-15943	Brown

SOLENOID/FLASHER LOCATION

Item	Coil/Flasher No.	Assy No.	Description
01	AE-26-1200	A-16231	Ball Popper
02	AE-23-800	A-14525	Ball Launch
03	AE-26-1200	A-14615	Totem Drop Up
04	AE-26-1500	A-16765	Ball Release
05	AE-26-1200	A-16032-2	Center Drop Bank
06	AE-26-1500	A-16226	Idol Release
07	AE-23-800	B-10686-1	Knocker
08	AE-26-1200	A-17073	Left Eject
09	AE-26-1200	A-9415-2	Left Jet Bumper
10	AE-26-1200	A-9415-2	Right Jet Bumper
11	AE-26-1200	A-9415-2	Bumpeur Bas
12	AE-27-1200	A-14369-L	Left Slingshot
13	AE-27-1200	A-14369-R	Right Slingshot
14	A-14406	A-14422	Left Control Gate
15	A-14406	A-14422	Right Control Gate
16	SM1-26-600	A-14615	Totem Drop Down
17	24-8802	A-12336-1	Eternal Life #906
	24-8802	-----	Backbox #906
18	24-8802	A-16824	Light Jackpot #906
19	24-8704	A-9302	Super Jackpot #89
20	24-8704	A-8798	Jackpot #89
	24-8802	-----	Backbox #906
21	24-8704	A-8798	Path Of Adventure #89
	24-8802	-----	Backbox #906
22	14-7988	A-16738	Mini Motor Left
23	14-7988	A-16738	Mini Motor Right
24	-----	A-16834	Plane Gun LEDs
	24-8802	-----	Backbox #906
25	24-8704	A-9359	Dogfight Hurry Up #89
26	24-8704	A-8798/A-16861	Right Ramp #89
	24-8802	-----	Backbox #906
27	24-8704	A-16861	Left Ramp #89
	24-8802	-----	Backbox #906
28	AE-26-1500	A-16317	Subway Release
29 to 36 see Flipper Circuits			
37	24-8704	A-8798	Left Side Flasher #89
	24-8802	-----	Backbox #906
38	24-8704	A-8798	Right Side Flasher #89
	24-8802	-----	Backbox #906
39	24-8704	A-9302	Special Flashers #89
40	24-8704	A-9302	Totem Flasher #89
41	24-8704	A-8798	Jackpot Multiplier Flshr #89
42	14-7982	A-16228	Wheel Motor



General Illumination

01	24-6549	-----	*Top Playfield #44
02	24-6549	-----	*Bottom Playfield #44
03	24-8768	-----	*Insert Top #555
04	24-8768	-----	*Insert Bottom #555
05	24-6549	-----	*Return Lane/Coin #44

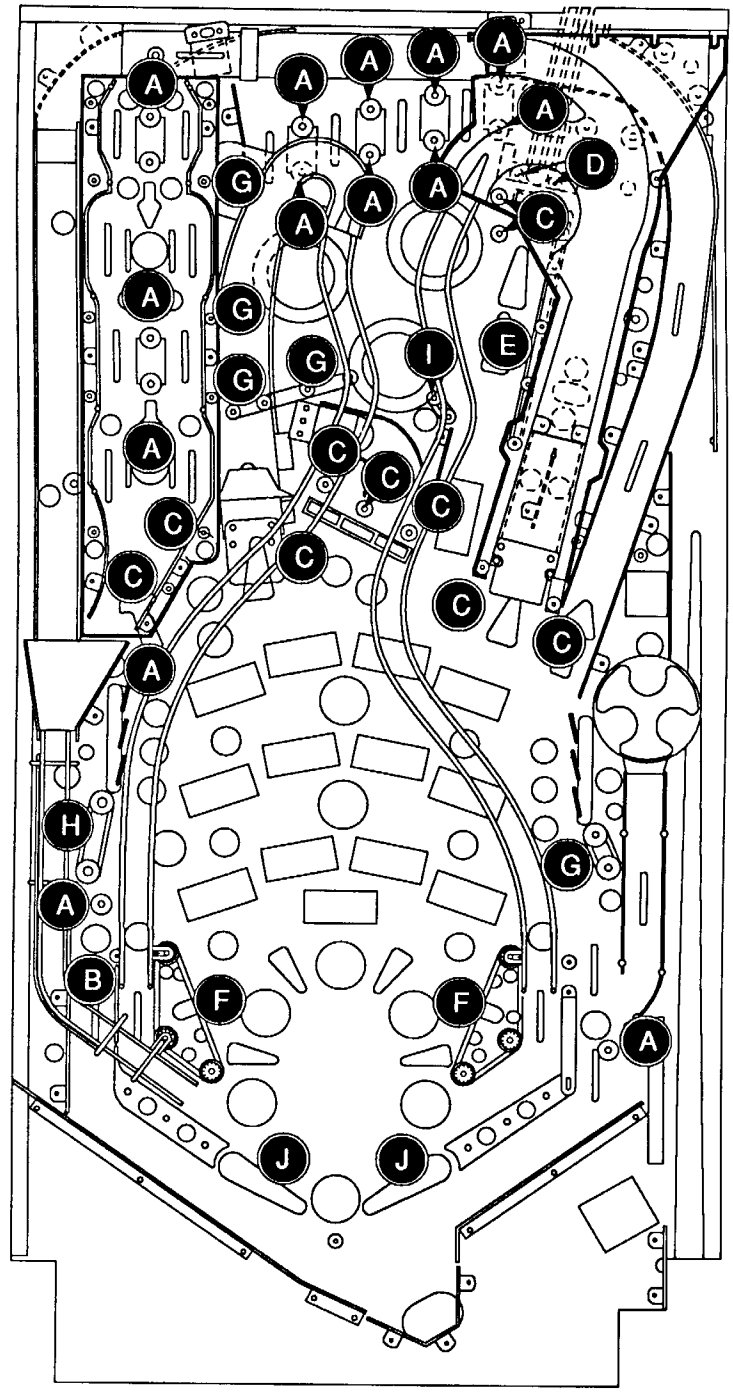
Flippers

29-30	FL-11629	A-15205-R-2	*Lower Right Flipper
31-32	FL-11629	A-15205-L-2	*Lower Left Flipper
33	FL-11753-1	A-16301	Diverter Power
34	FL-11753-1	A-16301	Diverter Hold
35	A-15943	A-16656	Top Lockup Power
36	A-15943	A-16656	Top Lockup Hold

* Not Shown

RUBBER PARTS LOCATIONS

Item	Part No.	Qty	Description
A	23-6300	16	5/16" Rubber Rings
B	23-6535	1	Bumper
C	23-6556	10	Black Sleeve Bumpers
D	23-6552	2	Yellow Sleeve Bumpers
E	23-6308	1	3-1/2" Rubber Ring
F	23-6306	2	2-1/2" Rubber Rings
G	23-6301	5	3/4" Rubber Rings
H	23-6303	1	1-1/4" Rubber Ring
I	23-6599	2	7/16" Rubber Rings
J	23-6695	2	Black Flipper Rings



SECTION 3

Schematics, Wiring Diagrams, and Circuit Theory

CONNECTOR & COMPONENT IDENTIFICATION

Each plug or jack -except the Audio Board and Dot Matrix Display/Driver Board - 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 Audio Board.

Prefix numbers for the WPC circuit boards are listed below.

1- Power Driver Board
2- CPU Board
6- Dot Matrix Controller
9-Fliptronic II Controller Board

Audio Board and Dot Matrix Display/Driver Board do not have an identification number.

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

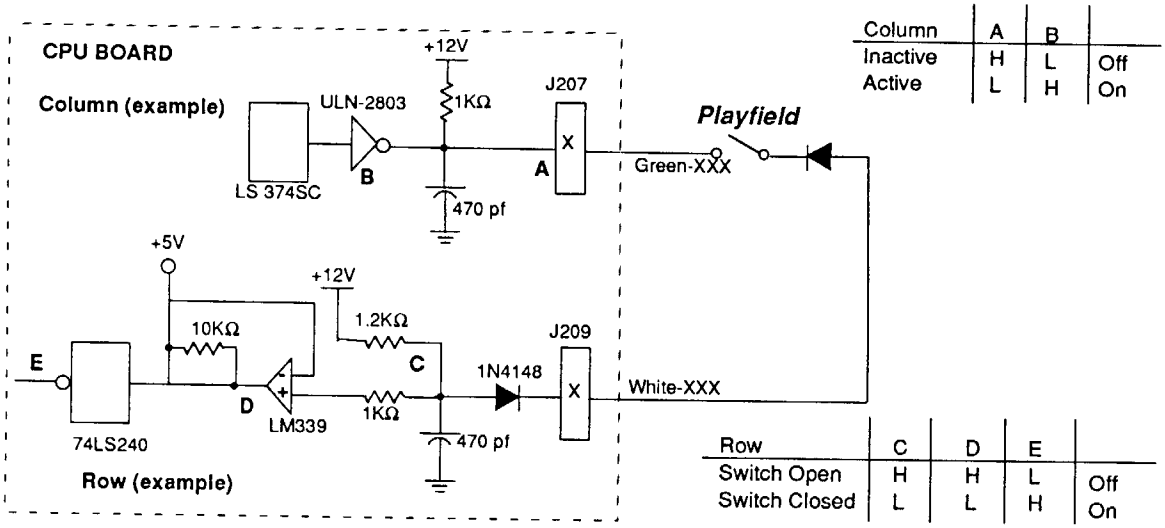
Green — White

Column / Row	1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-9 U20-11	9 Violet-White Q11 J5-4
1 White-Brown J209-1 U18-11	Single Drop Top 11	Slam Tilt 21	Left Eject 31	Left Ramp Enter 41	Advent(u)re Tgt. 51	(A)dventure Tgt. 61	Captive Ball Frt. 71	Trough 6 81	Wheel Position 1 91
2 White-Red J209-2 U18-9	Buy-in Button 12	Coin Door Closed 22	Exit Idol 32	Right Ramp Enter 42	Adventu(r)e Tgt. 52	A(d)venture Tgt. 62	Mini Top Hole 72	Trough 5 82	Wheel Position 2 92
3 White-Orange J209-3 U18-5	Start Button 13	Ticket Opto 23	Left Slingshot 33	Top Idol Enter 43	Adventur(e) Tgt. 53	Ad(v)enture Tgt. 63	Mini Bottom Hole 73	Trough 4 83	Wheel Position 3 93
4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Gun Trigger 34	Right Popper 44	Left Loop Top 54	Captive Ball Back 64	Right Ramp Made 74	Trough 3 84	Mini Playfield Left Limit 94
5 White-Green J209-5 U19-11	Left Outlane 15	(I)ndy Lane 25	Left Jet 35	Center Enter 45	Left Loop Bottom 55	Mini Top Left 65	Mini Top Right 75	Trough 2 85	Mini Playfield Right Limit 95
6 White-Blue J209-7 U19-9	Left Return Lane 16	I(n)dy Lane 26	Right Jet 36	Top Post 46	Right Loop Top 56	Mini Middle Top Left 66	Mini Middle Top Right 76	Trough 1 86	
7 White-Violet J209-8 U19-5	Right Return Lane 17	In(d)y Lane 27	Bottom Jet 37	Subway Lockup 47	Right Loop Bottom 57	Mini Middle Bottom Left 67	Mini Middle Bottom Right 77	Top Trough 87	
8 White-Gray J209-9 U19-7	Right Outlane Top 18	Ind(y) Lane 28	Center Standup 38	Right Slingshot 48	Right Outlane Bottom 58	Mini Bottom Left 68	Mini Bottom Right 78	Shooter 88	

Flipper Grounded Switches
Black-Green J906-1 Lower Right E.O.S. F1
Blue-Violet J905-1 Lower Right Opto F2
Black-Blue J906-3 Lower Left E.O.S. F3
Blue-Gray J905-2 Lower Left Opto F4
Black-Violet J906-4 *Center Drop Bank Left F5
Black-Yellow J905-3 *Center Drop Bank Middle F6
Black-Gray J906-5 *Center Drop Bank Right F7
Black-Blue J905-5 *Left Ramp Made F8

***Note:** Used as switches other than flipper switches in this game.

Switch Matrix Circuit



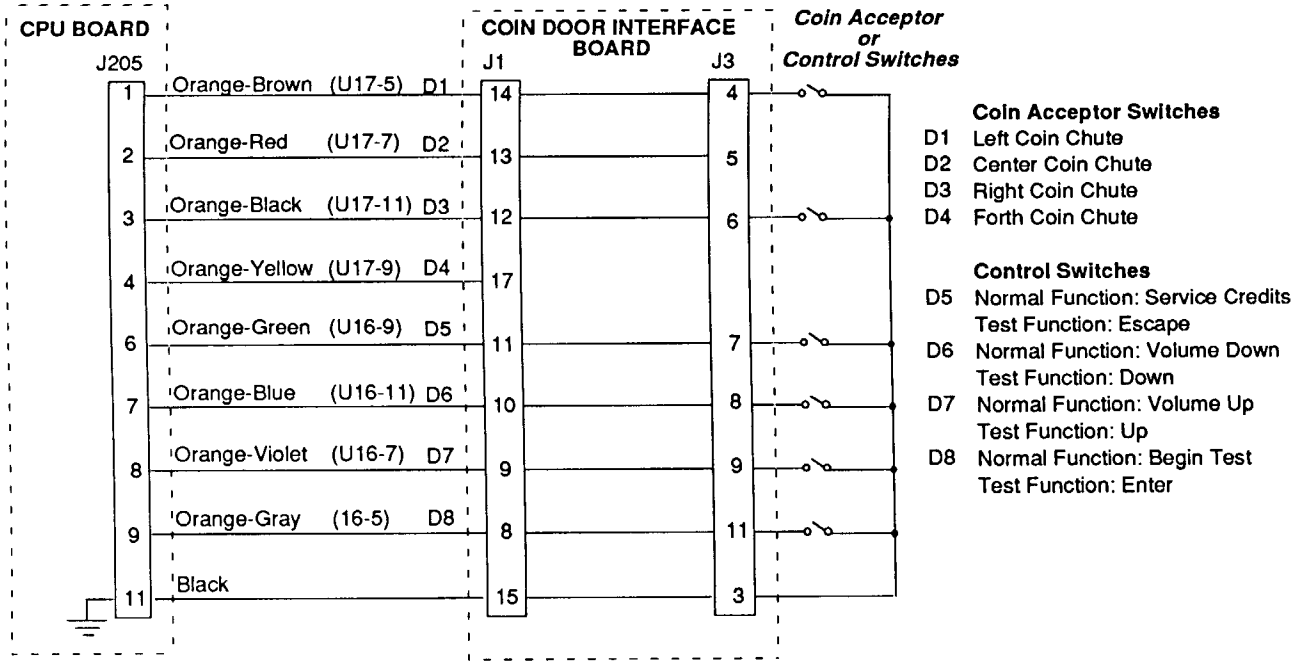
Column	A	B	
Inactive	H	L	Off
Active	L	H	On

Row	C	D	E	
Switch Open	H	H	L	Off
Switch Closed	L	L	H	On

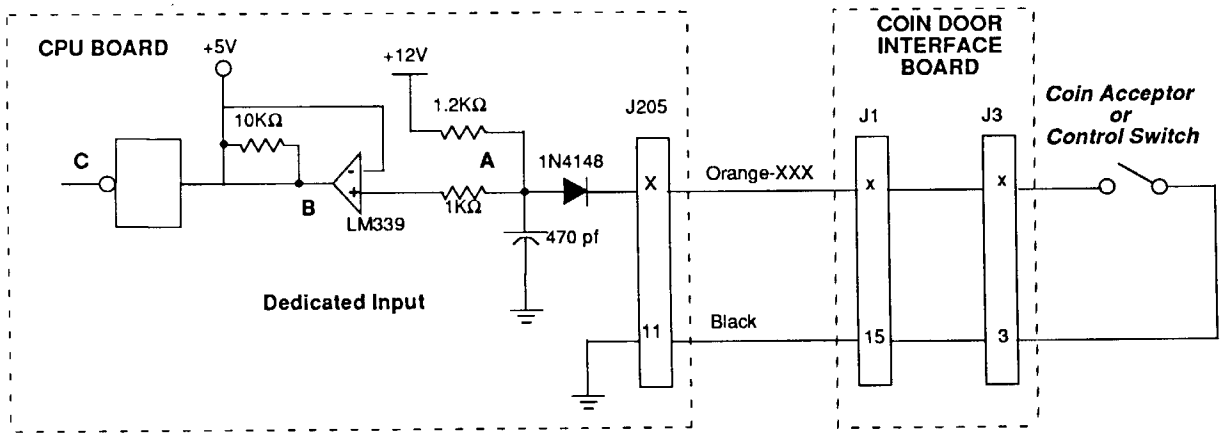
The microprocessor is constantly strobing the column side of the switch. When point "A" on the column circuit toggles low the column side is active.

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

Dedicated Switches



Dedicated Switch Circuit

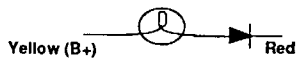


Switch	A	B	C	
Open	H	H	L	Off
Closed	L	L	H	On

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).

