

MANUAL NO. 0365-00H07-1001  
GAME NO. 0H07



## Operating & Parts Manual

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## TABLE OF CONTENTS

| SECTION                                                   | PAGE  |
|-----------------------------------------------------------|-------|
| 1. GAME INSTALLATION .....                                | 1-1   |
| 2. GAME OPERATION .....                                   | 2-1   |
| 3. TAILORING & TESTING THE GAME .....                     | 3-1   |
| 4. FEATURE OPERATION & SCORING .....                      | 4-1   |
| 5. GAME REGISTERS & OPTIONS INFORMATION .....             | 5-1   |
| 6. SERVICING THE GAME .....                               | 6-1   |
| 7. ROUTINE MAINTENANCE ON LOCATION .....                  | 7-1   |
| 8. SERVICE HINTS .....                                    | 8-1   |
| 9. TROUBLESHOOTING THE GAME ON LOCATION .....             | 9-1   |
| 10. COMPONENT LAYOUTS, SCHEMATICS & WIRING DIAGRAMS ..... | 10-1  |
| ROM/EPROM LIST .....                                      | 10-39 |
| 11. ILLUSTRATED PARTS BREAKDOWN (IPB) .....               | 11-1  |
| 12. TECHNICAL INFORMATION .....                           | 12-1  |
| APPENDIX .....                                            | A-1   |

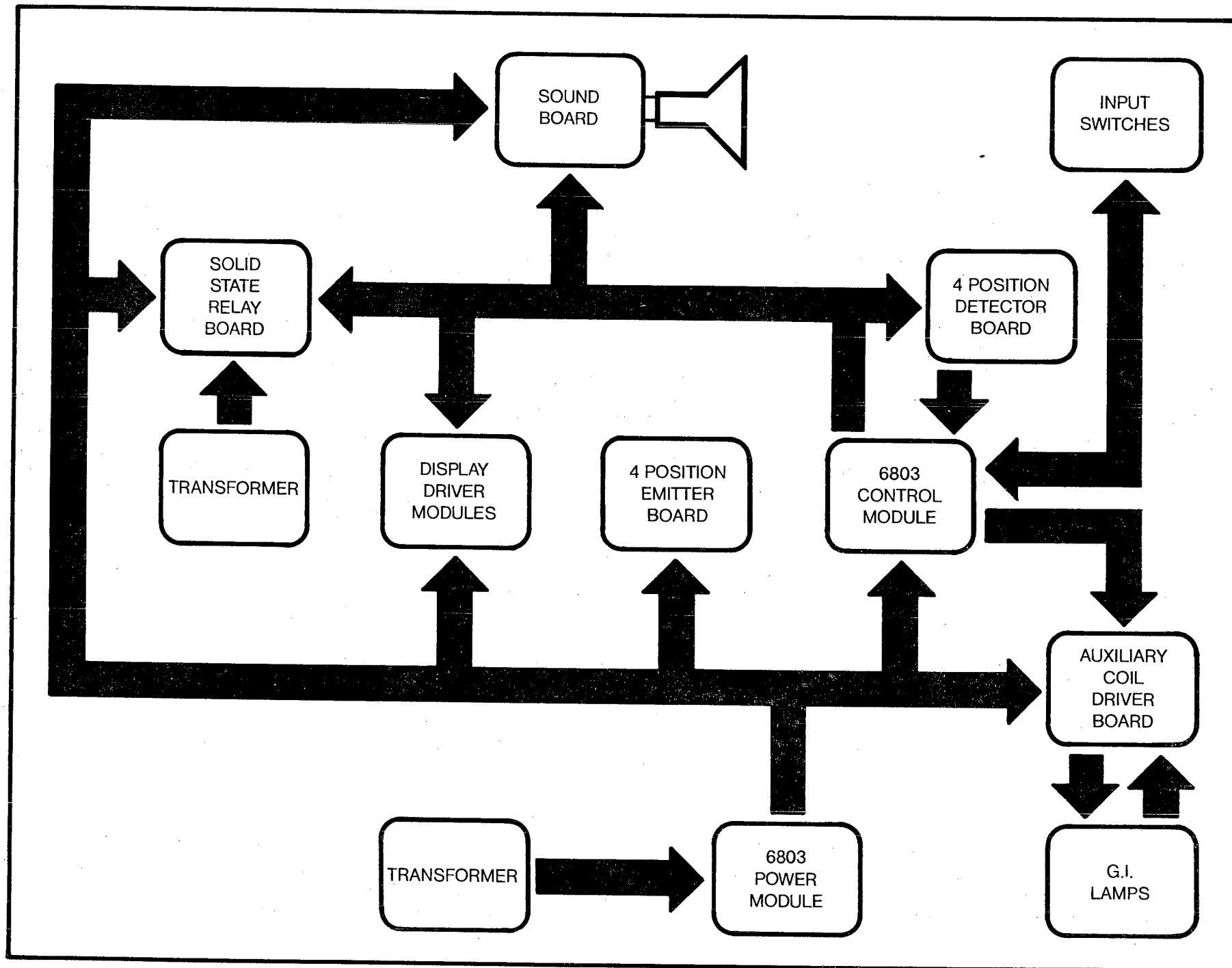
## LIST OF ILLUSTRATIONS

| SECTION | FIGURE | DESCRIPTION                                                                               | PAGE  |
|---------|--------|-------------------------------------------------------------------------------------------|-------|
|         | 1      | ELECTRONIC GAME BLOCK DIAGRAM .....                                                       | iv    |
| 1       | A      | BACKBOX POSITIONING .....                                                                 | 1-3   |
|         | B      | DOLLY—ASSIST STILT ASSEMBLY .....                                                         | 1-5   |
| 2       | A      | SHOOTER LANE DECAL .....                                                                  | 2-3   |
| 4       | A      | PLAYFIELD TOP VIEW—BALL PLAY VECTORS .....                                                | 4-12  |
|         | B      | PLAYFIELD TOP VIEW—BALL EJECT VECTORS .....                                               | 4-13  |
| 5       | A      | REGISTERS & OPTIONS SELECT BUTTONS .....                                                  | 5-5   |
| 6       | A      | PINBALL GAME BACKBOX BEFORE DETACHING .....                                               | 6-3   |
| 7       | A      | DROP TARGET ASSEMBLY LUBRICATION POINTS .....                                             | 7-3   |
|         | B      | PLAYFIELD ASSEMBLY—TOP VIEW WITH PARTS LIST .....                                         | 7-4   |
|         | C      | PLAYFIELD ASSEMBLY—TOP VIEW WITH RAMPS, RUBBER RINGS &<br>POSTS PARTS LIST .....          | 7-5   |
|         | D      | BLACKWATER 100 PINBALL GAME PARTS LOCATION .....                                          | 7-6   |
| 8       | A      | PLAYFIELD IN SEMI-UPRIGHT POSITION & UPRIGHT POSITION .....                               | 8-3   |
|         | B      | SECURING THE FRONT PLATFORM (BOTTOM ARCH) TO THE PLAYFIELD .....                          | 8-5   |
| 9       | A      | PLAYFIELD ASSEMBLY—TOP VIEW WITH COIL, SOLENOID & SWITCH<br>ASSIGNMENT NUMBER TABLE ..... | 9-10  |
|         | B      | PLAYFIELD ASSEMBLY—TOP VIEW WITH FEATURE LAMP ASSIGNMENT<br>NUMBER TABLE .....            | 9-11  |
| 11      |        | EXTERNAL GAME PARTS .....                                                                 | 11-2  |
|         |        | INTERNAL GAME PARTS .....                                                                 | 11-4  |
|         |        | BACKBOX ASSEMBLY .....                                                                    | 11-6  |
|         |        | PLAYFIELD ASSEMBLY—TOP .....                                                              | 11-8  |
|         |        | PLAYFIELD ASSEMBLY—BOTTOM .....                                                           | 11-10 |
|         |        | PLAYFIELD ASSEMBLY W/RAMPS .....                                                          | 11-12 |
|         |        | FRONT PLATFORM (BOTTOM ARCH) ASSEMBLY—TOP .....                                           | 11-14 |
|         |        | FRONT PLATFORM (BOTTOM ARCH) ASSEMBLY—BOTTOM .....                                        | 11-16 |
|         |        | REAR PLATFORM ASSEMBLY—TOP .....                                                          | 11-18 |
|         |        | REAR PLATFORM ASSEMBLY—BOTTOM .....                                                       | 11-20 |
|         |        | UPPER NETWORK ASSEMBLY .....                                                              | 11-22 |
|         |        | BALL SHOOTER ASSEMBLY .....                                                               | 11-24 |
|         |        | KNOCKER ASSEMBLY .....                                                                    | 11-25 |
|         |        | BALL STOP ASSEMBLY (START GATE) .....                                                     | 11-26 |
|         |        | COIN DOOR ASSEMBLY .....                                                                  | 11-28 |
|         |        | COIN DOOR ASSEMBLY W/VALIDATOR .....                                                      | 11-30 |
|         |        | DROP TARGET ASSEMBLY-5 UNIT SIDE BY SIDE .....                                            | 11-32 |
|         |        | FLIPPER ASSEMBLY (DOUBLE SWITCH LEFT) .....                                               | 11-34 |
|         |        | FLIPPER ASSEMBLY (DOUBLE SWITCH LEFT W/EXTENDER) .....                                    | 11-36 |
|         |        | FLIPPER ASSEMBLY (DOUBLE SWITCH RIGHT) .....                                              | 11-38 |
|         |        | FLIPPER ASSEMBLY (SINGLE SWITCH RIGHT) .....                                              | 11-40 |
|         |        | FLIPPER ASSEMBLY (SINGLE SWITCH RIGHT W/EXTENDER) .....                                   | 11-42 |
|         |        | KICKER ASSEMBLY (MULTI-BALL) .....                                                        | 11-44 |
|         |        | SAUCER (EJECT) ASSEMBLY LEFT .....                                                        | 11-46 |
|         |        | SAUCER (EJECT) ASSEMBLY RIGHT .....                                                       | 11-48 |
|         |        | SLINGSHOT KICKER ASSEMBLY .....                                                           | 11-50 |
|         |        | TOP MOUNTED BALL RETURN KICKER ASSEMBLY .....                                             | 11-52 |
|         |        | PLAYFIELD LAMP SOCKETS ASSEMBLIES .....                                                   | 11-54 |

## LIST OF TABLES

| SECTION | TABLE | DESCRIPTION                                                                                | PAGE |
|---------|-------|--------------------------------------------------------------------------------------------|------|
| 2       | A     | USES OF THE LOWER RIGHT AND THE LOWER LEFT CABINET PUSH BUTTONS . . . .                    | 2-4  |
| 4       | A     | START LAMP SEQUENCE . . . . .                                                              | 4-3  |
|         | B     | SWAMP DROP TARGET LAMP SEQUENCE . . . . .                                                  | 4-5  |
|         | C     | GAME OPTIONS REGISTER SETTINGS: TOP SAUCER & RIGHT SAUCER HOLD<br>TIMER SETTINGS . . . . . | 4-7  |
|         | D     | BONUS MULTIPLIER AWARDS . . . . .                                                          | 4-8  |
|         | E     | GAME OPTIONS REGISTER SETTINGS: BONUS MULTIPLIER RESET . . . . .                           | 4-8  |
|         | F     | PLAYFIELD MULTIPLIER LAMP SEQUENCE . . . . .                                               | 4-9  |
|         | G     | GAME OPTIONS REGISTER SETTINGS: PLAYFIELD MULTIPLIER RESET . . . . .                       | 4-9  |
|         | H     | SWAMP LOOP AWARDS & LAMP SEQUENCE . . . . .                                                | 4-10 |
| 5       | A     | REGISTERS & OPTIONS . . . . .                                                              | 5-2  |
|         | B     | RECOMMENDED 3 & 5 HEAT OPTION SETTINGS . . . . .                                           | 5-6  |

FIGURE 1. ELECTRONIC GAME BLOCK DIAGRAM



# BACKBOX SAFETY WARNING

## WARNING

TO AVOID INJURY TO OWNER/SERVICE PERSONNEL AND TO PREVENT DAMAGE TO THE MACHINE, THE BACKBOX **MUST** BE SECURED WITH THE BOLTS PROVIDED BEFORE THE MACHINE IS ACTIVATED.

MO51-00365-A063

## IMPORTANT NOTICE

FOUR PLAYFIELD BALLS MUST BE INSERTED IN THE OUTHOLE.

THIS GAME WILL NOT START IF THERE IS A BALL IN THE SHOOTER LANE IN THE GAME OVER MODE.

SHOOT  
**3**  
BALLS  
TO LOAD  
START  
GATE

## SAFETY

The following safety hints apply to all game Operators and Service Technicians. Specific warnings and cautions will be found throughout this manual. *Bally-Midway* recommends that you read this page and the operating information before preparing the game for play.

### WARNINGS

#### AC POWER CONNECTION

Before connecting the game to the AC power source, verify that the "location voltage" jumper wires are installed correctly for the line voltage in the area. For additional information, see page 1-2 and Table A on page 10-6.

#### PROPERLY GROUND THE GAME

Service Technicians and players may receive an electrical shock if this game is not properly grounded! To avoid shocks, **DO NOT** plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded 3-wire outlet. After servicing any portion of the game, check to ensure that the grounded wires are secure in the game before locking up the game or returning the game to the play mode.

