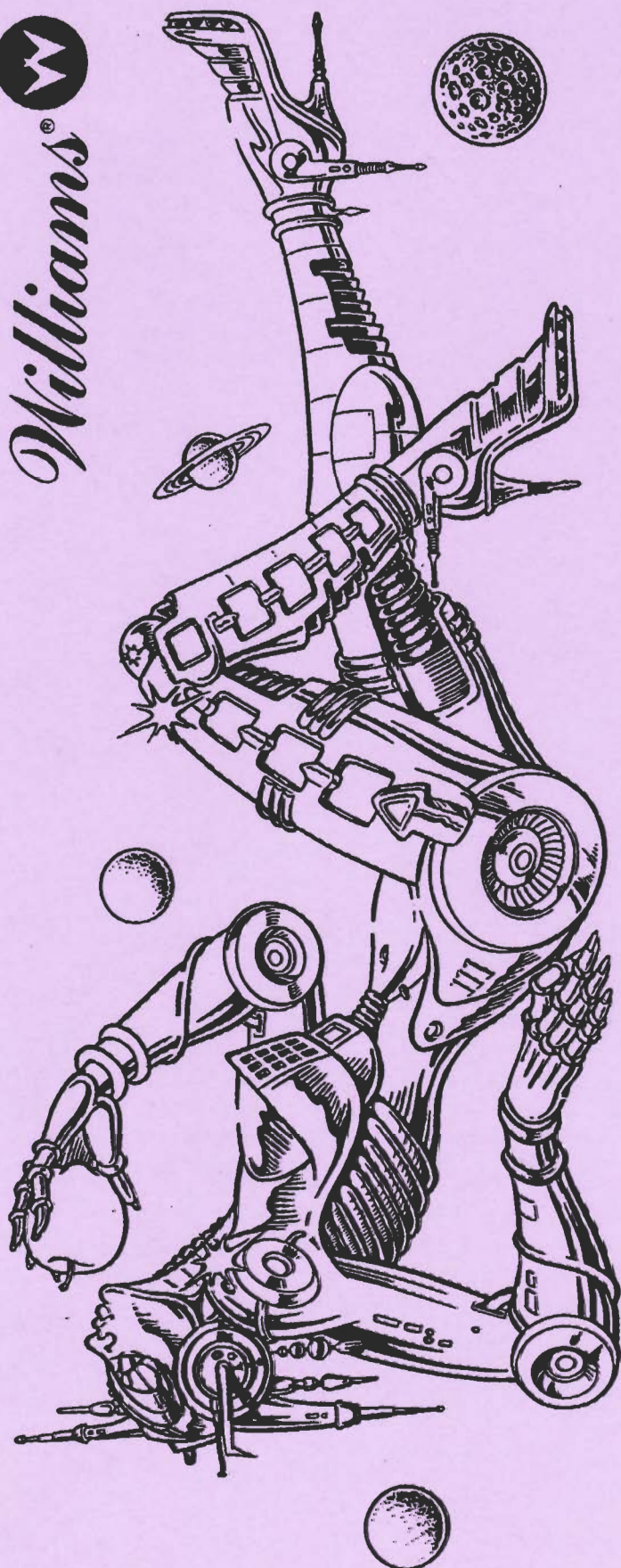



Williams



THE MACHINE™ **OPERATIONS MANUAL**

- * Game Rules & Playfield Shots
- * Game Operation & Adjustments
- * Game Testing & Problem Diagnosis
- * Parts Information
- * Reference Diagrams & Schematics

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

THE MACHINE Jumper Chart

	W14	W15	W16	W17	W18
American*	In	In	In	In	In
French	In	In	In	Out	In
German	In	In	In	In	Out

* All of the above jumpers in, or two or more of these cut

THE MACHINE Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color	Connections	Driver Trnstr	Solenoid Part Number Flashlamp Type
01	Outhole	High Power	Vio-Bm	J130-1	Q82	AE-27-1200
02	Ball Release	High Power	Vio-Red	J130-2	Q80	AE-26-1200
03	Under Playfield Kicker	High Power	Vio-Om	J130-4	Q78	AE-23-800
04	Controlled Gate	High Power	Vio-Yel	J130-5	Q76	A-14406
05	Skill Shot Kicker	High Power	Vio-Gm	J130-6	Q64	AE-24-900
06	Wire Ball Holder	High Power	Vio-Blu	J130-7	Q66	AE-26-1200
07	Knocker	High Power	Vio-Blk	J130-8	Q68	AE-23-800
08	Head Mouth	High Power	Vio-Gry	J130-9	Q70	AE-30-2000
09	Upper Left Jet Bumper	Low Power	Bm-Blk	J127-1	Q58	AE-26-1200
10	Left (sling) Kicker	Low Power	Bm-Red	J127-3	Q56	AE-26-1500
11	Upper Right Jet Bumper	Low Power	Bm-Om	J127-4	Q54	AE-26-1200
12	Right (sling) Kicker	Low Power	Bm-Yel	J127-5	Q52	AE-26-1500
13	Lower Jet Bumper	Low Power	Bm-Gm	J127-6	Q50	AE-26-1200
14	Jets Sling	Low Power	Bm-Blu	J127-7	Q48	AE-26-1500
15	Head - Left Eye	Low Power	Bm-Vio	J127-8	Q46	AE-30-2000
16	Head - Right Eye	Low Power	Bm-Gry	J127-9	Q44	AE-30-2000
17	Billion Flasher	Flasher	Blk-Bm	J125-1	Q42	#89 pfd
18	Left Ramp Flash	Flasher	Blk-Red	J126-2 J125-2	Q40	#89 pfd, #906 Insert
19	Jackpot Flasher	Flasher	Blk-Om	J126-3 J125-3	Q38	#89 pfd, #906 Insert
20	Skill Shot Flasher	Flasher	Blk-Yel	J126-4	Q36	#89 pfd
21	Left Helmet Flasher	Flasher	Blu-Gm	J126-6 J125-6	Q28	#555 pfd, #906 Insert
22	Right Helmet Flasher	Flasher	Blu-Blk	J126-7 J125-7	Q30	#555 pfd, #906 Insert
23	Jets Enter Flash	Flasher	Blu-Vio	J126-8 J125-8	Q34	#555 pfd, #906 Insert
24	Left Loop Flash	Flasher	Blu-Gry	J126-9 J125-9	Q32	#555 pfd, #906 Insert
25	Helmet Lights Data Port	Special	Blu-Bm	J122-1	Q26	
26	Helmet Light Clock Port	Special	Blu-Red	J122-2	Q24	
27	Motor Relay	Special	Blu-Om	J122-3	Q22	A-14423-1
28	Head Motor	Special	Blu-Yel	J122-4	Q20	A-14119
General Illumination Circuits						
01	Backglass Body	G.I.	Wht-Bm	J121-7	Q18	#555
02	Used In Helmet	G.I.	Wht-Org	J120-8	Q10	#555
03	Rear Playfield	G.I.	Wht-Yel	J120-9	Q14	#555
04	Backglass - No Body	G.I.	Wht-Gm	J121-11	Q16	#555
05	Front Playfield	G.I.	Wht-Vio	J120-11	Q12	#555
	Lower Right Flipper		Blu-Yel	J109-7		FL-11630
	Lower Left Flipper		Gry-Yel	J109-5		FL-11630

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

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THE MACHINE

**PLAYFIELD SHOT MAPS
&
RULES**

THE MACHINE BUILDING & OPERATION INSTRUCTIONS

HEAD OBJECTIVES

FIRST FACE: Shoot ball up Shuttle Ramp, lock in her mouth & activate **VOCAL CIRCUITS**.

SECOND FACE: Shoot two balls up Shuttle Ramp, lock in her eyes to activate **OPTICAL CIRCUITS** & start Multiball.

THIRD FACE: During Multiball two balls up Shuttle Ramp activate **MACHINE** & starts metamorphosis **TO HUMAN**.

FOURTH FACE: During multiball two balls up Shuttle Ramp gives her life & spins **BIG WHEEL** for millions of points or lights **1 BILLION** shot. **1 BILLION** is collected up Heart Ramp when 1 Billion is Lit.

BODY FUNCTIONS

FAR LEFT SHOT: Spins Small Wheel for scores, lit Extra Ball, Extra Ball or Lit Jackpot. **JACKPOT** collected when shot is Lit. During Multiball it's a Power Charge worth 100K to 1 Million points.

LEFT LOOP: Builds up lights to reach Lit Extra Ball.

HEART RAMP: 3 consecutive shots activate unlimited million.

RIGHT LOOP: Builds up lights to reach Lit Jackpot.

BOTTOM LANE CHANGE: Collects Extra Ball when Lit.

BONUS MULTIPLIER: Complete 3 stand up targets or go backwards through right loop.

Build Jackpot---Loops, Ramp Shots, and Spinner advance Jackpot.

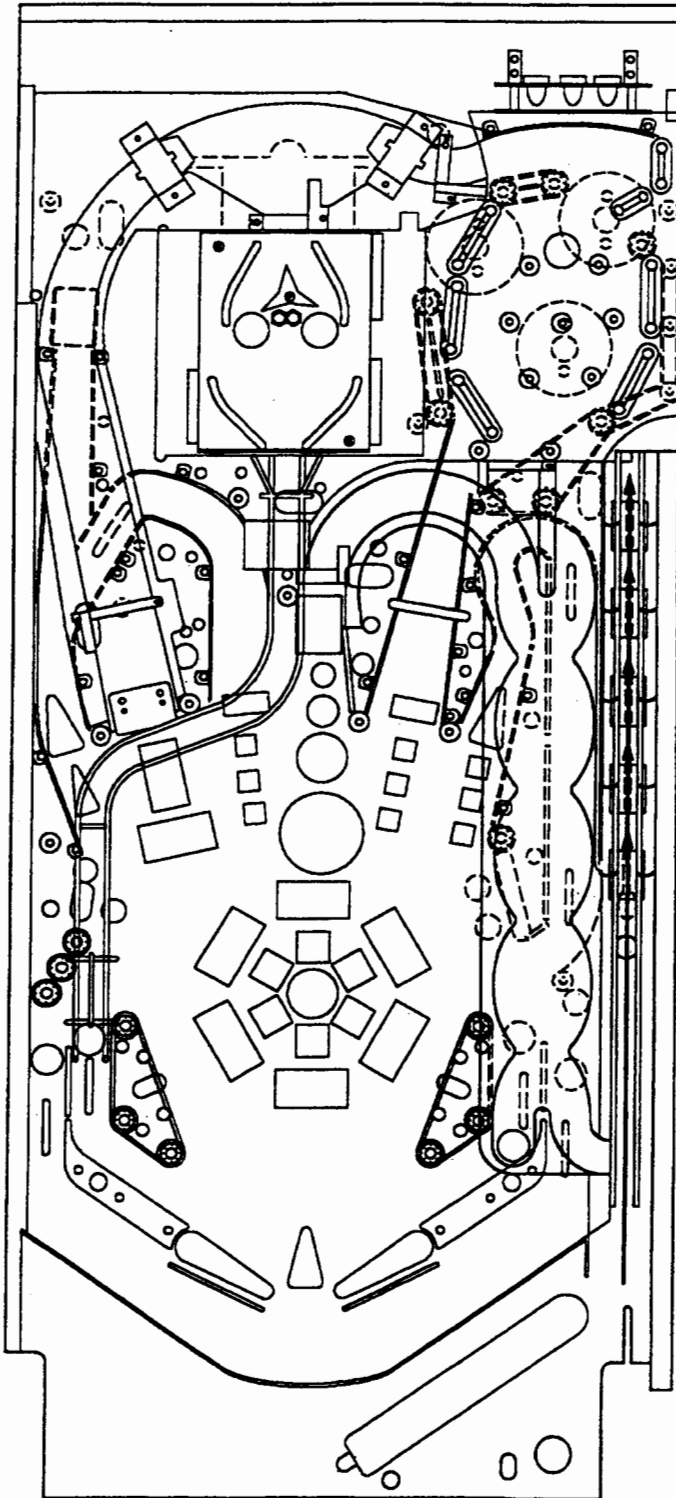
Build Bonus---Drains, return lanes, bumpers, and slingshots.

End Of Ball Bonus---(Bonus value + (10,000 points x # of loops this ball)) x Bonus Multiplier = End of Ball Bonus.

PINBOT

PINBOT miniplayfield reached by Shuttle Ramp scores progressively higher & lights Extra Ball.

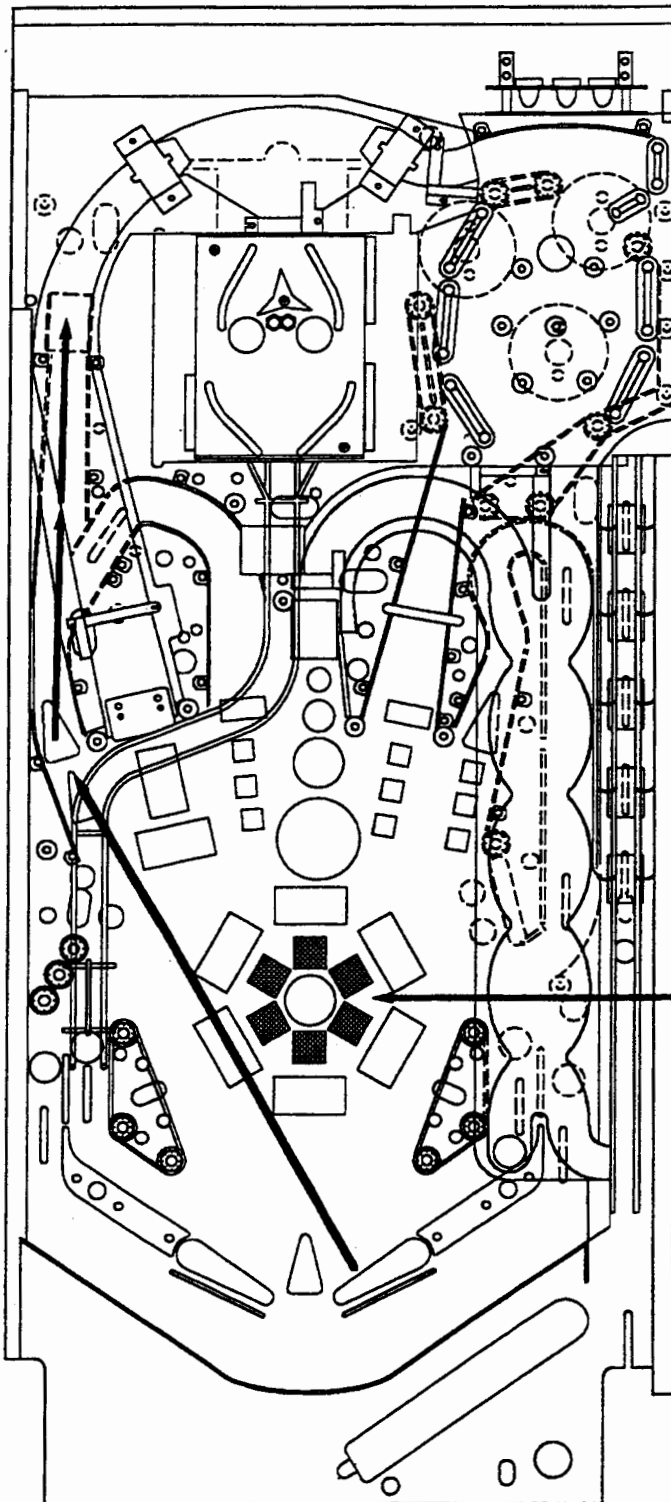
The Machine Playfield Shot Maps



Shuttle Skill Shot:

Shoot the plunger shot between the rubber cylinders to score the highest values.

The Machine Playfield Shot Maps



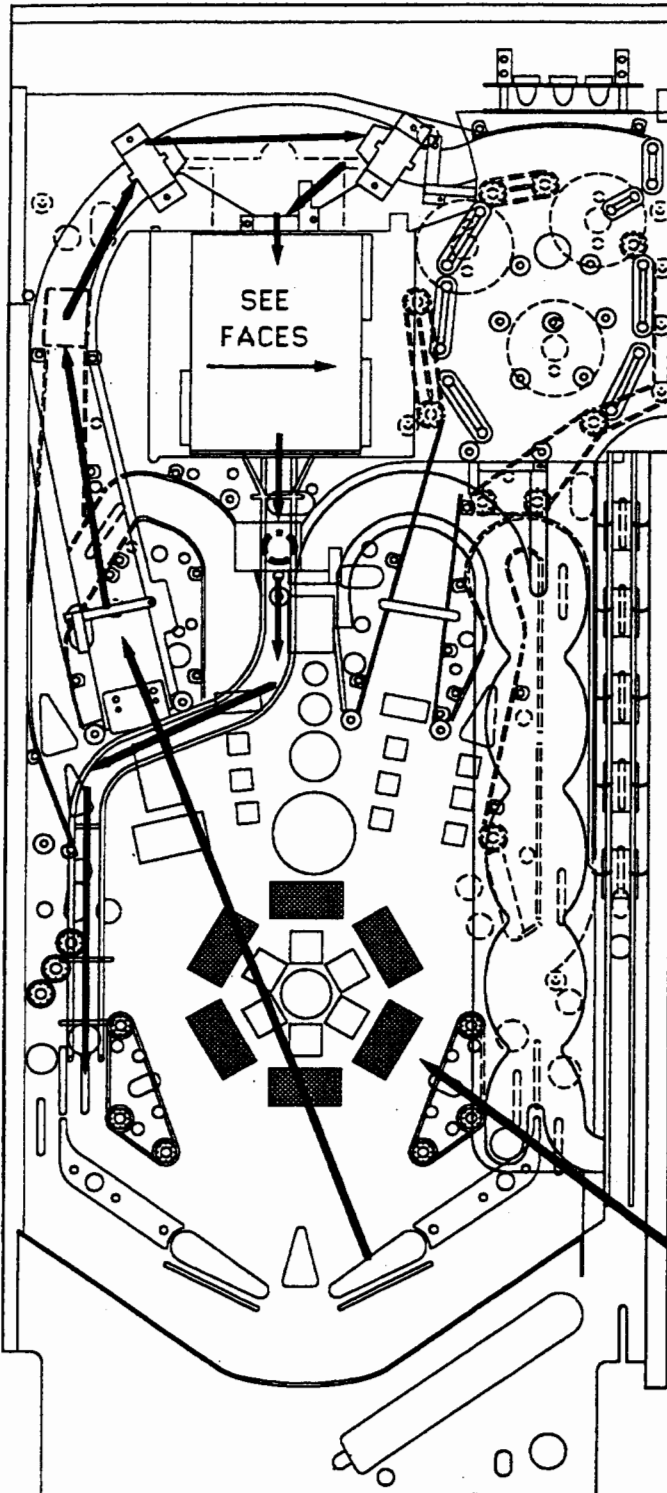
Small Wheel Shot:

Far left shot spins small wheel for possible score. Light Extra Ball, Extra Ball, or Jackpot.

Far left shot also collects Jackpot when lit, & during Multiball it awards a Power Charge score of 100K to 1 Million points.

Small Wheel

The Machine Playfield Shot Maps



Machine Building Shot(s):

1. Shoot ball up Shuttle Ramp to Face 1 (mouth), activates vocal circuits.



2. Shoot two balls up Shuttle Ramp to Face 2 (eyes), activates optical link & starts Multiball.



3. Shoot two balls up Shuttle Ramp to Face 3 (neck) during Multiball; this begins metamorphosis to human & continues multiball.

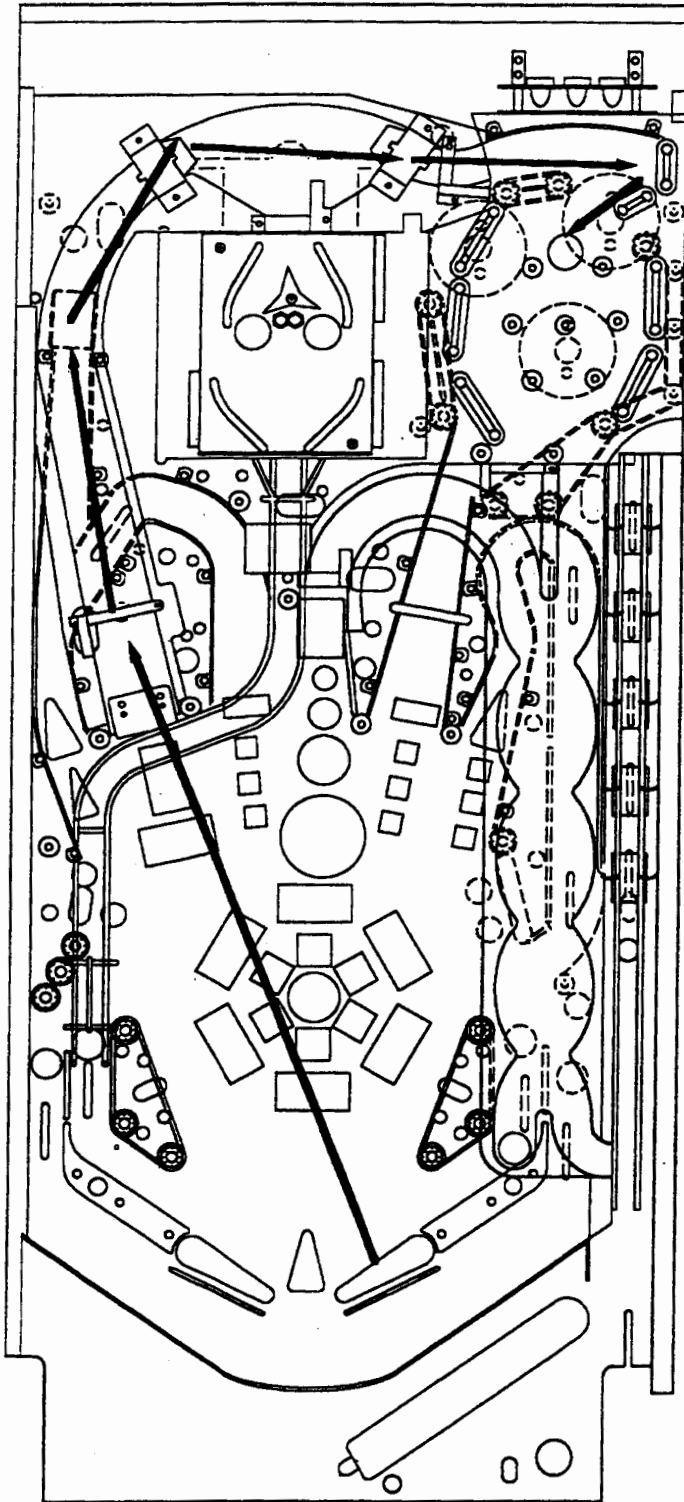


4. Shoot two balls up Shuttle Ramp to Face 4 (metamorphosis) during Multiball; this spins big wheel for millions of points or light 1 Billion Shot.



Big Wheel

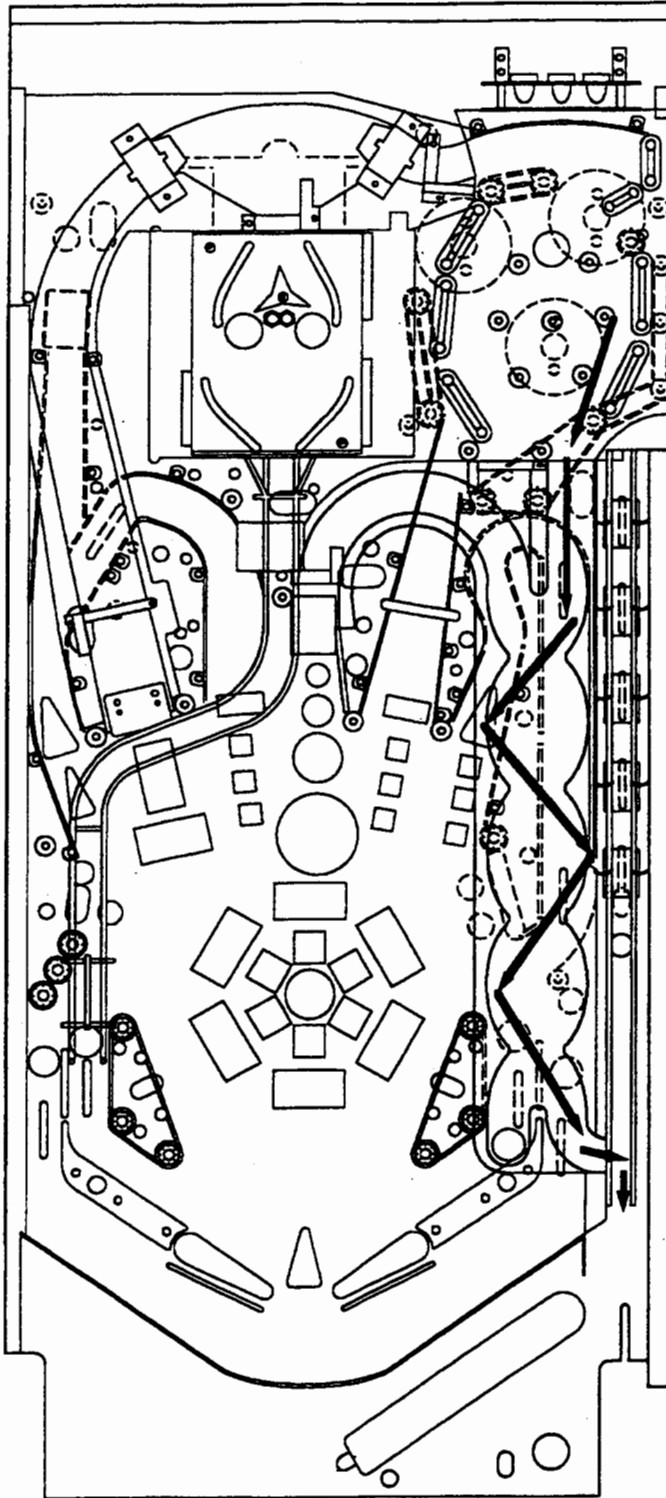
The Machine Playfield Shot Maps



Pinbot Shot:

Shoot Shuttle Ramp to enter Pinbot playfield area when Lit to score 100k, 200K, 300K, or 600K & Light Extra Ball.

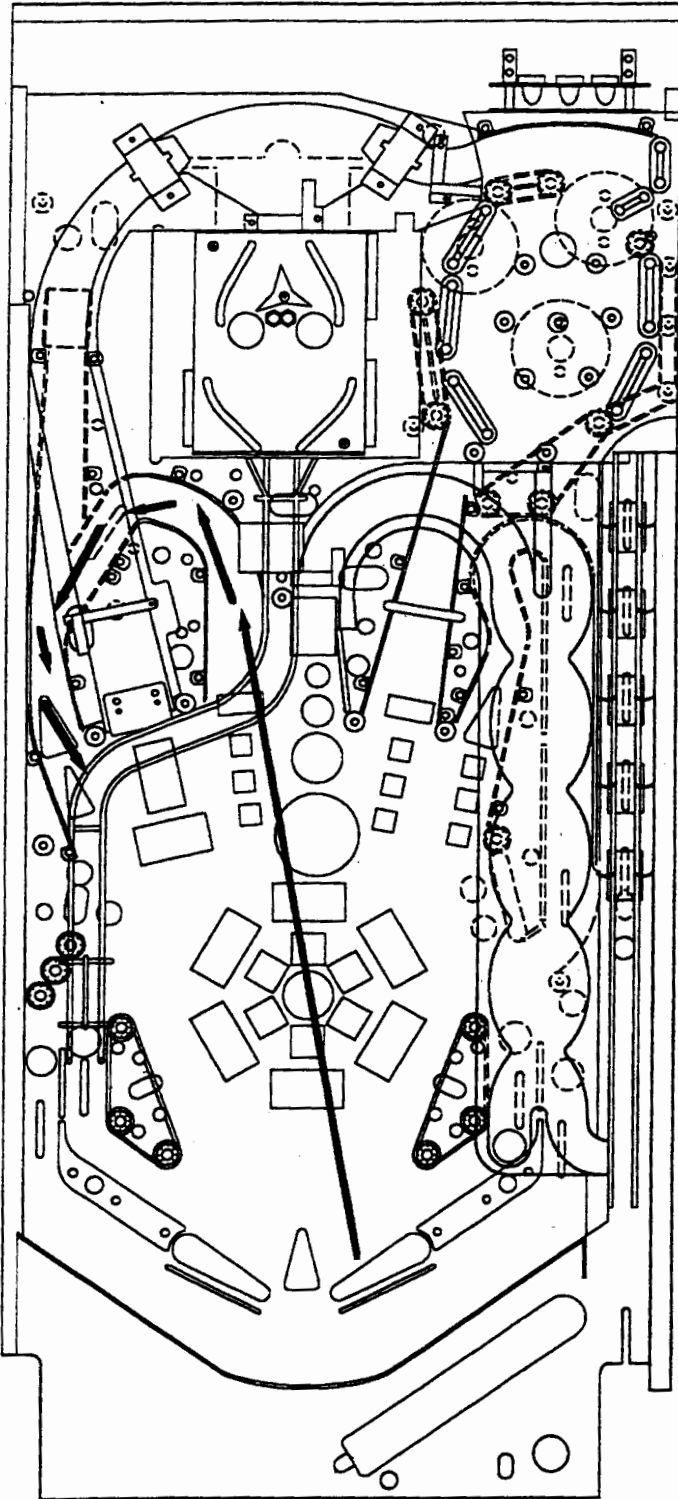
The Machine Playfield Shot Maps



Skill Shot Multiplier:

Leave Pinbot playfield on right side to increase skill shot multiplier for present ball. Shoot skill shot again.

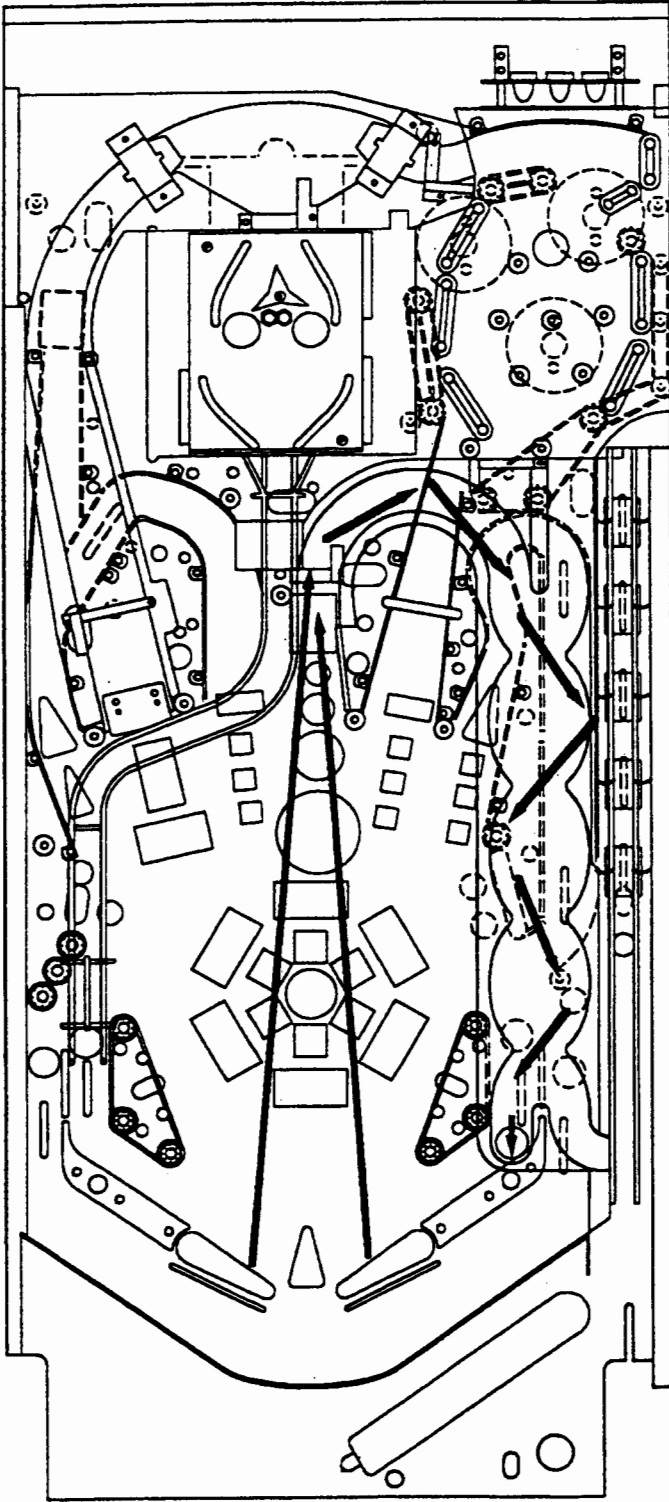
The Machine Playfield Shot Maps



Left Loop Shot:

Build up lights to score increasing point values and light Extra Ball.

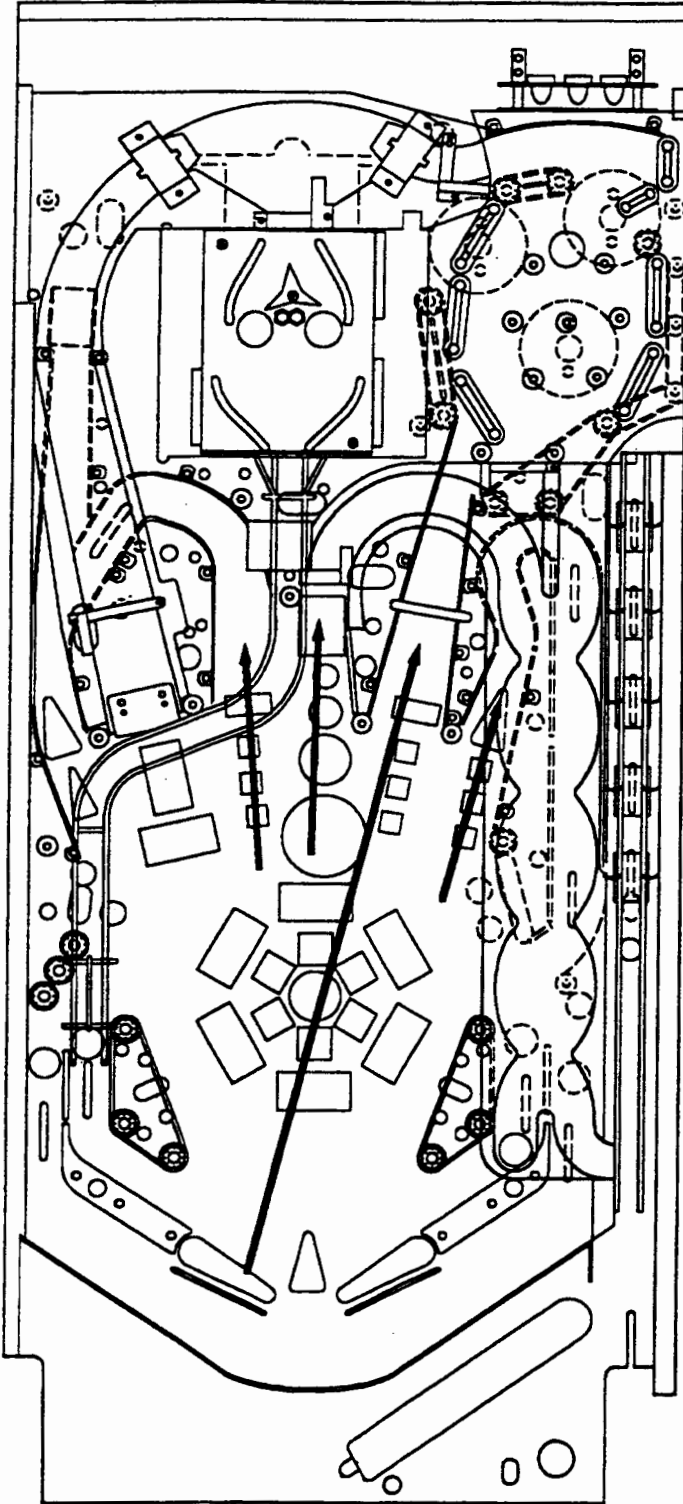
The Machine Playfield Shot Maps



Unlimited Million Shot:

Shoot Heart Ramp 3
consecutive times for
unlimited million (every
consecutive shot up ramp
worth one million points).

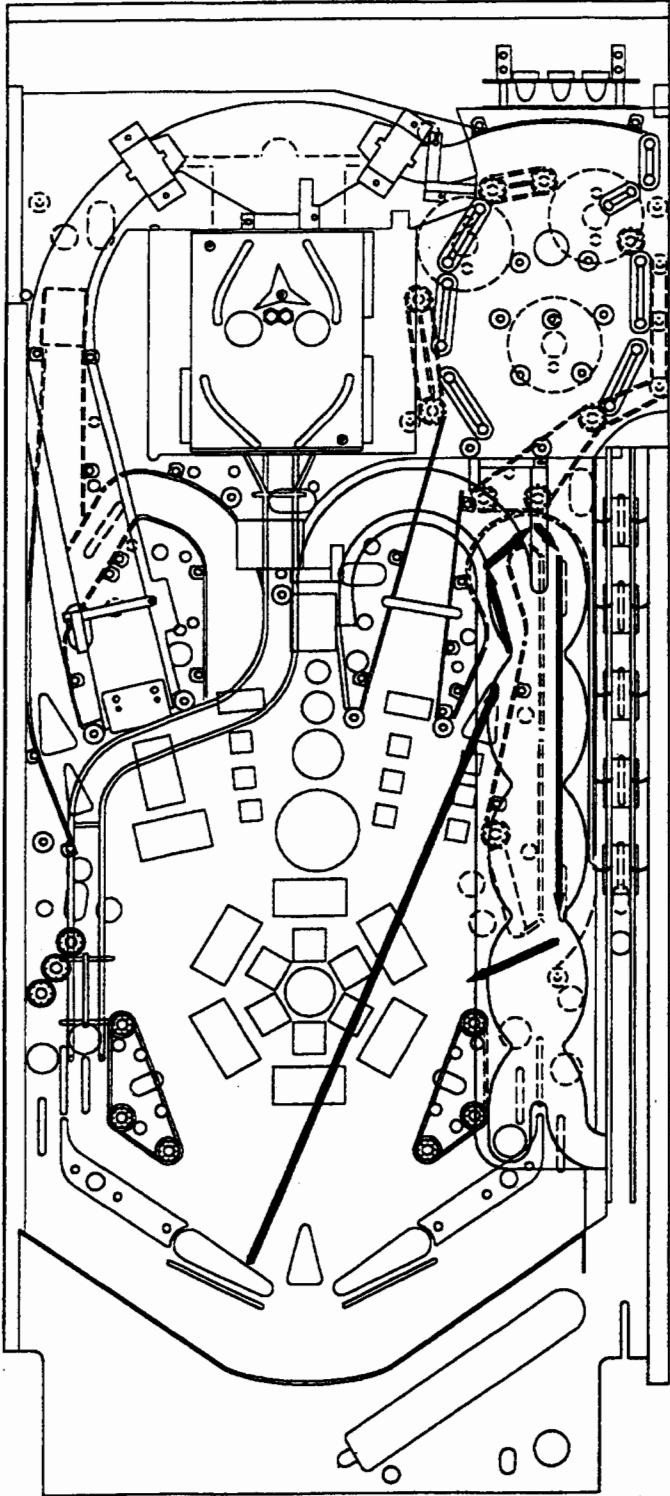
The Machine Playfield Shot Maps



Build Jackpot Shot(s):

Jackpot builds by shooting
Loops, Heart Ramp Shot,
and the Spinner.

