

# ***THE GETAWAY***

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***H I G H S P E E D I I***

## Jumper Charts

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

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

## Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color	Connections Playfield - Insert - Hood	Driver Trnstr	Solenoid Part Number Flashlamp Type
01	Diverter High	High Power	Vio-Brn	J130-1	Q82	A-14701
02	Up Ramp	High Power	Vio-Red	J130-2	Q80	AE-26-1200
03	Down Ramp	High Power	Vio-Org	J130-4	Q78	SM1-28-900-DC
04	Locker (Disappearing Post)	High Power	Vio-Yel	J130-5	Q76	AE-26-1200
05	Left Slingshot	High Power	Vio-Grn	J130-6	Q64	AE-26-1500
06	Right Slingshot	High Power	Vio-Blu	J130-7	Q66	AE-26-1500
07	Knocker	High Power	Vio-Blk	J130-8	Q68	AE-23-800
08	Kickback	High Power	Vio-Gry	J130-9	Q70	AE-23-800
09	Eject Hole	Low Power	Brn-Blk	J127-1	Q58	AE-26-1200
10	Diverter Low	Low Power	Brn-Red	J127-3	Q56	A-14701
11	Ball Release (Trough)	Low Power	Brn-Org	J127-4	Q54	AE-26-1200
12	Plunger Kicker	Low Power	Brn-Yel	J127-5	Q52	A-14789
13	Top Jet Bumper	Low Power	Brn-Grn	J127-6	Q50	AE-26-1200
14	Left Jet Bumper	Low Power	Brn-Blu	J127-7	Q48	AE-26-1200
15	Bottom Jet Bumper	Low Power	Brn-Vio	J127-8	Q46	AE-26-1200
16	Outhole	Low Power	Brn-Gry	J127-9	Q44	AE-27-1200
17	Right Bank Flasher	Flasher	Blk-Brn	J126-1	Q42	#89 1PL
18	Supercharger Flasher	Flasher	Blk-Red	J126-2 J125-2	Q40	#906 1PL - 1BB
19	Left Slingshot Flasher	Flasher	Blk-Org	J126-3 J125-3	Q38	#89/#906 1PL/1BB
20	Free Ride Flasher	Flasher	Blk-Yel	J126-4	Q36	#906 1PL
21	Left Ramp Flasher	Flasher	Blu-Grn	J126-5 J125-6	Q28	#89/#906 2PL/1PL - 1BB
22	Left Bank Flasher	Flasher	Blu-Blk	J126-6	Q30	#89 2PL
23	Flipper Flasher	Flasher	Blu-Vio	J126-7 J125-8	Q34	#89/#906 1PL/1PL - 1BB
24	Right Slingshot Flasher	Flasher	Blu-Gry	J126-8 J125-9	Q32	#89/#906 1PL/1BB
25	Enable 1	Low Power	Blu-Brn	J122-1	Q26	A-15685
26	Enable 2	Low Power	Blu-Red	J122-2	Q24	A-15685
27	Revolving Lamp	Low Power	Blu-Org	J123-4	Q22	14-7971
28	Enable 3	Low Power	Blu-Yel	J122-4	Q20	A-15685
	<b>General Illumination</b>			<b>Playfield - Insert - Cabinet</b>		
01	Playfield G.I.	G.I.	Wht-Brn	J120-7	Q18	
02	Playfield G.I.	G.I.	Wht-Org	J120-8	Q10	
03	Insert G.I.	G.I.	Wht-Yel	J121-9	Q14	
04	Insert G.I.	G.I.	Wht-Grn	J121-10	Q16	
05	Insert G.I.	G.I.	Wht-Vio	J121-11 J119-1	Q12	
				<b>Playfield</b>		
	Lower Right Flipper		Blu-Yel	J907-8, 9		FL-11629
	Lower Left Flipper		Gry-Yel	J907-6, 7		FL-11629
	Upper Right Flipper		Blu-Yel	J907-4, 5		FL-11630

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# **THE GETAWAY RULES**

## ***Stop Light Targets***

Shoot the Green, Yellow and Red targets, in that order, to light the LOCKS.

## ***Locks***

Lock 3 balls to Run the Red Light and start MULTI-BALL.

## ***Multi-ball***

During MULTI-BALL shoot SUPERCHARGER Ramp to light the JACKPOT.

## ***Jackpot & Super Jackpot***

Complete SUPERCHARGER Ramp Loops and shoot LOCK for GETAWAY JACKPOT & SUPER JACKPOT.

## ***Extra Ball***

Shoot the Lit FREEWAY Loops to light the EXTRA BALL.

## ***Gear Awards***

Shoot SPEED Loops to Advance TACH into REDLINE for GEAR FEATURE AWARDS.

## ***Video Mode***

STEER CAR with FLIPPER BUTTONS. SHIFT to CHANGE SPEEDS.

## ***Supercharger Multi-ball***

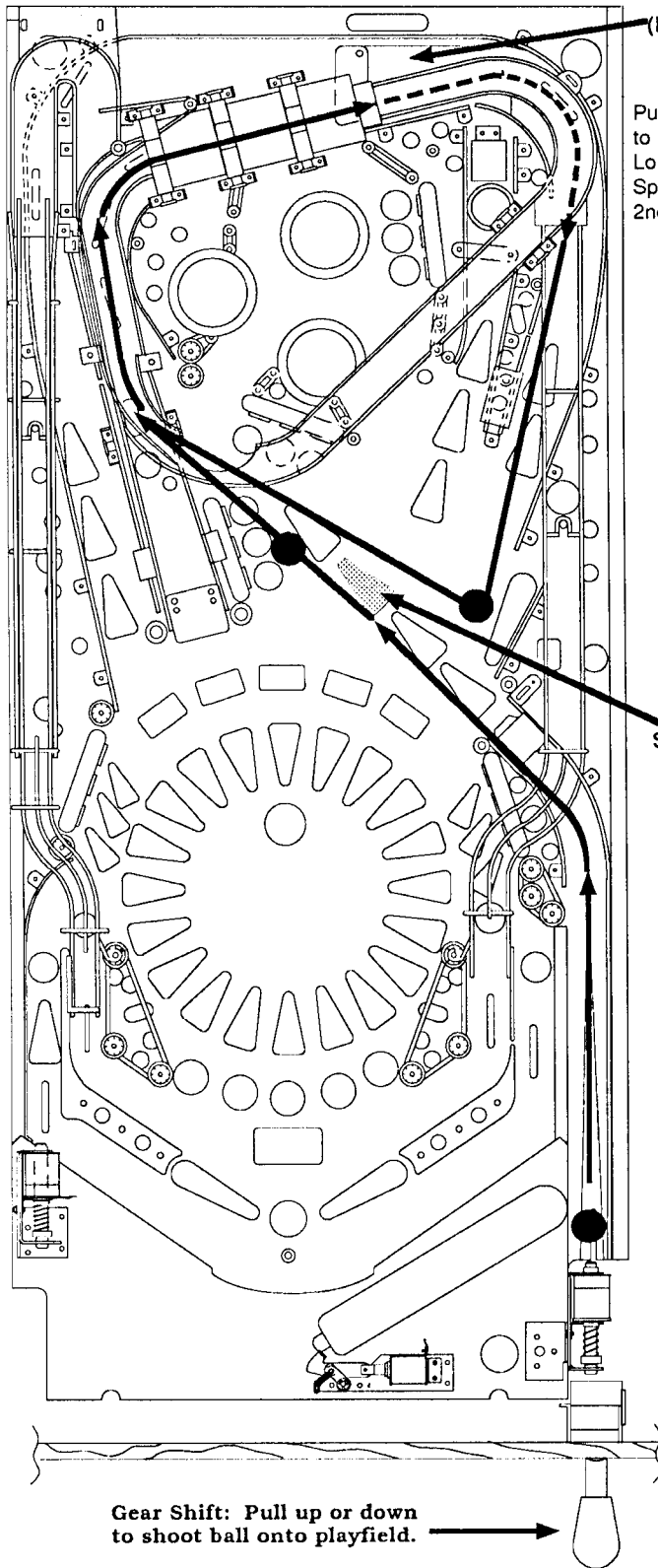
Shoot balls up the SUPERCHARGER RAMP for MILLIONS PLUS per LOOP.

## ***Redline Mania***

EVERYTHING IS LIT ! GO FOR IT !

# The GETAWAY

## Opening Shot & Speed Millions



(Ramp shown in up position).

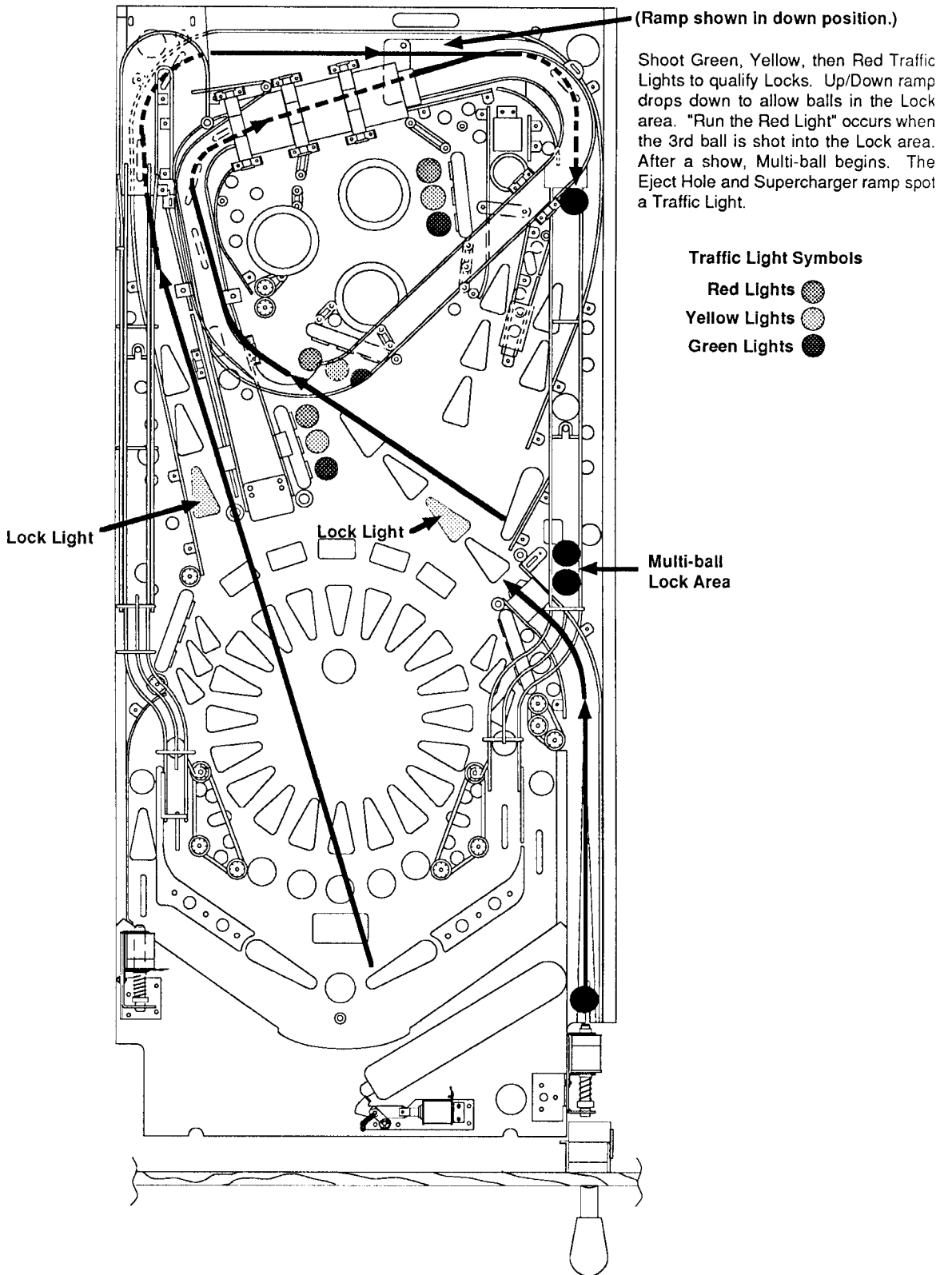
Pull up or push down on the Gear Shifter to launch the ball into play. Repeating Loops at the top of the game awards Speed Millions; 1st time = 1, 000, 000; 2nd time = 2, 000, 000 etc.

Speed Millions Light

Gear Shift: Pull up or down to shoot ball onto playfield.

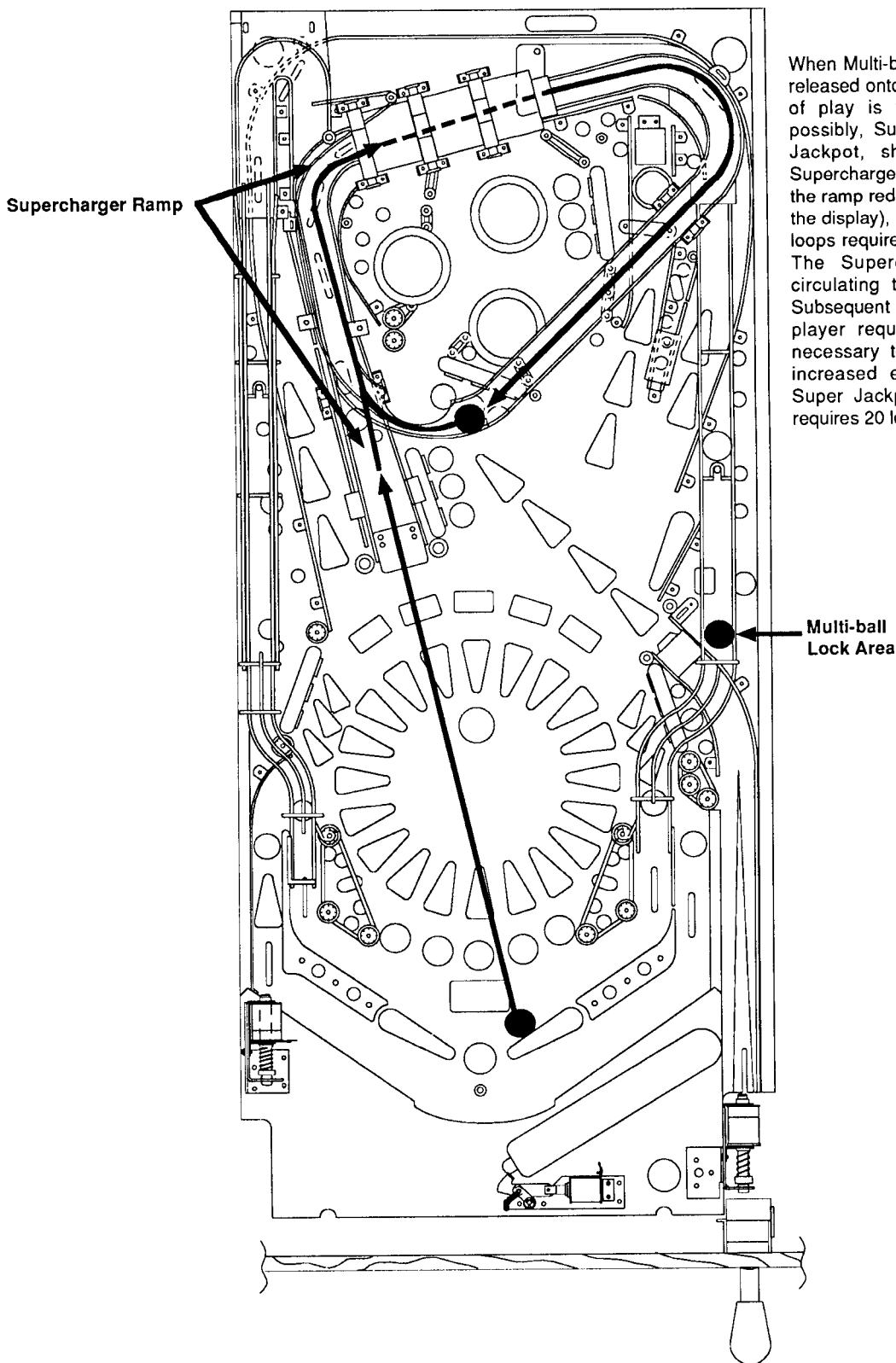
# The GETAWAY

## Traffic Light Targets & Qualifying Multi-ball



# The GETAWAY

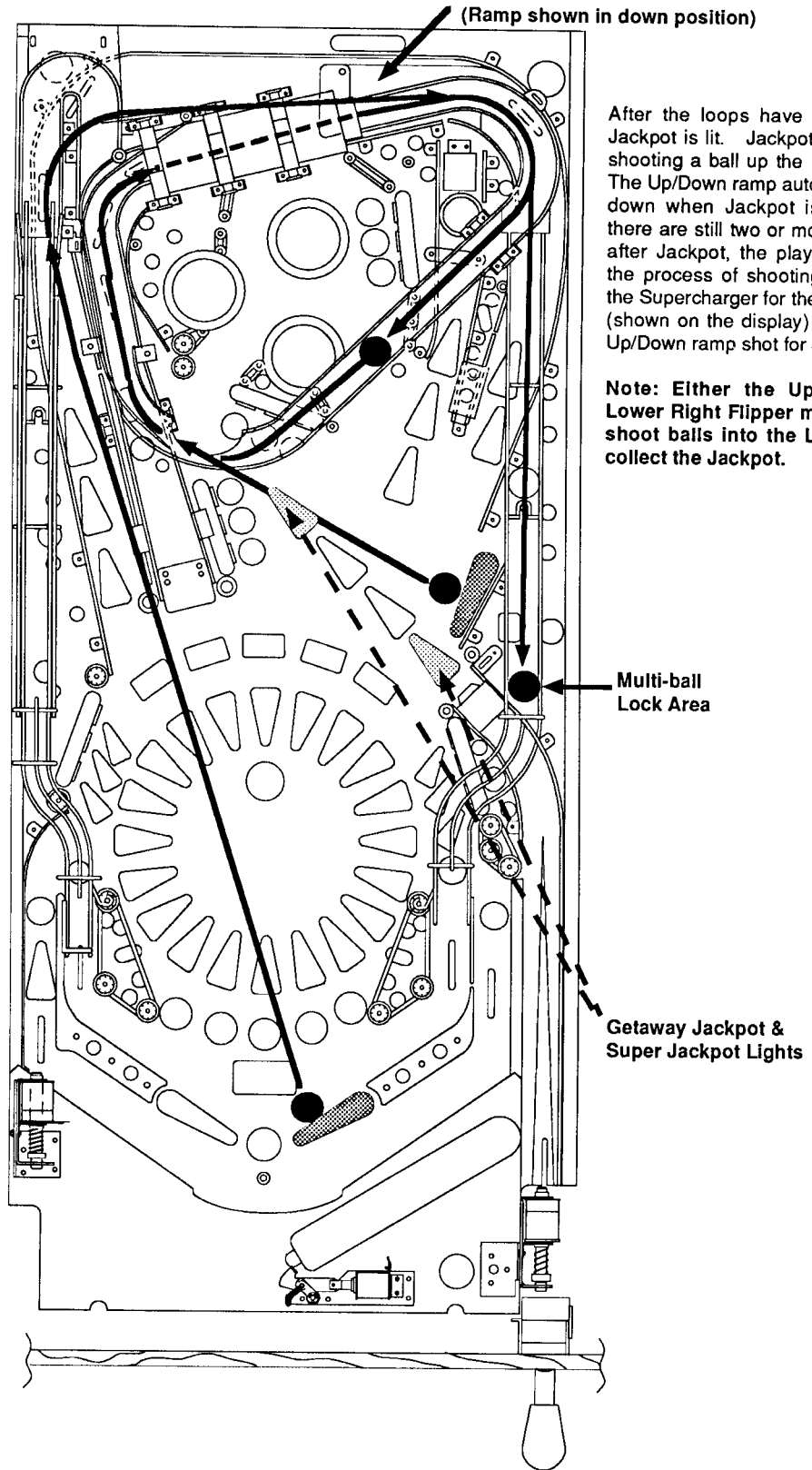
## Multi-ball / Qualifying for Jackpot



When Multi-ball begins, three balls are released onto the playfield. The object of play is to obtain Jackpot, and possibly, Super Jackpot. To qualify Jackpot, shoot the balls up the Supercharger ramp. Each ball shot up the ramp reduces the count, (shown on the display), by 10 loops. There are 10 loops required to light the 1st Jackpot. The Supercharger is capable of circulating three balls at one time. Subsequent Multi-balls achieved by the player require that the loop count necessary to qualify for Jackpot be increased each time by 10 loops. Super Jackpot on the 1st Multi-ball requires 20 loops.

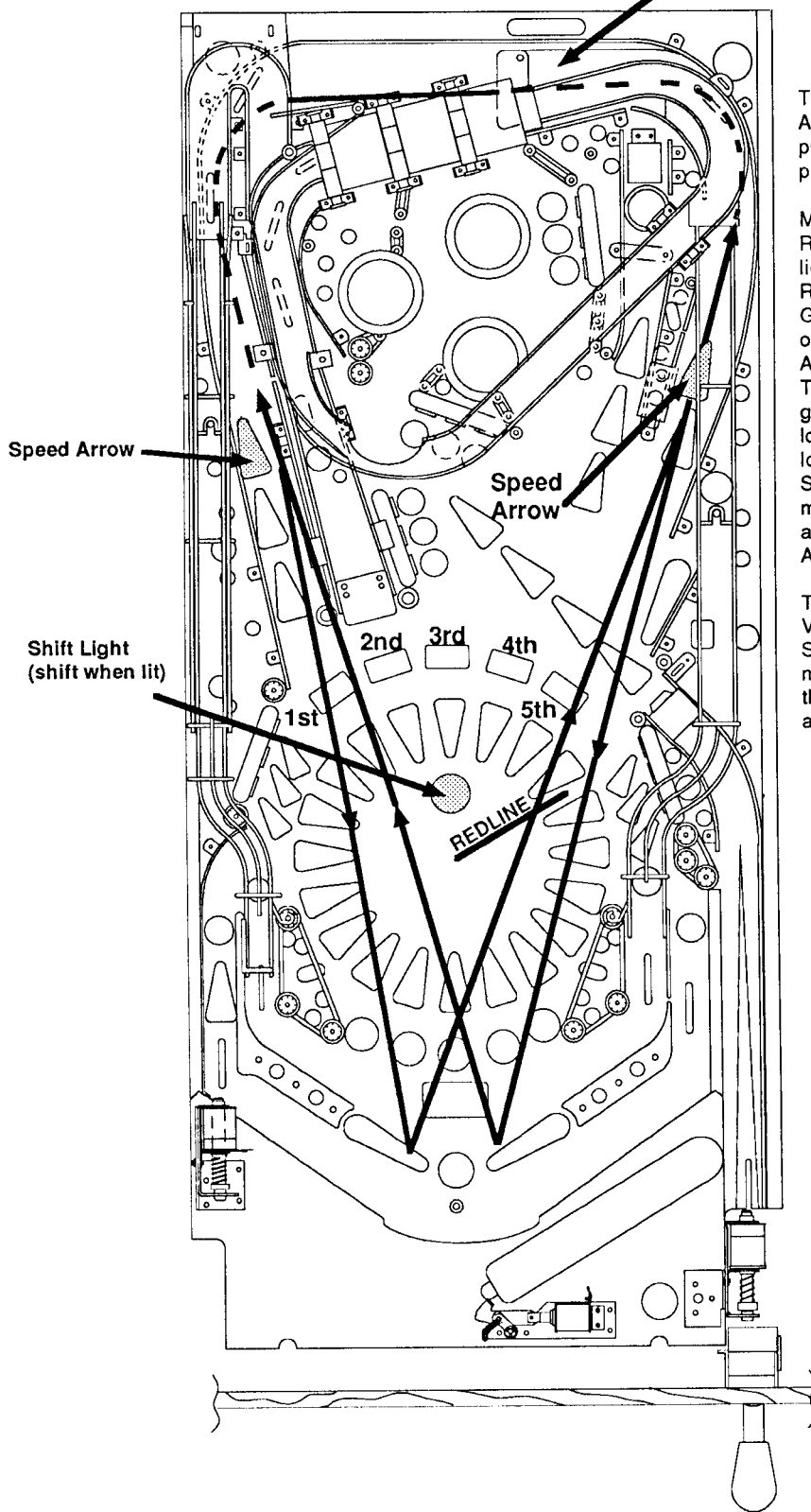


# The GETAWAY Jackpot & Super Jackpot



# The GETAWAY Going through the Gears

(Ramp shown in up position)



The Gear Shifter does several things: At the beginning of each ball, pull up or push down to launch the ball onto the playfield.

Making the Speed loops increases the RPMs on the Tachometer, (circle of lights), until the level reaches the Redline. The game says, "Shift Gears", and the player shifts, (either up or down), to advance the gears. Awards are achieved when the Tachometer is at Redline in a given gear. The 1st gear requires one Speed loop, the 2nd gear requires two Speed loops, the 3rd gear requires three Speed loops etc. Speed Arrow lights must be lit to award Speed and RPM advances on Tachometer. Speed Arrows are not lit during Multi-ball.

The Gear Shifter is also used during Video Mode. Pulling up on the Gear Shifter puts the car in a higher gear and makes it go faster. Pushing down on the shifter puts the car in a lower gear and makes it go slower.

**1st Gear awards 3 Million points.**

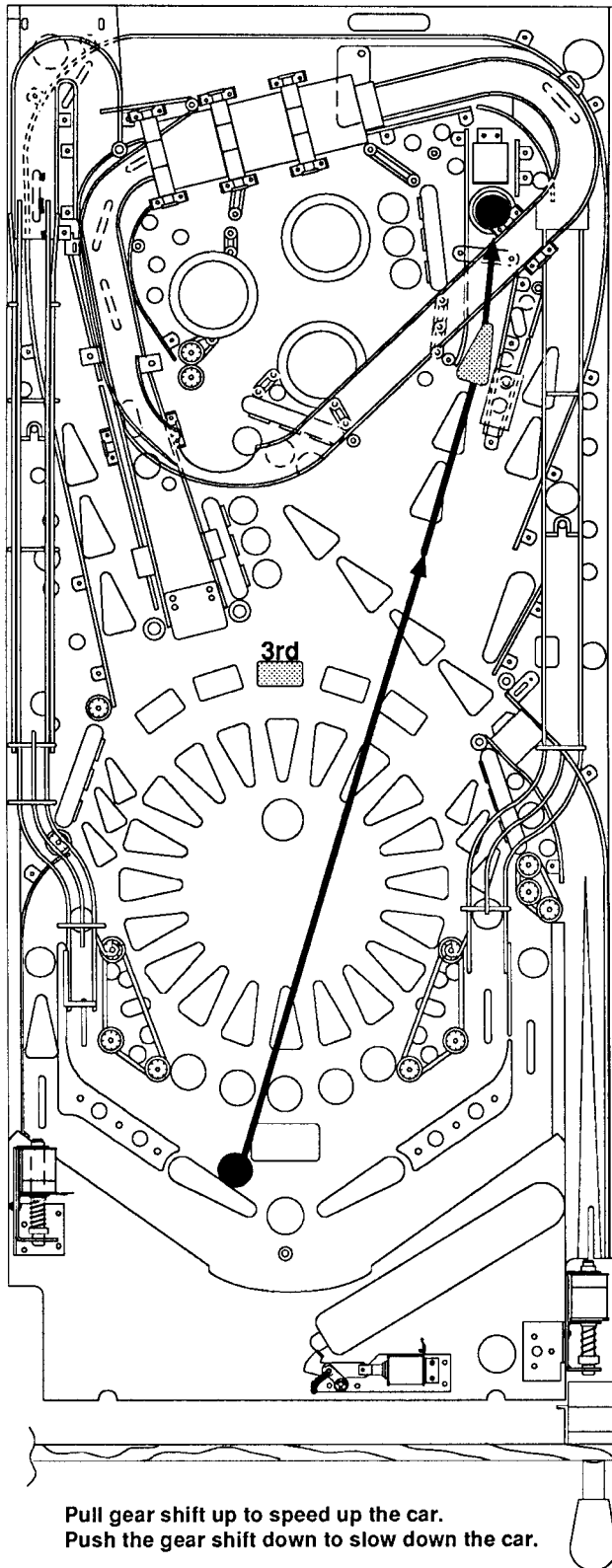
**2nd Gear awards Hold Bonus and Bonus X.**

**3rd Gear awards Video Mode Lit.**

**4th Gear awards Supercharger Mode, (2 ball Multi-ball).**

**5th Gear awards Redline Mania, (everything is lit).**

## The GETAWAY Video Mode



Video Mode in this game allows the player to "drive" a car through courses shown on the display. The faster the player drives the car, the more points the player can earn. Steer the car with the flipper buttons. Press the left flipper button and the car moves to the left. Press the right flipper button and the car moves to the right. Use the gear shift to control the speed at which the car travels. Shift Up to increase speed. Shift Down to decrease speed.

Video Mode is over when the player gets to the end of the course, or crashes, whichever comes first. Video Mode is lit by Redlining 3rd Gear or "Burn Rubber" Random Feature.

The Icon "EB" (denoting Extra Ball), appears during the Video Mode. The player steers the car to "crash" into the "EB" Icon to collect Extra Balls.

Left flipper button  
steers the car to the left.

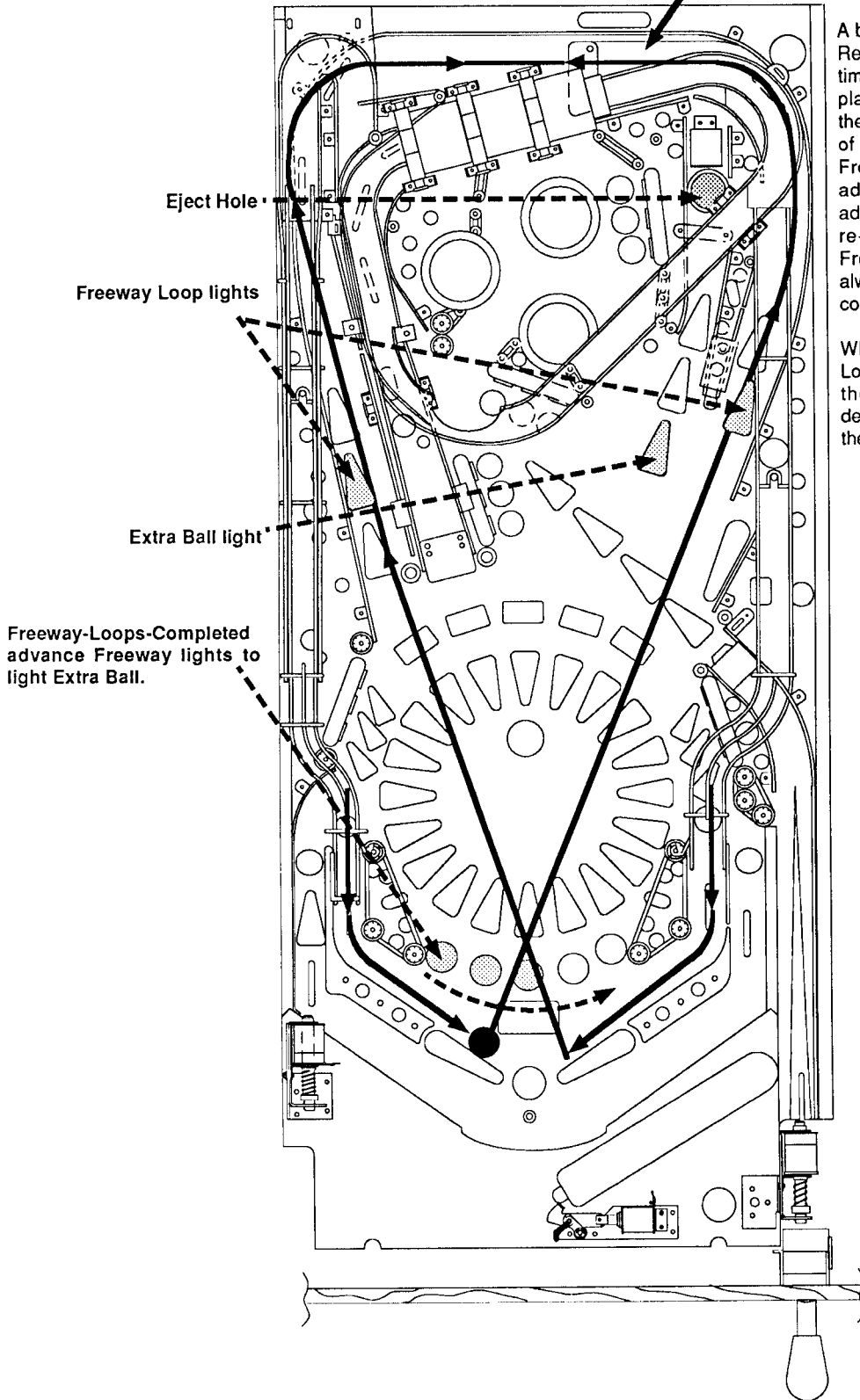
Right flipper button  
steers the car to the right.

Pull gear shift up to speed up the car.  
Push the gear shift down to slow down the car.

# The GETAWAY

## Freeway Loops & Extra Balls

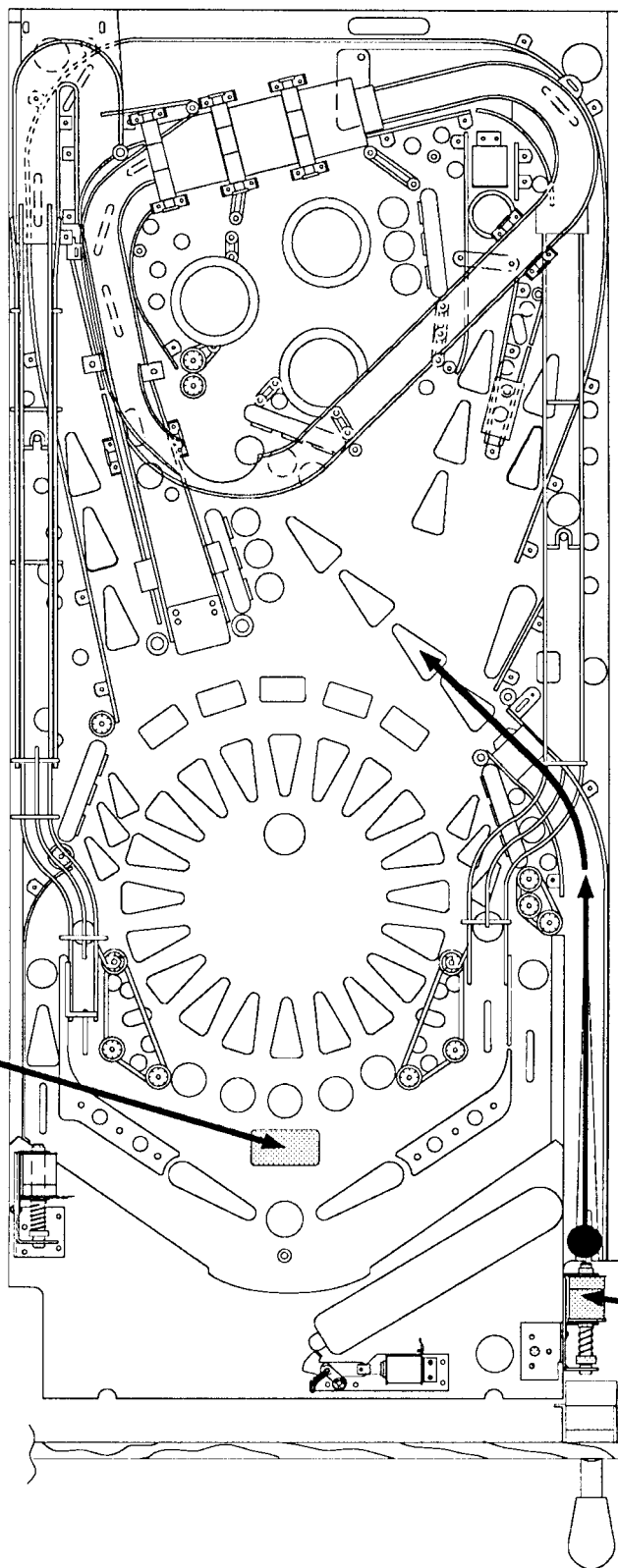
(Ramp shown in up position.)



A ball entering either of the Flipper Return Lanes turns On the flashing timed Freeway Loop lights. If a player completes a loop around the entire playfield, in the direction of the lit Freeway Loop lights, the Freeway-Loops-Completed lights advance toward Extra Ball lit. In addition, the Freeway Loop light is re-lit in that same direction. Freeway Loop opportunities are always available. Extra Balls are collected at the Eject Hole.

Whether or not the Freeway - Loops - Completed lamps are lit at the beginning of the game depends on the percentage set in the software.

# The GETAWAY Free Ride



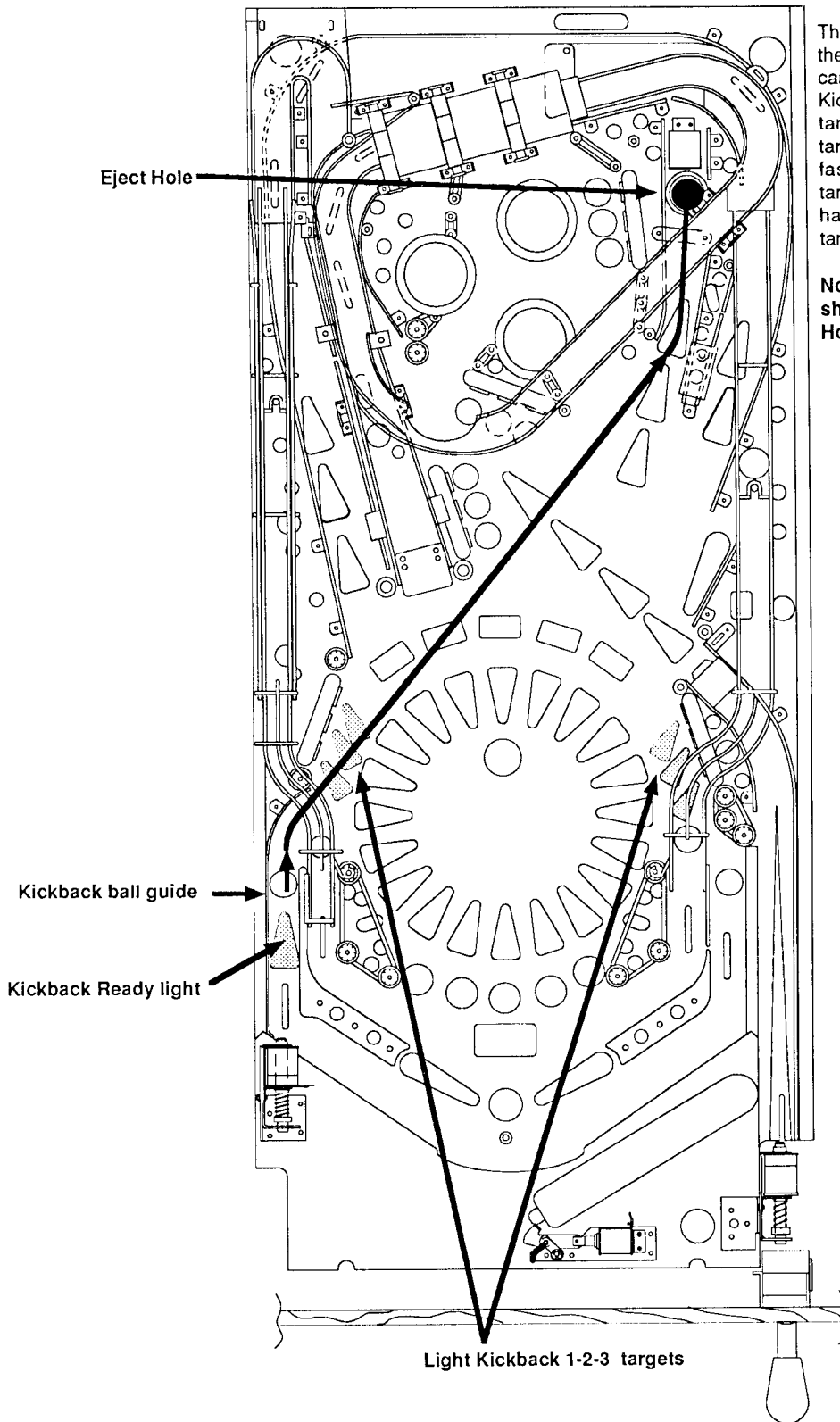
The Free Ride is a ball saving feature that returns the ball to the player when a very short ball time occurs. The ball is fed to the Auto-feed Kicker and launched back onto the playfield.

This feature is controlled by the amount of On-time, therefore, it is on less often as the players proceed through the game.

Free Ride light

Auto-feed Kicker

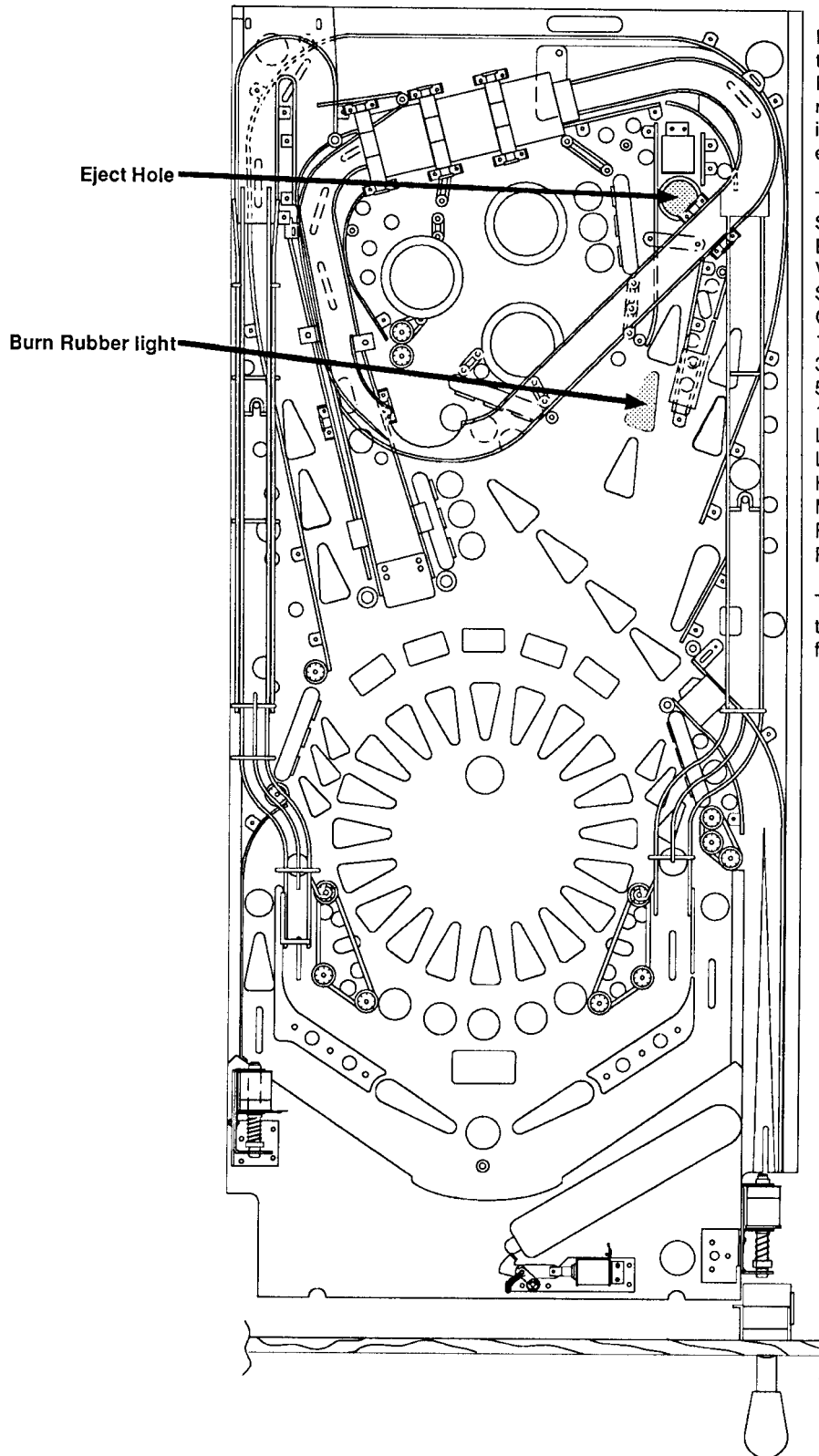
# The GETAWAY Kickback



The Kickback is lit at the beginning of the first ball of a game. Thereafter, it can be re-lit by completing either set of Kickback Re-light 1-2-3 targets. The target lights, located in front of the targets, are timed, and begin blinking faster as time runs out. Hitting the targets on the left side of the playfield has the same effect as hitting the targets on the right side of the playfield.

**Note: A properly adjusted Kickback should shoot the ball into the Eject Hole.**

## The GETAWAY Burn Rubber Random Feature



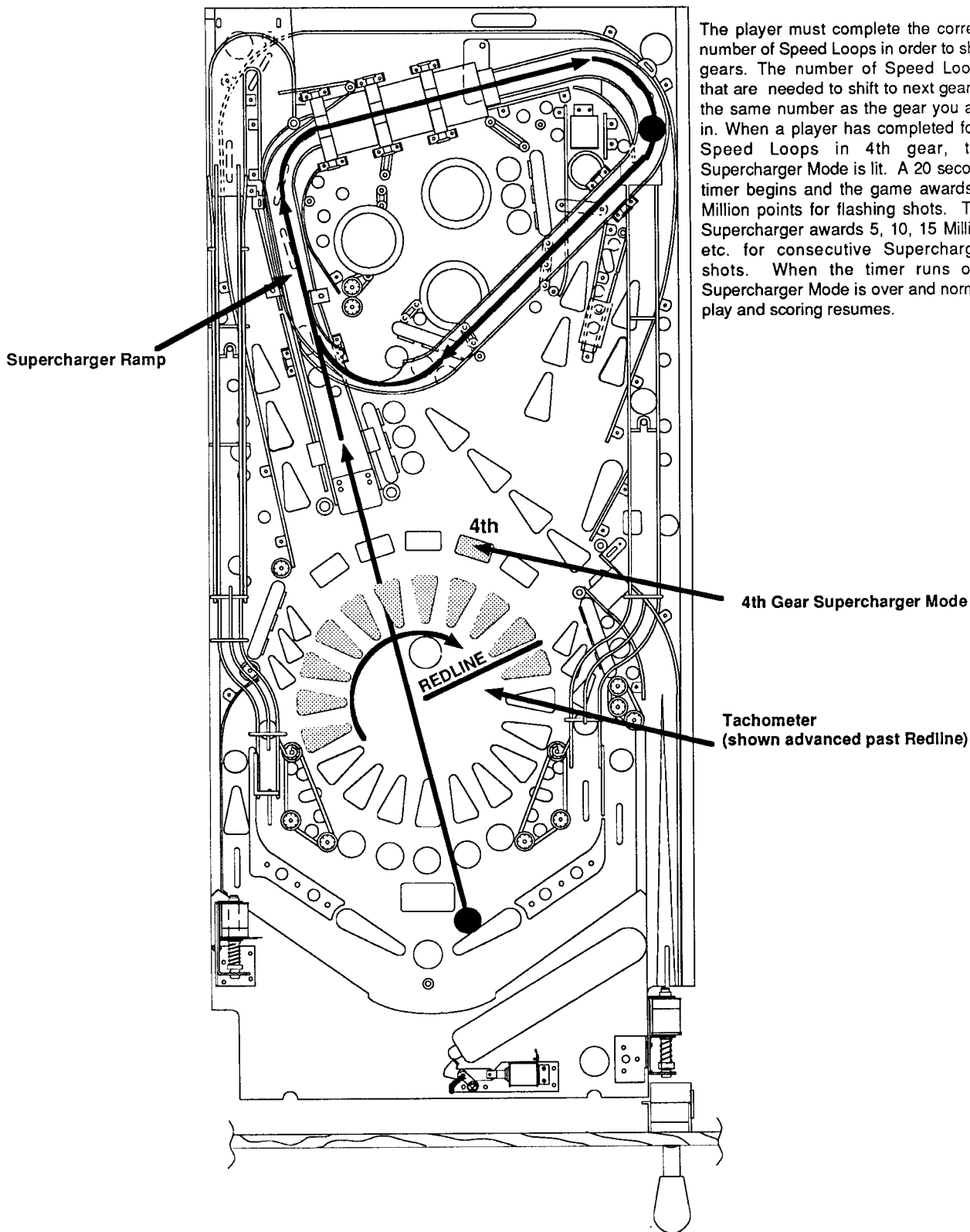
Each time a player shifts into a gear, the Burn Rubber light in front of the Eject Hole turns on. Burn Rubber is a random feature that awards one of 15 items along with providing an entertaining show on the display.