#### DISCONNECT POWER DURING REPAIRS

To avoid electrical shock, disconnect the game from the AC power source before disconnecting, repairing or removing components from the game. Before removing the 6803 Power Module or Display Module(s) from the game, or servicing the Module(s) in the game, turn power off and **wait** a minimum of 30 seconds for any 'stored' voltages to drain (bleed) off to a safe operating level.

#### USE THE PROPER FUSE

To avoid damaging components in the game, **use** the replacement fuses which are specified in the parts list(s) for this game. All replacement fuses **must** match the original fuses (replaced) in fuse type, voltage rating and current rating.

### CAUTION

#### PROPERLY ATTACH ALL CONNECTORS

Ensure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slide on easily, **DO NOT** force them. A reversed connector **can** damage the game and void the game's Warranty. All connectors are 'keyed' to fit the specific pins on each board. If in doubt, **always** refer to the wiring diagram. To prevent damaging components on the printed circuit boards, **NEVER** disconnect a connector from a printed circuit board with power on.

**SECTION 1**  
**GAME INSTALLATION**  
**TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                             | <b>PAGE</b> |
|------------------------------------------------|-------------|
| INSTALLATION & INSPECTION PROCEDURE .....      | 1-2         |
| TRANSPORTING THE GAME BY DOLLY PROCEDURE ..... | 1-4         |

**LIST OF ILLUSTRATIONS**

| <b>FIGURE</b> | <b>DESCRIPTION</b>                 | <b>PAGE</b> |
|---------------|------------------------------------|-------------|
| A             | BACKBOX POSITIONING .....          | 1-3         |
| B             | DOLLY--ASSIST STILT ASSEMBLY ..... | 1-5         |

## INSTALLATION PROCEDURE

When the game is removed from the shipping carton, the following procedure is recommended for installing the game.

1—Carefully, remove the game from the shipping carton and set the game on a flat surface or on a dolly.

**NOTICE:** When installing this game with a Dolly or flat surface device, the Dolly Assist Stilt Assembly should be used. The procedure for use of this assembly can be found on page 1-4, TRANSPORTING THE GAME BY DOLLY.

2—Remove the legs from their shipping carton and remove the four (4) Leg Adjusters (Levellers) from the Spare Parts Bag in the Coin Box. Next, assemble the Leg Adjusters to the legs and install the legs onto the cabinet.

3—Referring to BACKBOX POSITIONING, FIGURE A, on page 1-3, raise the Backbox to the upright (play) position. Secure the Backbox to the cabinet with the two (2) long  $\frac{3}{8}$ " hold-down bolts and flat washers that are located in the Spare Parts Bag in the Coin Box.

4—Adjust the Leg Adjusters to level the cabinet so that the playfield is on a pitch angle of approximately 7°.

On all games, there are certain items that should be checked after shipment, and they are:

1—Check that all cable connectors are completely seated on all printed circuit board assemblies.

2—Check that all cables are clear of moving parts.

3—Check for wires that may have come loose during shipment.

4—Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of switches or lamp sockets.

5—Check coils for proper soldering. Cold solder connections may not show up in factory inspection, but vibration in shipment may cause loss of contact.

6—Check that fuses are firmly seated and making good contact.

7—Check and adjust the plumb bob tilt on the left side of the Cabinet.

8—Check wiring of the plug on the transformer to correspond to location voltage. For reference, see Table A on the BACKBOX WIRING SCHEMATIC on page 10-6.

For 115 VAC, install jumper wires 2-8, 3-6 and 7-10.

For 120 VAC, install jumper wires 2-8, 4-6 and 7-11.

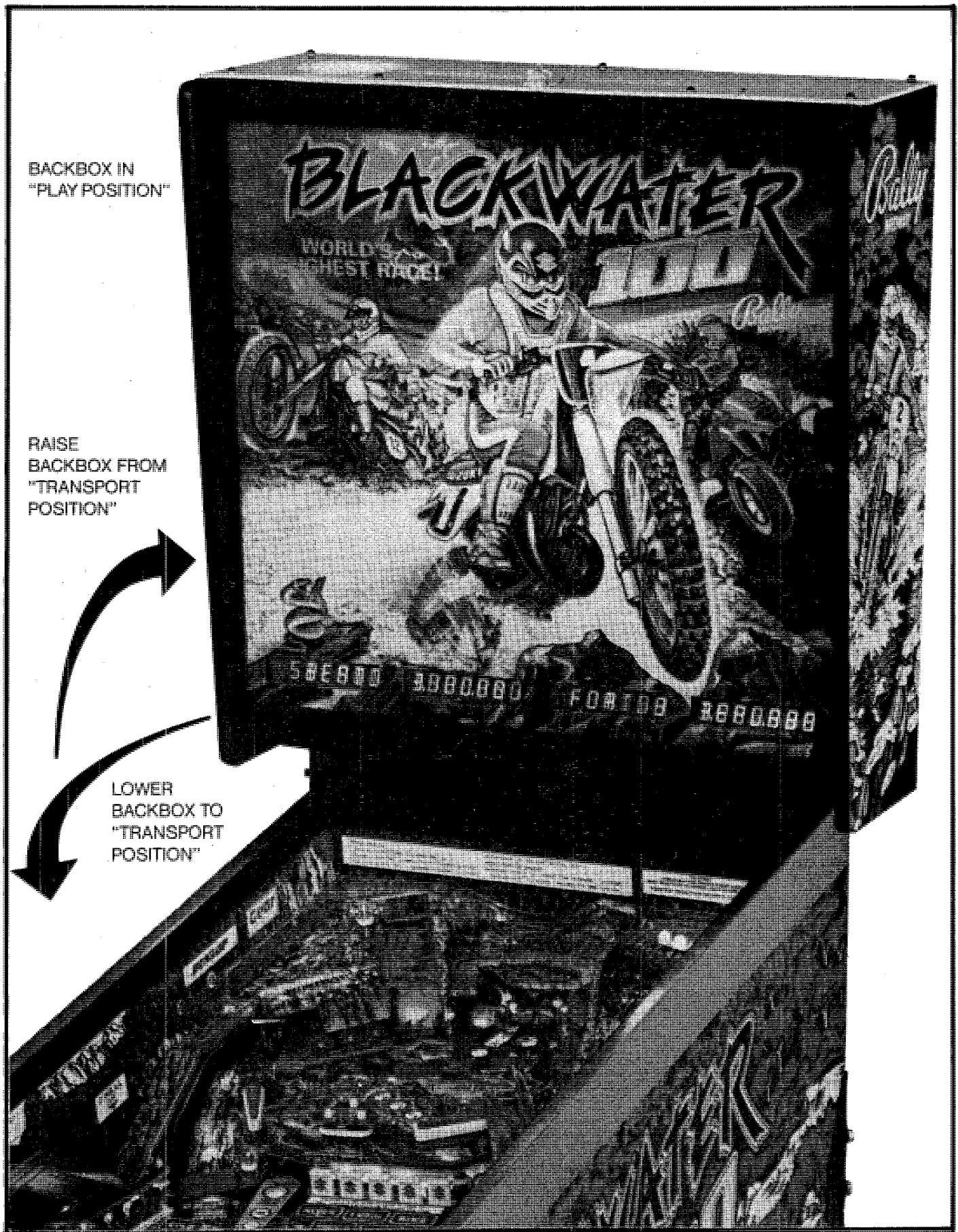
For 220 VAC, install jumper wires 4-8 and 7-9.

For 240 VAC, install jumper wires 4-8 and 7-11.

9—Place the four (4) game balls into the Playfield outhole.

10—Plug in the line cord.

FIGURE A. BACKBOX POSITIONING



## **TRANSPORTING THE GAME BY DOLLY**

The following procedure is recommended by Bally-Midway when transporting this game. The purpose of this procedure is to ensure that, by using the Dolly-Assist Assembly, the game can be properly transported on a dolly. This game is shipped with the Dolly-Assist Stilt Assembly #A365-07250-0003 attached to the inside of the cabinet assembly.

### **PROCEDURE**

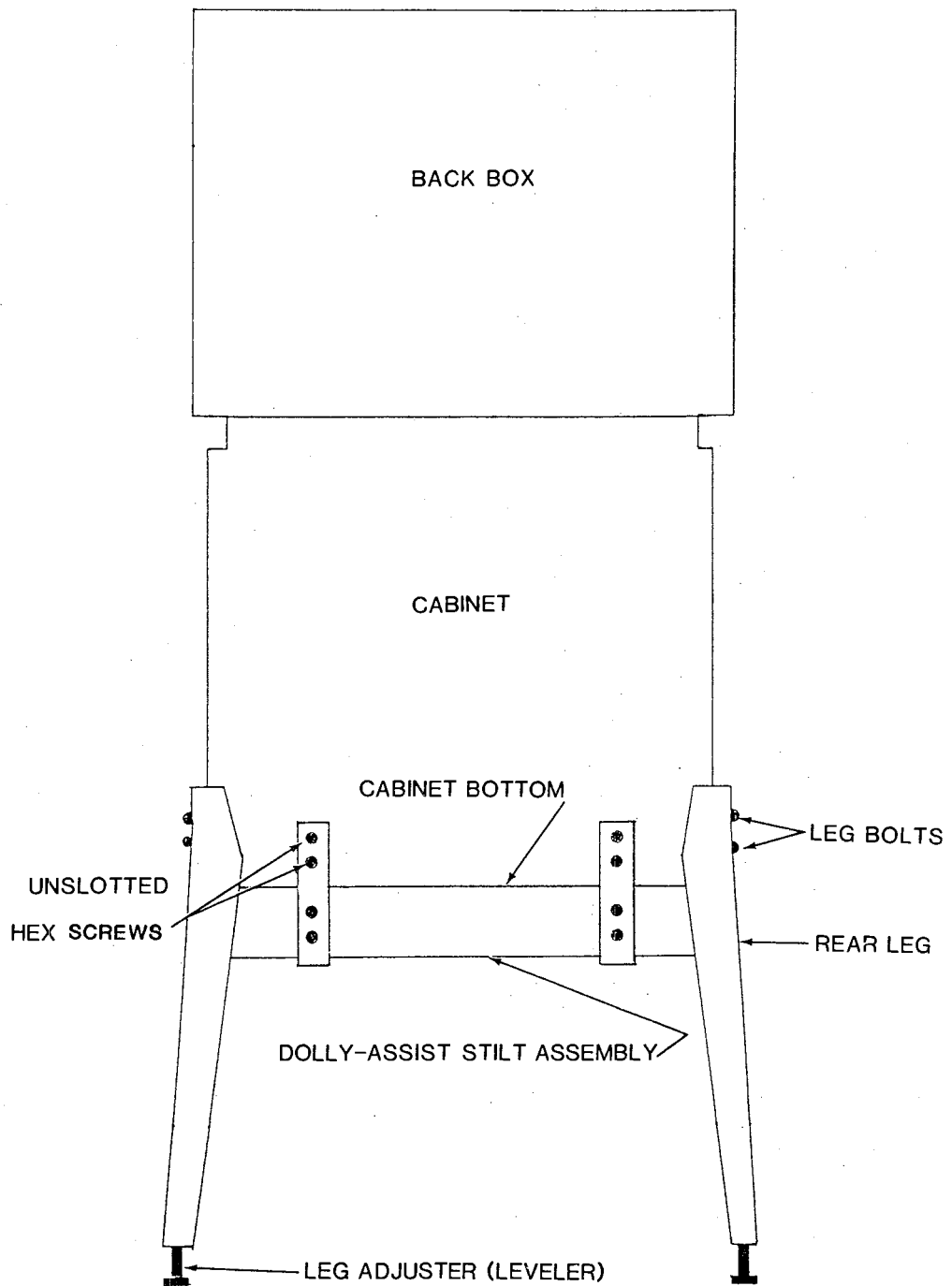
STEP 1—Unscrew the Dolly-Assist Stilt Assembly from inside the cabinet.

STEP 2—Remove the four (4) unslotted hex screws #0017-00101-1338 from the Spare Parts Bag Assembly.

STEP 3—Referring to FIGURE B, page 1-5, place the Dolly-Assist Stilt Assembly between the rear legs of the cabinet with the brackets pointing up toward the Backbox. Ensure that the Assembly is flush to the bottom of the cabinet before installing the four (4) unslotted hex screws.

**NOTICE:** Transporting this game with the legs removed and the Dolly-Assist Stilt Assembly installed will cause the Stilt Assembly brackets to bend as the game shifts forward.

FIGURE B. DOLLY-ASSIST STILT ASSEMBLY





## **SECTION 2 GAME OPERATION**

### **TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                 | <b>PAGE</b> |
|------------------------------------|-------------|
| GENERAL GAME OPERATION .....       | 2-2         |
| BUY-IN FEATURE .....               | 2-3         |
| SELECT INITIAL ENTRY FEATURE ..... | 2-3         |

### **LIST OF ILLUSTRATIONS**

| <b>FIGURE DESCRIPTION</b>  | <b>PAGE</b> |
|----------------------------|-------------|
| A SHOOTER LANE DECAL ..... | 2-3         |

### **LIST OF TABLES**

| <b>TABLE DESCRIPTION</b>                                            | <b>PAGE</b> |
|---------------------------------------------------------------------|-------------|
| A USES OF THE LOWER LEFT AND LOWER RIGHT CABINET PUSH-BUTTONS ..... | 2-4         |

## GENERAL GAME OPERATION

Move the ON/OFF switch (at the bottom right front corner of the cabinet) to the ON position. The game will reset the drop targets. If any switch is closed when the game powers-up, the name of the closed switch is displayed for a brief period of time. After a short delay, GAME OVER on the display will indicate that the game is ready for play.