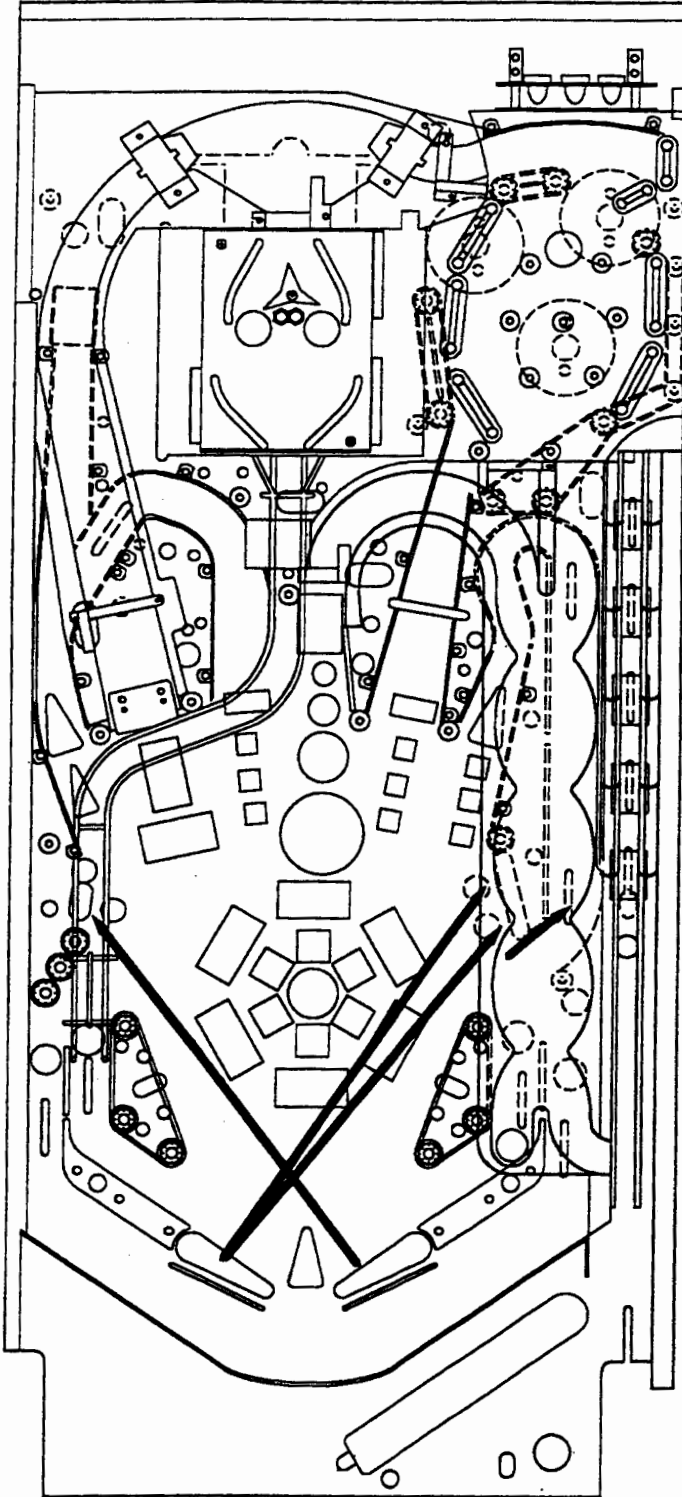
The Machine Playfield Shot Maps



Right Loop:

Build up lights to score increasing point values & "Light Jackpot."

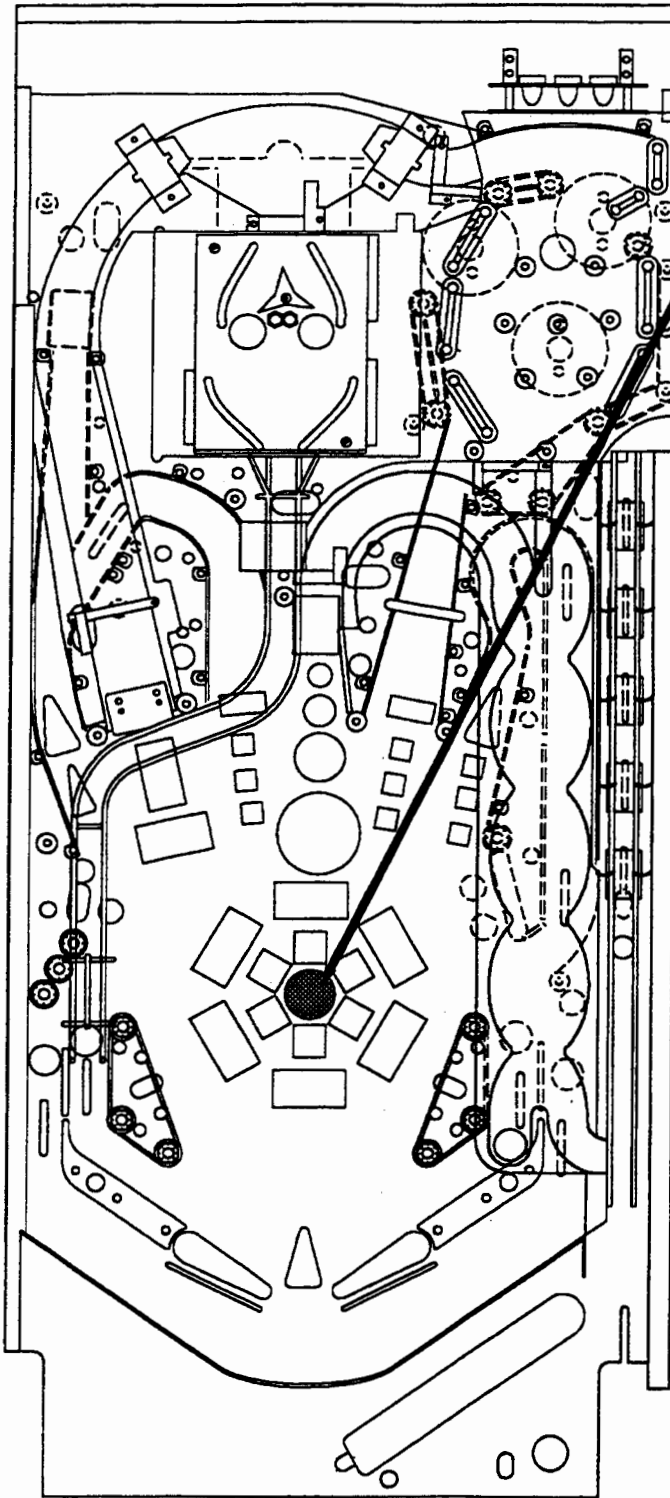
The Machine Playfield Shot Maps



Bonus Multiplier:

Complete three standup targets for bonus multiplier or go backwards through right loop.

The Machine Playfield Shot Maps



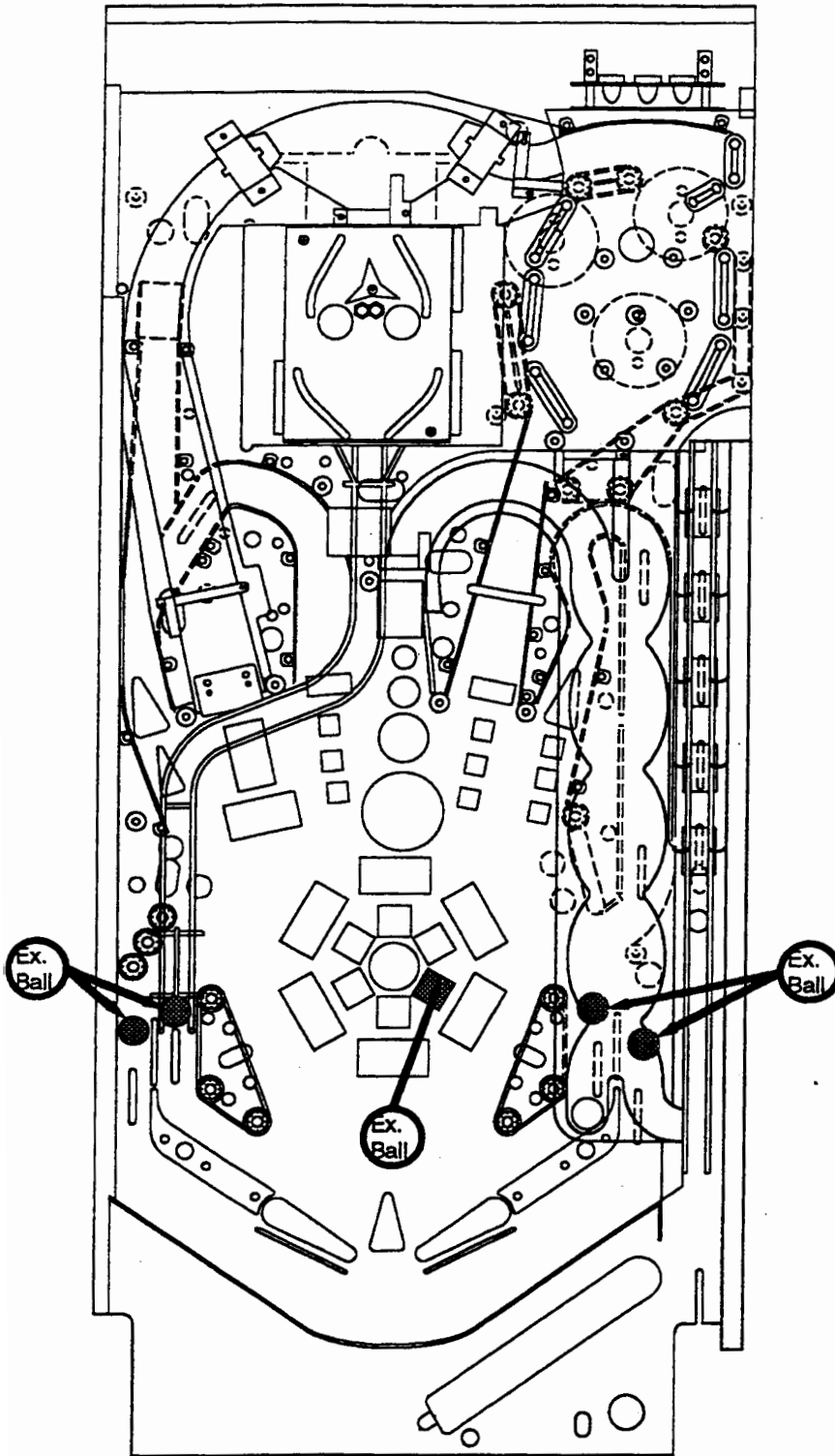
Playfield Multiplier:

All playfield values are doubled during Multiball.

The Machine Playfield Shot Maps

Extra Ball:

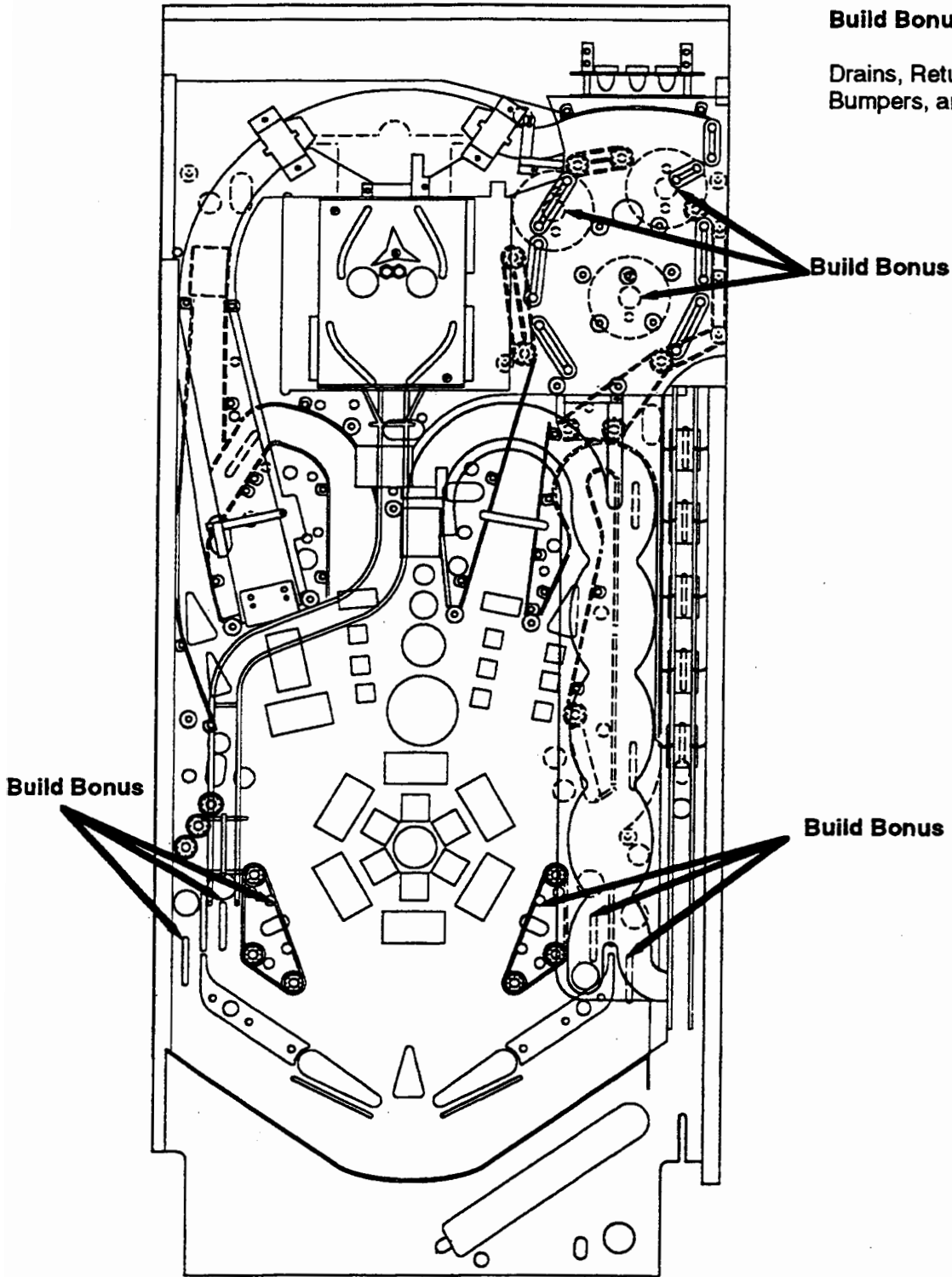
Collect off bottom lane
change when Lit, or collect
off spinning Small Wheel.



The Machine Playfield Shot Maps

Build Bonus:

Drains, Return Lanes,
Bumpers, and Slingshots.



Section 1

Game Operation & Test Information

- **THE MACHINE (System WPC) ROM Summary**
- **Pinball Game Assembly Instructions**
- **Game Play**
- **Menu System Operation**
 - Adjustments**
 - Audits**
 - Test/Diagnostic Procedures**
 - Utilities**

THE MACHINE (System WPC) ROM Summary

	IC	TYPE	LOCATION	BOARD	PART NUMBER
Game ROM 1	27010		U6	CPU	A-5343-50002-1
Music/Speech ROM 2	27010		U15	Audio	A-5343-50002-2
Music/Speech ROM 3	27010		U18	Audio	A-5343-50002-3

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.

CONNECTOR & COMPONENT IDENTIFICATION

Since **THE MACHINE** uses WILLIAMS ELECTRONICS GAMES' WPC Electronics System, a new technique to identify connectors and other game components must be introduced. 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); P306 designates plug 6 of board 3 (a Display Driver 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 circuit. 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
- 3- Display Driver Board
- 4- Dual or Single Display Board
- 5- Sound Board

CIRCUIT BOARDS

WPC Circuit Boards for **THE MACHINE** are in the backbox. They are accessible by unlocking the Backbox, removing the Backglass, unlatching the Insert Board, and swinging it open.

Lamp circuit boards are mounted under the Playfield.

CPU Board The WPC CPU Board, P/N A-12742-50002, must be equipped with the ROM specified in the ROM Summary.

Sound Board The Sound Board P/N A-12738-50002, must be equipped with the ROMs specified in the ROM Summary.

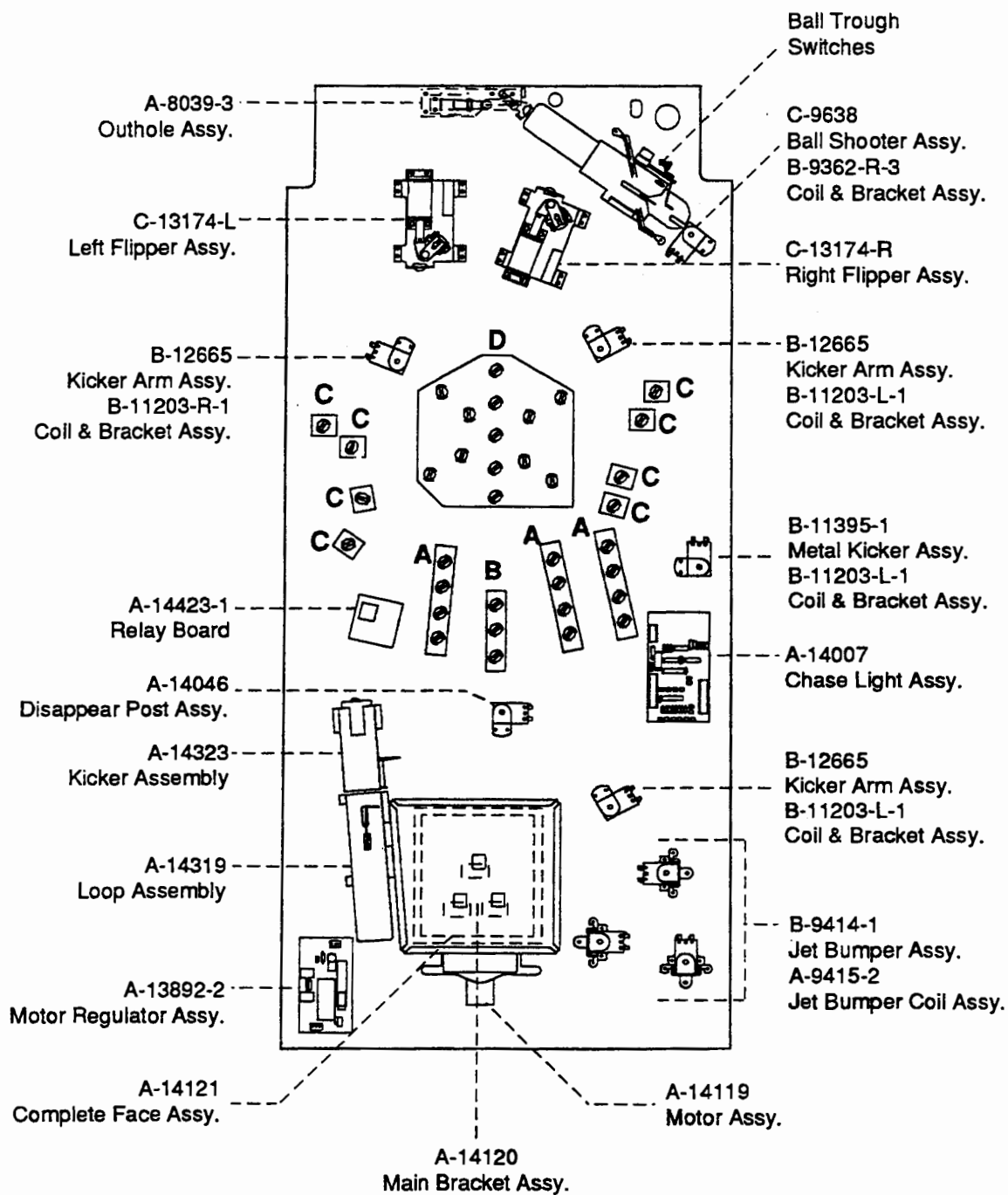
Power Driver Board The Power Driver Board is P/N A-12697.

Display Driver Board The Display Driver Board is P/N A-12739-1, -2, or -3. The dash number indicates whether an extended display is used, and if so, how many. No extended display = -1, one extended display = -2, two extended displays = -3. **THE MACHINE** uses the A-12739-1 Display Driver Board.

Single Display Board The Single Display Board is p/n A-12794.

Locations Diagram - Game Major Mechanisms

Underside of Playfield, Viewed in Raised Position



Lamp Boards

A.	A-14305	4-Lamp Board
B.	A-14302	3-Lamp Board
C.	B-12224	1-Lamp Board
D.	A-14304	13-Lamp Board

GAME CONTROL LOCATIONS

Cabinet Switches

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

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

Coin Door 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 places 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.

Coin Door Switches

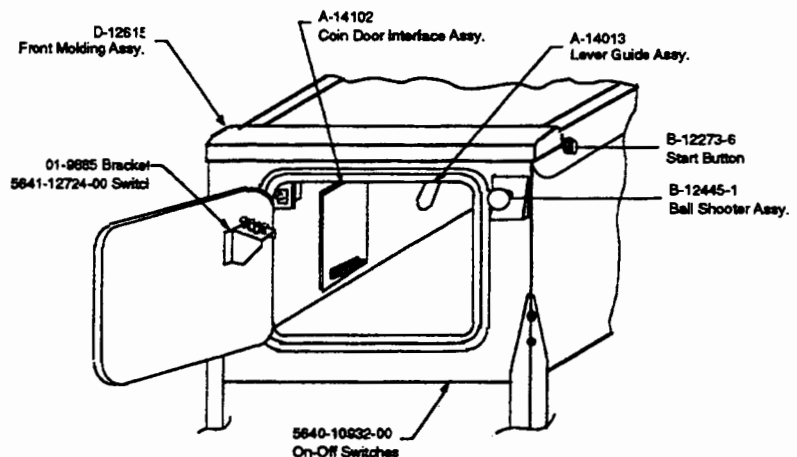
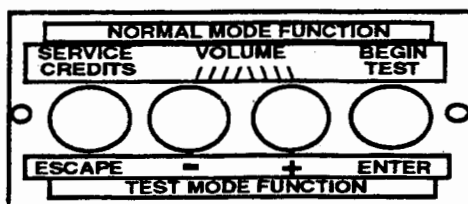


Figure 2. Pinball Game Controls Locations

PINBALL GAME ASSEMBLY INSTRUCTIONS

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

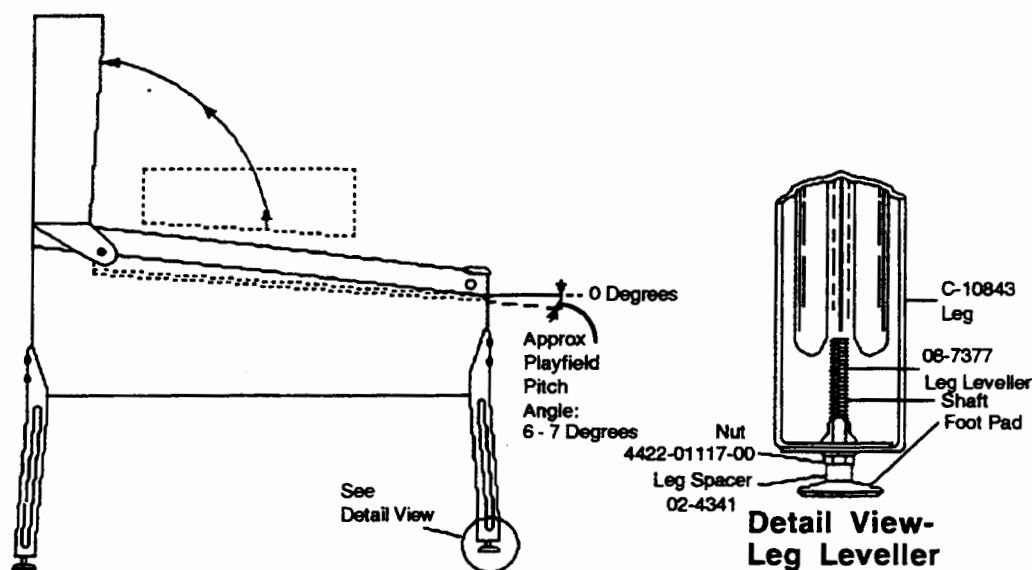


Figure 3. Pinball Assembly, Playfield Pitch Angle, and Leg Leveler Details.

4. Reach into the cabinet and backbox and ensure that the interconnecting cables are free to move (not kinked or pinched). Be careful to avoid damaging wires at any stage of the assembly process.
5. Raise the hinged backbox upright and latch it into position. Unlock the backbox, and remove the backglass, storing it carefully to avoid scratches. Remove the shipping block holding the Insert Board. Unlatch and open the Insert Board. This allows access to the bolt holes used for securing the backbox upright. Install the washer-head mounting bolts through the bottom holes of the backbox into the threaded fasteners in the cabinet to secure the backbox. Close the Insert Board and latch it in position. Reinstall the backglass, and lock the backbox.

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) and playfield pitch angle (incline) of approximately 6-7 degrees. NOTE: It is recommended that these measurements be made ON the playfield, not the cabinet nor the playfield cover glass. Tighten the nut on each leg leveler shaft to maintain this setting, as shown in Figure 3.

CAUTION

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

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

10. Verify that the *required number* of balls are installed in the game. **THE MACHINE** uses 3 balls.

11. Install playfield mylars if desired.

12. Clean and reinstall the playfield cover glass, reversing the procedure of step 7. Prepare the game for player operation.

GAME OPERATION

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. Perform the following 'power up' routine upon completion of the assembly and installation procedure, as well as at the beginning of each period of game operation. Initially, it will confirm that the game is in proper operating condition; later, it will aid the operator via its messages (refer to later text entitled "Problem Analysis Messages").

Procedure. With the coin door closed, plug the game in, and switch it ON, using the On-Off switch. In normal operation, the displays initially show the last score. Then, 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).

Open the coin door and press the BEGIN TEST switch to begin the game test routine. The left score display shows the game name, and the right score display shows the game number and game software revision. The message changes. The left score display shows the sound software revision, and the right score display shows the revision level of the system software and the date the game software was revised.

THE MACHINE
50002 Rev. L-1

Sound Rev. L-1
SY. 0.90 1-3-91

Perform the entire test menu routine to verify that the game is operating satisfactorily (refer to later text entitled "Menu System Operation"). Successful completion of the tests shows that the game is ready to begin earning your investment return.

After the game has been on location for a period of time, the test routine may be preceded by messages concerning game problems. The text entitled 'Problem Analysis Messages' contains more details concerning messages displayed at each game turn-on.

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"
("GIVE ME VOICE, GIVE ME SIGHT, GIVE ME LIFE, THE MACHINE.")*;
- 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.

* - operator-adjustable feature

CREDIT POSTING. Insert coin(s). A sound is heard for each coin, and the player score displays show 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 player score display decreases by one. The left score display flashes 00 (until the first playfield switch is actuated), and the right score display shows ball 1, except for 4-player games where the ball # shows in the individual player's display. Additional players may enter the game by pressing the Start button once for each player, before the end of play on the first ball.

TILTS. Actuating the Slam Tilt switch 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.

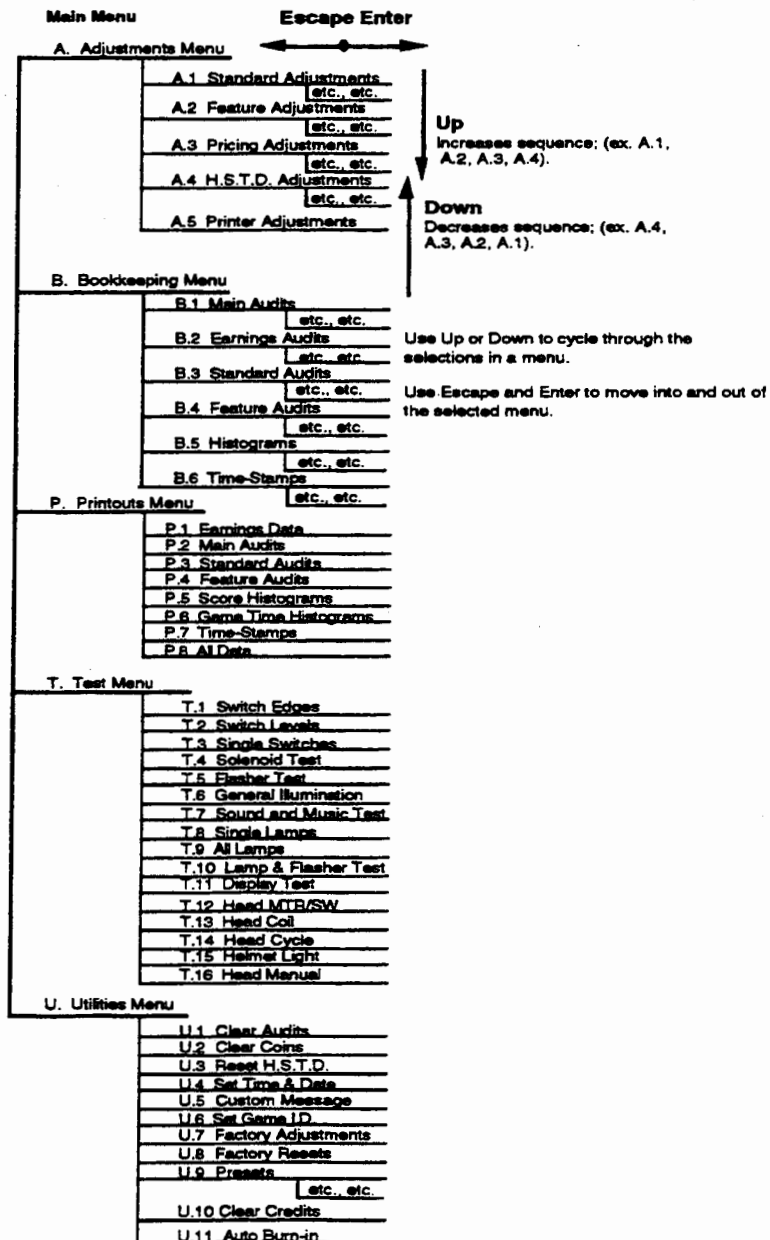
END OF GAME. All earned scores and bonuses are awarded. If a player's final score exceeds the specified value, the player receives a designated award for achieving the current highest score. A random digit set* appears in the display. Credit* may be awarded, when the last two digits of any player's score 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 player score displays. Then, the high scores flash on the appropriate player score displays. The game proceeds to the Attract Mode.

* - operator-adjustable feature

MENU SYSTEM OPERATION

THE MACHINE 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

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

The game Adjustments are the first category available from the Main Menu. Press the Enter button to activate the Adjustments Menu. Press the Up or Down button to cycle through the Adjustment Menu selections. Press the Enter button to activate the desired Adjustment Group when that group appears in the displays.

A. ADJUSTMENTS MENU

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

Once you have entered the adjustment group desired, press the Up or Down button to cycle through the available adjustments in that group. When the desired adjustment appears press the Enter button to activate that adjustment. When an adjustment is activated, the setting value begins to flash. Use the Up or Down button to raise or lower the setting value. 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.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 changes 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 1, 000, 000 to 15, 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 the starting replay level value. When three or four replay levels are chosen, their values are automatically adjusted to three or four times the starting replay level 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 25, 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 25, 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 25, 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 25, 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 canceled when Credits=0, when the player inserts another coin, or when Begin Test is pressed. The choices are:

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

*For Auto % Replay. ** For Fixed Replay

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.

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 digits result in the 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:
- YES - A message is displayed
NO - 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 - Allow dimming the General Illumination during the Attract Mode & Effects.
NO - Do Not dim the General Illumination.
- A.1 26 Tournament Play**
The operator chooses whether to equalize Multi-ball and Jackpots during multi-player games, (do not carry over to next player). The choices are:
- YES - Keep Multi-ball and Jackpots equal.
NO - Do Not Keep Multi-ball and Jackpots equal.
- 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.

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 Extra Ball Percentage**
The operator selects the percentage of times the game will award an Extra Ball when the Small Wheel is spun. (Setting Range: 0% - 99%)
- A.2 02 Extra Ball Lit Off Wheel Percentage**
The operator selects the percentage of times the game will award an Extra Ball Lit when the Small Wheel is spun. (Setting Range: 0% - 99%)
- A.2 03 Jackpot Lit Off Wheel Percentage**
The operator selects the percentage of times the game will award a Jackpot Lit when the Small Wheel is spun. (Setting Range: 0% - 99%)
- A.2 04 Big Wheel 1 Million**
The operator selects the percentage of times the game will award 1 Million when the Small Wheel is spun. (Setting Range: 0% - 99%)
- A.2 05 Big Wheel 10 Million**
The operator selects the percentage of times the game will award 10 Million when the Small Wheel is spun. (Setting Range: 0% - 99%)
- A.2 06 Big Wheel 50 Million**
The operator selects the percentage of times the game will award 50 Million when the Small Wheel is spun. (Setting Range: 0% - 99%)
- A.2 07 Big Wheel Lit Billion**
The operator selects the percentage of times the game will award Lit Billion Shot when the Big Wheel is spun. (Setting Range: 0% - 99%)
- A.2 08 Special Percentage**
The operator selects the percentage of times the game will award a Special when the Big Wheel is spun. (Setting Range: 0% - 99%)
- A.2 09 Left Loop Time Down Rate**
The operator selects the rate at which the four lights on the left loop time down once lit. (Setting Range: 0 - 99 seconds)
- A.2 10 Right Loop Time Down Rate**
The operator selects the rate at which the four lights on the right loop time down once lit. (Setting Range: 0 - 99 seconds)
- A.2 11 Right Ramp Time Down Rate**
The operator selects the rate at which the three lights on the right ramp time down once lit. (Setting Range: 0 - 99 seconds)

A.2 Feature Adjustments Continued

- A.2 12 Jackpot Time Out Rate**
The operator selects the rate at which the jackpot will time down & go out once lit. (Setting Range: 0 - 99 seconds)
- A.2 13 Billion Lit Time Down**
The operator selects the rate at which the Billion Shot will time down & go out once lit. (Setting Range: 0 - 99 seconds)
- A.2 14 Consolation Extra Ball Time**
The operator can choose whether a less skilled player can obtain an extra ball easier. An extra ball lane will be lit if the player's score is less than 1 million and the game time is less than or equal to the consolation time. (Setting Range: 0 - 99 seconds - selecting 0 seconds will disable this feature)
- A.2 15 Billionaire Club On/Off**
The operator can choose whether the Billionaire Club Members (people who score 1 billion or more) HSTD table is displayed in attract mode. These scores are Not Cleared when a "High Score Reset Every" occurs. The choices are:
ON - The billionaire club members will be displayed.
OFF - The billionaire club members will not be displayed.
- A.2 16 Credits For Becoming a Billionaire**
The operator selects the number of credits or tickets awarded for players who score a billion or more points. (Setting Range: 00 - 10)
- A.2 17 Extra Ball Lit Memory**
The operator chooses whether or not the extra ball lanes remain lit ball to ball or reset at the start of each new ball. The choices are:
YES - The extra ball lamps are carried over from ball to ball.
NO - The extra ball lamps are reset at the start of each ball.
- A.2 18 Jet Lane Memory**
The operator chooses whether or not the four lights leading to the jet bumpers are carried over from ball to ball or are reset for each new ball. The choices are:
YES - The Jet Lane lamps are carried over from ball to ball.
NO - The Jet Lane lamps are reset at the start of each ball.
- A.2 19 Attract Mode Sounds**
The operator can select whether or not the attract mode has sound to attract the player. The choices are:
YES - The attract mode does have sound.
NO - The attract mode does not have sound.
- A.2 20 Enter Mini Playfield (Pinbot)**
The operator can select how often the control gate that allows the ball to enter the mini (Pinbot) playfield is opened. The choices are:
HARD - The gate is open once on the first face & twice on the second face.
EASY - The gate is open once on the first face & once on the second face.
- A.2 21 Family Mode**
The operator can remove certain speech that might be found offensive in a family-type establishment. The choices are:
YES - Remove Speech.
NO - Use ALL Speech.
- A.2 22 Singing Mode**
The operator can prevent the singing from being played when a player gets to the fourth face. The choices are:
YES - Allow Singing.
NO - Do Not Allow Singing.
- A.2 23 Combination Loop Start**
The operator can select how many consecutive loops it takes to get the first combination loop award. The range of this setting is: 1 - 10 loops.

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 are available)**
This adjustment is used to preset 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.

THE MACHINE Pricing Table

Country	Coin Chute			Games/Coin	Display	Pricing Adjustments A.3																					
	Left	Center	Right			02	03	04	05	06	07	08	09														
USA	25¢	-	25¢	1/25¢, 4/\$1 ²	U.S.A. 4/\$1																						
				1/50¢, 2/75¢, 3/\$1 ^{1,2}	50¢ - 75¢ - \$1																						
				1/50¢, 2/\$1 ²	U.S.A. 2/\$1																						
				1/25¢, 3/\$1 ²	U.S.A. 3/\$1																						
				1/25¢, 3/50¢, 6/\$1	CUSTOM															01	04	01	00	01	02	01	00
1/25¢, 5/\$1	CUSTOM	01	00	01	00	01	04	01	00																		
Canada	25¢	-	\$1	1/50¢, 2/75¢, 3/\$1 ²	CANADA 1																						
				1/50¢, 2/\$1 ²	CANADA 2																						
Austria	5 Sch	10 Sch	10 Sch	1/2x5 Sch, 3/2x10 Sch ²	AUSTRIA																						
	5 Sch	-	10 Sch	2/5 Sch, 5/10 Schilling	CUSTOM															02	00	05	00	01	00	01	00
Australia	20¢	-	\$1	1/3x20¢, 2/\$1 ²	AUSTRALIA																						
United Kingdom	10 P	50 P	1£	1/2x10 P, 3/50 P, 7/1£ ²	U.KINGDOM																						
	10 P	50 P	20P	1/10 P, 5/50 P, 2/20 Pence	CUSTOM															01	05	02	00	01	00	01	00
Switzerland	1 Fr	2 Fr	5 Fr	1/1 Fr, 3/2 Fr, 7/5 Franc ²	SWISS																						
	1 Fr	-	2 Fr	1/1 Fr, 3/2 Fr	CUSTOM															03	00	06	00	02	00	01	00
Belgium	5 Fr	20 Fr	50 Fr	1/4x5 F, 1/20 F, 3/50 F ²	BELGIUM																						
West Germany	1 DM	2 DM	5 DM	1/1 DM, 2/2 DM, 7/5 DMark ^{2,3}	GER. 7/6 DM																						
				1/1 DM, 2/2 DM, 6/5 DM ^{1,2}	GER. 6/5 DM																						
				1/1 DM, 3/2 DM, 9/5 DM	CUSTOM															09	18	45	00	05	00	01	00
				1/2x1 DM, 1/2 DM, 3/5 DM	CUSTOM															03	06	15	00	05	00	01	00
				2/1 DM, 5/2 DM, 14/5 DM	CUSTOM	13	26	65	00	05	65	01	00														
Netherlands	1 Hfl	2.5 Hfl	2.5 Hfl	1/1 Hfl, 3/2.5 Holland Florin ²	NETHERLND																						
	25¢	-	1G	1/25¢, 5/1 Guilder	CUSTOM															01	00	05	00	01	00	01	00
	1G	-	1G	1/1 Guilder ²	HOLLAND																						
Sweden	5 Kr	5 Kr	5 Kr	1/5 Krona ²	SWEDEN																						
	1 Kr	-	1 Kr	1/2x1 Krona	CUSTOM															01	04	01	00	02	00	01	01
France	1 Fr	5 Fr	10 Fr	2/5 F, 4/10 F, 9/2x10 Franc ^{1,2}	TARIF 1																						
	1 Fr	5 Fr	10 Fr	1/2x1 F, 3/5 F, 7/10 Franc	TARIF 2															03	15	30	30	05	30	01	00
	1 Fr	5 Fr	10 Fr	1/5 F, 3/10 F, 7/2x10 Franc	TARIF 3															03	15	30	30	10	60	01	15
	1 Fr	5 Fr	10 Fr	1/3 x 1 F, 2/5 F, 5/10 Franc	TARIF 4															02	10	20	20	05	40	01	10
	1 Fr	5 Fr	10 Fr	2/5 F, 5/10 F, 11/2x10 Franc	TARIF 5															01	05	10	10	02	20	01	05
	1 Fr	5 Fr	10 Fr	1/5 F, 3/10 F (5 ball play)	TARIF 6																						
Italy	500L	500L	500L	1/500 Lire ²	ITALY																						
Spain	25 P	-	100 P	1/25 P, 5/100 Peseta ²	SPAIN																						
	25 P	-	100 P	1/25 P, 4/100 Peseta	CUSTOM															01	00	04	00	01	00	01	00
	25 P	-	100 P	1/2x25 P, 2/100 Peseta	CUSTOM															01	00	04	00	02	00	01	00
	25 P	-	100 P	1/2x25 P, 3/100 Peseta	CUSTOM															03	00	12	00	04	00	01	06
Japan	100 ¥	-	100 ¥	1/100 Yen ²	JAPAN																						
Antilles, Nthrd	25¢	-	1G	1/25¢, 4/1 Guilder ²	ANTILLES																						
Chile	Token	-	Token	1/1 Token ²	CHILE																						
Denmark	1 Kr	5 Kr	10 Kr	1/2x1 Kr, 3/5 Kr, 7/10 Krone ²	DENMARK																						
Finland	1 Mka	-	5 Mka	1/2x1 Mka, 3/5 Markka ²	FINLAND																						
New Zealand	20¢	-	20¢	1/3x20¢ ²	N. ZEALAND																						
Norway	5 Kr	-	10 Kr	1/5 Kr, 2/10 Kr, 5/20 Krone ²	NORWAY																						
Argentina	10¢	10¢	10¢	1/1 Token ²	ARGENTINA																						
Greece	10 D	20 D	50 D	1/2x10D, 1/20D, 3/50 Drachma ²	GREECE																						
Hungary	10 F	20 F	20 F	1/1x20F, 1/2x10F, 3/2x20 Forint	HUNGARY																						

Notes: 1. Factory Default. 2. Standard Setting - Change by pressing Enter button. 3. Other functions are also affected.