The following items can be awarded:

- Special
- Extra Ball
- Video Mode
- Speed Increments
- Gear Advance
- 1 Million
- 3 Million
- 5 Million
- 10 Million
- Light Kickback
- Light Lock
- Hold Bonus
- Multi-ball
- Free Ride
- Freeway Advance

The feature allows the game software to control the percentage of various features throughout the game.

# The GETAWAY Supercharger Mode



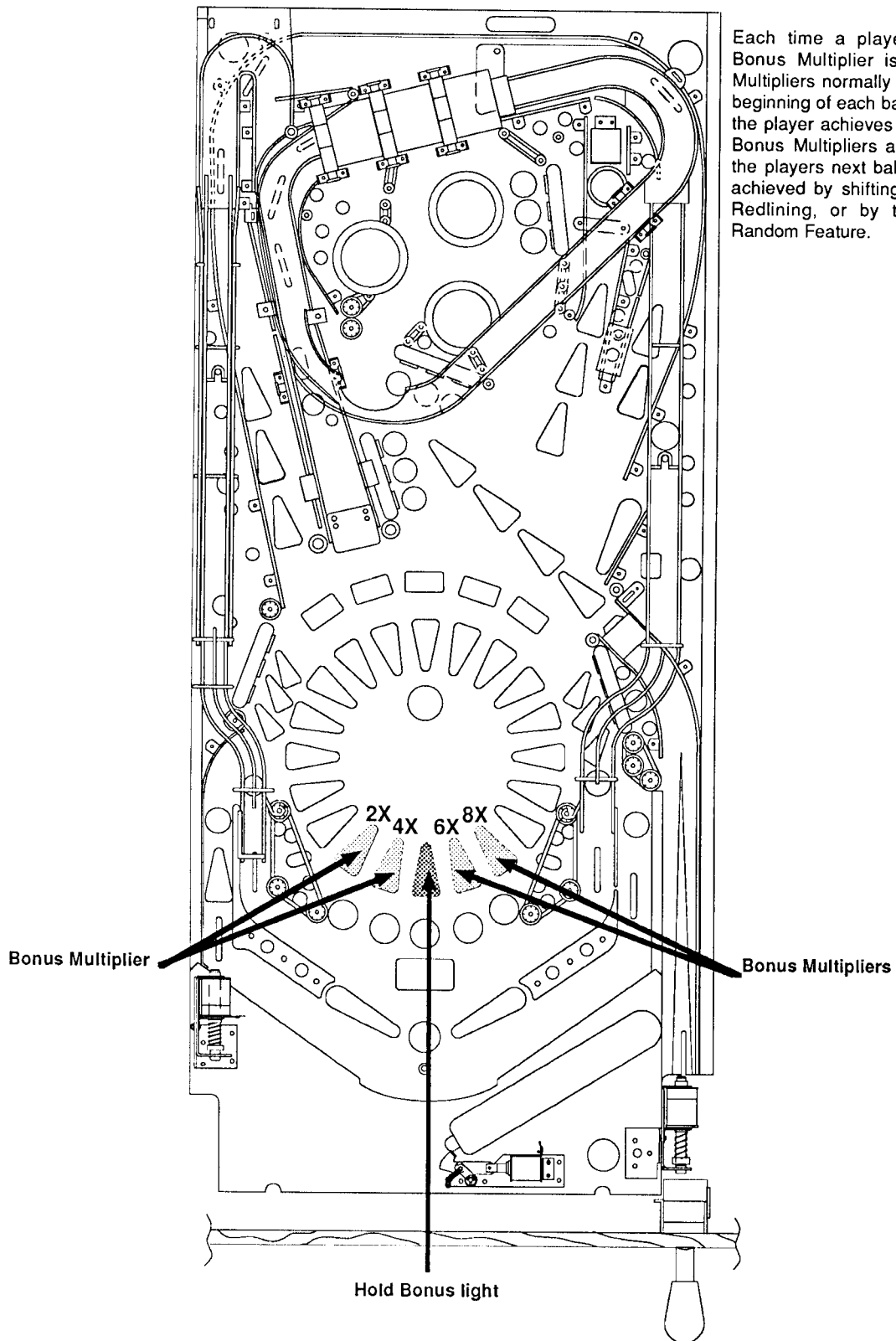
The player must complete the correct number of Speed Loops in order to shift gears. The number of Speed Loops that are needed to shift to next gear is the same number as the gear you are in. When a player has completed four Speed Loops in 4th gear, the Supercharger Mode is lit. A 20 second timer begins and the game awards 5 Million points for flashing shots. The Supercharger awards 5, 10, 15 Million etc. for consecutive Supercharger shots. When the timer runs out, Supercharger Mode is over and normal play and scoring resumes.



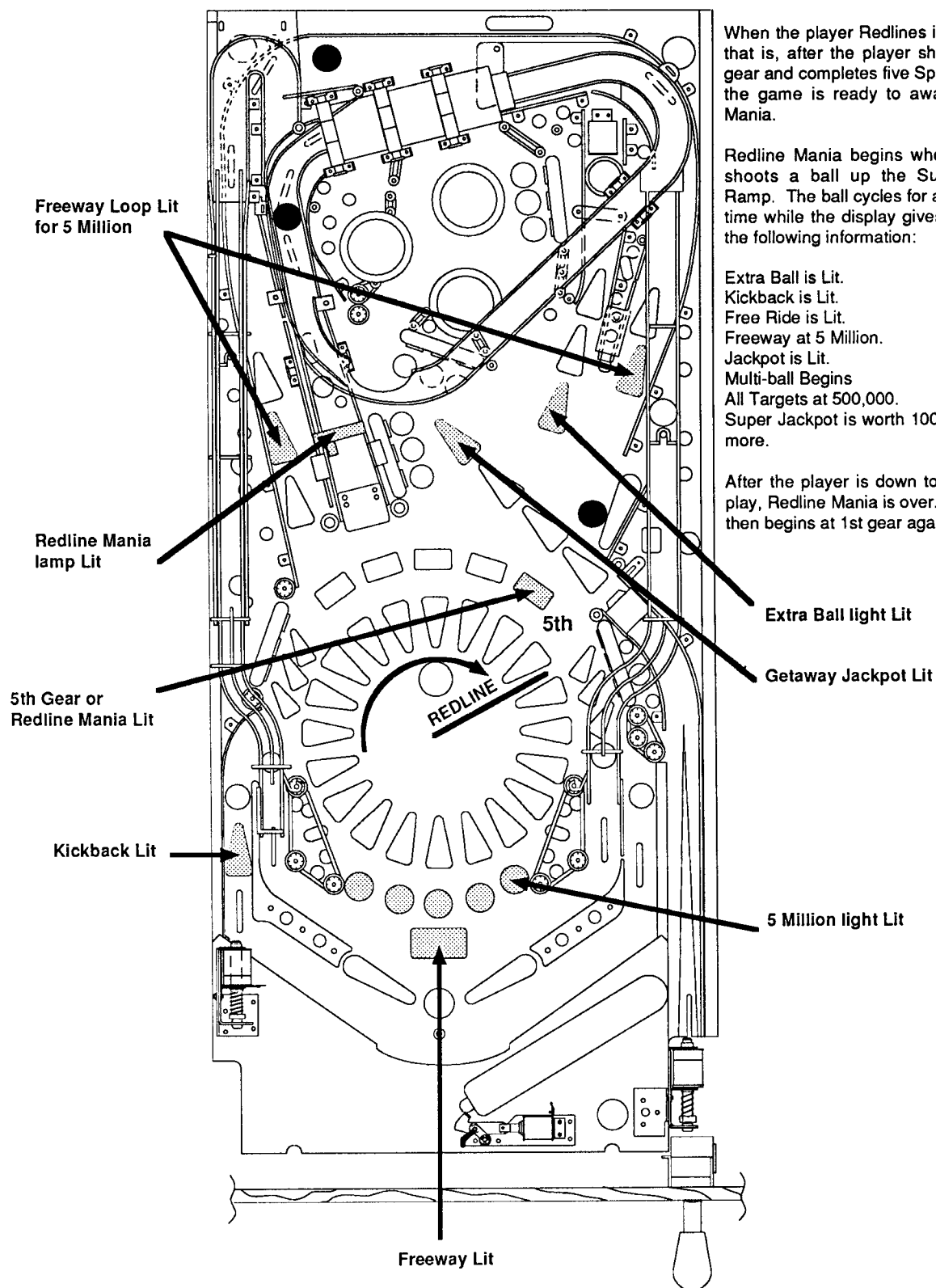
# The GETAWAY

## Bonus X & Hold Bonus

Each time a player shifts gears a Bonus Multiplier is lit. The Bonus Multipliers normally reset to Off at the beginning of each ball. However, if the player achieves Hold Bonus the lit Bonus Multipliers are carried over to the player's next ball. Hold Bonus is achieved by shifting to 2nd gear and Redlining, or by the Burn Rubber Random Feature.



# The GETAWAY Redline Mania



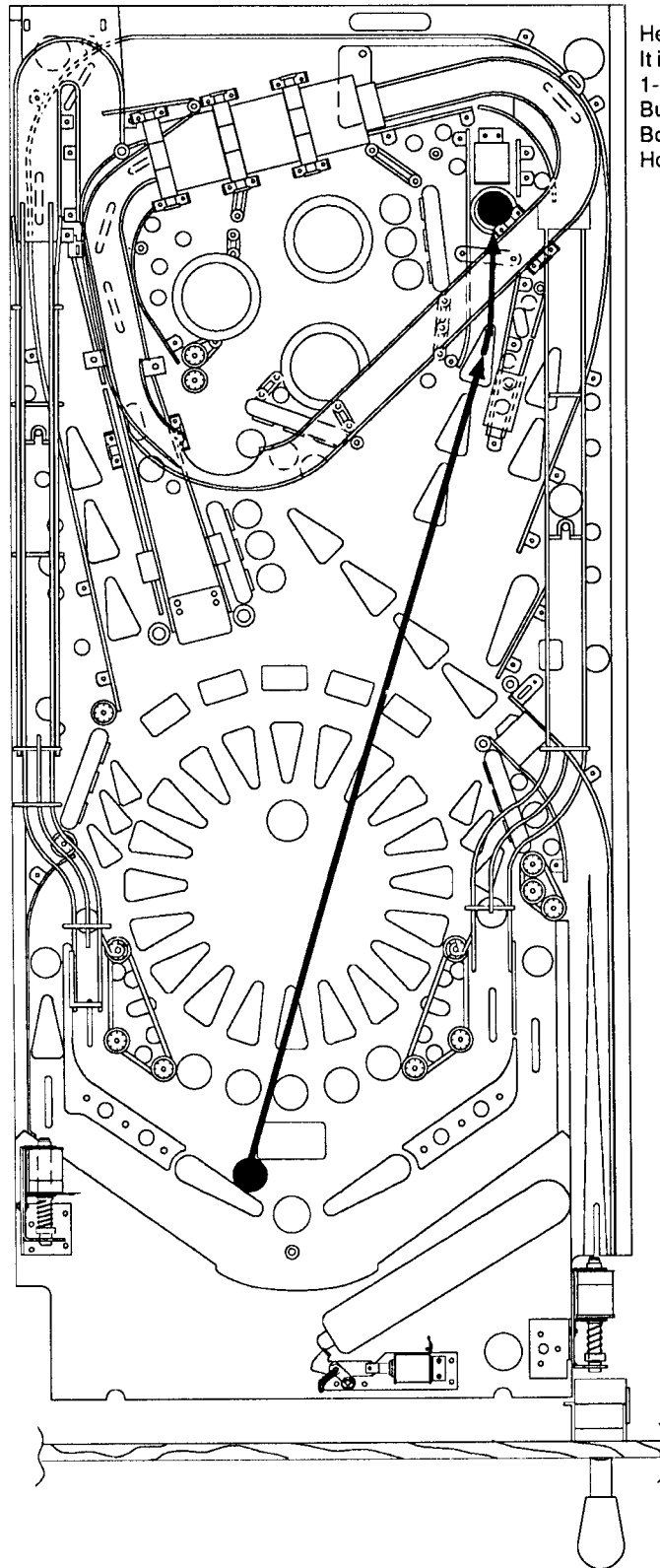
When the player Redlines in 5th gear - that is, after the player shifts into 5th gear and completes five Speed Loops - the game is ready to award Redline Mania.

Redline Mania begins when a player shoots a ball up the Supercharger Ramp. The ball cycles for an extended time while the display gives the player the following information:

- Extra Ball is Lit.
- Kickback is Lit.
- Free Ride is Lit.
- Freeway at 5 Million.
- Jackpot is Lit.
- Multi-ball Begins
- All Targets at 500,000.
- Super Jackpot is worth 100,000,000 or more.

After the player is down to one ball in play, Redline Mania is over. The player then begins at 1st gear again.

# The GETAWAY Helicopter Bonus



Helicopter Bonus is a Hidden Feature. It is advanced and built up by hitting the 1-2-3 Kickback Targets and the Jet Bumpers. To collect the Helicopter Bonus, shoot the ball into the Eject Hole After Any Jackpot Has Been Won.

# Section 1

## *Game Operation Information*

### Assembly & Operation

#### The Getaway WPC ROM Summary

Game Assembly Instructions

Game Play

Menu System Operation

Audits

Test/Diagnostic Procedures

Utilities

Adjustments

	<b>ROM SUMMARY</b>			
<b>IC</b>	<b>Type</b>	<b>Location</b>	<b>Board</b>	<b>Part Number</b>
Game ROM 1	27c040	U6	CPU	A-5343-50004-1
Music/Speech ROM 1	27c040	U18	Audio	A-5343-50004-4

#### **NOTICE**

To order a replacement ROM from your authorized WILLIAMS ELECTRONICS GAMES distributor, specify: (1) part number (if available); (2) ROM label color; (3) ROM level (number) on the label; (4) which game the ROM is used in.

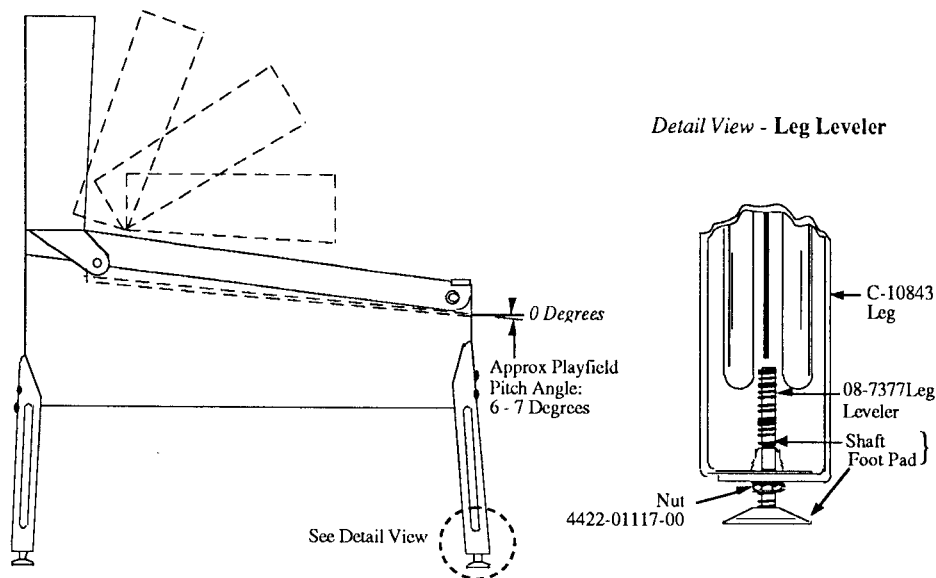
# Pinball Game Assembly Instructions

## 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 operation. **DO NOT** use a 'cheater' plug to defeat the ground pin on the line cord. **DO NOT** cut off the ground pin.

### The Getaway is a three ball game.

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



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

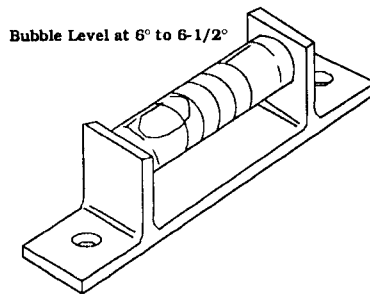
**FAILURE TO INSTALL** the backbox mounting hardware properly can cause personal injury. **NEVER TRANSPORT** a pinball game with the hinged backbox erect. Always lower the backbox forward onto the playfield cabinet on a layer of protective material to prevent marring or damage and possible personal injury.

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. Locate the Molding Latch Lever, and move the lever toward the left side of the game, to release the Front Molding. Lift the Front Molding off the playfield cover glass return the Latch Lever 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, storing it carefully to avoid breakage.

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

Please note the new Tru-Pitch™ level located on the shooter rail. This allows the operator to accurately pitch the game - without removing the glass - when it is first set in a new location. The first line on the level is approximately 6 degrees. Every line after that is approximately another 1/2 degree of pitch. We recommend you pitch the game with the nose of the bubble between the first and second line on the level (between 6 and 6-1/2 degrees).



**! IMPORTANT !**

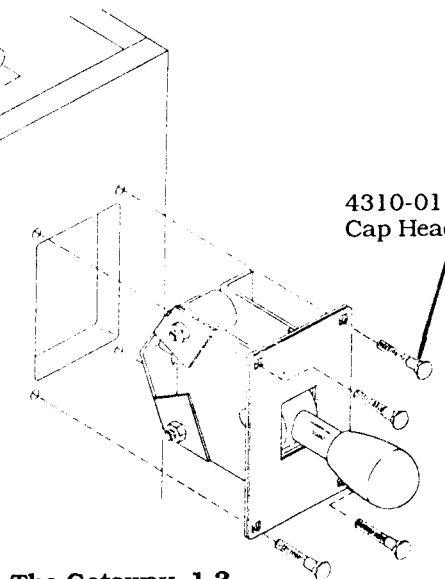
Playfield pitch angle adjustments can affect the operation of the plumb bob tilt, inside the cabinet. The plumb bob weight is among the parts in the cash box; the operator should install the weight and adjust this tilt mechanism for proper operation, after completion of the desired playfield pitch angle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

9. Install the Gear Shift Mechanism. Lift the playfield and rest it on the support arm. Place the Gear Shift into the hole in the cabinet (where the plunger is normally located). Be sure "Shift Up" is on top. From the front of the cabinet, slide a cap head screw through each of the four holes. From the inside of the cabinet, slide a washer over each of the four screws. Secure into place with an ESNA nut. Plug the Gear Shift Cable into the Cabinet Cable. Be sure the wire colors match on both connectors. Lower the playfield.

4410-01119-00 (4 used)  
Nut 10-24 ESN

4700-00023-00 (4 used)  
Flat Washer .203 x .625 x .059

4310-01123-20 (4 used)  
Cap Heads Screw 10-24 x 1-1/4



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

**Note:** The **The Getaway** playfield is coated with a covering called Diamond Plate™ and does not require a protective mylar. However, mylars can be purchased through your local Williams Distributor. Specify part number 03-8661-1 for full playfield mylar.

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

## 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 Switches

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

#### Normal Function

The Service Credits Switch puts credits on the game that are not included in the game audits.

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

The Volume Down Switch 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 Switch starts the Menu System Operation and changes the Coin Door Switches from Normal Function to Test Function.

#### Test Function

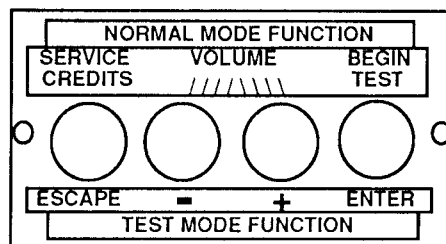
The Escape Switch allows you to get out of a menu selection or return to the Attract Mode.

The Up Switch allows you to cycle forward through the menu selections or adjustment choices.

The Down Switch allows you to cycle backward through the menu selections or adjustment choices.

The Enter Switch allows you to get into a menu selection or lock in an adjustment choice. Holding the Enter button for 5 seconds, during the Attract Mode, resets the High Scores.

### Coin Door Switch Locations



## 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, using the On-Off switch. 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 (playfield and backbox lamps flashing, sounds being heard, etc., if the operator does not change the Factory Setting). **Note:** After the game has been on location for a period of 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, the game number, and the game software revision. The message changes. The display shows the sound software revision, the revision level of the system software, and the date the game software was revised.

**Example:**

	<b>The Getaway</b>		<b>Sound Rev. L-1</b>	
<b>50004</b>		<b>Rev. L-X</b>	<b>SY. 0.X0</b>	<b>X-X-92</b>

Press the Enter button to enter the WPC Menu System (refer to the section entitled "Menu System Operation" for more information). Perform the entire Test Menu routine to verify that the game is operating satisfactorily. Successful completion of the tests in the Test Menu routine shows that the game is ready to begin earning your investment return.

**Attract Mode\*.** After completing the Test Menu routine, press the Escape button three times to enter the Attract Mode. During the Attract Mode, playfield and backbox lamps blink. The player score displays exhibit a series of messages informing the player concerning:

- A. Recent highest scores\*;
- B. A "custom message"
- C. The score to achieve to obtain a Replay award\*;

These (or similar) displays reappear occasionally, accompanied by sounds and music, until a player initiates game play by inserting a coin, or when credits are available, pressing the Start button.

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

**Starting a Game.** Press the Start button once. A startup sound plays, and the Credit amount shown in the display decreases by one. The display flashes 00 (until the first playfield switch is actuated), and shows ball 1. Additional players may enter the game by pressing the Start button once for each player, before the end of play on the first ball.

\* - operator-adjustable feature



**Tilts** Actuating the Slam Tilt switch on the coin door 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 display (1 through 4) 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

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

### Main Menu

<b>B. Bookkeeping Menu</b>		<b>Press Escape</b> To move out of a menu selection.  <b>Press Enter</b> To get into a menu selection.  <b>Press Up</b> Increases sequence; (ex. A.1, A.2, A.3, A.4).  <b>Press Down</b> 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.
	B.1 Main Audits	
	B.2 Earning Audits	
	B.3 Standard Audits	
	B.4 Feature Audits	
	B.5 Histograms	
	B.6 Time-stamps	
<b>P. Printouts Menu</b>		
	P.1 Earnings Data	
	P.2 Main Audits	
	P.3 Standard Audits	
	P.4 Feature Audits	
	P.5 Score Histograms	
	P.6 Game Time Histograms	
	P.7 Time-Stamps	
	P.8 All Data	
<b>T. Test Menu</b>		
	T.1 Switch Edges	
	T.2 Switch Levels	
	T.3 Single Switches	
	T.4 Solenoid Test	
	T.5 Flasher Test	
	T.6 General Illumination	
	T.7 Sound and Music Test	
	T.8 Single Lamps	
	T.9 All Lamps	
	T.10 Lamp & Flasher Test	
	T.11 Display Test	
	T.12 Supercharger Test	
	T.13 Supercharger Time Test	
<b>U. Utilities Menu</b>		
	U.1 Clear Audits	
	U.2 Clear Coins	
	U.3 Reset H.S.T.D.	
	U.4 Set Time & Date	
	U.5 Custom Message	
	U.6 Set Game I.D.	
	U.7 Factory Adjustments	
	U.8 Factory Resets	
	U.9 Presets	
	U.10 Clear Credits	
	U.11 Auto Burn-in	
<b>A. Adjustments Menu</b>		
	A.1 Standard Adjustments	
	A.2 Feature Adjustments	
	A.3 Pricing Adjustments	
	A.4 H.S.T.D. Adjustments	
	A.5 Printer Adjustments	

## Main Menu

- B. Bookkeeping**
- P. Printouts** (optional board required)
- T. Tests**
- U. Utilities**
- A. Adjustments**

The game 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 the desired Bookkeeping Group when that group appears in the displays.

## 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**

Once you have entered the desired Bookkeeping Group, press the Up or Down button to cycle through the audits in that group. Audits cannot be set, they can only be cleared by using U1 and U2 from the Utilities Menu.

## One-Button Audit System

Information from the Bookkeeping Menu is obtainable directly from the Attract Mode. Continually pressing the Enter button, while in the Attract Mode, will cycle through all of the game audits.

**B.1 Main Audits** These audits (which appear in other groups) are the most important, and are grouped here for easier access.

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

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

## 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

\* Note: These Audits are NOT  
Resettable. They are a record  
of the earnings of the game  
since the "CLOCK 1ST SET"  
Time -Stamp.

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or the Down button to return to a previous group). Press the Enter button to activate. Press the Up or Down button to cycle through the available audits.

## 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	Minutes of Play	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 Cycles	00

As a new WPC feature, the "Total Plays"  
counter only counts completed games.  
A game is considered completed when the  
final ball begins. Audit information from  
an incomplete game is ignored. Therefore  
operation for test and service do not affect  
the Audits.

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

## **B.4 Feature Audits**

B.4	01	Green was Lit	# of times the player achieved the Green Light level.
B.4	02	Yellow was Lit	# of times the player achieved the Yellow Light level.
B.4	03	Red was Lit	# of times the player achieved the Red Light level.
B.4	04	Ran Red Light	# of times Running the Red Light started Multi-ball.
B.4	05	Redline 1st Gear	# of times 1st Gear was Redlined.
B.4	06	Redline 2nd Gear	# of times 2nd Gear was Redlined.
B.4	07	Redline 3rd Gear	# of times 3rd Gear was Redlined.
B.4	08	Redline 4th Gear	# of times 4th Gear was Redlined.
B.4	09	Redline 5th Gear	# of times 5th Gear was Redlined.
B.4	10	Video Modes	# of times Video Mode was played.
B.4	11	Video Mode Ex. Ball	# of times Extra Ball was awarded in the Video Mode.
B.4	12	Video Mode Ended	# of times Video Mode was played to the end.
B.4	13	Redline Mania	# of times the player started Redline Mania.
B.4	14	Supercharger Boost	# of times the Supercharger Boost was awarded.
B.4	15	Jackpots Lit	# of times the Jackpot was lit.
B.4	16	Jackpots Awarded	# of times the Jackpot was awarded.
B.4	17	Super Jackpots Lit	# of times the Super Jackpot was lit.
B.4	18	Super Jackpot Awarded	# of times the Super Jackpot was awarded.
B.4	19	Getaway Times	# of times a Jackpot was not awarded in Multi-ball.
B.4	20	Helicopter Bonus	# of times a Helicopter Bonus was awarded.
B.4	21	Kickback Re-lit	# of times Kickback wasn't lit when 1,2,3 completed.
B.4	22	Kickbacks Used	# of times the Kickback was used.
B.4	23	Freeway Loops	# of times the Freeway Loop was achieved.
B.4	24	Freeway 5 Million	# of times the Freeway 5 Mill. Loops were achieved.
B.4	25	Freeway Extra Balls	# of times the Freeway awarded an Extra Ball.
B.4	26	Two-way Combo	# of times the Two-way Combo was achieved.
B.4	27	Burn Rubber	# of times the Burn Rubber feature was used.
B.4	28	Random Extra Balls	# of times the random feature awards an Extra Ball.
B.4	29	Random Specials	# of times the random feature awards a Special.
B.4	30	Random Multi-balls	# of times the random feature awards a Multi-ball.
B.4	31	Random 10 Million	# of times the random feature awards 10 Million.
B.4	32	Free Ride Saves	# of times Free Ride saved the ball.
B.4	33	Speed Millions	# of times the Speed Million was awarded.
B.4	34	Ball Searches	# of times the game searched for the ball.
B.4	35	Tunnel Shots	# of times the ball went in the Eject Hole.
B.4	36	Special Lit	# of times the Special was lit.
B.4	37	Lit Consolation Ball	# of times the Extra Ball was lit for consolation.
B.4	38	Consolation Ball	# of times the player received a Consolation Ex. Ball.
B.4	39	Supercharger 5 Million	# of shots players made in Supercharger Mode.
B.4	40	Left Flipper Flips	# of times the Left Flipper was flipped.
B.4	41	Right Flipper Flips	# of times the Right Flipper was flipped.

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to the advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

## B.5 Histograms

B.5	01	0.0-1.9 Million Scores	00%	00
B.5	02	2.0-4.9 Million Scores	00%	00
B.5	03	5.0-9.9 Million Scores	00%	00
B.5	04	10-19 Million Scores	00%	00
B.5	05	20-29 Million Scores	00%	00
B.5	06	30-39 Million Scores	00%	00
B.5	07	40-49 Million Scores	00%	00
B.5	08	50-69 Million Scores	00%	00
B.5	09	70-99 Million Scores	00%	00
B.5	10	100-149 Million Scores	00%	00
B.5	11	150-199 Million Scores	00%	00
B.5	12	200-299 Million Scores	00%	00
B.5	13	Over 300 Million	00%	00
B.5	14	Game Time 0.0-1.0 Mins	00%	00
B.5	15	Game Time 1.0-1.5 Mins	00%	00
B.5	16	Game Time 1.5-2.0 Mins	00%	00
B.5	17	Game Time 2.0-2.5 Mins	00%	00
B.5	18	Game Time 2.5-3.0 Mins	00%	00
B.5	19	Game Time 3.0-3.5 Mins	00%	00
B.5	20	Game Time 3.5-4.0 Mins	00%	00
B.5	21	Game Time 4-5 Mins	00%	00
B.5	22	Game Time 5-6 Mins	00%	00
B.5	23	Game Time 6-8 Mins	00%	00
B.5	24	Game Time 8-10 Mins	00%	00
B.5	25	Game Time 10-15 Mins	00%	00
B.5	26	Game Time Over 15 Mins	00%	00

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

## B.6 Time-Stamps

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

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

Press the Escape button to return to the Bookkeeping Menu. Then, either press the Up or Down button to return to a previous Bookkeeping Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu either press the Up button to advance to the next menu selection, the Printouts Menu, or press the Down button to return to a previous Main Menu selection.

Press the Enter button to activate the Printouts Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Printouts Menu selections. Press the Enter button to activate the desired Printouts Group when that group appears in the displays.

**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.

Press the Escape button to return to the Printouts Menu. Then, either press the Up or Down button to return to a previous Printouts Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu press the Up button to advance to the next menu selection, the Test Menu, or press the Down button to return to a previous Main Menu selection.

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 the desired test when that test appears in the display.

## **T. Test Menu**

- T.1 Switch Edges**
- T.2 Switch Levels**
- T.3 Single Switch**
- T.4 Solenoid Test**
- T.5 Flasher Test**
- T.6 General Illumination**
- T.7 Sound & Music Test**
- T.8 Single Lamps**
- T.9 All Lamps**
- T.10 Lamp & Flasher Tests**
- T.11 Display Test**
- T.12 Supercharger Test**
- T.13 Supercharger Time Test**

The entire switch matrix is displayed on the left side of the display. It shows the state of ALL switches. A dot indicates the switch is open. A square indicates the switch is closed. Also, 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 means 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**

To activate the Switch Edges Test, from the Test Menu, press the Enter button. Press each switch one at a time. The name and number of the switch is shown in the display. If a switch other than the one pressed, or no switch at all is indicated, the system has detected a problem with the switch circuit.

Press Escape to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

### **T.2 Switch Levels**

Once the test name is shown under the Test Menu, press the Enter button. 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 position in the matrix.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.



### T.3 Single Switches

Once the test name is shown under the Test Menu, press the Enter button. 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. Press the Start button to obtain wire color, connector, and fuse information of any switch when that switch is displayed.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

### T.4 Solenoid Test

Once the test name is shown under the Test Menu, press the Enter button. 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 than one solenoid pulses, a solenoid comes On and stays On, or no solenoid pulses during the Repeat or Run test modes. Press the Start button to see the wire color, driver number, connector, and fuse information for any coil.

**Repeat-** The Repeat mode allows you to pulse 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 you press the Up or Down button to move to the next one. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next mode.

**Stop** - The Stop mode allows you to stop 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 Run mode allows you to cycle through the solenoids automatically. Press the Enter button during the Stop mode. The display shows you the name and number of the solenoid currently being pulsed.

Either press the Enter button to return to the Repeat mode, or press the Escape button to return to the Test Menu. Once in the Test Menu press, the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

### T.5 Flasher Test

Once the test name is shown under the Test Menu, press the Enter button. 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 than one circuit pulses, a circuit stays On, or no circuit pulses during the Repeat or Run modes. Press the Start button to see the wire color, driver number, connector, and fuse information of any flashlamp circuit.

**Repeat -** The Repeat mode allows you to pulse a single flashlamp. Once you have entered this test, the name and number of the first flashlamp circuit shows in the display and the corresponding bulb(s) flashes. Press the Up or Down button to cycle through all of the flashlamps circuits one at a time. The same circuit pulses until you press the Up or Down button to move to the next one. Either, press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.

**Stop** - The Stop mode allows you to stop the Flasher Test. Press the Enter button during the Repeat mode. The Flasher Test stops. No flashlamp circuit should be turned On 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.

## **Flasher Test Continued...**

**Run-** The Run mode allows you to cycle through the flashlamps automatically. Press the Enter button during the Stop mode. The display shows the name and number of the circuit currently being pulsed, and the corresponding bulb(s) flashes.

Either press the Enter button to return to the Repeat mode or, press the Escape button to return to the Test Menu. Once in the Test Menu, press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

## **T.6 General Illumination**

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to check all of the General Illumination circuits. There are two modes of operation, Stop and Run. To obtain wire color, driver number, connector, and fuse information, press the Start button when the desired General Illumination circuit appears in the display.

**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 Stop 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.

Either press the Enter button to return to Stop mode, or the Escape button to return to the Test Menu. Once in the Test Menu press the Up button to advance to the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

## **T.7 Sound and Music Test**

Once the test name is shown under the Test Menu, press the Enter button. The Sound and Music Test allows you to check the audio circuits. This test has three modes for testing the sound and music circuits, Run, Repeat and Stop.

**Run** - The Run mode steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test allows you to advance 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 Run mode to cause the program to stop and repeat a particular sound or 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.

Use the Enter button to return to the Run test mode, or the Escape button to return to the Test Menu. Once in the Test Menu press the Up button to display the next test, (or the Down button to return to a previous test) . Press the Enter button to activate the test.

## **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.

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to test 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. Press the Start button to obtain wire color, connector, and fuse information when the desired lamp is lit.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

## **T.9 All Lamps Test**

Once the test name is shown under the Test Menu, press the Enter button. 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.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

## **T.10 Lamp and Flasher Test**

Once the test name is shown under the Test Menu, press the Enter button. 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.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

## **T.11 Display Test**

Once the test name is shown under the Test Menu, press the Enter button. 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.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

## **T.12 Supercharger Test**

Once the test name is shown under the Test Menu, press the Enter button. This test allows the operator to check the magnets of the Supercharger individually. At the start all of the magnets are disabled. The Up and Down buttons allow the operator to cycle through the eight different combinations of magnets enabled or disabled. The magnets and corresponding optos are numbered across the device 1, 2, 3 from left to right.

Example of the screen:

	<b>Coils</b>	<b>Switches</b>
# 1)	Disabled	Closed
# 2)	Enabled	Closed
# 3)	Disabled	Closed

## **Supercharger Test Continued...**

In this example, Coil # 2 (middle coil) is enabled and the remaining two coils are disabled. All of the switches (optos) are closed. If the ball was in the Supercharger one of the optos may be open and only Coil #2 would effect the ball.

A good way to test the magnets is to enable them, one at a time, and then roll a ball through the Supercharger.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate the test.

### **T.13 Supercharger Time Test**

Once the test name is shown under the Test Menu, press the Enter button. This test allows the operator to check the Supercharger Ramp as a whole. A ball inserted into the Supercharger should start to circle it. The "Last Time" is a measure of time that the ball spent in the last cycle. If this number is consistently higher than 145 there may be a problem with the Supercharger Ramp. One of the following may be the cause:

- Optos 1, 2, or 3 are bad.

- Magnets 1, 2, or 3 are bad.

- The diverter is not operating properly.

- A wire has come loose from a magnet or opto.

- The ramp is not mounted properly.

- The leg of the ramp below the bottom Jet Bumper is not fastened properly.

If all of the above are found to be normal, then the ball should circle through the Supercharger .

Press the Escape button to return to the Test Menu. Then, either press the Up or Down button to return to a previous Test, or press the Escape button again to return to the Main Menu. Once in the Main Menu, press the Up button to move to the next menu selection, the Utilities Menu, or press the Down button to return to a previous Main Menu selection.

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 the desired Utility or Utility Group when it appears in the display. If you change a utility setting and realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is still in the display. The original setting is retained and the new setting is ignored.

## **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, Feature Audits, and Histograms. Press the Up button to display the next utility.

### **U.2 Clear Coins**

Press the Enter button to clear the Earnings Audits. Press the Up button to display the next utility.

### **U.3 Reset H.S.T.D.**

Press the Enter button to clear the High Score to Date Table, the Grand Champion and the Loop Champion. Press the Up button to display the next utility.

### **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 you make a mistake press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained. Press the Up button to move to the next utility.

**U.5 Custom Message Note:** 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 you make a mistake, use Up and Down to select the "back-arrow" character. The "back-arrow" character is located before the space character and after the number nine. Press Enter while the back-arrow shows to erase the previously entered character. Once your message is complete, press and hold the Enter button until "Message Stored" is displayed.

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

## U.6 Set Game I.D.

This utility allows the operator to install a message, such as game location, that only appears on printouts. Press the Enter button to activate Set Game I.D.. Use the Up or Down button to 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, then press the Up button to display the next utility.

## 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. Press the Up button to display the next utility.

**Factory Setting Table**

Adj #	Adj Description	U.S.A.	German	French	European
A.1 09	Replay Level 1	75,000,000	85,000,000	85,000,000	85,000,000
A.1 13	Replay Boost	7,000,000	7,000,000	7,000,000	7,000,000
A.4 10	Backup Champion	200,000,000	250,000,000	250,000,000	250,000,000
A.4 11	Backup H.S.T.D. 1	150,000,000	175,000,000	175,000,000	175,000,000
A.4 12	Backup H.S.T.D. 2	125,000,000	150,000,000	150,000,000	150,000,000
A.4 13	Backup H.S.T.D. 3	100,000,000	125,000,000	125,000,000	125,000,000
A.4 14	Backup H.S.T.D. 4	75,000,000	100,000,000	100,000,000	100,000,000

## U.9 Presets

Press the Enter button to activate the Presets Group. 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 you realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

### U.9 01 Install Extra Easy

The operator can change the game play difficulty adjustments to a combination that is MUCH LESS difficult than the Factory Settings. The Game Difficulty Setting Table lists the adjustments and the settings that comprise the 'Extra Easy' Group.

### U.9 02 Install Easy

The operator can change the game play difficulty adjustments to a combination that is somewhat LESS difficult than the Factory Settings. The Game Difficulty Setting Table lists the adjustments and the settings that comprise the 'Easy' Group.

### U.9 03 Install Medium

The operator can change the game play difficulty adjustments to a combination that is about the SAME difficulty as the Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the 'Medium' Group.

### U.9 04 Install Hard

**U.9 04 Install Hard**

The operator can change the game play difficulty adjustments to a combination that is somewhat MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the 'Hard' Group.

**U.9 05 Install Extra Hard**

The operator can change the game play difficulty adjustments to a combination that is MUCH MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the 'Extra Hard' Group.

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

Adj #	Adj Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03 (factory)	Hard U.9 04	Extra Hard U.9 05
A.2 03	Extra Ball Percent	20%	15%	12%	10%	10%
A.2 06	Kickback Setting	On ball strt timer Off	On ball strt timer 12 sec	On gme strt timer 12 sec	On gme strt timer 10 sec	On gme strt timer 8 sec
A.2 07	Extra Ball Memory	On	On	On	On	Off
A.2 09	Getaway Timer	30 sec	25 sec	20 sec	20 sec	15 sec
A.2 10	Video Mode Timer	20 sec	17 sec	14 sec	14 sec	12 sec
A.2 11	Freeway Timer	16 sec	12 sec	8 sec	8 sec	7 sec
A.2 13	Multi-ball Percent	30%	25%	20%	18%	15%
A.2 14	Supercharger Timer	30 sec	25 sec	20 sec	20 sec	15 sec
A.2 17	Spot L. on S.Ramp	On	On	On	Off	Off

**Game Difficulty Setting Table for German/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	Extra Ball Percent	15 %	12%	10%	10%	8%
A.2 06	Kickback Setting	On ball strt timer 12 sec	On gme strt timer 12 sec	On gme strt timer 10 sec	On gme strt timer 8 sec	On gme strt timer 8 sec
A.2 07	Extra Ball Memory	On	On	On	On	Off
A.2 09	Getaway Memory	25 Sec	20 Sec	20 sec	15 sec	12 sec
A.2 10	Video Mode Timer	20 sec	17 sec	14 sec	14 sec	12 sec
A.2 11	Freeway Timer	15 sec	10 sec	8 sec	7 sec	6 sec
A.2 13	Multi -ball Percent	25%	20%	15%	12%	10%
A.2 14	Supercharger Timer	30 sec	25 sec	20 sec	20 sec	15 sec
A.2 17	Spot L. on S. Ramp	On	On	Off	Off	Off

**U.9 06 Install 5 Ball**  
 The operator can change the game to 5 ball play, including the changing of certain features to the recommended 5-ball level. The Preset Game Adjustments Table for U.S./Canadian Games lists the adjustments and settings that comprise the 'Install 5 Ball' Group.

**U.9 07 Install 3 Ball**  
 The operator can change the game to 3 ball play, including the changing of certain features to the recommended 3-ball level. The Preset Game Adjustments Table for U.S./Canadian Games lists the adjustments and settings that comprise the 'Install 3 Ball' Group.

**Preset game Adj's Table for U.S./Canadian Games**

Adj #	Adj Description	Install 5-ball U.9 06	Install 3-ball U.9 07
A.1 01	Balls/Game	5 Balls	3 Balls
A.1 07	Replay Start	150,000,000	75,000,000
A.2 03	Extra Ball Percent	8%	12%
A.2 06	Kickback	Extra Hard	Medium
A.2 11	Freeway Timer	6 seconds	8 seconds
A.2 13	Multi-ball Percent	15%	20%
A.2 17	Spot L. on S. Ramp	Off	On

**U.9 08 Install Add -A -Ball**  
 The operator utilizes this option to delete all Free Play awards and replace them with Extra Ball awards. Individual adjustments are affected, as follows:

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

**U.9 09 Install Ticket**  
 The operator utilizes this option to delete Credit awards and replace them with Ticket awards. Individual adjustments are affected as follows:

Ad	Name	New Settings
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**

The operator utilizes this option to removes all Free Play and Extra Ball awards. Individual adjustments are affected as follows:

<b>Ad</b>	<b>Name</b>	<b>New Setting</b>
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**

The operator uses this option to automatically set game pricing to 1 for 50¢/2 for \$1.00 and 1 Coin Buy-in (A.3 19) to YES.

**U9 12 Not Used**

**U.9 13 Not Used**

**U.9 14 Not Used**

**U.9 15 Not Used**

**U.9 16 Not Used**

- U.9 17 Install German 1•**  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German Games lists the adjustments and settings that comprise the 'Install German 1' Group.
- U.9 18 Install German 2•**  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustment Table for German Games lists the adjustments and settings that comprise the 'Install German 2' Group.
- U.9 19 Install German 3•**  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German Games lists the adjustments and settings that comprise the 'Install German 3' Group.
- U.9 20 Install German 4•**  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German Games lists the adjustments and settings that comprise the 'Install German 4' Group.
- U.9 21 Install German 5•**  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German Games lists the adjustments and settings that comprise the 'Install German 5' Group.
- U.9 22 Install German 6•**  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German Games lists the adjustments and settings that comprise the 'Install German 6' Group.

### Preset Game Adjustments 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	1spiele/2DM	1spiele/2DM	1spiele/2DM	1spiele/1DM	1spiele/1DM	1spiele/1DM
A.4 02	H.S.T.D. Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.2 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	250.000.000	250.000.000	00	250.000.000	250.000.000	00
A.4 11	Backup H.S.T.D. 1	175.000.000	175.000.000	00	175.000.000	175.000.000	00
A.4 12	Backup H.S.T.D. 2	150.000.000	150.000.000	00	150.000.000	150.000.000	00
A.4 13	Backup H.S.T.D. 3	125.000.000	125.000.000	00	125.000.000	125.000.000	00
A.4 14	Backup H.S.T.D. 4	100.000.000	100.000.000	00	100.000.000	100.000.000	00

• For German Jumpered CPU Boards only.

German Jumpers are:

<u>W14</u>	<u>W15</u>	<u>W16</u>	<u>W17</u>	<u>W18</u>
In	In	In	In	Out

- U.9 23 Install French 1\***  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the 'Install French 1' Group.
- U.9 24 Install French 2\***  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the 'Install French 2' Group.
- U.9 25 Install French 3\***  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the 'Install French 3' Group.
- U.9 26 Install French 4\***  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the 'Install French 4' Group.
- U.9 27 Install French 5\***  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the 'Install French 5' Group.
- U.9 28 Install French 6\***  
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the 'Install French 6' Group.

**Preset Game Adjustments for French Games**

Adj #	Adj Description	French 1 U.9 23	French 2 U.9 24	French 3 U.9 25	French 4 U.9 26	French 5 U.9 27	French 6 U.9 28
A.2 03	Extra Ball Percent	12%	8%	12%	12%	12%	10%
A.2 06	Kickback	Hard	Ex. Hard	Medium	Hard	Hard	Ex. Hard
A.2 11	Freeway Timer	8 secs.	6 secs.	10 secs.	8 secs.	8 secs.	7 secs.
A.2 13	Multi-ball Percent	18%	14%	20%	18%	18%	16%
A.2 17	Spot L. on S. Ramp	On	Off	On	On	On	Off

\* For French Jumpered CPU Boards only. French Jumpers are:  
W14    W15    W16    W17    W18  
 In      In      In      Out    In

Press the Escape button to return to the Presets menu. Then press the Up button to display the next utility, (or the Down button to return to a previous utility).

**U.10 Clear Credits**

Press the Enter button to clear the game Credits. Press the Up button to display the next utility.

**U.11 Auto Burn-in**

Press the Enter button to activate Auto Burn-in. This allows you to automatically cycle 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, and the G.I. Test.

Press the Escape button to return to the Utilities Menu. Then, either press the Up or Down button to return to a previous Utility or press the Escape button again to return to the Main Menu. Once in the Main Menu, press the Up button to move to the next menu selection, the Adjustments Menu, or press the Down button to return to a previous Main Menu selection.

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 the desired adjustments group when it appears in the display.

When an adjustment is activated, the setting value begins to flash. Use the Up or Down button to raise or lower the setting value. When the desired value is displayed press Enter to lock in the value. If you realize you have made an error, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

## **A. Adjustment Menu**

- A.1 Standard Adjustments**
- A.2 Feature Adjustments**
- A.3 Pricing Adjustments**
- A.4 H.S.T.D Adjustments**
- A.5 Printer Adjustments** (optional board required)

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

- A.1 01 Balls Per Game**  
The operator defines a "game" by specifying the number of balls to be played. The range of this setting is 1 through 10.
  
- A.1 02 Tilt Warnings**  
The operator specifies the number of total actuations of the plumb bob mechanism that can occur before the game is "tilted". The range of this setting is 1 through 10.
  
- A.1 03 Maximum Extra Balls**  
The operator chooses the number of Extra Balls that a player may accumulate. The range of this setting is 1 through 10, or "No Extra Ball" (extra ball disabled).
  
- A.1 04 Maximum Extra Balls/Ball in Play**  
The operator chooses the number of Extra Balls to be awarded per ball in play. The range of this setting is:  
  
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 operator chooses the replay system to be used. The choices are:  
  
Fixed - Replay value is set by the operator and does not change during game play.  
Auto%- Replay starting value is set by the operator and change every 50 games to comply with the percentage of replays desired.