The game should accept coins and post (display) the appropriate amount of credits. Pressing the Credit/Start button on the cabinet will cause the Multi-Ball Kicker to 'kick' the first ball of the Heat, of three (3) balls held in the Ball Trough, to the Shooter Lane. As this occurs, the game sound sequence is played to announce play-readiness.

Each time the Credit/Start Button is pressed, one (1) player is 'posted' and the remaining credits are reduced by one. Game play is initiated shortly after the player shoots three (3) consecutive balls to the Start Gate. The game awards all points earned by the player(s).

When the third and last ball of each Heat enters the outhole and then is 'kicked' by the Top Mounted Ball Kicker to the Multi-Ball Kicker and the Sensor P.C. Boards in the Ball Trough, the Bonus score is added to the total game score. The player-up and/or current Heat is advanced one (1) position. The Multi-Ball Kicker 'kicks' the first ball of the new Heat to the Shooter Lane to initiate play. This continues until each player has played the allowable number of Heats per game. After each player has played the allowable number of Heats per game, a random Match number appears in the display. If the Match number is the same as the last two (2) digits in a player's score, a free credit game is awarded.

Any extra balls won during the game are played immediately after the player's third and last ball enters the Outhole. The player-up and/or current Heat are not advanced before the game serves the extra ball for play.

If, at the end of the game, either the "High Score To Date" is beaten or if the score is over 10,000,000, free games will be awarded according to the HISCORE AWARD register setting.

Tilting the game results in the loss of the ball in play and the remainder of the current Heat. Bonus points are not awarded, the flippers go dead, and none of the Playfield switches score. The purpose of the tilt penalty is to discourage the player from 'jostling' (shaking) the game in an attempt to prolong game play. Game action returns to normal after the Kicker 'kicks' the ball the Multi-Ball Kicker, which then 'kicks' the ball to the Shooter Lane, beginning a new Heat.



FIGURE A.  
SHOOTER LANE  
DECAL

## **BUY-IN FEATURE**

The BUY-IN feature allows each player, at the conclusion of all active players' last Heat<sup>1</sup>, the option of continuing the current Race<sup>2</sup> or ending the game. Each player is allowed only one (1) BUY-IN per game.

The BUY-IN feature can be adjusted by the Operator to select the number of BUY-IN Heats allowed for one (1) credit. To adjust the BUY-IN feature, press the Test Button to enter the Test Mode and select the GAME SETUP category. Next, select the register titled BUY-IN. When the register is set to zero (0), no BUY-IN Heats query will be offered. To select the number of BUY-IN Heats, refer to TABLE A-REGISTERS & OPTIONS on page 5-2.

The BUY-IN feature begins for each player (in turn) with the displayed message "RACE OVER UNLESS BUY-IN." Next, the BUY-IN time period of fifteen (15) seconds begins with information shown in both Displays. In the left Display, a countdown timer indicates the time remaining to make the BUY-IN decision. Also, in both Displays, a message repeats for fifteen (15) seconds detailing the number of Heats that can be bought for one (1) credit. Credits are awarded for coins inserted during the BUY-IN time period.

When the player chooses to BUY-IN, all of the game features carry-over from Heat-to-Heat as if there were simply additional Heats left to play. Pressing the Credit/Start push-button with at least one (1) credit present during the BUY-IN time period allows that player to keep racing. Pressing either lower cabinet push-button indicates that the player chooses to end the race.

In the multiple-player situation, players who do not BUY-IN are spectators while the others continue to play. All players will receive their HISCORE SPECIAL, MATCH SPECIAL and PLAYFIELD SPECIAL awards and, also, Select Initials entry opportunities when the last active player finishes the game.

### **NOTES:**

<sup>1</sup> HEAT: A three (3) ball start which gives the player an opportunity to complete Sections, Laps and the Race.

<sup>2</sup> RACE: Completing three (3) Laps<sup>3</sup> completes the Race.

<sup>3</sup> LAP: Completing all eight (8) Sections on the Map completes a Lap.

## **SELECT INITIALS ENTRY FEATURE**

When, at the end of the game, the player's final game score is greater than the HIGH SCORE TO DATE, the HISCORE SPECIAL is awarded along with other specials earned during game play. The player is also given the opportunity to select name initials and enter them on the Display.

The player can use the lower right cabinet push-button to advance through displayed letters or use the lower left cabinet push-button to back-up through displayed letters. The selected letter is entered by pressing the Credit/Start push-button. Two (2) additional letters can be selected and entered. The player is given a certain period of time to enter each of the three (3) letters. Otherwise, the letter "A" is automatically entered each time.

As a result of entering them, the player's initials, along with the score, will appear on the Display during the Attract Mode whenever the lower left push-button is pressed. This continues until four (4) higher scores have been earned.

**TABLE A. USES OF LOWER RIGHT & LOWER LEFT CABINET PUSH-BUTTONS**

| MODE    | PRESS LOWER CABINET PUSH-BUTTON | PURPOSE                                                                                                                                                                                     | RESULT                                                                                                                                                                            |
|---------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GAME    | Either                          | A fast reaction to the moment that the GREEN START LIGHT turns ON earns START BONUS POINTS.                                                                                                 | See the START FEATURE and START BONUS POINTS feature on page 4-3.                                                                                                                 |
|         | Either                          | To change the Playfield or Rear Platform locations of the flashing Section lamps.                                                                                                           | See the SECTIONS feature on pages 4-4 and 4-5.                                                                                                                                    |
|         | Either                          | To end game participation during the period of time that the BUY-IN feature is active.                                                                                                      | See the BUY-IN feature on page 2-3.                                                                                                                                               |
|         | Right<br>Left                   | During the period of time that the SELECT INITIALS ENTRY feature is active:<br>To advance through letters displayed in the Backbox.<br>To back-up through letters displayed in the Backbox. | See the SELECT INITIALS ENTRY feature on page 2-3.                                                                                                                                |
| TEST    | Either                          | To select any Test Mode category.<br>To select any 'option' register.<br>To change any 'option' register value.                                                                             | For any of these three (3) selection actions, see GAME REGISTERS ACCESS & MODIFICATION INSTRUCTIONS on page 3-2 and also TABLE A-REGISTERS & OPTIONS on pages 5-1 and 5-2.        |
|         | Either                          | During the SINGLE LAMPS Test in the GAME CHECK-UP category:<br>1. To stop lamps from flashing sequentially.<br>2. To flash each lamp one at a time.                                         | See DIAGNOSTIC TEST REGISTER ACCESS INSTRUCTIONS on page 3-3, the GAME CHECK-UP category in TABLE A-REGISTERS & OPTIONS on page 5-3, and also see page 9-3.                       |
|         | Either                          | During the DISPLAY TEST in the GAME CHECK-UP category:<br>To shift to another digit in either Display Driver Module for testing.                                                            | See DIAGNOSTIC TEST REGISTER ACCESS INSTRUCTIONS on page 3-3, the GAME CHECK-UP category in TABLE A-REGISTERS & OPTIONS, and also see pages 9-4 and 9-5.                          |
|         | Right<br>Left                   | During the COIL TEST in the GAME CHECK-UP category:<br>To advance to the next Solenoid in the test.<br>To test the same Solenoid under test.                                                | In either case, see DIAGNOSTIC TEST REGISTER INSTRUCTIONS on page 3-3, the GAME CHECK-UP category in TABLE A-REGISTERS & OPTIONS on page 5-3, and also see pages 9-5 through 9-8. |
| ATTRACT | Right                           | To view game play instructions on the Backbox Display.                                                                                                                                      | Game play instructions appear in sequence on both Backbox Display Driver Modules.                                                                                                 |
|         | Left                            | To view the four (4) highest game scores on the Backbox Display.                                                                                                                            | The four (4) highest game scores (each one is shown next to the scoring player's initials) appear on both Display Driver Modules in sequence, by rank, from left to right.        |

**SECTION 3**  
**TAILORING & TESTING THE GAME**

**TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                                      | <b>PAGE</b> |
|---------------------------------------------------------|-------------|
| INTRODUCTION .....                                      | 3-2         |
| GAME REGISTERS ACCESS & MODIFICATION INSTRUCTIONS ..... | 3-2         |
| DIAGNOSTIC TEST REGISTER ACCESS INSTRUCTIONS .....      | 3-3         |
| SELF-PERCENTAGING .....                                 | 3-4         |

## INTRODUCTION

The system in this game provides a large amount of easily accessible information to the Operator and it also communicates with the player through the use of alpha-numerics and sound effects.

The system is designed to be "user friendly" to the Operator. It can be used without a manual. This will come to light the moment you press the Self-Test button and the displays come to life with their messages of assistance. You can now change difficulty levels, awards, threshold level settings and monitor specific special awards, replay percent and income just by reading what is displayed and by using three (3) cabinet push buttons. The categories of registers are described with useful titles such as GAME SET-UP or GAME CHECK-UP.

If you've ever changed the replay threshold levels on a machine and you forgot to change the replay card because you were distracted by a customer, listen to this: "It will never happen again!" When using this system, if you want to change the first replay threshold level to 2,000,000 in the LEVEL 1 SCORE register, the corresponding message; FIRST REPLAY AT 2,000,000 will be displayed at Game Over.

All of the information that follows in this section should provide you with an understanding of how to access and change the various game registers in order to tailor or test this game. But, before reading this information, Bally-Midway recommends that you first read through all of TABLE A—REGISTERS & OPTIONS found on pages 5-1 through 5-3.

### GAME REGISTERS ACCESS & MODIFICATION INSTRUCTIONS

1. Enter the Test Mode by pressing the Test button inside the front door. The category GAME STATUS will appear on the display.
2. To select a different category, use the lower right cabinet button on the front cabinet to advance to that category. If the category is passed by, press the lower left cabinet button to back-up to the previous category.
3. When the selected category appears on the display, press the Credit/Start button to open the category and enter its directory. The first register in a directory of registers will appear on the display.
4. To select a different register, use either lower cabinet button to step to that register. Using the lower right cabinet button allows you to step to the end of the register directory, and out to the same category. The lower left cabinet button allows you to back-up in the same manner.

With the exception of the GAME CHECK-UP category and the HELP READ ME HELP category, all other categories in the Test Mode contain registers with optional values<sup>1</sup>. Included are registers with values that can be reset to zero (0).

5. When the selected register appears on the display and you want to change its value<sup>1</sup>.
  - A. Press the Credit/Start button to open the register. A flashing value appears on the display to the left of the register name and its existing value<sup>1</sup>.
  - B. Use the lower cabinet buttons, as shown in Step 2 above, to step to the desired new flashing register value.
  - C. Lock-in the selected new register value by pressing the Credit/Start button. The flashing value shifts to the left and becomes the new fixed register value.

<sup>1</sup>Each register in the COIN SET-UP category contains three (3) optional values instead of one (1) optional value as in the other registers. Each of the three values can be changed sequentially (from left to right) by following Steps 5A, 5B, and 5C above. However, due to lack of space on the display, each new flashing value will replace each existing value on the display before the new value is locked-in. For additional information, see pages 5-2 and 5-4.

6. To make further changes to registers in the selected category, repeat Step #4 & Step #5 on page 3-2. To close the directory and remain in the same category, repeat Step #4 on page 3-2 only. To exit the Test Mode, press the Test button.

### DIAGNOSTIC TEST REGISTER ACCESS INSTRUCTIONS

The GAME CHECK-UP category in the Test Mode contains a directory of Diagnostic Test registers (except for the PROGRAM VERSION register which displays EPROM program version information). Each test is performed as follows:

- A. Enter the directory and select the register to be displayed by using the Credit/Start button and the buttons as shown in Steps 1 through 4 on page 3-2.
  - B. When the selected register appears in the display, press the Credit/Start button to open the register and begin the test. From this point on, until you exit from the directory, the lower cabinet buttons are used only in stepping through certain register test sequences.
  - C. When the test is completed in any test register, press the Credit/Start button to advance to the next register. Press the Credit/Start button again to open that register. Repeating this procedure will advance you to the end of the directory. The last register in the directory is the SWITCH TEST.
  - D. When finished with the SWITCH TEST, exit from the register and the directory by holding in the Credit/Start button for one full second.
  - E. To exit the Test Mode, press the Test button.
1. Located in the GAME CHECK-UP category of the Test Mode are the following registers:
    - A. ALL LAMPS
    - B. SINGLE LAMPS
    - C. DISPLAY TEST
    - D. COIL TEST
    - E. PROGRAM VERSION
    - F. SWITCH TEST

These are all Diagnostic Test registers with the exception of item E, the PROGRAM VERSION register, which displays only EPROM program version information. The application of each Diagnostic Test register is explained in detail in SECTION 9—TROUBLESHOOTING ON LOCATION. An abbreviated description of each of these registers is given in the GAME CHECK-UP category of TABLE A—REGISTERS & OPTIONS on page 5-3.

2. Diagnostic Test in registers are performed as follows:

- A. Enter the GAME CHECK-UP category's directory and select the register to be displayed by using the Credit/Start button and either of the lower cabinet buttons as shown in Steps 1 through 4 on page 3-2.
- B. When the selected register appears in the display, press the Credit/Start button to open the register and begin the test(s). From this point on, until you exit from the directory, both lower cabinet buttons are used only in stepping through certain register test sequences.
- C. When the test is completed in any test register, (except the SWITCH TEST register) press the Credit/Start button again to exit from that register and to enter the next register. Repeating this procedure will advance you to the end of the directory. The last register in the directory is the SWITCH TEST.