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, Grand Champion, & Billionaire Club H.S. 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 99, 900, 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 99, 900, 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 99, 900, 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 99, 900, 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 99, 900, 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**
The operator chooses the column width to be printed. The range of this setting is 22 through 80.
- A.5 02 Lines Per Page**
The operator chooses the amount of lines per page. The range of this setting is 20 through 80.
- A.5 03 Pause Every Page**
The operator chooses whether the printer pauses at the end of a page. The choices are:
 - YES - The printer does pause.
 - NO - The printer doesn't pause.

Press the Escape button to return to the Adjustments Menu. Then, either press the Up or Down button to return to a previous Adjustment 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 Bookkeeping Menu, or press the Down button to return to a previous Main Menu selection.

Press the Enter button to activate the Bookkeeping Menu, once the menu name is shown under the Main Menu. Then, use 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 available 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 also 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	Games Completed	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	* Note: These Audits are NOT Resettable. They are a record of the earnings of the game since the "CLOCK 1ST SET" Time -Stamp.
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	

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 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.3 Standard Audits

B.3	01	Games Started	00	• Games Completed is a new feature in WPC. 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.
B.3	02	Games Completed*	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

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	Face 1- Returned to Face 1 - mouth	00
B.4	02	Face 2- Made Face 2- eyes	00
B.4	03	Face 3- Made Face 3- Neck	00
B.4	04	Face 4- Made Face 4- Human	00
B.4	05	Extra Ball Lit Off Left Loop	00
B.4	06	Extra Ball Lit Off Pinbot	00
B.4	07	Extra Ball Lit Off Random - Small Wheel Spin	00
B.4	08	Jackpots	00
B.4	09	Jackpot Lit Off Random - Small Wheel Spin	00
B.4	10	Jackpot Lit Off Loop	00
B.4	11	Small Wheel Spin	00
B.4	12	Big Wheel Spins	00
B.4	13	Multiball	00
B.4	14	Jets at Maximum	00
B.4	15	Skill Shot 50K	00
B.4	16	Skill Shot 75K	00
B.4	17	Skill Shot 100K	00
B.4	18	Skill Shot 200K	00
B.4	19	Skill Shot 25K	00
B.4	20	Enter Pinbot Playfield	00
B.4	21	Bonus Multiplier -going backwards through right Loop	00
B.4	22	Bonus Multiplier - off three standup targets	00
B.4	23	Unlimited Million- off right ramp	00
B.4	24	Collect Billion from right ramp	00
B.4	25	Skill Multiplier- returned to skill shot from ramp	00
B.4	26	Billion Lit - from spinning Big Wheel	00
B.4	27	Wheel 50 Million - from spinning Big Wheel	00
B.4	28	Wheel 10 Million - from spinning Big Wheel	00
B.4	29	Wheel 1 Million - from spinning Big Wheel	00
B.4	30	Power Charge - during multiball	00
B.4	31	Lock 1 In Eyes - lock 1st ball in her eyes	00
B.4	32	Lock 1 In Neck - lock 1st ball in her neck (3rd face)	00
B.4	33	Lock 1 Human - lock 1st ball in her neck (3rd face)	00
B.4	34	Mini Exit Left	00
B.4	35	Mini Exit Right	00

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	0.0-0.5 Million Scores	00%	00
B.5	02	0.5-1.0 Million Scores	00%	00
B.5	03	1.0-1.5 Million Scores	00%	00
B.5	04	1.5-2.0 Million Scores	00%	00
B.5	05	2.0-3.0 Million Scores	00%	00
B.5	06	3.0-4.0 Million Scores	00%	00
B.5	07	4.0-5.0 Million Scores	00%	00
B.5	08	5.0-6.0 Million Scores	00%	00
B.5	09	6.0-8.0 Million Scores	00%	00
B.5	10	8.0-10 Million Scores	00%	00
B.5	11	10-15 Million Scores	00%	00
B.5	12	15-20 Million Scores	00%	00
B.5	13	Over 20 Million	00%	00
B.5	14	Game Time 0.0-1.0 Min.	00%	00
B.5	15	Game Time 1.0-1.5 Min.	00%	00
B.5	16	Game Time 1.5-2.0 Min.	00%	00
B.5	17	Game Time 2.0-2.5 Min.	00%	00
B.5	18	Game Time 2.5-3.0 Min.	00%	00
B.5	19	Game Time 3.0-3.5 Min.	00%	00
B.5	20	Game Time 3.5-4.0 Min.	00%	00
B.5	21	Game Time 4-5 Min.	00%	00
B.5	22	Game Time 5-6 Min.	00%	00
B.5	23	Game Time 6-8 Min.	00%	00
B.5	24	Game Time 8-10 Min.	00%	00
B.5	25	Game Time 10-15 Min.	00%	00
B.5	26	Game Time Over 15 Min.	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 & Billionaire Reset
B.6	11	Last Printout

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)

- P1 Earnings Data**
- P2 Main Audits**
- P3 Standard Audits**
- P4 Feature Audits**
- P5 Score Histograms**
- P6 Time Histograms**
- P7 Time-Stamped**
- P8 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 displays.

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	Head Motor/Switch
T.13	Head Coils
T.14	Head Cycle
T.15	Helmet Light
T.16	Head Manual

Note: Switches in & on the Head Assembly can be tested and adjusted easier from Test .12 (Head Motor/Switch) on the Test Menu.

Note: Coils & Motor located on the head can only be tested in T.12, T.13, & T.14. Solenoid Test (T.4) will not activate the coils in the head.

Note: If head is in error and/or unable to calibrate, see T.16 "Head Manual" to manually control the turning & stopping of the head.

T.1 Switch Edges

For all switches, the number on the left indicates the column, the number on the right indicates the row. Example- Switch 23 means 2nd column, 3rd row.

To test the Left and Right Flippers, press the Left or Right Flipper buttons during switch test. The flipper name and switch number should show in the displays. Any other result indicates the system has detected a problem with the flipper circuit.

To activate the Switch Edges Test, from the Test Menu, press the Enter button. The name and number of each switch that is pressed is shown in the displays. If any other switch, 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. The name and number of each switch that is activated is shown in the displays. This test automatically cycles through all

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. Either Open or Closed appears in the displays to indicate the state of the switch at the present time. When the switch is activated, an "A" appears in the displays. 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.

THE MACHINE Switch Matrix

White  Green

Dedicated Grounded Switches	Column		1	2	3	4	5	6	7	8
	Row		Green-Brown	Green-Red	Green-Orange	Green-Yellow	Green-Black	Green-Blue	Green-Violet	Green-Gray
Orange-Brown ⁽¹⁾ Left Coin Chute D1	1	White-Brown	Right Flipper	Slam Tilt	Skill Shot 50K	Right Ramp Made	Spinner	Not Used	Wireform Top	
Orange-Red ⁽²⁾ Center Coin Chute D2	2	White-Red	Left Flipper	Coin Door Closed	Skill Shot 75K	Not Used	Shooter	Not Used	Wireform Bottom	
Orange-Black ⁽³⁾ Right Coin Chute D3	3	White-Orange	Start Button	Ticket Opto	Skill Shot 100K	Left Loop	Upper Right Jet Bumper	Head Left Eye	Enter Mini Playfield	
Orange-Yellow ⁽⁴⁾ 4th Coin Chute D4	4	White-Yellow	Plumb Bob Tilt	Always Closed	Skill Shot 200K	Right Loop Top	Upper Left Jet Bumper	Head Right Eye	Mini Exit Left	
Orange-Green ⁽⁵⁾ Normal Function Test Function Service Escape Credits D5	5	White-Green	Left Outlane	Right Trough	Skill Shot 25K	Right Loop Bottom	Lower Jet Bumper	Head Mouth	Mini Exit Right	
Orange-Blue ⁽⁶⁾ Normal Function Test Function Volume Down Down D6	6	White-Blue	Left Flipper Lane	Center Trough	Right Top Standup	Under Playfield Kickback	Jet Bumper Sling	Not Used	Left Ramp Enter	
Orange-Violet ⁽⁷⁾ Normal Function Test Function Volume Up Up D7	7	White-Violet	Right Flipper Lane	Left Trough	Right Bottom Standup	Enter Head	Left Slingshot	Face Position	Right Ramp Enter	
Orange-Gray ⁽⁸⁾ Normal Function Test Function Begin Enter Test D8	8	White-Gray	Right Outlane	Left Standup	Outhole	Not Used	Right Slingshot	Not Used	Not Used	

Note: Dedicated Switches are connected directly to ground.

T4 Solenoid Test

Note: Solenoids used in the Head Mechanism are NOT tested during the Solenoid Test. See T. 12, T. 13, and T. 14 for test the Head Mechanism.

Once the test name is shown under the Test Menu, press the Enter button. The Solenoid Test has three modes, Repeat, Stop, and Running. Only one solenoid should turn On at a time. The system has detected a problem if, more then one solenoid turns On, a solenoid comes On and stays On, or no solenoid turns On during the Repeat or Running test modes. Press the Start button to see the wire color, driver number, connector and, fuse information of any coil, when that coil is displayed.

- Repeat - This test allows you to stop and pulse a single coil or flashlamp. Once you have entered the Solenoid Test, coil 1 shows in the displays and the corresponding solenoid activates. Press the Up or Down button to cycle through the solenoids, one at a time, manually. 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 test mode.
- Stop - This test allows you to stop the Solenoid Test at any point. Press Enter during the Repeat test mode and the Solenoid Test stops. There should not be any solenoids 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 test mode.
- Running - This test allows you to cycle through the solenoids automatically. Press the Enter button during the Stop test mode. The displays show you the name and number of the solenoid currently being pulsed.

Either press the Enter button to return to the Repeat test 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.

T5 Flasher Test

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to test the flashlamp part of the solenoid circuit exclusively. This test, like the Solenoid Test, has three test modes Repeat, Stop, and Running. During this test, only one flashlamp circuit should turn On at a time. If, more then one flashlamp circuit turns On, or stays On, or no flashlamp circuit turns On at all during the Repeat or Running test modes the system has detected a problem. Press the Start button to see the wire color, driver number, connector, and fuse information of any flashlamp circuit when that circuit appears in the displays.

- Repeat - This test allows you to stop and pulse a single flashlamp. Once you have entered the Flasher Test the name and number of the first flashlamp circuit shows in the displays and the corresponding bulb(s) flashes. Press the Up or Down button to cycle through all of the flashlamps circuits one at a time, manually. The same flashlamp 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 test mode.
- Stop - This test allow you to stop the Flasher Test at any time. Press the Enter button during the Repeat test mode. The Flasher Test stops. There should not be any flashlamp circuit turned On during this test mode. Either press the Escape button to

return to the Test Menu, or press the Enter button to advance to the next test mode.

Running - This test allows you to cycle through the flashlamps automatically. Press the Enter button during the Stop test mode. The displays show you the name and number of the flashlamp currently being pulsed, and the corresponding bulb(s) flashes.

Either press the Enter button to return to the Repeat test 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.

THE MACHINE Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color	Connections	Driver Trmt	Solenoid Part Number Flashlamp Type
01	Outhole	High Power	Vio-Bm	J130-1	Q82	AE-26-1200
02	Ball Release	High Power	Vio-Red	J130-2	Q80	AE-26-1200
03	Under Playfield Kicker	High Power	Vio-Orn	J130-4	Q78	AE-23-800
04	Controlled Gate	High Power	Vio-Yel	J130-5	Q76	A-14406
05	Skill Shot Kicker	High Power	Vio-Gm	J130-6	Q64	AE-26-1500
06	Wire Ball Holder	High Power	Vio-Blu	J130-7	Q66	AE-26-1200
07	Knocker	High Power	Vio-Blk	J130-8	Q68	AE-23-800
08	Head Mouth	High Power	Vio-Gry	J130-9	Q70	AE-23-800
09	Upper Left Jet Bumper	Low Power	Bm-Blk	J127-1	Q58	AE-26-1200
10	Left (sling) Kicker	Low Power	Bm-Red	J127-3	Q56	AE-26-1500
11	Upper Right Jet Bumper	Low Power	Bm-Orn	J127-4	Q54	AE-26-1200
12	Right (sling) Kicker	Low Power	Bm-Yel	J127-5	Q52	AE-26-1500
13	Lower Jet Bumper	Low Power	Bm-Gm	J127-6	Q50	AE-26-1200
14	Jets Sling	Low Power	Bm-Blu	J127-7	Q48	AE-26-1500
15	Head - Left Eye	Low Power	Bm-Vio	J127-8	Q46	AE-23-800
16	Head - Right Eye	Low Power	Bm-Gry	J127-9	Q44	AE-23-800
17	Billion Flasher	Flasher	Blk-Bm	J125-1	Q42	#89 pfd
18	Left Ramp Flash	Flasher	Blk-Red	J126-2 J125-2	Q40	#89 pfd, #906 Insert
19	Jackpot Flasher	Flasher	Blk-Orn	J126-3 J125-3	Q38	#89 pfd, #906 Insert
20	Skill Shot Flasher	Flasher	Blk-Yel	J126-4	Q36	#89 pfd
21	Left Helmet Flasher	Flasher	Blu-Gm	J126-6 J125-6	Q28	#555 pfd, #906 Insert
22	Right Helmet Flasher	Flasher	Blu-Blk	J126-7 J125-7	Q30	#555 pfd, #906 Insert
23	Jets Enter Flash	Flasher	Blu-Vio	J126-8 J125-8	Q34	#555 pfd, #906 Insert
24	Left Loop Flash	Flasher	Blu-Gry	J126-9 J125-9	Q32	#555 pfd, #906 Insert
25	Helmet Lights Data Port	Special	Blu-Bm	J122-1	Q26	
26	Helmet Light Clock Port	Special	Blu-Red	J122-2	Q24	
27	Motor Relay	Special	Blu-Orn	J122-3	Q22	A-14423-1
28	Head Motor	Special	Blu-Yel	J122-4	Q20	A-14119
General Illumination Circuits						
01	Backglass Body	G.I.	Wht-Bm	J121-7	Q18	#555
02	Used In Helmet	G.I.	Wht-Orn	J120-8	Q10	#555
03	Rear Playfield	G.I.	Wht-Yel	J120-9	Q14	#555
04	Backglass - No Body	G.I.	Wht-Gm	J121-11	Q16	#555
05	Front Playfield	G.I.	Wht-Vio	J120-11	Q12	#555
	Lower Right Flipper		Blu-Yel	J109-7		FL-11630
	Lower Left Flipper		Gry-Yel	J109-5		FL-11630

T6 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 displays.

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 displays while the corresponding lamps lights. If any other result occurs, the system has detected an error.

Run - Press the Enter button any time during Stop test mode and the General Illumination Test cycles through automatically. For each circuit shown in the displays the corresponding bulbs should light. If any other result occurs, the system has detected a problem.

Either press the Enter button to return to Stop test 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 that test.

T7 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, Running, Repeat and Stop.

Running - This test 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. For each name and number that appears in the displays a sound or tune should be heard. Any other result indicates the system has detected a problem.

Repeat - Press the Enter button at any time during the Running test 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 result indicates the system has detected a problem.

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

Use the Enter button to return to the Running 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 that test.

THE MACHINE Lamp Matrix

Yellow (B+)  Red

Column Row	1 Yellow- Brown	2 Yellow- Red	3 Yellow- Orange	4 Yellow- Black	5 Yellow- Green	6 Yellow- Blue	7 Yellow- Violet	8 Yellow- Gray
1 Red- Brown	Left Outlane 11	Circle Lite Jackpot 21	Circle 250K 31	Skill Shot 50K 41	Left Loop 500K 51	Right Ramp 100K 61	Jackpot 8 Million 71	Backglass Hip 81
2 Red- Black	Left Return Lane 12	Circle Lite Billion 22	Circle 10 Million 32	Skill Shot 75K 42	Left Loop 100K 52	Right Ramp 500K 62	Jackpot 7 Million 72	Backglass Middle leg 82
3 Red- Orange	Right Return Lane 13	Circle Extra Ball 23	Circle 50 Million 33	Skill Shot 100K 43	Left Loop 50K 53	Right Ramp Million 63	Jackpot 6 Million 73	Backglass Knee 83
4 Red- Yellow	Right Outlane 14	Circle Lite Extra Ball 24	Circle Special 34	Skill Shot 200K 44	Left Loop 25K 54	Wire Ball Lock 64	Jackpot 5 Million 74	Backglass Foot 84
5 Red- Green	Left Standup 15	Circle 500K 25	Circle 5 Million 35	Skill Shot 25K 45	Right Loop 500K 55	Jet Enter 500K 65	Jackpot 4 Million 75	Backglass Shoulder 85
6 Red- Blue	Right Top Standup 16	Circle 100K 26	Circle 1 Million 36	Head Left Eye 46	Right Loop 100K 56	Jet Enter 100K 66	Jackpot 3 Million 76	Mini Playfield 100K 86
7 Red- Violet	Right Bottom Standup 17	Values Doubled 27	Space Shuttle 37	Head Right Eye 47	Right Loop 50K 57	Jet Enter 50K 67	Jackpot 2 Million 77	Mini Playfield 200K 87
8 Red- Gray	Shoot Again 18	Spin Small Wheel 28	Launch Pad 38	Head Mouth 48	Right Loop 25K 58	Jet Enter 25K 68	Jackpot 1 Million 78	Mini Playfield 300K 88

T8 Single Lamp Test

For all lamps, 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 displays the corresponding lamp should light. Any other result 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 that test.

T9 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 result 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 that test.

T10 Lamp and Flasher Test

Note: The lights on the Helmet Assembly are NOT tested from the Lamp & Flasher Test.
See T. 15 - Helmet Light, to test the lights on the Helmet.

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 result 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 that test.

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.

T.11 Display Test

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to cycle through all of the display circuits. Each segment and digit should light in its turn. If a segment or digit never lights, or stays lit all the time, the system has detected a problem. There are two modes for testing the displays, Running and Stop.

Running - This test cycles through several phases automatically. Each phase is designed to test either an entire digit or a specific segment.

Stop - Press the Enter button at any time during the Running test mode and the test stops. Use the Up or Down buttons to cycle through each phase of the test manually. Press the Enter button again to resume the Running test mode.

ENTERING A HEAD TEST & POSSIBLE HEAD PROBLEMS

Upon entering any of the head tests (T.12, T.13, T.14) (except for T.16 Head Manual) for the first time since entering diagnostics the head will rotate itself to the "home" position. A message will be displayed telling you: "homing head please wait". The home position for the head is the first face (mouth). Once the head has rotated to this face successfully the appropriate test will begin. If the head can not "home" itself to the first face (mouth) then it will try to calibrate itself. A message will be displayed telling you "calibrating head please wait". Calibrate re-times all the face positions of the head, this may take up to a minute to complete. The calibrating will end with the "home face" showing (mouth). Once the head has rotated to this face successfully the appropriate

test will begin. If the head can not calibrate itself an error message will be displayed "ERROR UNABLE TO CALIBRATE HEAD" for a few seconds & you will then enter the appropriate test. The test will probably not function correctly if the head was unable to calibrate. The main cause of the head not calibrating or being able to stop on the correct face is the HEAD POSITION SWITCH (#67). This switch MUST be adjusted properly for the head to work. It must be open when on an indentation and closed when not on an indentation. It should be able to easily trigger on & off when the head turns (between indentations). See T.12 Head MTR/SW or T.16 Head Manual Tests for testing this switch while the head is rotating. Or, if the head was unable to calibrate see T.16 Head Manual. T.16 will allow you to manually turn the Head Motor on and off - showing the state of the Head position switch (#67) in the display. When exiting Diagnostics after using one of the head tests the head will again calibrate itself to make sure it is working properly, please wait for it to finish rotating.

T.12 Head MTR/SW Test

NOTE: Please read the above information concerning the "Head Tests & Head Problems".

Once the test name is shown under the test menu, press the enter button. This check allows you to check the switches inside & outside the head assembly, and check to see that the head motor operates in forward (clockwise) and backwards (counter clockwise) directions.

Enter Button Not Used During Test.

UP Button (+): This will rotate the head forward (clockwise) to the next face. If it is on the mouth or the eyes face you may actuate the switches in the opening(s) and if they are working properly the name and switch number will appear in the display.

DOWN Button (-): This will rotate the head backward (counter clockwise) to the next face. If it is on the mouth or the eyes face you may actuate the switches in the opening(s) and if they are working properly the name and switch number will appear in the display.

Escape Button: Will return you to the Test menu any time it is pressed during the the Head MTR/SW test.

The display will show the status of the motor (MR=ON or MR=OFF) and the current, if any, head switch (SW=) number that is closed. This allows you to move the head to any face and test the switches in the head (mouth and eyes). ADJUSTMENT of the switch on top of the head (head position switch #67) is critical to proper operation of the head assembly. In order for the head to rotate and stop properly this switch must be open when on an indentation and closed when not on an indentation. If when the up button is pressed the head does not rotate clockwise or when the down button is pressed the head does not rotate counter clockwise or the head does not turn at all, the system has detected a problem. The motor or gears may be bad, the relay may be bad, or the power supply to the head may be bad (check for power off driver board AND 12V regulator board).

When done testing the head motor and switches, press escape 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 the previous test). Press enter to activate that test.

T13 Head Coils Test

NOTE: Please read the information concerning the "Head Tests & Head Problems" pg. 32 -33.

Once the test name is shown under the test menu, press the enter button. This test allows you to check the operation of the kicker coils inside the head assembly. Upon entering the test the head will rotate to the first face (mouth) to begin the test. Only two faces have openings for the coils to kick, the first face (mouth opening) and the second face (two eye openings). This test will rotate the head to allow the head kicker coils to fire in the openings. The head coil test has two modes; repeat and stop. Only one solenoid should turn on at a time. The system has detected a problem if: more than one solenoid turns On, a solenoid comes on and stays On, or no solenoid(s) turn on during the repeat test mode.

Enter Button: Selects between REPEAT and STOP modes:

Repeat - This allows you to pulse a single coil. The displays show the coil that is firing. Press up or down to cycle through the solenoids one at a time, manually. The same solenoid pulses until you move to the next one or change to stop mode.

Stop - This test allows you to stop the head coil test at any point. There should not be any solenoids active while the test is stopped.

UP Button (+) - Moves forward to the next coil in the test. If the coil is on another face, the head will rotate to the face and continue the test.

DOWN Button (-) - Moves backward to the previous coil in the test. If the coil is on another face, the head will rotate to the face and continue the test.

Escape Button - Will return you to the Test menu any time it is pressed during the head coil test.

When done testing the head coils, press escape 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 the previous test). Press enter to activate that test.

T14 Head Cycle Test

NOTE: Please read the information concerning the "Head Tests & Head Problems" pg. 32-33.

Once the test name is shown under the test menu, press the enter button. This test allows you to check the operation of the head assembly over long periods of time or to see if it functions properly on all faces (sides). It basically combines the head motor/switch test and the head coil test into one self running test. The Head Cycle Test will help to find intermittent problems by allowing the head assembly to rotate and kick coils for a long period of time. Upon entering the Head Cycle Test the head will start to rotate forward (clockwise) through all the faces stopping briefly at each one and kicking coils if there is an opening (the mouth and eyes faces). It will then rotate backward (counter clockwise) through the faces stopping briefly at each one and kicking coils if there is an opening (the mouth and eyes faces). This process will continue as long as the cycle test is in REPEAT mode. If the head does not go clockwise through the faces and then counter clockwise through the faces, the system has detected a problem (probably the direction relay). If the coils in the head kick on a face without opening, the system has detected a problem, possibly the switch on the back of the head (head position switch - #67). The Head Cycle Test has two modes: Repeat & Stop.

Enter Button: Selects between REPEAT and STOP modes:

Repeat - Will start the head rotating as described above. The head will continue to rotate until the mode is changed to stop (pressing enter) or the Head Cycle Test is exited (pressing escape).

Stop - This test allows you to stop the head cycle test at any point. There should not be any solenoids active while the test is stopped and the head should stop rotating once it has settled on a face (when you change to stop mode it will take a few seconds to stop).

UP Button (+) - Not used in this test.

DOWN Button (-) - Not used in this test.

Escape Button - Will return you to the Test menu any time it is pressed during the Head Cycle Test.

When done testing the head cycling, press escape 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 the previous test). Press enter to activate that test.

T.15 Helmet Light Test

Once the test name is shown under the test menu, press the enter button. This test will allow you to test the 16 lights on top of the helmet. Upon entering this test all lamps on the helmet should start blinking on and off. If they all are not, check for a burnt out bulb or socket contact not making a good connection or the power to the lights is lost (power is obtained through GI string #2). If this all checks out it may be the circuit that controls the lights. The Helmet Light Test has three modes: all lamps, single lamp, and cycle lamps.

Enter Button - Selects between the three modes: all lamps, single lamp, and cycle lamps.

ALL LAMPS - This will blink all the lamps on the helmet together at the same time on and off. This on/off cycle will continue until the mode is changed (pressing Enter).

SINGLE LAMP - This will allow you to turn on each light on the helmet individually. The first light on will be in the lower left corner of the helmet. You may then use the the up button to move clockwise to the next light or the down button to move counter clockwise to the previous light.

CYCLE LAMPS - This combines the above two tests into one self running test. Upon changing to this mode the helmet lights will all blink on and off a few times and a single light (starting in the lower left corner of the helmet) will turn each light on and off clockwise and then do the same counter clockwise. This process will be repeated until the mode is changed (pressing Enter button).

UP Button - Not used - except where noted above in the single lamp mode.

DOWN Button - Not used - except where noted above in the single lamp mode.

DOWN Button - Not used - except where noted above in the single lamp mode.

Escape - Will return you to the Test menu any time it is pressed during the Helmet Light Test.

When done testing the head cycling, press escape 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 the previous test). Press enter to activate that test.

T.16 Head Manual Control Test

NOTE: Please read the information concerning the "Head Tests & Head Problems" before using this test (pg. 32-33).

Once the test name is shown under the test menu, press the enter button. This test is not subject to the normal homing and calibrating of the other head tests (T.12, T.13, T.14). It will allow you to manually control the turning on and off of the head motor. The display will show the state of head position switch (#67) (sw=) and the status of the motor (MR=ON or MR= OFF). This test allows easier adjustment of the head position switch (#67) by allowing you to start and stop the rotating of the head while watching in the displays if the head position switch is triggering properly (switch should be open when on an indentation and closed when not on an indentation).

Enter Button - Not used in this test.

UP Button - This will turn the head motor on (rotating clockwise) if the motor was previously off. If the motor was previously on, it will turn the head motor off immediately.

DOWN Button - This will turn the head motor on (rotating counter clockwise) if the motor was previously off. If the motor was previously on, it will turn the head motor off immediately.

Escape - Will return you to the Test menu any time it is pressed during the Head Manual Test.

When done testing the Helmet Lights, press escape 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 the previous test). Press enter to activate that test.

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 displays. 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 displays. 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.

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- U.5 Custom Message**
- U.6 Set Game LD.**
- 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 and the Grand Champion & Billionaires Club H.S.T.D. 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. Press the Up button to move to the next utility.
- U.5 Custom Message**
This utility allows the operator to install a message that appears in the displays during the Attract Mode. Press the Enter button to activate 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. Note: Set Adjustment A.1 20 to YES before trying to write a Custom Message.
- U.6 Set Game LD.**
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 & Billionaires Club Table, and Custom Message/Game I.D. Press the Up button to display the next utility.
- 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**
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.
- 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.

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 01	Extra Ball %	25%	20%	15%	10%	8%
A.2 02	Extra Ball Lit Off Wheel %	20%	15%	10%	8%	5%
A.2 03	Jackpot Lit Off Wheel %	20%	15%	15%	10%	8%
A.2 04	Big Wheel 1 Million	5%	8%	10%	15%	25%
A.2 05	Big Wheel 10 Million	35%	30%	25%	20%	15%
A.2 06	Big Wheel 50 Million	35%	30%	25%	20%	15%
A.2 07	Big Wheel Lit Billion	50%	35%	25%	22%	20%
A.2 08	Special Percentage	20%	15%	10%	8%	5%
A.2 09	Left Loop Time Down Rate	20 sec.	12 sec.	8 sec.	7 sec.	5 sec.
A.2 10	R. Loop Time Down Rate	40 sec.	30 sec.	20 sec.	15 sec.	10 sec.
A.2 11	R. Ramp Time Down Rate	25 sec.	15 sec.	7 sec.	6 sec.	5 sec.
A.2 12	Jackpot Time Out Rate	40 sec.	30 sec.	20 sec.	15 sec.	10 sec.
A.2 13	Billion Lit Time Down Rate	30 sec.	22 sec.	15 sec.	12 sec.	10 sec.
A.2 14	Consolation Extra Ball Time	70 sec.	60 sec.	50 sec.	40 sec.	30 sec.
A.2 15	Extra Ball Lit Memory	ON	ON	ON	ON	OFF
A.2 16	Jet Lane Memory	ON	ON	ON	OFF	OFF
A.2 20	Enter Mini Playfield	EASY	EASY	EASY	EASY	HARD
A.2 23	Combo Loop Start	3	4	4	5	6

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 01	Extra Ball %	25%	20%	15%	10%	8%
A.2 02	Extra Ball Lit Off Wheel %	20%	15%	10%	8%	5%
A.2 03	Jackpot Lit Off Wheel %	20%	15%	15%	10%	8%
A.2 04	Big Wheel 1 Million	5%	8%	10%	15%	25%
A.2 05	Big Wheel 10 Million	35%	30%	25%	20%	15%
A.2 06	Big Wheel 50 Million	35%	30%	25%	20%	15%
A.2 07	Big Wheel Lit Billion	50%	35%	25%	22%	20%
A.2 08	Special Percentage	20%	15%	10%	8%	5%
A.2 09	Left Loop Time Down Rate	20 sec.	12 sec.	8 sec.	7 sec.	5 sec.
A.2 10	R. Loop Time Down Rate	40 sec.	30 sec.	20 sec.	15 sec.	10 sec.
A.2 11	R. Ramp Time Down Rate	25 sec.	15 sec.	7 sec.	6 sec.	5 sec.
A.2 12	Jackpot Time Out Rate	40 sec.	30 sec.	20 sec.	15 sec.	10 sec.
A.2 13	Billion Lit Time Down Rate	30 sec.	22 sec.	15 sec.	12 sec.	10 sec.
A.2 14	Consolation Extra Ball Time	70 sec.	60 sec.	50 sec.	40 sec.	30 sec.
A.2 15	Extra Ball Lit Memory	ON	ON	ON	ON	OFF
A.2 16	Jet Lane Memory	ON	ON	ON	OFF	OFF
A.2 20	Enter Mini Playfield	EASY	EASY	EASY	EASY	HARD
A.2 23	Combo Loop Start	3	4	4	5	6

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	3
A.1 07	Replay Start	9,5000,000	7,0000,000
A.2 20	Enter Mini Playfield	Hard	Easy

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:

<u>Ad</u>	<u>Name</u>	<u>New Setting</u>
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.

<u>Ad</u>	<u>Name</u>	<u>New Settings</u>
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.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:

<u>Ad</u>	<u>Name</u>	<u>New Setting</u>
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.
- U.9 17 Install German 1 • • For German Jumpered CPU Boards only.**
The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German/European 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/ European 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/European 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/European 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/European 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/European Games lists the adjustments and settings that comprise the 'Install German 6' Group.

Preset Game Adjustments Table for German/European Games

Adj #	Adj Description	German 1 U.9 17	German 2 U.9 18	German 3 U.9 19	German 4 U.9 20	German 5 U.9 21	German 6 U.9 22
A.1 14	Replay Award	Credit	Ticket	Audit	Credit	Ticket	Audit
A.1 15	Special Award	Credit	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	6 spiele/5 DM	6 spiele/5 DM	6 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM
A.4 02	H.S.T.D. Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.4 04	Champion Credits	03	03	00	03	03	00
A.4 05	High Score 1 Credits	01	01	00	01	01	00
A.4 06	High Score 2 Credits	00	00	00	00	00	00
A.4 07	High Score 3 Credits	00	00	00	00	00	00
A.4 08	High Score 4 Credits	00	00	00	00	00	00
A.4 10	Backup Champion	15,000,000	00	00	00	00	00
A.4 11	Backup High Score 1	12,000,000	00	00	00	00	00
A.4 12	Backup High Score 2	11,000,000	00	00	00	00	00
A.4 13	Backup High Score 3	10,000,000	00	00	00	00	00
A.4 14	Backup High Score 4	9,000,000	00	00	00	00	00

- U.9 23 Install French 1* *For French Jumpered CPU Boards only.**
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 setting 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 list 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 list 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 setting 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.

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 utility 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 General Illumination Test.

Press the Escape button to return to the Utilities Menu. Then, either press the Up or Down button to return to a previous Utilities 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.

PROBLEM ANALYSIS MESSAGES

The WPC game program has a great capability to aid the operator and service personnel: At Game Turn-on (and after pressing the Begin Test switch) once the game has been operating for an extended period, the player score displays may signal with a message, "Press ENTER for Test Report", 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 MACHINE** 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 MACHINE** earning, until the service technician can repair the problem, bringing the game back to its normal good profits!)

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 MACHINE** 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 via 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).

"Head Motor/Switch Error" - Possible Causes:

1. The motor that turns the head is not functioning.
2. The switch that positions the head is not operating correctly (broke or needs adjustment). This error message gets set when the head turns and does not see a switch position closure within 20 seconds. The usual cause is the head positioning switch (top of the head) is not adjusted properly. It should trigger closed when not on an indentation and open when on an indentation. The head will NOT work properly unless this switch is adjusted correctly. See T. 12 - Head Motor/Switc & T.16 Head Manual tests for help in adjusting this switch.

Factory Settings Restored. Repeated appearance of 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 of U8 should be +5V (game turned On) and at least +3.8V (game turned Off). When the voltage drops below +3.8V, 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.

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

CPU Board L.E.D. Error Codes

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

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 Shooter Lane Feeder mechanism are the pivots for the arm. Note that the mechanism of other playfield devices are somewhat similar to the Ball Shooter Lane Feeder Device; and have the same lubrication requirements as the Ball Shooter Lane Feeder Device. A medium viscosity oil (20W or 30W) 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 20-8886, is a recommended lubricant.

SWITCH CONTACTS

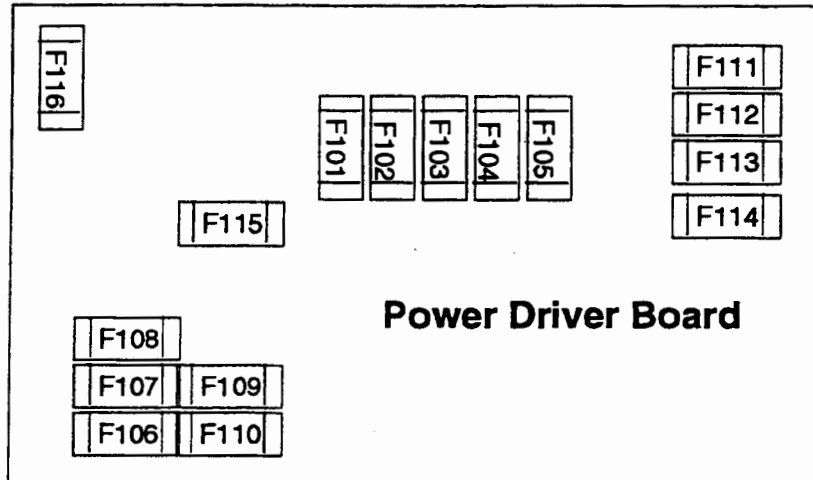
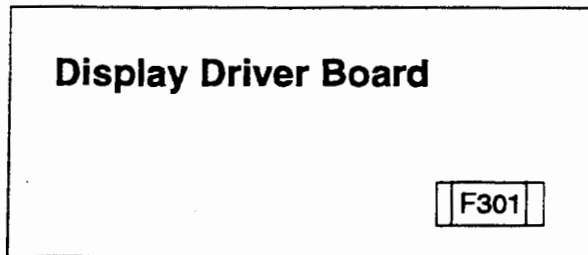
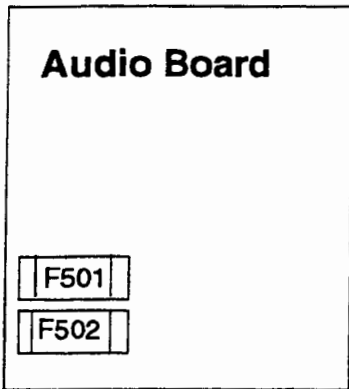
For proper game operation, switch contacts should be free of dust, dirt, contamination, and corrosion. Blade switch contacts are plated to resist corrosion. Cleaning blade switch contacts requires gentle closing of the contacts on a clean business card or piece of paper, and then pulling the paper about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

CLEANING

Good game action and extended playfield life are the result 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.

