

*Bally*

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# REVENGE FROM MARS™

## OPERATIONS MANUAL



### MANUAL INCLUDES

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

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

## SOLENOID TABLE

| Sol No. | Solenoid Function       | Fuse | Power to Playfield | Power Wire Color | Drive Transistor | Drive to Playfield | Drive Wire Color | Solenoid Part Number or Flasher Type |
|---------|-------------------------|------|--------------------|------------------|------------------|--------------------|------------------|--------------------------------------|
| 01      | LEFT MARTIAN            | F101 | J102-1             | RED-BRN          | Q59              | J110-13            | VIO-BRN          | AE1-26-1500                          |
| 02      | RIGHT MARTIAN           | F101 | J102-1             | RED-BRN          | Q60              | J110-14            | VIO-RED          | AE1-26-1500                          |
| 03      | JET EXIT POST           | F101 | J102-1             | RED-BRN          | Q61              | J110-15            | VIO-ORG          | AE1-26-1500                          |
| 04      | RIGHT GATE              | F101 | J102-1             | RED-BRN          | Q62              | J110-16            | VIO-YEL          | A-14406                              |
| 05      | LEFT GATE               | F102 | J102-2             | RED-BLK          | Q63              | J110-17            | VIO-GRN          | A-14406                              |
| 06      | DROP TARGET DOWN        | F102 | J102-2             | RED-BLK          | Q64              | J110-18            | VIO-BLU          | SM1-26-600                           |
| 07      | DROP TARGET UP          | F102 | J102-2             | RED-BLK          | Q65              | J110-19            | VIO-BLK          | AE1-26-1200                          |
| 08      | RIGHT POPPER            | F102 | J102-2             | RED-BLK          | Q66              | J110-20            | VIO-GRY          | AE1-25-1000                          |
| 09      | TROUGH EJECT            | F103 | J102-3             | RED-ORG          | Q51              | J112-11            | BRN-BLK          | AE1-26-1500                          |
| 10      | LEFT SLINGSHOT          | F103 | J102-3             | RED-ORG          | Q52              | J112-12            | BRN-RED          | AE1-26-1200                          |
| 11      | RIGHT SLINGSHOT         | F103 | J102-3             | RED-ORG          | Q53              | J112-13            | BRN-ORG          | AE1-26-1200                          |
| 12      | LEFT JET BUMPER         | F103 | J102-3             | RED-ORG          | Q54              | J112-14            | BRN-YEL          | AE1-26-1200                          |
| 13      | RIGHT JET BUMPER        | F100 | J102-7             | RED-YEL          | Q55              | J112-15            | BRN-GRN          | AE1-26-1200                          |
| 14      | BOTTOM JET BUMPER       | F100 | J102-7             | RED-YEL          | Q56              | J112-16            | BRN-BLU          | AE1-26-1200                          |
| 15      | AUTO PLUNGER            | F100 | J102-7             | RED-YEL          | Q57              | J112-17            | BRN-VIO          | AE1-23-800                           |
| 16      | RIGHT LOCKUP            | F100 | J102-7             | RED-YEL          | Q58              | J112-18            | BRN-GRY          | AE1-23-800                           |
| 17      | CENTER ARROW FLASHER    | F109 | J102-8             | RED-WHT          | Q43              | J110-1             | BLU-BRN          | #906                                 |
| 18      | NOT USED                | F109 |                    |                  | Q44              | J110-2             | BLU-RED          |                                      |
| 19      | NOT USED                | F109 |                    |                  | Q45              | J110-3             | BLU-ORG          |                                      |
| 20      | NOT USED                | F109 |                    |                  | Q46              | J110-4             | BLU-YEL          |                                      |
| 21      | NOT USED                | F109 |                    |                  | Q47              | J110-5             | BLU-GRN          |                                      |
| 22      | RIGHT POPPER FLASHER    | F109 | J102-8             | RED-WHT          | Q48              | J110-6             | BLU-BLK          | #906                                 |
| 23      | LEFT ARCH FLASHER       | F109 | J102-8             | RED-WHT          | Q49              | J110-7             | BLU-VIO          | #89                                  |
| 24      | NOT USED                | F109 |                    |                  | Q50              | J110-8             | BLU-GRY          |                                      |
| 25      | RIGHT ARCH FLASHER      | F109 | J102-8             | RED-WHT          | Q67              | J112-9             | BLK-BRN          | #89                                  |
| 26      | LEFT MARTIAN FLASHER    | F109 | J102-8             | RED-WHT          | Q68              | J112-10            | BLK-RED          | #89                                  |
| 27      | RIGHT MARTIAN FLASHER   | F109 | J102-8             | RED-WHT          | Q69              | J112-19            | BLK-ORG          | #89                                  |
| 28      | RED HOT DOG FLASHER     | F109 | J102-8             | RED-WHT          | Q70              | J112-20            | BLK-YEL          | #906                                 |
|         | <b>Flipper Circuits</b> |      |                    |                  |                  |                    |                  |                                      |
| 33      | LOW RIGHT FLIPPER PWR   |      |                    |                  | Q35              | J112-1             | YEL-GRN          |                                      |
| 34      | LOW RIGHT FLIPPER HOLD  | F104 | J103-1             | RED-GRN          | Q36              | J112-2             | ORG-GRN          | FL1-11629                            |
| 35      | LOW LEFT FLIPPER PWR    |      |                    |                  | Q37              | J112-3             | YEL-BLU          |                                      |
| 36      | LOW LEFT FLIPPER HOLD   | F105 | J103-2             | RED-BLU          | Q38              | J112-4             | ORG-BLU          | FL1-11629                            |
| 37      | LOCK DIVERter POWER     |      |                    |                  | Q39              | J112-5             | YEL-VIO          |                                      |
| 38      | LOCK DIVERter HOLD      | F106 | J103-3             | RED-VIO          | Q40              | J112-6             | ORG-VIO          | FL1-22241                            |
| 39      | UP/DOWN RAMP POWER      |      |                    |                  | Q41              | J112-7             | YEL-GRY          |                                      |
| 40      | UP/DOWN RAMP HOLD       | F107 | J103-4             | RED-GRY          | Q42              | J112-8             | ORG-GRY          | FL1-11753                            |

# DECLARATION OF CONFORMITY

## WILLIAMS ELECTRONICS GAMES, INC.

3401 N. CALIFORNIA AVE.  
CHICAGO, IL 60618  
U.S.A.

WE, HEREBY DECLARE UNDER SOLE RESPONSIBILITY THAT  
THE MODEL: "REVENGE FROM MARS" 50270,50370,50470,50770,50970,51070,  
51170,51270, 51370,51470,51870,52070,52170,52370,57270

**TO WHICH THIS DECLARATION RELATES IS IN CONFORMITY  
WITH THE FOLLOWING EUROPEAN PRODUCT SAFETY**

**ELECTROMAGNETIC COMPATABILITY DIRECTIVE**  
(89/336/EEC AND AMENDMENTS 91/C162/08, 92/31/EEC,93/68/EEC

**ELECTRICAL EQUIPMENT DESIGNED FOR USE WITHIN  
CERTAIN VOLTAGE LIMITS DIRECTIVE**  
(73/23/EEC AND AMENDMENTS 88/C168/02, 92/C210/01,  
93/68/EEC, 94/C199/03, 95/C214/02)

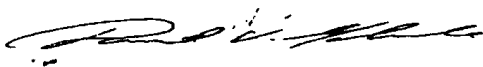
AS IS VERIFIED BY COMPLIANCE WITH THE FOLLOWING STANDARDS

EN 55014:1993 EN55104:1995 EN61000-4-2: 1995  
IEC 801-3: 1984 (EN61000-4-3 ) EN61000-4-4: 1995 EN61000-4-5: 1995  
ENV50141: 1993 (EN61000-4-6 ) EN61000-4-11: 1994 EN60335-1: 1995  
IEC 335-2-82 (DRAFT)

FREBRUARY 22, 1999

Date issued:

MANUFACTURE'S SIGNATURE



**DAN GALARDE**  
CORPORATE V.P. OF QUALITY



## **THESE ARE SOME OF THE NEW FEATURES AVAILABLE WITH PINBALL 2000:**

### **GAME PLAY**

The video display allows dynamic interactive features.

The video display allows many playfield devices to occupy the same position at different times in the game.

Video can clearly lead the player through the game, making clear what is happening each time that a target is hit. You see the result at the point of impact with the ball.

The video 'mechanisms' allow for simpler 'real' mechanisms on the playfield. The result is reduced service problems.

### **ELECTRONICS**

The backbox contains a commercial motherboard, housed in a PC style case, and a monitor. The system will become more powerful as new motherboards are introduced.

The Power Driver board is located in the cabinet and is connected to the PC via a standard parallel printer cable. A laptop or a service computer can use this connection for powerful troubleshooting.

The PINBALL 2000 Power Driver board is secured with two screws and has 17 uniquely keyed connectors allowing for easy replacement. The WPC-95 Power Driver board, on the other hand, was secured with nine screws and had 39 connectors.

Each fuse has its own LED indicator.

Blown fuses and burnt out bulbs are shown by built in diagnostics on the video screen.

A PC connector at the coin door allows for advanced diagnostics, (a laptop computer can become a portable test fixture), data transfer and software updates.

The operator may add a low cost modem to the PC for remote data retrieval, an Internet connection and software updates. A revenue sharing system could be implemented on this platform.

### **SOFTWARE UPDATES**

There are no EPROMs in the system. Software updates are done using a PC connected to the front door or via a modem and phone line.

There will be a chip based updated method available for a low-tech customer that is similar to updating a video game hard drive program.

All software resides in the backbox section. The system has been designed such that the software can be updated without uncrating the backbox.

### **CABINET AND BACKBOX FEATURES**

The attendant can gain access to playfield through a key-released front molding. Playfield glass may be removed by location attendant for minor problems) such as trapped balls. Playfield remains locked by passive latch built into coin door.

Computer Case is an easy pull-out drawer in the backbox. This allows for easy access for troubleshooting and service. Entire CPU section may be swapped out in 60 seconds.

Backbox locks provides higher security than previous design and secures CPU case for transit.

### ***CABINET AND BACKBOX FEATURES CONTINUED...***

Provision available for CPU case padlock in backbox.

Backglass stores easily over playfield glass and provides reflected image while servicing.

The playfield is at proper playing angle with all leg levelers in their lowest position.

The wiring from the backbox to the cabinet is only a few cables.

Main cable from the cabinet mounted driver board is significantly reduced in length for greater reliability and lower emissions and interference.

The cover for the Power Driver board is hinged to ensure that it is put back in its protective position after service is performed.

DCS II sound system delivers stereo sound directly to the player to enhance game excitement without requiring a high volume level.

### ***CONVERTIBILITY***

**Operators are able to use the convertibility to rotate their pinball games by moving playfield and a PC board instead of the entire machine. This is possible because of the ease of conversion and the way the devices on the bottom of the playfield are protected by the underside runners.**

The playfield has unique runners protecting the parts on the underside of the playfield. These runners provide the following features:

Installation and removal of the playfield is an easy process requiring little physical strength. This ease is enhanced due to the main cable's attachment to the cabinet instead of the playfield.

The devices on the bottom of the playfield are naturally protected in the shipment of these kits.

The playfield may be handled and stored outside of the cabinet without fear of damage to the devices attached to the underside.

# REVENGE FROM MARS™



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

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# SECTION ONE

## GAME OPERATION AND TEST INFORMATION

### ROM SUMMARY

| IC    | TYPE | BOARD                   | LOCATION | PART NUMBER   |
|-------|------|-------------------------|----------|---------------|
| Image | ROM  | Prism ROM Daughter Card | U100     | 5341-16205-00 |
| Image | ROM  | Prism ROM Daughter Card | U101     | 5341-16206-00 |
| Image | ROM  | Prism ROM Daughter Card | U102     | 5341-16207-00 |
| Image | ROM  | Prism ROM Daughter Card | U103     | 5341-16208-00 |
| Image | ROM  | Prism ROM Daughter Card | U104     | 5341-16209-00 |
| Image | ROM  | Prism ROM Daughter Card | U105     | 5341-16210-00 |
| Image | ROM  | Prism ROM Daughter Card | U106     | 5341-16211-00 |
| Image | ROM  | Prism ROM Daughter Card | U107     | 5341-16212-00 |
| Sound | ROM  | Prism ROM Daughter Card | U109     | 5341-16213-00 |
| Sound | ROM  | Prism ROM Daughter Card | U110     | 5341-16214-00 |

# PINBALL GAME ASSEMBLY INSTRUCTIONS

It takes two people to assemble a PINBALL 2000 game.

Do not plug in or switch on power to the cabinet until assembly is complete!

It is not necessary to open the computer case to assemble a PINBALL 2000 game. However, should you ever find it necessary to open the case, be sure to replace the computer case cover. Failure to do so will void FCC, UL and CE compliance, and may cause damage to the PC boards in the case. The foam lining of the cover holds the PC boards securely in place and protects them from vibrations that normally occur in a pinball game.

**Power:** Domestic 120V @ 60Hz  
Foreign 230V @ 50Hz  
Japan 100V @ 50Hz  
**Temp:** 32°F to 100° F, (0°C to 38°C)  
**Humidity:** Not to exceed 95% relative.

**Dimensions:** Width: 24" approx.  
Length: 48" approx.  
Height: 73" approx.  
**Weight:** Backbox: 130 LB approx.  
Cabinet: 230 LB approx.

1. Remove all cartons, parts, and other items from the shipping containers and set them aside.
2. The leg levelers, nut, and leg bolts are among the parts in the cash box. Install a leg leveler and nut on each of the front and rear legs. Place the cabinet on a support. Using two leg bolts in each leg attach the rear legs to the cabinet. Next, using two leg bolts in each leg, attach the front legs to the cabinet. See Figure 1.
3. Once the legs are securely attached, remove the support from the cabinet. Adjust the leg levelers so that the cabinet does not wobble.

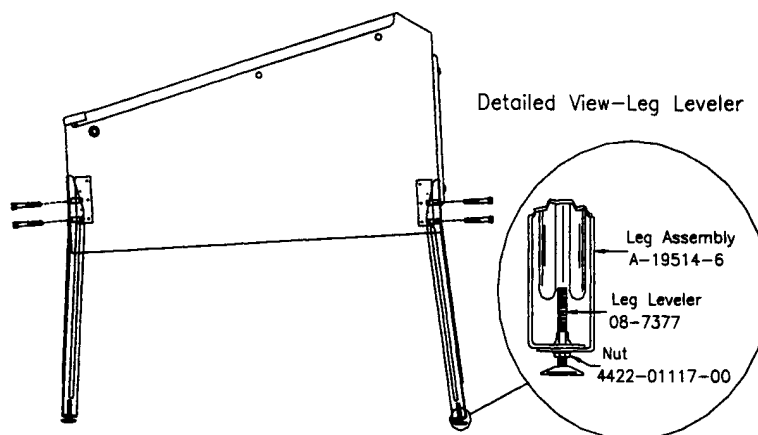


Figure 1

4. Remove the playfield from the cabinet before trying to attach the backbox. To do this, unlock and open the coin door. Pull the yellow lever, (located to the left of the coin door), to the right. The front molding pops up. Lift the molding from the cabinet. Slide the playfield glass down and lift it off of the cabinet. See Figure 2.

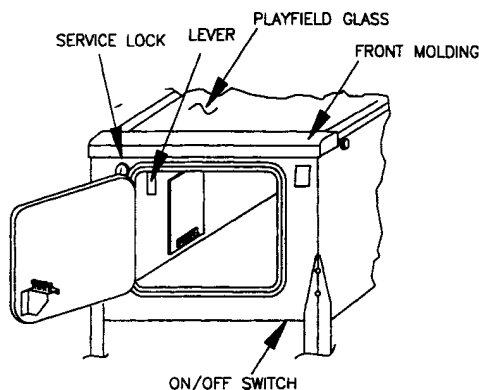
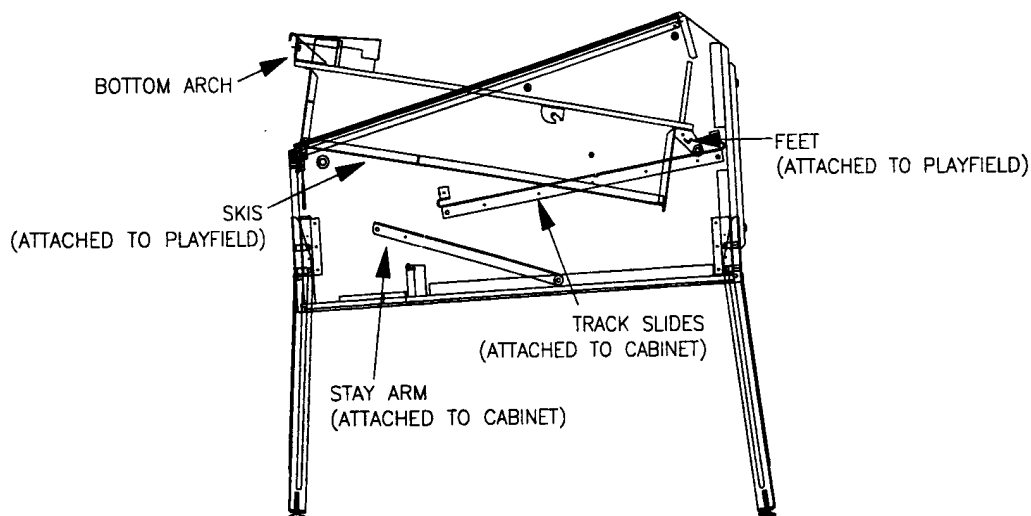


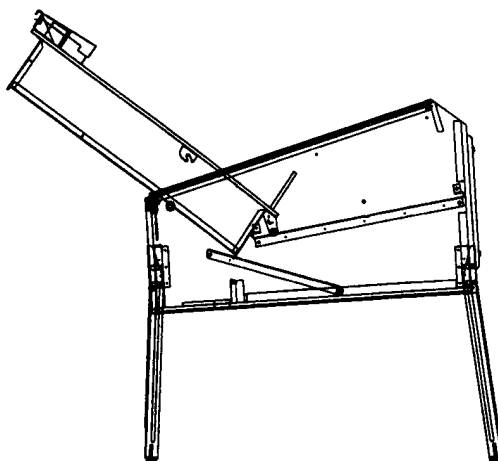
Figure 2

5. Lift the playfield by the support bracket under the bottom arch. Rest the playfield on the top of the cabinet as shown in Figure 3. Close the coin door.

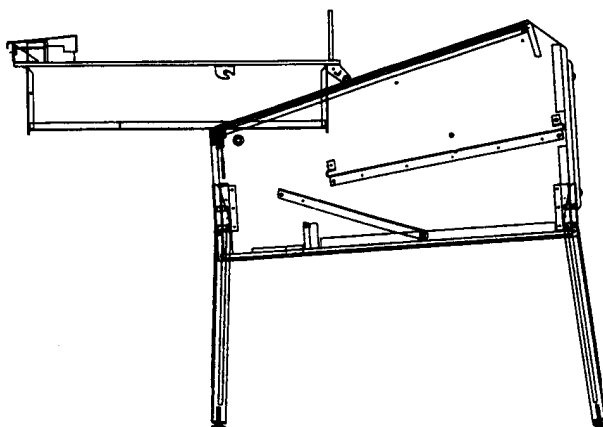


**Figure 3**

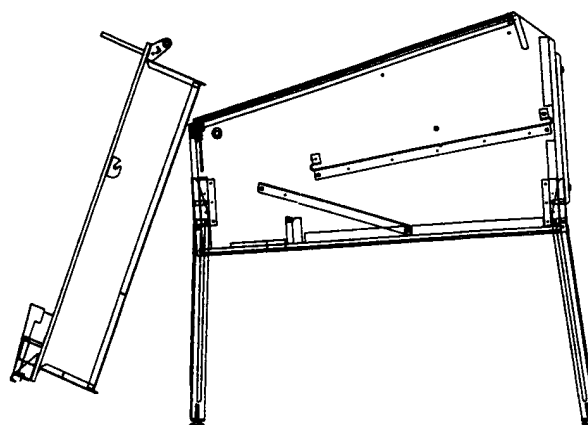
6. Firmly grasp the playfield on the sides and slide it forward (toward you) along the bottom track slide brackets. Do not unplug the cables on the bracket attached to the back of the playfield. Rotate the front of the playfield down and set it on the floor as shown in Figures 4, 5, and 6.



**Figure 4**

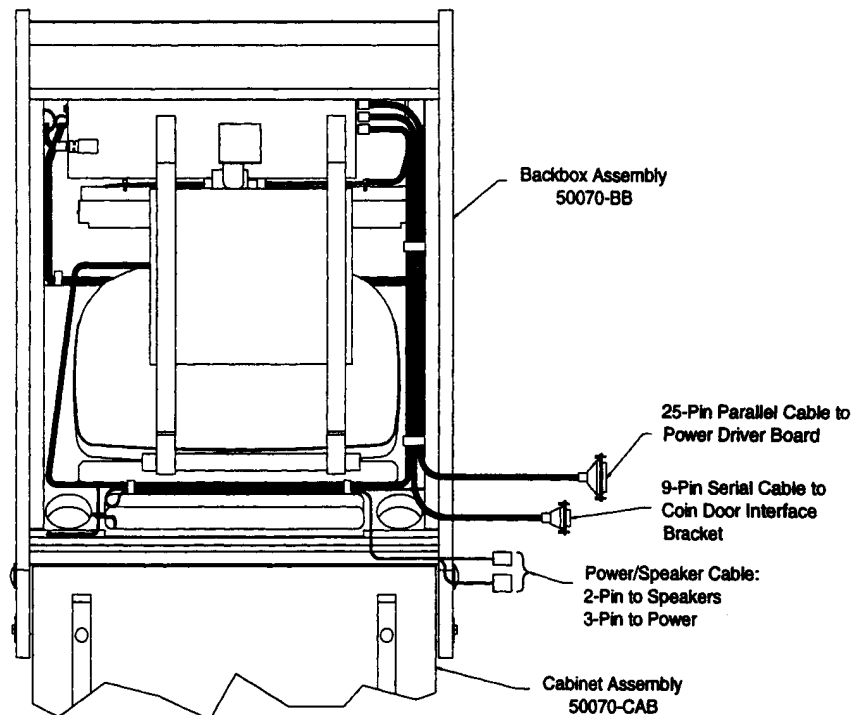


**Figure 5**



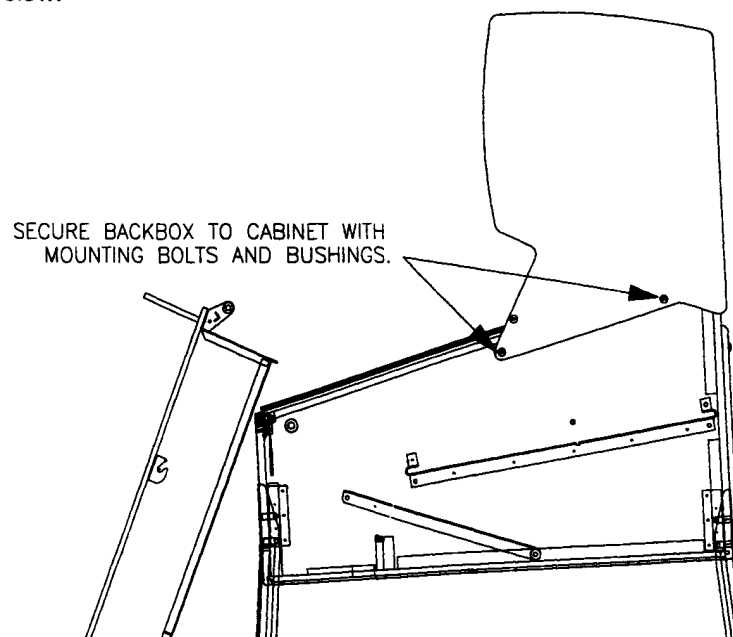
**Figure 6**

7. Next prepare the backbox. Locate the four mounting bolts and bushings among the parts in the cash box and set them aside. Cut the tie-wrap that holds the 9-pin serial cable, the 25-pin parallel cable and the power/speaker cable to the wood shipping brace. The shipping brace is held in place by two screws located on the left and right sides of the backbox. Remove the screws and shipping brace from the backbox.
8. Stand the backbox upright. Unlock and remove the rear door. Pull the three cables out through the back door opening and let them hang down the rear of the backbox. See Figure 7.



**Figure 7**

9. With the help of another person, carefully lift the backbox and set it on the cabinet.
10. Line up the four mounting holes in the cabinet with the mounting holes in the backbox. Place a bushing in each of the mounting holes in the cabinet. Fasten the two assemblies together by inserting a bolt through the backbox and into the cabinet in each of the four mounting holes. See Figure 8 below.



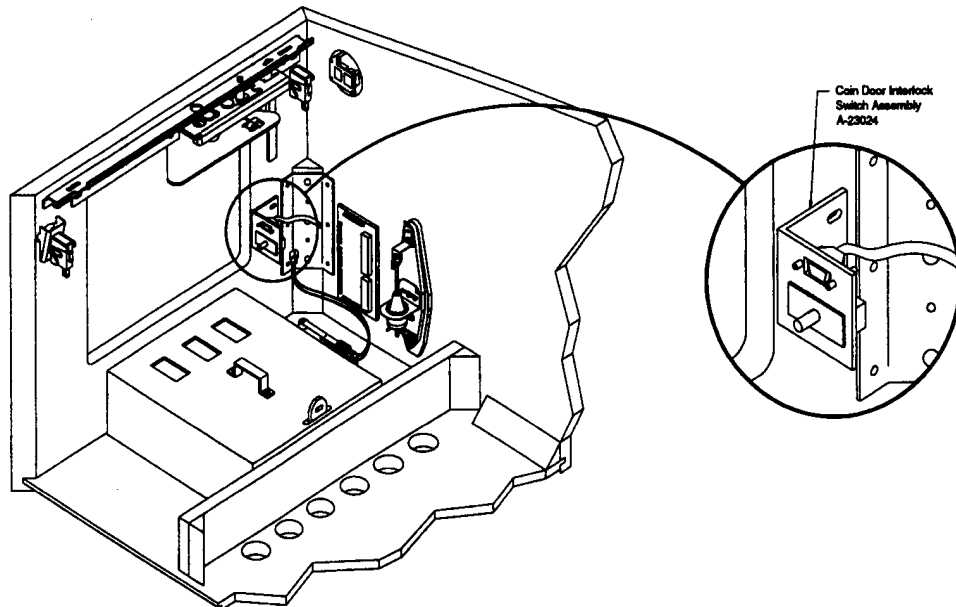
**Figure 8**



**CAUTION**  
**FAILURE TO INSTALL the backbox mounting hardware properly can cause personal injury.**

11. Slide the three cables back inside the backbox and let them hang down inside the cabinet.
12. Next, connect the cables. *Do not force cables onto connectors. Cables should plug in easily.* The three cables coming from the backbox and going to the cabinet are the 9-pin serial cable, the 25-pin parallel cable and the power/speaker cable. There is one cable from the cabinet that goes to the backbox, it is the ground strap. See Figure 8, on the previous page.

Plug the 9-pin serial cable into the bracket near the coin door and screw it securely in place (see Figure 9 below). Plug the 25-pin parallel cable into the Power Driver board at J100 and screw it securely in place. The power/speaker cable has two connectors, a 2-pin connector for the speakers and a 3-pin connector for power. Plug the speaker cable connector into the 2-pin connector near the speakers, and plug the power cable connector into the 3-pin isolation tap from the transformer, which is also located near the speakers. Be sure to match the wire colors on the speaker and power cables.



**Figure 9**

The last cable to attach is the ground strap. Remove the four screws holding the backbox rear door. Unlock and remove the rear door. The ground strap is located in the rear of the cabinet. Reach through the rectangle hole and pull the ground strap up. Remove the wing nut from the ring lug located to the left of the rectangle hole. Slip the ground strap loop over the ring lug and secure it in place with the wing nut. Replace and lock the backbox rear door. Replacing the screws is optional.

13. Open the coin door. Carefully, lift the playfield from the front and tip the back of it onto the slides. Slide it back into the cabinet. Be sure that the cables at the back of the playfield are not kinked.
14. Place a level or an inclinometer on the playfield surface. Adjust the leg levelers for proper playfield level (side-to-side).

**NOTE:** This measurement must be made **ON the playfield, not the cabinet or the playfield cover glass.** Tighten the nut on each leg leveler shaft to maintain this setting.

15. The TRU-PITCH™ level is located on the right shooter rail. This allows the playfield pitch angle to be properly adjusted **WITHOUT REMOVING THE GLASS**. The first line (closest to the front of the game) on the level is approximately 6 degrees. Every line thereafter is approximately another 1/2 degree of pitch. The recommended pitch is 6-1/2 degrees. The NOSE of the bubble should be between the first and second line on the level (see diagram below).

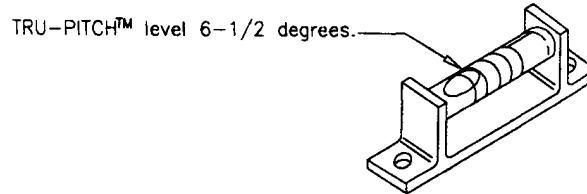


Figure 10

### IMPORTANT!

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

16. Be sure the **required number** of balls is installed.
17. Replace the playfield glass. Be sure that the PINBALL 2000 logo is in the lower left corner and that the 'smiley' faces are visible. See Figure 11 below. Snap the front molding securely into place. Close and lock the coin door.

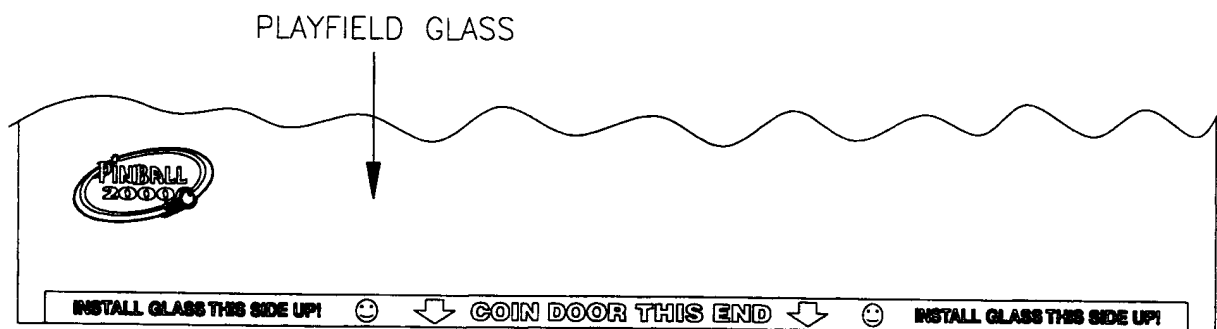


Figure 11

18. Plug the line cord into the game cabinet. Match the prongs on the plug with the holes in the receptacle, and push the line cord securely into place. See Figure 12.

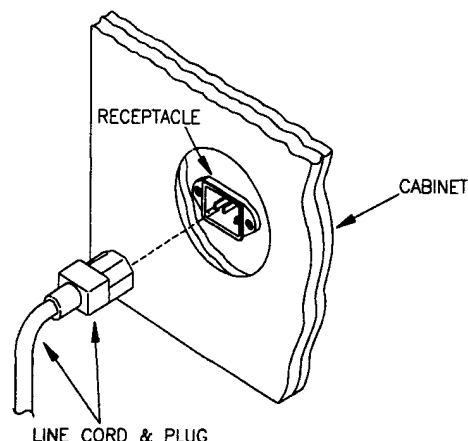
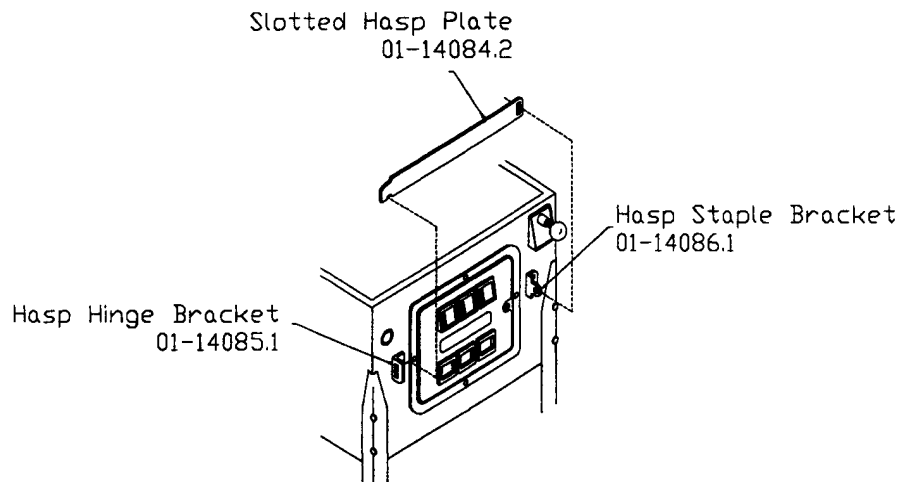


Figure 12

19. Move the game into the desired location. Adjust the leg levelers so that the playfield pitch is the recommended 6-1/2 degrees. This places the game in a FIXED position.
20. If a padlock is desired, install the security bar as shown below in Figure 13.



**Figure 13**

21. Plug the game into a properly grounded outlet.



**CAUTION**

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

22. **POWERING UP.** With the coin door closed, plug the game in and switch it on. In normal operation the game performs Start-up Tests. Once the Start-up tests have been successfully completed, the game enters the Attract mode.
23. **IMPORTANT:** Fill out and return the registration card.

## RAISING THE PLAYFIELD

### CAUTION

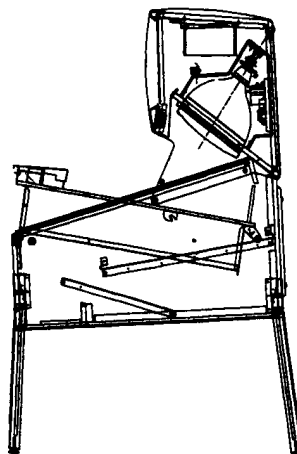
This game uses ski assemblies to raise and lower the playfield. Be sure the back of the playfield skis slide along the cabinet tracks until the feet hook into the loop at the end of the track.

#### Before Raising the Playfield:

Be sure there are no balls present in any of the ball-holding playfield devices (i.e. poppers). Raising the playfield with balls present in these locations may cause them to come loose and damage the playfield. Use the "Empty Balls Test" to remove all of the balls from these locations.

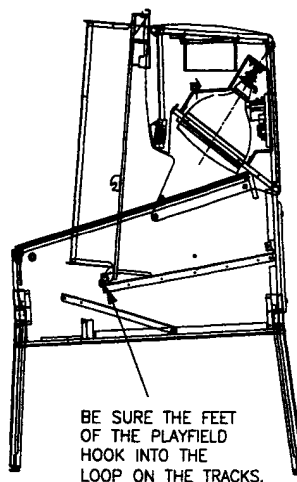
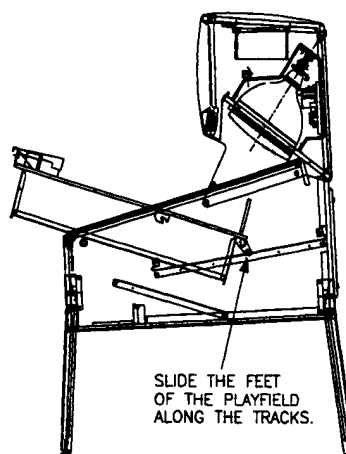
#### To Raise the Playfield:

1. Open the coin door. Remove the front molding and the playfield glass. Lift the playfield by the metal bracket under the bottom arch. Rest it on the top of the cabinet.
2. Close the coin door. Grasp the playfield on the sides and pull it toward you along the track slides. Rotate the front of the playfield up and back toward the backbox.



#### To Lower the Playfield

1. Rotate the front of the playfield down and push it back, away from you, along the track slides. Rest it on top of the cabinet. Open the coin door.
2. Grasp the playfield by the metal bracket under the bottom arch and lower it back into the cabinet. Replace the playfield glass and the front molding. Close and lock the coin door.



## 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 push-button to the left of the coin door on the cabinet exterior. Press the Start button to begin a game, or during the diagnostic mode, to ask for HELP.

### Coin Door Buttons

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

#### NORMAL FUNCTION

The SERVICE CREDITS button puts credits on the games that are not included in any of the game audits.

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

The VOLUME DOWN (-) button lowers the sound level of the game. Press and hold the button until the desired level is reached. See the Adjustment menu to turn the sound down all the way.

The \*\*BEGIN TEST button starts the Menu System operation and changes the coin door buttons from Normal Function to Test Function.

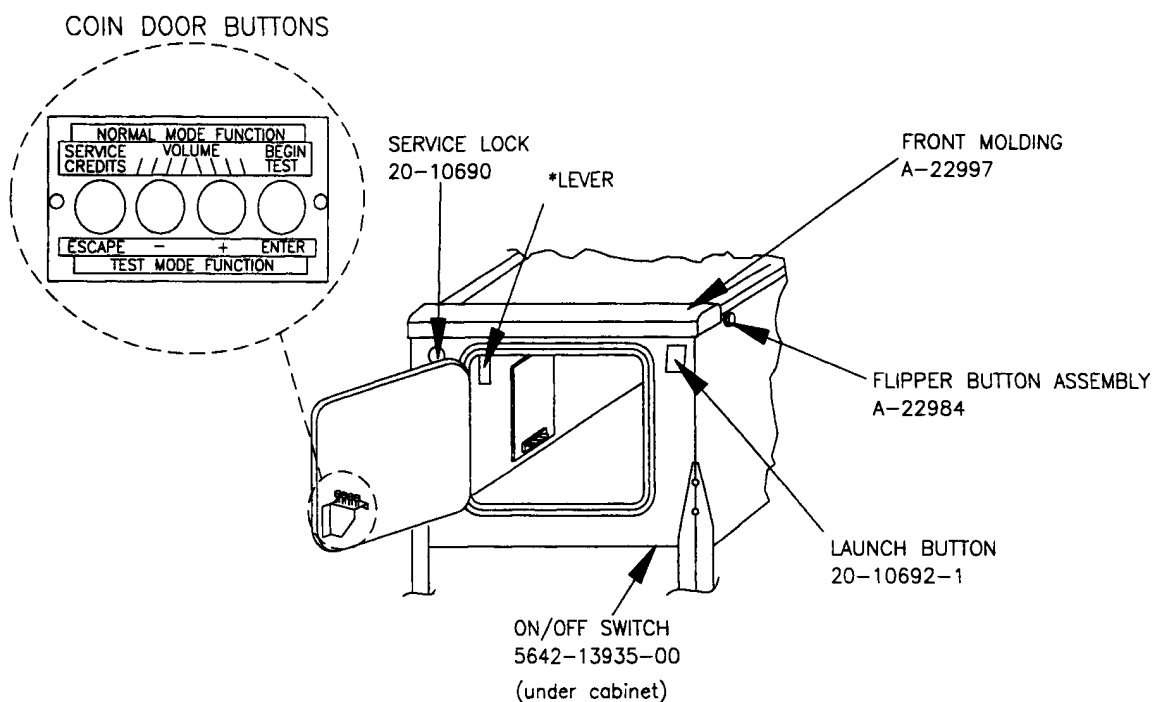
#### TEST FUNCTION

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

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

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

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



The START BUTTON (p/n 20-9663-16) is not shown on this drawing.  
It is located below the service lock.

\*The LEVER is part of the LOCK BRACKET ASSEMBLY (p/n A-22996).

\*\* To reset the High Scores, press and hold the BEGIN TEST button.

## GAME OPERATION

### CAUTION

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

**POWERING UP.** With the coin door closed, plug the game in, and switch it on. The game performs Start-up Tests. A test pattern and 'PLEASE WAIT' appears on the screen. The screen changes and 'TESTING' appears on the screen. Once the Start-up tests have been successfully completed the game goes into the Attract mode.

*Note: After the game has been on location for a time, the Start-up tests may contain messages concerning game problems.*

**ATTRACT MODE.** During the Attract mode, the screen shows a series of messages informing the player of the recent highest scores.

**CREDIT POSTING.** Insert coin(s). The screen shows the number of credits purchased.

**STARTING A GAME.** Press the Start button. A ball is ejected into the shooter lane. Press the Ball Launch button on the cabinet to send the ball onto the playfield and begin game play. If credits are posted, additional players may enter the game by pressing the Start button once for each player, before the end of play on the first ball.

**TILTS.** Actuating the cabinet slam tilt switch inside the cabinet ends the current game and proceeds to the Game-over mode. With the third closure of the plumb bob tilt switch, the player loses the remaining play of that ball, but can complete the game.

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

**GAME-OVER MODE.** The **Game-over** screen shows the high scores and the game proceeds to the Attract Mode.

## MENU SYSTEM OPERATION

The System Menu allows you to choose from several menus, which in turn, lead to other menus to choose from. To access the System Menu, open the coin door and press the Enter button. The System Menu appears on the screen. Press either the Up or the Down buttons to move the cursor up or down the screen. Notice how the menu options are highlighted in order. A menu option must be highlighted for it to be selected. To open a System Menu item, (Diagnostics menu, Adjustments menu etc.), press the Enter button when that menu is highlighted. To return to the System Menu (from the Diagnostics menu, Adjustments menu, etc.) press the Escape button at any time. The following outline shows the System Menu and the next lower level of menus available from the System Menu.

### SYSTEM MENU

#### DIAGNOSTICS

|                  |
|------------------|
| Switch Edges     |
| Single Switches  |
| DIP Switch       |
| Solenoid Test    |
| Single Lamp Test |
| Lamp Row/Column  |
| All Lamps        |
| Video Tests      |
| Fuse Check       |

#### ADJUSTMENTS

|                     |
|---------------------|
| Audio Adjustments   |
| System Adjustments  |
| Feature Adjustments |
| Game Pricing        |
| High Scores         |
| Communication       |

#### BOOKKEEPING

|                 |
|-----------------|
| Main Audits     |
| Earning Audits  |
| Standard Audits |
| Feature Audits  |
| Histograms      |
| Timestamps      |
| Earnings Charts |

#### UTILITIES

|                     |
|---------------------|
| System Information  |
| Show Shell Window   |
| Set Location I.D.   |
| Update Game Code    |
| Clear Audits        |
| Clear Coins         |
| Reset High Scores   |
| Set Clock           |
| Factory Adjustments |
| Factory Reset       |
| Install Presets     |
| Clear Credits       |

#### PRINTOUTS

|                   |
|-------------------|
| Print Audits      |
| Print Adjustments |
| Print Everything  |

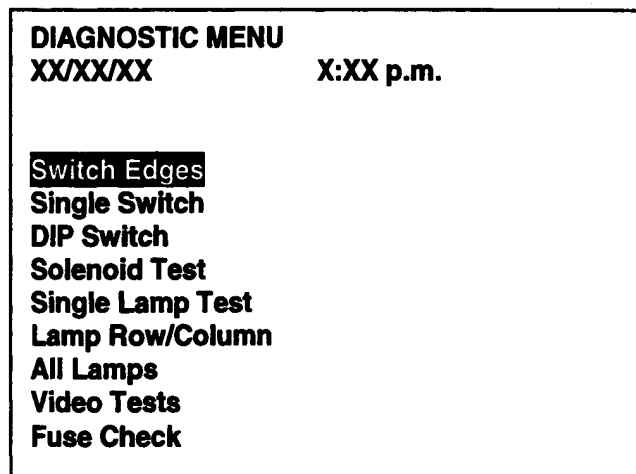
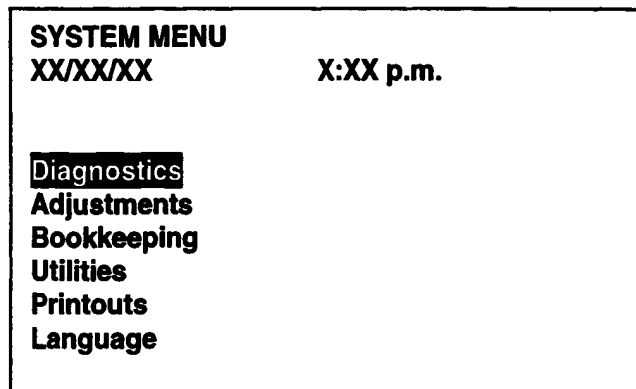
#### LANGUAGE

|          |
|----------|
| English  |
| Deutsch  |
| Francais |
| Espanol  |

## DIAGNOSTICS

Open the coin door, press the Enter button and the System Menu appears on the screen. Use the Up and Down buttons to move the cursor and select the Diagnostic menu. Press the Enter button to open the menu when it is selected. Once the Diagnostic menu is open, use the Up and Down buttons to move the cursor and select a test. Press the Enter button to enable the test. Press the Escape button to return to the Diagnostic menu. Press the Escape button a second time to return to the System Menu.

*In order to operate the tests that use the +50V or +20V circuits, pull the interlock switch button out. The interlock switch is located on a bracket in the coin door opening.*



### SWITCH EDGES TEST

Press each of the switches one at a time. The name and number of the switch is on the screen. If a switch other than the one pressed, or no switch at all is indicated, the system has detected a problem with the switch circuit. To return the Diagnostic menu, press the Escape button.

### SINGLE SWITCHES TEST

This test isolates a single switch and shows its state in the display. A mechanical switch is 'made' when the display reads closed. An opto switch is 'made' (opto beam broken) when the display reads open. Use the Up or Down buttons to select the switch to be tested. To return the Diagnostic menu, press the Escape button.

### DIP SWITCH TEST

This test is used to show the positions of the DIP Switches. To return to the Diagnostic menu, press the Escape button.

## **SOLENOID TEST**

The Solenoid test has three modes -- Repeat, Stop, and Run. Only one solenoid should pulse at a time. The system has detected a problem if more than one solenoid pulses, a solenoid comes on and stays on, or no solenoids pulse during the Repeat and Run modes.

**Repeat:** The Repeat mode activates an individual solenoid. Press the Enter button to start this test. The name of the first solenoid shows in the display and the corresponding coil pulses. Press the Up or Down buttons to cycle through the solenoids, one at a time. The same solenoid pulses until you press the Up or Down buttons to advance to the next one. To return the Test menu, press the Escape button. To advance to the next test mode, press the Enter button.

**Stop:** The Stop mode halts the Solenoid test. No solenoids should be active. To return the Test menu, press the Escape button. To advance to the next test mode, press the Enter button.

**Run:** The Run mode cycles through the solenoids automatically. The display shows the name and number of the solenoid currently being pulsed. To return the Test menu, press the Escape button. To return to the Repeat mode, press the Enter button.

## **SINGLE LAMP TEST**

The Single Lamp test checks each lamp circuit individually. Press the Up or Down buttons to scroll through this test. A lamp should light for each name and number that is displayed. Any other results indicate the system has detected a problem. To return to the Diagnostic menu, press the Escape button.

## **LAMP ROW/COLUMN**

This test allows individual rows and columns in the lamp matrix to be operated. This is useful for troubleshooting wiring and driver problems.

Press the Up and Down buttons to cycles through the different rows and columns. To return to the Diagnostic menu, press the Escape button.

## **ALL LAMPS TEST**

This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other results indicate the system has detected a problem. To return to the Diagnostic menu, press the Escape button.

## **VIDEO TEST**

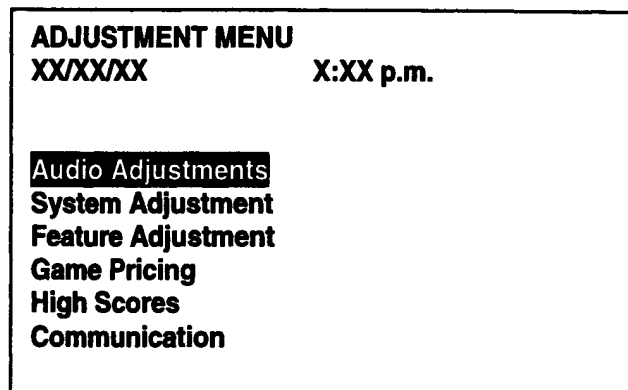
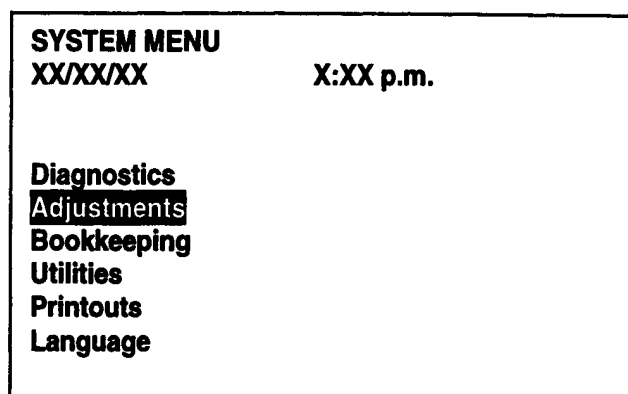
## **FUSE CHECK**

## ADJUSTMENTS

Open the coin door, press the Enter button and the System Menu appears on the screen. Use the Up and Down buttons to move the cursor and select the Adjustment menu. Press the Enter button to open the menu when it is selected. Once the Adjustment menu is open, use the Up and Down buttons to move the cursor and select a sub-menu. Press the Enter button to enable the sub-menu and view the next level of functions.

Use the Up and Down buttons to move the cursor and select a sub-menu function. Press the Enter button to enable that function. Use the Up and Down buttons to change the value. Press the Enter button to lock in the new value, or press the Escape button to retain the original value and return to the sub-menu.

Press the Escape button to return to the sub-menu. Press the Escape button a second time to return to the Adjustment menu and a third time to return to the System Menu.



## AUDIO ADJUSTMENTS

### **Current Volume**

This adjustment shows the current volume level of the game.

Settings:

Factory Setting: XX

### **Minimum Volume Override**

The volume can be turned off.

Settings: Yes or No

Factory Setting: No

### **Volume Interlock**

Settings: Yes or No

Factory Setting: No

## **SYSTEM ADJUSTMENTS**

### **Extra Ball**

This adjustment leads to a menu of adjustments for the Extra Ball feature.

### **Match**

This adjustment lead to a menu of adjustments for the Match feature.

### **Replay**

This adjustment leads to a menu of adjustments for the Replay feature.

### **Power Saver**

This adjustment leads to a menu of adjustments for the Power Saver feature.

### **Clock/Format**

This adjustment leads to a menu of adjustments for the Clock feature.

### **Balls Per Game**

A "game" is defined by specifying the number of balls to be played.

Settings: 1 to 10

Factory Setting: 3

### **Game Restart**

When you press the Start button during or after the 2nd ball, the game in progress ends and a new game begins. This adjustment has three settings to determine how to handle this.

Settings: **Never** – Don't allow a new game start until the current game is over.

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

**Instantly** - Restart as soon as the Start button is pressed. When you press the Start button during game over, or during the 1st ball (to add a player), it is always handled instantly.

Factory Setting: Slow

### **Tournament Play**

Equalize random game features and global score values during multi-player games.

Settings: Yes or No

Factory Default: No

### **Maximum Tickets per Player**

The amount of tickets each player can earn.

Settings: 00 to 100.

Factory Default: 25

### **Special Award**

The award a player receives when he/she earns a Special.

Settings:

Factory Setting: Credit

### **Slam Tilt Penalty**

Whether of not the player is penalized for causing a Slam Tilt.

Settings: Yes or No

Factory Setting: No

### **Tilt Warning**

The number of total actuation's of the plumb bob that can occur before the game is "tilted".

Settings: 1 to 10

Factory Setting: 3

## **System Adjustments Continued...**

### **Allow Chase Ball**

The Chase Ball feature will attempt to keep a game operational in the event that a ball becomes stuck on the playfield. After a number of unsuccessful ball searches, the game software will end the player's current ball, give a bonus award, then serve a new ball (or end the game if that was the last ball in the player's game). This ball 'chases' the stuck ball on the playfield and will hopefully knock it loose. Setting this adjustment to NO will revert to the previous behavior of searching endlessly until the stuck ball becomes freed, or the machine's power is turned off and back on.

Settings: Yes or No

Factory Setting: Yes

### **Midas Enabled**

This enables the second serial port to work with the Midas Security Unit.

Settings: Yes or No

Factory Setting: No

## **FEATURE ADJUSTMENTS**

### **Bonus Wave Count**

Settings:

Factory Setting: 5

### **Scene Select Timer**

Settings:

Factory Settings: 10

### **Paris Saucer Hits Required**

Settings:

Factory Settings: 10

### **Martian Attack Timer**

Settings:

Factory Setting: 30

### **Capture Multiball Difficulty**

Settings:

Factory Setting: Medium

### **Missile Extra Ball 1**

Settings:

Factory Setting: 20

### **Missile Extra Ball 2**

Settings:

Factory Settings: 70

## **Feature Adjustments Continued...**

### **Disable Martians**

Settings: Yes or No

Factory Setting: No

### **Disable Left Gate**

Settings: Yes or No

Factory Setting: No

### **Disable Right Gate**

Settings: Yes or No

Factory Setting: No

### **Disable Lock Diverter**

Setting: Yes or No

Factory Setting: No

### **Disable Up/Down Ramp**

Settings: Yes or No

Factory Settings: Yes or No

### **Disable Jet Exit Post**

Settings: Yes or No

Factory Settings: No

### **Disable Right Ramp Drop Target**

Settings: Yes or No

Factory Setting: No

### **Timed Plunger**

This adjustment specifies the number of seconds before automatically plunging a ball onto the playfield that can otherwise be plunged by the player via the launch button.

Settings: Off, 29-90: The number of seconds before automatically plunging the ball.

Factory Setting: Off

## **GAME PRICING**

### **Free Play**

This adjustment determines whether or not the player can play the game for free.

Settings: Yes or No

Factory Setting: No

### **Maximum Credits**

This is the maximum amount of credits that can be bought at one time.

Settings:

Factory Setting: 10

### **Hide Coin Audits**

This determines if the coin audits are visible to service personnel.

Settings: Yes or No

Factory Setting: No

## **HIGH SCORES**

### **Highest Scores**

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

Settings: Yes or No

Factory Setting: Yes

### **High Score To Date Award**

This is the award given for achieving the High Score to Date or the Champion High Score to Date.

Settings: Credit or Ticket.

Factory Setting: Credit

### **Champion Credit**

The number of credits or tickets awarded for a Grand Champion Score.

Settings: 0 to 10

Factory Settings: 1

### **H.S.T.D. 1 Credits**

### **H.S.T.D. 2 Credits**

### **H.S.T.D. 3 Credits**

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

The number of credits or tickets awarded whenever a player exceeds the four highest scores.

Settings: 00 to 10

Factory Setting: 1

### **H.S.T.D. Reset Every**

The number of games to be played before an automatic reset of the displayed Highest Score occurs. The operator selects the values provided at reset in the Back-up High Scores.

Settings: OFF (disabled), 250 to 20,000.

Factory Settings: 2000 Games

### **Default Champion**

The Back-up Grand Champion Score.

Settings: 00 to 200,000,000

Factory Settings: 50,000,00

|                           |                   |
|---------------------------|-------------------|
| <b>Default H.S.T.D. 1</b> | <b>40,000,000</b> |
|---------------------------|-------------------|

|                           |                   |
|---------------------------|-------------------|
| <b>Default H.S.T.D. 2</b> | <b>30,000,000</b> |
|---------------------------|-------------------|

|                           |                   |
|---------------------------|-------------------|
| <b>Default H.S.T.D. 3</b> | <b>20,000,000</b> |
|---------------------------|-------------------|

|                           |                   |
|---------------------------|-------------------|
| <b>Default H.S.T.D. 4</b> | <b>10,000,000</b> |
|---------------------------|-------------------|

The first through fourth Default High Score values. The game automatically restores this value when the "High Score Reset Every" value is reached.

Settings: 00 to 200,000,000

Factory Settings: Default H.S.T.D. 1 = 40,000,000

Default H.S.T.D. 2 = 30,000,000

Default H.S.T.D. 3 = 20,000,000

Default H.S.T.D. 4 = 10,000,000

## BOOKKEEPING

*Audits Cannot Be Set, They Can Only Be Cleared.*

Open the coin door, press the Enter button and the System Menu appears on the screen. Use the Up and Down buttons to move the cursor and select the Bookkeeping menu. Press the Enter button to open the menu when it is selected. Once the Bookkeeping menu is open, use the Up and Down buttons to move the cursor and select a sub-menu. Press the Enter button to enable the sub-menu and view the next level of functions.

Use the Up and Down buttons to move the cursor and select a sub-menu function. Press the Enter button to enable that function. Use the Up and Down buttons to reset the value to zero. Press the Enter button to lock in the zero value, or press the Escape button to retain the original value and return to the sub-menu.