- A.1 06 Replay Percent\***  
The operator chooses the percentage of replays the players are able to earn when Auto Replay is used. The range of this setting is 5% to 50%.
- A.1 07 Replay Start\***  
The operator chooses the replay starting value when Auto% Replay is used. The range of this setting is 15, 000, 000 to 250, 000, 000.
- A.1 08 Replay Levels\***  
The operator chooses the number of replay levels used by the Auto% Replay mode. The range of this setting is 1 through 4. When the operator chooses two replay levels, the second replay level is automatically adjusted to twice starting replay level value. When three or four replay levels are chosen, their values are automatically adjusted to three or four times the starting replay level value.
- A.1 09 Replay Level 1\*\***  
The operator chooses the value to be used for the first Fixed Replay. The range of this setting is 00 to 250, 000, 000.
- A.1 10 Replay Level 2\*\***  
The operator chooses the value to be used for the second Fixed Replay. The range of this setting is 00 to 250, 000, 000.
- A.1 11 Replay Level 3\*\***  
The operator chooses the value to be used for the third Fixed Replay. The range of this setting is 00 to 250, 000, 000.
- A.1 12 Replay Level 4\*\***  
The operator chooses the value to be used for the fourth Fixed Replay. The range of this setting is 00 to 250, 000, 000.
- A.1 13 Replay Boost**  
The operator chooses if 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=0, when the player inserts another coin, or when Begin Test is pressed. The range of this setting is Off, 1, 000, 000 to 50, 000, 000.
- A.1 14 Replay Award**  
For either Auto% Replay or Fixed Replay the operator can choose the form of the award automatically provided when the player exceeds any replay level. The choices are:
- 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.

\*For Auto % Replay. \*\* For Fixed Replay

- A.1 15 Special Award**  
The operator can choose the award automatically provided when the player scores a special. The choices are:
- 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 operator can choose the award automatically provided when the players wins a match. The choices are:
- Credit - Winning a Match awards a Credit.
  - Ticket - Winning a Match awards a Ticket.
- A.1 17 Extra Ball Ticket**  
The operator can choose whether a Ticket is awarded when the player earns an Extra Ball. The choices are:
- Yes - The player is awarded a Ticket in addition to an Extra Ball.
  - No - The player is not awarded a Ticket.
- A.1 18 Maximum Ticket/Player**  
The operator can choose the amount of Tickets each player can earn. The range of this setting is 00 to 100.
- A.1 19 Match Feature**  
The operator can choose the desired percentage for the Match Feature occurring at the end of the game. The range of this setting is:
- Off - Match Feature is not available.
  - 1 -50% - 1% is 'hard'; 50% is 'extremely easy'. During the Match Feature the game selects a random two-digit number at the end of the game and compares each players score for an identical two digits in the rightmost two positions. A matching of these two digit results in an award of a Credit or a Ticket.
- A.1 20 Custom Message**  
The operator chooses if a message is displayed during the Attract Mode. The choices are:
- On - A message is displayed
  - Off - A message is not displayed.
- A.1 21 Language**  
The operator chooses what language the game uses. The choices are English, French, or German.
- A.1 22 Clock Style**  
The operator chooses what style of clock the game uses. The choices are A.M./P.M. or 24 Hours.
- A.1 23 Date Style**  
The operator chooses what style of date the game uses. The choices are Month/Date/Year, or Date/Month/Year.

- A.1 24 Show Date and Time**  
The operator chooses whether the date and time show in the Attract Mode. The choices are:
- 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 operator chooses whether to allow the game program to dim the General Illumination for special effects and during the Attract Mode. The choices are:
- Yes - Dim the General Illumination during the Attract Mode.  
No - Do Not dim the General Illumination.
- A.1 26 Tournament Play**  
The operator chooses whether to equalize the Helicopter Bonus and Burn Rubber features during multi-player games. The choices are:
- Yes - The Helicopter Bonus does not grow. It remains at 5 Million. The Burn Rubber feature awards items in order instead of randomly. The order is : 5 Million, RPM's, a Freeway, Video Mode, Multi-ball, and then it starts over again at 5 Million.  
No - The Helicopter Bonus and Burn Rubber features perform normally.
- A.1 27 Euro. Scr. Format**  
The operator chooses whether to have commas or dots between digits when numbers are displayed. The choices are:
- 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 operator chooses whether the volume can be turned Off. The choices are:
- Yes - Volume can be turned Off.  
No - Volume can be turned Down but not Off.
- A.1 29 G.I. Power Saver**  
This adjustment allows the General Illumination and Controlled lamps to be dimmed following a time interval after a game is played. A.1 30 (Power Saver Level) determines how dim the lamps get. Using this feature substantially increases the life of the lamps. The range of this setting is Off, 2 through 60 minutes.
- A.1 30 Power Saver Level**  
When A.1 29 (G.I. Power Saver) is set to On, this adjustment controls the intensity of the G.I. and Controlled lamps once the game has been idle for a specified time period. The range of this setting is 4 through 7.
- 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. The choices are:
- Yes - Ticket Expansion Board is connected.  
No - Ticket Expansion Board is NOT installed in the game.

**A.1 32 No Bonus Flips**

The operator chooses whether or not the flippers activate during the end of ball Bonus sequence. **Note:** Setting to Yes may extend the useful life of the flippers. The choices are:

- Yes - The flippers do not activate during the end of ball Bonus sequence.
- No - The flippers activate during the end of ball Bonus sequence.

Press the Escape button to return to the Adjustments Menu. Press the Up button to advance to the next desired Adjustments Group, (or press the Down button to return to a previous group). Press the Enter button to activate. Use the Up or Down button to cycle through the available adjustments.

**A.2 Feature Adjustments**

**A.2 01 Attract Sounds**

The operator chooses whether the game produces sounds during the Attract Mode. The choices are:

- On - The game does produce sounds during the Attract Mode.
- Off - The game does not produce sound during the Attract Mode.

**A.2 02 Special Percent**

The operator chooses the percent of games that a Special is awarded. The range of this setting is Off, 1% through 10%. **Note :** If set to Off, the Random feature (Burn Rubber) awards zero Specials and the Skilled Method is unavailable.

**A.2 03 Extra Ball Percent**

The operator chooses the percent of games that award an Extra Ball. The range of this setting is Off, 1% through 35%. **Note :** If set to Off, the Random feature (Burn Rubber) and the Video Mode awards zero Extra Balls, but the Skilled Extra Ball is available.

**A.2 04 Timed Plunger**

The operator chooses whether the plunger kicks automatically for the player. The choices are:

- On - After 1 seconds to 120 seconds of inactive play, the plunger kicks automatically.
- Off - The plunger does not kick automatically.

**A.2 05 Flipper Plunger**

The operator chooses whether pressing the Flipper buttons, as well as the Gear Shifter, can shoot the ball. The choices are:

- On - Pressing the Flipper buttons shoots the ball.
- Off - Pressing the Flipper buttons does not shoot the ball.

**A.2 06 Kickback Setting**

The operator chooses whether the Kickback is turned On at the beginning of a ball or at the beginning of a game. This setting also alters the time of the 1-2-3 Targets. The time is the number of seconds the player has to hit the next required target.

- Extra Easy - Kickback On at ball start, Timer is Off.
- Easy - Kickback is On at ball start, Timer is set at 12 seconds.
- Medium - Kickback is On at game start, Timer is set at 12 seconds.
- Hard - Kickback is On at game start, Timer is set at 10 seconds
- Extra Hard - Kickback is On at game start, Timer is set at 8 seconds.



- A.2 07 Extra Ball Memory**  
The operator chooses whether the Extra Ball Light is carried over from ball to ball, or reset at ball start. The choices are:
- On - The Extra Ball Light is carried over from ball to ball.
  - Off - The Extra Ball Light is reset at ball start.
- A.2 08 Consolation Ball**  
The operator chooses if a player with a low score has a chance to obtain a Consolation Ball. The choices are:
- On - The player has a chance to obtain a Consolation Ball.
  - Off - The player cannot obtain a Consolation Ball.
- A.2 09 Getaway Timer**  
The operator chooses the time allowed to complete the Jackpot. The range of this setting is 10 seconds to 99 seconds.
- A.2 10 Video Mode Timer**  
The operator the number of seconds the player is challenged with traffic. The range of this setting is 10 seconds to 30 seconds.
- A.2 11 Freeway Timer**  
The operator chooses the number of seconds the Freeway lights blink before they time out. The range of this setting is 6 seconds to 20 seconds.
- A.2 12 Photo Shoot**  
The operator chooses whether the flippers can change the appearance of the Attract Mode. The choices are:
- On - The flippers control the Attract Mode appearance.
  - Off - The flippers do not control the Attract Mode appearance.
- A.2 13 Multi-ball Percent**  
The operator chooses the percent of Multi-balls the game awards. If the player are not achieving this percent of Multi-balls on their own, the Random Feature (Burn Rubber) makes up the difference. The range of this setting is 10% to 50%.
- A.2 14 Supercharger Timer**  
The operator chooses the number of seconds the player has to make as many Supercharger shots as they can. The range of this setting is 10 seconds to 99 seconds.
- A.2 15 Diverter Broken**  
When set to On, the operator is telling the game software that something is wrong with the Diverter or the Supercharger and he/she does not want the diverter to open. The game still works as best as possible. The choices are:
- On - Diverter or Supercharger is broken: Diverter do not open.
  - Off - Diverter and Supercharger are not broken: Diverter does open.
- A.2 16 Up/Down Ramp Broken**  
When set to On, the operator is telling the game software that something is wrong with the Up/Down Ramp and he/she does not want the ramp to drop down. The game still works as best as possible. The choices are:
- On - Up/Down Ramp is broken: Ramp do not drop down.
  - Off - Up/Down Ramp is not broken: Ramp does drop down.

**A.2 17 Spot L. on S. Ramp**

When set to On, the Left Ramp spots "Spot Lamps". This helps the player achieve the 1st Multi-ball faster. The ramp never spots lamps if the player has already achieved Multi-ball. The choices are:

- On - Left Ramp spots "Spot Lamps".
- Off - Left Ramp does not spot "Spot Lamps".

Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

**A. 3 Pricing Adjustments**

**A.3 01 Game Pricing (if set to custom, then 02 to 09 are available)**

The operator chooses the cost for a game from a selection of Standard pricing or by installing Custom pricing.

**A.3 02 Left Coin Units**

The operator can specify the number of coin units purchased by a coin passing through the left coin chute.

**A.3 03 Center Coin Units**

The operator can specify the number of coin units purchased by a coin passing through the center coin chute.

**A.3 04 Right Coin Units**

The operator can specify the number of coin units purchased by a coin passing through the right coin chute.

**A.3 05 4th Slot Units**

The operator can specify the number of coin units purchased by a coin passing through the fourth coin chute.

**A.3 06 Units/Credits**

The operator 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**

The operator can specify that 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 operator specifies the number of credits that are awarded when the Units/Bonus level is achieved.

**A.3 09 Minimum Units**

The operator can specify that 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 operator chooses what coin system is used to display the Earning Audits.
- A.3 12 Left Slot Value**  
The operator can specify the monetary value of the left coin chute.
- A.3 13 Center Slot Value**  
The operator can specify the monetary value of the center coin chute.
- A.3 14 Right Slot Value**  
The operator can specify the monetary value of the right coin chute.
- A.3 15 4th Slot Value**  
The operator can specify the monetary value of the 4th coin chute.
- A.3 16 Maximum Credits**  
The operator can specify the maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of this setting is 5 through 10. Reaching the specified setting prevents the award of any credits.
- A.3 17 Free Play**  
The operator can specify whether a player can operate the game without a coin (free play) or with a coin. The choices are:
- No - A coin is necessary for game play.
  - Yes - Game play is free; no coin required.
- A.3 18 Hide Coin Audits**  
The operator chooses whether or not to show the coin audits. The choices are:
- Yes - The coin audits are not displayed.
  - No - The coin audits are displayed.
  - Hide Names - The coin audit value is shown but not the audit name.
- A.3 19 1 Coin Buy-in**  
If the game pricing is set to 1 for 50¢/2 for \$1.00 the operator chooses whether the player is allowed to 'buy-in' a subsequent game for 1 coin. The number of games that may be purchased at this cost is determined by the number of players in the previous game; that is, if the previous game had three players, 3 Credits can be purchased at the rate of 1 coin per credit. The choices are:
- 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.

## Pricing Table

Country	Coin Chutes				Games/Coins	Display	Pricing Adjustments A3									
	Left	Center	Right	4th Chute			02	03	04	05	06	07	08	09		
USA	25¢	\$1.00*	25¢	-	1/25¢, 4/\$1 <sup>2</sup> 1/50¢, 2/75¢, 3/\$1 1,2 1/50¢, 2/\$1 <sup>2</sup> 1/25¢, 3/\$1 2 1/25¢, 3/50¢, 6/\$1 1/25¢, 5/\$1	USA 4/\$1.00 50¢, 75¢, \$1.00 USA 2/\$1.00 USA 3/\$1.00 CUSTOM CUSTOM	01 04 01 00 01 02 01 00 01 00 01 00 01 04 01 00									
Canada	25¢	-	\$1.00	-	1/50¢, 2/75¢, 3/\$1 <sup>2</sup> 1/50¢, 2/\$1 <sup>2</sup>	CANADA 1 CANADA 2										
Austria	5sch 5sch	10sch -	10sch 10sch	- -	1/2x5sch, 3/2x10sch 2 2/5sch, 5/10sch	AUSTRIA CUSTOM	02 00 05 00 01 00 01 00									
Australia	20¢	\$1	\$1	\$2	1/\$1, 3/\$2 <sup>2</sup>	AUSTRALIA										
U.K.	£1.00	50P	20P	10P	1/3x10P, 2/50P, 4/£1 <sup>2</sup>	U. KINGDOM										
Switzerland	1Fr	2Fr	5Fr	-	1/1Fr, 3/2Fr, 7/5Fr <sup>2</sup>	SWISS										
Belgium	5Fr	20Fr	50Fr	-	1/4x5Fr, 1/20Fr, 3/50Fr <sup>2</sup>	BELGIUM										
West Germany	1DM	2DM	5DM	-	1/2DM, 2/3DM, 3/4DM, 5/5DM <sup>1,2</sup> 1/1DM, 2/2DM, 5/5DM <sup>2</sup> 1/1DM, 2/2DM, 6/5DM <sup>2</sup> 1/1DM, 3/2DM, 9/5DM 1/2x1DM, 1/2DM, 3/5DM 2/1DM, 5/2DM, 14/5DM	GER. 1/2DM GER. 1/1DM GER. 6/5DM CUSTOM CUSTOM CUSTOM	09 18 45 00 05 00 01 00 03 06 15 00 05 00 01 00 13 26 65 00 05 65 01 00									
Netherlands	1Hfl 25¢ 1G	2.5Hfl - -	2.5Hfl 1G 1G	- - -	1/1Hfl, 3/2.5 Hfl <sup>2</sup> 1/25¢, 5/1G 1/1G	NETHERLANDS CUSTOM HOLLAND	01 00 05 00 01 00 01 00									
Sweden	5Kr	5kr	5Kr	-	1/5Kr <sup>2</sup>	SWEDEN										
France	1Fr 1Fr 1Fr 1Fr 1Fr 1Fr	5Fr 5Fr 5Fr 5Fr 5Fr 5Fr	10Fr 10Fr 10Fr 10Fr 10Fr 10Fr	- - - - - -	1/3x1Fr, 2/5Fr, 5/10Fr <sup>2,3</sup> 1/2x1Fr, 3/5Fr, 7/10Fr <sup>2,3</sup> 1/5Fr, 3/10Fr, 7/2x10Fr <sup>2,3</sup> 2/5Fr, 4/10Fr, 9/2x10Fr <sup>1,2,3</sup> 2/5Fr, 5/10Fr, 11/2x10Fr <sup>2,3</sup> 1/5Fr, 3/10Fr <sup>2,3</sup>	TARIF 1 TARIF 2 TARIF 3 TARIF 4 TARIF 5 TARIF 6										
Italy	500L	500L	500L	-	1/500L <sup>2</sup>	ITALY										
Spain	100P 25P 25P 25P 25P	- - - -	500P 100P 100P 100P 100P	- - - - -	1/100P, 6/500P <sup>2</sup> 1/25P, 5/100P 1/25P, 4/100P 1/2x25P, 2/100P 1/2x25P, 3/100P	SPAIN CUSTOM CUSTOM CUSTOM CUSTOM	01 00 04 00 01 04 01 00 01 00 04 00 01 00 01 00 01 00 04 00 02 00 01 00 03 00 12 00 04 00 01 06									
Japan	100¥	-	100¥	-	1/100¥ <sup>2</sup>	JAPAN										
Antilles, Netherlands	25¢	-	1G	-	1/25¢, 4/1G <sup>2</sup>	ANTILLES										
Chile	Token	-	Token	-	1/1Token <sup>2</sup>	CHILE										
Denmark	1Kr	5Kr	10Kr	-	1/2x1 Kr, 3/5Kr, 7/10Kr <sup>2</sup>	DENMARK										
Finland	1Mka	-	5Mka	-	1/2x1Mka, 3/5Mka <sup>2</sup>	FINLAND										
New Zealand	\$1.00 20¢	- -	\$2.00 20¢	- -	1/\$1, 3/\$2 <sup>2</sup> 1/3x20¢ <sup>2</sup>	NEW ZEALAND CUSTOM	01 00 01 00 03 00 00 01									
Norway	5Kr	-	10Kr	-	1/5Kr, 2/10Kr, 5/20Kr <sup>2</sup>	NORWAY										
Argentina	10¢	10¢	10¢	-	1/1 Token <sup>2</sup>	ARGENTINA										
Greece	10D	20D	50D	-	1/2x10D, 1/20D, 3/50D <sup>2</sup>	GREECE										
Hungary	10F	10F	20F	-	1/1x20F, 1/2x10F, 3/2x20F <sup>2</sup>	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.

Press the Escape button to return to the Adjustment Menu. Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

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

### **A.4 01 Highest Scores**

The operator specifies whether the game is to maintain a record of the four highest scores achieved to date. The choices are:

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

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

The operator chooses whether the "Highest" High Score is displayed in the Attract Mode. This score is not cleared when "High Score Reset Every" occurs. The choices are:

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 operator chooses the number of credits or tickets awarded for a Grand Champion Score. The range of this setting is 00 through 10.

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

The operator selects the number of credits or tickets to be awarded whenever a player exceeds the previous Highest Score. The range of this setting is 00 to 10.

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

The operator selects the number of credits or tickets to be awarded whenever a player exceeds the second highest score. The range of this setting is 00 to 10.

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

The operator selects the number of credits or tickets to be awarded whenever a player exceeds the third highest score. The range of this setting is 00 to 10.

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

The operator selects the number of credits or tickets to be awarded whenever a player exceeds the fourth highest score. The range of this setting is 00 to 10.

### **A.4 09 High Score Reset Every**

The operator can specify that the game will provide an automatic reset of the displayed "Highest scores", and the number of games to be played before the reset occurs. The values provided upon reset are those selected by the operator in the Back-up High Scores. The range of this setting is OFF (disabled) and 250 to 20, 000.

### **A.4 10 Backup Champion**

The operator sets the Back-up Grand Champion Score. The range of this setting is 00 through 999, 000, 000.

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

The operator can set the Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 999, 000, 000.

- A.4 12 Backup H.S.T.D. 2**  
The operator can set the second Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 999, 000, 000.
- A.4 13 Backup H.S.T.D. 3**  
The operator can set the third Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 999, 000, 000.
- A.4 14 Backup H.S.T.D. 4**  
The operator can set the fourth Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 999, 000, 000.

Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

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

- A.5 01 Column Width**  
Choose the column width to be printed. The range of this setting is 22 to 80.
- A.5 02 Lines Per Page**  
Choose the amount of lines per page. The range of this setting is 20 to 80.
- A.5 03 Pause Every Page**  
Choose whether the printer pauses at the end of a page. The choices are:  
  
  - Yes - The printer does pause.
  - No - The printer doesn't pause.
- A.5 04 Printer Type**  
Select the type of printer. The choices are: Parallel, Serial or ADP.
- A.5 05 Serial Baud Rate**  
Select which baud rate to use for serial or ADP communications (bit rate). The choices are 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.

Press the Escape button to return to the Adjustments Menu. Then, either press the Up or Down button to return to a previous Adjustments Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu either use the Up or Down buttons to return to a previous menu selection, or press the Escape button again to return to the Attract Mode.

## 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 **The Getaway** 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) by displaying the message "Adjust Switch ##", listing each problem switch by number. (The game program compensates the game play requirements affected by each disabled switch to allow 'nearly normal' play. This helps keep **The Getaway** earning, until the service technician can repair the problem, bringing the game back to its normal operation.)

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.**

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

### **xxxx 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 .**

Frequent appearance of this message requires activation of the Switch Levels Test to locate the switch causing the "WHT-xxx ROW x SHORT" message. Possible 'row short' causes are: 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 instance is NOT a switch problem; however, for most games this is a very rare possibility.

### Factory Settings Restored.

This message indicates that the CMOS RAM no longer retains any custom Pricing or Game Adjustment settings and has reverted to factory default settings. Generally, the following CPU checks will isolate the cause of the CMOS RAM memory failure. The voltage at pin 28 and pin 26 of U8 should be +5V (game turned On) and at least +4V (game turned Off). When the voltage drops below +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.

### U6 Checksum Error.

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

### Time and Date Not Set.

The real time clock is not running. If this occurs go to U.4 of the Utilities Menu and set the time and date.

### 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

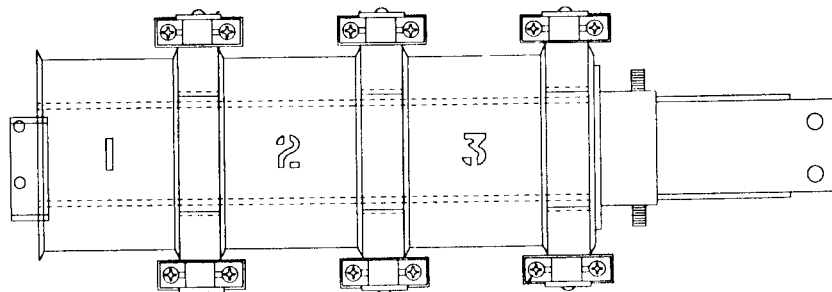
D20 blinks one time -	ROM Error U6
D20 blinks two times -	RAM Error U8
D20 blinks three times -	Custom Chip Failure U9

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

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

### Opto #1 - #2 - #3 is stuck open.

The - First, Second, Third - opto on the Supercharger is stuck open. The game software disables the corresponding magnet until the opto is fixed.





**Adjustment A.2 15 is set to On.**

This is a reminder to the operator that the adjustment "Diverter Broken" is set to On. This adjustment must be set to Off once the diverter is fixed.

**Adjustment A.2 16 is set to On.**

This is a reminder to the operator that the adjustment "Up/Down Ramp Broken" is set to On. This adjustment must be set to Off once the Up/Down Ramp is fixed.

**Ramp Error -- Will Not Lower or Will Not Raise**

The game software has detected that the ramp is not operating properly and needs attention. The ramp switch may be the problem.

**Diverter Error -- Will Not Open or Will Not Close**

The game software has detected that the diverter is not operating properly and needs attention. The Enter Ramp opto switch may be the problem.

**Up/Down Shifter, (Gear Shifter), Error**

The game software has detected that the Up/Down Shifter, (Gear Shifter), is not operating properly and needs attention. The Shift Up and/or Shift Down switches may be the problem.

## **Maintenance Information**

Regular maintenance is essential to a game's continuing contribution to the operator's earnings.

### **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, 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**

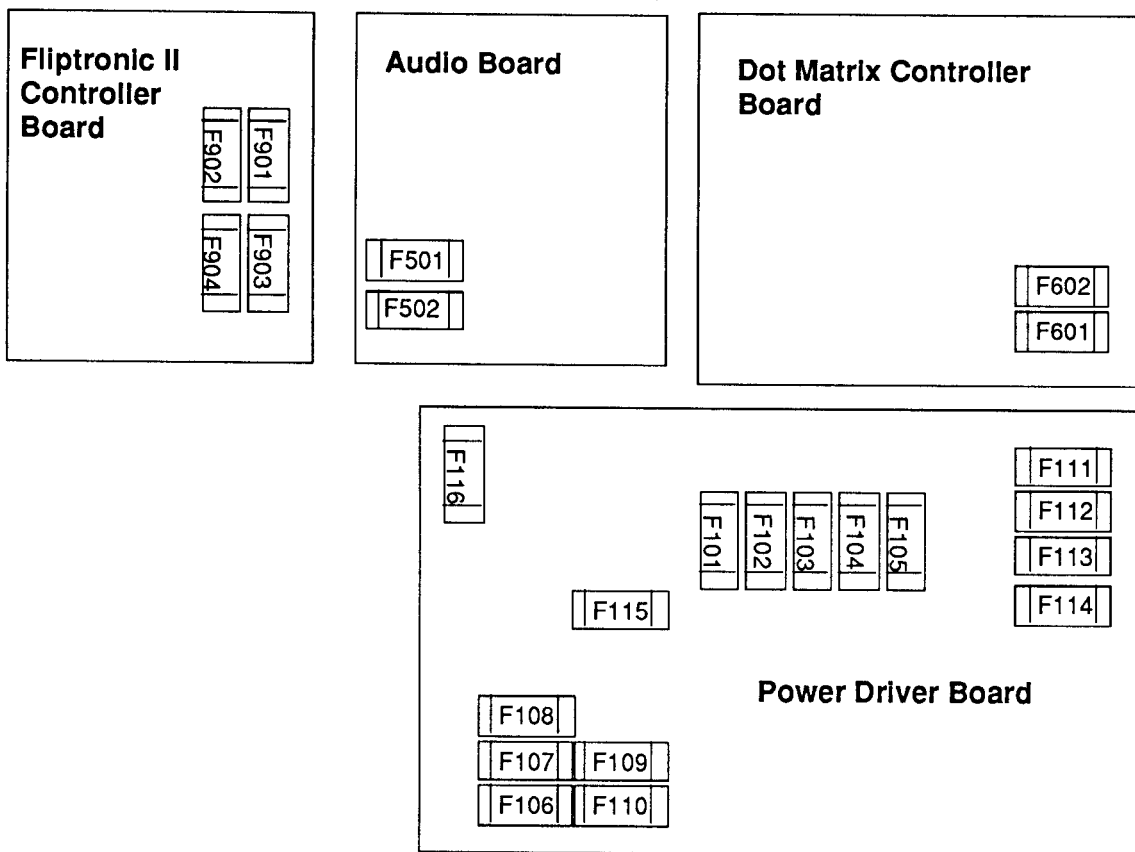
This game uses the new Fliptronic II Electronic Flipper System. The End-of-Stroke switches, now called Breakaway switches, are NORMALLY OPEN. The switch should close when the flipper is energized. All Breakaway switches and flipper button cabinet switches are gold flashed computer grade leaf switches. Only low computer current is carried thru 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. Unlike the old style of flipper, a Breakaway switch failure does not harm the flipper. The game will notify the operator of the switch being mis-adjusted in the test report, but continues to play. The Breakaway 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.

## 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, 5A, S.B.  
 F113 +5V Logic, 5A, S.B.  
 F114 +18V Lamp Matrix, 8A, N.B.  
 F115 +12V Switch Matrix, 3/4A, S.B.  
 F116 +12V Secondary, 3A, S.B.

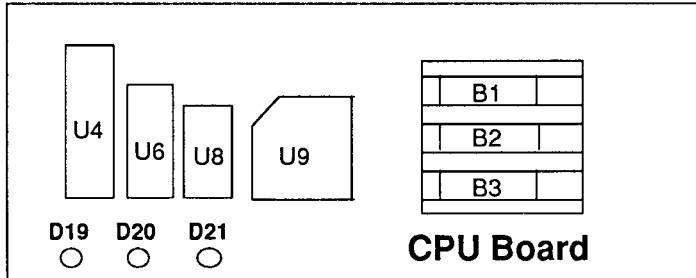
### Fliptronic II Controller Board

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

### Line Filter

Domestic Game 8A, N.B.  
 Foreign Game 4A, S.B.

## LED List



**CPU Board**

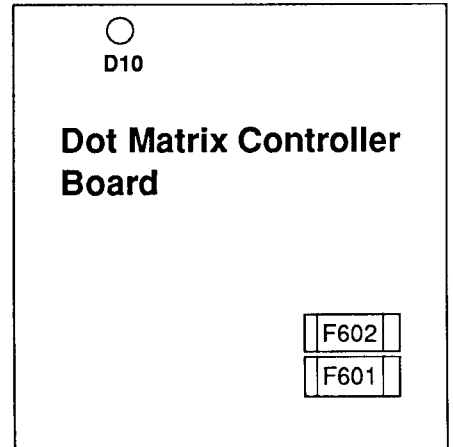
D19 , Blanking

D20, Diagnostic

D21, +5vdc

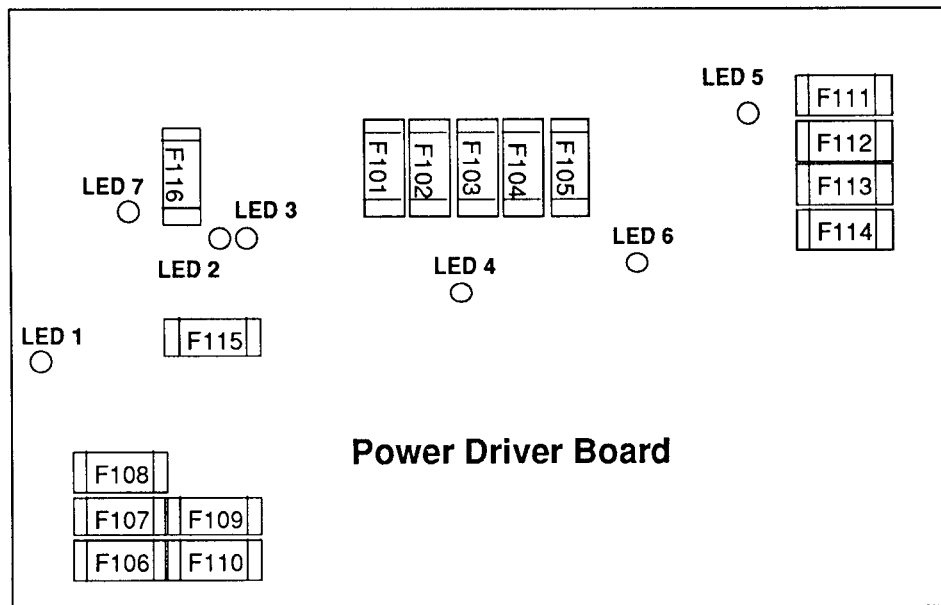
At game Turn-On = D19 & D21 On, D20 Off

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



**Dot Matrix Controller Board**

D10, +5V Circuit, Normally On



**Power Driver Board**

LED 1, +12vdc Switch Circuit, Normally On

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

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

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

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

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

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



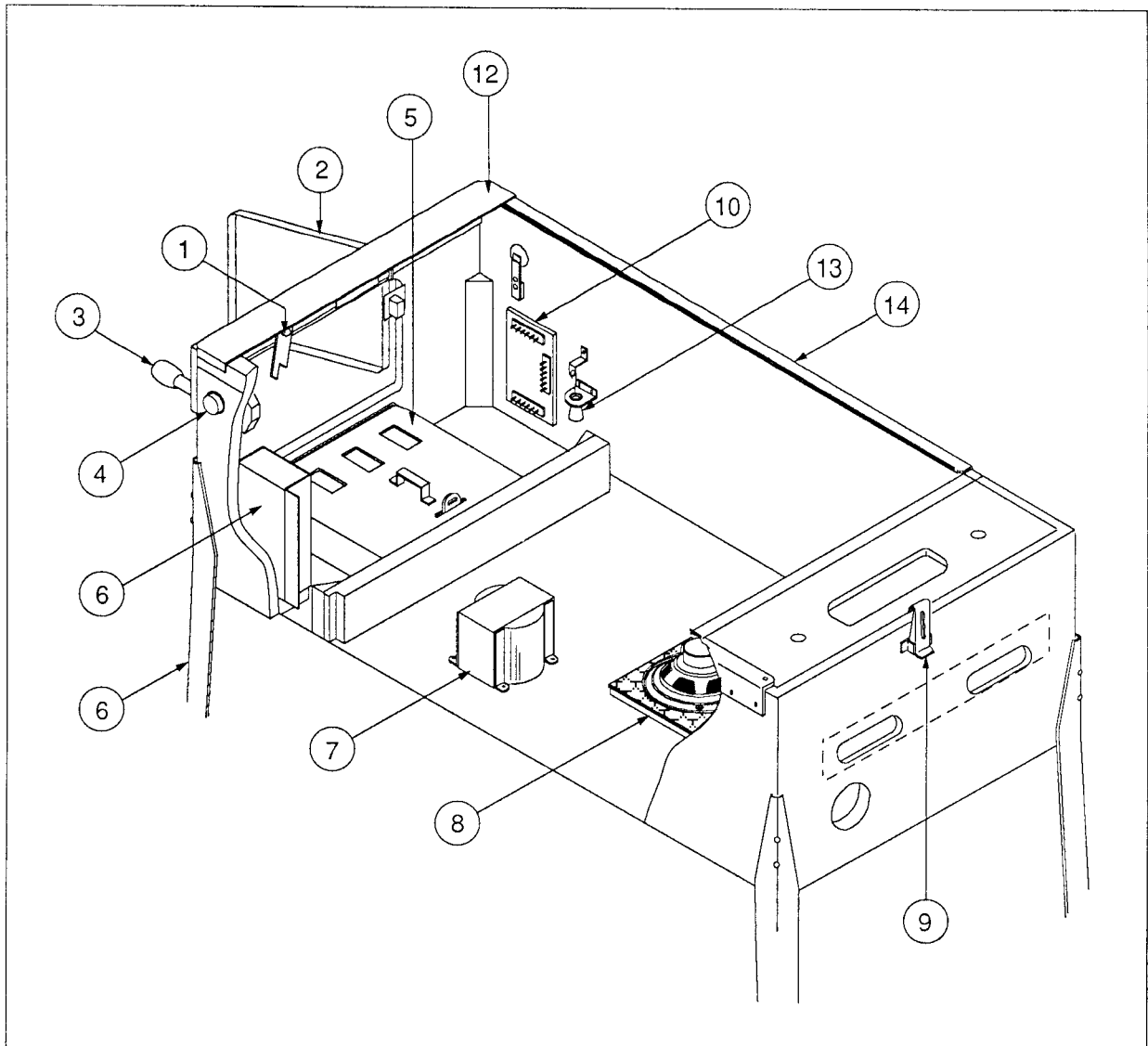
# Section 2

## *Game Parts Information*

### **Parts Lists & Diagrams**

Cabinet • Backbox • WPC Audio Board • WPC System CPU Board  
WPC Power Driver Board • Dot Matrix Controller Board  
Fliptronic Board • Major Mechanism Assemblies • Playfield Parts  
Lower Playfield Parts • Lamps • Switches • Solenoids/Flashers  
Rubber Rings • Ramps

## Cabinet Parts



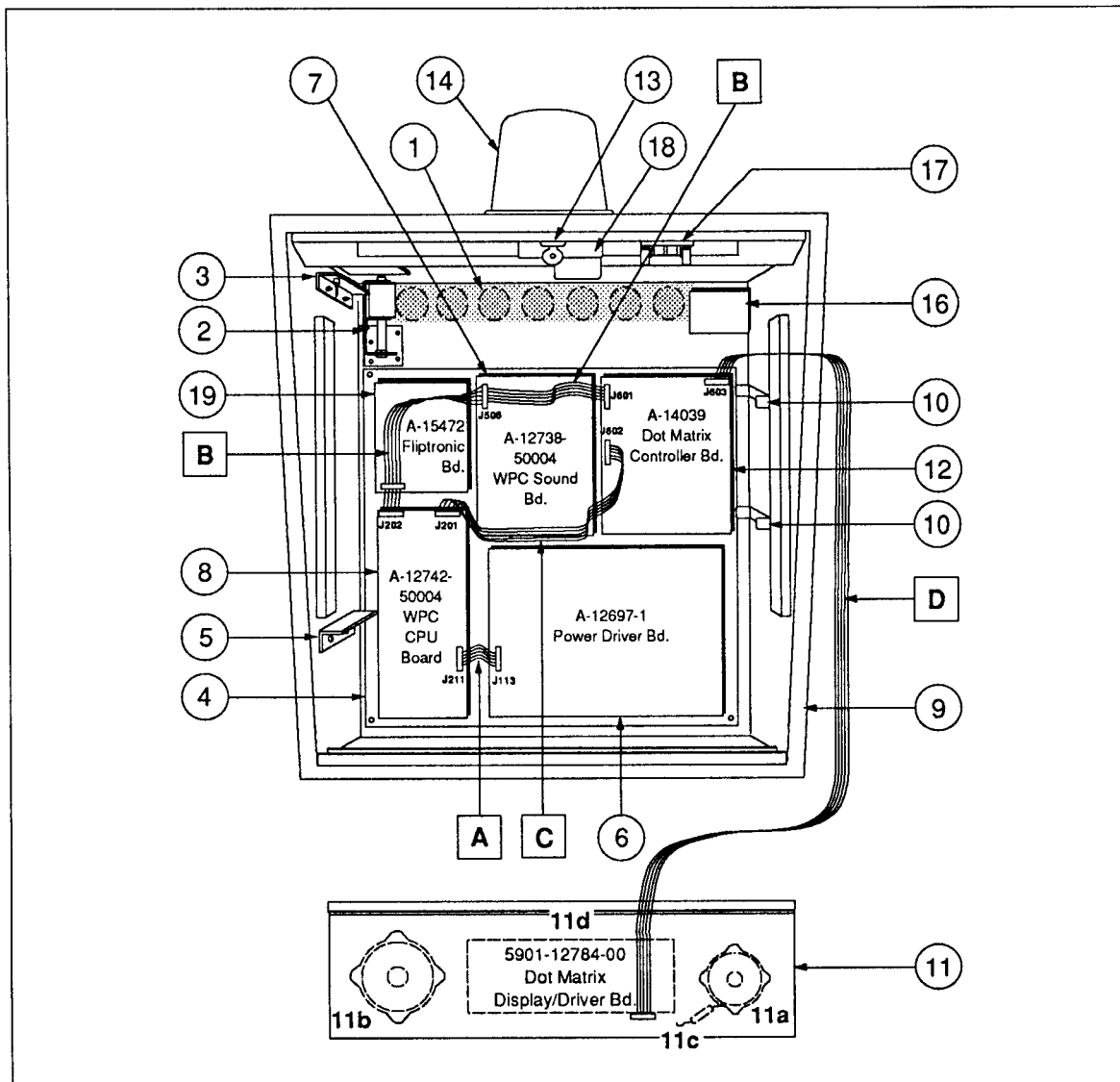
### Cabinet Parts

Item	Part Number	Description
1.	D-9174-2	Lever Guide Assembly
2.	A-14148-1	Coin Door - 2 Slot
3.	A-15419	Gear Shift Assembly
4.	B-12273-4	Flipper Button-Red (2 Used)
5.	A-15671-1	Cashbox Assembly
6.	A-14744-USA	Line Filter Assembly
7.	5610-12835-00	Transformer, 115/230v
8.	5555-12929-00	Speaker, 4Ω, 6", 25w
9.	20-9347	Toggle Latch
10.	A-14689	WPC Coin Door Interface Bd.
11.	C-10843	Metal Leg
12.	D-12615	Front Molding Assy.
13.	20-6502-A	Plum Bob
14.	A-12359-3	Side Molding Assembly

### Miscellaneous Parts

Part Number	Description
08-7028-T	Tempered Playfield Glass: 21" x 43"
A-8552-50004	Backglass Assembly
08-7456	Backbox Glass: 27" X 18-7/8"
31-1357-50004	Screened Backglass
20-6500	Steel Ball, 1-1/16" (3)

# Backbox Assembly



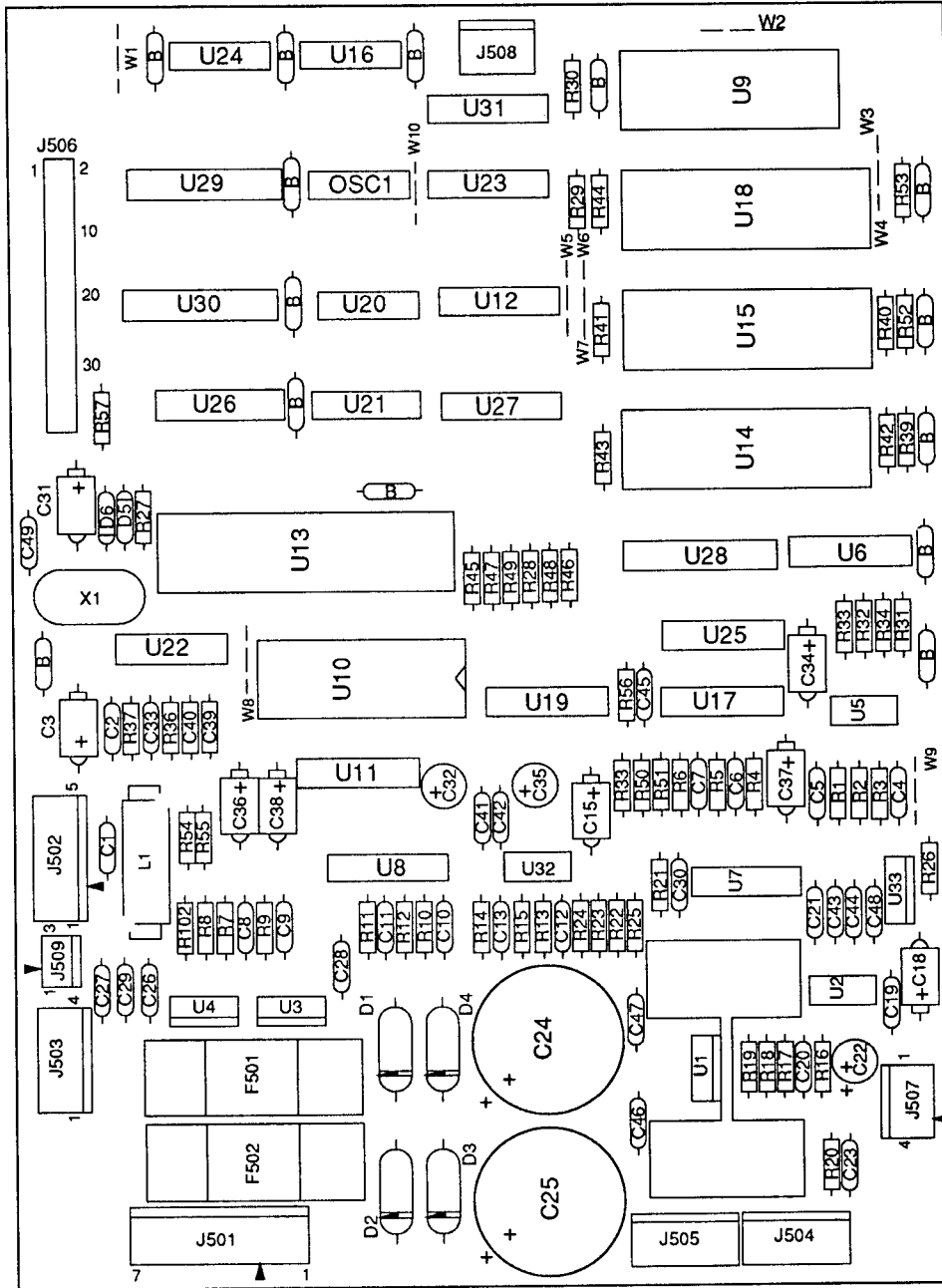
Item	Part Number	Description	Item	Part Number	Description
1.	01-6645	Venting Screen	13.	A-13379	Lock & Plate Assembly
2.	B-10686-1	Knocker & Bracket Assy.	a)	20-9637	Lock & Cam Kit
3.	A-12497	Upper Insert Bd Hinge Assy.	14.	03-7981	Beacon Lens Cover
4.	A-14092-3	Mounting Plate Assembly	15.	50004-IN	Insert Board
5.	A-12498	Lower Insert Bd Hinge Assy.	a)	01-6571	Hinge Mounting Bracket
6.	A-12697-1	Power Driver Assembly	b)	01-6655	Insert Latch
7.	A-12738-50004	WPC Sound Board	16.	A-13088-2	Triac Driver Assembly
8.	A-12742-50004	WPC CPU Board	17.	A-15309	2-10W Resistor PCB Assy.
9.	A-15262-50004	Backbox Assembly	18.	A-15311	Revolving Flash Lamp Assy.
10.	01-9047	Insert Stop Bracket	19.	A-15472	Fliptronic Board
11.	A-15207	Speaker / Display Assy.	<b>RIBBON CABLES:</b>		
a)	5555-12924-00	Speaker, 4Ω, 15w	A.	5795-12653-03	Ribbon Cable, 3"
b)	5555-12856-00	Speaker, 5-1/4", 4Ω, 25w	B.	5795-13018-00	Ribbon Cable, 22"
c)	5045-12914-00	Cap., 10μfd., 50v, (±20%)	C.	5795-10938-14	Ribbon Cable, 14"
d)	5901-12784-00	Dot Matrix Display/Driver Bd.	D.	5795-12838-30	Ribbon Cable, 30"
e)	31-1420-50004-1	Screened Speaker Panel			
12.	A-14039	Dot Matrix Contoller Board			



Part No.	Designator	Description	Part No.	Designator	Description
01-9980		Shield: Wire Protector	5070-08919-00	D5, D6	Diode, 1N4148
4004-01005-06	U1	Mach. Screw, 4-40 x 3/8	5070-09045-00	D1-D4	Diode MR501, 3.0A
4104-01012-04	U1	Sh. Mach. Screw, #4 x 1/4	5250-10495-00	U3	Reg. 7912 1.0A -12v.
4404-01119-00	U1	Nut, 4-40 SNUT	5281-09215-00	U22	IC, 74LS04 Hex INV
5010-08772-00	R21	Resistor, 15K $\Omega$ , 1/4w, 5%	5281-09246-00	U12	IC, 74LS139 2-4 Dec.
5010-12065-00	R22, R25	Resistor, 120K $\Omega$ , 1/4w, 5%	5281-09486-00	U28-U30	IC, 74LS374 8 Dual Flipflop
5010-08991-00	R51	Resistor, 4.7K $\Omega$ , 1/4w, 5%	5281-09487-00	U6, U23-U25	IC, 74LS74 Dual Flipflop
5010-10987-00	R23, R24	Resistor, 56K $\Omega$ , 1/4w, 5%	5281-09500-00	U31	IC, 74LS32
5010-09034-00	R13, R14, R29-R31, R33, R34, R50, R45-R49	Resistor, 10K $\Omega$ , 1/4w, 5%	5281-09745-00	U26, U27	IC, 74LS138 DMLTPX
5010-09035-00	R4	Resistor, 47K $\Omega$ , 1/4w, 5%	5281-09850-00	U20	IC, 74LS11 Tripple AND
5010-09036-00	R35	Resistor, 100 $\Omega$ , 1/4w, 5%	5281-10577-00	U16	IC, 74LS125 Q/B Bfr
5010-09134-00	R1, R2, R6, R8, R9, R11, R12	Resistor, 150K $\Omega$ , 1/4w, 5%	5370-11086-00	U10	IC, YM2151 Sound
5010-09162-00	R26, R102	Resistor, 100K $\Omega$ , 1/4w, 5%	5371-11087-00	U11	IC, YMU3012 D/A
5010-08774-00	R3, R5, R17, R19	Resistor, 22K, 1/4w, 5%	5400-10320-00	U13	IC, MPU 68B09E
5010-09269-00	R15	Resistor, 12K $\Omega$ , 1/4w, 5%	5284-12651-00	U21	IC 4584
5010-09358-00	R18, R32	Resistor, 1K $\Omega$ , 1/4w, 5%	5340-12278-00	U9	S/Ram 2064
5010-09416-00	R28, R36, R37, R39-R44 R52, R53, R57	Resistor, 470 $\Omega$ , 1/4w, 5%	5370-09691-00	U17	IC, 55536 CVSD
5010-09534-00	W3, W5, W7-W10	Resistor, 0 $\Omega$	5370-12260-00	U2	IC, 3340 Elec Atten
5010-10171-00	R38, R56	Resistor, 56 $\Omega$ , 1/4w, 5%	5370-12728-00	U1	IC, Audio Amp LM1875
5010-10258-00	R16	Resistor, 1M, 1/4w, 5%	5370-12730-00	U7, U8	IC, Op Amp TL084
5010-10650-00	R7, R10	Resistor, 62K, 1/4w, 5%	5370-12742-00	U32	IC, Op Amp TL082
5010-10989-00	R54, R55, R27	Resistor, 470K, 1/4w, 5%	5371-12727-00	U19	Dac AD7524
5010-12752-00	R20	Resistor, 1 $\Omega$ , 1/4w, 5%	5432-12726-00	U5	EE Prom Pot X9503
5040-08986-00	C3	Capacitor, 100M, 10v ( $\pm$ 20%)	5460-12423-00	U4	IC, LM7812
5040-09332-00	C15, C18, C34, C36, C38	Capacitor, 47 $\mu$ fd., 25v, Axial	5460-12743-00	U33	LM7809 TO-220
5040-11036-00	C32, C35	Capacitor, 47 $\mu$ fd., 16v, Rad	5520-09020-00	X1	Crystal, 3.58 MHz.
5040-12729-00	C24, C25	Capacitor, 4700 $\mu$ fd., 35v.	5521-10931-00	OSC1	Oscillator, 8.0 MHz.
5040-12750-00	C22	Capacitor, 22 $\mu$ fd., 35v, Rad.	5551-09822-00	L1	Ind, 4.7UH 3.0A.
5041-09031-00	C26-C29, C37, C46-C48	Capacitor, 1 $\mu$ fd. TANT	5700-08985-00	U13	Socket, IC 40-pin, .6"
5041-09243-00	C20, C21	Capacitor, 10 $\mu$ fd. TANT	5700-09004-00	U10	Socket, IC 24-pin, .6"
5043-08980-00	C41-C44, B(15)	Capacitor, .01M, 50v, (+80, -20)	5700-09006-00	U11	Socket, IC 16-pin, .3"
5043-08996-00	C1, C2	Capacitor, .1 $\mu$ fd., 50v, 10%	A-5343-50004-4	U18	IC, Audio ROM
5048-11027-00	C8, C10	Capacitor, 33pfd., 50v, 10%	*	U15	
5048-11028-00	C45	Capacitor, 22pfd., 50V, Axial	*	U14	
5048-11029-00	C33, C49	Capacitor, 100pfd., 50v	5700-12088-00	U1	Socket, IC 32-pin (U18)
5048-11030-00	C12	Capacitor, 470pfd., 50v	5705-12755-00		Heatsink 5299B-220
5048-11031-00	C19, C31	Capacitor, .001 $\mu$ fd., 50v, 10%	5731-10356-00	F501, F502	Fuse, 3A, S-B, 250v
5048-11065-00	C13	Capacitor, .0022 $\mu$ fd., 50v, 10%, Ax.	5733-12060-01		Fuse Holder (F501, F502)
5048-11072-00	C39, C40	Capacitor, .0033 $\mu$ fd.	5791-10862-04	J504, J505	Connector, 4-pin Header Sq. .156
5048-12036-00	C23	Capacitor, .22 $\mu$ fd., 10v, Ceramic	5791-10862-05	J502	Connector, 5-pin Header Sq. .156
5048-12745-00	C4, C6	Capacitor, 1800pfd., 50V, 10%	5791-10862-07	J501	Connector, 7-pin Header Sq. .156
5048-12746-00	C5, C7	Capacitor, 330pfd., 50V	5791-12462-03	J509	Connector, 3-pin Header Sq. .100
5048-12748-00	C9, C11, C30	Capacitor, 220pfd., 50V	5791-12462-04	J508	Connector, 4-pin Header Sq. .100
			5791-12516-00	J506	34 Hen 2x17 STR

Note: \* = Not used.