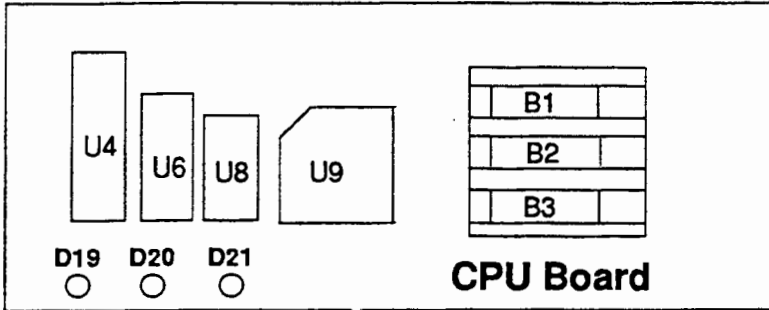
Display Driver Board

F301 ±100V Circuit 3/8A, S.B.

Power Driver Board

F101	Left Flipper	2.5A, S.B.	F113	+5V Logic	5A, S.B.
F102	Right Flipper	2.5A, S.B.	F114	+18V Lamp Matrix	8A, N.B.
F103	Solenoid 25-28	3A, S.B.	F115	+12V Switch Matrix	3/4A, S.B.
F104	Solenoids 9-16	3A, S.B.	F116	+12V Secondary	3A, S.B.
F105	Solenoids 1-8	3A, S.B.			
F106	G.I. #2 Wht-Vio	5A, S.B.			
F107	G.I. #3 Wht-Yel	5A, S.B.			
F108	G.I. #5 Wht-Grn	5A, S.B.			
F109	G.I. #4 Wht-Orn	5A, S.B.			
F110	G.I. #1	5A, S.B.			
F111	Flasher Secondary	5A, S.B.			
F112	Solenoid Secondary	5A, S.B.			

LED List



CPU Board

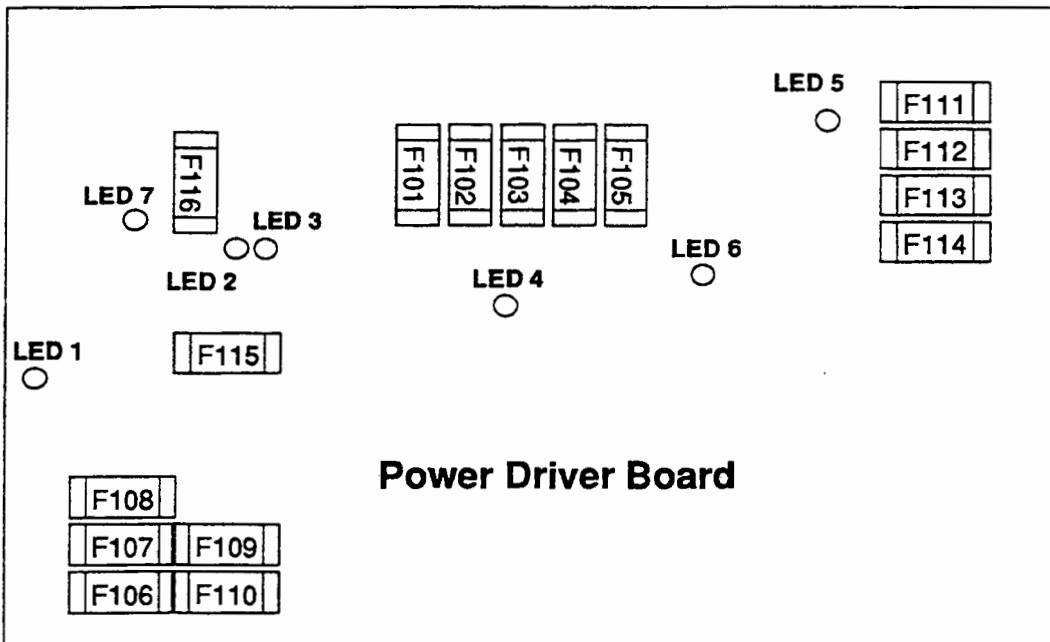
D19 , Blanking

D20, Diagnostic

D21, +5vdc

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

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



Power Driver Board

LED1, +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 Off

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

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

NOTES:

Section 2

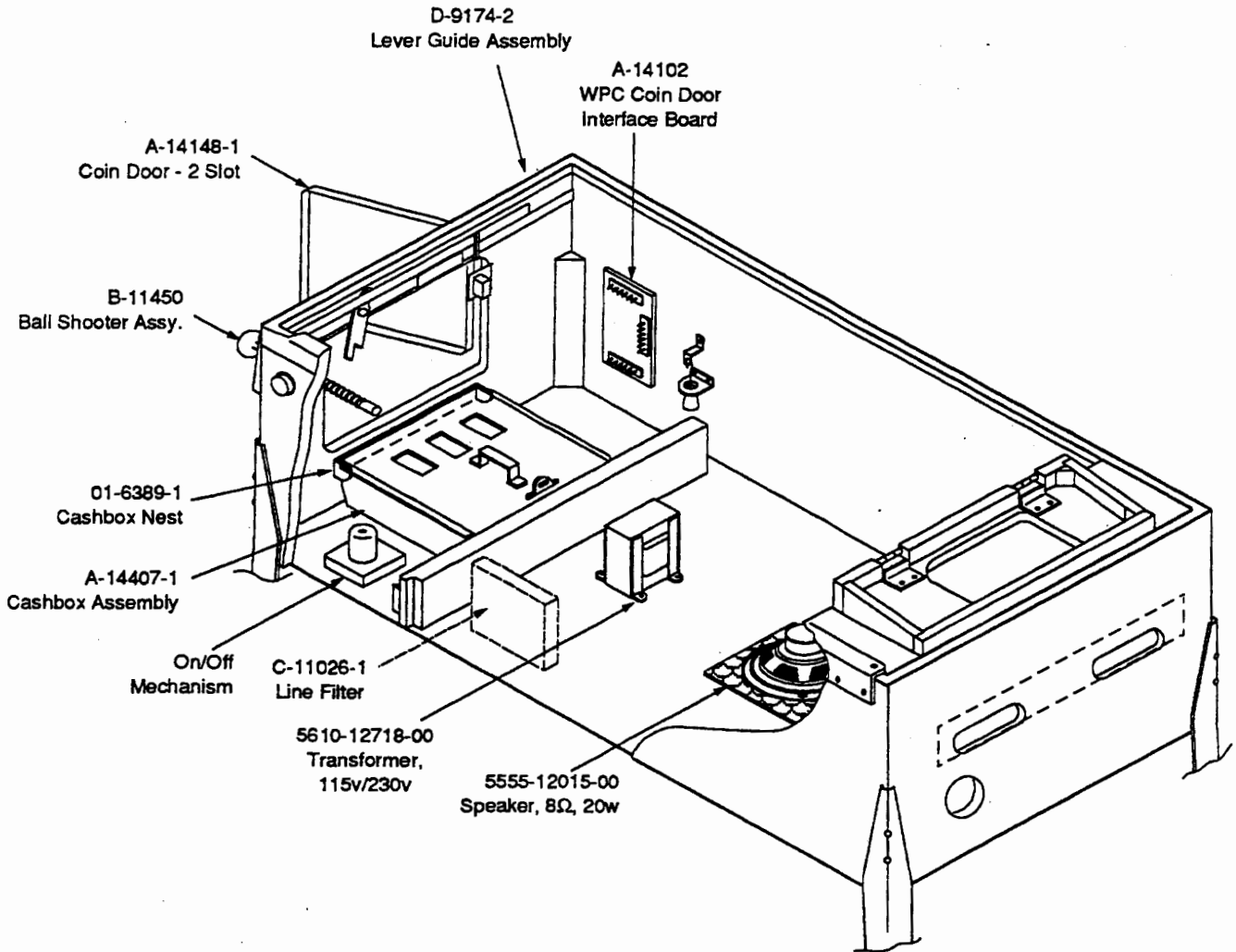
Game Parts Information

- ***Parts Lists & Diagrams***

Cabinet Parts
Game Circuit Boards
Major Mech. Location Diagram
Audio Board
CPU Board
Power Driver Board
Display Driver Board
Lamp Boards
Coin Door Interface Board

Major Mechanism Assemblies
Rubbers
Lamps
Switches
Solenoids/Flashers
Playfield Parts

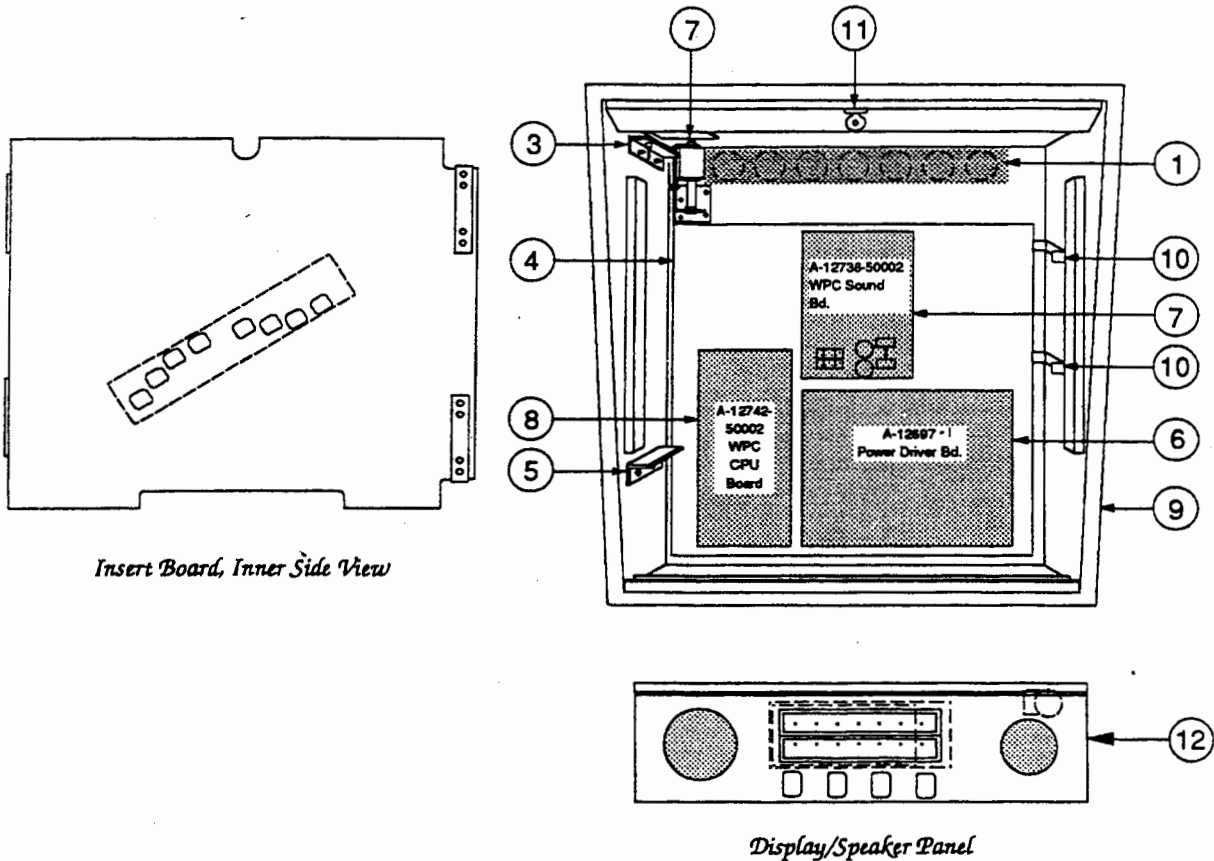
Cabinet Parts



Miscellaneous Parts

Part Number	Description	Part Number	Description
03-7960-50002	Playfield Mylar	31-1009-50002	Shooter Plate (Screened)
08-7028-T	Glass Playfield	31-1524-1	Decal - Coinage
08-7456	Backbox Glass, 27 x 18-7/8	31-1524-2	Decal - Tokens
31-1002-50002	Playfield (Screened)	31-1524-3	Decal - See Cards
31-1008-50002	Bottom Arch (Screened)	31-1-50002-	Playfield Plastics Set (Screened)

Backbox Assembly



Item	Part Number	Description	Item	Part Number	Description
1	01-6645	Venting Screen	9	A-14376-50002	The Machine Backbox
2	B-10686-1*	Knocker & Bracket Assy.	10	01-9047	Insert Stop Bracket
3	A-12497	Upper Insert Bd Hinge Assy.	11	A-13379	Lock Plate Assembly
4	A-14092	Plate & Clip Assembly	a)	20-9637	Lock & Cam Kit
5	A-12498	Lower Insert Bd Hinge Assy.	12	A-14368	Speaker / Display Assembly
6	A-12697-1	Power Driver Assembly	a)	A-14087-1	WPC Display/Driver Assy.
7	A-12738-50002	WPC Sound Board	1)	A-12739-1	WPC Display Drive Assy.
8	A-12742-50002	WPC CPU Board	b)	5555-12015-00	Speaker, 8Ω, 6", 20w
			c)	5555-12068-00	Piezo Speaker, 4", 50w.
			d)	A-14292-1	Coil & Bracket Assembly

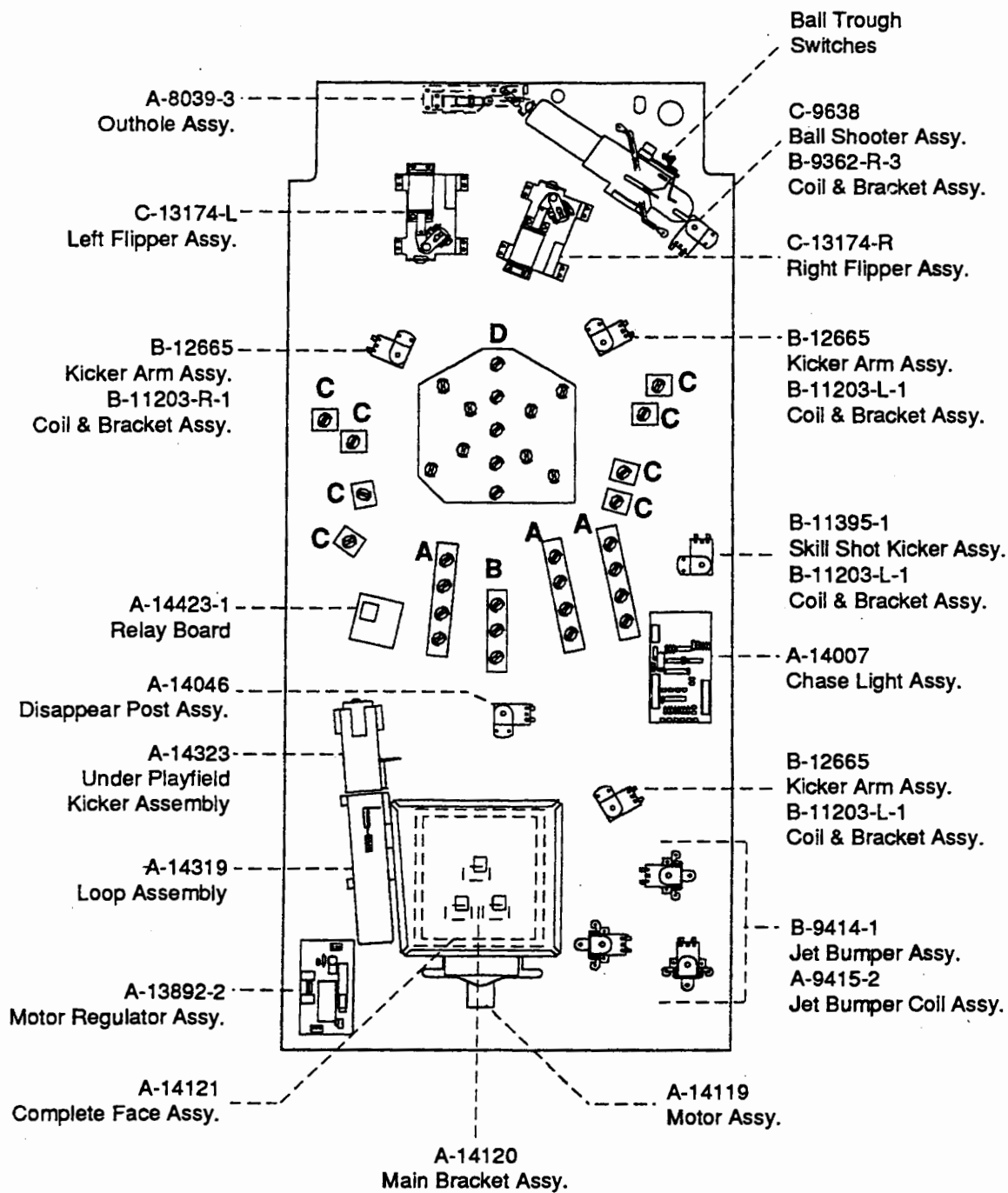
* Refer to Individual Unit's Parts List

Miscellaneous Backbox Parts

Part Number	Description
A-1552-50002	Backglass Assembly
31-1357-50002	The Machine Backglass
50002-IN	The Machine Insert
01-6571	Hinge Mounting Bracket
01-6655	Latch -Insert Board
01-6652	Insert Stop Bracket
03-8149-9	Mini Dome - Tr. Red
03-8519	Egg Crate

Locations Diagram - Game Major Mechanisms

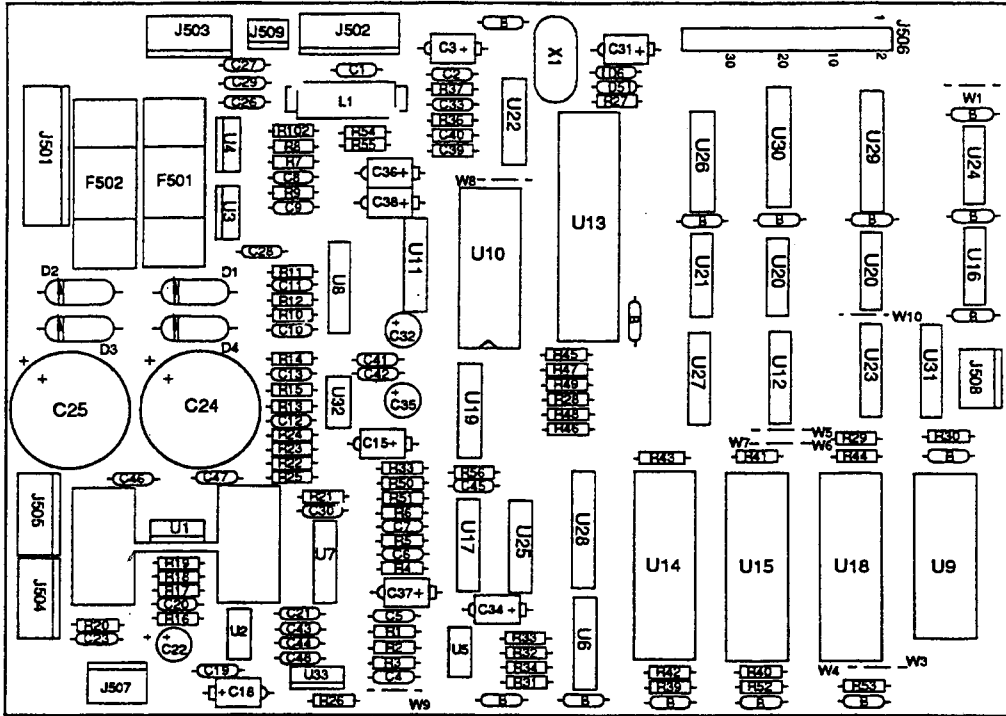
Underside of Playfield, Viewed in Raised Position



Lamp Boards

A.	A-14305	4-Lamp Board
B.	A-14302	3-Lamp Board
C.	B-12224	1-Lamp Board
D.	A-14304	13-Lamp Board

A-12738-50002 WPC Audio Board

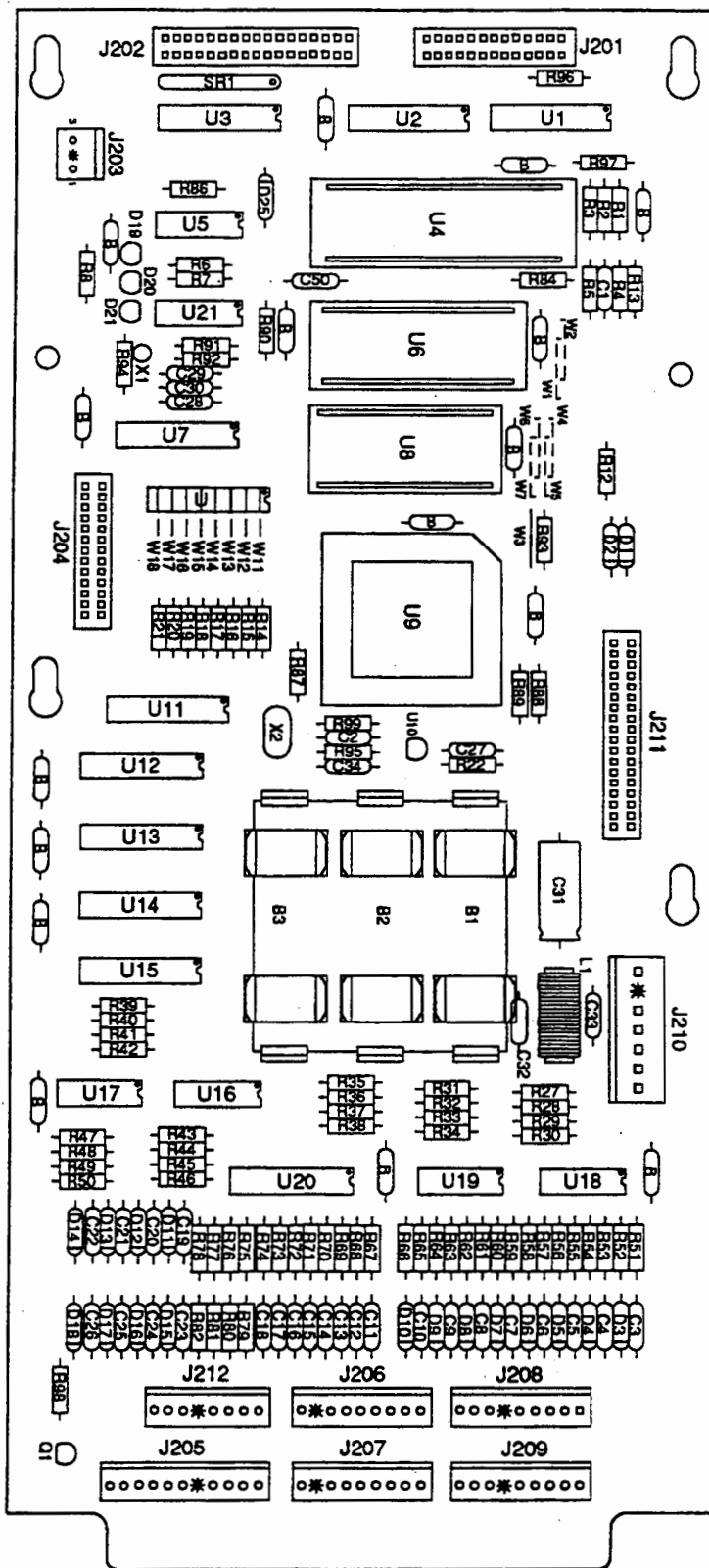


Part No.	Ckt Designator	Description	Part No.	Ckt Designator	Description
01-9980		Shield: Wire Protector	5048-12746-00	C5, C7	Capacitor, 330pfd., 50V
20-8229	U1	Thermal Compound	5048-12748-00	C8, C11, C30	Capacitor, 220pfd., 50V
4004-01005-06	U1	Mach. Screw, 4-40 x 3/8	5070-08919-00	D5, D6	Diode, 1N4148
4104-01012-04	U1	Sh. Mach. Screw, #4 x 1/4	5070-09045-00	D1-D4	Diode MR601, 3.0A.
4104-01012-04	U1	Sh. Metal Screw, #4 x 1/4	5250-10495-00	U3	Reg. 7912 1.0A -12v
4404-01119-00	U1	Nut, 4-40 SNUIT	5281-09215-00	U22	IC, 74LS04 Hex INV
5010-09324-00	R21	Resistor 27KΩ, 1/4w, 5%	5281-09246-00	U12	IC, 74LS139 2-4 Dec.
5010-12065-00	R22, R25	Resistor, 120KΩ, 1/4w, 5%	5281-09486-00	U28-U30	IC, 74LS374 8 Dual Flipflop
5010-08991-00	R51	Resistor, 4.7KΩ, 1/4w, 5%	5281-09487-00	U6, U23-U25	IC, 74LS74 Dual Flipflop
5010-08998-00	R36, R37	Resistor, 2.2KΩ, 1/4w, 5%	5281-09500-00	U31	IC, 74LS92
5010-09034-00	R13, R14, R29-R31, R33, R34, R50, R45-R49	Resistor, 10KΩ, 1/4w, 5%	5281-09745-00	U26, U27	IC, 74LS138 DMLTPX
5010-09035-00	R4	Resistor, 47KΩ, 1/4w, 5%	5281-09850-00	U20	IC, 74LS11 Tripple AND
5010-09036-00	R35	Resistor, 100Ω, 1/4w, 5%	5281-10577-00	U16	IC, 74LS125 Q/B Bfr
5010-09134-00	R1, R2, R6, R8, R9, R11, R12, R23, R24	Resistor, 150KΩ, 1/4w, 5%	5370-11086-00	U10	IC, YM2151 Sound
5010-09162-00	R25, R102	Resistor, 100KΩ, 1/4w, 5%	5371-11087-00	U11	IC, YM3012 D/A
5010-08774-00	R3, R5, R17, R19	Resistor, 22K, 1/4w, 5%	5400-10320-00	U13	IC, MPU 68B09E
5010-09269-00	R15	Resistor, 12KΩ, 1/4w, 5%	5284-12651-00	U21	IC 4584
5010-09358-00	R18, R32	Resistor, 1KΩ, 1/4w, 5%	5340-12278-00	U9	S/Ram 2064
5010-09416-00	R28, R39, R40-R44, R52, R53, R57	Resistor, 470Ω, 1/4w, 5%	5370-09691-00	U17	IC, 55536 CVSD
5010-09534-00	W3, W5, W7-W10	Resistor, Ω	5370-12260-00	U2	IC, 3340 Elec Atten
5010-10171-00	R38, R56	Resistor, 56Ω, 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, 1Ω, 1/4w, 5%	5432-12726-00	U5	EE Prom Pot X9503
5040-08986-00	C3	Capacitor, 100M, 10v (±20%)	5460-12423-00	U4	IC, LM7812
5040-09332-00	C15, C18, C34, C36, C38	Capacitor, 47µfd., 25v, Axial	5460-12743-00	U33	LM7809 TO-220
5040-11036-00	C32, C35	Capacitor, 47µfd., 16v, Rad.	5520-09020-00	X1	Crystal, 3.58 MHz.
5040-12729-00	C24, C25	Capacitor, 4700µfd., 35v	5521-10931-00	OSC1	Oscillator, 8.0 MHz.
5040-12750-00	C22	Capacitor, 22µfd., 35v, Rad.	5551-09822-00	L1	Ind. 4.7UH 3.0A.
5041-09031-00	C26-C29, C37, C46-C48	Capacitor, 1µfd. TANT	5700-08985-00	U13	Socket, IC 40-pin, .6"
5041-09243-00	C20, C21	Capacitor, 10µfd. TANT	5700-09004-00	U8, 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, .1µfd., 50v, 10%	A-5343-50002-2	U14	IC, Audio ROM
5048-11027-00	C8, C10	Capacitor, 33pfd., 50v, 10%	A-5343-50002-3	U15	IC, Audio ROM
5048-11028-00	C45	Capacitor, 22pfd., 50V, Axial	A-5343-50002-4	U18	IC, Audio ROM
5048-11029-00	C33	Capacitor, 100pfd., 50v	5700-12088-00		Socket, IC 32-pin (U14, U15, U18)
5048-11030-00	C12	Capacitor, 470pfd., 50v	5705-12755-00	U1	Heatsink 5295B-220
5048-11031-00	C19, C31	Capacitor, .001µfd., 50v, 10%	5731-08633-00	F501, F502	Fuse, 3A, S-B
5048-11065-00	C13	Capacitor, .0022µfd., 50v, 10%, Ax.	5733-12060-01		Fuse Holder (F501, F502)
5048-11072-00	C39, C40	Capacitor, .0033µfd.	5766-12433-00		PCB-Sound 90
5048-12036-00	C23	Capacitor, 22µfd., 10v, Ceramic	5791-10862-04	J504, J505	Connector, 4-pin Header Sq. .156
5048-12745-00	C4, C6	Capacitor, 1800pfd., 50V, 10%	5791-10862-05	J502	Connector, 5-pin Header Sq. .156
			5791-10862-07	J501	Connector, 7-pin Header Sq. .156
			5791-12462-03	J509	Connector, 3-pin Header Sq. .100
			5791-12462-04	J508	Connector, 4-pin Header Sq. .100
			5791-12516-00	J506	34 Hen 2x17 STR
			16-8850-339		PCB Label

A-12742-50002 WPC CPU Board

Item	Part Number	Ckt Designator	Description
1	5010-09034-00	R14-R22, R27-R42, R86, R90, R94, R98	Resistor, 10K Ω , 1/4w, 5%
2	5010-09085-00	R1, R2, R4, R93, R96, R97	Resistor, 1.5K Ω , 1/4w, 5%
3	5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Resistor, 1.2K Ω , 1/4w, 5%
4	5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84	Resistor, 1K Ω , 1/4w, 5%
5	5010-09416-00	R5-R8, R12, R13, R87-R89	Resistor, 470 Ω , 1/4w, 5%
6	5010-09534-00	W2, W4, W7, W13-W18	Resistor, 0 Ω
7	5010-10258-00	R95, R99	Resistor, .01 μ fd Ω , 1/4w, 5%
8	5010-10989-00	R92	Resistor, 470K Ω , 1/4w, 5%
9	5010-12104-00	R91	Resistor, 22 μ fd, 1/4w, 5%
10	5019-09362-00	SIP 1	SIP, 9P, 10-pin, 4.7K Ω , 5%
11	5040-08986-00	C31	Capacitor, 100 μ fd, 10v (\pm 20%)
12	5043-08980-00	B	Capacitor, .01 μ fd, 50v, (+80, -20%)
13	5043-09030-00	C27	Capacitor, 0.047 μ fd, 50v (\pm 20%)
14	5043-09065-00	C3 - C26	Capacitor, 470pfd, 50v (\pm 20%)
15	5043-09491-00	C2, C29, C30, C34	Capacitor, 22pfd, 1KV, (\pm 10%)
16	5043-09492-00	C28	Capacitor, 100pfd, 50v, (\pm 10%)
17	5043-09845-00	C32, C33	Capacitor, 1KP, 50v, (\pm 20%)
18	5070-08919-00	D2 - D18	Diode, 1N4148, 150MA
19	5070-09266-00	D1, D25	Diode, 1N5817, 1.0A.
20	5160-10269-00	Q1	Transistor, 2N3904, NPN
21	5162-12422-00	U20	IC, ULN, 2803A
22	5281-09308-00	U3	IC, 74LS245, Octal Bus Trncv
23	5281-09486-00	U14	IC, 74LS374, 8D F/F
24	5281-09851-00	U5	IC, 74LS14, SMT/TRG
25	5281-09867-00	U1, U2, U7	IC, Octal Buffer, 74LS244
26	5281-10182-00	U11, U12, U13, U15	IC, 74LS240 Driver
27	5284-12651-00	U21	IC, 4584
28	5340-12278-00	U8	S/RAM 2064
29	5370-12272-00	U16 - U19	IC, LM339, Quad. Comp
30	5370-12687-00	U10	MC, 34064 Reset Chip
31	5520-10438-00	X2	Crystal, 8.0MHZ.
32	5520-12084-00	X1	Crystal 32.768 KHz
33	5551-09822-00	L1	ILN, 4.7 UH 3A
34	5671-09019-00	D19 - D21	DSPL LED RED
35	5700-08985-00	U4	Socket, IC 40P, .6"
36	5700-12088-00	U6	Socket, IC 32P, .6"
37	5700-12424-00	U9	Socket, 84 Pin PLCC
38	5764-12431-00		PC Board
39	5791-10850-00	J201, J204	Connector, 26-pin Header Str Sq.
40	5791-10862-07	J210	Connector, 7-pin Header Str Sq.
41	5791-12461-08	J212	Connector, 8-pin Header Str Sq.
42	5791-12461-09	J206 - J209	Connector, 9-pin Header Sq. pin
43	5791-12461-12	J205	Connector, 12-pin Header Sq. pin
44	5791-12516-00	J202, J211	34' Hen 2x17 STR
45	5881-09021-00	B1 - B3	Battery Holder "AA"
46	5048-11033-00	C50	Capacitor, 0.022 μ f, 10v
47	16-8850-321		PCB Label
48	A-5343-50002-1	U6	Game PROM Assembly
49	5410-12426-00	U9	WPC-89 ASIC
50	5400-10320-00	U4	IC MPU 68B09E
51	5880-09022-00	B1 - B3	Battery, Alkaline, 1.5v ("AA")

