

# The Addams Family™



Operations Manual Includes:  
Operations & Adjustments, Testing & Problem Diagnosis,  
Parts Information, Reference Diagrams & Schematics

Midway Manufacturing Company

## Jumper Charts

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

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

## Solenoid/Flasher Table

| Sol. No. | Function                         | Solenoid Type | Wire Color | Connection    | Driver Trnstr | Solenoid/Flashlamp Type |
|----------|----------------------------------|---------------|------------|---------------|---------------|-------------------------|
| 01       | Chair Kickout                    | High Power    | Vio-Brn    | J130-1        | Q82           | AE-26-1200              |
| 02       | Thing Knocker                    | High Power    | Vio-Red    | J132-2        | Q80           | AE-23-800               |
| 03       | Ramp Diverter                    | High Power    | Vio-Orn    | J130-4        | Q78           | AE-26-1500              |
| 04       | Ball Release                     | High Power    | Vio-Yel    | J130-5        | Q76           | AE-26-1200              |
| 05       | Outhole                          | High Power    | Vio-Grn    | J130-6        | Q64           | AE-27-1200              |
| 06       | Thing Magnet                     | High Power    | Vio-Blu    | J130-7        | Q66           | A-12158-1               |
| 07       | Thing Kickout                    | High Power    | Vio-Blk    | J130-8        | Q68           | AE-23-800               |
| 08       | Lockup Kickout                   | High Power    | Vio-Gry    | J130-9        | Q70           | AE-26-1200              |
| 09       | Upper Left Jet                   | Low Power     | Brn-Blk    | J127-1        | Q58           | AE-26-1200              |
| 10       | Upper Right Jet                  | Low Power     | Brn-Red    | J127-3        | Q56           | AE-26-1200              |
| 11       | Center Left Jet                  | Low Power     | Brn-Org    | J127-4        | Q54           | AE-26-1200              |
| 12       | Center Right Jet                 | Low Power     | Brn-Yel    | J127-5        | Q52           | AE-26-1200              |
| 13       | Lower Jet                        | Low Power     | Brn-Grn    | J127-6        | Q50           | AE-26-1200              |
| 14       | Left Slingshot                   | Low Power     | Brn-Blu    | J127-7        | Q48           | AE-27-1200              |
| 15       | Right Slingshot                  | Low Power     | Brn-Vio    | J127-8        | Q46           | AE-27-1200              |
| 16       | Left Magnet*                     | Low Power     | Brn-Gry    | J127-9        | Q44           | 20-9247 12V             |
| 17       | Telephone/Upper Right Ramp       | Flasher       | Blk-Brn    | J126-1 J125-1 | Q42           | #906                    |
| 18       | Train/Upper Left Ramp            | Flasher       | Blk-Red    | J126-2 J125-2 | Q40           | #906                    |
| 19       | Lower Ramp/Jet Bumpers (2)       | Flasher       | Blk-Org    | J126-3 J125-3 | Q38           | #906                    |
| 20       | Left Lightning Bolt/Mini Flipper | Flasher       | Blk-Yel    | J126-4 J125-5 | Q36           | #906                    |
| 21       | Right Lightning Bolt/Swamp       | Flasher       | Blu-Grn    | J126-5 J125-6 | Q28           | #906                    |
| 22       | The Power/Backbox Clowd (3)      | Flasher       | Blu-Blk    | J126-6 J125-7 | Q30           | #906                    |
| 23       | Upper Magnet*                    | Low Power     | Blu-Vio    | J126-7 J125-8 | Q34           | 20-9247 12V             |
| 24       | Right Magnet*                    | Low Power     | Blu-Gry    | J126-8 J125-9 | Q32           | 20-9247 12V             |
| 25       | Thing Motor                      | Flasher       | Blu-Brn    | J122-1        | Q26           | 14-7966 12V             |
| 26       | Thing Eject Hole                 | Flasher       | Blu-Red    | J122-2        | Q24           | AE-30-2000              |
| 27       | Bookcase Motor                   | Flasher       | Blu-Org    | J122-3        | Q22           | 14-7969 12V             |
| 28       | Swamp Release                    | Flasher       | Blu-Yel    | J122-4        | Q20           | AE-30-2000              |
|          | <b>G. I. Circuits</b>            |               |            |               |               |                         |
| 01       | Left Playfield String            | G.I.          | Brown      | J120-1        | Q18           | #44                     |
| 02       | Insert House String              | G.I.          | Orange     | J120-2        | Q10           | #555                    |
| 03       | Insert People String             | G.I.          | Yellow     | J120-3        | Q14           | #555                    |
| 04       | Not Used                         | G.I.          | Green      | J121-5        | Q16           |                         |
| 05       | Right Playfield String           | G.I.          | Violet     | J121-6        | Q12           | #44                     |
|          | Upper Left Flipper               |               | Gry-Yel    | J109-5        |               | FL-11753                |
|          | Upper Right Flipper              |               | Blu-Yel    | J109-7        |               | FL-11630                |
|          | Lower Left Flipper               |               | Gry-Yel    | J109-5        |               | FL-15411                |
|          | Lower Right Flipper              |               | Blu-Yel    | J109-7        |               | FL-15411                |

\*Magnet fuse is a 5 Amp S.B. located on the underside of the playfield.

Midway Manufacturing Company 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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# The ADDAMS FAMILY

"THING FLIPS" FEATURE,  
RULES  
&  
PLAYFIELD SHOT MAPS

# "Thing Flips" Automatic Calibration

The "Thing Flips" feature is an exclusive Williams/Bally pinball innovation.

Using advanced artificial intelligence systems, the game will learn to shoot the ball into the swamp from the upper left flipper. The feature is enabled by coming through the far left flipper return lane (labeled "Lite Thing Flips").

This will lite the "Thing Flips" arrow that points up the center ramp. If the center ramp is hit while this arrow is flashing, the ball will be diverted to the upper left mini-flipper and the game ("Thing") will attempt to shoot the ball into the swamp. Once the game has "learned" the specifics of the game, (slope, dirt, flipper power, etc.) it will successfully make the shot between 50-60% of the time. This is several times better than the best players are able to achieve.

The game continually monitors the performance and compensates for changes. When the game 1st begins gathering data, it quickly learns to be "in the ballpark", then it slowly refines its ability to make the shot. When the game is moved from one location to another it will eventually learn the new shot regardless of intervention, but it is possible to speed up the process by either:

- a) A Full Factory Reset (Function U.8)
- b) Executing "NEW LOCATION" (Function U.12)

*Remember, when fully calibrated, the "Thing Flips" feature will successfully make the shot between 50-60% of the time. The BEST players make the shot under 20% of the time (this is a VERY difficult shot).*

If after awhile, your game is not successfully making the shot as often as expected, check the operation of the opto, (switch 57 above the upper left mini-flipper), the 3 Swamp Targets (switches 45, 47, and 48), and the upper "Swamp Lock" switch (switch 71). The program relies on these switches to calibrate the system. Also check the upper left flipper for proper operation.

After setting the game up on location, it will automatically calibrate itself over time. If you would like to speed up this process:

1. Setup game ON LOCATION. Set the pitch and level. Calibrating the game before it is sent to its final location may help, but could actually slow down the process.
2. Activate function U.12 (New Location). This will clear out any previously learned data.
3. With the glass off, manually throw the ball up the SIDE RAMP (labeled Super Jackpot). Repeat this four times.
4. After pressing the left flipper return lane rollover (Lite Thing Flips), throw the ball up the center ramp. It will be diverted and "Thing" will shoot toward the swamp.

Repeat this process (left flipper lane followed by center ramp) at least 30 times. After 30 attempts, it should be at a level where it will make at least 40% of its shots. The more shots you make, the more accurate it will become. It takes several HUNDRED shots for the machine to fine tune its ability to make the shot.

## MANSION AWARDS RULES

There are 13 possible MANSION AWARDS. Each window of the MANSION has a different value or set of rules that can occur when awarded. Please see the diagram for the numbering from 1 to 13.

1. This window awards 3 Million points.
2. This window sets the Jet Bumpers (GRAVEYARD) to their maximum value.
3. **Hit Cousin It.** This starts a timed sequence where all targets award a special point value which can be RAISED by hitting the COUSIN IT target at (S).
4. **The Manushka.** This starts a timed sequence where all targets score a special point value.
5. This window scores 6 Million points.
6. **Quick Multi-ball.** This lights THING so that he will take the current ball in play and start Quick Multi-ball. In quick multi-ball, the Bookcase opens at (K) so that any shot to the Vault (L) scores MILLION PLUS.
7. **Festers Tunnel Hunt.** This starts a timed sequence where shots should be made to the three tunnels (G) (H) (L), in any order. These score 5, 10 and 15 Million points.
8. **Seance.** This starts a timed sequence where the player tries to shoot any three ramp shots. This is the only time a single ball causes the POWER of the ADDAMS FAMILY to appear.
9. This window awards 9 Million points.
10. **Thing.** This window starts a timed sequence where the player tries to get the ball to THING. If successful a point value is awarded and the Bookcase opens for a version of Quick Multi-ball. In Quick Multi-ball, any shot to the VAULT awards the original point value over and over again!
11. **Raise the Dead.** This starts a timed sequence where the player tries to get the ball into the Jet Bumpers (GRAVEYARD). Each Jet Bumper has a counter that decrements each time it is hit. If the counter reaches 0, then that spirit has been "Raised", and 5 Million points are awarded.
12. **Light Extra Ball.** This window lights THING to award an Extra Ball.
13. **?.** When all other windows are lit, this window will light to award 50 Million points, light the Specials, and begin re-awarding all other Mansion values in a special sequence.

## SHOT MAPS

**SKILL SHOT:** The plunger skill shot is made to THINGS EJECT SAUCER at (A). It awards 2 Million plus 1 additional Million for each subsequent Skill Shot.

**EXTRA BALL:** There are four possible Extra Balls that can be awarded in the ADDAMS FAMILY. The first and second are lit by "Bear Kick" shots around the Center Staircase (ramp) at (B). Extra Ball is always collected by shooting the ball to THINGS EJECT SAUCER. (A). A third Extra Ball is lit from the possible MANSION AWARDS at (D). The fourth Extra Ball is lit after multiple TRAIN WRECKS from the Train Wreck feature shot at (E).

**MANSION AWARDS:** The available Mansion Awards are at (D) on the playfield. The currently lit award is changed by the Jet Bumpers (F). The awards are COLLECTED when the yellow lamp is lit on the ELECTRIC CHAIR (G) and the ball is shot to either the Electric Chair or the SWAMP KICKOUT (H). The yellow lamp is re-lit when the ball passes thru the right flipper lane (J). Please see the rules for the individual awards below.

**MULTI-BALL:** Hitting the BOOKCASE (K) spells the word G-R-E-E-D. When GREED has been spelled, the Bookcase will swing open to reveal the shot to the VAULT (L). Balls may be LOCKED at any one of the flashing LOCK arrows. When two balls have been locked, the third ball is put into play and MULTI-BALL can be started by shooting the ball into the VAULT (L) or into the ELECTRIC CHAIR (G). During the attempted release sequence the POWER of the ADDAMS FAMILY can be seen as the ball passes over the central portion of the playfield.

**JACKPOT:** While in MULTI-BALL any shot made to the TRAIN WRECK SHOT (E) will score single JACKPOT. Any shot made to the Left Staircase (ramp) at (N) scores a multiple of the Jackpot value depending on how many balls were LOCKED into the Vault directly prior to Multi-ball. Once the Jackpot shot on the ramp is made, the BOOKCASE (K) will open. A shot made into the Vault can re-light the JACKPOT ARROWS for another Jackpot.

**THINGS REMATCH:** If two balls are lost during Multi-ball before a JACKPOT is scored, then THINGS EJECT HOLE (A) lights for a restart of Multi-ball. If the player gets the ball to THING in the time period allowed, Thing will take the ball and Multi-ball will be restarted.

**TRAIN WRECK:** Multiple shots to the standup target at (E) produce TRAIN-WRECKS. Train wrecks hold the players current GRAVEYARD VALUE from the Jet Bumpers and award incrementing point values.

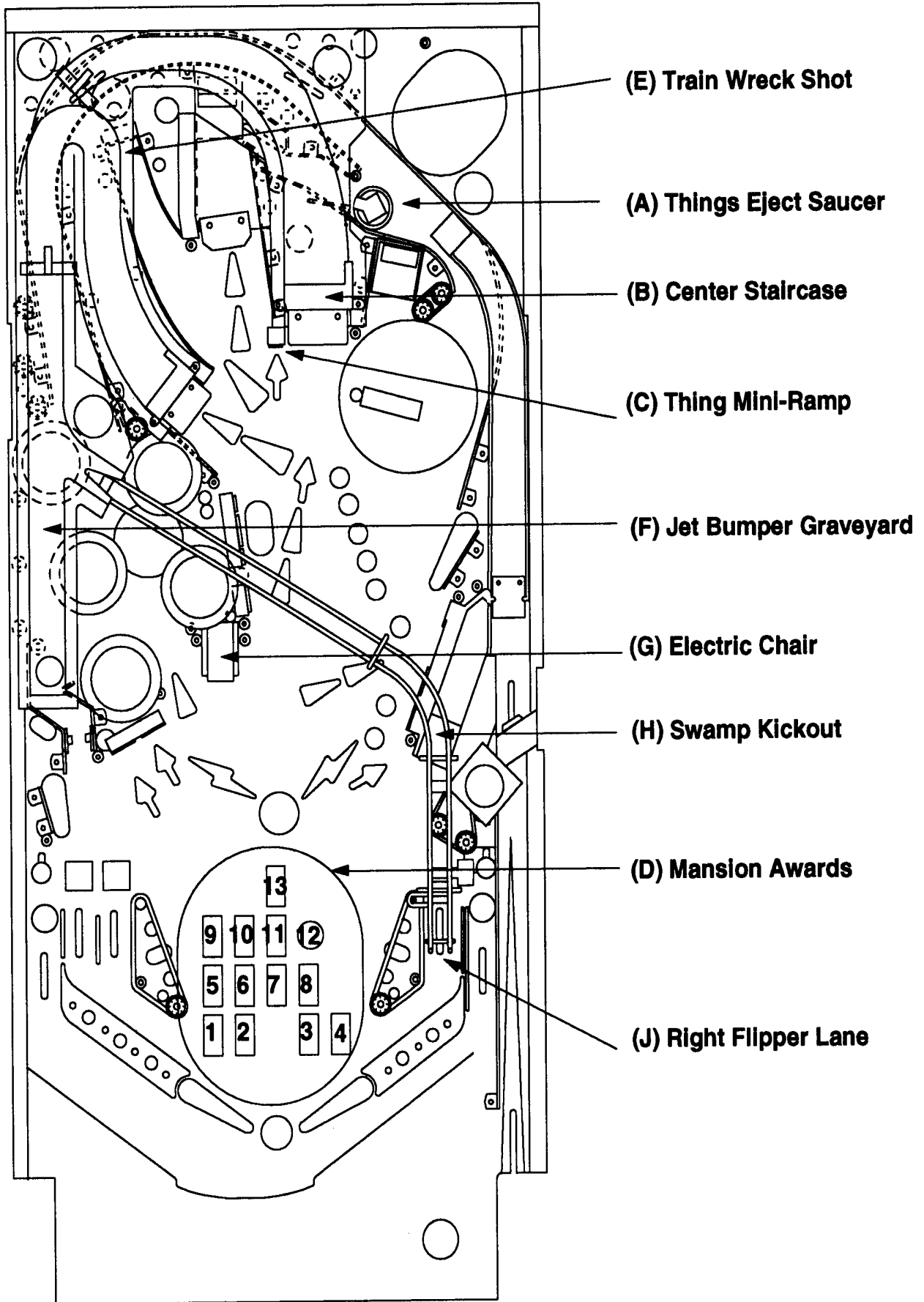
**GRAVEYARD VALUE:** Any shot into the Jet Bumpers increases the GRAVEYARD VALUE. This value is a one ball value unless it has been carried over because of a TRAIN WRECK. The GRAVEYARD VALUE is COLLECTED by any ball that goes into the SWAMP (P). Five times the GRAVEYARD VALUE can be collected by shooting the ball into the SWAMP with THINGS MINI-FLIPPER (Q).

**THING FLIPS:** Any ball that goes thru the left outer flipper lane (R) and is then shot around the Center Staircase (B) will be diverted to THINGS MINI-FLIPPER (Q). The game will AUTOMATICALLY FLIP ON ITS OWN and attempt to shoot the ball into the SWAMP!!!!

**T-H-I-N-G AWARD:** Every time a ball is shot into THINGS EJECT HOLE (A), a letter is added to the THING spellout on the speaker display panel. When T-H-I-N-G has been spelled, the next shot to Thing will activate the Hand and 5 Million will be scored. If a player can do it again, then 10 Million etc., will be scored.

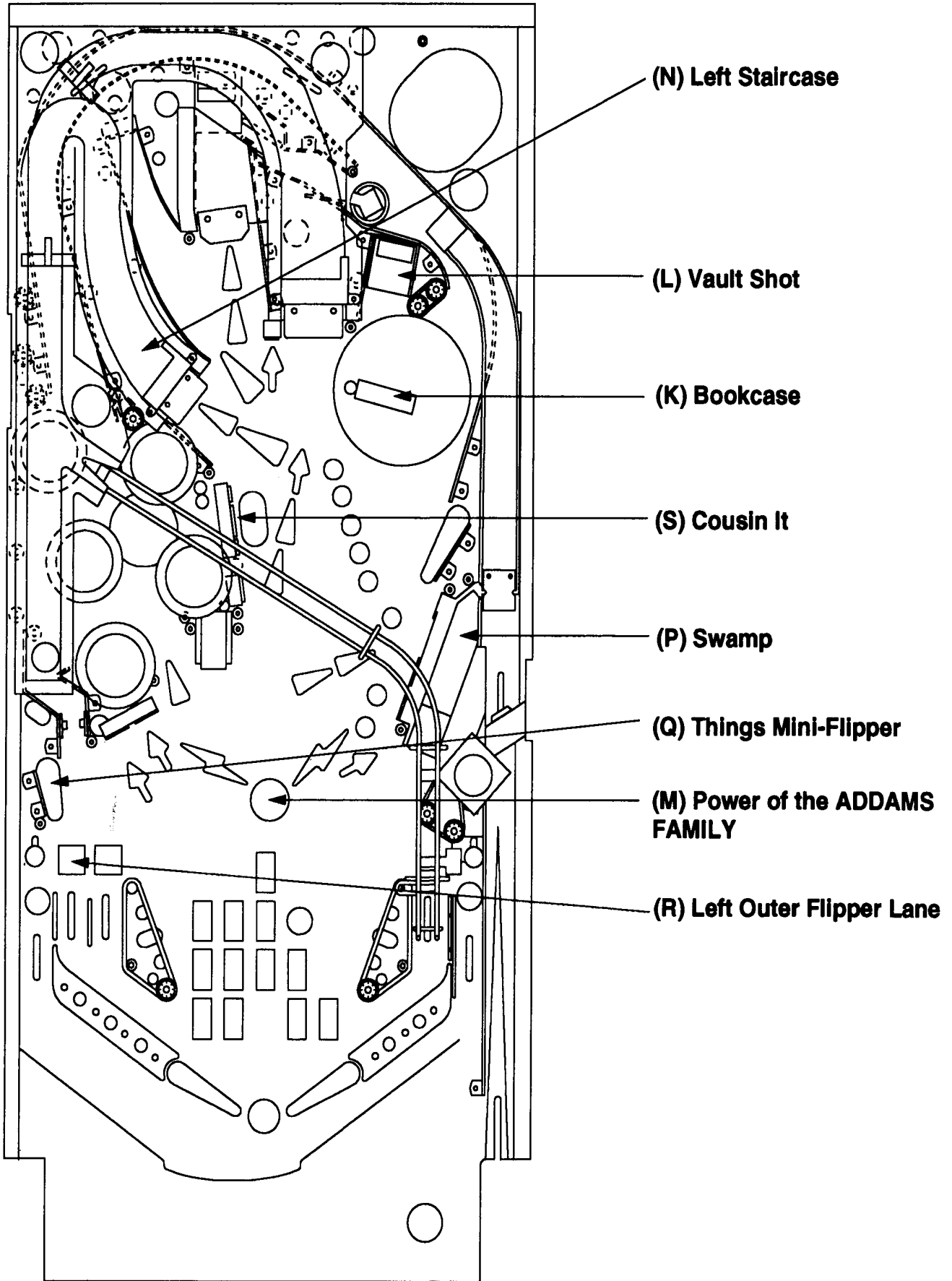


# ADDAMS FAMILY



The ADDAMS FAMILY E

# ADDAMS FAMILY



The ADDAMS FAMILY F

# Section 1

## *Game Operation & Test Information*

- 
- THE ADDAMS FAMILY (System WPC) ROM Summary
  - Pinball Game Assembly Instructions
  - Game Play
  - Menu System Operation

Adjustments  
Audits  
Test/Diagnostic Procedures  
Utilities

### THE ADDAMS FAMILY (System WPC) ROM Summary

| IC | TYPE             | LOCATION | BOARD     | PART NUMBER    |
|----|------------------|----------|-----------|----------------|
|    | Game ROM         | 27020    | U6 CPU    | A-5343-20017-1 |
|    | Music/Speech ROM | 27040    | U18 Audio | A-5343-20017-4 |

### **NOTICE**

Order replacement ROMs from your authorized MIDWAY MANUFACTURING CO. distributor. Specify: (1) part number (if available); (2) ROM label color; (3) ROM level (number) on the label; (4) which game the ROM is used in.

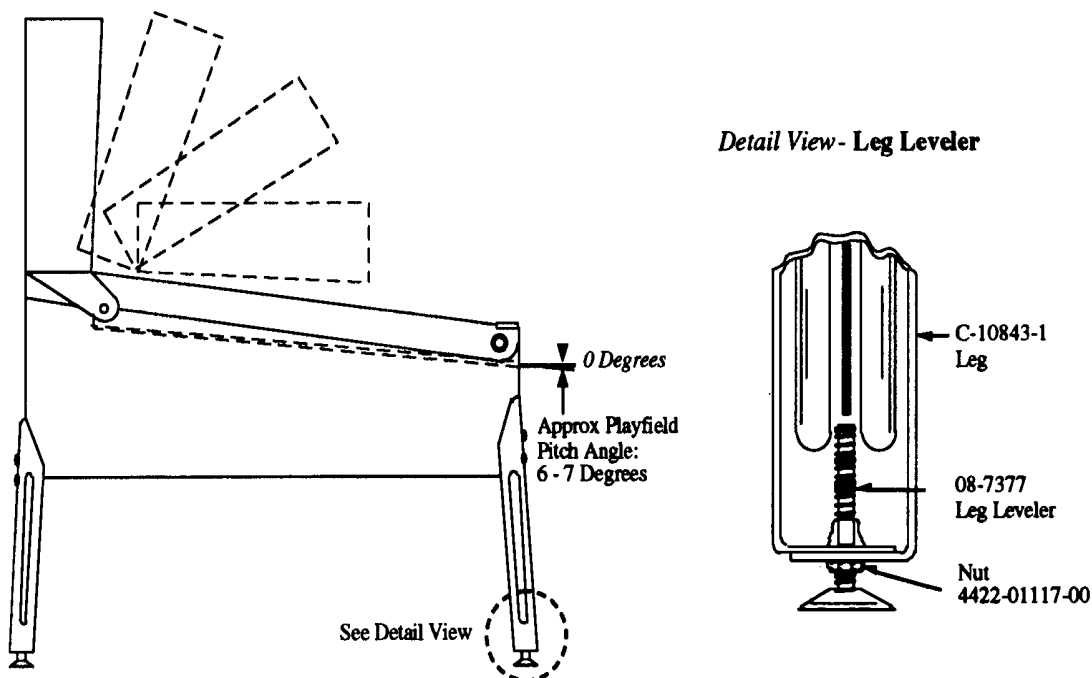
## PINBALL GAME ASSEMBLY INSTRUCTIONS

THE ADDAMS FAMILY IS A 3 BALL GAME.

Weight: 290 Lbs.  
Width: 26" Approx.

Length: 55" Approx.  
Height: 85" Approx.

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



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

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

### CAUTION

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

5. Raise the hinged backbox upright and latch it into position. Unlock the backbox, and remove the backglass, storing it carefully to avoid scratches. Remove the shipping block holding the Insert Board. Unlatch and open the Insert Board. This allows access to the bolt holes used for securing the backbox upright. Install the washer-head mounting bolts through the bottom holes of the backbox into the threaded fasteners in the cabinet to secure the backbox. Close the Insert Board and latch it in position. Reinstall the backglass, and lock the backbox.
6. Extend each leg leveler slightly below the leg bottom, so that all four foot pads are extended about the same distance. Remove the cabinet from its support and place it on the floor.
7. Unlock and open the coin door. Locate the Molding Latch Lever, and move the lever toward the left side of the game, to release the Front Molding. Lift the Front Molding off the playfield cover glass return the Latch Lever toward the right, and close the coin door. Carefully slide the glass downward, until it clears the grooves of the Left and Right Side Moldings. Lift the glass up and away from the game, storing it carefully to avoid breakage.
8. Place a level or an inclinometer on the playfield surface. Adjust the leg levelers for proper playfield level (side-to-side) and playfield pitch angle (incline) of approximately 6-7 degrees. NOTE: It is recommended that these measurements be made ON the playfield, not the cabinet nor the playfield cover glass. Tighten the nut on each leg leveler shaft to maintain this setting, as shown in Figure 3.

### **CAUTION**

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

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

**NOTE:** **THE ADDAMS FAMILY** Diamond Plate™ playfield does not require a protective mylar. However, playfield mylars can be purchased thru your local Bally Distributor. Specify part number 03-7960-20017-1 for full playfield mylar.

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

## GAME CONTROL LOCATIONS

### Cabinet Switches

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

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

### Coin Door Switches

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

#### Normal Function

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

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

The Volume Down switch lowers the sound level of the game. Press and hold the button until the desired level is reached. See Adjustment A.1 28 to shut sound Off completely.

The Begin Test switch starts the Menu System Operation and changes the Coin Door Switches from Normal Function to Test Function.

#### Test Function

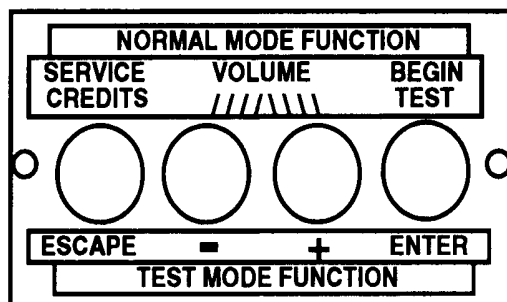
The Escape switch allows you to get out of a menu selection or return to the Attract Mode.

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

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

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

### Coin Door Switches





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

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

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

**END OF GAME.** All earned scores and bonuses are awarded. If a player's final score exceeds the specified value, the player receives a designated award for achieving the current highest score. A random digit set\* appears in the display. Credit\* may be awarded when the last two digits of any player's score (1 through 4) match the random digits. Match, high score and game over sounds are made, as appropriate.

**GAME OVER MODE.** GAME OVER will show in the display. Afterward, the high scores will flash on the display. The game proceeds to the Attract Mode.

\*Operator-adjustable feature.



## MENU SYSTEM OPERATION

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

### Main Menu

|                                   |   |
|-----------------------------------|---|
| <p><b>B. Bookkeeping Menu</b></p> | <p>B.1 Main Audits<br/>Etc., etc.</p> <p>B.2 Earnings Audits<br/>Etc., etc.</p> <p>B.3 Standard Audits<br/>Etc., etc.</p> <p>B.4 Feature Audits<br/>Etc., etc.</p> <p>B.5 Histograms<br/>Etc., etc.</p> <p>B.6 Time-Stamps<br/>Etc., etc.</p>   |
| <p><b>P. Printouts Menu</b></p>   | <p>P.1 Earnings Data</p> <p>P.2 Main Audits</p> <p>P.3 Standard Audits</p> <p>P.4 Feature Audits</p> <p>P.5 Score Histograms</p> <p>P.6 Game Time Histograms</p> <p>P.7 Time-Stamps</p> <p>P.8 All Data</p>   |
| <p><b>T. Test Menu</b></p>        | <p>T.1 Switch Edges</p> <p>T.2 Switch Levels</p> <p>T.3 Single Switches</p> <p>T.4 Solenoid Test</p> <p>T.5 Flasher Test</p> <p>T.6 General Illumination</p> <p>T.7 Sound &amp; Music Test</p> <p>T.8 Single Lamps</p> <p>T.9 All Lamps</p> <p>T.10 Lamp &amp; Flasher Test</p> <p>T.11 Display Test</p> <p>T.12 Thing Test</p> <p>T.13 Bookcase Test</p> |
| <p><b>U. Utilities Menu</b></p>   | <p>U.1 Clear Audits</p> <p>U.2 Clear Coins</p> <p>U.3 Reset H.S.T.D.</p> <p>U.4 Set Time &amp; Date</p> <p>U.5 Custom Message</p> <p>U.6 Set Game I.D.</p> <p>U.7 Factory Adjustments</p> <p>U.8 Factory Resets</p> <p>U.9 Presets<br/>Etc., etc.</p> <p>U.10 Clear Credits</p> <p>U.11 Auto Burn-In</p>  |
| <p><b>A. Adjustments Menu</b></p> | <p>A.1 Standard Adjustments<br/>Etc., etc.</p> <p>A.2 Feature Adjustments<br/>Etc., etc.</p> <p>A.3 Pricing Adjustments<br/>Etc., etc.</p> <p>A.4 H.S.T.D. Adjustments<br/>Etc., etc.</p> <p>A.5 Printer Adjustments</p>  |

**Press Escape**  
To move out of a menu selection.

**Press Enter**  
To get into a menu selection.

**Press Up**  
Increases sequence; Example A.1, A.2, A.3, A.4.

**Press Down**  
Decreases Sequence; Example A.4, A.3, A.2, A.1.

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

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

## MAIN MENU

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

Bookkeeping is the first category available from the Main Menu. Press the Enter button to activate the Bookkeeping Menu. Press the Up or Down button to cycle through the selections. Press the Enter button to activate the desired Bookkeeping group when it appears on the display.

## B. BOOKKEEPING MENU

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

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

### **One Button Audit System**

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

## B.1 Main Audits

|     |    |                    |    |  |
|-----|----|--------------------|----|--|
| B.1 | 01 | Total Earnings     | 00 | These audits (which also appear in other groups) are the most important, and are grouped here for easier access. |
| B.1 | 02 | Recent Earnings    | 00 |  |
| B.1 | 03 | Free Play Percent  | 00 |  |
| B.1 | 04 | Average Ball Time  | 00 |  |
| B.1 | 05 | Average Game Time  | 00 |  |
| B.1 | 06 | Total Plays        | 00 |  |
| B.1 | 07 | Replay Awards      | 00 |  |
| B.1 | 08 | Percent Replays    | 00 |  |
| B.1 | 09 | Extra Balls        | 00 |  |
| B.1 | 10 | Percent Extra Ball | 00 |  |

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

## B.2 Earning Audits\*

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

\*NOTE: These audits are NOT resettable. They are a record of the earnings since the "CLOCK 1ST SET" Time-Stamp.

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

### B.3 Standard Audits

|     |    |                      |    |   |
|-----|----|----------------------|----|---|
| B.3 | 01 | Games Started        | 00 | •As a new WPC feature, the "Total Plays" counter only counts completed games. A game is considered completed when the final ball begins. Audit information from an incomplete game is ignored. Therefore operation for test and service do not affect the Audits. |
| B.3 | 02 | Total Plays•         | 00 |   |
| B.3 | 03 | Total Free Play      | 00 |   |
| B.3 | 04 | Free Play Percent    | 00 |   |
| B.3 | 05 | Replay Awards        | 00 |   |
| B.3 | 06 | Percent Replays      | 00 |   |
| B.3 | 07 | Special Awards       | 00 |   |
| B.3 | 08 | Percent Special      | 00 |   |
| B.3 | 09 | Match Awards         | 00 |   |
| B.3 | 10 | Percent Match        | 00 |   |
| B.3 | 11 | H.S.T.D. Credits     | 00 |   |
| B.3 | 12 | Percent H.S.T.D      | 00 |   |
| B.3 | 13 | Extra Ball           | 00 |   |
| B.3 | 14 | Percent Extra Ball   | 00 |   |
| B.3 | 15 | Tickets Awarded      | 00 |   |
| B.3 | 16 | Percent Tickets      | 00 |   |
| B.3 | 17 | Left Drains          | 00 |   |
| B.3 | 18 | Right Drains         | 00 |   |
| B.3 | 19 | Average Ball Time    | 00 |   |
| B.3 | 20 | Average Game Time    | 00 |   |
| B.3 | 21 | Minutes of Play      | 00 |   |
| B.3 | 22 | Minutes On           | 00 |   |
| B.3 | 23 | Balls Played         | 00 |   |
| B.3 | 24 | Tilts                | 00 |   |
| B.3 | 25 | Replay 1 Awards      | 00 |   |
| B.3 | 26 | Replay 2 Awards      | 00 |   |
| B.3 | 27 | Replay 3 Awards      | 00 |   |
| B.3 | 28 | Replay 4 Awards      | 00 |   |
| B.3 | 29 | 1 Player Games       | 00 |   |
| B.3 | 30 | 2 Player Games       | 00 |   |
| B.3 | 31 | 3 Player Games       | 00 |   |
| B.3 | 32 | 4 Player Games       | 00 |   |
| B.3 | 33 | H.S.T.D. Reset Count | 00 |   |
| B.3 | 34 | Burn-in Cycles       | 00 |   |
| B.3 | 35 | 1st Replay Level     | 00 |   |

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

## B.4 Feature Audits

|     |    |                                    |    |
|-----|----|------------------------------------|----|
| B.4 | 01 | Games In Which Bookcase Was Opened | 00 |
| B.4 | 02 | Multiball                          | 00 |
| B.4 | 03 | 2nd Multiball                      | 00 |
| B.4 | 04 | 3rd Multiball                      | 00 |
| B.4 | 05 | Rematch Made                       | 00 |
| B.4 | 06 | Train Jackpot                      | 00 |
| B.4 | 07 | Ramp Jackpot                       | 00 |
| B.4 | 08 | Double Jackpots                    | 00 |
| B.4 | 09 | Triple Jackpots                    | 00 |
| B.4 | 10 | Quick Multiball                    | 00 |
| B.4 | 11 | Vault Millions                     | 00 |
| B.4 | 12 | Hurry-Up (Thing Lock) Multiball    | 00 |
| B.4 | 13 | Thing Vault                        | 00 |
| B.4 | 14 | Mansion Awards                     | 00 |
| B.4 | 15 | Mansion Extra Ball                 | 00 |
| B.4 | 16 | Tour The Mansion                   | 00 |
| B.4 | 17 | Ramp Extra Ball Lit                | 00 |
| B.4 | 18 | Train Wreck Extra Ball Lit         | 00 |
| B.4 | 19 | Train Target                       | 00 |
| B.4 | 20 | Train Wrecks                       | 00 |
| B.4 | 21 | Swamp 1X                           | 00 |
| B.4 | 22 | Swamp 5X                           | 00 |
| B.4 | 23 | Skill Shots                        | 00 |
| B.4 | 24 | Center Ramp                        | 00 |
| B.4 | 25 | Side Ramp                          | 00 |
| B.4 | 26 | Center Kickout                     | 00 |
| B.4 | 27 | Right Kickout                      | 00 |
| B.4 | 28 | Thing Trips                        | 00 |
| B.4 | 29 | Thing Awards                       | 00 |
| B.4 | 30 | Thing Flips                        | 00 |
| B.4 | 31 | Thing Flips Hits                   | 00 |
| B.4 | 32 | Mansion Spots                      | 00 |

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

## B.5 Histograms

|     |    |                        |     |    |
|-----|----|------------------------|-----|----|
| B.5 | 01 | 0.0-0.5 Million Scores | 00% | 00 |
| B.5 | 02 | 0.5-0.9 Million Scores | 00% | 00 |
| B.5 | 03 | 1.0-1.5 Million Scores | 00% | 00 |
| B.5 | 04 | 1.5-1.9 Million Scores | 00% | 00 |
| B.5 | 05 | 2.0-2.9 Million Scores | 00% | 00 |
| B.5 | 06 | 3.0-3.9 Million Scores | 00% | 00 |
| B.5 | 07 | 4.0-4.9 Million Scores | 00% | 00 |
| B.5 | 08 | 5.0-5.9 Million Scores | 00% | 00 |
| B.5 | 09 | 6.0-7.9 Million Scores | 00% | 00 |
| B.5 | 10 | 8.0-9.9 Million Scores | 00% | 00 |
| B.5 | 11 | 10-15 Million Scores   | 00% | 00 |
| B.5 | 12 | 15-20 Million Scores   | 00% | 00 |
| B.5 | 13 | Over 20 Million        | 00% | 00 |
| B.5 | 14 | Game Time 0.0-1.0 Mins | 00% | 00 |
| B.5 | 15 | Game Time 1.0-1.5 Mins | 00% | 00 |
| B.5 | 16 | Game Time 1.5-2.0 Mins | 00% | 00 |
| B.5 | 17 | Game Time 2.0-2.5 Mins | 00% | 00 |
| B.5 | 18 | Game Time 2.5-3.0 Mins | 00% | 00 |
| B.5 | 19 | Game Time 3.0-3.5 Mins | 00% | 00 |
| B.5 | 20 | Game Time 3.5-4.0 Mins | 00% | 00 |
| B.5 | 21 | Game Time 4-5 Mins     | 00% | 00 |
| B.5 | 22 | Game Time 5-6 Mins     | 00% | 00 |
| B.5 | 23 | Game Time 6-8 Mins     | 00% | 00 |
| B.5 | 24 | Game Time 8-10 Mins    | 00% | 00 |
| B.5 | 25 | Game Time 10-15 Mins   | 00% | 00 |
| B.5 | 26 | Game Time Over 15 Mins | 00% | 00 |

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

## B.6 Time-Stamps

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

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

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

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

## **P. PRINTOUTS MENU**

(optional board required)

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

The Printouts Menu is a combination of the other menus. This menu allows you to access and print information in the available menu selections.

If no Printer is attached the the message "Waiting for Printer" appears in the displays. Note: Set the print specification from the Adjustment Menu, A.5 Printer Adjustments.

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



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

## T. TEST MENU

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

### T.1 Switch Edges

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

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

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

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

### T.2 Switch Levels

Once the test name is shown under the Test Menu, press the Enter button. The name and number of each switch that is activated is shown in the displays. This test automatically cycles through all switches that are detected closed. Current switch is indicated by a filled square.

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

### T.3 Single Switches

Once the test name is shown under the Test Menu, press the Enter button. The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the switch to be tested. During the Single Switch Test, a flashing cross indicates your location in the matrix, a square indicates a closed switch, and a dot indicates an open switch. Press the Start button to obtain wire color, connector, and fuse information of any switch when that switch is displayed.

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

### T.4 Solenoid Test

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

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

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

## T.5 Flasher Test

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

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

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

## T.6 General Illumination

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

- Stop - Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number shows in the displays while the corresponding lamps light. If any other results occur the system has detected an error.
- Run - Press the Enter button any time during Stop test mode and the General Illumination Test cycles through automatically. For each circuit shown in the displays the corresponding bulbs should light. If any other results occurs the system has detected a problem.

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

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

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

- Running - This test steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test allows you to advance to a particular sound or tune without having to wait for the program to play all the sounds available in the test. For each name and number that appears in the displays a sound or tune should be heard. Any other results indicates the system has detected a problem.
- Repeat - Press the Enter button at any time during the Running test mode to cause the program to stop and repeat a particular sound or tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other results indicates the system has detected a problem.
- Stop - Press the Enter button at any time during the Repeat test mode to stop this test altogether. Nothing should be heard. Any other results indicates the system has detected a problem.

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

### **T.8 Single Lamp Test**

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

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to test each lamp circuit individually. Press the Up or Down button to cycle through this test. For each name and number that is shown in the displays the corresponding lamp should light. Any other results indicates the system has detected a problem. Press the Start button to obtain wire color, connector, and fuse information when the desired lamp is lit.

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

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

Once the test name is shown under the Test Menu, press the Enter button. This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other results indicates the system has detected a problem.

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

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

Once the test name is shown under the Test Menu, press the Enter button. This test causes all the flashlamps and the controlled lamps to flash at the same time. The controlled lamps blink, while the flashlamps cycle from highest to lowest. Any other results indicates the system has detected a problem.

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

### **T.11 Display Test**

Once the test name is shown under the Test Menu, press the Enter button. This Test automatically turns On and Off every dot in the Dot Matrix Display. A series of patterns appear in sequence. It starts with one line, turned On, moving across the screen vertically, then horizontally. The screen inverses and one line, turned Off, moves across the screen vertically, then horizontally. The second pattern is a series of lines, turned On, moving across the screen diagonally. The screen inverses and there is a series of lines, turned Off, moving across the screen diagonally. The third pattern is gridlines turned On, then turned Off. The last pattern is a box forming an outline of dots around the matrix that are turned On. After the box outline the test repeats itself.

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

### **T.12 Thing Test**

Select T.12 from the Test Menu and press "Enter" to enter the "Thing" Test. Using the Up and Down buttons, 2 different test can be run:

#### **T.12 01 Motor Test**

This allows the operator to start and stop the motor that operates the "Thing Hand". Pressing "Enter" will alternately start and stop the motor. The status of the opto limit switches is shown on the bottom line of the display.

#### **T.12 02 Operation Test**

This allows the operator to do a normal operation of the hand mechanism. Each time "Enter" is pressed, a cycle will begin which will operate the mechanism as is don during game play. If a ball is placed in the eject hole, the hand should take the ball and drop it into its box where it will then be returned to the playfield. During the operation of this test, the status of the opto limit switches is shown on the bottom line of the display.

### **T.13 Bookcase Test**

This allows you to start and stop the motor that operates the Bookcase. Pressing "Enter" will alternately start and stop the motor. The status of the bookcase limit switches is shown on the bottom line of the display.

Press the Enter button to activate the Utilities Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Utility Menu selections. Press the Enter button to activate the desired Utility or Utility Group when it appears in the displays. If you change a utility setting and realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is still in the displays. The original setting is retained and the new setting is ignored.