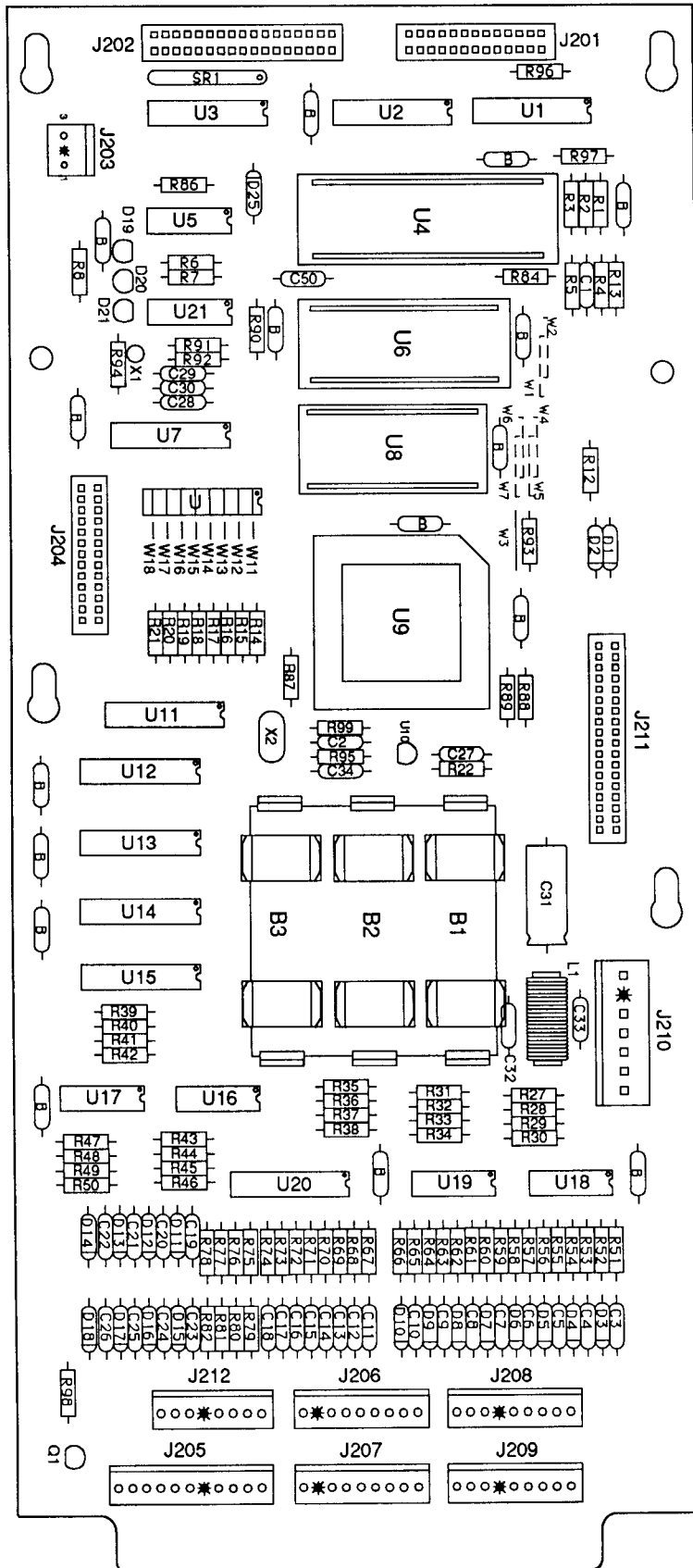
# A-12738-50004 WPC Audio Board



# A-12742-50004      WPC CPU Board

Part Number	Designator	Description
5010-09034-00	R14-R22, R27-R42, R86, R90, R94, R98	Resistor, 10K $\Omega$ , 1/4w, 5%
5010-09085-00	R1, R2, R4, R93, R96, R97	Resistor, 1.5K $\Omega$ , 1/4w, 5%
5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Resistor, 1.2K $\Omega$ , 1/4w, 5%
5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84	Resistor, 1K $\Omega$ , 1/4w, 5%
5010-09416-00	R5-R8, R12, R13, R87-R89	Resistor, 470 $\Omega$ , 1/4w, 5%
5010-09534-00	W1, W4, W7, W13 - W18	Resistor, 0 $\Omega$
5010-10258-00	R95, R99	Resistor, .01 $\mu$ fd $\Omega$ , 1/4w, 5%
5010-10989-00	R92	Resistor, 470K $\Omega$ , 1/4w, 5%
5010-12104-00	R91	Resistor, 22 $\mu$ fd, 1/4w, 5%
5019-09362-00	SIP 1	SIP, 9R, 10-pin, 4.7K $\Omega$ , 5%
5040-08986-00	C31	Capacitor, 100 $\mu$ fd, 10v ( $\pm$ 20%)
5043-08980-00	B	Capacitor, .01 $\mu$ fd, 50v, (+80, -20%)
5043-09030-00	C27	Capacitor, 0.047 $\mu$ fd, 50v ( $\pm$ 20%)
5043-09065-00	C3 - C26	Capacitor, 470pfd, 50v ( $\pm$ 20%)
5043-09491-00	C2, C29, C30, C34	Capacitor, 22pfd, 1KV, ( $\pm$ 10%)
5043-09492-00	C28	Capacitor, 100pfd, 50v, ( $\pm$ 10%)
5043-09845-00	C32, C33	Capacitor, 1KP, 50v, ( $\pm$ 20%)
5070-08919-00	D2 - D18	Diode, 1N4148, 150MA
5070-09266-00	D1, D25	Diode, 1N5817, 1.0A.
5160-10269-00	Q1	Transistor, 2N3904, NPN
5162-12422-00	U20	IC, ULN, 2803A
5281-09308-00	U3	IC, 74LS245, Octal Bus Trncv
5281-09486-00	U14	IC, 74LS374, 8D F/F
5281-09851-00	U5	IC, 74LS14, SMT/TRG
5281-09867-00	U1, U2, U7	IC, Octal Buffer, 74LS244
5281-10182-00	U11, U12, U13, U15	IC, 74LS240 Driver
5284-12651-00	U21	IC, 4584
5340-12278-00	U8	S/RAM 2064
5370-12272-00	U16 - U19	IC, LM339, Quad. Comp
5370-12687-00	U10	MC, 34064 Reset Chip
5520-10438-00	X2	Crystal, 8.0MHz.
5520-12084-00	X1	Crystal 32.768 KHz
5551-09822-00	L1	ILN, 4.7 UH 3A
5671-09019-00	D19 - D21	DSPL LED RED
5700-08985-00	U4	Socket, IC 40P, .6"
5700-12088-00	U6	Socket, IC 32P, .6"
5700-12424-00	U9	Socket, 84 Pin PLCC
5791-10850-00	J201, J204	Connector, 26-pin Header Str Sq.
5791-10862-07	J210	Connector, 7-pin Header Str Sq.
5791-12461-08	J212	Connector, 8-pin Header Str Sq.
5791-12461-09	J206 - J209	Connector, 9-pin Header Sq. pin
5791-12461-12	J205	Connector, 12-pin Header Sq. pin
5791-12516-00	J202, J211	34 Hen 2x17 STR
5881-09021-00	B1 - B3	Battery Holder "AA"
5048-11033-00	C50	Capacitor, 0.022 $\mu$ f, 10v
A-5343-50004-1	U6	Game PROM Assembly
5410-12426-00	U9	WPC-89 ASIC
5400-10320-00	U4	IC MPU 68B09E
5880-09022-00	B1 - B3	Battery, Alkaline, 1.5v ( "AA")

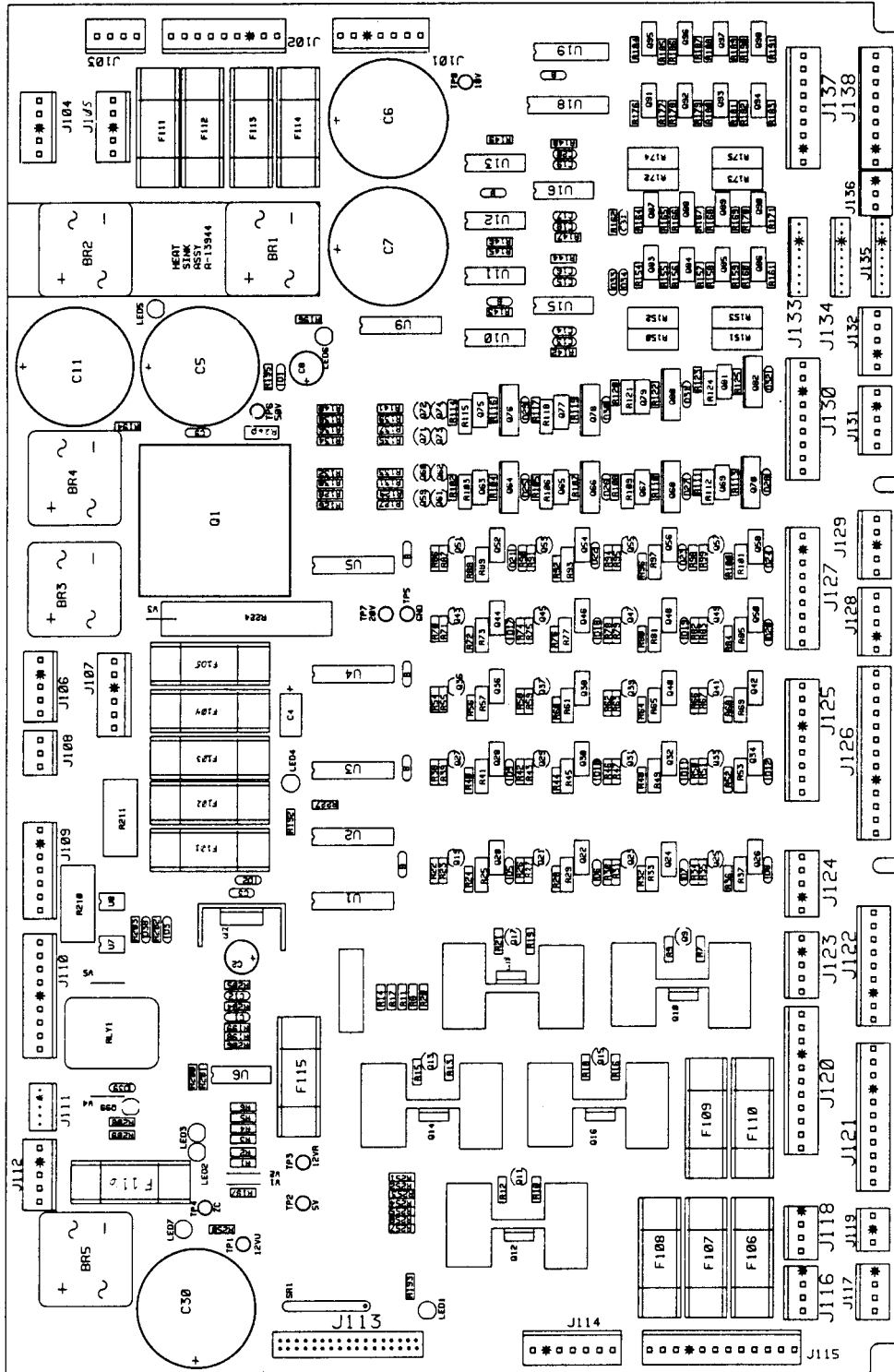
# A-12742-50004 WPC CPU Board



# A-12697-1 WPC Power Driver Assembly

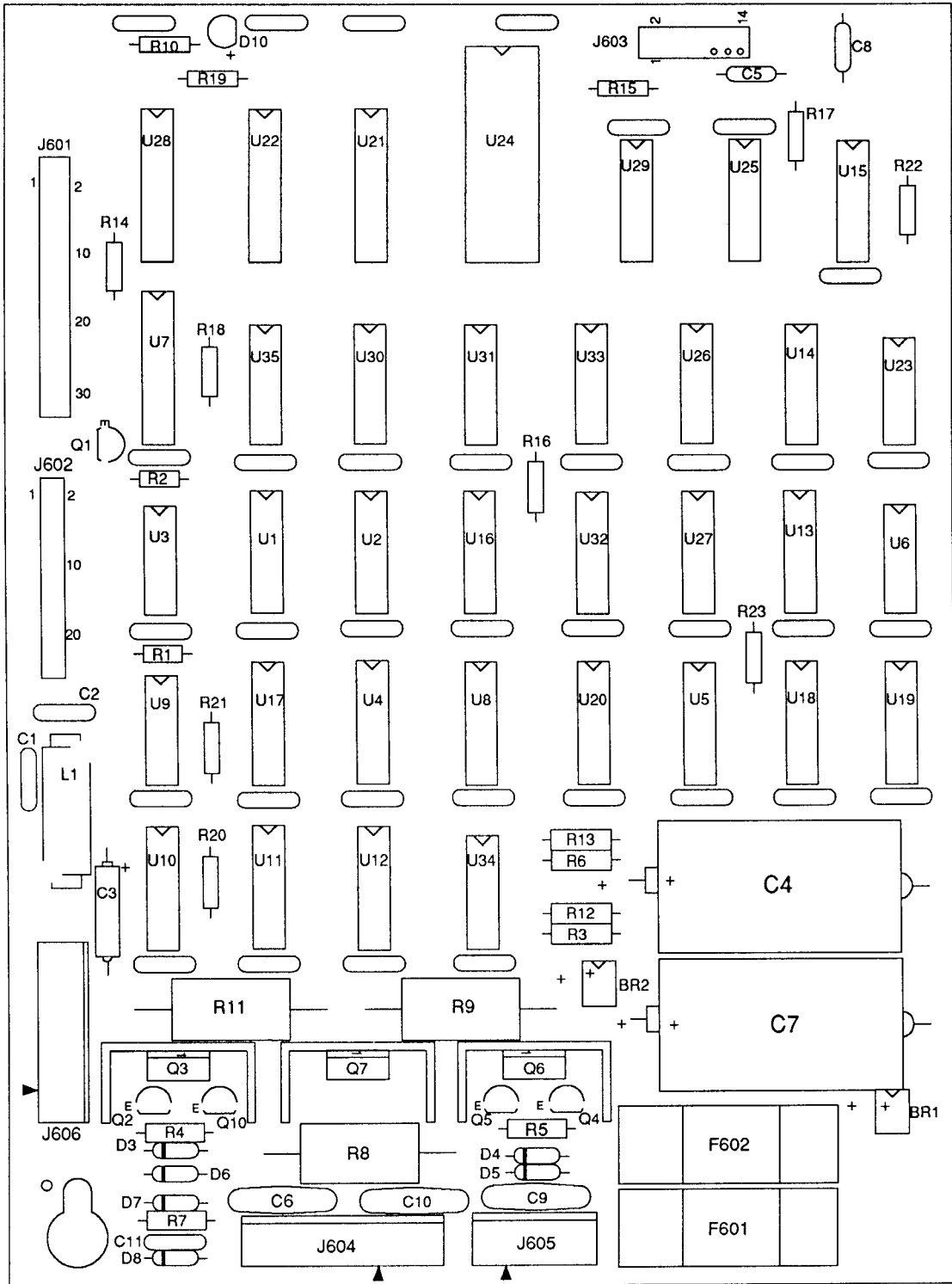
Item	Part Number	Ckt Designator	Description	Item	Part Number	Ckt Designator	Description
1	Not Used			32	5043-08996-00	C13-C20, C31	Capacitor, .1µfd, 50v (±20%)
2	4006-01005-06	Q1, Q2	Mach. Screw, 6-32 x 3/8	33	5043-09845-00	C1, C12	Capacitor, 1.000µfd, 50v (±20%)
3	4406-01128-00	Q1, Q2	Nut, 6-32 KEPS	34	5048-10994-00	C3	Capacitor, .33µfd, 50v (±20%) Ax.
4	4004-01005-06	Q10, Q12, Q14, Q16, Q18	Mach. Screw, 4-40 x 3/8	35	5070-08919-00	D33, D34	Diode, 1N4148, 150MA.
5	4404-01119-00	Q10, Q12, Q14, Q16, Q18	Nut, 4-40 SNUT	36	5070-09054-00	D1-D3, D5-D12, D17-D32, D38, D39	Diode, 1N4004, 1.0A.
6	5010-08981-00	R260	Resistor, 10KΩ, 1/2w, 5%	37	5100-09690-00	BR1-BR5	Bridge Rectifier, 35A., 200v
7	5010-08991-00	R9, R12, R15, R18, R21, R23, R27, R31, R35, R39, R43, R47, R51, R55, R59, R63, R67, R71, R75, R79, R83, R87, R91, R95, R99, R126, R128, R130, R132, R134, R136, R138, R140, R209, R227	Resistor, 4.7KΩ, 14w, 5%	38	5131-12725-00	Q10, Q12, Q14, Q16, Q18	Triac, BT138E
8	5010-08992-00	R8, R11, R14, R17, R20, R177, R179, R181, R183, R185, R187, R189, R191	Resistor, 560Ω, 1/4w, 5%	39	5162-12422-00	U19	IC, ULN 2803
9	5010-08993-00	R25, R29, R33, R37, R41, R45, R49, R53, R57, R61, R65, R69, R73, R77, R81, R85, R89, R93, R97, R101, R103, R106, R109, R112, R115, R118, R121, R124	Resistor, 68Ω, 1/4w, 5%	40	5162-12635-00	Q20, Q22, Q24, Q26, Q28, Q30, Q32, Q34, Q36, Q38, Q40, Q42, Q44, Q46, Q48, Q50, Q52, Q54, Q56, Q58, Q63, Q65, Q67, Q69, Q75, Q77, Q79, Q81, Q83 - Q90	Transistor, TIP 102
10	5010-08997-00	R24, R28, R32, R36, R40, R44, R48, R52, R56, R60, R64, R68, R72, R76, R80, R84, R88, R92, R96, R100, R102, R105, R108, R111, R114, R117, R120, R123, R195	Resistor, 2.7KΩ, 1/4w, 5%	41	5194-09055-00	Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74, Q99	Transistor, 2N5401 PNP
11	5010-08998-00	R155, R157, R159, R161, R165, R167, R169, R171	Resistor, 2.2KΩ, 1/4w, 5%	42	5191-12179-00	Q64, Q66, Q68, Q70, Q76 Q78, Q80, Q82	Transistor, TIP36C PNP
12	5010-09034-00	R3, R4, R6, R142-R149, R197-R198	Resistor, 10KΩ, 1/4w, 5%	43	5192-12428-00	Q91-Q98	Resistor, TIP 107
13	5010-09085-00	R194, R196, R251, R253-R257	Resistor, 1.5KΩ, 1/4w, 5%	44	5250-12634-00	Q1	Reg LM 323 5v
14	5010-09086-00	R252	Resistor, 6.8KΩ, 1/4w, 5%	45	5281-09486-00	U1-U5, U18	IC, 74LS374 8 Dual D Flipflop
15	5010-09224-00	R1, R2, R192, R201- R205, R208	Resistor, 270Ω, 1/4w, 5%	46	5281-09487-00	U10-U13	IC, 74LS74 Dual D Flipflop
16	5010-09314-00	R176, R178, R180, R182, R184, R186, R188, R190	Resistor, 1.2KΩ, 1/4w, 5%	47	5281-10182-00	U9	IC, 74LS240, L/Drv
17	5010-09324-00	R206	Resistor, 27KΩ, 1/4w, 5%	48	5370-12272-00	U6, U15, U16	IC, LM339 Quad. Comp
18	5010-09358-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200, R250	Resistor, 1KΩ, 1/4w, 5%	49	5460-12423-00	Q2	IC, LM 7812
19	5010-09361-00	R104, R107, R110, R113, R116, R119, R122, R125	Resistor, 220Ω, 1/4w, 5%	50	5490-10892-00	U7, U8	Opto Isolator, 4N25
20	5010-09416-00	R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 470Ω, 1/4w, 5%	51	5580-08994-01	RLY 1	Relay 4PDT 6VDC5A VS
21	5010-09534-00	W1, W2	Resistor, 0Ω	52	5671-09019-00	LED1 - LED7	Display LED Red
22	5010-11079-00	R7, R10, R13, R16, R19	Resistor, 51Ω, 1/4w, 5%	53	5701-09652-00	Q1	Thermal Pad TO-3
23	5010-12427-00	R150-R153, R172-R175	Resistor, .22Ω, 1w, 5%	54	5705-09199-00	Q2	Heatsink, #6030B
24	5012-12632-00	R224	Resistor, .12Ω, 10w, 5%	55	Not Used		
25	5012-12238-00	R210, R211	Resistor, 3.3KΩ, 5w, 10%	56	5705-12637-00	Q1	Heatsink 5054
26	5019-10143-00	SR1	SIP, 9R, 10 pin, 470Ω, 5%	57	5705-12638-00	Q10, Q12, Q14, Q16, Q18	Heatsink 5298B
27	5040-08986-00	C4	Capacitor, 100µfd, 10v (±20%)	58	5733-12060-01		Fuse Holder, F101-F116
28	5040-09421-00	C2	Capacitor, 100µfd, 25v (+50, -10%)	59	Not Used		
29	5040-09537-00	C8	Capacitor, 100µfd, 100v (±20%)	60	5791-10862-03	J108, J119, J136	Connector, 3-pin Header STR Sq.
30	5040-12313-00	C5, C6, C7, C11, C30	Capacitor, 15,000µfd, 25v (±20%)	61	5791-10862-04	J103, J116-J118	Connector, 4-pin Header STR Sq.
31	5043-08980-00	B-BYPASS	Capacitor, .01µfd, 50v (+80, -20%)	62	5791-10862-05	J112, J104-J106, J123, J124, J128, J129, J131, J132	Connector, 5-pin Header STR Sq.
				63	5791-10862-06	J107	Connector, 6-pin Header STR Sq.
				64	5791-10862-07	J101, J109, J114	Connector, 7-pin Header STR Sq.
				65	5791-10862-09	J102, J110, J122, J125, J127, J130, J137, J138	Connector, 9-pin Header STR Sq.
				66	5791-10862-11	J120, J121	Connector, 11-pin Header STR Sq.
				67	5791-10862-12	J115	Connector, 12-pin Header STR Sq.
				68	5791-10862-13	J126	Connector, 13-pin Header STR Sq.
				69	5791-12461-05	J111	Connector, 5-pin Header STR Sq.
				70	5791-12461-09	J133-J135	Connector, 9-pin Header STR Sq.
				71	5791-12516-00	J113	34 HEN 2x17 STR
				72	5824-09248-00	TP1-TP8	Test Point #1502-1
				73	5041-09163-00	C9	Capacitor, 2.2µfd TANT
				74-100	Not Used		
				101	Not Used		
				102	5730-09071-00	F114	Fuse, BA, 32v
				103	Not Used		
				104	Not Used		
				105	5731-09651-00	F106-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-12697-1 WPC Power Driver Assembly



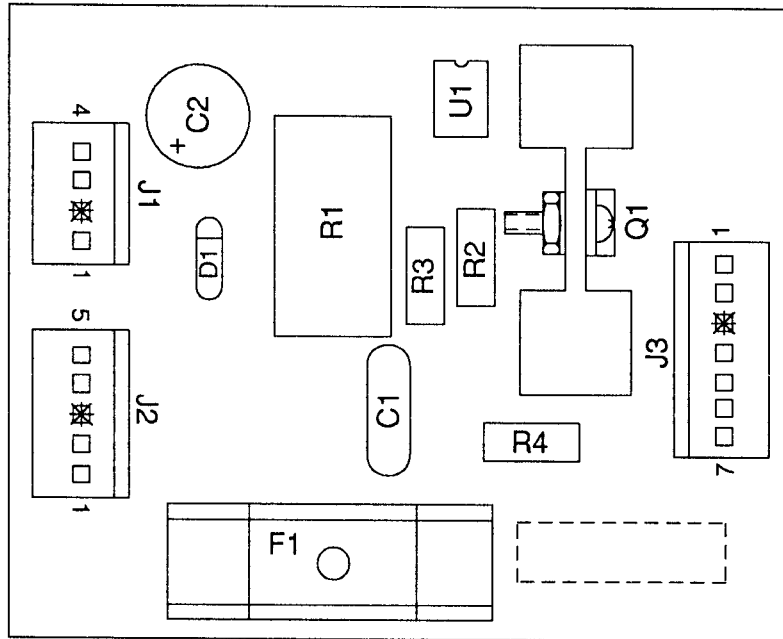
# A-14039      Dot Matrix Controller Assembly

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



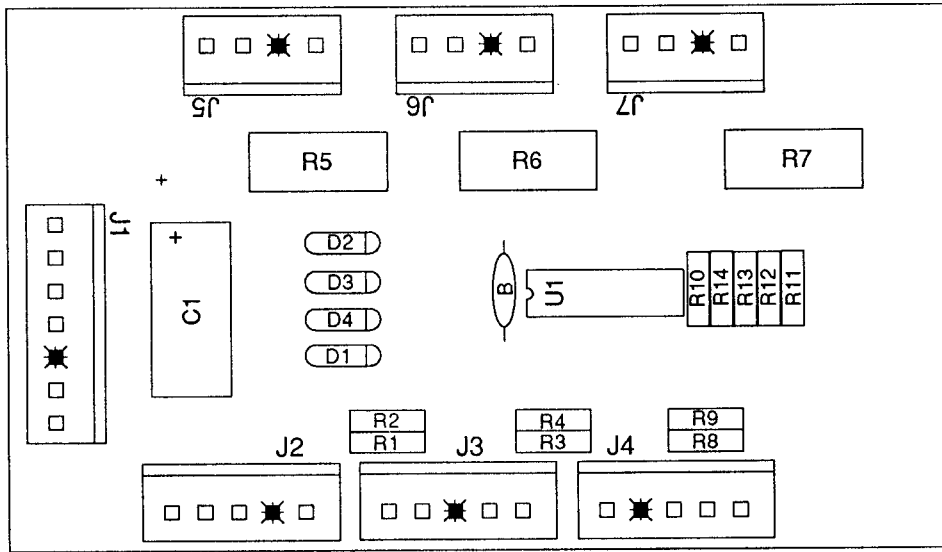


## A-13088-2 Triac Driver Assembly



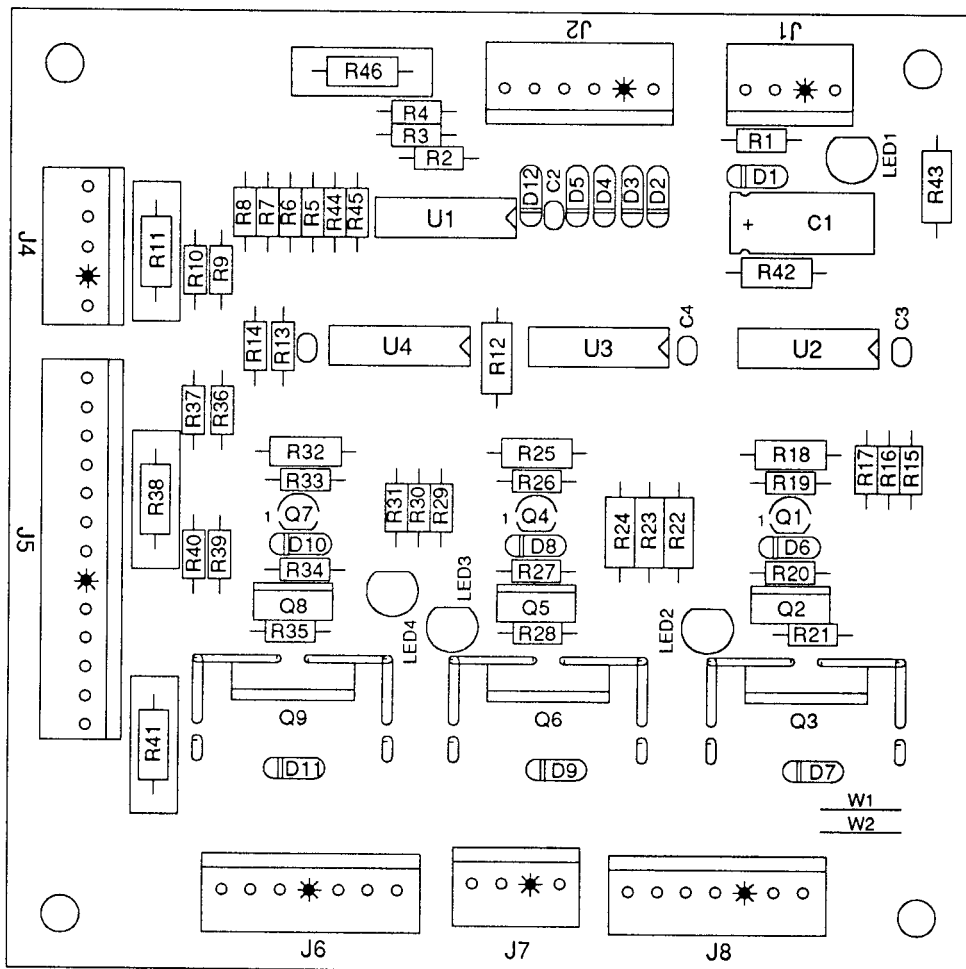
Part Number	Designator	Description
5791-10862-04	J1	Connector, 4-pin Hdr, Sq Pin
5791-10862-05	J2	Connector, 5-pin Hdr, Sq Pin
5791-10862-07	J3	Connector, 7-pin Hdr, Sq Pin
5733-12060-01	-	Fuse Holder (F1)
5731-09651-00	F1	Fuse, 5A, S-B, 250v
5131-12543-00	Q1	Triac ISL, 400V, 10A.
5705-12464-00	-	Heatsink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

# A-13901-1 Opto Ramp Switch Assembly



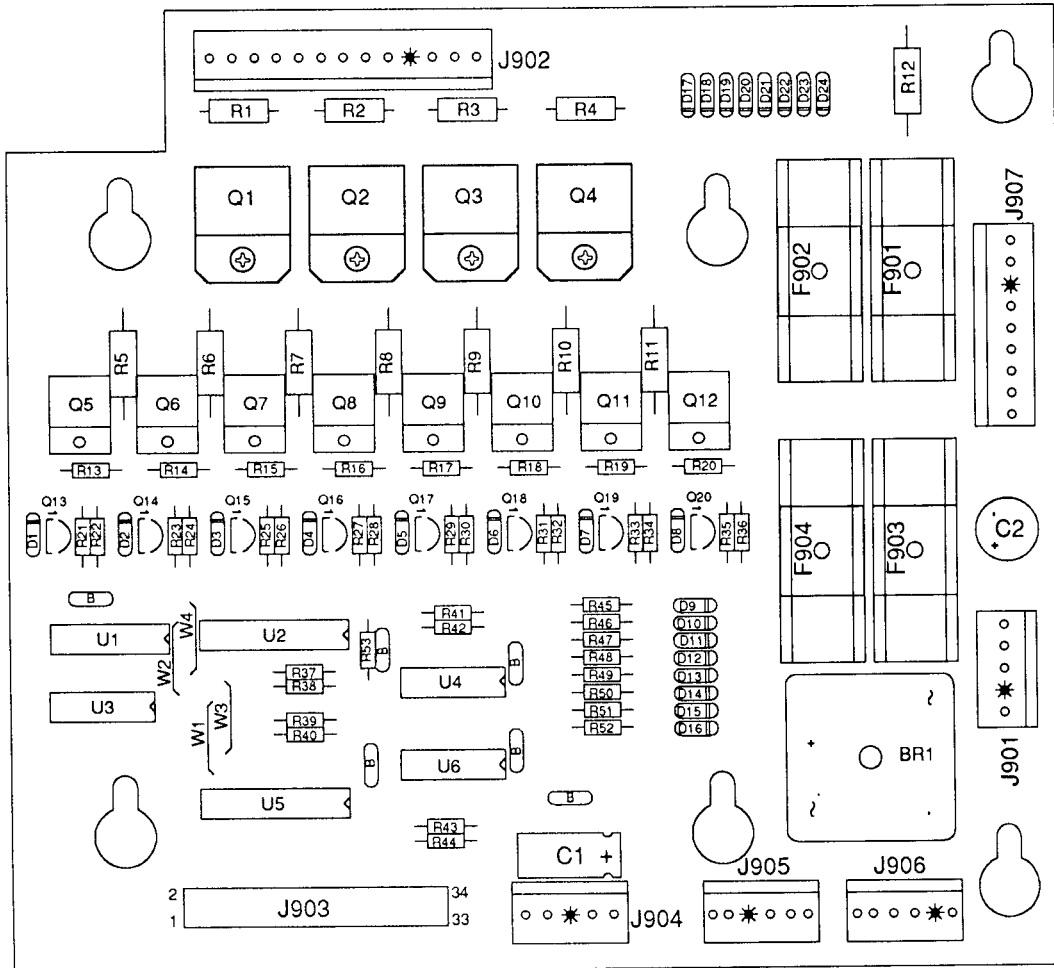
Part Number	Designator	Description
5010-08774-00	R10, R13	Resistor, 22ΩK, 1/4w, 5%
5010-09034-00	R14	Resistor, 10KΩ, 1/4w, 5%
5010-09162-00	R11, R12	Resistor, 100KΩ, 1/4w, 5%
5010-09999-00	R1 - R4, R8, R9	Resistor, 2KΩ, 1/4w, 5%
5010-12733-00	R5 - R7	Resistor, 220Ω, 1w, 5%
5040-12298-00	C1	Capacitor, 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	Connector, 5-pin Header Sq.
5791-12273-07	J1	Connector, 7-pin Header Sq.

# A-15189 Ball Accelerator PCB Assembly



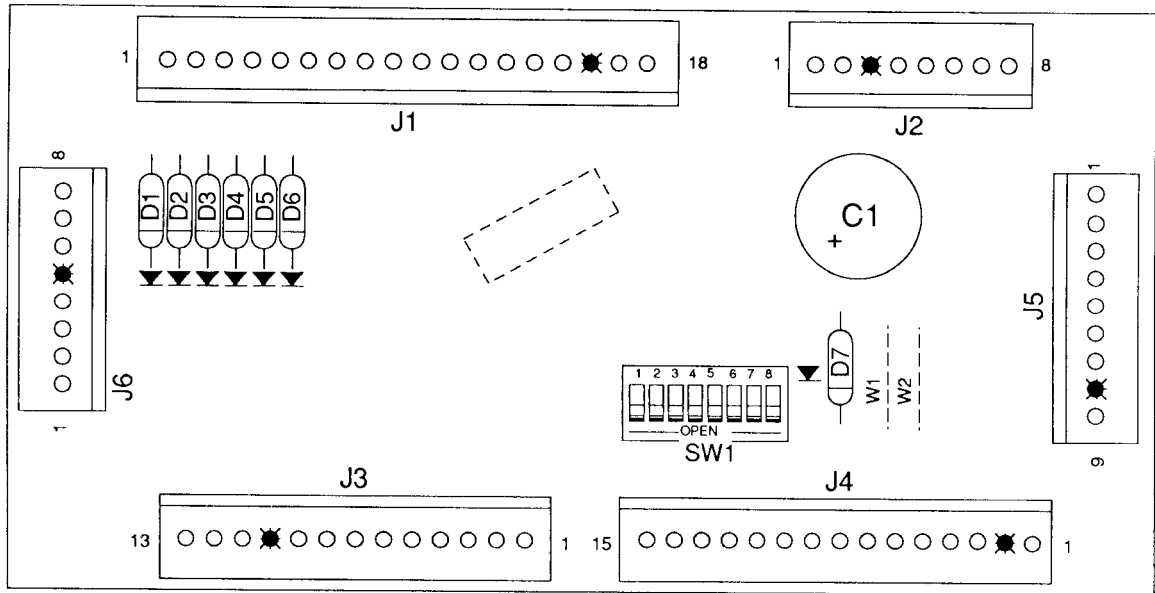
Part Number	Designator	Description
5791-10862-04	J1, J7	Connector, 4-pin Header STR Sq. Pin .156
5791-10862-06	J2	Connector, 6-pin Header STR Sq. Pin .156
5791-10862-07	J6, J8	Connector, 7-pin Header STR Sq. Pin .156
5791-10862-13	J5	Connector, 13-pin Header STR Sq. Pin .156
5370-12272-00	U1, U4	IC, LM339 QUAD
5310-09155-00	U2	IC, 4011 QUAD NAND
5310-09237-00	U3	IC, 4071 QUAD OR
5040-12298-00	C1	Capacitor, 100 $\mu$ fd, 40v ( $\pm$ 50)
5671-09019-00	LED1 - LED4	Display LED Red
5010-09314-00	R1, R29-R31	Resistor, 1.2K $\Omega$ , 1/4w, 5%
5010-08930-00	R12, R22-R24, R42, R43	Resistor, 470 $\Omega$ , 1/2w, 5%
5010-09162-00	R3, R6, R7, R13	Resistor, 100K $\Omega$ , 1/4w, 5%
5010-08774-00	R5, R8, R14	Resistor, 22K $\Omega$ , 1/4w, 5%
5010-09034-00	R2, R19, R26, R33	Resistor, 10K $\Omega$ , 1/4w, 5%
5010-09999-00	R9, R10, R36, R37, R39, R40, R44, R45	Resistor, 2K $\Omega$ , 1/4w, 5%
5010-12928-00	R11, R38, R41, R46	Resistor, 270 $\Omega$ , 1/4w, 5%
5010-09324-00	R15-R17	Resistor, 27K $\Omega$ , 1/4w, 5%
5010-08997-00	R20, R27, R34	Resistor, 2.7K $\Omega$ , 1/4w, 5%
5010-09361-00	R18, R21, R25, R28, R32, R35	Resistor, 220 $\Omega$ , 1/2w, 5%
5043-08980-00	C2 - C5	Capacitor, 0.01 $\mu$ fd, 50v
5070-09054-00	D1-D12	Diode 1N4004 1.0A.
5160-08938-00	Q1, Q4, Q7	Transistor, 2N4401 NPN
5162-12635-00	Q2, Q5, Q8	Transistor, TIP 102
5191-12179-00	Q3, Q6, Q9	Transistor TIP 36C

# A-15472 Fliptronic II Board



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

# A-14689 WPC Coin Door Interface Board



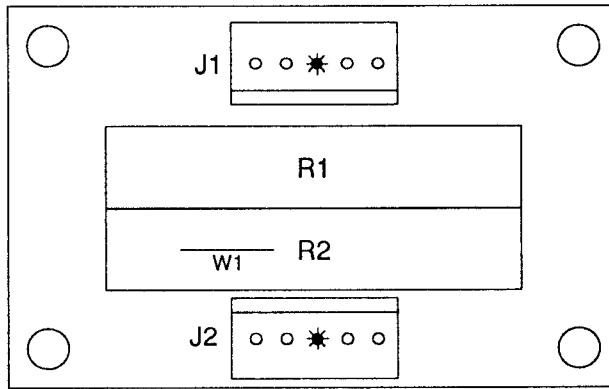
Part Number	Designator	Description
5070-09054-00	D1-D7	Diode, 1N4004, 1.0A.
5791-10862-18	J1	Connector, 18-pin Header Str Sq.
5791-10862-08	J2, J6	Connector, 8-pin Header Str Sq.
5791-10862-13	J3	Connector, 13-pin Header Str Sq.
* 5791-10862-15	J4	Connector, 15-pin Header Str Sq.
* 5791-10862-09	J5	Connector, 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-15309

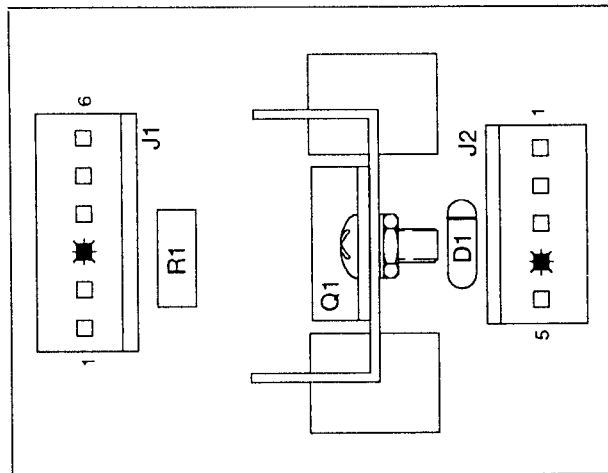
# 2-10W Resistor PCB Assembly



Part Number	Designator	Description
5012-13138-00	R1, R2	Resistor, 1Ω, 10w, 5%
5791-10862-05	J1, J2	Connector, 5-pin Header
03-8022-1		Spacer

# C-13509-1

# High Current Driver Assembly



Part Number	Designator	Description
4406-01128-00	-	Nut 6-32 KEPS
4006-01003-06	-	Mach. Screw, 6-32 x 3/8 P-PH-S
5705-12805-00		Heatsink
5010-09361-00	R1	Resistor, 220Ω, 1/2w, 5%
5070-09054-00	D1	Diode, 1N4004, 1.0A.
5191-12179-00	Q1	Transistor, TIP36C PNP
5791-10862-05	J2	Connector, 5-pin STR Sq. .156
5791-10862-06	J1	Connector, 6-pin STR Sq. .156

## A-15205-R Flipper Assembly (Upper Right)

Item	Part Number	Description
1.	B-13104-R	Flipper Base Assy, Right
2.	SW-1A-193	End of Stroke (EOS) Sw.
3.	4701-00002-00	Lockwasher, #6 Split
4.	4105-01019-10	Sh. Metal Screw, #5 x 5/8
5.	4008-01079-05	Mach. Screw, 8-32 x 5/16
6.	4701-00003-00	Lockwasher, #8 Split
7.	01-9375	Switch Mounting Bracket
8.	20-6516	Speednut, Tinnerman
9.	4010-01066-06	Cap Screw, 10-32 x 3/8, SH
10.	4701-00004-00	Lockwasher, #10 Split
11.	A-12111	Flipper Stop Assembly
12.	FL-11630	Flipper Coil (Red)
a)	03-7066-5	Coil Tubing
13.	01-7695	Solenoid Bracket
14.	4006-01017-04	Mach. Screw, 6-32 x 1/4
15.	10-364	Spring
16.	B-13882-R	Crank Link Assembly, Right
17.	23-6577	Bumper Plug
18.	03-7568	Flipper Bushing
19.	4006-01005-06	Mach. Screw, 6-32 x 3/8
20.	4406-01117-00	Nut, 6-32 Hex.

### *Flipper Assembly Notes...*

1. Each Flipper Assembly is mounted beneath the playfield, in conjunction with the plastic Flipper Plastic Paddle and Shaft (20-9250-6) and Flipper Rubber (23-6519-4) on the upper side of the playfield.
2. With the flipper in the actuated position the E.O.S. Switch contacts must have a gap of .062 (±.015) inch.
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. The lane change switch must have a gap between contacts of .046 (±.015) when open.
5. All moving elements of the assembly must operate freely without any evidence of binding.
6. Apply Loctite™ 242 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.