A-12742-50002 WPC CPU Board

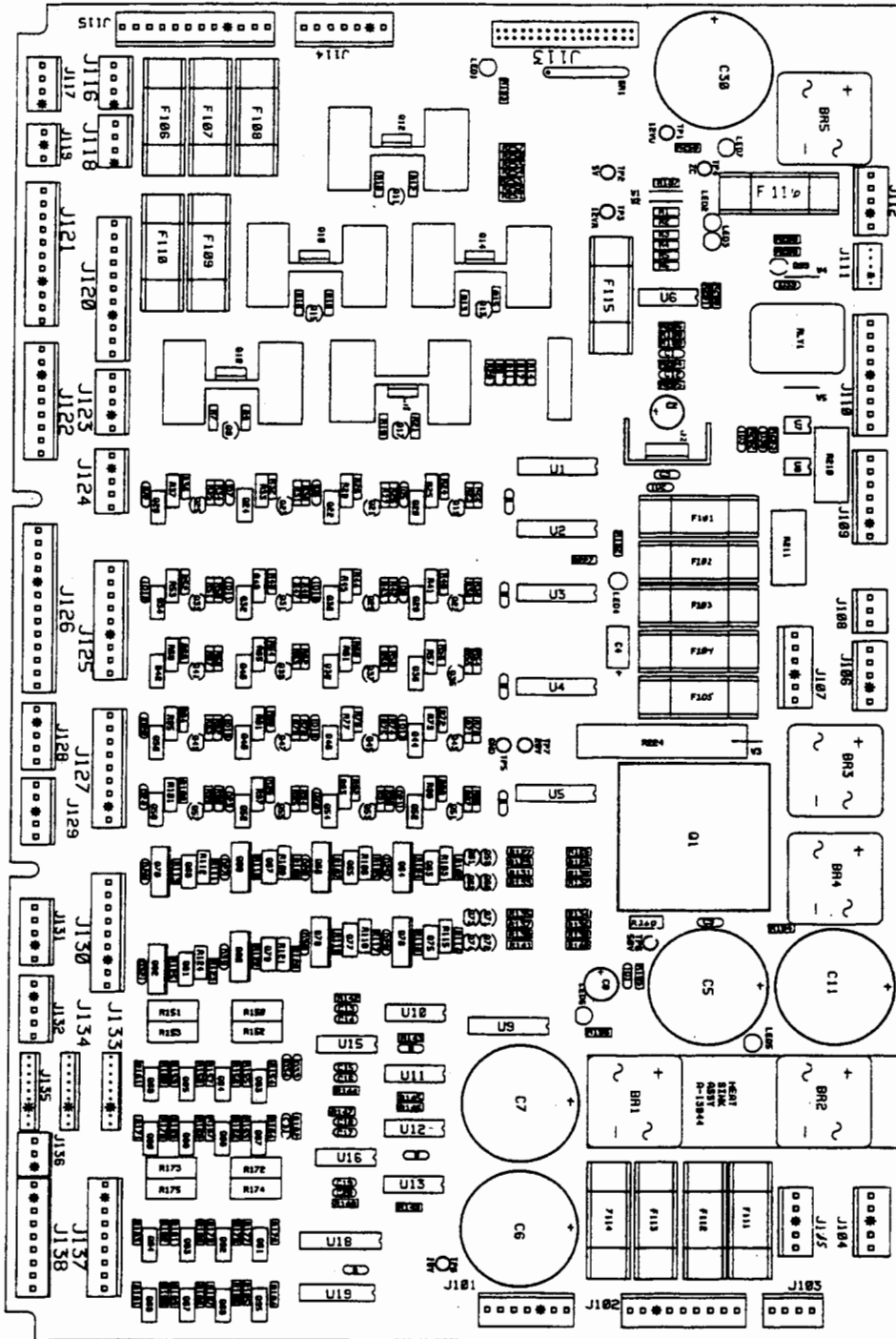


A-12697-1 WPC Power Driver Assembly

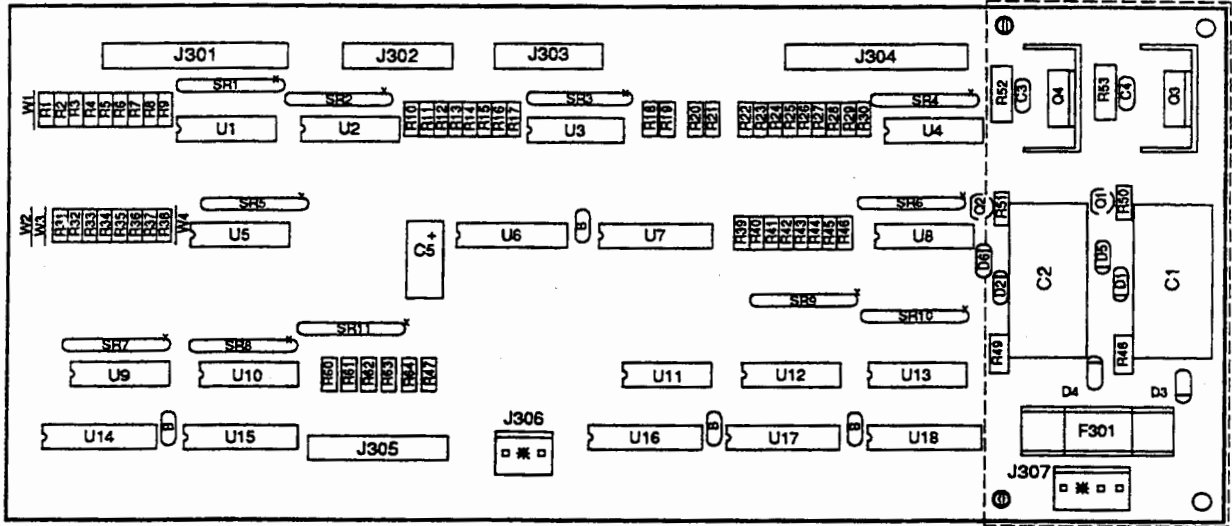
Item	Part Number	Ckt Designator	Description	Item	Part Number	Ckt Designator	Description
1	20-9229	Q2, Q10, Q12, Q14, Q16, Q18	Thermal Compound	41	5194-09055-00	Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74, Q99	Transistor, 2N4403 PNP
2	4006-01005-06	Q1, Q2	Mach. Screw, 6-32 x 3/8	42	5191-12179-00	Q64, Q66, Q68, Q70, Q76 Q78, Q80, Q82	Transistor, TIP36C PNP
3	4406-01128-00	Q1, Q2	Nut, 6-32 KEPS	43	5192-12428-00	Q91-Q98	Transistor, TIP 107
4	4004-01005-06	Q10, Q12, Q14, Q16, Q18	Mach. Screw, 4-40 x 3/8	44	5250-12634-00	Q1	Reg LM 323 5v
5	4404-01119-00	Q10, Q12, Q14, Q16, Q18 R260	Nut, 4-40 SNUT	45	5281-09486-00	U1-U5, U18	IC, 74LS374 8 Dual D Flipflop
6	5710-08981-00	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, 10K Ω , 1/2w, 5% Resistor, 4.7K Ω , 14w, 5%	46	5281-09487-00	U10-U13	IC, 74LS74 Dual D flipflop
7	5010-08991-00	R8, R11, R14, R17, R20, R177, R179, R181, R183, R165, R187, R189, R191, R208	Resistor, 560 Ω , 1/4w, 5%	47	5281-10182-00	U9	IC, 74LS240, L/Drvr
8	5010-08992-00	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 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, 68 Ω , 1/4w, 5%	48	5370-12272-00	U6, U15, U16	IC, LM339 Quad. Comp
9	5010-08993-00	R155, R157, R159, R161, R165, R167, R169, R171 R197-R198	Resistor, 2.7K Ω , 1/4w, 5%	49	5460-12423-00	Q2	IC, LM 7812
10	5010-08997-00	R184, R186, R188, R190 R206	Resistor, 2.2K Ω , 1/4w, 5%	50	5490-10892-00	U7, U8	Opto Isolator, 4N25
11	5010-08998-00	R176, R178, R180, R182 R184, R186, R188, R190 R206	Resistor, 10K Ω , 1/4w, 5%	51	5580-08994-01	RLY 1	Relay 4PDT 6VDC5A VS
12	5010-09034-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200 R250	Resistor, 1.5K Ω , 1/4w, 5%	52	5671-09019-00	LED1 - LED7	Display LED Red
13	5010-09085-00	R104, R107, R110, R113 R116, R119, R122, R125 R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141 W1, W2	Resistor, 6.8K Ω , 1/4w, 5% Resistor, 270 Ω , 1/4w, 5% Resistor, 1.2K Ω , 1/4w, 5%	53	5701-09652-00	Q1	Thermal Pad TO-3
14	5010-09086-00	R176, R178, R180, R182 R184, R186, R188, R190 R206	Resistor, 27K Ω , 1/4w, 5%	54	5705-09199-00	Q2	Heatsink, #6030B
15	5010-09224-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200 R250	Resistor, 1K Ω , 1/4w, 5%	55	A-13944	Bridge Assembly	WPC Heatsink Rectifier Assy
16	5010-09314-00	R104, R107, R110, R113 R116, R119, R122, R125 R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 1K Ω , 1/4w, 5%	56	5705-12637-00	Q1	Heatsink 5054
17	5010-09324-00	R104, R107, R110, R113 R116, R119, R122, R125 R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 27K Ω , 1/4w, 5%	57	5705-12638-00	Q10, Q12, Q14, Q16, Q18	Heatsink 5298B
18	5010-09358-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200 R250	Resistor, 1K Ω , 1/4w, 5%	58	5733-12060-01		Fuse Holder, F101-F116
19	5010-09361-00	R104, R107, R110, R113 R116, R119, R122, R125 R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 220 Ω , 1/4w, 5%	59	5763-12405-00		Bare PCB
20	5010-09416-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200 R250	Resistor, 470 Ω , 1/4w, 5%	60	5791-10862-03	J108, J119, J136	Connector, 3-pin Header STR Sq.
21	5010-09534-00	W1, W2	Resistor, 0 Ω	61	5791-10862-04	J103, J116-J118	Connector, 4-pin Header STR Sq.
22	5010-11079-00	R7, R10, R13, R16, R19 R150-R153, R172-R175	Resistor, 51 Ω , 1/4w, 5%	62	5791-10862-05	J112, J104-J106, J123, J124, J128, J129, J131, J132, J105	Connector, 5-pin Header STR Sq.
23	5010-12427-00	R150-R153, R172-R175	Resistor, .22 Ω , 1w, 5%	63	5791-10862-06	J107	Connector, 6-pin Header STR Sq.
24	5010-12632-00	R224	Resistor, .12 Ω , 10w, 5%	64	5791-10862-07	J101, J109, J114	Connector, 7-pin Header STR Sq.
25	5012-12238-00	R210, R211	Resistor, 3.3K Ω , 5w, 10%	65	5791-10862-09	J102, J110, J122, J125, J127, J130, J137, J138	Connector, 9-pin Header STR Sq.
26	5019-10143-00	SR1	SIP, 9R, 10 pin, 470 Ω , 5%	66	5791-10862-11	J120, J121	Connector, 11-pin Header STR Sq.
27	5040-08986-00	C4	Capacitor, 100 μ fd, 10v (\pm 20%)	67	5791-10862-12	J115	Connector, 12-pin Header STR Sq.
28	5040-09421-00	C2	Capacitor, 100 μ fd, 25v (+50, -10%)	68	5791-10862-13	J126	Connector, 13-pin Header STR Sq.
29	5040-09537-00	C8	Capacitor, 100 μ fd, 100v (\pm 20%)	69	5791-12461-05	J111	Connector, 5-pin Header STR Sq.
30	5040-12313-00	C5, C6, C7, C11, C30	Capacitor, 15,000 μ fd, 25v (\pm 20%)	70	5791-12461-09	J133-J135	Connector, 9-pin Header STR Sq.
31	5043-08980-00	B-BYPASS	Capacitor, .01 μ fd, 50v (+80, -20%)	71	5791-12516-00	J113	34 HEN 2x17 STR
32	5043-08996-00	C13-C20, C31	Capacitor, .1 μ fd, 50v (\pm 20%)	72	5824-09248-00	TP1-TP8	Test Point #1502-1
33	5043-09845-00	C1, C12	Capacitor, 1,000 μ fd, 50v (\pm 20%)	73	5041-09163-00	C9	Capacitor, 2.2 μ fd TANT
34	5048-10994-00	C3	Capacitor, .33 μ fd, 50v (\pm 20%) Ax.	74-100	Not Used		ID Label
35	5070-08919-00	D33, D34	Diode, 1N4148, 150MA.	101	16-8850-323		Fuse, 8A, 32v
36	5070-09054-00	D1-D3, D5-D12, D17-D32, D38, D39	Diode, 1N4004, 1.0A.	102	5730-09071-00	F114	Fuse, S-B, 2.5A., 250v
37	5100-09690-00	BR3-BR5	Bridge Rectifier, 35A., 200v	103	5731-09128-00	F101, F102	Fuse, S-B, 5A., 250v
38	5131-12725-00	Q10, Q12, Q14, Q16, Q18 U19	Triac, BT138E	104	Not Used		Fuse, S-B, 3A., 250v
39	5162-12422-00	U19	IC, ULN 2803	105	5731-09651-00	F106-F113	Fuse, S-B, 3/4A., 250v
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	106	Not Used		

NOTE: For schematic refer to drawing #16-9057.

A-12697-1 WPC Power Driver Board



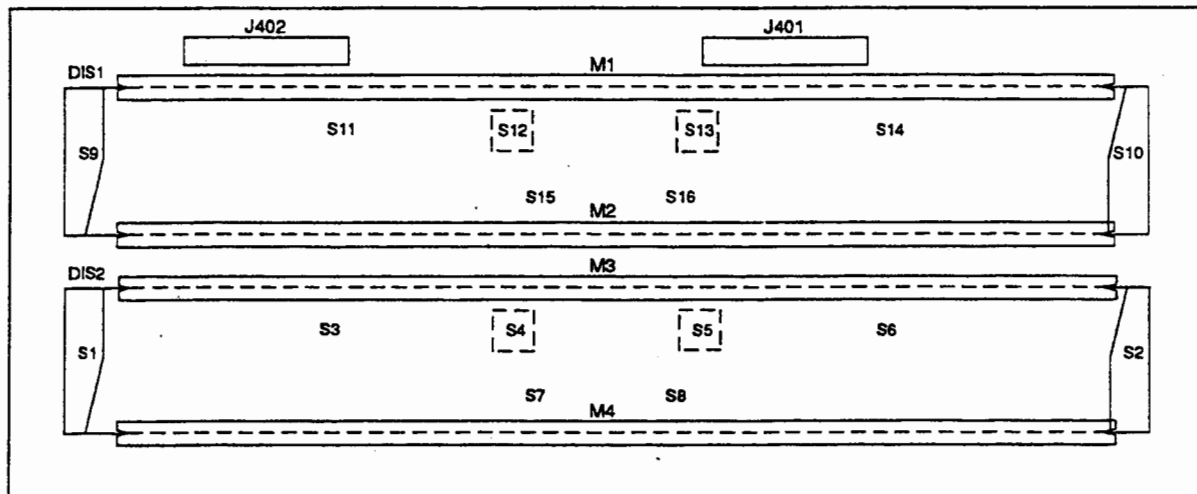
A-12739-1 WPC Display Driver Assembly



Part Number	Ckt Designator	Description	Part Number	Ckt Designator	Description
20-9229	Q3, Q4	Thermal Compound	5043-08980-00	B	Cap., 0.01µfd, 50v, (+80, -20%)
4006-01003-06	Q3, Q4	Mach. Screw, 6-32 x 3/8	5043-09072-00	C3, C4	Cap., 0.1µfd, 500v, (+80, -20%)
4406-01128-00	Q3, Q4	Nut, 6-32 KEPS	5070-09054-00	D3, D4	Diode, 1N4004, 1.0A.
5010-08991-00	R47	Resistor, 4.7KΩ, 1/4w, 5%	5075-09059-00	D1, D2	Zener, 1N5990, 3.9v, 1/2w
5010-09061-00	R50, R51	Resistor, 680Ω, 1/2w, 5%	5075-12650-00	D5, D6	Zener, 1N4763A, 91v, 1w
5010-09069-00	R52, R53	Resistor, 330KΩ, 1/2w, 5%	5164-09056-00	Q1	Transistor, MPSD02 NPN
5010-09085-00	R60- R64	Resistor, 1.5KΩ, 1/4w, 5%	5164-12154-00	Q4	Transistor, MJE15030 NPN
5010-09536-00	R48, R49	Resistor, 39KΩ, 1w, 5%	5194-09055-00	Q2	Transistor, MPSD52 PNP
5010-10258-00	R3, R18 - R21, R24	Resistor, 1MΩ, 1/4w, 5%	5194-12155-00	Q3	Transistor, MJE15031 PNP
5010-08773-00	R4, R5, R25, R26, R33, R38, R41, R46	Resistor, 18KΩ, 1/4w, 5%	5281-09246-00	U11	IC, 2-4 Dec, 74LS139
5010-09034-00	R6, R27, R31, R34, R36, R39, R42, R44	Resistor, 10KΩ, 1/4w, 5%	5281-09486-00	U14 - U18	IC, Dual D Flipflop, 74LS374
5010-09219-00	R1, R2, R7-R9, R22, R23, R28-R30, R32, R35, R37, R40, R43, R45	Resistor, 8.2KΩ, 1/4w, 5%	5281-10182-00	U6, U7	IC, 74LS240 L/Driver
5010-09534-00	W3, W4	Resistor, 0Ω	5680-08969-00	U9, U10, U12, U13	IC, 7180 Cathode Drive
5019-10143-00	SR11	SIP, 9R, 10-pin, 470Ω, 5%	5680-08968-00	U1, U4, U5, U8	IC, 6184 Anode Drive
5019-12509-00	SR1, SR4-SR10	SIP, 10R, 10-pin, 100KΩ, 5%	5705-09199-00	Q3, Q4	Heatsink, #6030B
5040-08986-00	C51	Cap., 100µfd, 10v, (±20%)	5731-12328-00	F301	Fuse, 3/8A., S-B, 250v
5040-12324-00	C1, C2	Cap., 150µfd, 160v, (±50%)	5733-12060-01		Fuse Holder, F301
			5764-12432-00	PCB	PCB Display Driver
			5791-10850-00	J305	Connector, 26-pin STR Sq.
			5791-10862-03	J306	Connector, 3-pin STR Sq.
			5791-10862-04	J307	Connector, 4-pin STR Sq.
			5791-12516-00	J301, J304	34 HEN 2x17 STR
			03-8019-2		PCB Support Post
			01-9967		Shield

Note: For Schematic refer to drawing #16-9059

A-12793 WPC Dual Assembly



Part Number	Ckt Designator	Description
03-8329	S1, S2, S9, S10	Retainer
03-8088-1	S4, S5, S12, S13	Support 3/8"
5760-12448-00	PCB	Bare PCB
5670-12308-00	DIS1, DIS2	Alphanumeric Display Board
5791-12516-00	J401, J402	Connector, 34 Hen 2x17 STR
23-6655	M1-M4	Mask WPC Display

Lamp Boards

B-12224 Single Lamp Board

Part Number	Description
5768-12312-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.

C-12000 3-Lamp Board

Part Number	Description
5768-12245-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-05	Connector, 5-pin Header Sq Post

Lamp Boards - (Continued)

A-14025 Face Lamp Assembly

Part Number	Description
5768-12708-00	Lamp PCB
24-8804	Socket V-Wedge PCB
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10862-05	Connector, 5-pin Header Sq Post

A-14302 3-Lamp Board

Part Number	Description
5768-12762-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-06	Connector, 6-pin Header Sq Post

A-14303 5-Lamp Board

Part Number	Description
5768-12763-00	Lamp PCB
24-8805	Socket H-Wedge PCB
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10869-07	Connector, 7-pin Header Sq Post

A-14304 13-Lamp Board

Part Number	Description
5768-12764-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-10	Connector, 10-pin Flat Header

A-14305 4-Lamp Board

Part Number	Description
5768-12765-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-06	Connector, 6-pin Header Sq Post

A-14410 8-Chase Lamp Board

Part Number	Description
5768-12775-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.

A-14412 8-Chase Lamp Board

Part Number	Description
5768-12778-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.

A-14423-1 Playfield Relay Board

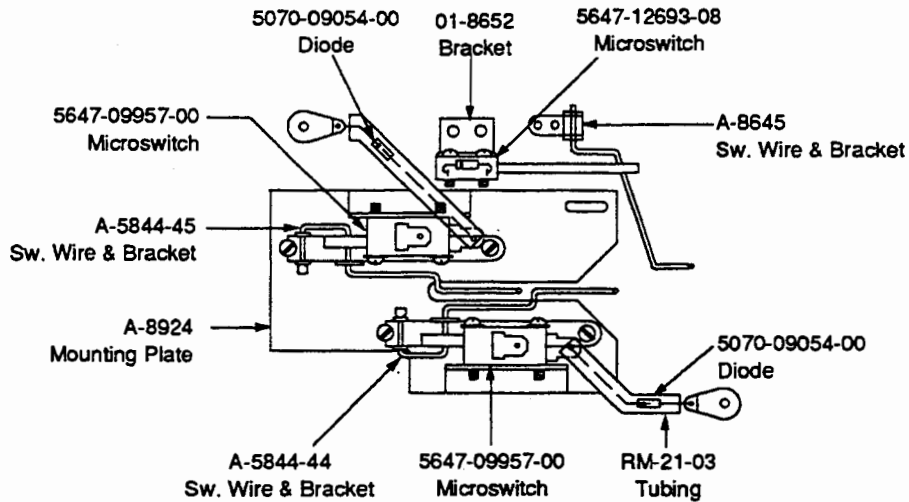
Part Number	Description
5768-12243-00	Lamp PCB
5010-09534-00	Resistor, 0Ω
5070-09054-00	Diode, 1N4004, 1.0A.
5580-12782-00	Relay, 12vdc
5791-12273-02	Connector, 2-pin Header
5791-12273-07	Connector, 7-pin Header

C-11998-1 Relay Board

Part Number	Description
5768-12243-00	Lamp PCB
5010-09534-00	Resistor, 0Ω
5070-09054-00	Diode, 1N4004, 1.0A.
5580-09555-01	Relay, 24vdc, 30A.
5791-12273-02	Connector, 2-pin Header
5791-12273-07	Connector, 7-pin Header

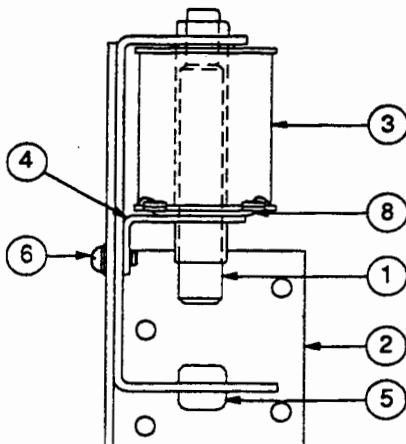
Ball Trough Switches

(Viewed from underside of playfield to show locations)



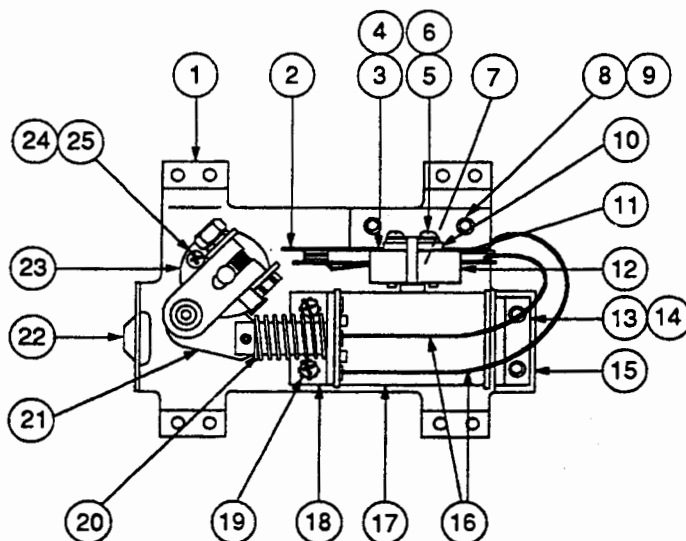
Part Number	Description	Part Number	Description
B-8925	Ball Trough Switch Plate Assy.	5070-09054-00	Diode, 1N4004, 1.0A.
A-5844-44	Switch Wire & Bracket Assy.	5825-06522-00	Solder Lug-Flat, #6
A-5844-45	Switch Wire & Bracket Assy.	RM-21-03	Insulating Tubing, #10 x 1.75
A-8924	Bracket & Mounting Plate Assembly	A-11680	Ball Trough Switch, Right
5647-09957-00	Microswitch, Center & Left Ball Trough	5647-12693-08	Submin. Switch
4004-01003-10	Mach. Screw, 4-40 x 5/8	5070-09054-00	Diode, 1N4001, 1.0A.
4005-01005-02	Mach. Screw, 5-40 x 1/8	A-8645	Switch Wire & Bracket Assy.

B-10686-1 Knocker Assembly



Item	Part Number	Description
1	A-5387	Coil Plunger Assembly
a)	02-2653	Coil Plunger
b)	03-6013	Bell Arm Ext.
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

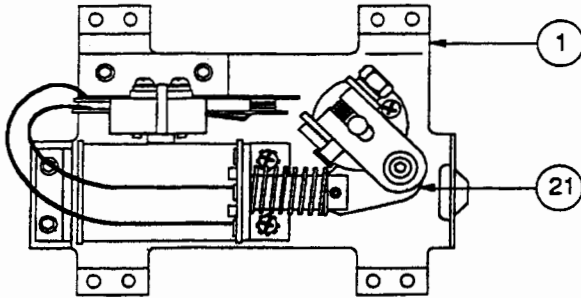
C-13174-R Right Flipper Assembly



Item	Part Number	Description	Item	Part Number	Description
1	B-13104-R	Flipper Base Assy, R.	21	B-10655-R	Crank Link Assembly, Right
2	03-7811	End of Stroke (EOS) Sw	a)	02-4179	Link Spacer Bushing
3	RM-21-06	Sleeve, Vinyl (Cap. leads)	b)	4010-01086-14	Cap Screw, 10-32 x 7/8, SH
4	5045-12098-00	Capacitor, 2.2 μ Fd, 250V, 20%	c)	4700-00023-00	Flatwasher, 5/8 x 13/64 x 16ga.
5	4701-00002-00	Lockwasher, #6 Split	d)	4701-00004-00	Lockwasher, #10 Split
6	4105-01019-10	Sh. Metal Screw, #5 x 5/8	e)	4410-01132-00	Nut, 10-32 ESNA
7	23-6622	Tape, Double-sided	f)	A-10656	Flipper Link Assembly
8	4008-01079-05	Cap Screw, 8-32 x 5/16	1.)	02-4219	Coil Plunger
9	4701-00003-00	Lockwasher, #8 Split	2.)	20-9370-1	Spring Pin, 5/32 dia. x 7/16
10	01-9375	Switch Mounting Bracket	3.)	03-8050-1	Flipper Link
11	03-7520-2	Ty-Wrap, Nylon	g)	B-10657-R	Flipper Crank Assy, R.
12	20-6516	Speednut, Tinnerman	1.)	01-8073-R	Flipper Crank, R.
13	4010-01066-06	Cap Screw, 10-32 x 3/8, SH	2.)	17-1037	Crank Washer
14	4701-00004-00	Lockwasher, #10 Split	3.)	4010-01066-20	Cap Screw, 10-32 x 1-1/4
15	A-12111	Flipper Stop Assembly	4.)	4410-01127-00	Nut, 10-32 Hex Hd.
16	HW-30018-6	Wire, 18 AWG, Blue	5.)	4700-00107-00	Flatwasher, 5/8 x 13/64 x 12ga.
17	FL-11630	Flipper Coil (Red)	6.)	4701-00004-00	Lockwasher, #10 Split
18	01-7695	Solenoid Bracket	7.)	RM-23-06	Tubing, H. S. 1/4 DWP
19	4006-01017-04	Mach. Screw, 6-32 x 1/4	22	23-6577	Bumper Plug
20	10-376	Coil Plunger Spring	23	03-7568	Flipper Bushing
			24	4006-01005-06	Mach. Screw, 6-32 x 3/8
			25	4406-01117-00	Nut, 6-32 Hex.

Associated Parts: 20-9250-5 Flipper Arm on Shaft (White)
 23-6519-4 Red Rubber Ring (Red)

C-13174-L Left Flipper Assembly



(Parts listed replace same items of C-13174-R)

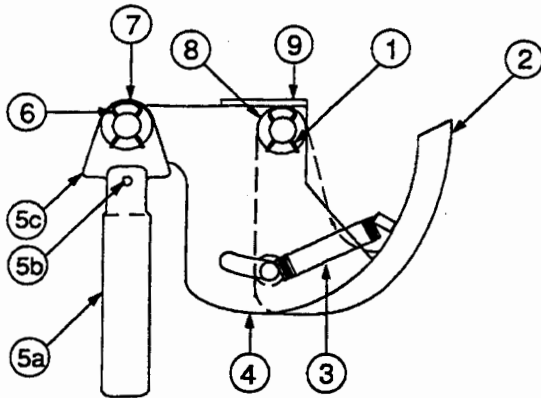
Item	Part Number	Description
1	B-13104-L	Flipper Base Assembly, L
21	B-10655-L	Crank Link Assembly, L
g)	B-10657-L	Flipper Crank Assembly
1.)	01-8073-L	Flipper Crank, Left

Associated Parts: 20-9250-5 Flipper Arm on Shaft (White)
23-6519-4 Red Rubber Ring (Red)

Flipper Assembly Notes...

1. Each Flipper Assembly on the Lower Playfield is mounted beneath the playfield, in conjunction with the plastic Flipper Paddle and Shaft (20-9250-5) and Flipper Rubber (23-6519-4) on the upper side of the playfield.
2. The tip of the EOS Switch must travel 0.150 (+ .010, - .000) inch, before the contacts fully open, with the flipper in the actuated position. The EOS Switch contacts must have a gap of 0.062 (\pm .015) inch. Adjustment of the EOS Switch must be made at a minimum distance of 0.25 inch from the switch body.
3. All moving elements of the assembly must operate freely, with no evidence of binding.
4. The large end of the Coil Plunger Spring (item 20) must fit within the four lugs of the Solenoid Bracket.
5. For coil replacement, remove the Solenoid Bracket (item 18) to prevent screw damage.
6. Use Loctite™ 242 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.
7. When replacing their Bumper Plug (item 22) to restore proper flipper operation, readjust the flipper paddle and shaft position.
8. Solid-color blue wire connects to the banded end of each diode, mounted on the connector end of the Flipper Coil (item 17). Trace-color wire connects to the unbanded end of the diode.

C-9638 Ball Shooter Lane Feeder

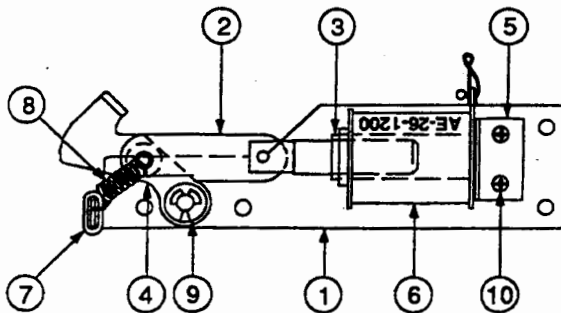


Item	Part Number	Description
1	12-6227	Hair Pin Clip
2	A-8247	Eject Cam Assembly
3	10-362	Ejector Spring (Plain)
4	A-6949-L	Spring Plate Assembly
5	A-8050-1	Coil Plunger Assy, 2-1/8"
a)	02-3407-2	Coil Plunger, 2-1/8"
b)	20-8716-5	Roll Pin, 1/8 x 7/16
c)	03-8085	Armature Link
6	12-6227	Hair Pin Clip
7	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
8	4700-00103-00	Flatwasher, 17/64 x 1/2 x 28ga.
9	A-8268	Mounting Bracket Assembly

Associated Parts

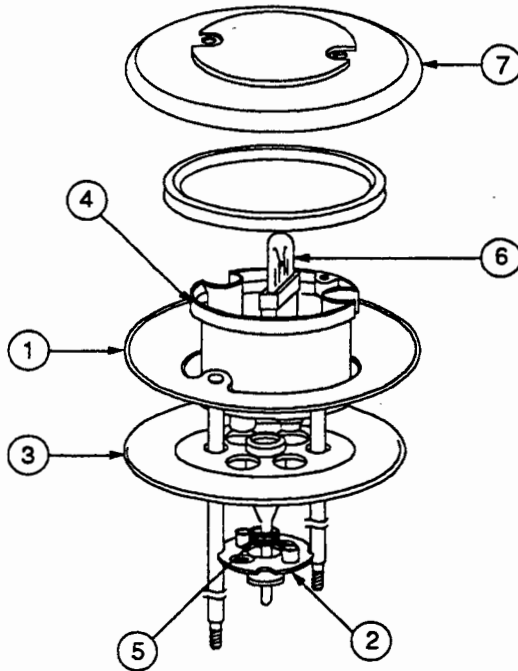
B-9362-R-3	Coil & Bracket Assembly
B-7572-1	Bracket & Stop Assembly
01-8-508-S	Coil Retaining Bracket
4006-01017-06	Mach. Screw, 6-32 x 3/8
4406-01119-00	Nut, 6-32 ESN
AE-26-1200	Coil Assembly
03-7066	Coil Tubing

A-8039-3 Outhole Kicker Assembly



Item	Part Number	Description
1	A-6378	Mounting Plate Assembly
2	A-8335	Coil Plunger Assembly
a)	02-2364	Coil Plunger
b)	20-8716-5	Roll Pin, 1/8 x 7/16
c)	01-4251	Ball Return Link
3	03-7066	Coil Tubing
4	A-6889	Kicker Lever Assembly
5	A-8038	Coil Stop Assembly
6	AE-26-1200	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

B-9414-1 Jet Bumper Assembly

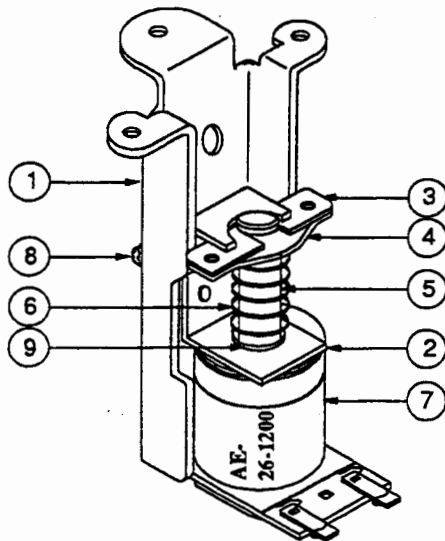


Item	Part Number	Description
1	A-4754	Bumper Ring Assembly
2	03-6009-A5	Bumper Base - White
3	03-6035-1	Bumper Wafer - Blue
4	03-7443-5	Bumper Body - White
5	10-7	Spring - Jet Bumper
6	A-11199	Socket & Bulb

Associated Part:

7	03-8254-9	Jet Bumper Cap - Red
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A-9415-2 Jet Bumper Coil Assembly

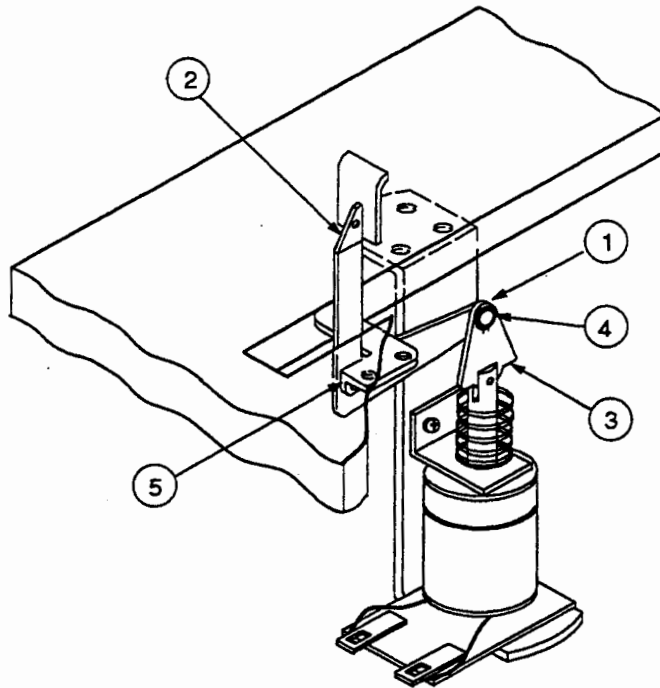


Item	Part Number	Description
1	B-7417	Bracket & Stop Assembly
2	01-1747	Coil Retaining Bracket
3	01-5492	Armature Link, Steel
4	01-5493	Armature Link, Bakelite
5	02-3406-1	Coil Plunger
6	10-326	Armature Spring
7	AE-26-1200	Coil Assembly
8	4006-01017-04	Mach. Screw, 6-32 x 1/4
9	03-7066	Coil Tubing

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-12665 Kicker Arm (Slingshot) Assembly (Left & Right Kickers)



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

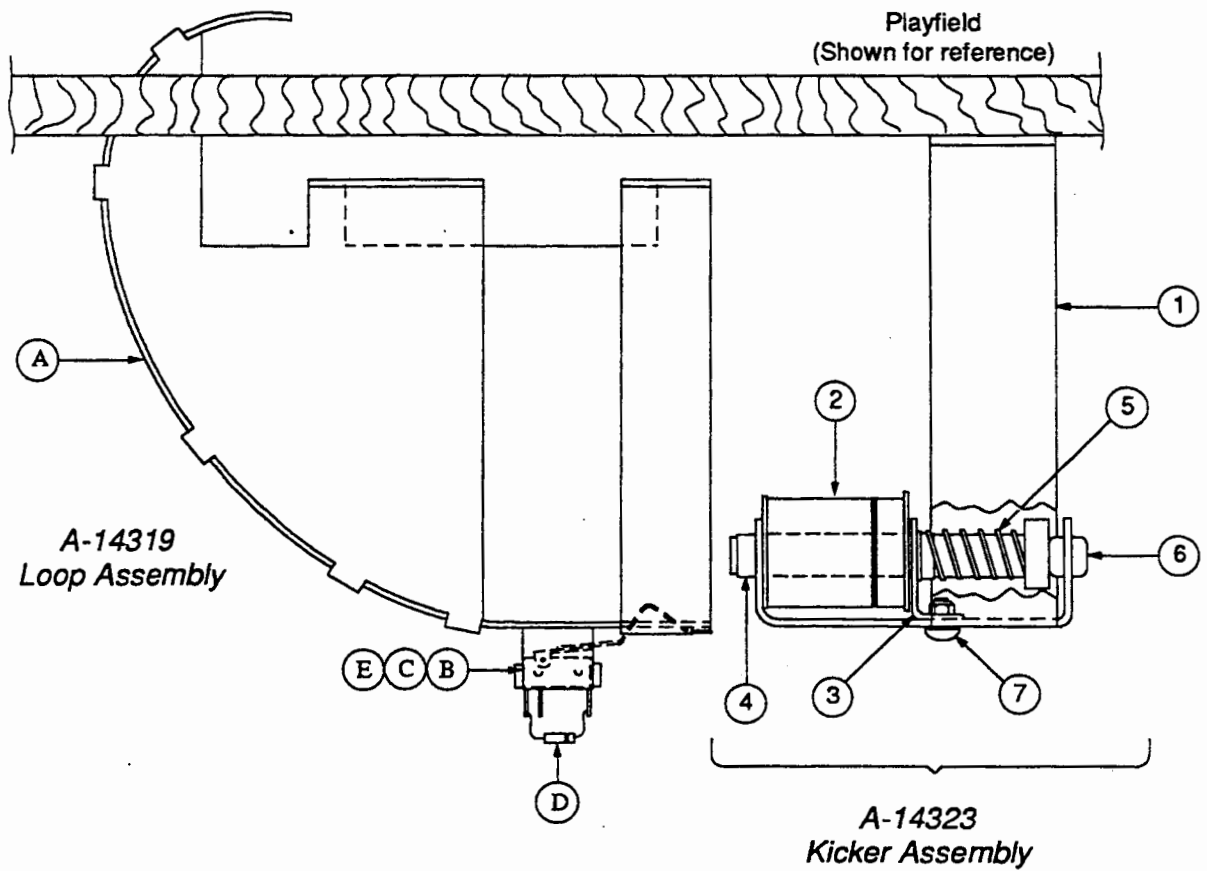
Associated Parts for Left Kicker

B-11203-R-1	Coil & Bracket Assembly
B-7572-1	Bracket & Stop Assembly
01-8-508-S	Coil Retaining Bracket
4006-01017-06	Mach. Screw, 6-32 x 3/8
4406-01119-00	Nut, 6-32 ESN
AE-26-1500	Coil Assembly
03-7066	Coil Tubing

Associated Parts for Right Kicker

B-11203-L-1	Coil & Bracket Assembly
B-7572-1	Bracket & Stop Assembly
01-8-508-S	Coil Retaining Bracket
4006-01017-06	Mach. Screw, 6-32 x 3/8
4406-01119-00	Nut, 6-32 ESN
AE-26-1500	Coil Assembly
03-7066	Coil Tubing

Loop & Kicker Assembly



A-14319 Loop Assembly

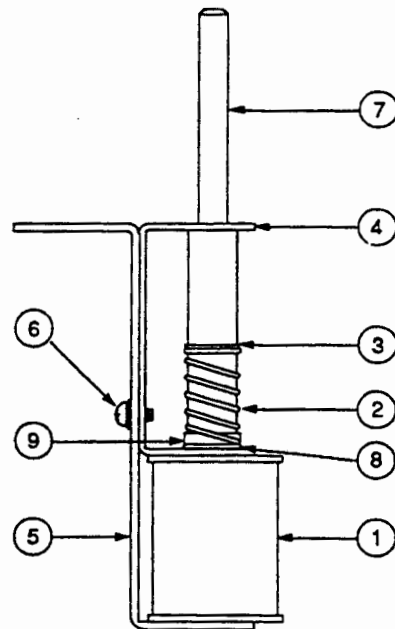
Item	Part No.	Description
A	A-14320	Loop Sub-Assembly
B	01-8240	Nut Plate, #2-56
C	4002-01105-07	Mach. Screw, 2-56 x 7/16
D	5070-09054-00	Diode, 1N4001, 1.0A
E	5647-12693-25	Microswitch

A-14323 Kicker Assembly

Item	Part No.	Description
1	01-10130	Kicker Mounting Bracket
2	AE-23-800	Coil Assembly
3	01-8-508-T	Retainer Bracket
4	03-7067	Coil Tubing
5	10-135	Coil Spring Plunger
6	23-6420	Rubber Grommet
7	4008-01017-05	Mach. Screw, 8-32 x 5/16

A-14046 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	01-1748-1	Mounting Bracket
6	4006-01005-04	Mach. Screw, #6-32 x 1/4
7	02-4494	Post
8	01-10024	Insulator
9	03-7066-3	Tubing Coil, 1-7/8"

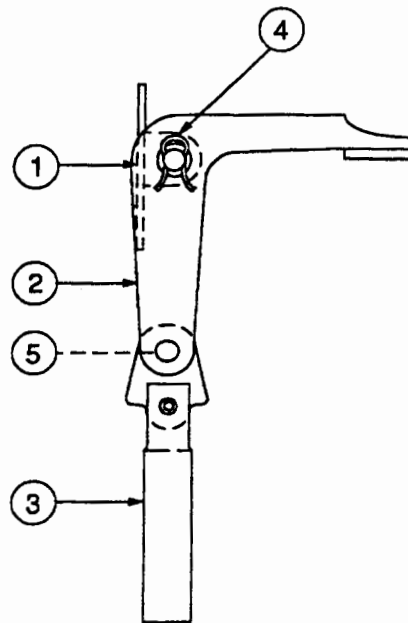


B-11395-1 Skill Shot Kicker Assembly

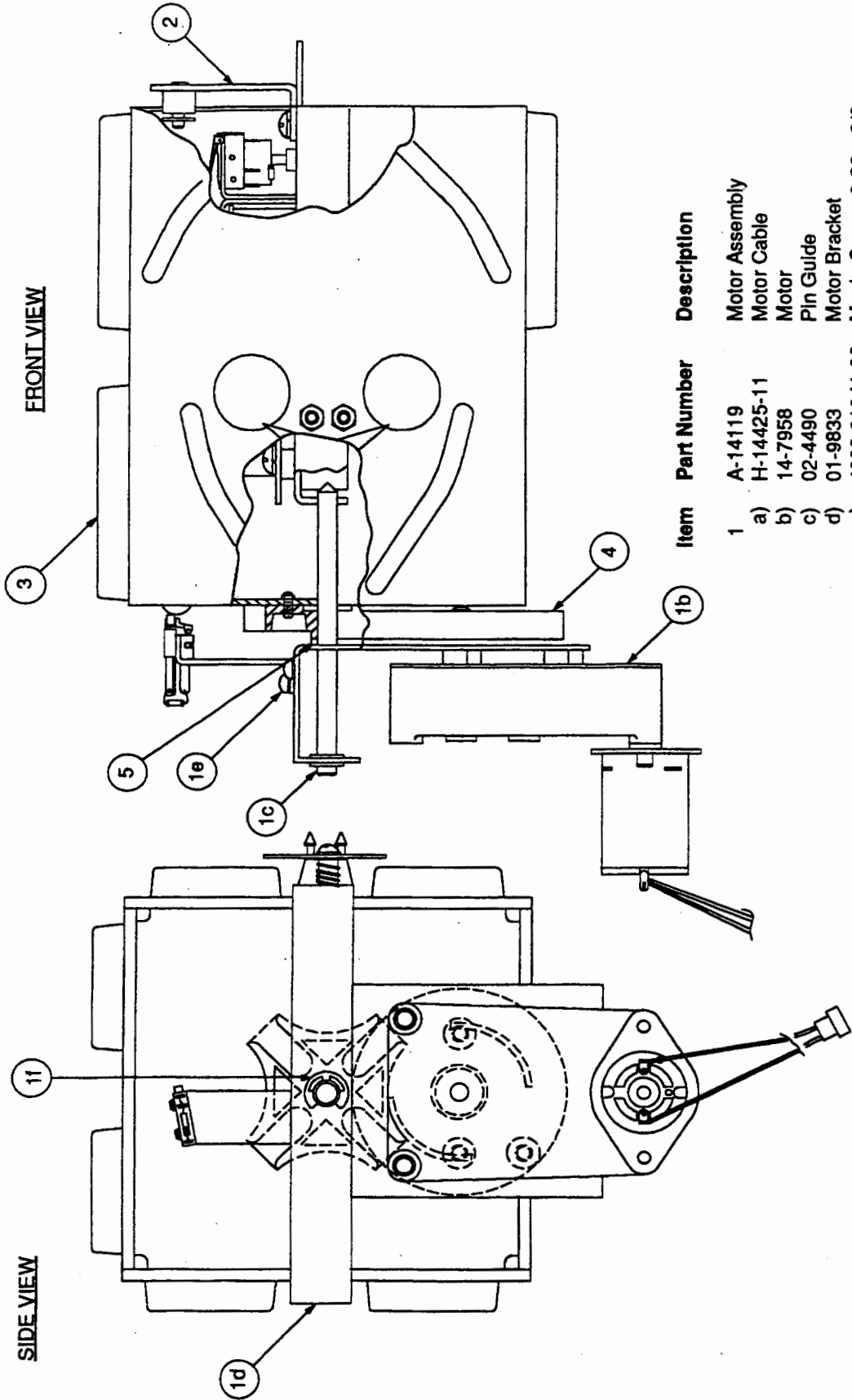
Item	Part No.	Description
1	A-11396	Kicker Mtg. Bracket Assy
2	A-5652-1	Kicker Crank Assembly
a)	A-8769	Kicker Crank Sub-Assembly
b)	02-2089	Pin Cam
3	A-5103	Plunger Assembly
a)	02-2364	Coil Plunger
b)	03-8085	Armature Link
c)	20-8716-5	Roll Pin, 1/8 x 7/16"
4	12-6227	Hairpin Clip
5	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.