## U. UTILITIES MENU

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

- U.1 **Clear Audits**  
Press the Enter button to clear the Standard Audits, Feature Audits, and Histograms. Press the Up button to display the next utility.
- U.2 **Clear Coins**  
Press the Enter button to clear the Earnings Audits. Press the Up button to display the next utility.
- U.3 **Reset H.S.T.D.**  
Press the Enter button to clear the High Score to Date Table and the Grand Champion. Press the Up button to display the next utility.
- U.4 **Set Time and Date**  
Press the Enter button to activate the time and date. Use the Up or Down button to change the value, then press the Enter button to lock in that value. If you make a mistake press the Escape button while "Saving Adjustment Value" is displayed. Press the Up button to move to the next utility.
- U.5 **Custom Message**  
Set A.1 20 to YES before writing a Custom Message. Press the Enter button to begin entry of the custom message that appears in the displays during the Attract Mode. Use the Up or Down button to rotate letters. Use the Start button to rotate punctuation marks, (if desired). Press the Enter button to lock in the desired letter and punctuation. If you make a mistake, use Up and Down to select the "back-arrow" character located before the space character and after the number nine. Press Enter while the back-arrow shows to erase the previously entered character. Once your message is complete, press and hold the Enter button until "Message Stored" is displayed.

- U.6 Set Game I.D.**  
This utility allows the operator to install a message, such as game location, that only appears on printouts . Press the Enter button to activate Set Game I.D.. Use the Up or Down button to rotate letters. Use the Start button to rotate punctuation marks, (if desired). Press the Enter button to lock in the desired letter and punctuation.
- U.7 Factory Adjustment**  
Press the Enter button to restore the adjustments to factory settings, then press the Up button to display the next utility.
- U.8 Factory Reset**  
Press the Enter button to restore the adjustments to their factory setting, clear the Audits, H.S.T.D Table, and Custom Message/Game I.D. Press the Up button to display the next utility.
- U.9 Presets**  
Press the Enter button to activate the Presets Group. Use the Up or Down buttons to cycle through the available Presets. When the desired Preset is displayed, press the Enter button to lock in that Preset. If you realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.
- U.9 01 Install Extra Easy**  
The operator can change the game play difficulty adjustments to a combination that is MUCH LESS difficult than the Factory Settings. The Game Difficulty Setting Table lists the adjustments and the settings that comprise the 'Extra Easy' Group.
- U.9 02 Install Easy**  
The operator can change the game play difficulty adjustments to a combination that is somewhat LESS difficult than the Factory Settings. The Game Difficulty Setting Table lists the adjustments and the settings that comprise the 'Easy' Group.
- U.9 03 Install Medium**  
The operator can change the game play difficulty adjustments to a combination that is about the SAME difficulty as the Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the 'Medium' Group.
- U.9 04 Install Hard**  
The operator can change the game play difficulty adjustments to a combination that is somewhat MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the 'Hard' Group.
- U.9 05 Install Extra Hard**  
The operator can change the game play difficulty adjustments to a combination that is MUCH MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the 'Extra Hard' Group.

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

| Adj. No. | Adjustment Description  | Extra Easy<br>U.9 01 | Easy<br>U.9 02 | Medium<br>U.9 03 | Hard<br>U.0 04 | Extra Hard<br>U.9 05 |
|----------|-------------------------|----------------------|----------------|------------------|----------------|----------------------|
| A.2 01   | Extra Ball Percent      | 35                   | 30             | 25               | 20             | 15                   |
| A.2 02   | Bear Kick Extra Ball 1  | 06                   | 06             | 08               | 08             | 10                   |
| A.2 04   | Train Wreck Extra Ball  | 03                   | 03             | 04               | 04             | 04                   |
| A.2 06   | House Extra Ball Memory | Yes                  | Yes            | Yes              | No             | No                   |
| A.2 09   | Last Swamp Lock         | 02                   | 01             | 01               | 01             | 00                   |
| A.2 10   | Last Chair Release      | 02                   | 02             | 02               | 01             | 00                   |
| A.2 12   | Million Plus Memory     | Yes                  | No             | No               | No             | No                   |
| A.2 15   | House From Swamp        | Yes                  | Yes            | Yes              | Yes            | No                   |
| A.2 16   | Free Thing Lamps        | 04                   | 03             | 03               | 02             | 01                   |
| A.2 18   | Train Wreck Hits        | 02                   | 02             | 02               | 03             | 03                   |
| A.2 23   | Quick Multiball Memory  | Yes                  | Yes            | Yes              | No             | No                   |

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

| Adj. No. | Adjustment Description  | Extra Easy<br>U.9 01 | Easy<br>U.9 02 | Medium<br>U.9 03 | Hard<br>U.0 04 | Extra Hard<br>U.9 05 |
|----------|-------------------------|----------------------|----------------|------------------|----------------|----------------------|
| A.2 01   | Extra Ball Percent      | 35                   | 30             | 25               | 20             | 15                   |
| A.2 02   | Bear Kick Extra Ball 1  | 06                   | 06             | 08               | 08             | 10                   |
| A.2 04   | Train Wreck Extra Ball  | 03                   | 03             | 04               | 04             | 04                   |
| A.2 06   | House Extra Ball Memory | Yes                  | Yes            | Yes              | No             | No                   |
| A.2 09   | Last Swamp Lock         | 02                   | 01             | 01               | 01             | 00                   |
| A.2 10   | Last Chair Release      | 02                   | 02             | 02               | 01             | 00                   |
| A.2 12   | Million Plus Memory     | Yes                  | No             | No               | No             | No                   |
| A.2 15   | House From Swamp        | Yes                  | Yes            | Yes              | Yes            | No                   |
| A.2 16   | Free Thing Lamps        | 04                   | 03             | 03               | 02             | 01                   |
| A.2 18   | Train Wreck Hits        | 02                   | 02             | 02               | 03             | 03                   |
| A.2 23   | Quick Multiball Memory  | Yes                  | Yes            | Yes              | No             | No                   |



**U.9 06 Install 5 Ball**

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

**U.9 07 Install 3 Ball**

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

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

| Adjustment Number | Adjustment Description  | Install 5-Ball U.9 06 | Install 3 Ball U.9 07 |
|-------------------|-------------------------|-----------------------|-----------------------|
| A.1 01            | Balls Per Game          | 3                     | 5                     |
| A.2 01            | Extra Ball Percent      | 25                    | 25                    |
| A.2 02            | Bear Kick Extra Ball 1  | 08                    | 12                    |
| A.2 04            | Train Wreck Extra Ball  | 04                    | 4                     |
| A.2 06            | House Extra Ball Memory | Yes                   | Yes                   |
| A.2 09            | Last Swamp Lock         | 01                    | 00                    |
| A.2 10            | Last Chair Release      | 02                    | 01                    |
| A.2 12            | Million Plus Memory     | No                    | No                    |
| A.2 15            | House From Swamp        | Yes                   | No                    |
| A.2 16            | Free Thing Lamps        | 03                    | 02                    |
| A.2 18            | Train Wreck Hits        | 02                    | 03                    |
| A.2 23            | Quick Multiball Memory  | Yes                   | No                    |

**U.9 08 Install Add -A -Ball**

The operator utilizes this option to delete all Free Play awards and replace them with Extra Ball awards. Individual adjustments are affected, as follows:

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

### U.9 09 Install Ticket

The operator utilizes this option to delete Credit awards and replace them with Ticket awards. Individual adjustments are affected as follows.

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

### U.9 10 Install Novelty

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

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

### U.9 11 Install Buy-in

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

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

• For German Jumpred CPU Boards only.

**Preset Game Adjustments Table for German/European Games**

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

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

\*For French Jumpered CPU Boards only.

**Preset Game Adjustments Table for French Games**

| Adj. # | Adjustment Description | French 1<br>U.9 23 | French 2<br>U.9 24 | French 3<br>U.9 25 | French 4<br>U.9 26 | French 5<br>U.9 27 | French 6<br>U.9 28 |
|--------|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| U.9 06 | Install 5 Ball         | N/A                | N/A                | N/A                | N/A                | N/A                | Yes                |

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

**U.10 Clear Credits**

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

**U.11 Auto Burn-in**

Press the Enter button to activate Auto Burn-in. This utility allows you to automatically cycle through several tests. This helps in finding intermittent problems. The tests that Auto Burn-in cycles through are the Display Test, the Sound and Music Test, the All Lamps Test, the Solenoid Test, the Flashers Test, and the General Illumination Test.

**U.12 New Location**

This function is used to alert the "Thing Flips" calibration system that the game has been moved to a new location. Select Function U.12. Press Enter. The game will confirm that you have re-started calibration of the "Thing Flips" system.

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

Press the Enter button to activate the Adjustments Menu. Press the Up or Down button to cycle through the Adjustment Menu selections. Press the Enter button to activate the desired Adjustment group when it appears on the display.

## A. ADJUSTMENTS MENU

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

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

### A.1 Standard Adjustments

#### A.1 01 Balls Per Game

The operator defines a "game" by specifying the number of balls to be played. The range of this setting is 1 through 10.

#### A.1 02 Tilt Warnings

The operator specifies the number of total actuations of the plumb bob mechanism that can occur before the game is "tilted". The range of this setting is 1 through 10.

#### A.1 03 Maximum Extra Balls

The operator chooses the number of Extra Balls that a player may accumulate. The range of this setting is 1 through 10, or "No Extra Ball" (Extra Ball disabled).

#### A.1 04 Maximum Extra Balls/Ball in Play

The operator chooses the number of Extra Balls to be awarded per ball in play. The range of this setting is:

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

**A.1 05 Replay System**

The operator chooses the replay system to be used. The choices are:

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

**A.1 06 Replay Percent\***

The operator chooses the percentage of replays the players are able to earn when Auto Replay is used. The range of this setting is 5% to 50%.

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

The operator chooses the replay starting value when Auto% Replay is used. The range of this setting is 1, 000, 000 to 20, 000, 000.

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

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

\*For Auto % Replay.

**A.1 09 Replay Level 1\*\***

The operator chooses the value to be used for the first Fixed Replay. The range of this setting is 00 to 25, 000, 000.

**A.1 10 Replay Level 2\*\***

The operator chooses the value to be used for the second Fixed Replay. The range of this setting is 00 to 25, 000, 000.

**A.1 11 Replay Level 3\*\***

The operator chooses the value to be used for the third Fixed Replay. The range of this setting is 00 to 25, 000, 000.

**A.1 12 Replay Level 4\*\***

The operator chooses the value to be used for the fourth Fixed Replay. The range of this setting is 00 to 25, 000, 000.

\*\* For Fixed Replay

**A.1 13 Replay Boost**

The operator chooses if the replay score can be temporarily boosted by the selected amount EACH time the player reaches or exceeds the replay score. This temporary boost is canceled when Credits=0, when the player inserts another coin, or when Begin Test is pressed. The choices are:

ON-Score is boosted between 500, 000 and 5, 000, 000 points.

OFF-The replay score is not boosted.

**A.1 14 Replay Award**

For either Auto% Replay or Fixed Replay the operator can choose the form of the award automatically provided when the player exceeds any replay level. The choices are:

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

**A.1 15 Special Award**

The operator can choose the award automatically provided when the player scores a special. The choices are:

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

**A.1 16 Match Award**

The operator can choose the award automatically provided when the players wins a match. The choices are:

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

**A.1 17 Extra Ball Ticket**

The operator can choose whether a Ticket is awarded when the player earns an Extra Ball. The choices are:

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

**A.1 18 Maximum Ticket/Player**

The operator can choose the amount of Tickets each player can earn. The range of this setting is 00 to 100.



**A.1 19 Match Feature**

The operator can choose the desired percentage for the Match Feature occurring at the end of the game. The range of this setting is:

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

**A.1 20 Custom Message**

The operator chooses if a message is displayed during the Attract Mode. The choices are:

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

**A.1 21 Language**

The operator chooses what language the game uses. The choices are, English, French, or German.

**A.1 22 Clock Style**

The operator chooses what style of clock the game uses. The choices are A.M./P.M. or 24 Hours.

**A.1 23 Date Style**

The operator chooses what style of date the game uses. The choices are Month/Date/Year, or Date/Month/Year.

**A.1 24 Show Date and Time**

The operator chooses whether the date and time show in the Attract Mode. The choices are:

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

**A.1 25 Allow Dim Illumination**

The operator chooses whether to allow the game program to dim the General Illumination for special effects and during the Attract Mode. The choices are:

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

**A.1 26 Tournament Play**

The operator chooses whether to equalize Multi-ball and Jackpots during multi-player games, (do not carry over to next player). The choices are:

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

**A.1 27 Euro. Scr. Format**

The operator chooses whether to have commas or dots between digits when numbers are displayed. The choices are:

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

**A.1 28 Minimum Volume Control**

The operator chooses whether the volume can be turned Off. The choices are:

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

**A.1 29 General Illumination Power Saver**

This adjustment allows the general illumination and controlled lamps to be dimmed following a time interval after a game is played. Power Saver Level (A.1 30) determines how dim the lamps will get. The use of this feature will substantially increase the life of the lamps.

Settings: Off 2-60 Minutes

**A.1 30 Power Saver Level**

When General Illumination Power Saver (A.1 29) is set to On, this adjustment controls the intensity of the G.I. and controlled lamps once the game has been idle for a specified period of time.

Settings: 4-7

**A.1 31 Ticket Expansion Board**

When a Ticket Expansion Board is connected, full control of the ticket dispenser is available. This includes a ticket low/error lamp, resume on ticket jam, and manual ticket dispense switch. The choices are:

- Yes - Ticket Expansion Board is connected.
- No - Ticket Expansion Board is NOT installed in the game.

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

## **A.2 Feature Adjustments**

### **A.2 01 Extra Ball Percent**

This is used to enter the desired extra ball percentage. The House and Train Wreck extra balls always remain fixed, and the Bear Kick extra ball threshold will automatically be modified to reach the desired percentage.

Range: 15% - 40%

Set to "Fixed" to disable the automatic percentaging of the Bear Kick Extra Ball.

### **A.2 02 Bear Kick Extra Ball 1**

This is the number of Bear Kicks that will light the 1st extra ball. The machine will start with this value and modify it as necessary to achieve the percentage specified in A.2 01. To use a fixed level for the 1st extra ball, set A.2 01 to "fixed" and set this level here.

Range: OFF, 4-12

### **A.2 03 Bear Kick Extra Ball 2**

This determines whether a 2nd extra ball is available at 50 Bear Kicks.

Range: OFF, 30-99

### **A.2 04 Train Wreck Extra Ball**

This is the number of train wrecks that will light the Train Wreck extra ball.

Setting: On/Off

### **A.2 05 Bear Extra Ball Memory**

This determines whether extra balls lit from the Bear Kick feature remain in memory from ball to ball.

Setting: Yes/No

### **A.2 06 House Extra Ball Memory**

This determines whether extra balls lit from the Mansion feature remain in memory from ball to ball.

Setting: Yes/No

### **A.2 07 Train Extra Ball Memory**

This determines whether extra balls lit from the Train Wreck feature remain in memory from ball to ball.

Setting: Yes/No

- A.2 08 Last Thing Lock**  
This determines that last multiball in which Thing is allowed to help lock the balls.  
Range: Off, 1 - 5
- A.2 09 Last Swamp Lock**  
This determines that last multiball in which balls may be locked in the Swamp.  
Range: 1 - 5
- A.2 10 Last Chair Release**  
This determines that last multiball in which multiball may begin from an Electric Chair shot.  
Range: Off, 0 - 5
- A.2 11 Jackpot Carryover**  
When set to "Yes", a player's uncollected Jackpot will carry over to subsequent multiball. If set to "No" the Jackpot value will reset to 10 Million at the start of each multiball. Anytime the Jackpot is collected, it automatically resets to 10 Million.  
Setting: Yes/No
- A.2 12 Million Plus Memory**  
This determines whether the side ramp Million Plus feature carries over from ball to ball or is reset to one million at the start of each ball.  
Setting: Yes/No
- A.2 13 Million Plus Maximum**  
This sets the maximum value for the side ramp Million Plus feature. Subsequent shots will award this maximum value without increasing.  
Range: 5,000,000 - 20,000,000
- A.2 14 Hurry Up Start**  
This is the starting (maximum) value for the Thing "Hurry Up" quick multiball feature. The award will start at this value and count down to 3,000,000.  
Range: 10,000,000 - 20,000,000
- A.2 15 House From Swamp**  
This allows the Mansion awards to be awarded by balls entering the Swamp kickout.  
Setting: Yes/No

- A.2 16 Free Thing Lamps**  
This gives each player this many lamps in the T-H-I-N-G spell out at the start of each game.  
Range: 0 - 5
- A.2 17 Raise Dead Hits**  
This is the number of hits on each bumper required to complete the bumper for the "Raise the Dead" mode.  
Range: 3 - 9
- A.2 18 Train Wreck Hits**  
This is the number of hits required for the 1st Train Wreck. Each subsequent Train Wreck requires 1 additional hit up to a maximum of 6.  
Range: 2-4
- A.2 19 Special Memory**  
This determines the Special (which is lit by the "Tour The Mansion" feature) stays in memory from ball to ball  
Setting: Yes/No
- A.2 20 Disable THING**  
Set to "Yes" to stop the operation of the Thing hand.  
Setting: Yes/No
- A.2 21 Disable BOOKCASE**  
Set to "Yes" to stop the operation of the Bookcase.  
Setting: Yes/No
- A.2 22 Train Wreck Memory**  
This determines whether the Train Wreck progress is maintained ball to ball (yes), or reset every ball (no).
- A.2 23 Quick Multiball Memory**  
This determines whether the quick multiball lamp (earned as a Mansion award) carries over from ball to ball  
Setting: Yes/No

**A.2 24 Green Lock Lamp**

Certain prototype games did not have the Green Lock lamp hanging over the "Thing" shot. By setting this adjustment to "NO", the game will use the yellow "Multiball" lamp in its place.

Setting: Yes/No

**A.2 25 Tour the Mansion Extra Ball Memory**

When an extra ball is lit from "Tour the Mansion", this adjustment determines whether that extra ball is carried over from ball to ball.

**A.2 26 Tour the Mansion Difficulty**

When set to "Medium", the 3 Million and 6 Million Mansion windows will both light when either is hit. When set to "Hard", each of these windows must be earned independently.

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

### **A. 3 Pricing Adjustments**

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

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

#### **A.3 02 Left Coin Units**

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

#### **A.3 03 Center Coin Units**

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

#### **A.3 04 Right Coin Units**

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

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

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

#### **A.3 06 Units/Credits**

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

#### **A.3 07 Units/Bonus**

The operator can specify that additional credits are to be indicated in the credits display, when a certain number of coin units are accumulated.

#### **A.3 08 Bonus Credits**

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

**A.3 09 Minimum Units**

The operator can specify that No credits are to be posted (indicated in the credit display), until the credits unit counter reaches a particular value, by setting this value to 02 (or more).

**A.3 10 Coin Door Type (if set to custom, then 11 to 15 are available)**

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

**A.3 11 Collection Text**

The operator chooses what coin system is used to display the Earning Audits.

**A.3 12 Left Slot Value**

The operator can specify the monetary value of the left coin chute.

**A.3 13 Center Slot Value**

The operator can specify the monetary value of the center coin chute.

**A.3 14 Right Slot Value**

The operator can specify the monetary value of the right coin chute.

**A.3 15 4th Slot Value**

The operator can specify the monetary value of the 4th coin chute.

**A.3 16 Maximum Credits**

The operator can specify the maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of this setting is 5 through 10. Reaching the specified setting prevents the award of any credits.

**A.3 17 Free Play**

The operator can specify whether a player can operate the game without a coin (free play) or with a coin. The choices are:

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

**A.3 18 Hide Coin Audits**

The operator chooses whether or not to show the coin audits. The choices are:

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



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

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

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

**A.3 20 Base Coin Size**

This number is used for the ticket per coin calculations.

**A.3 21 Coin Meter Units**

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

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

### Pricing Table

| Country           | Coin Chute |         |        |           | Games/Coin  | Display   | Pricing Adjustments A.3 |    |    |    |    |    |    |    |  |  |  |
|-------------------|------------|---------|--------|-----------|---|---|-------------------------|----|----|----|----|----|----|----|--|--|--|
|                   | Left       | Center  | Right  | 4th Chute |   |   | 02                      | 03 | 04 | 05 | 06 | 07 | 08 | 09 |  |  |  |
| USA               | 25¢        | *\$1.00 | 25¢    | -         | 1/25¢, 4/\$1 <sup>2</sup><br>1/50¢, 2/75¢, 3/\$1 <sup>1,2</sup><br>1/50¢, 2/\$1 <sup>2</sup><br>1/25¢, 3/\$1 <sup>2</sup><br>1/25¢, 3/50¢, 6/\$1<br>1/25¢, 5/\$1  | U.S.A. 4/\$1.00<br>50-75-1.00<br>U.S.A. 2/\$1.00<br>U.S.A. 3/\$1.00<br>CUSTOM<br>CUSTOM |                         |    |    |    |    |    |    |    |  | 01 04 01 00 01 02 01 00<br>01 00 01 00 01 04 01 00 |  |
| Canada            | 25¢        | -       | \$1.00 | -         | 1/50¢, 2/75¢, 3/\$1 <sup>2</sup><br>1/50¢, 2/\$1 <sup>2</sup>   | CANADA 1<br>CANADA 2  |                         |    |    |    |    |    |    |    |  |  |  |
| Austria           | 5 Sch      | 10 Sch  | 10 Sch | -         | 1/2x5 Sch, 3/2x10 Sch <sup>2</sup><br>2/5 Sch, 5/10 Schilling   | AUSTRIA<br>CUSTOM   |                         |    |    |    |    |    |    |    |  |  | 02 00 05 00 01 00 01 00  |
| Australia         | 20¢        | \$1     | \$1    | \$2       | 1/\$1, 3/\$2 <sup>2</sup>   | AUSTRALIA   |                         |    |    |    |    |    |    |    |  |  |  |
| United Kingdom    | £1.00      | 50 P    | -      | 20 P      | 1/3x10P, 2/50P, 4/£1.00, 4/5x20P  | U. KINGDOM  |                         |    |    |    |    |    |    |    |  |  |  |
| Switzerland       | 1 Fr       | 2 Fr    | 5 Fr   | -         | 1/1 Fr, 3/2 Fr, 7/5 Franc <sup>2</sup>  | SWISS   |                         |    |    |    |    |    |    |    |  |  |  |
| Belgium           | 5 Fr       | 20 Fr   | 50 Fr  | -         | 1/4 x 5F, 1/20 F, 3/50 Franc <sup>2</sup>   | BELGIUM   |                         |    |    |    |    |    |    |    |  |  |  |
| West Germany      | 1DM        | 2DM     | 5DM    | -         | 1/1 DM, 2/2 DM, 7/5 DMark <sup>2</sup><br>1/1 DM, 2/2 DM, 6/5 DM <sup>1,2</sup><br>1/1 DM, 3/2 DM, 9/5 DM<br>1/2x1 DM, 1/2 DM, 3/5 DM<br>2/1 DM, 5/2 DM, 14/5 DM  | GER. 7/6 DM<br>GER. 6/5 DM<br>CUSTOM<br>CUSTOM<br>CUSTOM                                |                         |    |    |    |    |    |    |    |  |  | 09 18 45 00 05 00 01 00<br>03 06 15 00 05 00 01 00<br>13 26 65 00 05 65 01 00                            |
| Netherlands       | 1HFI       | 2.5HFI  | 2.5HFI | -         | 1/1 HFI, 3/2.5 Holland Florin <sup>2</sup><br>1/25¢, 5/1 Guilder<br>1/1 Guilder <sup>2</sup>  | NETHERLAND<br>CUSTOM<br>HOLLAND   |                         |    |    |    |    |    |    |    |  |  | 01 00 05 00 01 00 01 00  |
| Sweden            | 5 Kr       | 5 Kr    | 5 Kr   | -         | 1/5 Krona <sup>2</sup>  | SWEDEN  |                         |    |    |    |    |    |    |    |  |  |  |
| France            | 1 Fr       | 5 Fr    | 10 Fr  | -         | 1/3x1 F, 2/5 F, 5/10 Franc <sup>2,3</sup><br>1/2x1 F, 3/5 F, 7/10 Franc <sup>2,3</sup><br>1/5 F, 3/10 F, 7/2x10 Franc <sup>2,3</sup><br>2/5 F, 4/10 F, 9/2x10 Franc <sup>1,2,3</sup><br>2/5 F, 5/10 F, 11/2x10 Franc <sup>2,3</sup><br>1/5 F, 3/10 Franc <sup>2,3</sup> | TARIF 1<br>TARIF 2<br>TARIF 3<br>TARIF 4<br>TARIF 5<br>TARIF 6                          |                         |    |    |    |    |    |    |    |  |  |  |
| Italy             | 500L       | 500L    | 500L   | -         | 1/500 Lire <sup>2</sup>   | ITALY   |                         |    |    |    |    |    |    |    |  |  |  |
| Spain             | 100 P      | -       | 500 P  | -         | 1/100 P, 6/500 Peseta <sup>2</sup><br>1/25 P, 5/100 Peseta<br>1/25 P, 4/100 Peseta<br>1/2x25 P, 2/100 Peseta<br>1/25x25 P, 3/100 Peseta   | SPAIN<br>CUSTOM<br>CUSTOM<br>CUSTOM<br>CUSTOM   |                         |    |    |    |    |    |    |    |  |  | 01 00 04 00 01 04 01 00<br>01 00 04 00 01 00 01 00<br>01 00 04 00 02 00 01 00<br>03 00 12 00 04 00 01 06 |
| Japan             | 100 ¥      | -       | 100 ¥  | -         | 1/100 Yen <sup>2</sup>  | JAPAN   |                         |    |    |    |    |    |    |    |  |  |  |
| Antilles, Nthrlnd | 25¢        | -       | 1G     | -         | 1/25¢, 4/1 Guilder <sup>2</sup>   | ANTILLES  |                         |    |    |    |    |    |    |    |  |  |  |
| Chile             | Token      | -       | Token  | -         | 1/1 Token <sup>2</sup>  | CHILE   |                         |    |    |    |    |    |    |    |  |  |  |
| Denmark           | 1 Kr       | 5 Kr    | 10 Kr  | -         | 1/2x1 Kr, 3/5 Kr, 7/10 Krone <sup>2</sup>   | DENMARK   |                         |    |    |    |    |    |    |    |  |  |  |
| Finland           | 1Mka       | -       | 5 Mka  | -         | 1/2x1 Mka, 3/5 Markka <sup>2</sup>  | FINLAND   |                         |    |    |    |    |    |    |    |  |  |  |
| New Zealand       | \$1.00     | -       | \$2.00 | -         | 1/\$1.00, 3/\$2.00<br>1/3x20¢ <sup>2</sup>  | NEW ZEALAND<br>CUSTOM   |                         |    |    |    |    |    |    |    |  |  | 01 00 01 0 03 00 00 01   |
| Norway            | 5 Kr       | -       | 10 Kr  | -         | 1/5 Kr, 2/10 Kr, 5/20 Krone <sup>2</sup>  | NORWAY  |                         |    |    |    |    |    |    |    |  |  |  |
| Argentina         | 10¢        | 10¢     | 10¢    | -         | 1/1 Token <sup>2</sup>  | ARGENTINA   |                         |    |    |    |    |    |    |    |  |  |  |
| Greece            | 10 D       | 20 D    | 50 D   | -         | 1/2x10D, 1/20D, 3/50 Drachma <sup>2</sup>   | GREECE  |                         |    |    |    |    |    |    |    |  |  |  |
| Hungary           | 10 F       | 20 F    | 20 F   | -         | 1/1x20F, 1/2x10F, 3/2x20 Forint   | HUNGARY   |                         |    |    |    |    |    |    |    |  |  |  |

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

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

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

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

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

OFF - No high scores are recorded, or displayed.

ON - The four highest scores are stored in memory and displayed in the Attract Mode.

##### **A.4 02 H.S.T.D. Award**

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

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

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

ON - The "Highest" High Score is retained in memory and displayed.

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

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

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

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

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

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

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

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

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

- A.4 08 H.S.T.D. 4 Credits**  
The operator selects the number of credits or tickets to be awarded whenever a player exceeds the fourth highest score. The range of this setting is 00 to 10.
- A.4 09 High Score Reset Every**  
The operator can specify that the game will provide an automatic reset of the displayed "Highest scores", and the number of games to be played before the reset occurs. The values provided upon reset are those selected by the operator in the Back-up High Scores. The range of this setting is OFF (disabled) and 250 to 20,000.
- A.4 10 Backup Champion**  
The operator sets the Back-up Grand Champion Score. The range of this setting is 00 through 99,900,000.
- A.4 11 Backup H.S.T.D. 1**  
The operator can set the Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 99,900,000.
- A.4 12 Backup H.S.T.D. 2**  
The operator can set the second Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 99,900,000.
- A.4 13 Backup H.S.T.D. 3**  
The operator can set the third Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 99,900,000.
- A.4 14 Backup H.S.T.D. 4**  
The operator can set the fourth Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 99,900,000.

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

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

**A.5 01 Column Width**

The operator chooses the column width to be printed. The range of this setting is 22 through 80.

**A.5 02 Lines Per Page**

The operator chooses the amount of lines per page. The range of this setting is 20 through 80.

**A.5 03 Pause Every Page**

The operator chooses whether the printer pauses at the end of a page. The choices are:

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

**A.5 04 Printer Type**

The operator selects which kind of printer to use. The choices are Parallel, Serial or ADP.

**A.5 05 Serial Baud Rate**

The operator selects which baud rate to use for Serial or ADP communications (bit rate). The choices are 300, 600, 1200, 2400, 4800. or 9600.

**A.5 06 Serial D.T.R. (Data Terminal Ready)**

When a Serial Printer is used, this line may be connected to a printer output line signaling that the printer is busy.

- Normal = Normal D.T.R. signal goes low to indicate the printer is not ready.
- Inverted = Inverted D.T.R. (busy) signal goes high to indicate printer is not ready.
- Ignore = D.T.R. signal is ignored.

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

## PROBLEM ANALYSIS MESSAGES

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

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

### Check Switch ##.

This message indicates that at least one switch was stuck 'On' at game turn-on or has NOT been actuated during ball play (for 90 balls or ≈30 games) by displaying the message "Adjust Switch ##", listing each problem switch by number. (The game program compensates the game play requirements affected by each disabled switch to allow 'nearly normal' play. This helps keep THE ADDAMS FAMILY earning, until the service technician can repair the problem, bringing the game back to its normal good profits!)

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

### Pinball Missing.

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

### xxxx Sw. is Stuck On.

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

### Ground Short Row-N, Wht-xxx.

Frequent appearance of this message requires activation of the Switch Levels Test to locate the switch causing the "WHT-xxx ROW x SHORT" message. Possible 'row short' causes are: 1) Slam Tilt (or other coin door) switch touching the grounded coin door; 2) A leaf-type, playfield switch touching a grounded part; 3) Players poking metallic objects (wires, coat hangers, etc.) into the game; 4) Switch cable insulation pierced or damaged allowing bare wire contact with a grounded part; 5) All switches in a row closing at the same time (Note: This instance is NOT a switch problem; however, for most games this is a very rare possibility).

### **Factory Settings Restored.**

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

### **U6 Checksum Error.**

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

### **Time and Date Not Set.**

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

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

### **CPU Board L.E.D. Error Codes**

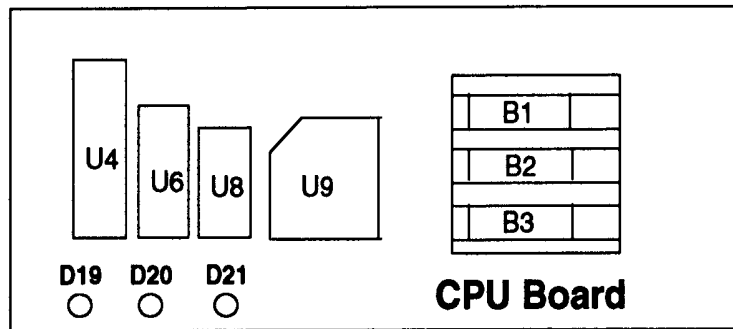
|                                  |   |                        |
|----------------------------------|---|------------------------|
| Center L.E.D. blinks one time    | - | ROM Error U6           |
| Center L.E.D. blinks two times   | - | RAM Error U8           |
| Center L.E.D. blinks three times |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

### **Sound Board Beep Error Codes**

#### **Upon Game Turn-On:**

|         |   |                   |
|---------|---|-------------------|
| 1 Beep  | = | Sound Board O.K.  |
| 2 Beeps | = | U9 Failure (RAM)  |
| 3 Beeps | = | U18 Failure (ROM) |
| 4 Beeps | = | U15 Failure (ROM) |
| 5 Beeps | = | U14 Failure (ROM) |

## LED List



### CPU Board

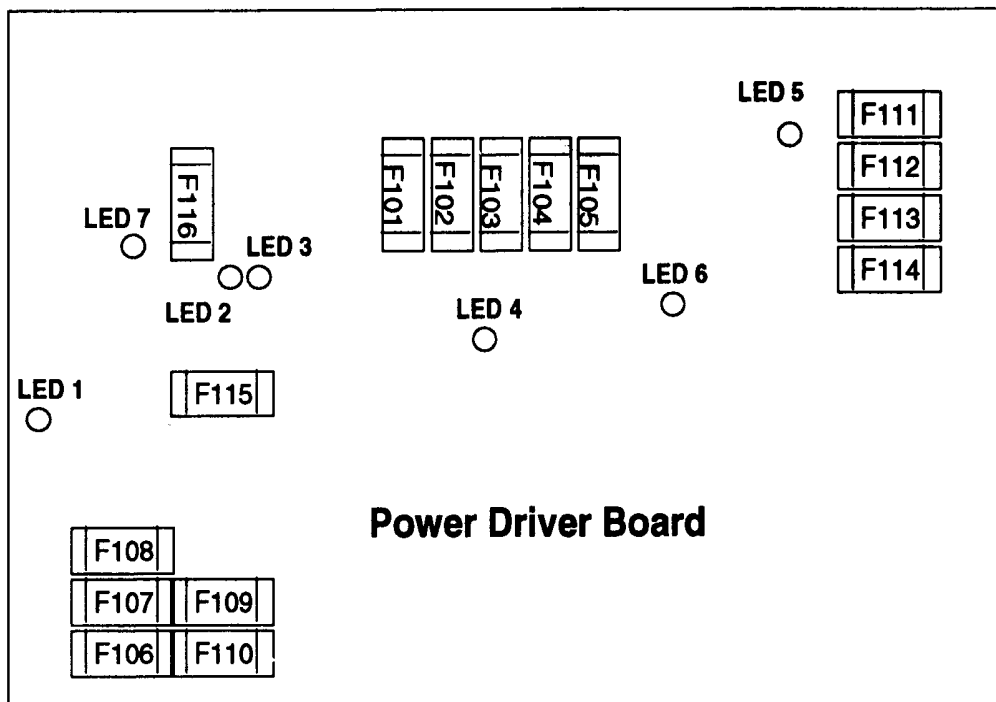
D19, Blanking

D20, Diagnostic

D21, +5vdc

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

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



### Power Driver Board

LED 1, +12vdc, Switch Circuit, Normally On

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

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

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

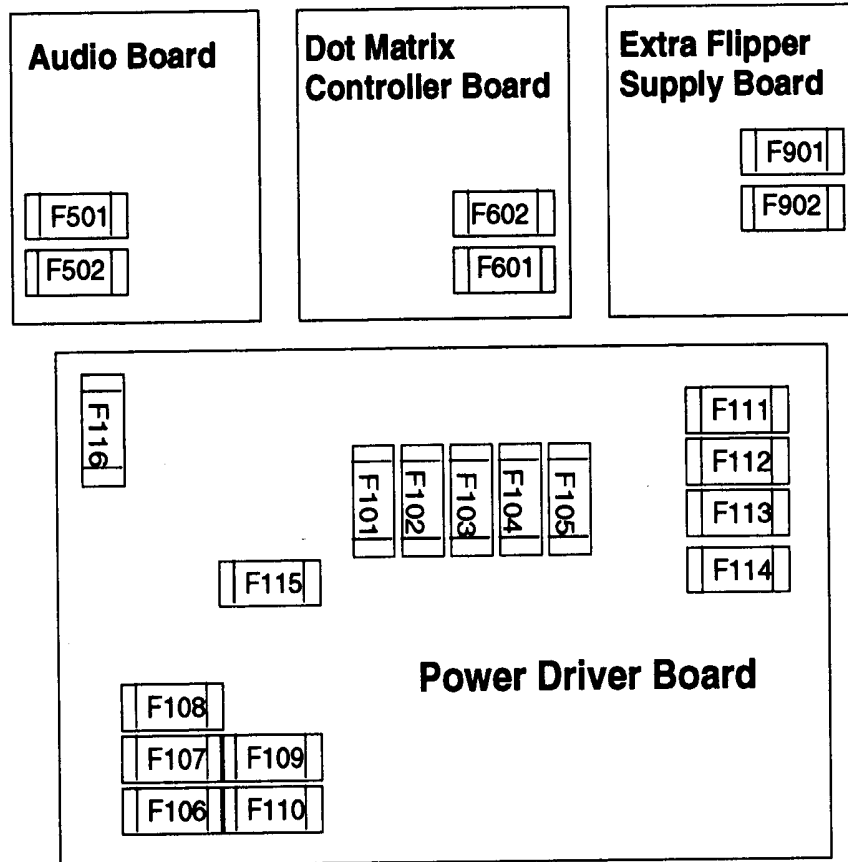
LED 5, +20vdc, Flashlamp Circuit, Normally On

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

LED 7, +12vdc, Power Circuit (Motors, Relays, Etc.), Normally On



## Fuse List



### Audio Board

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

### Extra Flipper Supply Board

|      |                     |          |
|------|---------------------|----------|
| F901 | Upper Left Flipper  | 3A, S.B. |
| F902 | Upper Right Flipper | 3A, S.B. |

### Dot Matrix Controller Board

|      |            |            |
|------|------------|------------|
| F601 | +80V A.C.  | 3/8A, S.B. |
| F602 | +100V A.C. | 3/8A, S.B. |

### Power Driver Board

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

### Line Filter

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

## MAINTENANCE INFORMATION

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

### LUBRICATION

The two main lubrication points of the Ball Shooter Lane Feeder mechanism are the pivots for the arm. Note that the mechanism of other playfield devices are somewhat similar to the Ball Shooter Lane Feeder Device; and have the same lubrication requirements as the Ball Shooter Lane Feeder Device. A 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 20-8886, is a recommended lubricant.