**NOTE:** Exit from the Test Mode AT ANY TIME by pressing the Test button.

- D. When finished with the SWITCH TEST, exit from the register and the directory by holding in the Credit/Start button for one full second or exit from the Test Mode by pressing the Test button.

**NOTE:** While performing the series of tests within the SINGLE LAMPS register or the COIL TEST register, holding the lower right cabinet button will continuously cycle (advance) the display from one driver to the next. Holding in the lower left cabinet button will continuously cycle the display backwards from one driver to the previous driver.

3. SECTION 9—TROUBLESHOOTING ON LOCATION contains specific Diagnostic Test procedure information for the following test registers.
  - A. For ALL LAMPS, see page 9-3.
  - B. For SINGLE LAMPS, see page 9-3.
  - C. For DISPLAY TEST, see pages 9-4 and 9-5.
  - D. For COIL TEST, see pages 9-5 through 9-8.
  - E. For SWITCH TEST, see page 9-9.

### **SELF-PERCENTAGING**

1. The term Self-Percentaging refers to the game's ability to automatically adjust the score level of the First Replay Threshold to attain a desired replay percentage, also known as the TARGET PERCENT. For additional information, see Step #9 on page 3-5.
2. Self-Percentaging also applies to extra balls, when used instead of replays.
3. Initially a minimum of 200 games must be played before the Self-Percentaging Process goes into effect. It then monitors the current replay percentage of the First Replay Threshold only and makes any adjustment, if necessary, every 50 games.
4. The Self-Percentaging Process will automatically adjust the score level of the First Replay Threshold only. It makes NO adjustments to other Award features in the game.
5. Located within the SCORING STATUS category of your games Test Mode are the following registers:

|                            |                    |
|----------------------------|--------------------|
| A. LEVEL 1 SCORE           | F. LEVEL 1 PERCENT |
| B. LEVEL 2 SCORE           | G. LEVEL 2 PERCENT |
| C. LEVEL 3 SCORE           | H. LEVEL 3 PERCENT |
| D. HIGHEST SCORE           | I. TARGET PERCENT  |
| E. TIMES HIGH SCORE BEATEN |                    |

Each of these registers are explained in detail further in this section.

6. To set or check the current score level of the First Replay Threshold:
  - A. Step through the Test Mode categories until you reach SCORING STATUS.
  - B. Press the Credit/Start button to select this category and enter its directory.
  - C. The first register displayed in the directory will be LEVEL 1 SCORE.

**LEVEL 1 SCORE**—This register displays the current score level of the First Replay Threshold.

- D. Use either lower cabinet button to select any value from 0 to 9,900,000. The LEVEL 1 SCORE value can only be changed in steps of 100,000 points.
- E. Press the Credit/Start button to set the desired score level.
- F. Use either lower cabinet button to exit the directory or press the Test button to exit the Test Mode.

7. To set or check the current score level of the Second Replay Threshold, repeat Step #6 on page 3-4, but in Step 6.C, use the lower right cabinet button to select the register titled LEVEL 2 SCORE.
8. To set or check the current score level of the Third Replay Threshold, repeat Step #6 on page 3-4, but in Step 6.C, use the lower right cabinet button to select the register titled LEVEL 3 SCORE.
9. To adjust the desired Replay Percentage for the First Replay Threshold:

- A. Step through the games Test Mode until you reach the category titled SCORING STATUS.
- B. Press the Credit/Start button to select this category, and enter its directory.
- C. Use either lower cabinet button to select the TARGET PERCENT register in the directory.

**TARGET PERCENT**—This register displays the desired percentage of replays to be awarded for reaching the First Replay Threshold Level.

- D. For example, if you want the First Replay Threshold Level to award a replay in 15% of the games played, use either lower cabinet button to select 15% and then press the Credit/Start button to set the percentage. The register will then display 15% as your goal or TARGET PERCENT.
- E. Use either lower cabinet button to exit the directory or press the Test button to exit the Test Mode.

**IMPORTANT NOTES:**

When the value of this register is set at 0%, the Self-Percentaging feature, as defined in Step #1 on page 3-4, is disabled.

This register automatically defaults to a Factory Setting of 10%, when the FACTORY SETTING register, in the GAME SET-UP category, is disabled.

10. The Total Replay Percentage will be 10% or 15% higher with the addition of Match, Special and High Score To Date credits.

11. To manually check the current replay percentage of the First Replay Threshold Level, only:

- A. Step through your game's Test Mode with either lower cabinet button until you reach the category titled SCORING STATUS.
- B. Press the Credit/Start button to select this category, and enter its directory.
- C. Use either lower cabinet button to select the register in the directory titled LEVEL 1 PERCENT.

**LEVEL 1 PERCENT**—The value displayed in this register is the percentage of replays awarded for reaching the First Replay Threshold Level. Progress of the Self-Percentaging Process may be monitored by comparing the current value displayed in this register with the TARGET PERCENT.

- D. Use either lower cabinet button to exit the directory or press the Test button to exit the Test Mode.

12. The size of adjustment, made by the Self-Percentaging Process to the score level of the First Replay Threshold, is determined by the current difference between the TARGET PERCENT (entered by the Operator) and the actual percentage of replays awarded for reaching the First Replay Threshold.

- A. A difference of 10% or more will result in a 10% adjustment.
- B. A difference equal to or greater than 5%, but less than 10%, will result in a 5% adjustment.

C. A difference of less than 5% will result in a 1% adjustment.

13. To check the current score level of the First Replay Threshold, see Step #6 on page 3-4.
14. When the CLEAR ACCOUNT register is enabled, the Self-Percentaging Process is re-initiated.
15. The Second Replay Threshold Level and the Third Threshold Level are not affected in any way by the Self-Percentaging Process.
16. To check the current replay percent of the Second Replay Threshold Level, only, repeat Step #11 on page 3-5, and use either lower cabinet button to select the register titled LEVEL 2 PERCENT.
17. To check the current replay percent of the Third Replay Threshold Level, only, repeat Step #11 on page 3-5, and use either one of the lower cabinet buttons to select the register titled LEVEL 3 PERCENT.
18. To adjust the HIGH SCORE TO DATE Level at which a replay (or replays) is awarded:
  - A. Step through the game's Test Mode until you reach the category titled SCORING STATUS.
  - B. Press the Credit/Start button to select this category and enter its directory.
  - C. Use either lower cabinet button to select the HIGHEST SCORE register in the directory.

**HIGHEST SCORE**—This register displays the High Score To Date for which the replay level is set.
  - D. Use either lower cabinet button to select any value from 0 to 990,000. The HIGHEST SCORE register value can only be changed in steps of 100,000 points.
  - E. Press the Credit/Start button to set the desired score level.
  - F. Use either lower cabinet button to exit the directory or press the Test button to exit the Test Mode.
19. To check the number of times the HIGH SCORE TO DATE Level was exceeded:
  - A. Step through the game's Test Mode until you reach the category titled SCORING STATUS.
  - B. Press the Credit/Start button to select this category and enter its directory.
  - C. Use either lower cabinet button to select the TIMES HS BEATEN register in the directory.

**TIMES HS BEATEN**—This register displays the number of times the HIGH SCORE TO DATE Level was exceeded. This information aids the Operator in deciding at what point level the High Score To Date will be adjusted to in the HIGHEST SCORE register. For additional information, see Step 18 above.
  - D. Use either lower cabinet button to select any value from 0 to 9,900,000. The HIGHEST SCORE register value can be changed only in steps of 100,000 points.
  - E. Press the Credit/Start button to set the desired score level.
  - F. Use either lower cabinet button to exit the directory or press the Test button to exit the Test Mode.

## SECTION 4 FEATURE OPERATIONS & SCORING

### TABLE OF CONTENTS

| DESCRIPTION                | PAGE |
|----------------------------|------|
| INTRODUCTION .....         | 4-2  |
| START FEATURE .....        | 4-3  |
| START BONUS POINTS .....   | 4-3  |
| SECTIONS .....             | 4-4  |
| FAST LINE .....            | 4-5  |
| SPECIAL TEST .....         | 4-6  |
| EJECT (SAUCER) HOLES ..... | 4-7  |
| BONUS MULTIPLIER .....     | 4-8  |
| PLAYFIELD MULTIPLIER ..... | 4-9  |
| SAVE IT .....              | 4-10 |
| SPECIAL .....              | 4-11 |
| SLING SHOTS .....          | 4-11 |

### LIST OF ILLUSTRATIONS

| FIGURE DESCRIPTION         | PAGE |
|----------------------------|------|
| A BALL PLAY VECTORS .....  | 4-12 |
| B BALL EJECT VECTORS ..... | 4-13 |

### LIST OF TABLES

| TABLE DESCRIPTION                                                                        | PAGE |
|------------------------------------------------------------------------------------------|------|
| A START LAMP SEQUENCE .....                                                              | 4-3  |
| B SWAMP DROP TARGET LAMP SEQUENCE .....                                                  | 4-5  |
| C GAME OPTIONS REGISTER SETTINGS:<br>TOP SAUCER & RIGHT SAUCER HOLD TIMER SETTINGS ..... | 4-7  |
| D BONUS MULTIPLIER AWARDS .....                                                          | 4-8  |
| E GAME OPTIONS REGISTER SETTINGS: BONUS MULTIPLIER RESET .....                           | 4-8  |
| F PLAYFIELD MULTIPLIER LAMP SEQUENCE .....                                               | 4-9  |
| G GAME OPTIONS REGISTER SETTINGS: PLAYFIELD MULTIPLIER RESET .....                       | 4-9  |
| H SWAMP LOOP AWARDS & LAMP SEQUENCE .....                                                | 4-10 |

## **INTRODUCTION**

BLACKWATER 100 is the World's toughest race in which the player (motorcycle racer) races against the course and other players. When the player completes all eight SECTIONS (of the race course) the first time, LAP 1 will be completed. Completing all three (3) LAP's completes the race. Each race consists of an optional number of Heats that is Operator selectable.

### **GAME PLAY INSTRUCTIONS**

### **REFER TO PAGE(S)**

#### **RACE RULES:**

- Light all eight (8) Sections to finish one (1) Lap.
- Make the "Fast Line" to complete a flashing Section.
- Use either lower cabinet push-button to change the flashing Sections.

4-4 & 4-5

#### **AFTER EACH LAP, TRY FOR THE SPECIAL TEST**

4-6

1. Shoot for the top Eject (Saucer) Hole.
2. When the ball kicks out, shoot for the "Downhill" Section to finish the "Special Test."  
Finishing the Test scores 1,000,000 points and awards a "Special."

#### **TO START THE RACE:**

4-3

- Use either lower cabinet push-button to drop the Start Gate.
- A fast reaction to the Green (Go) Start Light scores more points.
- The fastest reaction scores 250,000 points.

### **GAME FEATURES**

START FEATURE  
START BONUS POINTS  
SECTIONS  
FAST LINE  
SPECIAL TEST  
EJECT (SAUCER) HOLES  
BONUS MULTIPLIER  
PLAYFIELD MULTIPLIER  
SAVE IT  
SPECIAL  
SLINGSHOTS

## **START FEATURE**

When the first ball enters the shooter lane, the Red (ready) lamp flashes behind the START GATE. When the player shoots the first ball to the START GATE in the upper right-hand corner of the Playfield, the second ball enters the shooter lane. After the second ball enters the shooter lane and is shot to the START GATE, the third ball enters the shooter lane. To start the Race, the player must shoot the third ball to the START GATE.

When all three (3) balls are at the START GATE, the Start Lamp Sequence begins. Following is the Start Lamp Sequence pattern.

- A. The Start Red (ready) lamp is flashing when the first and second balls are shot to the START GATE.
- B. The Start Red (ready) lamp stops flashing and turns on continuously for a period of time, and then goes out.
- C. The Start Yellow (set) lamp comes on for a period of time and then goes out.
- D. The Start Green (go) lamp comes on for a period of time.

**TABLE A—START LAMP SEQUENCE**

| BALL SEQUENCE          | LAMPS |        |       |
|------------------------|-------|--------|-------|
|                        | RED   | YELLOW | GREEN |
| 1ST BALL AT START GATE | ON    | OFF    | OFF   |
| 2ND BALL AT START GATE | ON    | OFF    | OFF   |
| 3RD BALL AT START GATE | OFF   | ON     | OFF   |
| 3RD BALL AT START GATE | OFF   | OFF    | ON    |

When the Green lamp comes on, the player can press either the lower right or lower left cabinet push-button, below the flipper push-buttons, to lower the START GATE and start the Race. If the player does not press either push-button, to start the Race, the START GATE will automatically lower. When the Race starts, the game will start in 3-ball Multi-Ball Play.

The Green (go) lamp is the signal to the player to start the Race. Also, the player's reaction time to pressing either push-button, determines the START BONUS point value.

## **START BONUS POINTS**

The amount of time from when the Green (go) lamp goes on to when either one of the lower cabinet push-buttons (start buttons) is pressed to start the race, determines the START BONUS point value. The faster the player presses the start push-buttons when the Green lamp is on, the more points the player will be awarded when the Race begins. START BONUS points are awarded in increments of 10,000 points, starting at 100,000 points. When the player presses the start button the moment the Green lamp comes on, the player is awarded a Hole Shot valued at 250,000 points. However, if the player does not press the start button when the Green lamp comes on, after a period of time, the START GATE will automatically lower and the Race will begin, and the player will not be awarded any START BONUS points.