Press the Escape button to return to the sub-menu. Press the Escape button a second time to return to the Bookkeeping menu and a third time to return to the System Menu.

|                    |           |
|--------------------|-----------|
| <b>SYSTEM MENU</b> |           |
| XX/XX/XX           | X:XX p.m. |
| <br>               |           |
| Diagnostics        |           |
| Adjustments        |           |
| Bookkeeping        |           |
| Utilities          |           |
| Printouts          |           |
| Language           |           |

|                         |           |
|-------------------------|-----------|
| <b>BOOKKEEPING MENU</b> |           |
| XX/XX/XX                | X:XX p.m. |
| <br>                    |           |
| Main Audits             |           |
| Earnings Audits         |           |
| Standard Audits         |           |
| Feature Audits          |           |
| Histograms              |           |
| Timestamps              |           |
| Earnings Charts         |           |

## MAIN AUDITS

No Main Audits at this time.

## EARNING AUDITS

|                        |    |               |    |
|------------------------|----|---------------|----|
| Total Earnings         | XX | Recent Slot 6 | XX |
| Recent Earnings        | XX | Recent Slot 7 | XX |
| Recent Paid Credits    | XX | Recent Slot 8 | XX |
| Total Paid Credits     | XX | Total Slot 1  | XX |
| Recent Service Credits | XX | Total Slot 2  | XX |
| Total Service Credits  | XX | Total Slot 3  | XX |
| Recent Slot 1          | XX | Total Slot 4  | XX |
| Recent Slot 2          | XX | Total Slot 5  | XX |
| Recent Slot 3          | XX | Total Slot 6  | XX |
| Recent Slot 4          | XX | Total Slot 7  | XX |
| Recent Slot 5          | XX | Total Slot 8  | XX |

### STANDARD AUDITS

|                     |        |                   |    |     |
|---------------------|--------|-------------------|----|-----|
| Games Started       | XX     | Right Drains      | XX | XX% |
| Total Plays         | XX     | Game Tilts        | XX |     |
| Average Game Time   | XX     | Slam Tilts        | XX |     |
| Balls Played        | XX     | Plumb Bob Tilts   | XX |     |
| Average Ball Time   | XX     | Ball Roll Tilts   | XX |     |
| Extra Balls         | XX XX% | 1 Player Games    | XX |     |
| Tickets Awarded     | XX XX% | 2 Player Games    | XX |     |
| Match Awards        | XX XX% | 3 Player Games    | XX |     |
| Total Replay Awards | XX XX% | 4 Player Games    | XX |     |
| Replay 1 Awards     | XX XX% | Ball Searches     | XX |     |
| Replay 2 Awards     | XX XX% | Ball Searches (5) | XX |     |
| Replay 3 Awards     | XX XX% | Chase Balls       | XX |     |
| Replay 4 Awards     | XX XX% |                   |    |     |
| Left Drains         | XX XX% |                   |    |     |

### FEATURE AUDITS

|                            |    |                             |    |
|----------------------------|----|-----------------------------|----|
| Fuel Started               | XX | Paris in Peril Started      | XX |
| Saucer Started             | XX | Big-O-Beam Started          | XX |
| Weapons Started            | XX | Mars Kneads Women Started   | XX |
| Alien Abduction            | XX | Tower Struggle Started      | XX |
| Martian Happy Hour Started | XX | Question Mark Started       | XX |
| Secret Weapon Started      | XX | Drive-in Demolition Started | XX |

### HISTOGRAMS

Score Histograms  
Ball Histograms

### TIMESTAMPS

|                     |    |
|---------------------|----|
| Total Uptime        | XX |
| Current Uptime      | XX |
| System Downtime     | XX |
| Last Game Start     | XX |
| Last Service Credit | XX |

### EARNINGS CHARTS

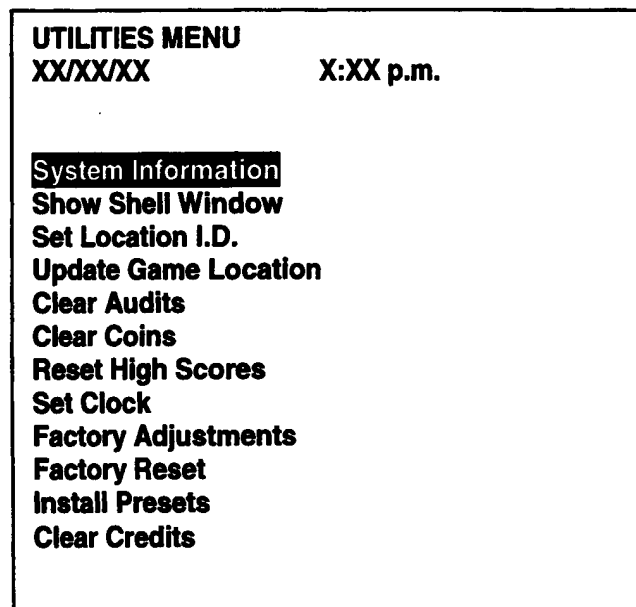
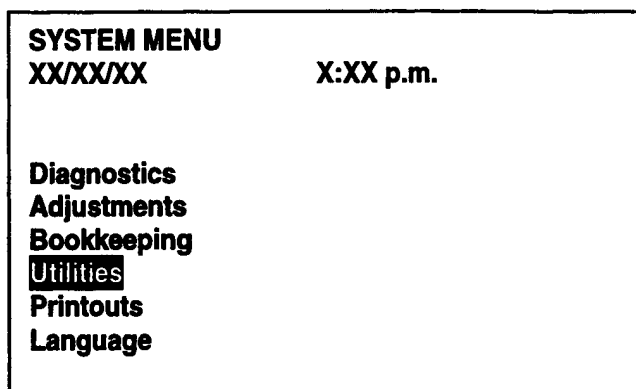
Last 24 Hours  
Last 21 Hours  
Last 21 Days  
Last 12 Hours

## UTILITIES

Open the coin door, press the Enter button and the System Menu appears on the screen. Use the Up and Down buttons to move the cursor and select the Utilities menu. Press the Enter button to open the menu when it is selected. Once the Utilities menu is open, use the Up and Down buttons to move the cursor and select a function. Press the Enter button to enable the function.

Use the Up and Down buttons to change the function setting. Press the Enter button when the desired setting is displayed and a 'countdown' screen appears. Press the Enter button during the 'countdown' to lock in the new setting. Or, wait for the 'countdown' to complete and the new setting is locked in automatically. Press the Escape button, during the 'countdown' to retain the original setting and return to the Utilities Menu.

Press the Escape button to return to the Utilities menu. Press the Escape button a second time to return to the System Menu.



## SYSTEM INFORMATION

The System Information utility displays game specifications. It cannot be cleared.

## SHOW SHELL WINDOW

This is used to show the system terminal window. It is for diagnostic use.

## **SET LOCATION I.D.**

This utility allows the operator to show the game's location on printouts. Press the Enter button to open the utility. Use the Up and Down buttons to move the cursor and select letters. Press the Enter button to lock in desired letters.

## **UPDATE GAME CODE CODE (You will typically want to run the latest update).**

Use this menu to enable or disable the update game code (stored in the PRISM board FLASH memory).

### **Enable Updated Code**

If the update game code is enabled, the system will run the last version of update game code installed (REFERENCE SOFTWARE UPDATES IN NEW FEATURES OF PINBALL 2000).

### **Disabled Updated Code**

If the update game code is disabled, the system will run the version of game code located in the original PRISM board ROMs.

## **WARNING TO THE OPERATOR.**

In early releases of the Revenge from Mars game code ROMs, DO NOT perform the Disabled Updated Code. Doing so will cause your game to run in Free Only Mode and the UPDATE GAME CODE utility menu will not allow the updated game code to be enabled.

If you accidentally disable the update game code, do one of the following:

- 1) Plug a keyboard into the keyboard port (located near the computer case in the backbox) or,
- 2) Plug a computer terminal into the COM 1 port (located near the coin door).

Then, at the command (%) prompt type the following:

% fupdate enable

to re-enable the Updated Game Code.

Note: This operation takes about 15 seconds to complete.

## **CLEAR AUDITS**

Press the Enter button to clear the all of the audits.

## **CLEAR COINS**

Press the Enter button to clear the Earnings Audits.

## **RESET HIGH SCORES**

Press the Enter button to clear the High Score to Date Table.

## **SET CLOCK**

Press the Enter button to activate the clock. Use the Up and Down buttons to change the time, then press the Enter button to lock in the time.

## **FACTORY ADJUSTMENT**

Press the Enter button to restore the adjustments to factory settings.

## **FACTORY RESET**

Press the Enter button to restore the adjustments to their factory setting, clear the Audits, Reset the High Score, and the Location I.D.

## **INSTALL PRESETS**

Press the Enter button to open the utility. Use the Up and Down buttons to move the cursor and select from the available Presets. When the desired Preset is selected, press the Enter button to lock it in. Press the Escape button, during the 'countdown' to retain the original setting and return to the Utilities Menu.

## **CLEAR CREDITS**

Press the Enter button to clear the game Credits.

## PRINTOUTS

Open the coin door, press the Enter button and the System Menu appears on the screen. Use the Up and Down buttons to move the cursor and select the Printouts menu. Press the Enter button to open the menu when it is selected. Once the Printouts menu is open, use the Up and Down buttons to move the cursor and select a function. Press the Enter button to enable the function.

Press the Escape button to return to the Printouts menu. Press the Escape button a second time to return to the System Menu.

|                    |           |
|--------------------|-----------|
| <b>SYSTEM MENU</b> |           |
| XX/XX/XX           | X:XX p.m. |
|                    |           |
| Diagnostics        |           |
| Adjustments        |           |
| Bookkeeping        |           |
| Utilities          |           |
| <b>Printouts</b>   |           |
| Language           |           |

|                       |           |
|-----------------------|-----------|
| <b>PRINTOUTS MENU</b> |           |
| XX/XX/XX              | X:XX p.m. |
|                       |           |
| <b>Print Audits</b>   |           |
| Print Adjustments     |           |
| Print Everything      |           |

### PRINT AUDITS

Print all System Audits.

### PRINT ADJUSTMENTS

Print a record of all System Adjustments. A \*\*\* signifies a changed adjustment.

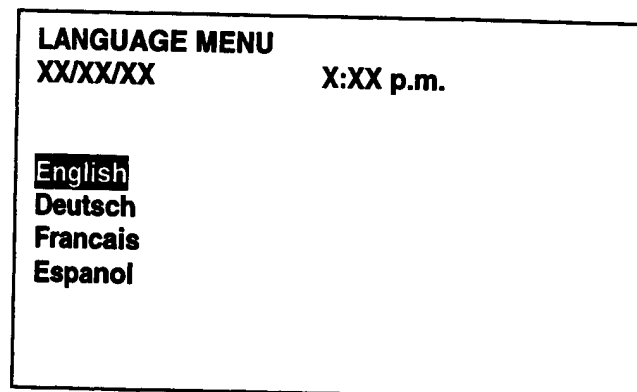
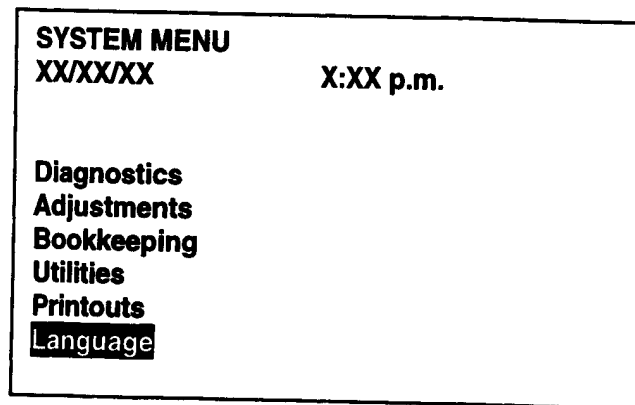
### PRINT EVERYTHING

Print both audits and adjustments.

## LANGUAGE

Open the coin door, press the Enter button and the System Menu appears on the screen. Use the Up and Down buttons to move the cursor and select the Language menu. Press the Enter button to open the menu when it is selected. Once the Language menu is open, use the Up and Down buttons to move the cursor and select a language. Press the Enter button to enable that language.

Press the Escape button to return to the Language menu. Press the Escape button a second time to return to the System Menu.



## ROUTINE MAINTENANCE INFORMATION

### ♦ CLEANING

Good game action and extended playfield life are the results of regular playfield cleaning. During each collection stop, the playfield glass should be removed and thoroughly cleaned using only a non-abrasive sprayed liquid glass cleaner and a soft cloth. The playfield should be wiped off with a clean, lint-free cloth. The game steel 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.

### ♦ GLASS PARTS

Wear protective gloves and use both hands when carrying or moving parts made of glass. Glass pieces can fly eight feet (two meters) or more from the point of impact.

---

## SERVICE INFORMATION

**Only trained personal should service the game. Always turn off power and unplug the game before attempting any service!**

### ♦ HIGH VOLTAGE CONSIDERATIONS

CRTs and their power supplies can retain energy for long periods of time after the power has been turned off. This is especially true when a defective circuit prevents a normal discharge. Connect a very well insulated ground strap to the metal chassis. Slide the free end of the strap under the CRT anode cap until contact is made. Wait two minutes for charge recovery, then discharge the anode a second time.

### ♦ RADIATION

The high voltages used in the Video Monitor Assembly are capable of generating X-rays under fault conditions. Do not substitute high voltage components or modify the circuit without factory authorization. Follow the manufacturer's directions for measuring and adjusting the CRT anode voltage.

### ♦ BATTERY

Note the position of the battery. Gently lift the contact arm to release tension. Do not bend the arm. Slide the battery out of it holder. To reinstall the battery, orient the cell near the holder and slide it under the contact arm. Do not force the battery into the holder.



### CAUTION

Danger of explosion if battery is incorrectly replaced. Replace with only the same or equivalent type recommended by manufacturer. Do not attempt to recharge these batteries. Avoid direct shorts across terminals or from terminals to ground. Dispose of used batteries according to manufacturer's instructions.

#### ♦ MEMORY

The ROM chips contain the computer operating instructions. Memory devices are very sensitive to static charges. Use grounding precautions when handling these parts.

To remove a ROM chip from its socket, carefully note its position and then lift the chip using a chip extraction tool. To reinstall a ROM, place the chip over its socket so that the notch in the chip lines up with the silkscreen on the board, and press down firmly to seat. Do not force the chip into the socket. Do not bend the pins under the chip.

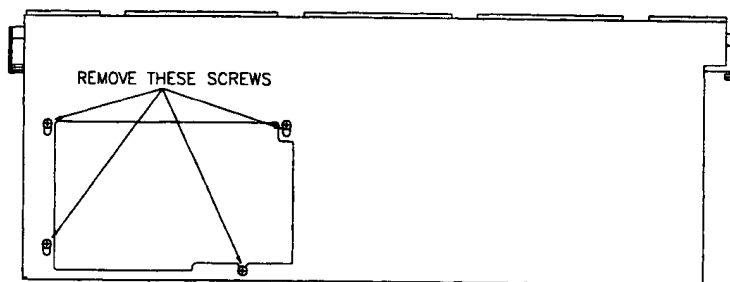


#### CAUTION

Use wrist straps, conductive mats or other methods of safely discharging static electricity. Hold all integrated circuits by their packages and not by the metal pins. Extractor and insertion tools are recommended to avoid bent or broken pins caused by excessive force.

#### ♦ POWER SUPPLY

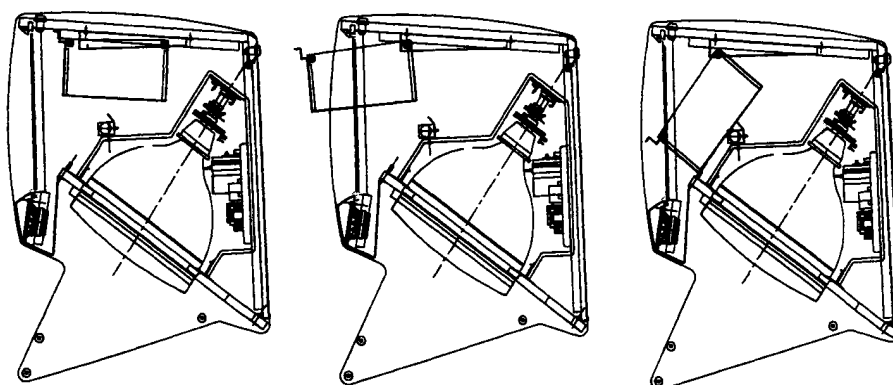
Unlock and remove the backbox rear door. Unplug the IEC cord and remove the four outer screws surrounding the power supply that secure it to the case. See the drawing below.



**Rear view of the computer case**

Unlock and remove the backglass and the translite. Unscrew the two screws on either side of the power switch. Grasp the computer case from the front and slide it toward you. Let it hang in front of the backbox, see the drawing below.

SLIDE THE COMPUTER CASE FORWARD AND REST IT ON THE MONITOR BRACKET.



**Side View of Backbox**

Open the top of the computer case. Unplug the cable harnesses leading from the power supply; one plug is going to one connector on the power amp and two plugs are going to one connector on the CPU board. Lift the power supply out of the computer case.

#### NOTICE

**Always replace the computer case cover. Failure to do so will void FCC, UL and CE compliance, and may cause damage to the PC boards in the case. The foam lining of the cover holds the PC boards securely in place and protects them from vibrations that normally occur in a pinball game.**

◆ **GLASS PARTS**

Wear protective gloves and use both hands when carrying or moving parts made of glass. Fluorescent tubes and CRTs will usually implode if broken. Glass pieces can fly eight feet (two meters) or more from the point of impact.

◆ **FLUORESCENT TUBE, STARTER, OR FLUORESCENT LIGHT ASSEMBLY**

Remove the backglass and translite. Remove both plastic lamp locks. Grasp the bulb at each end and give it a quarter turn. Gently pull the bulb straight out to remove it from its socket. The starter also requires a quarter turn for removal. Do not force the bulb or starter during reinstallation. Clean the bulb to remove fingerprints and dust, then reinstall the translite and backglass.

To remove the entire light fixture, remove the lamp locks and the bulb as described above. Disconnect the fluorescent light assembly connector from its power cable. Remove the screws that hold the assembly to the cabinet, then lift out the assembly.

**If you drop a fluorescent tube or a CRT and it breaks, it will implode! Use care in handling.**

◆ **CIRCUIT PROTECTION**

To avoid equipment damage, any replacement fuse must match the original in fuse type, voltage rating, and current rating. Do not use fuses with different time delay characteristics.

◆ **MONITOR**

Unlock and remove the backbox rear door. Disconnect all of the cables going to the monitor. Remove the four flange nuts securing the monitor's mounting brackets to its mounting panel. **CAREFULLY**, Pull the monitor from the backbox. Clean the face of the monitor before reinstalling it.



**CAUTION**

THE VIDEO MONITOR IS HEAVY, WITH MOST OF THE WEIGHT TOWARD THE FRONT OF THE ASSEMBLY. Be sure it is firmly supported as it is removed from the cabinet. The monitor does require isolation from the A.C. line voltage in normal operation. When operating outside the backbox or servicing the monitor on a test bench, **YOU MUST ISOLATE THE MONITOR FROM LINE VOLTAGE WITH A TRANSFORMER. THE MONITOR MUST BE POWERED AT 110V.**

◆ **LUBRICATION**

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

Because of the functional design (arm-actuated via solenoid plunger operation), the pivot points of the Left and Right Kickers ("Slingshots") all require lubrication as a regular servicing procedure. Lubrication to ensure proper operation also applies to the target blades of the Drop Targets. MBI Instrument Grease, also known as Drop Target Switch Lubricant, with a Williams' part number of EI165, is a recommended lubricant.

◆ **SWITCH CONTACTS**

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

### ***Switch Contacts Continued...***

**Flipper Switches.** This game uses the Fliptronic II Electronic Flipper System. The End-of-Stroke switches are NORMALLY OPEN. The switch should close when the flipper is energized. All E.O.S. switches are gold flashed computer grade leaf switches. Only low computer current is carried through these switches. DO NOT FILE or abrasively clean these switches! DO NOT REPLACE these switches with the tungsten high current switches, as intermittent operation could occur.

**NOTE:** *Unlike the old style of flipper, an E.O.S. switch failure does not harm the flipper. The game notifies the operator that the switch is misadjusted in the test report, but continues to play. The E.O.S. switches are a means by which the new electronic flippers feel and play with all of the subtleties of the old flippers.*

## **EPILEPSY WARNING**

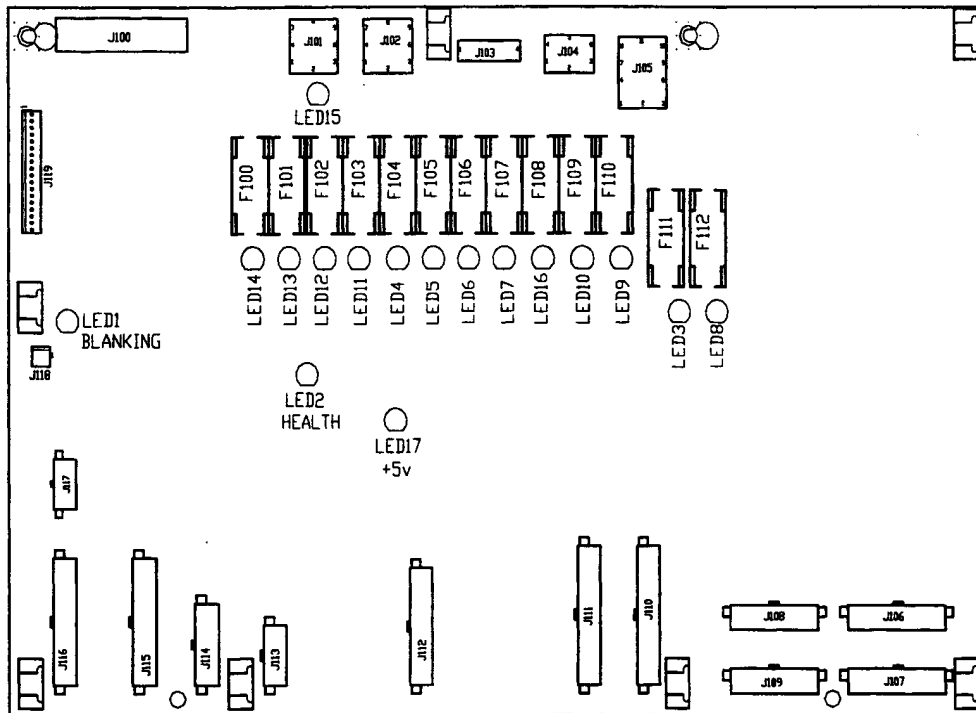
A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights that are present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. People who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g., seizures or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, DISCONTINUE USE IMMEDIATELY and consult your physician.

## LED AND FUSE LIST

### POWER DRIVER BOARD



### LED LIST

|              |                          |               |                  |
|--------------|--------------------------|---------------|------------------|
| <b>LED 1</b> | Watchdog                 | <b>LED 10</b> | +20V Flashlamps  |
| <b>LED 2</b> | Health                   | <b>LED 11</b> | Solenoid Power 1 |
| <b>LED 3</b> | +18V Lamp Matrix A       | <b>LED 12</b> | Solenoid Power 2 |
| <b>LED 4</b> | +50V Lower Right Flipper | <b>LED 13</b> | Solenoid Power 3 |
| <b>LED 5</b> | +50V Lower Left Flipper  | <b>LED 14</b> | Solenoid Power 4 |
| <b>LED 6</b> | +50V Upper Right Flipper | <b>LED 15</b> | +20V             |
| <b>LED 7</b> | +50V Upper Left Flipper  | <b>LED 16</b> | +12V             |
| <b>LED 8</b> | +18V Lamp Matrix B       | <b>LED 17</b> | +5V              |
| <b>LED 9</b> | +50V Solenoids           |               |                  |

### FUSE LIST

| Loc.        | Value |      | Part Number   | Description               |
|-------------|-------|------|---------------|---------------------------|
| <b>F100</b> | T4.0A | 250V | 5371-14530-00 | Solenoid Power 4          |
| <b>F101</b> | T4.0A | 250V | 5371-14530-00 | Solenoid Power 1          |
| <b>F102</b> | T4.0A | 250V | 5371-14530-00 | Solenoid Power 2          |
| <b>F103</b> | T4.0A | 250V | 5371-14530-00 | Solenoid Power 3          |
| <b>F104</b> | T4.0A | 250V | 5371-14530-00 | Lower Right Flipper Power |
| <b>F105</b> | T4.0A | 250V | 5371-14530-00 | Lower Left Flipper Power  |
| <b>F106</b> | T4.0A | 250V | 5371-14530-00 | Upper Right Flipper Power |
| <b>F107</b> | T4.0A | 250V | 5371-14530-00 | Upper Left Flipper Power  |
| <b>F108</b> | T4.0A | 250V | 5371-14530-00 | 12VAC Unregulated         |
| <b>F109</b> | T4.0A | 250V | 5371-14530-00 | 20VAC Flashlamps          |
| <b>F110</b> | T6.3A | 250V | 5731-14529-00 | 50VAC Solenoids           |
| <b>F111</b> | T5.0A | 250V | 5731-14046-00 | 18VAC Lamp Matrix A       |
| <b>F112</b> | T5.0A | 250V | 5731-14046-00 | 18VAC Lamp Matrix B       |

### LINE FUSE

| Location | Value |      | Part Number   |
|----------|-------|------|---------------|
| Foreign  | T4.0A | 250V | 5731-14530-00 |
| Domestic | T5.0A | 250V | 5731-14046-00 |

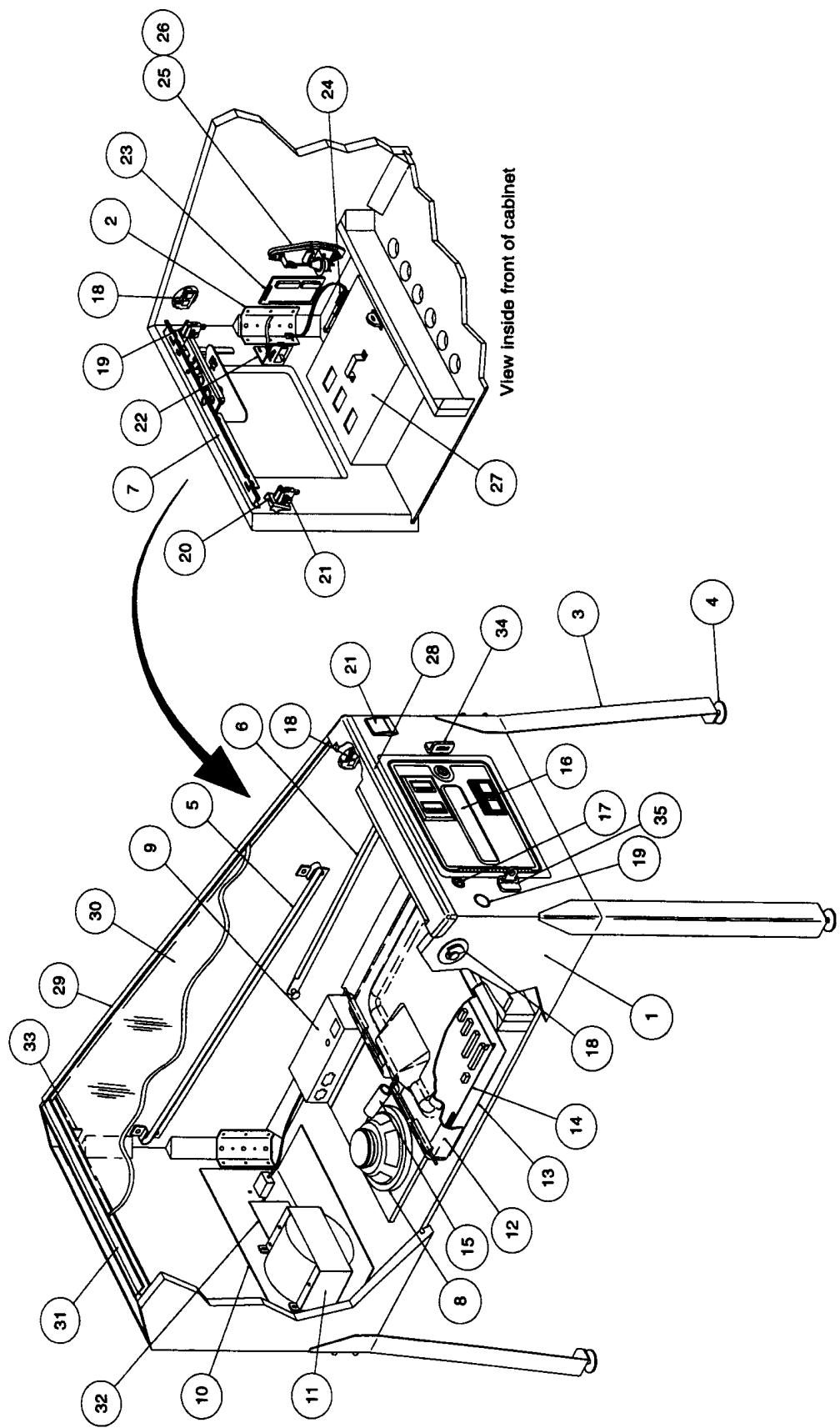
## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# **SECTION TWO**

## **PARTS INFORMATION**

**Items listed as Associated Parts are not sold as part of the main assembly.  
Associated Parts are only sold separate.**

# **50070-CAB** **Cabinet Assembly**



**50070-CAB**

# Cabinet Assembly Parts List

| <u>Item</u> | <u>Part Number</u> | <u>Description</u>                           |
|-------------|--------------------|----------------------------------------------|
| 1           | 04-12480.4         | Cabinet                                      |
| 2           | 01-11400-1         | Leg Mounting Bracket (x4)                    |
| 3           | A-19514-6          | Leg Assembly – Black Ridge (x4)              |
| 4           | 08-7377            | Leg Leveler/Adjuster (x4)                    |
| 5           | 01-15132-1         | Playfield Slide Track – Right                |
| 6           | 04-12610           | Stay Arm                                     |
| 7           | A-22996            | Lockdown Bracket Assembly                    |
| 8           | 5555-16059-00      | Speaker, 6.5" Woofer, 4Ω                     |
| 9           | A-22966            | Power Control Box Assembly                   |
| 10          | 04-12596.1         | Drip Plate                                   |
| 11          | 5610-15930-00      | Transformer Assembly                         |
| 12          | A-22998            | Driver Board Cover Assembly                  |
| 13          | A-23299            | Driver Board Back Plate Assembly             |
| 14          | 04-12329           | Power Driver Board PCB Assembly              |
| 15          | 03-10011           | Cover Stop Tube                              |
| 16          | 09-96032-33        | Coin Door – USA                              |
| 17          | 20-10690           | Hand Molding Lock                            |
| 18          | A-22984            | Flipper Button Assembly (x2)                 |
| 19          | 20-10696           | Push Button w/Switch – <i>START</i> (Yellow) |
| 20          | 01-15184           | Launch Button Bracket                        |
| 21          | 20-10692-1         | Push Button w/Switch – <i>LAUNCH</i> (Red)   |
| 22          | A-23024            | Coin Door Interlock Switch Assembly          |
| 23          | A-22964            | Coin door Interface PCB Assembly & Spacer    |
| 24          | A-17195-2          | Tilt Switch Assembly w/Cable                 |
| 25          | 04-10346.1         | Tilt Mechanism Assembly                      |
| 26          | 20-6502-A          | Plumb Bob                                    |
| 27          | A-23139            | 4-Ball Cash Box Assembly                     |
| 28          | A-22997            | Hand Molding Assembly                        |
| 29          | A-22976-1          | Side Molding Assembly (x2)                   |
| 30          | 04-12739.1         | Tinted Playfield Glass Assembly              |
| 31          | 03-8091            | Rear Molding                                 |
| 32          | 01-15214           | Hole Cover                                   |
| 33          | 01-15212           | Cabinet Corner Bracket                       |
| 34          | 01-14085.1         | Hasp Hinge Bracket                           |
| 35          | 01-14086.1         | Hasp Staple Bracket                          |

## Miscellaneous Parts: (Not Shown)

| <u>Part Number</u> | <u>Description</u>               |
|--------------------|----------------------------------|
| 01-15132-2         | Playfield Slide Track – Left     |
| 04-12628.2         | Safety Pin Bracket               |
| 01-15136-1-2       | Lock Plate                       |
| *                  | Cordset                          |
| 20-6500            | Steel Ball, Ø1-1/16" (x4)        |
| 01-6389-1          | Cash Box lock Bracket            |
| 01-12352           | Clip Bracket                     |
| 4322-1125-40       | 3/8 x 16 Hex Acorn Head Leg Bolt |
| 01-14084.2         | Slotted Hasp Plate               |

## Cabinet Cables:

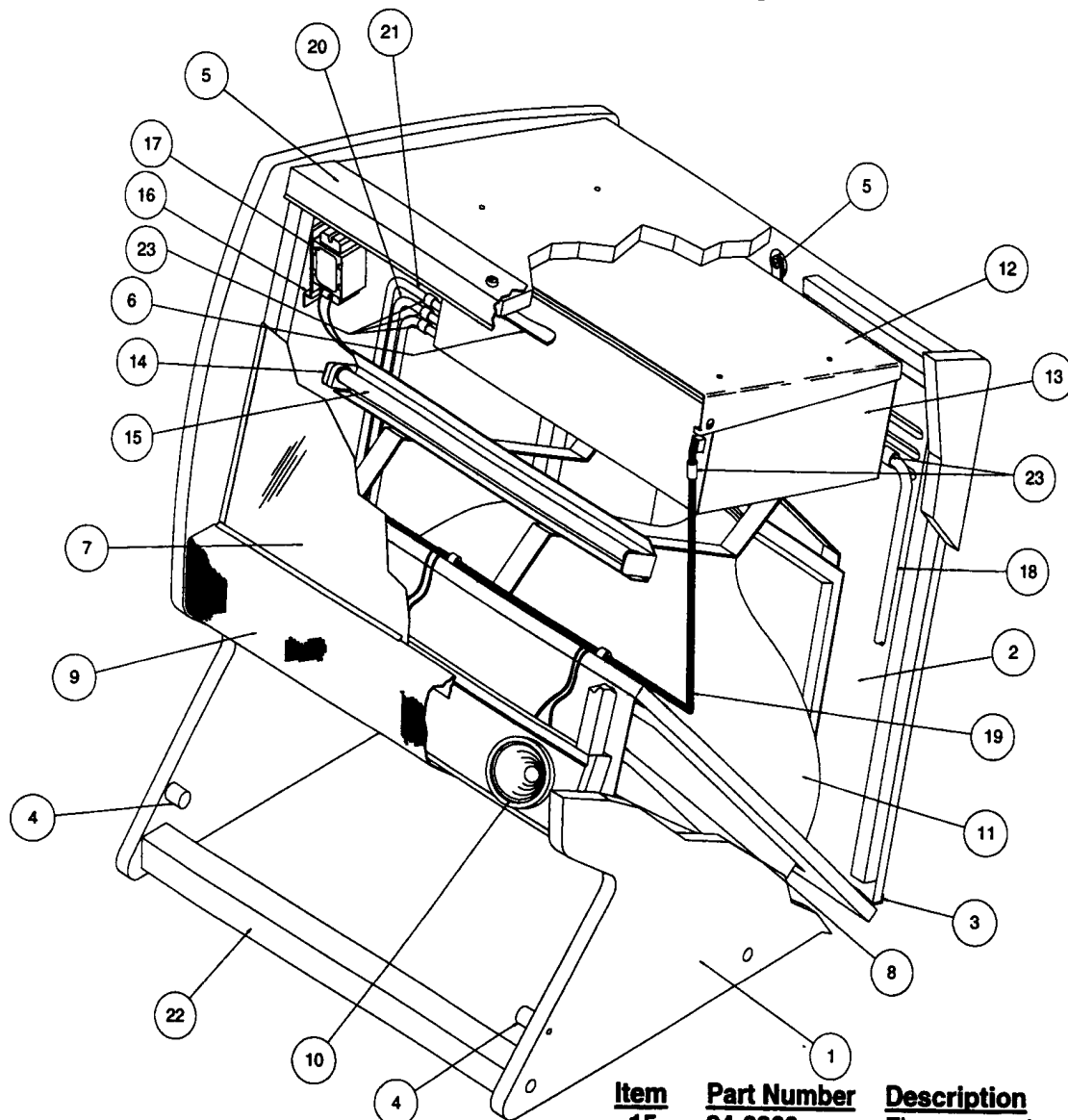
| <u>Part Number</u> | <u>Description</u>          |
|--------------------|-----------------------------|
| H-22740-2.1        | Cabinet Cable               |
| H-22740-1.2        | Cabinet Cable               |
| H-22736            | Secondary power Cable       |
| H-22737-2          | Cabinet Power/Speaker Cable |
| H-22955            | Cabinet Switch/Lamp Cable   |

---

\* See Power Interface/Cordset Application Chart on page 2-31

# 50070-BB

## Back Box Assembly



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>             |
|-------------|--------------------|--------------------------------|
| 1           | 04-12489.4         | Back Box                       |
| 2           | A-22982            | Back Door Assembly             |
| 3           | 01-15131           | Door Channel                   |
| 4           | 03-9992            | Knob                           |
| 5           | A-22981            | Lock & Plate Assembly          |
| 6           | 01-15134           | Front Lock Cam                 |
| 7           | A-22975-50070      | Marquee Assembly               |
| 8           | 04-12607.1         | Speaker Grill Bracket          |
| 9           | 04-12606.1         | Speaker Grill                  |
| 10          | 5555-16223-00      | Speaker - 4Ω, 25W              |
| 11          | 5675-16058-02      | Monitor - 19"                  |
| 12          | 01-15130.2         | Computer Case Mounting Bracket |
| 13          | A-22724            | Computer Case Assembly         |
| 14          | A-22980            | Fluorescent Lamp Assembly      |

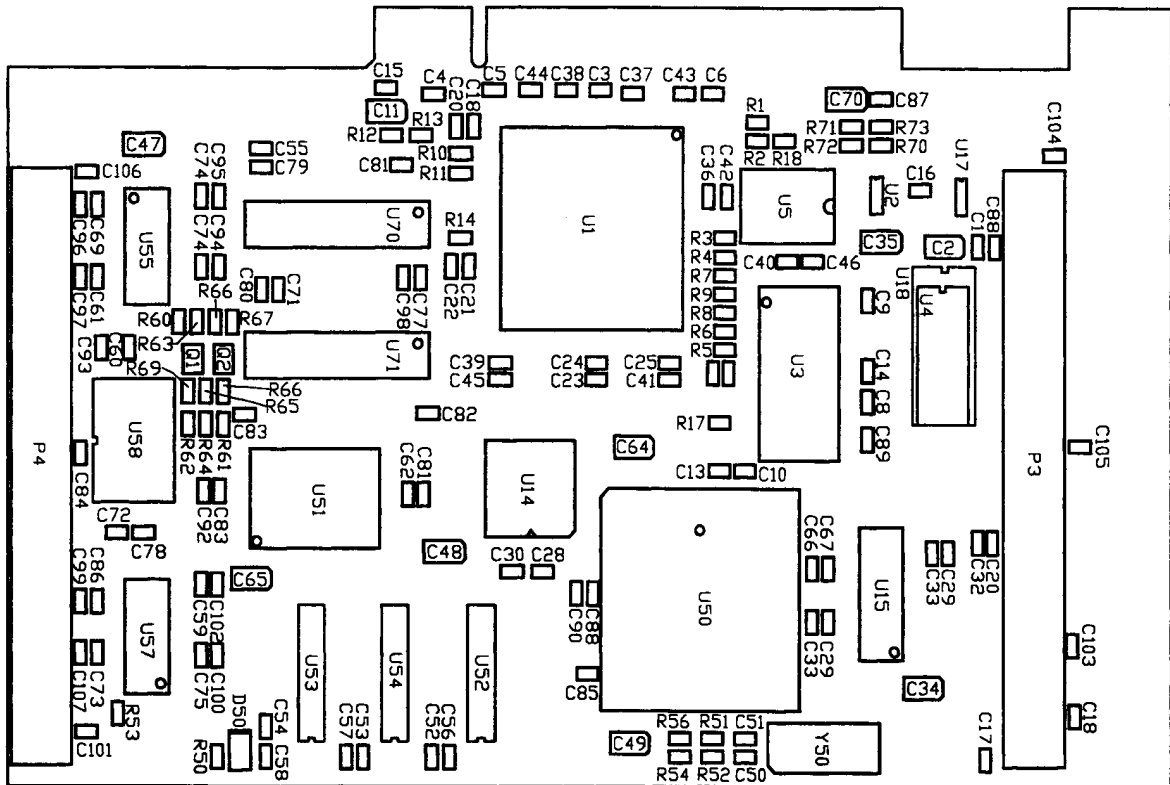
| <u>Item</u> | <u>Part Number</u> | <u>Description</u>          |
|-------------|--------------------|-----------------------------|
| 15          | 24-8809            | Fluorescent Lamp 15W, 18"   |
| 16          | 04-12752           | Ballast Mounting Bracket    |
| 17          | A-23155            | Ballast Assembly            |
| 18          | A-23160            | CPU/AC Power Cable          |
| 19          | H-22737-1          | AC/Speaker Cable            |
| 20          | 20-10583           | Extension Cable db09 - 10ft |
| 21          | 20-10584           | Extension Cable db25 - 10ft |

### Miscellaneous Parts:

| <u>Item</u> | <u>Part Number</u> | <u>Description</u>                      |
|-------------|--------------------|-----------------------------------------|
| 22          | 11-1464            | Back Box Shipping Brace                 |
| 23          | 5556-15272-00      | Ferrite                                 |
| *24         | 02-4352-2          | Pivot Bushing                           |
| *25         | 4322-10228-12      | CS 3/8-16 x ¾ Button Head - Nylon Patch |
| *26         | 4700-00111-00      | FW .390 x .875 x .062                   |

\* Item not shown

# 04-12602 Prism PCB Assembly



## Designator

R1-R14, R17, R18, R52-R54, R56, R65, R66,  
R69-R73  
R50  
R62, R63, R64, R67, R68  
C2, C11, C34, C35, C47, C48 C49, C64, C65, C70  
C50, C51  
C1, C7-C10, C17, C19, C21 C24-C29, C36-C40,  
C52-C55, C67, C90-C100  
C3-C6, C12-C16, C20, C22, C23, C41-C46,  
C101-C107  
C18, C30-C33, C56-C63, C66, C68, C69, C78-C89  
Q1, Q2  
U15  
U55, U57  
U4  
U2  
U58  
U3  
U5  
U17  
U50  
U51  
U52, U53, U54  
U1  
U14  
Y50  
D50  
P3, P4

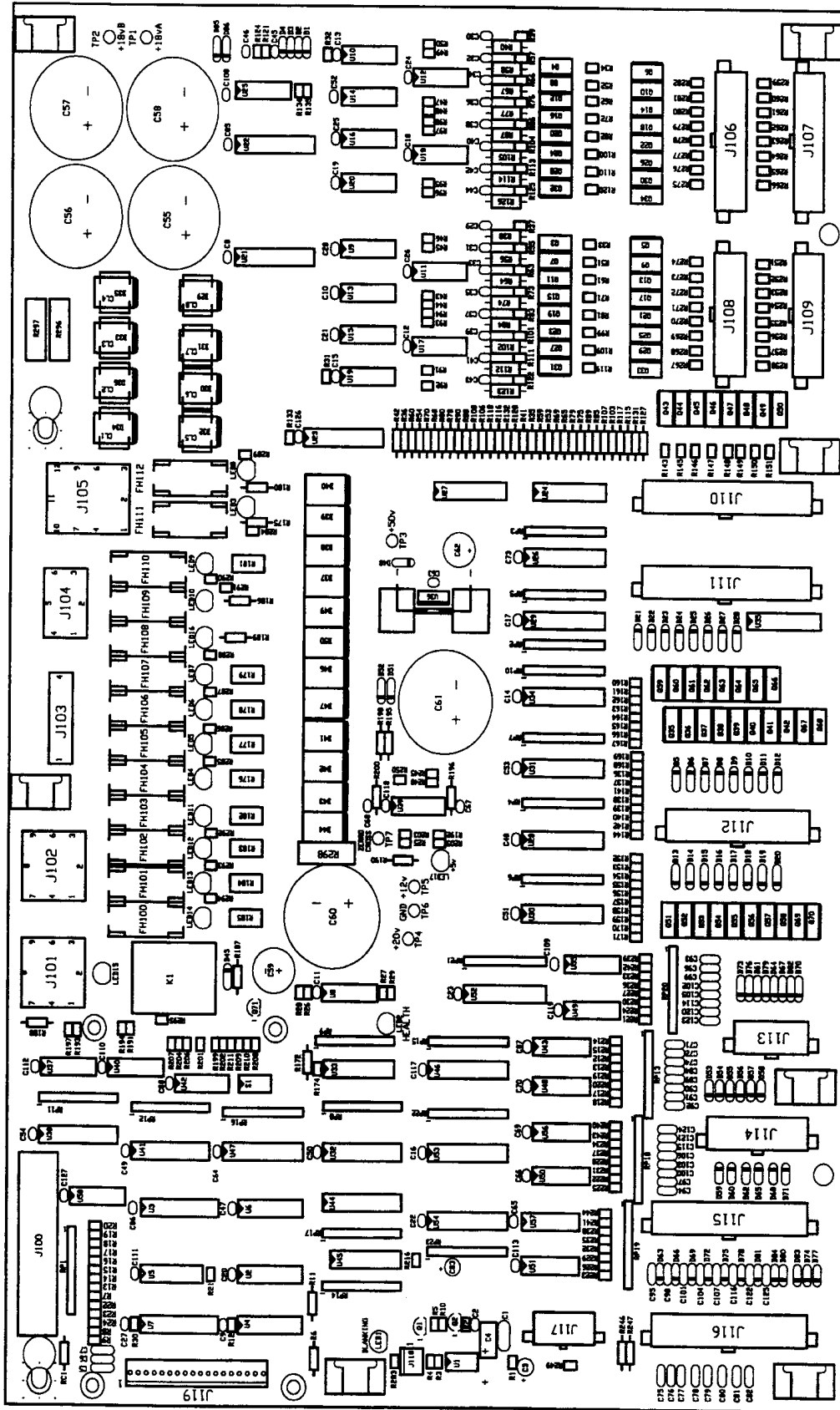
## Part Number

5020-14156-00  
  
5020-14160-00  
5020-14152-00  
5051-14151-00  
5052-14149-00  
5052-14164-00  
  
5052-14165-00  
  
5052-14368-00  
5160-16056-00  
5283-16051-00  
5285-14601-00  
5340-16204-00  
5345-16049-00  
5345-16053-00  
5345-16196-00  
5521-16050-00  
5432-16052-00  
5400-15450-00  
5410-14590-00  
5349-14606-00  
5430-16048-00  
A-23290  
5520-16054-00  
5671-14653-00  
5792-16057-00

## Description

Resistor, 10K $\Omega$ , 5%, 1/10W, R0805  
  
Resistor, 330 $\Omega$ , 5%, 1/10W, R0805  
Resistor, 100 $\Omega$ , 5%, 1/10W, R0805  
Capacitor, 10 $\mu$ f, 16V  $\pm$ 20%, SMD TANT  
Capacitor, 22pf, 100V 10%, SMD  
Capacitor, .01 $\mu$ f, 50V 20%, SMD  
  
Capacitor, .1 $\mu$ f, 50V 20%, SMD Z5U  
  
Capacitor, 22pf, 100V 10%, SMD  
Transistor, NPN 2N3904 SC70  
IC, Bus Transceiver, 74FCT162543T  
IC, 74FCT162245  
IC, SRAM, 32K x 8, 70ns, SOP28  
IC, EE Serial PROM  
IC, Flash 8Mbit TSOP48  
IC, Flash EEPROM, 28F320J5 SSOP  
OSC, 30MHz SMT  
IC, NVRAM Controller SOIC8  
ADSP-2104KP-40  
IC, SDR ASIC Video  
IC, SRAM, 32K x 8 - 15, 28PSQJ  
IC, PCI Bus Interface, PCI9502  
IC, CPLD U14 Assembly  
OSC, 16MHz Crystal SMT  
LED, Yellow SMD  
Connector, Dual Row 2 x 40 SMT

# 04-12329 Power Driver Board



04-12329

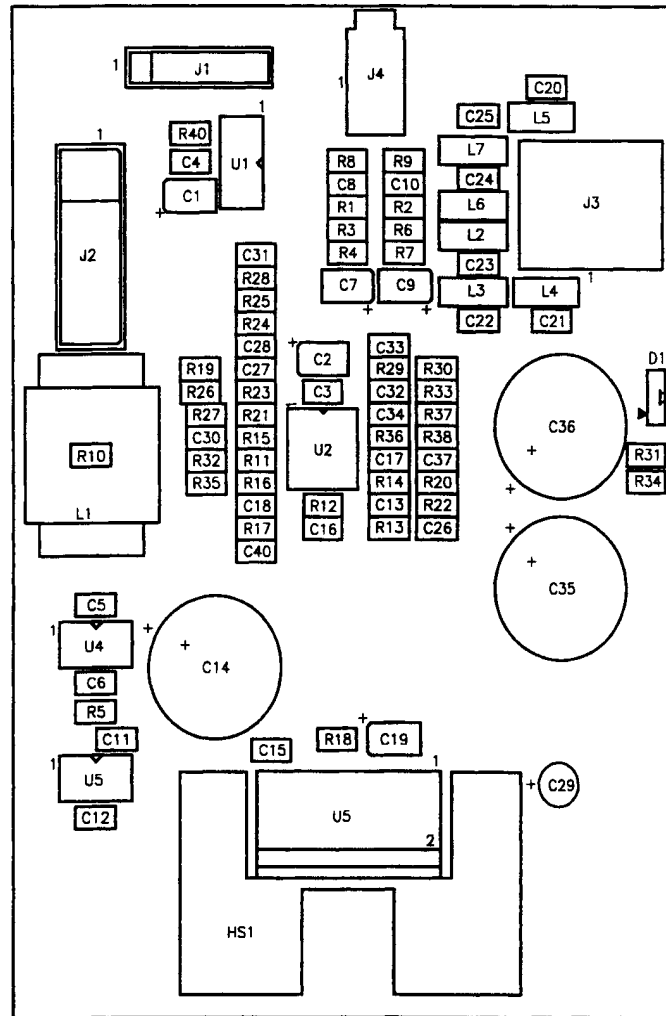
# Power Driver Board Parts List

| Part Number   | Description                            | Designator                                                                                                                                                             |
|---------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5043-08996-00 | Capacitor, 0.1µf, 50V ±20% Axial       | C1, C2, C8-C54, C63-C70, C73, C85-C88, C108-C113, C117-C119, C126, C127                                                                                                |
| 5040-13098-00 | Capacitor, 4.7µf, 35V ±20%             | C3, C83                                                                                                                                                                |
| 5040-09365-00 | Capacitor, 1µf, 63V +50%-10% Axial     | C4                                                                                                                                                                     |
| 5048-11029-00 | Capacitor, 100pf 50V ±5% Axial         | C5-C7                                                                                                                                                                  |
| 5040-15413-00 | Capacitor, 10000µf, 35V, 25mm          | C55-C58, C60, C61                                                                                                                                                      |
| 5040-09537-00 | Capacitor, 100µf, 100V ±20% Radial     | C59                                                                                                                                                                    |
| 5040-13102-00 | Capacitor, 470µf, 35V ±20% Radial      | C62                                                                                                                                                                    |
| 5048-11030-00 | Capacitor, 470pf, 50V Axial            | C71, C72, C74-C82, C84, C89, C90-C107, C114-C116, C120-C125                                                                                                            |
| 5070-08919-00 | Diode, 1N4148, 150mA                   | D1-D4, D53-D84                                                                                                                                                         |
| 5070-09054-00 | Diode, 1N4004, 1.0A                    | D5-D28, D45, D48, D51, D52                                                                                                                                             |
| 5070-14526-00 | Diode, P600G, 6A, 400 PIV              | D29-D44, D46, D47, D49, D50                                                                                                                                            |
| 5733-14528-00 | Fuse Holder, 5x20mm, 10A               | FH100-FH112                                                                                                                                                            |
| 5731-14530-00 | Fuse, 5x20mm, T4A, 250V                | F100, F101, F102, F103, F104, F105, F106, F107, F108, F109                                                                                                             |
| 5731-14529-00 | Fuse, 5X20mm, T6.3A, 250V              | F110                                                                                                                                                                   |
| 5731-14046-00 | Fuse, 5x20mm, SB T5A                   | F111, F112                                                                                                                                                             |
| 5705-14562-00 | Heatsink, 10-220 Wave Sol 287          | HS1                                                                                                                                                                    |
| 5791-16065-00 | 25 Pin D-SUB Connector, R/A PCB Mount  | J100                                                                                                                                                                   |
| 5792-13223-09 | 9 Pin Female, .084 MLX                 | J102, J101                                                                                                                                                             |
| 5792-13223-04 | 4 Pin Female, .084 MLX                 | J103                                                                                                                                                                   |
| 5792-13223-06 | 6 Pin Female, .084 MLX                 | J104                                                                                                                                                                   |
| 5792-13223-12 | 12 Pin Female, .084 MLX                | J105                                                                                                                                                                   |
| 5791-13356-18 | Header-PCB Mount, 0.165 center 18P     | J106, J107                                                                                                                                                             |
| 5791-13356-16 | Header-PCB Mount, 0.165 center 16P     | J108, J109                                                                                                                                                             |
| 5791-13356-24 | Header-PCB Mount, 0.165 center 24p     | J110, J111                                                                                                                                                             |
| 5791-13356-20 | Header-PCB Mount, 0.165 center 20p     | J112                                                                                                                                                                   |
| 5791-13356-10 | Header-PCB Mount, 0.165 center 10P     | J113                                                                                                                                                                   |
| 5791-13356-14 | Header-PCB Mount, 0.165 center 14P     | J114                                                                                                                                                                   |
| 5791-13356-22 | Header-PCB Mount, 0.165 center 22P     | J115, J116                                                                                                                                                             |
| 5791-13356-08 | Header-PCB Mount, 0.165 center 8P(N)   | J117                                                                                                                                                                   |
| 5791-13830-03 | 3H Straight Square Pin, .100 Solid Tab | J118                                                                                                                                                                   |
| 5792-15928-18 | Connector, 18 Pin, 22-02-7183 Top EN   | J119                                                                                                                                                                   |
| 5580-12782-00 | Relay DPDT 12VDC                       | K1                                                                                                                                                                     |
| 5671-13732-00 | LED, Display Red, T1¼                  | LED1-LED15, LED17                                                                                                                                                      |
| 5190-10270-00 | Transistor, 2N3906 PNP                 | Q1, Q2                                                                                                                                                                 |
| 5162-12635-00 | Transistor, Tip 102                    | Q3, Q4, Q7, Q8, Q11, Q12, Q15, Q16, Q19, Q20, Q23, Q24, Q27, Q28, Q31, Q32                                                                                             |
| 5192-12428-00 | Transistor, Tip 107                    | Q5, Q6, Q9, Q10, Q13, Q14, Q17, Q18, Q21, Q22, Q25, Q26, Q29, Q30, Q33, Q34                                                                                            |
| 5220-15710-00 | Transistor-FET, STP20N10L, N-Channel   | Q35-Q70                                                                                                                                                                |
| 5160-10269-00 | Transistor, 2N3904, NPN                | Q71                                                                                                                                                                    |
| 5019-09669-00 | SIP Resistor, 1KΩ, 9R 10, 5%           | RP14                                                                                                                                                                   |
| 5019-16328-00 | SIP Resistor, 2.2KΩ, 9R 10P, 5%        | RP19                                                                                                                                                                   |
| 5019-10661-00 | SIP Resistor, 10KΩ, 9R 10, 5%          | RP1-RP13, RP15-RP18, RP20-RP23                                                                                                                                         |
| 5010-13517-00 | Resistor, 15Ω, 1/4W,                   | R247                                                                                                                                                                   |
| 5010-13594-00 | Resistor, 1kΩ, 1/8W, 5% Film           | R1, R22, R23, R31-R34, R51, R52, R61, R62, R71, R72, R81, R82, R99, R100, R109, R110, R119, R120, R121, R124, R191, R193, R194, R197, R201, R204, R205-R215, R217-R244 |
| 5010-13365-00 | Resistor, 4.7kΩ, 1/8W, 5%              | R2                                                                                                                                                                     |
| 5010-13366-00 | Resistor, 470Ω, 1/8W, 5%               | R3, R4, R7, R8, R9, R136-R171                                                                                                                                          |
| 5010-13368-00 | Resistor, 3.9kΩ, 1/8W, 5%              | R5                                                                                                                                                                     |
| 5010-09160-00 | Resistor, 220Ω, 1/4W, 5%               | R6, R11, R172, R190, R195, R196, R198, R200                                                                                                                            |
| 5010-14395-00 | Resistor, 6.8kΩ, 1/8W, 5%              | R10, R284, R289, R291                                                                                                                                                  |
| 5010-13593-00 | Resistor, 10kΩ, 1/8W, 5% Film          | R12, R21, R25-R28, R29, R43-R50, R91-R98, R134, R135, R192, R199, R245, R248-R282                                                                                      |
| 5010-13364-00 | Resistor, 33Ω, 1/8W, 5%                | R13-R20, R24, R30, R133, R174, R216                                                                                                                                    |
| 5010-09358-00 | Resistor, 1kΩ, 1/4W, 5%                | R35, R36, R53, R54, R65, R68, R75, R78, R85, R88, R103, R106, R115, R116, R127, R128                                                                                   |
| 5010-13372-00 | Resistor, 220Ω, 1/8W, 5%               | R37, R39, R55, R57, R63, R66, R73, R76, R83, R86, R101, R104, R111, R113, R122, R125, R283                                                                             |
| 5010-12427-00 | Resistor, 22Ω, 1W, 5%                  | R38, R40, R56, R58, R64, R67, R74, R77, R84, R87, R102, R105, R112, R114, R123, R126                                                                                   |
| 5010-08992-00 | Resistor, 560Ω, 1/4W, 5%               | R41, R42, R59, R60, R69, R70, R79, R80, R89, R90, R107, R108, R117, R118, R131, R132                                                                                   |
| 5010-14093-00 | Resistor, 0Ω, 1/8W, 5%                 | R246                                                                                                                                                                   |
| 5010-09999-00 | Resistor, 2KΩ, 1/4W, 5%                | R175, R180, R186-R189                                                                                                                                                  |
| 5010-14711-00 | Resistor, 10kΩ, 1W, 5%                 | R176-R179, R181-R185                                                                                                                                                   |
| 5010-13595-00 | Resistor, 2.7kΩ, 1/8W, 5% Film         | R202                                                                                                                                                                   |
| 5010-13843-00 | Resistor, 22kΩ, 1/8W, 5% Film          | R203                                                                                                                                                                   |
| 5010-13841-00 | Resistor, 47kΩ, 1/8W, 5%               | R285-R290, R292-R295                                                                                                                                                   |
| 5011-13292-00 | Resistor, 330Ω, 2W, 5%                 | R296-R298                                                                                                                                                              |
| 5645-12554-00 | Switch DIP, 4 Position                 | S1                                                                                                                                                                     |
| 5824-09248-00 | Test Point #1502-1                     | TP5, TP6                                                                                                                                                               |
| 5431-10449-00 | IC, 555 Timer                          | U1                                                                                                                                                                     |
| 5315-12812-00 | IC, 74HCT138, 3 to 8 Decoder           | U2, U4, U5, U6                                                                                                                                                         |
| 5315-12813-00 | IC, 74HCT245, Octal Transceiver        | U3                                                                                                                                                                     |
| 5315-13079-00 | IC, 74HCT574, Octal D-Latch            | U7, U26, U28-U32, U34, U44                                                                                                                                             |
| 5281-09487-00 | IC, 74LS74, Dual D F/F                 | U8-U10, U13-U16, U19, U20                                                                                                                                              |
| 5370-12272-00 | IC, LM339, Quad Comp                   | U11, U12, U17, U18, U25, U37, U39, U40, U42, U43, U48, U49, U50, U51, U55, U56, U57                                                                                    |
| 5315-12821-00 | IC, 74HCT240, Octal Buffer             | U21-U23, U38, U41, U46, U47, U52-U54                                                                                                                                   |
| 5162-12422-00 | Trans, ULN 2803 Oc-Drl                 | U24, U27, U33, U35, U45                                                                                                                                                |
| 5250-09157-00 | Reg, 7805, 1.0A, 5V                    | U36                                                                                                                                                                    |
| 5311-12538-00 | IC, 74HC14, Hex S-T-                   | U58                                                                                                                                                                    |
| 5671-12993-00 | LED, Green, 5mm, T1¼ Diffused          | LED16                                                                                                                                                                  |
| 5070-09266-00 | Diode, 1N5817, 1.0A, Schottky          | D85, D86                                                                                                                                                               |
| DNP           | Do Not Populate                        | TP1-TP4, TP7, RC1, CL1-CL8                                                                                                                                             |
| MRD           | Missing Reference Designators          | R173, RP24-RP27, C126, R129, R130                                                                                                                                      |