### SWITCH CONTACTS

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

### CLEANING

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

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

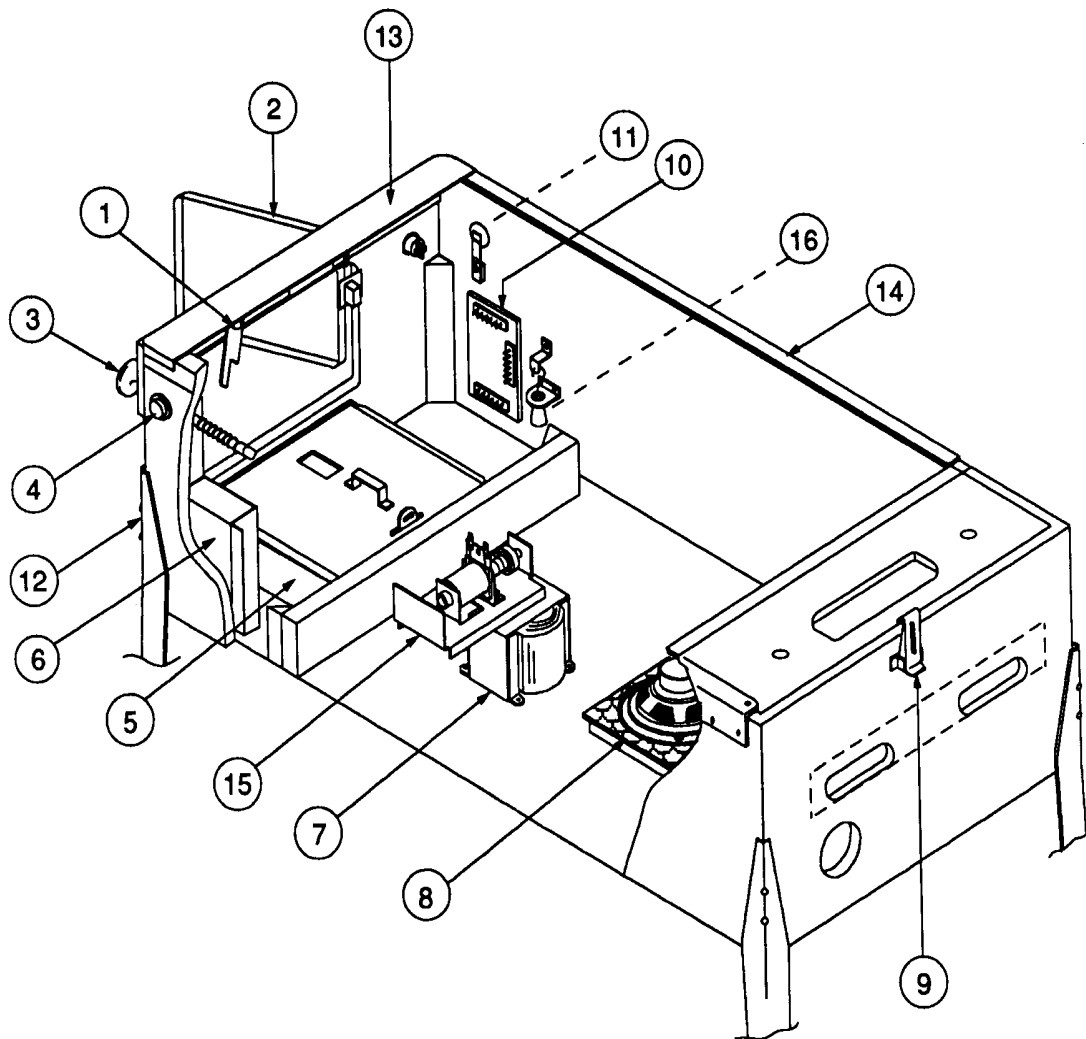
## Section 2

# *Game Parts Information*

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Cabinet Assembly  
Backbox Assembly  
WPC Audio Board  
WPC System CPU Board  
WPC Power Driver Board  
Dot Matrix Controller Board  
Flipper Controller Board  
Major Mechanism Assemblies  
Upper Playfield Parts  
Lower Playfield Parts  
Lamps  
Switches  
Solenoids/Flashers

## Cabinet Parts



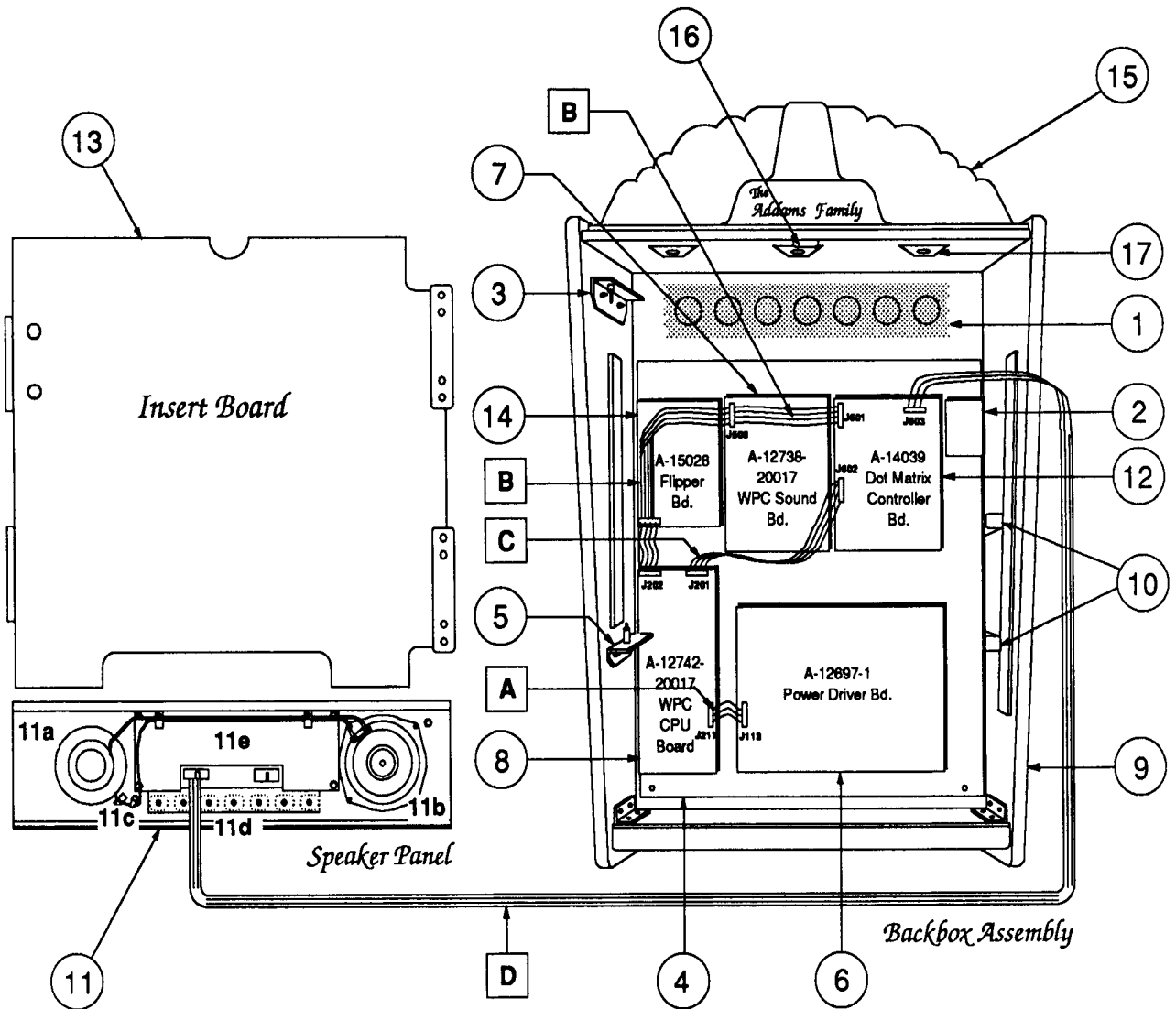
### Cabinet Parts

| Item | Part Number   | Description                   |
|------|---------------|-------------------------------|
| 1.   | D-9174-2      | Lever Guide Assembly          |
| 2.   | A-14148-1     | Coin Door, 2-Slot             |
| 3.   | B-12445-4     | Ball Shooter Assembly         |
| a)   | 10-149        | Spring                        |
| 4.   | B-12273-6     | Flipper Button Assy. (Yellow) |
| 5.   | A-15158-1     | Cashbox Assembly              |
| 6.   | A-14744-USA   | Line Filter Assembly          |
| 7.   | 5610-12835-00 | Transformer, 115/230v         |
| 8.   | 5555-12929-00 | Speaker, 4Ω, 6", 25w          |
| 9.   | 20-9347       | Toggle Latch                  |
| 10.  | A-14689       | WPC Coin Door Interface Bd.   |
| 11.  | B-12273-6     | Flipper Button Assy. (Yellow) |
| 12.  | C-10843       | Metal Leg                     |
| 13.  | D-12615       | Front Molding Assy.           |
| 14.  | A-12359-3     | Side Molding Assy.            |
| 15.  | A-15267       | Knocker Assembly              |
| 16.  | 12-6231       | Plum Bob                      |

### Miscellaneous Parts

| Part Number   | Description                            |
|---------------|--|
| 08-7028-T     | Tempered Playfield Glass:<br>21" x 43" |
| A-8552-20017  | Tempered Backglass Assembly            |
| 08-7456       | Backbox Glass:<br>27" x 18-7/8         |
| 31-1357-20017 | Screened Backglass                     |
| 20-6500       | Steel Ball, 1-1/16" (3)                |

# Backbox Assembly



| Item | Part Number   | Description                 | Item | Part Number | Description                 |
|------|---------------|-----------------------------|------|-------------|-----------------------------|
| 1.   | 01-6645       | Venting Screen              | 12.  | A-14039     | Dot Matrix Controller Board |
| 2.   | A-15416       | Extra Flipper Supply Bd.    | 13.  | 20017-IN    | Insert Board                |
| 3.   | A-12497       | Upper Insert Bd Hinge Assy. | a)   | 01-6571     | Hinge Mounting Bracket      |
| 4.   | A-14092-2     | Mounting Plate Assembly     | b)   | 01-6655     | Insert Latch                |
| 5.   | A-12498       | Lower Insert Bd Hinge Assy. | 14.  | A-15028     | Flipper Controller Board    |
| 6.   | A-12697-1     | Power Driver Assembly       | 15.  | A-15375     | Cloud Assembly              |
| 7.   | A-12738-20017 | WPC Sound Board             | 16.  | A-13379     | Lock & Plate Assembly       |
| 8.   | A-12742-20017 | WPC CPU Board               | 17.  | A-15280     | Single Flashlamp Board      |
| 9.   | A-13767-20017 | Backbox Assembly            |      |             |                             |
| 10.  | 01-9047       | Insert Stop Bracket         |      |             |                             |
| 11.  | A-15212       | Speaker / Display Assy.     |      |             |                             |
| a)   | 5555-12924-00 | Speaker, 4Ω, 15w Tweeter    |      |             |                             |
| b)   | 5555-12856-00 | Speaker, 4Ω, 5-1/4", 25w    |      |             |                             |
| c)   | 5045-12914-00 | Capacitor, 10μfd 50v, ±20%  |      |             |                             |
| d)   | D-12501       | 7-Lamp Board                |      |             |                             |
| e)   | 5901-12784-00 | Dot Matrix Display          |      |             |                             |

## RIBBON CABLES:

|    |               |                   |
|----|---------------|-------------------|
| A. | 5795-12653-03 | Ribbon Cable, 3"  |
| B. | 5795-13018-00 | Ribbon Cable, 22" |
| C. | 5795-10938-14 | Ribbon Cable, 14" |
| D. | 5795-12838-30 | Ribbon Cable, 30" |

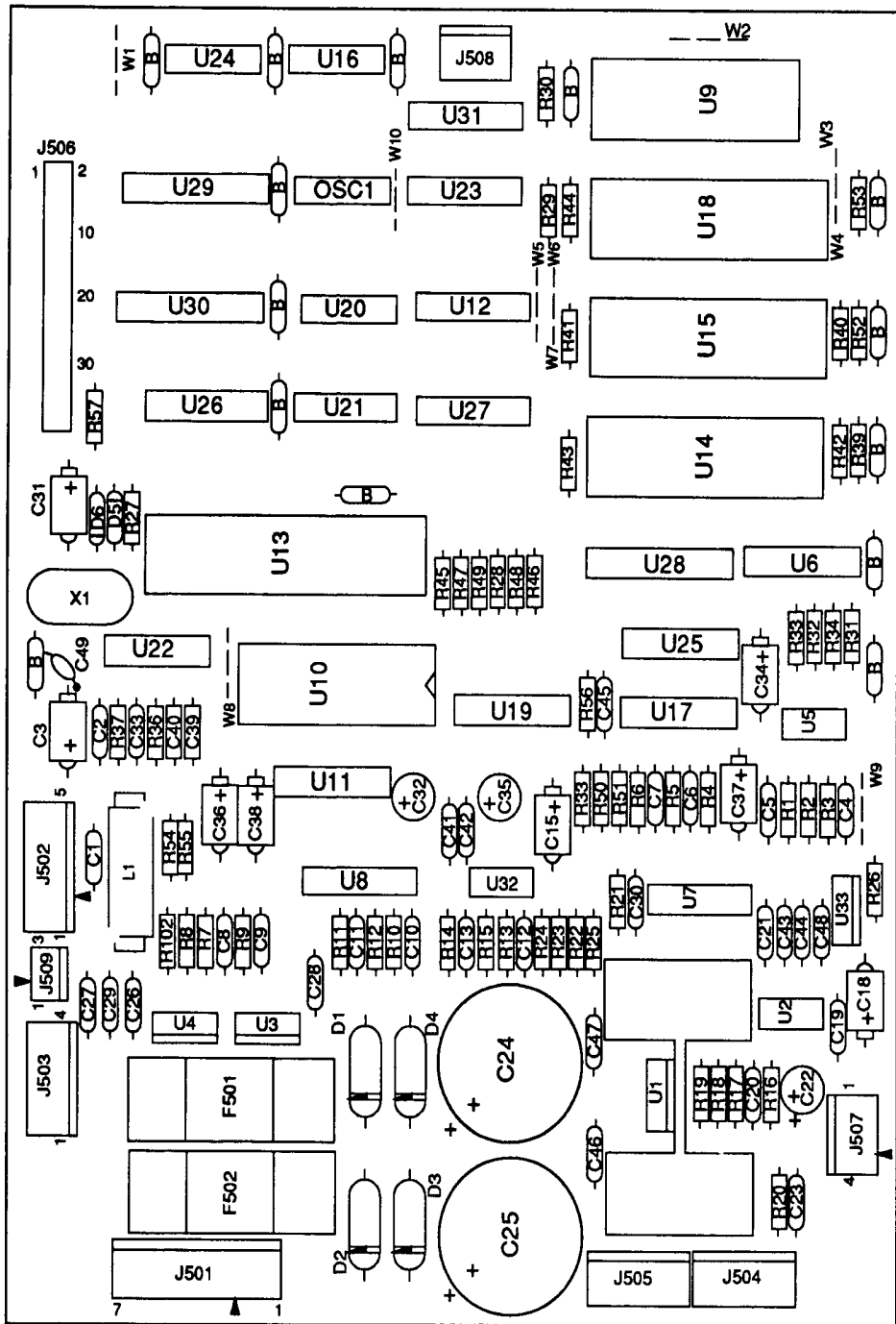
# A-12738-20017      WPC Audio Board

| Part No.      | Designator                                | Description                         |
|---------------|---|-------------------------------------|
| 01-9980       |   | Shield: Wire Protector              |
| *             | U1  | Thermal Compound                    |
| 4004-01005-06 | U1  | Mach. Screw, 4-40 x 3/8             |
| 4104-01012-04 | U1  | Sh. Mach. Screw, #4 x 1/4           |
| 4404-01119-00 | U1  | Nut, 4-40 SNUT                      |
| 5010-08772-00 | R21                                       | Resistor, 15KΩ, 1/4w, 5%            |
| 5010-12065-00 | R22, R25                                  | Resistor, 120KΩ, 1/4w, 5%           |
| 5010-08991-00 | R51                                       | Resistor, 4.7KΩ, 1/4w, 5%           |
| 5010-10987-00 | R23, R24                                  | Resistor, 56KΩ, 1/4w, 5%            |
| 5010-09034-00 | R13, R14, R29-R31, R33, R34, R50, R45-R49 | Resistor, 10KΩ, 1/4w, 5%            |
| 5010-09035-00 | R4  | Resistor, 47KΩ, 1/4w, 5%            |
| 5010-09036-00 | R35                                       | Resistor, 100Ω, 1/4w, 5%            |
| 5010-09134-00 | R1, R2, R6, R8, R9, R11, R12              | Resistor, 150KΩ, 1/4w, 5%           |
| 5010-09162-00 | R26, R102                                 | Resistor, 100KΩ, 1/4w, 5%           |
| 5010-08774-00 | R3, R5, R17, R19                          | Resistor, 22K, 1/4w, 5%             |
| 5010-09269-00 | R15                                       | Resistor, 12KΩ, 1/4w, 5%            |
| 5010-09358-00 | R18, R32                                  | Resistor, 1KΩ, 1/4w, 5%             |
| 5010-09416-00 | R28, R36, R37, R39-R44 R52, R53,          | Resistor, 470Ω, 1/4w, 5%            |
| 5010-09534-00 | W3, W5, W7-W10                            | Resistor, 0Ω                        |
| 5010-10171-00 | R38, R56                                  | Resistor, 56Ω, 1/4w, 5%             |
| 5010-10258-00 | R16                                       | Resistor, 1M, 1/4w, 5%              |
| 5010-10650-00 | R7, R10                                   | Resistor, 62K, 1/4w, 5%             |
| 5010-10989-00 | R54, R55, R27                             | Resistor, 470K, 1/4w, 5%            |
| 5010-12752-00 | R20                                       | Resistor, 1Ω, 1/4w, 5%              |
| 5040-08986-00 | C3  | Capacitor, 100M, 10v (±20%)         |
| 5040-09332-00 | C15, C18, C34, C36, C38                   | Capacitor, 47μfd., 25v, Axial       |
| 5040-11036-00 | C32, C35                                  | Capacitor, 47μfd., 16v, Rad         |
| 5040-12729-00 | C24, C25                                  | Capacitor, 4700μfd., 35v.           |
| 5040-12750-00 | C22                                       | Capacitor, 22μfd., 35v, Rad.        |
| 5041-09031-00 | C26-C29, C37, C46-C48                     | Capacitor, 1μfd. TANT               |
| 5041-09243-00 | C20, C21                                  | Capacitor, 10μfd. TANT              |
| 5043-08980-00 | C41-C44, B(15)                            | Capacitor, .01M, 50v, (+80, -20)    |
| 5043-08996-00 | C1, C2                                    | Capacitor, .1μfd., 50v, 10%         |
| 5048-11027-00 | C8, C10                                   | Capacitor, 33pfd., 50v, 10%         |
| 5048-11028-00 | C45                                       | Capacitor, 22pfd., 50V, Axial       |
| 5048-11029-00 | C33, C49                                  | Capacitor, 100pfd., 50v             |
| 5048-11030-00 | C12                                       | Capacitor, 470pfd., 50v             |
| 5048-11031-00 | C19, C31                                  | Capacitor, .001μfd., 50v, 10%       |
| 5048-11065-00 | C13                                       | Capacitor, .0022μfd., 50v, 10%, Ax. |
| 5048-11072-00 | C39, C40                                  | Capacitor, .0033μfd.                |
| 5048-12036-00 | C23                                       | Capacitor, 22μfd., 10v, Ceramic     |
| 5048-12745-00 | C4, C6                                    | Capacitor, 1800pfd., 50V, 10%       |
| 5048-12746-00 | C5, C7                                    | Capacitor, 330pfd., 50V             |
| *             |   | PCB Label                           |

| Part No.       | Designator   | Description                       |
|----------------|--------------|-----------------------------------|
| 5048-12748-00  | C9, C11, C30 | Capacitor, 220pfd., 50V           |
| 5070-08919-00  | D5, D6       | Diode, 1N4148                     |
| 5070-09045-00  | D1-D4        | Diode MR501, 3.0A                 |
| 5250-10495-00  | U3           | Reg. 7912 1.0A -12v.              |
| 5281-09215-00  | U22          | IC, 74LS04 Hex INV                |
| 5281-09246-00  | U12          | IC, 74LS139 2-4 Dec.              |
| 5281-09486-00  | U28-U30      | IC, 74LS374 8 Dual Flipflop       |
| 5281-09487-00  | U6, U23-U25  | IC, 74LS74 Dual Flipflop          |
| 5281-09500-00  | U31          | IC, 74LS32                        |
| 5281-09745-00  | U26, U27     | IC, 74LS138 DMLTPX                |
| 5281-09850-00  | U20          | IC, 74LS11 Tripple AND            |
| 5281-10577-00  | U16          | IC, 74LS125 Q/B Bfr               |
| 5370-11088-00  | U10          | IC, YM2151 Sound                  |
| 5371-11087-00  | U11          | IC, YM3012 D/A                    |
| 5400-10320-00  | U13          | IC, MPU 68B09E                    |
| 5284-12651-00  | U21          | IC 4584                           |
| 5340-12278-00  | U9           | S/Ram 2064                        |
| 5370-09691-00  | U17          | IC, 55536 CVSD                    |
| 5370-12260-00  | U2           | IC, 3340 Elec Atten               |
| 5370-12728-00  | U1           | IC, Audio Amp LM1875              |
| 5370-12730-00  | U7, U8       | IC, Op Amp TL084                  |
| 5370-12742-00  | U32          | IC, Op Amp TL082                  |
| 5371-12727-00  | U19          | Dac AD7524                        |
| 5432-12726-00  | U5           | EE Prom Pot X9503                 |
| 5460-12423-00  | U4           | IC, LM7812                        |
| 5460-12743-00  | U33          | LM7809 TO-220                     |
| 5520-09020-00  | X1           | Crystal, 3.58 MHz.                |
| 5521-10931-00  | OSC1         | Oscillator, 8.0 MHz.              |
| 5551-09822-00  | L1           | Ind, 4.7UH 3.0A.                  |
| 5700-08985-00  | U13          | Socket, IC 40-pin, .6"            |
| 5700-09004-00  | U10          | Socket, IC 24-pin, .6"            |
| 5700-09006-00  | U11          | Socket, IC 16-pin, .3"            |
| A-5343-20017-4 | U18          | IC, Audio ROM                     |
| ●              | U15          |                                   |
| ●              | U14          |                                   |
| 5700-12088-00  | U1           | Socket, IC 32-pin (U14, U15, U18) |
| 5705-12755-00  |              | Heatsink 5299B-220                |
| 5731-10356-00  | F501, F502   | Fuse, 3A, S-B, 250v               |
| 5733-12060-01  |              | Fuse Holder (F501, F502)          |
| *              |              | PCB-Sound 90                      |
| 5791-10862-04  | J504, J505   | Connector, 4-pin Header Sq. .156  |
| 5791-10862-05  | J502         | Connector, 5-pin Header Sq. .156  |
| 5791-10862-07  | J501         | Connector, 7-pin Header Sq. .156  |
| 5791-12462-03  | J509         | Connector, 3-pin Header Sq. .100  |
| 5791-12462-04  | J508         | Connector, 4-pin Header Sq. .100  |
| 5791-12516-00  | J506         | 34 Hen 2x17 STR                   |

- Notes:**
1. See separate manual for schematics.
  2. \* = Not available for individual sale.
  3. ● = Not used.

# A-12738-20017 WPC Audio Board



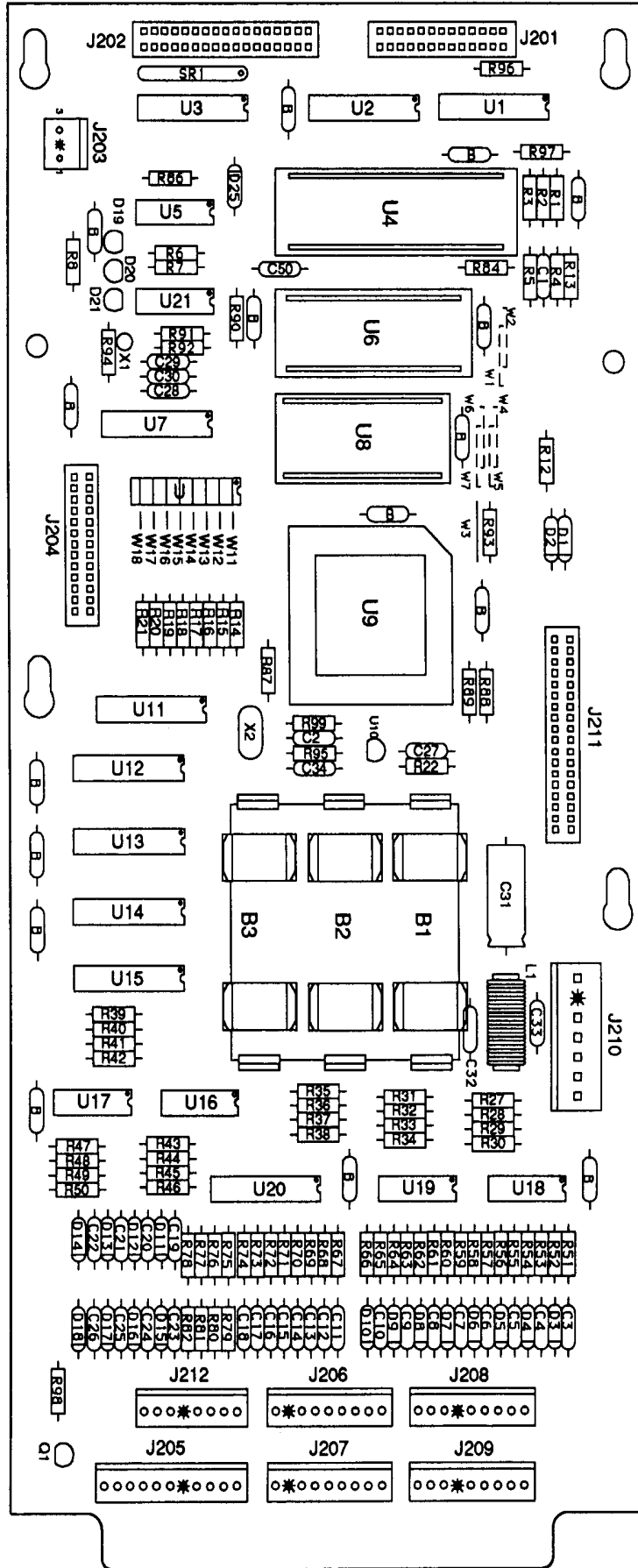
## A-12742-20017    WPC CPU Board

| Item | Part Number    | Designator   | Description                                 |
|------|----------------|--|---|
| 1    | 5010-09034-00  | R14-R22, R27-R42, R86,<br>R90, R94, R98                            | Resistor, 10K $\Omega$ , 1/4w, 5%           |
| 2    | 5010-09085-00  | R1, R2, R4, R93, R96, R97  | Resistor, 1.5K $\Omega$ , 1/4w, 5%          |
| 3    | 5010-09314-00  | R52, R54, R56, R58, R60,<br>R62, R64, R66, R75-R82                 | Resistor, 1.2K $\Omega$ , 1/4w, 5%          |
| 4    | 5010-09358-00  | R3, R43-R51, R53, R55, R57,<br>R59, R61, R63, R65, R67-R74,<br>R84 | Resistor, 1K $\Omega$ , 1/4w, 5%            |
| 5    | 5010-09416-00  | R5-R8, R12, R13, R87-R89   | Resistor, 470 $\Omega$ , 1/4w, 5%           |
| 6    | 5010-09534-00  | W1, W4, W7, W13 - W18  | Resistor, 0 $\Omega$                        |
| 7    | 5010-10258-00  | R95, R99   | Resistor, .01 $\mu$ fd, 1/4w, 5%            |
| 8    | 5010-10989-00  | R92  | Resistor, 470K $\Omega$ , 1/4w, 5%          |
| 9    | 5010-12104-00  | R91  | Resistor, 22 $\mu$ fd, 1/4w, 5%             |
| 10   | 5019-09362-00  | SIP 1  | SIP, 9R, 10-pin, 4.7K $\Omega$ , 5%         |
| 11   | 5040-08986-00  | C31  | Capacitor, 100 $\mu$ fd, 10v ( $\pm$ 20%)   |
| 12   | 5043-08980-00  | B  | Capacitor, .01 $\mu$ fd, 50v, (+80, -20%)   |
| 13   | 5043-09030-00  | C27  | Capacitor, 0.047 $\mu$ fd, 50v ( $\pm$ 20%) |
| 14   | 5043-09065-00  | C3 - C26   | Capacitor, 470pfd, 50v ( $\pm$ 20%)         |
| 15   | 5043-09491-00  | C2, C29, C30, C34  | Capacitor, 22pfd, 1KV, ( $\pm$ 10%)         |
| 16   | 5043-09492-00  | C28  | Capacitor, 100pfd, 50v, ( $\pm$ 10%)        |
| 17   | 5043-09845-00  | C32, C33   | Capacitor, 1KP, 50v, ( $\pm$ 20%)           |
| 18   | 5070-08919-00  | D2 - D18   | Diode, 1N4148, 150MA                        |
| 19   | 5070-09266-00  | D1, D25  | Diode, 1N5817, 1.0A.                        |
| 20   | 5160-10269-00  | Q1   | Transistor, 2N3904, NPN                     |
| 21   | 5162-12422-00  | U20  | IC, ULN, 2803A                              |
| 22   | 5281-09308-00  | U3   | IC, 74LS245, Octal Bus Trncv                |
| 23   | 5281-09486-00  | U14  | IC, 74LS374, 8D F/F                         |
| 24   | 5281-09851-00  | U5   | IC, 74LS14, SMT/TRG                         |
| 25   | 5281-09867-00  | U1, U2, U7   | IC, Octal Buffer, 74LS244                   |
| 26   | 5281-10182-00  | U11, U12, U13, U15   | IC, 74LS240 Driver                          |
| 27   | 5284-12651-00  | U21  | IC, 4584                                    |
| 28   | 5340-12278-00  | U8   | S/RAM 2064                                  |
| 29   | 5370-12272-00  | U16 - U19  | IC, LM339, Quad. Comp                       |
| 30   | 5370-12687-00  | U10  | MC, 34064 Reset Chip                        |
| 31   | 5520-10438-00  | X2   | Crystal, 8.0MHz.                            |
| 32   | 5520-12084-00  | X1   | Crystal 32.768 KHz                          |
| 33   | 5551-09822-00  | L1   | ILN, 4.7 UH 3A                              |
| 34   | 5671-09019-00  | D19 - D21  | DSPL LED RED                                |
| 35   | 5700-08985-00  | U4   | Socket, IC 40P, .6"                         |
| 36   | 5700-12088-00  | U6   | Socket, IC 32P, .6"                         |
| 37   | 5700-12424-00  | U9   | Socket, 84 Pin PLCC                         |
| 38   | 5791-10850-00  | J201, J204   | Connector, 26-pin Header Str Sq.            |
| 39   | 5791-10862-07  | J210   | Connector, 7-pin Header Str Sq.             |
| 40   | 5791-12461-08  | J212   | Connector, 8-pin Header Str Sq.             |
| 41   | 5791-12461-09  | J206 - J209  | Connector, 9-pin Header Sq. pin             |
| 42   | 5791-12461-12  | J205   | Connector, 12-pin Header Sq. pin            |
| 43   | 5791-12516-00  | J202, J211   | 34 Hen 2x17 STR                             |
| 44   | 5881-09021-00  | B1 - B3  | Battery Holder "AA"                         |
| 45   | 5048-11033-00  | C50  | Capacitor, 0.022 $\mu$ f, 10v               |
| 46   | *              |  | PCB Label                                   |
| 47   | A-5343-20017-1 | U6   | Game PROM Assembly                          |
| 48   | 5410-12426-00  | U9   | WPC-89 ASIC                                 |
| 49   | 5400-10320-00  | U4   | IC MPU 68B09E                               |
| 50   | 5880-09022-00  | B1 - B3  | Battery, Alkaline, 1.5v ( "AA")             |
| 51   | *              |  | Bare PC Board                               |

- Notes:
1. See separate manual for schematics.
  2. \* = Not available for individual sale.



# A-12742-20017 WPC CPU Board

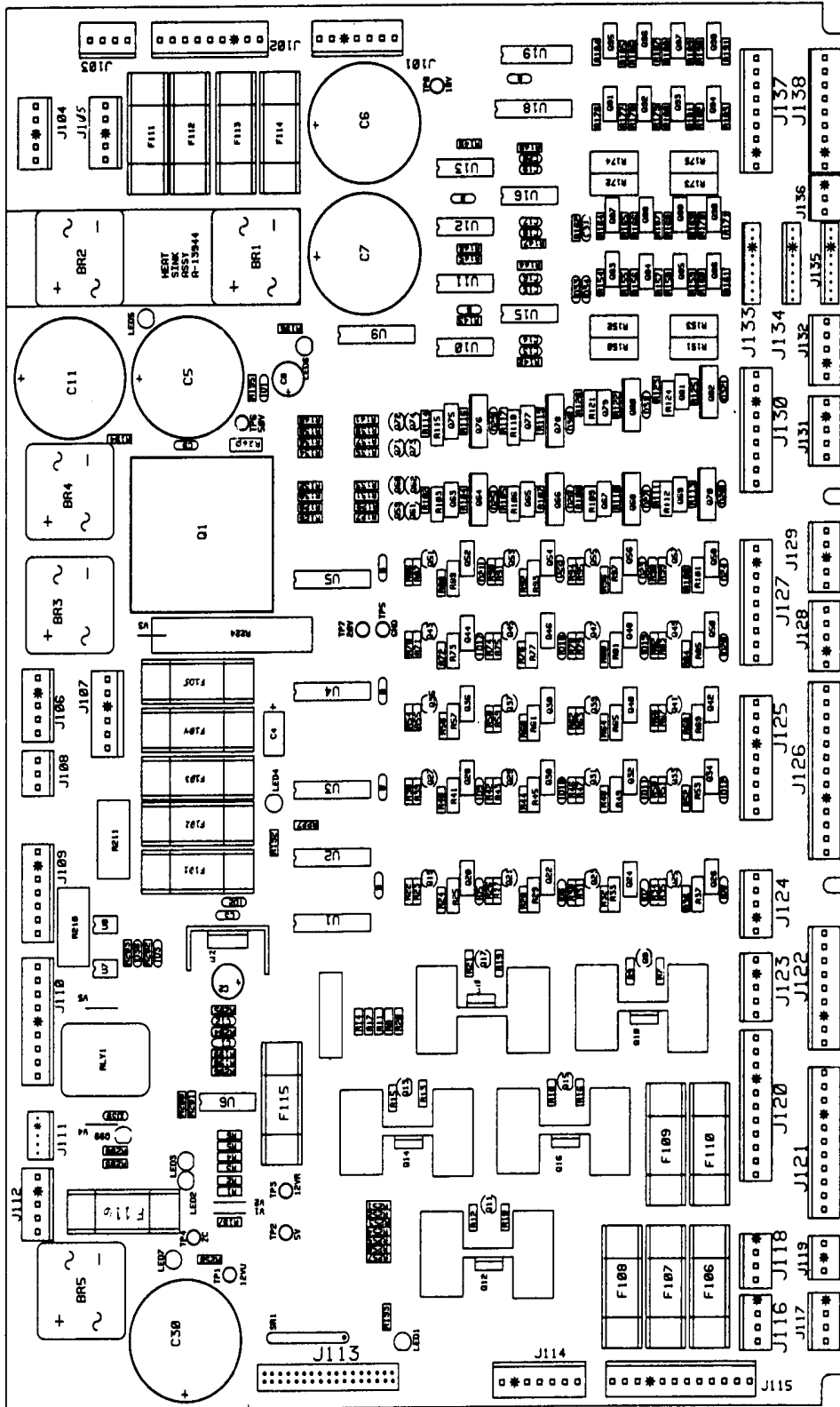


# A-12697-1 WPC Power Driver Assembly

| Item | Part Number   | Ckt Designator   | Description  | Item   | Part Number   | Ckt Designator   | Description                       |
|------|---------------|--|--|--------|---------------|--|-----------------------------------|
| 1    | *             | Q2, Q10, Q12, Q14, Q16, Q18  | Thermal Compound                                     | 32     | 5043-08996-00 | C13-C20, C31   | Capacitor, .1µfd, 50v (±20%)      |
| 2    | 4006-01005-06 | Q1, Q2   | Mach. Screw, 6-32 x 3/8                              | 33     | 5043-08845-00 | C1, C12  | Capacitor, 1,000µfd, 50v (±20%)   |
| 3    | 4406-01128-00 | Q1, Q2   | Nut, 6-32 KEPS                                       | 34     | 5048-10994-00 | C3   | Capacitor, .33µfd, 50v (±20%) Ax. |
| 4    | 4004-01005-06 | Q10, Q12, Q14, Q16, Q18  | Mach. Screw, 4-40 x 3/8                              | 35     | 5070-08819-00 | D33, D34   | Diode, 1N4148, 150MA.             |
| 5    | 4404-01119-00 | Q10, Q12, Q14, Q16, Q18 R260   | Nut, 4-40 SNUT                                       | 36     | 5070-09054-00 | D1-D3, D5-D12, D17-D32, D38, D39   | Diode, 1N4004, 1.0A.              |
| 6    | 5010-08981-00 | R9, R12, R15, R18, R21, R23, R27, R31, R35, R39, R43, R47, R51, R55, R59, R63, R67, R71, R75, R79, R83, R87, R91, R95, R99, R126, R128, R130, R132, R134, R136, R138, R140, R209, R227 | Resistor, 10KΩ, 1/2w, 5%<br>Resistor, 4.7KΩ, 14w, 5% | 37     | 5100-08690-00 | BR1-BR5  | Bridge Rectifier, 35A., 200v      |
| 7    | 5010-08991-00 | R8, R11, R14, R17, R20, R177, R179, R181, R183, R185, R187, R189, R191   | Resistor, 560Ω, 1/4w, 5%                             | 38     | 5131-12725-00 | Q10, Q12, Q14, Q16, Q18 U19  | Triac, BT138E                     |
| 8    | 5010-08992-00 | R25, R29, R33, R37, R41, R45, R49, R53, R57, R61, R65, R69, R73, R77, R81, R85, R89, R93, R97, R101, R103, R106, R109, R112, R115, R118, R121, R124                                    | Resistor, 68Ω, 1/4w, 5%                              | 39     | 5162-12422-00 | Q20, Q22, Q24, Q26, Q28 Q30, Q32, Q34, Q36, Q38, Q40, Q42, Q44, Q46, Q48, Q50, Q52, Q54, Q56, Q58, Q63, Q65, Q67, Q69, Q75, Q77, Q79, Q81, Q83 - Q90 | Transistor, TIP 102               |
| 9    | 5010-08993-00 | R24, R28, R32, R36, R40, R44, R48, R52, R56, R60, R64, R68, R72, R76, R80, R84, R88, R92, R96, R100, R102, R106, R108, R111, R114, R117, R120, R123, R195                              | Resistor, 2.7KΩ, 1/4w, 5%                            | 40     | 5162-12835-00 | Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74, Q99    | Transistor, 2N5401 PNP            |
| 10   | 5010-08997-00 | R155, R157, R159, R161, R165, R167, R169, R171   | Resistor, 2.2KΩ, 1/4w, 5%                            | 41     | 5194-09055-00 | Q64, Q66, Q68, Q70, Q76 Q78, Q80, Q82  | Transistor, TIP36C PNP            |
| 11   | 5010-08998-00 | R3, R4, R6, R142-R149, R197-R198   | Resistor, 10KΩ, 1/4w, 5%                             | 42     | 5191-12179-00 | Q91-Q98  | Transistor, TIP 107               |
| 12   | 5010-09034-00 | R194, R198, R251, R253-R257  | Resistor, 1.5KΩ, 1/4w, 5%                            | 43     | 5192-12428-00 | Q1   | Reg LM 323 5v                     |
| 13   | 5010-09085-00 | R252   | Resistor, 6.8KΩ, 1/4w, 5%                            | 44     | 5250-12634-00 | U1-U5, U18   | IC, 74LS374 8 Dual D flipflop     |
| 14   | 5010-09086-00 | R1, R2, R192, R201- R205, R208   | Resistor, 270Ω, 1/4w, 5%                             | 45     | 5281-09486-00 | U10-U13  | IC, 74LS74 Dual D flipflop        |
| 15   | 5010-09224-00 | R176, R178, R180, R182, R184, R186, R188, R190   | Resistor, 27KΩ, 1/4w, 5%                             | 46     | 5281-09487-00 | U9   | IC, 74LS240, U/Dvrr               |
| 16   | 5010-09314-00 | R154, R156, R158, R160, R164, R166, R168, R170, R182, R193, R199, R200, R250   | Resistor, 1KΩ, 1/4w, 5%                              | 47     | 5281-10182-00 | U6, U15, U16   | IC, LM339 Quad. Comp              |
| 17   | 5010-09324-00 | R104, R107, R110, R113, R116, R119, R122, R125   | Resistor, 220Ω, 1/4w, 5%                             | 48     | 5370-12272-00 | Q2   | IC, LM 7812                       |
| 18   | 5010-09358-00 | R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141                                     | Resistor, 470Ω, 1/4w, 5%                             | 49     | 5460-12423-00 | U7, U8   | Opto Isolator, 4N25               |
| 19   | 5010-09361-00 | W1, W2   | Resistor, 0Ω   | 50     | 5490-10892-00 | RLY 1  | Relay 4PDT 6VDC5A VS              |
| 20   | 5010-09416-00 | R7, R10, R13, R16, R19, R150-R153, R172-R175   | Resistor, 51Ω, 1/4w, 5%                              | 51     | 5580-08994-01 | LED1 - LED7  | Diaplay LED Red                   |
| 21   | 5010-09534-00 | R224   | Resistor, .22Ω, 1w, 5%                               | 52     | 5671-09019-00 | Q1   | Thermal Pad TO-3                  |
| 22   | 5010-11079-00 | R210, R211   | Resistor, .12Ω, 10w, 5%                              | 53     | 5701-09652-00 | Q2   | Heatsink, #6030B                  |
| 23   | 5010-12427-00 | SR1  | Resistor, 3.3KΩ, 5w, 10%                             | 54     | 5705-09199-00 | Q1   | Heatsink 5054                     |
| 24   | 5012-12632-00 | C4   | SIP, 9R, 10 pin, 470Ω, 5%                            | 55     | Not Used      | Q10, Q12, Q14, Q16, Q18  | Heatsink 5298B                    |
| 25   | 5012-12238-00 | C2   | Capacitor, 100µfd, 10v (±20%)                        | 56     | 5705-12637-00 | Q1   | Fuse Holder, F101-F116            |
| 26   | 5019-10143-00 | C8   | Capacitor, 100µfd, 25v (+50, -10%)                   | 57     | 5705-12638-00 | Q10, Q12, Q14, Q16, Q18  | Bare PC Board                     |
| 27   | 5040-08986-00 | C5, C6, C7, C11, C30   | Capacitor, 15,000µfd, 25v (±20%)                     | 58     | 5733-12060-01 | Q1   | Connector, 3-pin Header STR Sq.   |
| 28   | 5040-09421-00 | B-BYPASS   | Capacitor, .01µfd, 50v (+80, -20%)                   | 59     | *             | Q2   | Connector, 4-pin Header STR Sq.   |
| 29   | 5040-09537-00 |  |  | 60     | 5791-10862-03 | J108, J119, J138   | Connector, 5-pin Header STR Sq.   |
| 30   | 5040-12313-00 |  |  | 61     | 5791-10862-04 | J103, J116-J118  | Connector, 9-pin Header STR Sq.   |
| 31   | 5043-08980-00 |  |  | 62     | 5791-10862-05 | J112, J104-J106, J123, J124, J128, J129, J131, J132, J105  | Connector, 11-pin Header STR Sq.  |
|      |               |  |  | 63     | 5791-10862-06 | J107   | Connector, 12-pin Header STR Sq.  |
|      |               |  |  | 64     | 5791-10862-07 | J101, J109, J114   | Connector, 13-pin Header STR Sq.  |
|      |               |  |  | 65     | 5791-10862-09 | J102, J110, J122, J125, J127, J130, J137, J138   | Connector, 5-pin Header STR Sq.   |
|      |               |  |  | 66     | 5791-10862-11 | J120, J121   | Connector, 9-pin Header STR Sq.   |
|      |               |  |  | 67     | 5791-10862-12 | J115   | Connector, 11-pin Header STR Sq.  |
|      |               |  |  | 68     | 5791-10862-13 | J126   | Connector, 13-pin Header STR Sq.  |
|      |               |  |  | 69     | 5791-12461-05 | J111   | Connector, 5-pin Header STR Sq.   |
|      |               |  |  | 70     | 5791-12461-09 | J133-J135  | Connector, 9-pin Header STR Sq.   |
|      |               |  |  | 71     | 5791-12516-00 | J113   | 34 HEN 2x17 STR                   |
|      |               |  |  | 72     | 5824-08248-00 | TP1-TP8  | Test Point #1502-1                |
|      |               |  |  | 73     | 5041-09163-00 | C9   | Capacitor, 2.2µfd TANT            |
|      |               |  |  | 74-100 | Not Used      |  |                                   |
|      |               |  |  | 101    | *             |  | ID Label                          |
|      |               |  |  | 102    | 5730-09071-00 | F114   | Fuse, 8A, 32v                     |
|      |               |  |  | 103    | 5731-09128-00 | F101, F102   | Fuse, S-B, 2.5A., 250v            |
|      |               |  |  | 104    | Not Used      |  |                                   |
|      |               |  |  | 105    | 5731-09651-00 | F108-F113  | Fuse, S-B, 5A., 250v              |
|      |               |  |  | 106    | Not Used      |  |                                   |
|      |               |  |  | 107    | 5731-10356-00 | F101-F105, F116  | Fuse, S-B, 3A., 250v              |
|      |               |  |  | 108    | 5730-09797-00 | F115   | Fuse, S-B, 3/4A., 250v            |
|      |               |  |  | 109    | 5705-12698-00 |  | Heatsink #62365                   |
|      |               |  |  | 110    | 4010-01006-00 |  | Mach. Screw, 10-32 x 5/8          |

- Notes: 1. See separate manual for schematics.  
2. \* = Not available for individual sale.