### Associated Parts for Left & Right Flippers:

23-6519-4	Flipper Rubber (Red)
20-9250-5	Flipper & Shaft (White)

## A-15205-L-1 Flipper Assembly (Lower Right)

(Parts listed replace same items of **A-15205-R**)

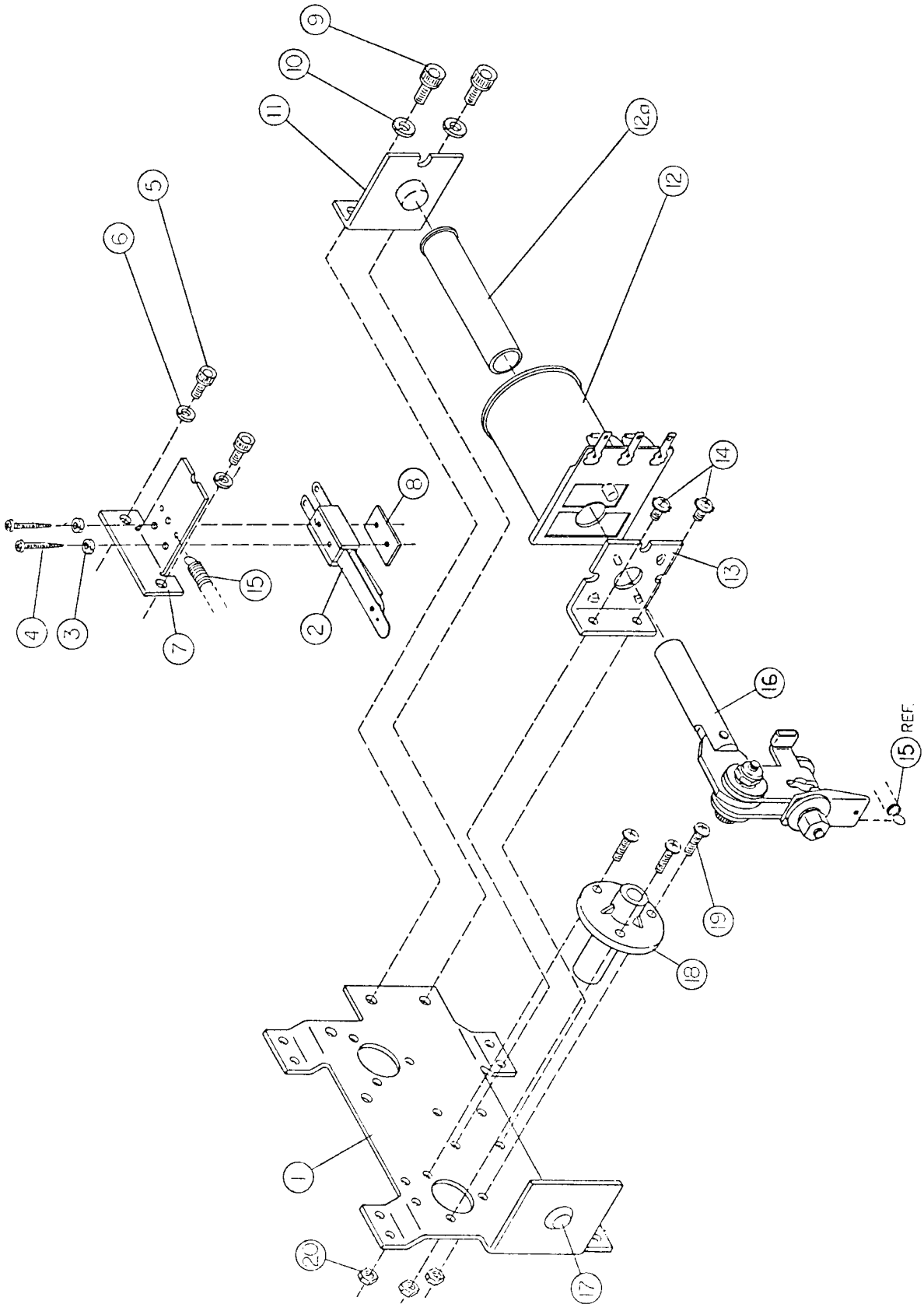
Item	Part Number	Description
1.	B-13104-L	Flipper Base Assy, Left
12.	FL-11629	Flipper Coil (Blue)
16.	B-13882-L	Crank Link Assembly, Left

## A-15205-R-2 Flipper Assembly (Lower Left)

(Parts listed replace same items of **A-15205-R**)

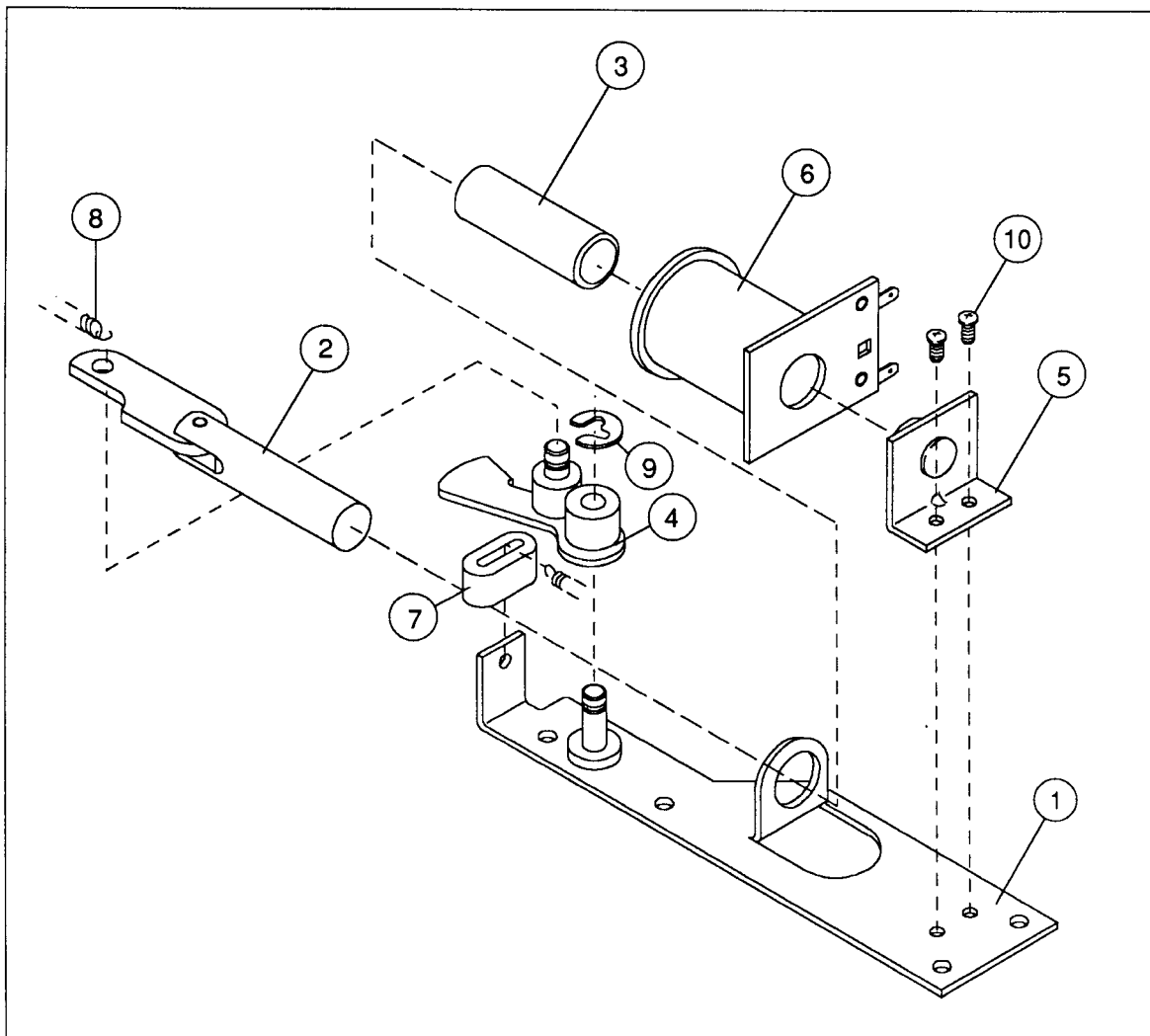
Item	Part Number	Description
12.	FL-11629	Flipper Coil (Blue)

# A-15205-R & A-15205-L Flipper Assembly



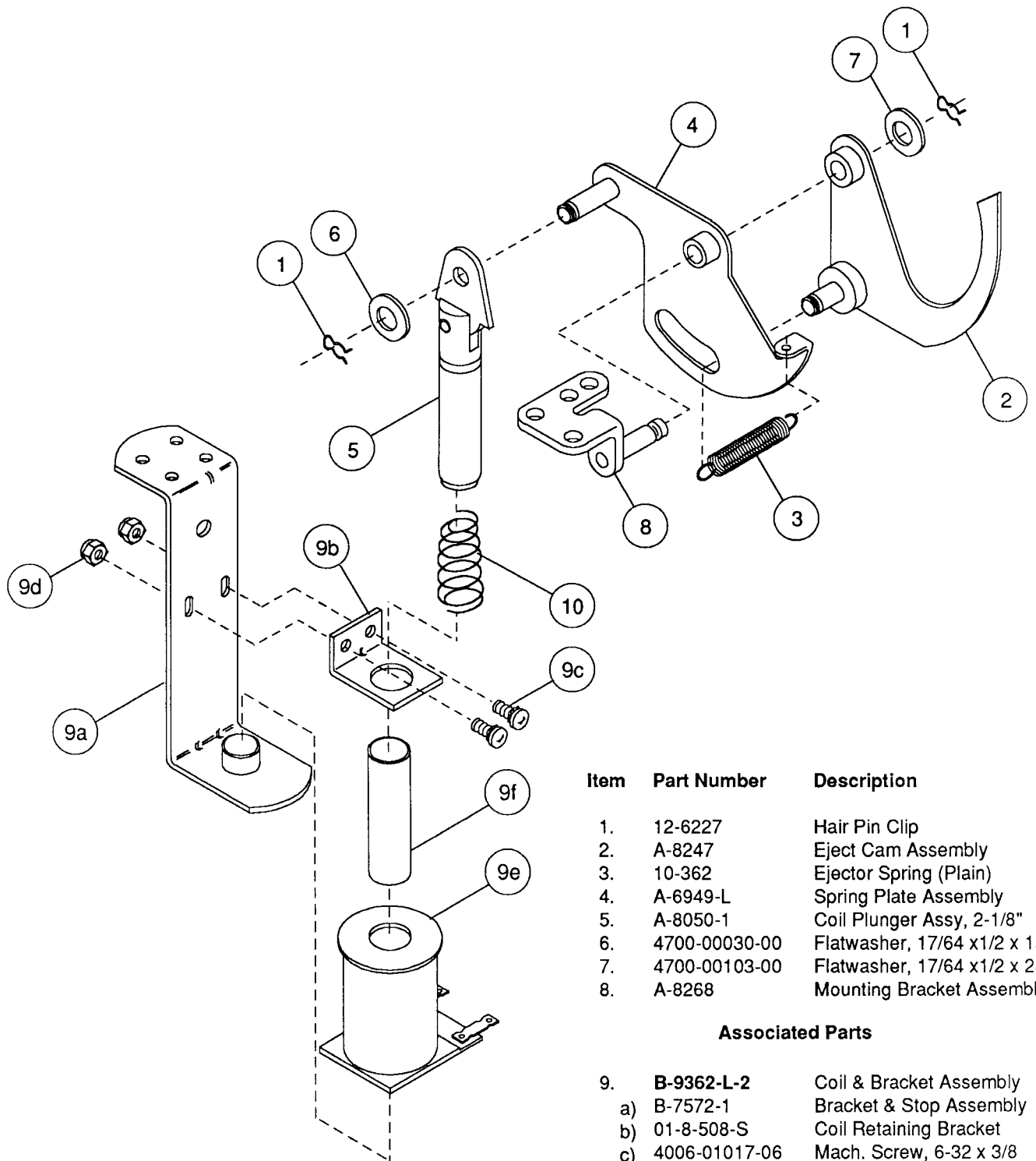


## A-8039-3 Outhole Kicker Assembly



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

# C-9638 Ball Shooter Lane Feeder

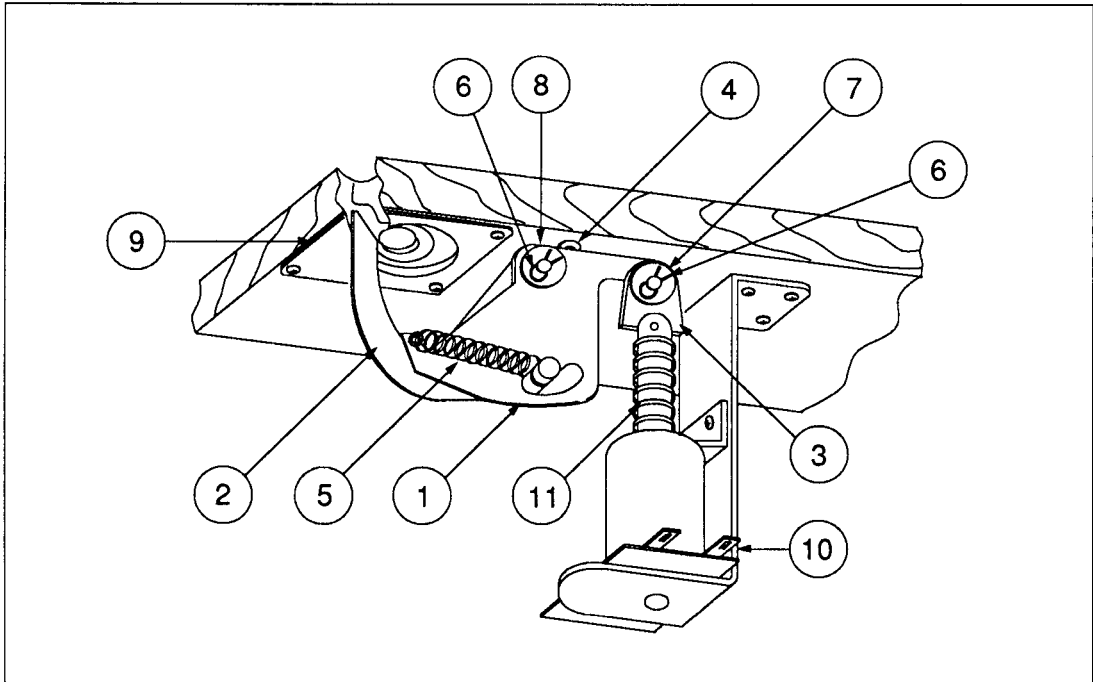


Item	Part Number	Description
1.	12-6227	Hair Pin Clip
2.	A-8247	Eject Cam Assembly
3.	10-362	Ejector Spring (Plain)
4.	A-6949-L	Spring Plate Assembly
5.	A-8050-1	Coil Plunger Assy, 2-1/8"
6.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
7.	4700-00103-00	Flatwasher, 17/64 x 1/2 x 28ga.
8.	A-8268	Mounting Bracket Assembly

### Associated Parts

9.	<b>B-9362-L-2</b>	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
10.	10-128	Spring

## B-9361-R-1      Ball Eject Assembly

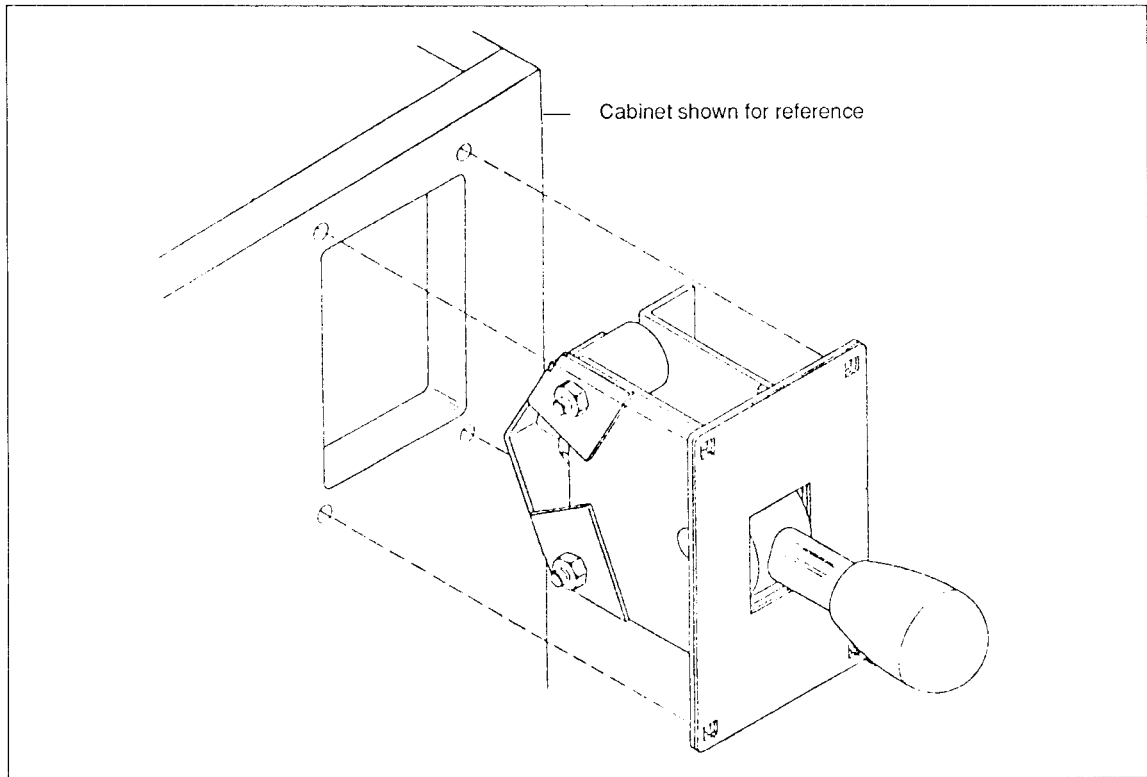


Item	Part Number	Description
1.	A-6949-R	Spring Plate
2.	A-7471-R	Eject Cam Assembly
3.	A-8050-1	Plunger Assy., 2-1/8"
4.	A-8268	Mounting Bracket Assy.
5.	10-362	Eject Spring
6.	12-6227	Hairpin Clip
7.	4700-00030-00	FW, 17/64 x 1/2 x 15ga.
8.	4700-00103-00	FW, 17/64 x 1/2 x 28ga.

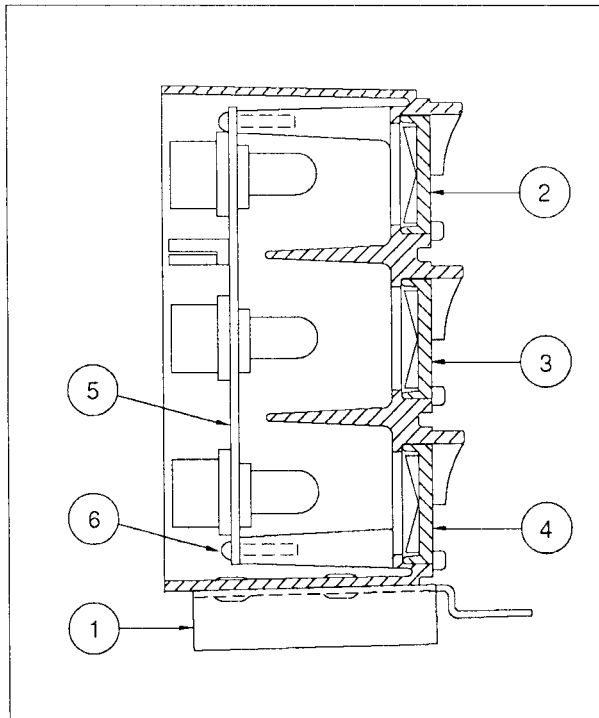
### Associated Parts:

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

## 20-9710 Up-Down Shifter

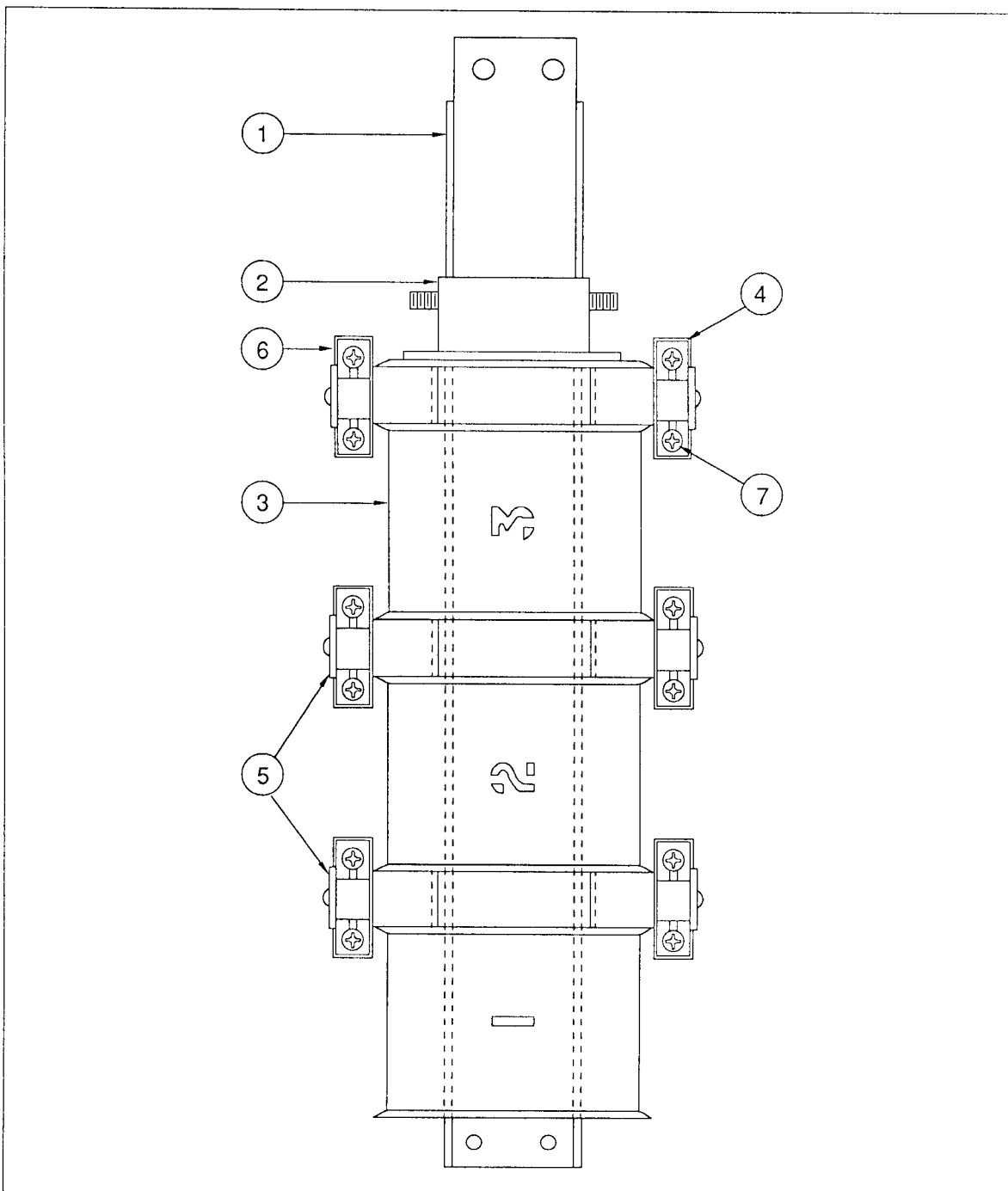


## A-15283 Stop Light Assembly



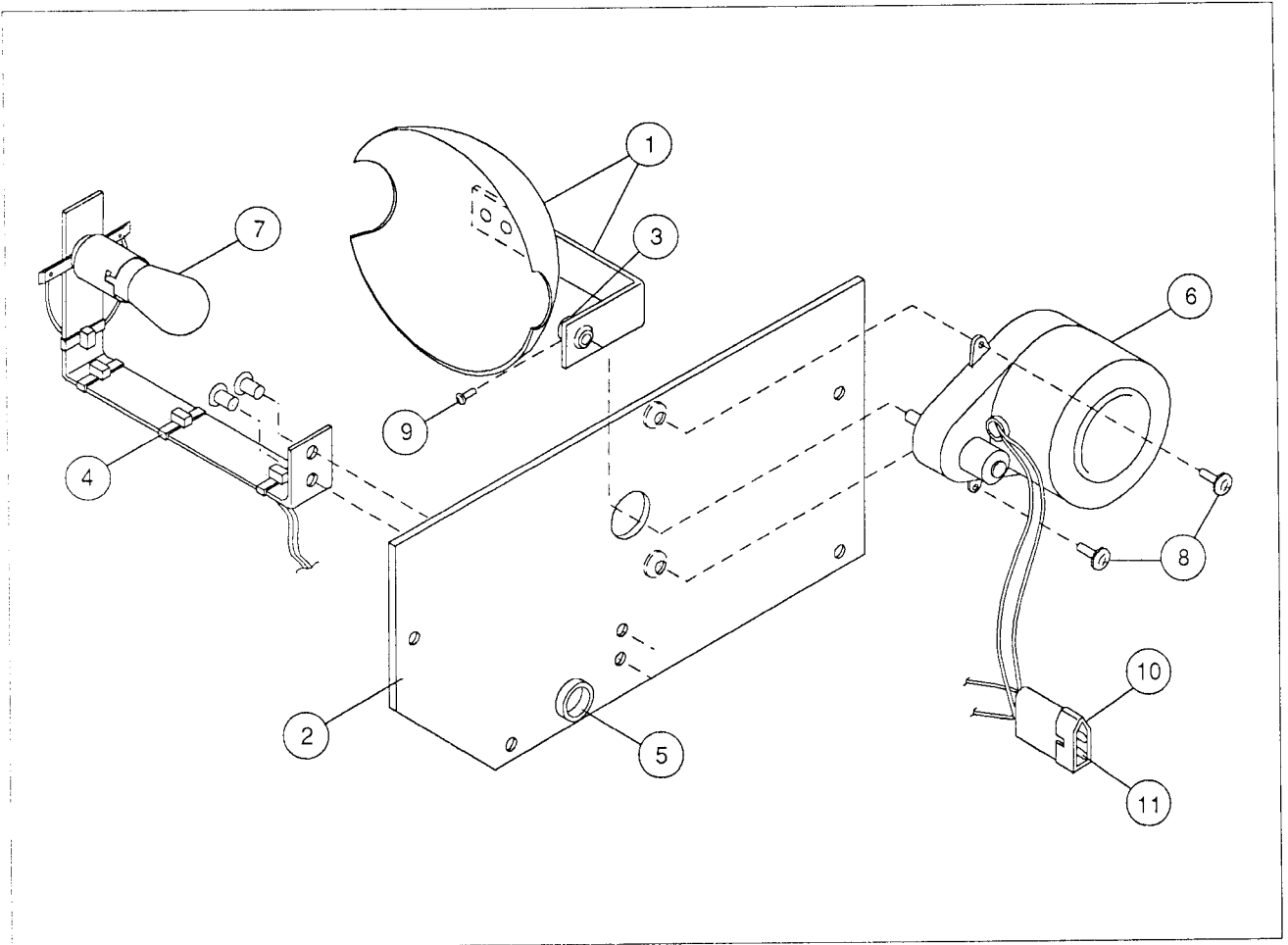
Item	Part Number	Description
1.	A-15418	Stop Light Rivet Assembly
2.	03-7642-9	Starburst Insert, 1" Trans. Red
3.	03-7642-12	Starburst Insert, 1" Trans. Orange
4.	03-7642-11	Starburst Insert, 1" Trans. Green
5.	A-15260	3-Lamp PC Board Assembly
6.	4104-01009-06	Sh. Metal Screw, #6 x 3/8 P-PH-P

# A-15300 Accelerator Tray Assembly



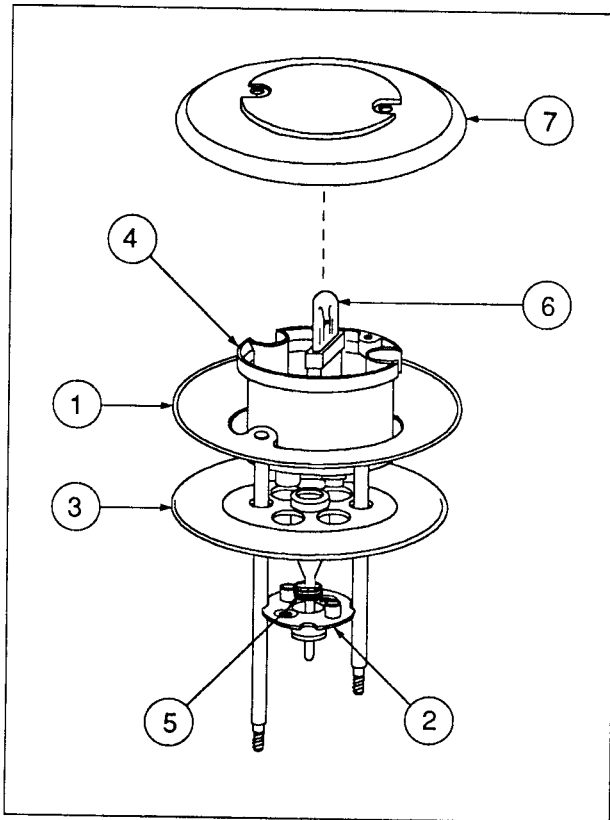
Item	Part Number	Description
1.	A-15299	Coil Holder Tray
2.	01-10612	Bracket: Coil Lock Collar
3.	A-15685	Coil Assembly
4.	A-15298	Coil Spacer Bracket Weldment
5.	A-14316	Opto P/T Assembly (Black)
6.	A-14315	Opto LED Assembly (White)
7.	4004-01003-06	Mach. Screw #4-40 x 3/8

# A-15311 Revolving Flash Lamp Assembly



Item	Part Number	Description
1.	B-10917	Reflector Assembly
2.	B-10934-1	Motor Plate & Bracket Assembly
3.	02-4239	Collar Motor Shaft
4.	03-7520-2	Nylon Ty-Wrap (4 used)
5.	03-7869-1	Snap Bushing
6.	14-7971	Motor 12V, 100RPM
7.	24-8826	Bulb #1156 /12V
8.	4004-01003-05	MS 4-40 x 5/16 P-PH-S (2 used)
9.	4006-01076-04	SS 6-32 x 1/4 SH-CP
10.	5791-09111-00	3-Position Connector
11.	5820-09080-00	Male Crimp Pin (2 used)

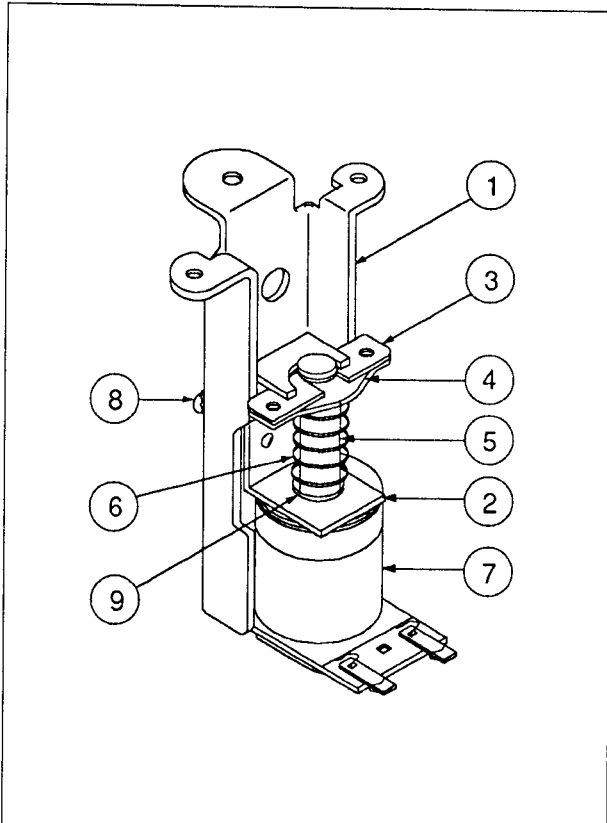
## B-9414-1 Jet Bumper Assembly



Item	Part Number	Description
1.	A-4754	Bumper Ring Assembly
2.	03-6009-A5	Bumper Base - White
3.	03-6035-1	Bumper Wafer - Blue
4.	03-7443-5	Bumper Body - White
5.	10-7	Spring - Jet Bumper
6.	A-11199	Socket & Bulb Assy.

### Associated Parts:

7.	03-8254-9	Jet Bumper Cap - Trans. Red (3)
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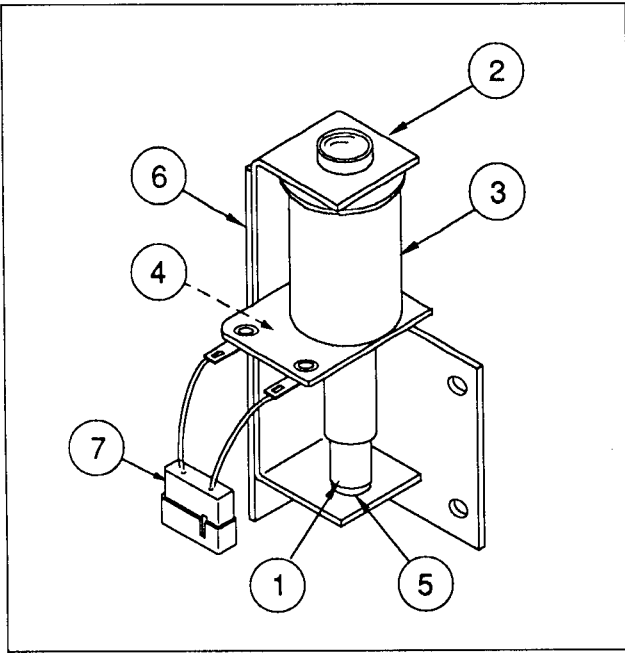
## A-9415-2 Jet Bumper Coil Assembly

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

### Associated Parts:

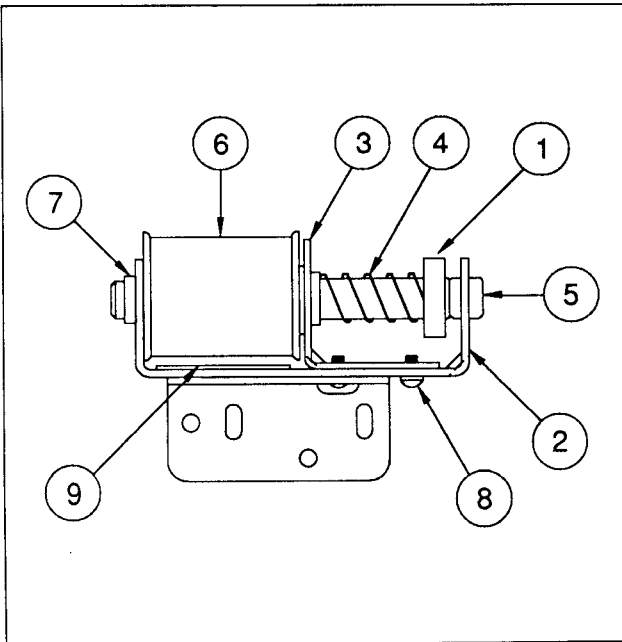
B-12030-2	Jet Bumper Sw & Diode Assy
B-12029-2	Jet Bumper Sw & Brkt. Assy
SW-11A-37	Jet Bumper Switch Assy
5070-09054-00	Diode, 1N4004

## B-10686-1 Kicker Assembly



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

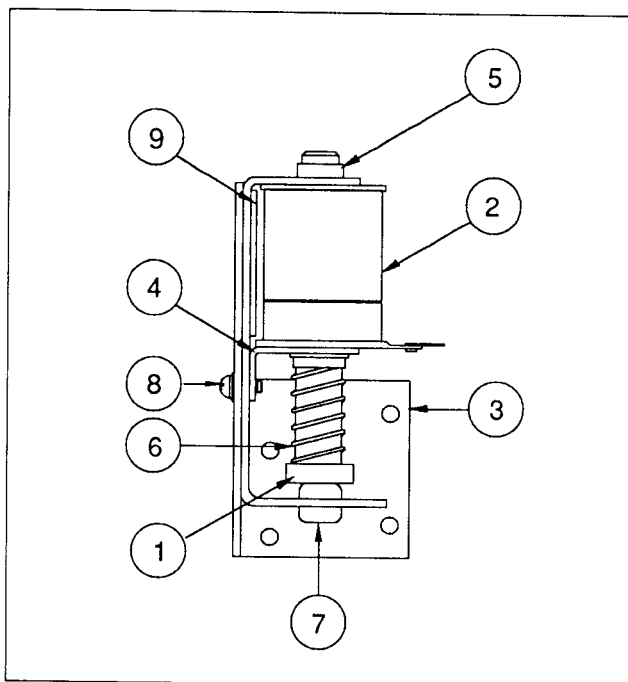
## A-15708 Kicker Assembly



Item	Part Number	Description
1.	A-15709	Bell Armature Assembly
2.	A-15676	Kicker Mounting Bracket Assy.
3.	01-10794	Solenoid Bracket
4.	10-128	Solenoid Spring
5.	23-6420	Rubber Grommet
6.	A-14789	Coil Assembly
7.	03-7067-6	Coil Tubing
8.	4008-01017-04	Mach. Screw, #8-32 x 5/16
9.	03-8523	Insulator

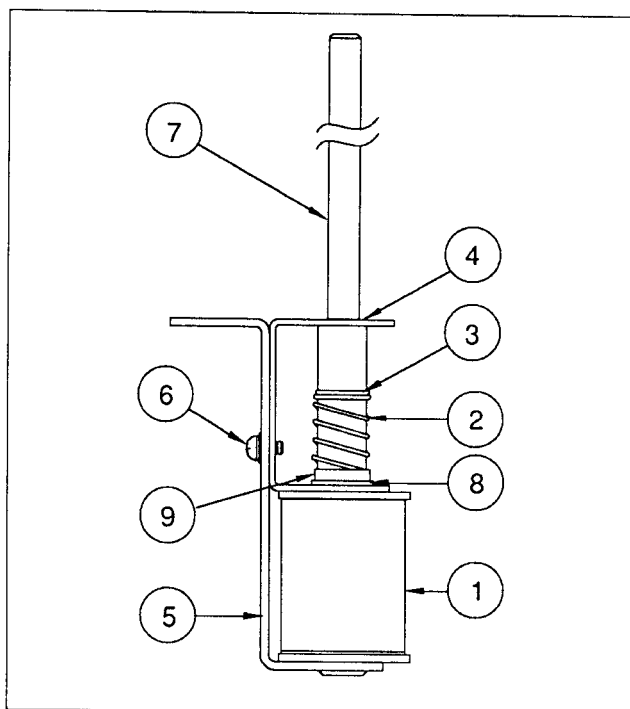


## B-11873 Kickback Assembly



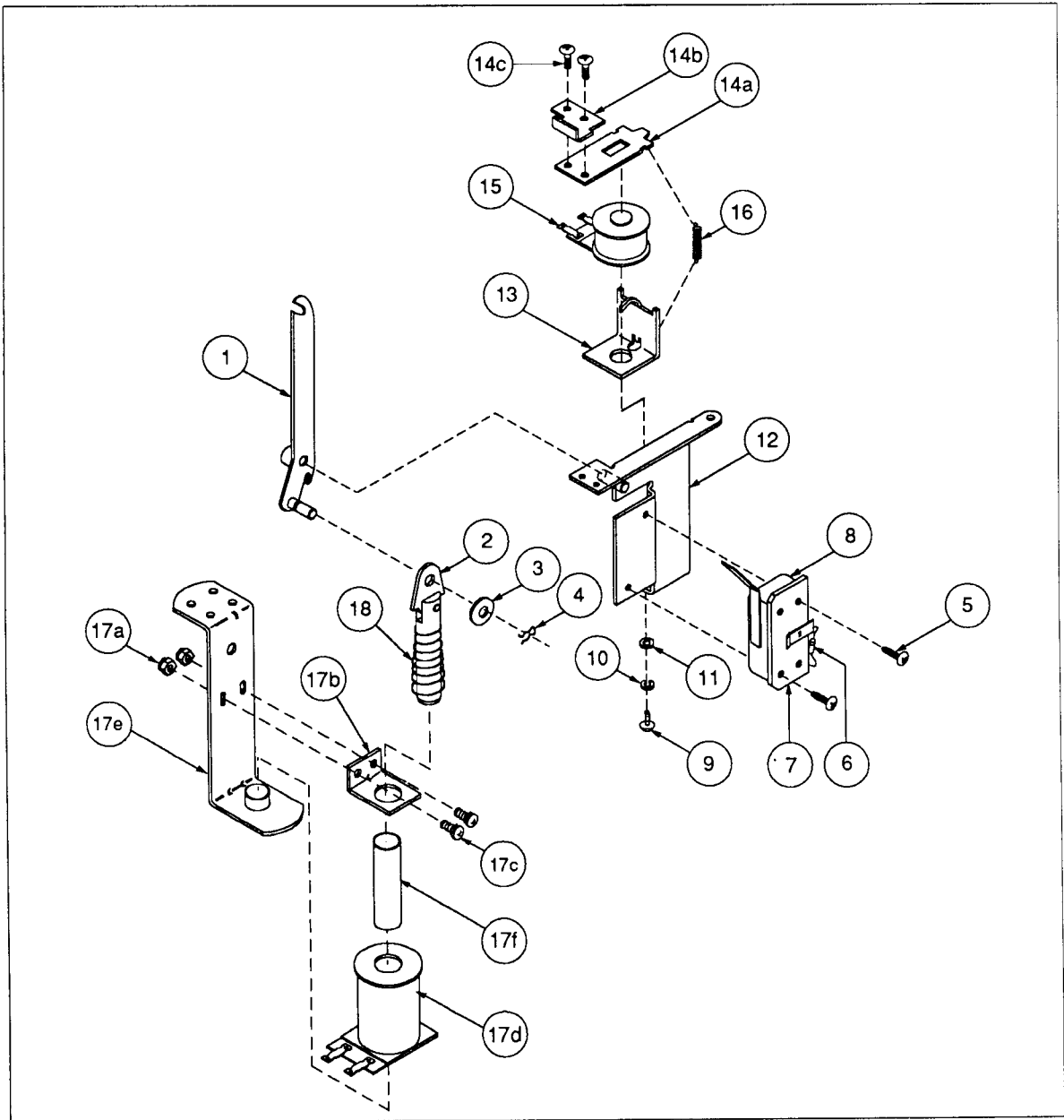
Item	Part Number	Description
1.	A-6306-2	Bell Armature Assy.
2.	AE-23-800	Coil Assembly
3.	B-7409-2	Mounting Bracket
4.	01-8-508-T	Solenoid Bracket
5.	03-7067-5	Coil Tubing
6.	10-135	Solenoid Spring
7.	23-6420	Rubber Grommet
8.	4008-01017-05	Mach. Screw, 8-32 x 5/16"
9.	03-8523	Insulator

## A-15127 Disappear Post Assembly



Item	Part Number	Description
1.	AE-26-1200	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.	4006-01005-04	Mach. Screw, #6-32 x 1/4"
7.	02-4587	Disappearing Post
8.	01-10024	Insulator
9.	03-7066-3	Coil Tubing, 1-7/8" Lg.