04-12621

# 04-12621

## P2000 Audio Amplifier PCB Assembly

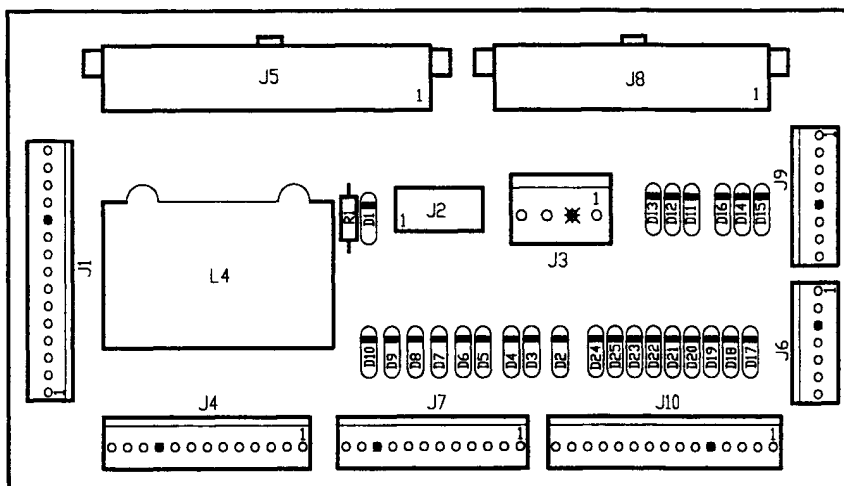


| Designator                   | Part Number   | Description                                    |
|------------------------------|---------------|------------------------------------------------|
| R18                          | 5020-14156-00 | Resistor, 10K $\Omega$ , 1/10W 5% R0805        |
| R19, R29                     | 5020-16081-00 | Resistor, 18K $\Omega$ , 1/10W 5% 0805         |
| R24, R36                     | 5020-16082-00 | Resistor, 68K $\Omega$ , 1/10W 5% 0805         |
| R14                          | 5020-16080-00 | Resistor, 82K $\Omega$ , 1/10W 5% 0805         |
| R1, R2, R4, R7               | 5020-16079-00 | Resistor, 56K $\Omega$ , 1/10W 5% 0805         |
| R13                          | 5020-14383-00 | Resistor, 9.1K $\Omega$ , 1/10W 1% SMD-0805    |
| R10, R12, R20                | 5020-14349-00 | Resistor, 0K $\Omega$ , 1/10W SMD-0805         |
| R21, R26, R30                |               |                                                |
| R32                          |               |                                                |
| R11, R15, R16                | 5020-16222-00 | Resistor, 100K $\Omega$ , 1/10W 5% SMD-0805    |
| R17                          |               |                                                |
| R3, R6                       | 5020-15029-00 | Resistor, 2.4K $\Omega$ , 1/10W 5% SMD-0805    |
| R25, R28, R31                | 5020-14157-00 | Resistor, 1K $\Omega$ , 1/10W 5% SMD-0805      |
| R37, R38                     |               |                                                |
| C1, C2, C7, C9               | 5051-14151-00 | Capacitor, 10 $\mu$ f, 16V $\pm$ 20%, SMD TANT |
| C19                          |               |                                                |
| C3, C4, C15, C31             | 5052-14165-00 | Capacitor, .1 $\mu$ f, 50V $\pm$ 20%, SMD Z5U  |
| C37                          |               |                                                |
| C10, C8                      | 5052-14166-00 | Capacitor, 1000pf, 50V $\pm$ 5%, SMD           |
| C17                          | 5052-14170-00 | Capacitor, 6800pf, 50V $\pm$ 5%, SMD           |
| C20, C21, C22, C23, C24, C25 | 5052-14367-00 | Capacitor, 150pf, 50V $\pm$ 5%                 |

| Designator              | Part Number   | Description                                       |
|-------------------------|---------------|---------------------------------------------------|
| C5, C6, C11, C12        | 5052-15041-00 | Capacitor, .22 $\mu$ f, 25V Y5V, 0805             |
| C30, C32, C40           |               |                                                   |
| C13, C27, C28, C33, C34 | 5052-16078-00 | Capacitor, .068 $\mu$ f, 25V $\pm$ 10%, 7R 0805   |
| C14, C35, C36           | 5040-14630-00 | Capacitor, 2200 $\mu$ f, 25V Radial               |
| C29                     | 5040-11036-00 | Capacitor, 47 $\mu$ f, 16V Radial $\pm$ 20%, 105C |
| C26                     | 5052-16221-00 | Capacitor, 68 $\mu$ f, 16V Y5V +80% -20%, 0805    |
| D1                      | 5671-16083-00 | LED, Red Side View, SMT                           |
| U4                      | 5250-16069-00 | IC, Regulator 78L05 SOIC8                         |
| U5                      | 5250-16070-00 | IC, Regulator 78L08 SOIC8                         |
| U2                      | 5370-16072-00 | IC, LM324A Quad OpAmp SOIC14                      |
| U3                      | 5370-16073-00 | IC, Audio Amp TDA7375                             |
| U1                      | 5371-16074-00 | IC, DAC Stereo, 16Bit CS4333, SOP8                |
| L2 - L7                 | 5553-16075-00 | Ferrite BD, 60 $\Omega$ , 6A, 1806 SMD            |
| J1                      | 5791-16076-08 | Connector, JST PH, Vertical 8-Pin                 |
| J3                      | 5791-16071-06 | Header, PCB Mount, R/A MiniFit 6-Pin              |
| J2                      | 5796-14955-00 | Connector, 4 CKT, Vertical Header 10A/250V        |
| HS1                     | 5705-16067-00 | Heat Sink, Multiwatt 15, 2 Inch                   |

## 04-12492

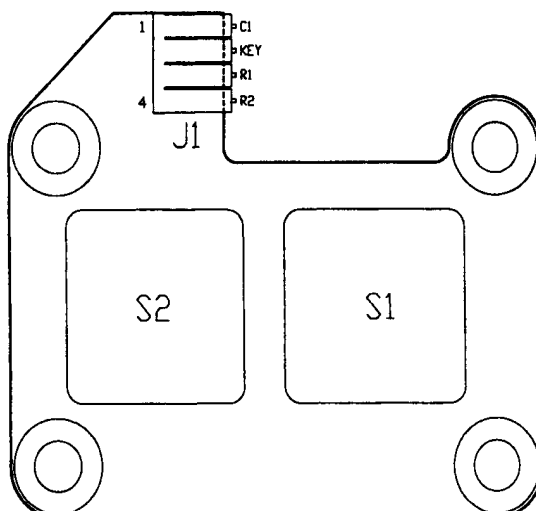
### Coin Door Interface PCB Assembly



| <u>Designator</u> | <u>Part Number</u> | <u>Description</u>                           |
|-------------------|--------------------|----------------------------------------------|
| D1-D25            | 5070-09054-00      | Diode, 1N4004, 1.0A                          |
| J5                | 5791-13356-24      | Header, PCB Mount, 0.165 Center, 24 Pin      |
| J8                | 5791-13356-20      | Header, PCB Mount, 0.165 Center, 20 Pin      |
| J9                | 5791-13830-08      | 8H, Straight Square Pin, .100 Solid Tab      |
| J6                | 5791-13830-07      | 7H, Straight Square Pin, .100 Solid Tab      |
| J1, J10           | 5791-13830-15      | 15H, Straight Square Pin, .100 Solid Tab     |
| J7                | 5791-13830-12      | 12H, Straight Square Pin, .100 Solid Tab     |
| J4                | 5791-13830-13      | 13H, Straight Square Pin, .100 Solid Tab     |
| J3                | 5791-13830-04      | 4H, Straight Square Pin, .156                |
| J2                | 5791-11000-10      | 10 Square Pin Straight Header, .100 w/Shroud |
| R1                | 5010-13517-00      | Resistor, 15Ω, ¼W                            |

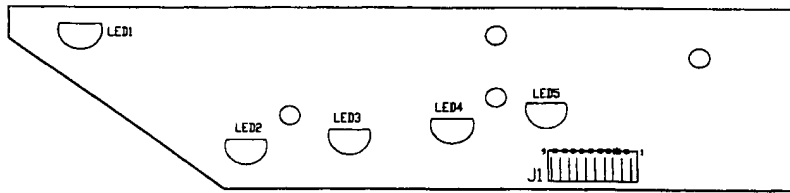
## 04-12612

### 2 Switch Flipper PCB Assembly



| <u>Designator</u> | <u>Part Number</u> | <u>Description</u>                    |
|-------------------|--------------------|---------------------------------------|
| J1                | 5791-12622-04      | R/A Square Pin Header, .100 Solid Tab |
| S1, S2            | 5641-16194-00      | Keyswitch w/Jumper                    |

## A-18617-1 Trough IR LED PCB Assembly

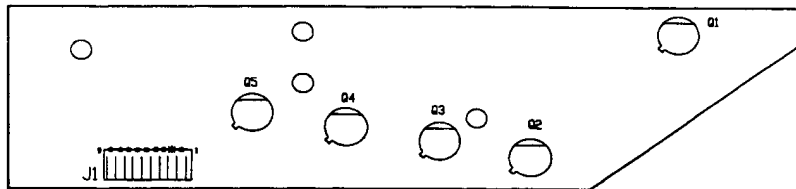


**Designator**  
LED1 – LED5  
J1

**Part Number**  
5671-12731-00  
5791-12622-09

**Description**  
Infra Red Diode  
Connector, 9-Pin Header Sq.

## A-18618-1 Trough IR Photo Transistor PCB Assembly



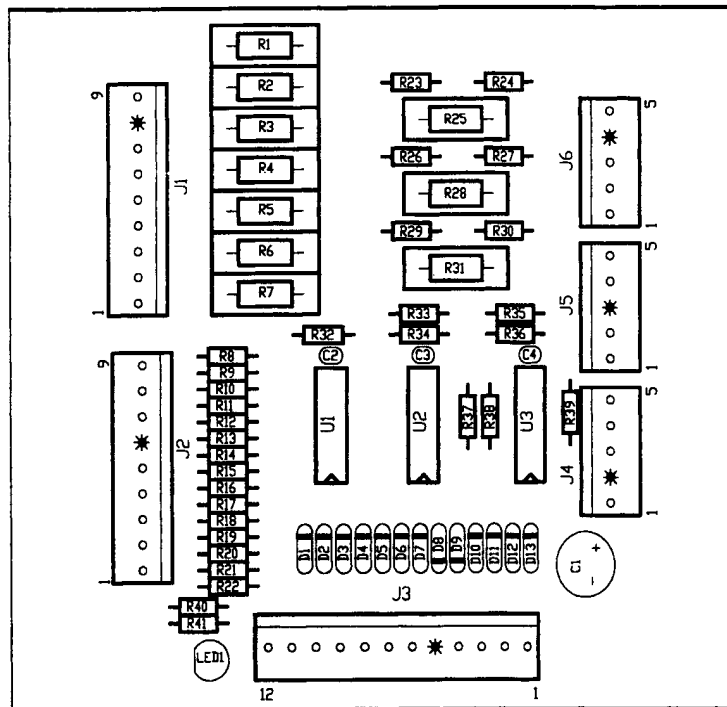
**Designator**  
Q1 – Q5  
J1

**Part Number**  
5163-14114-00  
5791-12622-09

**Description**  
Infra Red Photo Transistor  
Connector, 9-Pin Header Sq.

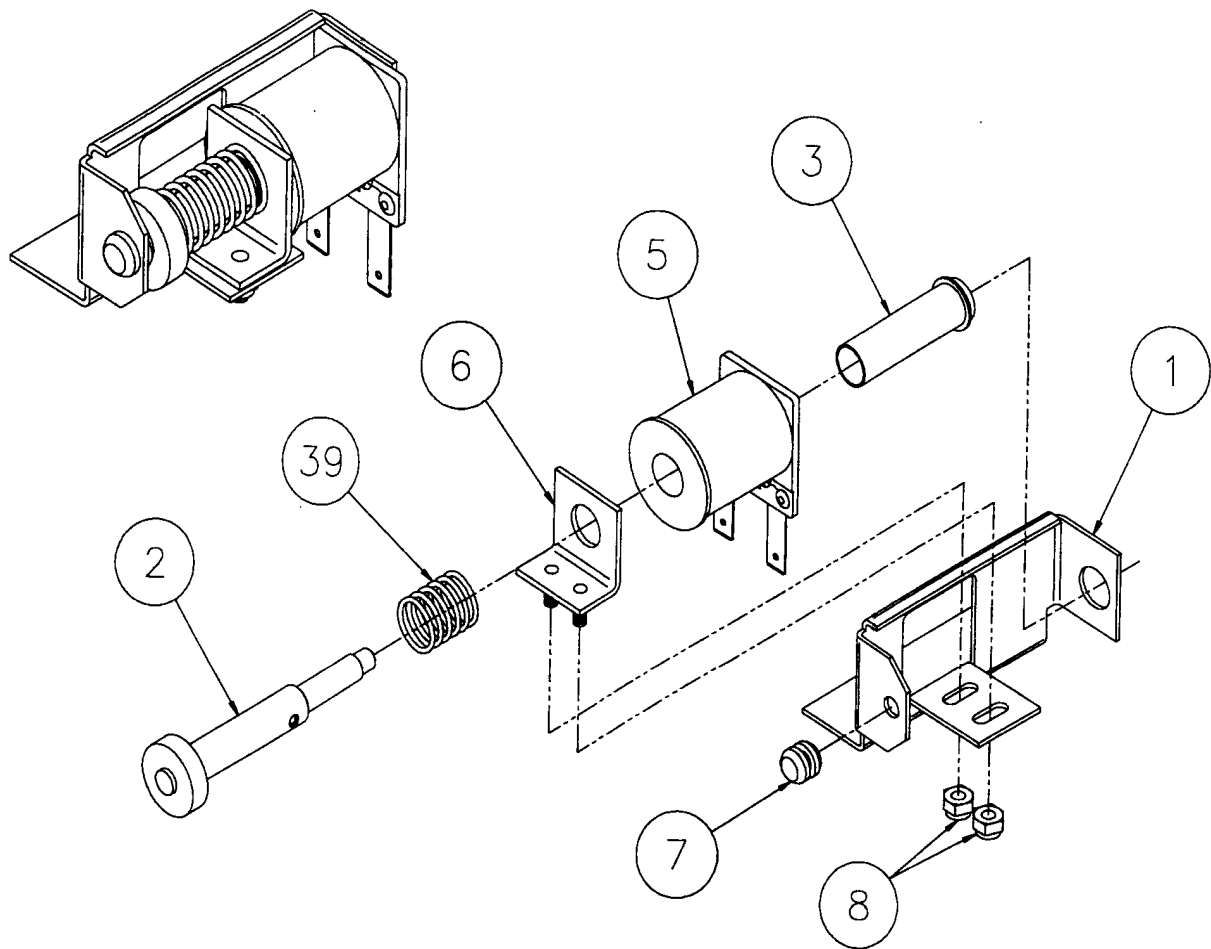
# A-20246

## 10-Opto PCB Assembly w/Bracket



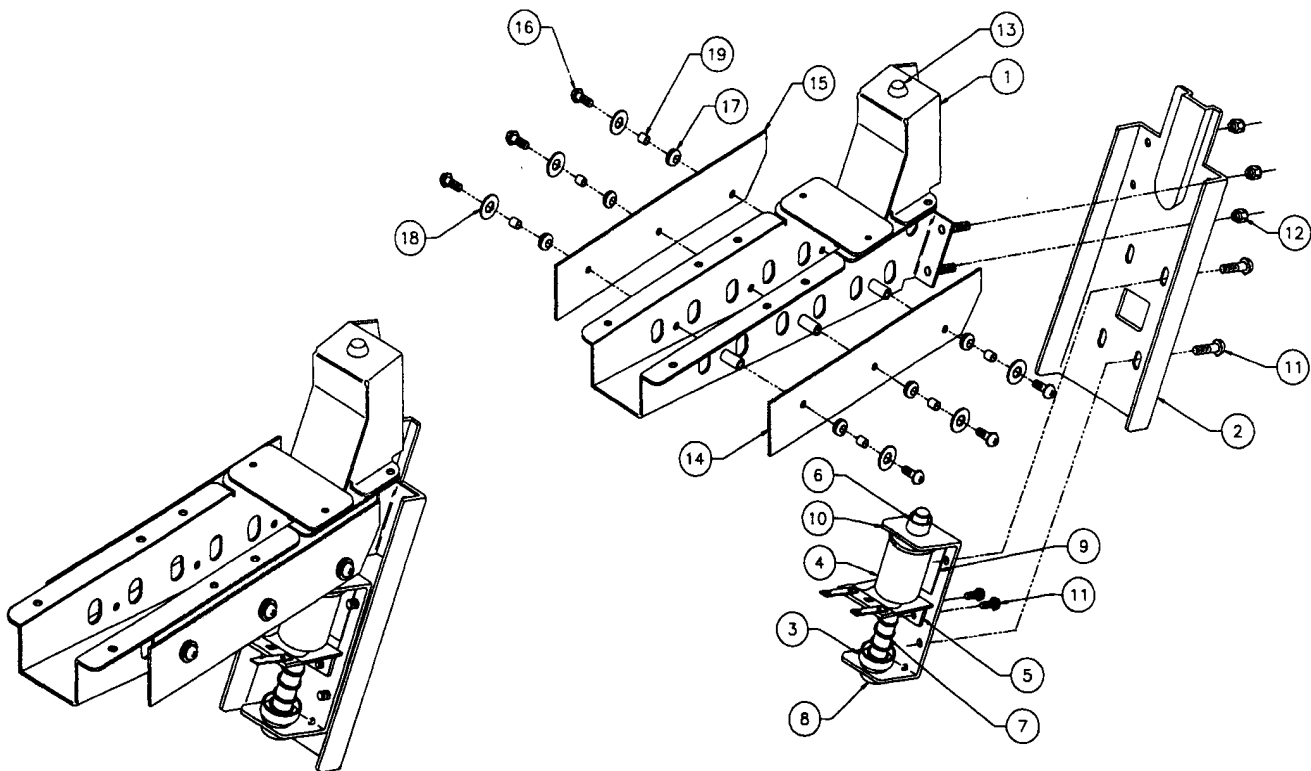
| <b><u>Designator</u></b>   | <b><u>Part Number</u></b> | <b><u>Description</u></b>                     |
|----------------------------|---------------------------|-----------------------------------------------|
|                            | <b>A-18159.1</b>          | 10-Opto PCB Assembly                          |
| C1                         | <b>5040-10974-00</b>      | Capacitor, 100M, 35V radial                   |
| C2-C4                      | <b>5043-08996-00</b>      | Capacitor, 0.1M, 50V $\pm 20\%$ Ax.           |
| D1-D13                     | <b>5070-09054-00</b>      | Diode 1N4004, 1.0A                            |
| J1, J2                     | <b>5791-10862-09</b>      | Connector, 9-Pin Header                       |
| J3                         | <b>5791-10862-12</b>      | Connector, 12-Pin Header                      |
| J4- J6                     | <b>5791-10862-05</b>      | Connector, 5-Pin Header                       |
| LED1                       | <b>5671-13732-00</b>      | LED, Display Red T-1 $\frac{3}{4}$            |
| R1-R7, R28, R31, R50       | <b>5010-12928-00</b>      | Resistor, 270 $\Omega$ , 2W, 5%               |
| R8-R24, R26, R27, R29, R30 | <b>5010-09999-00</b>      | Resistor, 2K $\Omega$ , $\frac{1}{4}$ W, 5%   |
| R32, R35, R39-R41          | <b>5010-09162-00</b>      | Resistor, 100K $\Omega$ , $\frac{1}{4}$ W, 5% |
| R34, R36-R38,              | <b>5010-08774-00</b>      | Resistor, 22K $\Omega$ , $\frac{1}{4}$ W, 5%  |
| R33                        | <b>5010-08776-00</b>      | Resistor, 68K $\Omega$ , $\frac{1}{4}$ W, 5%  |
| U1-U3                      | <b>5370-12272-00</b>      | IC, LM339 Quad Comp                           |
| -                          | <b>01-10756</b>           | PCB Mounting Bracket                          |
| -                          | <b>07-6688-18N</b>        | Rivet, 1/8" x 3/16"                           |

## A-22429-4 Auto-Fire Assembly



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>     |
|-------------|--------------------|------------------------|
| 1           | 01-14618.1         | Auto-Fire Bracket      |
| 2           | A-6306-2           | Plunger                |
| 3           | 03-7067            | Coil Tubing            |
| 4           | 04-10910-1         | Coil Centering Bracket |
| 5           | AE1-23-800         | Coil Assembly          |
| 6           | 10-135             | Spring                 |
| 7           | 23-6420            | Rubber Grommet         |
| 8           | 4408-01119-01      | Nut 8-32 ESN/NTM       |

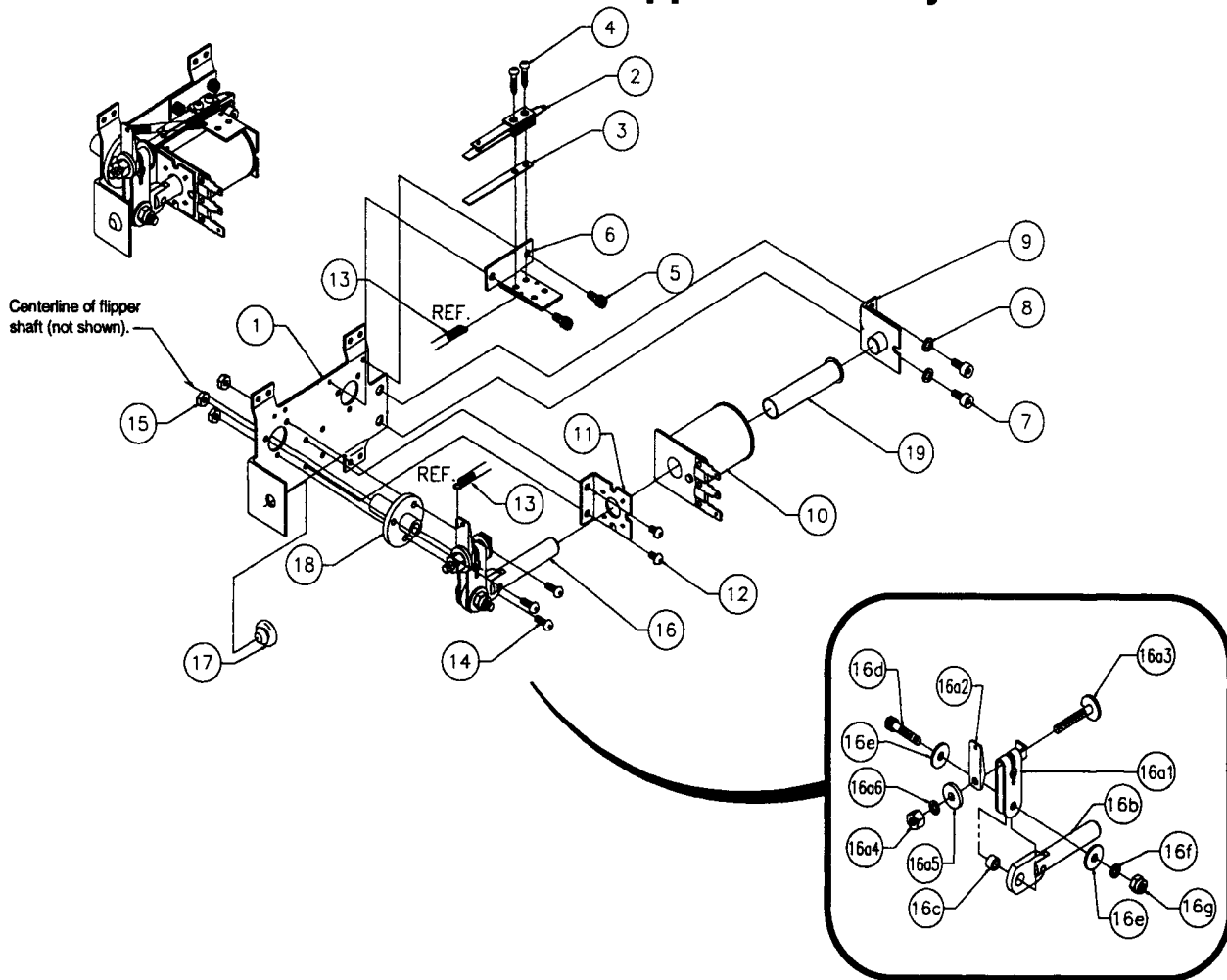
## A-19963-4 Ball Trough Assembly



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>          |
|-------------|--------------------|-----------------------------|
| 1           | A-16809-2          | Ball Trough Welded Assembly |
| 2           | 01-11587           | Ball Trough Front           |
| 3           | A-6306-2           | Bell Armature Assembly      |
| 4           | AE1-26-1500        | Coil                        |
| 5           | 01-8-508-T         | Coil Retainer Bracket       |
| 6           | 03-7067-5          | Coil Tubing                 |
| 7           | 10-135             | Spring                      |
| 8           | 23-6420            | Rubber Grommet              |
| 9           | 03-8523            | Insulator                   |
| 10          | 01-11586           | Coil Mounting Bracket       |
| 11          | 4008-01227-05      | MS 8-32 x 5/16" Pin-Hd-S    |

| <u>Item</u> | <u>Part Number</u> | <u>Description</u>                  |
|-------------|--------------------|-------------------------------------|
| 12          | 4408-01119-00      | Nut 8-32 ESN                        |
| 13          | 23-6702            | Bumper Plug                         |
| 14          | A-18617-1          | Trough IRED LED PCB Assembly        |
| 15          | A-18618-1          | Trough IRED Transistor PCB Assembly |
| 16          | 4006-01003-10      | MS 6-32 x 5/8" P-PH-S               |
| 17          | 23-6626            | Rubber Grommet                      |
| 18          | 4700-00004-00      | FW .146 x .375 x .032               |
| 19          | 02-4975            | Bushing                             |

# A-23004-R-2 Flipper Assembly



| Item   | Part Number   | Description                     | Item   | Part Number   | Description              |
|--------|---------------|---------------------------------|--------|---------------|--------------------------|
| 1      | A-14877.1-R   | Flipper Bracket Assembly, Right | 16a)2. | 01-9376       | Bracket Retaining Spring |
| 2      | SW-1A-194     | Switch Assembly                 | 16a)3. | 04-11222      | Locking Stud             |
| 3      | 03-9878       | Shock Deflector                 | 16a)4. | 4410-01127-00 | Nut 10-32 Hex Heavy Duty |
| 4      | 4006-01003-08 | MS 6-32 x 1/2" P-PH-S           | 16a)5. | 4700-00107-00 | FW .203 x .625 x .104    |
| 5      | 4008-01227-05 | MS 8-32 x 5/16" Pin Hd-SEMS     | 16a)6. | 4701-00004-00 | LW #10 Split             |
| 6      | 01-14998      | Switch Bracket                  | 16b)   | A-15847       | Flipper Link Assembly    |
| 7      | 4010-01066-06 | CS-10-31 x 3/8" SH              | 16c)   | 02-4676       | Bushing -- Link Spacer   |
| 8      | 4701-00004-00 | LW #10 Split                    | 16d)   | 4010-01086-14 | CS 10-32 x 7/8" SH       |
| 9      | A-12390       | Flipper Stop Bracket Assembly   | 16e)   | 4700-00023-00 | FW .203 x .625 x .059    |
| 10     | FL1-11629     | Flipper Coil (Blue)             | 16f)   | 4701-00004-00 | LW #10 Split             |
| 11     | 01-7695-1     | Solenoid Bracket                | 16g)   | 4410-01132-00 | Nut 10-32 ESNA           |
| 12     | 4006-01003-04 | MS 6-32 x 1/4" P-PH-S           | 17     | 23-6577       | Bumper Plug              |
| 13     | 10-364        | Spring                          | 18     | 03-7568       | Flipper Bushing          |
| 14     | 4006-01005-06 | MS 6-32 x 3/8" P-PH             | 19     | 03-7066-5     | Coil Tubing              |
| 15     | 4406-01117-00 | Nut 6-32 Hex                    |        |               |                          |
| 16     | A-23000       | Flipper Crank Link Assembly     |        |               |                          |
| 16a)   | A-22999       | Flipper Crank Assembly          |        |               |                          |
| 16a)1. | 01-11764-R    | Flipper Crank, Right            |        |               |                          |

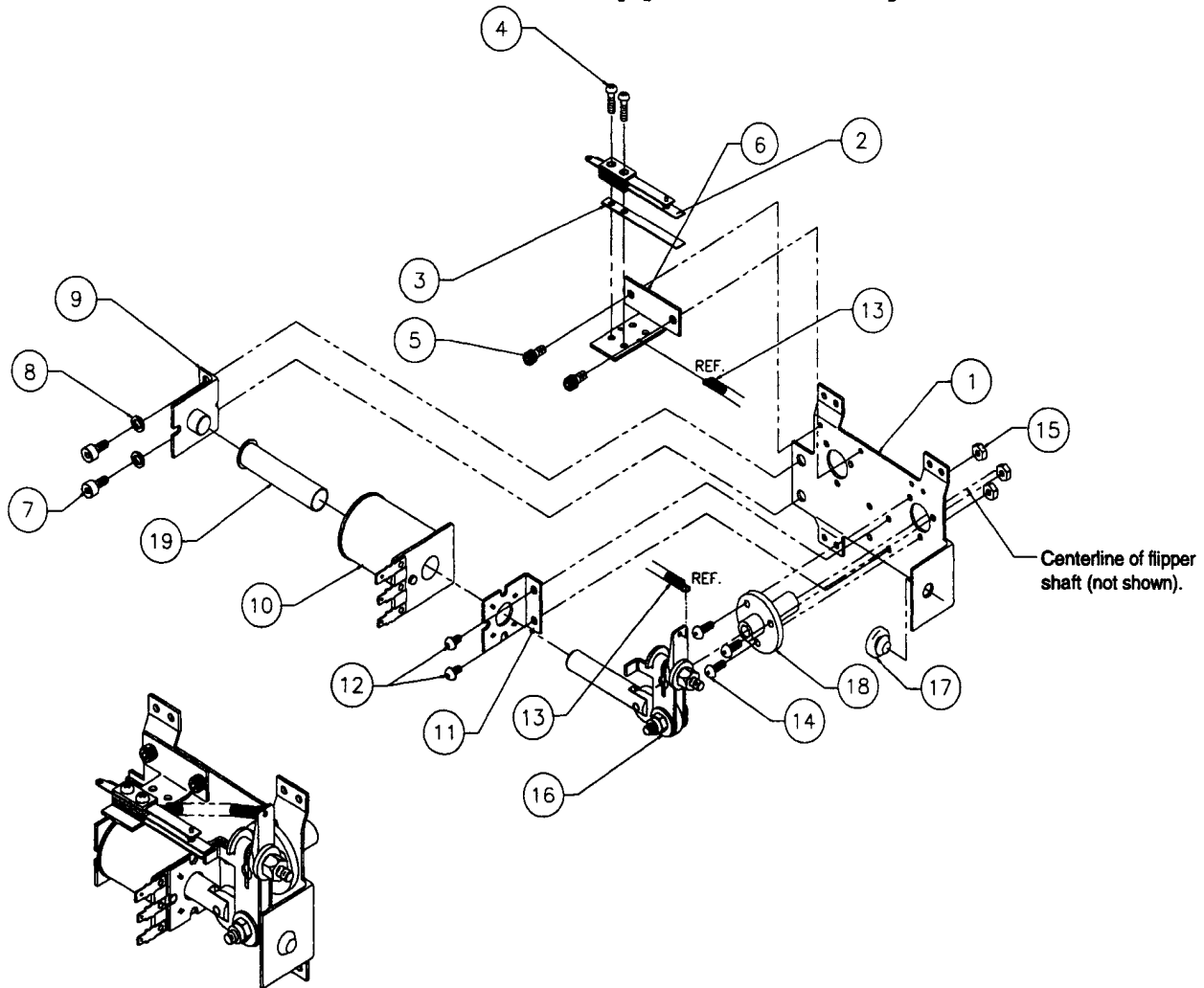
## Associated Parts: (Not Shown)

|            |                     |
|------------|---------------------|
| 23-6695    | Flipper Ring        |
| 20-10110-5 | Flipper Bat w/Shaft |

## Notes...

- Each Flipper Assembly is mounted beneath the playfield, in conjunction with the Plastic Flipper & Shaft, and Flipper Rubber on the upper side of the playfield.
- With the flipper, in the non-activated position, the E.O.S. Switch contacts must have a gap of .062 ( $\pm .015$ ) inch. When flipper is activated switch must close.
- Any adjustment of the E.O.S. switch must be made at a minimum distance of 0.25 inch from the switch body.
- Longer blade of E.O.S. switch must be made straight. Gap adjustment is done by adjusting shorter blade.
- All moving elements of the assembly must operate freely without any evidence of binding.
- Apply Loctite™ 245 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.

## A-23001-L-2 Flipper Assembly



| Item   | Part Number   | Description                     |
|--------|---------------|---------------------------------|
| 1      | B-13104.1-L   | Flipper Bracket Assembly, Right |
| 2      | SW-1A-194     | Switch Assembly                 |
| 3      | 03-9878       | Shock Deflector                 |
| 4      | 4006-01003-08 | MS 6-32 x 1/2" P-PH-S           |
| 5      | 4008-01227-05 | MS 8-32 x 5/16" Pin Hd-SEMS     |
| 6      | 01-14998      | Switch Bracket                  |
| 7      | 4010-01066-06 | CS-10-31 x 3/8" SH              |
| 8      | 4701-00004-00 | LW #10 Split                    |
| 9      | A-12390       | Flipper Stop Bracket Assembly   |
| 10     | FL1-11629     | Flipper Coil (Blue)             |
| 11     | 01-7695-1     | Solenoid Bracket                |
| 12     | 4006-01003-04 | MS 6-32 x 1/4" P-PH-S           |
| 13     | 10-364        | Spring                          |
| 14     | 4006-01005-06 | MS 6-32 x 3/8" P-PH             |
| 15     | 4406-01117-00 | Nut 6-32 Hex                    |
| *16    | A-23000       | Flipper Crank Link Assembly     |
| 16a)   | A-22999       | Flipper Crank Assembly          |
| 16a)1. | 01-11764-R    | Flipper Crank, Right            |

| Item   | Part Number   | Description              |
|--------|---------------|--------------------------|
| 16a)2. | 01-9376       | Bracket Retaining Spring |
| 16a)3. | 04-11222      | Locking Stud             |
| 16a)4. | 4410-01127-00 | Nut 10-32 Hex Heavy Duty |
| 16a)5. | 4700-00107-00 | FW .203 x .625 x .104    |
| 16a)6. | 4701-00004-00 | LW #10 Split             |
| 16b)   | A-15847       | Flipper Link Assembly    |
| 16c)   | 02-4676       | Bushing - Link Spacer    |
| 16d)   | 4010-01086-14 | CS 10-32 x 7/8" SH       |
| 16e)   | 4700-00023-00 | FW .203 x .625 x .059    |
| 16f)   | 4701-00004-00 | LW #10 Split             |
| 16g)   | 4410-01132-00 | Nut 10-32 ESNA           |
| 17     | 23-6577       | Bumper Plug              |
| 18     | 03-7568       | Flipper Bushing          |
| 19     | 03-7066-5     | Coil Tubing              |

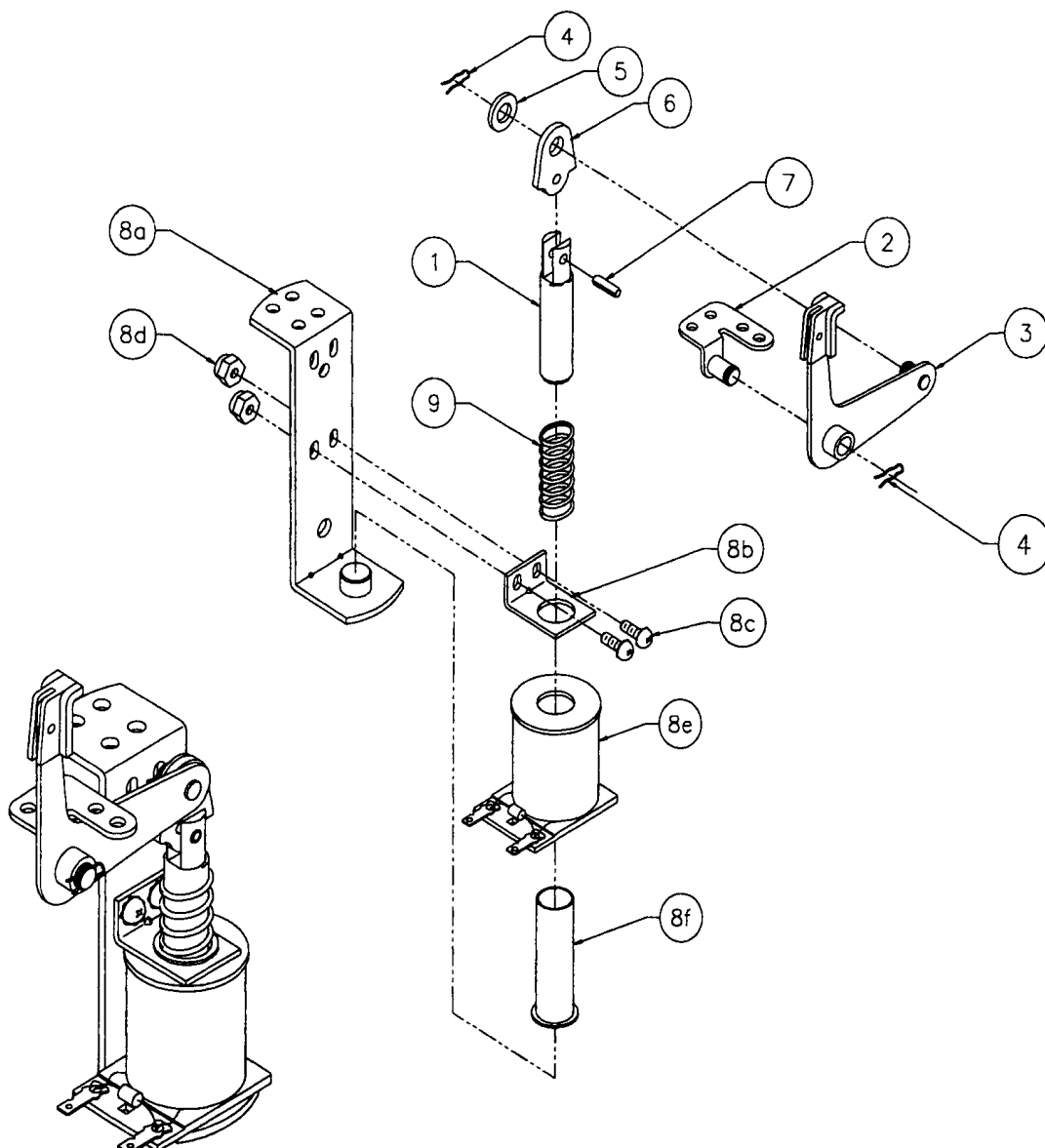
### Associated Parts: (Not Shown)

| Part Number | Description         |
|-------------|---------------------|
| 23-6695     | Flipper Ring        |
| 20-10110-5  | Flipper Bat w/Shaft |

\*See A-23004-R, Flipper Assembly, for assembly detail drawing.

**Note:** Switch Assembly to be attached to the Switch Bracket using the outermost threaded holes on the bracket

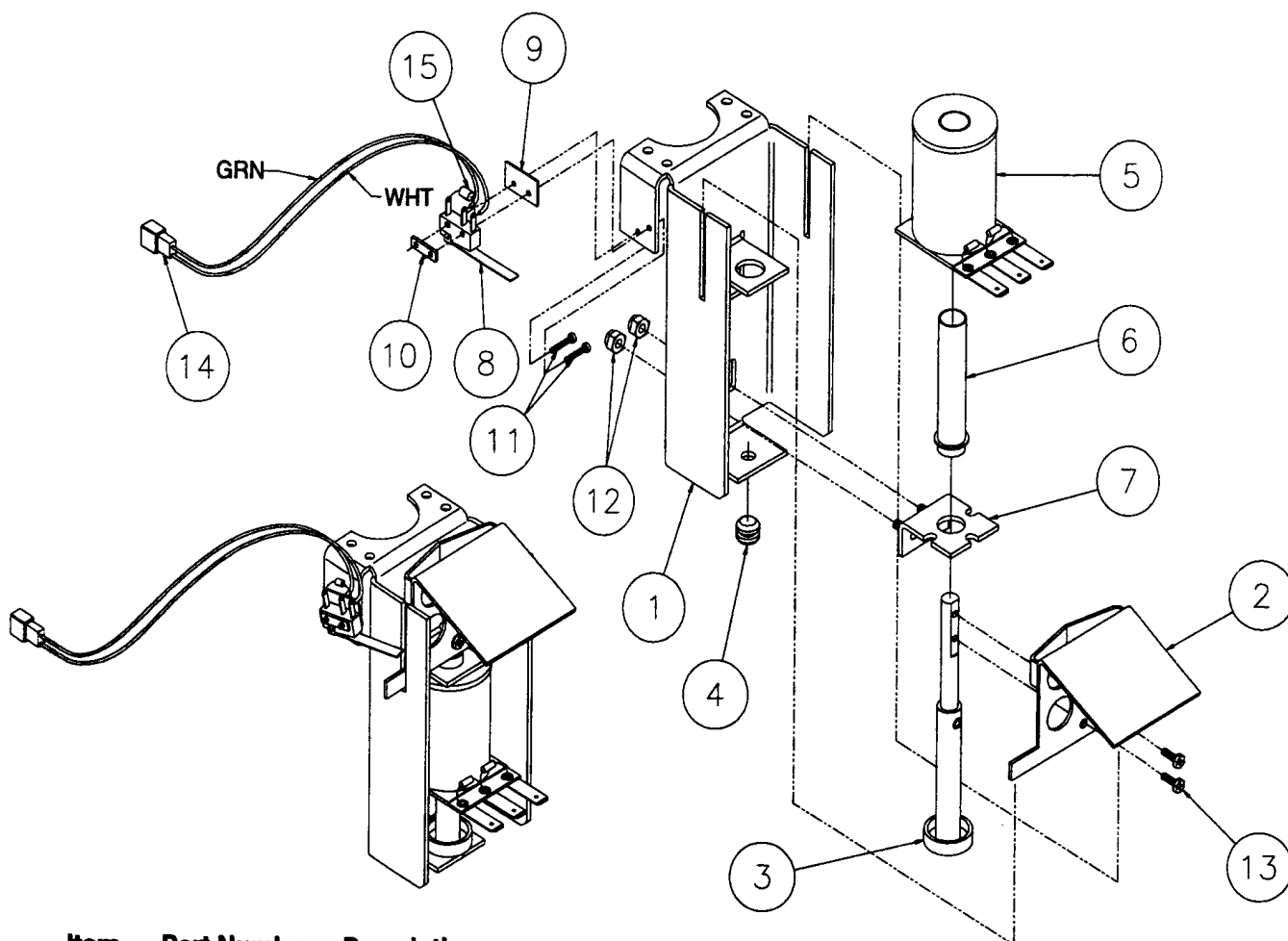
## A-17811 Kicker Assembly



| <u>Item</u> | <u>Part number</u> | <u>Description</u>               |
|-------------|--------------------|----------------------------------|
| 1           | 02-2364            | Coil Plunger                     |
| 2           | A-17810            | Kicker Mounting Bracket Assembly |
| 3           | A-12664            | Crank Assembly                   |
| 4           | 12-6227            | Hair Pin Clip                    |
| 5           | 4700-00030-00      | FW .265 x .500 x .067            |
| 6           | 03-8085            | Armature Link                    |
| 7           | 20-8716-5          | Roll Pin 1/8" x 7/16"            |

| <u>Associated Parts:</u> |                    |                              |
|--------------------------|--------------------|------------------------------|
| <u>Item</u>              | <u>Part number</u> | <u>Description</u>           |
| 8                        | A-22207-6          | Coil & Bracket Assembly-Left |
| 8a)                      | A-17808            | Bracket & Stop Assembly      |
| 8b)                      | 01-8-508-S         | Coil Retainer Bracket        |
| 8c)                      | 4006-01017-06      | MS 6-32 x 3/8" P-RH-S        |
| 8d)                      | 4406-01119-00      | Nut 6-32 ESN                 |
| 8e)                      | AE1-26-1200        | Coil Assembly                |
| 8f)                      | 03-7066            | Coil Tubing                  |
| 9                        | 10-128             | Kicker Spring                |

## A-22989 Skip Ramp Assembly



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>          |
|-------------|--------------------|-----------------------------|
| 1           | 01-15142           | Main Bracket                |
| 2           | 04-12615           | Ramp Bracket                |
| 3           | 04-12616.2         | Skip Ramp Armature Assembly |
| 4           | 23-6420            | Grommet                     |
| 5           | FL1-11753          | Flipper Coil – Yellow       |
| 6           | 03-7067-6          | Coil Tubing                 |
| 7           | 04-10911-1         | Coil Centering Bracket      |
| 8           | 5647-12693-07      | Sub-Mini Micro Switch       |
| 9           | 01-8600            | Insulator                   |
| 10          | 01-8240            | Plate Nut 2-56              |
| 11          | 4002-01105-08      | MS 2-56 x ½ P-PH-S          |
| 12          | 4408-01119-01      | Nut 8-32 ESN/NTM            |
| 13          | 4008-01227-06      | MS 8-32 x 3/8 Pin Hd SEMS   |
| 14          | H-23019-2          | 2 – Pin Cable               |
| 15          | 5070-09054-00      | Diode – 1N4004 1.0A         |

### Associated Parts: (Not Shown)

| <u>Part Number</u> | <u>Description</u>             |
|--------------------|--------------------------------|
| A-22988            | Skip Ramp Flap Assembly        |
| 01-15140           | Flap Assembly Mounting Bracket |

This exploded view diagram illustrates the assembly of a mechanical component. The parts are numbered 1 through 14. The diagram includes the following labels and callouts:

- 1**: Main vertical frame or support structure.
- 2**: Two L-shaped mounting brackets.
- 3**: A long vertical pin or shaft.
- 4**: A coiled spring.
- 5**: A short vertical pin or shaft.
- 6**: A cylindrical component, possibly a motor or actuator.
- 7**: A circular base or flange.
- 8**: A small screw or fastener.
- 9**: A small circular component, possibly a washer or spacer.
- 10**: A small cylindrical component, possibly a bush or spacer.
- 11**: A small bracket or fastener.
- 12**: A small screw or fastener.
- 13**: A small cylindrical component, possibly a bush or spacer.
- 14**: A small connector or plug.

Wiring is shown with color-coded labels:

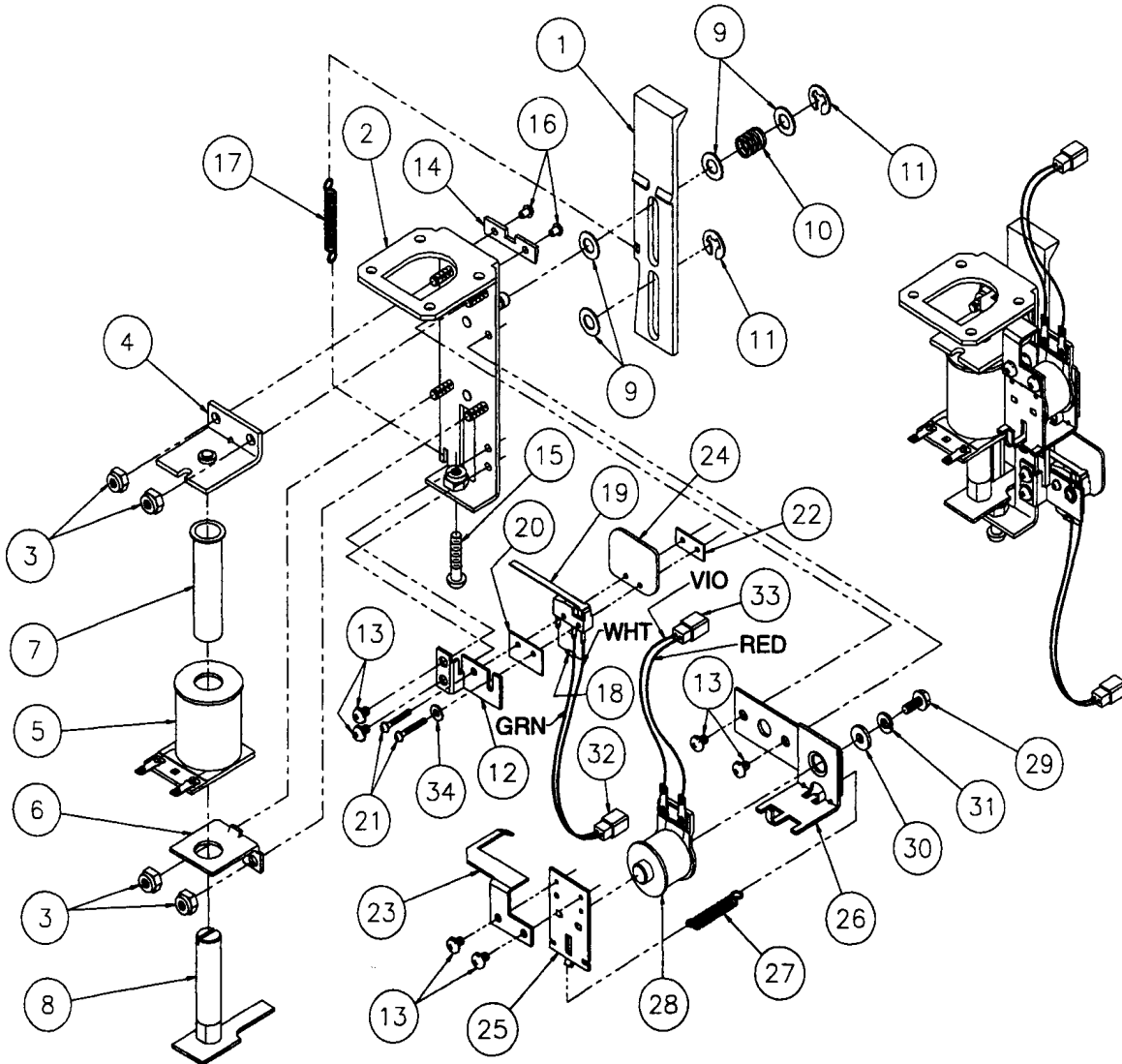
- BLK**: Black wire.
- GRY**: Gray wire.
- GRY/YEL**: Gray/Yellow wire.
- ORG**: Orange wire.

The diagram shows the assembly sequence, with parts 2, 6, 5, 7, 4, 3, 10, 9, 11, 12, 8, and 14 being assembled onto the main frame 1. The wiring is connected to the frame and the various components.