# A-12697-1 WPC Power Driver Assembly

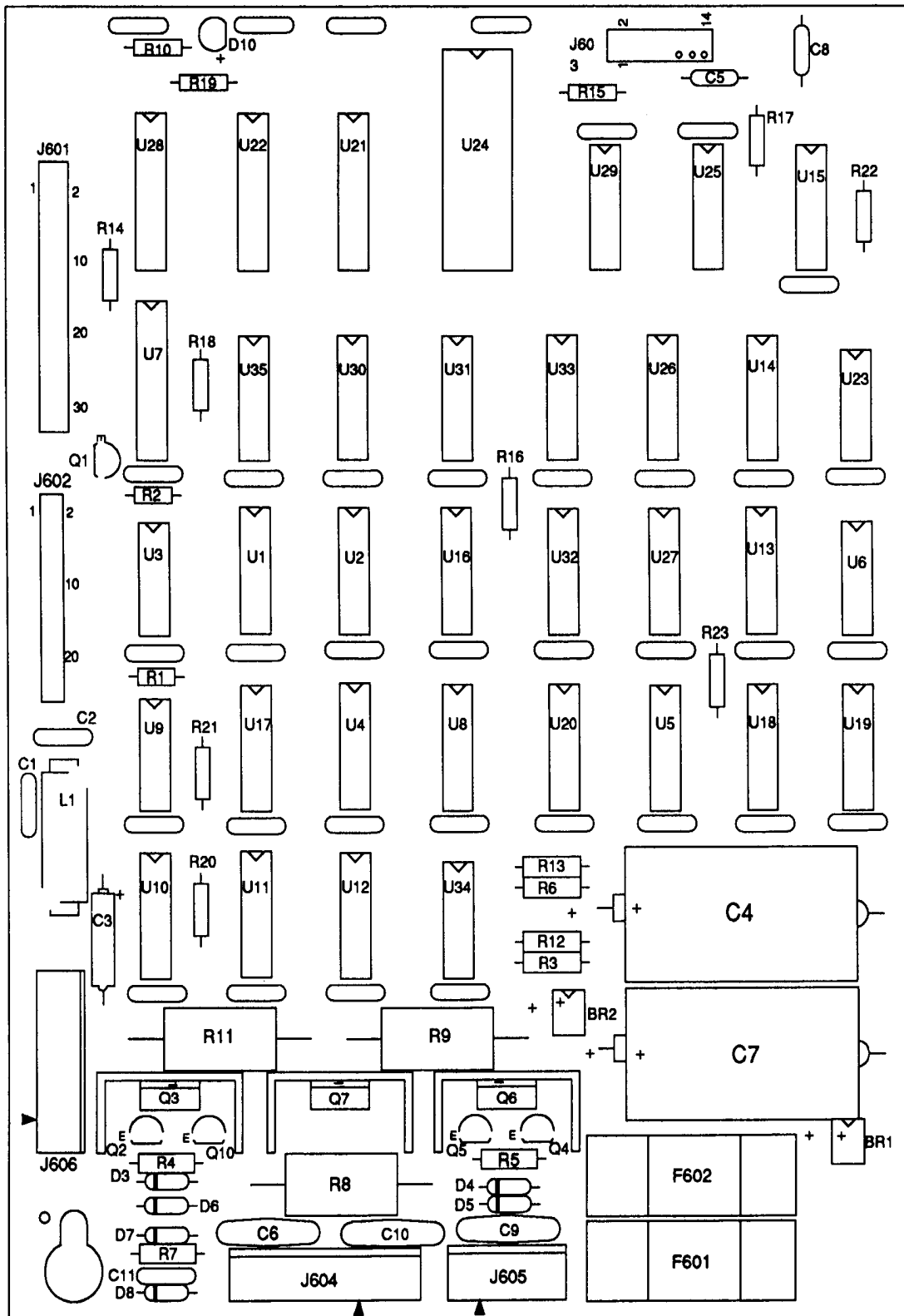


## A-14039      Dot Matrix Controller Assembly

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

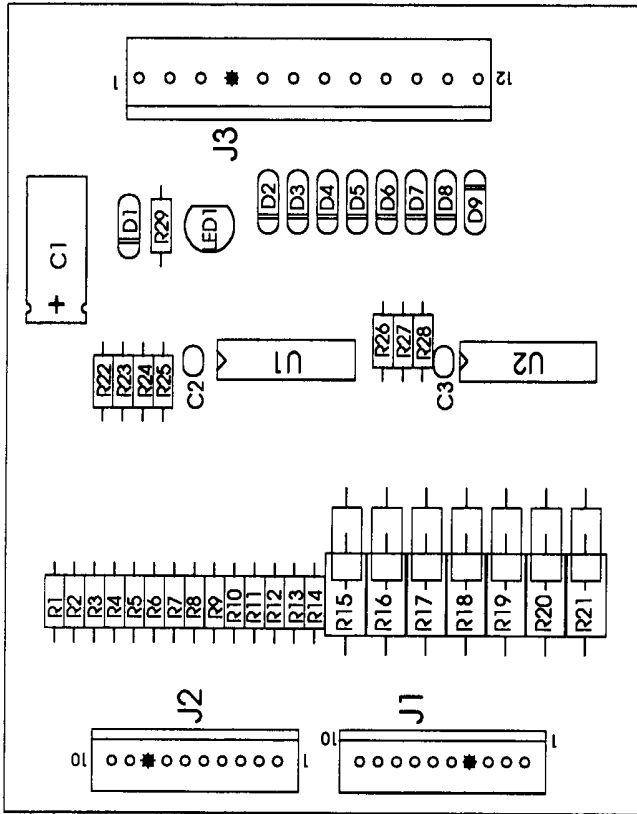
- NOTES: 1. See separate manual for schematics.  
2. \* = Not available for individual sale.

# A-14039    Dot Matrix Controller Assembly



A-14977

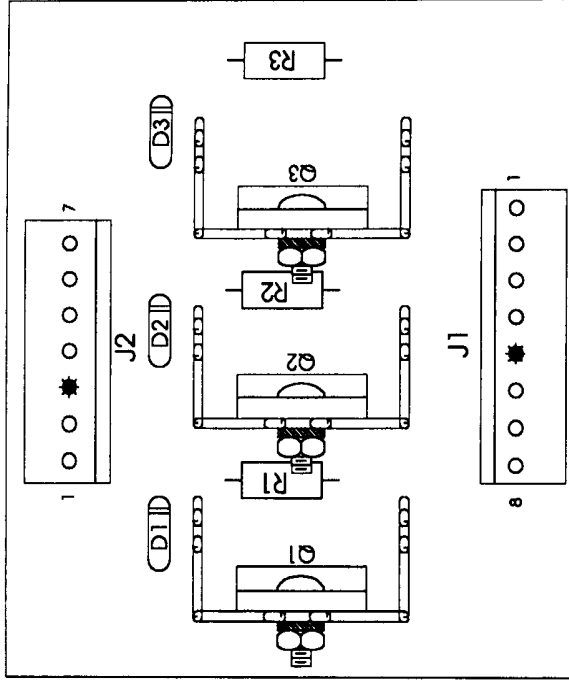
7-Opto PCB Switch Assembly



| Part Number     | Part Designator | Description  |
|-----------------|-----------------|--|
| * 5040-12298-00 | C1              | Bare PC Board  |
| 5043-08980-00   | C2, C3          | Capacitor, 100µfd, 40v (±50%)                        |
| 5671-09019-00   | LED 1           | Capacitor, .01µfd, 50v(+80,-20%)                     |
| 5370-12272-00   | U1, U2          | Display LED Red                                      |
| 5070-09054-00   | D1 - D9         | ICLM339 Quad   |
| 5010-12928-00   | R15 - R21       | Diode 1N4004 1.0A.                                   |
| 5010-09999-00   | R1 - R14        | Resistor, 270Ω, 2w, 5%                               |
| 5010-10631-00   | R29             | Resistor, 2KΩ, 1/4w, 5%                              |
| 5010-09162-00   | R23, R25        | Resistor, 1.2KΩ, 1/4w, 5%                            |
| 5010-08774-00   | R22, R24        | Resistor, 100KΩ, 1/4w, 5%                            |
| 5010-09034-00   | R28             | Resistor, 22KΩ, 1/4w, 5%                             |
| 5791-10862-12   | J3              | Resistor, 10KΩ, 1/4w, 5%                             |
| 5791-12462-10   | J1, J2          | Connector, 12-pin Header<br>Connector, 10-pin Header |

A-15139

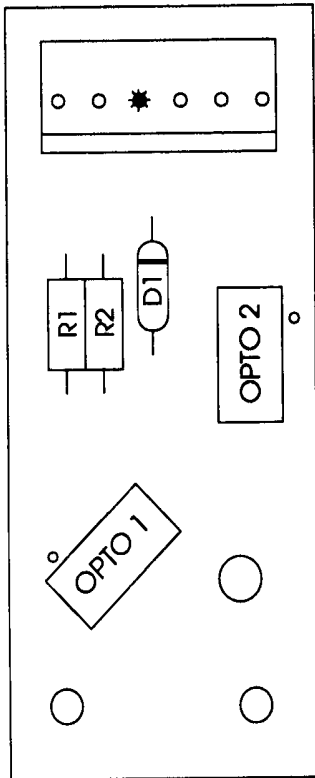
High Power Board



| Part Number     | Designator | Description  |
|-----------------|------------|--|
| * 5705-09199-00 | -          | Bare PC Board                                      |
| 5791-10862-08   | J1         | Heatsink 6030B                                     |
| 5791-10862-07   | J2         | Connector, 8-pin Header                            |
| 5010-09361-00   | R1-R3      | Connector, 7-pin Header                            |
| 5070-09054-00   | D1-D3      | Resistor, 220Ω, 1/2w, 5%                           |
| 4004-01005-06   | -          | Diode 1N4004 1.0A.                                 |
| 4404-01117-00   | -          | Mech. Screw, 4-40 x 3/8                            |
| 4703-00015-00   | -          | Nut 4-40 Hex.                                      |
| 5191-12179-00   | Q1-Q3      | Lockwasher #4 Extended Tooth<br>Trans. TIP 36C PNP |

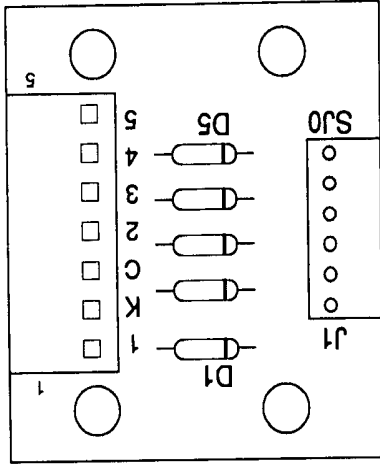
Notes: 1. \* = Not available for individual sale.  
2. See section 3 for schematics.

### A-15285 2-Opto Switch Assembly

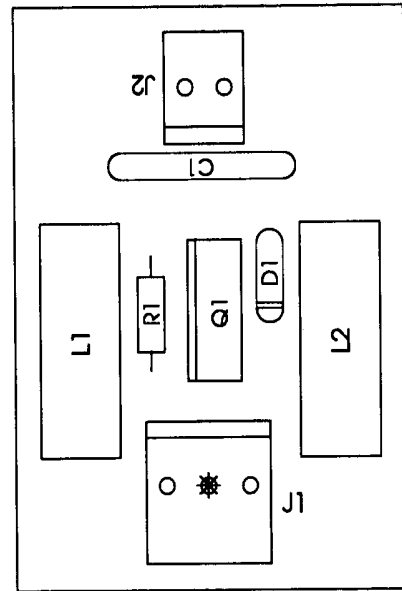


| Part Number   | Part Designator | Description              |
|---------------|-----------------|--------------------------|
| *             | -               | Bare PC Board            |
| 5070-09054-00 | D1              | Diode 1N4004 1.0A.       |
| 5010-08930-00 | R1, R2          | Resistor, 470Ω, 1/2w, 5% |
| 5490-12451-00 | OPTO1, OPTO2    | Opto Inter Lg 10MA       |
| 5791-10862-06 | -               | Connector, 6-pin Header  |

### C-13940 5-Switch & Diode Board



| Part Number   | Designator | Description                 |
|---------------|------------|-----------------------------|
| *             | -          | Bare PC Board               |
| 5070-09054-00 | D1 - D5    | Diode 1N4004, 1.0A.         |
| 5791-10862-07 | J2         | Connector, 7-pin Header Sq. |
| 5791-12462-06 | J1         | Connector, 6-pin Header Sq. |



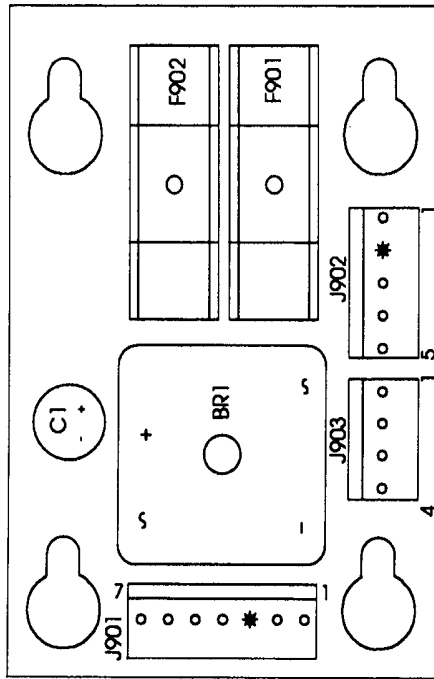
A-15340 Motor EMI Board

### A-15340 Motor EMI Board

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

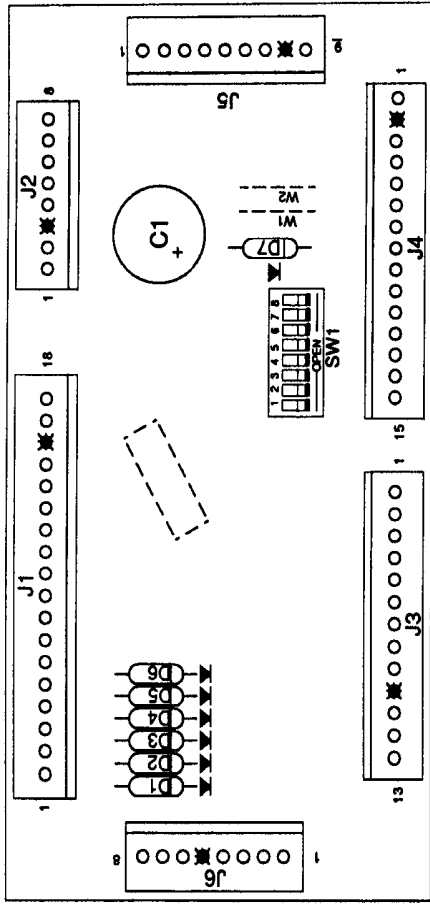
Notes: 1. \* = Not available for individual sale.  
2. See section 3 for schematics.

## A-15416 Extra Flipper Supply Board



| Part Number     | Designator | Description              |
|-----------------|------------|--------------------------|
| * 5791-10862-05 | J902       | Bare PC Board            |
| 5791-10862-04   | J903       | Connector, 5-pin Header  |
| 5791-10862-07   | J901       | Connector, 4-pin Header  |
| 5040-09637-00   | C1         | Connector, 7-pin Header  |
| 5100-09690-00   | BR1        | Capacitor, 100µF, 100v   |
| 5733-12060-01   | -          | Bridge Rectifier         |
| 5731-10356-00   | F901, F902 | Fuse Holder (F901, F902) |
|                 |            | Fuse, S-B, 3A., 250v     |

## A-14689 WPC Coin Door Interface Board



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

### ■ WPC Coin Door Interface Board Notes...

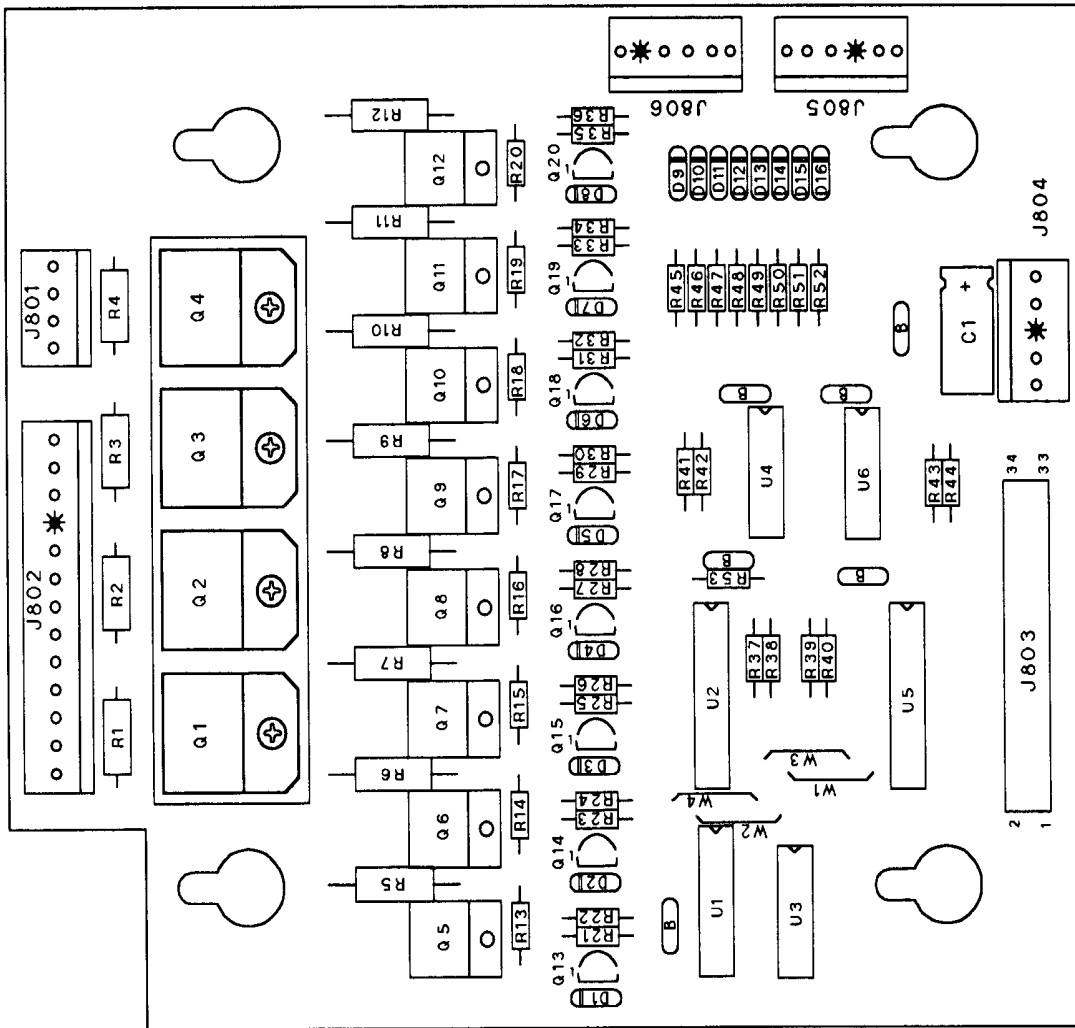
1. For Belgium, France, Finland, Sweden and England use A-14689-1 Coin Door Interface Board.
2. † = Used on Electronic Coin Door only.

Notes: 1. \* = Not available for individual sale.  
2. See section 3 for schematics.



# A-15028 Flipper Controller Assembly

| Part Number   | Designator  | Description                        |
|---------------|---|------------------------------------|
| 01-10572      | Q1-Q4   | Heatsink                           |
| 20-9684       | Q5-Q12  | Fastener Snap                      |
| 4006-01003-08 | Q1-Q4   | Mach. Screw, 6-32                  |
| 4406-01128-00 | Q1-Q4   | Nut 6-32 KEPS                      |
| 5010-09034-00 | R37 - R44, R53                                    | Resistor, 10K $\Omega$ , 1/4w, 5%  |
| 5010-09358-00 | R22, R24, R26, R28, R30, R32, R34, R36, R45 - R52 | Resistor, 1K $\Omega$ , 1/4w, 5%   |
| 5010-09361-00 | R1 - R4   | Resistor, 220 $\Omega$ , 1/2w, 5%  |
| 5010-09416-00 | R21, R23, R25, R27, R29, R31, R33, R35            | Resistor, 470 $\Omega$ , 1/4w, 5%  |
| 5010-09534-00 | W3, W4  | Resistor, 0 $\Omega$               |
| 5010-10171-00 | R13 - R20   | Resistor, 56 $\Omega$ , 1/4w, 5%   |
| 5011-12956-00 | R5 - R12  | Resistor, 2.7K $\Omega$ , 1w, 5%   |
| 5040-08986-00 | C1  | Capacitor, 100M, 10v               |
| 5043-08980-00 | B   | Capacitor, .01 $\mu$ F, 50v        |
| 5070-09054-00 | D1 - D16  | Diode 1N4004                       |
| 5162-12635-00 | Q5-Q12  | Transistor TIP102 NPN              |
| 5190-09016-00 | Q13 - Q20   | Transistor 2N4403 PNP              |
| 5191-12179-00 | Q1-Q4   | Transistor TIP36C PNP              |
| 5315-12009-00 | U2  | IC 74HCT374                        |
| 5315-12031-00 | U5  | IC 74HCT244                        |
| 5315-12812-00 | U1  | IC 74HCT138                        |
| 5315-12951-00 | U3  | IC 74HCT00                         |
| 5370-12272-00 | U4, U6  | IC LM339 QUAD COMP                 |
| *             |   | Bare PC Board                      |
| 5791-10862-04 | J801  | Connector, 4-pin Header Sq. Pin    |
| 5791-10862-05 | J804  | Connector, 5-pin Header Sq. Pin    |
| 5791-10862-13 | J802  | Connector, 13-pin Header Sq. Pin   |
| 5791-12461-06 | J805, J806  | Connector, Str Sq. Pin Header .100 |
| 5791-12516-00 | J803  | 34 HEN 2x17 STR                    |



NOTES:  
 1. See section 3 for schematic.  
 2. \* = Not available for individual sale.

## A-15205-R

### Flipper Assembly - Upper Right

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

#### Associated Parts:

|           |                         |
|-----------|-------------------------|
| 23-6519-4 | Flipper Rubber, Red     |
| 20-9250-6 | Flipper & Shaft, Yellow |

### Flipper Assembly Notes...

1. Each Flipper Assembly on the Lower Playfield is mounted beneath the playfield, in conjunction with the plastic Flipper Paddle and Shaft (20-9250-6) and Flipper Rubber (23-6519-4) on the upper side of the playfield.
2. The tip of the EOS Switch must travel 0.150 (+ .010, - .000) inch, before the contacts fully open, with the flipper in the actuated position. The EOS Switch contacts must have a gap of 0.062 (± .015) inch. Adjustment of the EOS Switch must be made at a minimum distance of 0.25 inch from the switch body.
3. All moving elements of the assembly must operate freely, with no evidence of binding.
4. For coil replacement, remove the Solenoid Bracket (Item 13) to prevent screw damage.
5. Use Loctite™ 242 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.
6. When replacing their Bumper Plug (item 17) to restore proper flipper operation, readjust the flipper paddle and shaft position.
7. Solid-color blue wire connects to the banded end of each diode, mounted on the connector end of the Flipper Coil (item 12). Trace-color wire connects to the unbanded end of the diode.
8. \* = Not available for individual sale

## A-15205-L-1

### Flipper Assembly - Upper Left

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

| Item | Part Number | Description               |
|------|-------------|---------------------------|
| 1.   | B-13104-L   | Flipper Base Assy, Left   |
| 12.  | FL-11753    | Flipper Coil              |
| 16.  | B-13882-L   | Crank Link Assembly, Left |

#### Associated Parts:

|           |                           |
|-----------|---------------------------|
| 23-6553-4 | Small Flipper Rubber, Red |
| 20-9264-6 | Small Flipper & Shaft     |

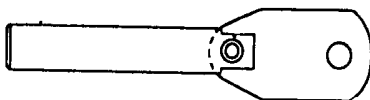
## A-15205-L-4

### Flipper Assembly - Lower Left

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

| Item | Part Number | Description               |
|------|-------------|---------------------------|
| 1.   | B-13104-L   | Flipper Base Assy, Left   |
| 12.  | FL-15411    | Flipper Coil - Orange     |
| 16.  | B-13882-L   | Crank Link Assembly, Left |

A-10656 Flipper Link



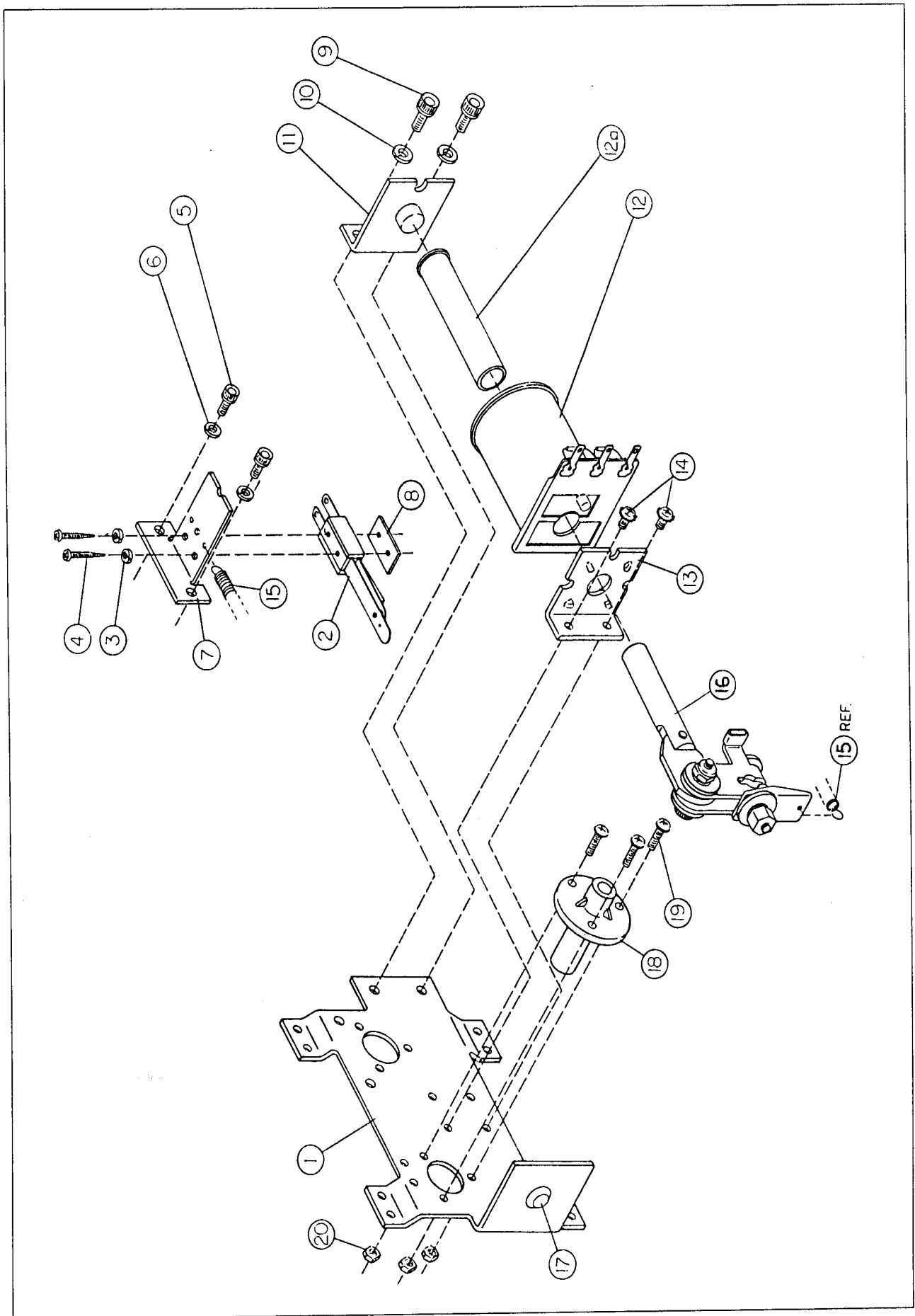
## A-15205-R-4

### Flipper Assembly - Lower Right

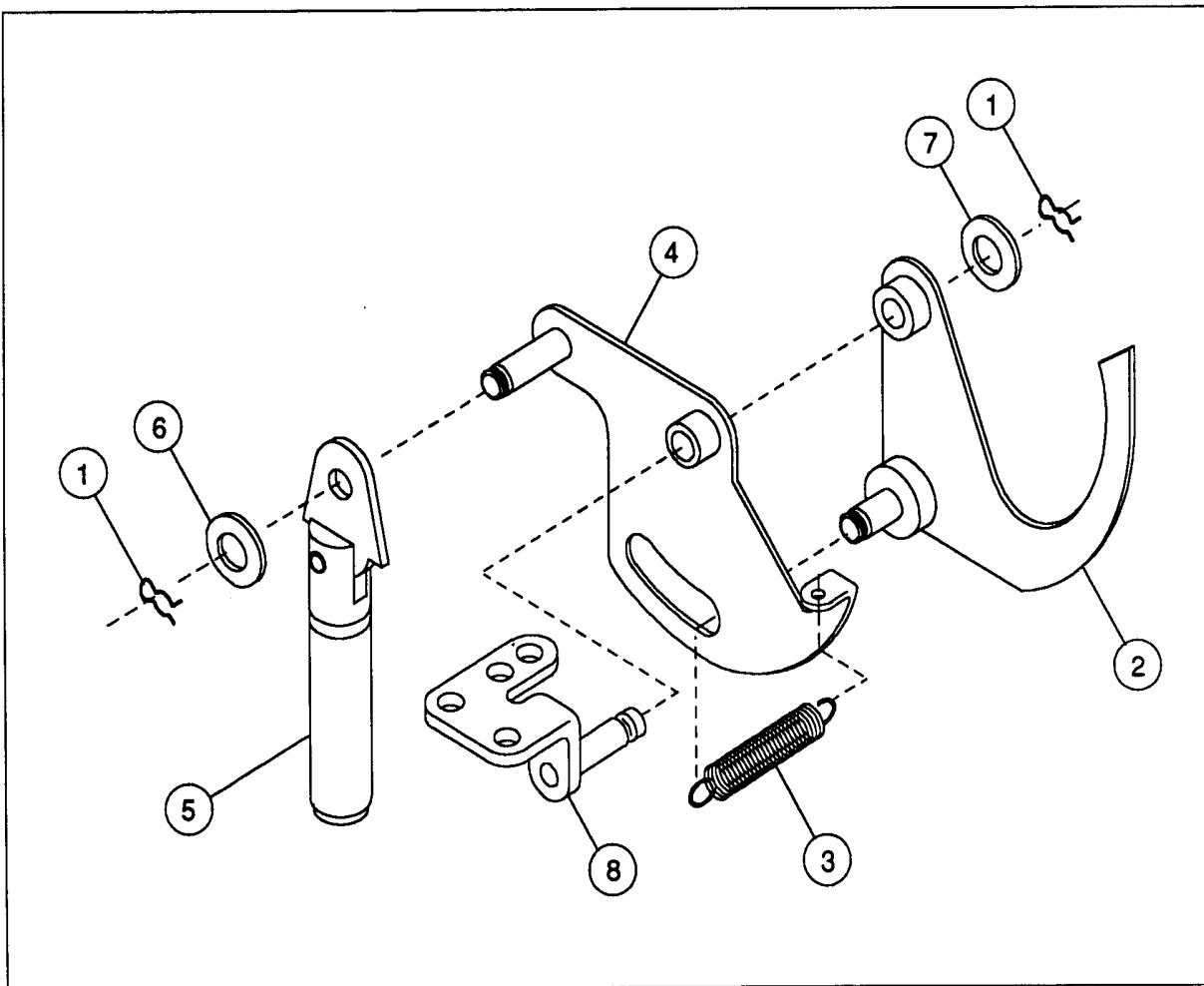
(Parts listed replace same items of A-15205-R)

| Item | Part Number | Description           |
|------|-------------|-----------------------|
| 12.  | FL-15411    | Flipper Coil - Orange |

# Flipper Assembly



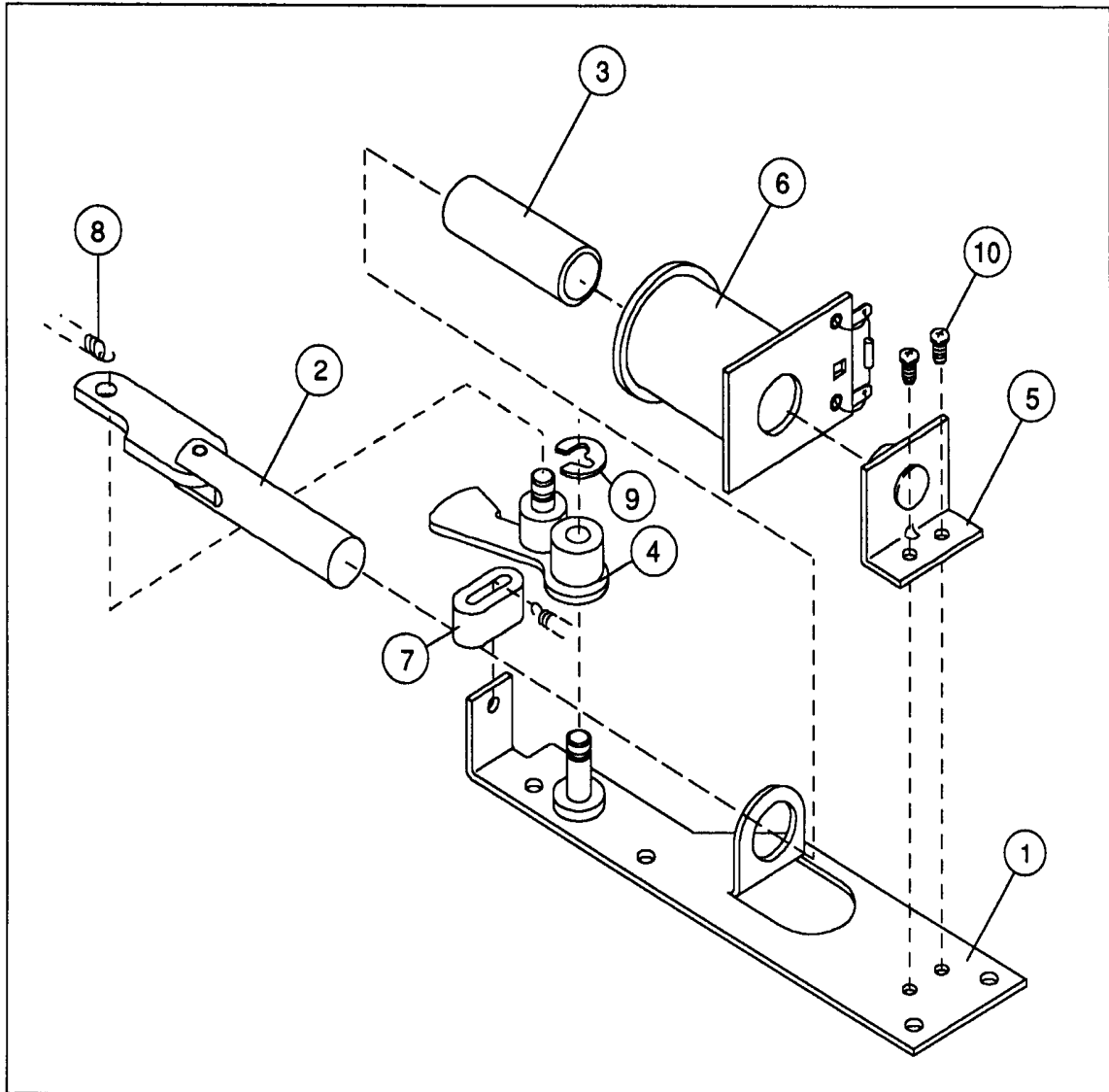
## C-9638 Ball Shooter Lane Feeder



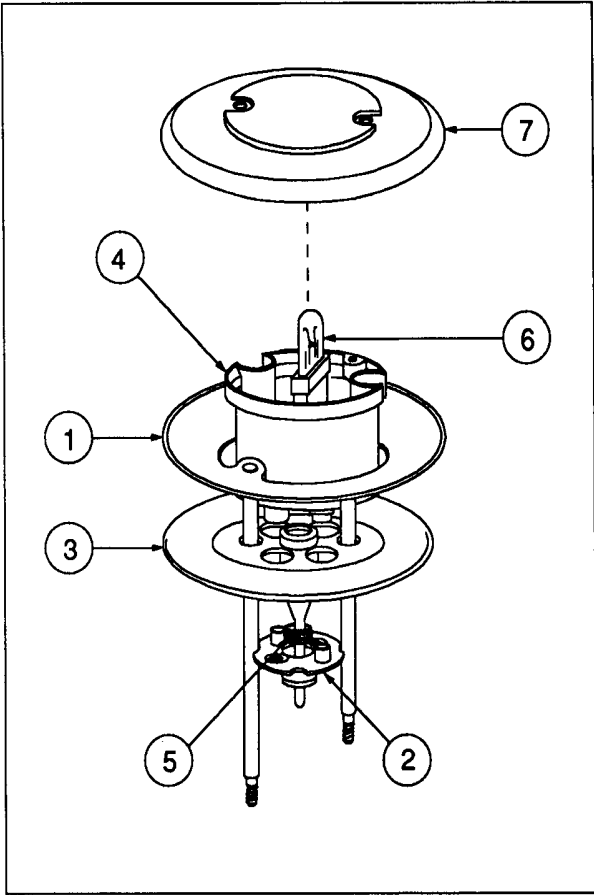
### Associated Parts (Not Shown)

| Item | Part Number   | Description                     | Item | Part Number       | Description             |
|------|---------------|---------------------------------|------|-------------------|-------------------------|
| 1.   | 12-6227       | Hair Pin Clip                   | 10.  | <b>B-9362-L-2</b> | Coil & Bracket Assy.    |
| 2.   | A-8247        | Eject Cam Assembly              |      | B-7572-1          | Bracket & Stop Assy.    |
| 3.   | 10-362        | Ejector Spring (Plain)          |      | 01-8-508-S        | Coil Retaining Bracket  |
| 4.   | A-6949-L      | Spring Plate Assembly           |      | 4006-01017-06     | Mach. Screw, 6-32 x 3/8 |
| 5.   | A-8050-1      | Coil Plunger Assy, 2-1/8"       |      | 4406-01119-00     | Nut, 6-32 ESN           |
| 6.   | 4700-00030-00 | Flatwasher, 17/64 x 1/2 x 15ga. |      | AE-26-1200        | Coil Assembly           |
| 7.   | 4700-00103-00 | Flatwasher, 17/64 x 1/2 x 28ga. |      | 03-7066           | Coil Tubing             |
| 8.   | A-8268        | Mounting Bracket Assembly       | 11.  | 10-128            | Spring                  |

## A-8039-3    Outhole Kicker Assembly



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

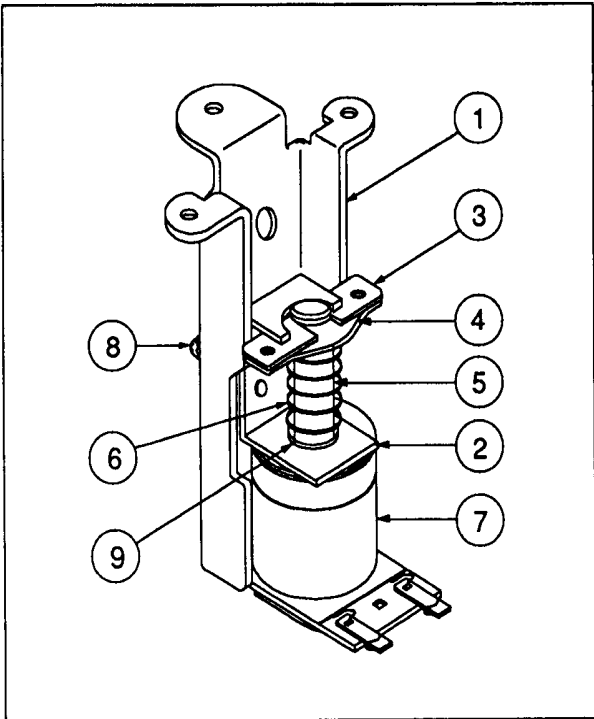


## B-9414-3 Jet Bumper Assembly

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

### Associated Parts:

|    |            |                                |
|----|------------|--------------------------------|
| 7. | 03-8254-8  | Jet Bumper Cap - Tr. Amber (1) |
|    | 03-8254-9  | Jet Bumper Cap - Red (1)       |
|    | 03-8254-10 | Jet Bumper Cap - Blue (1)      |
|    | 03-8254-16 | Jet Bumper Cap - Yellow (1)    |
|    | 03-8651-13 | Jet Bumper Cap - Clear (1)     |