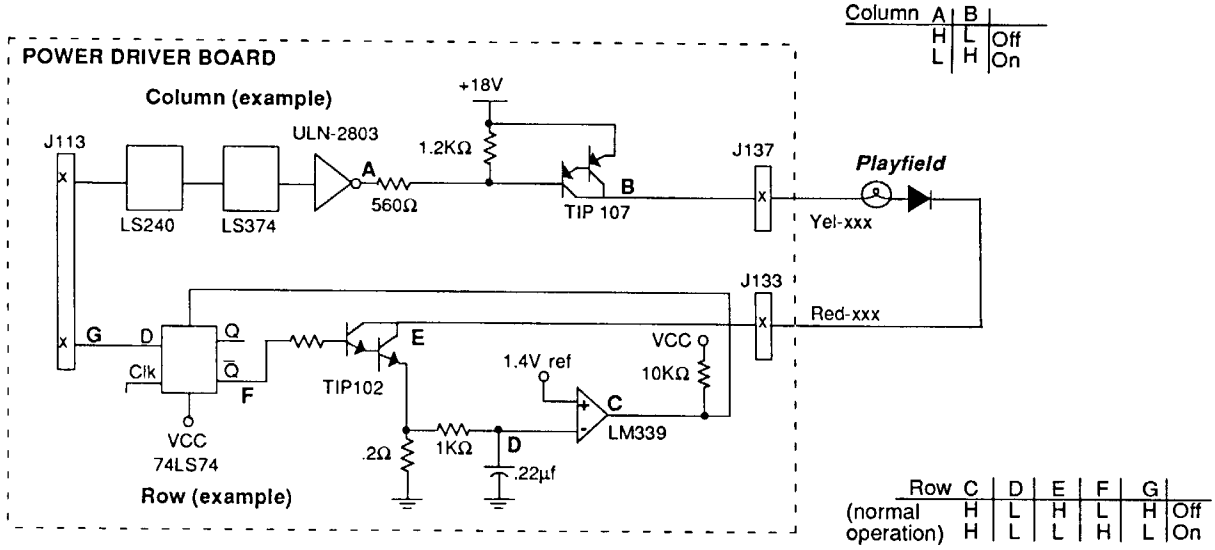
When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V therefore its output is low. Since the row circuit (dedicated input) is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the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

LAMPS



Column / Row	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J137-7 Q92	8 Yellow-Gray J137-9 Q91
Red-Brown J133-1 Q90 1	Mode Start 11	Tank Chase 21	Left Ramp Arrow 31	Mine Cart 41	Choose Wisely 51	(I)ndy 61	Mini Top Left 71	Mini Middle Bottom Left 81
Red-Black J133-2 Q89 2	Hand of Fate 12	Adven(t)ure Light 22	Castle Grunewald 32	Ark Jackpot 42	Right Plane Top 52	I(n)dy 62	Mini Top Right 72	Mini Middle Bottom Right 82
Red-Orange J133-4 Q88 3	Eject Extra Ball 13	Adv(e)ture Light 23	Left Plane Top 33	Raven Bar 43	Rope Bridge 53	In(d)y 63	Mini Middle Top Left 73	Mini Bottom Left 83
Red-Yellow J133-5 Q87 4	Ad(v)enture Light 14	Adve(n)ture Light 24	Monkey Brains 34	Right Plane Middle 44	Advent(u)re Light 54	Ind(y) 64	Mini Middle Top Right 74	Mini Bottom Right 84
Red-Green J133-6 Q86 5	A(d)venture Light 15	Steal The Stones 25	Left Plane Middle 35	Bonus 6X 45	Adventu(r)e Light 55	Willie 65	Mini Top Arrow 75	Mini Bottom Arrow 85
Red-Blue J133-7 Q85 6	(A)dventure Light 16	Grail Jackpot 26	Sallah 36	Right Plane Bottom 46	Adventur(e) Light 56	Bouns 2X 66	Marion 76	Totem Top Arrow 86
Red-Violet J133-8 Q84 7	Shoot Again 17	Streets Of Cairo 27	Bonus 4X 37	Well Of Souls 47	The 3 Challenges 57	Shorty 67	Bonus 8X 77	Center Lock 87
Red-Gray J133-9 Q83 8	Get The Idol 18	Stones Jackpot 28	Left Plane Bottom 38	Left Loop 48	Right Loop 58	Right Ramp Arrow 68	Dr. Jones 78	Start Button 88

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 xister	Drive Connections			Drive Wire Color	Solenoid Part Number Flashlamp Type	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Backbox
01	Ball Popper	High Power	J107-3			Q82	J130-1			Vio-Brn	AE-26-1200	
02	Ball Launch	High Power	J107-3			Q80	J130-2			Vio-Red	AE-23-800	
03	Totem Drop Up	High Power	J107-3			Q78	J130-4			Vio-Org	AE-26-1200	
04	Ball Release	High Power	J107-3			Q76	J130-5			Vio-Yel	AE-26-1500	
05	Center Drop Bank	High Power	J107-3			Q64	J130-6			Vio-Grn	AE-26-1200	
06	Idol Release	High Power	J107-3			Q66	J130-7			Vio-Blu	AE-26-1500	
07	Knocker	High Power	J107-3			Q68	J130-8			Vio-Blk	AE-23-800	
08	Left Eject	High Power	J107-3			Q70	J130-9			Vio-Gry	AE-26-1200	
09	Left Jet Bumper	Low Power	J107-2			Q58	J127-1			Brn-Blk	AE-26-1200	
10	Right Jet Bumper	Low Power	J107-2			Q56	J127-3			Brn-Red	AE-26-1200	
11	Bumpeur Bas	Low Power	J107-2			Q54	J127-4			Brn-Org	AE-26-1200	
12	Left Slingshot	Low Power	J107-2			Q52	J127-5			Brn-Yel	AE-27-1200	
13	Right Slingshot	Low Power	J107-2			Q50	J127-6			Brn-Grn	AE-27-1200	
14	Left Control Gate	Low Power	J107-2			Q48	J127-7			Brn-Blu	A-14406	
15	Right Control Gate	Low Power	J107-2			Q46	J127-8			Brn-Vio	A-14406	
16	Totem Drop Down	Low Power	J107-2			Q44	J127-9			Brn-Gry	SM1-26-600	
17	Eternal Life	Flasher	J107-6	J106-5		Q42	J126-1	J125-1		Blk-Brn	#906 (1)	#906 (3)
18	Light Jackpot	Flasher	J107-6			Q40	J126-2			Blk-Red	#906 (1)	
19	Super Jackpot	Flasher	J107-6			Q38	J126-3			Blk-Org	#89 (1)	
20	Jackpot	Flasher	J107-6	J106-5		Q36	J126-4	J125-5		Blk-Yel	#89 (1)	#906 (2)
21	Path Of Adventure	Flasher	J107-6	J106-5		Q28	J126-5	J125-6		Blu-Grn	#89 (1)	#906 (4)
22	Mini Motor Left	Low Power	J118-2			Q30	J126-6			Blu-Blk		
23	Mini Motor Right	Low Power	J118-2			Q34	J126-7			Blu-Vio	14-7988	
24	Plane Gun LEDS	Flasher	J118-2	J106-5		Q32	J126-8			Blu-Gry	A-16834	
25	Dogfight Hurry Up	Gen. Purpose	J107-6			Q26	J122-1			Blu-Brn	#89 (1)	
26	Right Ramp	Gen. Purpose	J107-6	J106-5		Q24	J122-2	J124-2		Blu-Red	#89 (3)	#906 (1)
27	Left Ramp	Gen. Purpose	J107-6	J106-5		Q22	J122-3	J124-3		Blu-Org	#89 (1)	#906 (1)
28	Subway Release	Gen. Purpose	J107-1			Q20	J122-4			Blu-Yel	AE-26-1500	
29-36	*See Flipper Circuits*											
37*	Left Side Flasher	Low Power	J107-6	J106-5		Q16	J4-2	J4-2		Brn-Wht	#89 (2)	#906 (1)
38*	Right Side Flasher	Low Power	J107-6	J106-5		Q15	J4-4	J4-4		Blk-Wht	#89 (2)	#906 (1)
39*	Special Flasher	Low Power	J107-6			Q14	J4-5			Org-Wht	#89 (2)	
40*	Totem Mutilball	Low Power	J107-6			Q13	J4-6			Yel-Wht	#89 (1)	
41*	Jackpot Multiplier Fl.	Low Power	J107-6			Q9	J3-2			Grn-Wht	#89 (1)	
42*	Wheel Motor	Low Power	J118-2			Q10	J3-3			Blu-Wht	14-7982	

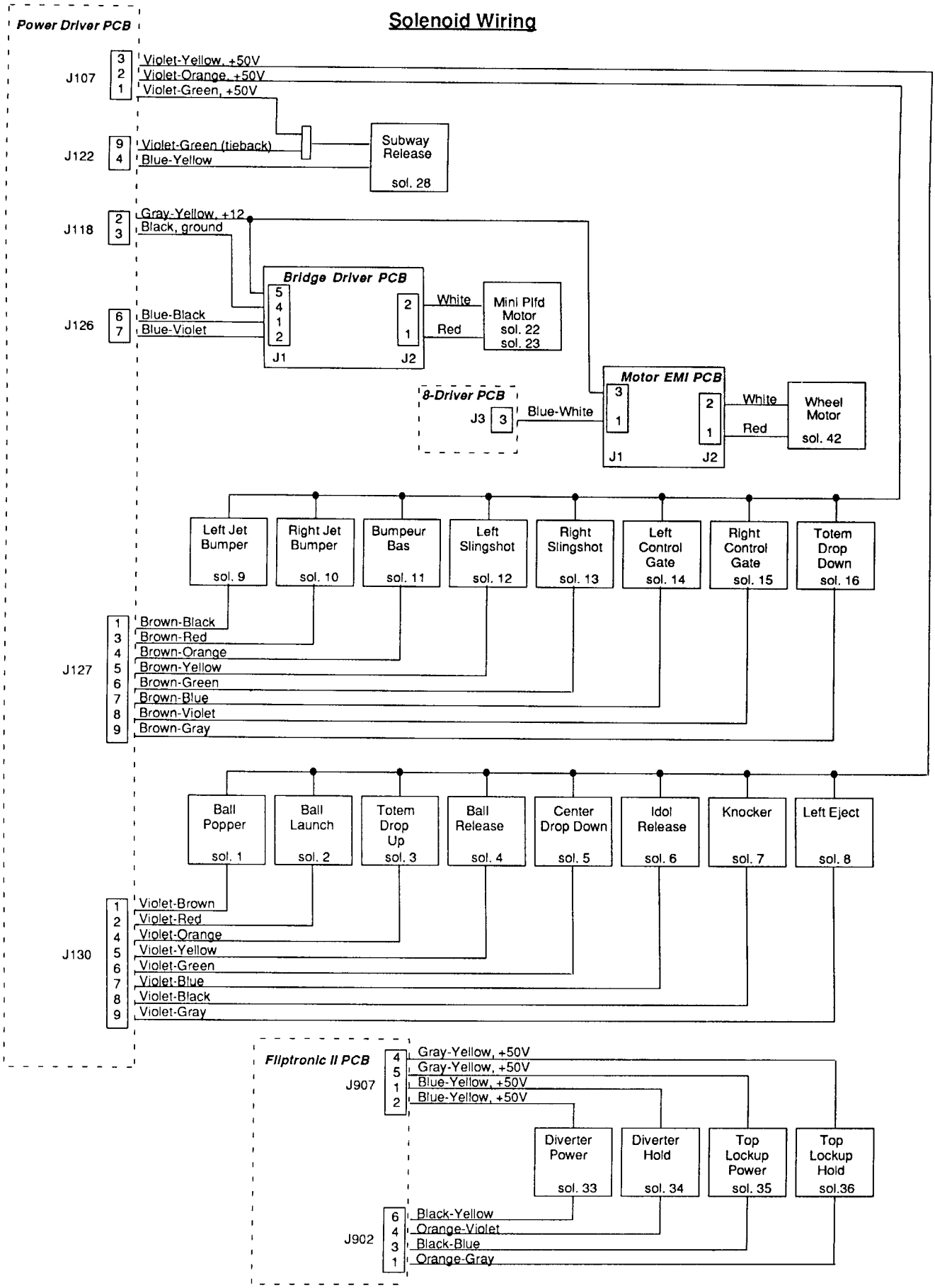
***Note: Controlled from the 8-Driver Board, not the Power Driver Board**

General Illumination

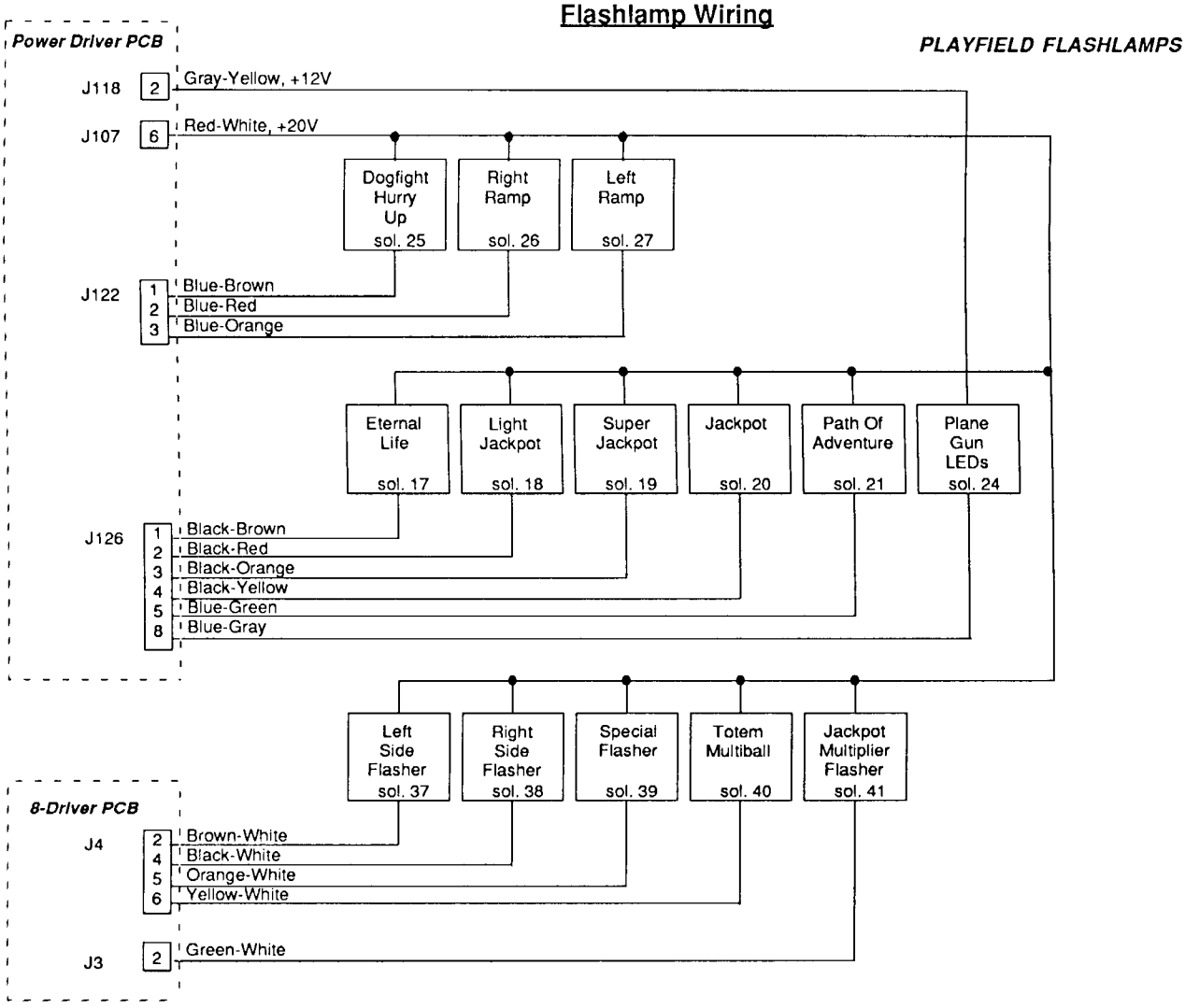
01	Top Playfield	G.I.	J121-1			Q18	J121-7			Wht-Brn	#44	
02	Bottom Playfield	G.I.	J121-2			Q10	J121-8			Wht-Org	#44	
03	Insert Top	G.I.		J120-3		Q14		J120-9		Wht-Yel		#555
04	Insert Bottom	G.I.		J120-4		Q16		J120-10		Wht-Grn		#555
05	Return Lane/Coin	G.I.	J121-6		J119-3	Q12	J121-11		J119-1	Wht-Vio	#44	

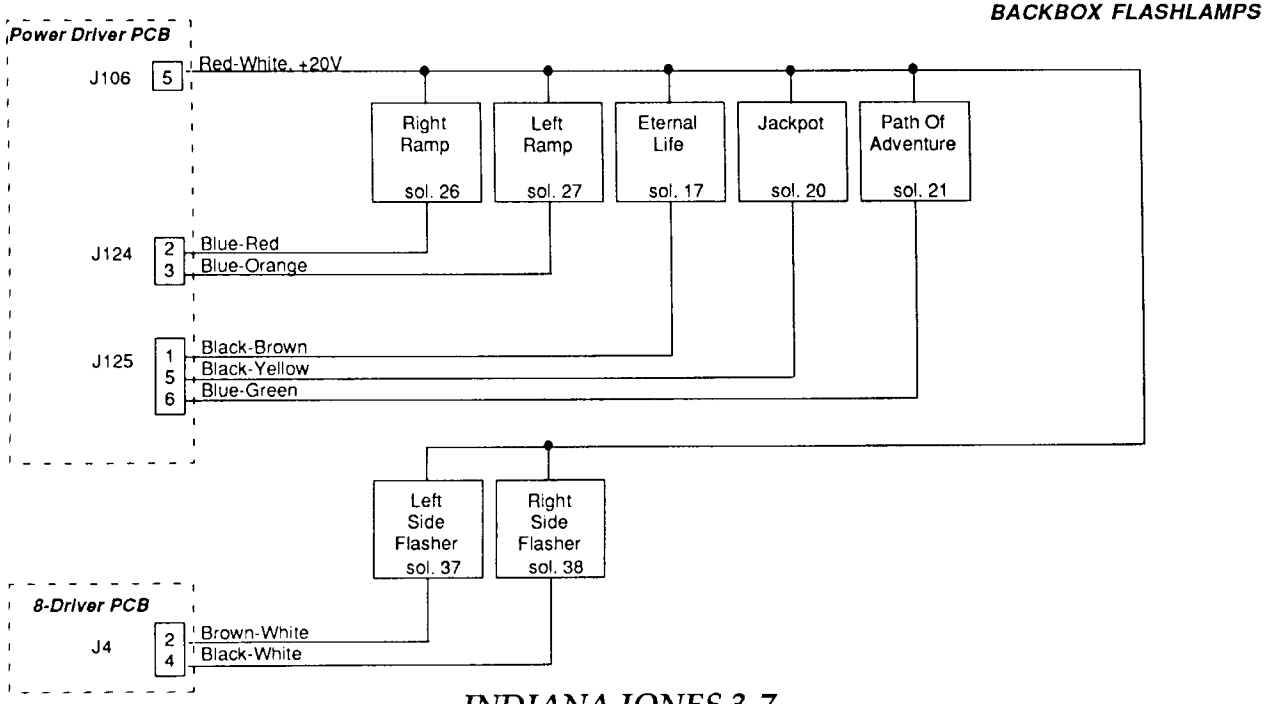
	Flipper Circuits		Voltage Connections Playfield	Drive Transistors Power	Drive Transistors Hold	Drive Connections Playfield	Drive Wire Colors Power	Drive Wire Colors Hold	Coil Part Number	Coil Colors
(29)	Lower Right Flipper	Lwr. Rt. Power	J907-7 (Blu-Yel)	Q4		J902-13	Blu-Vio		FL-11629	Blue
(30)		Lwr. Rt. Hold	J907-7 (Blu-Yel)		Q11	J902-11		Org-Grn		
(31)	Lower Left Flipper	Lwr. Lt. Power	J907-9 (Gry-Yel)	Q3		J902-9	Blu-Gry		FL-11629	Blue
(32)		Lwr. Lt. Hold	J907-9 (Gry-Yel)		Q9	J902-7		Org-Blu		
33	Diverter Power	Up Rt. Power	J907-1 (Blu-Yel)	Q2		J902-6	Blk-Yel		FL-11753-1	Yellow
34	Diverter Hold	Up Rt. Hold	J907-1 (Blu-Yel)		Q7	J902-4		Org-Vio		
35	Top Lockup Power	Up Lt. Power	J907-4 (Gry-Yel)	Q1		J902-3	Blk-Blu		A-15943	Brown
36	Top Lockup Hold	Up Lt. Hold	J907-4 (Gry-Yel)		Q5	J902-1		Org-Gry		