2-18

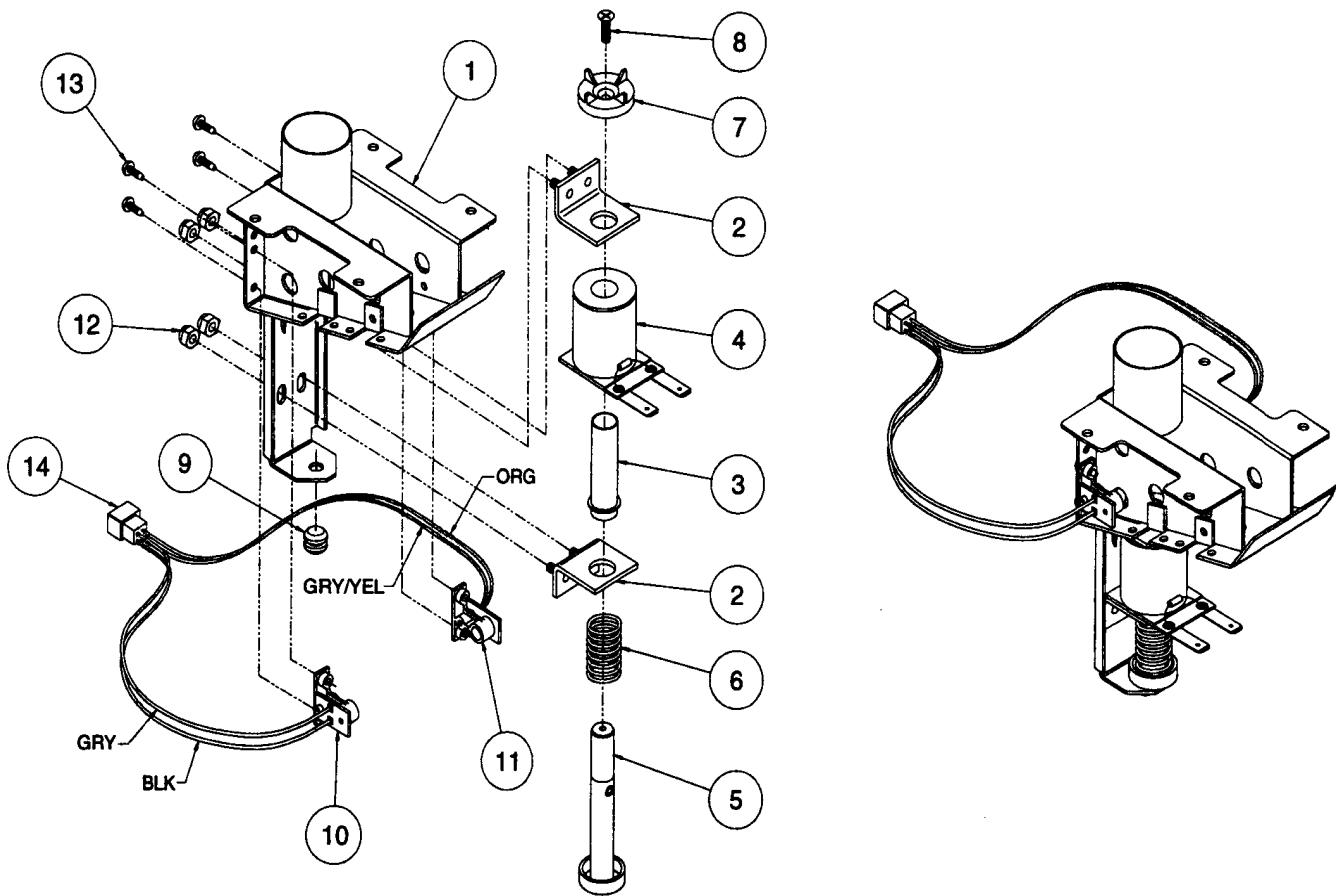
# A-15211-1

## 1 Bank Drop Target Assembly



| Item | Part Number   | Description                    | Item | Part Number   | Description                 |
|------|---------------|--------------------------------|------|---------------|-----------------------------|
| 1    | 03-8750       | Flush Target                   | 18   | 5070-09054-00 | Diode 1N4004 1.0A           |
| 2    | A-14617       | Bracket & Post Assembly        | 19   | 5647-12693-31 | Sub Mini Micro Switch       |
| 3    | 4408-01119-01 | Nut 8-32 ESNA-NTM              | 20   | 01-8600       | Insulator                   |
| 4    | A-11397       | Drop Target Stop Bracket       | 21   | 4002-01105-10 | MS 2-56 x 5/8" P-PH-S       |
| 5    | AE1-26-1200   | Coil Assembly                  | 22   | 01-8240       | Plate Nut 2-56              |
| 6    | 01-8413       | Coil Mounting Bracket          | 23   | 01-8647-R     | Actuator                    |
| 7    | 03-7066-4     | Coil Tubing                    | 24   | 03-8630       | Actuator Guide              |
| 8    | A-11388-2     | Plunger & Reset Plate Assembly | 25   | A-15821       | Armature Assembly           |
| 9    | 4700-00072-00 | FW .256 x .500 x .032          | 26   | A-15209       | Frame & Eyelet Assembly     |
| 10   | 10-392        | Compression Spring             | 27   | 10-363        | Extension Spring            |
| 11   | 20-8712-25    | E Ring - 1/4" Shaft            | 28   | SM1-26-600    | Coil Assembly               |
| 12   | 01-10183      | Switch Bracket                 | 29   | 4008-01021-06 | MS 8-32 x 3/8" P-RH Brass   |
| 13   | 4006-01003-03 | MS 6-32 x 3/16" P-PH-S         | 30   | 4700-00089-00 | FW .172 x .437 x .062 Brass |
| 14   | 03-8034       | Single Target Stop             | 31   | 4701-00003-00 | LW #8 Split                 |
| 15   | 4010-01025-14 | MS 10-32 x 7/8" P-RH           | 32   | H-23019-2     | Switch 2 Pin Cable          |
| 16   | 07-6688-17N   | Rivet 5/32" x 1/8" Nickel      | 33   | H-19523       | Solenoid 2 Pin Cable        |
| 17   | 10-433        | Extension Spring               | 34   | 4700-00003-00 | FW .125 x .281 x .032       |

## A-20680-1 3 Ball Popper Assembly

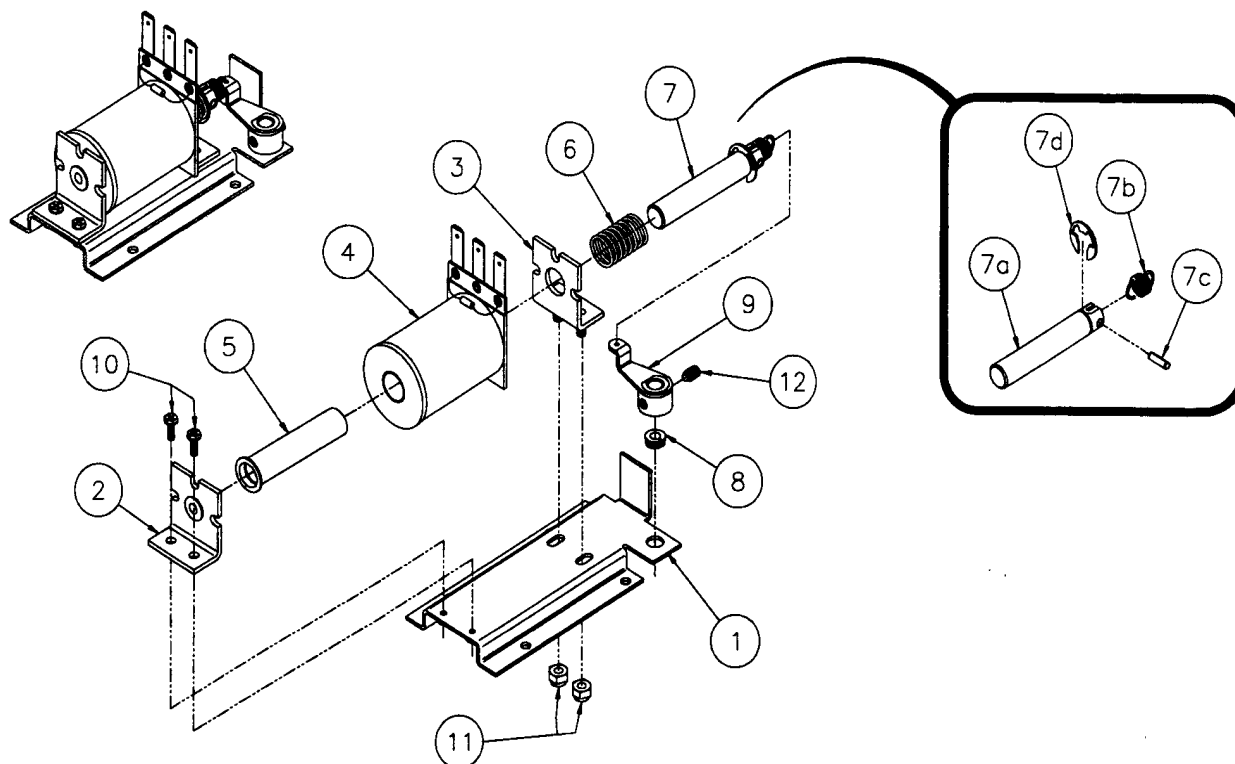


| <u>Item</u> | <u>Part Number</u> | <u>Description</u>            |
|-------------|--------------------|-------------------------------|
| 1           | 04-10323           | 3 Ball Popper Frame           |
| 2           | 04-10322-2         | Coil Bracket                  |
| 3           | 03-7067            | Coil Tubing                   |
| 4           | AE1-23-800         | Coil Assembly                 |
| 5           | 04-10291           | Armature & Extension Assembly |
| 6           | 10-135             | Plunger Spring                |
| 7           | 03-8561            | Ball Popper Cup               |
| 8           | 4106-01152-08      | SMS 6-32 x 1/2" TFP-FLH       |
| 9           | 23-6420            | Grommet                       |
| 10          | A-16908            | OPTO LED Assembly             |
| 11          | A-16909            | OPTO P/T Assembly             |
| 12          | 4408-01119-01      | Nut 8-32 ESN/NTM              |
| 13          | 4106-01013-06      | SMS 6-32 x 3/8 P-PH T-25      |
| 14          | H-23022-5          | 4-Pin Cable                   |

### Associated Parts: (Not Shown)

| <u>Part Number</u> | <u>Description</u> |
|--------------------|--------------------|
| 04-12598           | Popper Hood        |

## A-22993 Diverter Mechanism Assembly

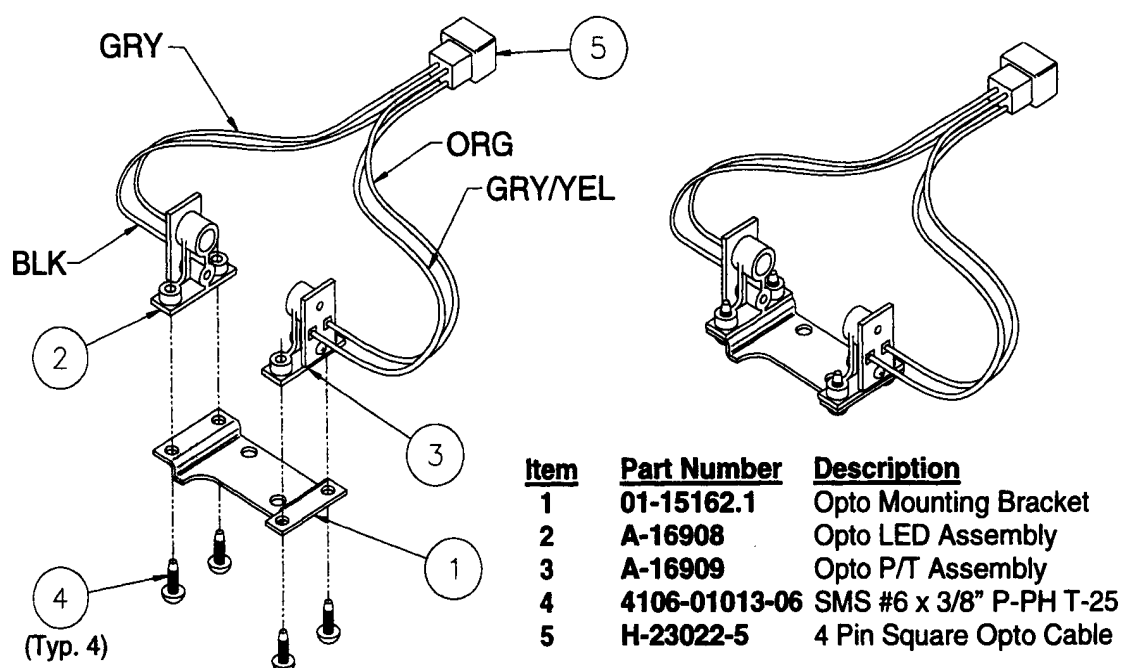


| <u>Item</u> | <u>Part Number</u> | <u>Description</u>        |
|-------------|--------------------|---------------------------|
| 1           | 04-12619           | Diverter Mech Bracket     |
| 2           | 04-10911-6         | ¾ Coil Centering Bracket  |
| 3           | 04-10911-1         | ¾ Coil Centering Bracket  |
| 4           | FL1-22241          | Flipper Coil              |
| 5           | 03-7066-5          | Coil Tubing               |
| 6           | 10-303             | Master Spring             |
| 7           | A-16636            | Diverter Plunger Assembly |
| 7a          | 02-4793            | Diverter Plunger          |
| 7b          | 10-389             | Gate Spring               |
| 7c          | 20-8716-5          | Roll Pin, Ø1/8" x 7/16"   |
| 7d          | 20-8712-43         | E-ring, Ø7/16" Shaft      |
| 8           | 20-8790            | Nyliner Bearing           |
| 9           | 04-10408           | Drive Arm Assembly        |
| 10          | 4008-01227-06      | MS 8-32 x 3/8 PIN HD - S  |
| 11          | 4408-01119-01      | Nut 8-32 ESNA - NTM       |
| 12          | 4010-01196-04      | SS 10-32 x ¼ SH - CP - N  |

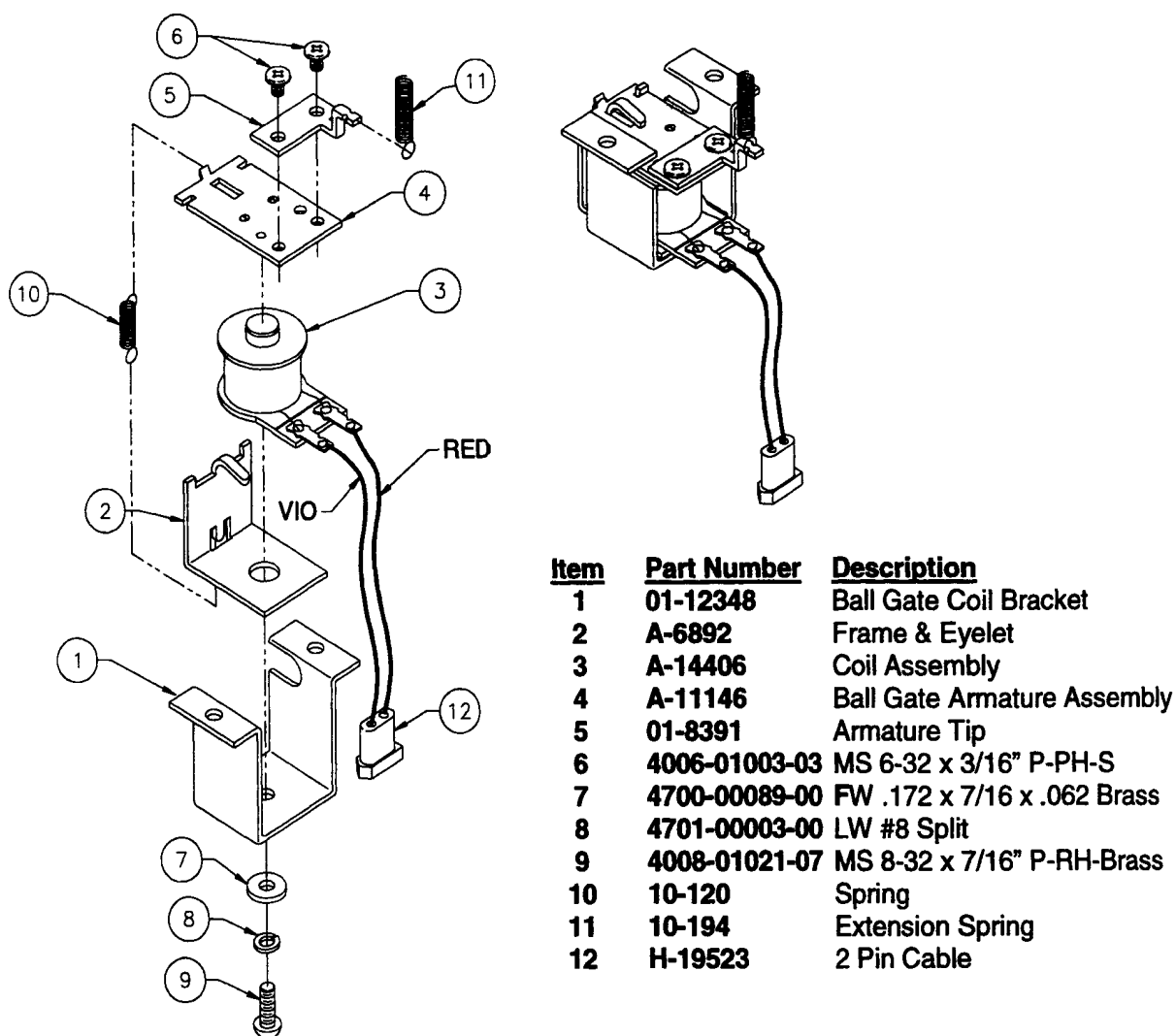
### Associated Parts: (Not Shown)

| <u>Part Number</u> | <u>Description</u>       |
|--------------------|--------------------------|
| A-22970            | Diverter Paddle Assembly |

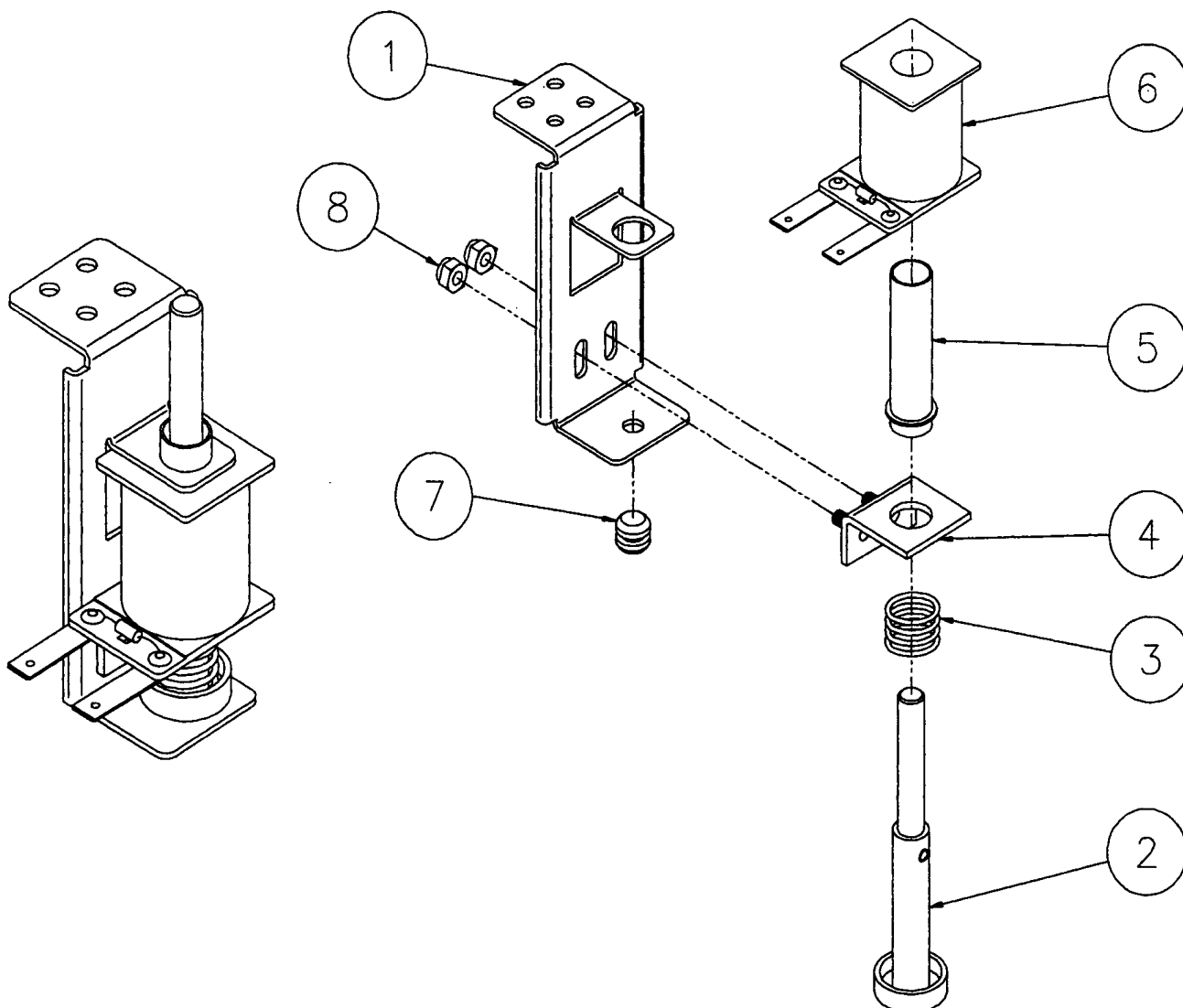
## A-23012 Opto Bracket Assembly



## A-17796 Ball Gate Actuator Assembly

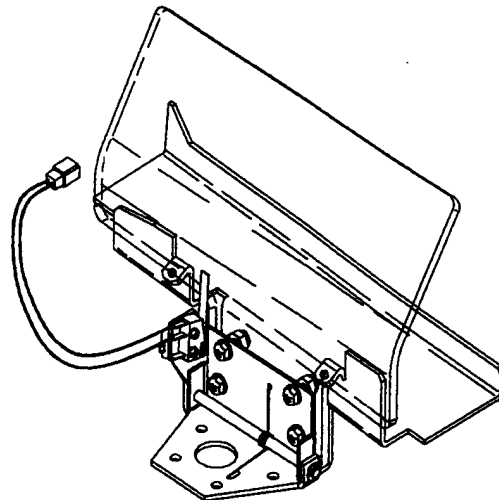
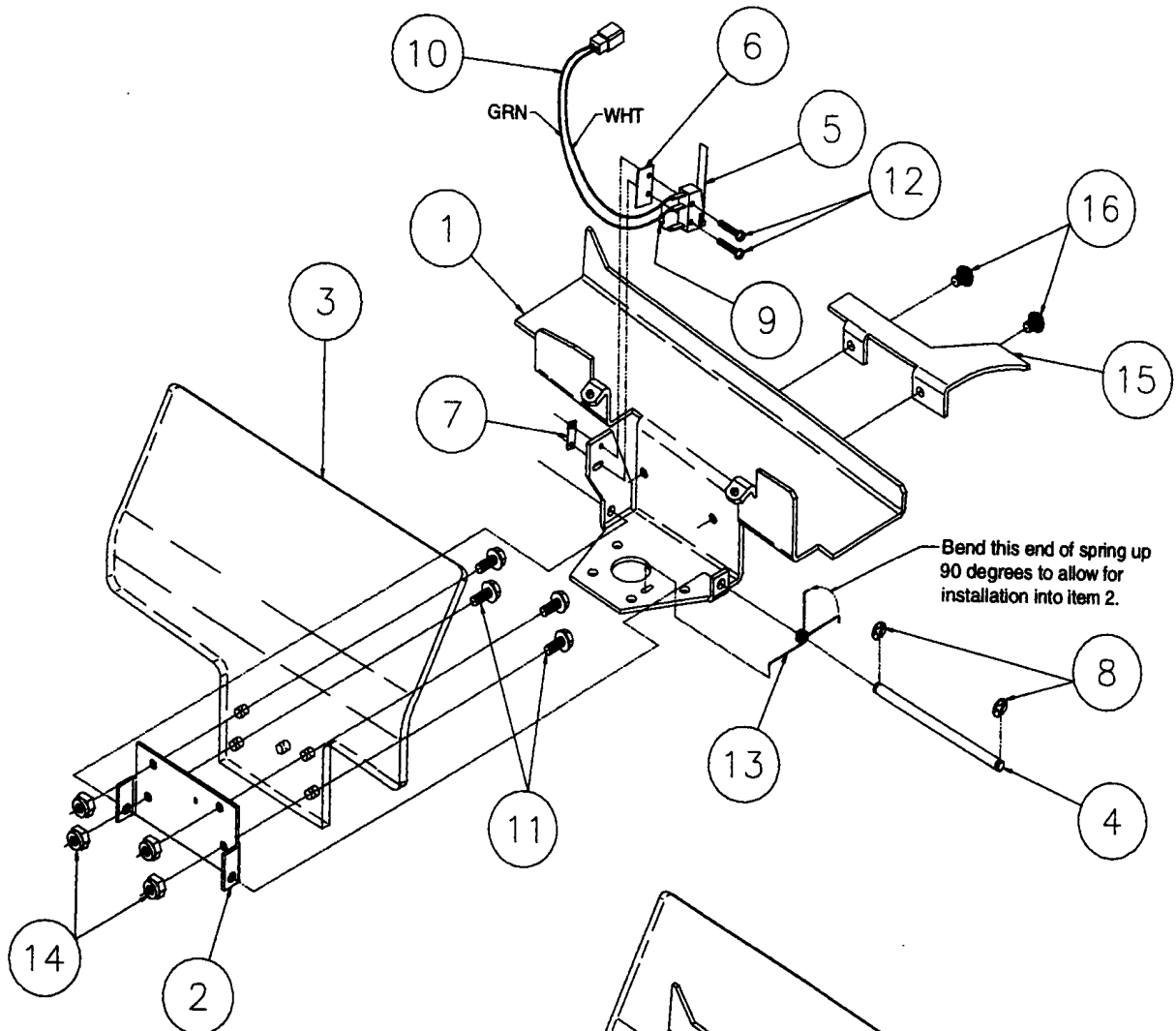


## A-22977 Up/Down Post Assembly



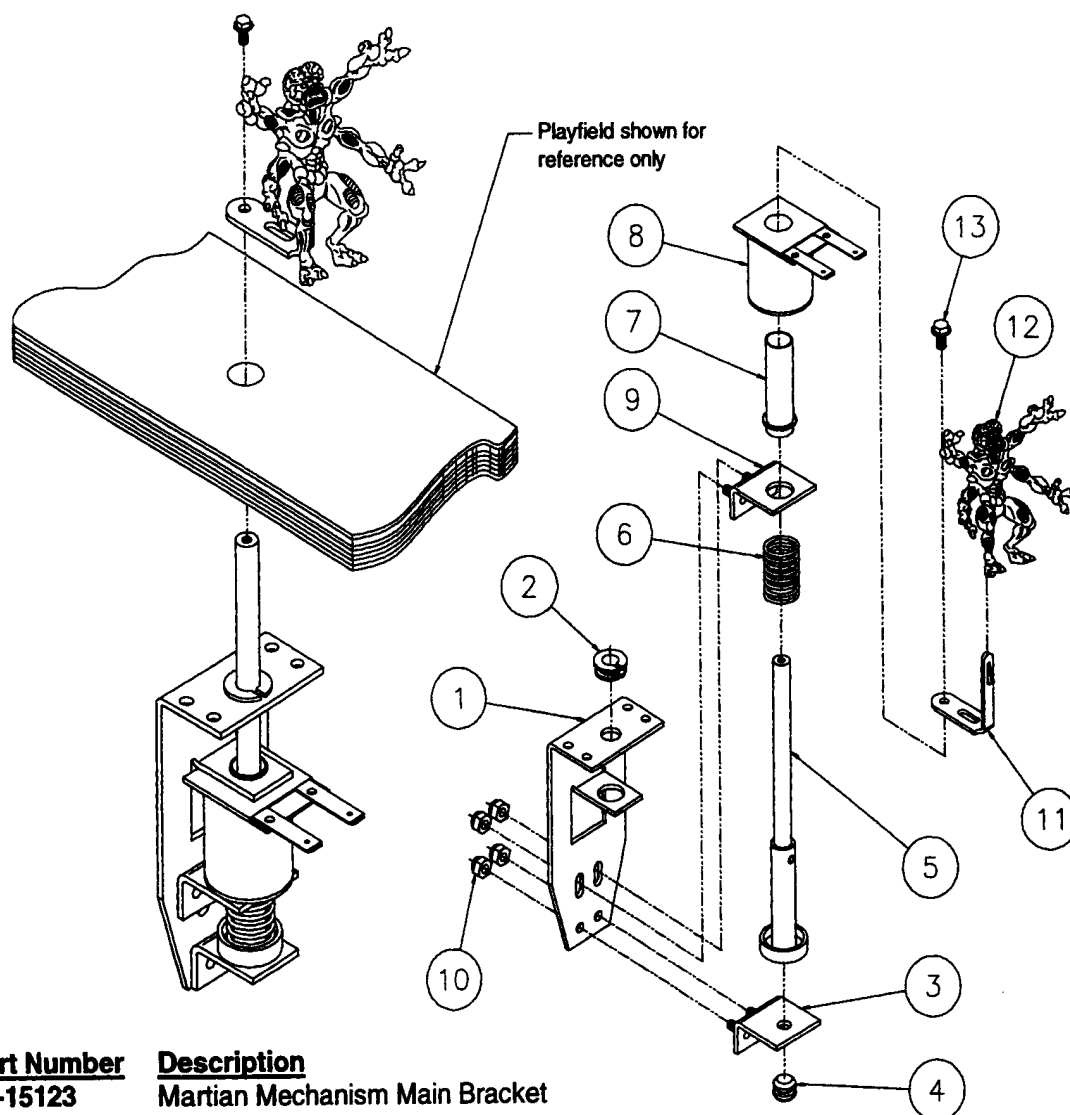
| <u>Item</u> | <u>Part Number</u> | <u>Description</u>            |
|-------------|--------------------|-------------------------------|
| 1           | 01-15122           | Up/Down Post Assembly Bracket |
| 2           | A-17986            | Bell Armature Assembly        |
| 3           | 10-135             | Plunger Spring                |
| 4           | 04-10910-1         | Coil Centering Bracket        |
| 5           | 03-7067-5          | Coil Tubing                   |
| 6           | AE1-26-1500        | Coil                          |
| 7           | 23-6420            | Grommet                       |
| 8           | 4408-01119-01      | Nut 8-32 ESN/NTM              |

## A-22992 Ball Catcher Assembly



| <u>Item</u> | <u>Part number</u> | <u>Description</u>                  |
|-------------|--------------------|-------------------------------------|
| 1           | 01-15193.2         | Ball Catcher Main Bracket           |
| 2           | 01-15194           | Backstop mounting Bracket           |
| 3           | 03-10008           | Ball Catcher Backstop               |
| 4           | 02-5476            | Ball Catcher Shaft                  |
| 5           | 5647-12693-11      | Sub Mini Micro Switch               |
| 6           | 01-8600            | Insulator                           |
| 7           | 01-8240            | Plate Nut 2-56                      |
| 8           | 20-8712-18         | E-Ring 3/16" Shaft                  |
| 9           | 5070-09054-00      | Diode 1N4004 1.0A                   |
| 10          | H-23019-8          | 2 Pin Cable                         |
| 11          | 4008-01220-08      | MS 8-32 x 1/2" Pin Hd               |
| 12          | 4002-01105-08      | MS 2-56 x 1/2" P-PH-S               |
| 13          | 10-562.1           | Ball Catcher Spring                 |
| 14          | 4408-01119-01      | Nut 8-32 ESNA/NTM                   |
| 15          | 01-15204.2         | Ball Catcher Anti Ball Trap Bracket |
| 16          | 4008-01227-04      | MS 8-32 x 1/4" Pin Hd-SEMS          |

## A-22960 Martian Mechanism Assembly

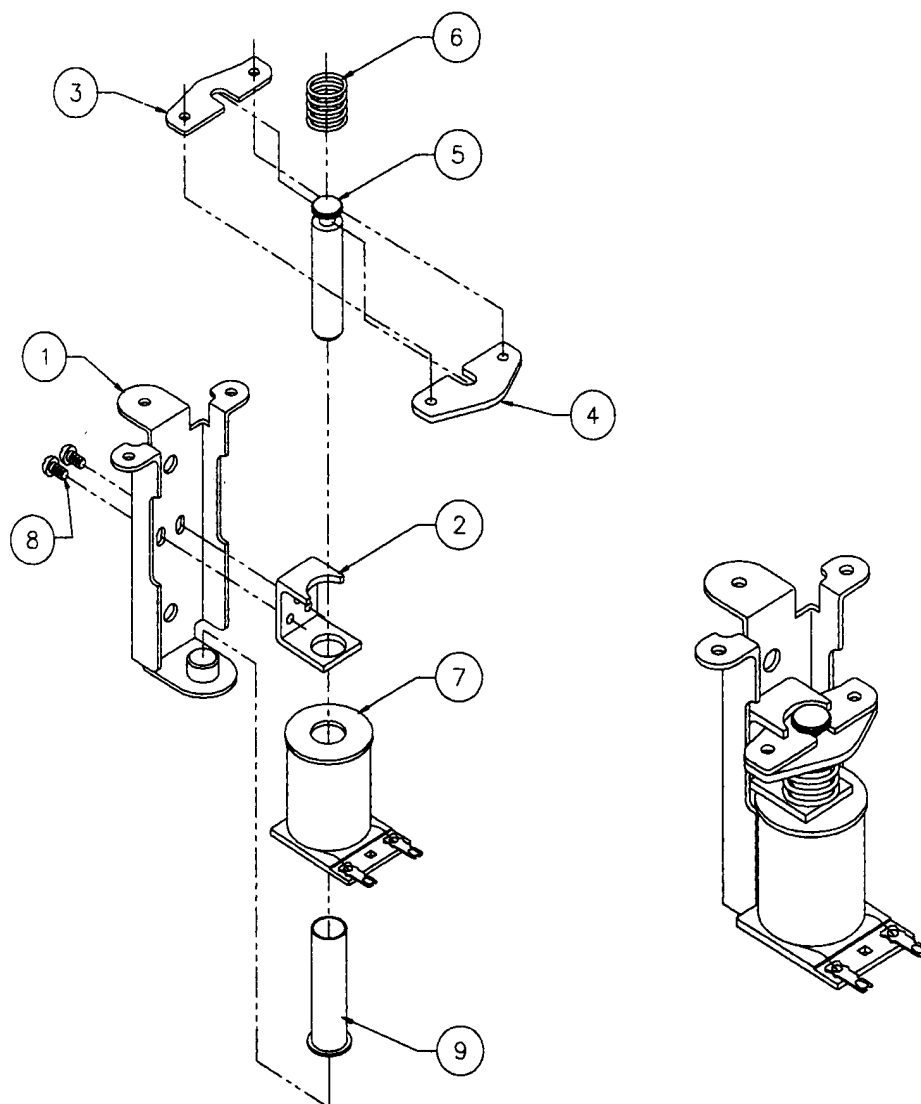


| <u>Item</u> | <u>Part Number</u> | <u>Description</u>             |
|-------------|--------------------|--------------------------------|
| 1           | 01-15123           | Martian Mechanism Main Bracket |
| 2           | 20-8790-2          | Nyliner Bearing                |
| 3           | 04-10910-7         | Coil Centering Bracket         |
| 4           | 23-6420            | Rubber Grommet                 |
| 5           | 04-12595.2         | Martian Plunger Assembly       |
| 6           | 10-135             | Plunger Spring                 |
| 7           | 03-7067            | Coil Tubing                    |
| 8           | AE1-26-1500        | Coil                           |
| 9           | 04-10910-1         | Coil Centering Bracket         |
| 10          | 4408-01119-01      | Nut 8-32 ESNA-NTM              |

### Associated Parts:

| <u>Item</u> | <u>Part Number</u> | <u>Description</u>         |
|-------------|--------------------|----------------------------|
| 11          | 01-15124           | Martian Retaining Bracket  |
| 12          | 23-6768            | Martian Figurine           |
| 13          | 4008-01168-06      | Machine Screw, 8-32 x 3/8" |

## A-22205-4 Jet Coil & Bracket Assembly



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>        |
|-------------|--------------------|---------------------------|
| 1           | 04-10888           | Bracket and Stop Assembly |
| 2           | 01-1747            | Coil Retainer Bracket     |
| 3           | 01-5492            | Armature Link (Steel)     |
| 4           | 01-5493            | Armature Link (Bakelite)  |
| 5           | 02-3406-1          | Coil Plunger              |
| 6           | 10-326             | Jet Bumper Spring         |
| 7           | AE1-26-1200        | Coil Assembly             |
| 8           | 4006-01017-04      | MS 6-32 x 1/4" P-RH-S     |
| 9           | 03-7066            | Coil Tubing               |

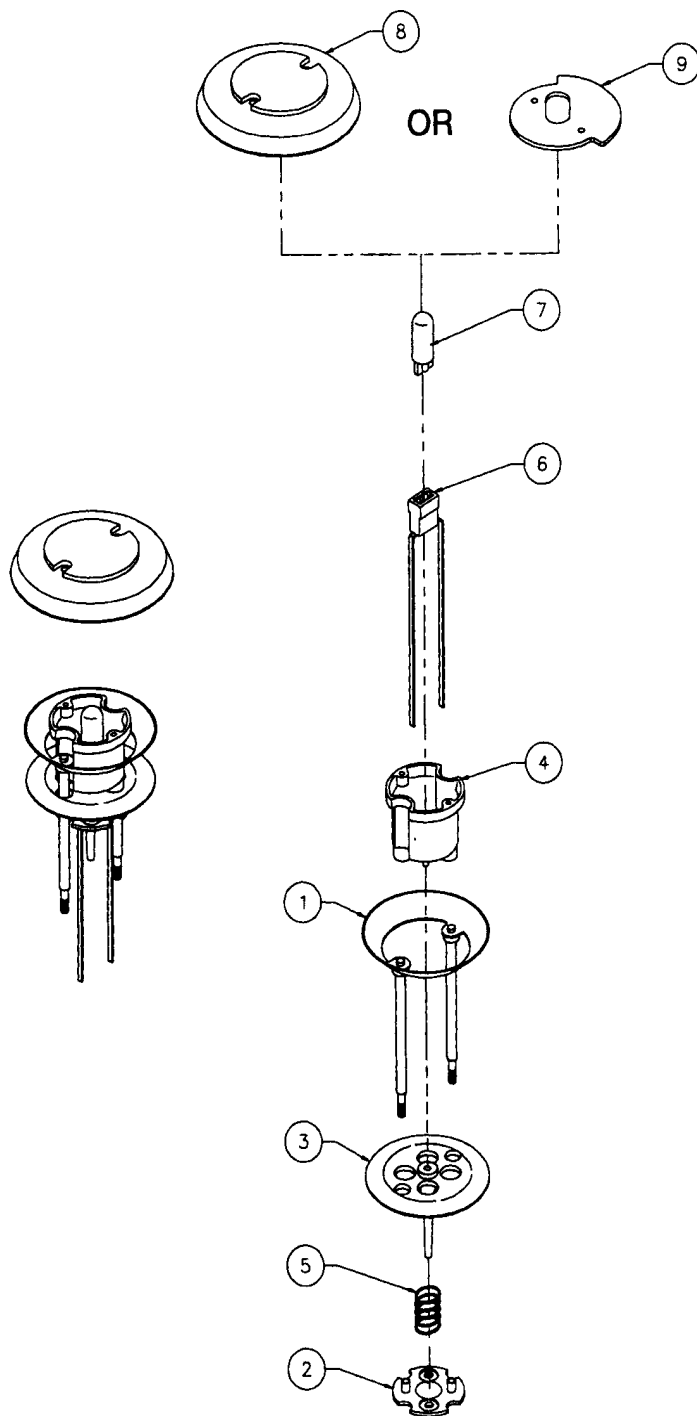
### Associated Parts: (Not Shown)

| <u>Item</u> | <u>Part Number</u> | <u>Description</u>                   |
|-------------|--------------------|--------------------------------------|
| 10          | A-12030-3          | Jet Bumper Leaf Switch Assembly      |
| 10a)        | A-16443-1          | Jet Bumper Switch and Diode Assembly |
| 10b)        | 01-1168            | Bumper Switch Mounting Bracket       |
| 10c)        | 01-3670            | Curved Switch Plate                  |
| 10d)        | 03-7395            | Switch Actuator                      |
| 10e)        | 4005-01003-12      | MS 5-40 x 3/4" P-PHS                 |
| 10f)        | 4405-01117-00      | Nut 5-40 Hex                         |

## B-9414-6

### Jet Bumper Assembly

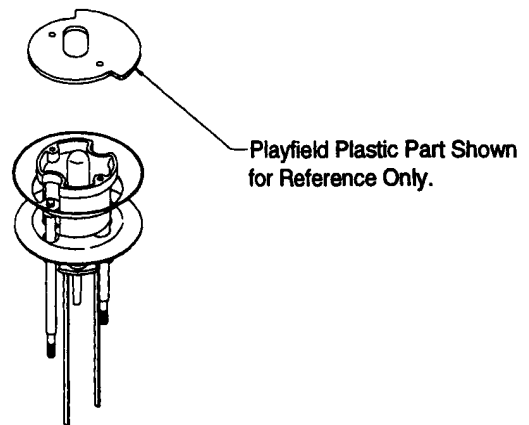
(Two B-9414-6 assemblies required. One to be used in conjunction with associated part number 03-8254-9, item 8, and the other to be used with item 9, part number 31-3437-24.)



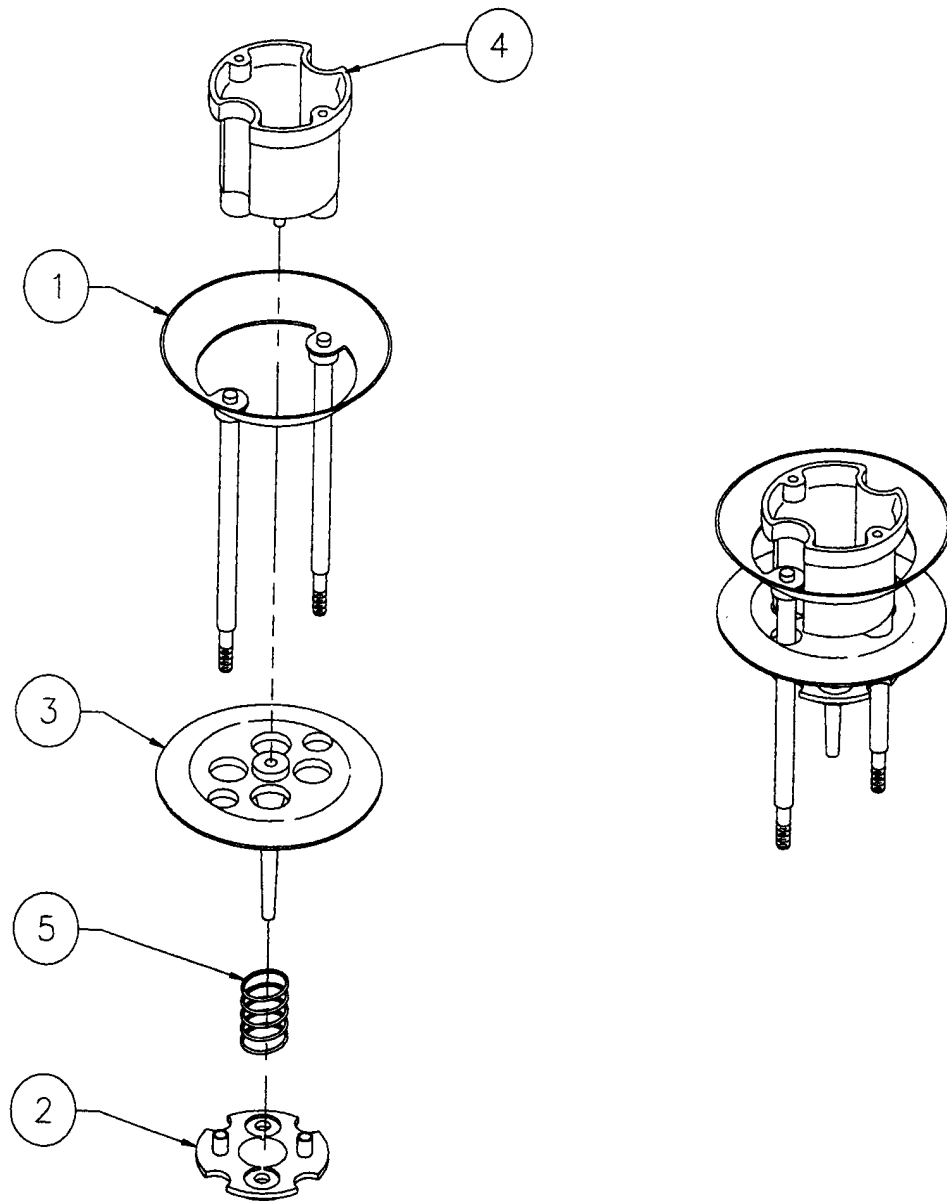
| Item | Part Number | Description             |
|------|-------------|-------------------------|
| 1    | A-4754      | Bumper Ring Assembly    |
| 2    | 03-6009-A5  | Bumper Base             |
| 3    | 03-6035-7   | Bumper Wafer – Black    |
| 4    | 03-7443-5   | Bumper Body             |
| 5   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

#### Associated Parts

| Item | Part Number | Description                   |
|------|-------------|-------------------------------|
| 8    | 03-8254-9   | Jet Bumper Cap, Red           |
| 9    | 31-3437-24  | Playfield Plastic (Ref. Only) |

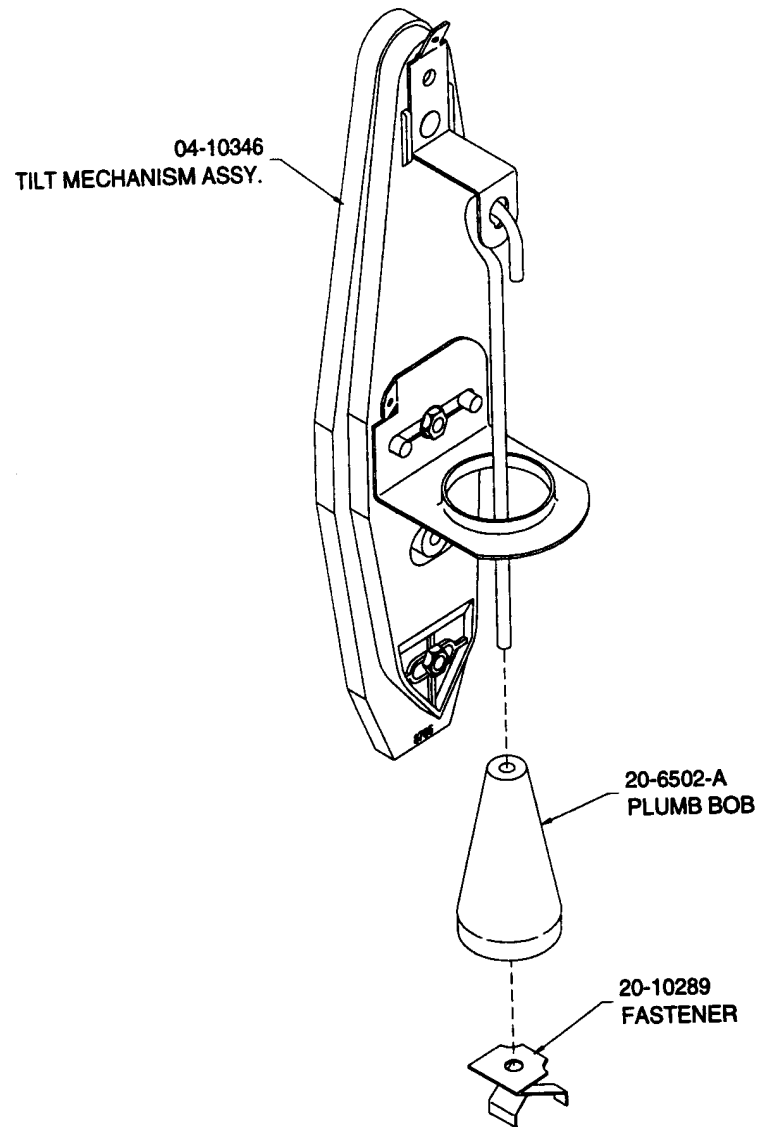


## B-13123-2 Jet Bumper Assembly

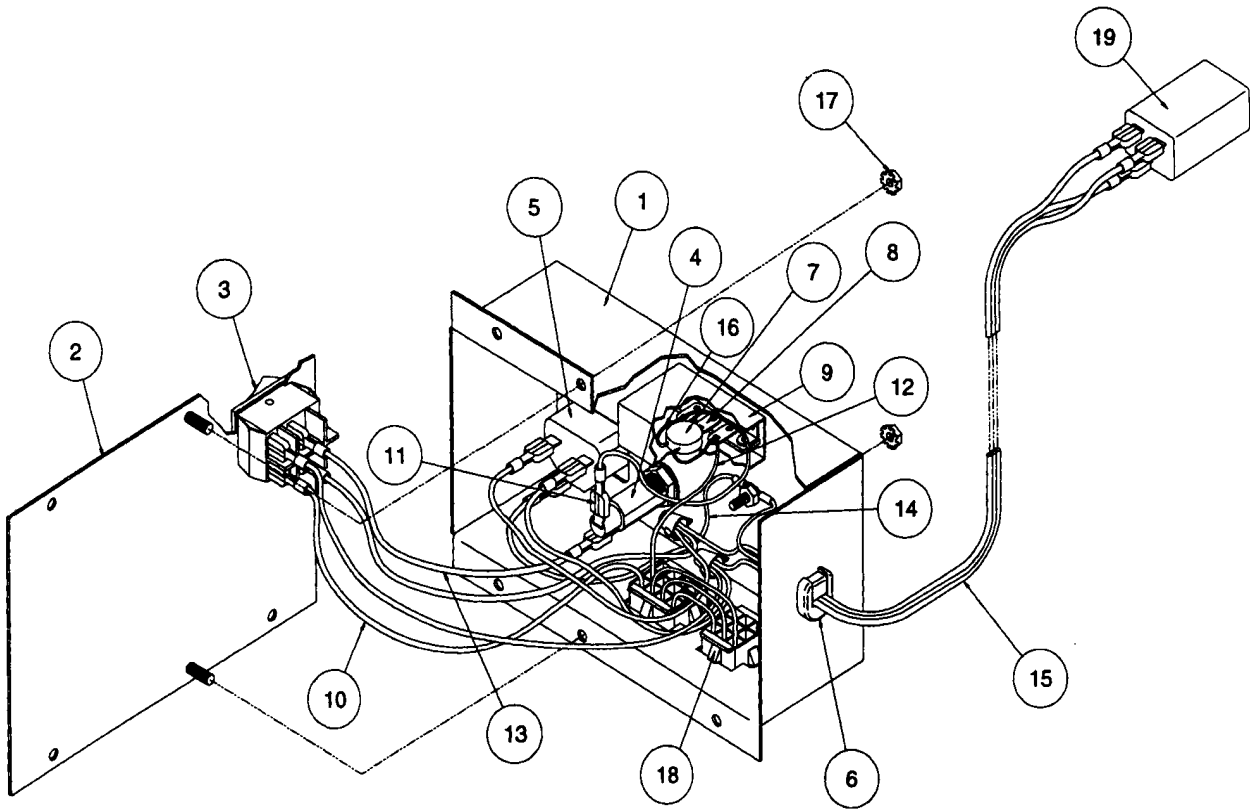


| <u>Item</u> | <u>Part Number</u> | <u>Description</u>   |
|-------------|--------------------|----------------------|
| 1           | A-4754             | Bumper Ring Assembly |
| 2           | 03-6009-A5         | Bumper Base          |
| 3           | 03-6035-7          | Bumper Wafer – Black |
|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

# 04-10346.1 Tilt Mechanism Assembly



## A-22966 Power Control Box Assembly



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>                   | <u>Item</u> | <u>Part Number</u> | <u>Description</u>                  |
|-------------|--------------------|--------------------------------------|-------------|--------------------|-------------------------------------|
| 1           | 01-15126           | Power Control Box                    | 11          | H-17543            | Jumper, Hot Cable                   |
| 2           | 04-12597           | Switch Mounting Plate                | 12          | H-23014            | Jumper, Hot Interface               |
| 3           | 5642-13935-00      | Rocker Switch - DPST                 | 13          | H-17545            | Jumper, SW/Fuse Cable               |
| 4           | 5733-14734-00      | Fuse Holder, 5 x 20mm                | 14          | H-17542            | Jumper, Ground Cable                |
| 5           | 5851-13867-00      | Outlet, IEC Connector<br>237 Socket  | 15          | H-23005            | 3 Conductor Power Cable<br>Assembly |
| 6           | 03-8712            | Strain Relief Bushing                | 16          | RM-21-06           | #18 Vinyl Sleaving                  |
| 7           | 5016-12978-00      | Thermistor, 8A, 2.5R25               | 17          | 4408-01128-00      | Nut, 8-32 KEPS                      |
| 8           | 5822-13865-00      | Terminal Strip, 3 CKT,<br>2 Mounting | 18          | H-22991            | Transformer Programming<br>Cable    |
| 9           | 01-12299           | Terminal Strip Insulator             | 19          | 5102-14793-00      | Line Filter                         |
| 10          | H-23015            | Jumper, Neutral SW/1FC               |             |                    |                                     |

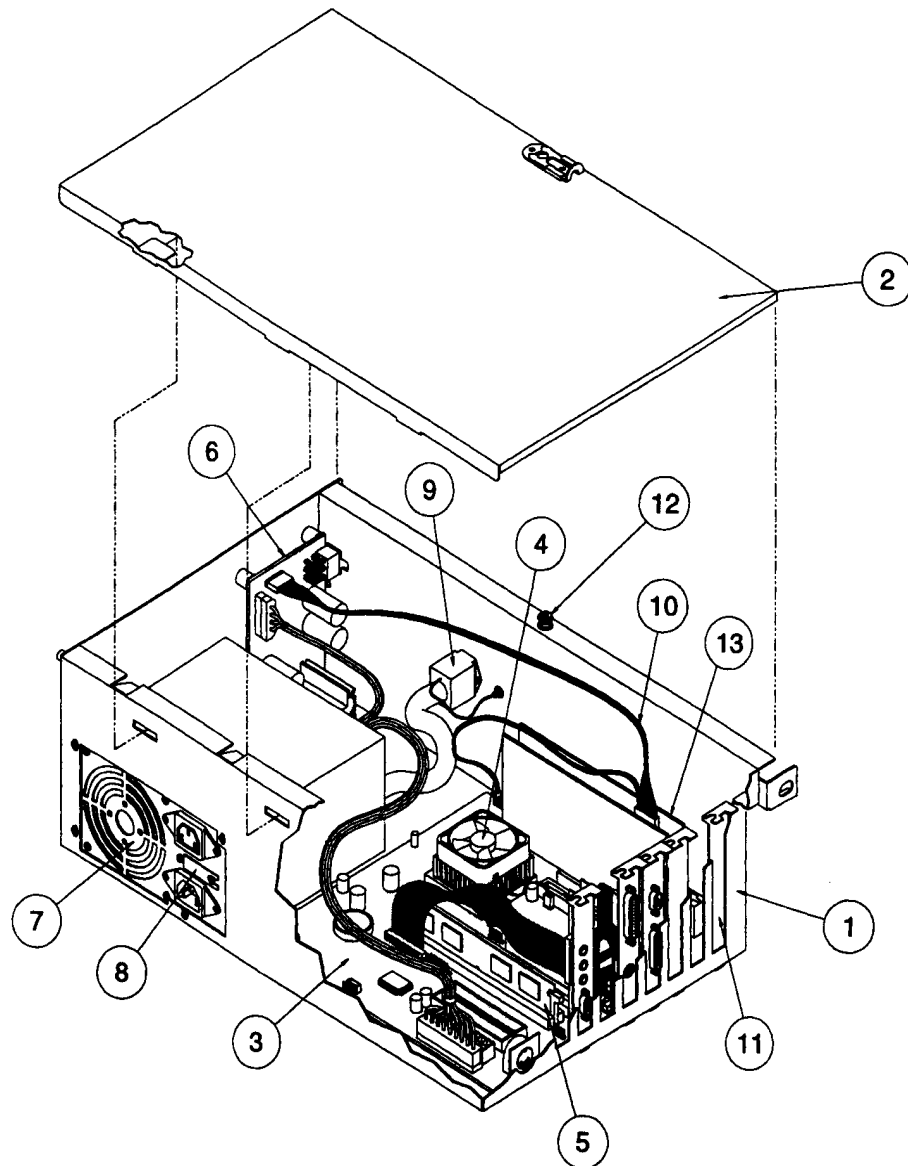
**Note:** This drawing is not to be used for the purpose of wiring the Power Control box Assembly. Refer to the appropriate schematic diagram when attempting the wiring of this assembly.