## **SECTIONS**

The game consists of eight (8) Sections that must be completed by the player to finish one (1) race Lap. Three (3) Laps must be completed to complete the race. The Sections are located at various locations on the Playfield and Rear Platform. The Section lamps are indicated by a Map in the center of the Playfield between the slingshots.

There are four (4) Sections on the Rear Platform titled BOG, DOWNHILL, CLIFF and ROCKS. The remaining four (4) Sections are on the Playfield and they are titled HILL CLIMB, RAPIDS, HWY93 (HIGHWAY 93) JUMP and SWAMP. When the player completes any of the Sections, 50,000 points is awarded when the Section lamp is not flashing and 100,000 points when the lamp is flashing (W/F). Completing each Lap awards 50,000 points. Completing a Race awards 500,000 points.

Completing each Section adds 10,000 points to the Bonus whether the Section lamp is flashing or not flashing. Completing each Lap adds 100,000 points to the Bonus. All Bonus points are collected when the third and last ball in each Heat enters the outhole.

**BOG SECTION** (Rear Platform, Bottom Left)

When operated, the three (3) Green bull's-eye targets light BIG, BAD and BOG lamps. When all three (3) lamps are lit, the BOG lamp lights in the Map. Each bull's-eye target scores 2,000 points when the lamps are not flashing and scores 5,000 points when the lamps are flashing (W/F).

**DOWNHILL SECTION** (Rear Platform, Top Left)

One shot to the ramp gate on the Rear Platform upper left corner, completes this Section and lights the DOWNHILL lamp in the Map. The ramp gate scores 50,000 points when the Section lamp is not flashing and scores 100,000 points when the lamp is flashing (W/F).

**CLIFF-HANGER SECTION** (Rear Platform, Rear Upper Cliff)

One shot to the Cliff-Hanger switch on the Rear Platform completes this Section and lights the CLIFF-HANGER lamp in the Map. The Cliff-Hanger switch scores 25,000 points when the Section lamp is not flashing and scores 50,000 points when the lamp is flashing (W/F).

**ROCKS SECTION** (Rear Platform, Top Right)

When operated, the three (3) Yellow bull's-eye targets, which are elevated above the ROCKS, light MEAN, MOON, and ROCKS lamps. When these three (3) lamps are lit, the ROCKS Section lamp lights in the Map. Each bull's-eye target scores 2,000 points when the lamps are not flashing and scores 5,000 when the lamps are flashing (W/F).

**HILL CLIMB SECTION** (Playfield, Top Left Ramp)

One shot to the ramp gate at the top of the hill completes this Section and lights the HILL CLIMB lamp in the Map. The ramp gate scores 25,000 points when the Section lamp is not flashing and scores 50,000 points when the lamps is flashing (W/F).

**RAPIDS SECTION** (Playfield, Below Hill Climb Section)

When operated, the four (4) Blue bull's-eye targets light COLD, WET, ROCK and RAPIDS lamps. When these four (4) lamps are lit, the RAPIDS Section lamp lights in the Map. Each bull's-eye target scores 2,000 points when the lamps are not flashing and scores 5,000 points when the lamps are flashing (W/F).

**HWY93 (HIGHWAY 93) SECTION** (Playfield, Right Ramp To Rear Platform)

This is a 'jump' ramp shot on the right side of the Playfield. One shot to the TOLL GATE completes this Section and lights the HWY93 Section lamp in the Map. The TOLL GATE scores 25,000 points when the Section lamp is not flashing and scores 50,000 points when the lamp is flashing (W/F).

**SWAMP SECTION** (Playfield, Center)

This Section consists of five (5) side-by-side drop targets in the center of the Playfield. In front of the drop targets are five (5) lamps titled NEVER, ENDIN, BIKE, SUCKIN and SWAMP. Each time all five (5) drop targets are knocked down, one of the lamps will light until all of the lamps are lit. When all five (5) lamps are lit, the SWAMP lamp lights in the Map. Each drop target scores 2,000 points when the lamps are not flashing and scores 5,000 points when the lamps are flashing (W/F).

**TABLE B—SWAMP DROP TARGET LAMP SEQUENCE**

| ALL DROP TARGETS<br>KNOCKED DOWN SEQUENCE | SWAMP LAMP<br>LIGHTS | SWAMP SECTION MAP LAMP                |                                        |
|-------------------------------------------|----------------------|---------------------------------------|----------------------------------------|
|                                           |                      | SCORE WHEN<br>NOT FLASHING            | SCORE WHEN<br>FLASHING                 |
| 1ST TIME ALL TARGETS DOWN                 | NEVER                | 2,000 POINTS                          | 5,000 POINTS                           |
| 2ND TIME ALL TARGETS DOWN                 | ENDIN                | 2,000 POINTS                          | 5,000 POINTS                           |
| 3RD TIME ALL TARGETS DOWN                 | BIKE                 | 2,000 POINTS                          | 5,000 POINTS                           |
| 4TH TIME ALL TARGETS DOWN                 | SUCKIN               | 2,000 POINTS                          | 5,000 POINTS                           |
| 5TH TIME ALL TARGETS DOWN                 | SWAMP                | 2,000 POINTS<br>PLUS<br>50,000 POINTS | 5,000 POINTS<br>PLUS<br>100,000 POINTS |

#### **NOTE:**

The player can change the Playfield or Rear Platform locations of flashing Section lamps at any time, during game play, by rotating the corresponding flashing lamp in the Section Map to a new Section position. Use the lower right cabinet push-button to rotate the flashing Section Map lamp clockwise. Use the lower left cabinet push-button to rotate the flashing lamp counter-clockwise.

#### **FAST LINE (Front Platform/Bottom Arch)**

Operating the FAST LINE switch will complete any flashing Section & score an additional 25,000 points. The player can select any flashing Section in the Map with either the lower left or the lower right cabinet push-button. Completing each Section adds 10,000 points to the Bonus whether the Section lamp is flashing or is not flashing. All Bonus points are collected when the third and last ball in the Heat enters the outhole.

#### **SPECIAL TEST (Rear Platform)**

During Multi-Ball Play or single ball play, completing LAP 1 or LAP 2 qualifies the Top Eject (Saucer) Hole to START SPECIAL TEST (however, completing LAP 3 completes the Race with no opportunity to START SPECIAL TEST). The START SPECIAL TEST WHEN FLASHING lamp, on the Rear Platform, flashes ON. The initial SPECIAL TEST BONUS value of one million (1,000,000) points will appear in the Display. From this time until the SPECIAL TEST begins, all game points earned will be added to the player's game score and, also, added to the player's SPECIAL TEST BONUS.

When the ball is shot into the Top Eject (Saucer) Hole on the Rear Platform, during single ball play while the START SPECIAL TEST WHEN FLASHING lamp is flashing, it will be 'kicked' (ejected) immediately and the SPECIAL TEST will begin. However, during Multi-Ball Play, the ball will not be 'kicked' (ejected) from the Top Eject (Saucer) Hole until the other two (2) balls have drained through the outhole. Then the SPECIAL TEST will begin.

At the moment the ball is 'kicked' (ejected) from the Eject (Saucer) Hole, a timer appears in the left Display and begins to count down. The DOWNHILL Section area will also become animated with bright flashing lamps. To finish the SPECIAL TEST, the player *MUST* make the DOWNHILL shot and then use the Front Platform (bottom arch) flipper to shoot the ball across the Front Platform to the Right Eject (Saucer) Hole on the Playfield (operating the FAST LINE switch is not required).

If the SPECIAL TEST is finished before the end of the time limit, the player will earn the SPECIAL TEST BONUS and a SPECIAL. The SPECIAL TEST BONUS value will be collected and game play will continue.

#### **EJECT (SAUCER) HOLES (Playfield & Rear Platform)**

During Multi-Ball Play, when a ball is shot into the Top Eject (Saucer) Hole or the Right Eject (Saucer) Hole, it will be held for a period of time to give the player a short 'break' from Multi-Ball Play. But during single ball play, the ball will be kicked (ejected) immediately back into play. Each HOLD W/F lamp flashes continuously during Multi-Ball Play except during the period of time the ball is held in the lamp's corresponding Eject (Saucer) Hole.

During single ball play, both HOLD W/F lamps will remain unlit. However, when a ball is shot into either Eject (Saucer) Hole, the 25K W/LIT lamp is lit and will remain lit until the end of the Heat.

While its HOLD W/F lamp is flashing during Multi-Ball Play, an Eject (Saucer) Hole shot scores 5,000 points. During single ball play, with both HOLD W/F lamps and both 25K W/LIT lamps not lit, an Eject (Saucer) Hole Shot scores 5,000 points. However, if its 25K W/LIT lamp is lit, an Eject (Saucer) Hole shot scores 25,000 points.

Referring to the GAME SET-UP category in TABLE A—REGISTERS & OPTIONS on page 5-2, the GAME OPTIONS register can be set for a particular game difficulty level which will affect the period of time the ball is held in either Eject (Saucer) Hole as indicated in Table C, below.

**TABLE C—GAME OPTIONS REGISTER SETTINGS: TOP SAUCER & RIGHT SAUCER HOLD TIMER SETTINGS**

| DIFFICULTY LEVEL SETTING                    | XX EASY | X EASY | EASY | MEDIUM <sup>1</sup> | HARD | X HARD | XX HARD |
|---------------------------------------------|---------|--------|------|---------------------|------|--------|---------|
| SAUCER HOLD TIME <sup>2</sup><br>IN SECONDS | 34      | 30     | 26   | 22                  | 18   | 14     | 10      |

<sup>1</sup>FACTORY RECOMMENDED SETTING

<sup>2</sup>THE BALL IS HELD ONLY DURING MULTI-BALL PLAY

## BONUS MULTIPLIER (Rear Platform)

The BONUS MULTIPLIER value is increased by shooting the ball through the Top Left Loop, using the Upper Right Flipper, while the left ADVANCE BONUS X AND 100K W/F lamp is briefly flashing or by shooting the ball through the Top Right Loop, using the Upper Left Flipper, while the right ADVANCE BONUS X AND 100K W/F lamp is briefly flashing. When no lamp is flashing, completing the Top Left Loop or the Top Right Loop (the ball operates the Loop's rollover switch) scores 3,000 points. When either lamp is flashing, completing its corresponding Loop scores 100,000 points and advances the BONUS MULTIPLIER value as shown in Table D, below.

To qualify either ADVANCE BONUS MULTIPLIER shots, completing either Loop will flash ON the opposite ADVANCE BONUS X AND 100K lamp. The BONUS MULTIPLIER can be advanced to a maximum value of 4X.

**TABLE D—BONUS MULTIPLIER AWARDS**

| TO LEFT LOOP OR<br>TOP RIGHT LOOP<br>COMPLETION | 'ADVANCE BONUS X<br>AND 100K W/F'<br>LAMP <sup>1</sup> | TOP LEFT LOOP OR<br>TOP RIGHT LOOP<br>ROLLOVER SWITCH SCORE | BONUS MULTIPLIER<br>LAMPS |     |     |
|-------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|---------------------------|-----|-----|
|                                                 |                                                        |                                                             | 2X                        | 3X  | 4X  |
| 1ST TIME                                        | OFF                                                    | 3,000 POINTS                                                | OFF                       | OFF | OFF |
| 2ND TIME                                        | FLASHES ON                                             | 100,000 POINTS                                              | ON                        | OFF | OFF |
| 3RD TIME                                        | FLASHES ON                                             | 100,000 POINTS                                              | OFF                       | ON  | OFF |
| 4TH TIME                                        | FLASHES ON                                             | 100,000 POINTS                                              | OFF                       | OFF | ON  |

<sup>1</sup>THIS LAMP IS LOCATED IN FRONT OF THE ENTRANCE TO THE LOOP BEING COMPLETED.

Referring to the GAME SET-UP category in TABLE A—REGISTERS & OPTIONS on page 5-2, the GAME OPTIONS register can be set for a particular game difficulty level which will affect the BONUS MULTIPLIER feature as indicated in Table E, below.

**TABLE E—GAME OPTIONS REGISTER SETTINGS: BONUS MULTIPLIER RESET**

| DIFFICULTY LEVEL SETTING                             | XX EASY | X EASY | EASY | MEDIUM <sup>1</sup> | HARD | X HARD | XX HARD |
|------------------------------------------------------|---------|--------|------|---------------------|------|--------|---------|
| RESET BONUS MULTIPLIER FROM<br>HEAT-TO-HEAT          | NO      | NO     | NO   | NO                  | NO   | YES    | YES     |
| CARRY OVER PLAYFIELD<br>MULTIPLIER FROM HEAT-TO-HEAT | YES     | YES    | YES  | YES                 | YES  | NO     | NO      |

<sup>1</sup>FACTORY RECOMMENDED SETTING

## PLAYFIELD MULTIPLIER (Front Platform/Bottom Arch)

The four (4) blue bull's-eye targets on the Front Platform Assembly spell R-A-I-N. Every time R-A-I-N is completed, the PLAYFIELD MULTIPLIER advances one value until a maximum value of 4X is reached as shown in Table F, below. Operating each target switch in R-A-I-N awards 5,000 points whether the target lamp is lit or not. Completing R-A-I-N awards an additional 50,000 points.