Solenoid Wiring

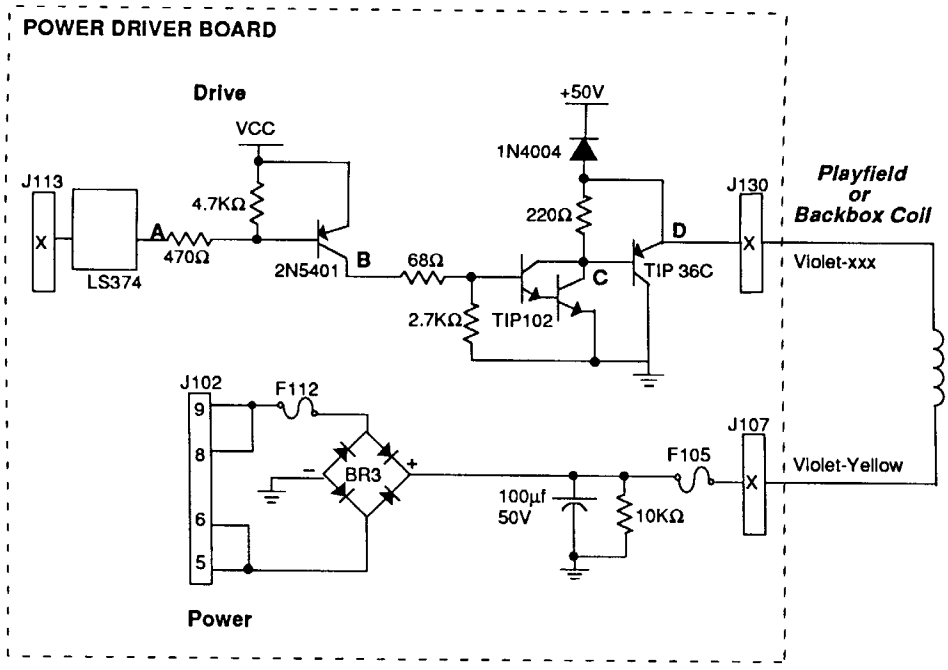


Flashlamp Wiring



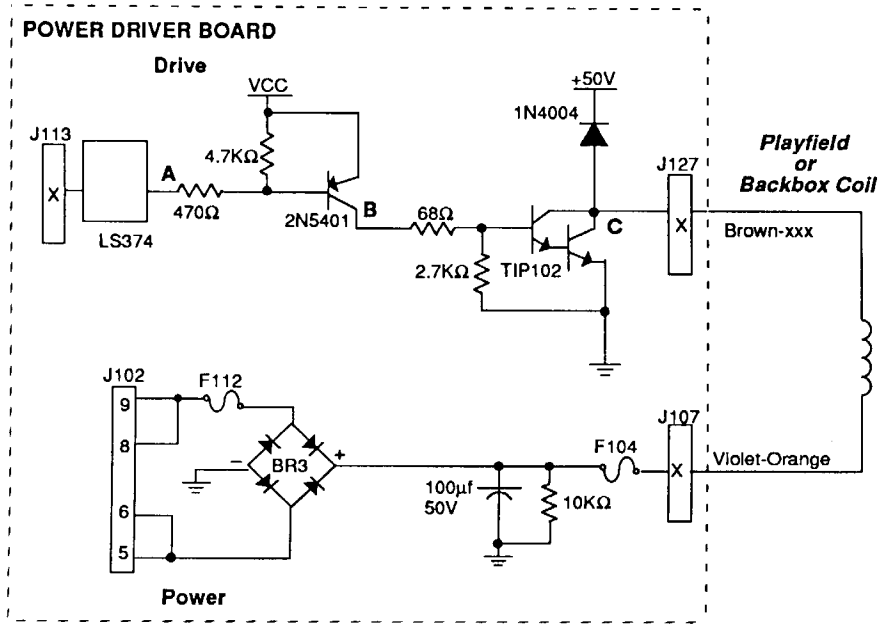


High Power Solenoid Circuit



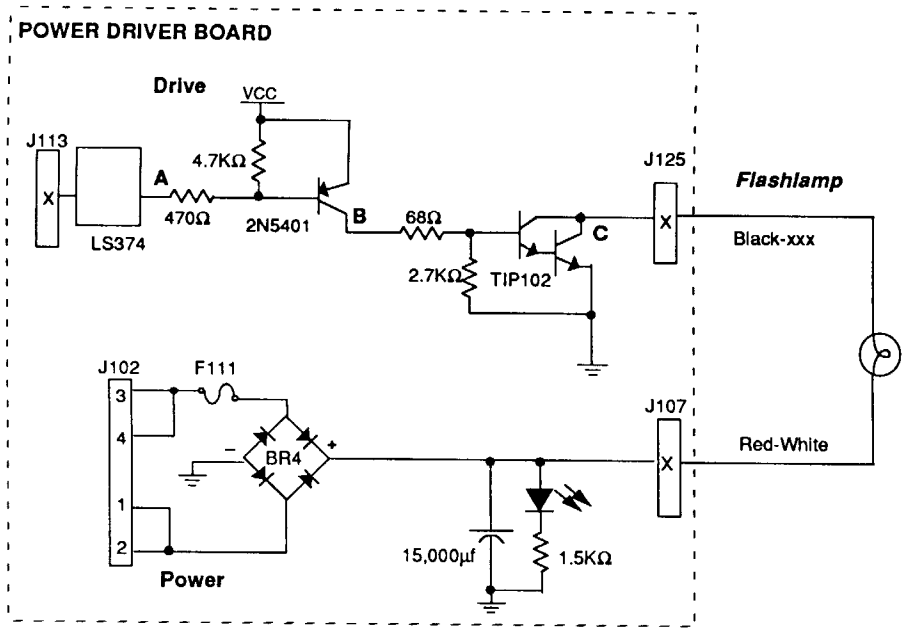
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" the collector of the 2N5401 transistor is high. A high at point "B" causes point "C" the collector of the TIP102 transistor, and point "D" the emitter of the TIP36 transistor to drop low. When point "D" is low the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

Low Power Solenoid Circuit



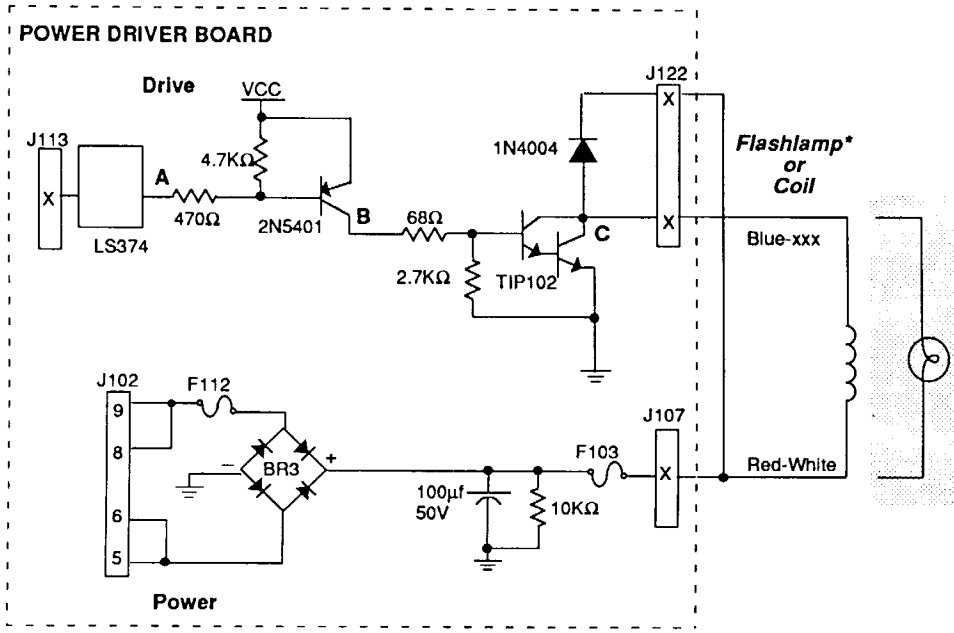
The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor is driven high. A high at point "B" turns On the TIP102 transistor and causes point "C" to drop low. When point "C" is low the coil is grounded through the transistor and the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

Flashlamp Circuit



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

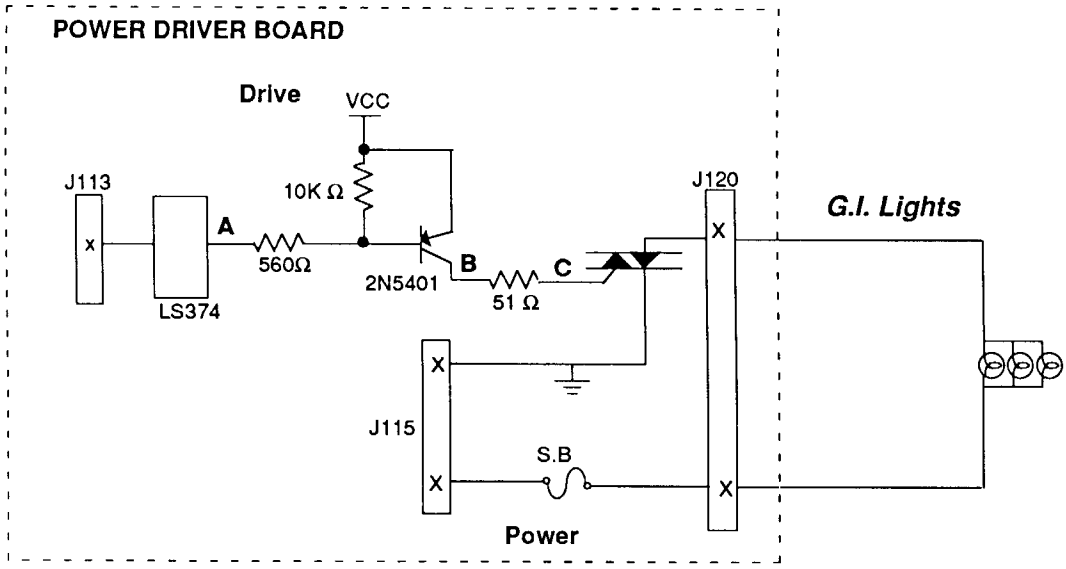
Special (General Purpose) Solenoid Circuit



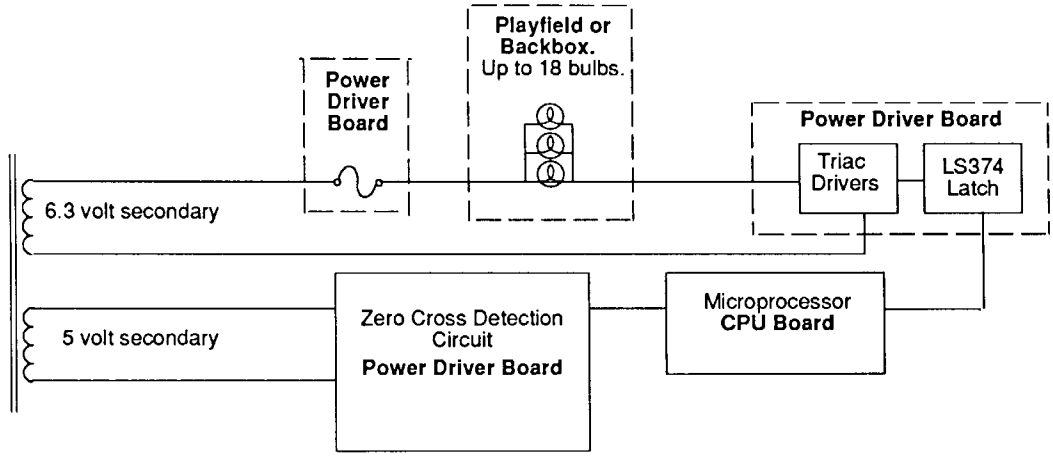
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" is high. A high at point "B" causes a low at point "C". When point "C" is low the coil/flashlamp is grounded through the transistor and the coil/flashlamp turns On. When point "A" toggles high the coil/flashlamp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

* Tieback Diode is not used for flashlamp circuit.

General Illumination Circuit

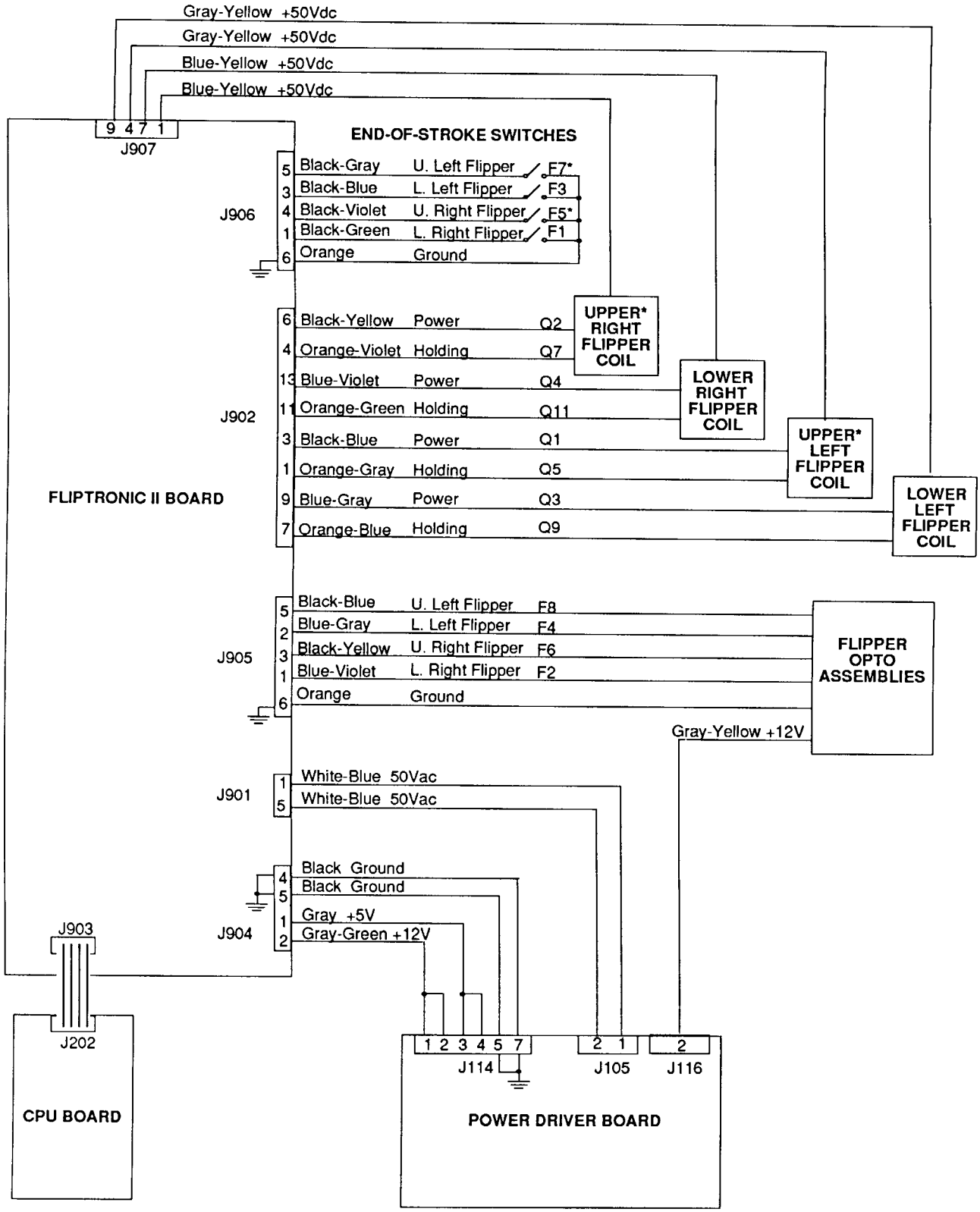


Block Diagram of General Illumination Circuit



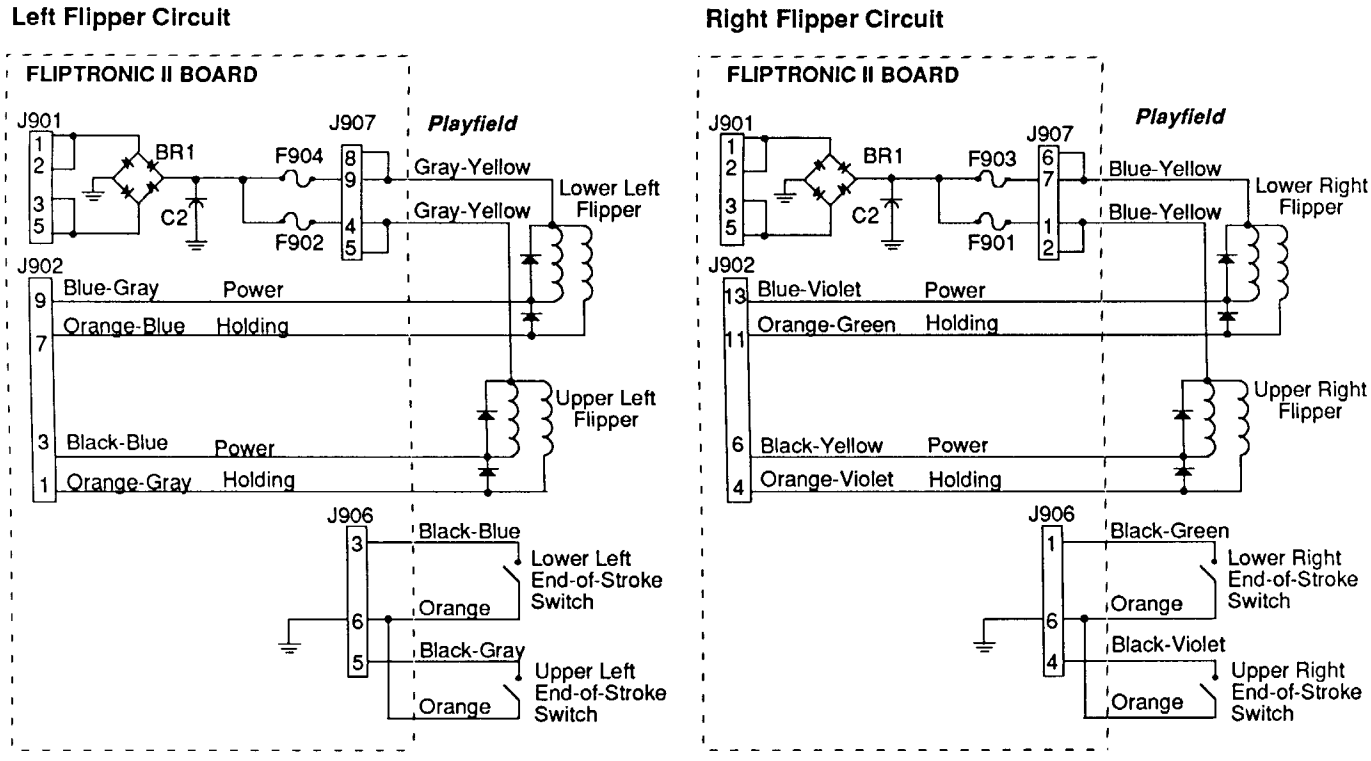
When point "A" toggles low, then points "B" and "C" are high. This turns On the triac and the desired General Illumination string lights.