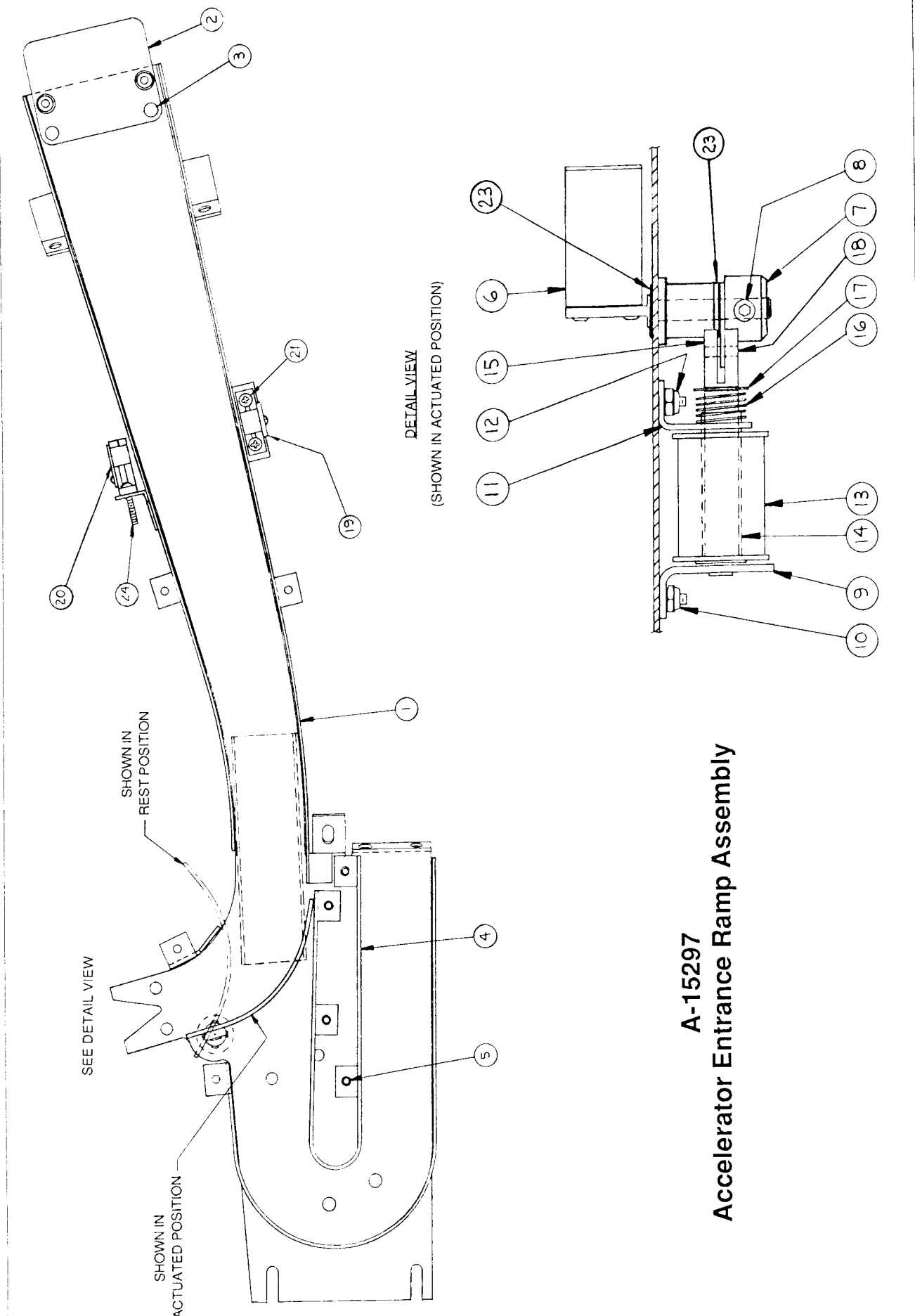
# B-12576 Ramp Lifting Mechanism Assembly



Item	Part Number	Description	Item	Part Number	Description
1.	A-12577	Lift Crank Assembly	14. b)	01-8390	Lift Crank Lock
2.	A-8050	Plunger Assembly, 2-1/4"	c)	4006-01003-03	Mach. Screw, 6-32 x 3/16
3.	4700-00073-00	Flatwasher, 9/32x1/2x21ga.	15.	SM1-28-900-DC	Coil Assembly
4.	12-6227	Hairpin Clip	16.	10-363	Extension Spring
5.	4004-01003-10	Mach. Screw, 4-40 x 5/8	<b>Associated Parts:</b>		
6.	5070-06258-00	Diode 1N4001, 1.0A.	17.	<b>B-9362-L-2</b>	Coil & Bracket Assembly
7.	A-7438-1	Terminal Strip Assembly	a)	4406-01119-00	Nut, 6-32 ESN
8.	5647-12001-00	Microswitch	b)	01-8-508-S	Coil Retaining Bracket
9.	4008-01021-07	Mach. Screw, 8-32 x 7/16	c)	4006-01017-06	Mach. Screw, 6-32 x 3/8
10.	4701-00003-00	Lockwasher, #8 Split	d)	AE-26-1200	Coil Assembly
11.	4700-00089-00	Flatwasher, 11/64x7/16x16ga.	e)	B-7572-1	Bracket & Stop Assembly
12.	B-11302	Lift Mech. Bracket Assy	f)	03-7066	Coil Tubing
13.	A-6892	Frame & Eyelet Assy	18.	10-128	Spring
14.	A-11139	Armature Assembly			
a)	A-8936	Armature Sub-Assembly			

## A-15297 Accelerator Entrance Ramp Assembly

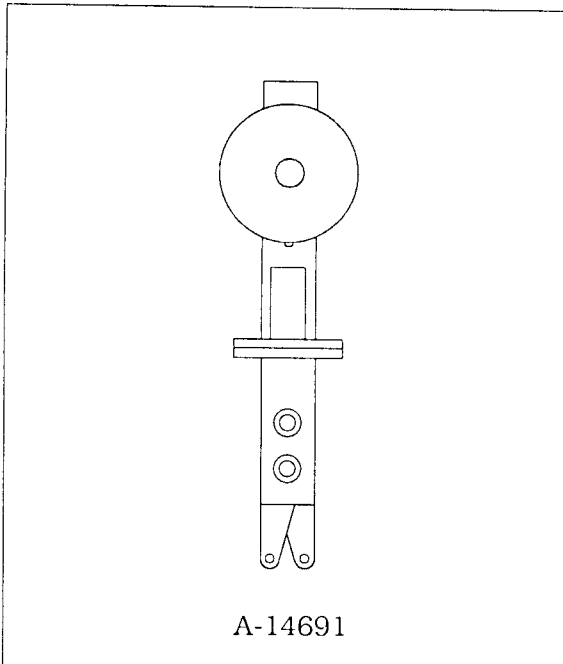
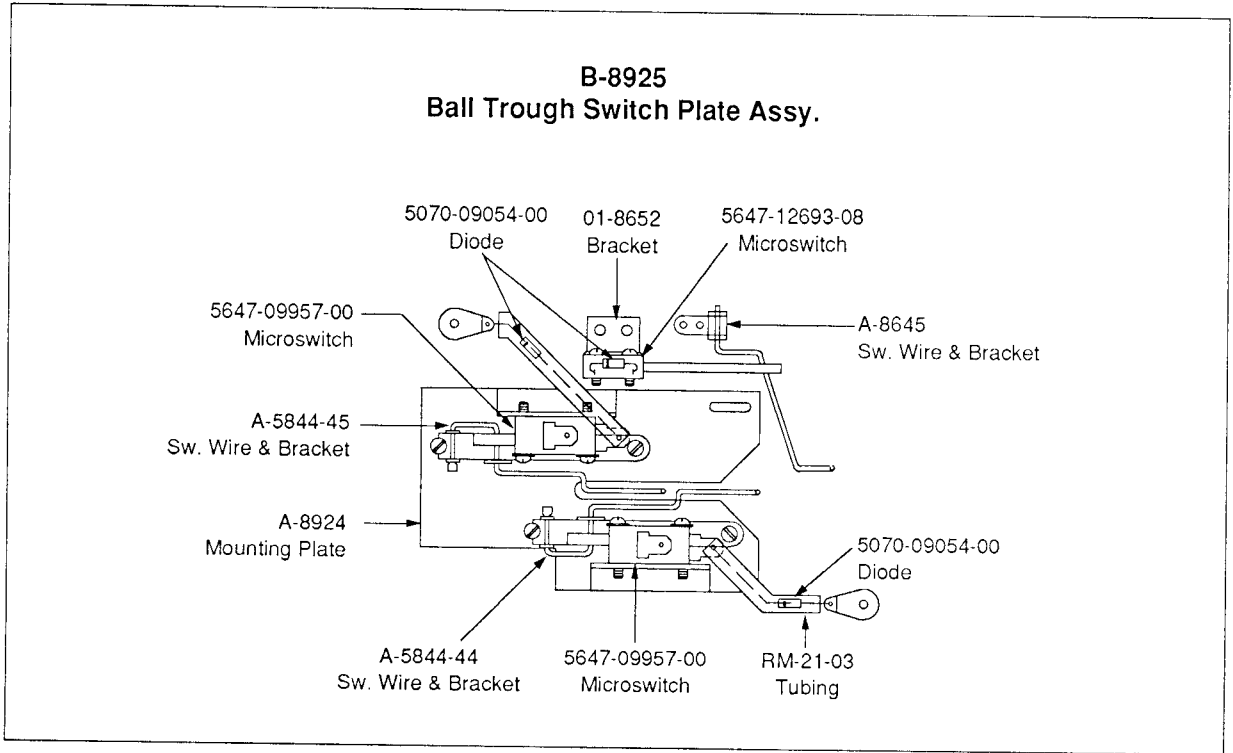
Item	Part Number	Description
1.	A-15296	Accelerator Ramp Weldment
2.	01-10614	Plate: Ramp Entrance
3.	07-6688-16N	Rivet: 1/8 x 1/8 Lg. Nic. Plt.
4.	01-10613	Ball Guide, Center Wall
5.	4008-01015-06	Mach. Screw, 8-32 x 3/8 PHL PAN
6.	A-15586	Divertor Pivot Shaft Assembly
7.	A-15569	Divertor Actuator Shaft Assy.
8.	4323-01158-06	SS 1/4-28 x 3/8 Sh. Knurled Cup Pt.
9.	A-15605	Coil Stop Bracket Assembly
10.	4408-01119-01	Nut 8-32 ESNA
11.	01-10225	Coil Mounting Bracket
12.	4406-01128-00	Nut 6-32 KEPS
13.	A-14701	Coil Assembly
14.	03-7066	Coil Tubing
15.	02-4606	Shaft, Divertor Actuator
16.	10-128	Spring
17.	20-8712-43	"E"-Ring 7/16"
18.	20-8716-5	Roll Pin, 1/8 x 7/16"
19.	A-14316	Opto P/T Assembly (Black)
20.	A-14315	Opto LED Assembly (White)
21.	4004-01003-06	#4 x 3/8 PHL PAN PT ST
22.	Not Used	
23.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 17ga.
24.	4004-01003-10	Mach. Screw, 4-40 x 5/8 P-PH-S



**A-15297**  
**Accelerator Entrance Ramp Assembly**

# Ball Trough Switches

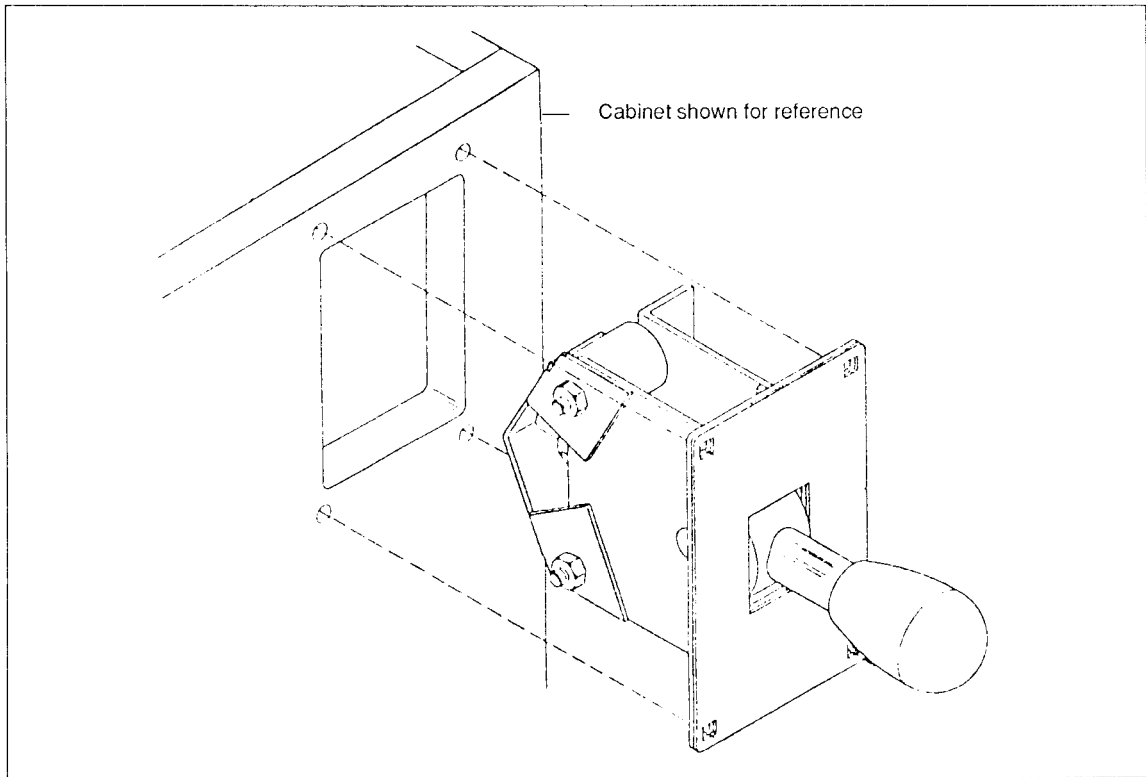
(Viewed from underside of playfield to show locations)



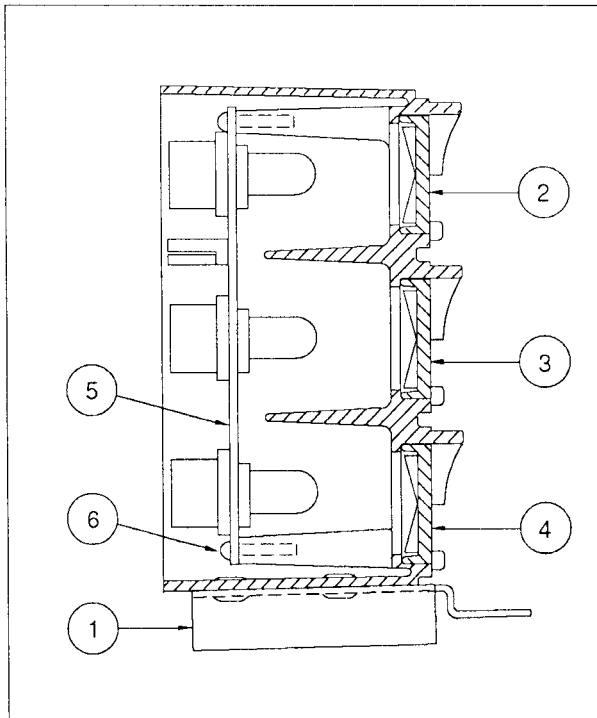
## Standup Targets

Part Number	Description
A-14691-2	Standup Target, Green
A-14691-4	Standup Target, Red
A-14691-5	Standup Target, White
A-14691-6	Standup Target, Yellow

## 20-9710 Up-Down Shifter



## A-15283 Stop Light Assembly



Item	Part Number	Description
1.	A-15418	Stop Light Rivet Assembly
2.	03-7642-9	Starburst Insert, 1" Trans. Red
3.	03-7642-12	Starburst Insert, 1" Trans. Orange
4.	03-7642-11	Starburst Insert, 1" Trans. Green
5.	A-15260	3-Lamp PC Board Assembly
6.	4104-01009-06	Sh. Metal Screw, #6 x 3/8 P-PH-P

# Coin Door Assembly

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

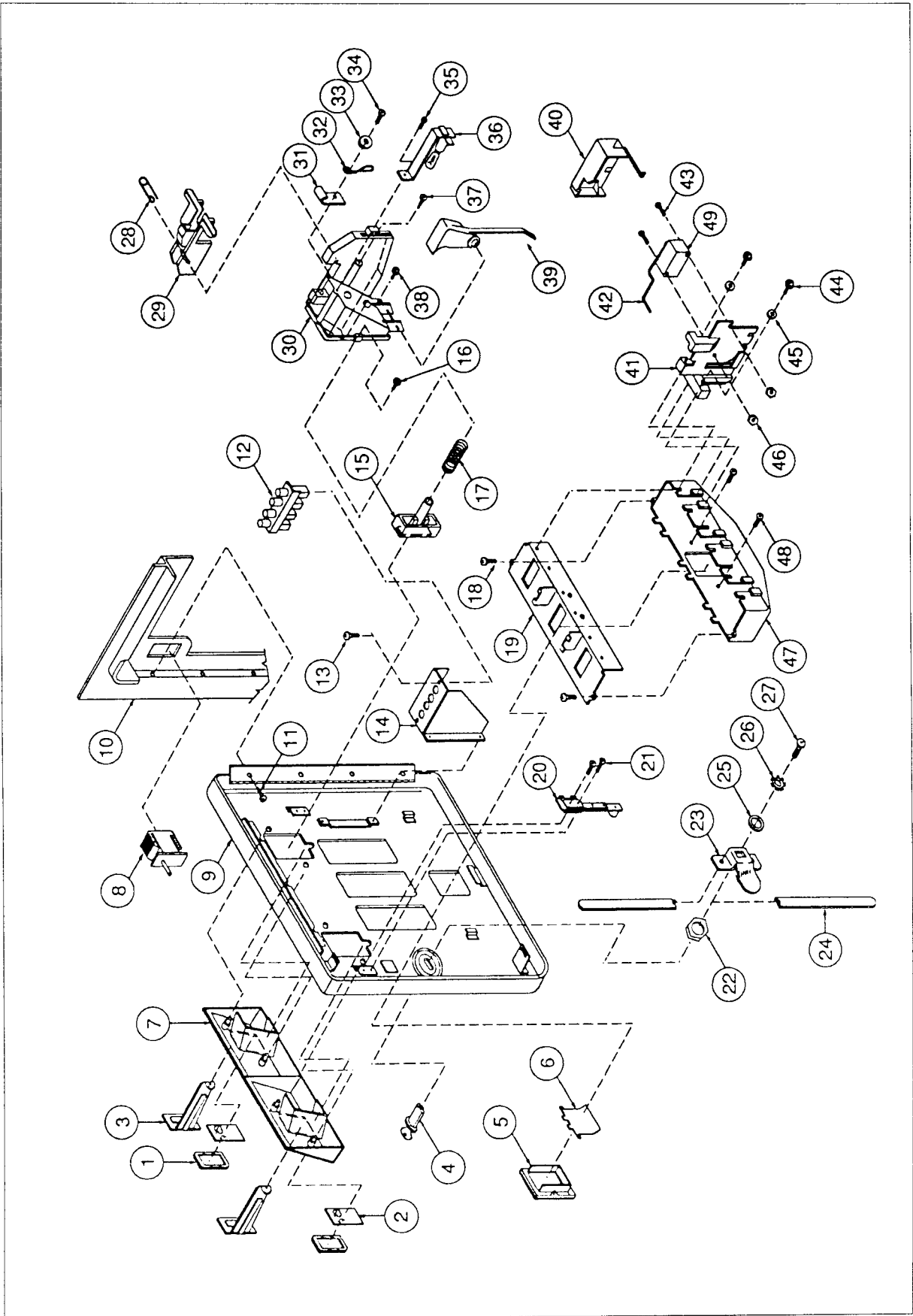
09-17002-x 2-Chute Door

09-17003-x 3-Chute Door

("x" is the country designator)

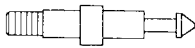
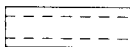
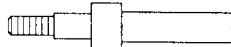
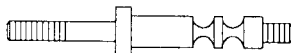


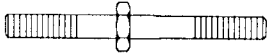
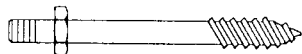


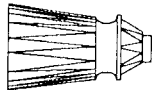
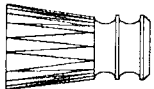
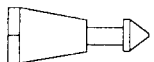
Item	Part No.	Description	Quantity
1	27-1038	Button Cover	2 or 3
2	27-1041-1→ 58	Price Panel	2 or 3
3	27-1026-1→ 17	Coin Entry Plate	2 or 3
4	27-1016	Lock Assembly	1
5	27-1061-1	Coin Return - Bezel	1
6	27-1062	Coin Return Flap	1
7	27-1021	Button Housing - 2-slot	1
	27-1022	Button Housing - 3-slot	1
8	27-1111	Interlock Switch	1
9	27-1006-1	Coin Door , 2-Slot	1
	27-1007-1	Coin Door , 3-Slot	1
10	27-1005	Coin Door Frame	1
11	27-1003	M/C Screw, 6-32 x 3/16	4
12	5641-12724-00	Diagnostic Switch	1
13	27-1101	M/C Screw, 4-40 x 1/4	2
14	01-9885	Bracket, Diagnostic Switch	1
15	03-7601-4	Button, Red	2
	03-7601-7	Button, Black	2
16	27-1078	M/C Screw, 6-32 x 3/8	2 or 3
17	27-1039	Conical Spring	2 or 3
18	27-1079	Self-tapping Screw, #6 x 1/4	2
19	27-1077-1	Coinbox Cover	1
20	27-1066	Slam Switch	1
21	27-1067	M/C Screw, 4-40 x 1/2	2
22	27-1017	Nut (key)	1
23	27-1012	Locking Cam	1
24	27-1011	Locking Arm	2
25	27-1020	Washer	1
26	27-1018	Star Washer	1
27	27-1019	M/C Screw, 1/4-28 x 5/16	1
28	27-1089	R-Ring	1
29	27-1083	Retainer	1
30	27-1081	Coin Inlet Chute	2 or 3
31	27-1088	Cable Clamp	2 or 3
32	27-1025	Key Hook	1
33	27-1086	Washer, #6	2 or 3
34	27-1078	M/C Screw, 6-32 x 3/8	1 or 2
	27-1113	M/C Screw, 6-32 x 7/16	1
35	27-1079	Self-tapping Screw, #6 x 1/4	2 or 3
36	27-1084	Lamp Socket	2 or 3
	27-1085	Lamp	2 or 3
37	27-1096	Self-tapping Screw, #5 x 3/8	2 or 3
38	27-1087	M/C Screw, 6-32 x 5/8	2 or 3
39	27-1082	Lever Arm	2 or 3
40	27-1097	Switch Cover	2 or 3
41	27-1091-1	Coin Accept Chute	2 or 3
42	27-1075	Wire Form (Small)	2 or 3
	or		
	27-1093	Wire Form (Large)	
43	27-1094	M/C Screw, 4-40 x 7/8	4 or 6
44	27-1087	M/C Screw, 6-32 x 5/8	4 or 6
45	27-1086	Washer, #6	4 or 6
46	27-1095	Nut, 4-40 ESNA	4 or 6
47	27-1076-1	Coin Return Box	1
48	27-1078	M/C Screw, 6-32 x 3/8	2
49	27-1092	Microswitch	2 or 3

# Coin Door Assembly





## Metal & Plastic Posts

	Part Number	Description	Quantity
	02-4003	Mini Post	1
	02-4020	Support Post	2
	02-4036	Mini Post	8
	02-4423	Double Bumper Post: 2-13/32 Lg.	5
	02-4423-1	Double Bumper Post: 2-21/32 Lg.	1
	02-4424-1	Spring Post, 6-32 x 8-32	5
	02-4425-1	Post, 8-32/ #8-32	2
	02-4426-1	Post, #6-32 / #8 SMS	1
	02-4450	Post Double Bumper	8
	02-4587	Disappear Post	1
	03-8319-13	Star Post #8 - Clear	11
	03-8247-13	Double Star Post, Clear	3
	03-8044-9	Mini Plastic Post - Trans. Amber	8

## Unique Parts

Part Number	Description	Part Number	Description
A-12738-50004	WPC Sound Board	A-15300	Accelerator Tray Assembly
A-12742-50004	WPC CPU Board	A-15301	Accelerator Ramp Assembly
A-13204-50004	Bottom Arch Assembly	A-15309	2-10W Resistor PCB Assembly
A-13769-50004	Playfield & Inserts Assembly	A-15311	Revolving Light Assembly
A-14092-3	WPC Mounting Plate Assembly	A-15419	Gear Shift Assembly
A-15076	Ramp Weld Assembly	A-15434	Super Charger Assembly
A-15082	Ball Guide Assembly	A-15456-1	Playfield Plastic Assembly
A-15083	Ball Guide Assembly	A-15456-2	Playfield Plastic Assembly
A-15084	Ball Guide Assembly	A-15456-3	Playfield Plastic Assembly
A-15085	Ball Guide Assembly	A-15456-4	Playfield Plastic Assembly
A-15086	Ball Guide Assembly	A-15456-5	Playfield Plastic Assembly
A-15087	Ball Guide Assembly	A-15456-6	Playfield Plastic Assembly
A-15088	Ball Guide Assembly	A-15456-7	Playfield Plastic Assembly
A-15101	Right Ramp Assembly	A-15472	Fliptronic II Assembly
A-15102	Wire Ramp Assembly - Left	A-15558-1	Ball Gate Assembly
A-15103	Wire Ramp Assembly	A-15601	Back Panel Assembly
A-15120	Ball Guide Assembly	A-15671-1	Cashbox Assembly
A-15127	Disappearing Post Assembly	A-8552-50004	Backglass Assembly
A-15135	Ball Guide & Gate Assembly		
A-15143	8-Lamp PCB Assembly	C-13509-1	High Current Driver Assy.
A-15144	8-Lamp PCB Assembly		
A-15145	8-Lamp PCB Assembly	SM1-28-900-DC	Coil Assembly
A-15146	10-Lamp PCB Assembly		
A-15147	3-Lamp PCB Assembly	02-4423-1	Post Bumper
A-15189	PCB Accelerator Assembly	02-4587	Disappear Post
A-15205-L-2	Electronic Flipper Assembly		
A-15205-R-2	Electronic Flipper Assembly	24-8826	Bulb #1156, 12v
A-15207	Speaker /Display Assembly		
A-15260	3-Lamp PCB Assembly	31-1002-50004	Screened Playfield
A-15262-50004	Backbox Assembly	31-1008-50004	Bottom Arch Screened
A-15277	Coil Assembly	31-1357-50004	Backglass
A-15283	Stop Light Assembly	31-1420-50004-1	Speaker Panel Cover, Screened
A-15291	Ball Guide Assembly	31-1674-	Screened Playfield Plastic Set

## Cable List

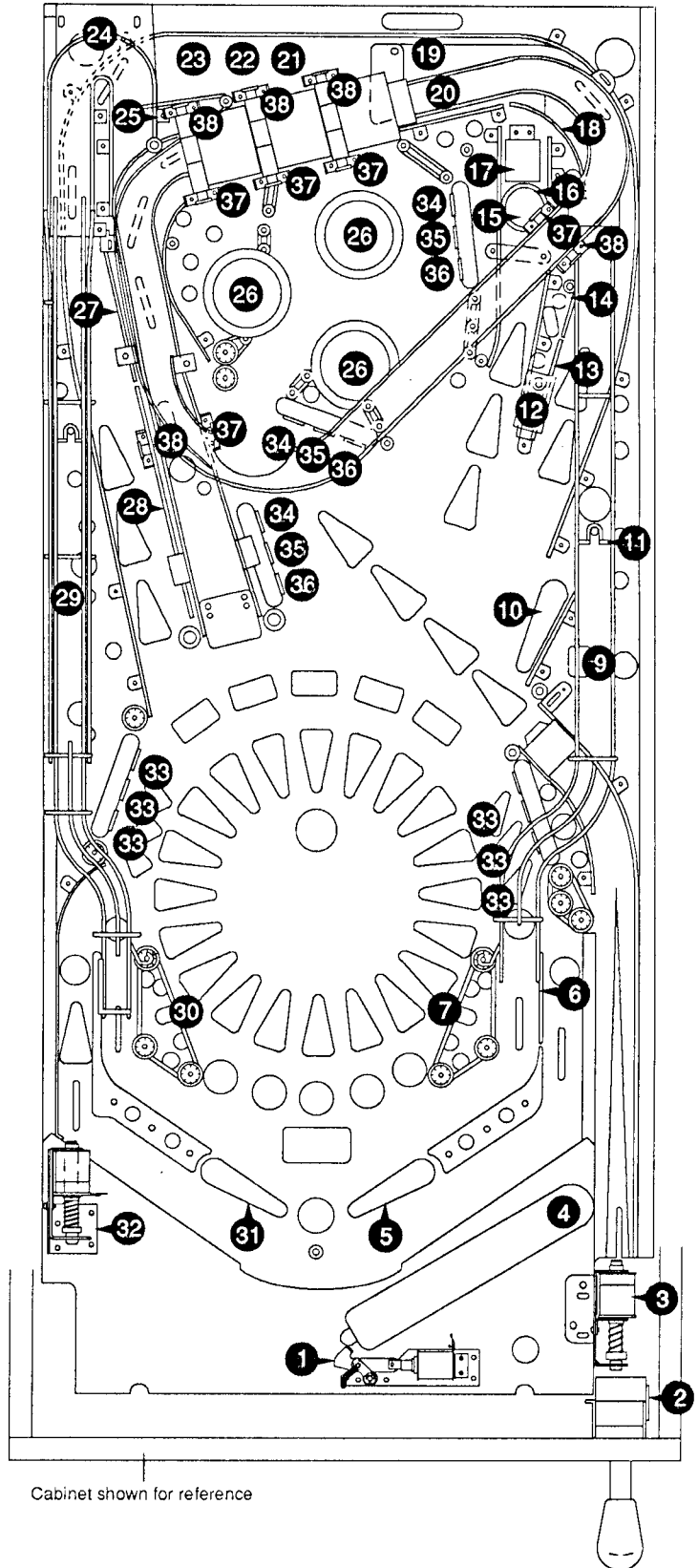
Part Number	Description	Part Number	Description
H-11835	Knocker Assembly	H-15319	General Switch Assembly
H-13870	Black Jumper Assembly	H-15320	General Switch Assembly
H-14582	Secondary Cable	H-15321	Stop Light Cable
H-14584	Dot Matrix Display	H-15322	Ramp Entry Opto Cable
H-14790	A.C. Cable	H-15323	Ramp Opto Cable
H-14792-1	A.C. Jumper Cable	H-15324	Super Charger Cable
H-14792-2	A.C. Jumper Cable	H-15325	Super Charger Cable
H-15011	Speaker Panel Cable	H-15326	Lock Switch Cable
H-15183	Single Flipper	H-15327	Super Charger
H-15184	Double Flipper	H-15328	Revolving Light Cable
H-15269	Playfield Switch Cable	H-15329	Revolving Light Cable
H-15270	Playfield Lamp Cable	H-15377	Revolving Light Cable
H-15271	Playfield Solenoid Cable	H-15420	Multi Flipper
H-15272	Cabinet Cable	H-15476	Logic Power Cable
H-15273	Insert Cable	H-15478	Tilt Switch Cable

# Playfield Parts

Item	Part Number	Description
1	A-8039-3	Outhole Assembly
2	A-15419	Gear Shift Assembly
3	A-15708	Plunger Kicker
4	C-9638	Ball Release (Trough)
5	A-15205-R-2	Lower Right Flipper
6	12-6466-12	Wireform 3"
7	A-14875-2	Right Kicker
a)	B-13935	Coil & Bracket Assembly
8	A-15135	Ball Gate & Guide
9	A-15127	Disappearing Post (Locker)
10	A-15205-R	Upper Right Flipper
11	A-15103	Wire Right Ramp
12	A-15283	Stop Light Assembly
13	12-6466-14	Wireform 3-1/2"
14	12-6466-9	Wireform 2-1/4"
15	B-9361-R-1	Ball Eject Assembly
16	B-9362-L-2	Coil & Bracket Assembly
17	A-13648	Eject Stop Assembly
18	12-7034	Ball Guide Wire 6-39/64"
19	A-15101	Right Ramp
20	A-15301	Accelerator Ramp Assembly
21	A-13901-1	Opto Ramp Switch Board Assembly
22	B-12576	Lift Ramp Mechanism
23	B-9362-L-2	Coil & Bracket Assembly
24	A-15189	Accelerator Board Assembly
25	12-6466-47	Wire Ball Guide 5-7/32"
26	A-9415-2	Jet Bumper Coil Assembly
27	12-7017	Wire Ball Guide 9-1/4"
28	12-6466-30	Wire Ball Guide 7-1/2"
29	A-15102	Left Ramp
30	A-14875-1	Left Kicker
a)	B-11203-L-1	Coil & Bracket Assembly
31	A-15205-L-2	Lower Left Flipper
32	B-11873	Kickback
33	A-14691-5	White Stationary Target
34	A-14691-4	Red Stationary Target
35	A-14691-6	Yellow Stationary Target
36	A-14691-2	Green Stationary Target
37	A-14315	Opto LED Assembly
38	A-14316	Opto Transistor Assembly

## Not Shown

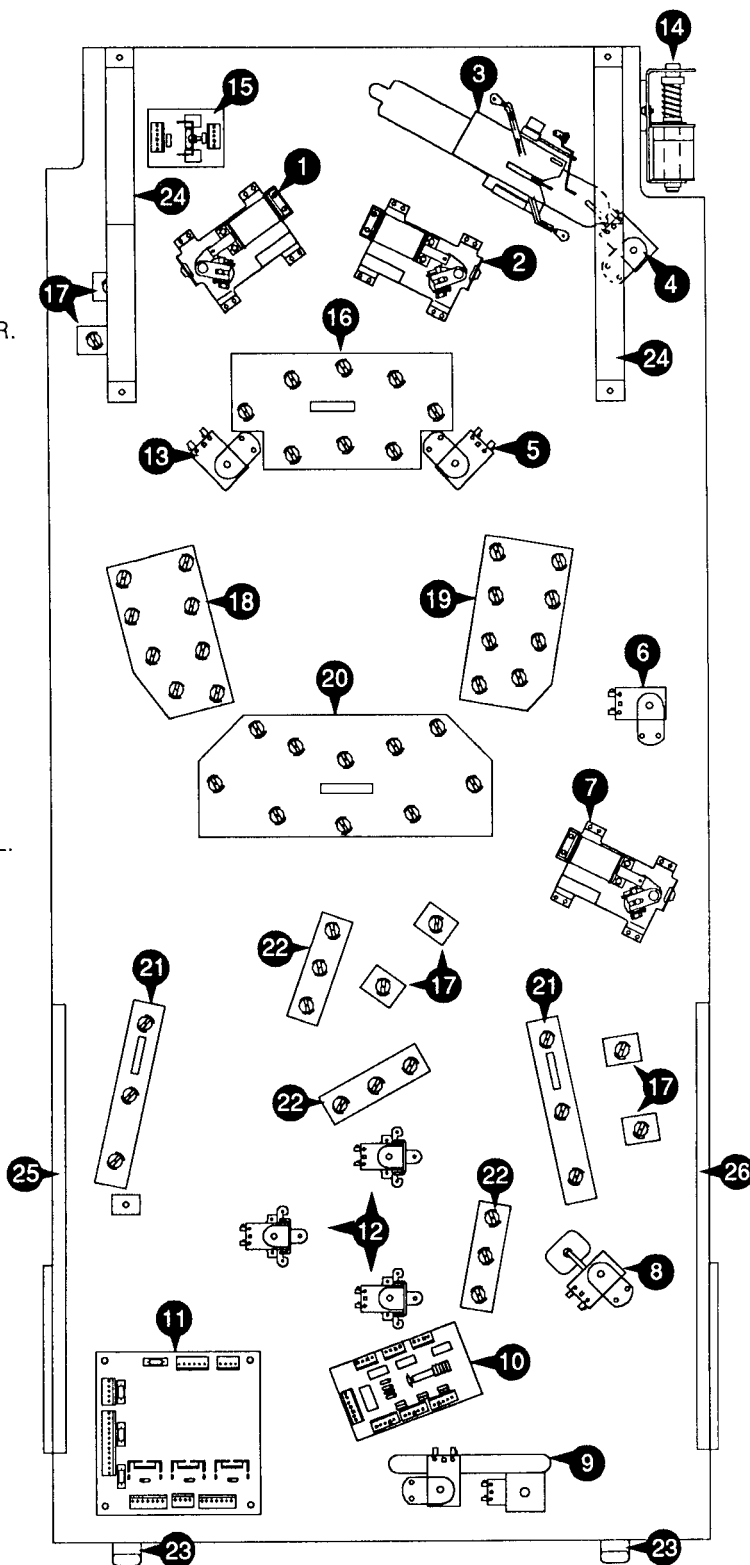
A-13204-50004	Bottom Arch Assembly
12-6842	Wire Fence
20-9041	Tinnerman Speednut
20-9045	Instruction Card Cover
16-50004-1	Instruction Card
23-6131-1	Rubber Grommet
31-1008-50004	Screened Bottom Arch
A-15058	Single Flipper Cabinet Switch
A-15060	Double Flipper Cabinet Switch
01-3569-1	Ball Return Runway
03-8661-2	Jet Bumper Playfield Mylar
20-6500	Steel Ball



Cabinet shown for reference

## Lower Playfield Parts

Item	Part Number	Description
1.	A-15205-L-2	Lower Left Flipper
2.	A-15205-R-2	Lower Right Flipper
3.	B-8925	Micro Switch Plate Assembly
4.	C-9638	Multiball Eject Assembly
	10-128	Spring
	B-9362-L-2	Coil & Bracket Assy.
5.	A-14875-2	Kicker Arm (Slingshot) Assy. - R.
	B-13935	Coil & Bracket Assembly
	A-8284-2	Kicker Switch Assy.
	10-128	Spring
6.	A-15127	Disappear Post Assembly
7.	A-15205-R	Upper Right Flipper
8.	B-9361-R-1	Ball Eject Assembly
	B-9362-L-2	Coil & Bracket Assembly
	10-128	Spring
9.	B-12576	Lift Mechanism Assy.
	B-9362-L-2	Coil & Bracket Assembly
10.	A-13901-1	Opto Ramp Switch Assy.
11.	A-15189	Ball Accelerator Board
12.	A-9415-2	Jet Bumper Assembly (3)
	B-12030-2	Switch & Diode Assy. (3)
13.	A-14875-1	Kicker Arm (Slingshot) Assy. - L.
	B-11203-L-1	Coil & Bracket Assembly
	A-8284-2	Kicker Switch Assy.
	10-128	Spring
14.	A-15675	Kicker Assembly
15.	C-13509-1	High Current Driver Assembly
16.	A-15144	8-Lamp PCB Assembly
17.	B-12224	Single PCB Assembly
18.	A-15143	8-Lamp PCB Assembly
19.	A-15145	8-Lamp PCB Assembly
20.	A-15146	10-Lamp PCB Assembly
21.	A-15147	3-Lamp PCB Assembly (2)
22.	C-13361	3-Lamp PCB Assembly (3)
23.	01-10726	Leg, Rear Guide (2)
24.	01-10721	Leg Support (2)
25.	A-15421-1	Playfield Slide Assy. - Left
26.	A-15421-2	Playfield Slide Assy. - Right



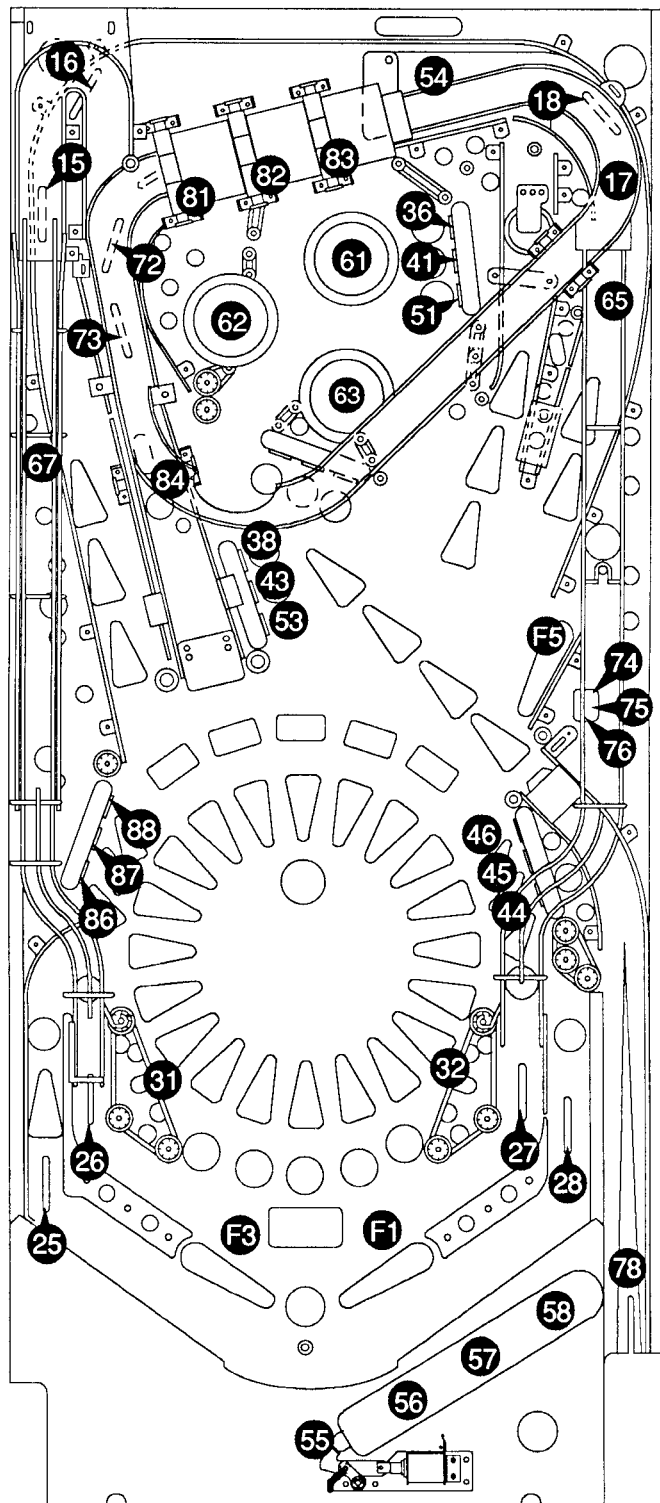
*Underside of Playfield, Viewed in Raised Position*

# Switch Locations

Item No.	Switch No.	Switch Assy No.	Description
11	SW-1A-193	A-15205-R	Upper Right Flipper*
11	SW-1A-193	A-15205-R-2	Lower Right Flipper*
12	SW-1A-193	A-15205-L-2	Left Flipper**
13	—	20-9663-1	Start Button
14	—	20-6502-A	Plumb Bob
15	5647-12693-19	A-12688L.	Freeway Bot.
16	5647-12693-19	A-12688L.	Freeway Top
17	5647-12693-19	A-12688R.	Freeway Bot.
18	5647-12693-19	A-12688R.	Freeway Top
21	—	20-1066	Slam Tilt
22	—	A-8630	Coin Door Close
23	—	(optional)	Tckt. Dispenser
24	—	A-8630	Always Closed
25	5647-12693-19	A-12688	Left Outlane
26	5647-12693-19	A-12688	L. Return Lane
27	5467-12693-19	A-12688	R. Return Lane
28	5647-12693-19	A-12688	R. Outlane
31	A-4834-H	A-8284-2	L. Slingshot
32	A-4834-H	A-8284-2	R. Slingshot
33	—	A-15419	Low Gear Shift
34	—	A-15419	High Gear Shift
35	—	—	Not Used
36	—	A-14691-4	Top Red
37	—	A-14691-4	Middle Red
38	—	A-14691-4	Bottom Red
41	—	A-14691-6	Top Yellow
42	—	A-14691-6	Middle Yellow
43	—	A-14691-6	Bottom Yellow
44	—	A-14691-5	R. Bank Bot.
45	—	A-14691-5	R. Bank Mid.
46	—	A-14691-5	R. Bank Top
47	—	—	Not Used
48	—	—	Not Used
51	—	A-14691-2	Top Green
52	—	A-14691-2	Middle Green
53	—	A-14691-2	Bottom Green
54	5647-12001-00	B-12576	Ramp Down
55	5647-12133-12	A-10417	Outhole
56	5647-09557-00	A-8925	Left Trough
57	5647-09557-00	A-8925	Center Trough
58	5647-12693-08	A-11680	Right Trough
61	—	B-12030-2	Top Jet
62	—	B-12030-2	Left Jet
63	—	B-12030-2	Bottom Jet
64	—	—	Not Used
65	5647-12693-21	A-15103	Made U/D Ramp
66	—	—	Not Used
67	5647-12693-21	A-15102	Made L. Ramp
68	—	—	Not Used
71	5647-12693-19	A-12688	Top Loop
72	5647-12693-19	A-12688	Middle Loop
73	5647-12693-19	A-12688	Bottom Loop
74	5647-12693-21	A-15103	Top Lock
75	5647-12693-21	A-15103	Middle Lock
76	5447-12693-21	A-15103	Bottom Lock
77	—	A-9381-R	Eject Hole
78	5647-12693-19	A-12688	Shooter
81	A-14316 (Trans)	A-14315 (LED)	Opto 1
82	A-14316 (Trans)	A-14315 (LED)	Opto 2
83	A-14316 (Trans)	A-14315 (LED)	Opto 3
84	A-14316 (Trans)	A-14315 (LED)	Opto Made Loop
85	A-14316 (Trans)	A-14315 (LED)	Enter Left Ramp
86	—	A-14691-5	Left Bank Bottom
87	—	A-14691-5	Left Bank Middle
88	—	A-14691-5	Left Bank Top

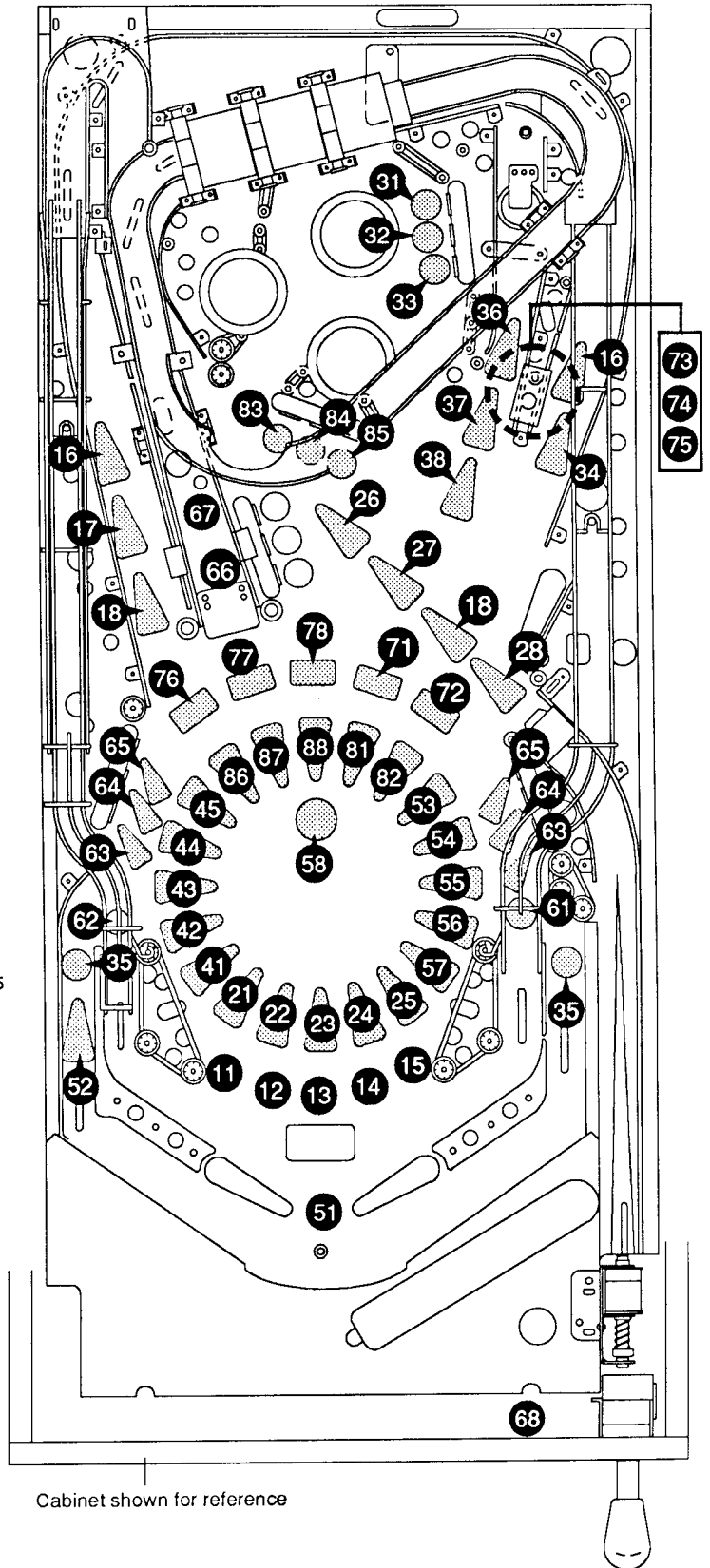
\*\* A-15058  
\*A-15060

Single Flipper Cabinet Switch  
Double Flipper Cabinet Switch



# Lamp Locations

Item No.	Bulb No.	Lamp Assy No.	Description
11	24-8768	A-15144	Freeway 1 #555
12	24-8768	A-15144	Freeway 2 #555
13	24-8768	A-15144	Freeway 3 #555
14	24-8768	A-15144	Freeway 4 #555
15	24-8768	A-15144	Freeway 5 #555
16	24-8768	A-15147/B-12224	Speed (2) #555
17	24-8768	A-15147	Left Freeway #555
18	24-8768	A-15147/B-12224	Lock (2) #555
21	24-6549	A-11754	2X #44
22	24-8768	A-15144	4X #555
23	24-8768	A-15144	Hold Bonus #555
24	24-8768	A-15144	6X #555
25	24-6549	A-11754	8X #44
26	24-8768	B-12224	Getaway #555
27	24-8768	B-12224	Speed Millions #555
28	24-6549	A-11754	Super Jackpot #44
31	24-8768	C-13361	Top Red #555
32	24-8768	C-13361	Top Yellow #555
33	24-8768	C-13361	Top Green #555
34	24-8768	B-12224	Right Freeway #555
35	24-8768	B-12224	Special (2) #555
36	24-8768	A-15147	Video Mode #555
37	24-8768	A-15147	Random Lamp #555
38	24-8768	A-15147	Extra Ball #555
41	24-6549	A-11754	Tach 1 #44
42	24-8768	A-15143	Tach 2 #555
43	24-8768	A-15143	Tach 3 #555
44	24-8768	A-15143	Tach 4 #555
45	24-8768	A-15143	Tach 5 #555
46	24-8768	C-13361	Bottom Red #555
47	24-8768	C-13361	Bottom Yellow #555
48	24-8768	C-13361	Bottom Green #555
51	24-6549	A-11754	Shoot Again #44
52	24-8768	B-12224	Kickback #555
53	24-8768	A-15145	Tach 11 #555
54	24-8768	A-15145	Tach 12 #555
55	24-8768	A-15145	Tach13 #555
56	24-8768	A-15145	Tach 14 #555
57	24-6549	A-11754	Tach 15 #44
58	24-6549	A-11754	Shift #44
61	24-8768	A-15145	Right Return Lane #555
62	24-8768	A-15143	Left Return Lane #555
63	24-8768	A-15143/A-15145	Six Bank Bottom(2) #555
64	24-8768	A-15143/A-15145	Six Bank Middle(2) #555
65	24-8768	A-15143/A-15145	Six Bank Top(2) #555
66	24-8768	A-15456-6	Supercharger #555
67	24-8768	A-15456-6	Red Line Mania #555
68	24-6549	20-9663-3	Start Button #44
71	24-8768	A-15146	4th Gear #555
72	24-8768	A-15146	5th Gear #555
73	24-8768	B-15283	Stop Light Red #555
74	24-8768	B-15283	Stop Light Yellow #555
75	24-8768	B-15283	Stop Light Green #555
76	24-8768	A-15146	1st Gear #555
77	24-8768	A-15146	2nd Gear #555
78	24-8768	A-15146	3rd Gear #555
81	24-8768	A-15146	Tach 9 #555
82	24-8768	A-15146	Tach 10 #555
83	24-8768	C-13361	Middle Red #555
84	24-8768	C-13361	Middle Yellow #555
85	24-8768	C-13361	Middle Green #555
86	24-8768	A-15146	Tach 6 #555
87	24-8768	A-15146	Tach 7 #555
88	24-8768	A-15146	Tach 8 #555