**TABLE F—PLAYFIELD MULTIPLIER LAMP SEQUENCE**

| R-A-I-N<br>TARGETS<br>COMPLETION | GAME<br>POINTS<br>SCORED | PLAYFIELD MULTIPLIER<br>LAMPS |     |     |
|----------------------------------|--------------------------|-------------------------------|-----|-----|
|                                  |                          | 2X                            | 3X  | 4X  |
| NONE                             | NONE                     | OFF                           | OFF | OFF |
| 1ST TIME                         | 50,000                   | ON                            | OFF | OFF |
| 2ND TIME                         | 50,000                   | OFF                           | ON  | OFF |
| 3RD TIME                         | 50,000                   | OFF                           | OFF | ON  |

Referring to the GAME SET-UP category in TABLE A—REGISTERS & OPTIONS on page 5-2, the GAME OPTIONS register can be set for a particular game difficulty level which affects the PLAYFIELD MULTIPLIER feature as indicated in Table G, below.

**TABLE G—GAME OPTIONS REGISTER SETTINGS: PLAYFIELD MULTIPLIER RESET**

| DIFFICULTY LEVEL SETTING                             | XX EASY | X EASY | EASY | MEDIUM <sup>1</sup> | HARD | X HARD | XX HARD |
|------------------------------------------------------|---------|--------|------|---------------------|------|--------|---------|
| RESET PLAYFIELD MULTIPLIER<br>FROM HEAT-TO-HEAT      | NO      | NO     | NO   | YES                 | YES  | YES    | YES     |
| CARRY OVER PLAYFIELD<br>MULTIPLIER FROM HEAT-TO-HEAT | YES     | YES    | YES  | NO                  | NO   | NO     | NO      |

<sup>1</sup>FACTORY RECOMMENDED SETTING

### **SAVE IT (Playfield, Left & Right Outlanes)**

The SAVE IT feature is similar to an extra ball feature. When the SAVE IT W/F lamp (each one is located above either outlane) is flashing and the ball enters that outlane and operates the lane's rollover switch, the player is awarded another ball to continue playing the same Heat. When this occurs, the player does not get another Race Start; however, the ball, that the Player shoots will roll over the START GATE into play.

The SAVE IT feature is qualified by lighting the SAVE IT W/F (flashes only), located above either outlane, when shooting the ball through the SWAMP Loop as indicated in Table H, below. When SAVE IT is qualified at either outlane, it can be moved to the other outlane by pressing either the right or the left lower cabinet push-button.

**TABLE H—SWAMP LOOP AWARDS & LAMP SEQUENCE**

| SWAMP LOOP COMPLETION <sup>1</sup> | SWAMP LOOP LAMPS <sup>1</sup> |                 |                 |                 | SAVE IT W/F LAMP <sup>1</sup> | GAME POINTS SCORED |
|------------------------------------|-------------------------------|-----------------|-----------------|-----------------|-------------------------------|--------------------|
|                                    | 5K W/ FLASHING                | 10K W/ FLASHING | 25K W/ FLASHING | 50K W/ FLASHING |                               |                    |
| NONE                               | FLASHING                      | OFF             | OFF             | OFF             | OFF                           | NONE               |
| 1ST TIME                           | ON                            | FLASHING        | OFF             | OFF             | OFF                           | 5,000              |
| 2ND TIME                           | ON                            | ON              | FLASHING        | OFF             | OFF                           | 10,000             |
| 3RD TIME                           | ON                            | ON              | ON              | FLASHING        | OFF                           | 25,000             |
| 4TH TIME                           | ON                            | ON              | ON              | FLASHING        | FLASHING                      | NONE               |
| 5TH TIME                           | FLASHING                      | OFF             | OFF             | FLASHING        | FLASHING                      | 50,000             |
| 6TH TIME                           | ON                            | FLASHING        | OFF             | FLASHING        | FLASHING                      | 5,000              |
| 7TH TIME                           | ON                            | ON              | FLASHING        | FLASHING        | FLASHING                      | 10,000             |
| 8TH TIME                           | ON                            | ON              | ON              | FLASHING        | FLASHING                      | 25,000             |
| 9TH TIME                           | FLASHING                      | OFF             | OFF             | FLASHING        | FLASHING                      | 50,000             |

<sup>1</sup>A LEFT SWAMP LOOP ENTRANCE SHOT AFFECTS ONLY THE SWAMP LOOP LAMPS AND THE SAVE IT W/F LAMP ON THE LEFT SIDE OF THE PLAYFIELD AND A RIGHT SWAMP LOOP ENTRANCE SHOT AFFECTS ONLY THE SWAMP LOOP LAMPS AND THE SAVE IT W/F LAMP ON THE RIGHT SIDE OF THE PLAYFIELD.

NOTE: While the SAVE IT W/F lamp continues to flash, game results of additional SWAMP LOOP completions beyond the 8th time will only repeat the SWAMP LOOP completion pattern of the 6th time through the 9th time as shown in Table H, above.

When the ball operates the rollover switch in the right or the left outlane, 1,000 points are scored, whether the SAVE IT W/F lamp above the outlane is flashing or not. Also, the SAME PLAYER RIDES AGAIN lamp flashes ON and continues to flash until the extra ball earned has been played and then either ball rolls through one of the outlanes or drains through the outhole which ends the Heat.

### **SPECIAL (Playfield, Left & Right Flipper Return Lanes)**

The SPECIAL W/LIT lamps in the left and right flipper return lanes will light when the 4X BONUS MULTIPLIER lamp is lit. The SPECIAL lamps light only once per game. When the ball rolls through either flipper return lane and operates the lane's rollover switch, 5,000 points are scored. This occurs whether the lane's SPECIAL W/LIT lamp is lit or not.

### **SLINGSHOTS (Playfield)**

When the ball hits the left slingshot or the right slingshot, it will operate one of two (2) switches per slingshot. Each hit scores 30 points.

① ADVANCE BONUS MULTIPLIER VALUE

② START SPECIAL TEST (ONLY WHEN THE BALL IS KICKED/EJECTED INTO PLAY)

③ FINISH SPECIAL TEST

- ① ADVANCE  
BONUS  
MULTIPLIER  
VALUE
- ② START  
SPECIAL  
TEST (ONLY  
WHEN THE  
BALL IS KICKED/  
EJECTED INTO  
PLAY)
- ③ FINISH  
SPECIAL  
TEST

- ① TWO (2) SOLID BALL EJECT VECTORS ARE SHOWN FOR TWO (2) SAUCER EJECT ASSEMBLIES.
- ② ONE (1) 'DASHED' BALL EJECT VECTOR IS SHOWN FOR ONE (1) MULTI-BALL TROUGH ASSEMBLY.

- ① TWO (2) SOLID BALL EJECT VECTORS ARE SHOWN FOR TWO (2) SAUCER EJECT ASSEMBLIES.
- ② ONE (1) 'DASHED' BALL EJECT VECTOR IS SHOWN FOR ONE (1) MULTI-BALL TROUGH ASSEMBLY.



**SECTION 5**  
**REGISTERS & OPTIONS INFORMATION**

**TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                                                         | <b>PAGE</b> |
|----------------------------------------------------------------------------|-------------|
| COIN SET-UP PROCEDURE .....                                                | 5-4         |
| BALLY PINBALL REGISTERS & OPTIONS ACCESS & MODIFICATION INSTRUCTIONS ..... | 5-5         |

**LIST OF TABLES**

| <b>TABLE DESCRIPTION</b>                          | <b>PAGE</b> |
|---------------------------------------------------|-------------|
| A    REGISTERS & OPTIONS .....                    | 5-2         |
| B    RECOMMENDED 3 & 5 HEAT OPTION SETTINGS ..... | 5-6         |

**TABLE A—REGISTERS & OPTIONS**

| CATEGORY          | REGISTER DIRECTORY         |                             |              |                                                                                         |
|-------------------|----------------------------|-----------------------------|--------------|-----------------------------------------------------------------------------------------|
|                   | PLAYER #1 & #2<br>DISPLAYS | PLAYER #3 &<br>#4 DISPLAYS* | SEE<br>NOTES | REGISTER DESCRIPTION                                                                    |
| GAME<br>STATUS    | TOTAL COINS                | XXXXXXX                     | 1            | Total Coins From All 3 Coin Chutes                                                      |
|                   | GAMES PLAYED               | XXXXXXX                     | 1            | # Of Games Played                                                                       |
|                   | REPLAYS AWARDED            | XXXXXXX                     | 1            | # Of Replays Awarded From All Scores                                                    |
|                   | REPLAYS PERCENT            | XX                          | 1            | Percentage Of All Replays—Maximum Of 99 Percent                                         |
|                   | AV GAME TIME =             | XX XX                       | 1            | Average Game Time In Minutes & Seconds                                                  |
|                   | HEATS PLAYED               | XXXXXXX                     | 1            | # Of Heats Played                                                                       |
|                   | X-BALLS AWARDED            | XXXXXXX                     | 1            | # Of Extra Balls Awarded                                                                |
|                   | X-BALL PERCENT             | XX                          | 1            | Percentage Of Extra Balls—Maximum Of 99 Percent                                         |
|                   | AV HEAT TIME =             | XX XX                       | 1            | Average Heat Time In Minutes & Seconds                                                  |
|                   | CLEAR ACCOUNT              | NO**                        | 2            | Clear All Account Date                                                                  |
| REPLAY<br>STATUS  | LEVEL 1 SPECIAL            | XXXXXXX                     | 1            | # Of 1 <sup>st</sup> Threshold Level Specials Awarded                                   |
|                   | LEVEL 2 SPECIAL            | XXXXXXX                     | 1            | # Of 2 <sup>nd</sup> Threshold Level Specials Awarded                                   |
|                   | LEVEL 3 SPECIAL            | XXXXXXX                     | 1            | # Of 3 <sup>rd</sup> Threshold Level Specials Awarded                                   |
|                   | HISCORE SPECIAL            | XXXXXXX                     | 1            | # Of High Score Specials Awarded                                                        |
|                   | PLAYFIELD SPECIAL          | XXXXXXX                     | 1            | # Of Playfield Specials Awarded                                                         |
|                   | MATCH SPECIAL              | XXXXXXX                     | 1            | # Of Match Feature Specials Awarded                                                     |
| SCORING<br>STATUS | LEVEL 1 SCORE =            | XXXXXXX                     | 3            | Set First Threshold Award Level & Display                                               |
|                   | LEVEL 2 SCORE =            | XXXXXXX                     | 3            | Set Second Threshold Award Level & Display                                              |
|                   | LEVEL 3 SCORE =            | XXXXXXX                     | 3            | Set Third Threshold Award Level & Display                                               |
|                   | HIGHEST SCORE =            | XXXXXXX                     | 3            | Set the High Score To Date Replay Level                                                 |
|                   | TIMES HS BEATEN            | XXXXXXX                     | 1            | # Of Times Point Total Exceeded High Score To Date Earned                               |
|                   | LEVEL 1 PERCENT            | XX                          | 1            | Actual Percentage Of First Threshold Level Replays Awarded                              |
|                   | LEVEL 2 PERCENT            | XX                          | 1            | Actual Percentage Of Second Threshold Level Replays Awarded                             |
|                   | LEVEL 3 PERCENT            | XX                          | 1            | Actual Percentage Of Third Threshold Level Replays Awarded                              |
|                   | TARGET PERCENT             | XX                          | 4            | Enter desired percentage of replays awarded for reaching the First Threshold Level      |
| COIN<br>STATUS    | LEFT COINS =               | XXXXXXX                     | 1            | # Of Coins Thru Left Coin Chute                                                         |
|                   | MIDDLE COINS =             | XXXXXXX                     | 1            | # Of Coins Thru Middle Coin Chute                                                       |
|                   | RIGHT COINS =              | XXXXXXX                     | 1            | # Of Coins Thru Right Coin Chute                                                        |
|                   | TOTAL COINS =              | XXXXXXX                     | 1            | Total # Of Coins Thru All Coin Chutes                                                   |
|                   | BONUS CREDITS              | XXXXXXX                     | 1            | # Of Bonus Credits Awarded                                                              |
| COIN<br>SET-UP*** | LEFT XX COIN               | YY CRDT, ZZ<br>BONS         | 10           | Left Coin Chute Set-Up                                                                  |
|                   | MIDDLE XX COIN             | YY CRDT, ZZ<br>BONS         | 10           | Middle Coin Chute Set-Up                                                                |
|                   | RIGHT XX COIN              | YY CRDT, ZZ<br>BONS         | 10           | Right Coin Chute Set-Up                                                                 |
| GAME<br>SET-UP    | FACTORY SETTING            | NO**                        | 2            | Reset to factory selected options.                                                      |
|                   | CREDIT LIMIT=              | 10**                        | 5            | Set Credit Limit from 1-4.                                                              |
|                   | HEATS ALLOWED              | 03**                        | 5            | Set # of Heats Allowed from 1-5.                                                        |
|                   | LEVELS AWARD               | REPLAY**                    | 6            | Set type of award for exceeding Threshold Levels.                                       |
|                   | SPECIAL AWARD =            | REPLAY**                    | 6            | Set type of award for lighting Special lights.                                          |
|                   | HISCORE AWARD              | 3 REPLAY**                  | 7            | Set type of award for exceeding High Score To Date.                                     |
|                   | BCKGRND SOUND              | ON**                        | 8            | Provide background music during game play.                                              |
|                   | MATCH PERCENT              | 10**                        | 5            | Set allowed Match Percent from 00-10.<br>00 = Option is disabled. 10 = Maximum percent. |
|                   | DISPLAY CREDITS            | YES**                       | 2            | Display credits when game is over.                                                      |
|                   | NO LIMIT REPLAY            | YES**                       | 2            | Allows more than 1 Special per game, per player.                                        |
|                   | FREE PLAY                  | NO**                        | 2            | Set NO = Coins, or set YES = Free Play mode.                                            |
|                   | TILT WARNING               | 01**                        | 5            | Set # of Tilt Warnings.                                                                 |
|                   | ATTRACT SOUNDS             | ON**                        | 8            | Set Attract Sound in Game Over mode.                                                    |
|                   | SLINGSHOTS                 | ON**                        | 8            | Activate slingshots.                                                                    |
|                   | GAME OPTIONS               | MEDIUM**                    | 9            | Set game difficulty level.                                                              |
|                   | MAXIMUM PLAYERS            | 04**                        | 5            | Set # of players allowed from 1-4.                                                      |
|                   | BUY-IN HEATS               | 02**                        | 5            | Set # of Buy-In Heats from 0-3.                                                         |
| MISC.<br>INFO.    | TOTAL TIME =               | XXXXXXX                     | 1            | Time in minutes the game is powered-up from the time the game is ready for play.        |

\*Player #3 & #4 indicate a variable range of values. The XXXXXXXX represents the number value and XX represents the % value. Player #4 shows the values that can be selected to replace the value shown in Player #3.