## Power Interface/Cordset Application Chart

| COUNTRY                | UNIVERSAL<br>PWR.<br>INTERFACE<br>ASSEMBLY | VOLTAGE<br>PROGRAMMING<br>JUMP CABLE |           |           | 4AMP<br>FUSE | 5AMP<br>FUSE | POWER<br>ADAPTER<br>CORD | CORDSET       |               |               |               |               |               |               |               |           |  |
|------------------------|--------------------------------------------|--------------------------------------|-----------|-----------|--------------|--------------|--------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|--|
|                        |                                            | H-22990-1                            | H-22990-2 | H-22990-3 |              |              |                          | 5850-13271-00 | 5850-13272-00 | 5850-13273-00 | 5850-13274-00 | 5850-13275-00 | 5850-13276-00 | 5850-13277-00 | 5850-13278-00 | A-17175-2 |  |
| UNITED STATES          | X                                          | X                                    |           |           |              | X            | X                        | X             |               |               |               |               |               |               |               |           |  |
| CANADA                 | X                                          | X                                    |           |           |              | X            |                          | X             |               |               |               |               |               |               |               |           |  |
| TAIWAN                 | X                                          | X                                    |           |           |              | X            |                          | X             |               |               |               |               |               |               |               |           |  |
| MEXICO                 | X                                          | X                                    |           |           |              | X            |                          | X             |               |               |               |               |               |               |               |           |  |
| CENTRAL AMERICA        | X                                          | X                                    |           |           |              | X            |                          | X             |               |               |               |               |               |               |               |           |  |
| SOUTH KOREA            | X                                          | X                                    |           |           |              | X            |                          | X             |               |               |               |               |               |               |               |           |  |
| PUERTO RICO            | X                                          | X                                    |           |           |              | X            |                          | X             |               |               |               |               |               |               |               |           |  |
| AUSTRIA                | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| BELGIUM                | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| FINLAND                | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| FRANCE                 | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| GREECE                 | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| HOLLAND                | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| HUNGARY                | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| NETHERLANDS            | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| NETH. ANTILLES         | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| NORWAY                 | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| POLAND                 | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| PORTUGAL               | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| SPAIN                  | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| SWEDEN                 | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| TURKEY                 | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| WEST GERMANY           | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |
| UNITED KINGDOM         | X                                          |                                      | X         |           | X            |              |                          |               |               | X             |               |               |               |               |               |           |  |
| IRELAND                | X                                          |                                      | X         |           | X            |              |                          |               |               | X             |               |               |               |               |               |           |  |
| HONG KONG              | X                                          |                                      | X         |           | X            |              |                          |               |               | X             |               |               |               |               |               |           |  |
| DENMARK                | X                                          |                                      | X         |           | X            |              |                          |               |               |               | X             |               |               |               |               |           |  |
| ITALY                  | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               | X             |               |               |               |           |  |
| CHILE                  | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               | X             |               |               |               |           |  |
| PEOPLE'S REP. OF CHINA | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               | X             |               |               |               |           |  |
| SWITZERLAND            | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               |               | X             |               |               |           |  |
| AUSTRALIA              | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               |               |               | X             |               |           |  |
| NEW ZEALAND            | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               |               |               | X             |               |           |  |
| ARGENTINA              | X                                          |                                      | X         |           | X            |              |                          |               |               |               |               |               |               | X             |               |           |  |
| JAPAN                  | X                                          |                                      |           | X         |              | X            |                          |               |               |               |               |               |               |               | X             | X         |  |
| CROATIA                | X                                          |                                      | X         |           | X            |              |                          |               | X             |               |               |               |               |               |               |           |  |

# A-22724

## Computer Case Assembly

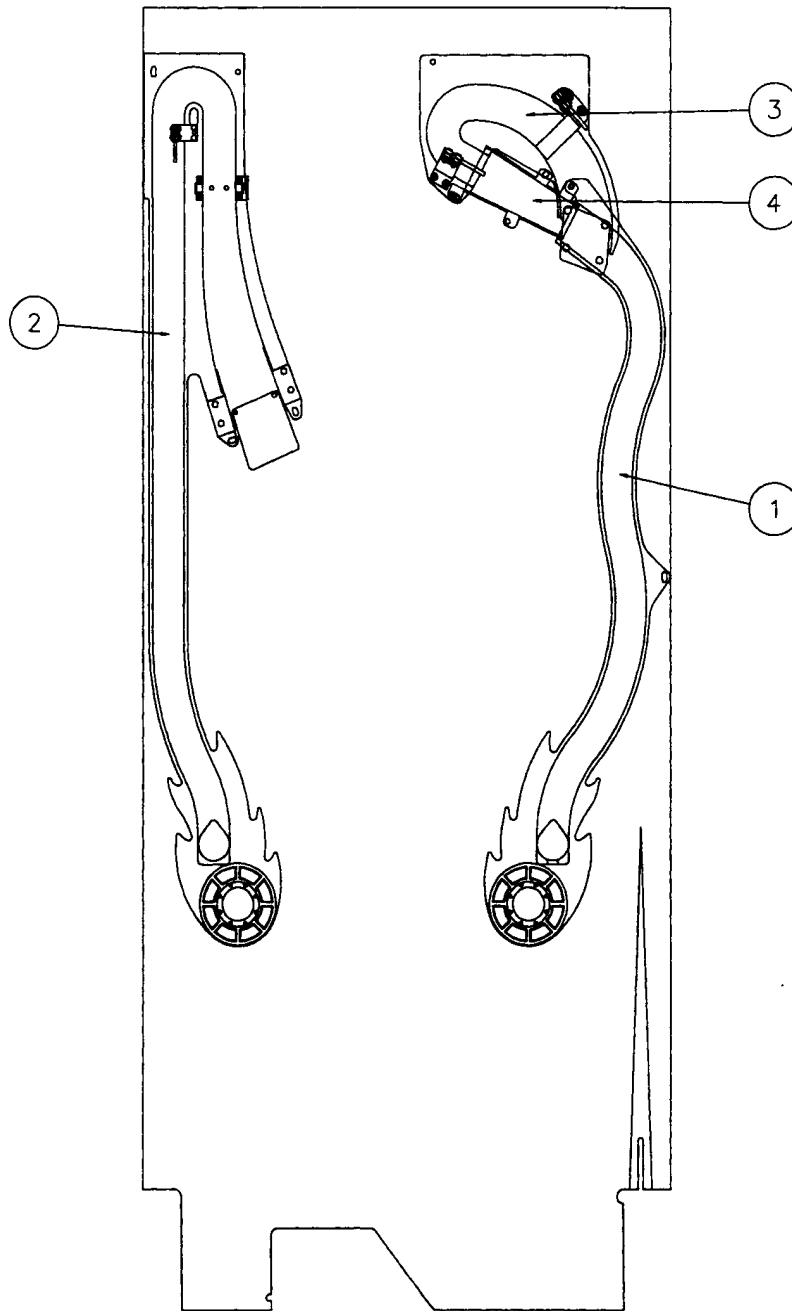


| <u>Item</u> | <u>Part Number</u> | <u>Description</u>                 |
|-------------|--------------------|------------------------------------|
| 1           | 04-12370.1A        | Computer Case                      |
| 2           | A-23301            | Computer Case Top Assembly         |
| 3           | 04-12604           | Mother Board                       |
| 4           | 20-10698           | Fan/Heat Sink - Socket 7           |
| 5           | 04-12618           | SDRAM DIMM Memory Module - 168 Pin |
| 6           | 04-12621           | Audio Amp Assembly                 |
| 7           | 20-10578           | Power Supply                       |
| 8           | 01-15195           | Power Supply Switch Cover          |
| 9           | 03-7601-4          | Button Switch - Red                |
| 10          | H-22978            | Audio/Reset Cable                  |
| 11          | 01-15165           | Computer Case Slot Cover           |
| 12          | 02-5477            | Bushing                            |

### Associated Parts

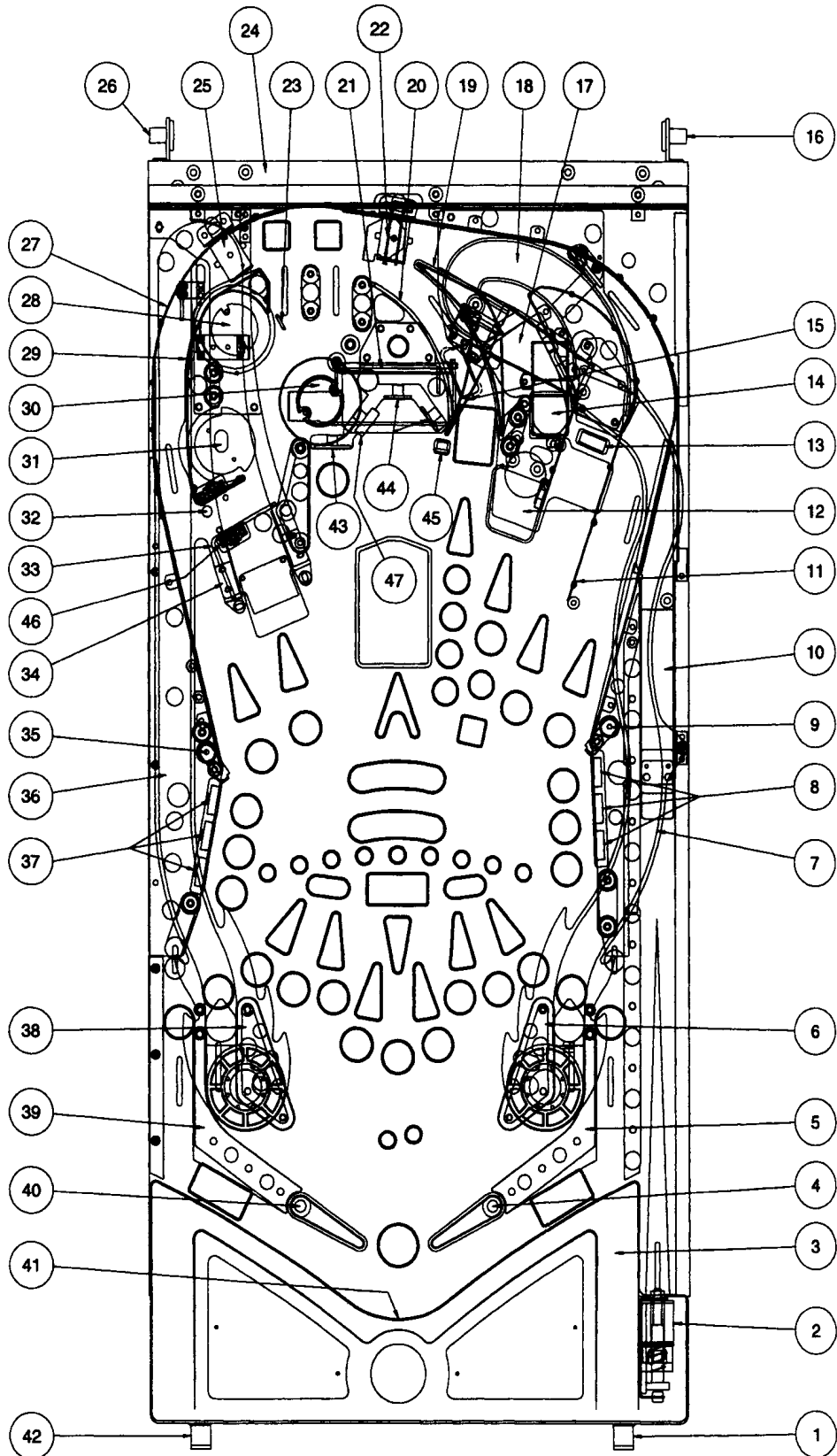
| <u>Item</u> | <u>Part Number</u> | <u>Description</u>           |
|-------------|--------------------|------------------------------|
| 13          | A-22994-50070      | Prism Card Sandwich Assembly |
| 13a         | A-23171-50070      | Programmed Prism Card        |
| 13b         | A-22995-50070      | Daughter Card w/ROM          |

## 50070-PL Upper Playfield Ramps



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>        |
|-------------|--------------------|---------------------------|
| 1           | A-23017            | Lower Right Ramp Assembly |
| 2           | A-23013            | Left ramp Assembly        |
| 3           | A-23016            | Upper Right Ramp Assembly |
| 4           | 01-15166           | Bridge                    |

# 50070-PL Upper Playfield Parts



## Upper Playfield Parts

| Item # | Part Number                                                       | Description                                                                                |
|--------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 1      | 01-14003-2                                                        | Right Playfield Hanger                                                                     |
| 2      | A-22429-4<br>AE1-23-800                                           | Auto-fire Kicker<br>Coil                                                                   |
| 3      | A-23006<br>03-8544-1<br>03-9883.1-2                               | Bottom Arch<br>Plastic Stud Grommet<br>Transparent Red Arch                                |
| 4      | 20-10110-5<br>A-23004-R-2<br>FL1-11629<br>SW-1A-194               | Flipper Bat & Shaft<br>Right Flipper Assembly<br>Coil<br>Switch                            |
| 5      | A-22739-1                                                         | Right Flipper Ball Guide                                                                   |
| 6      | A-22207-6<br>AE1-26-1200<br>A-17801<br>A-17811                    | Slingshot Coil & Bracket<br>Coil<br>Slingshot Switch Assembly<br>Slingshot Kicker Assembly |
| 7      | A-23017<br>03-9481-1                                              | Right Ramp<br>Saucer Disk w/Gm Dome                                                        |
| 8      | A-18018-21                                                        | Green Standup Targets (3)                                                                  |
| 9      | A-22960<br>AE1-26-1500<br>23-6768<br>01-15124                     | Alien Mechanism<br>Coil<br>Alien Figurine (not shown)<br>Retaining Bracket                 |
| 10     | A-23136                                                           | Shooter Ramp                                                                               |
| 11     | A-22969                                                           | Ball Guide #4                                                                              |
| 12     | A-23156<br>AE1-25-1000<br>A-16908<br>A-16909                      | Right Popper Assembly<br>Coil<br>LED Board<br>Photo Trans. Board                           |
| 13     | A-15211-1<br>AE1-26-1200<br>SM1-26-600<br>5647-12693-31           | Drop Target Assembly<br>Up Coil<br>Down Coil<br>Switch                                     |
| 14     | A-20680-1<br>AE1-23-800<br>A-16908<br>A-16909<br>04-12598         | Right Lockup Popper<br>Coil<br>LED Board<br>Photo Trans. Board<br>Popper Hood              |
| 15     | A-22993<br>FL1-22241<br>A-22970                                   | Diverter Mechanism<br>Flipper Coil-Brown<br>Diverter Paddle Assembly                       |
| 16     | 04-12608.1-1                                                      | Right Playfield Foot                                                                       |
| 17     | 01-15166                                                          | Bridge                                                                                     |
| 18     | A-23016<br>A-23140<br>5647-12693-36<br>12-7436.1<br>5647-12693-21 | Upper Right Ramp<br>Rollunder Gate<br>Switch<br>Wireform<br>Switch                         |
| 19     | 04-12600                                                          | Ball Guide #3                                                                              |
| 20     | 12-7448                                                           | Wire Ball Guide #2                                                                         |
| 21     | A-22992<br>5647-12693-11<br>03-10008                              | Ball Catcher<br>Switch<br>Ball Catcher Backstop                                            |
| 22     | A-17796<br>A-14406<br>A-17797-2<br>12-6657.1-R                    | Gate Actuator Assembly<br>Coil<br>Ball Gate Special Assy.<br>Wireform                      |
| 23     | 12-7455                                                           | Pound-in Wireform                                                                          |
| 24     | A-22852                                                           | Back Panel                                                                                 |
| 25     | A-17796<br>A-14406<br>A-19001<br>12-6657.1-L                      | Gate Actuator Assembly<br>Coil<br>Ball Gate Special Assy.<br>Wireform                      |
| 26     | 04-12608.1-2                                                      | Left Playfield Foot                                                                        |
| 27     | 04-12486.2                                                        | Ball Guide #1                                                                              |

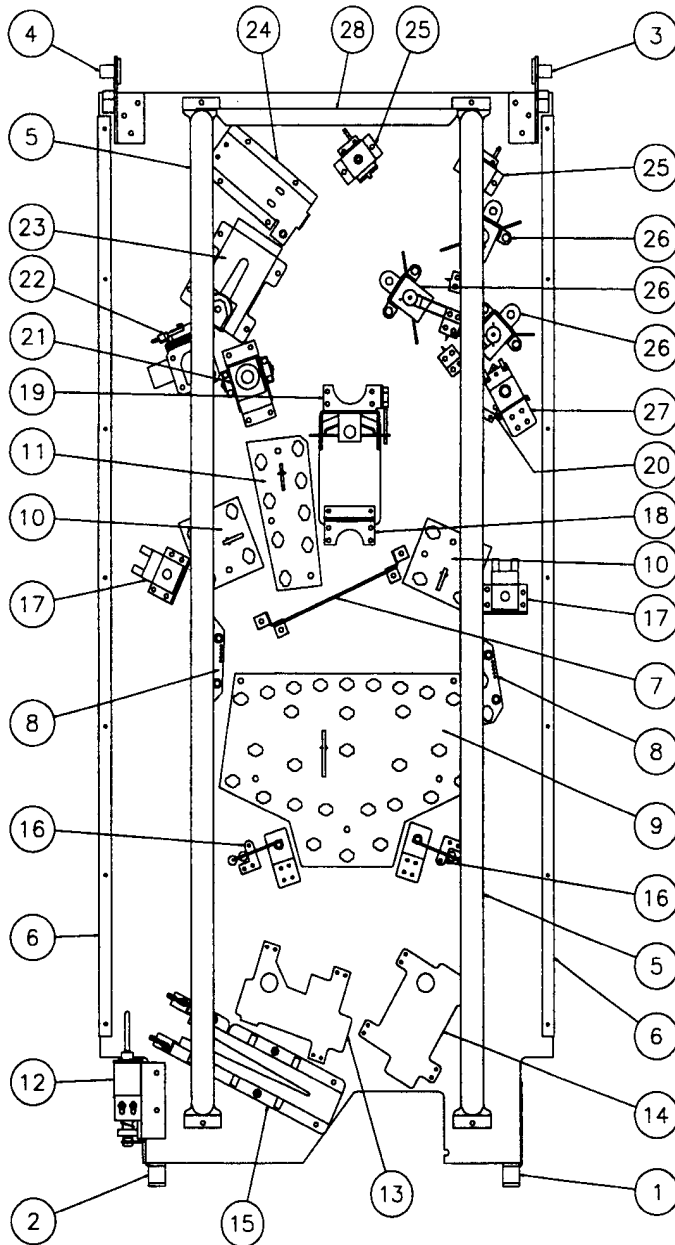
| Item # | Part Number                                                    | Description                                                                                   |
|--------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 28     | A-22205-4<br>AE1-26-1200<br>A-12030-3<br>B-9414-6<br>03-8254-9 | Jet Bumper Coil Assembly<br>Coil<br>Jet Bumper Switch Assy.<br>Jet Bumper Assembly<br>Red Cap |
| 29     | 04-12599                                                       | Ball Guide #2                                                                                 |
| 30     | A-22205-4<br>AE1-26-1200<br>A-12030-3<br>B-13123-2             | Jet Bumper Coil Assembly<br>Coil<br>Jet Bumper Switch Assy.<br>Jet Bumper Assembly            |
| 31     | A-22205-4<br>AE1-26-1200<br>A-12030-3<br>B-9414-6              | Jet Bumper Coil Assembly<br>Coil<br>Jet Bumper Switch Assy.<br>Jet Bumper Assembly            |
| 32     | A-22977<br>AE1-26-1500<br>A-17986                              | Up/Down Post Assembly<br>Coil<br>Bell Armature                                                |
| 33     | 12-7447                                                        | Wire Ball Guide #1                                                                            |
| 34     | A-23161<br>12-7454                                             | One-way Gate Assembly<br>Wireform                                                             |
| 35     | A-22960<br>AE1-26-1500<br>23-6768<br>01-15124                  | Alien Mechanism<br>Coil<br>Alien Figurine (not shown)<br>Retaining Bracket                    |
| 36     | A-23013<br>5647-12693-21<br>A-16908<br>A-16909                 | Left Ramp<br>Switch<br>LED Board<br>Photo Trans. Board                                        |
| 37     | A-21576-21                                                     | Green Standup Targets (3)                                                                     |
| 38     | A-22207-6<br>AE1-26-1200<br>A-17801<br>A-17811                 | Slingshot Coil & Bracket<br>Coil<br>Slingshot Switch Assembly<br>Slingshot Kicker Assembly    |
| 39     | A-22739-2                                                      | Left Flipper Ball Guide                                                                       |
| 40     | 20-10110-5<br>A-23001-L-2<br>FL1-11629<br>SW-1A-194            | Flipper Bat & Shaft<br>Right Flipper Assembly<br>Coil<br>Switch                               |
| 41     | 04-12477.1                                                     | Bottom Arch Handle                                                                            |
| 42     | 01-14003-2                                                     | Left Playfield Hanger                                                                         |
| 43     | A-18019-11                                                     | Green Standup Target                                                                          |
| 44     | A-18060-4                                                      | Red Standup Targets (2)                                                                       |
| 45     | A-18530-4                                                      | Red Standup Target                                                                            |
| 46     | A-23012<br>A-16908<br>A-16909                                  | Opto Bracket<br>LED Board<br>Photo Trans. Board                                               |
| 47     | A-20846-4                                                      | Red Standup Target                                                                            |

### Not Shown:

|            |                                |
|------------|--------------------------------|
| A-23167    | Bottom Arch Support Bracket    |
| 01-15201.1 | Playfield Side Rails (2)       |
| 03-8633    | Level Mount                    |
| 04-12739.1 | Tinted Playfield Glass w/Decal |
| 20-6500    | 1-1/16" Steel Ball (4)         |
| 20-9691    | Level                          |

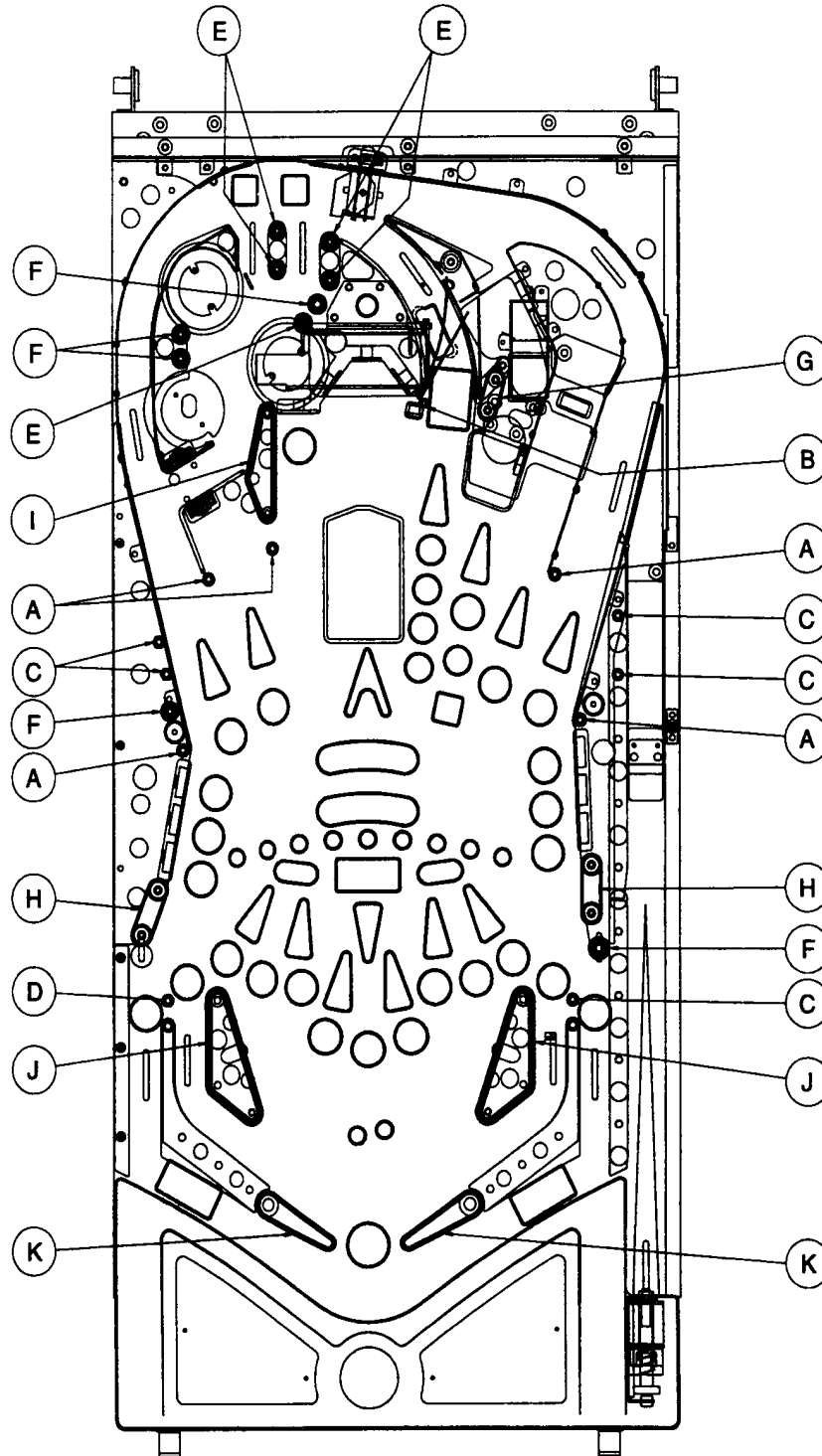
# 50070-PL

## Lower Playfield Parts



| Item | Part Number | Description                       |
|------|-------------|-----------------------------------|
| 1    | 01-14003-1  | Playfield Hanging Bracket - Right |
| 2    | 01-14003-2  | Playfield Hanging Bracket - Left  |
| 3    | 04-12608-1  | Playfield Slide Foot - Right      |
| 4    | 04-12608-2  | Playfield slide Foot - Left       |
| 5    | 01-15133.2  | Playfield Support Bracket         |
| 6    | 01-15201.1  | Playfield Side Rails              |
| 7    | A-20246     | 10 Opto PCB Assembly w/Brackets   |
| 8    | A21808-1    | 3-Lamp PCB Assembly w/Spacer      |
| 9    | A-22987     | 28-Lamp PCB Assembly w/Feet       |
| 10   | A-22983     | 4-Lamp PCB Assembly w/Feet        |
| 11   | A-22986     | 8-Lamp PCB Assembly w/Feet        |
| 12   | A-22429-4   | Auto-Fire Assembly                |
| 13   | A-23004-R-2 | Flipper Assembly - Right          |
| 14   | A-23001-L-2 | Flipper Assembly - Left           |
| 15   | A-19963-4   | Ball Trough Assembly              |
| 16   | A-17811     | Kicker Assembly                   |
|      | A-22206-6   | Coil & Bracket Assembly           |
|      | 10-128      | Spring                            |
| 17   | A-22960     | Martian Mechanism Assembly        |
| 18   | A-22988     | Skip Ramp Flap Assembly           |
|      | 01-15140    | Flap Assembly Mounting Bracket    |
| 19   | A-22989     | Skip Ramp Assembly                |
| 20   | A-23012     | Opto Bracket Assembly             |
| 21   | A-23156     | Popper Assembly                   |
| 22   | A-15211-1   | 1 Bank Drop Target Assembly       |
| 23   | A-20680-1   | 3 Ball Popper Assembly            |
| 24   | A-22993     | Diverter Mechanism Assembly       |
| 25   | A-17796     | Ball Gate Actuator Assembly       |
| 26   | A-22205-4   | Jet Coil & Bracket Assembly       |
| 27   | A-22977     | Up/Down post Assembly             |
| 28   | 01-15125.4  | Playfield Cable Bracket           |

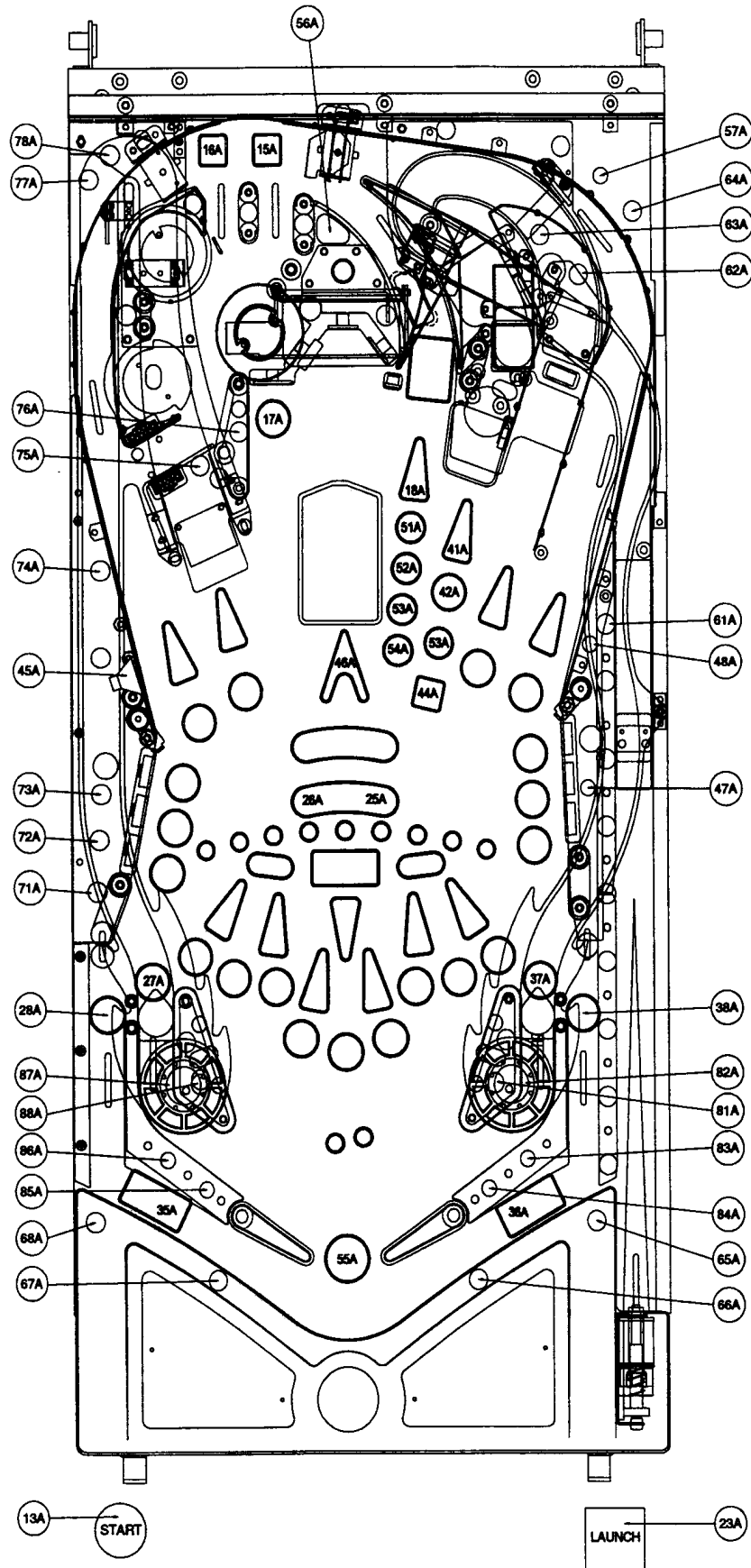
## 50070-PL Rubber Parts



| <u>Item</u> | <u>Part Number</u> | <u>Description</u>          | <u>Qty.</u> | <u>Item</u> | <u>Part Number</u> | <u>Description</u>        | <u>Qty.</u> |
|-------------|--------------------|-----------------------------|-------------|-------------|--------------------|---------------------------|-------------|
| A           | 23-6552            | Yellow Rubber Bumper Sleeve | 5           | G           | 23-6694-6          | 1" Black Rubber Ring      | 1           |
| B           | 23-6556            | Black Rubber Bumper Sleeve  | 1           | H           | 23-6694-7          | 1-1/4" Black Rubber Ring  | 2           |
| C           | 23-6641            | Black Rubber Bumper         | 5           | I           | 23-6694-8          | 2" Black Rubber Ring      | 1           |
| D           | 23-6694-1          | 3/32" Black Rubber Grommet  | 1           | J           | 23-6694-10         | 2-1/2" Black Rubber Ring  | 2           |
| E           | 23-6694-3          | 5/16" Black Rubber Ring     | 5           | K           | 23-6695            | Black Flipper Rubber Ring | 2           |
| F           | 23-6694-5          | 3/4" Black Rubber Ring      | 5           |             |                    |                           |             |

# 50070-PL Lamp Locations (Matrix A)

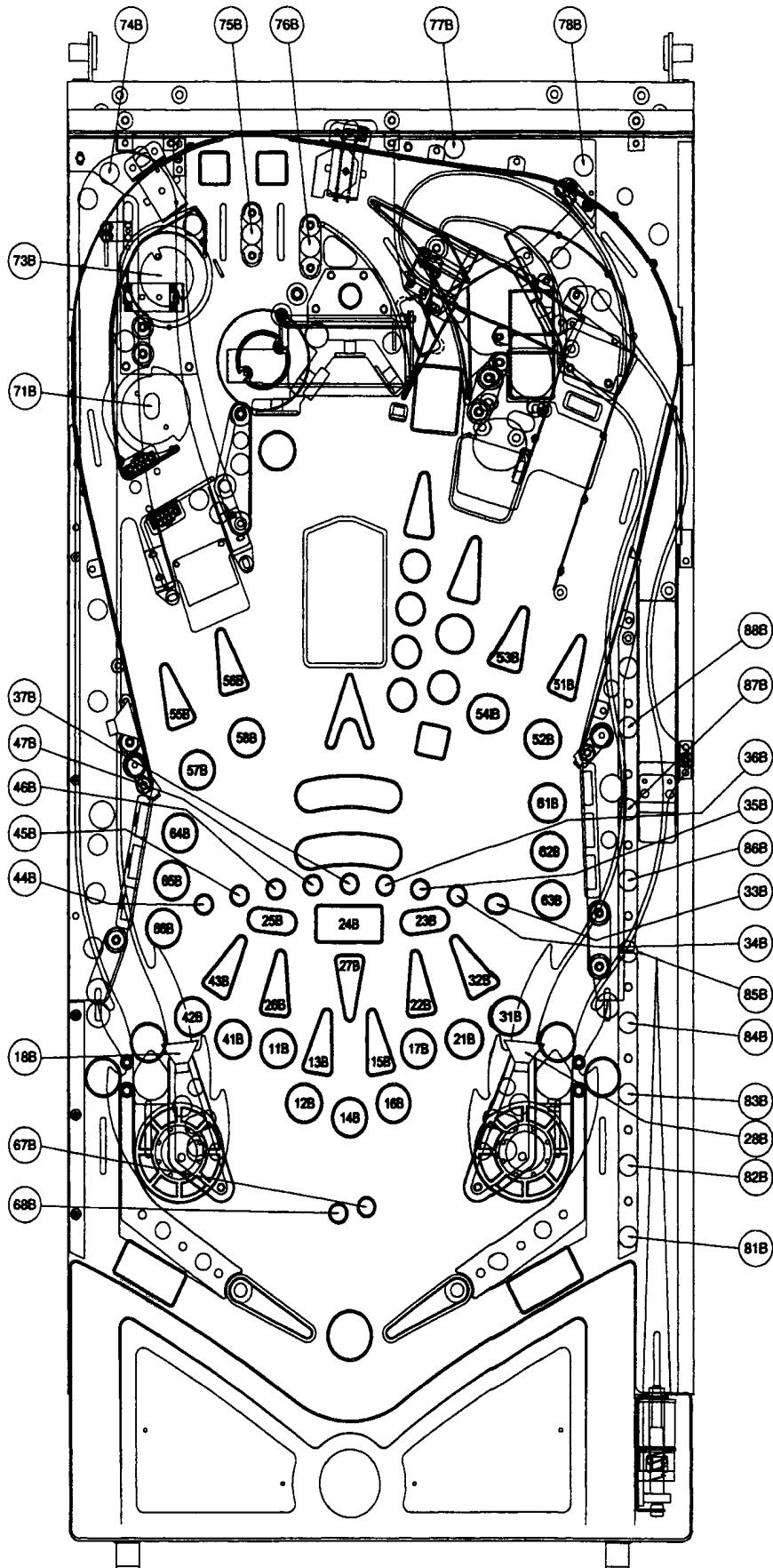
**Note:**  
Lamp, item number  
24A not shown.



## Lamp Matrix A Locations

| Item Number | Lamp Assembly Part Number | Bulb Type         | Bulb Part Number  | Socket Part Number | Description                  |
|-------------|---------------------------|-------------------|-------------------|--------------------|------------------------------|
| 11A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 12A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 13A         | 20-10696                  | Not Sold Separate | Not Sold Separate | Not Sold Separate  | START BUTTON                 |
| 14A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 15A         | A-17835                   | #44               | 24-6549           | Not Sold Separate  | RIGHT TOP LANE               |
| 16A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | LEFT TOP LANE                |
| 17A         | A-17807                   | #44               | 24-6459           | Not Sold Separate  | MARTIAN TARGET 4 (CENTER)    |
| 18A         | A-17835                   | #44               | 24-6549           | Not Sold Separate  | CENTER LOOP ARROW            |
| 21A         | Not Used                  | Not Used          | Not Used          | Not Used           | TICKETS LOW                  |
| 22A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 23A         | 20-10692-1                | Not Sold Separate | Not Sold Separate | Not Sold Separate  | LAUNCH BUTTON                |
| 24A         | Not Sold Separate         | Not Sold Separate | Not Sold Separate | Not Sold Separate  | COIN DOOR ILLUMINATION       |
| 25A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | MOTHERSHIP MULTIBALL (RIGHT) |
| 26A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | MOTHERSHIP MULTIBALL (LEFT)  |
| 27A         | A-17835                   | #44               | 24-6549           | Not Sold Separate  | LEFT RETURN LANE             |
| 28A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | LEFT OUTLANE                 |
| 31A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 32A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 33A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 34A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 35A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | LEFT DRAIN TO TROUGH         |
| 36A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | RIGHT DRAIN TO TROUGH        |
| 37A         | A-17835                   | #44               | 24-6549           | Not Sold Separate  | RIGHT RETURN LANE            |
| 38A         | A-17835                   | #44               | 24-6549           | Not Sold Separate  | RIGHT OUTLANE                |
| 41A         | 04-12613                  | #555              | 24-8768           | 24-8767            | RIGHT POPPER ARROW           |
| 42A         | 04-12613                  | #555              | 24-8768           | 24-8767            | EXTRA BALL                   |
| 43A         | 04-12613                  | #555              | 24-8768           | 24-8767            | MARTIAN ATTACK               |
| 44A         | 04-12613                  | #555              | 24-8768           | 24-8767            | STROKE OF LUCK               |
| 45A         | 04-11037-8                | #555              | 24-8768           | Not Sold Separate  | LEFT SIDE SPOTLIGHT          |
| 46A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | CENTER ARROW                 |
| 47A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT MARTIAN (HIGH)         |
| 48A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT MARTIAN (LOW)          |
| 51A         | 04-12613                  | #555              | 24-8768           | 24-8767            | MULTIBALL                    |
| 52A         | 04-12613                  | #555              | 24-8768           | 24-8767            | CAPTURE 2                    |
| 53A         | 04-12613                  | #555              | 24-8768           | 24-8767            | CAPTURE 1                    |
| 54A         | 04-12613                  | #555              | 24-8768           | 24-8767            | CATURE ZONE ACTIVE           |
| 55A         | A-17807                   | #44               | 24-6549           | Not Sold Separate  | SHOOT AGAIN                  |
| 56A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | BEHIND CENTER TARGETS        |
| 57A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UPPER RIGHT CORNER (MIDDLE)  |
| 58A         | Not Used                  | Not Used          | Not Used          | Not Used           | NOT USED                     |
| 61A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | SHOOTER LANE 9 (TOP)         |
| 62A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UNDER RIGHT RAMP (LOW)       |
| 63A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UNDER RIGHT RAMP (HIGH)      |
| 64A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UPPER RIGHT CORNER (LOW)     |
| 65A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT ARCH (RIGHT)           |
| 66A         | A-23164                   | #44               | 24-6549           | Not Sold Separate  | RIGHT ARCH (LEFT)            |
| 67A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT ARCH (RIGHT)            |
| 68A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT ARCH (LEFT)             |
| 71A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT SIDE 1 (BOTTOM)         |
| 72A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT SIDE 2                  |
| 73A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT SIDE 3                  |
| 74A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT SIDE 4 (TOP)            |
| 75A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UNDER LEFT RAMP (BOTTOM)     |
| 76A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UNDER LEFT RAMP (TOP)        |
| 77A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | BETWEEN LEFT & BOTTOM JETS   |
| 78A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | UPPER LEFT CORNER            |
| 81A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT SLINGSHOT (BOTTOM)     |
| 82A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT SLINGSHOT (SAUCER)     |
| 83A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT RETURN LANE (RIGHT)    |
| 84A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | RIGHT RETURN LANE (LEFT)     |
| 85A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT RETURN LANE (RIGHT)     |
| 86A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT RETURN LANE (LEFT)      |
| 87A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT SLINGSHOT (SAUCER)      |
| 88A         | A-23163                   | #44               | 24-6549           | Not Sold Separate  | LEFT SLINGSHOT (BOTTOM)      |

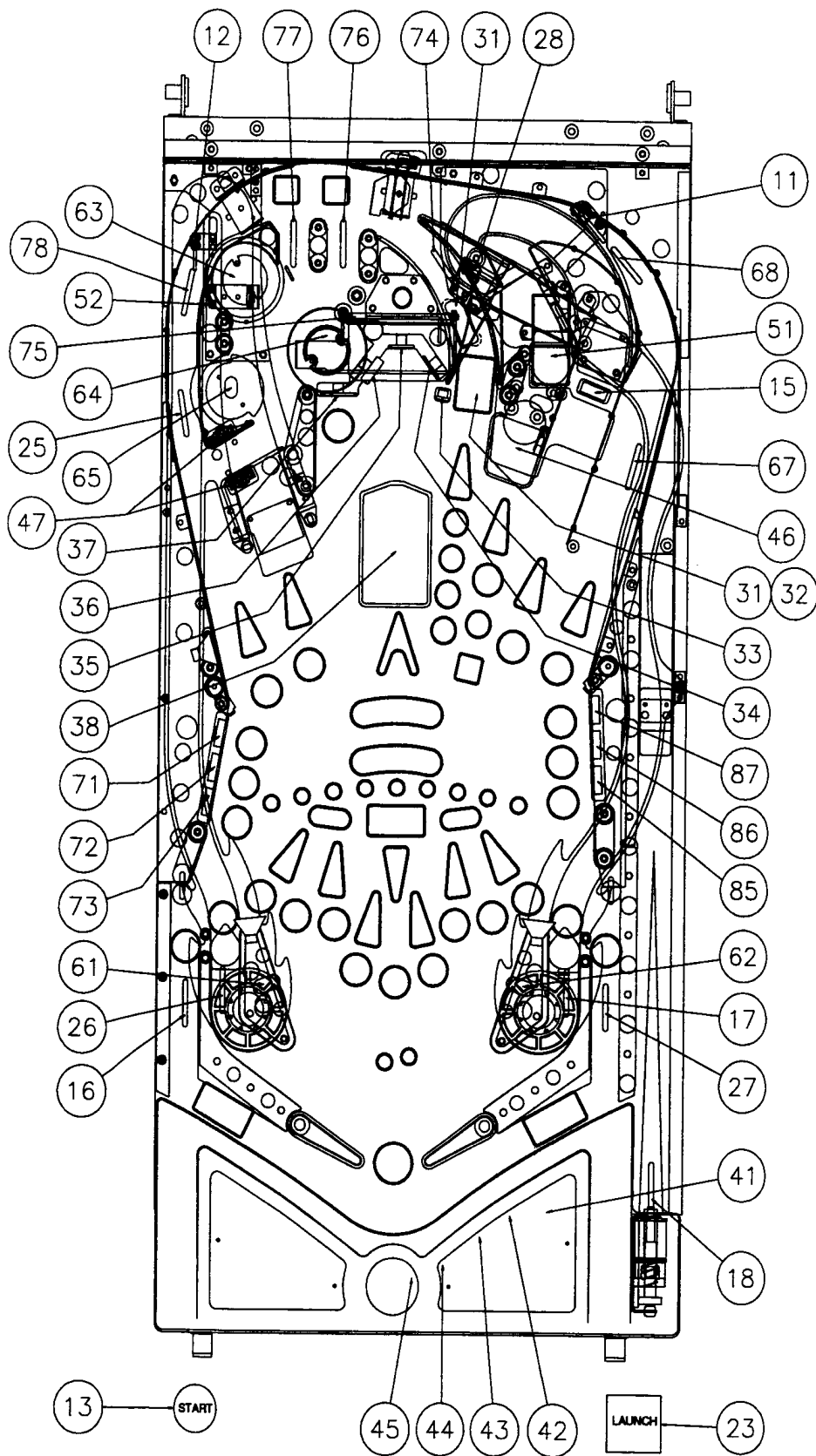
# 50070-PL Lamp Locations (Matrix B)



## Lamp Matrix B Locations

| Item Number | Lamp Assembly Part Number | Bulb Type | Bulb Part Number | Socket Part Number | Description                   |
|-------------|---------------------------|-----------|------------------|--------------------|-------------------------------|
| 11B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SECRET WEAPON                 |
| 12B         | 04-12614                  | #555      | 24-8768          | 24-8767            | TOWER STRUGGLE                |
| 13B         | 04-12614                  | #555      | 24-8768          | 24-8767            | CENTER SAUCER BEAM (LEFT)     |
| 14B         | 04-12614                  | #555      | 24-8768          | 24-8767            | QUESTION MARK                 |
| 15B         | 04-12614                  | #555      | 24-8768          | 24-8767            | CENTER SAUCER BEAM (RIGHT)    |
| 16B         | 04-12614                  | #555      | 24-8768          | 24-8767            | DRIVE-IN DEMOLITION           |
| 17B         | 04-12614                  | #555      | 24-8768          | 24-8767            | PARIS IN PERIL                |
| 18B         | 04-12860-2                | #555      | 24-8768          | Not Sold Separate  | LEFT SLINGSHOT SPOTLIGHT      |
| 21B         | 04-12614                  | #555      | 24-8768          | 24-8767            | BIG-O-BEAM                    |
| 22B         | 04-12614                  | #555      | 24-8768          | 24-8767            | RIGHT SAUCER BEAM (LEFT)      |
| 23B         | 04-12614                  | #555      | 24-8768          | 24-8767            | WEAPONS                       |
| 24B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER                        |
| 25B         | 04-12614                  | #555      | 24-8768          | 24-8767            | FUEL                          |
| 26B         | 04-12614                  | #555      | 24-8768          | 24-8767            | LEFT SAUCER BEAM (RIGHT)      |
| 27B         | 04-12614                  | #555      | 24-8768          | 24-8767            | CENTER SAUCER BEAM (CENTER)   |
| 28B         | 04-12860-2                | #555      | 24-8768          | Not Sold Separate  | RIGHT SLINGSHOT SPOTLIGHT     |
| 31B         | 04-12614                  | #555      | 24-8768          | 24-8767            | MARS KNEADS WOMEN             |
| 32B         | 04-12614                  | #555      | 24-8768          | 24-8767            | RIGHT SAUCER BEAM (RIGHT)     |
| 33B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 9 (RIGHT)          |
| 34B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 8                  |
| 35B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 7                  |
| 36B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 6                  |
| 37B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 5                  |
| 38B         | Not Used                  | Not Used  | Not Used         | Not Used           | NOT USED                      |
| 41B         | 04-12614                  | #555      | 24-8768          | 24-8767            | MARTIAN HAPPY HOUR            |
| 42B         | 04-12614                  | #555      | 24-8768          | 24-8767            | ALIEN ABDUCTION               |
| 43B         | 04-12614                  | #555      | 24-8768          | 24-8767            | LEFT SAUCER BEAM (LEFT)       |
| 44B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 1 (LEFT)           |
| 45B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 2                  |
| 46B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 3                  |
| 47B         | 04-12614                  | #555      | 24-8768          | 24-8767            | SAUCER RIM 4                  |
| 48B         | Not Used                  | Not Used  | Not Used         | Not Used           | NOT USED                      |
| 51B         | 04-12611                  | #555      | 24-8768          | 24-8767            | RIGHT LOOP ARROW              |
| 52B         | 04-12611                  | #555      | 24-8768          | 24-8767            | RIGHT LOOP CIRCLE             |
| 53B         | 04-12611                  | #555      | 24-8768          | 24-8767            | RIGHT RAMP ARROW              |
| 54B         | 04-12611                  | #555      | 24-8768          | 24-8767            | RIGHT RAMP CIRCLE             |
| 55B         | 04-12611                  | #555      | 24-8768          | 24-8767            | LEFT LOOP ARROW               |
| 56B         | 04-12611                  | #555      | 24-8768          | 24-8767            | LEFT RAMP ARROW               |
| 57B         | 04-12611                  | #555      | 24-8768          | 24-8767            | LEFT LOOP CIRCLE              |
| 58B         | 04-12611                  | #555      | 24-8768          | 24-8767            | LEFT RAMP CIRCLE              |
| 61B         | A-21808                   | #555      | 24-8768          | 24-8767            | MARTIAN TARGET 5 (RIGHT TOP)  |
| 62B         | A-21808                   | #555      | 24-8768          | 24-8767            | MARTIAN TARGET 6 (RIGHT MID.) |
| 63B         | A-21808                   | #555      | 24-8768          | 24-8767            | MARTIAN TARGET 7 (RIGHT BOT.) |
| 64B         | A-21808                   | #555      | 24-8768          | 24-8767            | MARTIAN TARGET 3 (LEFT TOP)   |
| 65B         | A-21808                   | #555      | 24-8768          | 24-8767            | MARTIAN TARGET 2 (LEFT MID.)  |
| 66B         | A-21808                   | #555      | 24-8768          | 24-8767            | MARTIAN TARGET 1 (LEFT BOT.)  |
| 67B         | A-17835                   | #44       | 24-6549          | Not Sold Separate  | RIGHT MARTIAN EYE             |
| 68B         | A-17835                   | #44       | 24-6549          | Not Sold Separate  | LEFT MARTIAN EYE              |
| 71B         | ---                       | #555      | 24-8768          | 24-8776            | BOTTOM JET BUMPER             |
| 72B         | Not Used                  | Not Used  | Not Used         | Not Used           | NOT USED                      |
| 73B         | ---                       | #555      | 24-8768          | 24-8776            | LEFT JET BUMPER               |
| 74B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | LEFT OF LEFT TOP LANE         |
| 75B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | BETWEEN LEFT/RIGHT TOP LANES  |
| 76B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | RIGHT OF RIGHT TOP LANES      |
| 77B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | TOP OF CENTER LOOP            |
| 78B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | UPPER RIGHT CORNER (HIGH)     |
| 81B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 1 (BOTTOM)       |
| 82B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 2                |
| 83B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 3                |
| 84B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 4                |
| 85B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 5                |
| 86B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 6                |
| 87B         | A-23163                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 7                |
| 88B         | A-17807                   | #44       | 24-6549          | Not Sold Separate  | SHOOTER LANE 8                |

# 50070-PL Playfield Switch Locations



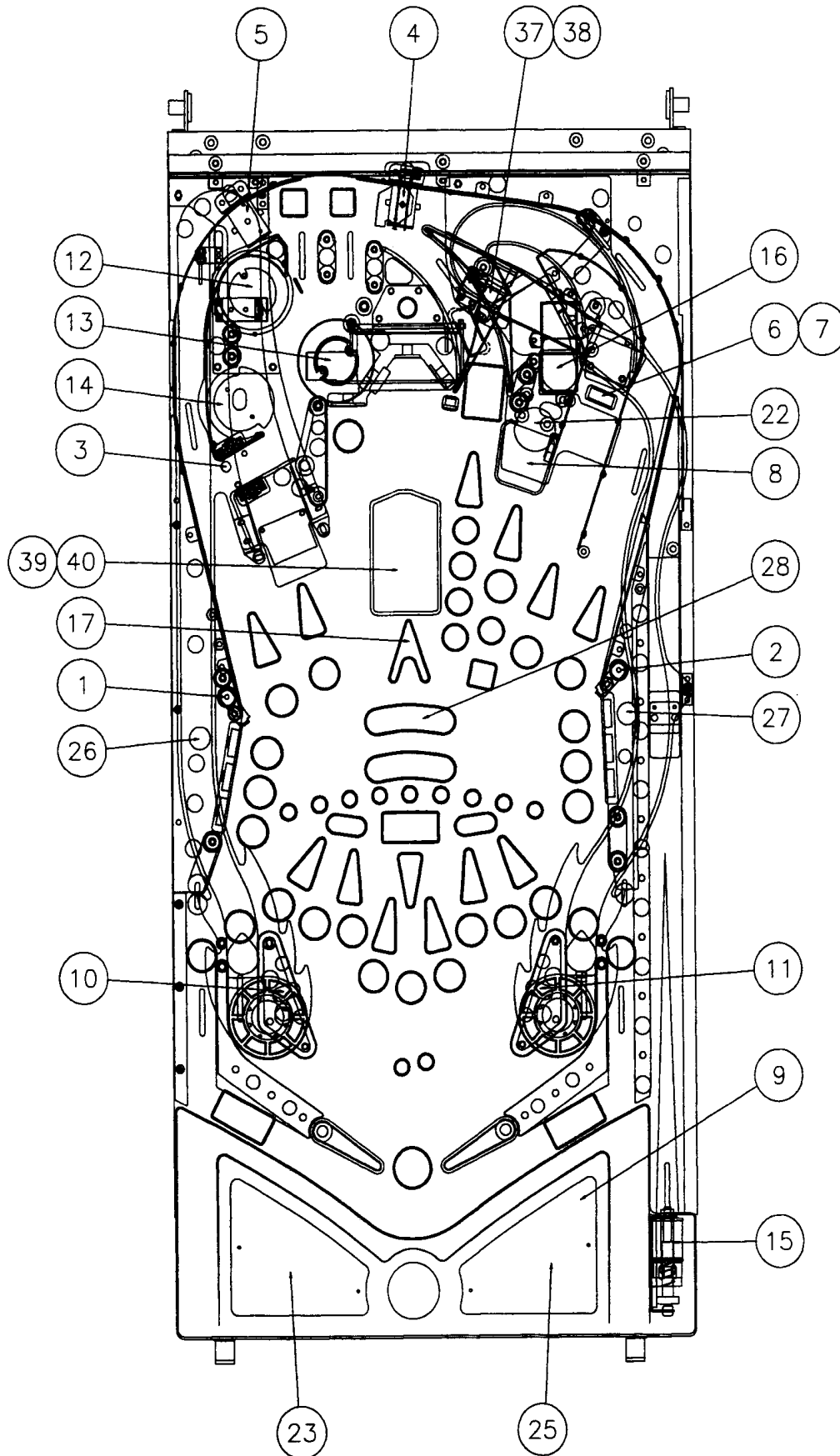
## Switch Locations

| Item Number | Switch Assembly Part Number <i>OR</i><br>Opto Assembly Part Number | Switch Part Number                  | Description                         |
|-------------|--------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| D13         | ---                                                                | SW-1A-194                           | *LOWER RIGHT FLIPPER E.O.S.         |
| D14         | ---                                                                | SW-1A-194                           | *LOWER LEFT FLIPPER E.O.S.          |
| D15         | NOT USED                                                           | NOT USED                            | UPPER RIGHT FLIPPER E.O.S.          |
| D16         | NOT USED                                                           | NOT USED                            | UPPER LEFT FLIPPER E.O.S.           |
| D21         | A-22984                                                            | ---                                 | *LOWER RIGHT FLIPPER CABINET BUTTON |
| D22         | A-22984                                                            | ---                                 | *LOWER LEFT FLIPPER CABINET BUTTON  |
| D23         | A-22984                                                            | ---                                 | RIGHT ACTION BUTTON                 |
| D24         | A-22984                                                            | ---                                 | LEFT ACTION BUTTON                  |
| 11          | A-23140                                                            | 5647-12693-36                       | RIGHT RAMP ENTRANCE                 |
| 12          | ---                                                                | 5647-12693-21                       | LEFT RAMP EXIT                      |
| 13          | 20-10696                                                           | ---                                 | START BUTTON                        |
| 14          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 15          | ---                                                                | 5647-12693-31                       | DROP TARGET DOWN                    |
| 16          | A-17813-1                                                          | 5647-12693-19                       | LEFT OUTLANE                        |
| 17          | A-17813                                                            | 5647-12693-19                       | RIGHT RETURN LANE                   |
| 18          | A-18973                                                            | 5647-12693-32                       | SHOOTER LANE                        |
| 21          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 22          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 23          | 20-10692-1                                                         | ---                                 | LAUNCH BUTTON                       |
| 24          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 25          | A-17813-1                                                          | 5647-12693-19                       | LEFT LOOP (LOW)                     |
| 26          | A-17813                                                            | 5647-12693-19                       | LEFT RETURN LANE                    |
| 27          | A-17813                                                            | 5647-12693-19                       | RIGHT OUTLANE                       |
| 28          | ---                                                                | 5647-12693-21                       | RIGHT RAMP EXIT                     |
| 31          | 20-10293                                                           | ---                                 | CENTER LOOP REED (BOTTOM)           |
| 32          | 20-10293                                                           | ---                                 | CENTER LOOP REED (TOP)              |
| 33          | A-18530-4                                                          | ---                                 | CENTER TARGET 4                     |
| 34          | A-18060-4                                                          | ---                                 | CENTER TARGET 3                     |
| 35          | A-18060-4                                                          | ---                                 | CENTER TARGET 2                     |
| 36          | A-20848-4                                                          | ---                                 | CENTER TARGET 1                     |
| 37          | A-18019-11                                                         | ---                                 | MARTIAN TARGET 4 (CENTER)           |
| 38          | ---                                                                | 5647-12693-07                       | UP/DOWN RAMP UP                     |
| 41          | A-18617-1 (LED)<br>A-18618-1 (PHOTO TRANS)                         | ---                                 | TROUGH EJECT                        |
| 42          | A-18617-1 (LED)<br>A-18618-1 (PHOTO TRANS)                         | ---                                 | TROUGH BALL 1                       |
| 43          | A-18617-1 (LED)<br>A-18618-1 (PHOTO TRANS)                         | ---                                 | TROUGH BALL 2                       |
| 44          | A-18617-1 (LED)<br>A-18618-1 (PHOTO TRANS)                         | ---                                 | TROUGH BALL 3                       |
| 45          | A-18617-1 (LED)<br>A-18618-1 (PHOTO TRANS)                         | ---                                 | TROUGH BALL 4                       |
| 46          | A-16908 (LED)<br>A-16909 (PHOTO TRANS)                             | ---                                 | RIGHT POPPER                        |
| 47          | A-16908 (LED)<br>A-16909 (PHOTO TRANS)                             | ---                                 | JET EXIT                            |
| 48          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 51          | A-16908 (LED)<br>A-16909 (PHOTO TRANS)                             | ---                                 | RIGHT LOCKUP 1                      |
| 52          | A-16908 (LED)<br>A-16909 (PHOTO TRANS)                             | ---                                 | LEFT RAMP ENTRANCE                  |
| 53          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 54          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 55          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 56          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 57          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 58          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 61          | A-17801                                                            | A-17800 (KICK)<br>A-17794 (SCORE)** | LEFT SLINGSHOT                      |
| 62          | A-17801                                                            | A-17800 (KICK)<br>A-17794 (SCORE)** | RIGHT SLINGSHOT                     |
| 63          | B-12030-3                                                          | A-16443-1                           | LEFT JET BUMPER                     |
| 64          | B-12030-3                                                          | A-16443-1                           | RIGHT JET BUMPER                    |
| 65          | B-12030-3                                                          | A-16443-1                           | BOTTOM JET BUMPER                   |
| 66          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 67          | A-17813                                                            | 5647-12693-19                       | RIGHT LOOP (LOW)                    |
| 68          | A-17813                                                            | 5647-12693-19                       | RIGHT LOOP (HIGH)                   |
| 71          | A-21576-21                                                         | ---                                 | MARTIAN TARGET 3 (LEFT TOP)         |
| 72          | A-21576-21                                                         | ---                                 | MARTIAN TARGET 2 (LEFT MIDDLE)      |
| 73          | A-21576-21                                                         | ---                                 | MARTIAN TARGET 1 (LEFT BOTTOM)      |
| 74          | A-17813-1                                                          | 5647-12693-19                       | CENTER LOOP ROLLOVER                |
| 75          | ---                                                                | 5647-12693-11                       | CENTER DEFLECTOR PANEL              |
| 76          | A-17813                                                            | 5647-12693-19                       | RIGHT TOP LANE                      |
| 77          | A-17813                                                            | 5647-12693-19                       | LEFT TOP LANE                       |
| 78          | A-17813                                                            | 5647-12693-19                       | LEFT LOOP (HIGH)                    |
| 81          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 82          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 83          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 84          | NOT USED                                                           | NOT USED                            | NOT USED                            |
| 85          | A-18018-21                                                         | ---                                 | MARTIAN TARGET 7 (RIGHT BOTTOM)     |
| 86          | A-18018-21                                                         | ---                                 | MARTIAN TARGET 6 (RIGHT MIDDLE)     |
| 87          | A-18018-21                                                         | ---                                 | MARTIAN TARGET 5 (RIGHT TOP)        |
| 88          | NOT USED                                                           | NOT USED                            | NOT USED                            |

\*NOT SHOWN. \*\*SCORE SWITCHES HAVE DIODES ATTACHED.