Associated Parts

B-11064-R-1	Coil & Bracket Assembly
B-7572-1	Bracket & Stop Assembly
01-8-508-S	Coil Retaining Bracket
4006-01017-06	Mach. Screw, 6-32 x 3/8
4406-01119-00	Nut, 6-32 ESN
AE-24-900	Coil Assembly

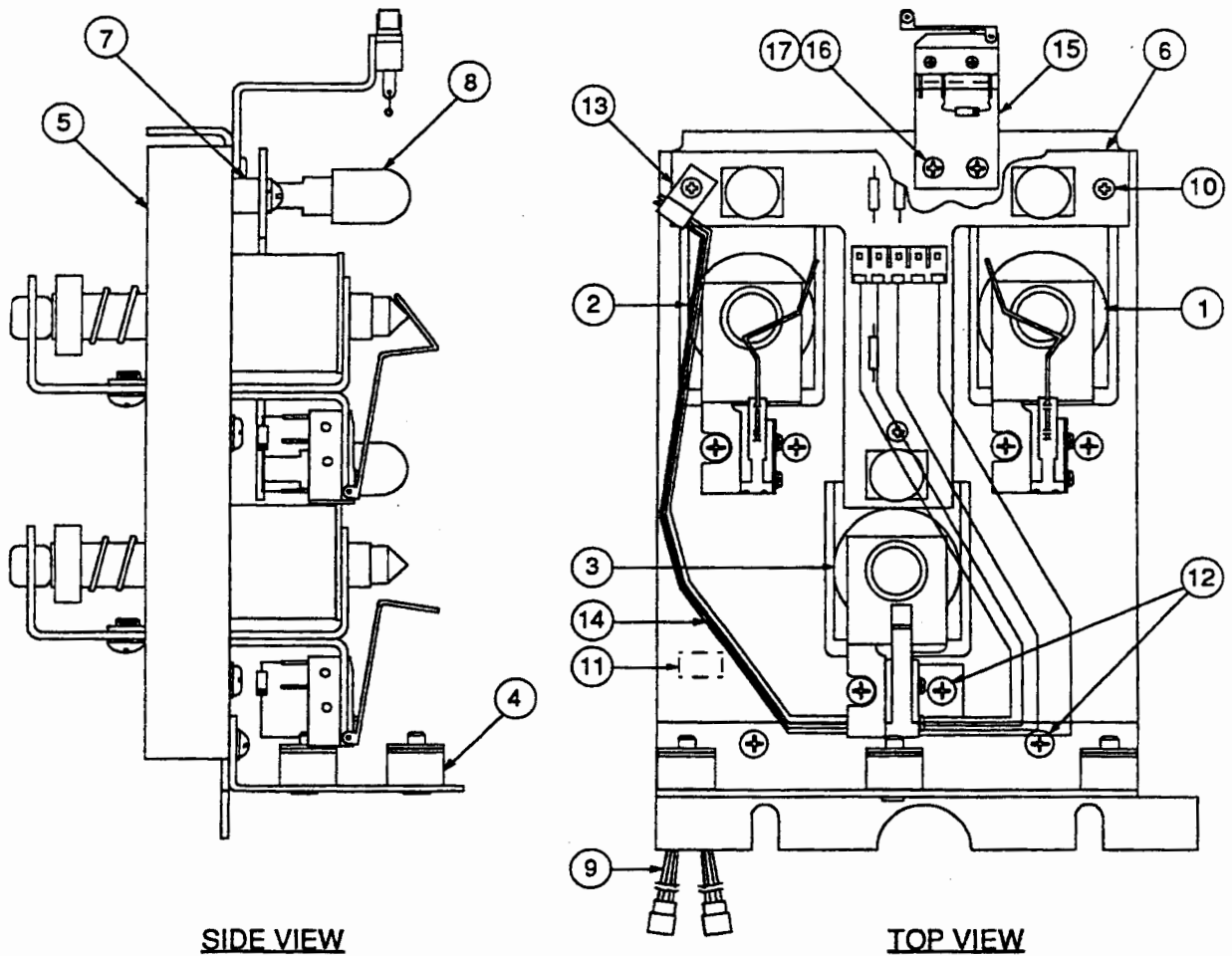


A-14118 Face Playfield Assembly



Item	Part Number	Description
1	A-14119	Motor Assembly
a)	H-14425-11	Motor Cable
b)	14-7958	Motor
c)	02-4490	Pin Guide
d)	01-9833	Motor Bracket
e)	4008-01041-06	Mach. Screw, 8-32 x 3/8
f)	20-8712-25	"E"-Ring, 1/4" Shaft
2	A-14120	Main Bracket Assembly (See p.2-22)
3	A-14121	Face Assembly (See p. 2-24)
4	03-8476	Wheel Drive
5	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.

A-14120 Main Bracket Assembly

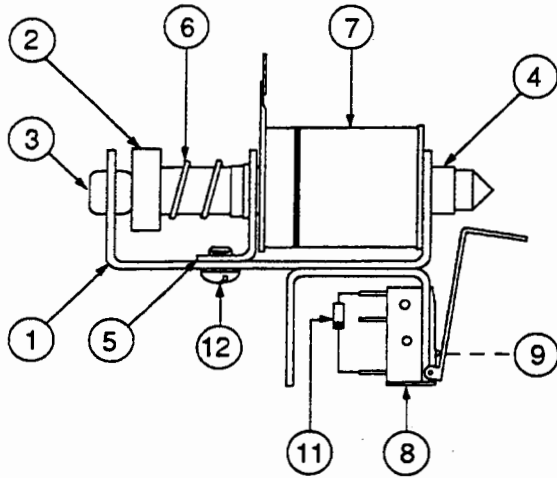


SIDE VIEW

TOP VIEW

Item	Part Number	Description
1	A-14123	Head Right Eye Assembly (See p.2-23)
2	A-14124	Head Left Eye Assembly (See p.2-23)
3	A-14125	Head Mouth Assembly (See p.2-23)
4	A-14126	Roller Assembly
5	A-14128	Main Bracket Sub-Assembly
6	A-14025	Face Lamp Assembly
7	03-8022-4	Spacer, 1/4" Lg.
8	03-8063-4	Light Bulb Sleeve (Red)
9	H-14425-3	Skull Cable
10	4006-01003-10	Mach. Screw, 6-32 x 5/8
11	03-7722-4	Kwik Clip, 1/4"
12	4008-01003-06	Mach. Screw, 8-32 x 3/8
13	03-7655-4	Clip Harness, 1/4"
14	H-14425-10	Skull Cable
15	A-14624	Top Switch Assembly
16	4006-01005-04	Mach. Screw, 6-32 x 1/4
17	4701-00002-00	Lockwasher #6 Split

A-14125 Head Mouth Assembly



Item	Part Number	Description
1	A-14135	Coil Switch Bracket Assy.
2	A-14134	Bell Armature Assembly
3	23-6420	Rubber Grommet
4	03-7067-5	Tubing Coil
5	01-8-508-T	Solenoid Bracket
6	10-135	Spring
7	AE-30-2000	Coil Sub-Assembly
8	5647-12693-39	Mini Microswitch
9	4002-01105-06	Mach. Screw, 2-56 x 3/8
10	Not Used	
11	5070-09054-00	Diode, 1N4004
12	4008-01017-04	Mach. Screw, 8-32 x 1/4

Note:

For Coil Assemblies A-14123 and A-14124, refer to diagram above
item #8 is the only one that changes.

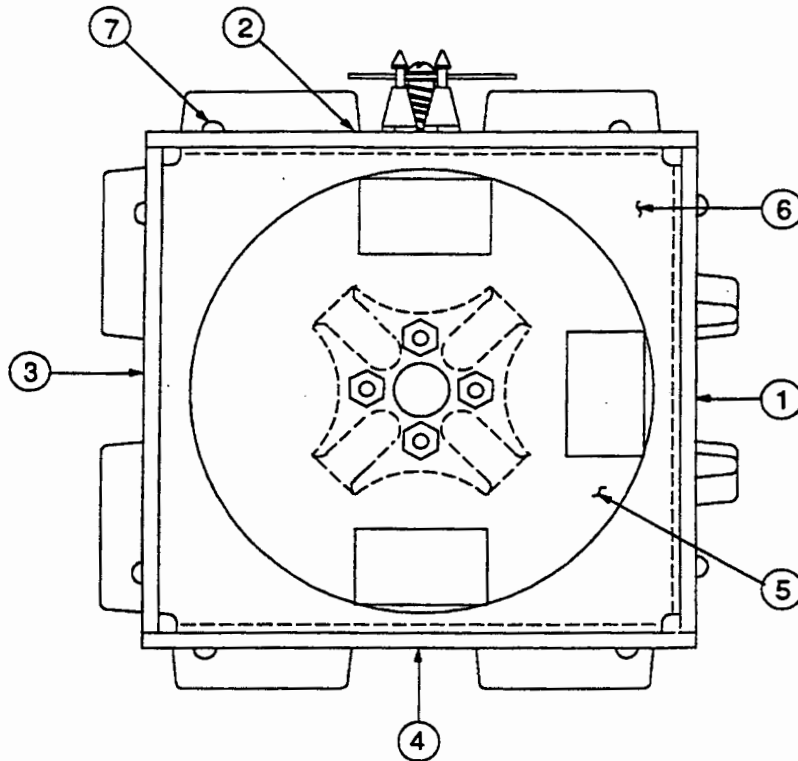
A-14123 Head-Right Eye Assembly

Item	Part Number	Description
1	A-14135	Coil Switch Bracket Assy.
2	A-14134	Bell Armature Assembly
3	23-6420	Rubber Grommet
4	03-7067-5	Tubing Coil
5	01-8-508-T	Solenoid Bracket
6	10-135	Spring
7	AE-30-2000	Coil Sub-Assembly
8	5647-12693-48	Mini Microswitch
9	4002-01105-06	Mach. Screw, 2-56 x 3/8
10	01-10112	Switch Bracket Adjustment
11	5070-09054-00	Diode, 1N4004
12	4008-01017-04	Mach. Screw, 8-32 x 1/4

A-14124 Head-Left Eye Assembly

Item	Part Number	Description
1	A-14135	Coil Switch Bracket Assy.
2	A-14134	Bell Armature Assembly
3	23-6420	Rubber Grommet
4	03-7067-5	Tubing Coil
5	01-8-508-T	Solenoid Bracket
6	10-135	Spring
7	AE-30-2000	Coil Sub-Assembly
8	5647-12693-47	Mini Microswitch
9	4002-01105-06	Mach. Screw, 2-56 x 3/8
10	01-10112	Switch Bracket Adjustment
11	5070-09054-00	Diode, 1N4004
12	4008-01017-04	Mach. Screw, 8-32 x 1/4

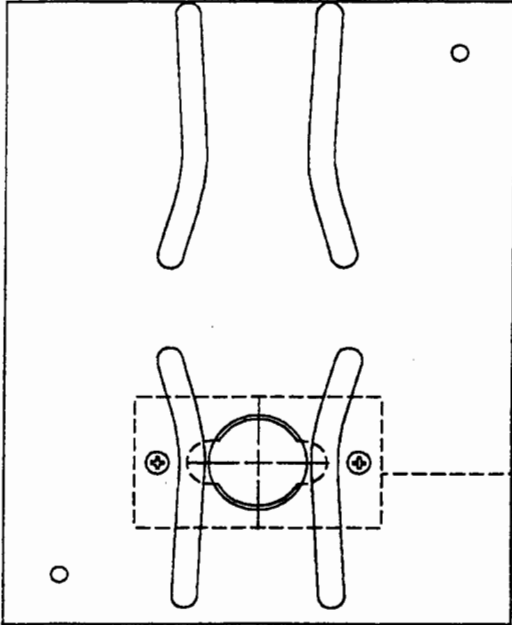
A-14121 Complete Face Assembly



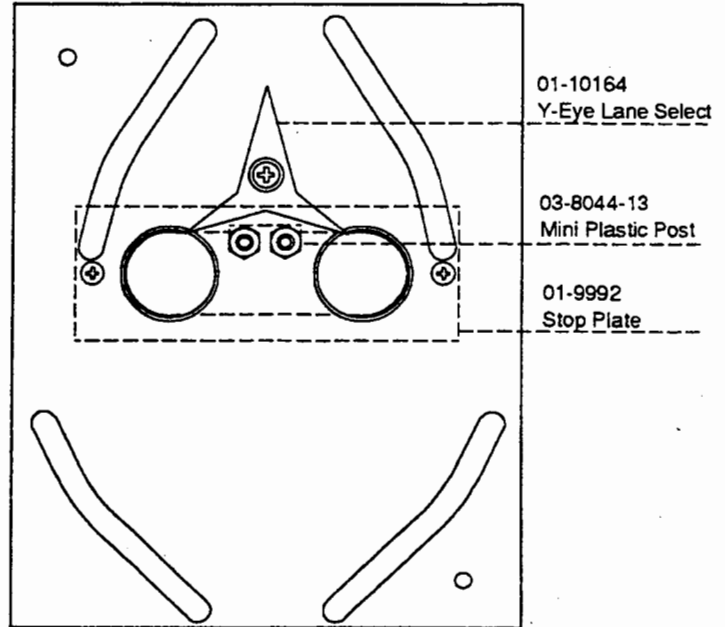
Item	Part Number	Description
1	A-14130	Face Plate - 1 Assembly
	31-1626-1	Screened Face Plate
	03-8482	Rail Ball Guide
	03-8498	Rail Ball Guide
2	01-9993	Stop Plate
	A-14131	Face Plate - 2 Assembly
	31-1626-2	Screened Face Plate
	01-10164	Y-Diverter-Eye Lane Select
	03-8482	Rail Ball Guide
	03-8498	Rail Ball Guide
3	03-8044-13	Mini Plastic Post
	01-9992	Stop Plate
	A-14132	Face Plate - 3 Assembly
	31-1626-3	Screened Face Plate
4	03-8482	Rail Ball Guide
	03-8498	Rail Ball Guide
	A-14133	Face Plate - 4 Assembly
5	31-1626-4	Screened Face Plate
	03-8482	Rail Ball Guide
	03-8498	Rail Ball Guide
6	A-14136	Bracket Assembly - Top
7	01-9832	Face Plate Bracket - Bottom
	4006-01027-06	Mach. Screw, 6-32 x 3/8

Face Plate Assemblies

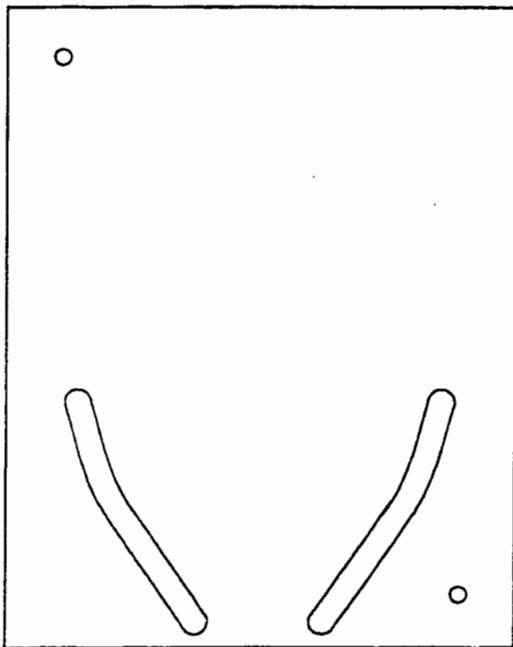
A-14130 Face Plate - 1



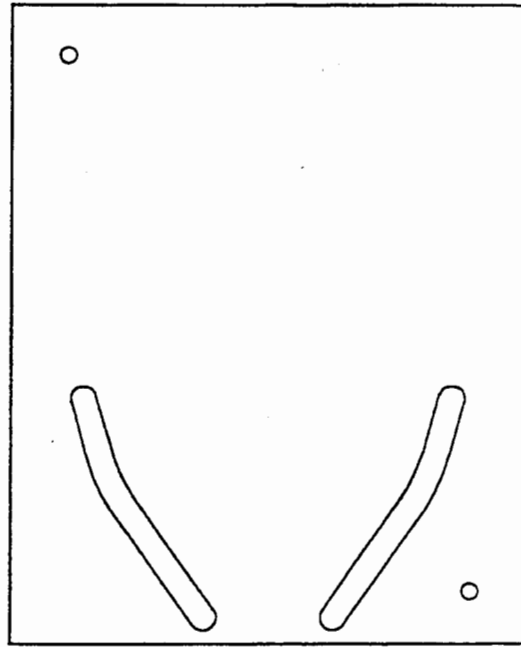
A-14131 Face Plate - 2



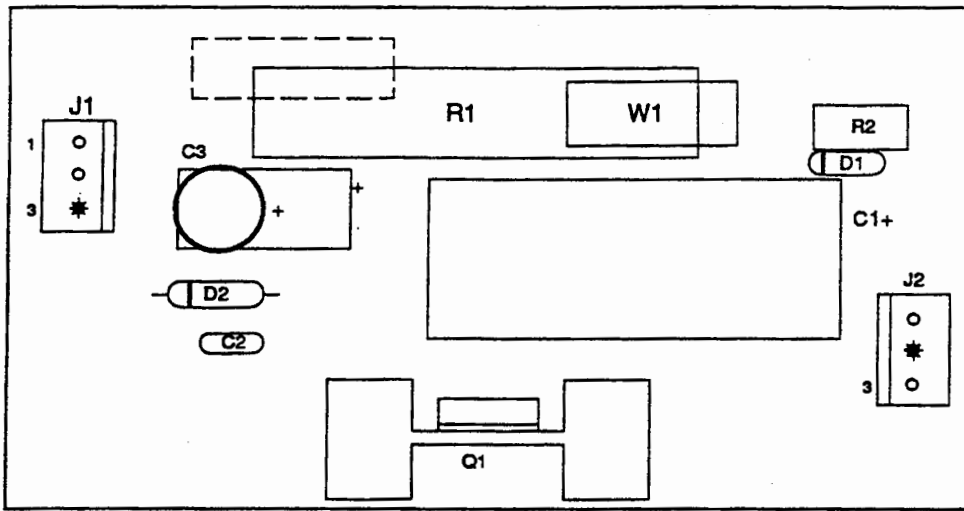
A-14132 Face Plate - 3



A-14133 Face Plate - 4

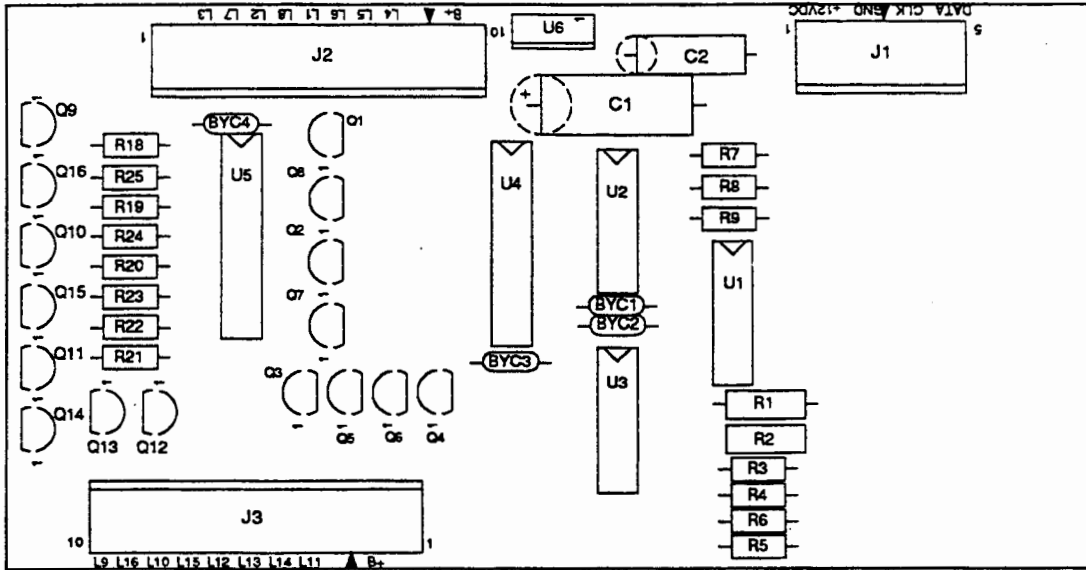


A-13892-2 Motor Regulator Assembly



Part Number	Designator	Description
5040-12466-00	C1	Capacitor, 1000 μ fd, 50v, Axial
5043-08996-00	C2	Capacitor, .1 μ fd, 50v, Axial
5040-10974-00	C3	Capacitor, 100 μ fd, 35v, Radial
5070-09054-00	D1	Diode, 1N40004, 1.0A.
5075-12467-00	D2	Zener, Diode 1N5243B, 13V.
5791-12273-03	J1, J2	Connector, 3-pin Header
5162-12635-00	Q1	Trans. NPN Darl TIP 102
Not Used		
5010-09061-00	R2	Resistor, 680 Ω , 1/2w, 5%
5705-12464-00		Heatsink
4004-01005-06		Mach. Screw, 4-40 x 3/8
4404-01117-00		Nut, 4-40 Hex.
4703-00015-00	W1	Fiatwasher External, #4
20-9229		Thermal Compound
5010-09534-00		Resistor, 0 Ω
5768-12685-00		PCB Motor Regulator
16-8850-352		Label

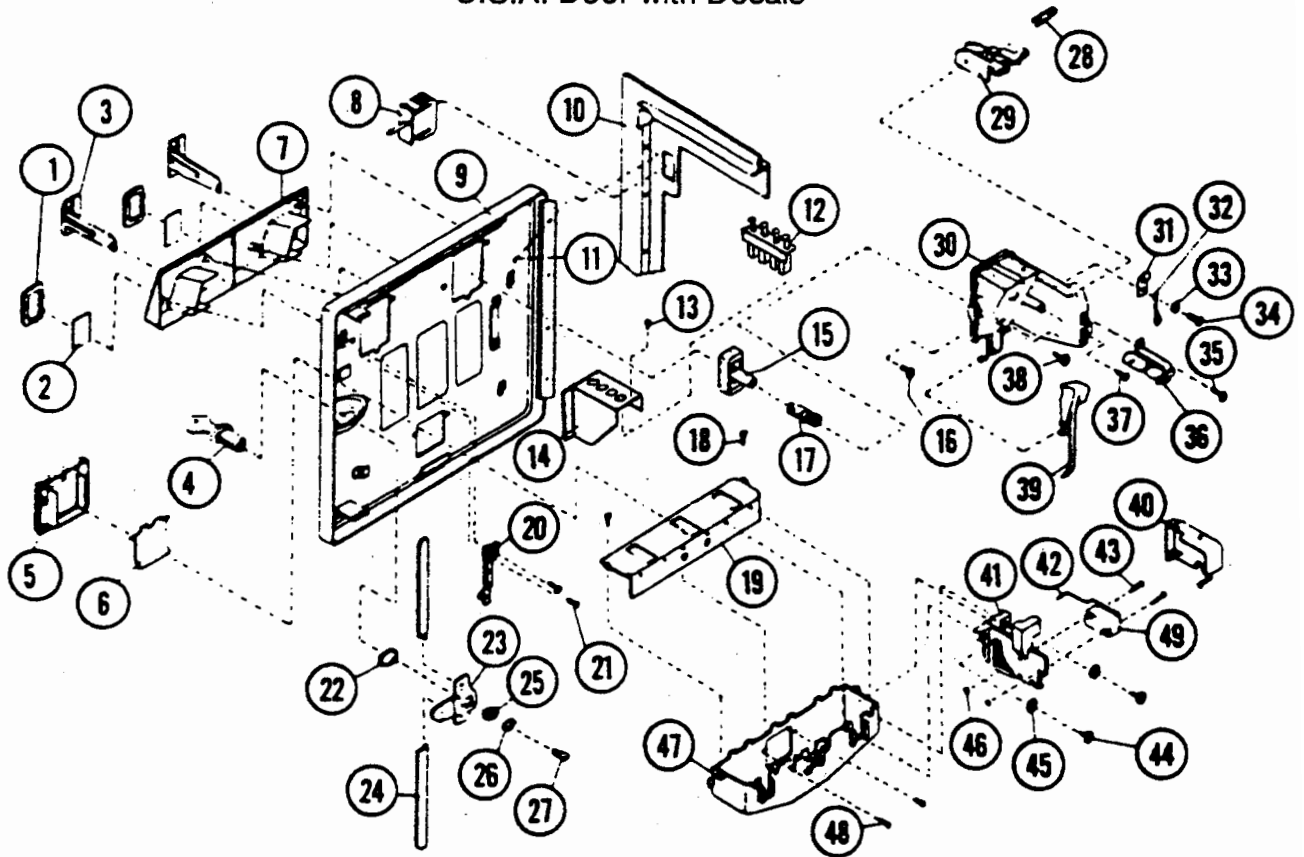
A-14007 Chase Light Assembly



Item	Part Number	Ckt Designator	Description
1	5768-12705-00		PCB Chase Light
2	5162-08976-00	Q1 - Q16	Tras. 2N6427 NPN
3	5010-08997-00	R10 - R25	Resistor, 2.7K Ω , 1/4w, 5%
4	5010-09034-00	R7 - R9	Resistor, 10K Ω , 1/4w, 5%
5	5010-09358-00	R3, R4	Resistor, 1K Ω , 1/4w, 5%
6	5010-09162-00	R5	Resistor, 100K Ω , 1/4w, 5%
7	5010-09113-00	R6	Resistor, 33K Ω , 1/4w, 5%
8	5010-08930-00	R1, R2	Resistor, 470 Ω , 1/4w, 5%
9	5040-09365-00	C2	Capacitor, 1 μ fd, 63v (+50, -10%)
10	5040-09421-00	C1	Capacitor, 100 μ fd, 25v (+50, -10%)
11	5043-08980-00	BYC1 - BYC4	Capacitor, .01 μ fd, 50v, (+80, -20%)
12	5281-09867-00	U4, U5	IC, 74LS244, Oct. Buff
13	5281-10447-00	U2, U3	IC, 74LS164
14	5370-12272-00	U1	IC, LM339 Quad. Comp
15	5250-09157-00	U6	Reg 7805, 1.0A, 5V
16	5791-10862-05	J1	Connector, 5-pin Header
17	5791-10862-10	J2, J3	Connector, 10-pin Header
18	4004-01005-06		Mach. Screw, 4-40 x 3/8
20	4404-01119-00		Lockwasher Nut, 4-40

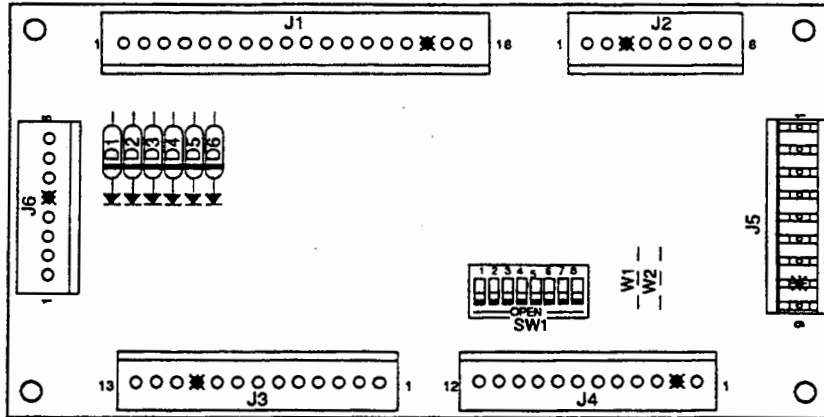
A-14148-1 Coin Door Assembly

U.S.A. Door with Decals



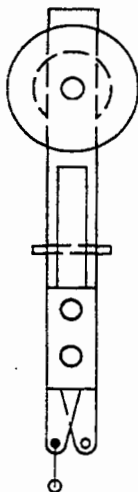
Item	Part No.	Description	Quantity	Item	Part No.	Description	Quantity
1	27-1038	Button Cover	2 or 3	26	27-1018	Star Washer	1
2	27-1041-1→58	Price Panel	2 or 3	27	27-1019	M/C Screw, 1/4-28 x 5/16	1
3	27-1026-1→17	Coin Entry Plate	2 or 3	28	Not Used		
4	27-1016	Lock Assembly	1	29	Not Used		
5	27-1061-1	Coin Return - Bezel	1	30	27-1112	Coin Inlet Chute	2 or 3
6	27-1062	Coin Return Flap	1	31	27-1088	Cable Clamp	2 or 3
7	27-1021	Button Housing - 2-slot	1	32	27-1025	Key Hook	1
	27-1022	Button Housing - 3-slot	1	33	27-1086	Washer, #6	2 or 3
8	27-1111	Interlock Switch	1	34	27-1078	M/C Screw, 6-32 x 3/8	1 or 2
9	27-1006-1	Coin Door, 2-Slot	1		27-1113	M/C Screw, 6-32 x 7/16	1
	27-1007-1	Coin Door, 3-Slot	1	35	27-1079	Self-tapping Screw, #6 x 1/4	2 or 3
10	27-1005	Coin Door Frame	1	36	27-1084	Lamp Socket	2 or 3
11	27-1003	M/C Screw, 6-32 x 3/16	4		27-1085	Lamp	2 or 3
12	5641-12724-00	Diagnostic Switch	1	37	27-1096	Self-tapping Screw, #5 x 3/8	2 or 3
13	27-1101	M/C Screw, 4-40 x 1/4	2	38	27-1087	M/C Screw, 6-32 x 5/8	2 or 3
14	01-9885	Bracket, Diagnostic Switch	1	39	27-1082	Lever Arm	2 or 3
15	03-7601-4	Button, Red	2	40	27-1097	Switch Cover	2 or 3
	03-7601-7	Button, Black	2	41	27-1091-1	Coin Accept Chute	2 or 3
16	27-1078	M/C Screw, 6-32 x 3/8	2 or 3	42	27-1075	Wire Form (Small)	2 or 3
17	27-1039	Conical Spring	2 or 3		or		
18	27-1079	Self-tapping Screw, #6 x 1/4	2		27-1093	Wire Form (Large)	
19	27-1077-1	Coinbox Cover	1	43	27-1094	M/C Screw, 4-40 x 7/8	4 or 6
20	27-1066	Slam Switch	1	44	27-1087	M/C Screw, 6-32 x 5/8	4 or 6
21	27-1067	M/C Screw, 4-40 x 1/2	2	45	27-1086	Washer, #6	4 or 6
22	27-1017	Nut (key)	1	46	27-1095	Nut, 4-40 ESNA	4 or 6
23	27-1012	Locking Cam	1	47	27-1076-1	Coin Return Box	1
24	27-1011	Locking Arm	2	48	27-1078	M/C Screw, 6-32 x 3/8	2
25	27-1020	Washer	1	49	27-1092	Microswitch	2 or 3

A-14102 WPC Coin Door Interface Board



Part Number	Ckt Designator	Description
5768-12716-00		PCB-WPC Coin Door
5070-09054-00	D1-D6	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.
5791-10862-09	J5	Connector, 9-pin Header Str Sq.
5792-10817-09	J5	9R Mt/End 22/.156

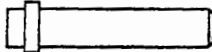
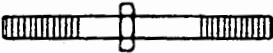
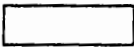

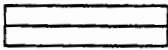


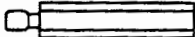
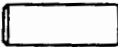

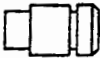


- Notes:**
1. For schematic refer to drawing #16-9152.
 2. For Belgium, France, and Switzerland use A-14102-1 Coin Door Interface Board.



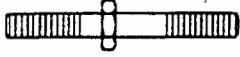
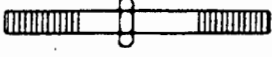
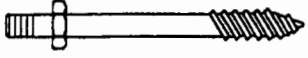
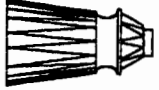
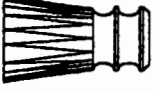
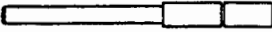
B-11854-4 Standup Target Assembly

Part Number	Description
SW-1A-170-A	Standup Target Assembly
03-8093-4	Target, Red
5070-06258-00	Diode, 1N4001, 1.0A.