# Solenoid/Flasher Locations

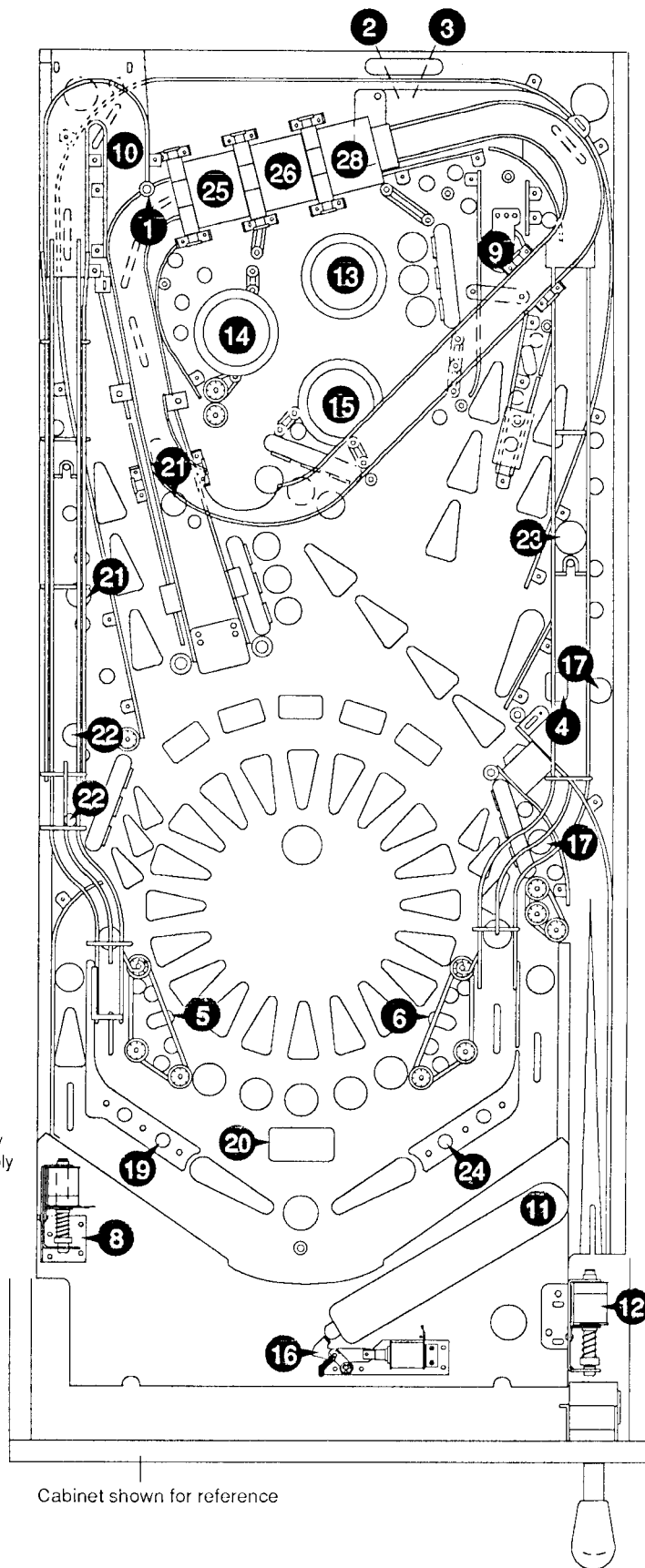
<u>Item No.</u>	<u>Coil/Flasher No.</u>	<u>Assy No.</u>	<u>Description</u>
01	A-14701	A-15297	Divterter High
02	AE-26-1200	B-9362-L-2	Up Ramp
03	SM1-28-900	B-12576	Down Ramp
04	AE-26-1200	A-15127	Dis. Post (Locker)
05	AE-26-1500	B-11203-L-1	Left Slingshot
06	AE-26-1500	B-13935	Right Slingshot
07	AE-23-800	B-10686-1	Knocker
08	AE-23-800	B-11873	Kickback
09	AE-26-1200	B-9362-L-2	Eject Hole
10	A-14701	A-15297	Divterter Low
11	AE-26-1200	C-9638	Ball Release (Trough)
12	A-14789	A-15675	Plunger Kicker
13	AE-26-1200	A-9415-2	Top Jet Bumper
14	AE-26-1200	A-9415-2	Left Jet Bumper
15	AE-26-1200	A-9415-2	Bottom Jet Bumper
16	AE-27-1200	A-8039-3	Outhole
17	24-8704	A-8789	Right Bank Flasher #89
18	24-8802	C-13337	Supercharger Flasher #906
18	24-8802	A-12336-1	Insert Flasher #906
19	24-8704	A-8789	Left Slingshot Flasher #89
19	24-8802	A-12336-1	Insert Flasher #906
20	24-8802	A-12336-1	Free Ride Flasher #906
21	24-8704	A-8789	Left Ramp Flasher #89
21	24-8802	C-13337	Left Ramp Flasher #906
21	24-8802	A-12336-1	Insert Flasher #906
22	24-8704	A-8789	Left Bank Flasher #89
23	24-8704	A-8789	Flipper Flasher #89
23	24-8802	C-13337	Flipper Flasher #906
23	24-8802	A-12336-1	Insert Flasher #906
24	24-8704	A-8789	Right Slingshot Flasher #89
24	24-8802	A-12336-1	Insert Flasher #906
25	A-15685	A-15300	Enable 1
26	A-15685	A-15300	Enable 2
27	14-7971	B-10934-1	Mars Lamp
28	A-15685	A-15300	Enable 3

## General Illumination

01	24-6549	A-11905	Playfield #44
02	24-6549	A-11905	Playfield #44
03	24-8768	---	Insert #555
04	24-8768	---	Insert #555
05	24-8768	---	Insert #555

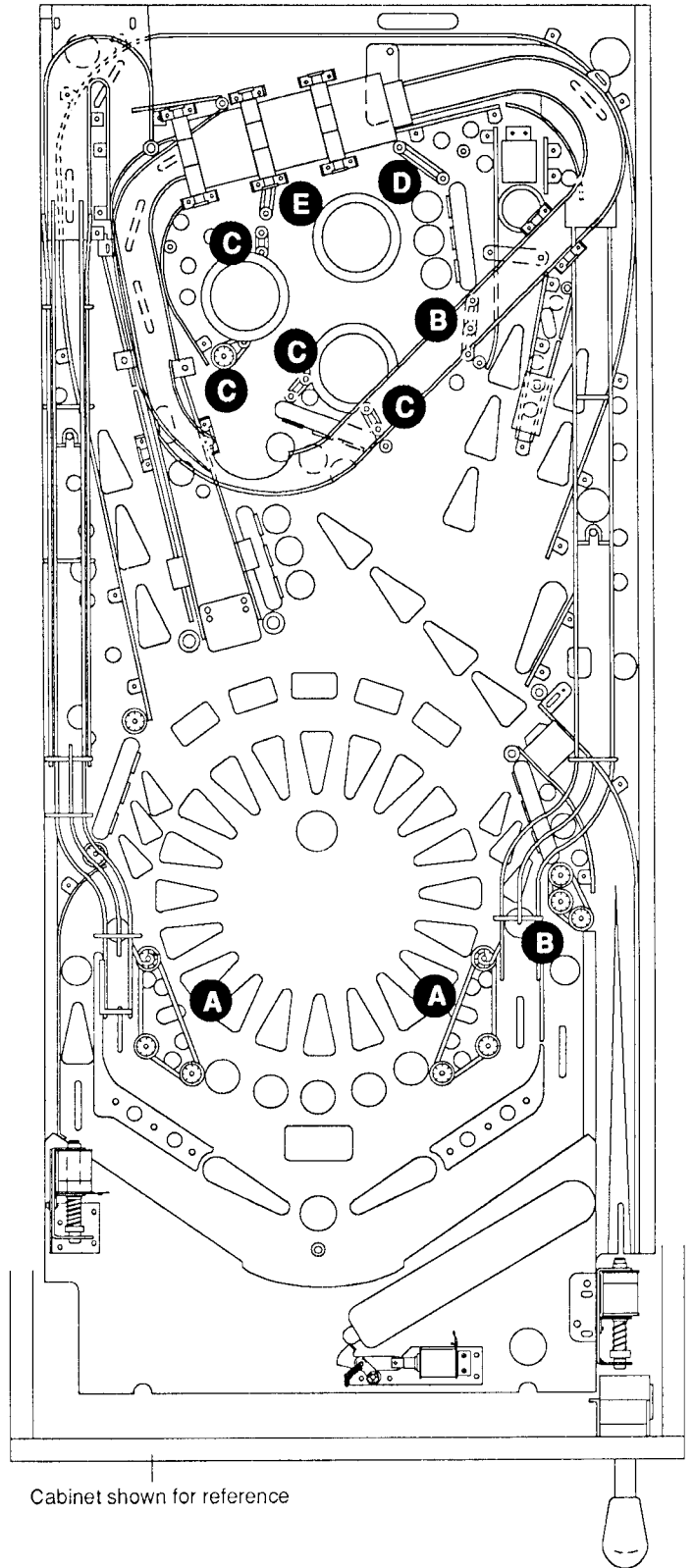
## Flippers

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



# Rubber Rings

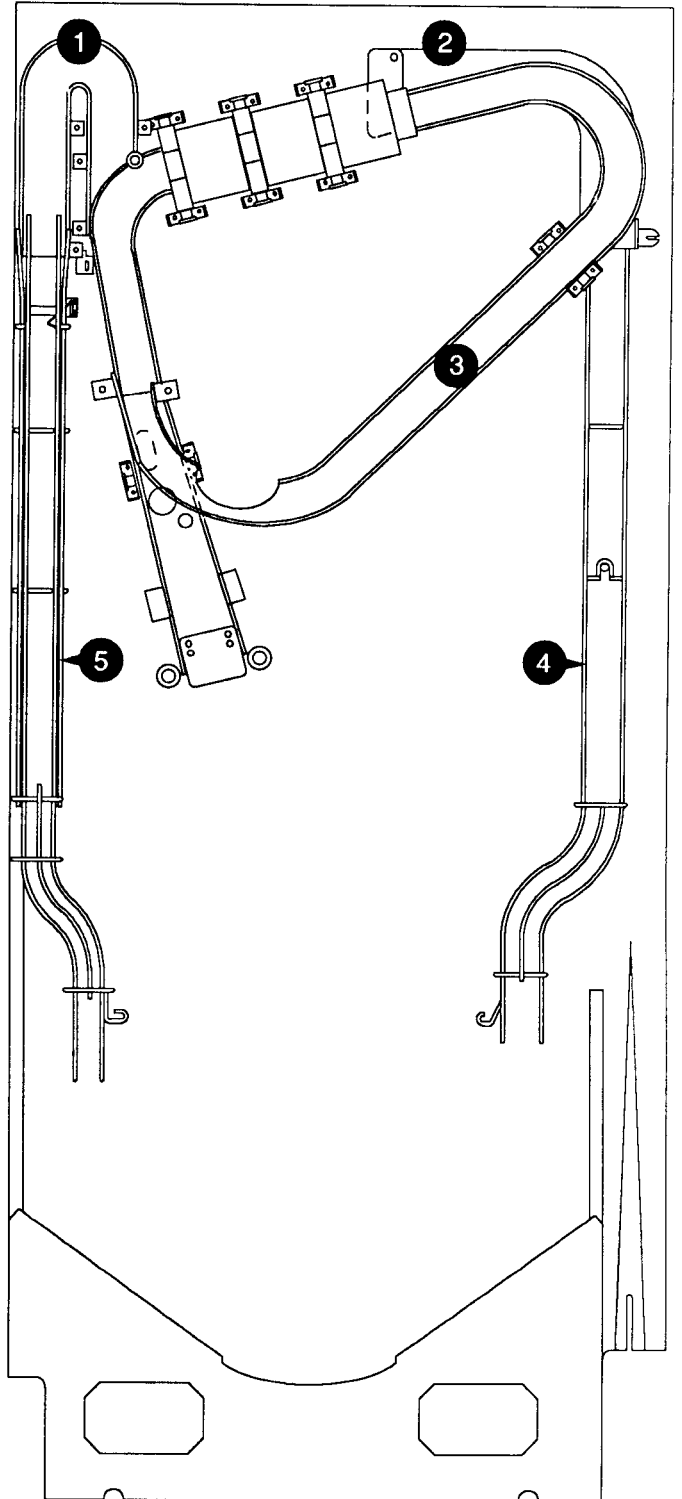
Item	Part Number	Description	Quantity
A	23-6306	Rubber Ring, 2-1/2"	2
B	23-6303	Rubber Ring, 1-1/4"	3
C	23-6599	Rubber Ring, 7/16"	8
D	23-6302	Rubber Ring, 1"	2
E	23-6301	Rubber Ring, 3/4"	2





# Ramp Locations

Item	Part Number	Description
1.	A-15297	Accelerator Ramp Assembly
2.	A-15101	Ramp Assembly, Right
3.	A-15293	Accelerator Return Assy.
4.	A-15103	Wire Ramp Assembly, Right
5.	A-15102	Wire Ramp Assembly, Left



# Section 3

## *Wiring Diagrams and Schematics*

### **CONNECTOR & COMPONENT IDENTIFICATION**

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

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

Prefix numbers for the WPC circuit boards are listed below.

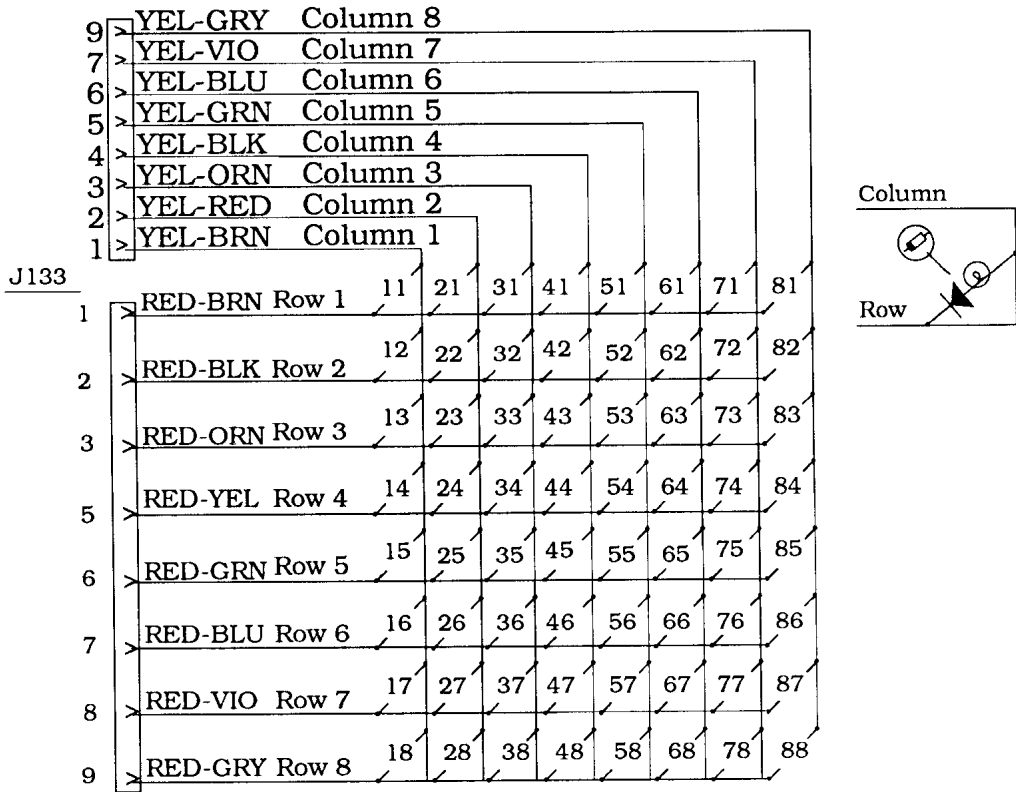
- 1- Power Driver Board
- 2- CPU Board
- 5- Sound Board
- 6- Dot Matrix Controller  
Dot Matrix Display/Driver Board
- 9-Fliptronic II Controller Board

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

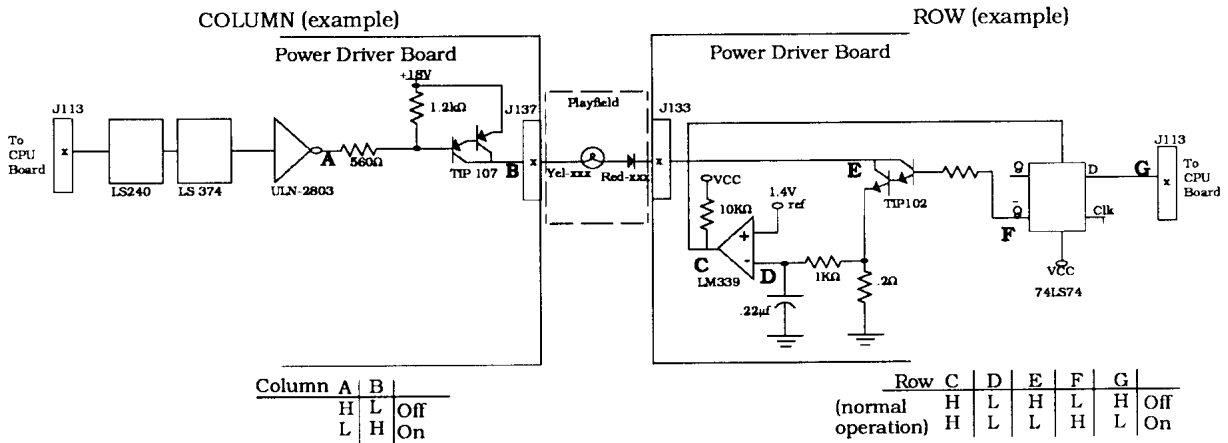
# LAMP MATRIX

Yellow (B+)  Red

Column \ Row	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J137-7 Q92	8 Yellow-Gray J138-9 Q91
1 Red-Brown J133-1 Q90	Freeway 1 11	2X 21	Top Red 31	Tach 1 41	Shoot Again 51	Right Return Lane 61	4th Gear 71	Tach 9 81
2 Red-Black J133-2 Q89	Freeway 2 12	4X 22	Top Yellow 32	Tach 2 42	Kickback 52	Left Return Lane 62	5th Gear 72	Tach 10 82
3 Red-Orange J133-4 Q88	Freeway 3 13	Hold Bonus 23	Top Green 33	Tach 3 43	Tach 11 53	Six Bank Bottom 63	Stop Light Red 73	Middle Red 83
4 Red-Yellow J133-5 Q87	Freeway 4 14	6X 24	Right Freeway 34	Tach 4 44	Tach 12 54	Six Bank Middle 64	Stop Light Yellow 74	Middle Yellow 84
5 Red-Green J133-6 Q86	Freeway 5 15	8X 25	Special 35	Tach 5 45	Tach 13 55	Six Bank Top 65	Stop Light Green 75	Middle Green 85
6 Red-Blue J133-7 Q85	Speed 16	Get Away 26	Video Mode 36	Bottom Red 46	Tach 14 56	Super Charger 66	1st Gear 76	Tach 6 86
7 Red-Violet J133-8 Q84	Left Freeway 17	Speed Millions 27	Random Lamp 37	Bottom Yellow 47	Tach 15 57	Red Line Mania 67	2nd Gear 77	Tach 7 87
8 Red-Gray J133-9 Q83	Lock 18	Super Jackpot 28	Extra Ball 38	Bottom Green 48	Shift 58	Start Button 68	3rd Gear 78	Tach 8 88

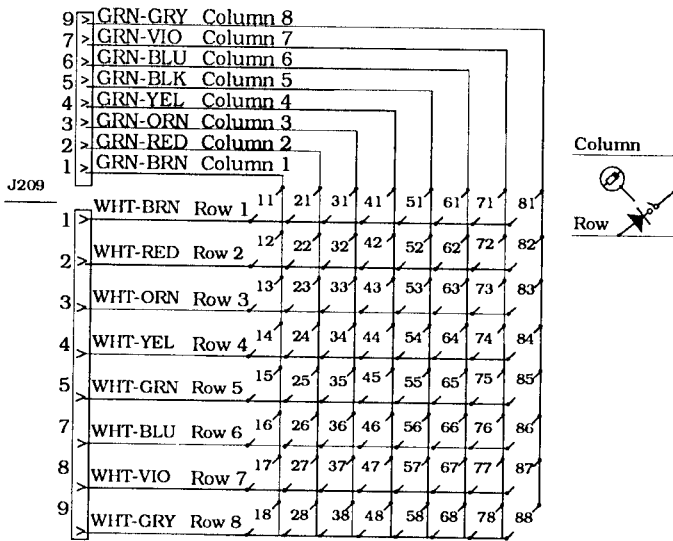


### Lamp Circuit



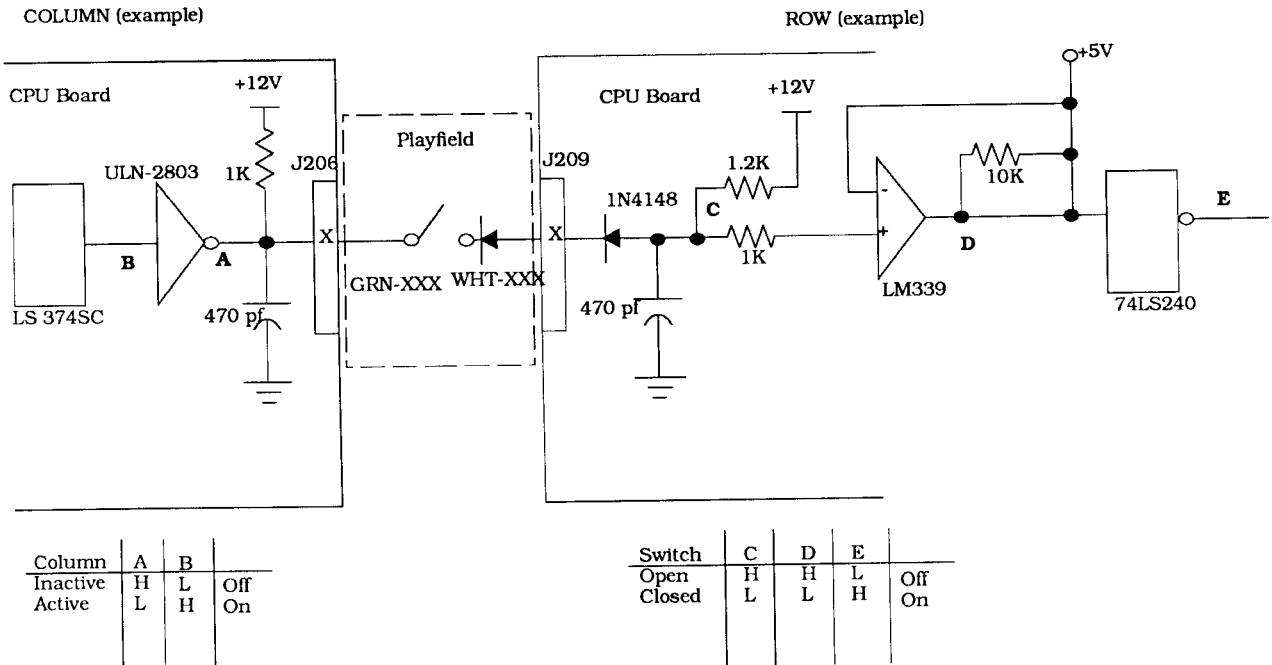
# SWITCH MATRIX

J206

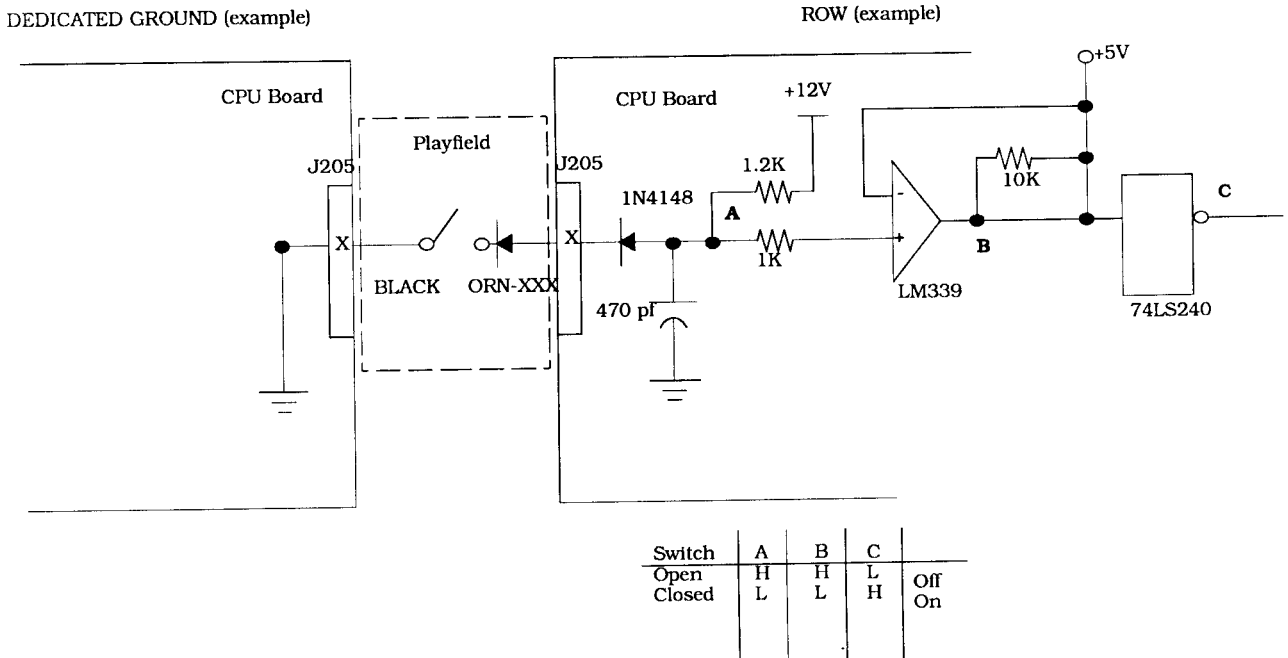


Dedicated Grounded Switches	White → ← Green								Flipper Grounded Switches	
	Column Row	1 Green-Brown J206-1 U20-18	2 Green-Red J206-2 U20-17	3 Green-Orange J206-3 U20-16	4 Green-Yellow J206-4 U20-15	5 Green-Black J206-5 U20-14	6 Green-Blue J206-6 U20-13	7 Green-Violet J206-7 U20-12		8 Green-Gray J206-8 U20-11
Orange-Brown (1) J205-1 Left Coin Chute D1	1 White-Brown J209-1 U18-11	Not Used 11	Slam Tilt 21	Left Sling 31	Top Yellow 41	Top Green 51	Top Jet 61	Top Loop 71	Opto 1 81	Black-Green J906-1 Right Flipper End of Stroke F1
Orange-Red (2) J205-2 Center Coin Chute D2	2 White-Red J209-2 U18-9	Not Used 12	Coin Door Closed 22	Right Sling 32	Middle Yellow 42	Middle Green 52	Left Jet 62	Middle Loop 72	Opto 2 82	Blue-Violet J905-1 Right Flipper Button F2
Orange-Black (3) J205-3 Right Coin Chute D3	3 White-Orange J209-3 U18-5	Start Button 13	Ticket Opto. 23	Gear Shifter Low 33	Bottom Yellow 43	Bottom Green 53	Bottom Jet 63	Bottom Loop 73	Opto 3 83	Black-Blue J906-3 Left Flipper End of Stroke F3
Orange-Yellow (4) J205-4 4th Coin Chute D4	4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Gear Shifter High 34	Right Bank Bottom 44	Ramp Down 54	Not Used 64	Top Lock 74	Opto Made Loop 84	Blue-Gray J905-2 Left Flipper Button F4
Orange-Green (5) J205-6 Normal Function Service Credits Test Function Escape D5	5 White-Green J209-5 U19-11	Left Freeway Bottom 15	Left Outlane 25	Not Used 35	Right Bank Middle 45	Outhole 55	Made Up/Down Ramp 65	Middle Lock 75	Enter Left Ramp 85	Black-Violet J906-4 Upper Right Flipper End of Stroke F5
Orange-Blue (6) J205-7 Normal Function Volume Down Test Function Down D6	6 White-Blue J209-7 U19-9	Left Freeway Top 16	Left Return Lane 26	Top Red 36	Right Bank Bottom 46	Left Trough 56	Not Used 66	Bottom Lock 76	Left Bank Bottom 86	Black-Yellow J905-3 Upper Right Flipper Button F6
Orange-Violet (7) J205-8 Normal Function Volume Up Test Function Up D7	7 White-Violet J209-8 U19-5	Right Freeway Bottom 17	Right Return Lane 27	Middle Red 37	Not Used 47	Center Trough 57	Made Left Ramp 67	Eject Hole 77	Left Bank Middle 87	Black-Gray J906-5 Upper Left Flipper End of Stroke F7
Orange-Gray (8) J205-9 Normal Function Begin Test Test Function Enter D8	8 White-Gray J209-9 U19-7	Right Freeway Top 18	Right Outlane 28	Bottom Red 38	Not Used 48	Right Trough 58	Not Used 68	Shooter 78	Left Bank Top 88	Black-Blue J905-5 Upper Left Flipper Button F8

## Switch Matrix Circuit



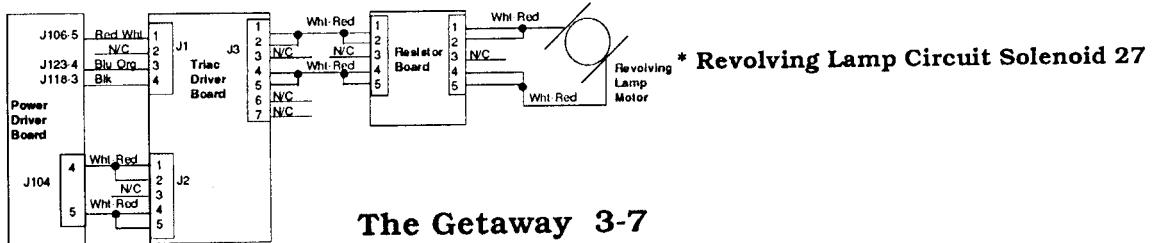
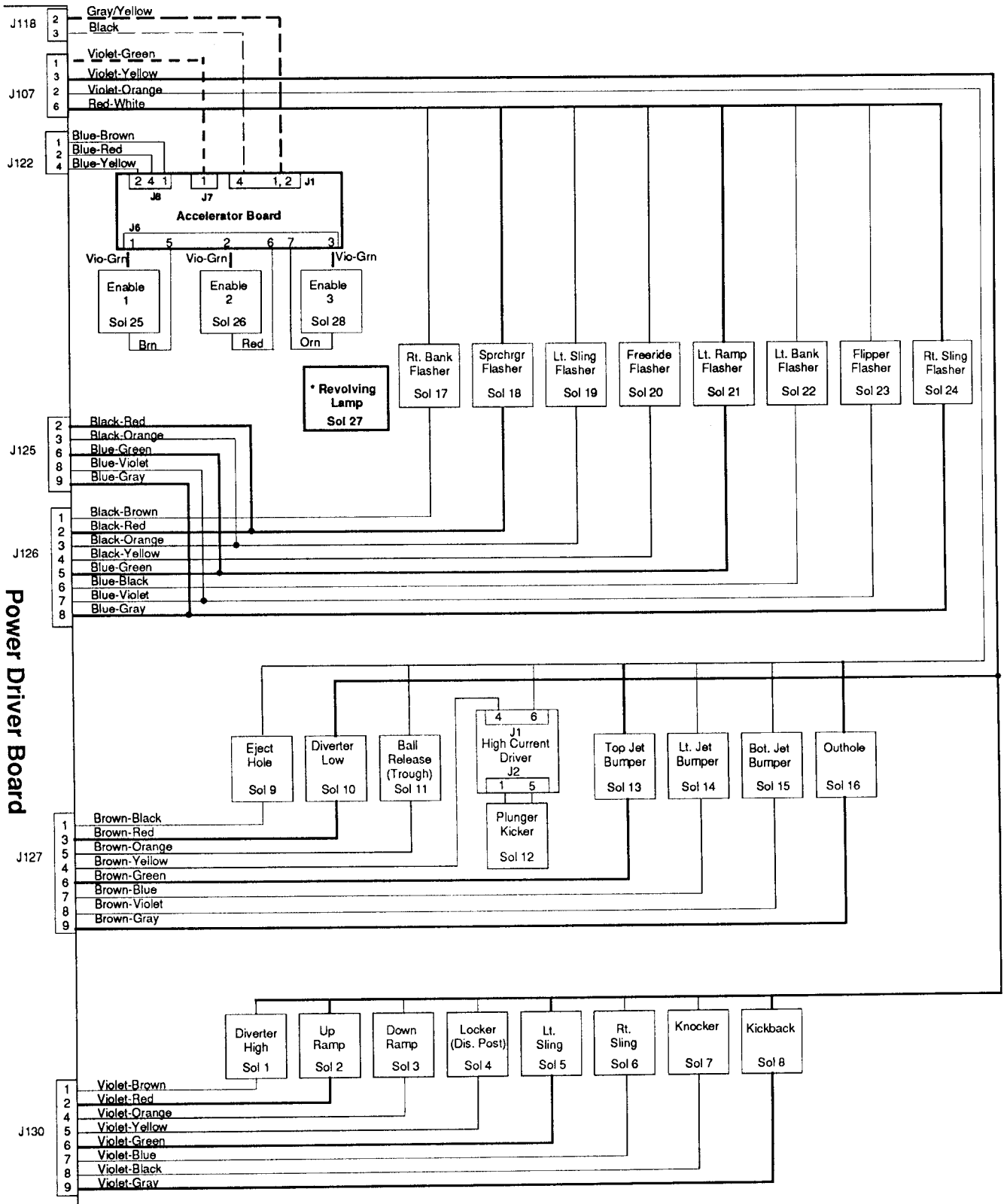
## Dedicated Switch Circuit



## Solenoid Table

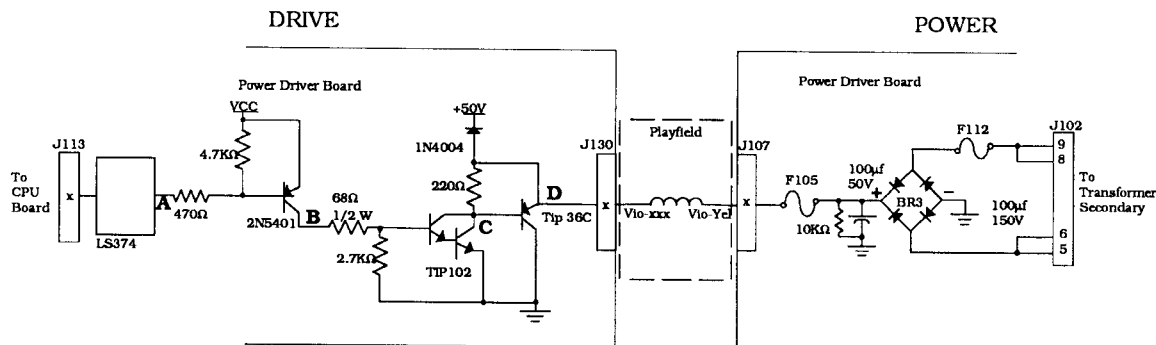
Sol. No.	Function	Solenoid Type	Wire Color	Connections	Driver Trnstr	Solenoid Part Number Flashlamp Type
01	Diverter High	High Power	Vio-Brn	J130-1		
02	Up Ramp	High Power	Vio-Red	J130-2	Q82	A-14701
03	Down Ramp	High Power	Vio-Org	J130-4	Q80	AE-26-1200
04	Locker (Disappearing Post)	High Power	Vio-Yel	J130-5	Q78	SM1-28-900-DC
05	Left Slingshot	High Power	Brn-Grn	J130-6	Q76	AE-26-1200
06	Right Slingshot	High Power	Vio-Blu	J130-7	Q64	AE-26-1500
07	Knocker	High Power	Vio-Blk	J130-8	Q66	AE-26-1500
08	Kickback	High Power	Vio-Gry	J130-9	Q68	AE-23-800
09	Eject Hole	Low Power	Brn-Blk	J127-1	Q70	AE-23-800
10	Diverter Low	Low Power	Brn-Red	J127-3	Q58	AE-26-1200
11	Ball Release (Trough)	Low Power	Brn-Org	J127-4	Q56	A-14701
12	Plunger Kicker	Low Power	Brn-Yel	J127-5	Q54	AE-26-1200
13	Top Jet Bumper	Low Power	Brn-Grn	J127-6	Q52	A-14789
14	Left Jet Bumper	Low Power	Brn-Blu	J127-7	Q50	AE-26-1200
15	Bottom Jet Bumper	Low Power	Brn-Vio	J127-8	Q48	AE-26-1200
16	Outhole	Low Power	Brn-Gry	J127-9	Q46	AE-26-1200
17	Right Bank Flasher	Flasher	Blk-Brn	J126-1	Q44	AE-27-1200
18	Supercharger Flasher	Flasher	Blk-Red	J126-2 J125-2	Q42	#89 1PL
19	Left Slingshot Flasher	Flasher	Blk-Org	J126-3 J125-3	Q40	#906 1PL - 1BB
20	Free Ride Flasher	Flasher	Blk-Yel	J126-4	Q38	#89/#906 1PL/1BB
21	Left Ramp Flasher	Flasher	Blu-Grn	J126-5 J125-6	Q36	#906 1PL
22	Left Bank Flasher	Flasher	Blu-Blk	J126-6	Q28	#89/#906 2PL/1PL - 1BB
23	Flipper Flasher	Flasher	Blu-Vio	J126-7 J125-8	Q30	#89 2PL
24	Right Slingshot Flasher	Flasher	Blu-Gry	J126-8 J125-9	Q34	#89/#906 1PL/1PL - 1BB
25	Enable 1	Low Power	Blu-Brn	J122-1	Q32	#89/#906 1PL/1BB
26	Enable 2	Low Power	Blu-Red	J122-2	Q26	A-15685
27	Revolving Lamp	Low Power	Blu-Org		Q24	A-15685
28	Enable 3	Low Power	Blu-Yel	J122-4	Q22	14-7971
					Q20	A-15685
	<b>General Illumination</b>			<b>Playfield - Insert - Cabinet</b>		
01	Playfield G.I.	G.I.	Wht-Brn	J120-7	Q18	
02	Playfield G.I.	G.I.	Wht-Org	J120-8	Q10	
03	Insert G.I.	G.I.	Wht-Yel	J121-9	Q14	
04	Insert G.I.	G.I.	Wht-Grn	J121-10	Q16	
05	Insert G.I.	G.I.	Wht-Vio	J121-11 J119-1	Q12	
				<b>Playfield</b>		
	Lower Right Flipper		Blu-Yel	J907-8, 9		FL-11629
	Lower Left Flipper		Gry-Yel	J907-6, 7		FL-11629
	Upper Right Flipper		Blu-Yel	J907-4, 5		FL-11630

# Solenoid Wiring



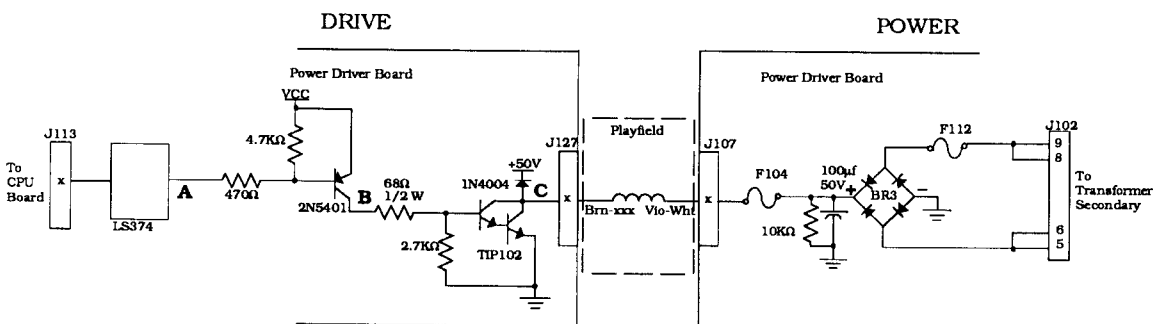


## High Power Solenoid Circuit



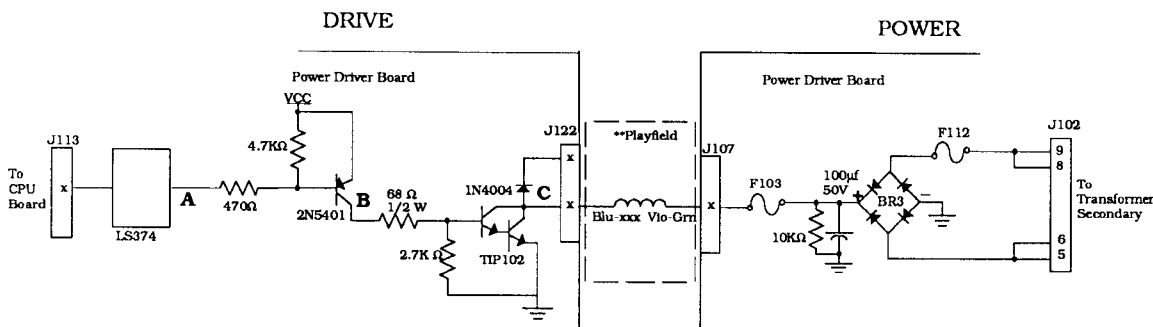
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" the collector of the 2N5401 transistor is high. A high at point "B" causes point "C" the collector of the TIP102 transistor, and point "D" the emitter of the TIP36 transistor to drop low. When point "D" is low the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

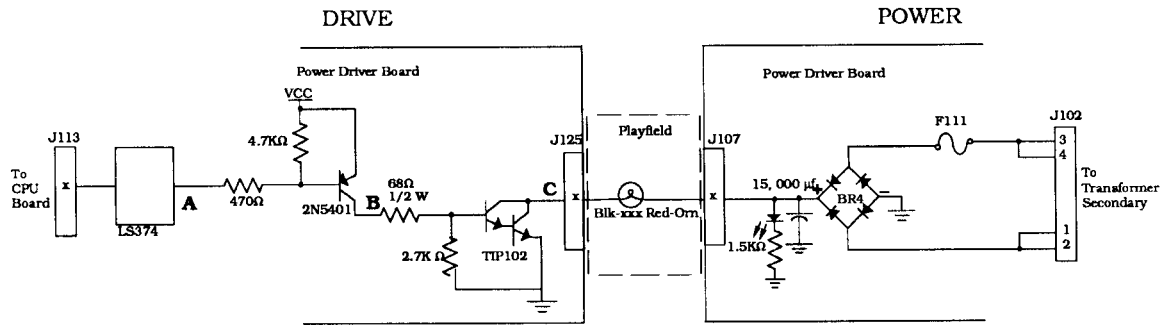
## Special (General Purpose) Solenoid Circuit



\* \*Playfield Circuit When used for coil driver only (either +50V or +20V). If used for flashlamp driver see playfield circuit below. Tieback Diode is not used for flashlamp circuit.