Flipper Circuit Diagram

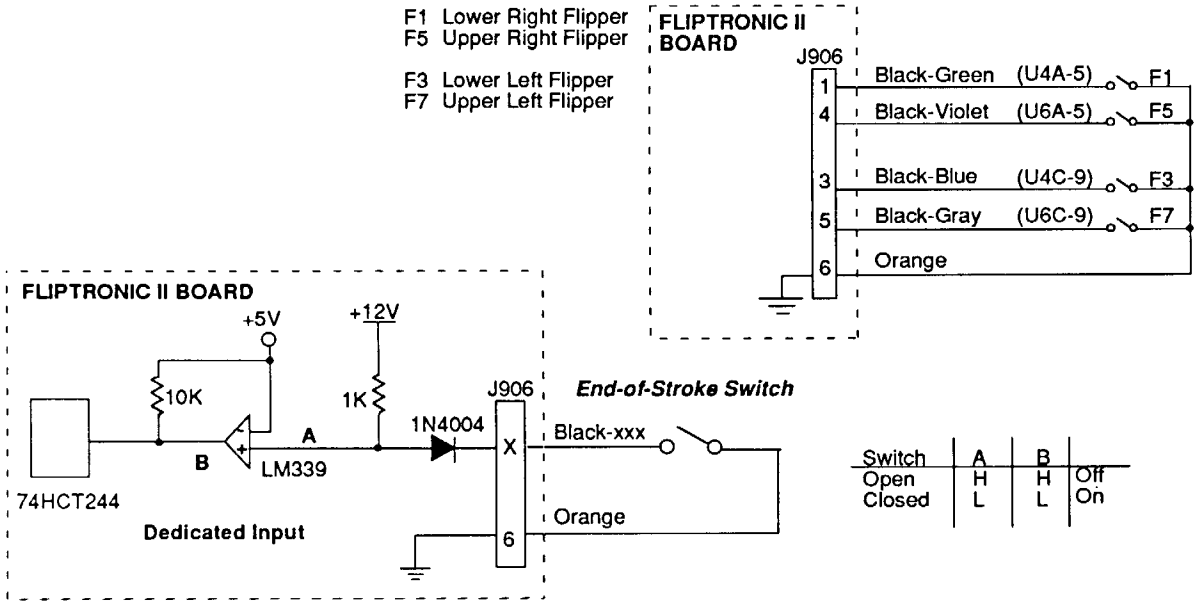


**Note: Used as circuits other than flipper circuits in this game.*

Flipper Coil Circuits



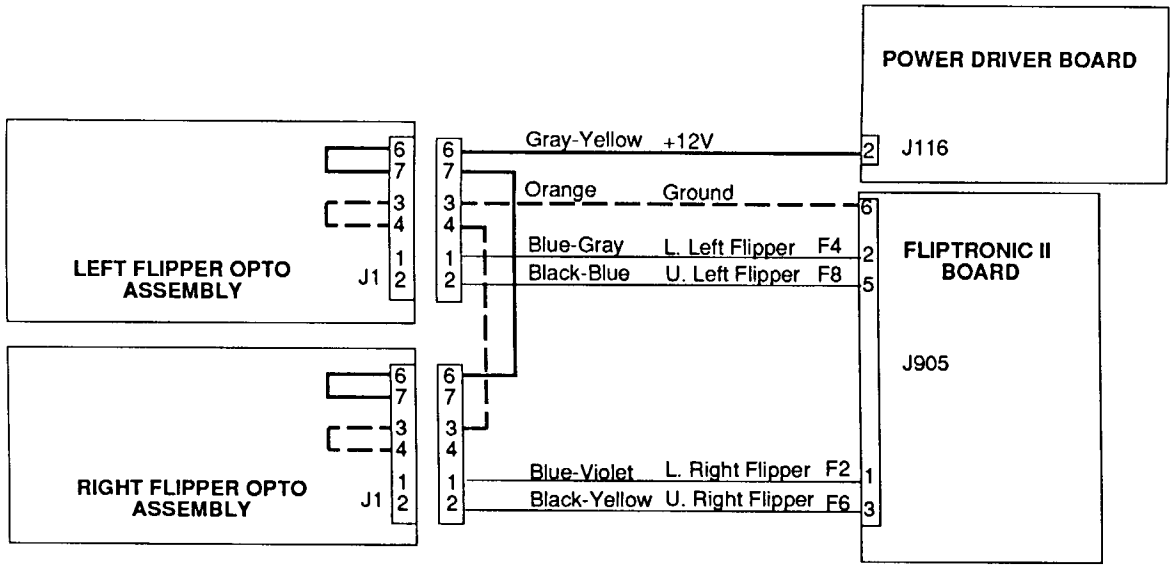
Flipper End-of-Stroke Switches



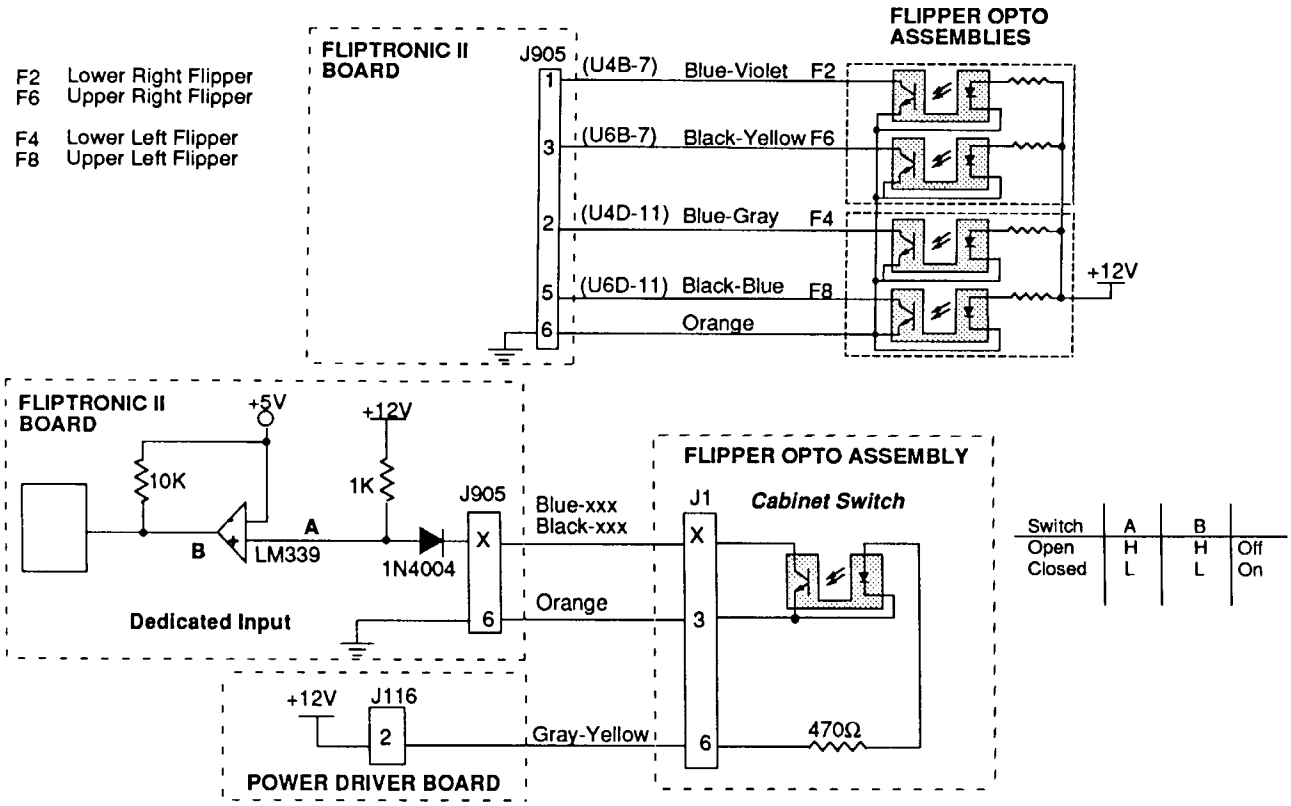
The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

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

Flipper Cabinet Switch Circuit Diagram



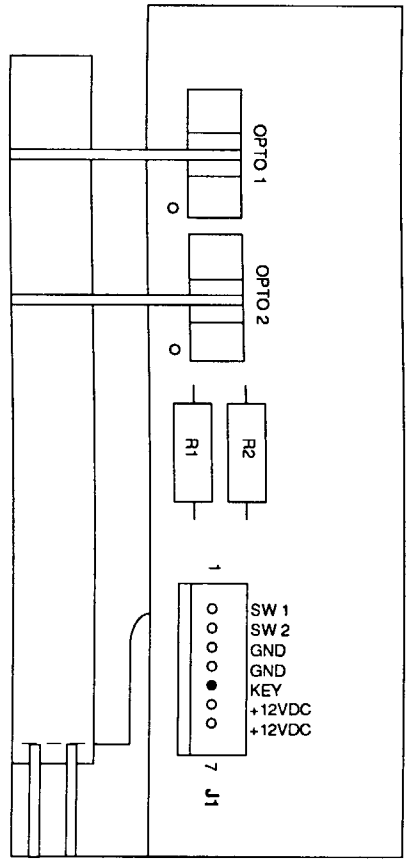
Flipper Cabinet Switches

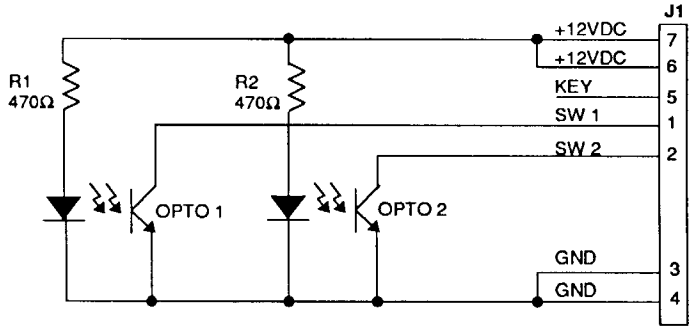


The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

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

A-16384-1
Flipper Opto PCB Assembly

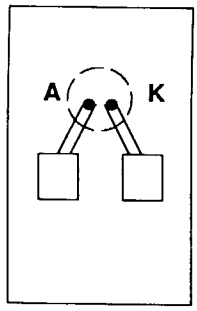




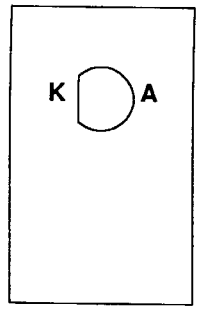
Left Side Flipper Cabinet Opto Switch Board
J1-1 Blue-Gray from Fliptronic II Board J905-2
J1-2 N/C
J1-3 N/C
J1-4 Orange from Fliptronic II Board J905-6
J1-5 N/C
J1-6 Gray-Yellow from Fliptronic II Board J904-2
J1-7 Gray-Yellow from Fliptronic II Board J904-2

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

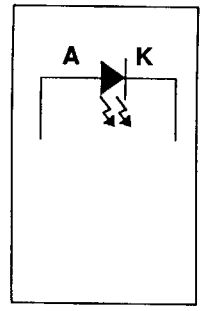
A-14231
LED PCB Assembly*
(green mask)



solder side

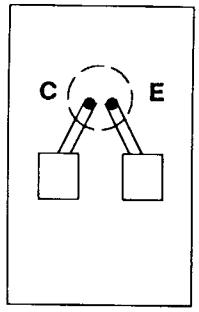


component side

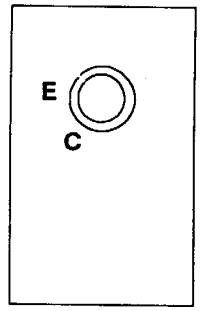


schematic

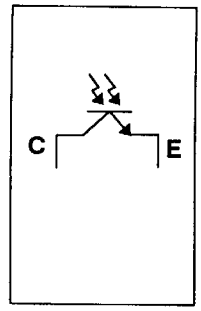
A-14232
Photo Transistor PCB Assembly**
(blue mask)



solder side



component side

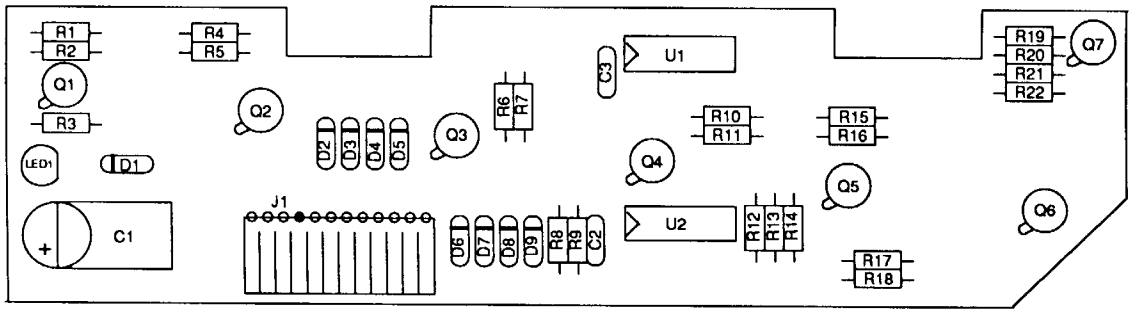


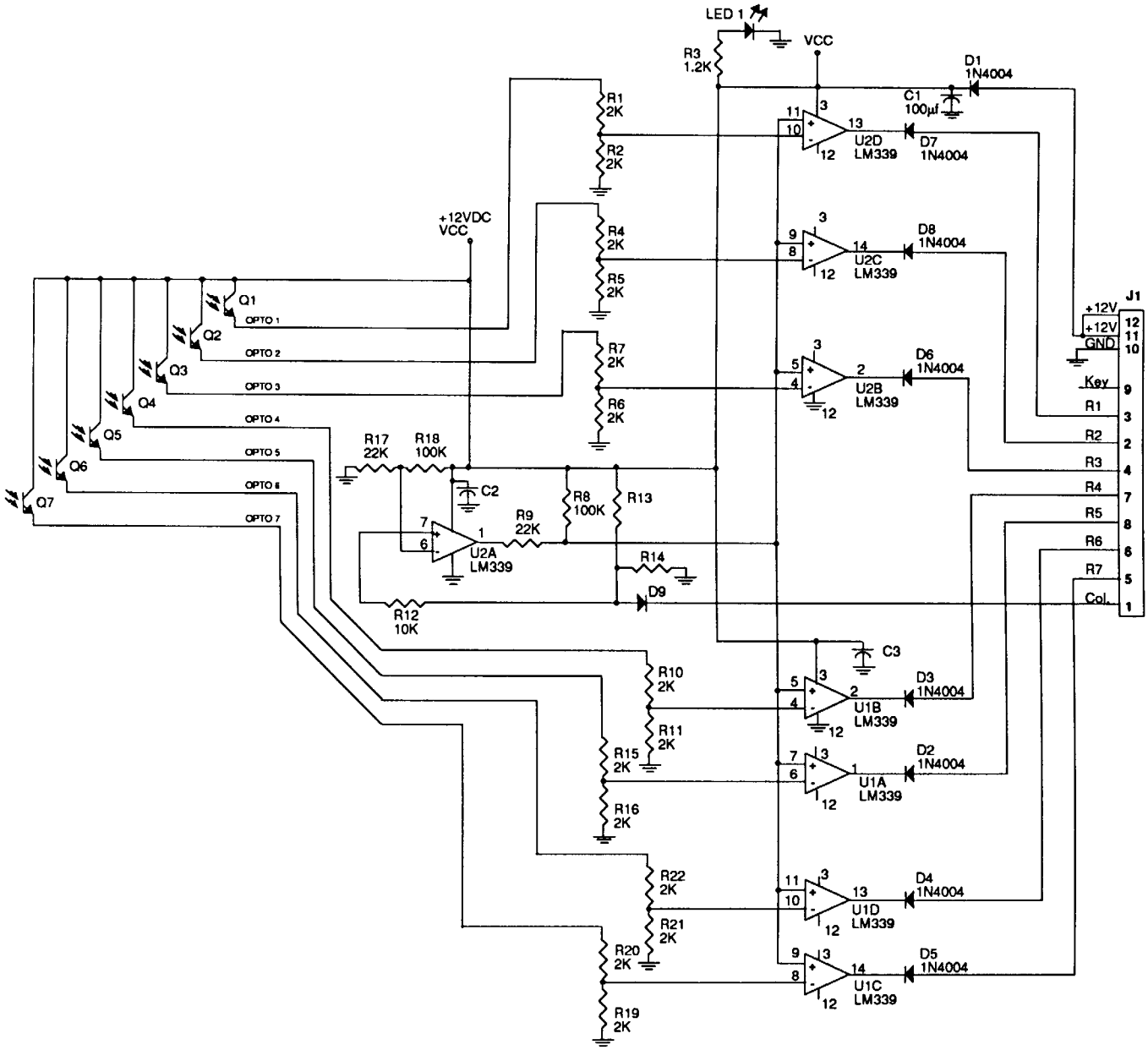
schematic

Note: ****Switches #41, #72 and #73 use part number A-16908 for LED PCB Assembly.***

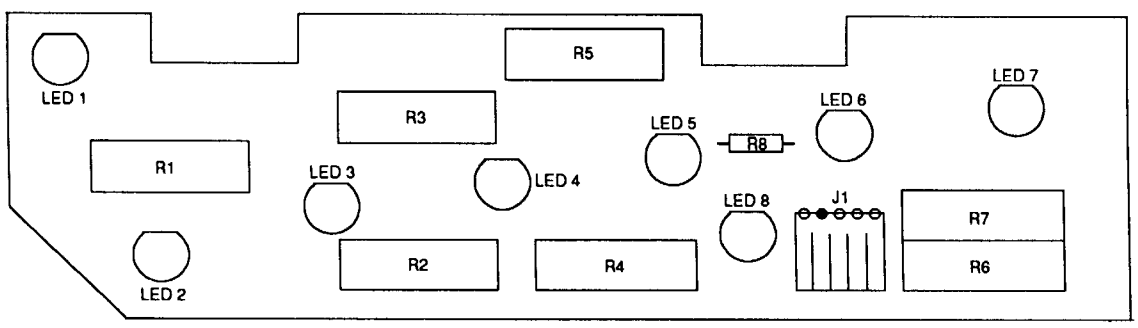
***** Switches #41, #72 and #73 use part number A-16909 for Photo Trans PCB Assembly.***

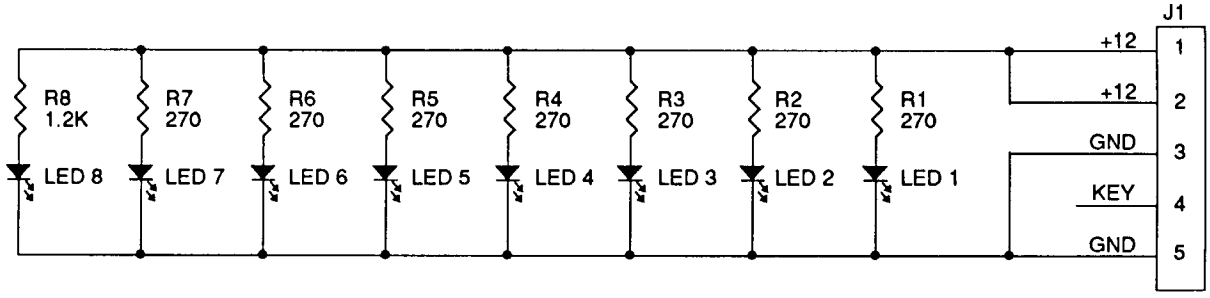
A-16926
7 Ball Trough Photo Transistor PCB Assembly





A-16927
7 Ball Trough LED PCB Assembly





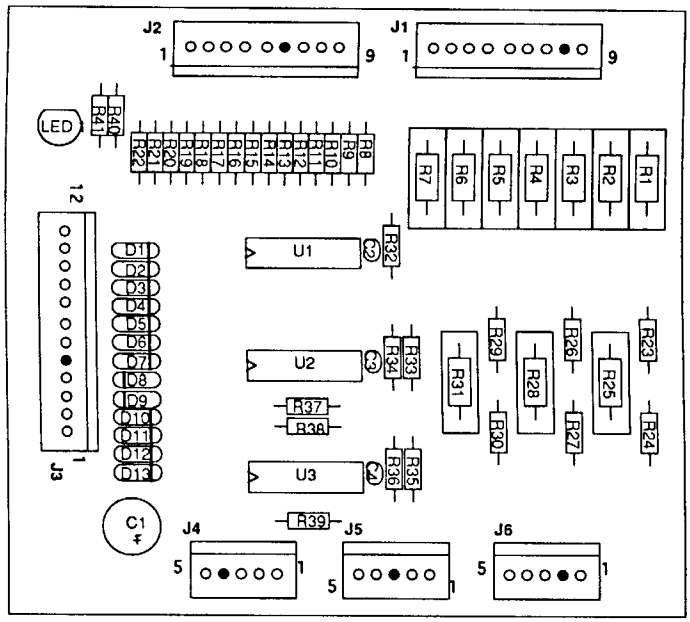
7 Ball Trough LED PCB Assembly
Connector Wiring

J1-1 Gray-Yellow, +12V from Power Driver Board J118-2
J1-2 N/C
J1-3 N/C
J1-4 Key
J1-5 Black, ground from Power Driver Board J118-3

7 Ball Trough Photo Transistor PCB Assembly
Connector Wiring

J1-1 Green-Gray, sw. col. 8 from CPU Board J207-9
J1-2 White-Red, sw. row 2 from CPU Board J209-2
J1-3 White-Brown, sw. row 1 from CPU Board J209-1
J1-4 White-Orange, sw. row 3 from CPU Board J209-3
J1-5 White-Violet, sw. row 7 from CPU Board J209-8
J1-6 White-Blue, sw. row 6 from CPU Board J209-7
J1-7 White-Yellow, sw. row 4 from CPU Board J209-4
J1-8 White-Green, sw. row 5 from CPU Board J209-5
J1-9 Key
J1-10 Black, ground from Power Driver Board J118-3
J1-11 Gray-Yellow, +12v from Power Driver Board J118-2
J1-12 Gray-Yellow, +12V from Power Driver Board J1-11