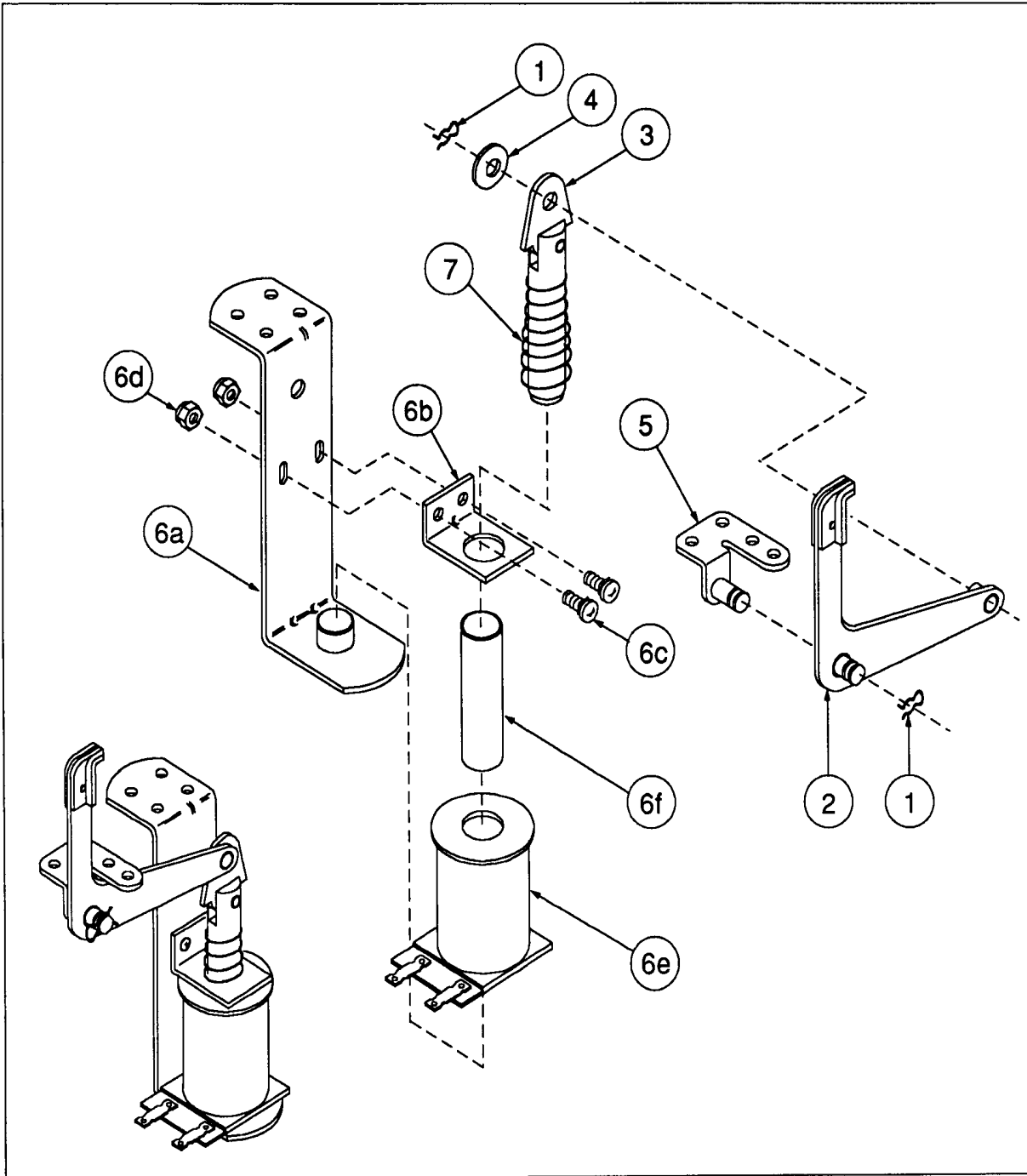
## A-9415-2 Jet Bumper Coil Assembly

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

### Associated Parts:

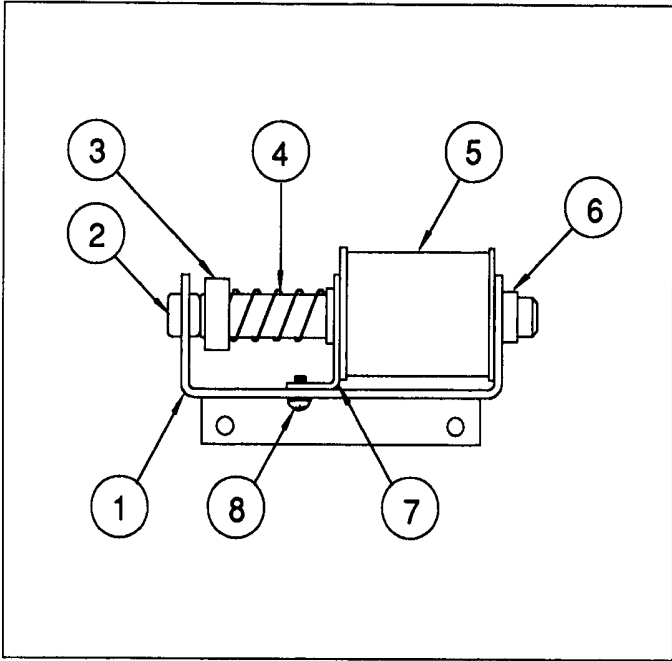
|               |                            |
|---------------|----------------------------|
| B-12030-2     | Jet Bumper Sw & Diode Assy |
| B-12029-2     | Jet Bumper Sw & Brkt. Assy |
| SW-11A-37     | Jet Bumper Switch Assy     |
| 5070-09054-00 | Diode, 1N4004              |

## B-12665 Kicker Arm (Slingshot) Assembly



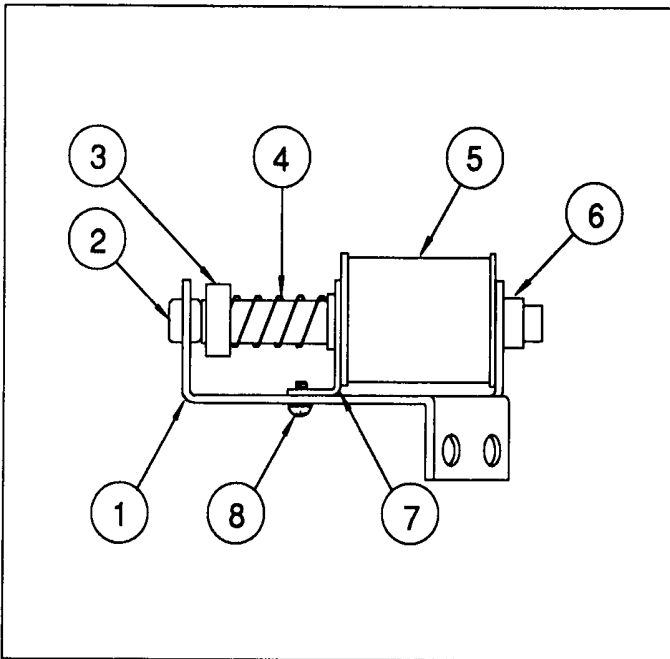
### Associated Parts for Left & Right Kicker

| Item | Part Number   | Description                     | Item | Part Number      | Description             |
|------|---------------|---------------------------------|------|------------------|-------------------------|
| 1.   | 12-6227       | Clip, Hairpin                   | 6.   | <b>B-14369-L</b> | Coil & Bracket Assembly |
| 2.   | A-12664       | Kicker Crank Assembly           | a)   | B-7572-1         | Bracket & Stop Assembly |
| 3.   | A-5103        | Coil Plunger Assembly           | b)   | 01-8-508-S       | Coil Retaining Bracket  |
| 4.   | 4700-00030-00 | Flatwasher, 17/64 x 1/2 x 15ga. | c)   | 4006-01017-06    | Mach. Screw, 6-32 x 3/8 |
| 5.   | A-5653        | Mounting Bracket Assembly       | d)   | 4406-01119-00    | Nut, 6-32 ESN           |
|      |               |                                 | e)   | AE-27-1200       | Coil Assembly           |
|      |               |                                 | f)   | 03-7066          | Coil Tubing             |
|      |               |                                 | 7.   | 10-128           | Spring                  |



## A-15367 Knockoff Assembly

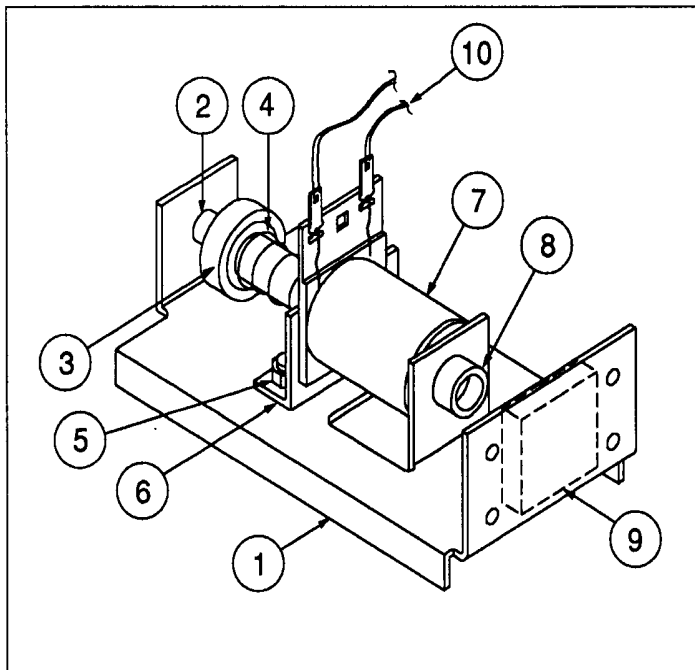
| Item | Part Number   | Description               |
|------|---------------|---------------------------|
| 1.   | 01-10651      | Bracket Assembly          |
| 2.   | 23-6420       | Rubber Grommet            |
| 3.   | A-15370       | Plunger Assembly          |
| 4.   | 10-135        | Solenoid Spring           |
| 5.   | AE-30-2000    | Coil Assembly             |
| 6.   | 03-7067-5     | Coil Tubing               |
| 7.   | 01-8-508-T    | Solenoid Bracket          |
| 8.   | 4008-01017-04 | Mach. Screw, #8-32 x 1/4" |



## A-15368 Eject Assembly

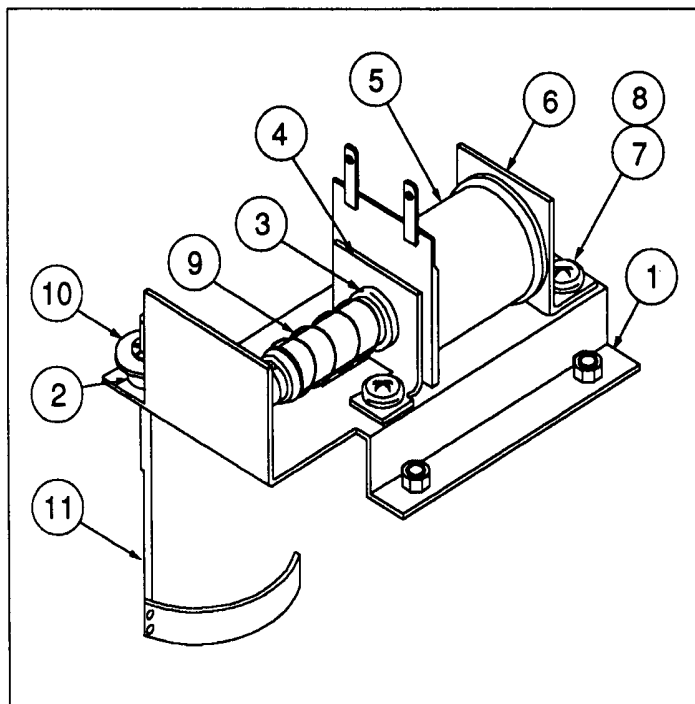
| Item | Part Number   | Description               |
|------|---------------|---------------------------|
| 1.   | 01-10652      | Bracket Assembly          |
| 2.   | 23-6420       | Rubber Grommet            |
| 3.   | A-15371       | Plunger Assembly          |
| 4.   | 10-135        | Solenoid Spring           |
| 5.   | AE-30-2000    | Coil Assembly             |
| 6.   | 03-7067-5     | Coil Tubing               |
| 7.   | 01-8-508-T    | Solenoid Bracket          |
| 8.   | 4008-01017-04 | Mach. Screw, #8-32 x 1/4" |





## A-15267 Knocker Assembly

| Item | Part Number   | Description            |
|------|---------------|------------------------|
| 1.   | A-15266       | Knocker Bracket Assy.  |
| 2.   | 23-6420       | Rubber Grommet         |
| 3.   | A-13270       | Bell Armature Assembly |
| 4.   | 10-135        | Solenoid Spring        |
| 5.   | 4408-01119-00 | Nut 8-32 ESN           |
| 6.   | 01-9423       | Coil Bracket           |
| 7.   | AE-23-800     | Coil Assembly          |
| 8.   | 03-7067       | Coil Tubing            |
| 9.   | 23-6629       | Bumper Pad             |
| 10.  | H-11835       | Cable                  |

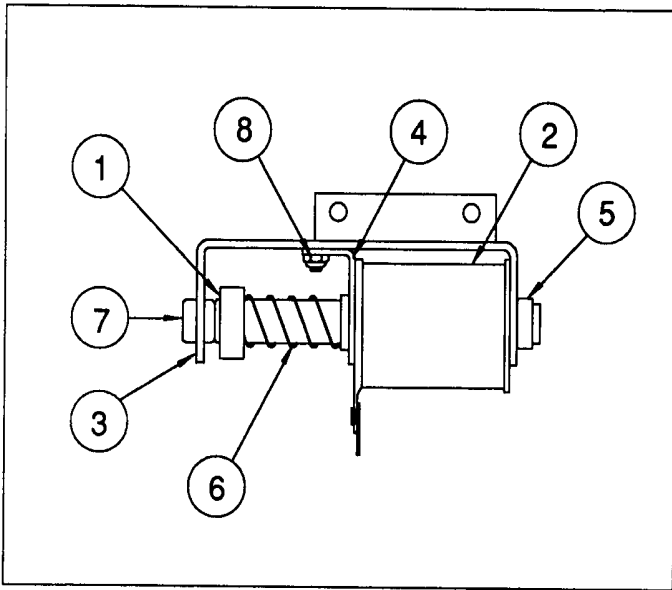


## A-15040 Diverter Assembly

| Item | Part Number   | Description                |
|------|---------------|----------------------------|
| 1.   | A-15041       | Mounting Bracket           |
| 2.   | 20-8790       | Nylined Bearing            |
| 3.   | 03-7066       | Coil Tubing                |
| 4.   | 01-8413       | Coil Mounting Bracket      |
| 5.   | AE-26-1500    | Coil Assembly              |
| 6.   | A-10821       | Flipper Stop Bracket Assy. |
| 7.   | 4010-01008-06 | Mach. Screw, 10-32 x 3/8   |
| 8.   | 4701-00004-00 | Lockwasher #10 Split       |

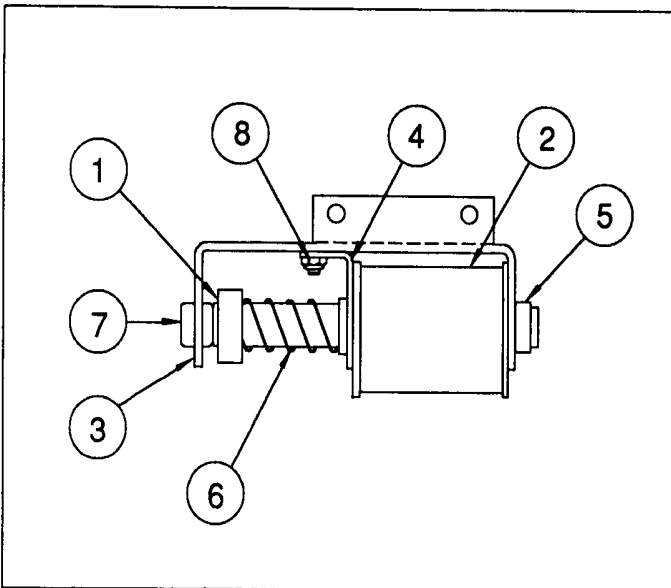
### Associated Parts

|     |         |                    |
|-----|---------|--------------------|
| 9.  | A-13278 | Plunger Assembly   |
| 10. | A-14185 | Drive Arm Assembly |
| 11. | A-15039 | Diverter Assembly  |



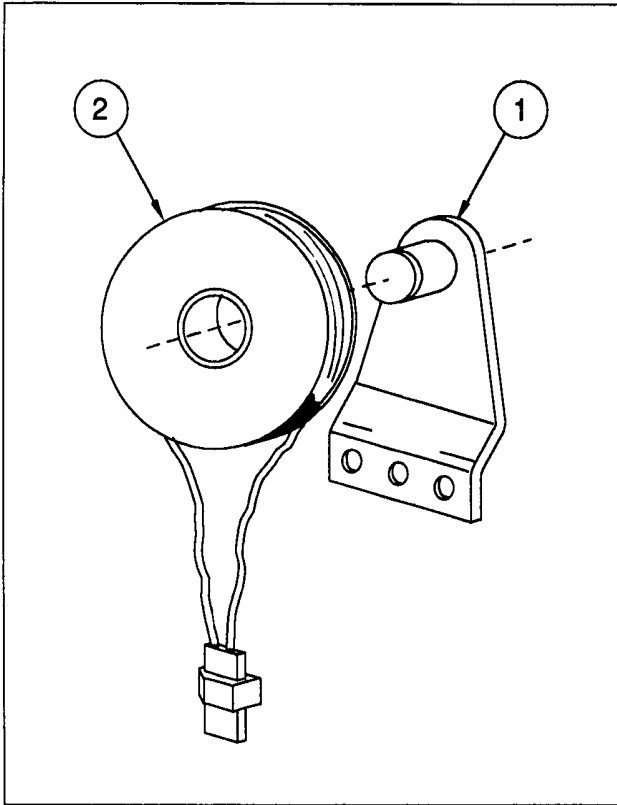
## A-14107 Kicker Assembly

| Item | Part Number   | Description            |
|------|---------------|------------------------|
| 1.   | A-13270       | Bell Armature Assembly |
| 2.   | AE-26-1200    | Coil Assembly          |
| 3.   | A-14106       | Mtg. Bracket Assembly  |
| 4.   | 01-9423       | Coil Bracket           |
| 5.   | 03-7067       | Coil Tubing            |
| 6.   | 10-135        | Solenoid Spring        |
| 7.   | 23-6420       | Rubber Grommet         |
| 8.   | 4408-01119-00 | Nut 8-32 ESN           |



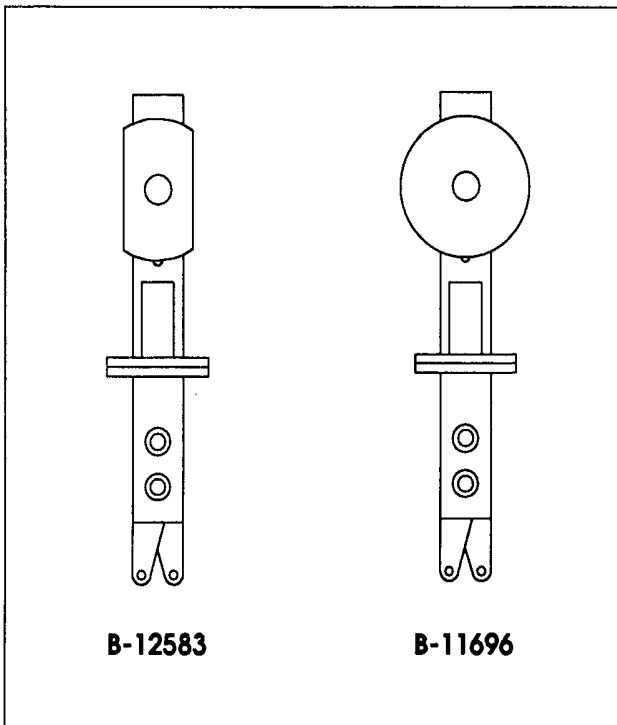
## A-15115 Kicker Assembly

| Item | Part Number   | Description            |
|------|---------------|------------------------|
| 1.   | A-13270       | Bell Armature Assembly |
| 2.   | AE-26-1200    | Coil Assembly          |
| 3.   | A-15116       | Mtg. Bracket Assembly  |
| 4.   | 01-9423       | Coil Bracket           |
| 5.   | 03-7067       | Coil Tubing            |
| 6.   | 10-135        | Solenoid Spring        |
| 7.   | 23-6420       | Rubber Grommet         |
| 8.   | 4408-01119-00 | Nut 8-32 ESN           |



## Coil Magnet & Bracket Assembly

| Item | Part Number | Description                |
|------|-------------|----------------------------|
| 1.   | A-15257     | Bracket & Pole Piece Assy. |
| 2.   | 20-9247     | Coil Magnet                |



## Standup Targets

### Round Targets

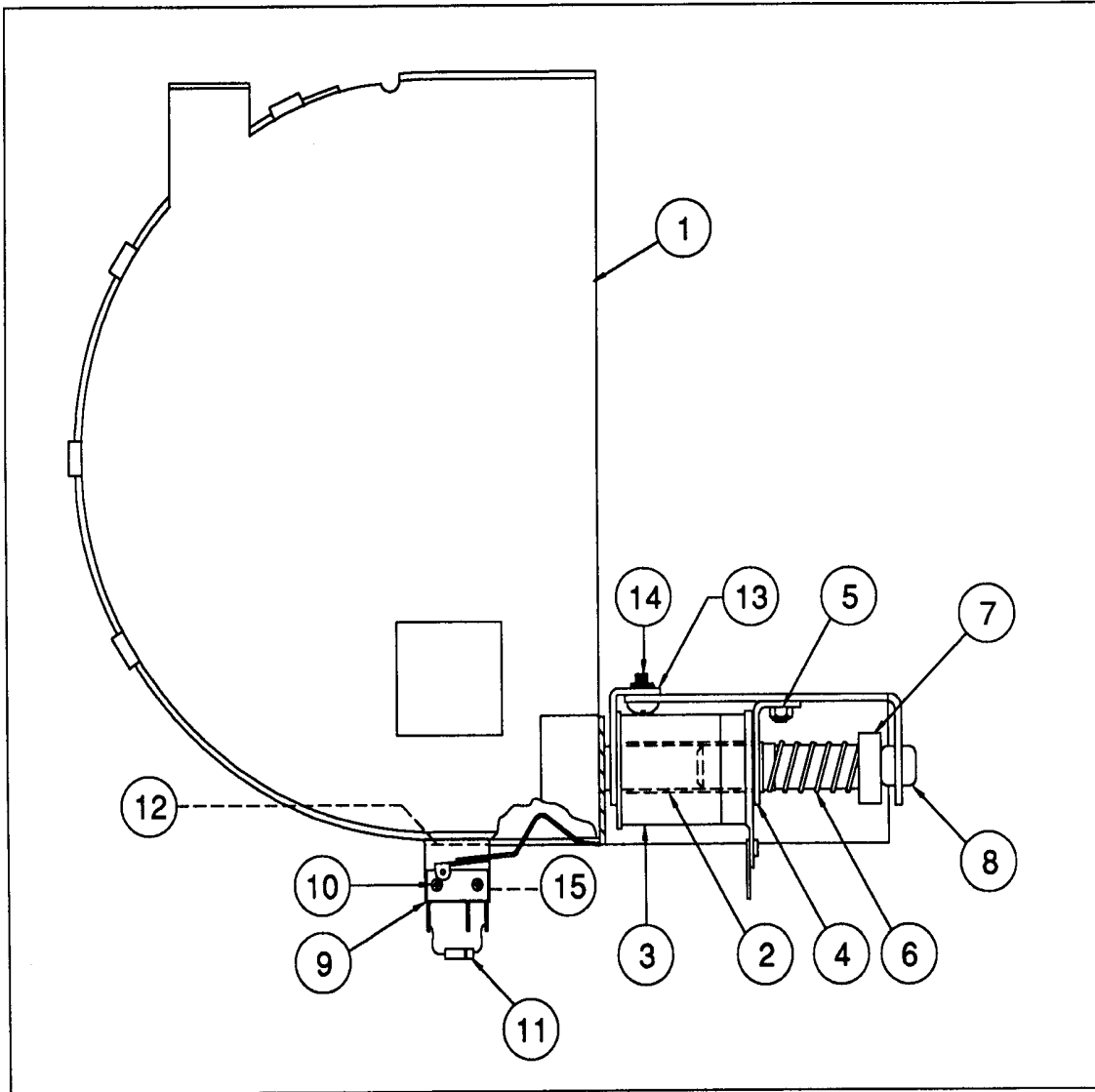
#### Target Assembly

- B-11696-1, Blue
- B-11696-4, Red
- B-11696-5, White
- B-11696-15, Orange

### Oblong Targets

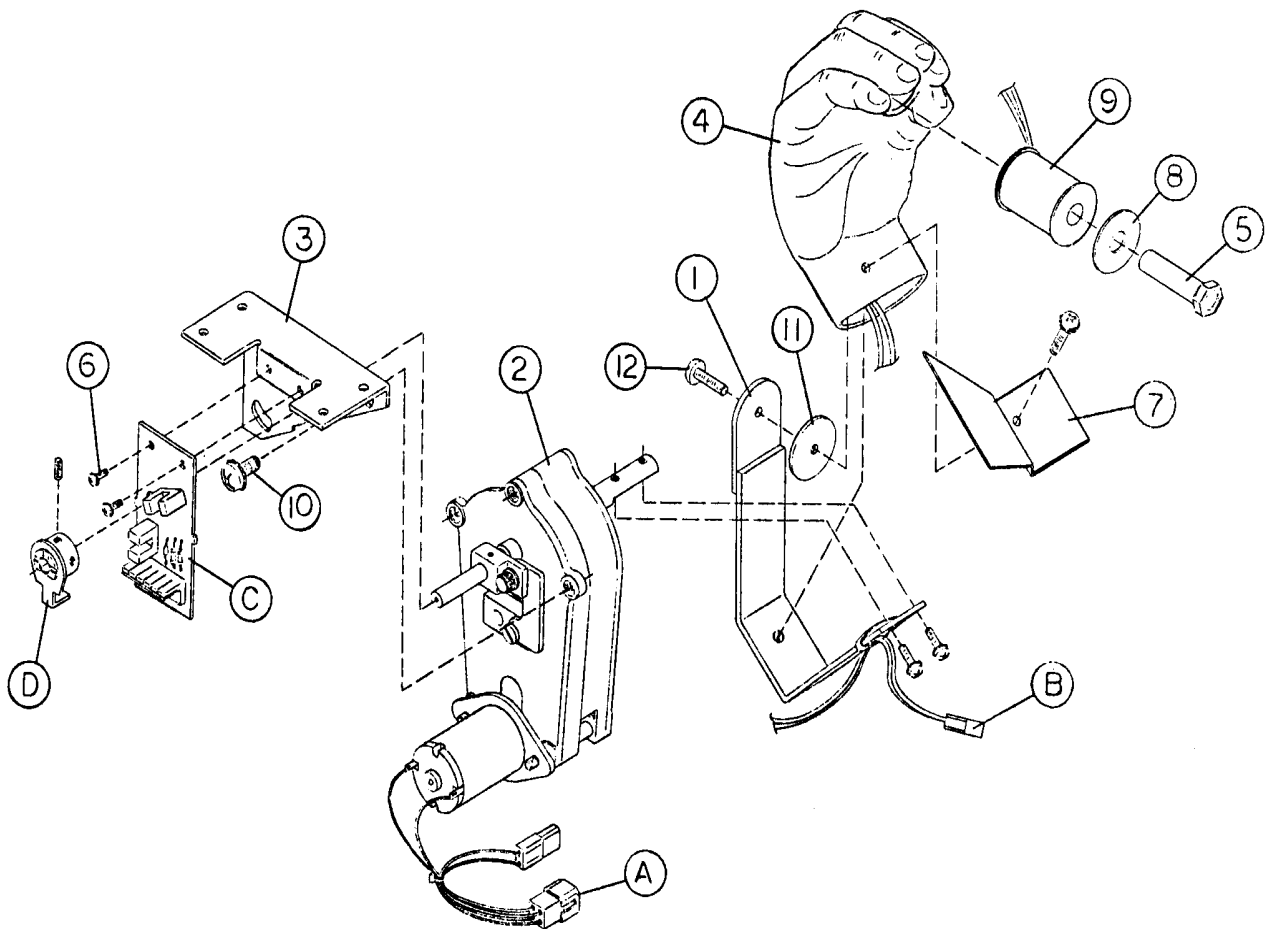
- B-12583-1, Blue
- B-12583-4, Red

## A-15200 Kickout Assembly



| Item | Part No.      | Description                    |
|------|---------------|--------------------------------|
| 1.   | A-15201       | Kickout Sub-Assembly           |
| 2.   | 03-7067       | Coil Tubing                    |
| 3.   | AE-23-800     | Coil Assembly                  |
| 4.   | 01-9423       | Coil Bracket Assy.             |
| 5.   | 4408-01119-00 | Nut 8-32 ESN                   |
| 6.   | 10-135        | Solenoid Spring                |
| 7.   | A-13270       | Bell Armature Assembly         |
| 8.   | 23-6420       | Rubber Grommet                 |
| 9.   | 5647-12693-25 | Switch                         |
| 10.  | 4002-01105-07 | Mach. Screw, 2-56 x 7/16P-PH-S |
| 11.  | 5070-09054-00 | Diode 1N4004                   |
| 12.  | 01-8240       | Nut Plate                      |
| 13.  | A-15376       | Coil Bracket - Front           |
| 14.  | 4008-01003-06 | Mach. Screw, 8-32 P-PH-S       |
| 15.  | 01-8600       | Insulator                      |

# A-14711 Hand Drive Assembly



| Item | Part Number   | Description             |
|------|---------------|-------------------------|
| 1    | A-15303       | Bracket Assembly        |
| 2    | 14-7966       | Motor 140               |
| 3    | 01-10561      | Motor Bracket           |
| 4    | 03-8644       | Plastic Molded Hand     |
| 5    | 02-4603       | Magnet Core             |
| 6    | 4006-01003-04 | MS 6-32 x 1/4 P-PH-S    |
| 7    | 01-10655      | Anti-Trap Bracket       |
| 8    | 31-1677       | Washer, Color           |
| 9    | A-12158-1     | Coil Assembly           |
| 10   | 4020-01003-08 | MS 1/4-20 x 1/2 P-PH-S  |
| 11   | 4700-00130-00 | FW .203 x 1.000 x .062  |
| 12   | 4010-01062-10 | MS 10-32 x 5/8 SL-BH-BR |

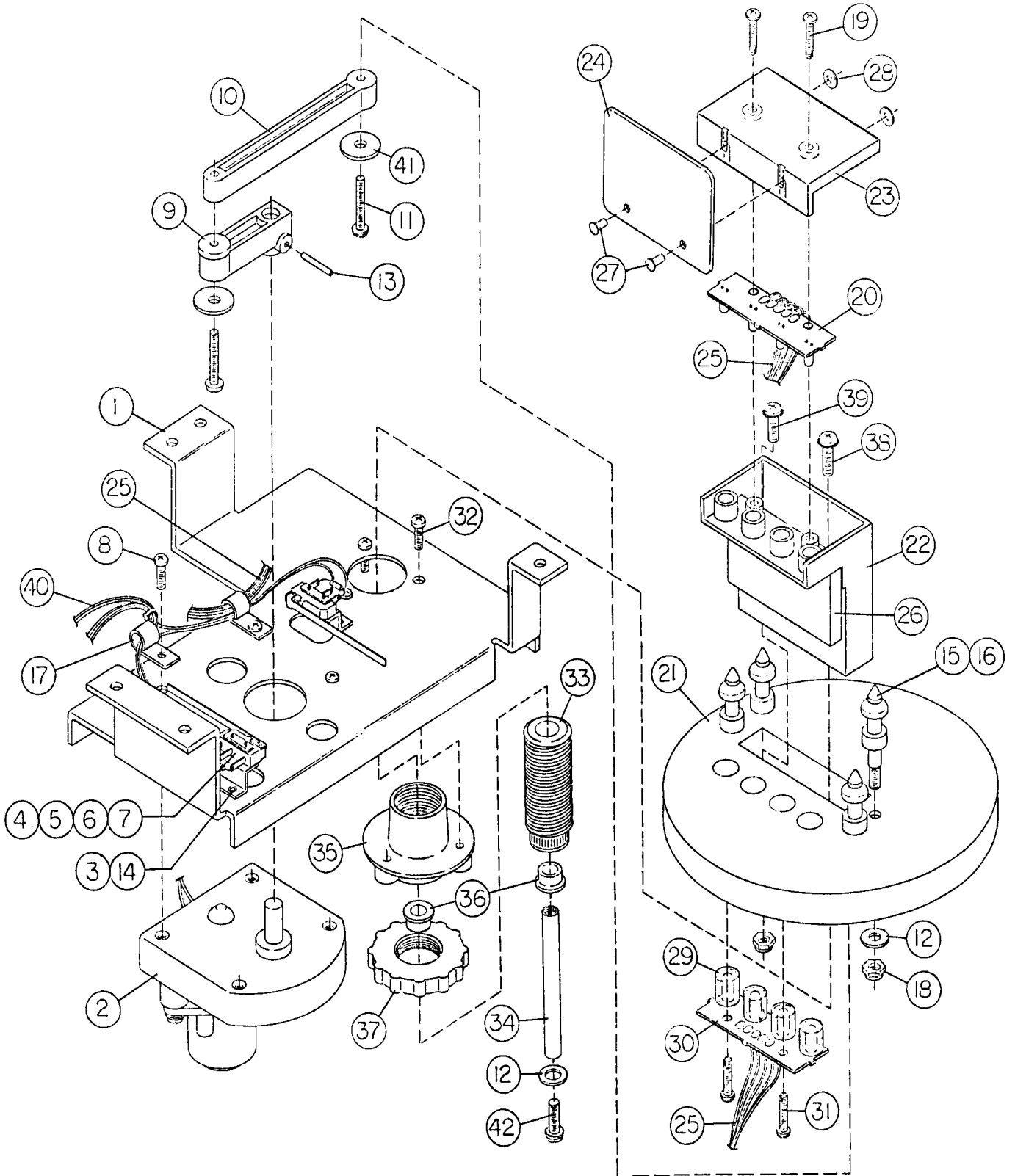
## Associated Assemblies:

|   |         |                            |
|---|---------|----------------------------|
| A | H-15228 | Hand Cable Assembly        |
| B | H-15263 | Magnet Coil Cable Assembly |
| C | A-15285 | Opto Switch-2 PCB Assembly |
| D | A-15310 | Interrupter Assembly       |

## A-14970 Bookcase Assembly

| Item | Part Number   | Description                | Qty. |
|------|---------------|----------------------------|------|
| 1    | 01-10398      | Mounting Bracket           | 1    |
| 2    | 14-7969       | Motor, Bookcase            | 1    |
| 3    | 01-10399      | Switch Bracket             | 2    |
| 4    | 5647-12693-08 | Mini Micro Switch          | 2    |
| 5    | 5070-09054-00 | Diode 1N4004 1.0A          | 2    |
| 6    | 01-8240       | Nut Plate #2-56            | 2    |
| 7    | 4002-01105-07 | MS 2-56 x 7/16 P-PH-S      | 4    |
| 8    | 4008-01005-10 | MS 8-32 x 5/8 P-PH         | 4    |
| 9    | 03-8619       | Crank, Bookcase            | 1    |
| 10   | 03-8620       | Actuator, Bookcase         | 1    |
| 11   | 4108-01031-14 | SMS #8 x 7/8 P-TH-Type 25  | 2    |
| 12   | 4700-00016-00 | FW .187 x .437 x .053      | 5    |
| 13   | 20-8716-2     | Rollpin 3/32 x 5/8         | 1    |
| 14   | 07-6688-18N   | Rivet 3/16 x 1/8 Nickel    | 4    |
| 15   | 02-4003       | Bumper Post 8-32           | 4    |
| 16   | 23-6535       | Rubber Bumper              | 4    |
| 17   | 03-7655-4     | Harness Clip 1/4           | 2    |
| 18   | 4408-01119-00 | Nut 8-32 ESN               | 5    |
| 19   | 4106-01004-10 | SMS #6 x 5/8 P-PH-ST       | 2    |
| 20   | A-15018       | 4 Infra Red LED Assembly   | 1    |
| 21   | 03-8623       | Base, Bookcase             | 1    |
| 22   | 03-8622       | Frame, Bookcase            | 1    |
| 23   | 03-8621       | Cover, Bookcase            | 1    |
| 24   | 31-1664-25    | Screened Playfield Plastic | 1    |
| 25   | H-15229       | Cable Assembly, Bookcase   | 1    |
| 26   | 23-6674       | Bumper Pad 1-1/8 x 2-5/16  | 1    |
| 27   | 07-6688-20N   | Rivet 1/4 x 1/8 Nickel     | 2    |
| 28   | 4700-00003-00 | FW .125 x .281 x .032      | 2    |
| 29   | 03-8624       | Lens, Bookcase             | 4    |
| 30   | A-15017       | 4 Opto PCB Assembly        | 1    |
| 31   | 4106-01004-06 | SMS #6 x 3/8 P-PH-ST       | 2    |
| 32   | 4108-01004-06 | SMS #8 x 3/8 P-PH-ST       | 3    |
| 33   | 02-4419       | Adjusting Screw            | 1    |
| 34   | 02-4418       | Shaft, 2-1/2               | 1    |
| 35   | 03-8347       | Gland                      | 1    |
| 36   | 20-9610       | Flange Bearing             | 2    |
| 37   | 03-8363       | Locking Nut                | 1    |
| 38   | 4008-01157-10 | MS 8-32 x 5/8 P-PH-S-Ny    | 1    |
| 39   | 4008-01017-08 | MS 8-32 x 1/2 P-PH-S       | 1    |
| 40   | H-15227       | Bookcase Switch Cable      | 1    |
| 41   | 4700-00070-00 | FW .187 x .625 x .059      | 2    |
| 42   | 4008-01157-08 | MS 8-32 x 1/2 P-PH-S-Ny    | 1    |

# A-14970 Bookcase Assembly



# Coin Door Assembly

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

09-17002-x 2-Chute Door

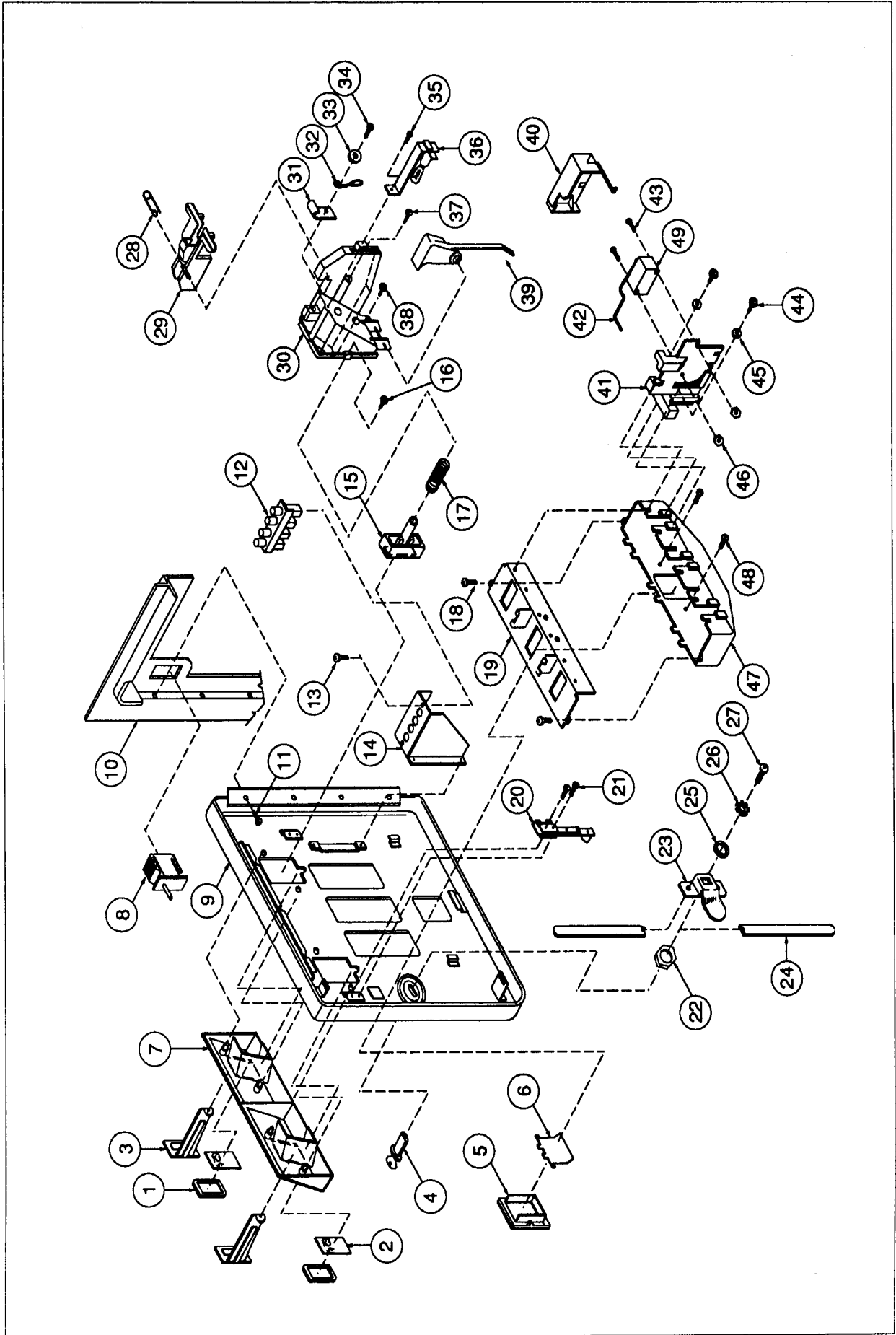
09-17003-x 3-Chute Door

("x" is the country designator)

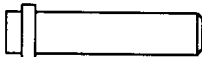
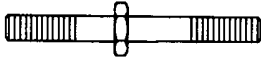
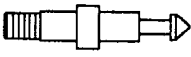



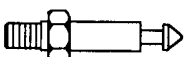
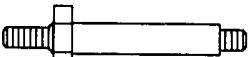

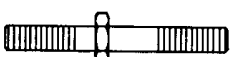
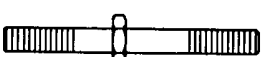
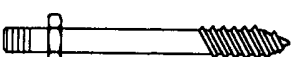


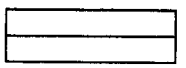
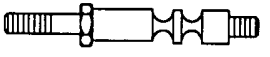
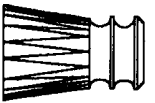
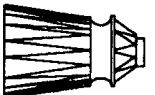
| Item | Part No.      | Description                  | Quantity |
|------|---------------|------------------------------|----------|
| 1    | 27-1038       | Button Cover                 | 2 or 3   |
| 2    | 27-1041-1→58  | Price Panel                  | 2 or 3   |
| 3    | 27-1026-1→17  | Coin Entry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



# Coin Door Assembly



## Metal & Plastic Posts

|   | Part Number | Description                  | Quantity |
|---|-------------|------------------------------|----------|
|    | 02-3409     | Spring Post                  | 1        |
|    | 02-3905     | Bumper Post, #8 WS           | 1        |
|    | 02-4003     | Bumper Post, 8-32            | 10       |
|    | 02-4036     | Rubber Bumper Post           | 3        |
|    | 02-4056     | Threaded Bumper Post         | 1        |
|    | 02-4057     | Short Bumper Post            | 6        |
|    | 02-4177     | Ball Guide Post              | 1        |
|    | 02-4342-1   | Bumper Post, Threaded        | 1        |
|  | 02-4423     | Bumper Post                  | 3        |
|  | 02-4424-1   | Spring Post, 6-32 x 8-32     | 10       |
|  | 02-4425-1   | Post, 8-32 / #8-32           | 1        |
|  | 02-4426-1   | Post, #6-32 / #8 SMS         | 8        |
|  | 02-4434     | Post, #8 x 1"                | 2        |
|  | 02-4435     | Playfield Post               | 2        |
|  | 02-4436-5   | Spacer, 1/4 x 2.83"          | 1        |
|   | 02-4436-7   | Spacer, 1/4 x 1-1/2"         | 1        |
|   | 02-4436-15  | Spacer, 1/4 x 1-7/16"        | 2        |
|  | 02-4493-1   | Post Double Bumper, Hex.     | 2        |
|  | 03-8247-13  | Double Star Post, Clear      | 12       |
|  | 03-8319-3   | Star Post #8 (Opaque Purple) | 2        |