# 50070-PL

## Solenoid/Flasher Locations



## Solenoid/Flasher Locations

| Item Number | Assembly Part Number | Coil or Flasher Part Number | Description           |
|-------------|----------------------|-----------------------------|-----------------------|
| 01          | A-22960              | AE1-26-1500                 | LEFT MARTIAN          |
| 02          | A-22960              | AE1-26-1500                 | RIGHT MARTIAN         |
| 03          | A-22977              | AE1-26-1500                 | JET EXIT POST         |
| 04          | A-17796              | A-14406                     | RIGHT GATE            |
| 05          | A-17796              | A-14406                     | LEFT GATE             |
| 06          | A-15211-1            | SM1-26-600                  | DROP TARGET DOWN      |
| 07          | A-15211-1            | AE1-26-1200                 | DROP TARGET UP        |
| 08          | A-23156              | AE1-25-1000                 | RIGHT POPPER          |
| 09          | A-19963-4            | AE1-26-1500                 | TROUGH EJECT          |
| 10          | A-22207-6            | AE1-26-1200                 | LEFT SLINGSHOT        |
| 11          | A-22207-6            | AE1-26-1200                 | RIGHT SLINGSHOT       |
| 12          | A-22205-4            | AE1-26-1200                 | LEFT JET BUMPER       |
| 13          | A-22205-4            | AE1-26-1200                 | RIGHT JET BUMPER      |
| 14          | A-22205-4            | AE1-26-1200                 | BOTTOM JET BUMPER     |
| 15          | A-22429-4            | AE1-23-800                  | AUTO PLUNGER          |
| 16          | A-20680-1            | AE1-23-800                  | RIGHT LOCKUP          |
| 17          | A-17802              | 24-8802 (#906)              | CENTER ARROW FLASHER  |
| 18          | NOT USED             | NOT USED                    | NOT USED              |
| 19          | NOT USED             | NOT USED                    | NOT USED              |
| 20          | NOT USED             | NOT USED                    | NOT USED              |
| 21          | NOT USED             | NOT USED                    | NOT USED              |
| 22          | ----                 | 24-8802 (#906)              | RIGHT POPPER FLASHER  |
| 23          | A-17983              | 24-8704 (#89)               | LEFT ARCH FLASHER     |
| 24          | NOT USED             | NOT USED                    | NOT USED              |
| 25          | A-17983              | 24-8704 (#89)               | RIGHT ARCH FLASHER    |
| 26          | A-17983              | 24-8704 (#89)               | LEFT MARTIAN FLASHER  |
| 27          | A-17983              | 24-8704 (#89)               | RIGHT MARTIAN FLASHER |
| 28          | A-17802              | 24-8802 (#906)              | ATTACK MARS FLASHER   |

### Flipper Circuits

|       | Assembly Part Number | Coil Part Number | Description         |
|-------|----------------------|------------------|---------------------|
| 33-34 | A-23004-R-2          | FL1-11629        | LOWER RIGHT FLIPPER |
| 35-36 | A-23001-L-2          | FL1-11629        | LOWER LEFT FLIPPER  |
| 37-38 | A-22993              | FL1-22241        | LOCK DIVERTER       |
| 39-40 | A-22989              | FL1-11753        | UP/DOWN RAMP        |

## LAMP MATRIX A

| COLUMN                         | 1A<br>YEL-BRN<br>J108-9<br>Q5          | 2A<br>YEL-RED<br>J108-10<br>Q9            | 3A<br>YEL-ORG<br>J108-11<br>Q13 | 4A<br>YEL-BLK<br>J108-12<br>Q17   | 5A<br>YEL-GRN<br>J108-13<br>Q21        | 6A<br>YEL-BLU<br>J108-14<br>Q25      | 7A<br>YEL-VIO<br>J108-15<br>Q29       | 8A<br>YEL-GRY<br>J108-16<br>Q33       |
|--------------------------------|----------------------------------------|-------------------------------------------|---------------------------------|-----------------------------------|----------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|
| ROW                            |                                        |                                           |                                 |                                   |                                        |                                      |                                       |                                       |
| 1A<br>BRN-BLK<br>J108-1<br>Q3  | NOT USED<br>11A                        | TICKETS<br>LOW<br>21A                     | NOT USED<br>31A                 | RIGHT POPPER<br>ARROW<br>41A      | MULTIBALL<br>51A                       | SHOOTER<br>LANE 9<br>(TOP)<br>61A    | LEFT SIDE<br>1<br>(BOTTOM)<br>71A     | RIGHT<br>SLINGSHOT<br>(BOTTOM)<br>81A |
| 2A<br>BRN-RED<br>J108-2<br>Q7  | NOT USED<br>12A                        | NOT USED<br>22A                           | NOT USED<br>32A                 | EXTRA<br>BALL<br>42A              | CAPTURE<br>2<br>52A                    | UNDER RIGHT<br>RAMP<br>(LOW)<br>62A  | LEFT SIDE<br>2<br>72A                 | RIGHT<br>SLINGSHOT<br>(SAUCER)<br>82A |
| 3A<br>BRN-ORG<br>J108-3<br>Q11 | START BUTTON<br>13A                    | LAUNCH<br>BUTTON<br>23A                   | NOT USED<br>33A                 | MARTIAN<br>ATTACK<br>43A          | CAPTURE<br>1<br>53A                    | UNDER<br>RIGHT RAMP<br>(HIGH)<br>63A | LEFT SIDE<br>3<br>73A                 | RIGHT RETURN<br>LANE (RIGHT)<br>83A   |
| 4A<br>BRN-YEL<br>J108-4<br>Q15 | NOT USED<br>14A                        | COIN<br>DOOR<br>ILLUMINA.<br>24A          | NOT USED<br>34A                 | STROKE OF<br>LUCK<br>44A          | CAPTURE<br>ZONE<br>ACTIVE<br>54A       | UPPER<br>RT. CORNER<br>(LOW)<br>64A  | LEFT SIDE<br>4<br>(TOP)<br>74A        | RIGHT RETURN<br>LANE (LEFT)<br>84A    |
| 5A<br>BRN-GRN<br>J108-5<br>Q19 | RIGHT TOP<br>LANE<br>15A               | MOTHERSHIP<br>MULTIBALL<br>(RIGHT)<br>25A | LEFT DRAIN TO<br>TROUGH<br>35A  | LEFT SIDE<br>SPOTLIGHT<br>45A     | SHOOT AGAIN<br>55A                     | RIGHT ARCH<br>(RIGHT)<br>65A         | UNDER LEFT<br>RAMP<br>(BOTTOM)<br>75A | LEFT RETURN<br>LANE (RIGHT)<br>85A    |
| 6A<br>BRN-BLU<br>J108-6<br>Q23 | LEFT TOP LANE<br>16A                   | MOTHERSHIP<br>MULTIBALL<br>(LEFT)<br>26A  | RIGHT DRAIN TO<br>TROUGH<br>36A | CENTER<br>ARROW<br>46A            | BEHIND<br>CENTER<br>TARGETS<br>56A     | RIGHT ARCH<br>(LEFT)<br>66A          | UNDER LEFT<br>RAMP<br>(TOP)<br>76A    | LEFT RETURN<br>LANE (LEFT)<br>86A     |
| 7A<br>BRN-VIO<br>J108-7<br>Q27 | MARTIAN<br>TARGET 4<br>(CENTER)<br>17A | LEFT RETURN<br>LANE<br>27A                | RIGHT RETURN<br>LANE<br>37A     | RIGHT<br>MARTIAN<br>(HIGH)<br>47A | UPPER RT.<br>CORNER<br>(MIDDLE)<br>57A | LEFT ARCH<br>(RIGHT)<br>67A          | BETWEEN L/B<br>JETS<br>77A            | LEFT<br>SLINGSHOT<br>(SAUCER)<br>87A  |
| 8A<br>BRN-GRY<br>J108-8<br>Q31 | CENTER LOOP<br>ARROW<br>18A            | LEFT OUTLANE<br>28A                       | RIGHT<br>OUTLANE<br>38A         | RIGHT<br>MARTIAN (LOW)<br>48A     | NOT USED<br>58A                        | LEFT ARCH<br>(LEFT)<br>68A           | UPPER LEFT<br>CORNER<br>78A           | LEFT<br>SLINGSHOT<br>(BOTTOM)<br>88A  |

## LAMP MATRIX B

| COLUMN                         | 1B<br>YEL-BRN<br>J107-10<br>Q6         | 2B<br>YEL-RED<br>J107-11<br>Q10        | 3B<br>YEL-ORG<br>J107-12<br>Q14  | 4B<br>YEL-BLK<br>J107-13<br>Q18   | 5B<br>YEL-GRN<br>J107-14<br>Q22 | 6B<br>YEL-BLU<br>J107-15<br>Q26           | 7B<br>YEL-VIO<br>J107-16<br>Q30      | 8B<br>YEL-GRY<br>J107-17<br>Q34      |
|--------------------------------|----------------------------------------|----------------------------------------|----------------------------------|-----------------------------------|---------------------------------|-------------------------------------------|--------------------------------------|--------------------------------------|
| ROW                            |                                        |                                        |                                  |                                   |                                 |                                           |                                      |                                      |
| 1B<br>RED-BRN<br>J107-1<br>Q4  | SECRET<br>WEAPON<br>11B                | BIG-O-BEAM<br>21B                      | MARS KNEADS<br>WOMEN<br>31B      | MARTIAN<br>HARRY HOUR<br>41B      | RIGHT LOOP<br>ARROW<br>51B      | MARTIAN<br>TARGET 5<br>(RT. TOP)<br>61B   | BOTTOM JET<br>BUMPER<br>71B          | SHOOTER<br>LANE 1<br>(BOTTOM)<br>81B |
| 2B<br>RED-BLK<br>J107-2<br>Q8  | TOWER<br>STRUGGLE<br>12B               | RIGHT SAUCER<br>BEAM (LEFT)<br>22B     | RIGHT SAUCER<br>BEAM (RT)<br>32B | ALIEN<br>ABDUCTION<br>42B         | RIGHT LOOP<br>CIRCLE<br>52B     | MARTIAN<br>TARGET 6 (RT.<br>MID.)<br>62B  | NOT<br>USED<br>72B                   | SHOOTER<br>LANE<br>2<br>82B          |
| 3B<br>RED-ORG<br>J107-3<br>Q12 | CENTER<br>SAUCER BEAM<br>(LEFT)<br>13B | WEAPONS<br>23B                         | SAUCER RIM 9<br>(RIGHT)<br>33B   | LEFT SAUCER<br>BEAM (LEFT)<br>43B | RIGHT RAMP<br>ARROW<br>53B      | MARTIAN<br>TARGET 7<br>(RT. BOT.)<br>63B  | LEFT JET<br>BUMPER<br>73B            | SHOOTER<br>LANE<br>3<br>83B          |
| 4B<br>RED-YEL<br>J107-4<br>Q16 | QUESTION<br>MARK<br>14B                | SAUCER<br>24B                          | SAUCER RIM 8<br>34B              | SAUCER RIM<br>1<br>(LEFT)<br>44B  | RIGHT RAMP<br>CIRCLE<br>54B     | MARTIAN<br>TARGET 3<br>(LEFT TOP)<br>64B  | LEFT OF LEFT<br>TOP<br>LANE<br>74B   | SHOOTER<br>LANE<br>4<br>84B          |
| 5B<br>RED-GRN<br>J107-5<br>Q20 | CENTER<br>SAUCER BEAM<br>(RT.)<br>15B  | FUEL<br>25B                            | SAUCER RIM<br>7<br>35B           | SAUCER RIM<br>2<br>45B            | LEFT LOOP<br>ARROW<br>55B       | MARTIAN<br>TARGET 2<br>(LEFT MID.)<br>65B | BETWEEN L/R<br>TOP LANES<br>75B      | SHOOTER<br>LANE<br>5<br>85B          |
| 6B<br>RED-BLU<br>J107-6<br>Q24 | DRIVE-IN<br>DEMOLITION<br>16B          | LEFT SAUCER<br>BEAM (RT.)<br>26B       | SAUCER RIM<br>6<br>36B           | SAUCER RIM<br>3<br>46B            | LEFT RAMP<br>ARROW<br>56B       | MARTIAN<br>TARGET 1<br>(LEFT BOT.)<br>66B | RIGHT OF<br>RIGHT TOP<br>LANE<br>76B | SHOOTER<br>LANE<br>6<br>86B          |
| 7B<br>RED-VIO<br>J107-7<br>Q28 | PARIS IN PERIL<br>17B                  | CENTER<br>SAUCER BEAM<br>(CNTR)<br>27B | SAUCER RIM<br>5<br>37B           | SAUCER RIM<br>4<br>47B            | LEFT LOOP<br>CIRCLE<br>57B      | RIGHT<br>MARTIAN<br>EYE<br>67B            | TOP OF<br>CENTER LOOP<br>77B         | SHOOTER<br>LANE<br>7<br>87B          |
| 8B<br>RED-GRY<br>J107-8<br>Q32 | LEFT<br>SLINGSHOT<br>SPOTLIGHT<br>18B  | RIGHT<br>SLINGSHOT<br>SPOTLIGHT<br>28B | NOT USED<br>38B                  | NOT USED<br>48B                   | LEFT RAMP<br>CIRCLE<br>58B      | LEFT MARTIAN<br>EYE<br>68B                | UPPER RT.<br>CORNER<br>(HIGH)<br>78B | SHOOTER<br>LANE<br>8<br>88B          |

## SWITCH MATRIX

| COLUMN                            | 1<br>GRN-BRN<br>J116-1<br>U45-18 | 2<br>GRN-RED<br>J116-2<br>U45-17 | 3<br>GRN-ORG<br>J116-3<br>U45-16      | 4<br>GRN-WHT<br>J116-4<br>U45-15 | 5<br>GRN-BLK<br>J116-5<br>U45-14 | 6<br>GRN-BLU<br>J116-6<br>U45-13 | 7<br>GRN-VIO<br>J116-7<br>U45-12         | 8<br>GRN-GRY<br>J116-8<br>U45-11        |
|-----------------------------------|----------------------------------|----------------------------------|---------------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------------------|-----------------------------------------|
| ROW                               |                                  |                                  |                                       |                                  |                                  |                                  |                                          |                                         |
| 1<br>WHT-BRN<br>J116-12<br>U51-7  | RIGHT<br>RAMP<br>ENTRANCE<br>11  | NOT USED<br>21                   | CENTER<br>LOOP REED<br>(BOTTOM)<br>31 | TROUGH<br>JAM<br>41              | RIGHT<br>LOCKUP<br>1<br>51       | LEFT<br>SLINGSHOT<br>61          | MARTIAN<br>TARGET 3<br>(LEFT TOP)<br>71  | NOT USED<br>81                          |
| 2<br>WHT-RED<br>J116-13<br>U51-5  | LEFT RAMP<br>EXIT<br>12          | NOT USED<br>22                   | CENTER<br>LOOP REED<br>(TOP)<br>32    | TROUGH<br>BALL<br>1<br>42        | LEFT RAMP<br>ENTRANCE<br>52      | RIGHT<br>SLINGSHOT<br>62         | MARTIAN<br>TARGET 2<br>(LEFT MID.)<br>72 | NOT USED<br>82                          |
| 3<br>WHT-ORG<br>J116-14<br>U51-9  | START<br>BUTTON<br>13            | LAUNCH<br>BUTTON<br>23           | CENTER<br>TARGET<br>4<br>33           | TROUGH<br>BALL<br>2<br>43        | NOT USED<br>53                   | LEFT JET<br>BUMPER<br>63         | MARTIAN<br>TARGET 1<br>(LEFT BOT.)<br>73 | NOT USED<br>83                          |
| 4<br>WHT-YEL<br>J116-15<br>U51-11 | NOT USED<br>14                   | NOT USED<br>24                   | CENTER<br>TARGET<br>3<br>34           | TROUGH<br>BALL<br>3<br>44        | NOT USED<br>54                   | RIGHT<br>JET<br>BUMPER<br>64     | CENTER<br>LOOP<br>ROLLOVER<br>74         | NOT USED<br>84                          |
| 5<br>WHT-GRN<br>J116-16<br>U57-7  | DROP<br>TARGET<br>DOWN<br>15     | LEFT LOOP<br>(LOW)<br>25         | CENTER<br>TARGET<br>2<br>35           | TROUGH<br>BALL<br>4<br>45        | NOT USED<br>55                   | BOTTOM<br>JET<br>BUMPER<br>65    | CENTER<br>DEFLECTOR<br>PANEL<br>75       | MARTIAN<br>TARGET 7<br>(RT. BOT.)<br>85 |
| 6<br>WHT-BLU<br>J116-17<br>U57-5  | LEFT<br>OUTLANE<br>16            | LEFT<br>RETURN<br>LANE<br>26     | CENTER<br>TARGET<br>1<br>36           | RIGHT<br>POPPER<br>46            | NOT USED<br>56                   | NOT USED<br>66                   | RIGHT TOP<br>LANE<br>76                  | MARTIAN<br>TARGET 6<br>(RT. MID.)<br>86 |
| 7<br>WHT-VIO<br>J116-18<br>U57-9  | RIGHT<br>RETURN<br>LANE<br>17    | RIGHT<br>OUTLANE<br>27           | MARTIAN<br>TARGET 4<br>(CENTER)<br>37 | JET EXT<br>47                    | NOT USED<br>57                   | RIGHT LOOP<br>(LOW)<br>67        | LEFT TOP<br>LANE<br>77                   | MARTIAN<br>TARGET 5<br>(RT. TOP)<br>87  |
| 8<br>WHT-GRY<br>J116-19<br>U57-11 | SHOOTER<br>LANE<br>18            | RIGHT RAMP<br>EXIT<br>28         | UP/DOWN<br>RAMP UP<br>38              | NOT USED<br>48                   | NOT USED<br>58                   | RIGHT LOOP<br>(HIGH)<br>68       | LEFT<br>LOOP<br>(HIGH)<br>78             | NOT USED<br>88                          |

= OPTO, TYPICALLY CLOSED

## COIN SLOT SWITCHES

| DIRECT<br>GROUND | ORN-BRN<br>J114-1<br>U43-7 | ORG-RED<br>J114-2<br>U43-5 | ORG-BLK<br>J114-3<br>U43-9 | ORG-YEL<br>J114-4<br>U43-11          | ORG-GRN<br>J114-5<br>U48-7 | ORG-BLU<br>J114-6<br>U48-5 | ORG-VIO<br>J114-8<br>U48-9 | ORG-GRY<br>J114-9<br>U48-11 |
|------------------|----------------------------|----------------------------|----------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|
| BLACK<br>J114-14 | LEFT COIN<br>SLOT<br>D1    | CENTER<br>COIN SLOT<br>D2  | RIGHT COIN<br>SLOT<br>D3   | 4 <sup>TH</sup> COIN<br>OPTION<br>D4 | NOT USED<br>D5             | NOT USED<br>D6             | NOT USED<br>D7             | NOT USED<br>D8              |

## DIAGNOSTIC SWITCHES SWITCHES (E.O.S.)

| DIRECT<br>GROUND | GRY-BLK<br>J114-10<br>U50-7 | GRY-ORG<br>J114-11<br>U50-5 | GRY-RED<br>J114-12<br>U50-9 | GRY-BRN<br>J114-13<br>U50-11 |
|------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| BLACK<br>J114-14 | 'ESCAPE'<br>BUTTON<br>D9    | 'DOWN'<br>BUTTON<br>D10     | 'UP'<br>BUTTON<br>D11       | 'ENTER'<br>BUTTON<br>D12     |

## PLAYFIELD FLIPPER

| DIRECT<br>GROUND | BLK-GRN<br>J115-9<br>U56-7                 | BLK-BLU<br>J115-10<br>U56-5               | BLK-VIO<br>J115-20<br>U56-9 | BLK-GRY<br>J115-21<br>U56-11 |
|------------------|--------------------------------------------|-------------------------------------------|-----------------------------|------------------------------|
| BLACK<br>J115-22 | LOWER<br>RIGHT<br>FLIPPER<br>E.O.S.<br>D13 | LOWER<br>LEFT<br>FLIPPER<br>E.O.S.<br>D14 | NOT USED<br>D15             | NOT USED<br>D16              |

## CABINET FLIPPER SWITCHES

| DIRECT<br>GROUND | BLK-BRN<br>J113-1<br>U49-7 | BLK-RED<br>J113-2<br>U49-5 | BLK-ORG<br>J113-3<br>U49-9 | BLK-YEL<br>J113-4<br>U49-11 | BLK-GRN<br>J113-6<br>U55-7        | BLK-BLU<br>J113-7<br>U55-5       | BLK-VIO<br>J113-8<br>U55-9       | BLK-GRY<br>J113-9<br>U55-11     |
|------------------|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------------|----------------------------------|----------------------------------|---------------------------------|
| BLACK<br>J113-10 | SLAM TILT<br>D17           | COIN DOOR<br>CLOSED<br>D18 | PLUMB BOB<br>TILT<br>D19   | NOT USED<br>D20             | RIGHT<br>FLIPPER<br>BUTTON<br>D21 | LEFT<br>FLIPPER<br>BUTTON<br>D22 | RIGHT<br>ACTION<br>BUTTON<br>D23 | LEFT<br>ACTION<br>BUTTON<br>D24 |

## SOLENOID TABLE

| Sol No. | Solenoid Function       | Fuse | Power to Playfield | Power Wire Color | Drive Transistor | Drive to Playfield | Drive Wire Color | Solenoid Part Number or Flasher Type |
|---------|-------------------------|------|--------------------|------------------|------------------|--------------------|------------------|--------------------------------------|
| 01      | LEFT MARTIAN            | F101 | J102-1             | RED-BRN          | Q59              | J110-13            | VIO-BRN          | AE1-26-1500                          |
| 02      | RIGHT MARTIAN           | F101 | J102-1             | RED-BRN          | Q60              | J110-14            | VIO-RED          | AE1-26-1500                          |
| 03      | JET EXIT POST           | F101 | J102-1             | RED-BRN          | Q61              | J110-15            | VIO-ORG          | AE1-26-1500                          |
| 04      | RIGHT GATE              | F101 | J102-1             | RED-BRN          | Q62              | J110-16            | VIO-YEL          | A-14406                              |
| 05      | LEFT GATE               | F102 | J102-2             | RED-BLK          | Q63              | J110-17            | VIO-GRN          | A-14406                              |
| 06      | DROP TARGET DOWN        | F102 | J102-2             | RED-BLK          | Q64              | J110-18            | VIO-BLU          | SM1-26-600                           |
| 07      | DROP TARGET UP          | F102 | J102-2             | RED-BLK          | Q65              | J110-19            | VIO-BLK          | AE1-26-1200                          |
| 08      | RIGHT POPPER            | F102 | J102-2             | RED-BLK          | Q66              | J110-20            | VIO-GRY          | AE1-25-1000                          |
| 09      | TROUGH EJECT            | F103 | J102-3             | RED-ORG          | Q51              | J112-11            | BRN-BLK          | AE1-26-1500                          |
| 10      | LEFT SLINGSHOT          | F103 | J102-3             | RED-ORG          | Q52              | J112-12            | BRN-RED          | AE1-26-1200                          |
| 11      | RIGHT SLINGSHOT         | F103 | J102-3             | RED-ORG          | Q53              | J112-13            | BRN-ORG          | AE1-26-1200                          |
| 12      | LEFT JET BUMPER         | F103 | J102-3             | RED-ORG          | Q54              | J112-14            | BRN-YEL          | AE1-26-1200                          |
| 13      | RIGHT JET BUMPER        | F100 | J102-7             | RED-YEL          | Q55              | J112-15            | BRN-GRN          | AE1-26-1200                          |
| 14      | BOTTOM JET BUMPER       | F100 | J102-7             | RED-YEL          | Q56              | J112-16            | BRN-BLU          | AE1-26-1200                          |
| 15      | AUTO PLUNGER            | F100 | J102-7             | RED-YEL          | Q57              | J112-17            | BRN-VIO          | AE1-23-800                           |
| 16      | RIGHT LOCKUP            | F100 | J102-7             | RED-YEL          | Q58              | J112-18            | BRN-GRY          | AE1-23-800                           |
| 17      | CENTER ARROW FLASHER    | F109 | J102-8             | RED-WHT          | Q43              | J110-1             | BLU-BRN          | #906                                 |
| 18      | NOT USED                | F109 |                    |                  | Q44              | J110-2             | BLU-RED          |                                      |
| 19      | NOT USED                | F109 |                    |                  | Q45              | J110-3             | BLU-ORG          |                                      |
| 20      | NOT USED                | F109 |                    |                  | Q46              | J110-4             | BLU-YEL          |                                      |
| 21      | NOT USED                | F109 |                    |                  | Q47              | J110-5             | BLU-GRN          |                                      |
| 22      | RIGHT POPPER FLASHER    | F109 | J102-8             | RED-WHT          | Q48              | J110-6             | BLU-BLK          | #906                                 |
| 23      | LEFT ARCH FLASHER       | F109 | J102-8             | RED-WHT          | Q49              | J110-7             | BLU-VIO          | #89                                  |
| 24      | NOT USED                | F109 |                    |                  | Q50              | J110-8             | BLU-GRY          |                                      |
| 25      | RIGHT ARCH FLASHER      | F109 | J102-8             | RED-WHT          | Q67              | J112-9             | BLK-BRN          | #89                                  |
| 26      | LEFT MARTIAN FLASHER    | F109 | J102-8             | RED-WHT          | Q68              | J112-10            | BLK-RED          | #89                                  |
| 27      | RIGHT MARTIAN FLASHER   | F109 | J102-8             | RED-WHT          | Q69              | J112-19            | BLK-ORG          | #89                                  |
| 28      | ATTACK MARS FLASHER     | F109 | J102-8             | RED-WHT          | Q70              | J112-20            | BLK-YEL          | #906                                 |
|         | <b>Flipper Circuits</b> |      |                    |                  |                  |                    |                  |                                      |
| 33      | LOW RIGHT FLIPPER PWR   | F104 | J103-1             | RED-GRN          | Q35              | J112-1             | YEL-GRN          | FL1-11629                            |
| 34      | LOW RIGHT FLIPPER HOLD  |      |                    |                  | Q36              | J112-2             | ORG-GRN          |                                      |
| 35      | LOW LEFT FLIPPER PWR    | F105 | J103-2             | RED-BLU          | Q37              | J112-3             | YEL-BLU          | FL1-11629                            |
| 36      | LOW LEFT FLIPPER HOLD   |      |                    |                  | Q38              | J112-4             | ORG-BLU          |                                      |
| 37      | LOCK DIVERTER POWER     | F106 | J103-3             | RED-VIO          | Q39              | J112-5             | YEL-VIO          | FL1-22241                            |
| 38      | LOCK DIVERTER HOLD      |      |                    |                  | Q40              | J112-6             | ORG-VIO          |                                      |
| 39      | UP/DOWN RAMP POWER      | F107 | J103-4             | RED-GRY          | Q41              | J112-7             | YEL-GRY          | FL1-11753                            |
| 40      | UP/DOWN RAMP HOLD       |      |                    |                  | Q42              | J112-8             | ORG-GRY          |                                      |

# **SECTION THREE**

## **GAME WIRING AND SCHEMATICS**

**Schematics for standard PINBALL 2000 PC boards that are located in the cabinet and backbox are found in the PINBALL 2000 Schematic Manual. Schematics for PC boards attached to the playfield are found in this section.**

## LAMP MATRIX A

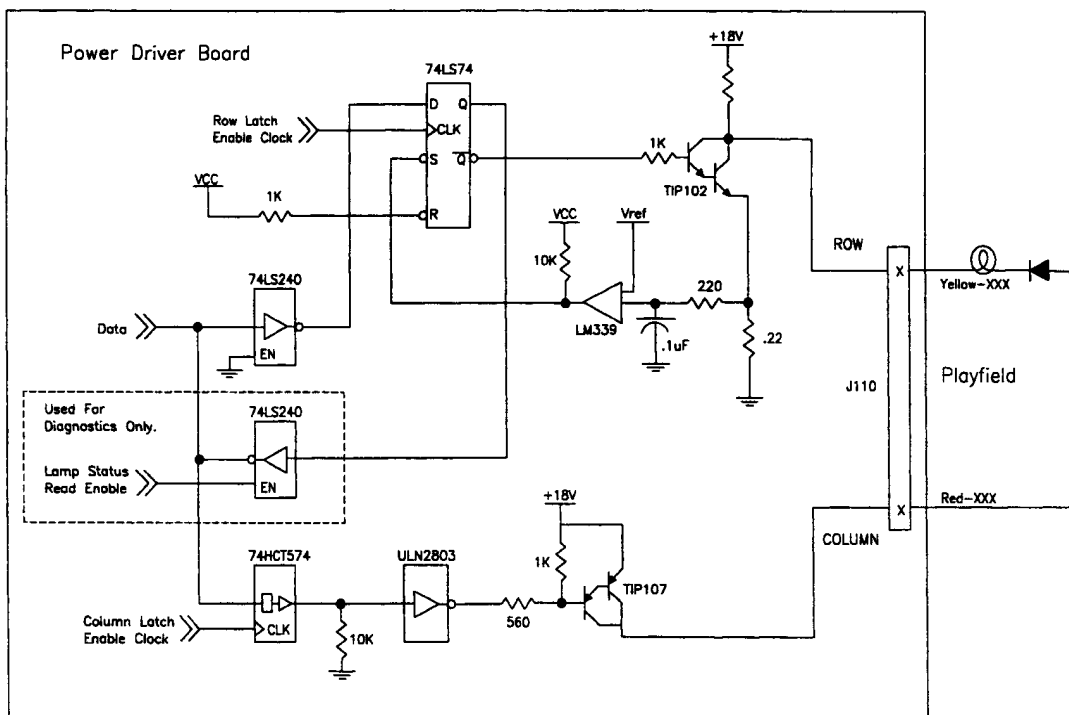
| COLUMN                         | 1A<br>YEL-BRN<br>J108-9<br>Q5          | 2A<br>YEL-RED<br>J108-10<br>Q9            | 3A<br>YEL-ORG<br>J108-11<br>Q13    | 4A<br>YEL-BLK<br>J108-12<br>Q17   | 5A<br>YEL-GRN<br>J108-13<br>Q21        | 6A<br>YEL-BLU<br>J108-14<br>Q25      | 7A<br>YEL-VIO<br>J108-15<br>Q29       | 8A<br>YEL-GRY<br>J108-16<br>Q33        |
|--------------------------------|----------------------------------------|-------------------------------------------|------------------------------------|-----------------------------------|----------------------------------------|--------------------------------------|---------------------------------------|----------------------------------------|
| ROW                            |                                        |                                           |                                    |                                   |                                        |                                      |                                       |                                        |
| 1A<br>BRN-BLK<br>J108-1<br>Q3  | NOT USED<br>11A                        | TICKETS<br>LOW<br>21A                     | NOT USED<br>31A                    | RIGHT<br>POPPER<br>ARROW<br>41A   | MULTIBALL<br>51A                       | SHOOTER<br>LANE 9<br>(TOP)<br>61A    | LEFT SIDE<br>1<br>(BOTTOM)<br>71A     | RIGHT<br>SLINGSHOT<br>(BOTTOM)<br>81A  |
| 2A<br>BRN-RED<br>J108-2<br>Q7  | NOT USED<br>12A                        | NOT USED<br>22A                           | NOT USED<br>32A                    | EXTRA<br>BALL<br>42A              | CAPTURE<br>2<br>52A                    | UNDER<br>RIGHT RAMP<br>(LOW)<br>62A  | LEFT SIDE<br>2<br>72A                 | RIGHT<br>SLINGSHOT<br>(SAUCER)<br>82A  |
| 3A<br>BRN-ORG<br>J108-3<br>Q11 | START<br>BUTTON<br>13A                 | LAUNCH<br>BUTTON<br>23A                   | NOT USED<br>33A                    | MARTIAN<br>ATTACK<br>43A          | CAPTURE<br>1<br>53A                    | UNDER<br>RIGHT RAMP<br>(HIGH)<br>63A | LEFT SIDE<br>3<br>73A                 | RIGHT<br>RETURN<br>LANE (RIGHT)<br>83A |
| 4A<br>BRN-YEL<br>J108-4<br>Q15 | NOT USED<br>14A                        | COIN<br>DOOR<br>ILLUMINA.<br>24A          | NOT USED<br>34A                    | STROKE OF<br>LUCK<br>44A          | CAPTURE<br>ZONE<br>ACTIVE<br>54A       | UPPER<br>RT. CORNER<br>(LOW)<br>64A  | LEFT SIDE<br>4<br>(TOP)<br>74A        | RIGHT<br>RETURN<br>LANE (LEFT)<br>84A  |
| 5A<br>BRN-GRN<br>J108-5<br>Q19 | RIGHT TOP<br>LANE<br>15A               | MOTHERSHIP<br>MULTIBALL<br>(RIGHT)<br>25A | LEFT DRAIN<br>TO<br>TROUGH<br>35A  | LEFT SIDE<br>SPOTLIGHT<br>45A     | SHOOT<br>AGAIN<br>55A                  | RIGHT ARCH<br>(RIGHT)<br>65A         | UNDER LEFT<br>RAMP<br>(BOTTOM)<br>75A | LEFT<br>RETURN<br>LANE (RIGHT)<br>85A  |
| 6A<br>BRN-BLU<br>J108-6<br>Q23 | LEFT TOP<br>LANE<br>16A                | MOTHERSHIP<br>MULTIBALL<br>(LEFT)<br>26A  | RIGHT DRAIN<br>TO<br>TROUGH<br>36A | CENTER<br>ARROW<br>46A            | BEHIND<br>CENTER<br>TARGETS<br>56A     | RIGHT ARCH<br>(LEFT)<br>66A          | UNDER LEFT<br>RAMP<br>(TOP)<br>76A    | LEFT<br>RETURN<br>LANE (LEFT)<br>86A   |
| 7A<br>BRN-VIO<br>J108-7<br>Q27 | MARTIAN<br>TARGET 4<br>(CENTER)<br>17A | LEFT<br>RETURN<br>LANE<br>27A             | RIGHT<br>RETURN<br>LANE<br>37A     | RIGHT<br>MARTIAN<br>(HIGH)<br>47A | UPPER RT.<br>CORNER<br>(MIDDLE)<br>57A | LEFT ARCH<br>(RIGHT)<br>67A          | BETWEEN<br>L/B<br>JETS<br>77A         | LEFT<br>SLINGSHOT<br>(SAUCER)<br>87A   |
| 8A<br>BRN-GRY<br>J108-8<br>Q31 | CENTER<br>LOOP<br>ARROW<br>18A         | LEFT<br>OUTLANE<br>28A                    | RIGHT<br>OUTLANE<br>38A            | RIGHT<br>MARTIAN<br>(LOW)<br>48A  | NOT USED<br>58A                        | LEFT ARCH<br>(LEFT)<br>68A           | UPPER LEFT<br>CORNER<br>78A           | LEFT<br>SLINGSHOT<br>(BOTTOM)<br>88A   |

J1XX = Power Driver Board

## LAMP MATRIX B

| COLUMN                         | 1B<br>YEL-BRN<br>J107-10<br>Q6         | 2B<br>YEL-RED<br>J107-11<br>Q10        | 3B<br>YEL-ORG<br>J107-12<br>Q14     | 4B<br>YEL-BLK<br>J107-13<br>Q18      | 5B<br>YEL-GRN<br>J107-14<br>Q22 | 6B<br>YEL-BLU<br>J107-15<br>Q26           | 7B<br>YEL-VIO<br>J107-16<br>Q30      | 8B<br>YEL-GRY<br>J107-17<br>Q34      |
|--------------------------------|----------------------------------------|----------------------------------------|-------------------------------------|--------------------------------------|---------------------------------|-------------------------------------------|--------------------------------------|--------------------------------------|
| ROW                            |                                        |                                        |                                     |                                      |                                 |                                           |                                      |                                      |
| 1B<br>RED-BRN<br>J107-1<br>Q4  | SECRET<br>WEAPON<br>11B                | BIG-O-BEAM<br>21B                      | MARS<br>KNEADS<br>WOMEN<br>31B      | MARTIAN<br>HARRY<br>HOUR<br>41B      | RIGHT LOOP<br>ARROW<br>51B      | MARTIAN<br>TARGET 5<br>(RT. TOP)<br>61B   | BOTTOM JET<br>BUMPER<br>71B          | SHOOTER<br>LANE 1<br>(BOTTOM)<br>81B |
| 2B<br>RED-BLK<br>J107-2<br>Q8  | TOWER<br>STRUGGLE<br>12B               | RIGHT<br>SAUCER<br>BEAM (LEFT)<br>22B  | RIGHT<br>SAUCER<br>BEAM (RT)<br>32B | ALIEN<br>ABDUCTION<br>42B            | RIGHT LOOP<br>CIRCLE<br>52B     | MARTIAN<br>TARGET 6<br>(RT. MID.)<br>62B  | NOT<br>USED<br>72B                   | SHOOTER<br>LANE<br>2<br>82B          |
| 3B<br>RED-ORG<br>J107-3<br>Q12 | CENTER<br>SAUCER<br>BEAM (LEFT)<br>13B | WEAPONS<br>23B                         | SAUCER RIM<br>9<br>(RIGHT)<br>33B   | LEFT<br>SAUCER<br>BEAM (LEFT)<br>43B | RIGHT RAMP<br>ARROW<br>53B      | MARTIAN<br>TARGET 7<br>(RT. BOT.)<br>63B  | LEFT JET<br>BUMPER<br>73B            | SHOOTER<br>LANE<br>3<br>83B          |
| 4B<br>RED-YEL<br>J107-4<br>Q16 | QUESTION<br>MARK<br>14B                | SAUCER<br>24B                          | SAUCER RIM<br>8<br>34B              | SAUCER RIM<br>1<br>(LEFT)<br>44B     | RIGHT RAMP<br>CIRCLE<br>54B     | MARTIAN<br>TARGET 3<br>(LEFT TOP)<br>64B  | LEFT OF<br>LEFT TOP<br>LANE<br>74B   | SHOOTER<br>LANE<br>4<br>84B          |
| 5B<br>RED-GRN<br>J107-5<br>Q20 | CENTER<br>SAUCER<br>BEAM (RT.)<br>15B  | FUEL<br>25B                            | SAUCER RIM<br>7<br>35B              | SAUCER RIM<br>2<br>45B               | LEFT LOOP<br>ARROW<br>55B       | MARTIAN<br>TARGET 2<br>(LEFT MID.)<br>65B | BETWEEN<br>L/R TOP<br>LANES<br>75B   | SHOOTER<br>LANE<br>5<br>85B          |
| 6B<br>RED-BLU<br>J107-6<br>Q24 | DRIVE-IN<br>DEMOLITION<br>16B          | LEFT<br>SAUCER<br>BEAM (RT.)<br>26B    | SAUCER RIM<br>6<br>36B              | SAUCER RIM<br>3<br>46B               | LEFT RAMP<br>ARROW<br>56B       | MARTIAN<br>TARGET 1<br>(LEFT BOT.)<br>66B | RIGHT OF<br>RIGHT TOP<br>LANE<br>76B | SHOOTER<br>LANE<br>6<br>86B          |
| 7B<br>RED-VIO<br>J107-7<br>Q28 | PARIS IN<br>PERIL<br>17B               | CENTER<br>SAUCER<br>BEAM (CNTR)<br>27B | SAUCER RIM<br>5<br>37B              | SAUCER RIM<br>4<br>47B               | LEFT LOOP<br>CIRCLE<br>57B      | RIGHT<br>MARTIAN<br>EYE<br>67B            | TOP OF<br>CENTER<br>LOOP<br>77B      | SHOOTER<br>LANE<br>7<br>87B          |
| 8B<br>RED-GRY<br>J107-8<br>Q32 | LEFT<br>SLINGSHOT<br>SPOTLIGHT<br>18B  | RIGHT<br>SLINGSHOT<br>SPOTLIGHT<br>28B | NOT USED<br>38B                     | NOT USED<br>48B                      | LEFT RAMP<br>CIRCLE<br>58B      | LEFT<br>MARTIAN<br>EYE<br>68B             | UPPER RT.<br>CORNER<br>(HIGH)<br>78B | SHOOTER<br>LANE<br>8<br>88B          |

## LAMP MATRIX CIRCUIT



## SWITCH MATRIX

| COLUMN                            | 1<br>GRN-BRN<br>J116-1<br>U45-18 | 2<br>GRN-RED<br>J116-2<br>U45-17 | 3<br>GRN-ORG<br>J116-3<br>U45-16      | 4<br>GRN-WHT<br>J116-4<br>U45-15 | 5<br>GRN-BLK<br>J116-5<br>U45-14 | 6<br>GRN-BLU<br>J116-6<br>U45-13 | 7<br>GRN-VIO<br>J116-7<br>U45-12         | 8<br>GRN-GRY<br>J116-8<br>U45-11        |
|-----------------------------------|----------------------------------|----------------------------------|---------------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------------------|-----------------------------------------|
| ROW                               |                                  |                                  |                                       |                                  |                                  |                                  |                                          |                                         |
| 1<br>WHT-BRN<br>J116-12<br>U51-7  | RIGHT<br>RAMP<br>ENTRANCE<br>11  | NOT USED<br>21                   | CENTER<br>LOOP REED<br>(BOTTOM)<br>31 | TROUGH<br>JAM<br>41              | RIGHT<br>LOCKUP<br>1<br>51       | LEFT<br>SLINGSHOT<br>61          | MARTIAN<br>TARGET 3<br>(LEFT TOP)<br>71  | NOT USED<br>81                          |
| 2<br>WHT-RED<br>J116-13<br>U51-5  | LEFT RAMP<br>EXIT<br>12          | NOT USED<br>22                   | CENTER<br>LOOP REED<br>(TOP)<br>32    | TROUGH<br>BALL<br>1<br>42        | LEFT RAMP<br>ENTRANCE<br>52      | RIGHT<br>SLINGSHOT<br>62         | MARTIAN<br>TARGET 2<br>(LEFT MID.)<br>72 | NOT USED<br>82                          |
| 3<br>WHT-ORG<br>J116-14<br>U51-9  | START<br>BUTTON<br>13            | LAUNCH<br>BUTTON<br>23           | CENTER<br>TARGET<br>4<br>33           | TROUGH<br>BALL<br>2<br>43        | NOT USED<br>53                   | LEFT JET<br>BUMPER<br>63         | MARTIAN<br>TARGET 1<br>(LEFT BOT.)<br>73 | NOT USED<br>83                          |
| 4<br>WHT-YEL<br>J116-15<br>U51-11 | NOT USED<br>14                   | NOT USED<br>24                   | CENTER<br>TARGET<br>3<br>34           | TROUGH<br>BALL<br>3<br>44        | NOT USED<br>54                   | RIGHT<br>JET<br>BUMPER<br>64     | CENTER<br>LOOP<br>ROLLOVER<br>74         | NOT USED<br>84                          |
| 5<br>WHT-GRN<br>J116-16<br>U57-7  | DROP<br>TARGET<br>DOWN<br>15     | LEFT LOOP<br>(LOW)<br>25         | CENTER<br>TARGET<br>2<br>35           | TROUGH<br>BALL<br>4<br>45        | NOT USED<br>55                   | BOTTOM<br>JET<br>BUMPER<br>65    | CENTER<br>DEFLECTOR<br>PANEL<br>75       | MARTIAN<br>TARGET 7<br>(RT. BOT.)<br>85 |
| 6<br>WHT-BLU<br>J116-17<br>U57-5  | LEFT<br>OUTLANE<br>16            | LEFT<br>RETURN<br>LANE<br>26     | CENTER<br>TARGET<br>1<br>36           | RIGHT<br>POPPER<br>46            | NOT USED<br>56                   | NOT USED<br>66                   | RIGHT TOP<br>LANE<br>76                  | MARTIAN<br>TARGET 6<br>(RT. MID.)<br>86 |
| 7<br>WHT-VIO<br>J116-18<br>U57-9  | RIGHT<br>RETURN<br>LANE<br>17    | RIGHT<br>OUTLANE<br>27           | MARTIAN<br>TARGET 4<br>(CENTER)<br>37 | JET EXT<br>47                    | NOT USED<br>57                   | RIGHT LOOP<br>(LOW)<br>67        | LEFT TOP<br>LANE<br>77                   | MARTIAN<br>TARGET 5<br>(RT. TOP)<br>87  |
| 8<br>WHT-GRY<br>J116-19<br>U57-11 | SHOOTER<br>LANE<br>18            | RIGHT RAMP<br>EXIT<br>28         | UP/DOWN<br>RAMP UP<br>38              | NOT USED<br>48                   | NOT USED<br>58                   | RIGHT LOOP<br>(HIGH)<br>68       | LEFT<br>LOOP<br>(HIGH)<br>78             | NOT USED<br>88                          |

= OPTO, TYPICALLY CLOSED

## COIN SLOT SWITCHES

| DIRECT<br>GROUND | ORN-BRN<br>J114-1<br>U43-7 | ORG-RED<br>J114-2<br>U43-5 | ORG-BLK<br>J114-3<br>U43-9 | ORG-YEL<br>J114-4<br>U43-11          | ORG-GRN<br>J114-5<br>U48-7 | ORG-BLU<br>J114-6<br>U48-5 | ORG-VIO<br>J114-8<br>U48-9 | ORG-GRY<br>J114-9<br>U48-11 |
|------------------|----------------------------|----------------------------|----------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|
| BLACK<br>J114-14 | LEFT COIN<br>SLOT<br>D1    | CENTER<br>COIN SLOT<br>D2  | RIGHT COIN<br>SLOT<br>D3   | 4 <sup>TH</sup> COIN<br>OPTION<br>D4 | NOT USED<br>D5             | NOT USED<br>D6             | NOT USED<br>D7             | NOT USED<br>D8              |

## DIAGNOSTIC SWITCHES

| DIRECT<br>GROUND | GRY-BLK<br>J114-10<br>U50-7 | GRY-ORG<br>J114-11<br>U50-5 | GRY-RED<br>J114-12<br>U50-9 | GRY-BRN<br>J114-13<br>U50-11 |
|------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| BLACK<br>J114-14 | 'ESCAPE'<br>BUTTON<br>D9    | 'DOWN'<br>BUTTON<br>D10     | 'UP'<br>BUTTON<br>D11       | 'ENTER'<br>BUTTON<br>D12     |

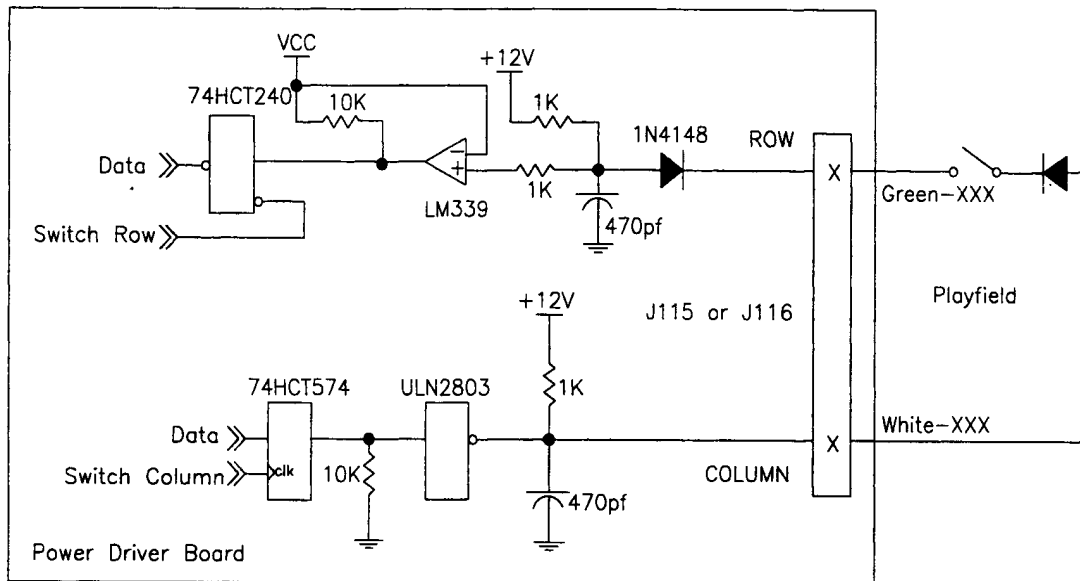
## PLAYFIELD FLIPPER SWITCHES (E.O.S.)

| DIRECT<br>GROUND | BLK-GRN<br>J115-9<br>U56-7                 | BLK-BLU<br>J115-10<br>U56-5               | BLK-VIO<br>J115-20<br>U56-9 | BLK-GRY<br>J115-21<br>U56-11 |
|------------------|--------------------------------------------|-------------------------------------------|-----------------------------|------------------------------|
| BLACK<br>J115-22 | LOWER<br>RIGHT<br>FLIPPER<br>E.O.S.<br>D13 | LOWER<br>LEFT<br>FLIPPER<br>E.O.S.<br>D14 | NOT USED<br>D15             | NOT USED<br>D16              |

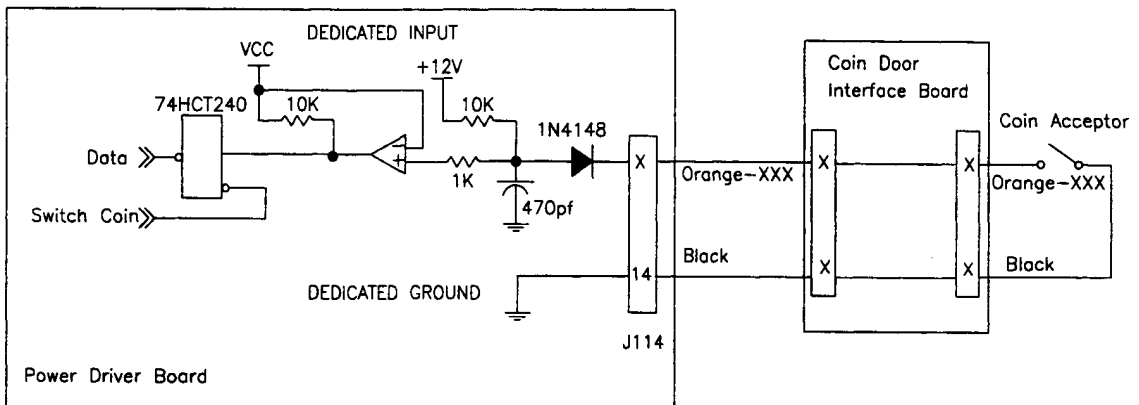
## CABINET FLIPPER SWITCHES

| DIRECT<br>GROUND | BLK-BRN<br>J113-1<br>U49-7 | BLK-RED<br>J113-2<br>U49-5 | BLK-ORG<br>J113-3<br>U49-9 | BLK-YEL<br>J113-4<br>U49-11 | BLK-GRN<br>J113-6<br>U55-7        | BLK-BLU<br>J113-7<br>U55-5       | BLK-VIO<br>J113-8<br>U55-9       | BLK-GRY<br>J113-9<br>U55-11     |
|------------------|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------------|----------------------------------|----------------------------------|---------------------------------|
| BLACK<br>J113-10 | SLAM TILT<br>D17           | COIN DOOR<br>CLOSED<br>D18 | PLUMB BOB<br>TILT<br>D19   | NOT USED<br>D20             | RIGHT<br>FLIPPER<br>BUTTON<br>D21 | LEFT<br>FLIPPER<br>BUTTON<br>D22 | RIGHT<br>ACTION<br>BUTTON<br>D23 | LEFT<br>ACTION<br>BUTTON<br>D24 |