A-15430
10 Sw.-Opto PCB Assembly



J1-1 Gray-Violet, to sw. 47 (Subway Lockup) LED brd anode
J1-2 Gray-Blue, not used
J1-3 Gray-Green, to sw. 45 (Center Enter) LED brd anode
J1-4 Gray-Black, to sw. 44 (Right Popper) LED brd anode
J1-5 Gray-Orange, to sw. 43 (Top Idol Enter) LED brd anode
J1-6 Gray-Red, to sw. 42 (Right Ramp Enter) LED brd anode
J1-7 Gray-Brown, to sw. 41 (Left Ramp Enter) LED brd anode
J1-8 Key
J1-9 Black, grd to LED brd cathode

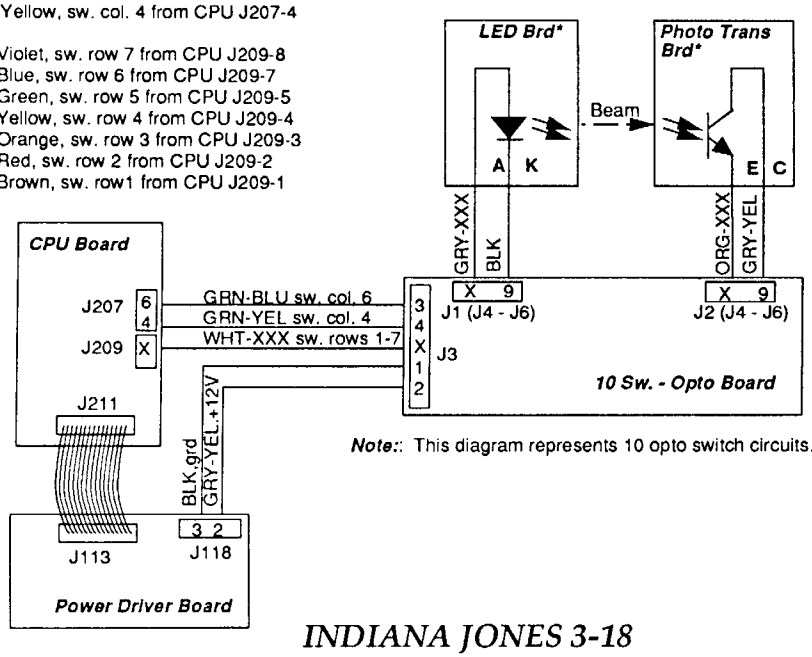
J2-1 Orange-Violet, to sw. 47 (Subway Lockup) Photo Trans. brd emiter
J2-2 Orange-Blue, not used
J2-3 Orange-Green, to sw. 45 (Center Enter) Photo Trans. brd emitter
J2-4 Orange-Yellow, to sw. 44 (Right Popper) Photo Trans. brd emitter
J2-5 Orange-Black,to sw. 43 (Top Idol Enter) Photo Trans. brd emitter
J2-6 Key
J2-7 Orange-Red, to sw. 42 (Right Ramp Enter) Photo Trans. brd emitter
J2-8 Orange-Brown, to sw. 41 (Left Ramp Enter) Photo Trans. brd emitter
J2-9 Gray-Yellow, +12V to Photo Trans. brd collector

J3-1 Black, grd from Power Driver Brd J118-3
J3-2 Gray-Yellow, +12V from Power Driver Brd J118-2
J3-3 Green-Blue, sw. col. 6 from CPU J207-6
J3-4 Green-Yellow, sw. col. 4 from CPU J207-4
J3-5 Key
J3-6 White-Violet, sw. row 7 from CPU J209-8
J3-7 White-Blue, sw. row 6 from CPU J209-7
J3-8 White-Green, sw. row 5 from CPU J209-5
J3-9 White-Yellow, sw. row 4 from CPU J209-4
J3-10 White-Orange, sw. row 3 from CPU J209-3
J3-11 White-Red, sw. row 2 from CPU J209-2
J3-12 White-Brown, sw. row1 from CPU J209-1

J4-1 Gray-Brown, to sw. 71 (Captive Ball Front) LED brd anode
J4-2 NC
J4-3 NC
J4-4 Key
J4-5 Orange-Brown, to sw. 71 (Captive Ball Front) Photo Trans. brd emitter

J5-1 Gray-Red, to sw. 72 (Mini Top Hole) LED brd anode
J5-2 NC
J5-3 Key
J5-4 NC
J5-5 Orange-Red, to sw. 72 (Mini Top Hole) Photo Trans. brd emitter

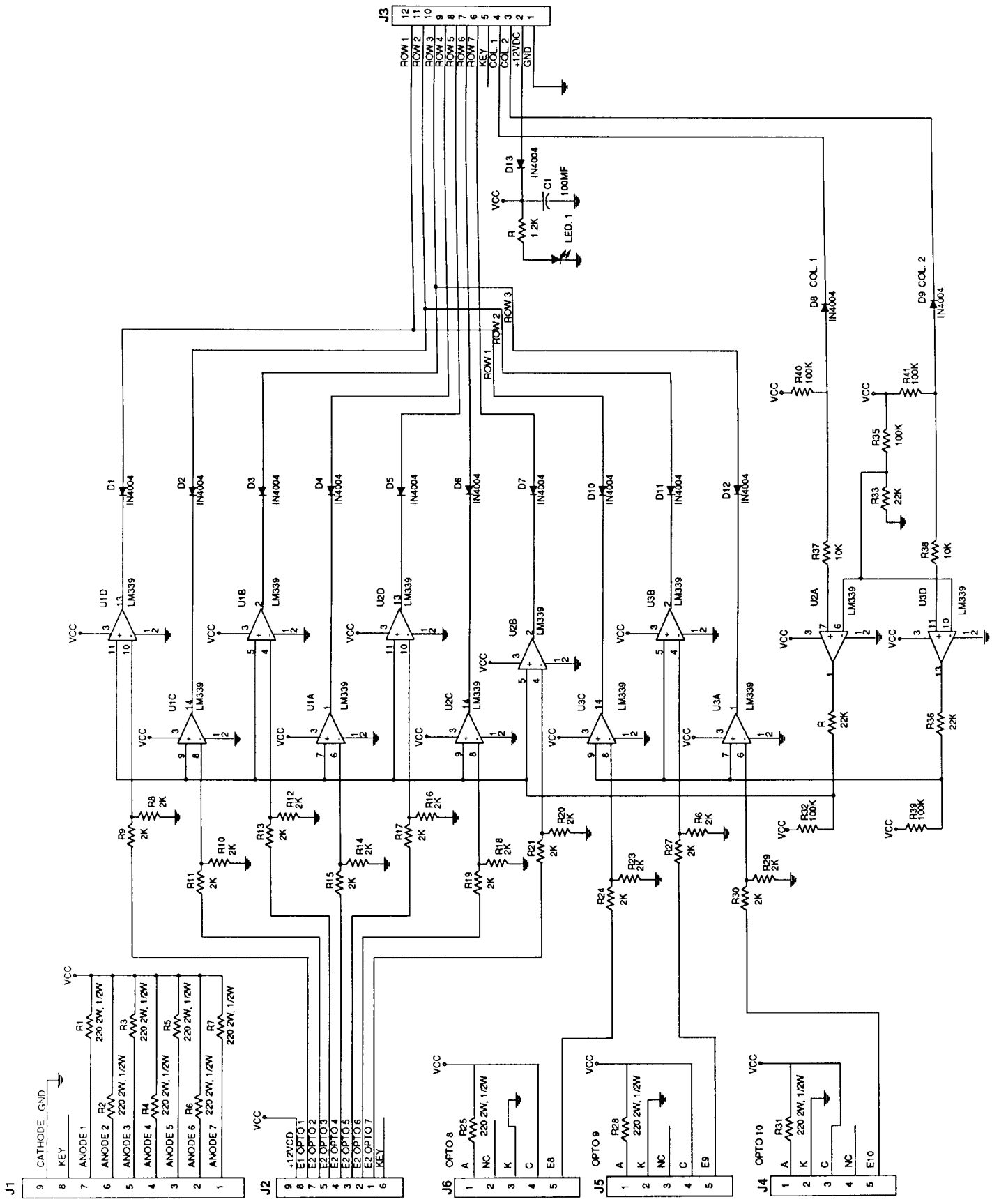
J6-1 Gray-Orange, to sw. 73 (Mini Bottom Hole) LED brd anode
J6-2 Key
J6-3 NC
J6-4 NC
J6-5 Orange-Black, to sw. 73 (Mini Bottom Hole) Photo Trans. brd emitter



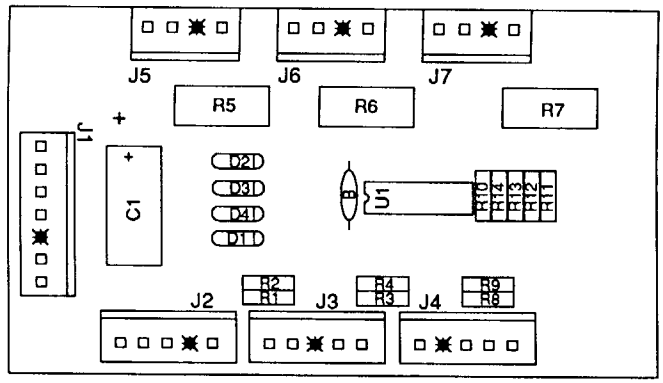
Note: LED Brds. are green. Photo Trans. Brds. are blue.

Note: This diagram represents 10 opto switch circuits.

A-15430
10 Sw.-PCB Schematic



A-13901-2
3-sw. Opto PCB Assembly
(for idol)



J1-1 Black, ground, from Power Driver board J118-3
J1-2 Gray-Yellow, +12V, from Power Driver board J118-2
J1-3 N/C
J1-4 White-Orange, switch row 3, from CPU board J209-3
J1-5 White-Red, switch row 2, from CPU board J209-2
J1-6 White-Brown, switch row 1, from CPU board J209-1
J1-7 Violet-White, switch column 9, from 8-Driver PCB J5-4

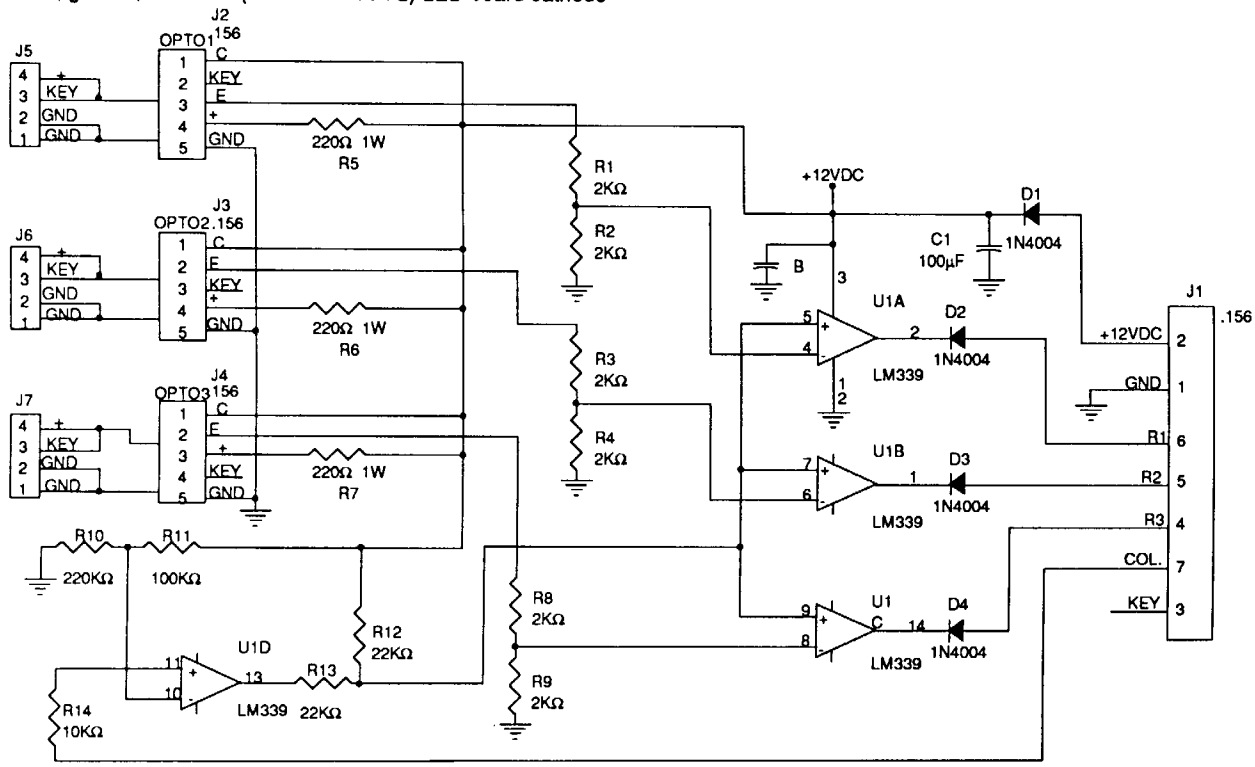
J4-1 Gray-Yellow, +12V, to sw. 93 (Wheel Position 3) Photo. Trans. brd. collector
J4-2 Orange-Black, to sw. 93 (Wheel Position 3) Photo. Trans. brd. emitter
J4-3 Gray-Orange, to sw. 93 (Wheel Position 3) LED board anode
J4-4 Key
J4-5 Black. ground, to sw. 93 (Wheel Position 3) LED board cathode

J5 through J7 are Not Used

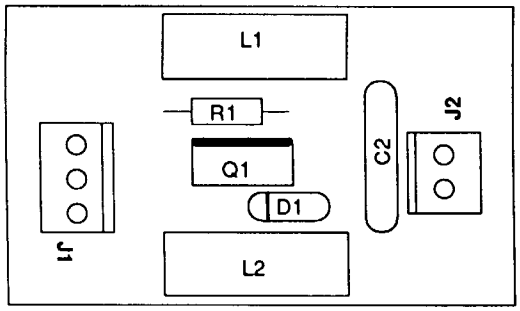
J2-1 Gray-Yellow, +12V, to sw. 91 (Wheel Position 1) Photo Trans. brd. collector
J2-2 Key
J2-3 Orange-Brown, to sw. 91 (Wheel Position 1) Photo Trans. brd. emitter
J2-4 Gray-Brown, to sw. 91 (Wheel Position 1) LED board anode
J2-5 Black, ground, to sw. 91 (Wheel Position 1) LED board cathode

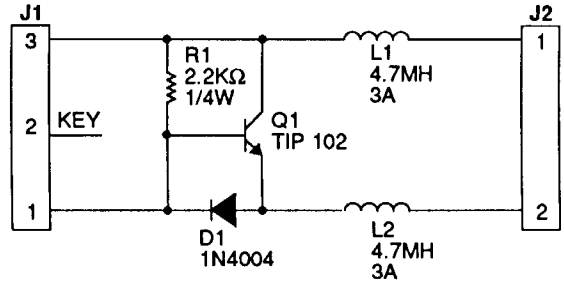
Note: LED Brds. are green.
Photo Trans. Brds. are blue.

J3-1 Gray-Yellow, +12V, to sw. 92 (Wheel Position 2) Photo Trans. brd. collertor
J3-2 Orange-Red, to sw. 92 (Wheel Position 2) Photo Trans. brd. emitter
J3-3 Key
J3-4 Gray-Red, to sw. 92 (Wheel Position 2) LED board anode
J3-5 Black, ground, to sw. 92 (Wheel Position 2) LED board cathode



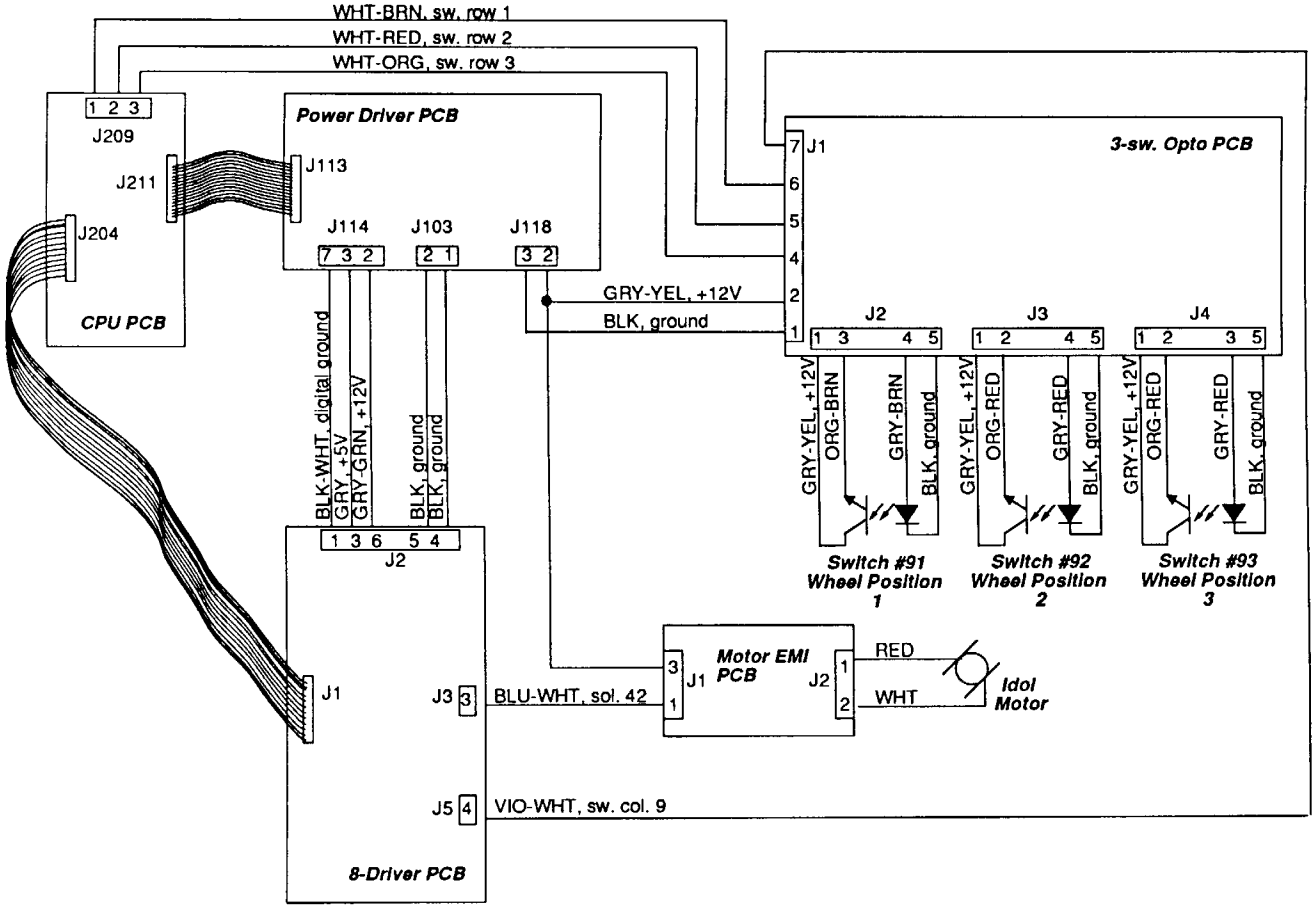
A-15340
Motor EMI PCB Assembly
(for idol)