## Unique Parts

| <u>Part Number</u> | <u>Description</u>             | <u>Part Number</u> | <u>Description</u>             |
|--------------------|--------------------------------|--------------------|--------------------------------|
| A-12738-20017      | WPC Sound Board                | A-15247            | Ball Guide Assembly            |
| A-12742-20017      | WPC CPU Board                  | A-15248            | Ball Guide Assembly            |
| A-13204-20017      | Bottom Arch Assembly           | A-15249            | Ball Guide Assembly            |
| A-13767-20017      | Backbox Assembly               | A-15250            | Ball Guide Assembly            |
| A-13769-20017      | Playfield & Insert Assembly    | A-15251            | Ball Guide Assembly            |
| A-14073            | Box Assembly                   | A-15257            | Bracket & Pole Piece Assy.     |
| A-14711            | Hand Drive Assembly            | A-15258            | Chair Bracket Assembly         |
| A-14962            | Loop Assembly                  | A-15267            | Knocker Assembly               |
| A-14970            | Bookcase Assembly              | A-15280            | Single Flashlamp Assembly      |
| A-14972            | X-Over Ramp Wire Chute Assy.   | A-15285            | 2-Switch Opto PC Board         |
| A-14973            | Shooter Ramp Assy.             | A-15310            | Interrupter Assembly           |
| A-14974            | Ball Guide Assy - Shooter Ramp | A-15340            | Motor EMI Board                |
| A-14977            | 7-Opto PC Board                | A-15367            | Knockoff Assembly              |
| A-15017            | 4-Opto PC Board                | A-15368            | Eject Assembly                 |
| A-15040            | Diverter Assembly              | A-15369-1          | Playfield Plastic Assembly     |
| A-15070            | Chute Assembly                 | A-15369-2          | Playfield Plastic Assembly     |
| A-15110            | 10-Lamp Board                  | A-15369-3          | Playfield Plastic Assembly     |
| A-15111            | 3-Lamp Board                   | A-15375            | Cloud Assembly                 |
| A-15112            | 5-Lamp Board                   | A-15416            | Extra Flipper Supply Board     |
| A-15113            | 4-Lamp Board                   |                    |                                |
| A-15114            | 4-Lamp Board                   | 02-4611-1          | M-F 8-32 x 3-1/2 Hex. Standoff |
| A-15115            | Kicker Assembly                |                    |                                |
| A-15139            | High Power PC Board            |                    |                                |
| A-15158-1          | Cashbox Assembly               | 03-8651-13         | Jet Bumper Cap - Clear         |
| A-15197            | Opto Ball Guide Assembly       | 03-8643            | Cloud                          |
| A-15199            | Opto Ball Guide Assembly       | 03-8644            | Hand                           |
| A-15200            | Kickout Assembly               | 03-8647            | Electric Chair                 |
| A-15205-L-1        | Flipper Assembly               |                    |                                |
| A-15205-L-4        | Flipper Assembly               | 10-437             | Kicker Spring                  |
| A-15205-R-4        | Flipper Assembly               |                    |                                |
| A-15212            | Speaker Display Assembly       |                    |                                |
| A-15239            | Ball Guide Assembly            | 23-6674            | Bumper Pad: 7/8 x 5/16         |
| A-15240            | Ball Guide Assembly            |                    |                                |
| A-15241            | Ball Guide Assembly            |                    |                                |
| A-15242            | Ball Guide Assembly            | 31-1002-20017      | Screened Playfield             |
| A-15243            | Ball Guide Assembly            | 31-1008-20017      | Screened Bottom Arch           |
| A-15244            | Ball Guide Assembly            | 31-1009-20017      | Screened Shooter Gauge         |
| A-15245            | Ball Guide Assembly            | 31-1357-20017      | Screened Translite             |
| A-15246            | Ball Guide Assembly            | 31-1420-20017      | Screened Spkr. Panel Cover     |

## A-14962 Loop Assembly

| Item | Part Number   | Description              |
|------|---------------|--------------------------|
| 1.   | A-14963       | Loop Sub-Assembly        |
| 2.   | 5647-12693-25 | Switch                   |
| 3.   | 5070-09054-00 | Diode 1N4001 1.0A.       |
| 4.   | 01-8240       | Nut Plate #2-56          |
| 5.   | 4002-01105-07 | Mach. Screw, 2-56 x 7/16 |
| 6.   | 01-8600       | Insulator                |

## A-14964 Lockup Loop Assembly

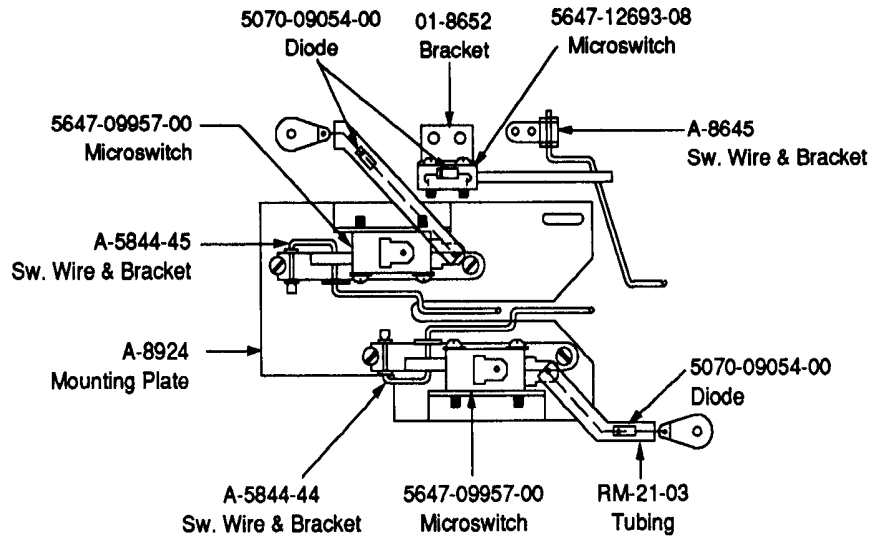
| Item | Part Number   | Description              |
|------|---------------|--------------------------|
| 1.   | A-14965       | Lockup Loop Assembly     |
| 2.   | 5647-12693-25 | Switch Sub-Assembly      |
| 3.   | 5070-09054-00 | Diode, 1N4001 1.0A.      |
| 4.   | 01-8240       | Nut Plate #2-56          |
| 5.   | 4002-01105-07 | Mach. Screw, 2-56 x 7/16 |
| 6.   | 01-8600       | Insulator                |

## Cables

| Part Number | Description            | Part Number | Description            |
|-------------|------------------------|-------------|------------------------|
| H-13870     | Black Jumper Cable     | H-15226     | House Cable            |
| H-14582     | Secondary Cable        | H-15227     | Bookcase Switch Cable  |
| H-14584     | Dot Matrix Display     | H-15228     | Hand Cable             |
| H-14790     | A.C. Cable             | H-15229     | Bookcase Cable         |
| H-14792-1   | A.C. Jumper Cable      | H-15230     | Switch Flasher Cable   |
| H-14792-2   | A.C. Jumper Cable      | H-15231     | Top Flasher G. I.      |
| H-14889     | Flash Cable            | H-15232     | Lower Flasher          |
| H-15094     | Flipper Ground Cable   | H-15233     | Logic Power Cabinet    |
| H-15220     | Playfield Switch Cable | H-15234     | Opto Transmitter Cable |
| H-15221     | Playfield Lamp Cable   | H-15235     | Opto Detector Cable    |
| H-15222     | CableCable             | H-15236     | Spkr. Panel Lamp Cable |
| H-15223     | Insert Cable           | H-15237     | Chair Cable            |
| H-15224     | Cabinet Cable          | H-15238     | Lamp Cable             |
| H-15225     | Ramp Cable             | H-15263     | Magnet Coil Cable      |

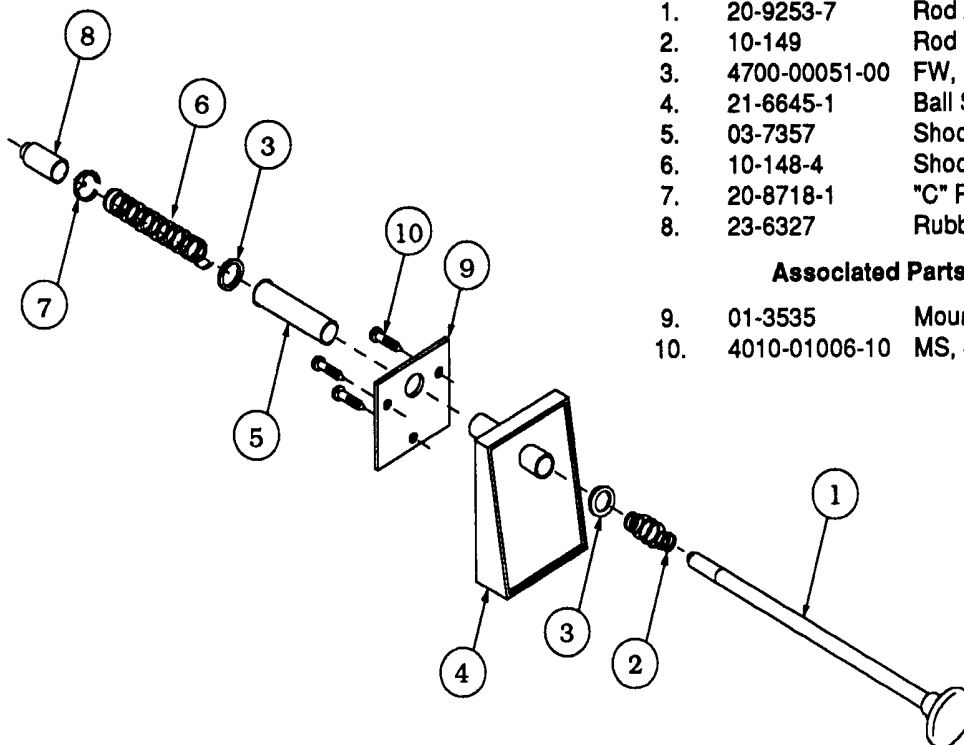
# Ball Trough Switches

(Viewed from underside of playfield to show locations)



**B-8925 Ball Trough Switch Plate Assembly**

# B-12445-4 Ball Shooter Assembly



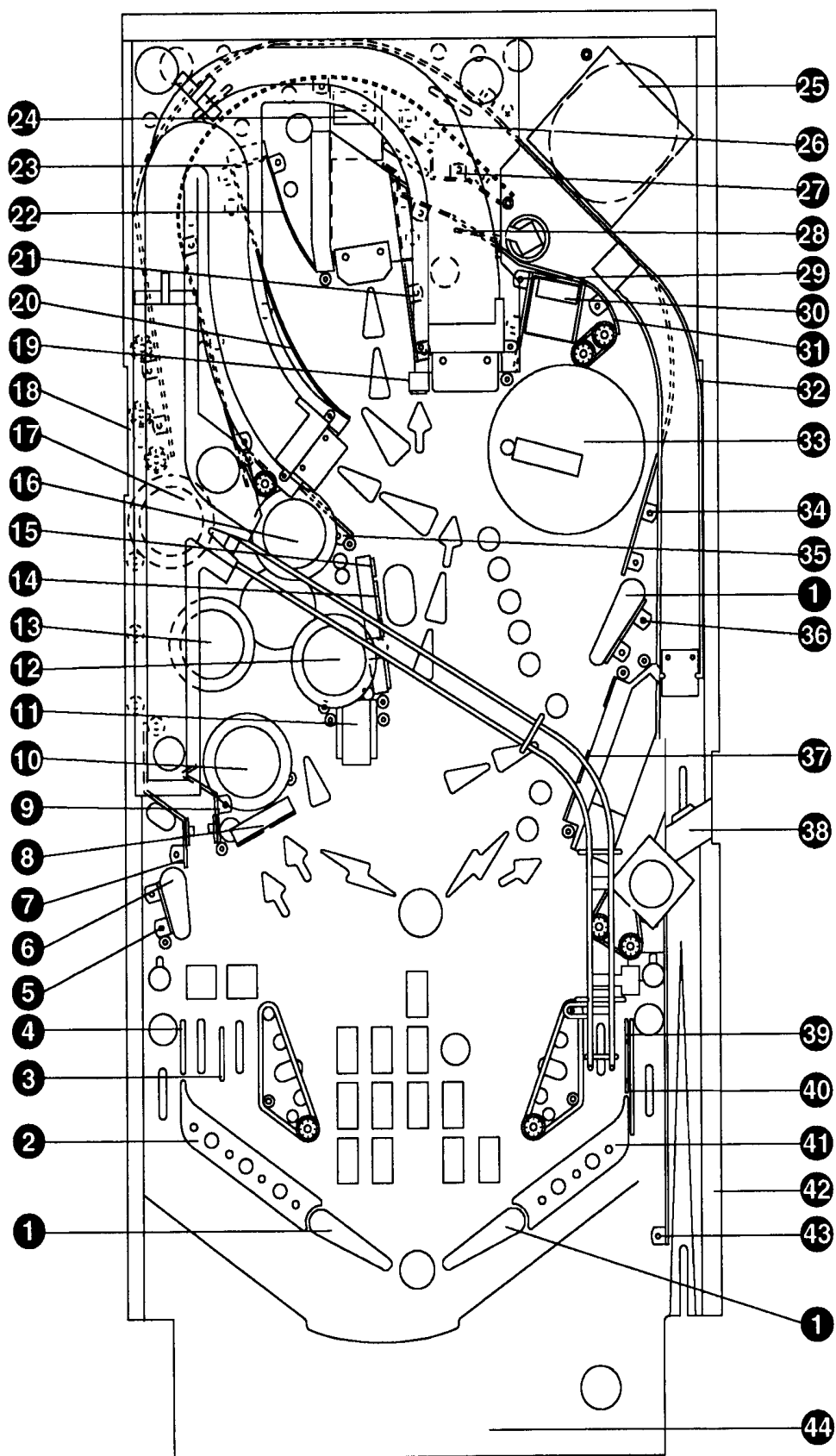
| Item | Part Number   | Description             |
|------|---------------|-------------------------|
| 1.   | 20-9253-7     | Rod Assembly            |
| 2.   | 10-149        | Rod Spring              |
| 3.   | 4700-00051-00 | FW, 25/64 x 5/8 x 16ga. |
| 4.   | 21-6645-1     | Ball Shooter Housing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

**Associated Parts**

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



# PLAYFIELD PARTS LOCATIONS (UPPER)

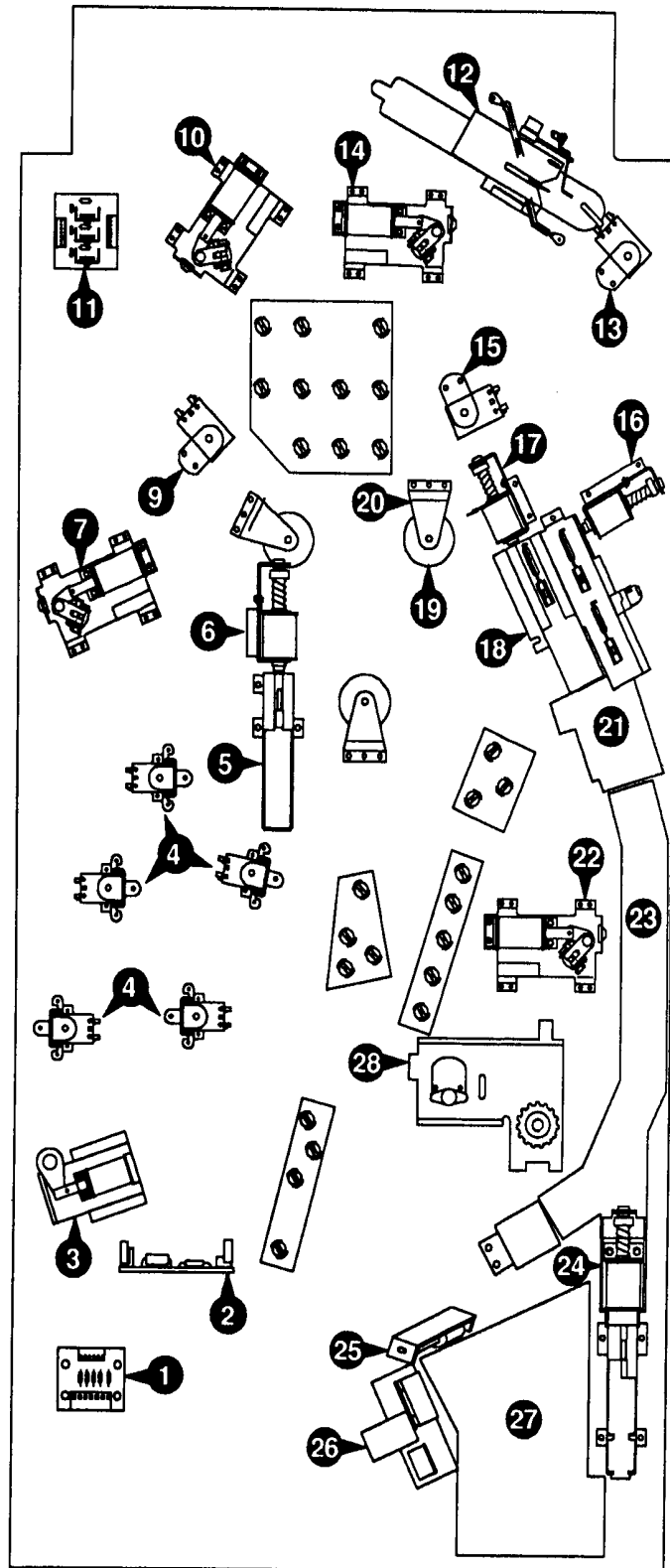


# LOWER PLAYFIELD PARTS

| Item | Part Number | Description               |
|------|-------------|---------------------------|
| 1    | C-13940     | 5 Switch & Diode Assy.    |
| 2    | A-14977     | 7 Opto PCB Switch Assy.   |
| 3    | 01-10427    | Diverter Support Bracket  |
|      | A-14185     | Drive Arm Assembly        |
|      | A-15040     | Diverter Assembly         |
|      | A-13278     | Plunger Assembly          |
|      | 10-437      | Kicker Spring, Heavy      |
| 4    | A-9415-2    | Jet Bumper Coil Assy. (5) |
|      | B-12030-2   | Switch & Diode Assy. (5)  |
|      | A-12753-2   | Lug & Diode Assembly (5)  |
| 5    | A-14962     | Loop Assembly             |
| 6    | A-15115     | Kicker Assembly           |
| 7    | A-15205-L-1 | Flipper Assembly          |
| 8    | 01-9510     | Post Adj. Plate #8 (2)    |
| 9    | A-14369-L   | Coil & Bracket Assy.      |
|      | B-8284-1    | Kicker Count Switch Assy. |
|      | B-12665     | Nylon Kicker Assembly     |
|      | 10-128      | Spring                    |
| 10   | A-15205-L-4 | Flipper Assembly          |
| 11   | A-15139     | Hi-Powered PCB Assy.      |
| 12   | B-8925      | Micro Switch Plate Assy.  |
| 13   | B-9362-L-2  | Coil & Bracket Assy.      |
|      | 10-128      | Spring                    |
|      | C-9638      | Outhole Eject Assy.       |
| 14   | A-15205-R-4 | Flipper Assembly          |
| 15   | A-14369-L   | Coil & Bracket Assy.      |
|      | A-11539-1   | Kicker Switch Assy.       |
|      | B-12665     | Nylon Kicker Assembly     |
|      | 10-128      | Spring                    |
| 16   | A-15367     | Knockoff Assembly         |
| 17   | A-14107     | Kicker Assembly           |
| 18   | A-14964     | Lock-up Loop Assembly     |
| 19   | 20-9247 (3) | Coil Magnet               |
| 20   | A-15257 (3) | Brkt. & Pole Piece Assy.  |
| 21   | 01-10446    | Swamp Bracket             |
| 22   | A-15205-R   | Flipper Assembly          |
| 23   | A-15070     | Chute Ramp Assy.          |
| 24   | A-15200     | Kickout Assembly          |
| 25   | A-15368     | Eject Assembly            |
|      | A-9381-R    | Switch & Bracket Assy.    |
| 26   | A-14711     | Hand Drive Assembly       |
| 27   | A-14703     | Box Assembly              |
| 28   | A-14970     | Bookcase Assembly         |

**Not Shown:**

|               |                               |
|---------------|-------------------------------|
| A-14632-3     | 3/4" Mtg. Brkt. Clamp Assy.   |
| A-14632-4     | 1" Mtg. Brkt. Clamp Assy.     |
| A-15340       | Motor EMI Board w/Brake       |
| 01-8726-L-1   | Playfield Holder Brkt., Left  |
| 01-8726-R-1   | Playfield Holder Brkt., Right |
| 5731-09651-00 | Fuse                          |
| 5733-10702-01 | Fuse Holder                   |



*Underside of Playfield, Viewed in Raised Position*



# SWITCH LOCATIONS

| Item  | Switch Number | Switch Assy.    | Description          |
|-------|---------------|-----------------|----------------------|
| 11-12 | --            | --              | Not Used             |
| 13    | --            | 20-9663-1       | Start Button         |
| 14    | --            | 20-6502-A       | *Plumb Bob Tilt      |
| 15    | 5647-09957-00 | B-8925          | Left Trough          |
| 16    | 5647-09957-00 | B-8925          | Center Trough        |
| 17    | 5647-12693-08 | A-11680         | Right Trough         |
| 18    | 5647-12133-12 | A-10417         | Outhole              |
| 21    | --            | 27-10666        | *Slam Tilt           |
| 22    | --            | A-8630          | *Coin Door Closed    |
| 23    | --            | Not Used        | *Ticket Opto.        |
| 24    | --            | A-8630          | *Always Closed       |
| 25    | 5647-12693-19 | A-12688         | Right Flipper Lane   |
| 26    | 5647-12693-19 | A-12688         | Right Outdane        |
| 27    | 5647-12693-04 | A-11619         | Ball Shooter         |
| 28    | --            | --              | Not Used             |
| 31    | SW-11A-37     | B-12030-2       | Upper Left Jet       |
| 32    | SW-11A-37     | B-12030-2       | Upper Right Jet      |
| 33    | SW-11A-37     | B-12030-2       | Center Left Jet      |
| 34    | SW-11A-37     | B-12030-2       | Center Right Jet     |
| 35    | SW-11A-37     | B-12030-2       | Lower Jet            |
| 36    | SW-1A-114     | B-8284-1        | Left Slingshot       |
| 37    | SW-1A-120     | A-11539-1       | Right Slingshot      |
| 38    | 5647-12693-19 | A-12688         | Upper Left Loop      |
| 41    | --            | B-11696-1       | Grave "G"            |
| 42    | --            | B-11696-1       | Grave "R"            |
| 43    | 5647-12693-25 | A-14962         | †Chair Kickout       |
| 44a   | --            | B-11696-4       | Cousin It (2)        |
| b     | --            | B-12583-4       | (2)                  |
| 45    | --            | B-11696-15      | Lower Swamp Million  |
| 46    | --            | --              | Not Used             |
| 47    | --            | B-11696-15      | Center Swamp Million |
| 48    | --            | B-11696-15      | Upper Swamp Million  |
| 51    | 5647-12693-19 | A-15372         | Shooter Lane         |
| 52    | --            | --              | Not Used             |
| 53    | --            | A-15017/A-15018 | Bookcase Opto 1      |
| 54    | --            | A-15017/A-15018 | Bookcase Opto 2      |
| 55    | --            | A-15017/A-15018 | Bookcase Opto 3      |
| 56    | --            | A-15017/A-15018 | Bookcase Opto 4      |
| 57    | --            | A-14231/A-14232 | Bumper Lane Opto     |
| 58    | 5647-12693-21 | A-14972         | Right Ramp Exit      |
| 61    | 5647-12693-11 | A-14492         | Left Ramp Enter      |
| 62    | --            | B-11696-5       | Train Wreck          |
| 63    | 5647-12693-19 | A-12688         | Thing Eject Lane     |
| 64    | 5647-12693-11 | A-13627-2       | Right Ramp Enter     |
| 65    | 5647-12693-21 | A-15047         | Right Ramp Top       |
| 66    | 5647-12693-21 | A-15047         | Left Ramp Top        |
| 67    | 5647-12693-19 | A-12688         | Upper Right Loop     |
| 68    | 5647-12693-08 | A-15070         | Vault                |
| 71    | 5647-12693-25 | A-14964         | †Swamp Lock Upper    |
| 72    | 5647-12693-25 | A-14964         | †Swamp Lock Center   |
| 73    | 5647-12693-25 | A-14964         | †Swamp Lock Lower    |
| 74    | 5647-12693-25 | A-14964         | †Lockup Kickout      |
| 75    | 5647-12693-19 | A-12688         | Left Outlane         |
| 76    | 5647-12693-19 | A-12688         | Left Flipper Lane 2  |
| 77    | 5647-12693-25 | A-15200         | †Thing Kickout       |
| 78    | 5647-12693-19 | A-12688         | Left Flipper Lane 1  |
| 81    | 5647-12693-08 | A-14970         | †Bookcase Open       |
| 82    | 5647-12693-08 | A-14970         | †Bookcase Closed     |
| 83    | --            | --              | Not Used             |
| 84    | --            | A-15285         | †Thing Down Opto     |
| 85    | --            | A-15285         | †Thing Up Opto       |
| 86    | --            | B-12583-1       | GRAVE "A"            |
| 87    | 5647-12133-11 | A-9381-R        | Thing Eject Hole     |
| 88    | --            | --              | Not Used             |



\* Not shown.

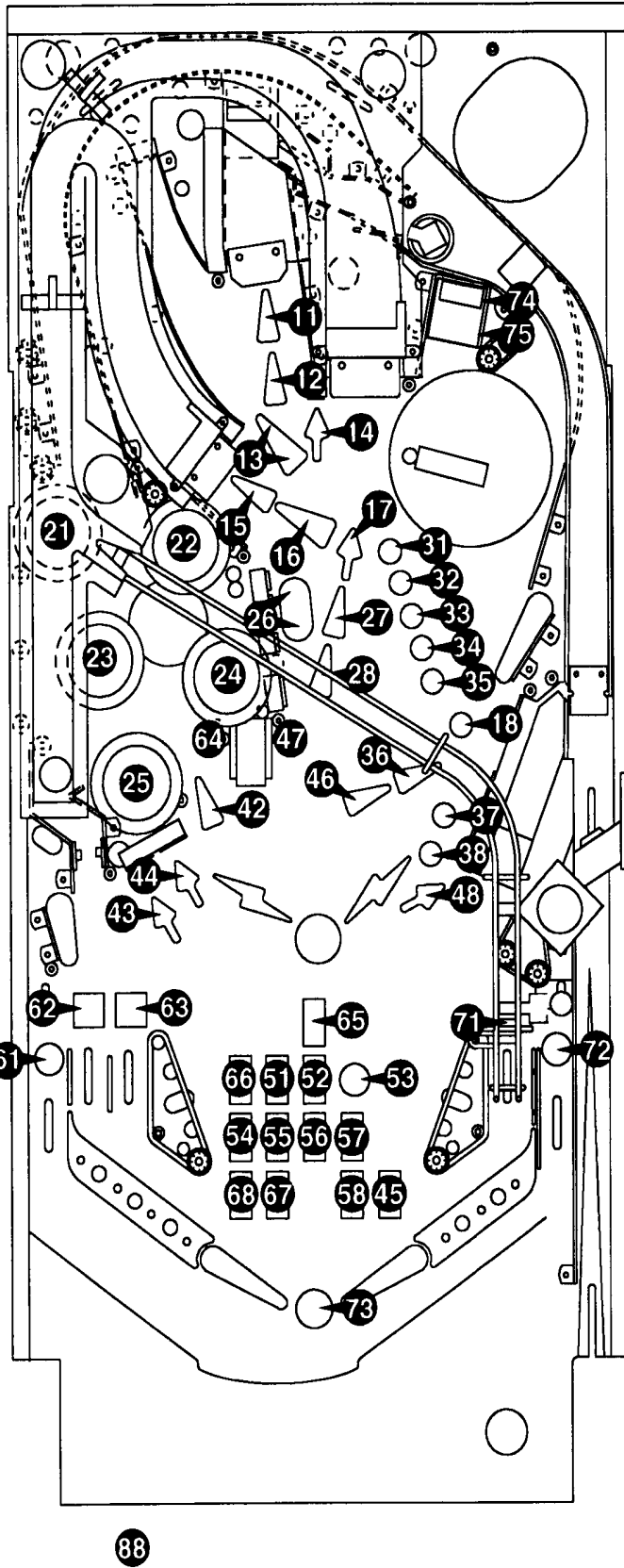
† Located on underside of playfield.

# LAMP LOCATIONS

81 82 83 84 85 86 87

| Item No. | Bulb No. | Lamp Assy. No. | Description                |
|----------|----------|----------------|----------------------------|
| 11       | 24-8768  | A-15114        | Thing Multiball #555       |
| 12       | 24-8768  | A-15114        | Extra Ball #555            |
| 13       | 24-8768  | A-15114        | Jackpot #555 (2)           |
| 14       | 24-6549  | A-11754        | Grave "A" #44              |
| 15       | 24-6549  | A-11754        | Stars #44                  |
| 16       | 24-6549  | A-11754        | Super Jackpot #44          |
| 17       | 24-6549  | A-11754        | Grave "V" #44              |
| 18       | 24-6549  | A-11271        | Upper Swamp Million #44    |
| 21       | 24-8768  | A-11199        | Upper Left Jet #555        |
| 22       | 24-8768  | A-11199        | Upper Right Jet #555       |
| 23       | 24-8768  | A-11199        | Center Left Jet #555       |
| 24       | 24-8768  | A-11199        | Center Right Jet #555      |
| 25       | 24-8768  | A-11199        | Lower Jet #555             |
| 26       | 24-8768  | A-15113        | Cousin It #555 (2)         |
| 27       | 24-8768  | A-15113        | 2 Bear Kicks #555          |
| 28       | 24-8768  | A-15113        | Thing Flips #555           |
| 31       | 24-8768  | A-15112        | G-R-E-E-D "G" #555         |
| 32       | 24-8768  | A-15112        | G-R-E-E-D "R" #555         |
| 33       | 24-8768  | A-15112        | G-R-E-E-D "E"-1 #555       |
| 34       | 24-8768  | A-15112        | G-R-E-E-D "E"-2 #555       |
| 35       | 24-8768  | A-15112        | G-R-E-E-D "D" #555         |
| 36       | 24-8768  | A-15111        | 5X Graveyard #555          |
| 37       | 24-8768  | A-15111        | Center Swamp Million #555  |
| 38       | 24-8768  | A-15111        | Lower Swamp Million #555   |
| 41       | ---      | ---            | Not Used                   |
| 42       | 24-6549  | A-11271        | Advance X #44              |
| 43       | 24-6549  | A-11754        | Grave "G" #44              |
| 44       | 24-6549  | A-11271        | Grave "R" #44              |
| 45       | 24-6549  | A-11271        | The Mamushka #44           |
| 46       | 24-6549  | A-11271        | Swamp Lock #44             |
| 47       | 24-8768  | ---            | Electric Chair Red #555    |
| 48       | 24-6549  | A-11271        | Grave "E" #44              |
| 51       | 24-8768  | A-15110        | Thing #555                 |
| 52       | 24-8768  | A-15110        | Raise The Dead #555        |
| 53       | 24-8768  | A-15110        | Lite Extra Ball #555       |
| 54       | 24-8768  | A-15110        | House 6 Million #555       |
| 55       | 24-8768  | A-15110        | Quick Multiball #555       |
| 56       | 24-8768  | A-15110        | Fester's Tunnel Hunt #555  |
| 57       | 24-8768  | A-15110        | House Seance #555          |
| 58       | 24-8768  | A-15110        | Hit Cousin It #555         |
| 61       | 24-6549  | A-11271        | Left Special #44           |
| 62       | 24-6549  | A-11271        | Lite Thing Flips 1 #44     |
| 63       | 24-6549  | A-11271        | Lite 2 Bear Kicks #44      |
| 64       | 24-8768  | ---            | Electric Chair Yellow #555 |
| 65       | 24-6549  | A-11271        | House "?" #44              |
| 66       | 24-6549  | A-11754        | House 9 Million #44        |
| 67       | 24-8768  | A-15110        | Graveyard At Max #555      |
| 68       | 24-8768  | A-15110        | House 3 Million #555       |
| 71       | 24-6549  | A-11271        | Lite Advance X #44         |
| 72       | 24-6549  | A-11271        | Right Special #44          |
| 73       | 24-8768  | A-12887-B      | Vault Green #555           |
| 75       | 24-8768  | A-12887-B      | Vault Red #555             |
| 76       | ---      | ---            | Not Used                   |
| 77       | 24-8768  | ---            | Thing Yellow #555          |
| 78       | 24-8768  | ---            | Thing Green #555           |
| 81       | 24-8768  | D-12501        | *Thing* "*" -1 #555        |
| 82       | 24-8768  | D-12501        | *Thing* "T" #555           |
| 83       | 24-8768  | D-12501        | *Thing* "H" #555           |
| 84       | 24-8768  | D-12501        | *Thing* "I" #555           |
| 85       | 24-8768  | D-12501        | *Thing* "N" #555           |
| 86       | 24-8768  | D-12501        | *Thing* "G" #555           |
| 87       | 24-8768  | D-12501        | *Thing* "*" -2 #555        |
| 88       | ---      | 20-9663-1      | Credit Button              |

\* Located in Speaker Panel



# SOLENOID/FLASHER LOCATIONS

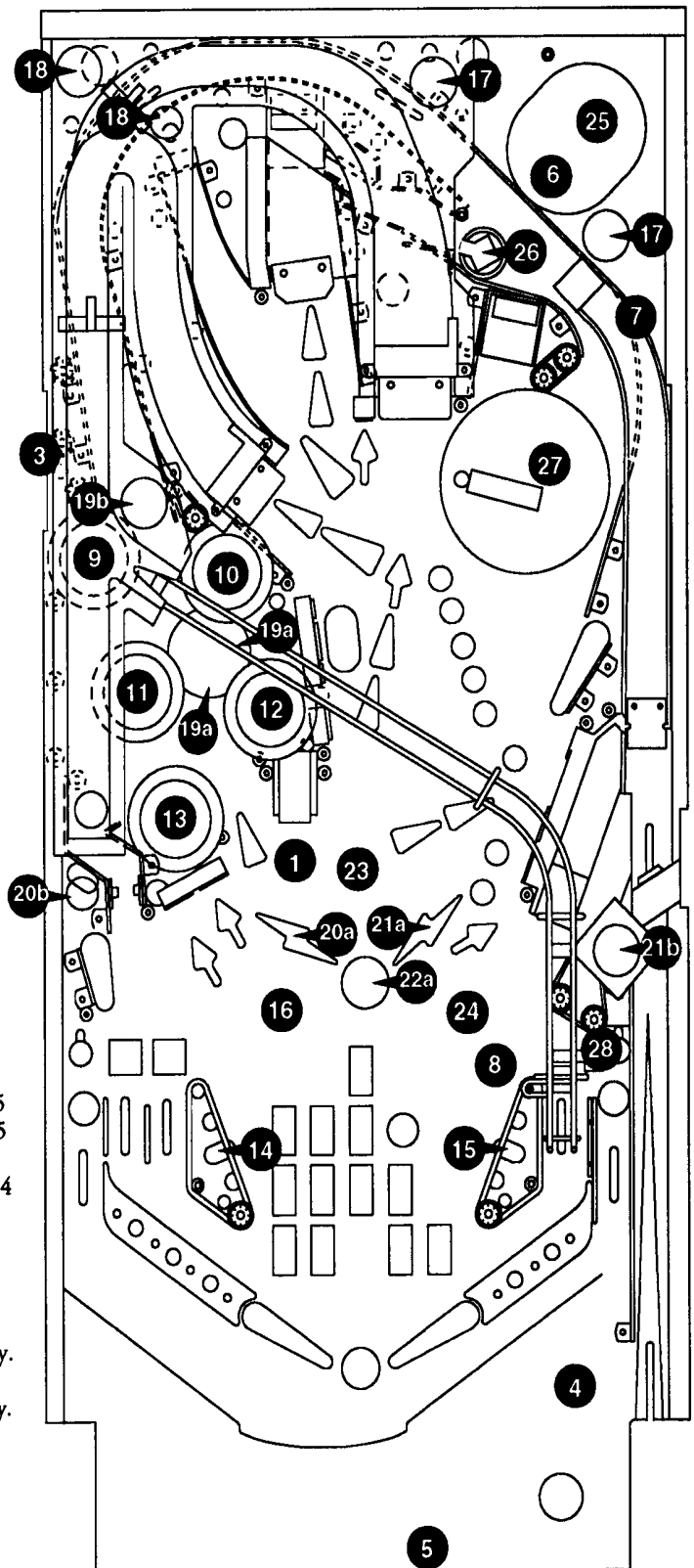
Item   Coil/Flasher   Assy. No.   Description  
           Number

|     |              |            |                   |
|-----|--------------|------------|-------------------|
| 01  | AE-26-1200   | A-15115    | †Chair Kickout    |
| 02  | AE-23-800    | A-15267    | ‡Thing Knocker    |
| 03  | AE-26-1500   | A-15040    | Ramp Diverter     |
| 04  | AE-26-1200   | B-9362-L-2 | Ball Release      |
| 05  | AE-27-1200   | A-8039-3   | Outhole           |
| 06  | ---          | A-12158-1  | Thing Magnet      |
| 07  | AE-23-800    | A-15200    | †Thing Kickout    |
| 08  | AE-26-1200   | A-14107    | †Lockup Kickout   |
| 09  | AE-26-1200   | A-9415-2   | Upper Left Jet    |
| 10  | AE-26-1200   | A-9415-2   | Upper Right Jet   |
| 11  | AE-26-1200   | A-9415-2   | Center Left Jet   |
| 12  | AE-26-1200   | A-9415-2   | Center Right Jet  |
| 13  | AE-26-1200   | A-9415-2   | Lower Jet         |
| 14  | AE-27-1200   | A-14369-L  | Left Slingshot    |
| 15  | AE-27-1200   | A-14369-L  | Right Slingshot   |
| 16  | 20-9247      | ---        | †Left Magnet 12V  |
| 17  | 24-8802 #906 | ---        | Flasher #1 (2)    |
| 18a | 24-8802 #906 | ---        | Flasher #2 (2)    |
| 19a | 24-8802 #906 | A-12336-1  | Flasher #3 (2)    |
| b   | 24-8802 #906 | ---        |                   |
| 20a | 24-8802 #906 | A-12336-1  | Flasher #4        |
| b   | 24-8802 #906 | ---        |                   |
| 21a | 24-8802 #906 | A-12336-1  | Flasher #5        |
| b   | 24-8802 #906 | ---        |                   |
| 22a | 24-8802 #906 | A-12336-1  | Flasher #6        |
| b   | 24-8802 #906 | ---        | « (3)             |
| 23  | 20-9247      | ---        | †Upper Magnet 12V |
| 24  | 20-9247      | ---        | †Right Magnet 12V |
| 25  | 14-7966      | A-14711    | Thing Motor 12V   |
| 26  | AE-30-2000   | A-15368    | Thing Eject Hole  |
| 27  | 14-7969 12V  | A-14970    | Bookcase Motor    |
| 28  | AE-30-2000   | A-15367    | †Swamp Release    |

## General Illumination Circuits

|     |         |         |                            |
|-----|---------|---------|----------------------------|
| *01 | 24-6549 | A-11905 | Left Playfield String #44  |
| *02 | 24-8768 | ---     | Insert House String #555   |
| *03 | 24-8768 | ---     | Insert People String #555  |
| *04 | ---     | ---     | Not Used                   |
| *05 | 24-6549 | A-11905 | Right Playfield String #44 |

|   |          |             |                           |
|---|----------|-------------|---------------------------|
| * | FL-11753 | A-15205-L-1 | Upper Left Flipper Assy.  |
| * | FL-11630 | A-15205-R   | Upper Right Flipper Assy. |
| * | FL-15411 | A-15205-L-4 | Lower Left Flipper Assy.  |
| * | FL-15411 | A-15205-R-4 | Lower Right Flipper Assy. |



\* Not shown.

† Located on bottom of playfield.

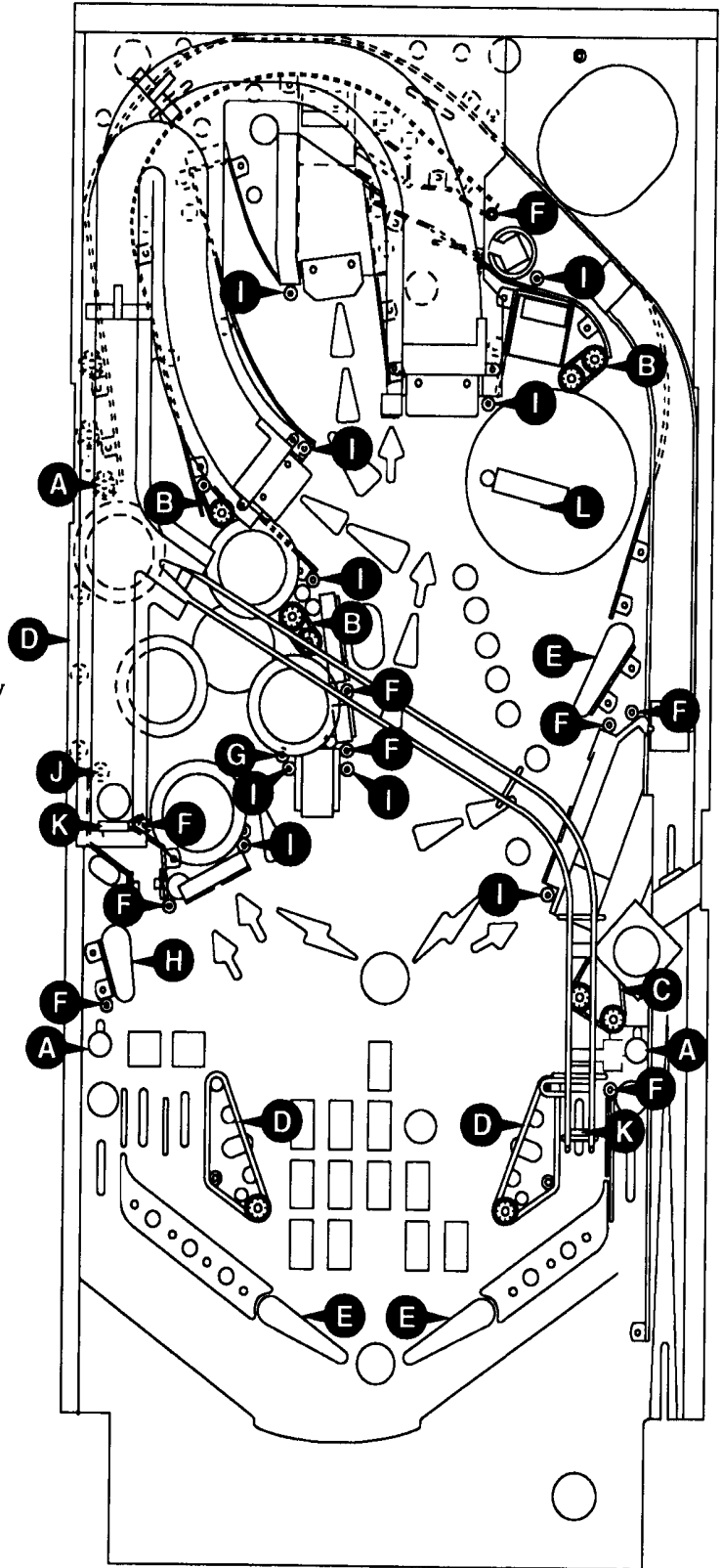
‡ Located in cabinet.