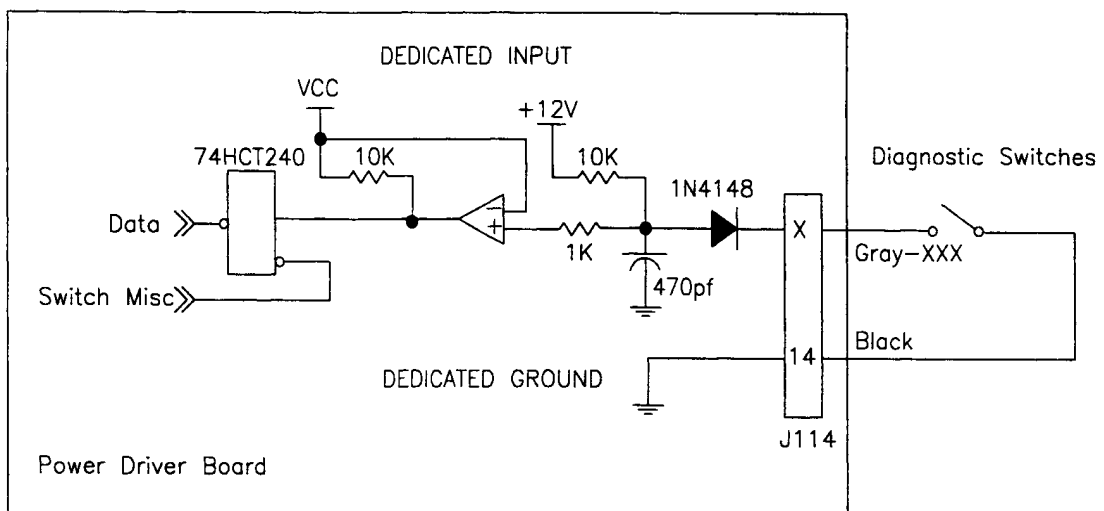
## SWITCH MATRIX CIRCUIT



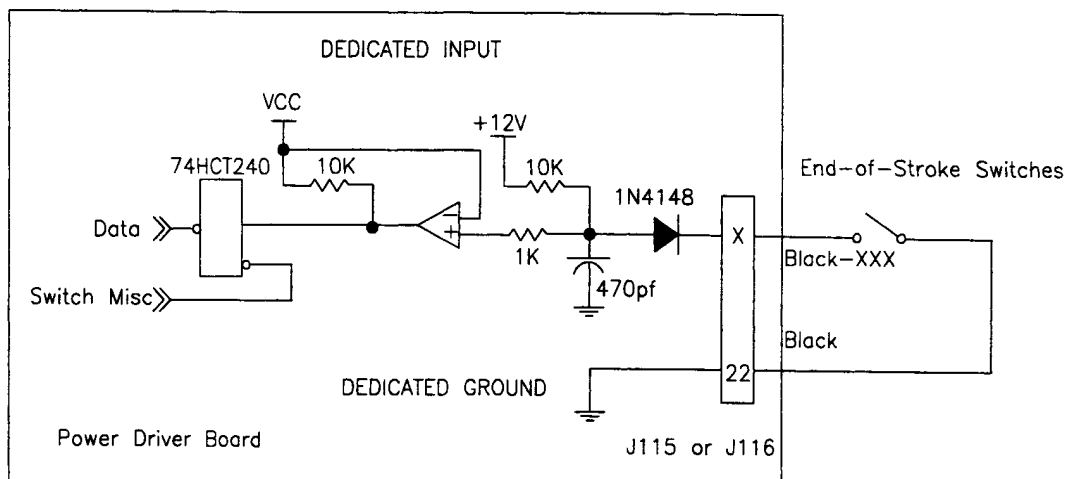
## COIN SLOT SWITCH CIRCUIT



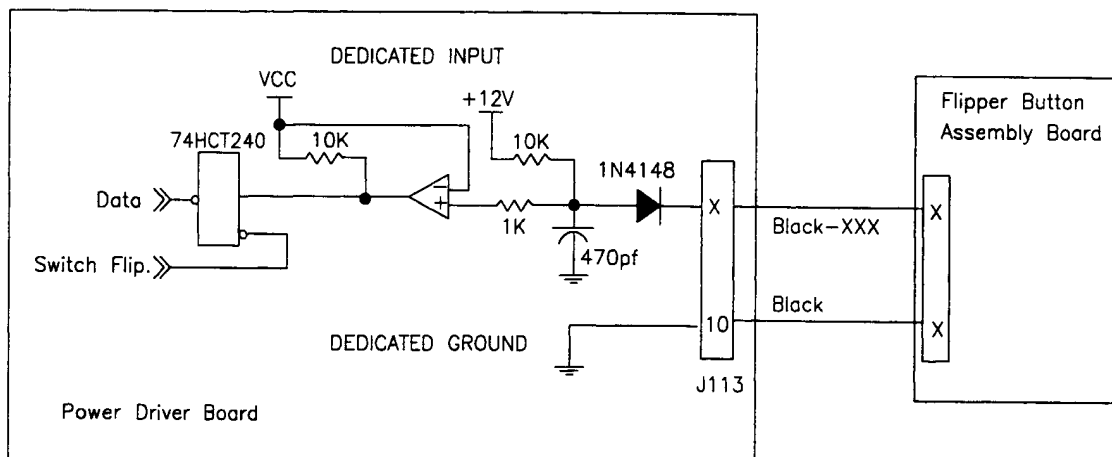
## DIAGNOSTIC SWITCH CIRCUIT



### PLAYFIELD FLIPPER SWITCH (E.O.S.) CIRCUIT



## CABINET FLIPPER SWITCH CIRCUIT

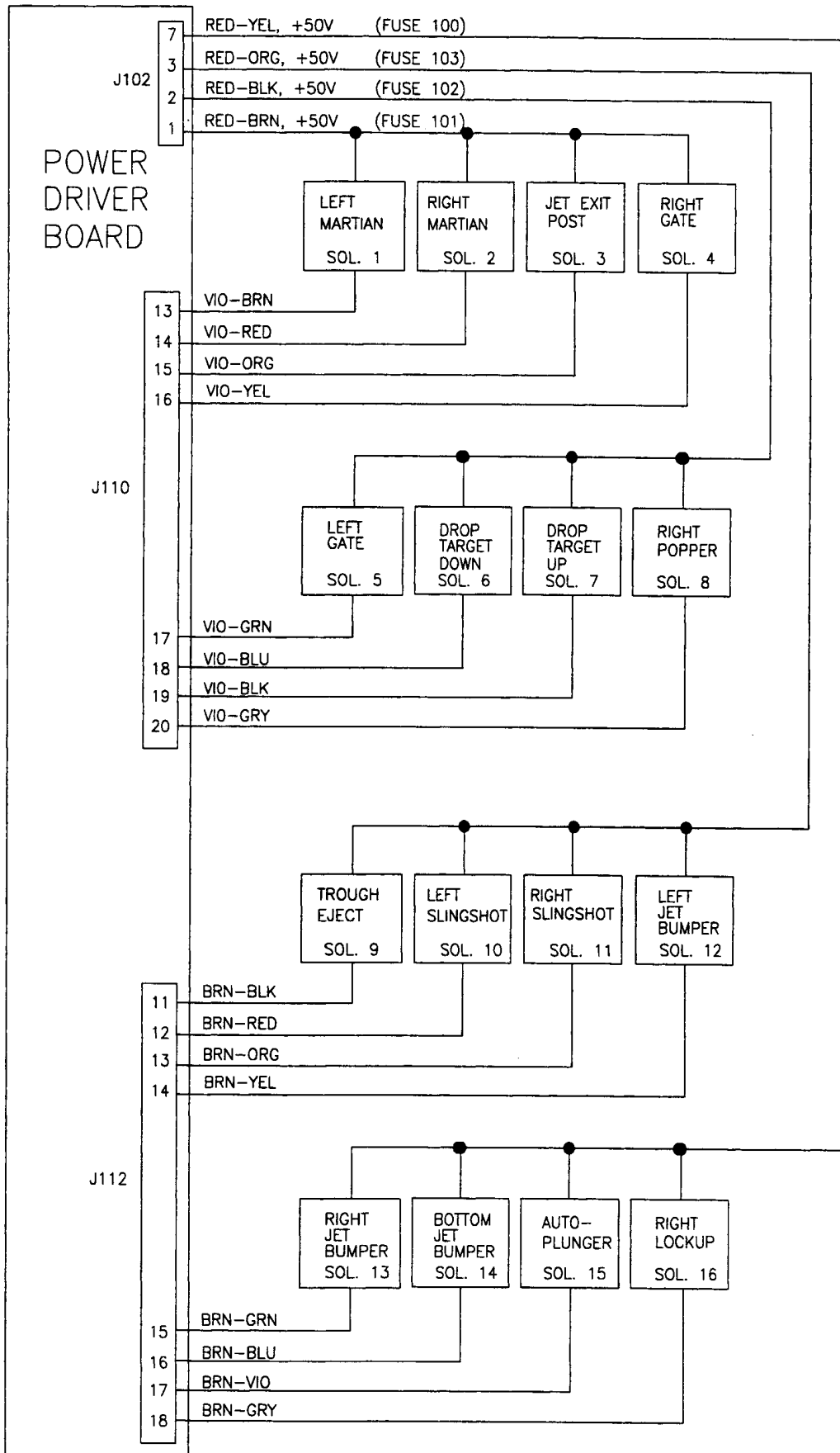


## SOLENOID TABLE

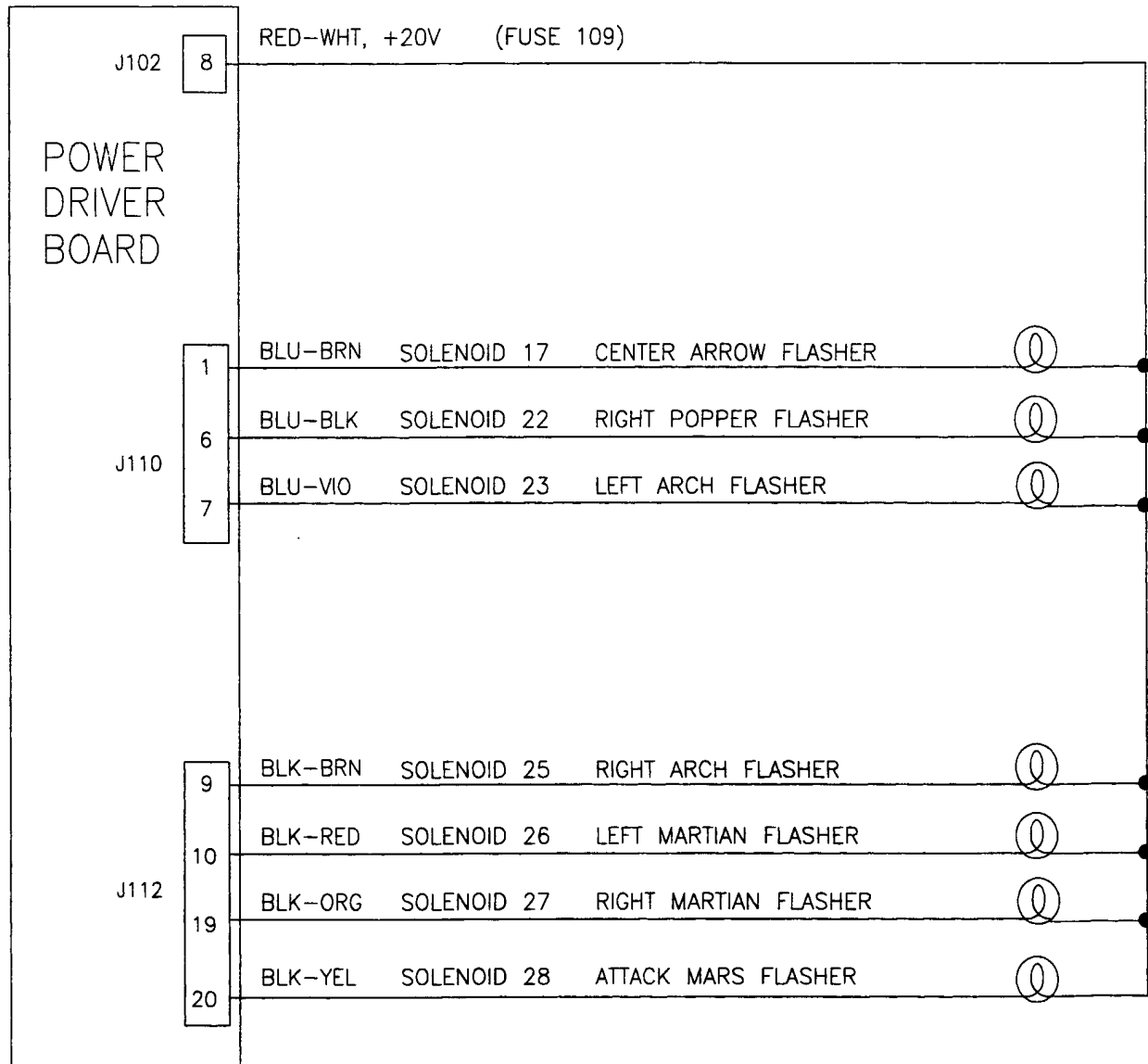
| Sol No. | Solenoid Function       | Fuse | Power to Playfield | Power Wire Color | Drive Transistor | Drive to Playfield | Drive Wire Color | Solenoid Part Number or Flasher Type |
|---------|-------------------------|------|--------------------|------------------|------------------|--------------------|------------------|--------------------------------------|
| 01      | LEFT MARTIAN            | F101 | J102-1             | RED-BRN          | Q59              | J110-13            | VIO-BRN          | AE1-26-1500                          |
| 02      | RIGHT MARTIAN           | F101 | J102-1             | RED-BRN          | Q60              | J110-14            | VIO-RED          | AE1-26-1500                          |
| 03      | JET EXIT POST           | F101 | J102-1             | RED-BRN          | Q61              | J110-15            | VIO-ORG          | AE1-26-1500                          |
| 04      | RIGHT GATE              | F101 | J102-1             | RED-BRN          | Q62              | J110-16            | VIO-YEL          | A-14406                              |
| 05      | LEFT GATE               | F102 | J102-2             | RED-BLK          | Q63              | J110-17            | VIO-GRN          | A-14406                              |
| 06      | DROP TARGET DOWN        | F102 | J102-2             | RED-BLK          | Q64              | J110-18            | VIO-BLU          | SM1-26-600                           |
| 07      | DROP TARGET UP          | F102 | J102-2             | RED-BLK          | Q65              | J110-19            | VIO-BLK          | AE1-26-1200                          |
| 08      | RIGHT POPPER            | F102 | J102-2             | RED-BLK          | Q66              | J110-20            | VIO-GRY          | AE1-25-1000                          |
| 09      | TROUGH EJECT            | F103 | J102-3             | RED-ORG          | Q51              | J112-11            | BRN-BLK          | AE1-26-1500                          |
| 10      | LEFT SLINGSHOT          | F103 | J102-3             | RED-ORG          | Q52              | J112-12            | BRN-RED          | AE1-26-1200                          |
| 11      | RIGHT SLINGSHOT         | F103 | J102-3             | RED-ORG          | Q53              | J112-13            | BRN-ORG          | AE1-26-1200                          |
| 12      | LEFT JET BUMPER         | F103 | J102-3             | RED-ORG          | Q54              | J112-14            | BRN-YEL          | AE1-26-1200                          |
| 13      | RIGHT JET BUMPER        | F100 | J102-7             | RED-YEL          | Q55              | J112-15            | BRN-GRN          | AE1-26-1200                          |
| 14      | BOTTOM JET BUMPER       | F100 | J102-7             | RED-YEL          | Q56              | J112-16            | BRN-BLU          | AE1-26-1200                          |
| 15      | AUTO PLUNGER            | F100 | J102-7             | RED-YEL          | Q57              | J112-17            | BRN-VIO          | AE1-23-800                           |
| 16      | RIGHT LOCKUP            | F100 | J102-7             | RED-YEL          | Q58              | J112-18            | BRN-GRY          | AE1-23-800                           |
| 17      | CENTER ARROW FLASHER    | F109 | J102-8             | RED-WHT          | Q43              | J110-1             | BLU-BRN          | #906                                 |
| 18      | NOT USED                | F109 |                    |                  | Q44              | J110-2             | BLU-RED          |                                      |
| 19      | NOT USED                | F109 |                    |                  | Q45              | J110-3             | BLU-ORG          |                                      |
| 20      | NOT USED                | F109 |                    |                  | Q46              | J110-4             | BLU-YEL          |                                      |
| 21      | NOT USED                | F109 |                    |                  | Q47              | J110-5             | BLU-GRN          |                                      |
| 22      | RIGHT POPPER FLASHER    | F109 | J102-8             | RED-WHT          | Q48              | J110-6             | BLU-BLK          | #906                                 |
| 23      | LEFT ARCH FLASHER       | F109 | J102-8             | RED-WHT          | Q49              | J110-7             | BLU-VIO          | #89                                  |
| 24      | NOT USED                | F109 |                    |                  | Q50              | J110-8             | BLU-GRY          |                                      |
| 25      | RIGHT ARCH FLASHER      | F109 | J102-8             | RED-WHT          | Q67              | J112-9             | BLK-BRN          | #89                                  |
| 26      | LEFT MARTIAN FLASHER    | F109 | J102-8             | RED-WHT          | Q68              | J112-10            | BLK-RED          | #89                                  |
| 27      | RIGHT MARTIAN FLASHER   | F109 | J102-8             | RED-WHT          | Q69              | J112-19            | BLK-ORG          | #89                                  |
| 28      | ATTACK MARS FLASHER     | F109 | J102-8             | RED-WHT          | Q70              | J112-20            | BLK-YEL          | #906                                 |
|         | <b>Flipper Circuits</b> |      |                    |                  |                  |                    |                  |                                      |
| 33      | LOW RIGHT FLIPPER PWR   |      |                    |                  | Q35              | J112-1             | YEL-GRN          |                                      |
| 34      | LOW RIGHT FLIPPER HOLD  | F104 | J103-1             | RED-GRN          | Q36              | J112-2             | ORG-GRN          | FL1-11629                            |
| 35      | LOW LEFT FLIPPER PWR    |      |                    |                  | Q37              | J112-3             | YEL-BLU          |                                      |
| 36      | LOW LEFT FLIPPER HOLD   | F105 | J103-2             | RED-BLU          | Q38              | J112-4             | ORG-BLU          | FL1-11629                            |
| 37      | LOCK DIVERter POWER     |      |                    |                  | Q39              | J112-5             | YEL-VIO          |                                      |
| 38      | LOCK DIVERter HOLD      | F106 | J103-3             | RED-VIO          | Q40              | J112-6             | ORG-VIO          | FL1-22241                            |
| 39      | UP/DOWN RAMP POWER      |      |                    |                  | Q41              | J112-7             | YEL-GRY          |                                      |
| 40      | UP/DOWN RAMP HOLD       | F107 | J103-4             | RED-GRY          | Q42              | J112-8             | ORG-GRY          | FL1-11753                            |

# COILS

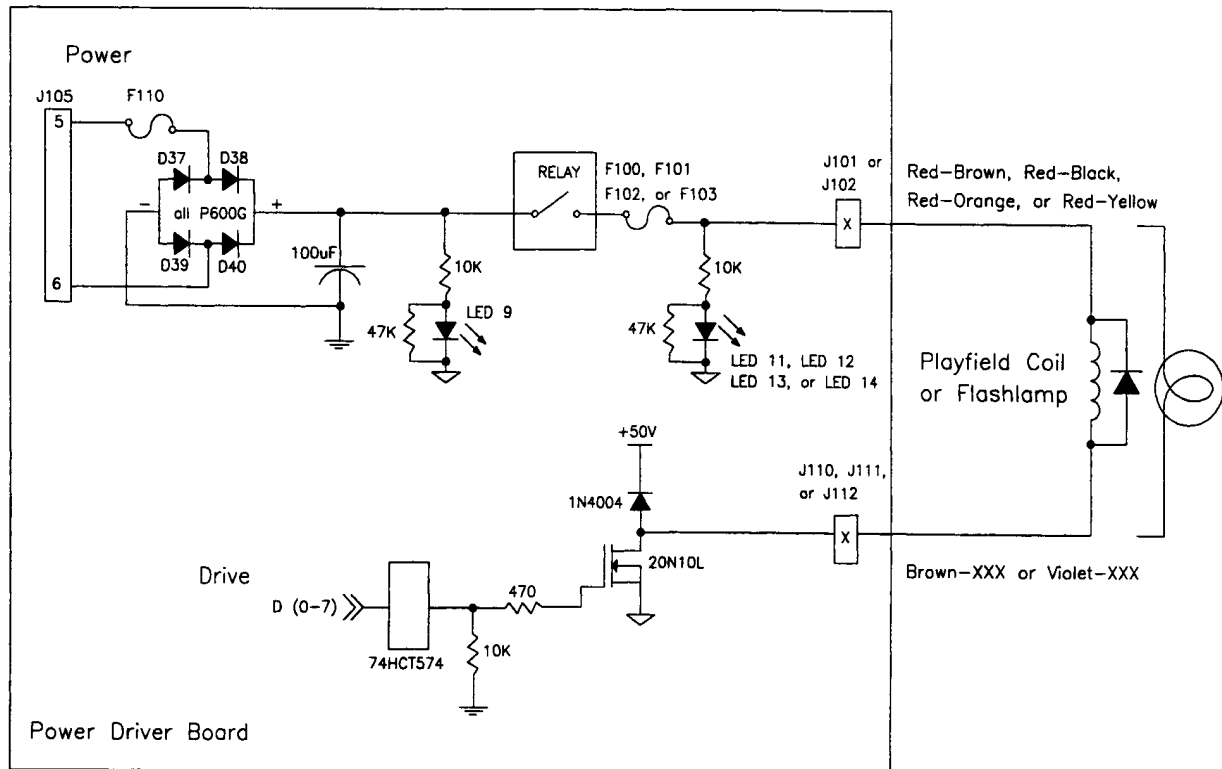
## SOLENOID WIRING



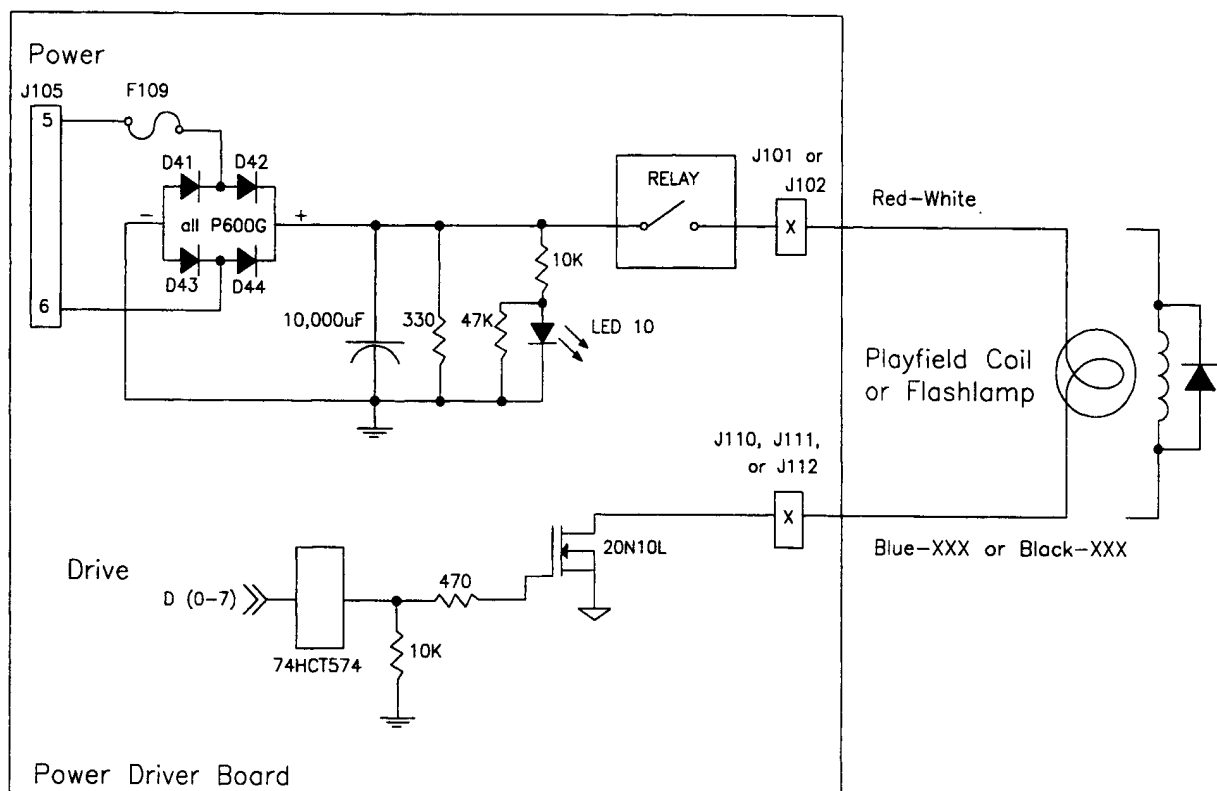
## FLASHLAMPS



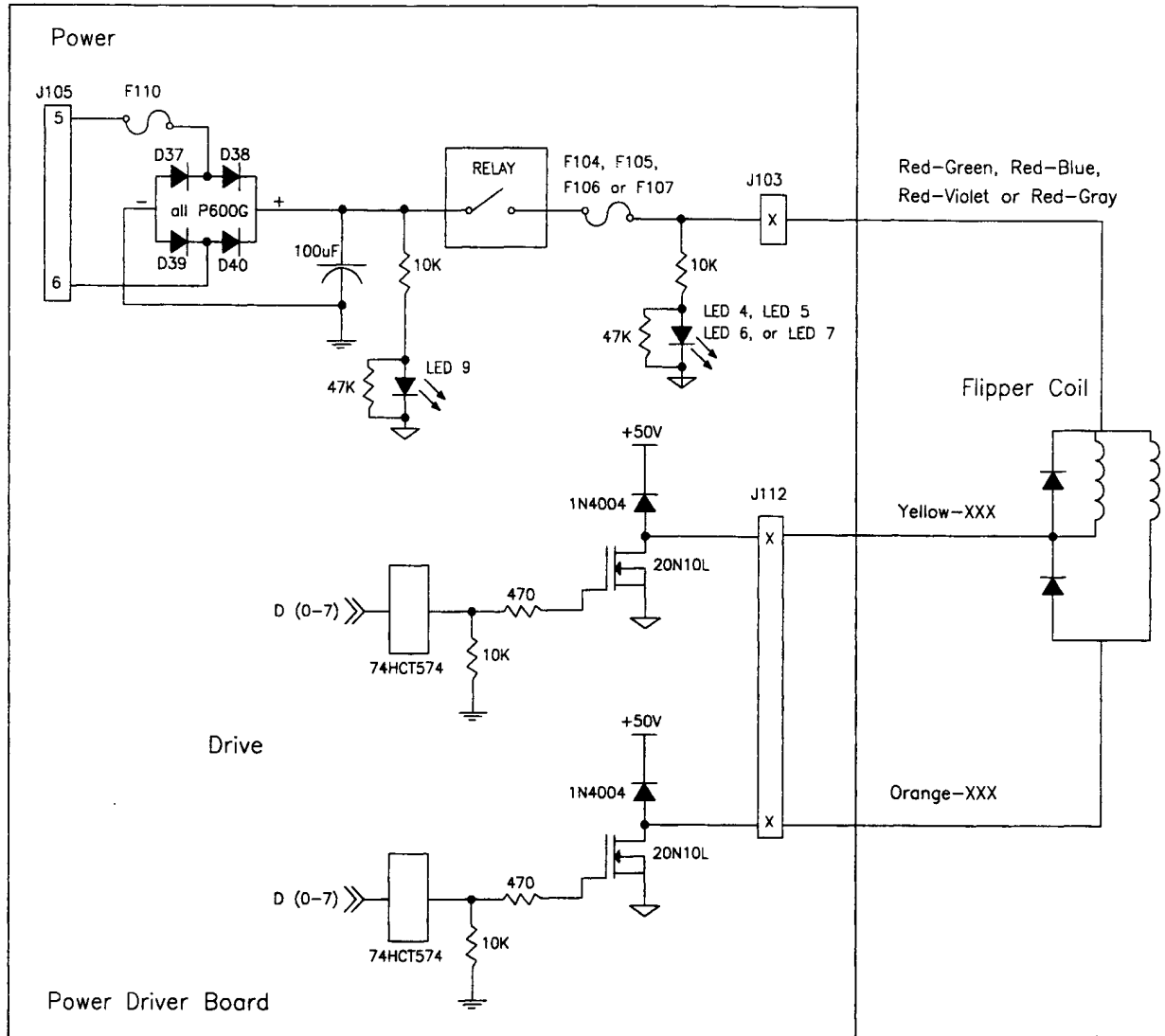
## CIRCUIT for SOLENOIDS 1 to 16



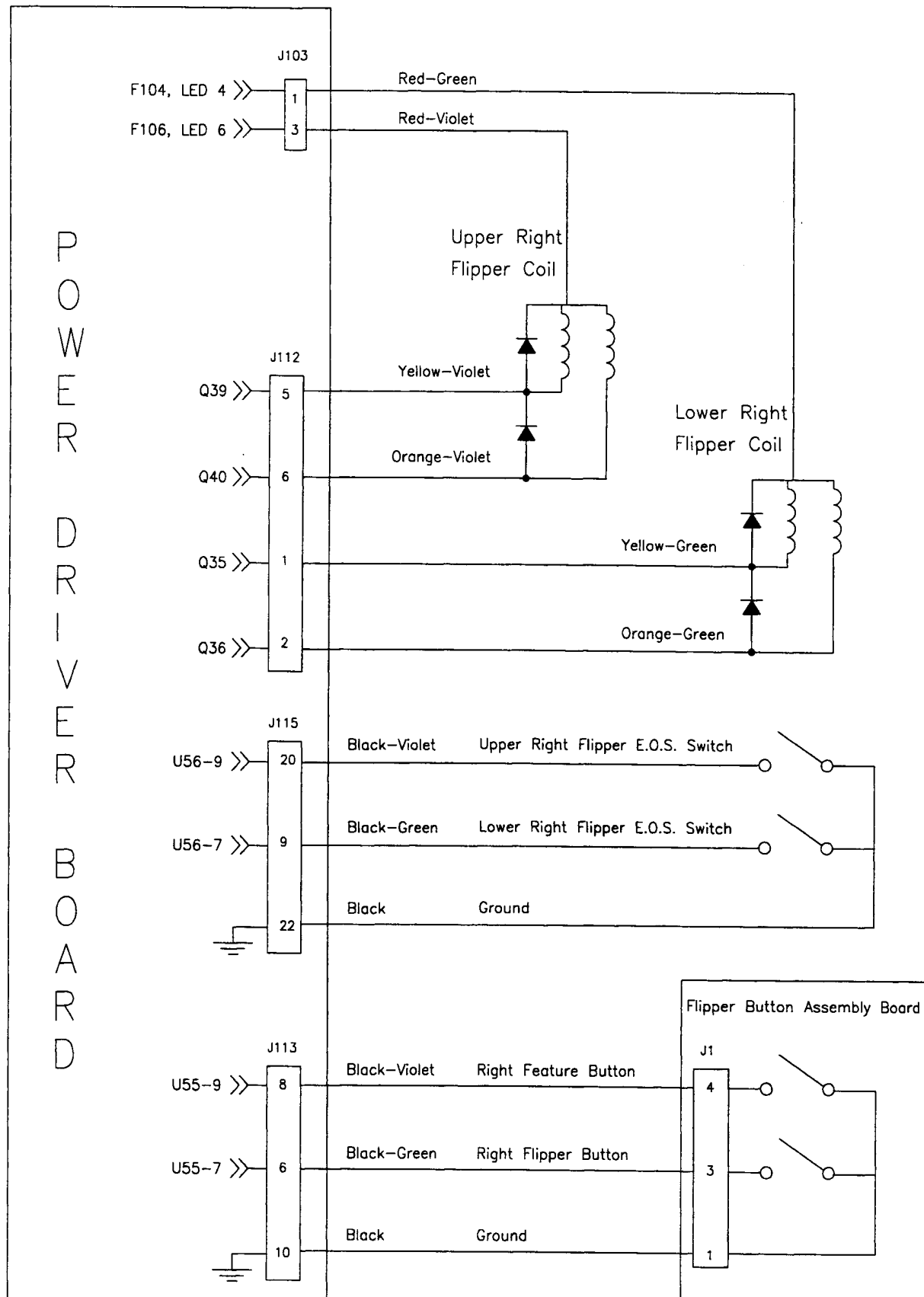
## CIRCUIT for SOLENOIDS 17 to 28



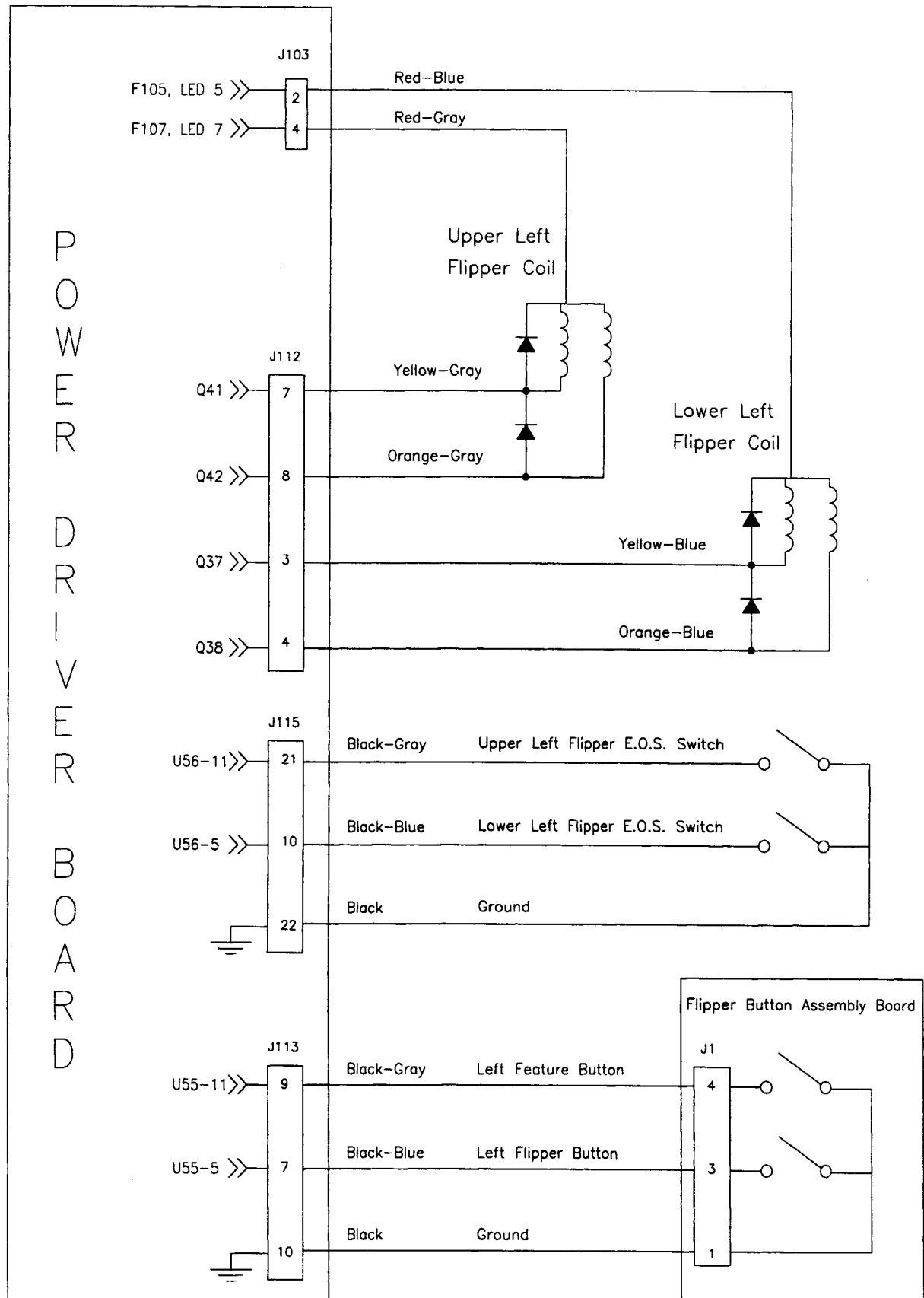
## FLIPPER COIL CIRCUIT



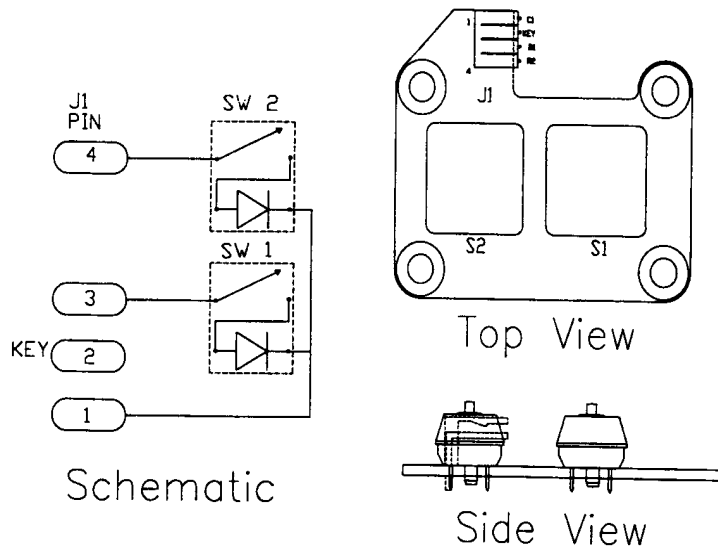
## UPPER AND LOWER RIGHT FLIPPER CIRCUITS



## UPPER AND LOWER LEFT FLIPPER CIRCUITS



## 2 SWITCH FLIPPER BUTTON ASSEMBLY 04-12612



### **Left Side Flipper**

J1-1 Black, Ground from Power Driver Board at J113-10

J1-2 Key

J1-3 Black-Blue, Flipper Button from Power Driver Board at J113-7

J1-4 Black-Gray, Feature Button from Power Driver Board at J113-9

### **Right Side Flipper**

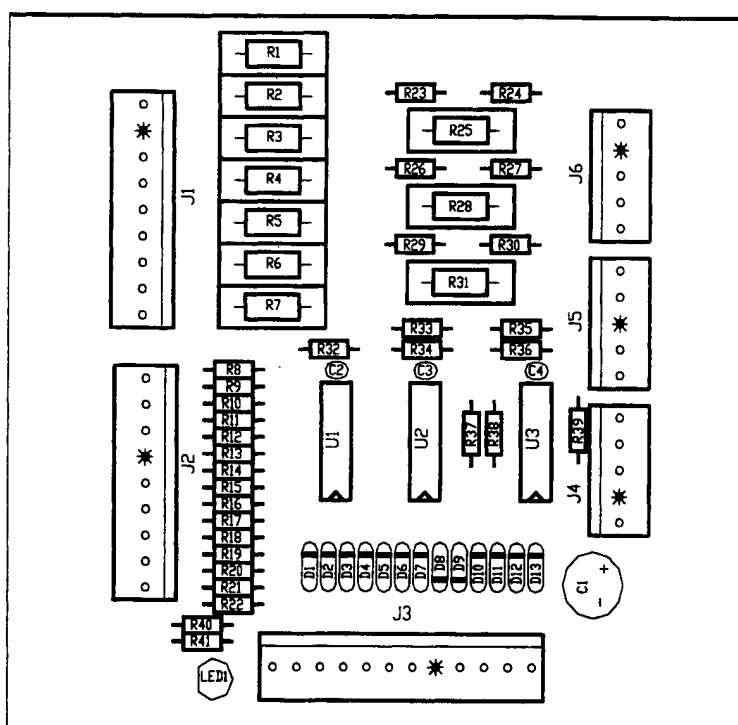
J1-1 Black, Ground from Power Driver Board at J113-10

J1-2 Key

J1-3 Black-Green, Flipper Button from Power Driver Board at J113-6

J1-4 Black-Violet, Feature Button from Power Driver Board at J113-8

## 10-Opto Switch Board Assembly A-18159.1

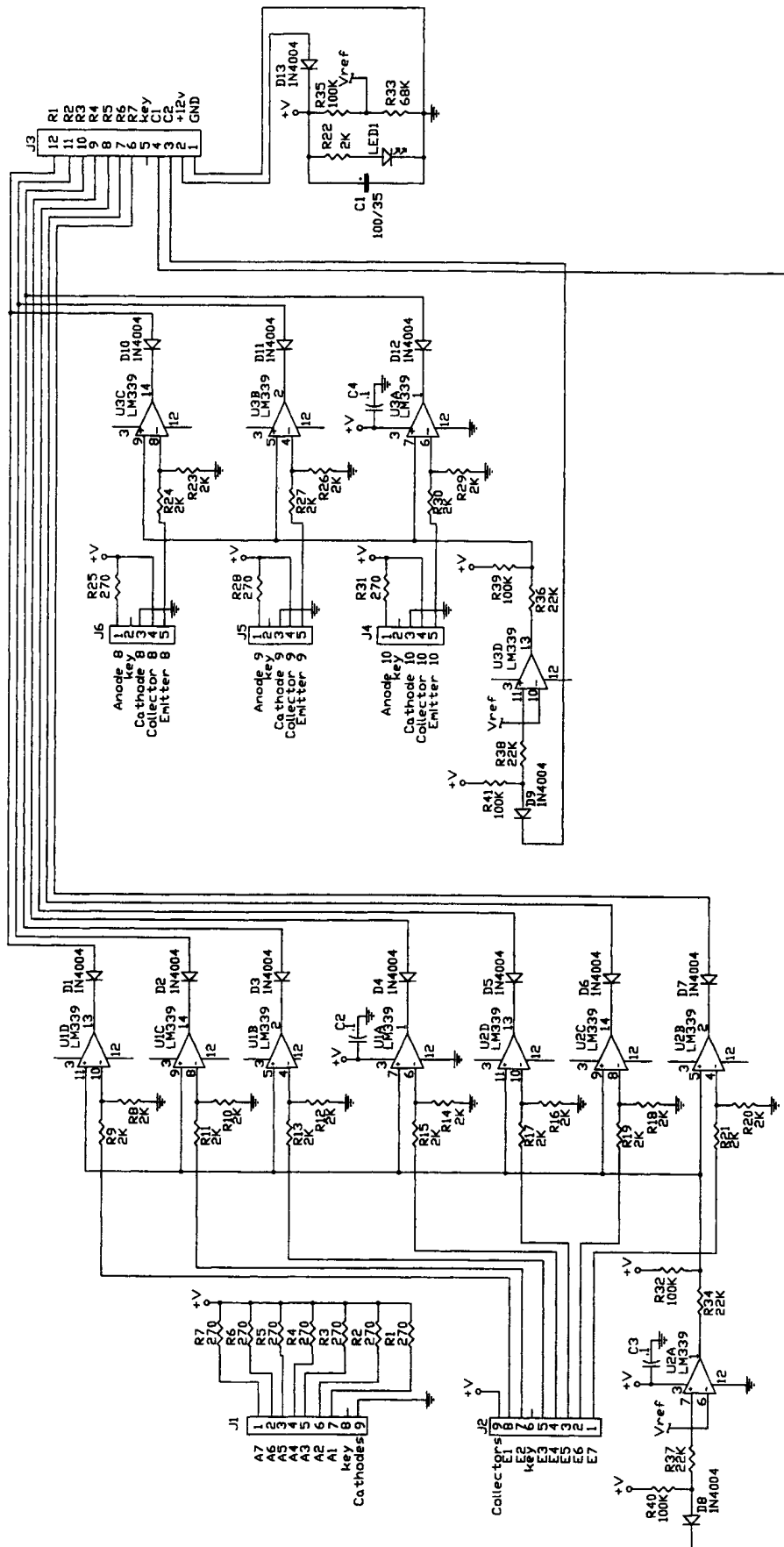


|      |         |                                  |
|------|---------|----------------------------------|
| J1-1 | GRY-VIO | To switch #47 LED board          |
| J1-2 | GRY-BLU | To switch #46 LED board          |
| J1-3 | GRY-GRN | To switch #45 LED board          |
| J1-4 | GRY-BLK | To switch #44 LED board          |
| J1-5 | GRY-ORG | To switch #43 LED board          |
| J1-6 | GRY-RED | To switch #42 LED board          |
| J1-7 | GRY-BRN | To switch #41 LED board          |
| J1-8 | KEY     |                                  |
| J1-9 | BLK     | Ground to LED boards             |
| J2-1 | ORG-VIO | To switch #47 Photo Trans. board |
| J2-2 | ORG-BLU | To switch #46 Photo Trans. board |
| J2-3 | ORG-GRN | To switch #45 Photo Trans. board |
| J2-4 | ORG-YEL | To switch #44 Photo Trans. board |
| J2-5 | ORG-BLK | To switch #43 Photo Trans. board |
| J2-6 | KEY     |                                  |
| J2-7 | ORG-RED | To switch #42 Photo Trans. board |
| J2-8 | ORG-BRN | To switch #41 Photo Trans. board |
| J2-9 | GRY-YEL | +12V to Photo Trans. boards      |

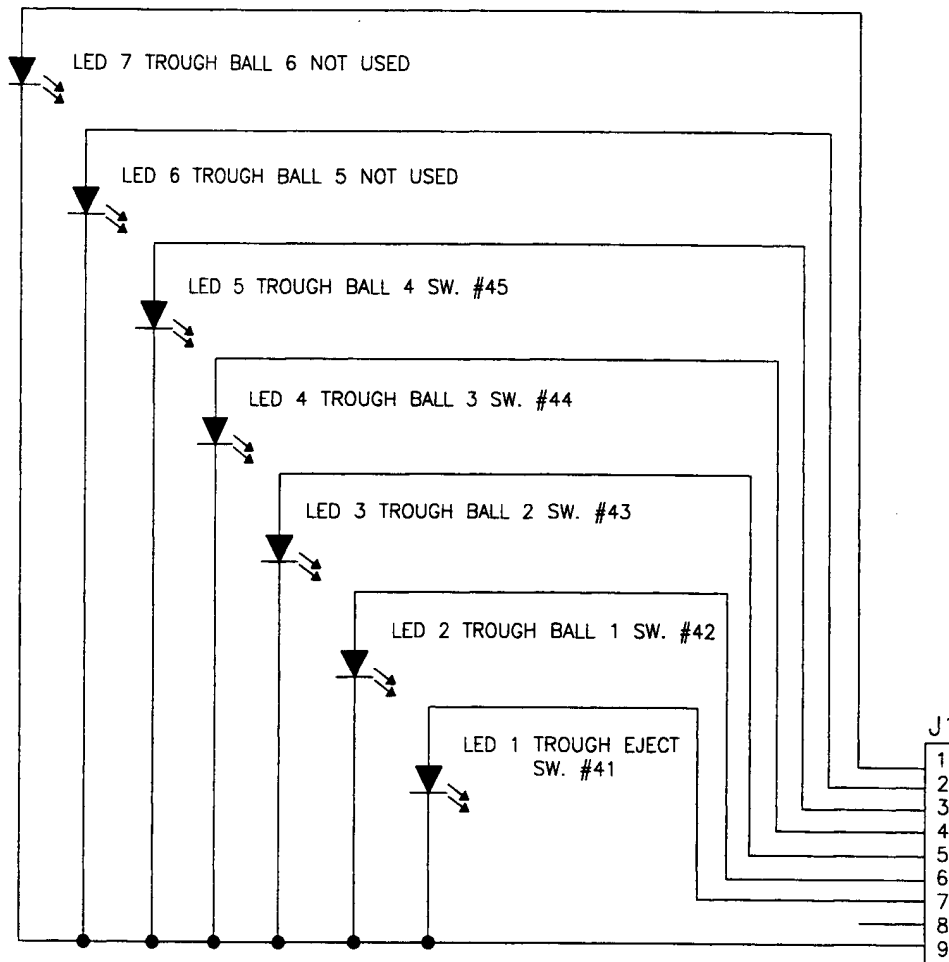
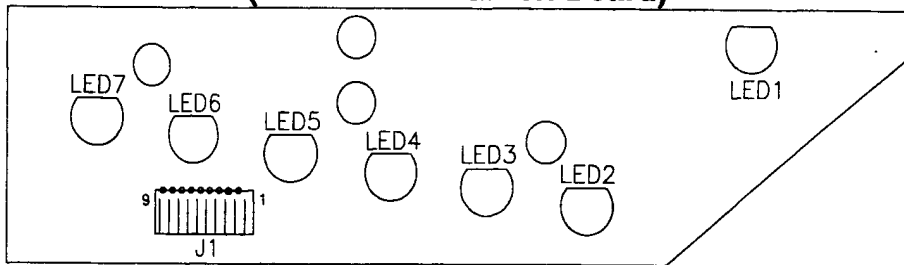
|       |         |                                                  |
|-------|---------|--------------------------------------------------|
| J3-1  | BLK     | Ground from Power Driver board J116-22           |
| J3-2  | GRY-YEL | +12V from Power Driver board J116-11             |
| J3-3  | GRN-BLK | Switch Row 5 from Power Driver board J116-5      |
| J3-4  | GRN-WHT | Switch Row 4 from Power Driver board J116-4      |
| J3-5  | KEY     |                                                  |
| J3-6  | WHT-VIO | Switch Column #7 from Power Driver board J116-18 |
| J3-7  | WHT-BLU | Switch Column #6 from Power Driver board J116-17 |
| J3-8  | WHT-GRN | Switch Column #5 from Power Driver board J116-16 |
| J3-9  | WHT-YEL | Switch Column #4 from Power Driver board J116-15 |
| J3-10 | WHT-ORG | Switch Column #3 from Power Driver board J116-14 |
| J3-11 | WHT-RED | Switch Column #2 from Power Driver board J116-13 |
| J3-12 | WHT-BRN | Switch Column #1 from Power Driver board J116-12 |

|      |         |                                   |
|------|---------|-----------------------------------|
| J4   |         | NOT USED                          |
| J5-1 | GRN-RED | To switch #52 LED board           |
| J5-2 | BLK     | Ground to switch #52 LED board    |
| J5-3 | KEY     |                                   |
| J5-4 | GRY-YEL | +12V to sw. #52 Photo Trans board |
| J5-5 | WHT-RED | To switch #52 Photo Trans. board  |
| J6-1 | GRN-BRN | To switch #51 LED board           |
| J6-2 | KEY     |                                   |
| J6-3 | BLK     | Ground to switch #51 LED board    |
| J6-4 | GRY-YEL | +12V to sw. #51 Photo Trans board |
| J6-5 | WHT-BRN | To switch #51 Photo Trans. board  |

# 10-Opto Switch Board Schematic A-18159.1

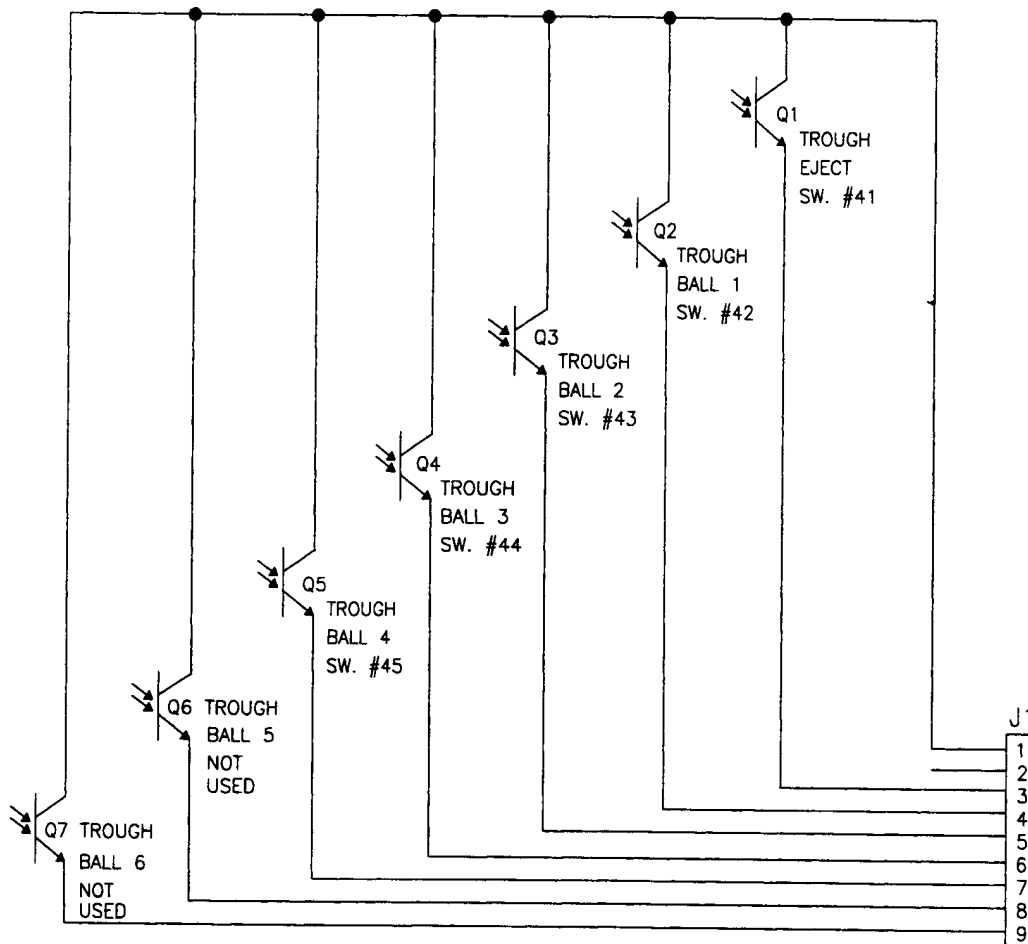
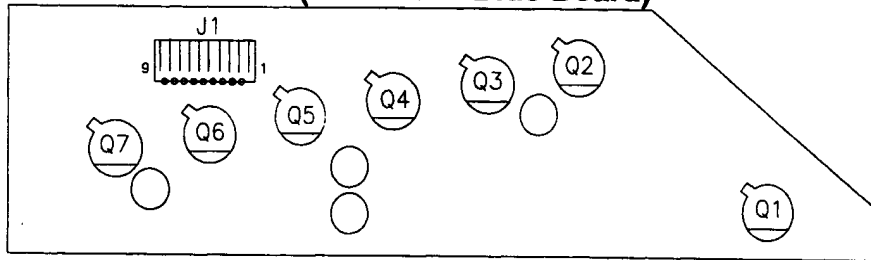


**Ball Trough Infrared LED Board Assembly  
A-18617-1  
(Transmitter - Green Board)**



|             |          |                                                             |
|-------------|----------|-------------------------------------------------------------|
| <b>J1-1</b> | N/C      |                                                             |
| <b>J1-2</b> | N/C      |                                                             |
| <b>J1-3</b> | GRY-GRN, | For TROUGH BALL 4 switch #45 from 10-Opto Switch Board J1-3 |
| <b>J1-4</b> | GRY-BLK, | For TROUGH BALL 3 switch #44 from 10-Opto Switch Board J1-4 |
| <b>J1-5</b> | GRY-ORG, | For TROUGH BALL 2 switch #43 from 10-Opto Switch Board J1-5 |
| <b>J1-6</b> | GRY-RED, | For TROUGH BALL 1 switch #42 from 10-Opto Switch Board J1-6 |
| <b>J1-7</b> | GRY-BRN, | For TROUGH EJECT switch #41 from 10-Opto Switch Board J1-7  |
| <b>J1-8</b> | KEY      |                                                             |
| <b>J1-9</b> | BLK,     | Ground from 10-Opto Switch Board J1-9                       |

**Ball Trough Infrared Photo Transistor Board Assembly  
A-18618-1  
(Receiver - Blue Board)**



|             |                 |                                                                    |
|-------------|-----------------|--------------------------------------------------------------------|
| <b>J1-1</b> | <b>GRY-YEL,</b> | <b>+12V from 10-Opto Switch Board J2-9</b>                         |
| <b>J1-2</b> | <b>KEY</b>      |                                                                    |
| <b>J1-3</b> | <b>ORG-BRN,</b> | <b>For TROUGH EJECT switch #41 from 10-Opto Switch Board J2-8</b>  |
| <b>J1-4</b> | <b>ORG-RED,</b> | <b>For TROUGH BALL 1 switch #42 from 10-Opto Switch Board J2-7</b> |
| <b>J1-5</b> | <b>ORG-BLK,</b> | <b>For TROUGH BALL 2 switch #43 from 10-Opto Switch Board J2-5</b> |
| <b>J1-6</b> | <b>ORG-YEL,</b> | <b>For TROUGH BALL 3 switch #44 from 10-Opto Switch Board J2-4</b> |
| <b>J1-7</b> | <b>ORG-GRN,</b> | <b>For TROUGH BALL 4 switch #45 from 10-Opto Switch Board J2-3</b> |
| <b>J1-8</b> | <b>N/C</b>      |                                                                    |
| <b>J1-9</b> | <b>N/C</b>      |                                                                    |

## Wiring Diagram for the Ball Trough Assembly Opto Switches

*This diagram shows the opto switches in the Ball Trough Assembly only. See page 3-21 for the individual playfield opto switches.*

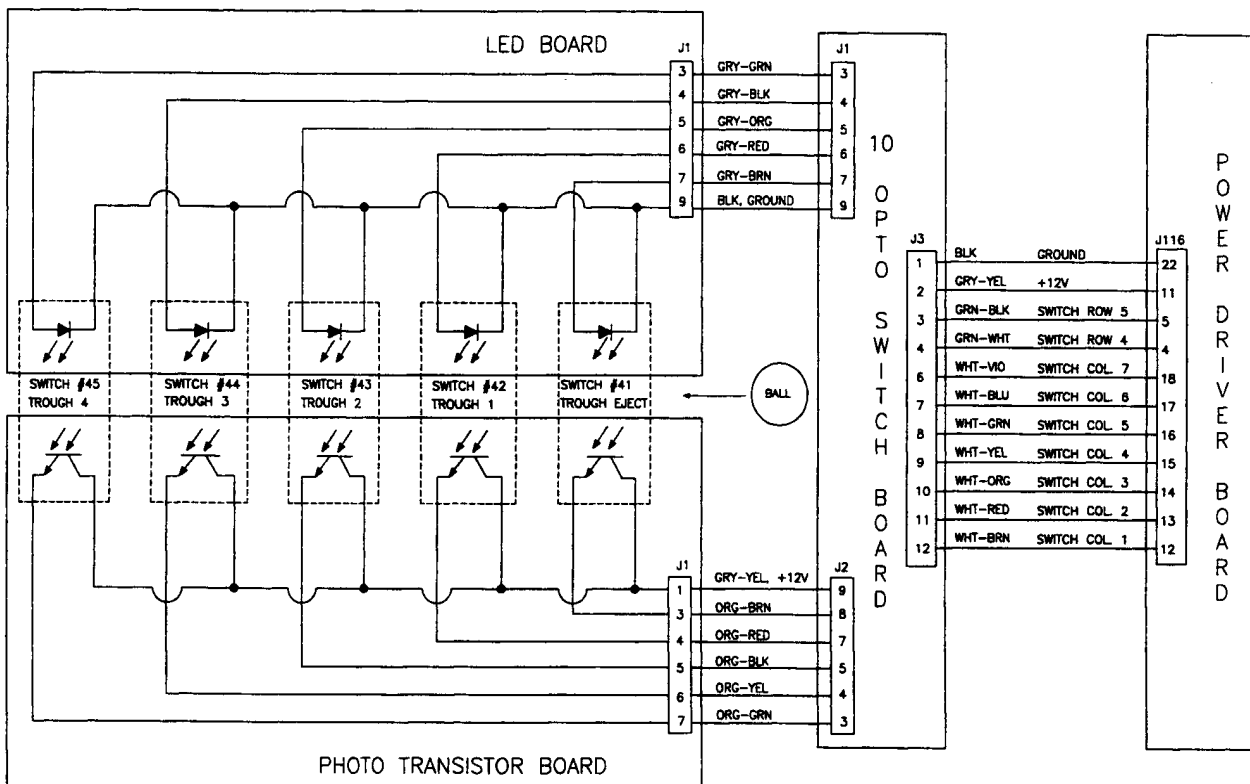
### The Ball Trough Assembly opto switches are:

|            |               |
|------------|---------------|
| Switch #41 | Trough Eject  |
| Switch #42 | Trough Ball 1 |
| Switch #43 | Trough Ball 2 |
| Switch #44 | Trough Ball 3 |
| Switch #45 | Trough Ball 4 |

The Ball Trough Assembly opto switches use a green Ball Trough LED board (P/N A-18617-1), and a blue Ball Trough Photo Transistor board (P/N A-18618-1).