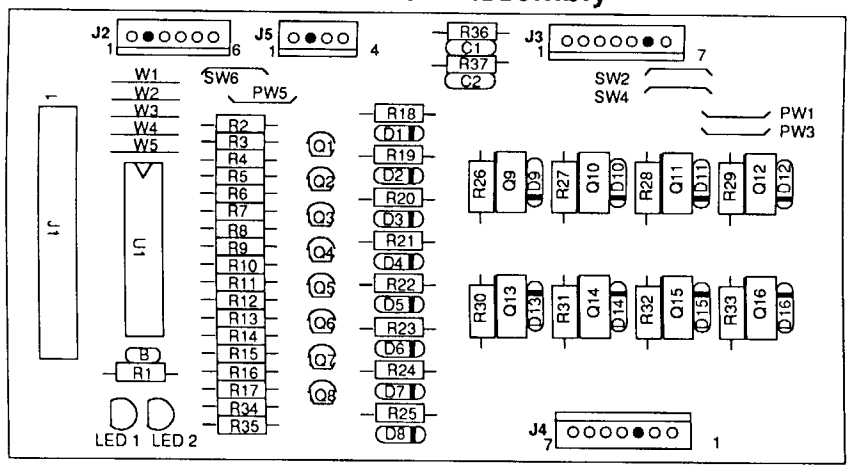


J1-1 Blue-White, solenoid 42 drive (Wheel Motor), from 8-Driver Board J3-3
J1-2 Key
J1-3 Gray-Yellow, +12V, from Power Driver Board J118-2

J2-1 Red, To motor
J2-2 White, To motor



A-16100
8-Driver PCB Assembly



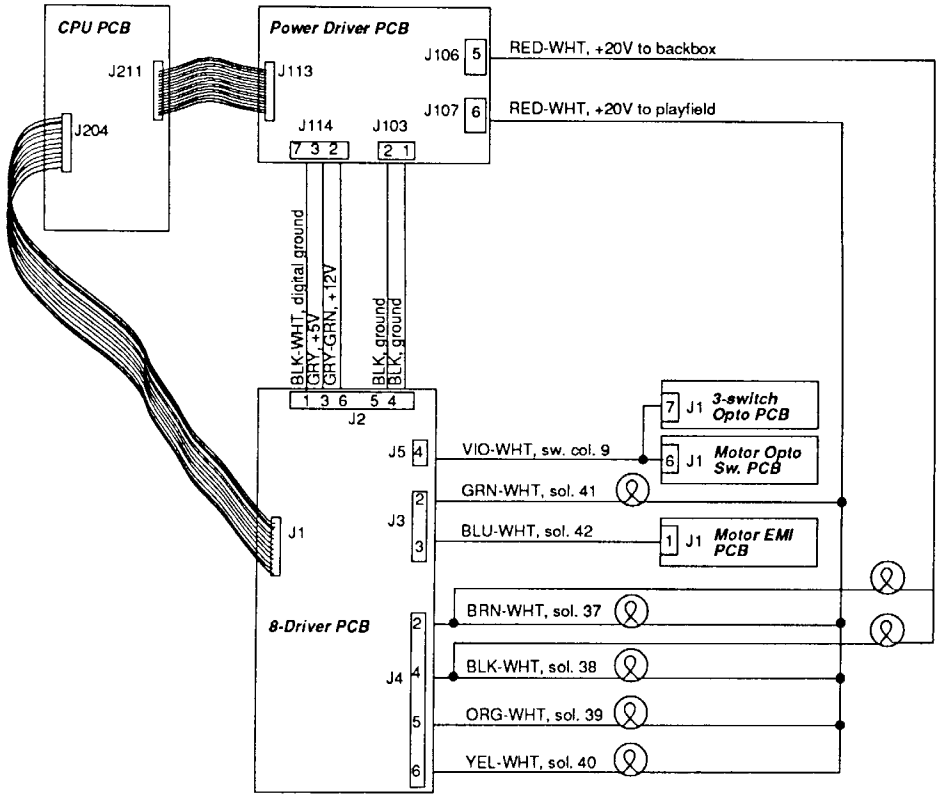
J1-1 Ribbon cable, data, from CPU Board J204

J2-1 Black-White, digital ground, from Power Driver Board J114-7
J2-2 Key
J2-3 Gray, +5V, from Power Driver Board J114-3
J2-4 Black, ground, from Power Driver Board J103-1
J2-5 Black, ground, from Power Driver Board J103-2
J2-6 Gray-Green, +12V, from Power Driver Board J114-2

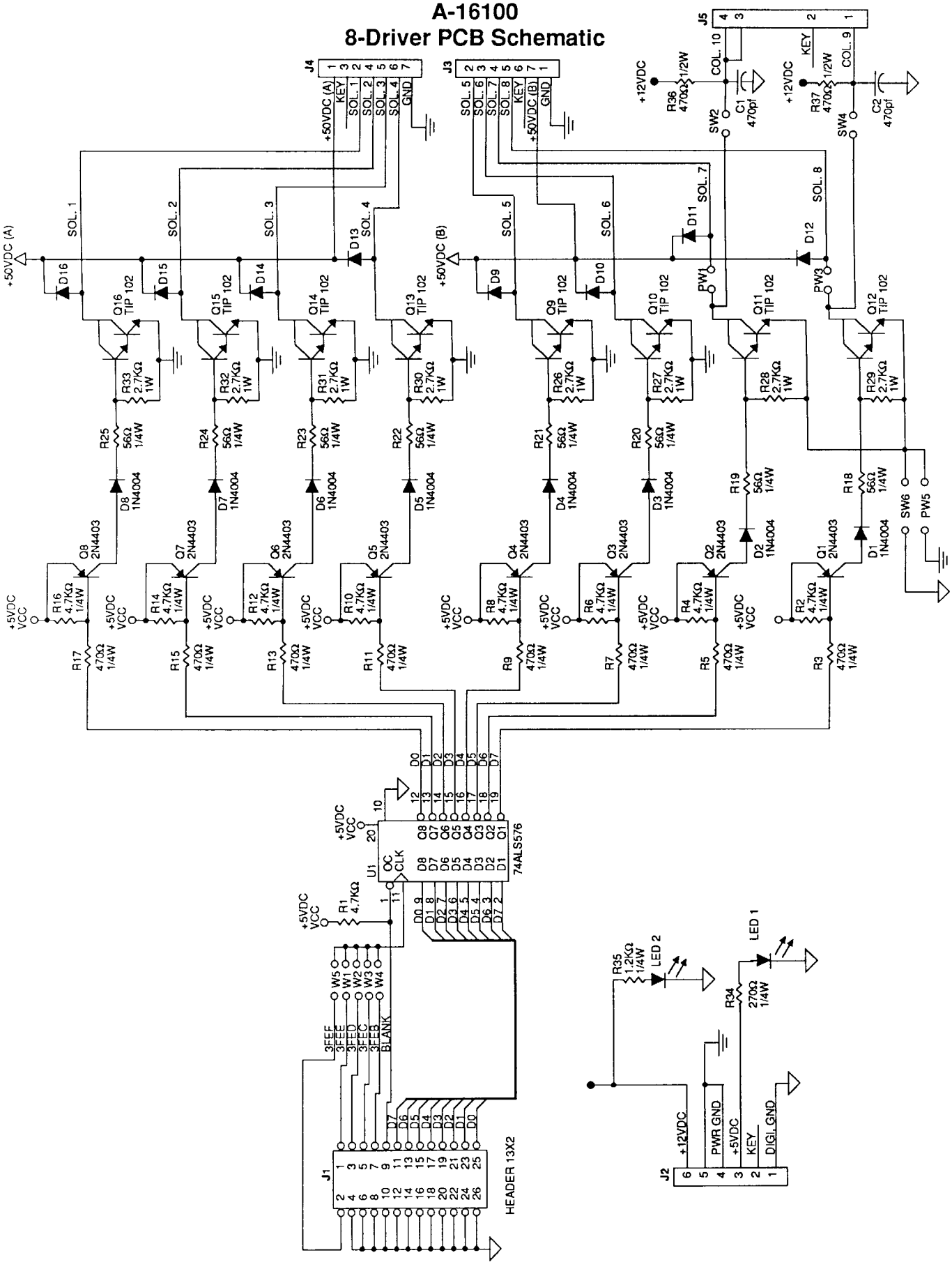
J3-1 N/C
J3-2 Green-White, sol. 41 drive (Jackpot Multiplier Fl), to plfd flasher
J3-3 Blue-White, sol. 42 drive (Wheel Motor), to Motor EMI Board J1-1
J3-4 N/C
J3-5 N/C
J3-6 Key
J3-7 N/C

J4-1 N/C
J4-2 Brown-White, sol. 37 drive (Left Side Fl), to bb and plfd flasher
J4-3 N/C
J4-4 Black-White, sol. 38 drive (Right Side Fl), to bb and plfd flasher
J4-5 Orange-White, sol. 39 drive (Special Fl), to plfd flasher
J4-6 Yellow-White, sol. 40 drive (Totem Multiball Fl), to plfd flasher

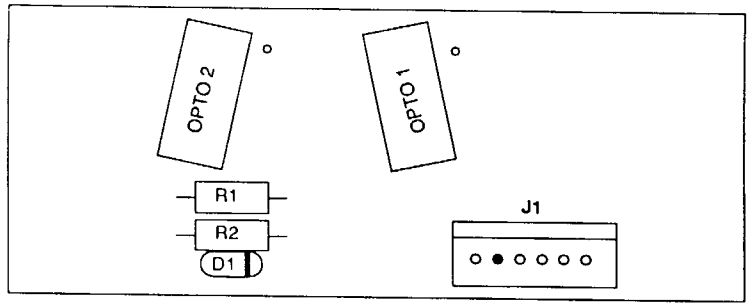
J5-1 N/C
J5-2 Key
J5-3 N/C
J5-4 Violet-White, switch column 9, to Motor Opto Switch Board J1-6 and 3-sw. Opto Board J1-7

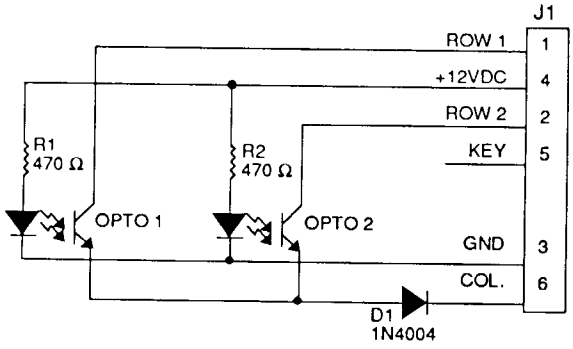


A-16100
8-Driver PCB Schematic

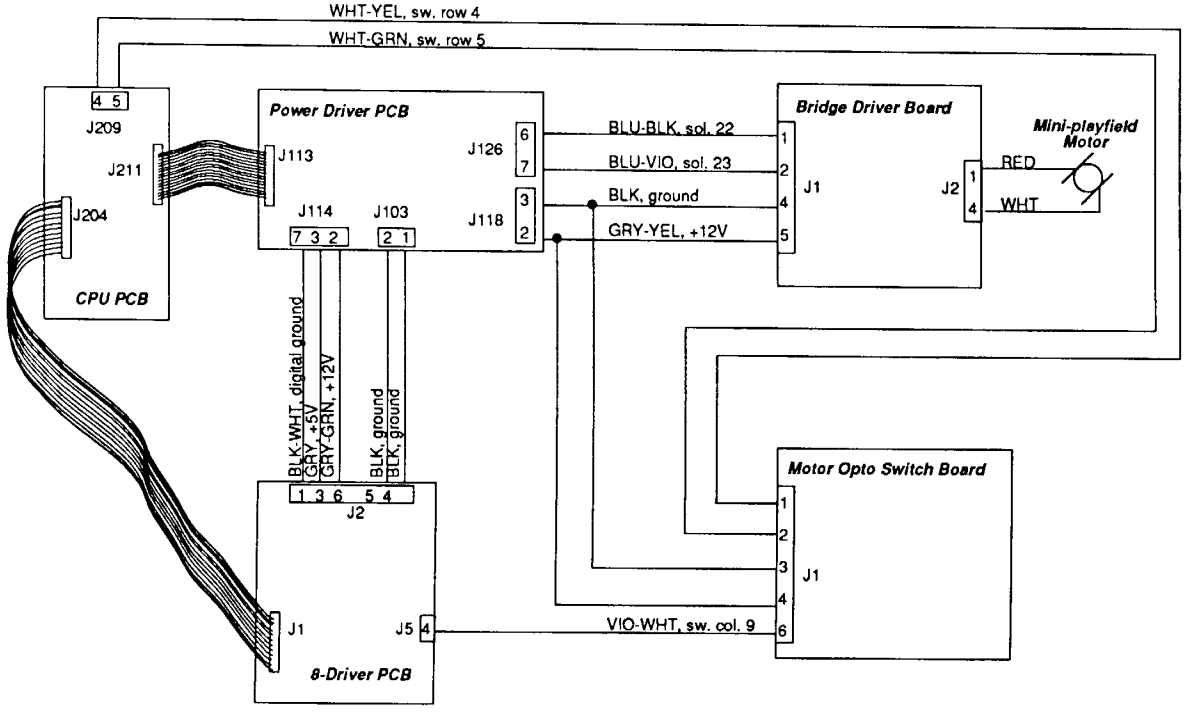


A-16657
Motor Opto Switch PCB Assembly
(for mini playfield)

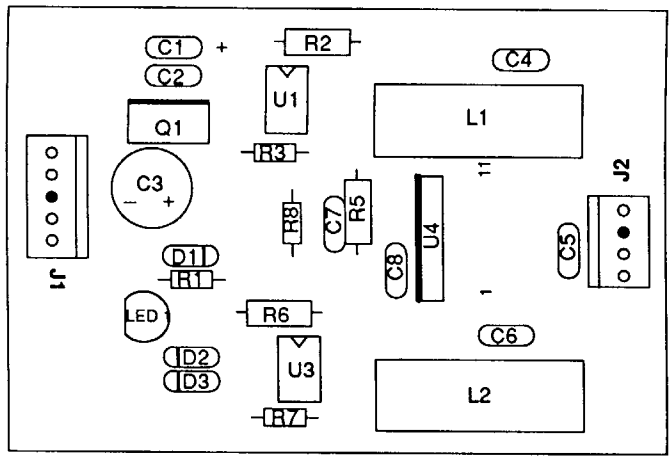


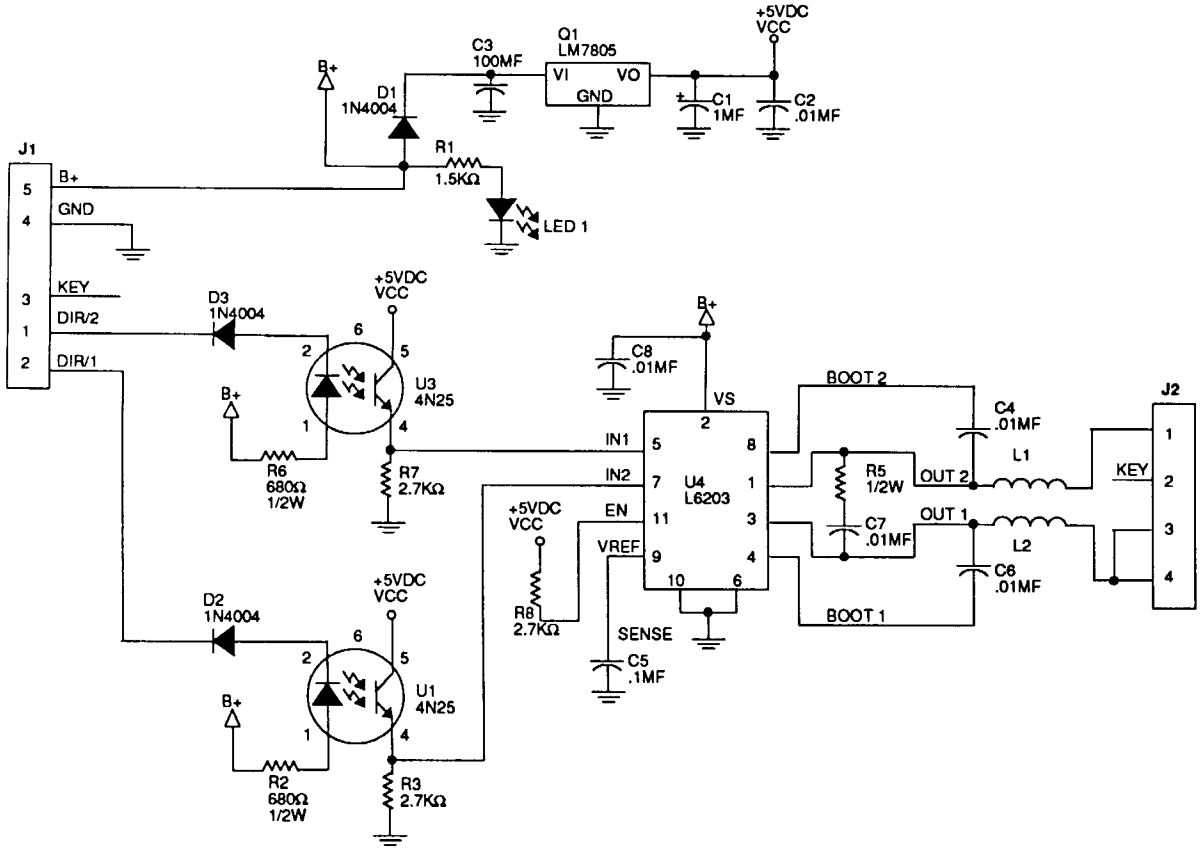


J1-1 White-Yellow, switch row 4, from CPU Board J209-4
J1-2 White-Green, switch row 5, from CPU Board J209-5
J1-3 Black, ground, from Power Driver Board J118-3
J1-4 Gray-Yellow, +12V, from Power Driver Board J118-2
J1-5 Key
J1-6 Violet-White, switch column 9, from 8-Driver Board J5-4



A-15946
Bridge Driver PCB Assembly
(for mini playfield)

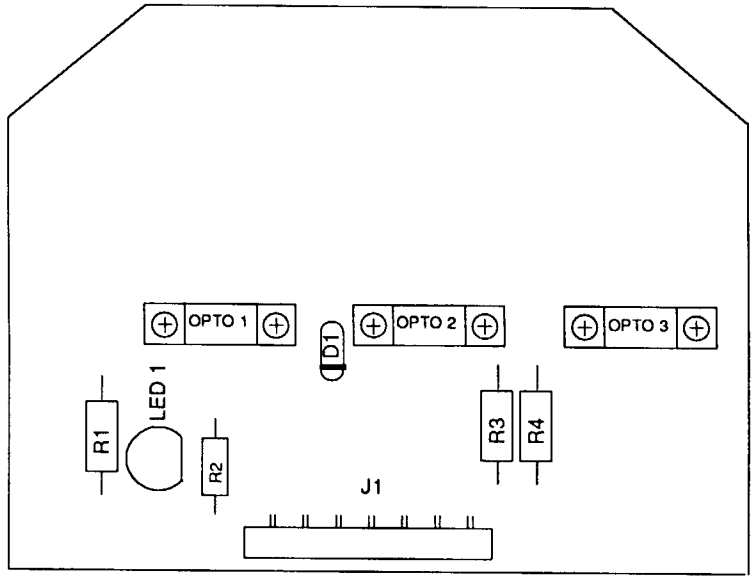


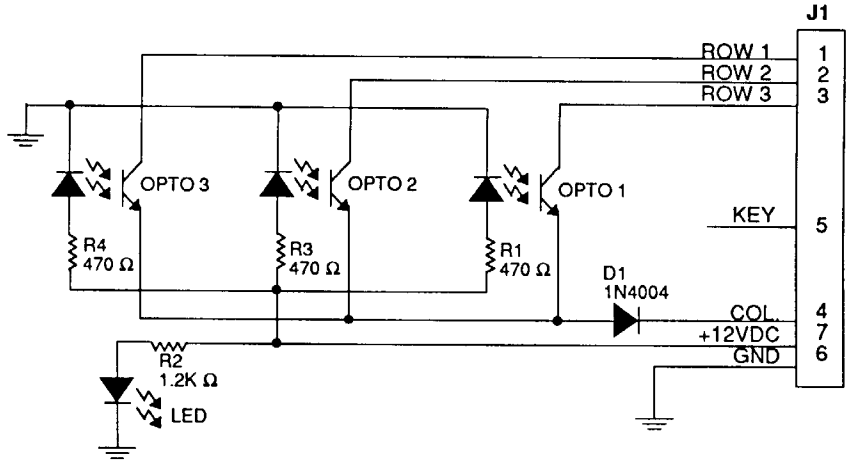


J1-1 Blue-Black, solenoid 22 drive (Mini Motor Left), from Power Driver Board J126-6
J1-2 Blue-Violet, solenoid 23 drive (Mini Motor Right), from Power Driver Board J126-7
J1-3 Key
J1-4 Black, ground, from Power Driver Board J118-3
J1-5 Gray-Yellow, +12V, from Power Driver Board J118-2