« Located on top of backbox.

# RUBBER RINGS

**ITEM PART NO. QTY DESCRIPTION**

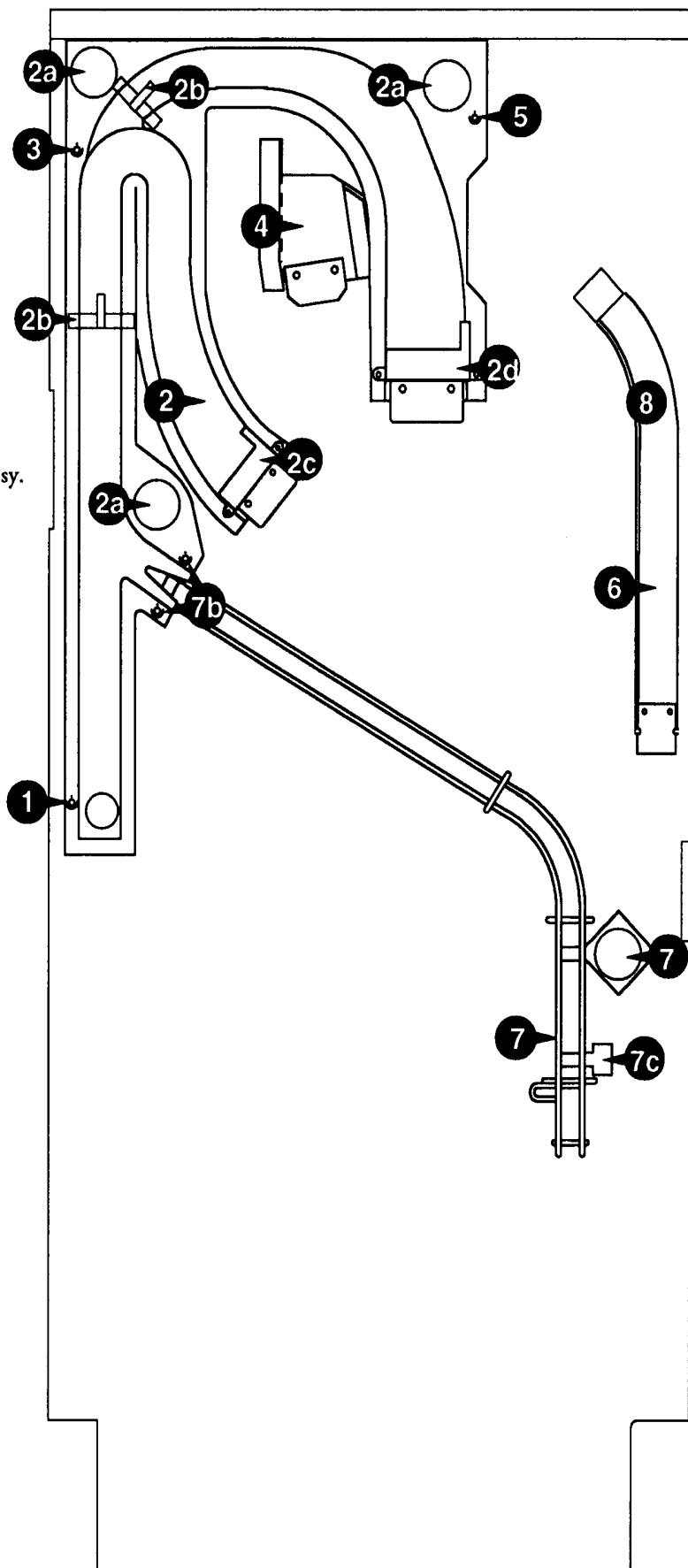
|    |           |   |                             |
|----|-----------|---|-----------------------------|
| A. | 23-6300   | 6 | 5/16" Rubber Ring           |
| B. | 23-6301   | 6 | 3/4" Rubber Ring            |
| C. | 23-6304   | 2 | 1 1/2" Rubber Ring          |
| D. | 23-6305   | 4 | 2" Rubber Ring              |
| E. | 23-6519-4 | 3 | Flipper Rubber, Red         |
| F. | 23-6535   | 9 | Rubber Bumper               |
| G. | 23-6552   | 1 | Rubber Bumper, Yellow       |
| H. | 23-6553-4 | 1 | Small Flipper Rubber, Red   |
| I. | 23-6556   | 9 | Rubber Sleeve, Black        |
| J. | 23-6579   | 1 | 3/4" Tapered Bumper, Yellow |
| K. | 03-7973   | 1 | Nylon Spacer                |
| L. | 23-6629   | 2 | Rubber Pad, Blue            |
| L. | 23-6674   | 1 | Rubber Pad, Blue            |



# RAMPS

| ITEM | PART NO.      | DESCRIPTION               |
|------|---------------|---------------------------|
| 1    | 02-4436-7     | 8-32 x 1 1/2" Standoff    |
|      | A-12258-2     | 8-32 Stud Plate Assy.     |
| 2    | A-15047       | Main Ramp Assy.           |
| a    | A-14265-13    | Receptacal & Skirt Assy.  |
|      | 03-8171-9     | Mini Dome, Red            |
| b    | 5647-12693-21 | Switch                    |
| c    | A-14492       | Ball Gate Assy.           |
| d    | A-13627-2     | Ball Gate Assy.           |
| 3    | 02-4436-5     | 8-32 x 2.83" Standoff     |
|      | A-12258-2     | 8-32 Stud Plate Assy.     |
| 4    | A-15150       | Window Ramp Assy.         |
| 5    | 02-4611-1     | 8-32 x 3 1/2" Standoff    |
| 6    | A-14973       | Shooter Ramp Assy.        |
| 7    | A-14972       | Crossover Wire Ramp Assy. |
| a    | A-14265-13    | Receptacal & Skirt Assy.  |
|      | 03-8171-13    | Mini Dome, Clear          |
| b    | 02-4436-15    | 8-32 x 1 7/8" Standoff    |
| c    | 5647-12693-21 | Switch                    |
| 8    | A-15070       | *Chute Ramp Assy.         |
|      | 5647-12693-08 | Micro Switch              |

\* Located under playfield.



Playfield (Top View)



## Section 3

# *Wiring Diagrams and Schematics*

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### CONNECTOR & COMPONENT IDENTIFICATION

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

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

Prefix numbers for the WPC circuit boards are listed below.

- 1- Power Driver Board
- 2- CPU Board
- 5- Sound Board
- 6- Dot Matrix Controller  
Dot Matrix Display/Driver Board
- 8 - Flipper Controller Board
- 9 - Extra Flipper Supply Board

# LAMP MATRIX

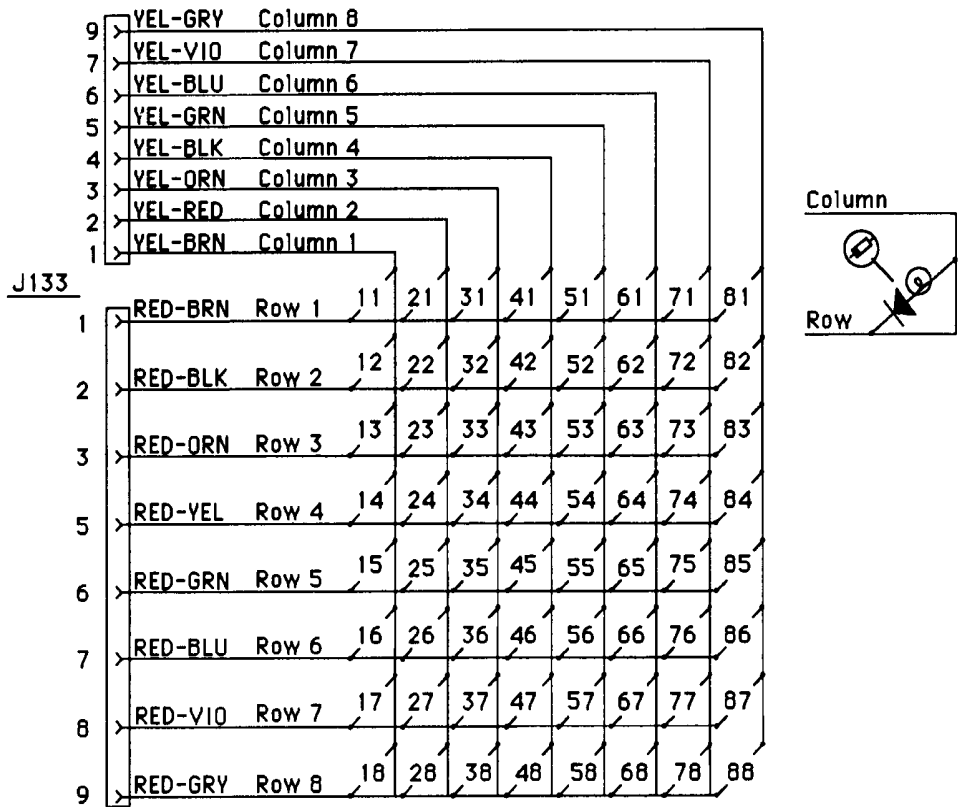
The ADDAMS FAMILY Lamp Matrix

Yellow (B+)  Red

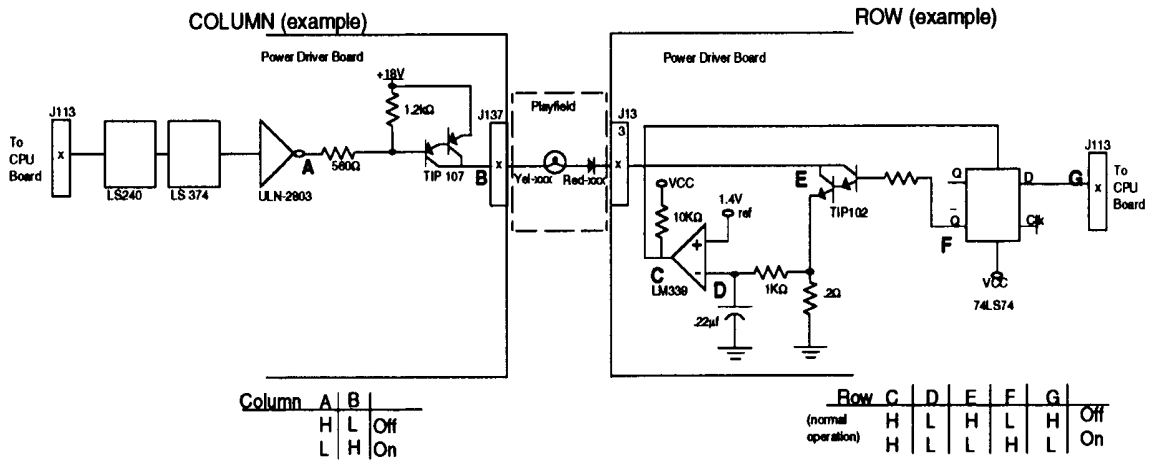
| Column \ Row                     | 1<br>Yellow-Brown<br>J137-1<br>Q98 | 2<br>Yellow-Red<br>J137-2<br>Q97 | 3<br>Yellow-Orange<br>J137-3<br>Q96 | 4<br>Yellow-Black<br>J137-4<br>Q95 | 5<br>Yellow-Green<br>J137-5<br>Q94 | 6<br>Yellow-Blue<br>J137-6<br>Q93 | 7<br>Yellow-Violet<br>J137-7<br>Q92 | 8<br>Yellow-Gray<br>J138-9<br>Q91 |
|----------------------------------|------------------------------------|----------------------------------|-------------------------------------|------------------------------------|------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|
| 1<br>Red-Brown<br>J133-1<br>Q90  | Thing<br>Multiball<br>11           | Upper<br>Left<br>Jet<br>21       | G-R-E-E-D<br>"G"<br>31              | Not<br>Used<br>41                  | Thing<br>51                        | Left<br>Special<br>61             | Lite<br>Advance<br>X<br>71          | *Thing*<br>""-1<br>81             |
| 2<br>Red-Black<br>J133-2<br>Q89  | Extra<br>Ball<br>12                | Upper<br>Right<br>Jet<br>22      | G-R-E-E-D<br>"R"<br>32              | Advance<br>X<br>42                 | Raise<br>The<br>Dead<br>52         | Lite<br>Thing<br>Flips<br>62      | Right<br>Special<br>72              | *Thing*<br>"T"<br>82              |
| 3<br>Red-Orange<br>J133-4<br>Q88 | Jackpot<br>13                      | Center<br>Left<br>Jet<br>23      | G-R-E-E-D<br>"E"-1<br>33            | Grave<br>"G"<br>43                 | Lite<br>Extra<br>Ball<br>53        | Lite<br>2<br>Bear<br>Kicks<br>63  | Shoot<br>Again<br>73                | *Thing*<br>"H"<br>83              |
| 4<br>Red-Yellow<br>J133-5<br>Q87 | Grave<br>"A"<br>14                 | Center<br>Right<br>Jet<br>24     | G-R-E-E-D<br>"E"-2<br>34            | Grave<br>"R"<br>44                 | House<br>6<br>Million<br>54        | Electric<br>Chair<br>Yellow<br>64 | Vault<br>Green<br>74                | *Thing*<br>"I"<br>84              |
| 5<br>Red-Green<br>J133-6<br>Q86  | Stars<br>15                        | Lower<br>Jet<br>25               | G-R-E-E-D<br>"D"<br>35              | The<br>Mamushku<br>45              | Quick<br>Multiball<br>55           | House<br>"?"<br>65                | Vault<br>Red<br>75                  | *Thing*<br>"N"<br>85              |
| 6<br>Red-Blue<br>J133-7<br>Q85   | Super<br>Jackpot<br>16             | Cousin<br>It<br>26               | 5X<br>Graveyard<br>36               | Swamp<br>Lock<br>46                | Fester's<br>Tunnel<br>Hunt<br>56   | House<br>9<br>Million<br>66       | Not<br>Used<br>76                   | *Thing*<br>"G"<br>86              |
| 7<br>Red-Violet<br>J133-8<br>Q84 | Grave<br>"V"<br>17                 | 2<br>Bear<br>Kicks<br>27         | Center<br>Swamp<br>Million<br>37    | Electric<br>Chair<br>Red<br>47     | House<br>Seance<br>57              | Graveyard<br>At<br>Max<br>67      | Thing<br>Yellow<br>77               | *Thing*<br>""-2<br>87             |
| 8<br>Red-Gray<br>J133-9<br>Q83   | Upper<br>Swamp<br>Million<br>18    | Thing<br>Flips<br>28             | Lower<br>Swamp<br>Million<br>38     | Grave<br>"E"<br>48                 | Hit<br>Cousin<br>It<br>58          | House<br>3<br>Million<br>68       | Thing<br>Green<br>78                | Credit<br>Button<br>88            |



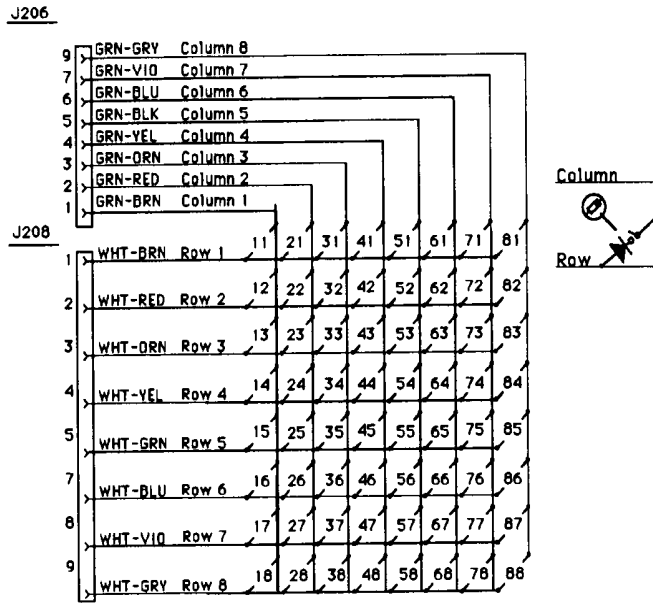
J137



Lamp Circuit



# SWITCH MATRIX



## The ADDAMS FAMILY Switch Matrix

| Dedicated Grounded Switches   | White → ← Green                 |                                      |                                    |                                       |                                       |                                      |                                     |                                       | Flipper Grounded Switches |   |
|---|---------------------------------|--------------------------------------|------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|-------------------------------------|---------------------------------------|---------------------------|---|
|   | Column                          | 1<br>Green-Brown<br>J206-1<br>U20-18 | 2<br>Green-Red<br>J206-2<br>U20-17 | 3<br>Green-Orange<br>J206-3<br>U20-16 | 4<br>Green-Yellow<br>J206-4<br>U20-15 | 5<br>Green-Black<br>J206-5<br>U20-14 | 6<br>Green-Blue<br>J206-6<br>U20-13 | 7<br>Green-Violet<br>J206-7<br>U20-12 |                           | 8<br>Green-Gray<br>J206-9<br>U20-11                               |
| Row   | 1                               | 2                                    | 3                                  | 4                                     | 5                                     | 6                                    | 7                                   | 8                                     |                           |   |
| Orange-Brown (1)<br>J205-1<br>Left Coin Chute<br>D1                 | White-Brown<br>J208-1<br>U18-11 | Not Used                             | Slam Tilt                          | Upper Left Jet                        | Grave "G"                             | Shooter Lane                         | Left Ramp Enter                     | Swamp Lock Upper                      | Bookcase Open             | Black-Green<br>J806-1<br>Right Flipper End of Stroke<br>F1        |
| Orange-Red (2)<br>J205-2<br>Center Coin Chute<br>D2                 | White-Red<br>J208-2<br>U18-9    | Not Used                             | Coin Door Closed                   | Upper Right Jet                       | Grave "R"                             | Not Used                             | Train Wreck                         | Swamp Lock Center                     | Bookcase Closed           | Blue-Violet<br>J805-1<br>Right Flipper Center<br>F2               |
| Orange-Black (3)<br>J205-3<br>Right Coin Chute<br>D3                | White-Orange<br>J208-3<br>U18-5 | Start Button                         | Ticket Opto.                       | Center Left Jet                       | Chair Kickout                         | Bookcase Opto 1                      | Thing Eject Lane                    | Swamp Lock Lower                      | Not Used                  | Black-Blue<br>J806-3<br>Left Flipper End of Stroke<br>F3          |
| Orange-Yellow (4)<br>J205-4<br>4th Coin Chute<br>D4                 | White-Yellow<br>J208-4<br>U18-7 | Plumb Bob Tilt                       | Always Closed                      | Center Left Jet                       | Cousin It                             | Bookcase Opto 2                      | Right Ramp Enter                    | Lockup Kickout                        | Thing Down Opto           | Blue-Gray<br>J805-2<br>Left Flipper Button<br>F4                  |
| Orange-Green (5)<br>J205-6<br>Normal Function Service Credits<br>D5 | White-Green<br>J208-5<br>U19-11 | Left Trough                          | Right Flipper Lane                 | Lower Jet                             | Lower Swamp Million                   | Bookcase Opto 3                      | Right Ramp Top                      | Left Outlane                          | Thing Up Opto             | Black-Violet<br>J806-4<br>Upper Right Flipper End of Stroke<br>F5 |
| Orange-Blue (6)<br>J205-7<br>Normal Function Volume Down<br>D6      | White-Blue<br>J208-7<br>U19-9   | Center Trough                        | Right Outlane                      | Left Slingshot                        | Not Used                              | Bookcase Opto 4                      | Left Ramp Top                       | Left Flipper Lane 2                   | Grave "A"                 | Black-Yellow<br>J805-3<br>Upper Right Flipper Button<br>F6        |
| Orange-Violet (7)<br>J205-8<br>Normal Function Volume Up<br>D7      | White-Violet<br>J208-8<br>U19-5 | Right Trough                         | Ball Shooter                       | Right Slingshot                       | Center Swamp Million                  | Bumper Lane Opto                     | Upper Right Loop                    | Thing Kickout                         | Thing Eject Hole          | Black-Gray<br>J806-5<br>Upper Left Flipper End of Stroke<br>F7    |
| Orange-Gray (8)<br>J205-9<br>Normal Function Water Test<br>D8       | White-Gray<br>J208-9<br>U19-7   | Outhole                              | Not Used                           | Upper Left Loop                       | Upper Swamp Million                   | Right Ramp Exit                      | Vault                               | Left Flipper Lane 1                   | Not Used                  | Black-Blue<br>J805-5<br>Upper Left Flipper Button<br>F8           |

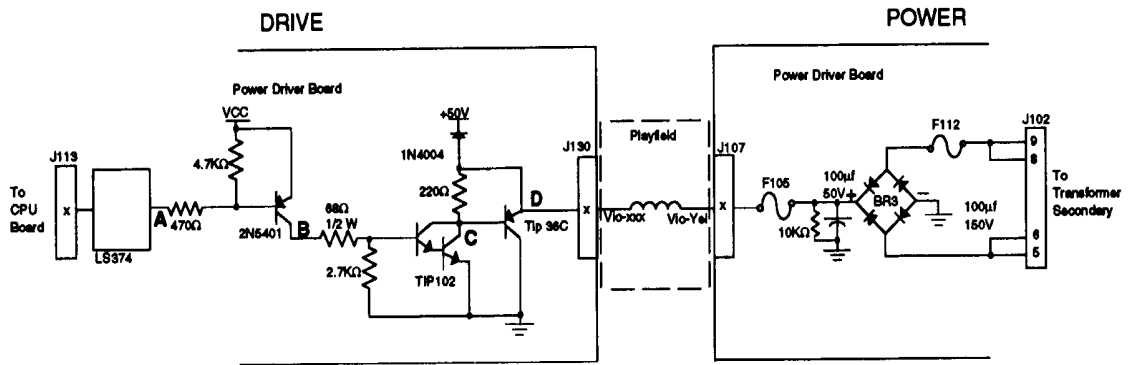


## SOLENOID/FLASHER TABLE

| Sol. No. | Function                             | Solenoid Type | Wire Color | Connection    | Driver Trnstr | Solenoid Part Number<br>Flashlamp Type |
|----------|--------------------------------------|---------------|------------|---------------|---------------|--|
| 01       | Chair Kickout                        | High Power    | Vio-Brn    | J130-1        | Q82           | AE-26-1200                             |
| 02       | Thing Knocker                        | High Power    | Vio-Red    | J130-2        | Q80           | AE-23-800                              |
| 03       | Ramp Diverter                        | High Power    | Vio-Orn    | J130-4        | Q78           | AE-26-1500                             |
| 04       | Ball Release                         | High Power    | Vio-Yel    | J130-5        | Q76           | AE-26-1200                             |
| 05       | Outhole                              | High Power    | Vio-Grn    | J130-6        | Q64           | AE-27-1200                             |
| 06       | Thing Magnet                         | High Power    | Vio-Blu    | J130-7        | Q66           | A-12158-1                              |
| 07       | Thing Kickout                        | High Power    | Vio-Blk    | J130-8        | Q68           | AE-23-800                              |
| 08       | Lockup Kickout                       | High Power    | Vio-Gry    | J130-9        | Q70           | AE-26-1200                             |
| 09       | Upper Left Jet                       | Low Power     | Brn-Blk    | J127-1        | Q58           | AE-26-1200                             |
| 10       | Upper Right Jet                      | Low Power     | Brn-Red    | J127-3        | Q56           | AE-26-1200                             |
| 11       | Center Left Jet                      | Low Power     | Brn-Org    | J127-4        | Q54           | AE-26-1200                             |
| 12       | Center Right Jet                     | Low Power     | Brn-Yel    | J127-5        | Q52           | AE-26-1200                             |
| 13       | Lower Jet                            | Low Power     | Brn-Grn    | J127-6        | Q50           | AE-26-1200                             |
| 14       | Left Slingshot                       | Low Power     | Brn-Blu    | J127-7        | Q48           | AE-27-1200                             |
| 15       | Right Slingshot                      | Low Power     | Brn-Vio    | J127-8        | Q46           | AE-27-1200                             |
| 16       | Left Magnet*                         | Low Power     | Brn-Gry    | J127-9        | Q44           | 20-9247 12V                            |
| 17       | Telephone/Upper Right Ramp           | Flasher       | Blk-Brn    | J126-1 J125-1 | Q42           | #906                                   |
| 18       | Train/Upper Left Ramp                | Flasher       | Blk-Red    | J126-2 J125-2 | Q40           | #906                                   |
| 19       | Lower Ramp/Jet Bumpers (2)           | Flasher       | Blk-Org    | J126-3 J125-3 | Q38           | #906                                   |
| 20       | Left Lightning Bolt/Mini Flipper     | Flasher       | Blk-Yel    | J126-4 J125-5 | Q36           | #906                                   |
| 21       | Right Lightning Bolt/Swamp           | Flasher       | Blu-Grn    | J126-5 J125-6 | Q28           | #906                                   |
| 22       | The Power/Backbox Clowd (3)          | Flasher       | Blu-Blk    | J126-6 J125-7 | Q30           | #906                                   |
| 23       | Upper Magnet*                        | Low Power     | Blu-Vio    | J126-7 J125-8 | Q34           | 20-9247 12V                            |
| 24       | Right Magnet*                        | Low Power     | Blu-Gry    | J126-8 J125-9 | Q32           | 20-9247 12V                            |
| 25       | Thing Motor                          | Flasher       | Blu-Brn    | J122-1        | Q26           | 14-7966 12V                            |
| 26       | Thing Eject Hole                     | Flasher       | Blu-Red    | J122-2        | Q24           | AE-30-2000                             |
| 27       | Bookcase Motor                       | Flasher       | Blu-Org    | J122-3        | Q22           | 14-7969 12V                            |
| 28       | Swamp Release                        | Flasher       | Blu-Yel    | J122-4        | Q20           | AE-30-2000                             |
|          | <b>General Illumination Circuits</b> |               |            |               |               |  |
| 01       | Left Playfield String                | G.I.          | Brown      | J120-1        | Q18           | #44                                    |
| 02       | Insert House String                  | G.I.          | Orange     | J120-2        | Q10           | #555                                   |
| 03       | Insert People String                 | G.I.          | Yellow     | J120-3        | Q14           | #555                                   |
| 04       | Not Used                             | G.I.          | Green      | J121-5        | Q16           |  |
| 05       | Right Playfield String               | G.I.          | Violet     | J121-6        | Q12           | #44                                    |
|          |                                      |               |            |               |               |  |
|          | Upper Left Flipper                   |               | Gry-Yel    | J109-5        |               | FL-11753                               |
|          | Upper Right Flipper                  |               | Blu-Yel    | J109-7        |               | FL-11630                               |
|          | Lower Left Flipper                   |               | Gry-Yel    | J109-5        |               | FL-15411                               |
|          | Lower Right Flipper                  |               | Blu-Yel    | J109-7        |               | FL-15411                               |

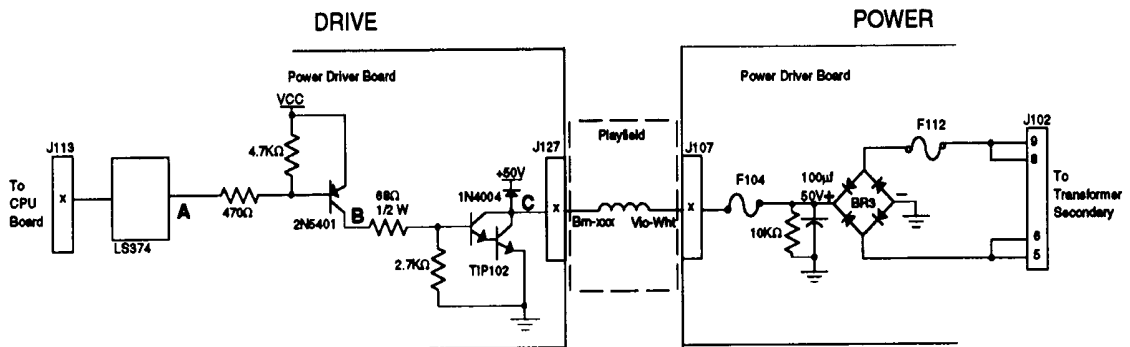
\*Magnet fuse is a 5 Amp S.B. located on the underside of the playfield.

## High Power Solenoid Circuit



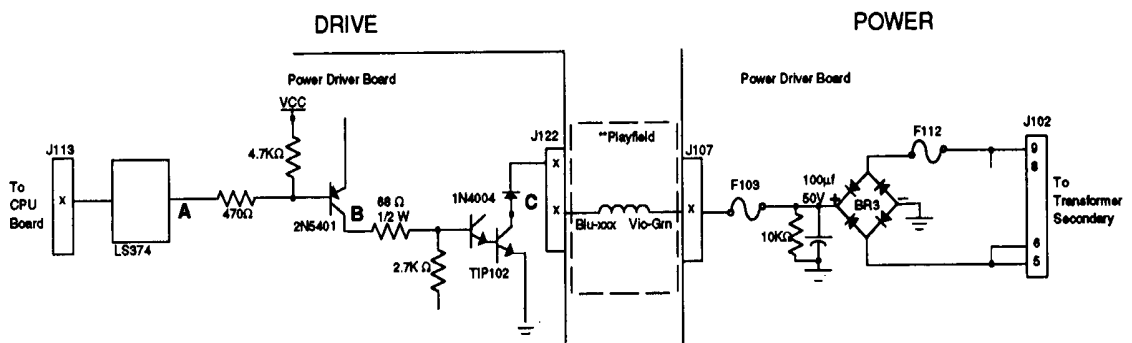
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" the collector of the 2N5401 transistor is high. A high at point "B" causes point "C" the collector of the TIP102 transistor, and point "D" the emitter of the TIP36 transistor to drop low. When point "D" is low the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

## Low Power Solenoid Circuit



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

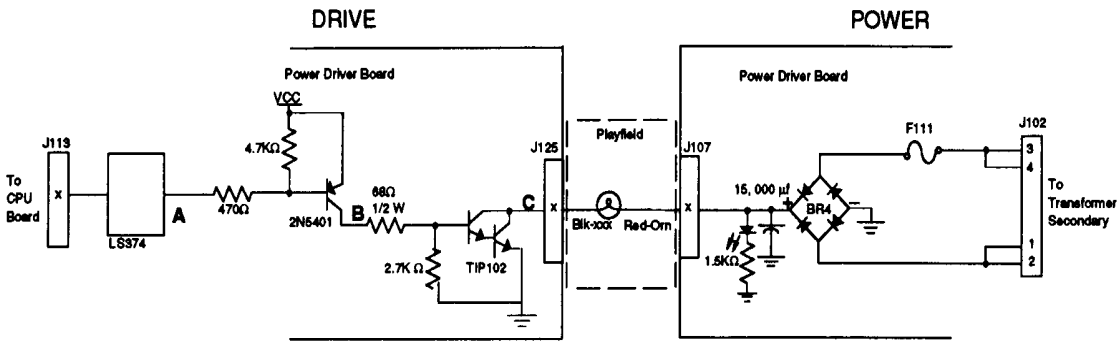
## Special (General Purpose) Solenoid Circuit



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

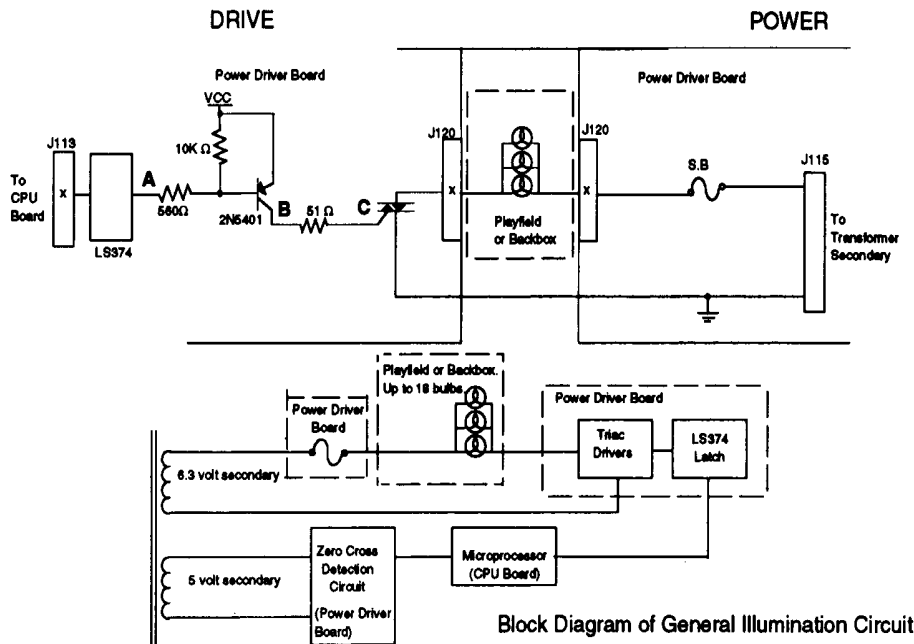
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" is high. A high at point "B" causes a low at point "C". When point "C" is low the coil/flashlamp is grounded through the transistor and the coil/flashlamp turns On. When point "A" toggles high the coil/flashlamp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

## Flashlamp Circuit



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

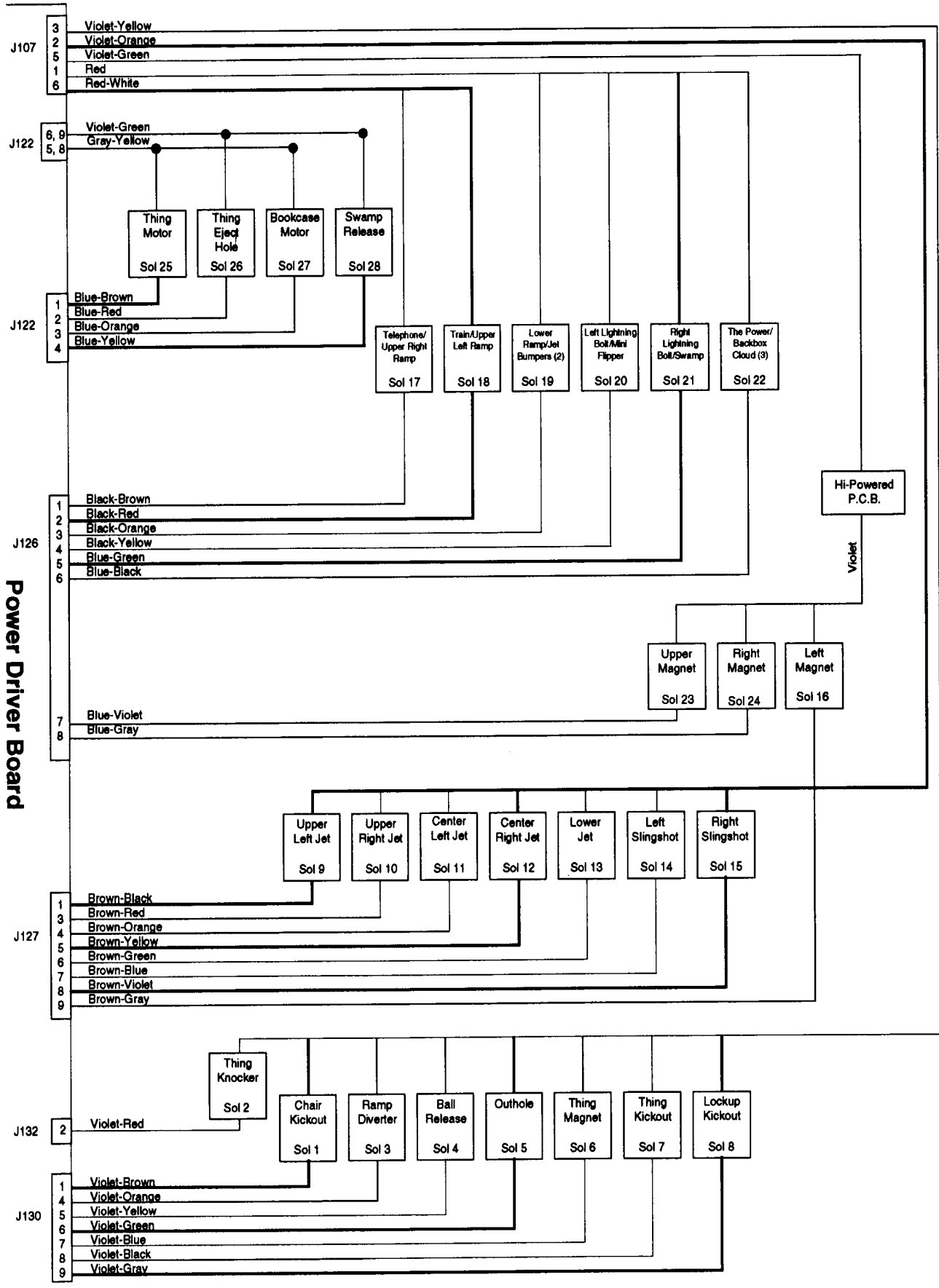
## General Illumination



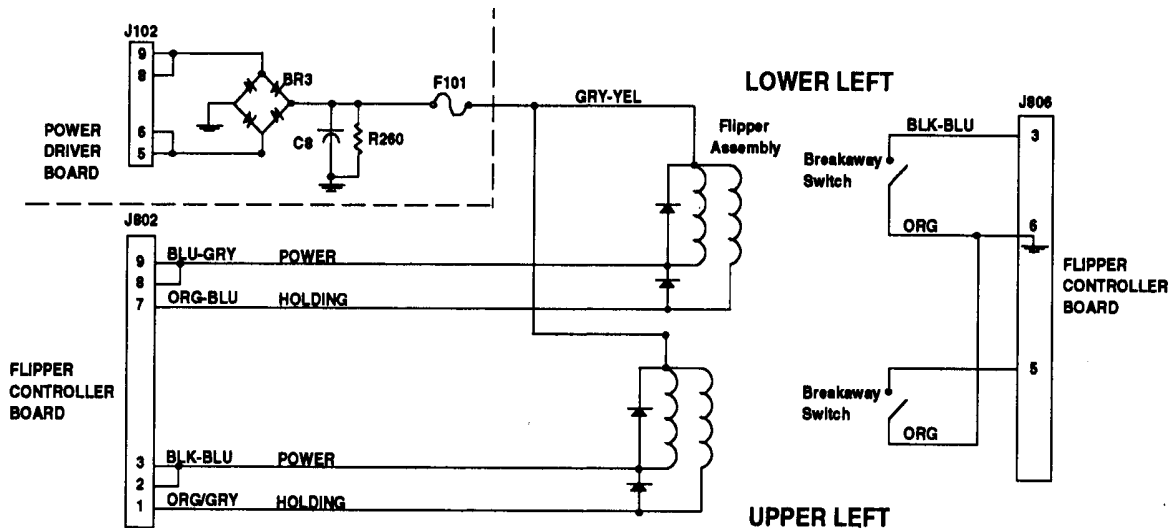
Block Diagram of General Illumination Circuit

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

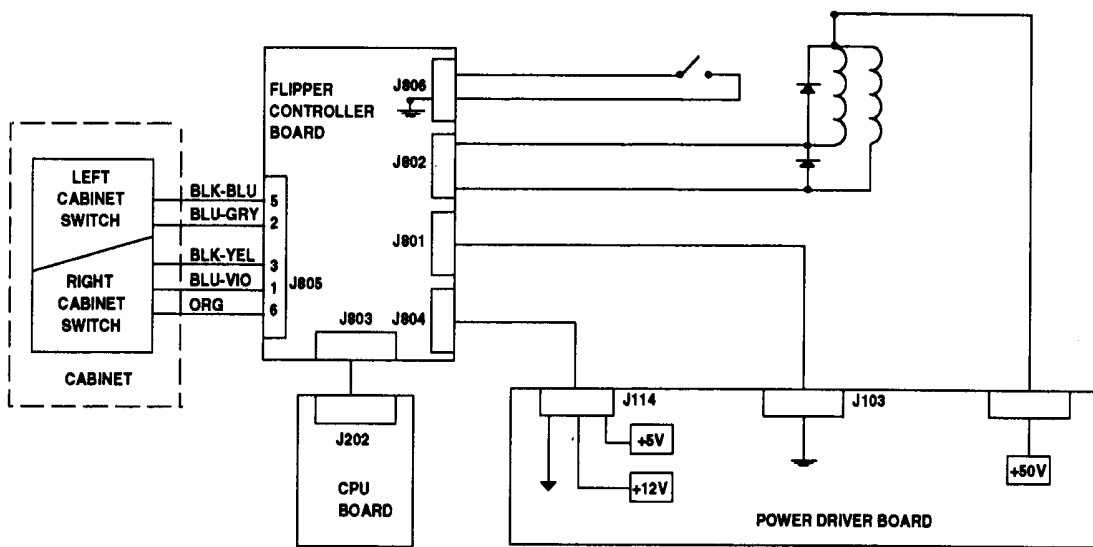
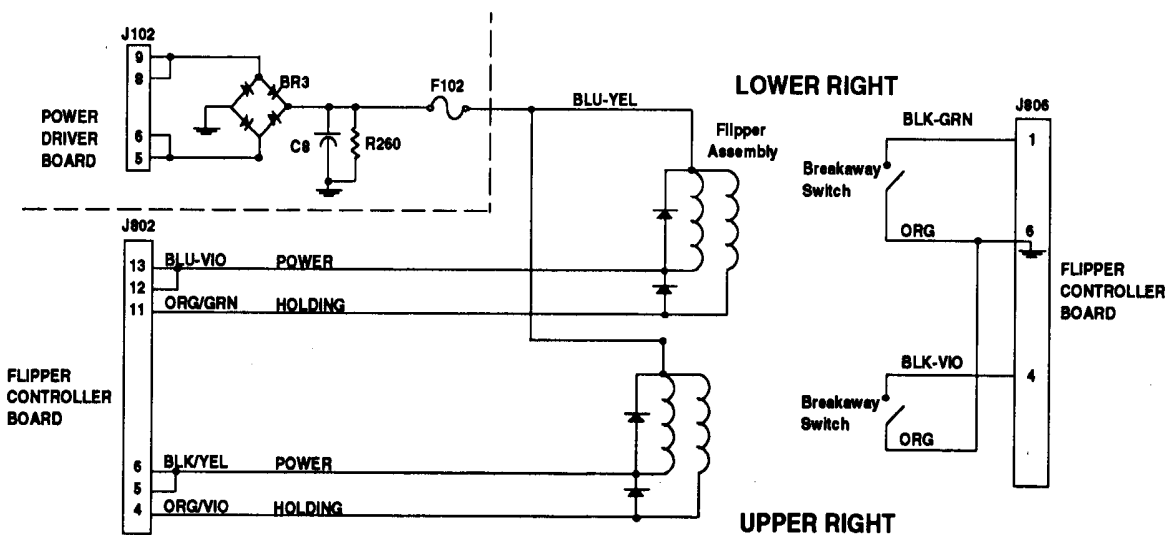
# SOLENOID WIRING