### OPTO SWITCH OPERATION:

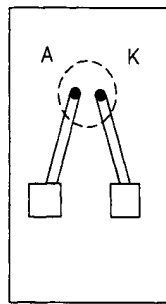
The ball rolls between the Ball Trough LED board and the Ball Trough Photo Transistor board and breaks the beam. The broken beam 'makes' the switch.



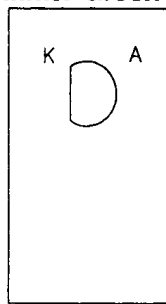
# Individual LED Board Assembly

## A-16908

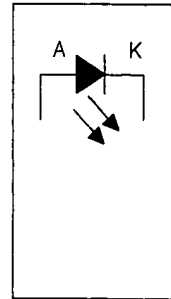
### (Transmitter-Green Board)



solder side



component side

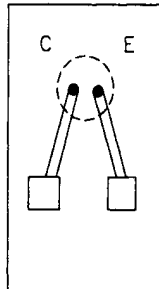


schematic

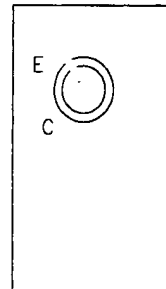
# Individual Photo Transistor Board Assembly

## A-16909

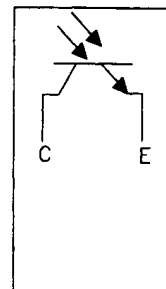
### (Receiver-Blue Board)



solder side



component side



schematic

## Typical Circuit Diagram

LED BOARD  
Transmitter  
1.0-1.4 volts

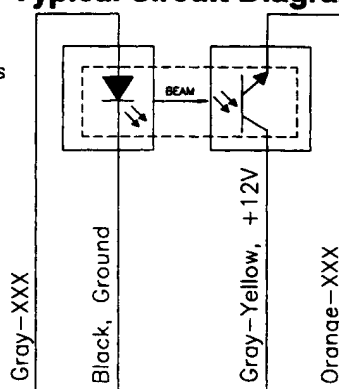
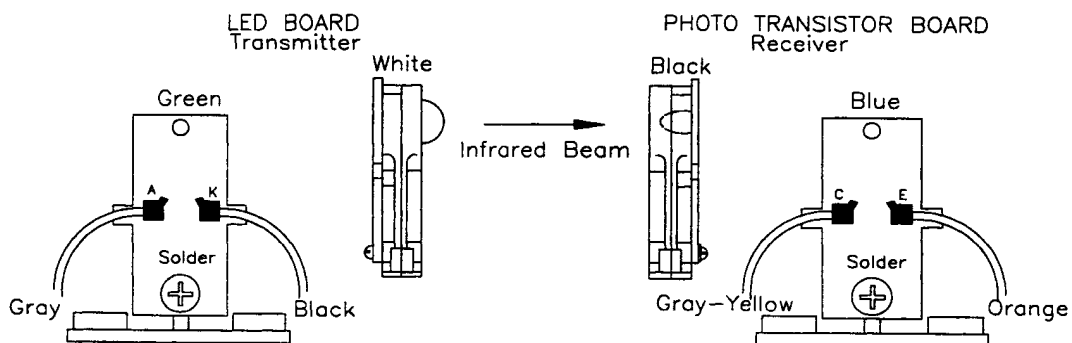


PHOTO TRANSISTOR BOARD  
Receiver  
0.1-0.7 volts unblocked  
11-13 volts blocked



## Wiring Diagram for Individual Playfield Opto Switches

This diagram shows the wiring for individual playfield opto switches only. See page 3-19 for the wiring diagram for the Ball Trough Assembly opto switches.

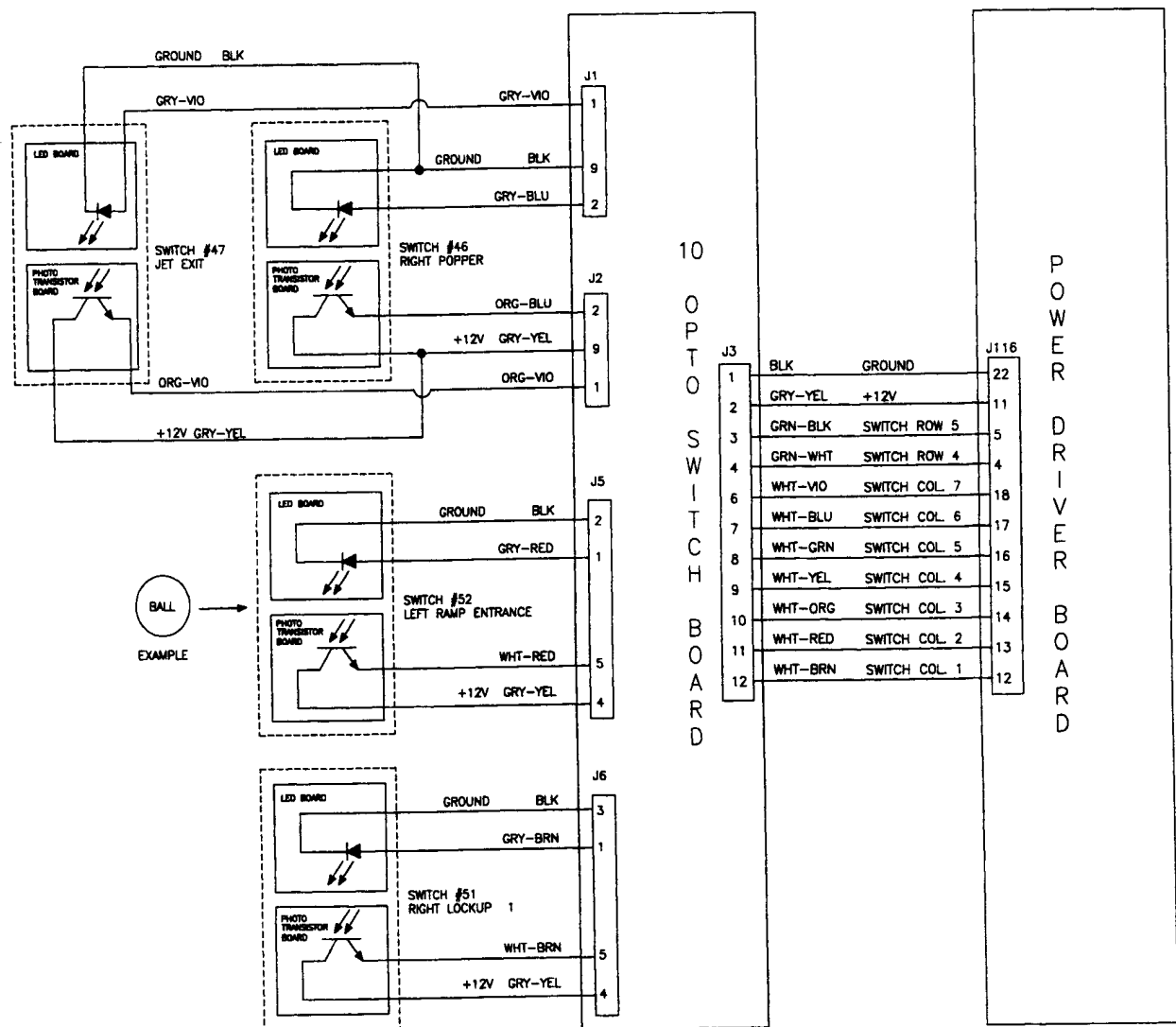
The individual playfield opto switches are:

- Switch #46 Right Popper
- Switch #47 Jet Eject
- Switch #51 Right Lockup 1
- Switch #52 Left Ramp Entrance

Each of these switches uses a green Individual LED board (P/N A-16908), and a blue Individual Photo Transistor board (P/N A-16909).

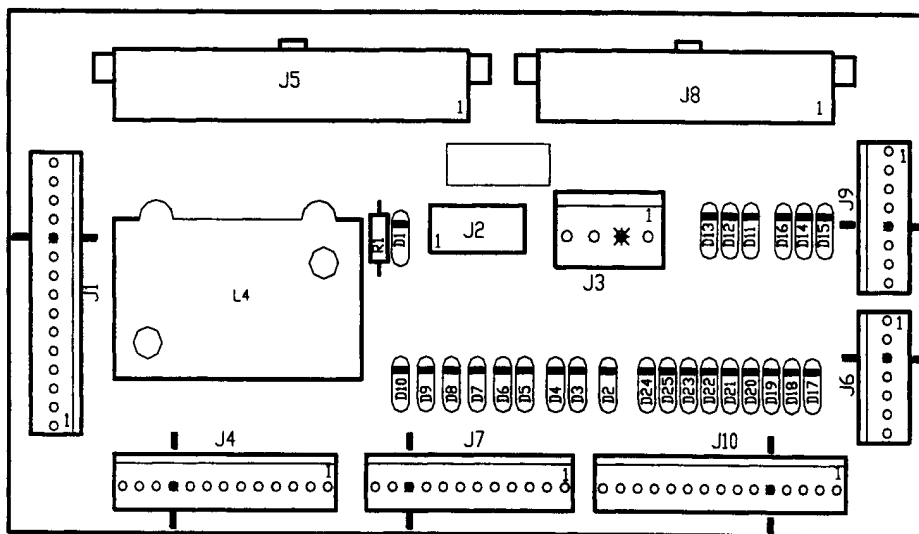
### OPTO SWITCH OPERATION:

The ball rolls between the Individual LED board and the Individual Photo Transistor board and breaks the beam. The broken beam 'makes' the switch.



# Coin Door Interface Board

## 04-12492



|       |              |                       |       |          |                  |
|-------|--------------|-----------------------|-------|----------|------------------|
| J1-1  | BLK-YEL      | Slam Tilt             | J5-1  | BLK-BRN  | Slam Switch      |
| J1-2  | BLK-RED      | Interlock Switch      | J5-2  | BLK-RED  | Interlock Switch |
| J1-3  | BLK-ORG      | Plumb Bob Tilt        | J5-3  | BLK-ORG  | Plumb Bob Tilt   |
| J1-4  | N/C          |                       | J5-4  | BLK-YEL  | Misc.            |
| J1-5  | BLK-GRN      | Right Flipper 1       | J5-5  | BLK-GRN  | Right Flipper 1  |
| J1-6  | BLK-BLU      | Left Flipper 1        | J5-6  | BLK-BLU  | Left Flipper 1   |
| J1-7  | BLK-VIO      | Right Flipper 2       | J5-7  | BLK-VIO  | Right Flipper 2  |
| J1-8  | BLK-GRY      | Left Flipper 2        | J5-8  | BLK-GRY  | Left Flipper 2   |
| J1-9  | N/C          |                       | J5-9  | GRY-BRN  | Enter Button     |
| J1-10 | N/C          |                       | J5-10 | GRY-RED  | Up Button        |
| J1-11 | Key          |                       | J5-11 | BLU      | Counter Signal   |
| J1-12 | N/C          |                       | J5-12 | GRY-YEL  | +12V             |
| J1-13 | BLK          | Flipper Switch Ground | J5-13 | ORG-BRN  | Coin 1           |
| J1-14 | GRY-YEL      | +12V                  | J5-14 | ORG-RED  | Coin 2           |
| J1-15 | N/C          | Ground                | J5-15 | ORG-BLK  | Coin 3           |
| J2    | Ribbon Cable |                       | J5-16 | ORG-YEL  | Coin 4           |
| J3-1  | BLU          | For DBV               | J5-17 | ORG-GRN  | Coin 5           |
| J3-2  | Key          |                       | J5-18 | ORG-BLU  | Coin 6           |
| J3-3  | N/C          |                       | J5-19 | ORG-VIO  | Coin 7           |
| J3-4  | BRN          | For DBV               | J5-20 | ORG-GRY  | Coin 8           |
| J4-1  | WHT-YEL      | Lamp Row 4            | J5-21 | GRY-ORG  | Down Button      |
| J4-2  | YEL-WHT      | Lamp Column 2         | J5-22 | GRY-BLK  | Escape Button    |
| J4-3  | BLK          | Switch Ground         | J5-23 | VIO-GRY  | Counter Power    |
| J4-4  | BLK-BRN      | Coin 1 Left           | J5-24 | BLK      | Ground           |
| J4-5  | N/C          | Coin 2 Center         | J6    | Not Used |                  |
| J4-6  | BLK-RED      | Coin 3 Right          | J7-1  | GRN-BRN  | Switch Column 1  |
| J4-7  | WHT-GRY      | Escape Button         | J7-2  | GRN-RED  | Switch Column 2  |
| J4-8  | ORG-RED      | Down Button           | J7-3  | N/C      |                  |
| J4-9  | ORG-GRN      | Up Button             | J7-4  | N/C      |                  |
| J4-10 | Key          |                       | J7-5  | N/C      |                  |
| J4-11 | BLK-BLU      | Enter Button          | J7-6  | N/C      |                  |
| J4-12 | GRN-BRN      | Slam Column           | J7-7  | N/C      |                  |
| J4-13 | BLK-GRN      | Slam Row              | J7-8  | WHT-ORG  | Start Button     |
|       |              |                       | J7-9  | WHT-ORG  | Switch #23       |
|       |              |                       | J7-10 | Key      |                  |
|       |              |                       | J7-11 | N/C      |                  |
|       |              |                       | J7-12 | N/C      |                  |

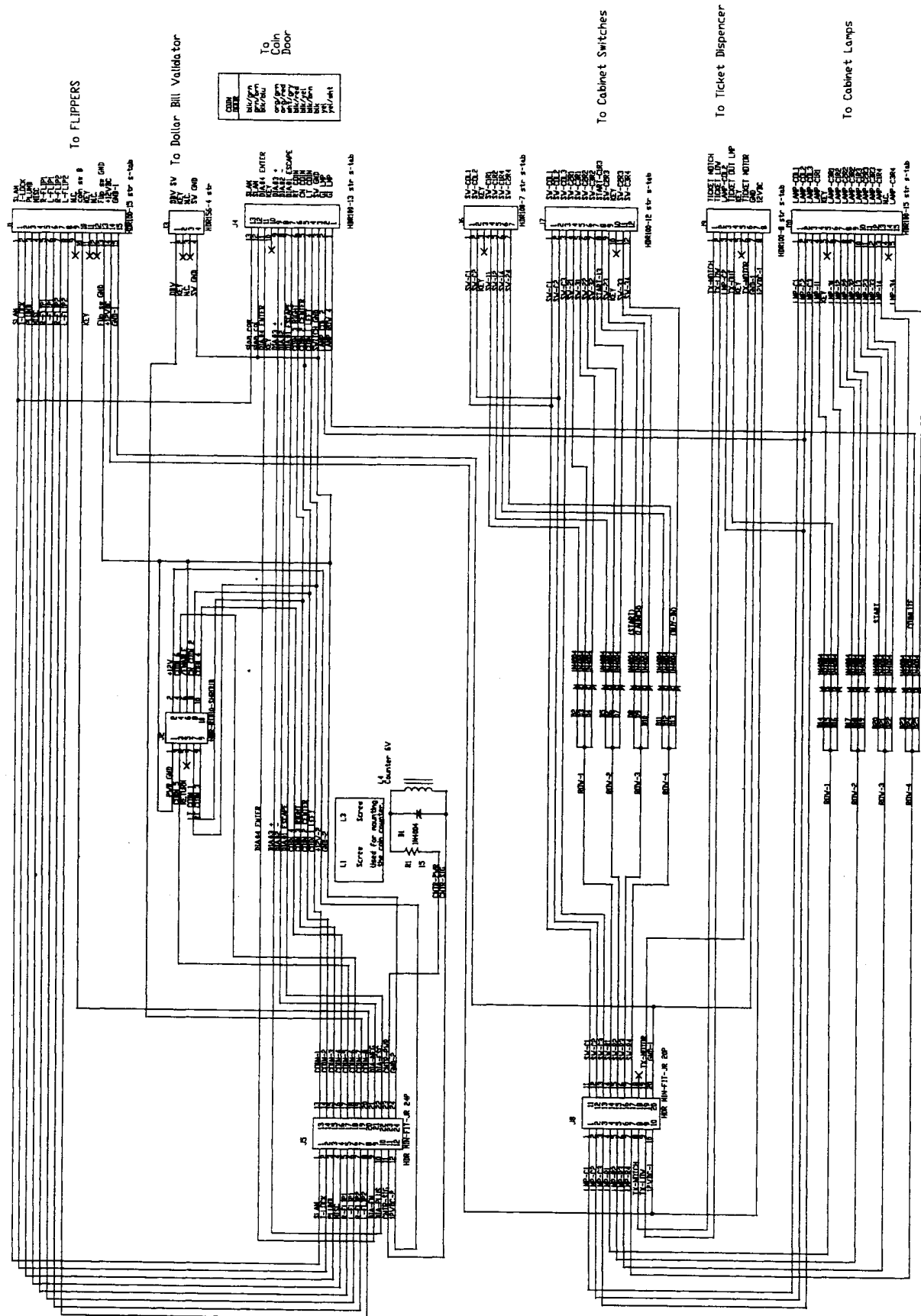
***Coin Door Interface Board Continued...***

|       |         |                 |
|-------|---------|-----------------|
| J8-1  | YEL-VIO | Lamp Column 1   |
| J8-2  | YEL-RED | Lamp Column 2   |
| J8-3  | YEL-ORG | Lamp Column 3   |
| J8-4  | BRN-BLK | Lamp Row 1      |
| J8-5  | BRN-RED | Lamp Row 2      |
| J8-6  | BRN-ORG | Lamp Row 3      |
| J8-7  | BRN-YEL | Lamp Row 4      |
| J8-8  | GRY-GRN | Ticket Notch    |
| J8-9  | GRY-BLU | Ticket Low      |
| J8-10 | GRY-YEL | +12V            |
| J8-11 | GRN-BRN | Switch Column 1 |
| J8-12 | GRN-RED | Switch Column 2 |
| J8-13 | GRN-ORG | Switch Column 3 |
| J8-14 | WHT-BRN | Switch Row 1    |
| J8-15 | WHT-RED | Switch Row 2    |
| J8-16 | WHT-ORG | Switch Row 3    |
| J8-17 | WHT-YEL | Switch Row 4    |
| J8-18 | Key     |                 |
| J8-19 | WHT     | Ticket Motor    |
| J8-20 | BLK     | Ground          |

J9      Not Used

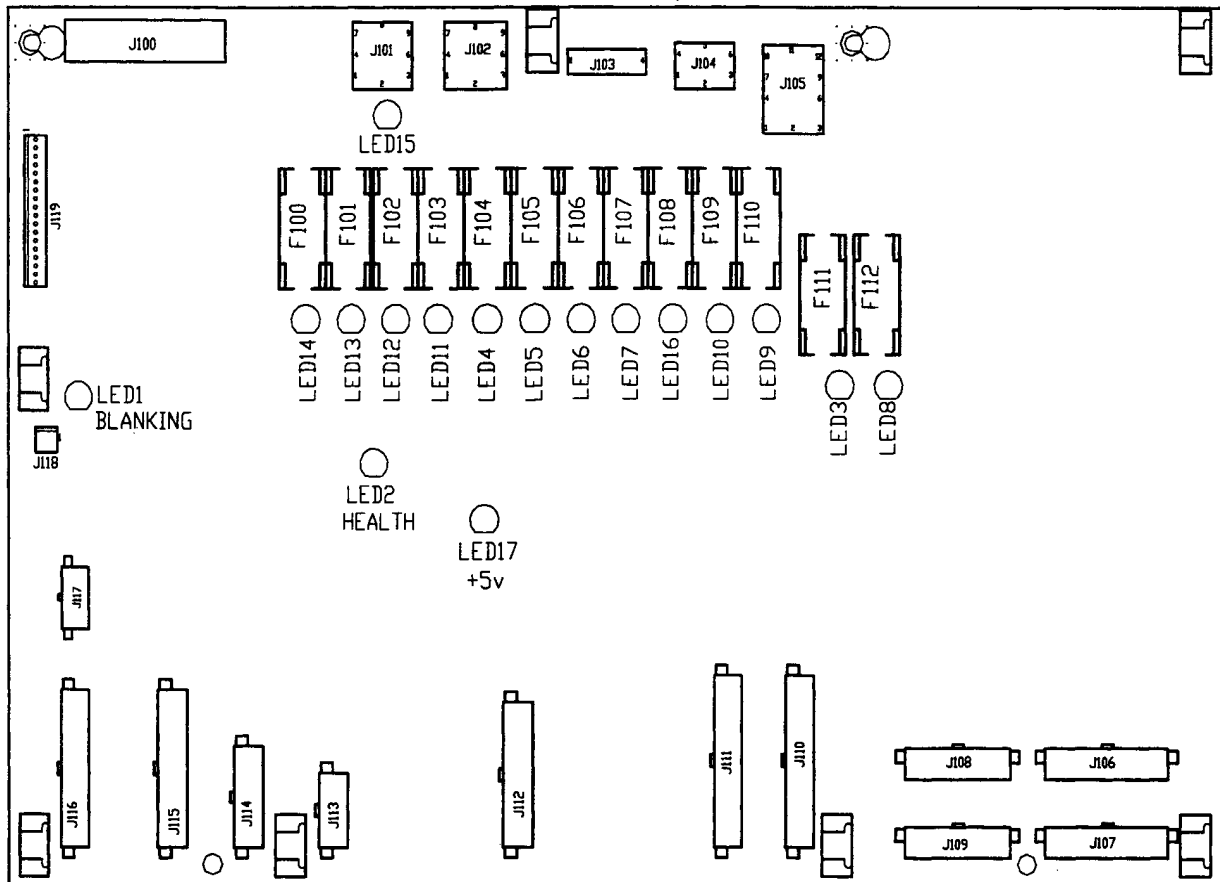
|        |         |               |
|--------|---------|---------------|
| J10-1  | N/C     |               |
| J10-2  | YEL-RED | Lamp Column 2 |
| J10-3  | YEL-BRN | Lamp Column 3 |
| J10-4  | Key     |               |
| J10-5  | N/C     |               |
| J10-6  | N/C     |               |
| J10-7  | N/C     |               |
| J10-8  | N/C     |               |
| J10-9  | N/C     |               |
| J10-10 | BRN-ORG | Lamp 13       |
| J10-11 | ORG-BRN | Lamp 23       |
| J10-12 | N/C     |               |
| J10-13 | N/C     |               |
| J10-14 | N/C     |               |
| J10-15 | N/C     |               |

# Coin Door Interface Board Schematic 04-12492



# Power Driver Board Assembly

## 04-12329



J100 DB25 Parallel Port Extension Cable for Data to/from CPU motherboard

|               |         |                              |
|---------------|---------|------------------------------|
| J101-1/J102-1 | RED-BRN | Power for solenoids 1 to 4   |
| J101-2/J102-2 | RED-BLK | Power for solenoids 5 to 8   |
| J101-3/J102-3 | RED-ORG | Power for solenoids 9 to 12  |
| J101-4/J102-4 | BLK     | Ground                       |
| J101-5/J102-5 | BLK     | Ground                       |
| J101-6/J102-6 | ORG     | Signal Ground                |
| J101-7/J102-7 | RED-YEL | Power for solenoids 13 to 16 |
| J101-8/J102-8 | RED-WHT | +20V flashlamp power         |
| J101-9/J102-9 | GRY-YEL | +12V unregulated power       |

|        |         |                               |
|--------|---------|-------------------------------|
| J103-1 | RED-GRN | Power for lower right flipper |
| J103-2 | RED-BLU | Power for lower left flipper  |
| J103-3 | RED-VIO | Power for upper right flipper |
| J103-4 | RED-GRY | Power for upper left flipper  |

|        |               |
|--------|---------------|
| J104-1 | 50V AC        |
| J104-2 | 50V AC        |
| J104-3 | No Connection |
| J104-4 | 20V AC        |
| J104-5 | 20V AC        |
| J104-6 | No Connection |

**Power Driver Board Continued...**

|         |         |                                    |
|---------|---------|------------------------------------|
| J105-1  | BLU-WHT | 18V AC Secondary for Lamp Matrix A |
| J105-2  | BLU-WHT | 18V AC Secondary for Lamp Matrix A |
| J105-3  | WHT-BLU | 18V AC Secondary for Lamp Matrix B |
| J105-4  | WHT-BLU | 18V AC Secondary for Lamp Matrix B |
| J105-5  | BLK-YEL | 51.4V AC Secondary                 |
| J105-6  | BLK-YEL | 51.4V AC Secondary                 |
| J105-7  | WHT-RED | 16V AC Secondary                   |
| J105-8  | WHT-RED | 16V AC Secondary                   |
| J105-9  | WHT-GRN | 9.8V AC Secondary                  |
| J105-10 | WHT-GRN | 9.8V AC Secondary                  |
| J105-11 |         | No Connection                      |
| J105-12 |         | No Connection                      |

|                 |         |                |
|-----------------|---------|----------------|
| J106-1/J107-1   | RED-BRN | Lamp Row 1B    |
| J106-2/J107-2   | RED-BLK | Lamp Row 2B    |
| J106-3/J107-3   | RED-ORG | Lamp Row 3B    |
| J106-4/J107-4   | RED-YEL | Lamp Row 4B    |
| J106-5/J107-5   | RED-GRN | Lamp Row 5B    |
| J106-6/J107-6   | RED-BLU | Lamp Row 6B    |
| J106-7/J107-7   | RED-VIO | Lamp Row 7B    |
| J106-8/J107-8   | RED-GRY | Lamp Row 8B    |
| J106-9/J107-9   |         | No Connection  |
| J106-10/J107-10 | YEL-BRN | Lamp Column 1B |
| J106-11/J107-11 | YEL-RED | Lamp Column 2B |
| J106-12/J107-12 | YEL-ORG | Lamp Column 3B |
| J106-13/J107-13 | YEL-BLK | Lamp Column 4B |
| J106-14/J107-14 | YEL-GRN | Lamp Column 5B |
| J106-15/J107-15 | YEL-BLU | Lamp Column 6B |
| J106-16/J107-16 | YEL-VIO | Lamp Column 7B |
| J106-17/J107-17 | YEL-GRY | Lamp Column 8B |
| J106-18/J107-18 |         | No Connection  |

|                 |         |                |
|-----------------|---------|----------------|
| J108-1/J109-1   | BRN-BLK | Lamp Row 1A    |
| J108-2/J109-2   | BRN-RED | Lamp Row 2A    |
| J108-3/J109-3   | BRN-ORG | Lamp Row 3A    |
| J108-4/J109-4   | BRN-YEL | Lamp Row 4A    |
| J108-5/J109-5   | BRN-GRN | Lamp Row 5A    |
| J108-6/J109-6   | BRN-BLU | Lamp Row 6A    |
| J108-7/J109-7   | BRN-VIO | Lamp Row 7A    |
| J108-8/J109-8   | BRN-GRY | Lamp Row 8A    |
| J108-9/J109-9   | YEL-BRN | Lamp Column 1A |
| J108-10/J109-10 | YEL-RED | Lamp Column 2A |
| J108-11/J109-11 | YEL-ORG | Lamp Column 3A |
| J108-12/J109-12 | YEL-BLK | Lamp Column 4A |
| J108-13/J109-13 | YEL-GRN | Lamp Column 5A |
| J108-14/J109-14 | YEL-BLU | Lamp Column 6A |
| J108-15/J109-15 | YEL-VIO | Lamp Column 7A |
| J108-16/J109-16 | YEL-GRY | Lamp Column 8A |

**Power Driver Board Continued...**

|                 |         |                                             |
|-----------------|---------|---------------------------------------------|
| J110-1/J111-1   | BLU-BRN | Solenoid Drive 17                           |
| J110-2/J111-2   | BLU-RED | Solenoid Drive 18                           |
| J110-3/J111-3   | BLU-ORG | Solenoid Drive 19                           |
| J110-4/J111-4   | BLU-YEL | Solenoid Drive 20                           |
| J110-5/J111-5   | BLU-GRN | Solenoid Drive 21                           |
| J110-6/J111-6   | BLU-BLK | Solenoid Drive 22                           |
| J110-7/J111-7   | BLU-VIO | Solenoid Drive 23                           |
| J110-8/J111-8   | BLU-GRY | Solenoid Drive 24                           |
| J110-9/J111-9   | BRN-WHT | Solenoid Drive 41-Logic                     |
| J110-10/J111-10 | ORG-WHT | Solenoid Drive 42-Logic                     |
| J110-11/J111-11 | YEL-WHT | Solenoid Drive 43-Logic                     |
| J110-12/J111-12 | BLU-WHT | Solenoid Drive 44-Logic                     |
| J110-13/J111-13 | VIO-BRN | Solenoid Drive 1                            |
| J110-14/J111-14 | VIO-RED | Solenoid Drive 2                            |
| J110-15/J111-15 | VIO-ORG | Solenoid Drive 3                            |
| J110-16/J111-16 | VIO-YEL | Solenoid Drive 4                            |
| J110-17/J111-17 | VIO-GRN | Solenoid Drive 5                            |
| J110-18/J111-18 | VIO-BLU | Solenoid Drive 6                            |
| J110-19/J111-19 | VIO-BLK | Solenoid Drive 7                            |
| J110-20/J111-20 | VIO-GRY | Solenoid Drive 8                            |
| J110-21/J111-21 | VIO-WHT | Solenoid Drive 45-Logic                     |
| J110-22/J111-22 | GRY-WHT | Solenoid Drive 46-Logic                     |
| J110-23/J111-23 | BLK-WHT | Solenoid Drive 47-Logic                     |
| J110-24/J111-24 | WHT     | Solenoid Drive 48-Logic                     |
|                 |         |                                             |
| J112-1          | YEL-GRN | Solenoid Drive 33-Lower Right Flipper Power |
| J112-2          | ORG-GRN | Solenoid Drive 34-Lower Right Flipper Hold  |
| J112-3          | YEL-BLU | Solenoid Drive 35-Lower Left Flipper Power  |
| J112-4          | ORG-BLU | Solenoid Drive 36-Lower Left Flipper Hold   |
| J112-5          | YEL-VIO | Solenoid Drive 37-Upper Right Flipper Power |
| J112-6          | ORG-VIO | Solenoid Drive 38-Upper Right Flipper Hold  |
| J112-7          | YEL-GRY | Solenoid Drive 39-Upper Left Flipper Power  |
| J112-8          | ORG-GRY | Solenoid Drive 40-Upper Left Flipper Hold   |
| J112-9          | BLK-BRN | Solenoid Drive 25                           |
| J112-10         | BLK-RED | Solenoid Drive 26                           |
| J112-11         | BRN-BLK | Solenoid Drive 9                            |
| J112-12         | BRN-RED | Solenoid Drive 10                           |
| J112-13         | BRN-ORG | Solenoid Drive 11                           |
| J112-14         | BRN-YEL | Solenoid Drive 12                           |
| J112-15         | BRN-GRN | Solenoid Drive 13                           |
| J112-16         | BRN-BLU | Solenoid Drive 14                           |
| J112-17         | BRN-VIO | Solenoid Drive 15                           |
| J112-18         | BRN-GRY | Solenoid Drive 16                           |
| J112-19         | BLK-ORG | Solenoid Drive 27                           |
| J112-20         | BLK-YEL | Solenoid Drive 28                           |
|                 |         |                                             |
| J113-1          | BLK-BRN | Direct Switch 17-Slam                       |
| J113-2          | BLK-RED | Direct Switch 18-Interlock                  |
| J113-3          | BLK-ORG | Direct Switch 19-Plumb Bob                  |
| J113-4          | BLK-YEL | Direct Switch 20-Not Used                   |
| J113-5          | GRY-YEL | +12V DC                                     |
| J113-6          | BLK-GRN | Direct Switch 21-Right Flipper Button       |
| J113-7          | BLK-BLU | Direct Switch 22-Left Flipper Button        |
| J113-8          | BLK-VIO | Direct Switch 23-Right Feature Button       |
| J113-9          | BLK-GRY | Direct Switch 24 Left Feature Button        |
| J113-10         | BLK     | Ground                                      |

**Power Driver Board Continued...**

|                 |         |                                                        |
|-----------------|---------|--------------------------------------------------------|
| J114-1          | ORG-BRN | Direct Switch 1-Left Coin Slot                         |
| J114-2          | ORG-RED | Direct Switch 2-Center Coin Slot                       |
| J114-3          | ORG-BLK | Direct Switch 3-Right Coin Slot                        |
| J114-4          | ORG-YEL | Direct Switch 4-4 <sup>th</sup> Coin Slot              |
| J114-5          | ORG-GRN | Direct Switch 5-Not Used                               |
| J114-6          | ORG-BLU | Direct Switch 6-Not Used                               |
| J114-7          | GRY-YEL | +12V DC                                                |
| J114-8          | ORG-VIO | Direct Switch 7-Not Used                               |
| J114-9          | ORG-GRY | Direct Switch 8-Not Used                               |
| J114-10         | GRY-BLK | Direct Switch 9-Diagnostic 'Escape' Button             |
| J114-11         | GRY-ORG | Direct Switch 10-Diagnostic 'Down' Button              |
| J114-12         | GRY-RED | Direct Switch 11-Diagnostic 'Up' Button                |
| J114-13         | GRY-BRN | Direct Switch 12-Diagnostic 'Enter' Button             |
| J114-14         | BLK     | Ground                                                 |
|                 |         |                                                        |
| J115-1/J116-1   | GRN-BRN | Switch Column 1                                        |
| J115-2/J116-2   | GRN-RED | Switch Column 2                                        |
| J115-3/J116-3   | GRN-ORG | Switch Column 3                                        |
| J115-4/J116-4   | GRN-WHT | Switch Column 4                                        |
| J115-5/J116-5   | GRN-BLK | Switch Column 5                                        |
| J115-6/J116-6   | GRN-BLU | Switch Column 6                                        |
| J115-7/J116-7   | GRN-VIO | Switch Column 7                                        |
| J115-8/J116-8   | GRN-GRY | Switch Column 8                                        |
| J115-9/J116-9   | BLK-GRN | Direct Switch 13-Lower Right Flipper E.O.S.            |
| J115-10/J116-10 | BLK-BLU | Direct Switch 14-Lower Left Flipper E.O.S.             |
| J115-11/J116-11 | GRY-YEL | +12V                                                   |
| J115-12/J116-12 | WHT-BRN | Switch Row 1                                           |
| J115-13/J116-13 | WHT-RED | Switch Row 2                                           |
| J115-14/J116-14 | WHT-ORG | Switch Row 3                                           |
| J115-15/J116-15 | WHT-YEL | Switch Row 4                                           |
| J115-16/J116-16 | WHT-GRN | Switch Row 5                                           |
| J115-17/J116-17 | WHT-BLU | Switch Row 6                                           |
| J115-18/J116-18 | WHT-VIO | Switch Row 7                                           |
| J115-19/J116-19 | WHT-GRY | Switch Row 8                                           |
| J115-20/J116-20 | BLK-VIO | Direct Switch 15-Upper Right Flipper E.O.S. (not used) |
| J115-21/J116-21 | BLK-GRY | Direct Switch 16-Upper Left Flipper E.O.S. (not used)  |
| J115-22/J116-22 | BLK     | Ground                                                 |
|                 |         |                                                        |
| J117-1          |         | +12V                                                   |
| J117-2          |         | +12V                                                   |
| J117-3          | WHT     | Drive 48-Logic-Ticket Driver                           |
| J117-4          | GRY-VIO | +12V Coin Door Power                                   |
| J117-5          | GRY-GRN | Direct Switch 25-Ticket Notch                          |
| J117-6          | GRY-BLU | Direct Switch 26-Ticket Low                            |
| J117-7          | BLUE    | Coin Counter                                           |
| J117-8          | BLK     | Ground                                                 |

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

## LAMP MATRIX A

| COLUMN                         | 1A<br>YEL-BRN<br>J108-9<br>Q5          | 2A<br>YEL-RED<br>J108-10<br>Q9            | 3A<br>YEL-ORG<br>J108-11<br>Q13    | 4A<br>YEL-BLK<br>J108-12<br>Q17   | 5A<br>YEL-GRN<br>J108-13<br>Q21        | 6A<br>YEL-BLU<br>J108-14<br>Q25      | 7A<br>YEL-VIO<br>J108-15<br>Q29       | 8A<br>YEL-GRY<br>J108-16<br>Q33        |
|--------------------------------|----------------------------------------|-------------------------------------------|------------------------------------|-----------------------------------|----------------------------------------|--------------------------------------|---------------------------------------|----------------------------------------|
| ROW                            |                                        |                                           |                                    |                                   |                                        |                                      |                                       |                                        |
| 1A<br>BRN-BLK<br>J108-1<br>Q3  | NOT USED<br>11A                        | TICKETS<br>LOW<br>21A                     | NOT USED<br>31A                    | RIGHT<br>POPPER<br>ARROW<br>41A   | MULTIBALL<br>51A                       | SHOOTER<br>LANE 9<br>(TOP)<br>61A    | LEFT SIDE<br>1<br>(BOTTOM)<br>71A     | RIGHT<br>SLINGSHOT<br>(BOTTOM)<br>81A  |
| 2A<br>BRN-RED<br>J108-2<br>Q7  | NOT USED<br>12A                        | NOT USED<br>22A                           | NOT USED<br>32A                    | EXTRA<br>BALL<br>42A              | CAPTURE<br>2<br>52A                    | UNDER<br>RIGHT RAMP<br>(LOW)<br>62A  | LEFT SIDE<br>2<br>72A                 | RIGHT<br>SLINGSHOT<br>(SAUCER)<br>82A  |
| 3A<br>BRN-ORG<br>J108-3<br>Q11 | START<br>BUTTON<br>13A                 | LAUNCH<br>BUTTON<br>23A                   | NOT USED<br>33A                    | MARTIAN<br>ATTACK<br>43A          | CAPTURE<br>1<br>53A                    | UNDER<br>RIGHT RAMP<br>(HIGH)<br>63A | LEFT SIDE<br>3<br>73A                 | RIGHT<br>RETURN<br>LANE (RIGHT)<br>83A |
| 4A<br>BRN-YEL<br>J108-4<br>Q15 | NOT USED<br>14A                        | COIN<br>DOOR<br>ILLUMINA.<br>24A          | NOT USED<br>34A                    | STROKE OF<br>LUCK<br>44A          | CAPTURE<br>ZONE<br>ACTIVE<br>54A       | UPPER<br>RT. CORNER<br>(LOW)<br>64A  | LEFT SIDE<br>4<br>(TOP)<br>74A        | RIGHT<br>RETURN<br>LANE (LEFT)<br>84A  |
| 5A<br>BRN-GRN<br>J108-5<br>Q19 | RIGHT TOP<br>LANE<br>15A               | MOTHERSHIP<br>MULTIBALL<br>(RIGHT)<br>25A | LEFT DRAIN<br>TO<br>TROUGH<br>35A  | LEFT SIDE<br>SPOTLIGHT<br>45A     | SHOOT<br>AGAIN<br>55A                  | RIGHT ARCH<br>(RIGHT)<br>65A         | UNDER LEFT<br>RAMP<br>(BOTTOM)<br>75A | LEFT<br>RETURN<br>LANE (RIGHT)<br>85A  |
| 6A<br>BRN-BLU<br>J108-6<br>Q23 | LEFT TOP<br>LANE<br>16A                | MOTHERSHIP<br>MULTIBALL<br>(LEFT)<br>26A  | RIGHT DRAIN<br>TO<br>TROUGH<br>36A | CENTER<br>ARROW<br>46A            | BEHIND<br>CENTER<br>TARGETS<br>56A     | RIGHT ARCH<br>(LEFT)<br>66A          | UNDER LEFT<br>RAMP<br>(TOP)<br>76A    | LEFT<br>RETURN<br>LANE (LEFT)<br>86A   |
| 7A<br>BRN-VIO<br>J108-7<br>Q27 | MARTIAN<br>TARGET 4<br>(CENTER)<br>17A | LEFT<br>RETURN<br>LANE<br>27A             | RIGHT<br>RETURN<br>LANE<br>37A     | RIGHT<br>MARTIAN<br>(HIGH)<br>47A | UPPER RT.<br>CORNER<br>(MIDDLE)<br>57A | LEFT ARCH<br>(RIGHT)<br>67A          | BETWEEN<br>LB<br>JETS<br>77A          | LEFT<br>SLINGSHOT<br>(SAUCER)<br>87A   |
| 8A<br>BRN-GRY<br>J108-8<br>Q31 | CENTER<br>LOOP<br>ARROW<br>18A         | LEFT<br>OUTLANE<br>28A                    | RIGHT<br>OUTLANE<br>38A            | RIGHT<br>MARTIAN<br>(LOW)<br>48A  | NOT USED<br>58A                        | LEFT ARCH<br>(LEFT)<br>68A           | UPPER LEFT<br>CORNER<br>78A           | LEFT<br>SLINGSHOT<br>(BOTTOM)<br>88A   |

## LAMP MATRIX B

| COLUMN                         | 1B<br>YEL-BRN<br>J107-10<br>Q6         | 2B<br>YEL-RED<br>J107-11<br>Q10        | 3B<br>YEL-ORG<br>J107-12<br>Q14     | 4B<br>YEL-BLK<br>J107-13<br>Q18      | 5B<br>YEL-GRN<br>J107-14<br>Q22 | 6B<br>YEL-BLU<br>J107-15<br>Q26           | 7B<br>YEL-VIO<br>J107-16<br>Q30      | 8B<br>YEL-GRY<br>J107-17<br>Q34      |
|--------------------------------|----------------------------------------|----------------------------------------|-------------------------------------|--------------------------------------|---------------------------------|-------------------------------------------|--------------------------------------|--------------------------------------|
| ROW                            |                                        |                                        |                                     |                                      |                                 |                                           |                                      |                                      |
| 1B<br>RED-BRN<br>J107-1<br>Q4  | SECRET<br>WEAPON<br>11B                | BIG-O-BEAM<br>21B                      | MARS<br>KNEADS<br>WOMEN<br>31B      | MARTIAN<br>HARRY<br>HOUR<br>41B      | RIGHT LOOP<br>ARROW<br>51B      | MARTIAN<br>TARGET 5<br>(RT. TOP)<br>61B   | BOTTOM JET<br>BUMPER<br>71B          | SHOOTER<br>LANE 1<br>(BOTTOM)<br>81B |
| 2B<br>RED-BLK<br>J107-2<br>Q8  | TOWER<br>STRUGGLE<br>12B               | RIGHT<br>SAUCER<br>BEAM (LEFT)<br>22B  | RIGHT<br>SAUCER<br>BEAM (RT)<br>32B | ALIEN<br>ABDUCTION<br>42B            | RIGHT LOOP<br>CIRCLE<br>52B     | MARTIAN<br>TARGET 6<br>(RT. MID.)<br>62B  | NOT<br>USED<br>72B                   | SHOOTER<br>LANE<br>2<br>82B          |
| 3B<br>RED-ORG<br>J107-3<br>Q12 | CENTER<br>SAUCER<br>BEAM (LEFT)<br>13B | WEAPONS<br>23B                         | SAUCER RIM<br>9<br>(RIGHT)<br>33B   | LEFT<br>SAUCER<br>BEAM (LEFT)<br>43B | RIGHT RAMP<br>ARROW<br>53B      | MARTIAN<br>TARGET 7<br>(RT. BOT.)<br>63B  | LEFT JET<br>BUMPER<br>73B            | SHOOTER<br>LANE<br>3<br>83B          |
| 4B<br>RED-YEL<br>J107-4<br>Q16 | QUESTION<br>MARK<br>14B                | SAUCER<br>24B                          | SAUCER RIM<br>8<br>34B              | SAUCER RIM<br>1<br>(LEFT)<br>44B     | RIGHT RAMP<br>CIRCLE<br>54B     | MARTIAN<br>TARGET 3<br>(LEFT TOP)<br>64B  | LEFT OF<br>LEFT TOP<br>LANE<br>74B   | SHOOTER<br>LANE<br>4<br>84B          |
| 5B<br>RED-GRN<br>J107-5<br>Q20 | CENTER<br>SAUCER<br>BEAM (RT.)<br>15B  | FUEL<br>25B                            | SAUCER RIM<br>7<br>35B              | SAUCER RIM<br>2<br>45B               | LEFT LOOP<br>ARROW<br>55B       | MARTIAN<br>TARGET 2<br>(LEFT MID.)<br>65B | BETWEEN<br>L/R TOP<br>LANES<br>75B   | SHOOTER<br>LANE<br>5<br>85B          |
| 6B<br>RED-BLU<br>J107-6<br>Q24 | DRIVE-IN<br>DEMOLITION<br>16B          | LEFT<br>SAUCER<br>BEAM (RT.)<br>26B    | SAUCER RIM<br>6<br>36B              | SAUCER RIM<br>3<br>46B               | LEFT RAMP<br>ARROW<br>56B       | MARTIAN<br>TARGET 1<br>(LEFT BOT.)<br>66B | RIGHT OF<br>RIGHT TOP<br>LANE<br>76B | SHOOTER<br>LANE<br>6<br>86B          |
| 7B<br>RED-VIO<br>J107-7<br>Q28 | PARIS IN<br>PERIL<br>17B               | CENTER<br>SAUCER<br>BEAM (CNTR)<br>27B | SAUCER RIM<br>5<br>37B              | SAUCER RIM<br>4<br>47B               | LEFT LOOP<br>CIRCLE<br>57B      | RIGHT<br>MARTIAN<br>EYE<br>67B            | TOP OF<br>CENTER<br>LOOP<br>77B      | SHOOTER<br>LANE<br>7<br>87B          |
| 8B<br>RED-GRY<br>J107-8<br>Q32 | LEFT<br>SLINGSHOT<br>SPOTLIGHT<br>18B  | RIGHT<br>SLINGSHOT<br>SPOTLIGHT<br>28B | NOT USED<br>38B                     | NOT USED<br>48B                      | LEFT RAMP<br>CIRCLE<br>58B      | LEFT<br>MARTIAN<br>EYE<br>68B             | UPPER RT.<br>CORNER<br>(HIGH)<br>78B | SHOOTER<br>LANE<br>8<br>88B          |

## SWITCH MATRIX

| COLUMN                            | 1<br>GRN-BRN<br>J116-1<br>U45-18 | 2<br>GRN-RED<br>J116-2<br>U45-17 | 3<br>GRN-ORG<br>J116-3<br>U45-16      | 4<br>GRN-WHT<br>J116-4<br>U45-15 | 5<br>GRN-BLK<br>J116-5<br>U45-14 | 6<br>GRN-BLU<br>J116-6<br>U45-13 | 7<br>GRN-VIO<br>J116-7<br>U45-12 | 8<br>GRN-GRY<br>J116-8<br>U45-11 |
|-----------------------------------|----------------------------------|----------------------------------|---------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| ROW                               |                                  |                                  |                                       |                                  |                                  |                                  |                                  |                                  |
| 1<br>WHT-BRN<br>J116-12<br>U51-7  | RIGHT<br>RAMP<br>ENTRANCE<br>11  | NOT USED<br>21                   | CENTER<br>LOOP REED<br>(BOTTOM)<br>31 | TROUGH<br>JAM<br>41              | RIGHT<br>LOCKUP<br>1<br>51       | LEFT<br>SLINGSHOT<br>61          | MA"R"TIAN<br>TARGET<br>71        | NOT USED<br>81                   |
| 2<br>WHT-RED<br>J116-13<br>U51-5  | LEFT RAMP<br>EXIT<br>12          | NOT USED<br>22                   | CENTER<br>LOOP REED<br>(TOP)<br>32    | TROUGH<br>BALL<br>1<br>42        | LEFT RAMP<br>ENTRANCE<br>52      | RIGHT<br>SLINGSHOT<br>62         | M"ARTIAN<br>TARGET<br>72         | NOT USED<br>82                   |
| 3<br>WHT-ORG<br>J116-14<br>U51-9  | START<br>BUTTON<br>13            | LAUNCH<br>BUTTON<br>23           | CENTER<br>TARGET<br>4<br>33           | TROUGH<br>BALL<br>2<br>43        | NOT USED<br>53                   | LEFT JET<br>BUMPER<br>63         | "M"ARTIAN<br>TARGET<br>73        | NOT USED<br>83                   |
| 4<br>WHT-YEL<br>J116-15<br>U51-11 | NOT USED<br>14                   | NOT USED<br>24                   | CENTER<br>TARGET<br>3<br>34           | TROUGH<br>BALL<br>3<br>44        | NOT USED<br>54                   | RIGHT<br>JET<br>BUMPER<br>64     | CENTER<br>LOOP<br>ROLLOVER<br>74 | NOT USED<br>84                   |
| 5<br>WHT-GRN<br>J116-16<br>U57-7  | DROP<br>TARGET<br>DOWN<br>15     | LEFT LOOP<br>(LOW)<br>25         | CENTER<br>TARGET<br>2<br>35           | TROUGH<br>BALL<br>4<br>45        | NOT USED<br>55                   | BOTTOM<br>JET<br>BUMPER<br>65    | CENTER<br>TROUGH<br>75           | MARTIA"N"<br>TARGET<br>85        |
| 6<br>WHT-BLU<br>J116-17<br>U57-5  | LEFT<br>OUTLANE<br>16            | LEFT<br>RETURN<br>LANE<br>26     | CENTER<br>TARGET<br>1<br>36           | RIGHT<br>POPPER<br>46            | NOT USED<br>56                   | NOT USED<br>66                   | RIGHT TOP<br>LANE<br>76          | MARTI"A"N<br>TARGET<br>86        |
| 7<br>WHT-VIO<br>J116-18<br>U57-9  | RIGHT<br>RETURN<br>LANE<br>17    | RIGHT<br>OUTLANE<br>27           | MAR"TI"AN<br>TARGET<br>37             | JET EXIT<br>47                   | NOT USED<br>57                   | RIGHT LOOP<br>(LOW)<br>67        | LEFT TOP<br>LANE<br>77           | MART"IAN<br>TARGET<br>87         |
| 8<br>WHT-GRY<br>J116-19<br>U57-11 | SHOOTER<br>LANE<br>18            | RIGHT RAMP<br>EXIT<br>28         | UP/DOWN<br>RAMP UP<br>38              | NOT USED<br>48                   | NOT USED<br>58                   | RIGHT LOOP<br>(HIGH)<br>68       | LEFT<br>LOOP<br>(HIGH)<br>78     | NOT USED<br>88                   |

= OPTO, TYPICALLY CLOSED

## COIN SLOT SWITCHES

| DIRECT<br>GROUND | ORN-BRN<br>J114-1<br>U43-7 | ORG-RED<br>J114-2<br>U43-5 | ORG-BLK<br>J114-3<br>U43-9 | ORG-YEL<br>J114-4<br>U43-11          | ORG-GRN<br>J114-5<br>U48-7 | ORG-BLU<br>J114-6<br>U48-5 | ORG-VIO<br>J114-8<br>U48-9 | ORG-GRY<br>J114-9<br>U48-11 |
|------------------|----------------------------|----------------------------|----------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|
| BLACK<br>J114-14 | LEFT COIN<br>SLOT<br>D1    | CENTER<br>COIN SLOT<br>D2  | RIGHT COIN<br>SLOT<br>D3   | 4 <sup>TH</sup> COIN<br>OPTION<br>D4 | NOT USED<br>D5             | NOT USED<br>D6             | NOT USED<br>D7             | NOT USED<br>D8              |

## DIAGNOSTIC SWITCHES

| DIRECT<br>GROUND | GRY-BLK<br>J114-10<br>U50-7 | GRY-ORG<br>J114-11<br>U50-5 | GRY-RED<br>J114-12<br>U50-9 | GRY-BRN<br>J114-13<br>U50-11 |
|------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| BLACK<br>J114-14 | 'ESCAPE'<br>BUTTON<br>D9    | 'DOWN'<br>BUTTON<br>D10     | 'UP'<br>BUTTON<br>D11       | 'ENTER'<br>BUTTON<br>D12     |

## PLAYFIELD FLIPPER SWITCHES (E.O.S.)

| DIRECT<br>GROUND | BLK-GRN<br>J115-9<br>U56-7                 | BLK-BLU<br>J115-10<br>U56-5               | BLK-VIO<br>J115-20<br>U56-9 | BLK-GRY<br>J115-21<br>U56-11 |
|------------------|--------------------------------------------|-------------------------------------------|-----------------------------|------------------------------|
| BLACK<br>J115-22 | LOWER<br>RIGHT<br>FLIPPER<br>E.O.S.<br>D13 | LOWER<br>LEFT<br>FLIPPER<br>E.O.S.<br>D14 | NOT USED<br>D15             | NOT USED<br>D16              |

## CABINET FLIPPER SWITCHES

| DIRECT<br>GROUND | BLK-BRN<br>J113-1<br>U49-7 | BLK-RED<br>J113-2<br>U49-5 | BLK-ORG<br>J113-3<br>U49-9 | BLK-YEL<br>J113-4<br>U49-11 | BLK-GRN<br>J113-6<br>U55-7        | BLK-BLU<br>J113-7<br>U55-5       | BLK-VIO<br>J113-8<br>U55-9        | BLK-GRY<br>J113-9<br>U55-11      |
|------------------|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| BLACK<br>J113-10 | SLAM TILT<br>D17           | COIN DOOR<br>CLOSED<br>D18 | PLUMB BOB<br>TILT<br>D19   | NOT USED<br>D20             | RIGHT<br>FLIPPER<br>BUTTON<br>D21 | LEFT<br>FLIPPER<br>BUTTON<br>D22 | RIGHT<br>FEATURE<br>BUTTON<br>D23 | LEFT<br>FEATURE<br>BUTTON<br>D24 |

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