\*\*Denotes Factory Setting.

\*\*\*See Coin Set-Up Procedure examples on page 5-4.

**TABLE A—REGISTERS & OPTIONS CONT'D.**

| CATEGORY                | REGISTER DIRECTORY         |                             |              |                                                                                                                                                                                                                                                                        |
|-------------------------|----------------------------|-----------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | PLAYER #1 & #2<br>DISPLAYS | PLAYER #3 &<br>#4 DISPLAYS* | SEE<br>NOTES | REGISTER DESCRIPTION                                                                                                                                                                                                                                                   |
| GAME<br>CHECK-UP        | ALL LAMPS                  |                             |              | Flashes all lamps on the Playfield.                                                                                                                                                                                                                                    |
|                         | SINGLE LAMPS               |                             |              | Lamps flash sequentially until either lower cabinet button, located on the side of the cabinet, is pressed.<br>Press the lower right cabinet button to advance to the next lamp in the test.<br>Press the lower left cabinet button to 'back-up' to the previous test. |
|                         | DISPLAY TEST               |                             |              | Continuously cycles through all segments of any selected digit in either Display Driver Module.<br>Press the lower right cabinet button to advance to the next digit to the right. Press the lower left cabinet button to 'back-up' to the previous digit to the left. |
|                         | COIL TEST                  |                             |              | Press the lower right cabinet button to advance to the next Solenoid in the test. Press the lower left cabinet button to test the same Solenoid under test.                                                                                                            |
|                         | PROGRAM VERSION            |                             |              | Displays EPROM's #U2 and #U3 program version.                                                                                                                                                                                                                          |
|                         | SWITCH TEST                |                             |              | Displays stuck switch by name.                                                                                                                                                                                                                                         |
| HELP<br>READ ME<br>HELP |                            | ALL OK                      |              | ALL OK is displayed when no game problems are detected. If a problem is detected in the game, assistance information will be displayed.                                                                                                                                |

**NOTES:**

- 1—Can be reset to 00, only.
- 2—Can be changed to YES (enabled) or NO (disabled), only.
- 3—Can be changed in 100,000 point steps.
- 4—Has a value from 00 thru 20. Self Percentage feature is off (disabled) if this setting is 00.
- 5—Can be changed in unit steps.
- 6—Can be changed to REPLAY, XBALL, POINTS or NOTHING.
- 7—Can be changed to 3 REPLAYS, 2 REPLAYS, 1 REPLAY or NOTHING.
- 8—Can be changed to ON (enable) or OFF (disable).
- 9—Can be changed to XX-EASY, X-EASY, EASY, MEDIUM, HARD, X-HARD or XX-HARD.
- 10—XX coins buys YY credits, and bonus credits will be awarded by buying ZZ credits.

## COIN SET-UP PROCEDURE

### EXAMPLE 1

A.—Enter COIN SET-UP category to set the right coin chute for 3 credits for 2 coins played (with no credits on the first coin).

B.—Enter the directory.

| PLAYER 1<br>DISPLAY | PLAYER 2<br>DISPLAY | PLAYER 3<br>DISPLAY | PLAYER 4<br>DISPLAY |
|---------------------|---------------------|---------------------|---------------------|
| RIGHT               | XX COIN             | YY CREDIT           | XX BONS             |

C.—Set the directory to RIGHT, 02 COIN, 03 CREDIT and 00 BONS.

| PLAYER 1<br>DISPLAY | PLAYER 2<br>DISPLAY | PLAYER 3<br>DISPLAY | PLAYER 4<br>DISPLAY |
|---------------------|---------------------|---------------------|---------------------|
| RIGHT               | 02 COIN             | 03 CREDIT           | 00 BONS             |

### EXAMPLE 2

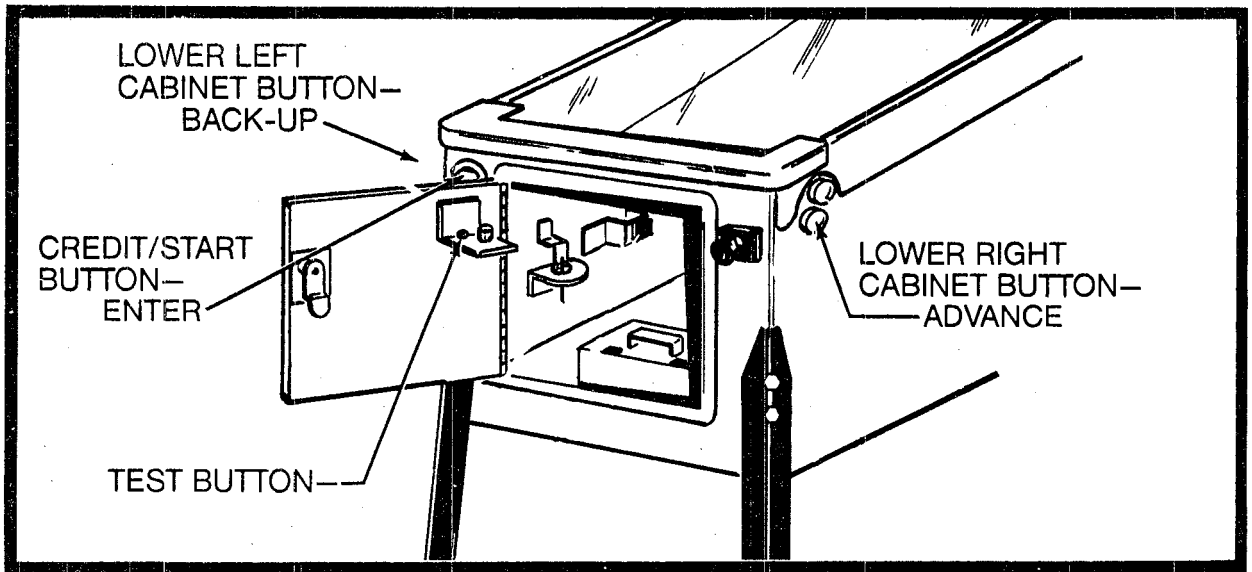
A.—Enter COIN SET-UP category to set the right coin chute for 3 credits for 2 coins played (with one credit on the first coin and 2 credits on the second coin).

B.—Enter the directory.

| PLAYER 1<br>DISPLAY | PLAYER 2<br>DISPLAY | PLAYER 3<br>DISPLAY | PLAYER 4<br>DISPLAY |
|---------------------|---------------------|---------------------|---------------------|
| RIGHT               | XX COIN             | YY CREDIT           | XX BONS             |

C.—Set the directory to RIGHT, 01 COIN, 01 CREDIT and 02 BONS.

| PLAYER 1<br>DISPLAY | PLAYER 2<br>DISPLAY | PLAYER 3<br>DISPLAY | PLAYER 4<br>DISPLAY |
|---------------------|---------------------|---------------------|---------------------|
| RIGHT               | 01 COIN             | 01 CREDIT           | 02 BONS             |



**FIGURE A—REGISTERS & OPTIONS  
SELECT BUTTONS**

***BALLY-MIDWAY PINBALL REGISTERS & OPTIONS  
ACCESS & MODIFICATION INSTRUCTIONS***

- 
1. Enter the Test Mode by pressing the Test Button on the inside of the front door.
  2. Change the category by pressing the right or the left lower cabinet button.
  3. Select the category and open its directory by pressing the Credit/Start buttons.
  4. Change directory by pressing the right or the left lower cabinet button.
  5. Select and open the register in the directory by pressing the Credit/Start button.
  6. Change register values by pressing the right or the left lower cabinet button.
  7. Lock-in selected register values by pressing the Credit/Start button.
  8. Repeat steps 4 through 7 for more register changes or changes in the same category. To exit the Test Mode, press the Test button.
-

**TABLE B--RECOMMENDED 3 & 5 HEAT OPTION SETTINGS**

| GAME MODE  | CATEGORY       | REGISTER DIRECTORY                                              |                                                    |                                        |                                  |                                     |                               |
|------------|----------------|-----------------------------------------------------------------|----------------------------------------------------|----------------------------------------|----------------------------------|-------------------------------------|-------------------------------|
|            |                | PLAYER 1<br>DISPLAY                                             | PLAYER 2<br>DISPLAY                                | 3 HEAT<br>PLAYER 3<br>DISPLAY          | 3 HEAT<br>PLAYER 4<br>DISPLAY    | 5 HEAT<br>PLAYER 3<br>DISPLAY       | 5 HEAT<br>PLAYER 4<br>DISPLAY |
| REPLAYS    | GAME SET UP    | SPECIAL AWARD<br>HISCORE AWARD<br>MATCH PERCENT<br>GAME OPTIONS |                                                    | REPLAY*<br>3 REPLAY*<br>10*<br>MEDIUM* |                                  | REPLAY<br>3 REPLAY<br>10<br>HARD    |                               |
|            | SCORING STATUS | LEVEL 1 SCORE<br>LEVEL 2 SCORE<br>HIGHEST SCORE                 |                                                    | 2,000,000<br>4,000,000<br>4,300,000    |                                  | 3,300,000<br>6,600,000<br>7,000,000 |                               |
|            | COIN SET UP    |                                                                 | RIGHT 01* COIN<br>LEFT 01* COIN<br>MIDDLE 01* COIN | 01* CRDT<br>01* CRDT<br>01* CRDT       | 00* BONS<br>00* BONS<br>00* BONS | 01 CRDT<br>01 CRDT<br>01 CRDT       | 00 BONS<br>00 BONS<br>00 BONS |
| EXTRA BALL | GAME SET UP    | SPECIAL AWARD<br>HISCORE AWARD<br>MATCH PERCENT<br>GAME OPTIONS |                                                    | XBALL<br>NOTHING<br>00<br>MEDIUM*      |                                  | XBALL<br>NOTHING<br>00<br>HARD      |                               |
|            | SCORING STATUS | LEVEL 1 SCORE<br>LEVEL 2 SCORE<br>HIGHEST SCORE                 |                                                    | 2,000,000<br>4,000,000<br>4,300,000    |                                  | 3,300,000<br>6,600,000<br>7,000,000 |                               |
|            | COIN SET UP    |                                                                 | RIGHT 01* COIN<br>LEFT 01* COIN<br>MIDDLE 01* COIN | 01* CRDT<br>01* CRDT<br>01* CRDT       | 00* BONS<br>00* BONS<br>00* BONS | 01 CRDT<br>01 CRDT<br>01 CRDT       | 00 BONS<br>00 BONS<br>00 BONS |
| NOVELTY    | GAME SET UP    | SPECIAL AWARD<br>HISCORE AWARD<br>MATCH PERCENT<br>GAME OPTIONS |                                                    | POINTS<br>NOTHING<br>00<br>MEDIUM*     |                                  | POINTS<br>NOTHING<br>00<br>HARD     |                               |
|            | SCORING STATUS | LEVEL 1 SCORE<br>LEVEL 2 SCORE<br>HIGHEST SCORE                 |                                                    | 2,000,000<br>4,000,000<br>4,300,000    |                                  | 3,300,000<br>6,600,000<br>7,000,000 |                               |
|            | COIN SET UP    |                                                                 | RIGHT 01* COIN<br>LEFT 01* COIN<br>MIDDLE 01* COIN | 01* CRDT<br>01* CRDT<br>01* CRDT       | 00* BONS<br>00* BONS<br>00* BONS | 01 CRDT<br>01 CRDT<br>01 CRDT       | 00 BONS<br>00 BONS<br>00 BONS |

\* = Denotes Factory Setting.

**NOTE:** Player #4 values can be selected to replace the settings shown in Player #3 display. However, the #4 Player values do not apply for any of the Coin Set Up Procedure or values. See the Coin Set-Up Procedure example on page 5-4.