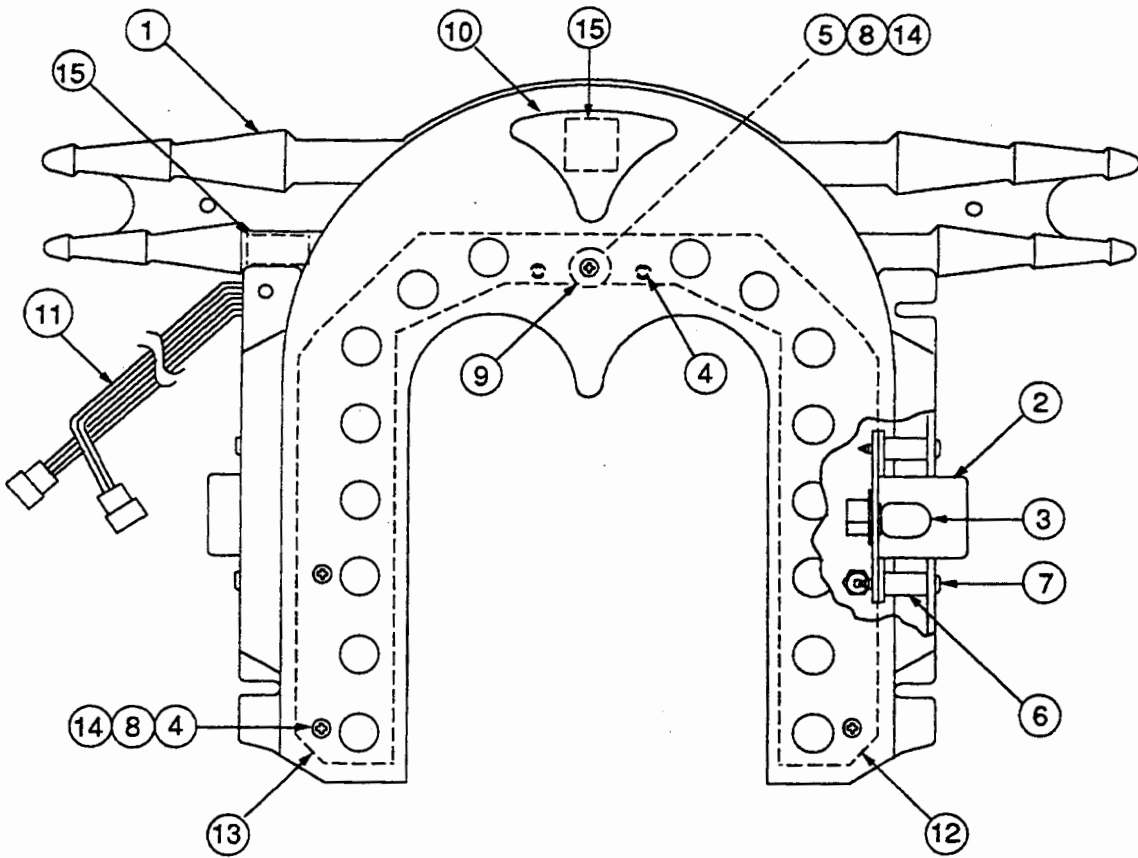
Metal & Plastic Posts

	Part Number	Description	Quantity
	02-3409	Spring Post	1
	02-3905	Bumper Post, #8 WS	3
	02-4020	Support Post	1
	02-4036	Rubber Bumper Post	5
	02-4252-10	F-F Spacer, 6-32 x 5/8"	2
	02-4252-13	F-F Spacer, 6-32 x 13/16"	1
	02-4252-14	F-F Spacer, 6-32 x 7/8"	1
	02-4252-22	F-F Spacer, 6-32 x 1-3/8"	1
	02-4252-29	F-F Spacer, 6-32 x 1-13/16"	1
	02-4266	Holding Post, 6-32 x 3/4	1
	02-4322-1	M-F Spacer, 8-32 x 3"	1
	02-4322-8	M-F Spacer, 8-32 x 3.63"	3
	02-4322-19	M-F Spacer, 8-32 x 2-1/8"	4
	02-4335-12	Mounting Post, 1.38	1
	02-4433	Post, #8 x 1-3/16"	2
	02-4434	Post, #8 x 1"	2
	02-4498	Roller Post	3
	03-8044-9	Mini Plastic Post - Tr. Red	25
	03-8044-13	Mini Plastic Post - Clear	4
	03-8365-10	Post, Trans. Blue	6

Metal & Plastic Posts - Continued

	Part Number	Description	Quantity
	02-4424-1	Spring Post, 6-32 x 8-32	6
	02-4425-1	Post, 8-32 / #8-32	4
	02-4426-1	Post, #6-32 / #8 SMS	12
	03-8319-10	Star Post, #8 Tr. Blue	16
	03-8247-13	Double Star Post, Tr. Blue	6
	02-4494	Disappearing Post	1

A-14508 Helmet Assembly



Item	Part Number	Description
1	01-8548	Helmet
2	03-8149-9	Mini Dome, Tr. Red
3	C-13337	Single Flashlamp Assy.
4	03-8022-4	Spacer, 1/4" Lg.
5	03-6047-1	Spacer, 1/4" Lg.
6	03-6047-3	Spacer, 1/2" Lg.
7	4106-01001-16	Sh. Metal Screw, #6 x 1"
8	4006-01003-12	Mach. Screw, 6-32 x 3/4
9	4700-00070-00	Flatwasher, 3/16 x 5/8 x 16ga.
10	31-2-50002-1	Decal
11	H-14425-7	Helmet Cable
12	A-14410	8-Lamp Board
13	A-14412	8-Lamp Board
14	4406-01128-00	Nut, 6-32 KEPS
15	03-7722-4	Clip, 1/4"
16	03-8063-6	Yellow Light Bulb Sleeve
17	03-8063-4	Red Light Bulb Sleeve

A-14359
Right Ramp Assembly

Item	Part No.	Description
1	A-14360	Switch Assembly
2	A-14361	Switch Assembly
3	A-14281	Gate & Switch Assembly
4	A-14421	Ramp Sub-Assembly
5	A-14494-2	Playfield Plastic Assy.
6	A-14523	Playfield Plastic Assy.
7	H-14425-2	Switch Cable
8	H-14425-5	Switch Cable
9	03-6047-1	Spacer, 1/4" Lg.
10	20-9646-1	Cover Switch Protect
11	20-9672	Cover Switch Protect
12	4106-01019-06	Sh. Metal Screw, #6 x 3/8
13	4006-01003-06	Mach. Screw, 6-32 x 3/8
14	4006-01003-10	Mach. Screw, #6-32 x 5/8
15	4406-01119-00	Nut, 6-32 ESN
16	31-3-50002-1	Decal
17	31-3-50002-2	Decal
18	31-3-50002-3	Decal
19	31-3-50002-4	Decal
20	31-3-50002-5	Decal
21	31-3-50002-6	Decal
22	02-4252-14	F-F Spacer, 6-32 x 7/8

A-14362
Left Ramp Assembly

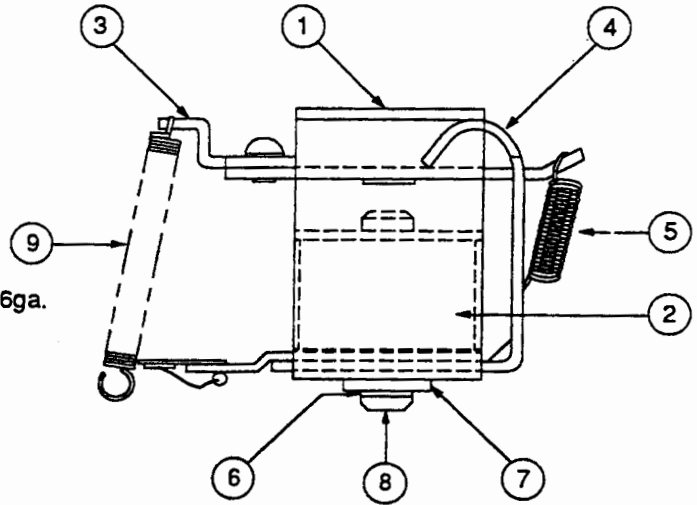
Item	Part No.	Description
1	A-12511	Ball Gate Assembly
2	A-14042	Ball Gate & Switch Assy.
2	A-14363	Gate Assembly
3	A-14364	Ball Gate Actuator Assy. (see p.2-34)
4	A-14420	Ramp Sub-Assembly
5	A-14281	Gate & Switch Assembly
6	H-14425-5	Switch Cable
7	H-14425-1	Switch Cable
8	20-9672	Cover Switch Protect
9	24-8821	Socket w/Diode
10	24-8768	Bulb #555 (6.3V)
11	31-3-50002-7	Decal
12	4006-01027-06	Mach. Screw, 6-32 x 3/8
13	4406-01119-00	Nut 6-32 ESN
14	4106-01033-08	Sh. Metal Screw, #6 x 1/2
15	4006-01041-06	Mach. Screw, 6-32 x 3/8

A-14357
Wire Ball Return Assembly

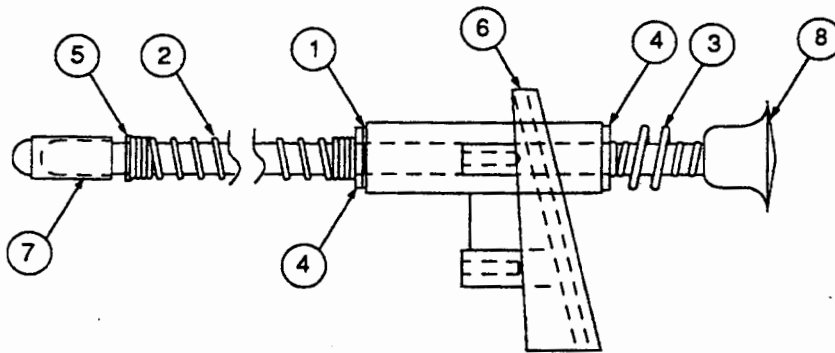
Item	Part No.	Description
1	12-6947	Wire-Ball Return
2	01-8600	Switch Insulator
3	01-8240	Nut Plate
4	5070-09054-00	Diode, 1N4001
5	5647-12693-21	Subminiature Switch
6	H-14425-4	Ball Lock Cable
7	A-14449	Cover & Socket Assembly
8	4002-01105-07	Mach. Screw, 2-56 x 7/16
9	4006-01027-04	Mach. Screw, 6-32

A-14364 Ball Gate Actuator Assembly

Item	Part No.	Description
1	01-8111	Ball Gate Coil Bracket
2	A-14406	Coil Assembly
3	A-11146	Armature Assembly
4	A-6892	Frame & Eyelet Assy.
5	10-120	Spring
6	4701-00003-00	Lockwasher, #8 Split
7	4700-00089-00	Flatwasher, 11/64 x 7/16 x 16ga.
8	4008-01021-07	Mach. Screw, 8-32 x 7/16
9	10-426	Extension Spring



B-11450 Ball Shooter Assembly



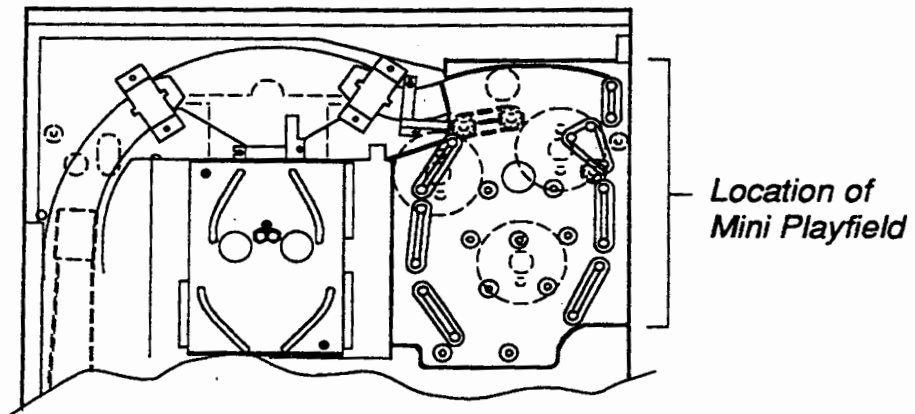
Item	Part Number	Description
1	03-7357	Shooter Sleeve
2	10-148-3	Shooter Spring
3	10-149	Rod Spring
4	4700-00051-00	Flatwasher, 25/64 x 5/8 x 16ga.
5	20-8718-1	"C"-Retaining Ring
6	21-6645	Ball Shooter Housing
7	23-6327	Rubber Shooter Tip
8	20-9253-7	Rod Assembly

Unique Parts

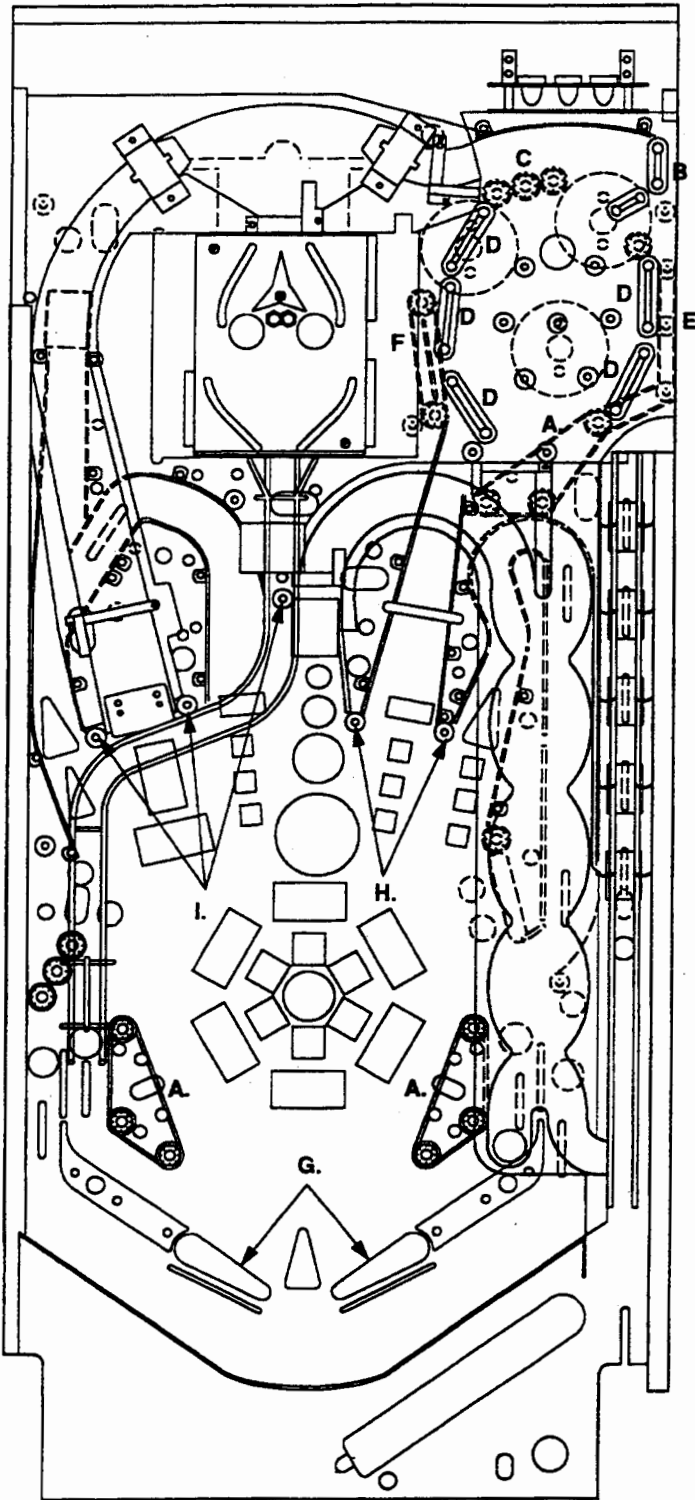
A-12732-50002	WPC Sound Board Assembly	A-14494-3	Playfield Plastic Assembly
A-12742-50002	WPC CPU Board	A-14494-5	Playfield Plastic Assembly
A-13204-50002	Bottom Arch Assembly	A-14508	Helmet Assembly
A-13769-50002	Playfield & Insert Assembly	A-14523	Playfield Plastic Assembly
A-13780-50002	Wood Speaker Panel Assembly	A-14559	Playfield Plastic Assembly
A-13892-2	Motor Regulator Assembly	A-14568	Cover Assembly
A-14007	Chase Light assembly	A-14588	Playfield Plastic Assembly
A-14025	Face Lamp Assembly	A-14609	Ball Gate Assembly
A-14042	Ball Gate & Switch Assembly	A-8108-R-2	Flipper Return Frame Assy.
A-14046	Disappearing Post Assembly	A-8552-50002	Backglass Assembly
A-14118	Face Playfield Assembly		
A-14119	Motor Assembly	AE-30-2000	Coil Assembly
A-14120	Main Bracket Assembly		
A-14121	Face Assembly	H-14425-1	Left Ramp Cable
A-14123	Coil Assembly (Right)	H-14425-10	Head Cable, Upper
A-14124	Coil Assembly (Left)	H-14425-2	Right Ramp Cable
A-14125	Coil Assembly (Center)	H-14425-3	Head Cable, Lower
A-14126	Roller Assembly	H-14425-4	Ball Lock Cable
A-14130	Face Plate - 1 Assembly	H-14425-5	Ramp Switch Cable
A-14131	Face Plate - 2 Assembly	H-14425-6	Flasher Cable
A-14132	Face Plate - 3 Assembly	H-14425-7	Helmet Cable
A-14133	Face Plate - 4 Assembly	H-14425-8	G. I. Cable
A-14281	Gate & Switch Assembly	H-14425-9	Lamp Cable
A-14302	3-Lamp Assembly	H-14426	Playfield Switch Cable
A-14303	5-Lamp Assembly	H-14427	Playfield Lamp Cable
A-14304	13-Lamp Assembly	H-14428	Playfield Solenoid Cable
A-14305	4-Lamp Assembly	H-14429	Insert Cable
A-14318	Ball Guide Assy. - Mini Playfield	H-14430	Cabinet Cable
A-14319	Loop Assembly	H-14431	Logic Power Cable
A-14323	Kicker Assembly		
A-14327	Ball Guide Assy. - Skill Shot	01-9990	Pan
A-14328	Ball Guide Skill Shot Assy.		
A-14333	Ball Guide Assembly	02-4497	Roller
A-14334	Ball Guide Assembly	02-4498	Roller Post
A-14335	Ball Guide Assembly		
A-14336	Ball Guide Assembly	03-7960-50002-1	Mylar - Playfield
A-14337	Ball Guide Assembly	03-7960-50002-2	Mylar - Playfield
A-14338	Ball Guide Assembly	03-8475	Wheel - Geneva
A-14339	Ball Guide Assembly	03-8476	Wheel - Drive
A-14340	Ball Guide Assembly		
A-14341	Ball Guide Assembly	23-6654	Roller, Rubber
A-14357	Wire Ball Return Assy.		
A-14358	Mini Playfield Assembly	31-1-50002	Playfield Plastics
A-14359	Right Ramp Assembly	31-1-50002-	Screened Playfield Plastics Set
A-14362	Left Ramp Assembly	31-1A-50002-1	Playfield Plastic
A-14363	Gate Assembly	31-1A-50002-2	Playfield Plastic
A-14364	Ball Gate Actuator Assy.	31-1A-50002-3	Playfield Plastic
A-14367	Lamp Board & Bracket Assy.	31-1002-50002	Screened Playfield
A-14368	Speaker / Display Assembly	31-1008-50002	Screened Bottom Arch
A-14372	Ball Gate Assembly	31-1009-50002	Shooter Plate Screened
A-14376-50002	Backbox Assembly	31-1420-50002	Speaker Panel Cover, Screened
A-14410	8-Chase Lamp Assembly	31-1625	Mini Playfield Screened
A-14412	8-Chase Lamp Assembly	31-2-50002-1	Decal, Helmet
A-14423-1	Relay 12vdc Assembly	31-2-50002-2 → -8	Decal
A-14451	3-Lamp & Bracket Assembly	31-3-50002-1 → -7	Decal - Bottom Side
A-14494-2	Playfield Plastic Assembly		

A-14358 Mini Playfield Assembly

Item	Part No.	Description
1	31-1625	Mini Playfield (Screened)
2	A-14318	Ball Guide Assembly
3	03-8044-9	Mini Post, Tr. Red
4	23-6535	Ball Guide Bumper
5	23-6301	Rubber Ring, 3/4"
6	23-6304	Rubber Ring, 1-1/2"
7	4106-01019-08	Sh. Metal Screw, #6 x 1/2
8	4006-01017-06	Mach. Screw, 6-32 x 3/8
9	4406-01119-00	Nut, 6-32 ESN
10	23-6300	Rubber Ring, 5/16"
11	23-6302	Rubber Ring, 1"
12	02-4335-12	Mounting Post, 1.38
13	4700-00021-00	Flatwasher, 13/64 x 7/16 x 21ga.
14	4408-01119-00	Nut, 8-32 ESN
15	01-10126	Shield - Right Side Head
16	03-6047-2	Spacer, 3/8"
17	4008-01003-12	Mach. Screw, 8-32 x 3/4



THE MACHINE RUBBERS



- A. Rubber Ring 23-6306, 2 1/2"
- B. Rubber Ring 23-6301, 3/4"
- C. Post Rubbers 23-6300, (6)
- D. Rubber Ring 23-6302, 1" (5)
- E. Rubber Ring 23-6304, 1 1/2"
- F. Rubber Ring 23-6305, 2" (2)
- G. Rubber Ring (Flipper), 23-6519-4 (red) (2)
- H. Rubber Bumper Sleeve, 23-6556 (blk) (2)
- I. Rubber Bumper Sleeve, 23-6552 (yel) (3)

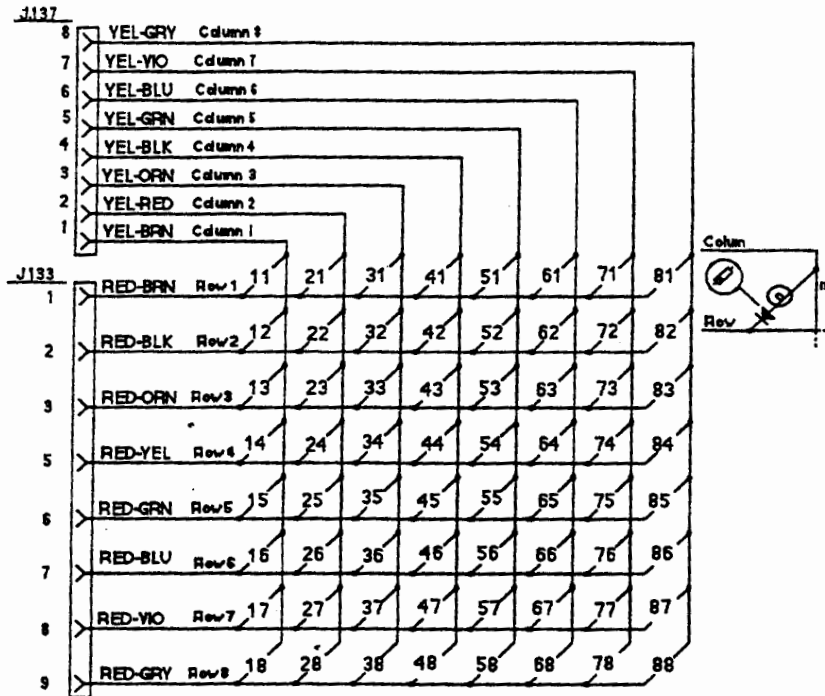
On Miniplayfield:

- 10 small post rubbers, 23-6535
- 1 small rubber ring, 23-6300

On Playfield:

- 9 large post rubbers, 23-6300
- 4 small post rubbers, 23-6535

Lamp Matrix

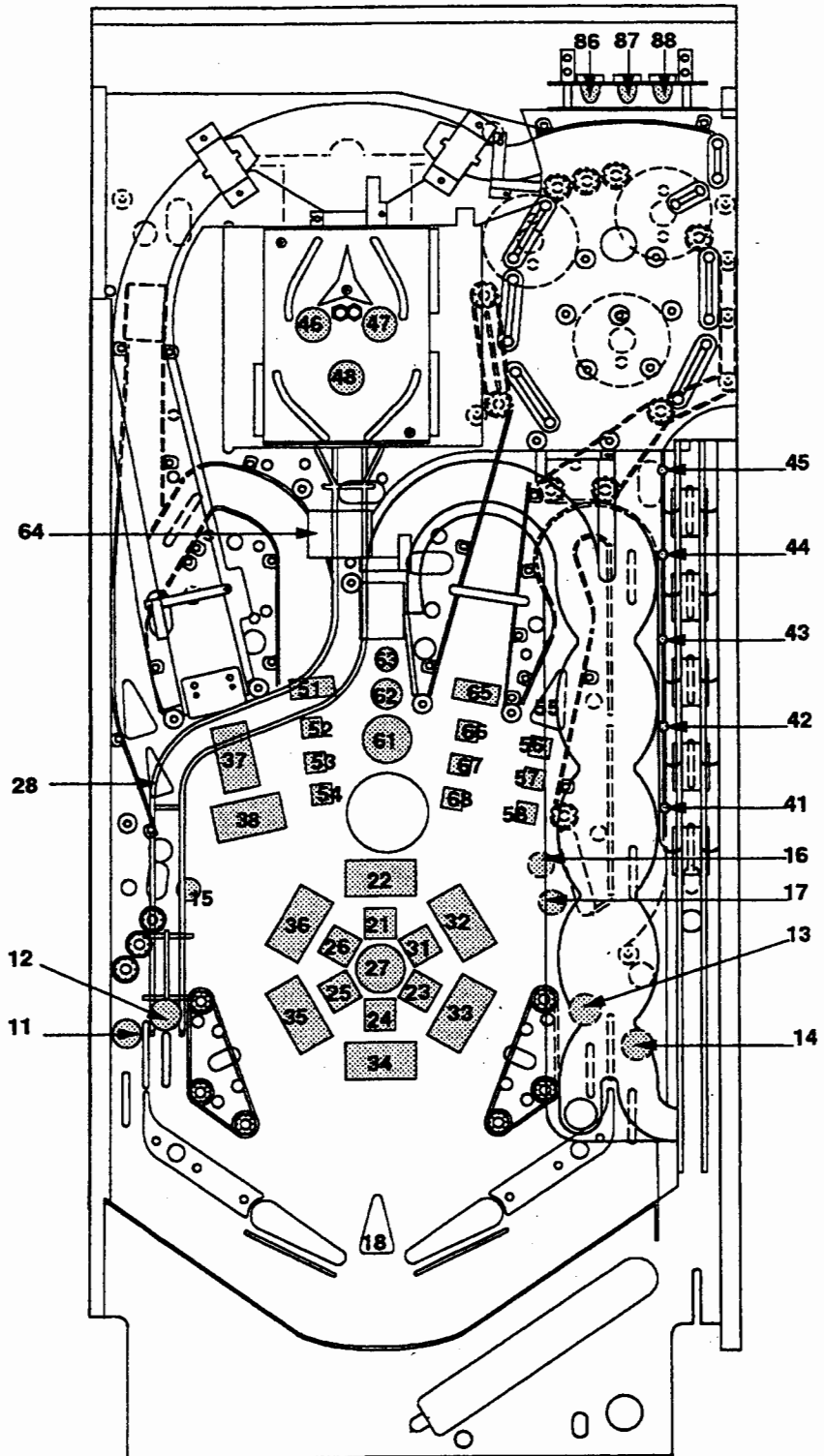


THE MACHINE Lamp Matrix

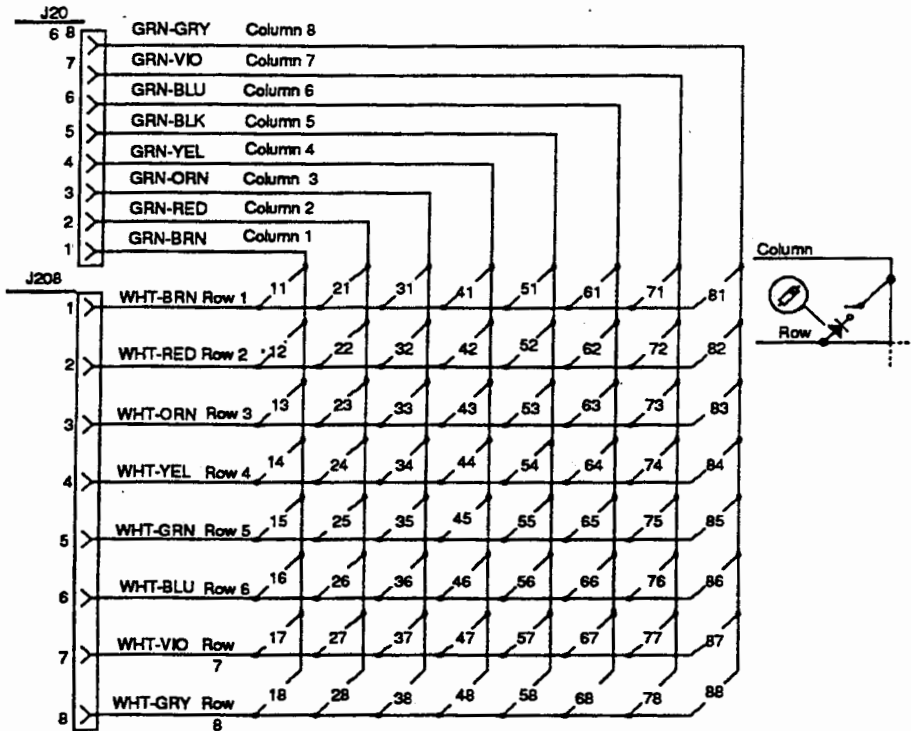
		Yellow (R+) → Red							
Column		1 Yellow-Brown	2 Yellow-Red	3 Yellow-Orange	4 Yellow-Black	5 Yellow-Green	6 Yellow-Blue	7 Yellow-Violet	8 Yellow-Gray
Row									
1	Red-Brown	Left Outlane 11	Circle Lite Jackpot 21	Circle 250K 31	Skill Shot 50K 41	Left Loop 500K 51	Right Ramp 100K 61	Jackpot 8 Million 71	Backglass Hip 81
2	Red-Black	Left Return Lane 12	Circle Lite Billion 22	Circle 10 Million 32	Skill Shot 75K 42	Left Loop 100K 52	Right Ramp 500K 62	Jackpot 7 Million 72	Backglass Middle leg 82
3	Red-Orange	Right Return Lane 13	Circle Extra Ball 23	Circle 50 Million 33	Skill Shot 100K 43	Left Loop 50K 53	Right Ramp Million 63	Jackpot 6 Million 73	Backglass Knee 83
4	Red-Yellow	Right Outlane 14	Circle Lite Extra Ball 24	Circle Special 34	Skill Shot 200K 44	Left Loop 25K 54	Wire Ball Lock 64	Jackpot 5 Million 74	Backglass Foot 84
5	Red-Green	Left Standup 15	Circle 500K 25	Circle 5 Million 35	Skill Shot 25K 45	Right Loop 500K 55	Jet Enter 500K 65	Jackpot 4 Million 75	Backglass Shoulder 85
6	Red-Blue	Right Top Standup 16	Circle 100K 26	Circle 1 Million 36	Head Left Eye 46	Right Loop 100K 56	Jet Enter 100K 66	Jackpot 3 Million 76	Mini Playfield 100K 86
7	Red-Violet	Right Bottom Standup 17	Values Doubled 27	Space Shuttle 37	Head Right Eye 47	Right Loop 50K 57	Jet Enter 50K 67	Jackpot 2 Million 77	Mini Playfield 200K 87
8	Red-Gray	Shoot Again 18	Spin Small Wheel 28	Launch Pad 38	Head Mouth 48	Right Loop 25K 58	Jet Enter 25K 68	Jackpot 1 Million 78	Mini Playfield 300K 88

THE MACHINE LAMP LOCATIONS

No.	Description	Bulb
11.	Left Outlane	555
12.	Left Return Lane	555
13.	Right Return Lane	555
14.	Right Outlane	555
15.	Left Standup	555
16.	Right Top Standup	555
17.	Right Bottom Standup	555
18.	Shoot Again	44
21.	Circle - Lite Jackpot	555
22.	Circle - Lite Billion	555
23.	Circle - Extra Ball	555
24.	Circle - Lite Extra Ball	555
25.	Circle - 50K	555
26.	Circle - 100K	555
27.	Circle - Values Doubled	555
28.	Spin Small Wheel	555
31.	Circle - 250K	555
32.	Circle - 10 Million	555
33.	Circle - 50 Million	555
34.	Circle - Special	555
35.	Circle - 5 Million	555
36.	Circle - 1 Million	555
37.	Space Shuttle Ramp	44
38.	Launch Pad	44
41.	Skill Shot 50K	555
42.	Skill Shot 75K	555
43.	Skill Shot 100K	555
44.	Skill Shot 200K	555
45.	Skill 25K	555
46.	Head - Left Eye	555
47.	Head - Right Eye	555
48.	Head - Mouth	555
51.	Left Loop - 500K	555
52.	Left Loop - 100K	555
53.	Left Loop - 50K	555
54.	Left Loop - 25K	555
55.	Right Loop - 500K	555
56.	Right Loop - 100K	555
57.	Right Loop - 50K	555
58.	Right Loop - 25K	555
61.	Right Ramp - Million	555
62.	Right Ramp - 500K	555
63.	Right Ramp - 100K	555
64.	Wire Ball Lock	44
65.	Jets Enter - 500K	555
66.	Jets Enter - 100K	555
67.	Jets Enter - 50K	555
68.	Jets Enter - 25K	555
71.	Jackpot - 8 Million (on insert)	555
72.	Jackpot - 7 Million (on insert)	555
73.	Jackpot - 6 Million (on insert)	555
74.	Jackpot - 5 Million (on insert)	555
75.	Jackpot - 4 Million (on insert)	555
76.	Jackpot - 3 Million (on insert)	555
77.	Jackpot - 2 Million (on insert)	555
78.	Jackpot - 1 Million (on insert)	555
81.	Backglass Hip (on insert)	555
82.	Backglass Middle Leg (on insert)	555
83.	Backglass Knee (on insert)	555
84.	Backglass Foot (on insert)	555
85.	Backglass Shoulder (on insert)	555
86.	Mini Playfield - 100K	555
87.	Mini Playfield - 200K	555
88.	Mini Playfield - 300K	555



Switch Matrix



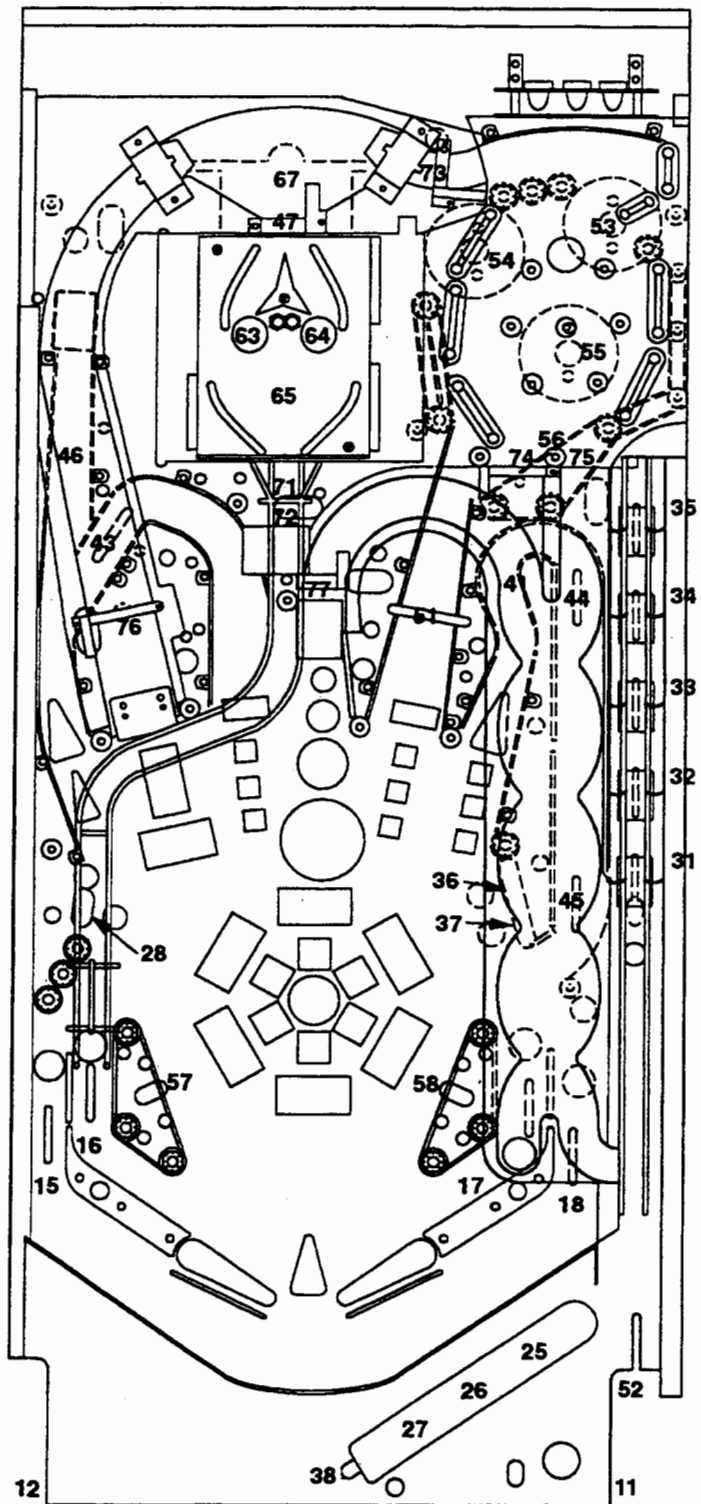
THE MACHINE Switch Matrix

White Green

Dedicated Grounded Switches	Columns		1	2	3	4	5	6	7	8
	Row		Green-Brown	Green-Red	Green-Orange	Green-Yellow	Green-Black	Green-Blue	Green-Violet	Green-Gray
Orange-Brown (D1) Left Coin Chute	1	White-Brown	Right Flipper	Slam Tilt	Skill Shot 50K	Right Ramp Made	Spinner	Not Used	Wireform Top	
Orange-Red (D2) Center Coin Chute	2	White-Red	Left Flipper	Coin Door Closed	Skill Shot 75K	Not Used	Shooter	Not Used	Wireform Bottom	
Orange-Black (D3) Right Coin Chute	3	White-Orange	Start Button	Ticket Opto	Skill Shot 100K	Left Loop	Upper Right Jet Bumper	Head Left Eye	Enter Mini Playfield	
Orange-Yellow (D4) 4th Coin Chute	4	White-Yellow	Plumb Bob Tilt	Always Closed	Skill Shot 200K	Right Loop Top	Upper Left Jet Bumper	Head Right Eye	Mini Exit Left	
Orange-Green (D5) Normal Function Test Function Service Credits Escape	5	White-Green	Left Outlane	Right Trough	Skill Shot 25K	Right Loop Bottom	Lower Jet Bumper	Head Mouth	Mini Exit Right	
Orange-Blue (D6) Normal Function Test Function Volume Down Down	6	White-Blue	Left Flipper Lane	Center Trough	Right Top Standup	Under Playfield Kickback	Jet Bumper Sling	Not Used	Left Ramp Enter	
Orange-Violet (D7) Normal Function Test Function Volume Up Up	7	White-Violet	Right Flipper Lane	Left Trough	Right Bottom Standup	Enter Head	Left Slingshot	Face Position	Right Ramp Enter	
Orange-Gray (D8) Normal Function Test Function Begin Enter Test Test	8	White-Gray	Right Outlane	Left Standup	Outhole	Not Used	Right Slingshot	Not Used	Not Used	

THE MACHINE SWITCH LOCATIONS

Item	Part Number	Description
11	A-9990-1	Right Flipper
12	A-9990-1	Left Flipper
13	SW-1A-126	Game Start
14	20-6502-A	Plum Bob Tilt
15	5647-12693-19	Left Outlane
16	5647-12693-19	Left Flipper Lane
17	5647-12693-19	Right Flipper Lane
18	5647-12693-19	Right Outlane
21	27-1066	Slam Tilt
22	A-8630	Coin Door Closed
23	Not Used	Ticket Opto.
24	A-8630	Always Closed
25	5647-12693-08	Right Trough
26	5647-09957-00	Center Trough
27	5647-09957-00	Left Trough
28	B-11854-4	Left Standup
31	5647-12693-46	Skill Shot 50K
32	5647-12693-19	Skill Shot 75K
33	5647-12693-19	Skill Shot 100K
34	5647-12693-19	Skill Shot 200K
35	5647-12693-19	Skill Shot 25K
36	B-11854-4	Right Top Standup
37	B-11854-4	Right Bottom Standup
38	5647-12133-12	Outhole
41	5647-12693-21	Right Ramp Made
42	Not Used	Not Used
43	5647-12693-19	Left Loop
44	5647-12693-18	Right Loop Top
45	5647-12693-18	Right Loop Bottom
46	5647-12693-25	Under Playfield Kicker
47	5647-12693-36	Enter Head
48	Not Used	Not Used
51	5647-12133-08	Spinner
52	5647-12693-04	Shooter Lane Feeder
53	SW-11A-37	Upper Right Jet Bumper
54	SW-11A-37	Upper Left Jet Bumper
55	SW-11A-37	Lower Jet Bumper
56	SW-1A-114	Jet Bumper Sling Kicker
57	SW-1A-114	B. L. Kicker (Sling)***
58	SW-1A-114	B. R. Kicker (Sling)***
61	Not Used	Not Used
62	Not Used	Not Used
63	5647-12693-47	Head - Left Eye
64	5647-12693-48	Head - Right Eye
65	5647-12693-39	Head - Mouth
66	Not Used	Not Used
67	5647-12693-06	Face Position
68	Not Used	Not Used
71	5647-12693-21	Wireform Top
72	5647-12693-21	Wireform Bottom
73	5647-12693-36	Enter Mini Playfield
74	5647-12693-36	Exit Mini Playfield Left
75	5647-12693-21	Exit Mini Playfield Right
76	5647-12693-36	Left Ramp Enter
77	5647-12693-21	Right Ramp Enter
78	Not Used	Not Used