J2-1 Red, To motor
J2-2 Key
J2-3 N/C
J2-4 White, To motor

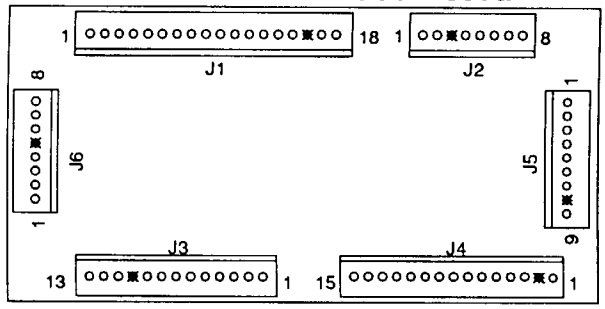
A-13609
3-bank Opto Drop Target PCB Assembly





J1-1 Black-Gray, switch F7 (Center Drop Bank Right), from Fliptronic II Board J906-5
J1-2 Black-Yellow, switch F6 (Center Drop Bank Middle), from Fliptronic II Board J905-3
J1-3 Black-Violet, switch F5 (Center Drop Bank Left), from Fliptronic II Board J906-4
J1-4 Orange, column (switch ground), from Fliptronic II Board J905-6
J1-5 Key
J1-6 Black, Ground from Power Driver Board J118-3
J1-7 Gray-Yellow, +12V from Power Driver Board J118-2

A-14689
Coin Door Interface Board



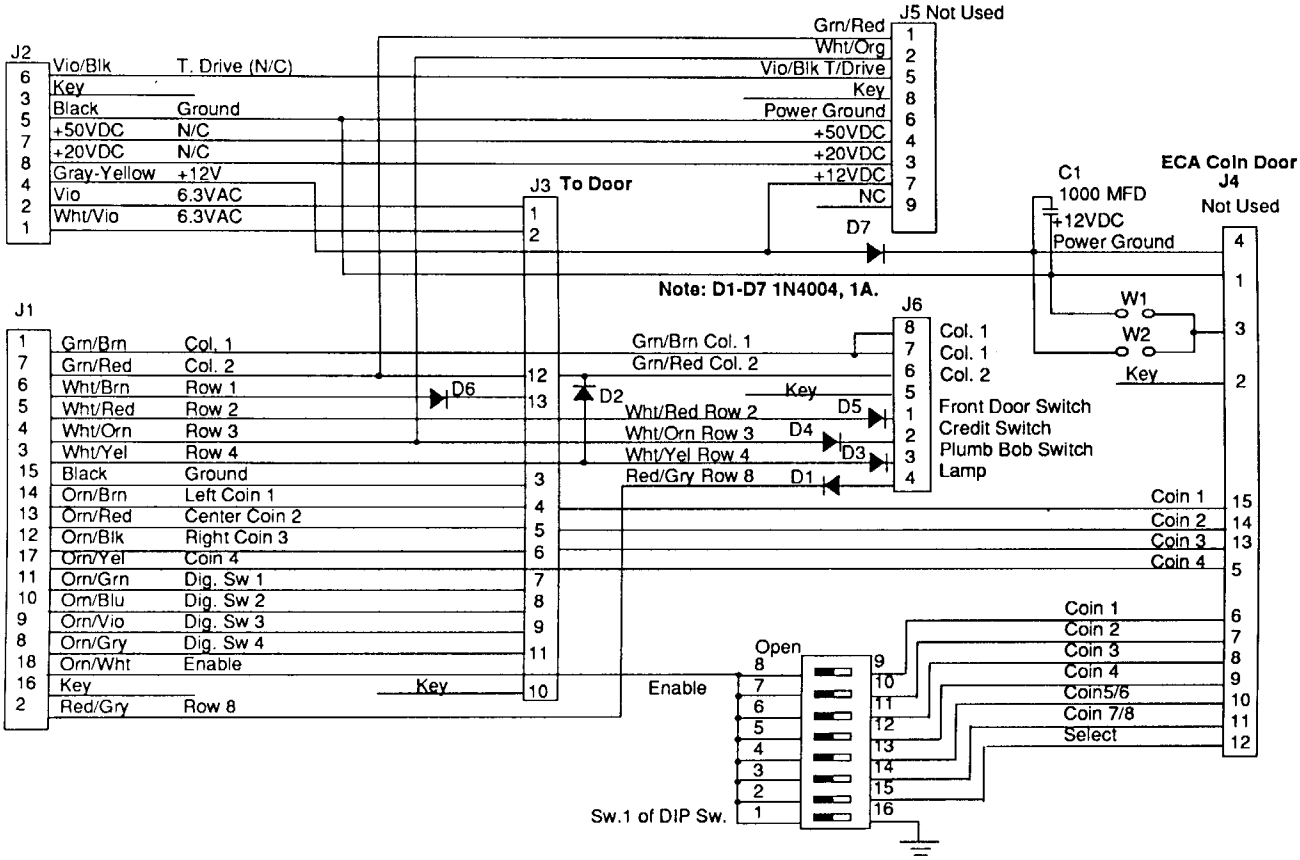
J1-1 Green-Brown, sw. col. 1, from CPU J212-1
J1-2 Red-Gray, lamp row 8, from Power Driver Brd J134-9
J1-3 White-Yellow, sw. row 4, from CPU J212-8
J1-4 White-Orange, sw. row 3, from CPU J212-7
J1-5 White-Red, sw. row 2, from CPU J212-6
J1-6 White-Brown, sw. row 1, from CPU J212-4
J1-7 Green-Red, sw.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

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

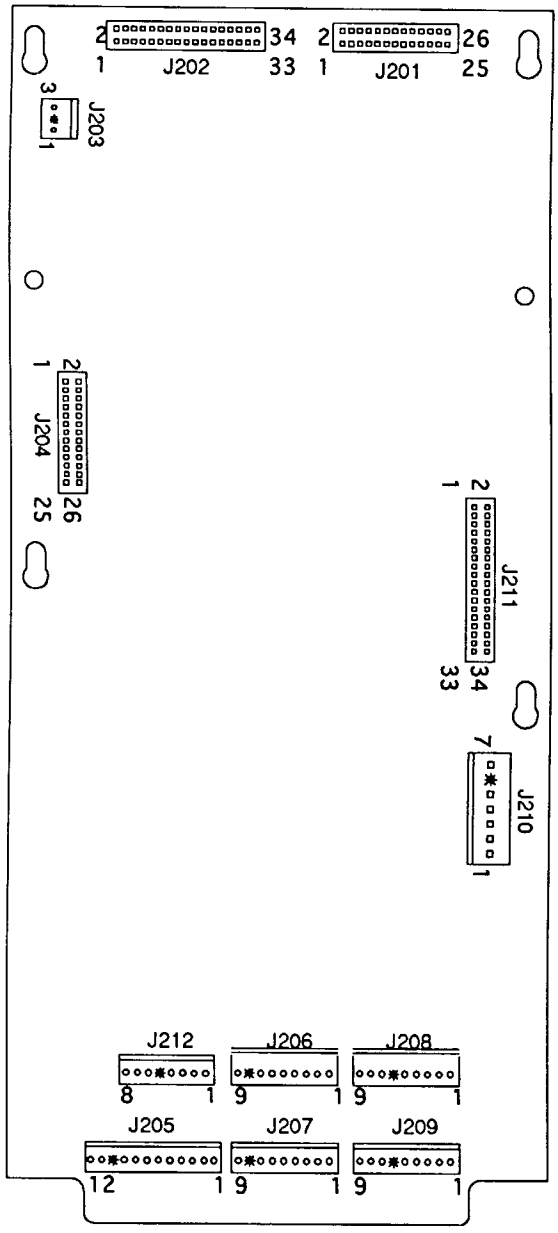
J3-1 Violet, G.I. return, to coin door
J3-2 White-Violet, G.I. 6.8VAC, to coin door
J3-3 Black, ground, to Door
J3-4 Orange-Brown, dedicated sw. row 1, to coin door
J3-5 N/C
J3-6 Orange-Black, dedicated sw. row 3, to coin door
J3-7 Orange-Green, dedicated sw. row 4, to coin door
J3-8 Orange-Blue, dedicated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

J4 - Not Used
J5 - Not Used

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



A-12742-50017
CPU Board



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

J202, 34-pin Ribbon Cable, data, To/from J903; P1; J601

J203-Not Used

J204, 26-pin Ribbon Cable, data To/from 8-Driver Board J1

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

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

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

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

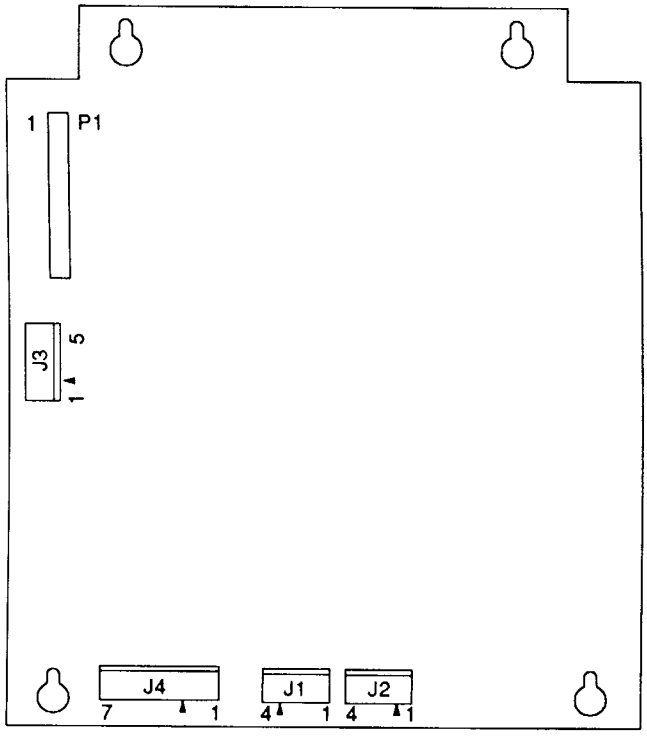
J209-1 White-Brown, sw. row 1, to playfield switches
J209-2 White-Red, sw. row 2, to playfield switches
J209-3 White-Orange, sw. row 3, to playfield switches
J209-4 White-Yellow, sw. row 4, to playfield switches
J209-5 White-Green, sw. row 5, to playfield switches
J209-6 N/C
J209-7 White-Blue, sw. row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

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

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

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

A-16917-50017
Audio Board



P1, 34-pin Ribbon Cable, data, To/from J601; J903; J202

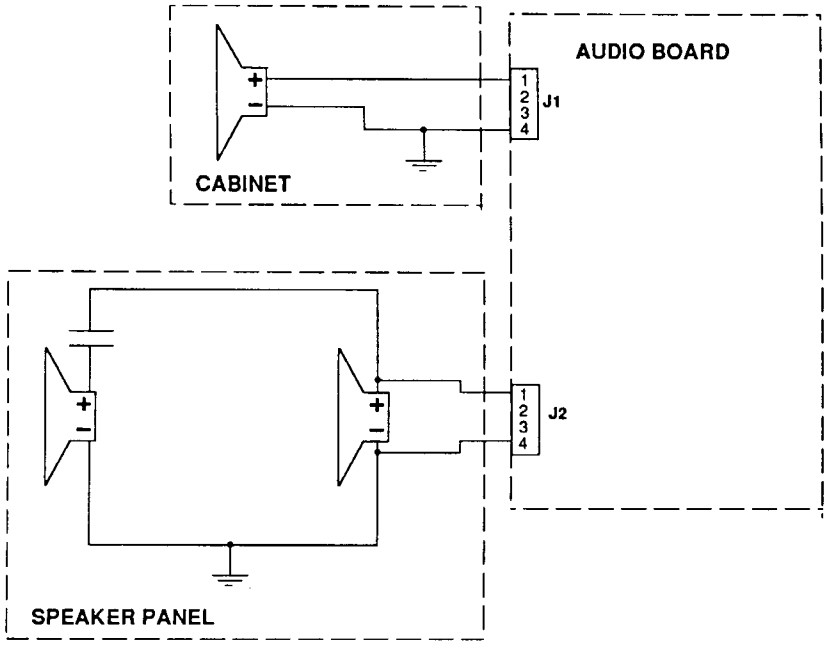
J1-1 Black-Yellow, signal to speaker
J1-2 N/C
J1-3 N/C
J1-4 Black-Yellow, signal to speaker

J2-1 Black-Yellow, signal to speaker
J2-2 N/C
J2-3 N/C
J2-4 Black-Yellow, signal to speaker

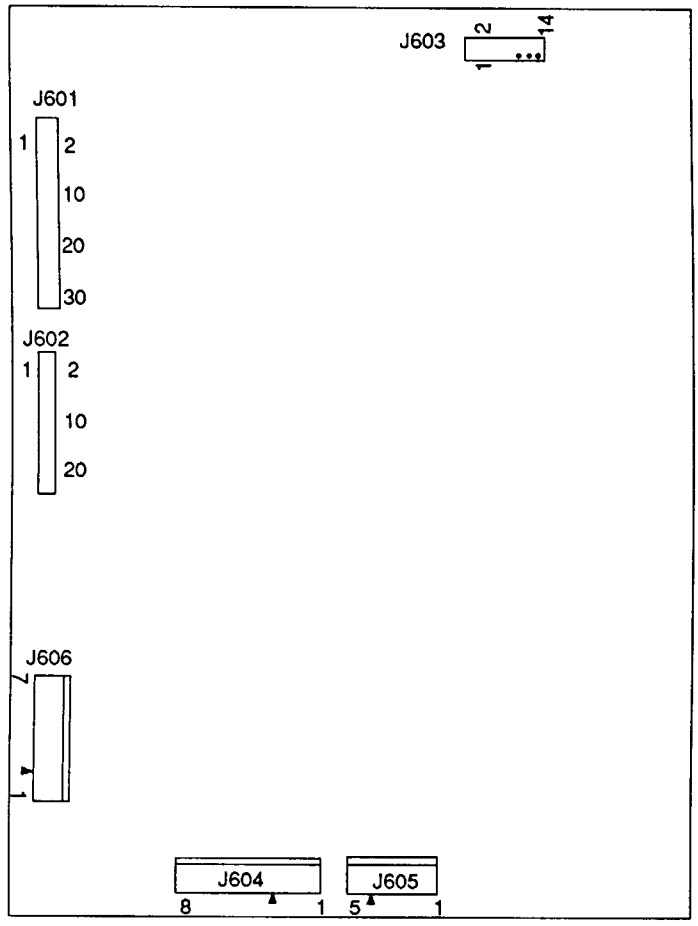
J3-1 Gray, +5V, from Power Driver Board J114-3,4
J3-2 N/C
J3-3 Gray, +5V, from Power Driver Board J114-3,4
J3-4 Black, ground, from Power Driver Board J114-5,7
J3-5 Black, ground, from Power Driver Board J114-5,7

J4-1 Gray-Green, 18VAC, from xformer secondary
J4-2 Gray-Green, 18VAC, loop from J4-1
J4-3 N/C
J4-4 Gray, 18VAC, from xformer secondary
J4-5 Gray, 18VAC, loop from J4-4
J4-6 Gray-White, 18VAC, from xformer secondary
J4-7 Gray-White, 18VAC, loop from J4-6

SPEAKER WIRING DIAGRAM



A-14039
Dot Matrix Controller Board



J601, 34-pin Ribbon Cable data, To/from J202; J903; P1

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

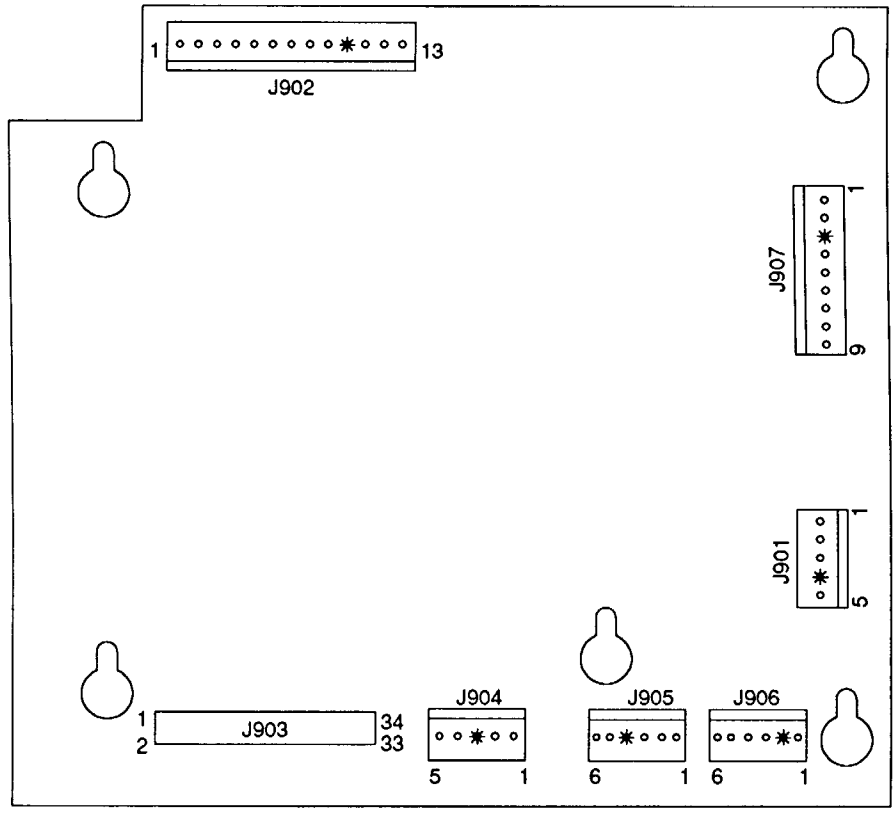
J603, 14-pin Ribbon Cable data, To/from Dot Matrix Display/Driver

J604-1 Orange, -125V, to Display/Driver pin 1
J604-2 Blue, -113V, to Display/Driver pin 2
J604-3 N/C
J604-4 Black, ground, to Display/Driver pin 4
J604-5 Black, ground, to Display/Driver pin 5
J604-6 Gray, +5V, to Display/Driver pin 6
J604-7 Gray-Yellow, +12V, to Display/Driver pin 7
J604-8 Brown, +62V, to Display/Driver pin 8

J605-1 White, 80VAC, from xformer secondary
J605-2 White, 80VAC, from xformer secondary
J605-3 Violet, 100VAC, from xformer secondary
J605-4 N/C
J605-5 Violet 100VAC, from xformer secondary.