### LEFT FLIPPER CIRCUIT



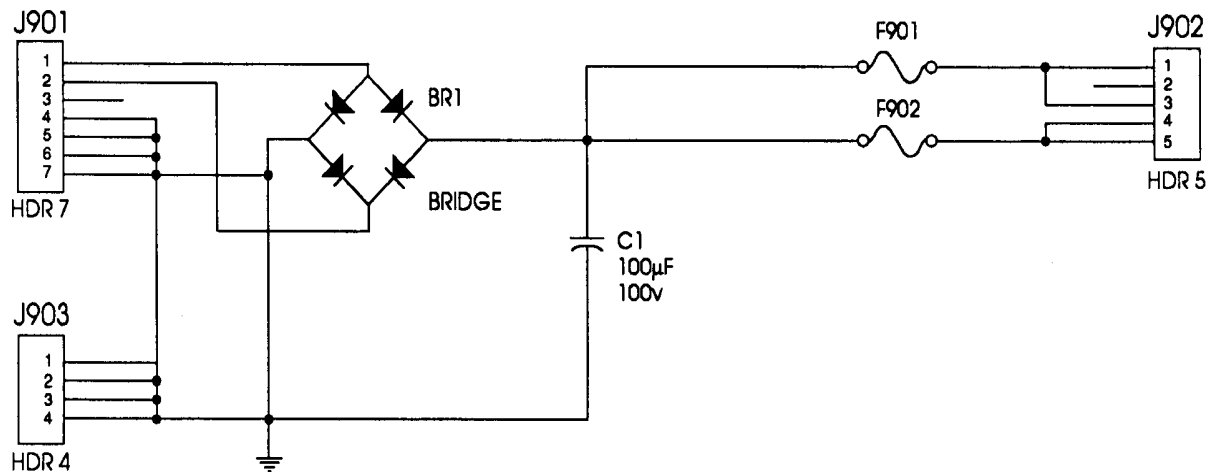
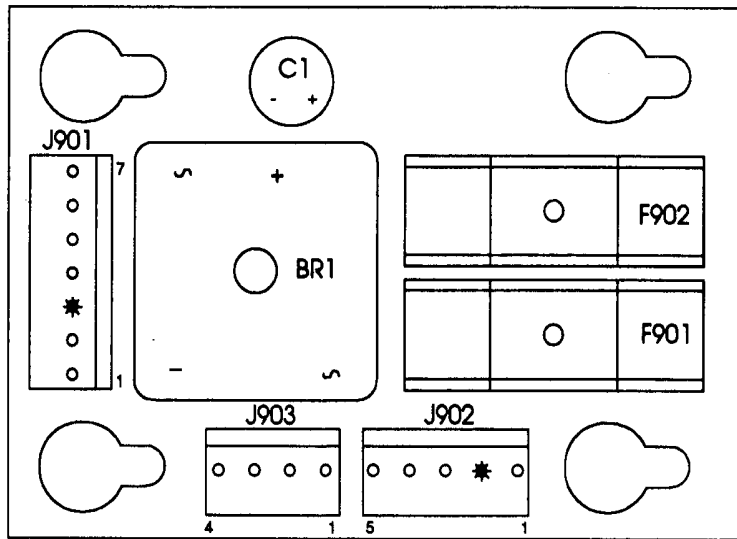
### RIGHT FLIPPER CIRCUIT



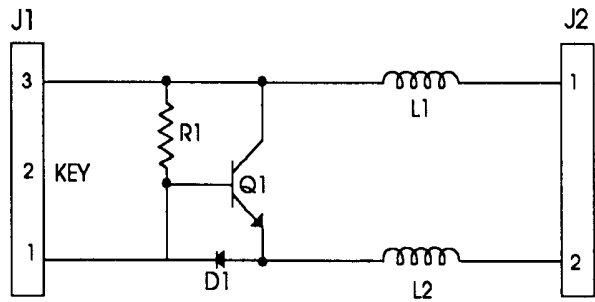
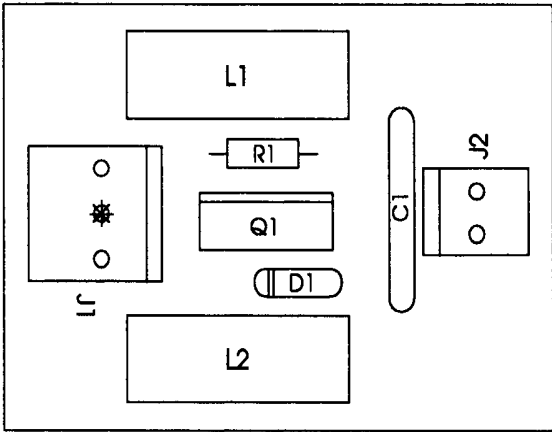
**BLOCK DIAGRAM OF FLIPPER CIRCUIT**



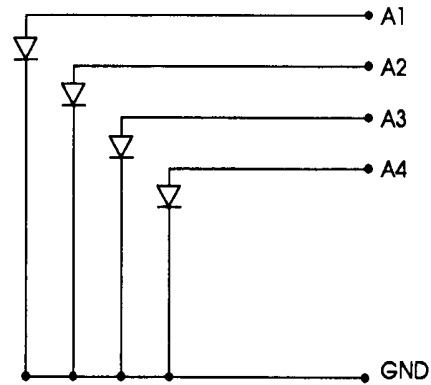
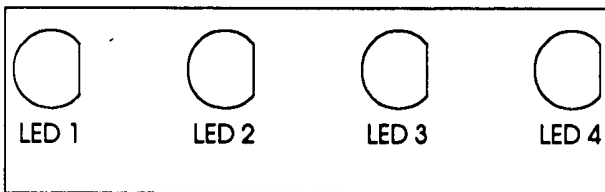
# A-15416 Extra Flipper Supply Board & Schematic



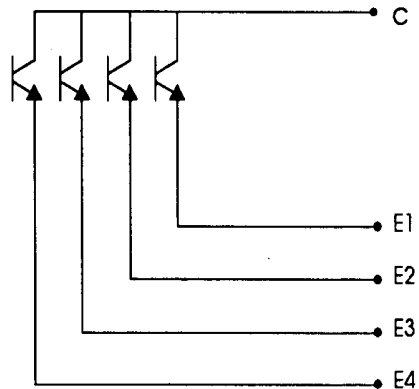
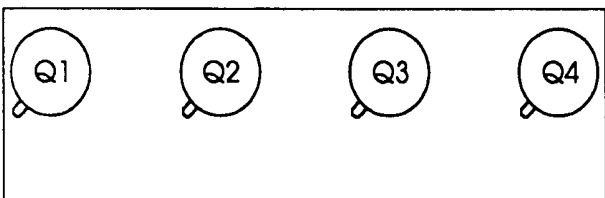
## A-15340 Motor EMI Board & Schematic



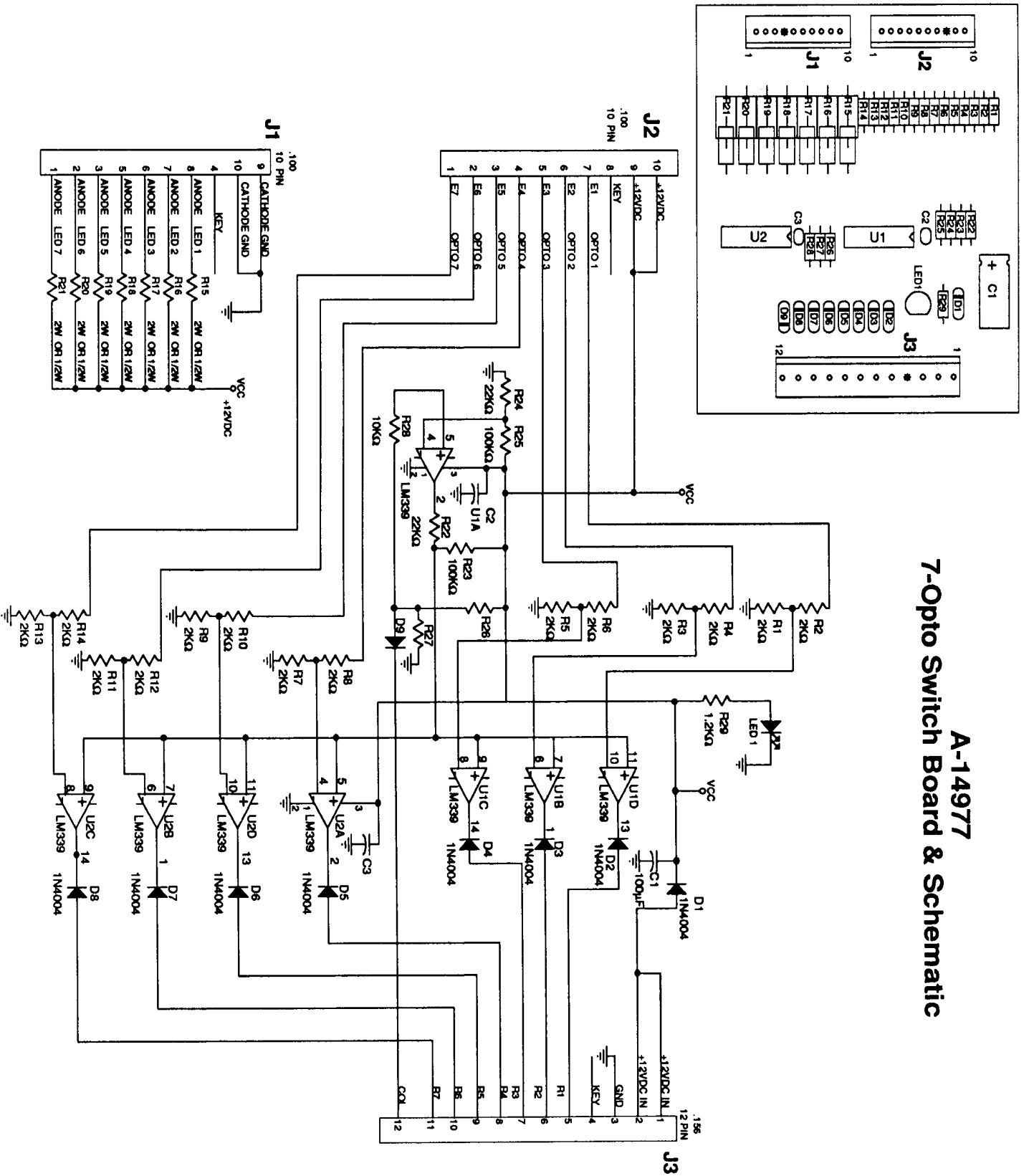
## A-15018 4 I.R. LED Board & Schematic



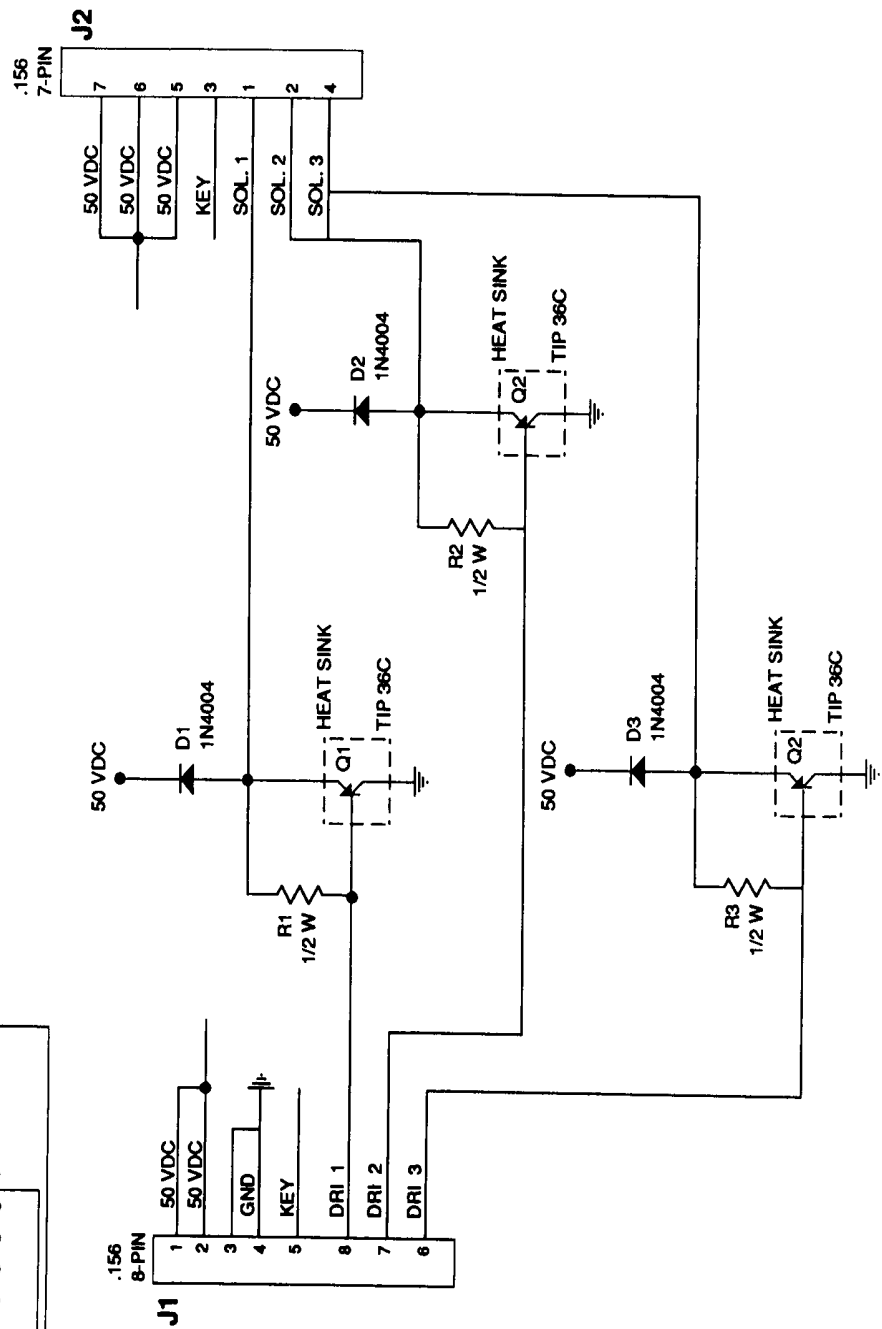
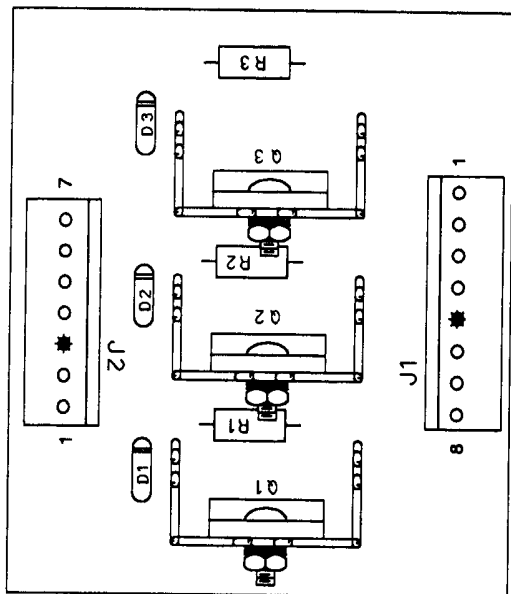
## A-15017 4 -Opto Board & Schematic



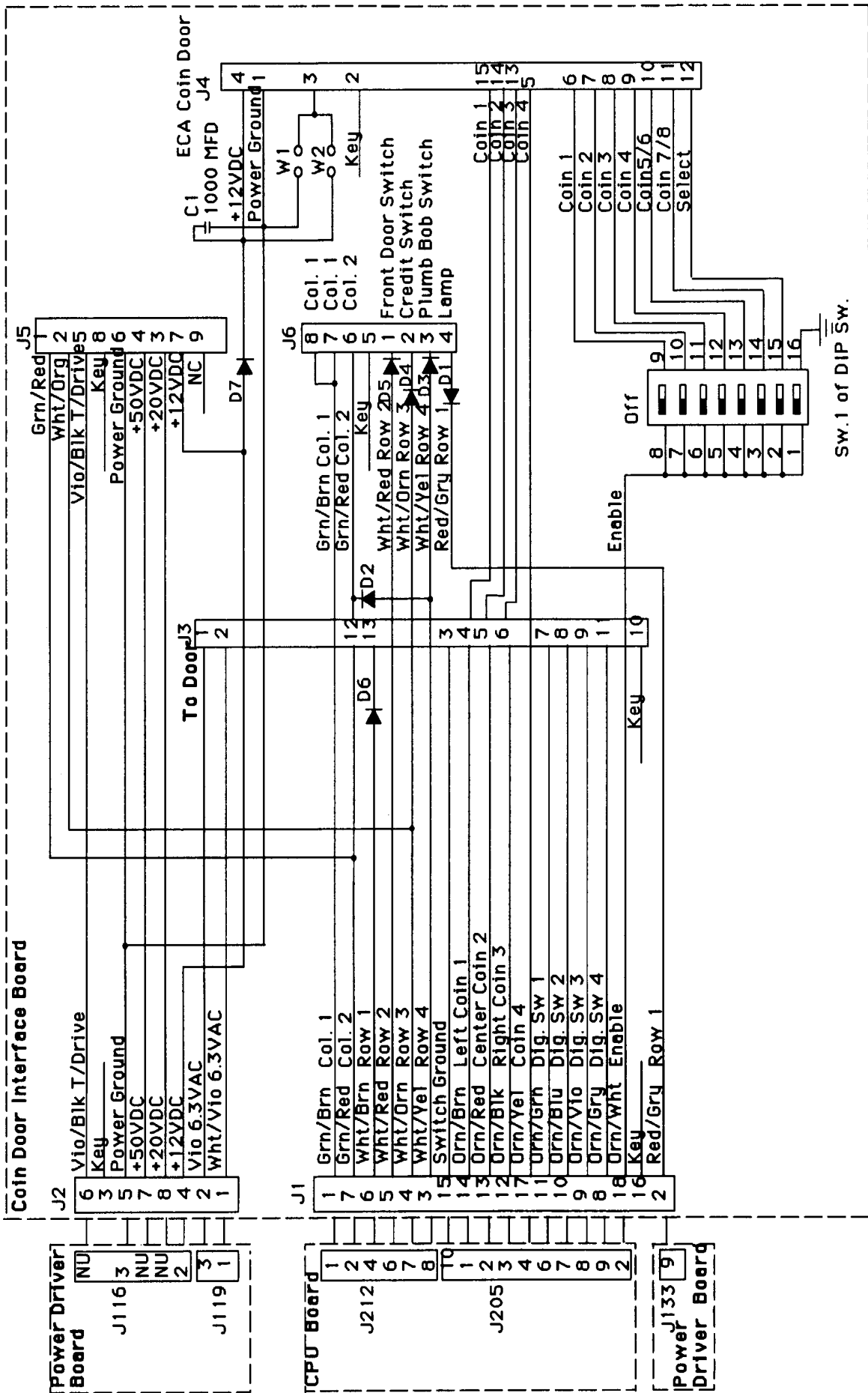
# A-14977 7-Opto Switch Board & Schematic



# A-15139 High Power Board & Schematic



# A-14689 Coin Door Interface Board Schematic



## Switch Circuits

Connector From CPU:

| <u>Wire Color</u> | <u>Function</u> | <u>To Playfield</u> | <u>To Cabinet</u> | <u>I.C.'s</u> |
|-------------------|-----------------|---------------------|-------------------|---------------|
| Green/Brown       | Column 1        | J206-1              | J212-1            | U20-18        |
| Green/Red         | Column 2        | J206-2              | J212-2            | U20-17        |
| Green/Orange      | Column 3        | J206-3              |                   | U20-16        |
| Green/Yellow      | Column 4        | J206-4              |                   | U20-15        |
| Green/Black       | Column 5        | J206-5              |                   | U20-14        |
| Green/Blue        | Column 6        | J206-6              |                   | U20-13        |
| Green/Violet      | Column 7        | J206-7              |                   | U20-12        |
| Green/Gray        | Column 8        | J206-9              |                   | U20-11        |
| White/Brown       | Row 1           | J208-1              | J212-4            | U18-11        |
| White/Red         | Row 2           | J208-2              | J212-6            | U18-9         |
| White/Orange      | Row 3           | J208-3              | J212-7            | U18-5         |
| White/Yellow      | Row 4           | J208-4              | J212-8            | U18-7         |
| White/Green       | Row 5           | J208-5              |                   | U19-11        |
| White/Blue        | Row 6           | J208-7              |                   | U19-9         |
| White/Violet      | Row 7           | J208-8              |                   | U19-5         |
| White/Gray        | Row 8           | J208-9              |                   | U19-7         |
| Orange/Brown      | Direct 1        | Left Coin           | J205-1            | U17-5         |
| Orange/Red        | Direct 2        | Center Coin         | J205-2            | U17-7         |
| Orange/Black      | Direct 3        | Right Coin          | J205-3            | U17-11        |
| Orange/Yellow     | Direct 4        | 4th Coin            | J205-4            | U17-9         |
| Orange/Green      | Direct 5        | Escape/Service      | J205-6            | U16-9         |
| Orange/Blue       | Direct 6        | Down/Vol. Down      | J205-7            | U16-11        |
| Orange/Violet     | Direct 7        | Up/Vol. Up          | J205-8            | U16-7         |
| Orange/Gray       | Direct 8        | Enter/Test          | J205-9            | U16-5         |
| Black             |                 | Ground              | J205-10           |               |
| Orange/White      |                 | Enable              | J205-12           |               |

## Lamp Circuits

Connectors From Power Driver Board:

| <u>Wire Color</u> | <u>Function</u> | <u>To Playfield</u> | <u>To Cabinet</u> | <u>To Backbox</u> | <u>Transistor</u> |
|-------------------|-----------------|---------------------|-------------------|-------------------|-------------------|
| Yellow/Brown      | Column 1        | J137-1              |                   |                   | Q98               |
| Yellow/Red        | Column 2        | J137-2              |                   |                   | Q97               |
| Yellow/Orange     | Column 3        | J137-3              |                   |                   | Q96               |
| Yellow/Black      | Column 4        | J137-4              |                   |                   | Q95               |
| Yellow/Green      | Column 5        | J137-5              |                   |                   | Q94               |
| Yellow/Blue       | Column 6        | J137-6              |                   |                   | Q93               |
| Yellow/Violet     | Column 7        | J137-7              |                   |                   | Q92               |
| Yellow/Gray       | Column 8        |                     | J136-3            | J138-9            | Q91               |
| Red/Brown         | Row 1           | J133-1              | J134-1            |                   | Q90               |
| Red/Black         | Row 2           | J133-2              | J134-2            |                   | Q89               |
| Red /Orange       | Row 3           | J133-4              | J134-4            |                   | Q88               |
| Red/Yellow        | Row 4           | J133-5              | J134-5            |                   | Q87               |
| Red/Green         | Row 5           | J133-6              | J134-6            |                   | Q86               |
| Red/Blue          | Row 6           | J133-7              | J134-7            |                   | Q85               |
| Red/Violet        | Row 7           | J133-8              | J134-8            |                   | Q84               |
| Red/Gray          | Row 8           | J133-9              | J135-9            |                   | Q83               |

## Solenoid Circuits

Connectors From Power Driver Board:

| <u>Wire Color</u> | <u>Function</u>              | <u>To Backbox</u> | <u>To Playfield</u> | <u>Transistor</u> |
|-------------------|------------------------------|-------------------|---------------------|-------------------|
| Violet/Brown      | Solenoid 1, High Power       |                   | J130-1              | Q82               |
| Violet/Red        | Solenoid 2, High Power       |                   | J132-2              | Q80               |
| Violet/Orange     | Solenoid 3, High Power       |                   | J130-4              | Q78               |
| Violet/Yellow     | Solenoid 4, High Power       |                   | J130-5              | Q76               |
| Violet/Green      | Solenoid 5, High Power       |                   | J130-6              | Q64               |
| Violet/Blue       | Solenoid 6, High Power       |                   | J130-7              | Q66               |
| Violet/Black      | Solenoid 7, High Power       |                   | J130-8              | Q68               |
| Violet/Gray       | Solenoid 8, High Power       |                   | J130-9              | Q70               |
| <hr/>             |                              |                   |                     |                   |
| Brown/Black       | Solenoid 9, Low Power        |                   | J127-1              | Q58               |
| Brown/Red         | Solenoid 10, Low Power       |                   | J127-3              | Q56               |
| Brown/Orange      | Solenoid 11, Low Power       |                   | J127-4              | Q54               |
| Brown/Yellow      | Solenoid 12, Low Power       |                   | J127-5              | Q52               |
| Brown/Green       | Solenoid 13, Low Power       |                   | J127-6              | Q50               |
| Brown/Blue        | Solenoid 14, Low Power       |                   | J127-7              | Q48               |
| Brown/Violet      | Solenoid 15, Low Power       |                   | J127-8              | Q46               |
| Brown/Gray        | Solenoid 16, Low Power       |                   | J127-9              | Q44               |
| <hr/>             |                              |                   |                     |                   |
| Black/Brown       | Sol. 17, Flasher 1, No Diode | J125-1            | J126-1              | Q42               |
| Black/Red         | Sol. 18, Flasher 2, No Diode | J125-2            | J126-2              | Q40               |
| Black/Orange      | Sol. 19, Flasher 3, No Diode | J125-3            | J126-3              | Q38               |
| Black/Yellow      | Sol. 20, Flasher 4, No Diode | J125-5            | J126-4              | Q36               |
| Blue/Green        | Sol. 21, Special 1 Drive     | J125-6            | J126-5              | Q28               |
| Blue/Black        | Sol. 22, Special 2 Drive     | J125-7            | J126-6              | Q30               |
| Blue/Violet       | Sol. 23, Special 3 Drive     | J125-8            | J126-7              | Q34               |
| Blue/Gray         | Sol. 24, Special 4 Drive     | J125-9            | J126-8              | Q32               |
| <hr/>             |                              |                   |                     |                   |
| Blue/Brown        | Sol. 25, Special 5 Drive     |                   | J122-1              | Q26               |
| Blue/Red          | Sol. 26, Special 6 Drive     |                   | J122-2              | Q24               |
| Blue/Orange       | Sol. 27, Special 7 Drive     |                   | J122-3              | Q22               |
| Blue/Yellow       | Sol. 28, Special 8 Drive     |                   | J122-4              | Q20               |
| <hr/>             |                              |                   |                     |                   |
| Gray/Yellow       | Sol. 25 & 27, Tieback Diode  |                   | J122-5, 8           |                   |
| Violet/Green      | Sol. 26 & 28, Tieback Diode  |                   | J122-6, 9           |                   |

## Flipper Circuits

### Connectors From Power Driver Board:

| <u>Wire Color</u> | <u>Function</u>     | <u>To Playfield</u> |
|-------------------|---------------------|---------------------|
| Gray/Yellow       | Left Flipper Power  | J109-5              |
| Blue/Yellow       | Right Flipper Power | J109-7              |

### Connectors From Flipper Controller Board:

| <u>Wire Color</u> | <u>Function</u>             | <u>To Power Driver</u> | <u>To CPU</u> | <u>To Cabinet</u> | <u>To Playfield</u> |
|-------------------|-----------------------------|------------------------|---------------|-------------------|---------------------|
| Black             | Ground                      | J801-1,4               |               |                   |                     |
| Gray              | +5V                         | J804-1                 |               |                   |                     |
| Gray/Green        | +12V                        | J804-2                 |               |                   |                     |
| Black             | Ground                      | J804-5,6               |               |                   |                     |
| Ribbon Cable      | Data                        |                        | J803          |                   |                     |
| Orange/Gray       | Upper Left Flipper Holding  |                        |               |                   | J802-1              |
| Black/Blue        | Upper Left Flipper Power    |                        |               |                   | J802-3              |
| Orange/Violet     | Upper Right Flipper Holding |                        |               |                   | J802-4              |
| Black/Yellow      | Upper Right Flipper Power   |                        |               |                   | J802-6              |
| Orange/Blue       | Lower Left Flipper Holding  |                        |               |                   | J802-7              |
| Blue/Gray         | Lower Left Flipper Power    |                        |               |                   | J802-9              |
| Orange/Green      | Lower Right Flipper Holding |                        |               |                   | J802-11             |
| Blue/Violet       | Lower Right Flipper Power   |                        |               |                   | J802-13             |
| Blue/Violet       | Right Flipper Button        |                        | J805-1        |                   |                     |
| Blue/Gray         | Left Flipper Button         |                        | J805-2        |                   |                     |
| Black/Yellow      | Right Flipper Button        |                        | J805-3        |                   |                     |
| Black/Blue        | Left Flipper Button         |                        | J805-5        |                   |                     |
| Orange            | Switch Ground               |                        | J805-6        |                   |                     |
| Black/Green       | Right Flipper Switch        |                        |               |                   | J806-1              |
| Black/Blue        | Left Flipper Switch         |                        |               |                   | J806-3              |
| Black/Violet      | Upper Right Flipper Switch  |                        |               |                   | J806-4              |
| Black/Gray        | Upper Left Flipper Switch   |                        |               |                   | J806-5              |
| Orange            | Switch Ground               |                        |               |                   | J806-6              |



## General Illumination Circuits

Connectors From Power Driver Board:

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

## Power Circuits

Connectors From Power Driver Board:

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

## Power Circuits

Connectors From Power Driver Board

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

## Logic Circuits

| <u>Wire Color</u> | <u>Function</u> |  |
|-------------------|-----------------|--|
| Ribbon Cable      | Data            | J201 To/From Dot Matrix Controller               |
| Ribbon Cable      | Data            | J202 To/From Sound Board & Dot Matrix Controller |
| Ribbon Cable      | Data            | J204 Not Used                                    |

Connectors From Power Driver Board

|              |        |        |
|--------------|--------|--------|
| Black        | Ground | J210-1 |
| Black        | Ground | J210-3 |
| Gray         | +5VDC  | J210-4 |
| Gray         | +5VDC  | J210-5 |
| Gray/Green   | +12VDC | J210-6 |
| Gray/Green   | +12VDC | J210-7 |
| Ribbon Cable | Data   | J211   |

## Display Circuits

| <u>Wire Color</u> | <u>Function</u> | <u>To:</u>                                   | <u>From:</u><br><u>CPU Bd.</u> | <u>From:</u><br><u>Sound Bd.</u> |
|-------------------|-----------------|--|--------------------------------|----------------------------------|
| Ribbon Cable      | Data            | J601   | J202                           | J506                             |
| Ribbon Cable      | Data            | J602   | 201                            |                                  |
| Ribbon Cable      | Data            | J603 To/From Dot Matrix Display/Driver Board |                                |                                  |

### Connector to Dot Matrix Display/Driver

|             |        |        |
|-------------|--------|--------|
| Orange      | -125V  | J604-1 |
| Blue        | -113V  | J604-2 |
| Black       | Ground | J604-4 |
| Black       | Ground | J604-5 |
| Gray        | +5V    | J604-6 |
| Gray/Yellow | +12V   | J604-7 |
| Brown       | +62V   | J604-8 |

### Connector to Transformer (AC)

|        |        |        |
|--------|--------|--------|
| White  | 80VAC  | J605-1 |
| White  | 80VAC  | J605-2 |
| Violet | 100VAC | J605-3 |
| Violet | 100VAC | J605-5 |

### Connector From Power Driver Board

|             |        |        |
|-------------|--------|--------|
| Black       | Ground | J606-1 |
| Black       | Ground | J606-3 |
| Gray        | +5V    | J606-4 |
| Gray        | +5V    | J606-5 |
| Gray/Yellow | +12V   | J606-6 |
| Gray/Yellow | +12V   | J606-7 |

## Sound Circuits

| <u>Wire Color</u> | <u>Function</u> |   |
|-------------------|-----------------|---|
| Ribbon Cable      | Data            | J506 To/From CPU Board, Flipper Board & Dot Matrix Controller |

### Connector From Transformer Secondary

|            |        |        |
|------------|--------|--------|
| Gray/Green | +12VDC | J501-1 |
| Gray/Green | +12VDC | J501-2 |
| Gray       | +5VDC  | J501-4 |
| Gray       | +5VDC  | J501-5 |
| Gray/White | -12VDC | J501-6 |
| Gray/White | -12VDC | J501-7 |

### Power From CPU/Power Driver Board

|       |        |        |
|-------|--------|--------|
| Gray  | +5VDC  | J502-1 |
| Gray  | +5VDC  | J502-3 |
| Black | Ground | J502-4 |
| Black | Ground | J502-5 |

### Cabinet Speaker Connection

|              |         |        |
|--------------|---------|--------|
| Black/Yellow | Speaker | J504-2 |
|--------------|---------|--------|

### Backbox Speaker Connection

|              |         |        |
|--------------|---------|--------|
| Black/Yellow | Speaker | J505-3 |
|--------------|---------|--------|

### The ADDAMS FAMILY Lamp Matrix

Yellow (B+) → Red

| Column<br>Row                    | 1<br>Yellow-Brown<br>J137-1<br>Q98 | 2<br>Yellow-Red<br>J137-2<br>Q97 | 3<br>Yellow-Orange<br>J137-3<br>Q96 | 4<br>Yellow-Black<br>J137-4<br>Q95 | 5<br>Yellow-Green<br>J137-5<br>Q94 | 6<br>Yellow-Blue<br>J137-6<br>Q93 | 7<br>Yellow-Violet<br>J137-7<br>Q92 | 8<br>Yellow-Gray<br>J137-9<br>Q91 |
|----------------------------------|------------------------------------|----------------------------------|-------------------------------------|------------------------------------|------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|
| 1<br>Red-Brown<br>J133-1<br>Q90  | Thing Multiball<br>11              | Upper Left Jet<br>21             | G-R-E-E-D "G"<br>31                 | Not Used<br>41                     | Thing<br>51                        | Left Special<br>61                | Lite Advance X<br>71                | *Thing* ***-1<br>81               |
| 2<br>Red-Black<br>J133-2<br>Q89  | Extra Ball<br>12                   | Upper Right Jet<br>22            | G-R-E-E-D "R"<br>32                 | Advance X<br>42                    | Raise The Dead<br>52               | Lite Thing Flips<br>62            | Right Special<br>72                 | *Thing* "T"<br>82                 |
| 3<br>Red-Orange<br>J133-4<br>Q88 | Jackpot<br>13                      | Center Left Jet<br>23            | G-R-E-E-D "E"-1<br>33               | Grave "G"<br>43                    | Lite Extra Ball<br>53              | Lite 2 Bear Kicks<br>63           | Shoot Again<br>73                   | *Thing* "H"<br>83                 |
| 4<br>Red-Yellow<br>J133-5<br>Q87 | Grave "A"<br>14                    | Center Right Jet<br>24           | G-R-E-E-D "E"-2<br>34               | Grave "R"<br>44                    | House 6 Million<br>54              | Electric Chair Yellow<br>64       | Vault Green<br>74                   | *Thing* "I"<br>84                 |
| 5<br>Red-Green<br>J133-6<br>Q86  | Stars<br>15                        | Lower Jet<br>25                  | G-R-E-E-D "D"<br>35                 | The Marmushku<br>45                | Quick Multiball<br>55              | House "?"<br>65                   | Vault Red<br>75                     | *Thing* "N"<br>85                 |
| 6<br>Red-Blue<br>J133-7<br>Q85   | Super Jackpot<br>16                | Cousin It<br>26                  | 5X Graveyard<br>36                  | Swamp Lock<br>46                   | Fester's Tunnel Hunt<br>56         | House 9 Million<br>66             | Not Used<br>76                      | *Thing* "G"<br>86                 |
| 7<br>Red-Violet<br>J133-8<br>Q84 | Grave "V"<br>17                    | 2 Bear Kicks<br>27               | Center Swamp Million<br>37          | Electric Chair Red<br>47           | House Seance<br>57                 | Graveyard At Max<br>67            | Thing Yellow<br>77                  | *Thing* ***-2<br>87               |
| 8<br>Red-Gray<br>J133-9<br>Q83   | Upper Swamp Million<br>18          | Thing Flips<br>28                | Lower Swamp Million<br>38           | Grave "E"<br>48                    | Hit Cousin It<br>58                | House 3 Million<br>68             | Thing Green<br>78                   | Credit Button<br>88               |

### The ADDAMS FAMILY Switch Matrix

White → Green

| Dedicated Grounded Switches   | Column<br>Row                     | 1<br>Green-Brown<br>J206-1<br>U20-18 | 2<br>Green-Red<br>J206-2<br>U20-17 | 3<br>Green-Orange<br>J206-3<br>U20-16 | 4<br>Green-Yellow<br>J206-4<br>U20-15 | 5<br>Green-Black<br>J206-5<br>U20-14 | 6<br>Green-Blue<br>J206-6<br>U20-13 | 7<br>Green-Violet<br>J206-7<br>U20-12 | 8<br>Green-Gray<br>J206-9<br>U20-11 | Flipper Grounded Switches                                      |
|---|-----------------------------------|--------------------------------------|------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|--|
| Orange-Brown (1)<br>J205-1<br>Left Coin Chute<br>D1                 | 1 White-Brown<br>J208-1<br>U18-11 | Not Used<br>11                       | Siam Tilt<br>21                    | Upper Left Jet<br>31                  | Grave "G"<br>41                       | Shooter Lane<br>51                   | Left Ramp Enter<br>61               | Swamp Lock Upper<br>71                | Bookcase Open<br>81                 | Black-Green J806-1<br>Right Flipper End of Stroke<br>F1        |
| Orange-Red (2)<br>J205-2<br>Center Coin Chute<br>D2                 | 2 White-Red<br>J208-2<br>U18-9    | Not Used<br>12                       | Coin Door Closed<br>22             | Upper Right Jet<br>32                 | Grave "R"<br>42                       | Not Used<br>52                       | Train Wreck<br>62                   | Swamp Lock Center<br>72               | Bookcase Closed<br>82               | Blue-Violet J805-1<br>Right Flipper Button<br>F2               |
| Orange-Black (3)<br>J205-3<br>Right Coin Chute<br>D3                | 3 White-Orange<br>J208-3<br>U18-5 | Start Button<br>13                   | Ticket Opto.<br>23                 | Center Left Jet<br>33                 | Chair Kickout<br>43                   | Bookcase Opto 1<br>53                | Thing Eject Lane<br>63              | Swamp Lock Lower<br>73                | Not Used<br>83                      | Black-Blue J806-3<br>Left Flipper End of Stroke<br>F3          |
| Orange-Yellow (4)<br>J205-4<br>4th Coin Chute<br>D4                 | 4 White-Yellow<br>J208-4<br>U18-7 | Plumb Bob Tilt<br>14                 | Always Closed<br>24                | Center Left Jet<br>34                 | Cousin It<br>44                       | Bookcase Opto 2<br>54                | Right Ramp Enter<br>64              | Lockup Kickout<br>74                  | Thing Down Opto<br>84               | Blue-Gray J805-2<br>Left Flipper Button<br>F4                  |
| Orange-Green (5)<br>J205-6<br>Normal Function Service Credits<br>D5 | 5 White-Green<br>J208-5<br>U19-11 | Left Trough<br>15                    | Right Flipper Lane<br>25           | Lower Jet<br>35                       | Lower Swamp Million<br>45             | Bookcase Opto 3<br>55                | Right Ramp Top<br>65                | Left Outlane<br>75                    | Thing Up Opto<br>85                 | Black-Violet J806-4<br>Upper Right Flipper End of Stroke<br>F5 |
| Orange-Blue (6)<br>J205-7<br>Normal Function Volume Down<br>D6      | 6 White-Blue<br>J208-7<br>U19-9   | Center Trough<br>16                  | Right Outlane<br>26                | Left Slings hot<br>36                 | Not Used<br>46                        | Bookcase Opto 4<br>56                | Left Ramp Top<br>66                 | Left Flipper Lane 2<br>76             | Grave "A"<br>86                     | Black-Yellow J805-3<br>Upper Right Flipper Button<br>F6        |
| Orange-Violet (7)<br>J205-8<br>Normal Function Volume Up<br>D7      | 7 White-Violet<br>J208-8<br>U19-5 | Right Trough<br>17                   | Ball Shooter<br>27                 | Right Slingshot<br>37                 | Center Swamp Million<br>47            | Bumper Lane Opto<br>57               | Upper Right Loop<br>67              | Thing Kickout<br>77                   | Thing Eject Hole<br>87              | Black-Gray J806-5<br>Upper Left Flipper End of Stroke<br>F7    |
| Orange-Gray (8)<br>J205-9<br>Normal Function Begin Test<br>D8       | 8 White-Gray<br>J208-9<br>U19-7   | Outhole<br>18                        | Not Used<br>28                     | Upper Left Loop<br>38                 | Upper Swamp Million<br>48             | Right Ramp Exit<br>58                | Vault<br>68                         | Left Flipper Lane 1<br>78             | Not Used<br>88                      | Black-Blue J805-5<br>Upper Left Flipper Button<br>F8           |

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