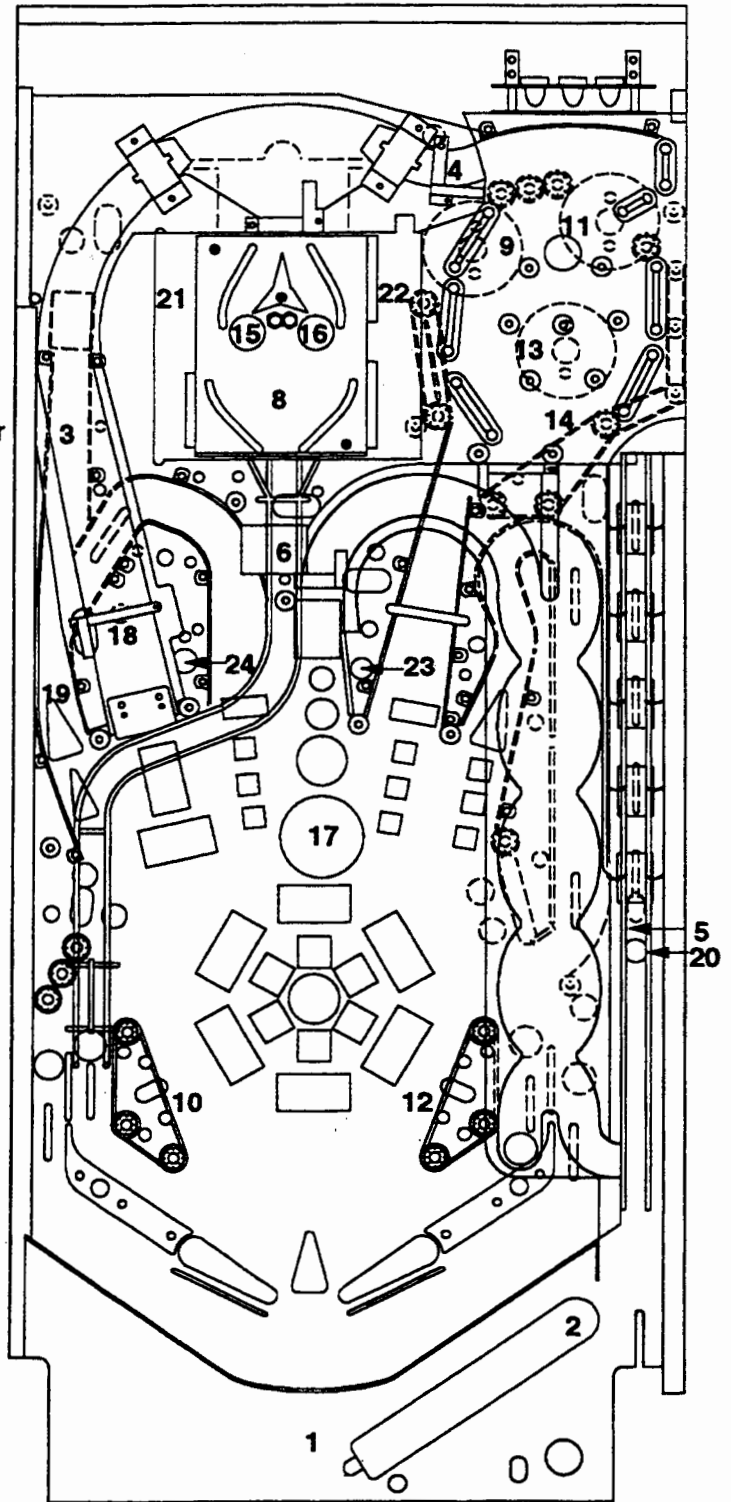
Solenoid Table

THE MACHINE Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color	Connections	Driver Trnstr	Solenoid Part Number Flashlamp Type
01	Outhole	High Power	Vio-Brn	J130-1	Q82	AE-27-1200
02	Ball Release	High Power	Vio-Red	J130-2	Q80	AE-26-1200
03	Under Playfield Kicker	High Power	Vio-Orn	J130-4	Q78	AE-23-800
04	Controlled Gate	High Power	Vio-Yel	J130-5	Q76	A-14406
05	Skill Shot Kicker	High Power	Vio-Grn	J130-6	Q64	AE-24-900
06	Wire Ball Holder	High Power	Vio-Blu	J130-7	Q66	AE-26-1200
07	Knocker	High Power	Vio-Blk	J130-8	Q68	AE-23-800
08	Head Mouth	High Power	Vio-Gry	J130-9	Q70	AE-30-2000
09	Upper Left Jet Bumper	Low Power	Brn-Blk	J127-1	Q58	AE-26-1200
10	Left (sling) Kicker	Low Power	Brn-Red	J127-3	Q56	AE-26-1500
11	Upper Right Jet Bumper	Low Power	Brn-Orn	J127-4	Q54	AE-26-1200
12	Right (sling) Kicker	Low Power	Brn-Yel	J127-5	Q52	AE-26-1500
13	Lower Jet Bumper	Low Power	Brn-Grn	J127-6	Q50	AE-26-1200
14	Jets Sling	Low Power	Brn-Blu	J127-7	Q48	AE-26-1500
15	Head - Left Eye	Low Power	Brn-Vio	J127-8	Q46	AE-30-2000
16	Head - Right Eye	Low Power	Brn-Gry	J127-9	Q44	AE-30-2000
17	Billion Flasher	Flasher	Blk-Brn	J125-1 J125-2	Q42	#89 pfd
18	Left Ramp Flash	Flasher	Blk-Red	J126-2 J125-3	Q40	#89 pfd, #906 Insert
19	Jackpot Flasher	Flasher	Blk-Orn	J126-3	Q38	#89 pfd, #906 Insert
20	Skill Shot Flasher	Flasher	Blk-Yel	J126-4 J125-6	Q36	#89 pfd
21	Left Helmet Flasher	Flasher	Blu-Grn	J126-6 J125-7	Q28	#555 pfd, #906 Insert
22	Right Helmet Flasher	Flasher	Blu-Blk	J126-7 J125-8	Q30	#555 pfd, #906 Insert
23	Jets Enter Flash	Flasher	Blu-Vio	J126-8 J125-9	Q34	#555 pfd, #906 Insert
24	Left Loop Flash	Flasher	Blu-Gry	J126-9	Q32	#555 pfd, #906 Insert
25	Helmet Lights Data Port	Special	Blu-Brn	J122-1	Q26	
26	Helmet Light Clock Port	Special	Blu-Red	J122-2	Q24	A-14423-1
27	Motor Relay	Special	Blu-Orn	J122-3	Q22	A-14119
28	Head Motor	Special	Blu-Yel	J122-4	Q20	
General Illumination Circuits						
01	Backglass Body	G.I.	Wht-Brn	J121-7	Q18	#555
02	Used In Helmet	G.I.	Wht-Org	J120-8	Q10	#555
03	Rear Playfield	G.I.	Wht-Yel	J120-9	Q14	#555
04	Backglass - No Body	G.I.	Wht-Grn	J121-11	Q16	#555
05	Front Playfield	G.I.	Wht-Vio	J120-11	Q12	#555
	Lower Right Flipper		Blu-Yel	J109-7		FL-11630
	Lower Left Flipper		Gry-Yel	J109-5		FL-11630

THE MACHINE SOLENOID LOCATIONS

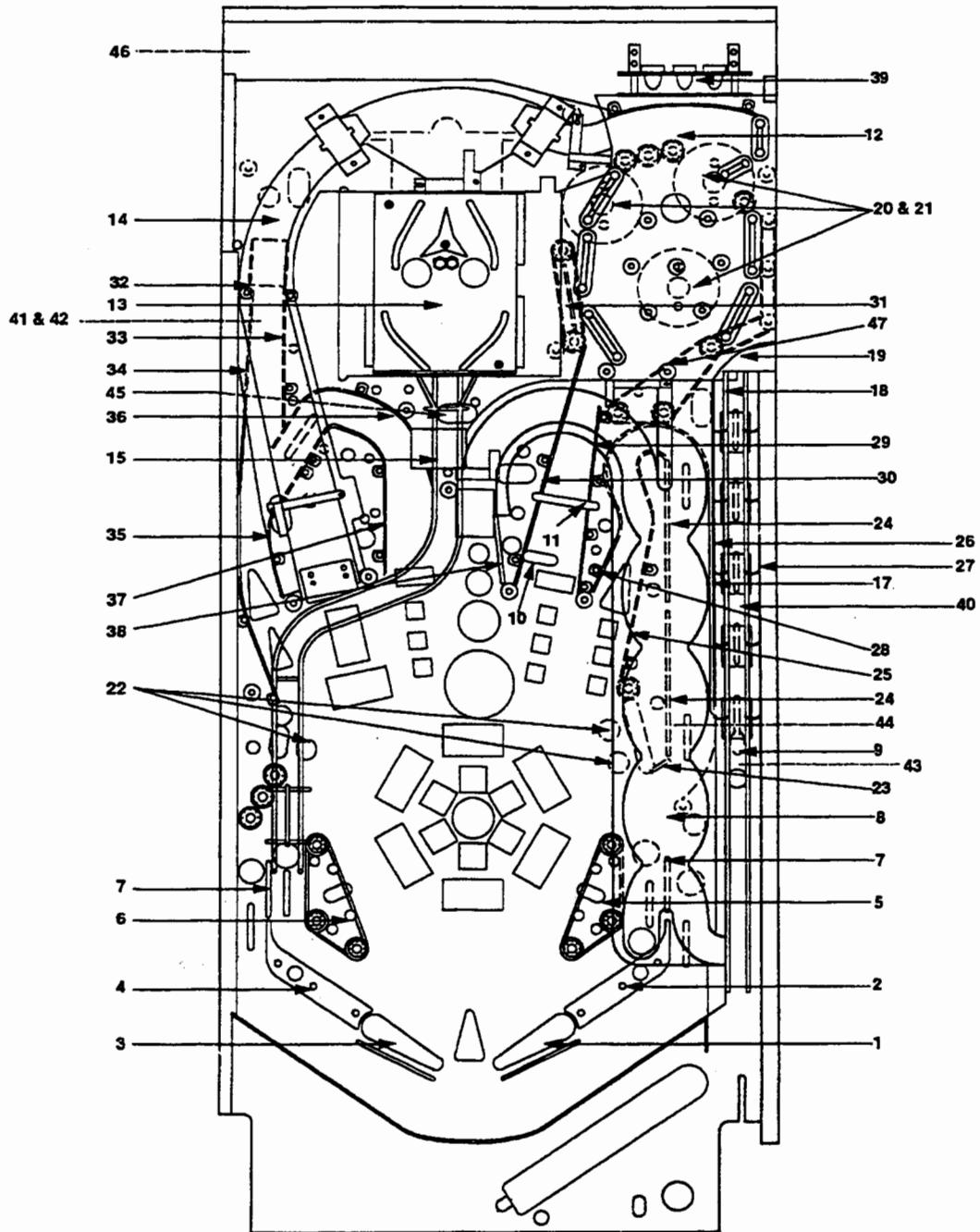
Item	Part Number	Description
01	AE-27-1200	Outhole Kicker
02	AE-26-1200	Ball Release
03	AE-23-800	Under Playfield Kicker
04	A-14406	Controlled Gate
05	AE-24-900	Skill Shot Kicker
06	AE-26-1200	Wire Ball Holder
07	AE-23-800	Knocker
08	AE-30-2000	Head - Mouth
09	AE-26-1200	Upper Left Jet Bumper
10	AE-26-1500	Left ("Sling") Kicker
11	AE-26-1200	Upper Right Jet Bumper
12	AE-26-1500	Left ("Sling") Kicker
13	AE-26-1200	Lower Middle Jet Bumper
14	AE-26-1500	Jets ("Sling") Kicker
15	AE-30-2000	Head - Left Eye
16	AE-30-2000	Head - Right Eye
17	#89PL	Billion Flasher
18	#89PL, #906In	Left Ramp Flash
19	#89PL, #906In	Jackpot Flasher
20	#89PL	Skill Shot Flasher
21	#89PL, #906In	Left Helmet Flasher
22	#89PL, #906In	Right Helmet Flasher
23	#89PL, #906In	Jets Enter Flash
24	#89PL, #906In	Left Loop Flash
25		Helmet Lights Data Port
26		Helmet Light Clock Port
27	A-14423-1	Motor Relay
28	A-14119	Head Motor



Playfield Parts

Item	Part Number	Description	Item	Part Number	Description
1	C-13174-R	Right Flipper	33	A-14339	Ball Guide Assy.
2	A-8108-R-2	Right Flipper Ball Guide Assy.	34	A-14333	Ball Guide Assy.
3	C-13174-L	Left Flipper	35	A-14334	Ball Guide Assy.
4	A-8108-L-2	Left Flipper Ball Guide Assy.	36	A-14336	Ball Guide Assy.
5	B-12665	Right "sling" Kicker	37	A-14335	Ball Guide Assy.
6	B-12665	Left "sling" Kicker	38	12-6959	Ball Guide Wire
7	12-6466-8	Wireform 2"	39	A-14451	Lamp Assy.
8	A-14359	Right Ramp Assy.	40	A-14126	Roller Assy.
a)	A-14281	Gate & Switch Assy.	41	A-14319	Loop Assembly
b)	A-14361	Ramp Switch Assy.	42	A-14323	Kicker Assembly
c)	03-8513	Right Ramp	43	B-11395-1	Metal Kicker Assembly
d)	01-10007	Ramp Flap	44	A-14007	Chase Light Assembly
e)	20-9646-1	Switch Protective Cover - Blk.	45	A-14046	Disappear Post Assy.
9	12-6957	Right Wire Ramp (Skill)	46	A-13892-2	Motor Regulator
10	A-14609	One Way Gate	47	B-12665	Kicker Arm Assy.
11	B-12586	Spinner (target assy.)	48	Parts below are located beneath Bottom Arch:	
12	A-14358	Mini Playfield Assy.	a)	B-8623	Upper Trough Baffle Assembly
f)	31-1625	Screened Mini Playfield	b)	C-8235	Lower Trough Baffle Assembly
g)	01-10126	Shield - Right Side of Head	c)	12-6542	Trough Baffle Wire
h)	03-8044-9	Mini Post TR - Red	d)	01-3569-1	Ball Trough (runway)
i)	A-14318	Ball Guide Assy.	e)	01-5575	Bottom Arch Mounting Bracket
13	A-14118	Face Assy.	f)	B-8039-2	Outhole Kicker Assembly
j)	A-14119	Motor Assy.	g)	C-9638	Shooter Lane Feeder
k)	A-14120	Main Bracket Assy.			
l)	A-14025	Face Lamp Assy.			
14	A-14362	Left Ramp Assy.			
m)	20-9672	Switch Protective Cover			
n)	03-8512	Left Main Ramp			
o)	01-9848	Ramp Flap			
p)	12-6657-L	Ball Gate Wireform - L			
q)	A-12511	Ball Gate Assy.			
r)	A-14042	Ball Gate & Switch Assy.			
s)	A-14363	Gate Assy.			
15	A-14357	Wire Chute Assy.			
t)	12-6947	Ramp - Ball Return			
u)	A-14449	Cover & Socket Assy.			
v)	5647-12693-21	Switch - Sub Mini Micro			
16	12-6959	Ball Guide Wire			
17	03-8514	Cover - Lamp Board & Skill Shot			
18	A-14367	Lamp Board & Brkt. Assy.			
19	A-14372	Ball Gate Assy.			
20	B-9414-1	Jet Bumper (blue)			
21	03-8254-9	Red Bumper Cap			
22	B-11854-4	Standup Target Assy. (red)			
23	12-6466-2	1/2" Wireform			
24	12-6466-22	5 1/2" Wireform			
25	A-14341	Ball Guide Assy.			
26	A-14329	Ball Guide Assy. (right)			
27	A-14327	Ball Guide Assy. (left)			
28	A-14340	Ball Guide Assy.			
29	A-14338	Ball Guide Assy.			
30	A-14337	Ball Guide Assy.			
31	12-6466-10	2 1/2" Wireform			
32	A-14320	Loop Ball Gde. Assy -under pffd			

THE MACHINE PLAYFIELD PART LOCATIONS

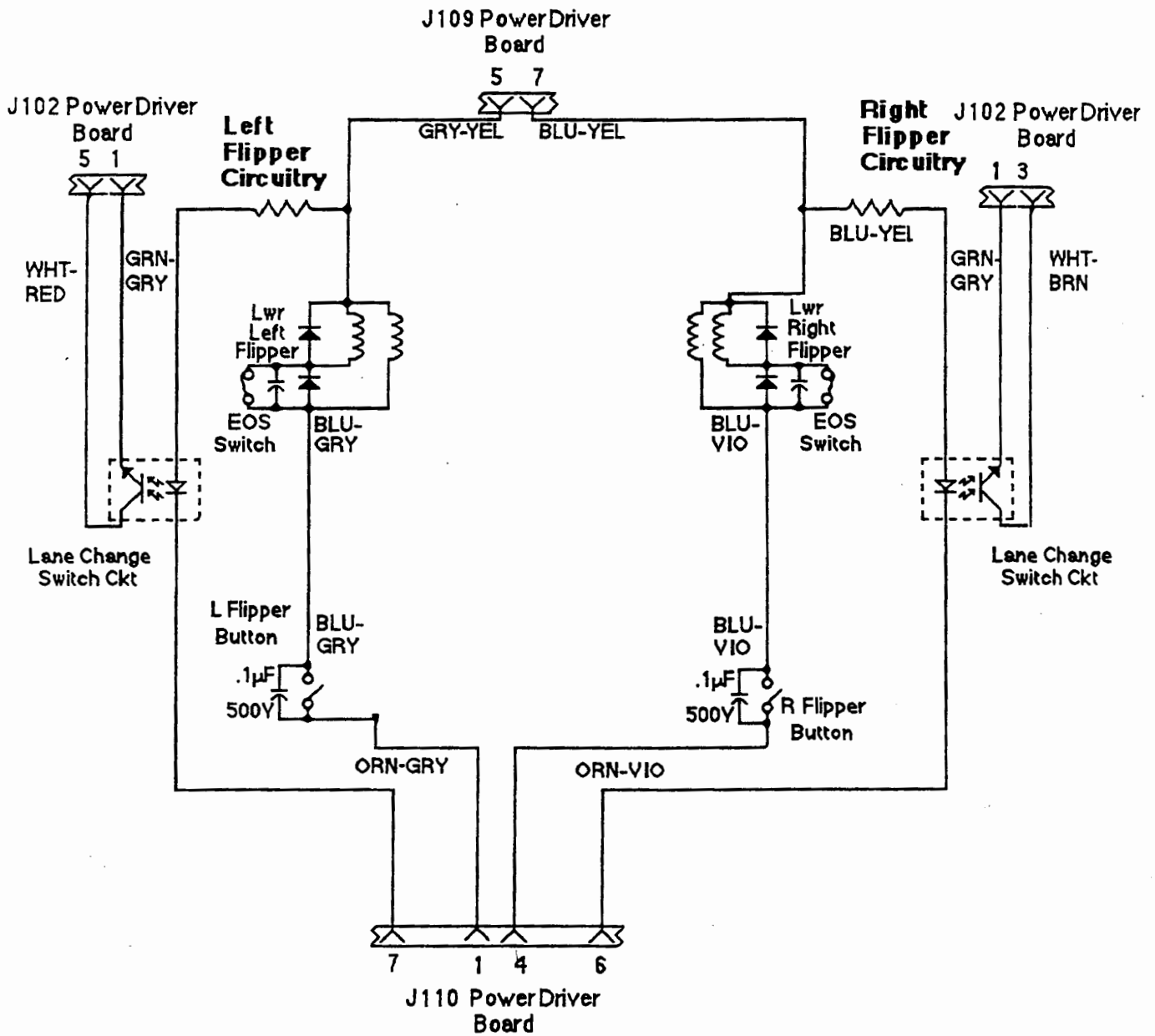


Section 3

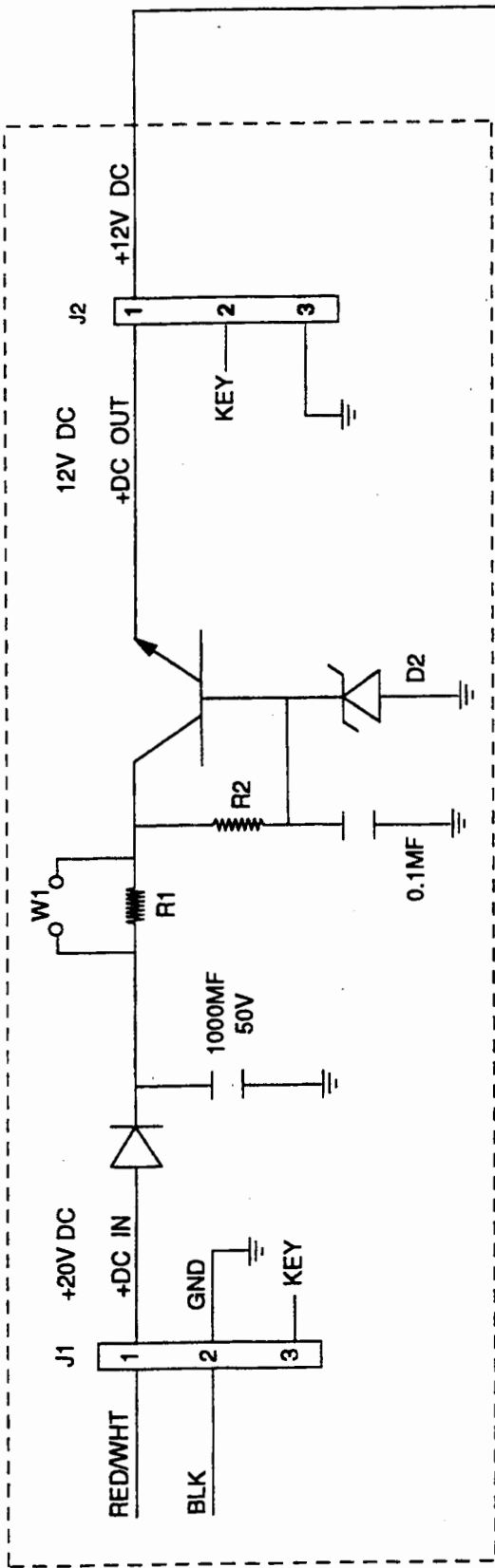
Wiring Diagrams and Schematics

- ***Diagrams & Schematics***

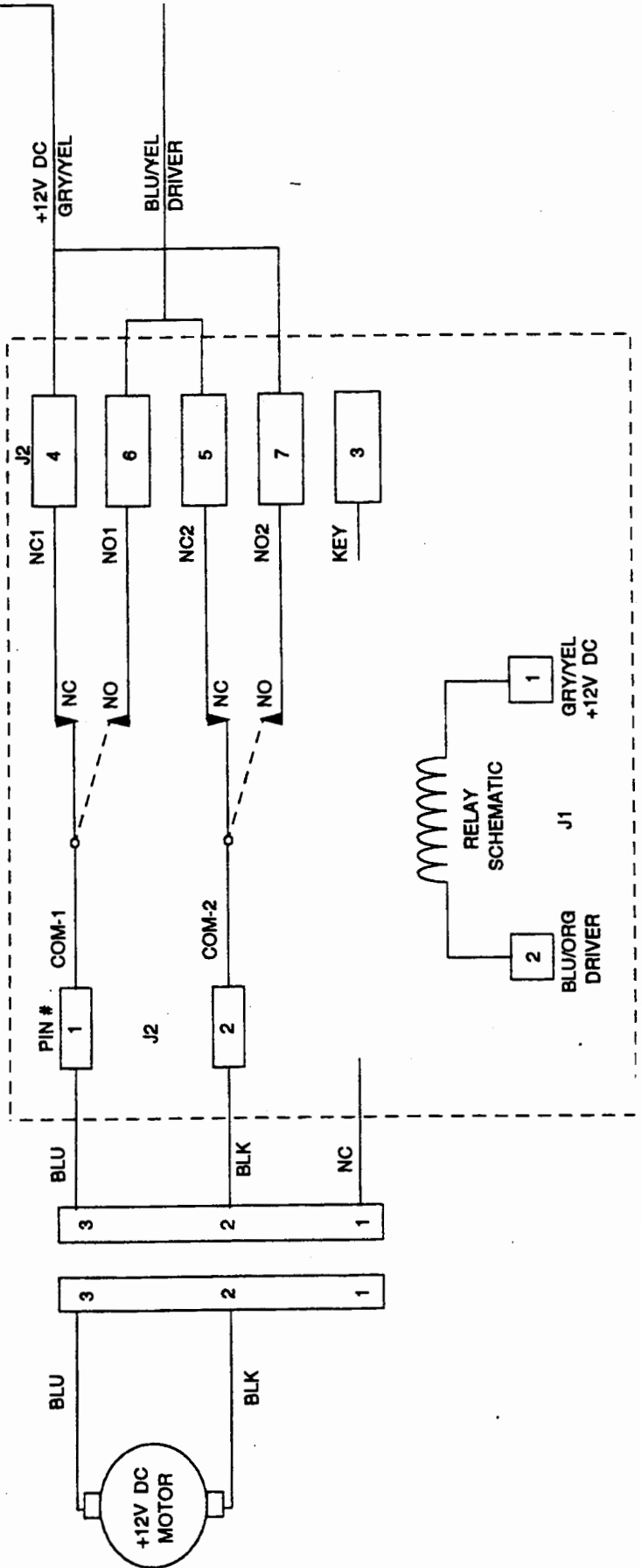
Flipper Wiring
Relay Assy. & Motor Regulator Board
Coin Interface Board
Solenoid Wiring
Chase Light Wiring
Power Wiring
CPU Board
Display Driver Board
Sound Board
Power Driver Board
Backbox Wiring
Interboard Wiring

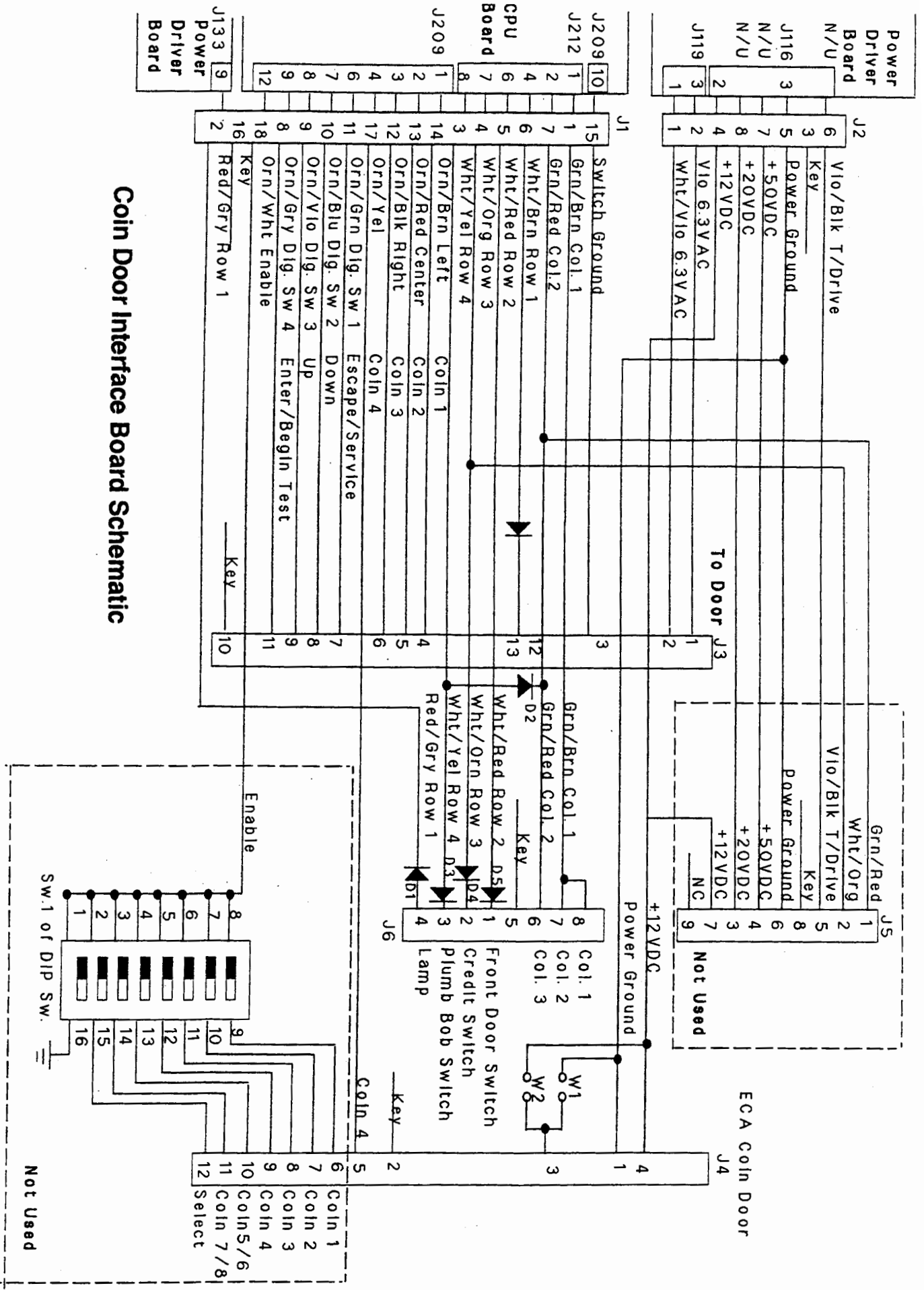


**MOTOR REGULATOR BOARD
A-13892-2**

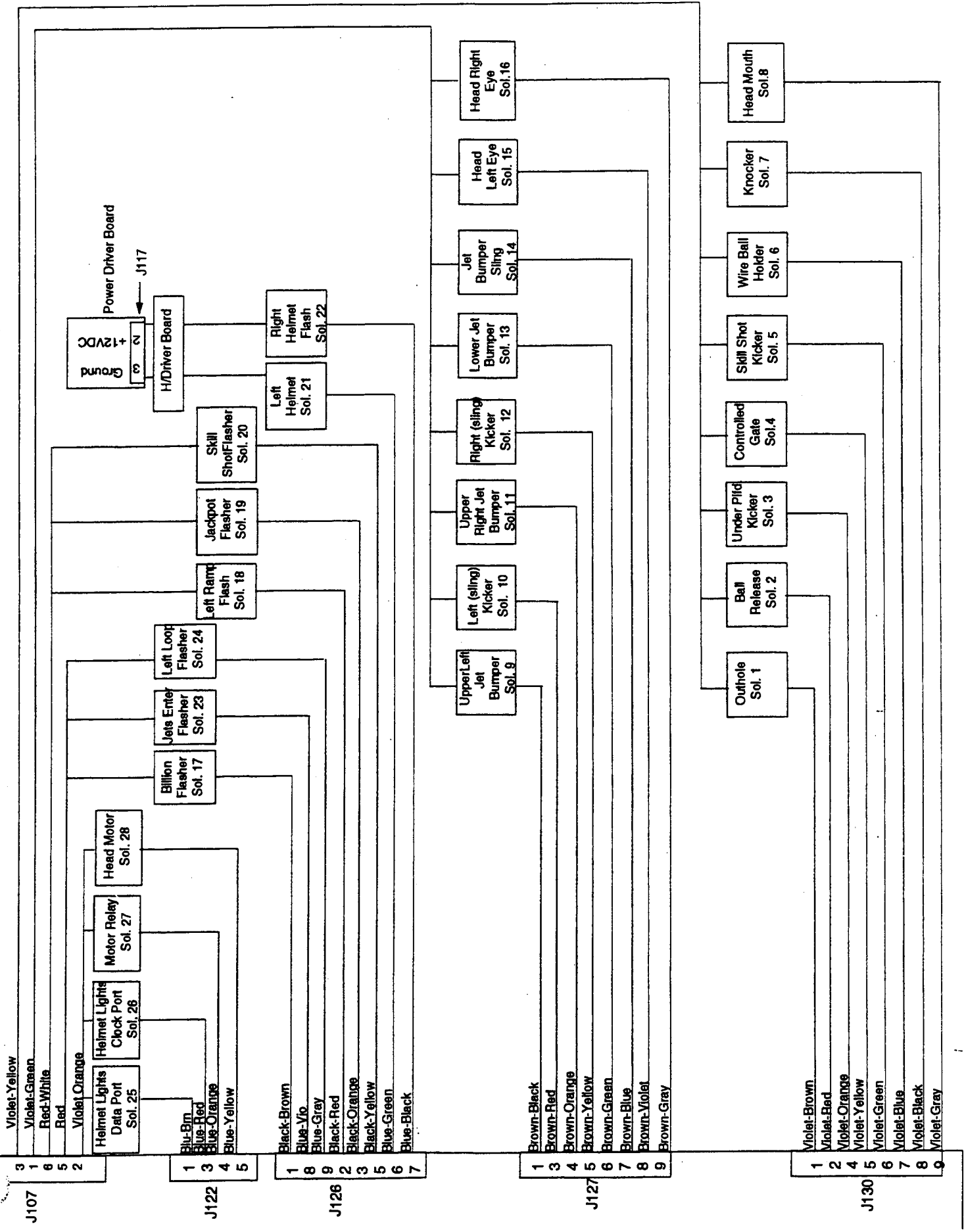


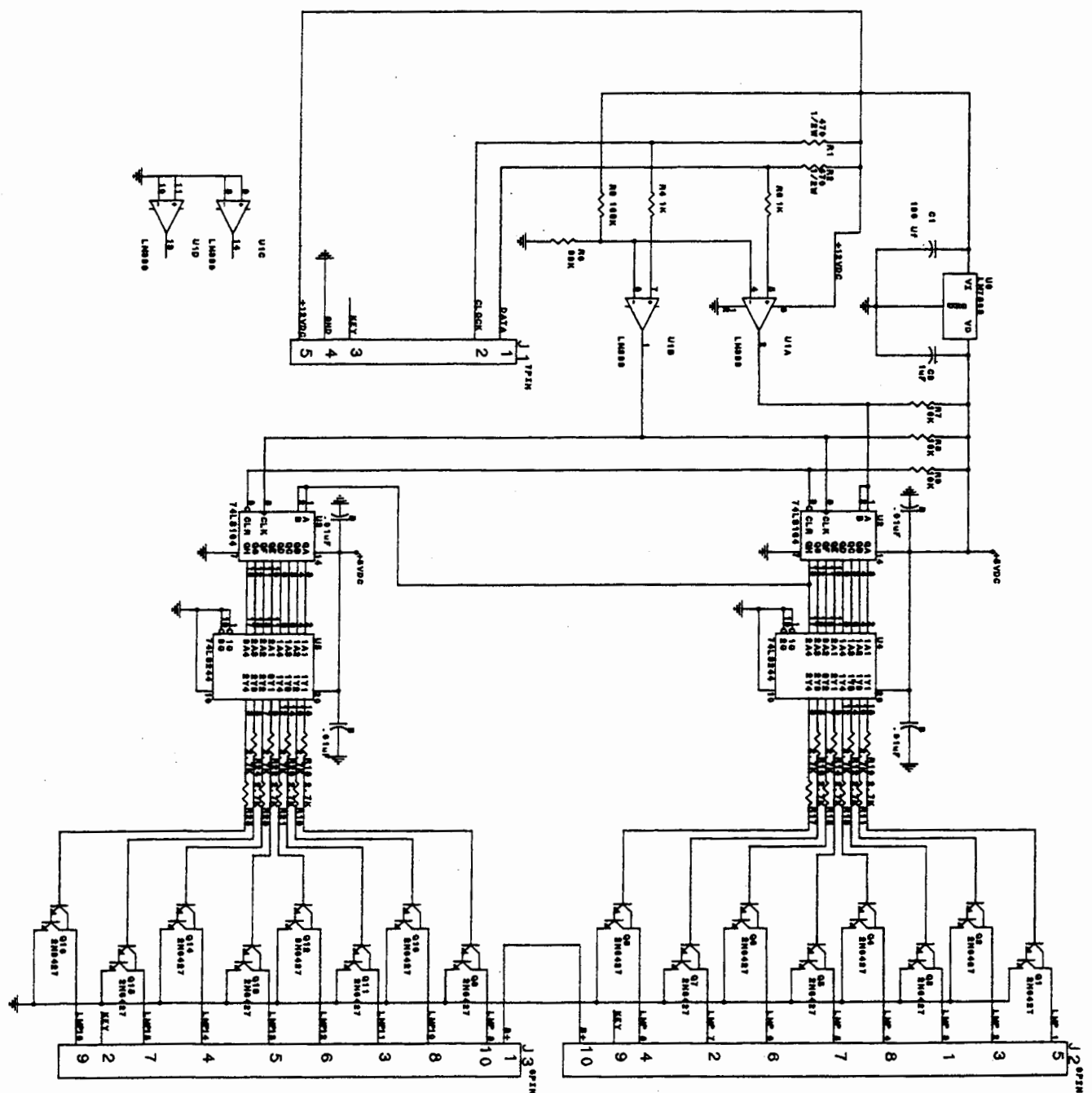
RELAY ASSEMBLY A-14423-1





Coin Door Interface Board Schematic





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DESIGNER	WILLIAMS ELECTRONIC CORP. 210-88818
DRW'N BY	M. JAYSWAL
CHECKED BY	M. JAYSWAL
DATE	1-7-71
PROJECT NO.	50002
REV	A-14007
REV	2. OF 2.
REV	CHASE LIGHT
REV	A-14007

THE MACHINE Lamp Matrix

Yellow (B+)  Red

Column Row	1 Yellow- Brown	2 Yellow- Red	3 Yellow- Orange	4 Yellow- Black	5 Yellow- Green	6 Yellow- Blue	7 Yellow- Violet	8 Yellow- Gray
1 Red- Brown	Left Outlane 11	Circle Lite Jackpot 21	Circle 250K 31	Skill Shot 50K 41	Left Loop 500K 51	Right Ramp 100K 61	Jackpot 8 Million 71	Backglass Hip 81
2 Red- Black	Left Return Lane 12	Circle Lite Billion 22	Circle 10 Million 32	Skill Shot 75K 42	Left Loop 100K 52	Right Ramp 500K 62	Jackpot 7 Million 72	Backglass Middle leg 82
3 Red- Orange	Right Return Lane 13	Circle Extra Ball 23	Circle 50 Million 33	Skill Shot 100K 43	Left Loop 50K 53	Right Ramp Million 63	Jackpot 6 Million 73	Backglass Knee 83
4 Red- Yellow	Right Outlane 14	Circle Lite Extra Ball 24	Circle Special 34	Skill Shot 200K 44	Left Loop 25K 54	Wire Ball Lock 64	Jackpot 5 Million 74	Backglass Foot 84
5 Red- Green	Left Standup 15	Circle 500K 25	Circle 5 Million 35	Skill Shot 25K 45	Right Loop 500K 55	Jet Enter 500K 65	Jackpot 4 Million 75	Backglass Shoulder 85
6 Red- Blue	Right Top Standup 16	Circle 100K 26	Circle 1 Million 36	Head Left Eye 46	Right Loop 100K 56	Jet Enter 100K 66	Jackpot 3 Million 76	Mini Playfield 100K 86
7 Red- Violet	Right Bottom Standup 17	Values Doubled 27	Space Shuttle 37	Head Right Eye 47	Right Loop 50K 57	Jet Enter 50K 67	Jackpot 2 Million 77	Mini Playfield 200K 87
8 Red- Gray	Shoot Again 18	Spin Small Wheel 28	Launch Pad 38	Head Mouth 48	Right Loop 25K 58	Jet Enter 25K 68	Jackpot 1 Million 78	Mini Playfield 300K 88

THE MACHINE Switch Matrix

White  Green

Dedicated Grounded Switches	Column Row	1 Green- Brown	2 Green- Red	3 Green- Orange	4 Green- Yellow	5 Green- Black	6 Green- Blue	7 Green- Violet	8 Green- Gray
Orange-Brown (1) Left Coin Chute	1 White- Brown	Right Flipper 11	Slam Tilt 21	Skill Shot 50K 31	Right Ramp Made 41	Spinner 51	Not Used 61	Wireform Top 71	81
Orange-Red (2) Center Coin Chute	2 White- Red	Left Flipper 12	Coin Door Closed 22	Skill Shot 75K 32	Not Used 42	Shooter 52	Not Used 62	Wireform Bottom 72	82
Orange-Black (3) Right Coin Chute	3 White- Orange	Start Button 13	Ticket Opto 23	Skill Shot 100K 33	Left Loop 43	Upper Right Jet Bumper 53	Head Left Eye 63	Enter Mini Playfield 73	83
Orange-Yellow (4) 4th Coin Chute	4 White- Yellow	Plumb Bob Tilt 14	Always Closed 24	Skill Shot 200K 34	Right Loop Top 44	Upper Left Jet Bumper 54	Head Right Eye 64	Mini Exit Left 74	84
Orange-Green (5) Normal Function Test Function Service Escape Credits	5 White- Green	Left Outlane 15	Right Trough 25	Skill Shot 25K 35	Right Loop Bottom 45	Lower Jet Bumper 55	Head Mouth 65	Mini Exit Right 75	85
Orange-Blue (6) Normal Function Test Function Volume Down	6 White- Blue	Left Flipper Lane 16	Center Trough 26	Right Top Standup 36	Under Playfield Kickback 46	Jet Bumper Sling 56	Not Used 66	Left Ramp Enter 76	86
Orange-Violet (7) Normal Function Test Function Volume Up	7 White- Violet	Right Flipper Lane 17	Left Trough 27	Right Bottom Standup 37	Enter Head 47	Left Slingshot 57	Face Position 67	Right Ramp Enter 77	87
Orange-Gray (8) Normal Function Test Function Begin Enter Test	8 White- Gray	Right Outlane 18	Left Standup 28	Outhole 38	Not Used 48	Right Slingshot 58	Not Used 68	Not Used 78	88