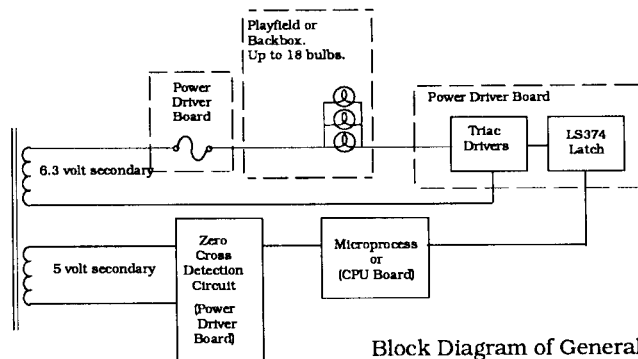
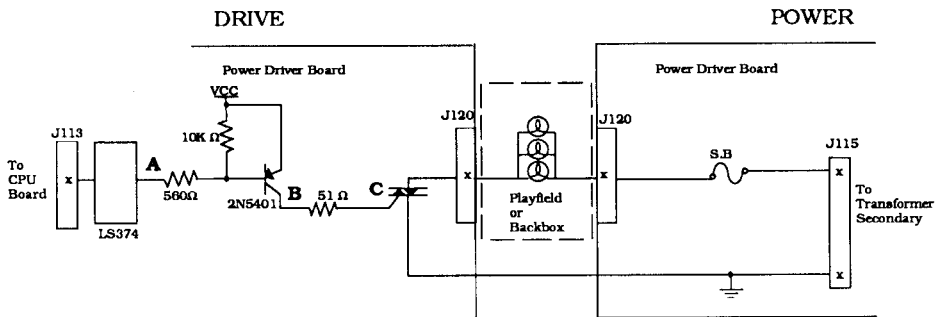
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" is high. A high at point "B" causes a low at point "C". When point "C" is low the coil/flashlamp is grounded through the transistor and the coil/flashlamp turns On. When point "A" toggles high the coil/flashlamp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

## 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.

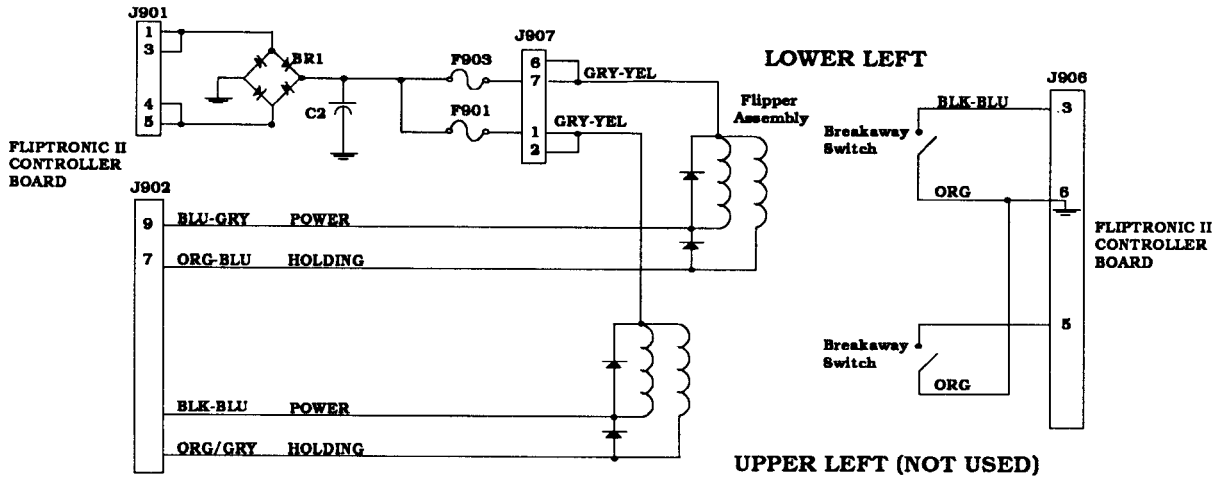
## General Illumination



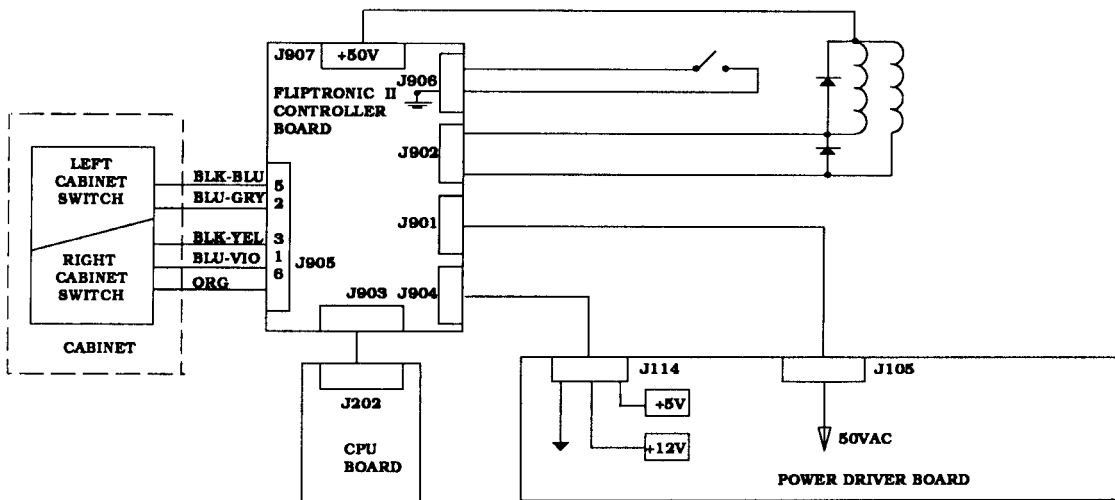
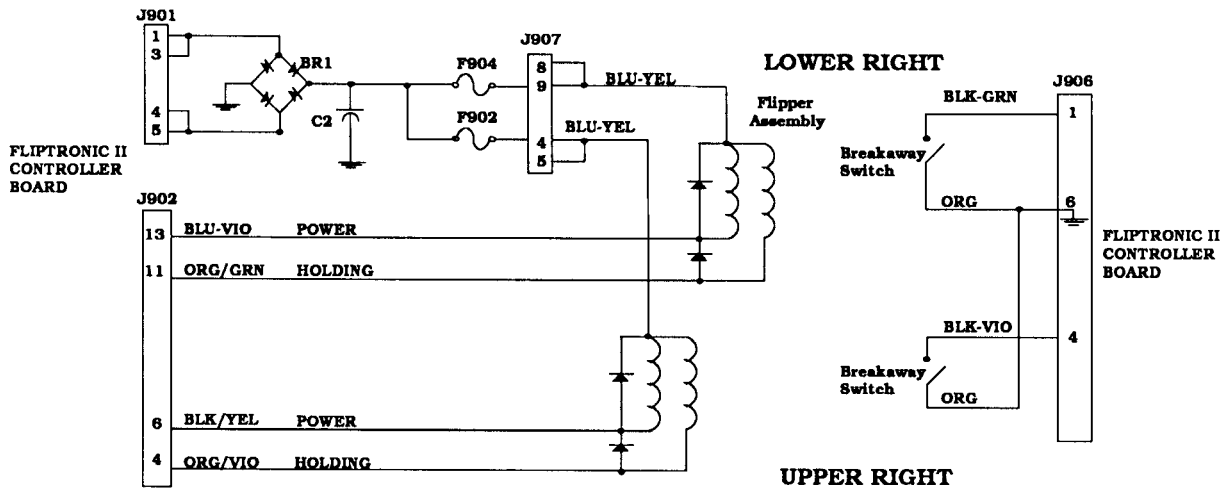
Block Diagram of General Illumination Circuit

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

## Left Flipper Circuit

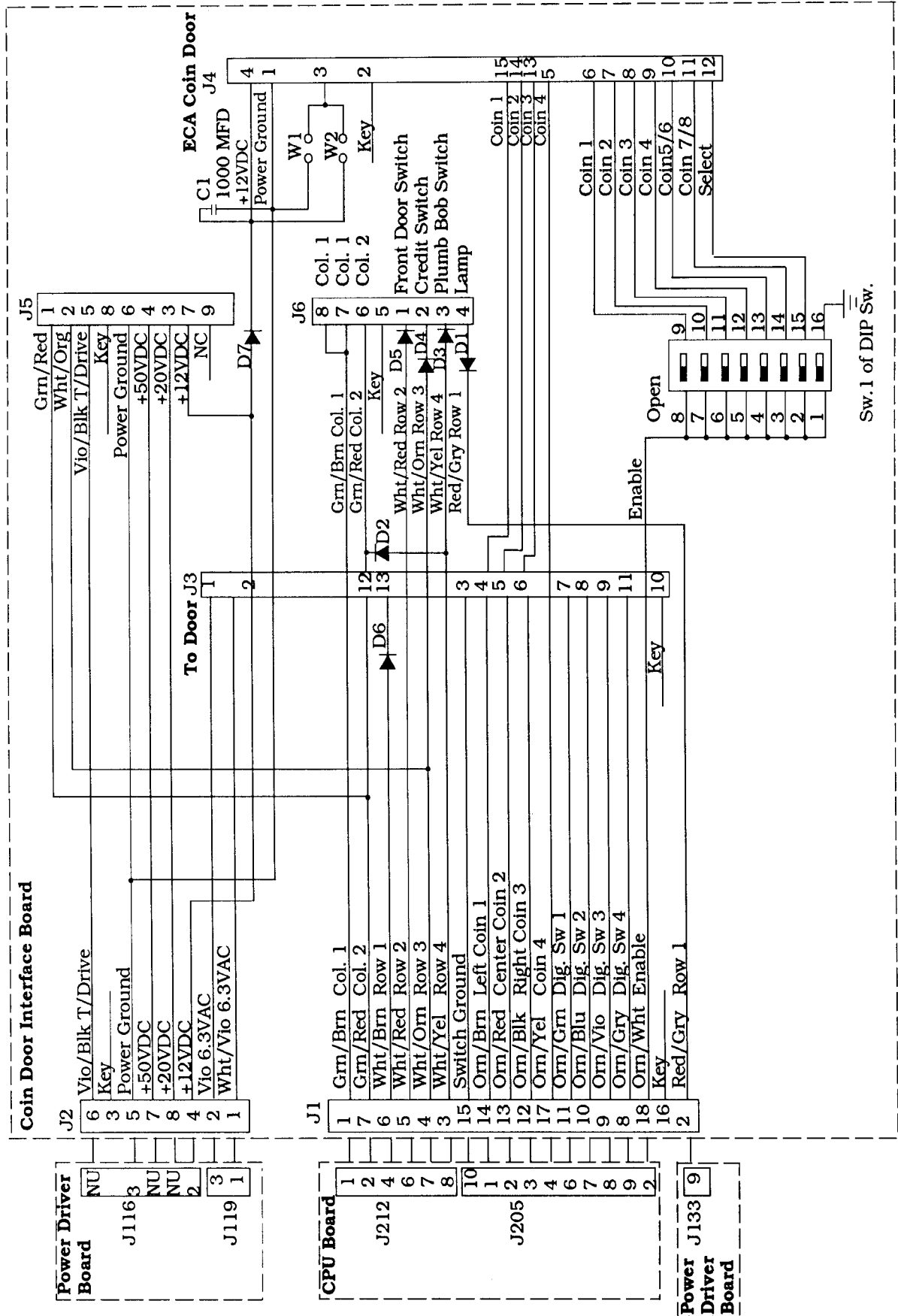


## Right Flipper Circuit

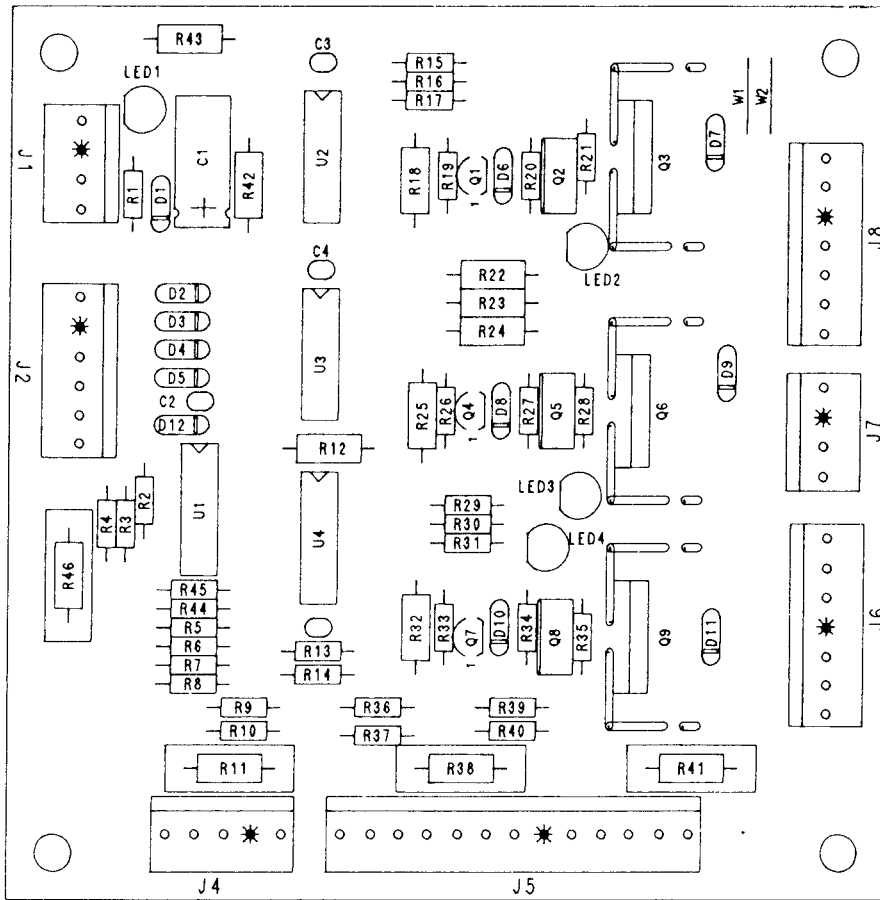


## Block Diagram Of Flipper Circuit

# A-14689 Coin Door Interface Board Schematic



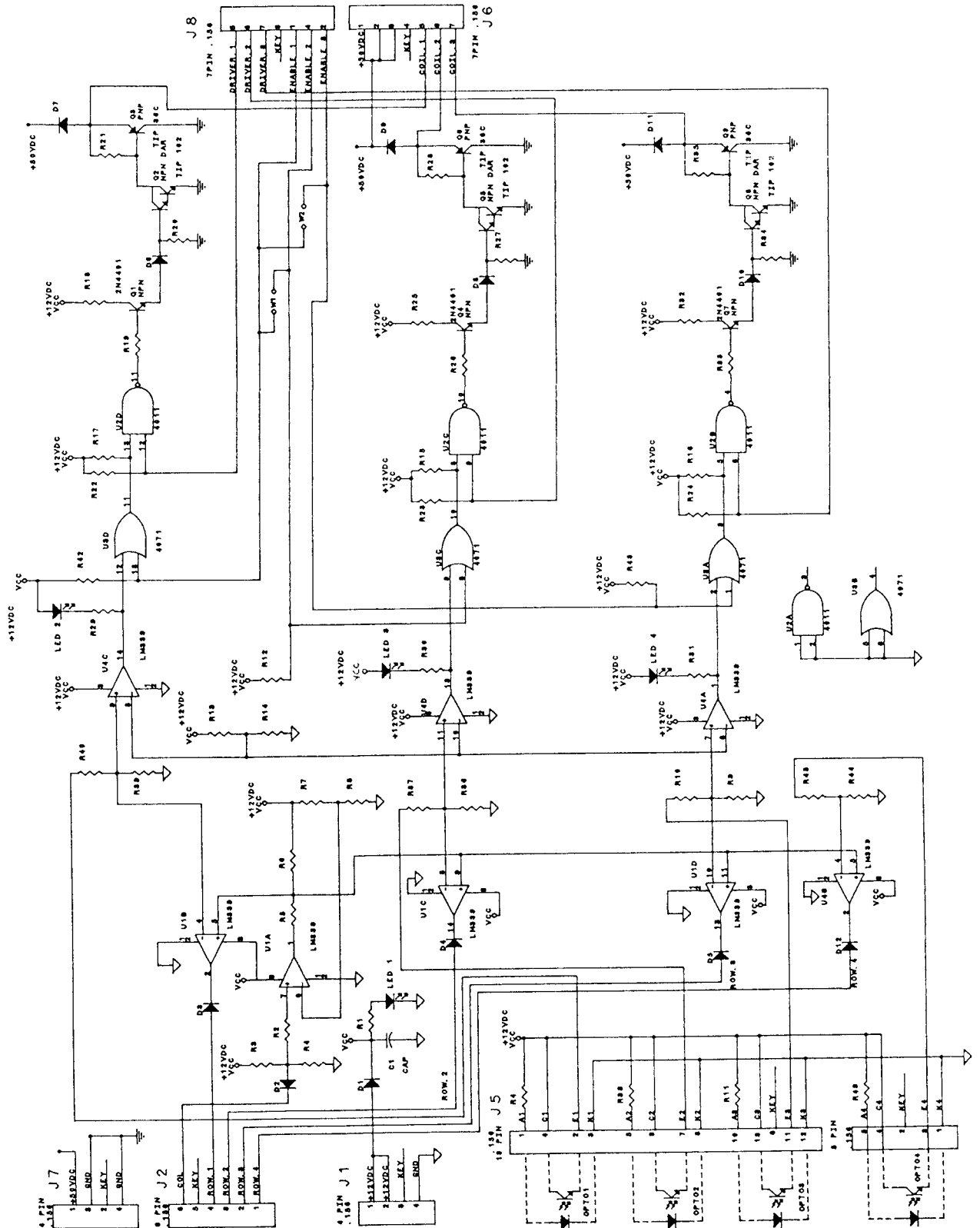
# A-15189 Accelerator Board Assembly



- J1 - 1 Gray-Yellow (+12V) from Power Driver Board J118-2
- J1 - 2 Gray-Yellow (+12V) loop from J1-1
- J1 - 3 N/C
- J1 - 4 Black (Ground) from Power Driver J118-3
  
- J2 - 1 N/C
- J2 - 2 White-Orange (Switch Row #3) from CPU Board J209-3
- J2 - 3 White-Red (Switch Row #2) from CPU Board J209-2
- J2 - 4 White-Brown (Switch Row #1) from CPU Board J209-1
- J2 - 5 N/C
- J2 - 6 Green-Gray (Switch Column #8) from CPU Board J206-1
  
- J4 Not Used
  
- J5 - 1 Red to Switch #81 Opto LED
- J5 - 2 Green -Brown to Switch #81 Opto Transistor
- J5 - 3 Black to Switch #81 Opto LED
- J5 - 4 White-Brown to Switch #81 Opto Transistor
- J5 - 5 Red to Switch #82 Opto LED
- J5 - 6 N/C
- J5 -7 Green-Red to Switch #82 Opto Transistor
- J5 - 8 Black to Switch #82 Opto LED
- J5 - 9 White-Red to Switch #82 Opto Transistor
- J5 - 10 Red to Switch #83 Opto LED
- J5 - 11 Green-Orange to Switch #83 Opto Transistor
- J5 - 12 Black to Switch #83 Opto LED
- J5 - 13 White-Orange to Switch #83 Opto Transistor

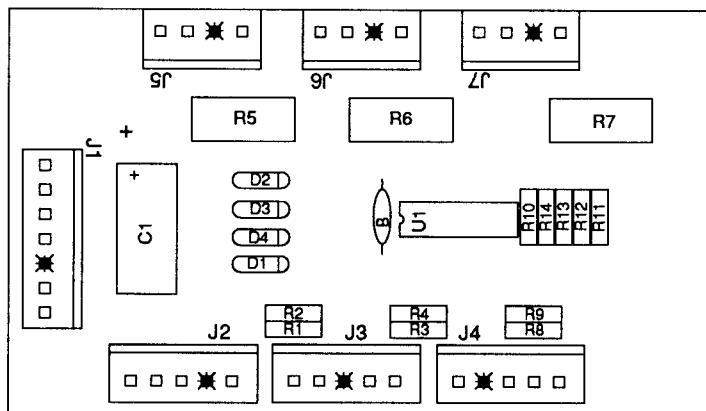
- J6 - 1 Violet-Green (Power) to Solenoid #25
- J6 - 2 Violet-Green (Power) to Solenoid #26
- J6 - 3 Violet-Green (Power) to Solenoid #28
- J6 - 4 N/C
- J6 - 5 Brown (Drive) to Solenoid #25
- J6 - 6 Red (Drive) to Solenoid #26
- J6 - 7 Orange (Drive) to Solenoid #28
  
- J7 - 1 Violet-Green (Power) from Power Driver Board J107-1
- J7 - 2 N/C
- J7 - 3 Black (Ground) from Power Driver Board J131-1, 4
- J7 - 4 Black (Ground) from Power Driver Board J131-1, 4
  
- J8 - 1 Blue-Brown (Enable) from Power Driver Board J122-1
- J8 - 2 Blue-Yellow (Enable) from Power Driver Board J122-4
- J8 - 3 N/C
- J8 - 4 Blue-Red (Enable) from Power Driver Board J112-4
- J8 - 5 to J8 - 7 N/C

# A-15189 Accelerator Board Schematic



# A-13901-1

## Opto Ramp Switch Board Assembly



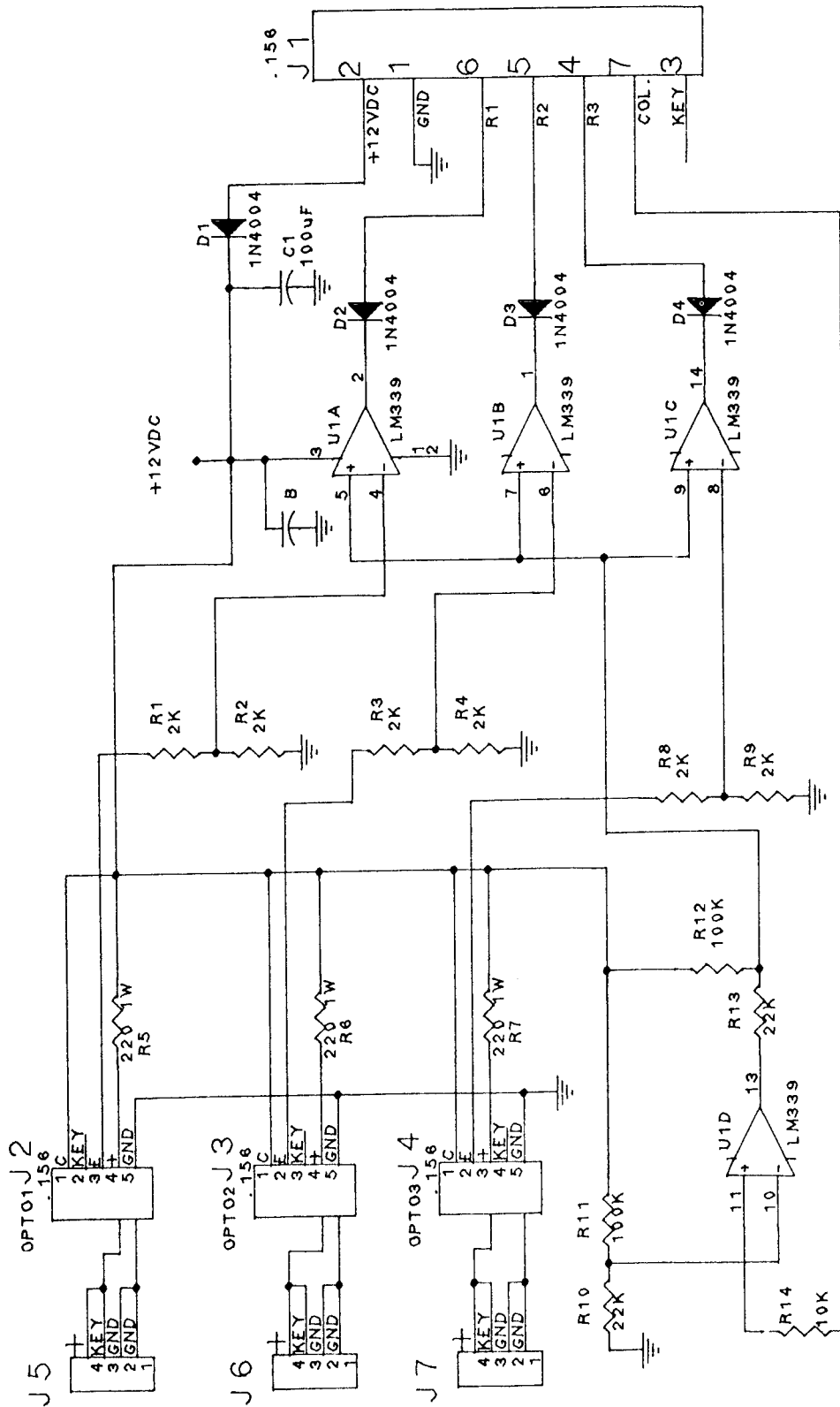
- J1 - 1** Black (Ground) from Power Driver Board J116-3
- J1 - 2** Gray-Yellow (+12V) from Power Driver Board J116-2
- J1 - 3** N/C
- J1 - 4** N/C
- J1 - 5** White-Green (Switch Row #5) from CPU Board J209-5
- J1 - 6** White-Yellow (Switch Row #4) from CPU Board J209-4
- J1 - 7** Green-Gray (Switch Column #8) from CPU Board J206-9

- J2 - 1** Black to Switch # 84 Opto LED
- J2 - 2** Red to Switch #84 Opto LED
- J2 - 3** Green-Yellow to Switch #84 Opto Transistor
- J2 - 4** N/C
- J2 - 5** White-Yellow to Switch #84 Opto Transistor

- J3 - 1** Black to Switch #85 Opto LED
- J3 - 2** Red to Switch #85 Opto LED
- J3 - 3** Green to Switch #85 Opto Transistor
- J3 - 4** N/C
- J3 - 5** White-Green to #Switch 85 Opto Transistor

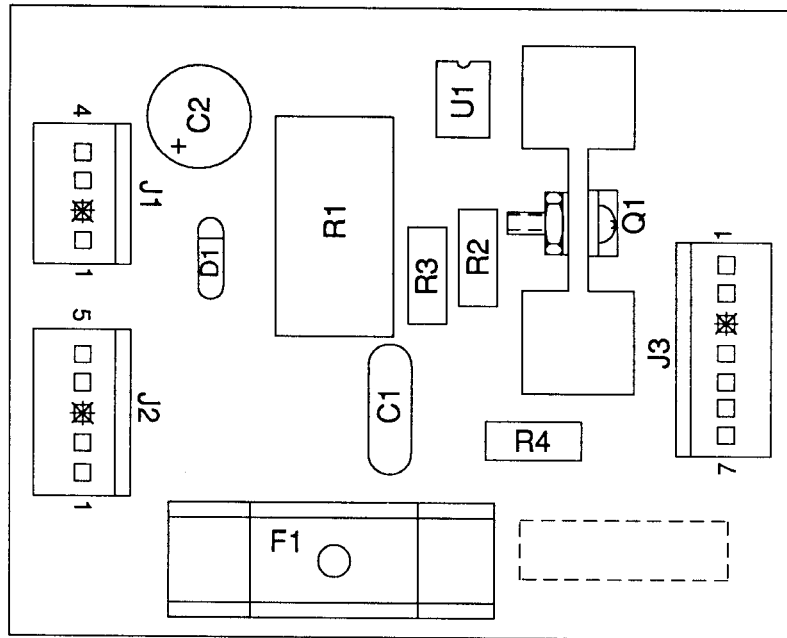
**J4 through J7 are Not Used**

# A-13901-1 Opto Ramp Switch Board Schematic



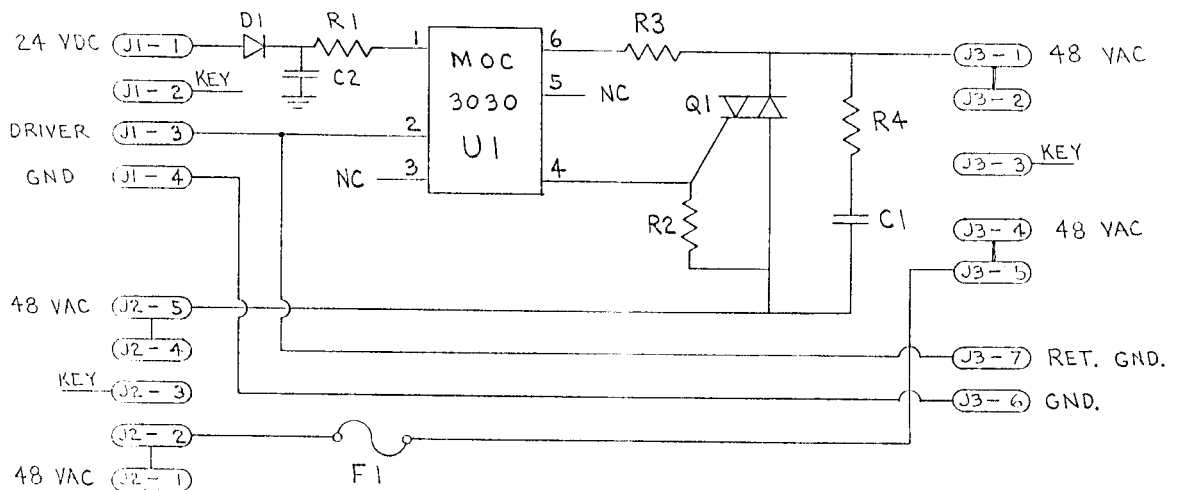


## A-13088-2 Triac Driver Board Assembly



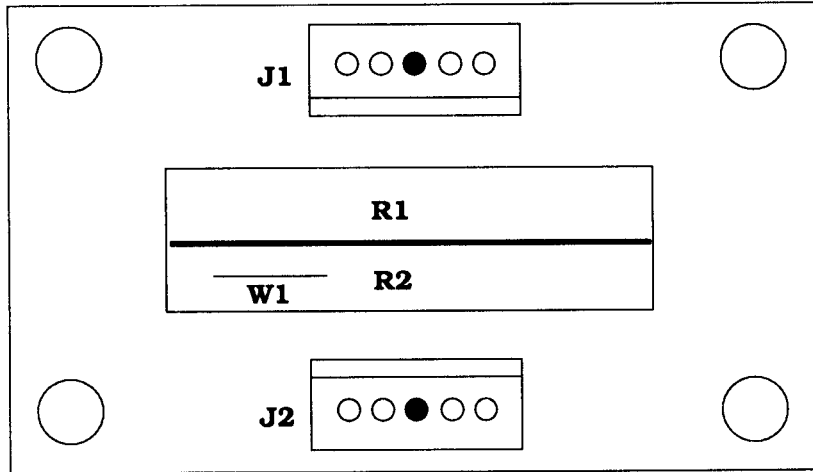
- J1 - 1** Red-White from Power Driver Board J106-3  
**J1 - 2** N/C  
**J1 - 3** Blue-Orange from Power Driver Board J123-4  
**J1 - 4** Black from Power Driver Board J118-3  
  
**J2 - 1** White-Red from Power Driver Board J104-4  
**J2 - 2** White-Red loop from J2-1  
**J2 - 3** N/C  
**J2 - 4** White-Red from Power Driver Board J104-5  
**J2 - 5** White-Red loop from J2-4

- J3 - 1** White-Red to Resistor Board J2-1  
**J3 - 2** White-Red loop from J3-1  
**J3 - 3** N/C  
**J3 - 4** White-Red to Resistor Board J2-4  
**J3 - 5** White-Red loop from J3-4  
**J3 - 6, 7** N/C



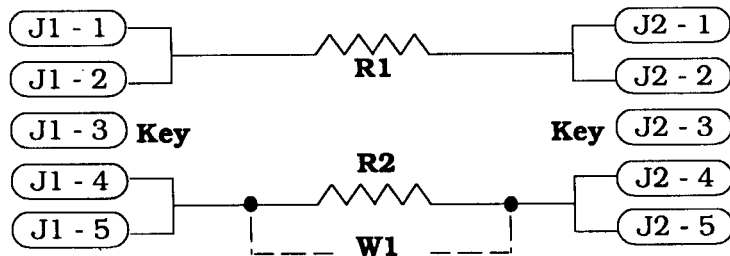
### Triac Driver Board Schematic

## A-15309 2-10W Resistor Board Assembly

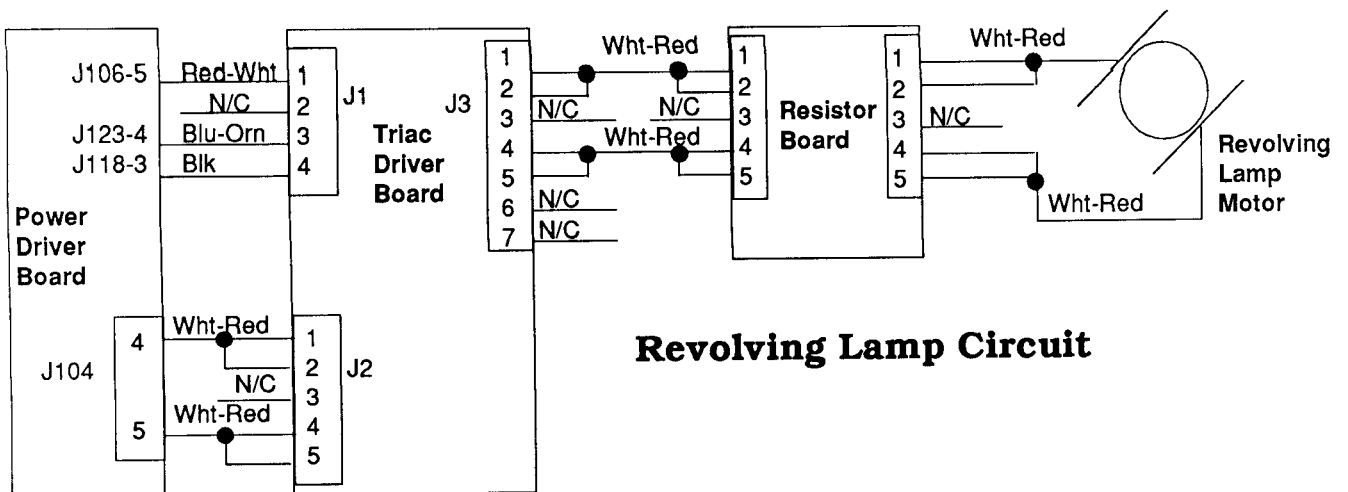


**J1 - 1** White-Red to Motor  
**J1 - 2** White-Red loop from J1-1  
**J1 - 3** N/C  
**J1 - 4** White-Red to Motor  
**J1 - 5** White-Red loop from J1-4

**J2 - 1** White-Red from Triac Board J3-1  
**J2 - 2** White-Red loop from J2-1  
**J2 - 3** N/C  
**J2 - 4** White-Red from Triac Board J3-4  
**J2 - 5** White-Red loop from J2-4

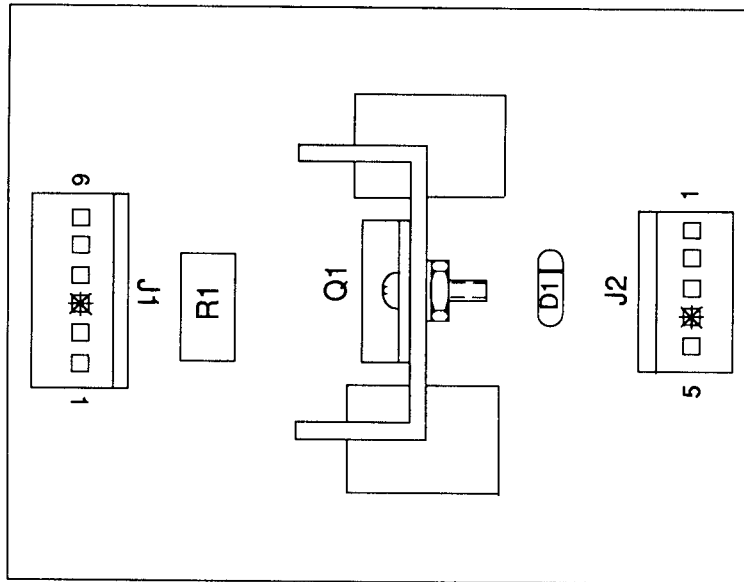


### 2-10W Resistor Board Schematic

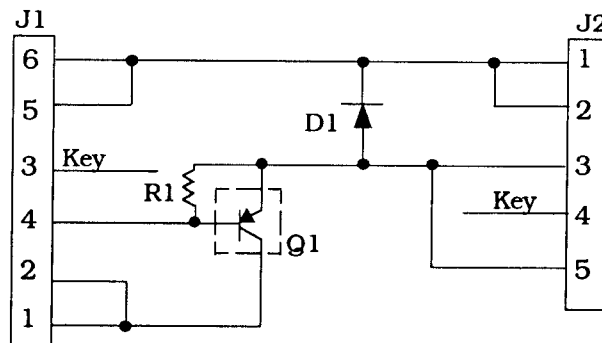


### Revolving Lamp Circuit

# C-13509-1 High Current Driver Board Assembly



- J1 - 1** Black, Ground from Power Driver Board J118-3
- J1 - 2** N/C
- J1 - 3** Key
- J1 - 4** Brown-Yellow, Solenoid 12 Driver from Power Driver Board J127-5
- J1 - 5** N/C
- J1 - 6** Violet-Orange, +50V dc from Power Driver Board J107-2
  
- J2 - 1** Violet-Orange, to Plunger Kicker Coil
- J2 - 2** Violet-Orange, jumper from J2-1
- J2 - 3** Brown, jumper from J2-5
- J2 - 4** Key
- J2 - 5** Brown, from Plunger Kicker Coil



## Switch Circuits

Connector From CPU:

<u>Wire Color</u>	<u>Function</u>	<u>To Playfield</u>	<u>To Cabinet</u>	<u>I.C.'s</u>
Green/Brown	Column 1	J206-1	J212-1	U20-18
Green/Red	Column 2	J206-2	J212-2	U20-17
Green/Orange	Column 3	J206-3	J212-3	U20-16
Green/Yellow	Column 4	J206-4		U20-15
Green/Black	Column 5	J206-5		U20-14
Green/Blue	Column 6	J206-6		U20-13
Green/Violet	Column 7	J206-7		U20-12
Green/Gray	Column 8	J206-9		U20-11
White/Brown	Row 1	J209-1	J212-4	U18-11
White/Red	Row 2	J209-2	J212-6	U18-9
White/Orange	Row 3	J209-3	J212-7	U18-5
White/Yellow	Row 4	J209-4	J212-8	U18-7
White/Green	Row 5	J209-5		U19-11
White/Blue	Row 6	J209-7		U19-9
White/Violet	Row 7	J209-8		U19-5
White/Gray	Row 8	J209-9		U19-7
Orange/Brown	Direct 1	Left Coin	J205-1	U17-5
Orange/Red	Direct 2	Center Coin	J205-2	U17-7
Orange/Black	Direct 3	Right Coin	J205-3	U17-11
Orange/Yellow	Direct 4	4th Coin	J205-4	U17-9
Orange/Green	Direct 5	Escape/Service	J205-6	U16-9
Orange/Blue	Direct 6	Down/Vol. Down	J205-7	U16-11
Orange/Violet	Direct 7	Up/Vol. Up	J205-8	U16-7
Orange/Gray	Direct 8	Enter/Test	J205-9	U16-5
Black		Ground	J205-10	
Orange/White		Enable	J205-12	

## Lamp Circuits

Connectors From Power Driver Board:

<u>Wire Color</u>	<u>Function</u>	<u>To Playfield</u>	<u>To Cabinet</u>	<u>To Backbox</u>	<u>Transistor</u>
Yellow/Brown	Column 1	J137-1			Q98
Yellow/Red	Column 2	J137-2			Q97
Yellow/Orange	Column 3	J137-3			Q96
Yellow/Black	Column 4	J137-4			Q95
Yellow/Green	Column 5	J137-5			Q94
Yellow/Blue	Column 6	J137-6			Q93
Yellow/Violet	Column 7	J137-7			Q92
Yellow/Gray	Column 8	J137-9			Q91
Red/Brown	Row 1	J133-1			Q90
Red/Black	Row 2	J133-2			Q89
Red /Orange	Row 3	J133-4			Q88
Red/Yellow	Row 4	J133-5			Q87
Red/Green	Row 5	J133-6			Q86
Red/Blue	Row 6	J133-7			Q85
Red/Violet	Row 7	J133-8			Q84
Red/Gray	Row 8	J133-9			Q83

## Solenoid Circuits

Connectors From Power Driver Board:

<u>Wire Color</u>	<u>Function</u>	<u>To Backbox</u>	<u>To Playfield</u>	<u>Transistor</u>
Violet/Brown	Solenoid 1, High Power		J130-1	Q82
Violet/Red	Solenoid 2, High Power		J130-2	Q80
Violet/Orange	Solenoid 3, High Power		J130-4	Q78
Violet/Yellow	Solenoid 4, High Power		J130-5	Q76
Violet/Green	Solenoid 5, High Power		J130-6	Q64
Violet/Blue	Solenoid 6, High Power		J130-7	Q66
Violet/Black	Solenoid 7, High Power		J130-8	Q68
Violet/Gray	Solenoid 8, High Power		J130-9	Q70
<hr/>				
Brown/Black	Solenoid 9, Low Power		J127-1	Q58
Brown/Red	Solenoid 10, Low Power		J127-3	Q56
Brown/Orange	Solenoid 11, Low Power		J127-4	Q54
Brown/Yellow	Solenoid 12, Low Power		J127-5	Q52
Brown/Green	Solenoid 13, Low Power		J127-6	Q50
Brown/Blue	Solenoid 14, Low Power		J127-7	Q48
Brown/Violet	Solenoid 15, Low Power		J127-8	Q46
Brown/Gray	Solenoid 16, Low Power		J127-9	Q44
<hr/>				
Black/Brown	Sol. 17, Flasher 1, No Diode		J126-1	Q42
Black/Red	Sol. 18, Flasher 2, No Diode	J125-2	J126-2	Q40
Black/Orange	Sol. 19, Flasher 3, No Diode	J125-3	J126-3	Q38
Black/Yellow	Sol. 20, Flasher 4, No Diode		J126-4	Q36
Blue/Green	Sol. 21, Special 1 Drive	J125-6	J126-5	Q28
Blue/Black	Sol. 22, Special 2 Drive		J126-6	Q30
Blue/Violet	Sol. 23, Special 3 Drive	J125-8	J126-7	Q34
Blue/Gray	Sol. 24, Special 4 Drive	J125-9	J126-8	Q32
<hr/>				
Blue/Brown	Sol. 25, Special 5 Drive		J122-1	Q26
Blue/Red	Sol. 26, Special 6 Drive		J122-2	Q24
Blue/Orange	Sol. 27, Special 7 Drive	J123-4		Q22
Blue/Yellow	Sol. 28, Special 8 Drive		J122-4	Q20

## Flipper Circuits

Connectors From Power Driver Board:

<u>Wire Color</u>	<u>Function</u>	<u>To Fliptronic II Controller Board</u>
White/Blue	50 VAC	J901-1, 5
Gray	+5V	J904-1
Gray/Green	+12V	J904-2
Black	Ground	J904-4, 5

Connectors From Flipper Controller Board:

<u>Wire Color</u>	<u>Function</u>	<u>To CPU</u>	<u>To Cabinet</u>	<u>To Playfield</u>
Blue-Yellow	Upper Right Flipper Power			J907-4, 5
Gray/Yellow	Lower Left Flipper Power			J907-6, 7
Blue/Yellow	Lower Right Flipper Power			J907-8, 9
Ribbon Cable	Data	J903		
Orange/Violet	Upper Right Flipper Holding			J902-4
Black/Yellow	Upper Right Flipper Power			J902-6
Orange/Blue	Lower Left Flipper Holding			J902-7
Blue/Gray	Lower Left Flipper Power			J902-9
Orange/Green	Lower Right Flipper Holding			J902-11
Blue/Violet	Lower Right Flipper Power			J902-13
Blue/Violet	Lower Right Flipper Button Switch		J905-1	
Blue/Gray	Lower Left Flipper Button Switch		J905-2	
Black/Yellow	Upper Right Flipper Button Switch		J905-3	
Black/Blue(NU)	Upper Left Flipper Button Switch		J905-5	
Blue	Switch Ground		J905-6	
Black/Green	Lower Right Flipper Break Switch			J906-1
Black/Blue	Lower Left Flipper Break Switch			J906-3
Black/Violet	Upper Right Flipper Break Switch			J906-4
Orange	Switch Ground			J906-6

## General Illumination Circuits

Connectors From Power Driver Board:

<u>Wire Color</u>	<u>Function</u>	<u>To Playfield</u>	<u>To Cabinet</u>	<u>To Insert</u>	<u>Triac</u>
Brown	Illum. String 1	J120-1			Q18
Orange	Illum. String 2	J120-2			Q10
Yellow	Illum. String 3			J121-3	Q14
Green	Illum. String 4			J121-5	Q16
Violet	Illum. String 5		J-119-3	J121-6	Q12
					<b><u>Fuses</u></b>
White/Brown	Return 1	J120-7			F110
White/Orange	Return 2	J120-8			F109
White/Yellow	Return 3			J121-9	F108
White/Green	Return 4			J121-10	F107
White/Violet	Return 5		J119-1	J121-11	F106

## Power Circuits

Connectors From Power Driver Board:

<u>Wire Color</u>	<u>Function</u>	<u>To Cabinet</u>	<u>To Dot Matrix Controller</u>	<u>To Playfield</u>	<u>To CPU &amp; Flipper Bd.</u>
Gray	Digital +5VDC		J117-4		J114-3,4
Gray/Green	Switch +12VDC				J114-1,2
Gray/Yellow	Analog +12VDC	J116-2	J117-2	J118-2	
Black	Ground	J116-3	J117-3	J118-3	J114-5,7

## Power Circuits

Connectors From Power Driver Board

<u>Wire Color</u>	<u>Function</u>	<u>To Playfield</u>	<u>To Backbox</u>
Violet/Yellow	High Power 50V	J107-3	
Violet/Orange	Low Power 50V	J107-2	
Violet/Green	Continuous Duty	J107-1	
Red	Flasher 20V	Not Used	
Red/White	Flasher 20V	J107-6	J106-5
White/Red	20VAC		J104-4
White/Red	20VAC		J104-5
Black	Ground	J103-3, 4	J103-1, 2
White/Blue	Flipper 50VAC		J105-1, 5

Connector From Transformer Secondary

<u>Wire Color</u>	<u>Function</u>	<u>To Backbox</u>
Black /Yellow		J102-6,5,8,9
White/Red		J102-1 to 4
Blue/White		J101-4 to 7
Red		J101-1, 2
Yellow/White		J115
White/Green		J112

## Logic Circuits

<u>Wire Color</u>	<u>Function</u>	
Ribbon Cable	Data	J201 To/From Dot Matrix Controller
Ribbon Cable	Data	J202 To/From Sound Brd, Dot Matrix Cntrlr & Fliptronic II Cntrlr
Ribbon Cable	Data	J204 Not Used
Connectors From Power Driver Board		
Black	Ground	J210-1
Black	Ground	J210-3
Gray	+5VDC	J210-4
Gray	+5VDC	J210-5
Gray/Green	+12VDC	J210-6
Gray/Green	+12VDC	J210-7
Ribbon Cable	Data	J211

## Display Circuits

<u>Wire Color</u>	<u>Function</u>	<u>To:</u>	<u>From:</u> <u>CPU Bd.</u>	<u>From:</u> <u>Sound Bd.</u>	<u>From:</u> <u>Fliptronic II Cntrlr</u>
Ribbon Cable	Data	J601	J202	J506	J903
Ribbon Cable	Data	J602	J201		
Ribbon Cable	Data	J603 To/From Dot Matrix Display/Driver Board			

Connector to Dot Matrix Display/Driver		
Orange	-125V	J604-1
Blue	-113V	J604-2
Black	Ground	J604-4
Black	Ground	J604-5
Gray	+5V	J604-6
Gray/Yellow	+12V	J604-7
Brown	+62V	J604-8

Connector to Transformer Secondary(AC)		
White	80VAC	J605-1
White	80VAC	J605-2
Violet	100VAC	J605-3
Violet	100VAC	J605-5

Connector From Power Driver Board		
Black	Ground	J606-1
Black	Ground	J606-3
Gray	+5V	J606-4
Gray	+5V	J606-5
Gray/Yellow	+12V	J606-6
Gray/Yellow	+12V	J606-7



## Sound Circuits

### Wire Color    Function

Ribbon Cable	Data	J506 To/From CPU Board, Fliptronic II Controller & Dot Matrix Controller
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Gray/Green	20VAC	Connector From Transformer Secondary J501-1
Gray/Green	20VAC	J501-2
Gray	(center tap)	J501-4
Gray	(center tap)	J501-5
Gray/White	20VAC	J501-6
Gray/White	20VAC	J501-7

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Gray	+5VDC	Power From CPU/Power Driver Board J502-1
Gray	+5VDC	J502-3
Black	Ground	J502-4
Black	Ground	J502-5

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Black/Yellow	Speaker	Cabinet Speaker Connection J504-3
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Black/Yellow	Speaker	Backbox Speaker Connection J505-2
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# Lamp Matrix

Yellow (B+) → Red

Column Row	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J137-7 Q92	8 Yellow-Gray J138-9 Q91
Red-1 Brown J133-1 Q90	Freeway 1 11	2X 21	Top Red 31	Tach 1 41	Shoot Again 51	Right Return Lane 61	4th Gear 71	Tach 9 81
Red-2 Black J133-2 Q89	Freeway 2 12	4X 22	Top Yellow 32	Tach 2 42	Kickback 52	Left Return Lane 62	5th Gear 72	Tach 10 82
Red-3 Orange J133-4 Q88	Freeway 3 13	Hold Bonus 23	Top Green 33	Tach 3 43	Tach 11 53	Six Bank Bottom 63	Stop Light Red 73	Middle Red 83
Red-4 Yellow J133-5 Q87	Freeway 4 14	6X 24	Right Freeway 34	Tach 4 44	Tach 12 54	Six Bank Middle 64	Stop Light Yellow 74	Middle Yellow 84
Red-5 Green J133-6 Q86	Freeway 5 15	8X 25	Special 35	Tach 5 45	Tach 13 55	Six Bank Top 65	Stop Light Green 75	Middle Green 85
Red-6 Blue J133-7 Q85	Speed 16	Get Away 26	Video Mode 36	Bottom Red 46	Tach 14 56	Super Charger 66	1st Gear 76	Tach 6 86
Red-7 Violet J133-8 Q84	Left Freeway 17	Speed Millions 27	Random Lamp 37	Bottom Yellow 47	Tach 15 57	Red Line Mania 67	2nd Gear 77	Tach 7 87
Red-8 Gray J133-9 Q83	Lock 18	Super Jackpot 28	Extra Ball 38	Bottom Green 48	Shift 58	Start Button 68	3rd Gear 78	Tach 8 88

# Switch Matrix

White → Green

Dedicated Grounded Switches	Column Row	1 Green-Brown J206-1 U20-18	2 Green-Red J206-2 U20-17	3 Green-Orange J206-3 U20-16	4 Green-Yellow J206-4 U20-15	5 Green-Black J206-5 U20-14	6 Green-Blue J206-6 U20-13	7 Green-Violet J206-7 U20-12	8 Green-Gray J206-9 U20-11	Flipper Grounded Switches
Orange-Brown (1) J205-1 Left Coin Chute D1	1 White-Brown J209-1 U18-11	Not Used 11	Slam Tilt 21	Left Sling 31	Top Yellow 41	Top Green 51	Top Jet 61	Top Loop 71	Opto 1 81	Black-Green J906-1 Right Flipper End of Stroke F1
Orange-Red (2) J205-2 Center Coin Chute D2	2 White-Red J209-2 U18-9	Not Used 12	Coin Door Closed 22	Right Sling 32	Middle Yellow 42	Middle Green 52	Left Jet 62	Middle Loop 72	Opto 2 82	Blue-Violet J905-1 Right Flipper Button F2
Orange-Black (3) J205-3 Right Coin Chute D3	3 White-Orange J209-3 U18-5	Start Button 13	Ticket Opto. 23	Gear Shifter Low 33	Bottom Yellow 43	Bottom Green 53	Bottom Jet 63	Bottom Loop 73	Opto 3 83	Black-Blue J906-3 Left Flipper End of Stroke F3
Orange-Yellow (4) J205-4 4th Coin Chute D4	4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Gear Shifter High 34	Right Bank Bottom 44	Ramp Down 54	Not Used 64	Top Lock 74	Opto Made Loop 84	Blue-Gray J905-2 Left Flipper Button F4
Orange-Green (5) J205-6 Normal Function Service Credits D5	5 White-Green J209-5 U19-11	Left Freeway Bottom 15	Left Outlane 25	Not Used 35	Right Bank Middle 45	Outhole 55	Made Up/Down Ramp 65	Middle Lock 75	Enter Left Ramp 85	Black-Violet J906-4 Upper Right Flipper End of Stroke F5
Orange-Blue (6) J205-7 Normal Function Volume Down D6	6 White-Blue J209-7 U19-9	Left Freeway Top 16	Left Return Lane 26	Top Red 36	Right Bank Bottom 46	Left Trough 56	Not Used 66	Bottom Lock 76	Left Bank Bottom 86	Black-Yellow J905-3 Upper Right Flipper Button F6
Orange-Violet (7) J205-8 Normal Function Volume Up D7	7 White-Violet J209-8 U19-5	Right Freeway Bottom 17	Right Return Lane 27	Middle Red 37	Not Used 47	Center Trough 57	Made Left Ramp 67	Eject Hole 77	Left Bank Middle 87	Black-Gray J906-5 Upper Left Flipper End of Stroke F7
Orange-Gray (8) J205-9 Normal Function Begin Test D8	8 White-Gray J209-9 U19-7	Right Freeway Top 18	Right Outlane 28	Bottom Red 38	Not Used 48	Right Trough 58	Not Used 68	Shooter 78	Left Bank Top 88	Black-Blue J905-5 Upper Left Flipper Button F8

## WARNINGS & NOTICES

### WARNING

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**CAUTION**

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

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