J606-1 Black, ground, loop from J606-3
J606-2 N/C
J606-3 Black, ground, from Power Driver Brd J117-3
J606-4 Gray, +5V, loop from J606-5
J606-5 Gray, +5V, from Power Driver Brd J117-4
J606-6 Gray-Yellow, +12V, loop from J606-7
J606-7 Gray-Yellow, +12V, from Power Driver Brd J117-2

A-15472-1
Fliptronic II Board



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

J902-1 Orange-Gray, sol. 36 (Top Lockup Hold)
J902-2 Black-Blue, sol. 35 (Top Lockup Power)
J902-3 N/C
J902-4 Orange-Violet, sol. 34 (Diverter Hold)
J902-5 N/C
J902-6 Black-Yellow,sol. 33 (Diverter Power)
J902-7 Orange-Blue, holding, lower left flipper coil
J902-8 N/C
J902-9 Blue-Gray, power, lower left flipper coil
J902-10 N/C
J902-11 Orange-Green, holding, lower right flipper coil
J902-12 N/C
J902-13 Blue-Violet, power, lower right flipper coil

J903, 34-pin Ribbon Cable, data, To/from J202; J601; P1

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

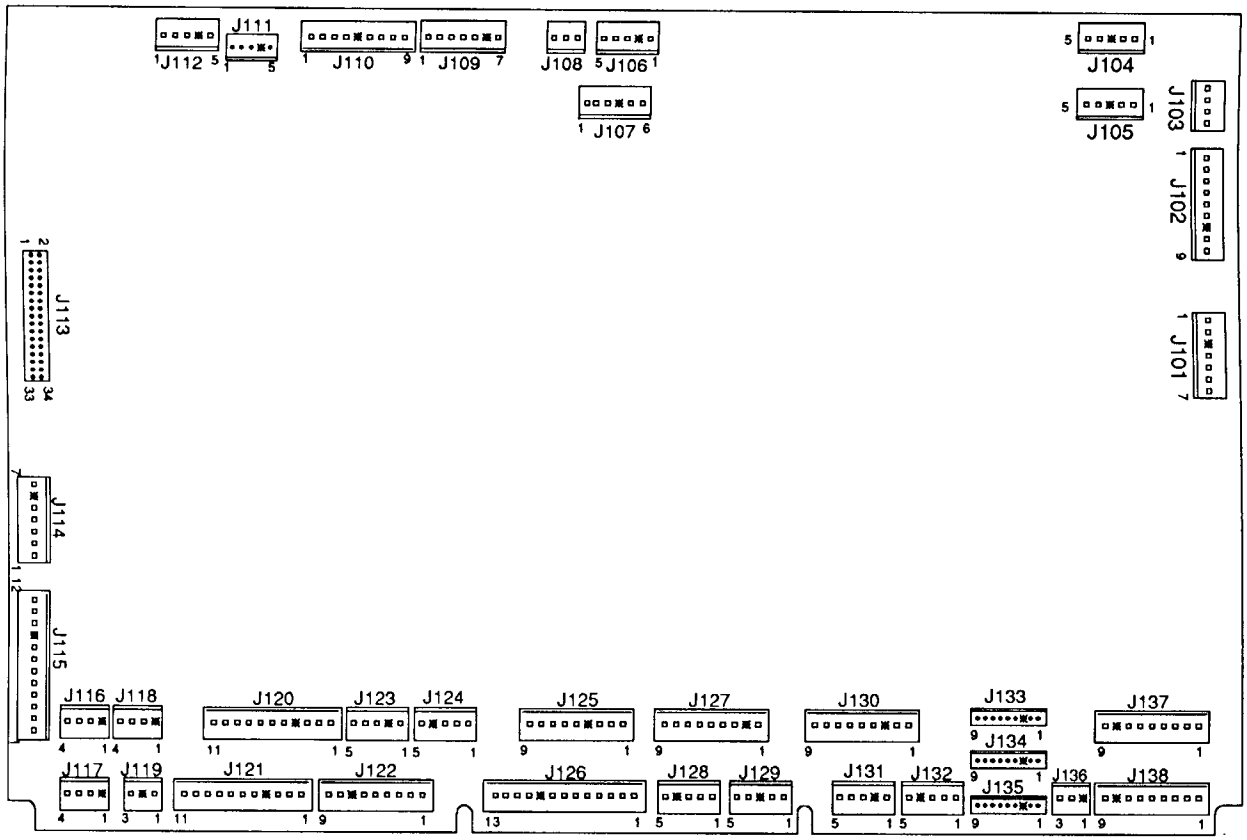
J905-1 Blue-Violet, F2, to right opto switch board J1-1
J905-2 Blue-Gray, F4, to left opto switch board J1-1
J905-3 Black-Yellow, F6 (Cntr Dr Bnk Mid.), to 3-bnk Opto Brd. J1-2
J905-4 N/C
J905-5 Black-Blue , F8 (Left Ramp Made), to playfield switch
J905-6 Orange, ground, to left opto switch board J1-3

J906-1 Black-Green, F1, to lower right EOS switch
J906-2 N/C
J906-3 Black-Blue, F3, to lower left EOS switch
J906-4 Black-Violet, F5 (Cntr Dr Bnk Lt), to 3-bnk Opto Brd. J1-3
J906-5 Black-Gray, F7 (Cntr Dr Bnk Rt), to 3-bnk Opto Brd. J1-1
J906-6 Orange, ground, to EOS switches

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

NOTE: In this game, the upper right and left flipper coil circuits are used to drive solenoids 33, 34, 35 and 36. The upper right and left flipper switch circuits are used as playfield switches.

A-12697-3
Power Driver Board



J101-1 Red, 9VAC, from xformer secondary
J101-2 Red, 9VAC, from xformer secondary
J101-3 N/C
J101-4 Blue-White, 13VAC, from xformer secondary
J101-5 Blue-White, 13VAC, loop from J101-4
J101-6 Blue-White, 13VAC, from xformer secondary
J101-7 Blue-White, 13VAC, loop from J101-6

J102-1 White-Red, 16VAC, loop from J102-2
J102-2 White-Red, 16VAC, from xformer secondary
J102-3 White-Red, 16VAC, loop from J102-4
J102-4 White-Red, 16VAC, from xformer secondary
J102-5 Black-Yellow, 16VAC, loop from J102-6
J102-6 Black-Yellow, 16VAC, from xformer secondary
J102-7 N/C
J102-8 Black-Yellow, 16VAC, loop from J102-9
J102-9 Black-Yellow, 16VAC, from xformer secondary

J103-1 Black, ground, to 8-Driver Brd J2-4
J103-2 Black, ground, to 8-Driver Brd J2-5
J103-3 N/C
J103-4 N/C

J104-1 White-Blue, 50VAC, to Fliptronic II Board J901-3
J104-2 White-Blue, 50VAC, to Fliptronic II Board J901-1
J104-3 N/C
J104-4 N/C
J104-5 N/C

J105-1 N/C
J105-2 N/C
J105-3 N/C
J105-4 N/C
J105-5 N/C

J106-1 N/C
J106-2 N/C
J106-3 N/C
J106-4 N/C
J106-5 Red-White, +20V, to backbox flashlamps

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

J108-1 N/C
J108-2 N/C
J108-3 N/C

J109-1 N/C
J109-2 N/C
J109-3 N/C
J109-4 N/C
J109-5 N/C
J109-6 N/C
J109-7 N/C

Power Driver Board Continued...

J110-1 N/C
J110-2 N/C
J110-3 N/C
J110-4 N/C
J110-5 N/C
J110-6 N/C
J110-7 N/C
J110-8 N/C
J110-9 N/C

J111-1 N/C
J111-2 N/C
J111-3 N/C
J111-4 N/C
J111-5 N/C

J112-1 White-Green, 9.8VAC, from xformer secondary
J112-2 White-Green, 9.8VAC, loop from J112-1
J112-3 White-Green, 9.8VAC, from xformer secondary
J112-4 N/C
J112-5 White-Green, 9.8VAC, loop from J112-3

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

J114-1 Gray-Green, +12V, to J210-6,7; J904-2
J114-2 Gray-Green, +12V, to 8-Driver Brd. J2-6
J114-3 Gray, +5V, to 8-Driver Brd. J2-3
J114-4 Gray, +5V, to J210-4,5; J3-1,3; J904-1
J114-5 Black-White, ground, to J210-1,3; J3-4,5; J904-4,5
J114-6 N/C
J114-7 Black-White, ground, to 8-Driver Brd. J2-1

J115-1 Yellow-White, 6.8VAC, from xformer secondary
J115-2 White-Brown, 6.8VAC, from xformer secondary
J115-3 White-Brown, 6.8VAC, from xformer secondary
J115-4 White-Orange, 6.8VAC, from xformer secondary
J115-5 White-Yellow, 6.8VAC, from xformer secondary
J115-6 White-Yellow, 6.8VAC, from xformer secondary
J115-7 Orange, 6.8VAC, from xformer secondary
J115-8 Orange, 6.8VAC, from xformer secondary
J115-9 N/C
J115-10 Green, 6.8VAC, from xformer secondary
J115-11 Brown, 6.8VAC, from xformer secondary
J115-12 Brown, 6.8VAC, from xformer secondary

J116-1 N/C
J116-2 Gray-Yellow, +12V, to Coin Door J2-4
J116-3 Black, ground, to Coin Door J2-5
J116-4 N/C

J117-1 N/C
J117-2 Gray-Yellow, +12V, to Dot Matrix Controller J606-7
J117-3 Black, ground, to Dot Matrix Controller J606-3
J117-4 Gray, +5V, to Dot Matrix Controller J606-5

J119-1 White-Violet, 6.8VAC, G.I. to Coin Door Brd J2-2
J119-2 N/C
J119-3 Violet, return, G.I. to Coin Door Brd J2-1

J118-1 N/C
J118-2 Gray-Yellow, +12V, to Playfield Boards and airplane flashers
J118-3 Black, ground, to Playfield Boards and airplane flashers
J118-4 N/C

J120-1 N/C
J120-2 N/C
J120-3 Yellow, return, G.I. to backbox
J120-4 N/C
J120-5 Green, return, G.I. to backbox
J120-6 N/C
J120-7 N/C
J120-8 N/C
J120-9 White-Yellow, 6.8VAC, G.I. to backbox
J120-10 White-Green, 6.8VAC, G.I. to backbox
J120-11 N/C

J121-1 Brown, return, G.I. to playfield
J121-2 Orange, return, G.I. to playfield
J121-3 N/C
J121-4 N/C
J121-5 N/C
J121-6 Violet, return, G.I. to playfield
J121-7 White-Brown, 6.8VAC, G.I. to playfield
J121-8 White-Orange, 6.8VAC, G.I. to playfield
J121-9 N/C
J121-10 N/C
J121-11 White-Violet, 6.8VAC, G.I. to playfield

J122-1 Blue-Brown, sol. 25 drive, to playfield flashlamp
J122-2 Blue-Red, sol. 26 drive, to playfield flashlamp
J122-3 Blue-Orange, sol. 27 drive, to playfield flashlamp
J122-4 Blue-Yellow, sol. 28 drive, to playfield coil
J122-5 N/C
J122-6 N/C
J122-7 N/C
J122-8 N/C
J122-9 Violet-Green, sol. tieback diode, to playfield coil

J123-1 N/C
J123-2 N/C
J123-3 N/C
J123-4 N/C
J123-5 N/C

J124-1 N/C
J124-2 Blue-Red, sol. 26 drive, to backbox flashlamp
J124-3 Blue-Orange, sol. 27 drive, to backbox flashlamp
J124-4 N/C
J124-5 N/C

J125-1 Black-Brown, sol.17 drive, to backbox flashlamp
J125-2 N/C
J125-3 N/C
J125-4 N/C
J125-5 Black-Yellow, sol. 20 drive, to backbox flashlamp
J125-6 Blue- Green, sol. 21 drive, to backbox flashlamp
J125-7 N/C
J125-8 N/C
J125-9 N/C

Power Driver Board Continued...

J126-1 Black-Brown, sol 17 drive, to playfield flashlamps
J126-2 Black-Red, sol. 18 drive, to playfield flashlamps
J126-3 Black-Orange, sol. 19 drive, to playfield flashlamps
J126-4 Black-Yellow, sol. 20 drive, to playfield flashlamps
J126-5 Blue-Green, sol. 21 drive, to playfield flashlamps
J126-6 Blue-Black, sol. 22 drive, to Bridge Driver assy J1-1
J126-7 Blue-Violet, sol. 23 drive, to Bridge Driver assy J1-2
J126-8 Blue-Gray, sol. 24 drive, to playfield flashlamps
J126-9 N/C
J126-10 N/C
J126-11 N/C
J126-12 N/C
J126-13 N/C

J127-1 Brown-Black, sol. 9 drive, to playfield coil
J127-2 N/C
J127-3 Brown-Red, sol. 10 drive, to playfield coil
J127-4 Brown-Orange, sol. 11 drive, to playfield coil
J127-5 Brown-Yellow, sol. 12 drive, to playfield coil
J127-6 Brown-Green, sol. 13 drive, to playfield coil
J127-7 Brown-Blue, sol. 14 drive, to playfield coil
J127-8 Brown-Violet, sol. 15 drive, to playfield coil
J127-9 Brown-Gray, sol.16 drive, to playfield coil

J128-1 N/C
J128-2 N/C
J128-3 N/C
J128-4 N/C
J128-5 N/C

J129-1 N/C
J129-2 N/C
J129-3 N/C
J129-4 N/C
J129-5 N/C

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

J131-1 N/C
J131-2 N/C
J131-3 N/C
J131-4 N/C
J131-5 N/C

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

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

J134-1 N/C
J134-2 N/C
J134-3 N/C
J134-4 N/C
J134-5 N/C
J134-6 N/C
J134-7 N/C
J134-8 N/C
J134-9 Red-Gray, lamp row 8, to coin door

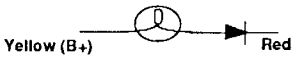
J135-1 N/C
J135-2 Red-Black, lamp row 2, to speaker panel J1-1
J135-3 N/C
J135-4 N/C
J135-5 N/C
J135-6 N/C
J135-7 Red-Blue, lamp row 6, to speaker panel, J1-6
J135-8 N/C
J135-9 Red-Gray, lamp row 8, to speaker panel, J1-5

J136-1 N/C
J136-2 N/C
J136-3 Yellow-Gray, lamp column 8, to coin door

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

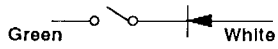
J138-1 Yellow-Red, lamp column 2, to speaker panel J1-3
J138-2 N/C
J138-3 N/C
J138-4 Yellow-Black, lamp column 4, to speaker panel J1-5
J138-5 N/C
J138-6 N/C
J138-7 N/C
J138-8 N/C
J138-9 N/C

LAMPS



Row \ Column	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J137-7 Q92	8 Yellow-Gray J137-9 Q91
1 Red-Brown J133-1 Q90	Mode Start 11	Tank Chase 21	Left Ramp Arrow 31	Mine Cart 41	Choose Wisely 51	(I)ndy 61	Mini Top Left 71	Mini Middle Bottom Left 81
2 Red-Black J133-2 Q89	Hand of Fate 12	Adven(t)ure Light 22	Castle Grunewald 32	Ark Jackpot 42	Right Plane Top 52	I(n)dy 62	Mini Top Right 72	Mini Middle Bottom Right 82
3 Red-Orange J133-4 Q88	Eject Extra Ball 13	Adv(e)ture Light 23	Left Plane Top 33	Raven Bar 43	Rope Bridge 53	In(d)y 63	Mini Middle Top Left 73	Mini Bottom Left 83
4 Red-Yellow J133-5 Q87	Ad(v)enture Light 14	Adve(n)ture Light 24	Monkey Brains 34	Right Plane Middle 44	Advent(u)re Light 54	Ind(y) 64	Mini Middle Top Right 74	Mini Bottom Right 84
5 Red-Green J133-6 Q86	A(d)venture Light 15	Steal The Stones 25	Left Plane Middle 35	Bonus 6X 45	Adventu(r)e Light 55	Willie 65	Mini Top Arrow 75	Mini Bottom Arrow 85
6 Red-Blue J133-7 Q85	(A)dventure Light 16	Grail Jackpot 26	Sallah 36	Right Plane Bottom 46	Adventur(e) Light 56	Bouns 2X 66	Marion 76	Totem Top Arrow 86
7 Red-Violet J133-8 Q84	Shoot Again 17	Streets Of Cairo 27	Bonus 4X 37	Well Of Souls 47	The 3 Challenges 57	Shorty 67	Bonus 8X 77	Center Lock 87
8 Red-Gray J133-9 Q83	Get The Idol 18	Stones Jackpot 28	Left Plane Bottom 38	Left Loop 48	Right Loop 58	Right Ramp Arrow 68	Dr. Jones 78	Start Button 88

SWITCHES



Dedicated Grounded Switches	Row \ Column	1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-9 U20-11	9 Violet-White Q11 J5-4	Flipper Grounded Switches
Orange-Brown J205-1 Left Coin Chute D1	1 White-Brown J209-1 U18-11	Single Drop Top 11	Slam Tilt 21	Left Eject 31	Left Ramp Enter 41	Advent(u)re Tgt. 51	(A)dventure Tgt. 61	Captive Ball Frt. 71	Trough 6 81	Wheel Position 1 91	Black-Green J906-1 Lower Right E.O.S. F1
Orange-Red J205-2 Center Coin Chute D2	2 White-Red J209-2 U18-9	Buy-in Button 12	Coin Door Closed 22	Exit Idol 32	Right Ramp Enter 42	Adventu(r)e Tgt. 52	A(d)venture Tgt. 62	Mini Top Hole 72	Trough 5 82	Wheel Position 2 92	Blue-Violet J905-1 Lower Right Opto F2
Orange-Black J205-3 Right Coin Chute D3	3 White-Orange J209-3 U18-5	Start Button 13	Ticket Opto 23	Left Slingshot 33	Top Idol Enter 43	Adventur(e) Tgt. 53	Ad(v)enture Tgt. 63	Mini Bottom Hole 73	Trough 4 83	Wheel Position 3 93	Black-Blue J906-3 Lower Left E.O.S. F3
Orange-Yellow J205-4 4th Coin Chute D4	4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Gun Trigger 34	Right Popper 44	Left Loop Top 54	Captive Ball Back 64	Right Ramp Made 74	Trough 3 84	Mini Playfield Left Limit 94	Blue-Gray J905-2 Lower Left Opto F4
Orange-Green J205-6 Normal Function Service Credits / Test Function Escape D5	5 White-Green J209-5 U19-11	Left Outlane 15	(I)ndy Lane 25	Left Jet 35	Center Enter 45	Left Loop Bottom 55	Mini Top Left 65	Mini Top Right 75	Trough 2 85	Mini Playfield Right Limit 95	Black-Violet J906-4 *Center Drop Bank Left F5
Orange-Blue J205-7 Normal Function Volume Down / Test Function Down D6	6 White-Blue J209-7 U19-9	Left Return Lane 16	I(n)dy Lane 26	Right Jet 36	Top Post 46	Right Loop Top 56	Mini Middle Top Left 66	Mini Middle Top Right 76	Trough 1 86		Black-Yellow J905-3 *Center Drop Bank Middle F6
Orange-Violet J205-8 Normal Function Volume Up / Test Function Up D7	7 White-Violet J209-8 U19-5	Right Return Lane 17	In(d)y Lane 27	Bottom Jet 37	Subway Lockup 47	Right Loop Bottom 57	Mini Middle Bottom Left 67	Mini Middle Bottom Right 77	Top Trough 87		Black-Gray J906-5 *Center Drop Bank Right F7
Orange-Gray J205-9 Normal Function Begin Test / Test Function Enter D8	8 White-Gray J209-9 U19-7	Right Outlane Top 18	Ind(y) Lane 28	Center Standup 38	Right Slingshot 48	Right Outlane Bottom 58	Mini Bottom Left 68	Mini Bottom Right 78	Shooter 88		Black-Blue J905-5 *Left Ramp Made F8

Note: Used as switches other than flipper switches in this game.

WARNINGS & NOTICES

WARNING

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

SUBSTITUTE PART OR EQUIPMENT MODIFICATIONS may void FCC Type Acceptance.

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THIS 'CONVERSION' PRINCIPLE ALSO APPLIES to unauthorized facsimiles of WILLIAMS equipment, logos, designs, publications, assemblies, and games (or game feature not deemed to be public domain), whether manufactured with WILLIAMS components or not.

NOTICE

WARNING

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF Interference Notice

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

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

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

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

FOR SERVICE... CALL your authorized WILLIAMS Distributor.