**SECTION 6**  
**SERVICING THE GAME**  
**TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                       | <b>PAGE</b> |
|------------------------------------------|-------------|
| DETACHING THE PINBALL GAME BACKBOX ..... | 6-2         |
| SWITCH ASSEMBLY ADJUSTMENTS .....        | 6-2         |

**LIST OF ILLUSTRATIONS**

| <b>FIGURE</b> | <b>DESCRIPTION</b>                          | <b>PAGE</b> |
|---------------|---------------------------------------------|-------------|
| A             | PINBALL GAME BACKBOX BEFORE DETACHING ..... | 6-3         |

## DETACHING THE PINBALL GAME BACKBOX

Before detaching the Backbox Assembly from the game, *Bally-Midway* recommends the following procedure. For additional information, refer to Figure A on page 6-3.

**STEP 1**—With the Backbox in the upright position, disconnect the Front Cabinet & Playfield cable connectors from the Backbox printed circuit board assemblies.

**NOTE:** Before disconnecting any connector on the printed circuit boards, turn OFF the power to the game.

**STEP 2**—Remove the two (2) long  $\frac{3}{8}$ " hold-down bolts and flat washers that secure the Backbox to the Front Cabinet Assembly and lower the Backbox to its "transport position".

**STEP 3**—Remove the two (2) nuts and bolts that hold the right Backbox mounting bracket to the "neck" portion of the Front Cabinet.

**STEP 4**—Raise the Backbox to its upright position.

**STEP 5**—Lift the right corner of the Backbox approximately  $\frac{3}{4}$ " and pull/slide the Backbox towards the right side of the Front Cabinet. The Backbox should now be disengaged from the right and left cabinet hinges and can now be detached from the Front Cabinet.

To re-attach the Backbox to the Front Cabinet, perform Steps 1 thru 5 in reverse.

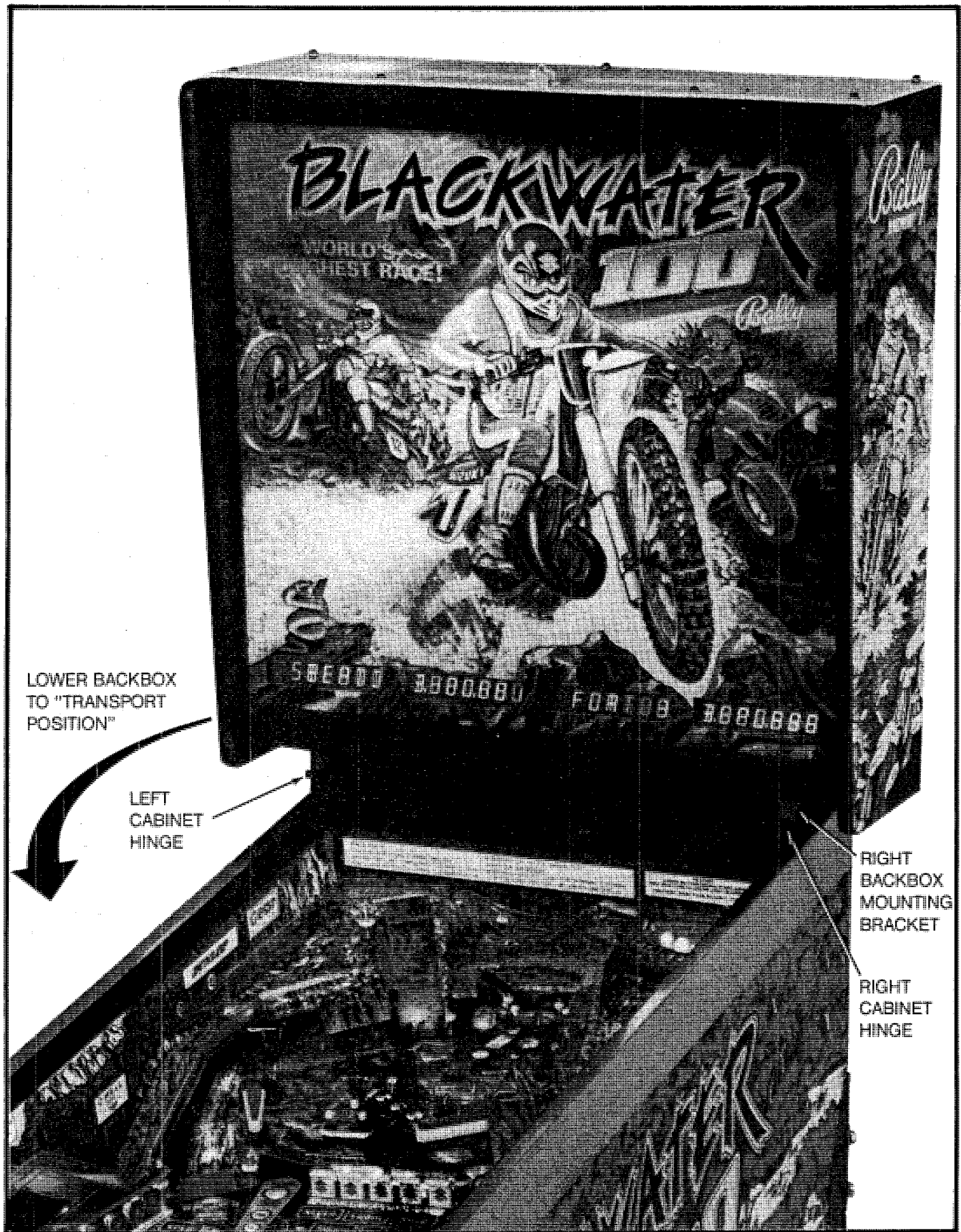
## SWITCH ASSEMBLY ADJUSTMENTS

All switch assemblies consist of switch blades, contacts separators, plastic tubing and screws to hold them to the mounting surface. Before attempting to adjust a switch assembly, ensure that the screws are tight. If not, tighten the front screw (closest to the switch blade) first and then the back screw (closest to the soldering end of the blade). This will prevent the assembly from being secured in such a manner that the switch blades tend to fan-out.

In general, all switch blades are adjusted for a  $\frac{1}{16}$ " gap between the switch contacts in the open position and adjusted for .010" over-travel or wipe in the closed position. All switch contacts should be free of dust and dirt. Contacts, with the exception of the Flipper Button Switch Assemblies, are plated to resist corrosion. Filing or burnishing the switch contacts breaks the finish and encourages corrosion. Clean the switch contacts by gently closing them on a clean business card or piece of paper and wiping until the contacts are clean.

To clean Flipper Button Switch Assembly contacts: Remove the tarnish from the switch contacts with a contact file followed by a burnishing tool. Severely pitted contacts must be replaced and adjusted only when they are found to be a source of game malfunction.

FIGURE A. PINBALL GAME BACKBOX BEFORE DETACHING





## **SECTION 7 ROUTINE MAINTENANCE ON LOCATION**

### **TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                                        | <b>PAGE</b> |
|-----------------------------------------------------------|-------------|
| SWITCH ASSEMBLY MAINTENANCE .....                         | 7-2         |
| LUBRICATION SPECIFICATIONS FOR DROP TARGET ASSEMBLY ..... | 7-2         |
| PLAYFIELD ASSEMBLY PARTS LIST .....                       | 7-4         |
| PLAYFIELD RAMPS, RUBBER RINGS & POSTS PARTS LIST .....    | 7-5         |

### **LIST OF ILLUSTRATIONS**

| <b>FIGURE</b> | <b>DESCRIPTION</b>                                                         | <b>PAGE</b> |
|---------------|----------------------------------------------------------------------------|-------------|
| A             | DROP TARGET ASSEMBLY LUBRICATION POINTS .....                              | 7-3         |
| B             | PLAYFIELD ASSEMBLY—TOP VIEW W/PARTS LIST .....                             | 7-4         |
| C             | PLAYFIELD ASSEMBLY—TOP VIEW W/RAMPS, RUBBER RINGS & POSTS PARTS LIST ..... | 7-5         |
| D             | PINBALL GAME PARTS LOCATIONS .....                                         | 7-6         |

## SWITCH ASSEMBLY MAINTENANCE

After successful completion of all Diagnostic Tests in the Test Mode's GAME CHECKUP category, set the game up for play. Exercise each rollover, thumper-bumper (if applicable), slingshot, target and rebound switches with a game ball until each switch on the Playfield has been checked for proper operation.

When the operation of any switch results in intermittent or no response, clean the switch contacts. Gently close them on a clean business card or piece of paper with a 'wiping' motion until the contacts are wiped clean. If necessary, re-gap the switch contacts to  $\frac{1}{16}$ ". **DO NOT burnish or file gold plated switch contacts!**

## LUBRICATION SPECIFICATIONS—DROP TARGET ASSEMBLY (5 SIDE-BY-SIDE)

Lubricating the various components on the Drop Target Assembly as part of routine maintenance, ensures reduced friction during game operation.

Referring to Figure A on page 7-3, the lubrication specifications are as follows.

**TABLE A—DROP TARGET ASSEMBLY LUBRICATION SPECIFICATIONS**

| STEP # | LUBRICANT | COMPONENT LOCATION                               |
|--------|-----------|--------------------------------------------------|
| 1      | OIL       | Item #8—In hole of each snap-in coil NYLINER     |
| 2      | OIL       | Item #22—Around surface of each PIVOT PIN        |
| 3      | GREASE    | Item #7—In pivot hole of each DROP TARGET LINK   |
| 4      | GREASE    | Item #20—In each slot of STATIONARY BOTTOM PLATE |
| 5      | GREASE    | Item #15—In each slot of BACK PLATE              |

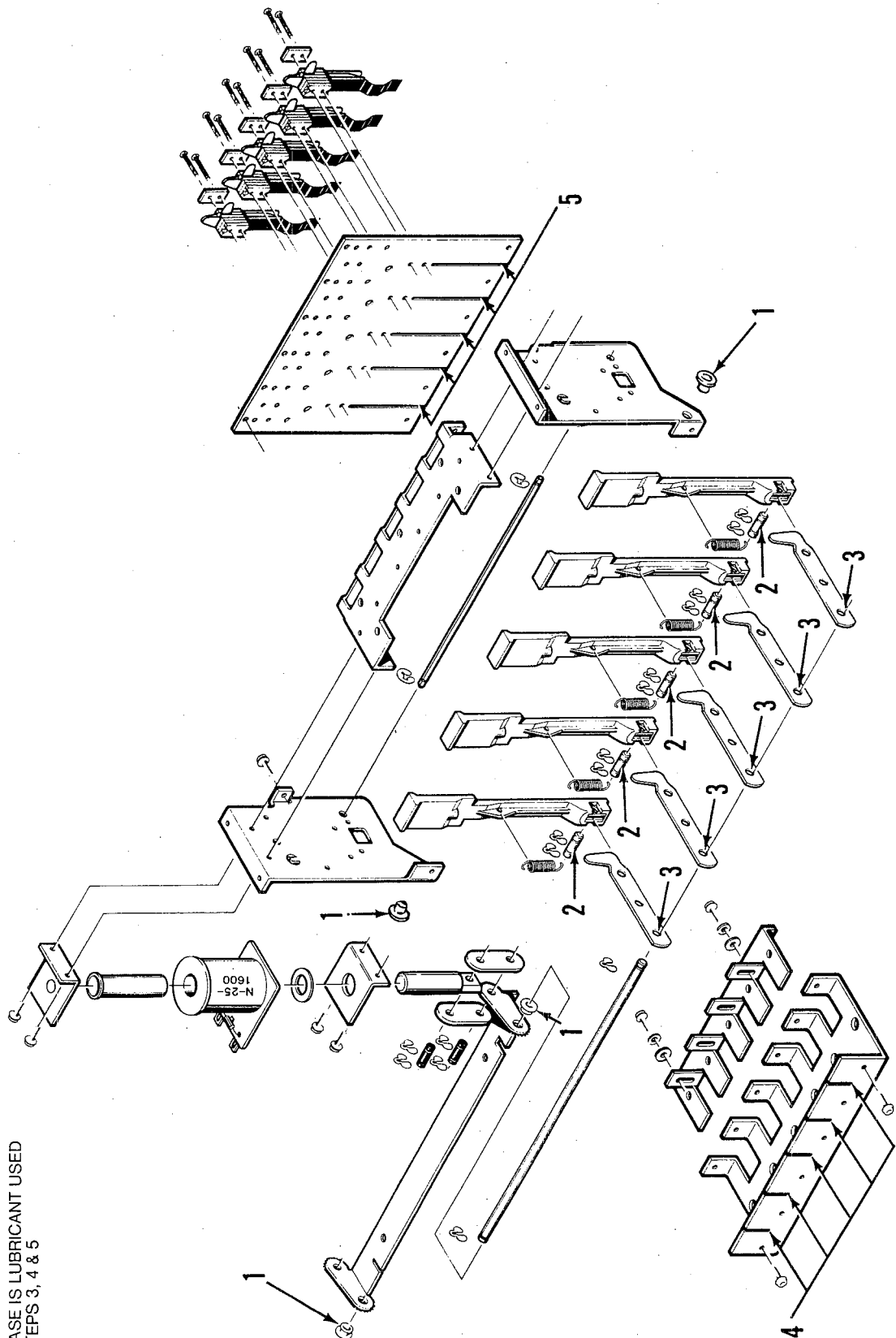
**NOTE:** See pages 11-28 & 11-29 for parts information.

*BALLY-MIDWAY* recommends that the following lubricants be used.

MEDIUM VISCOSITY OIL  
SUNEX #157, WAY OIL  
VISCOSITY: 300-350

MBI INSTRUMENT GREASE  
NON-GUMMING LUBRICANT

FIGURE A. DROP TARGET ASSEMBLY LUBRICATION POINTS

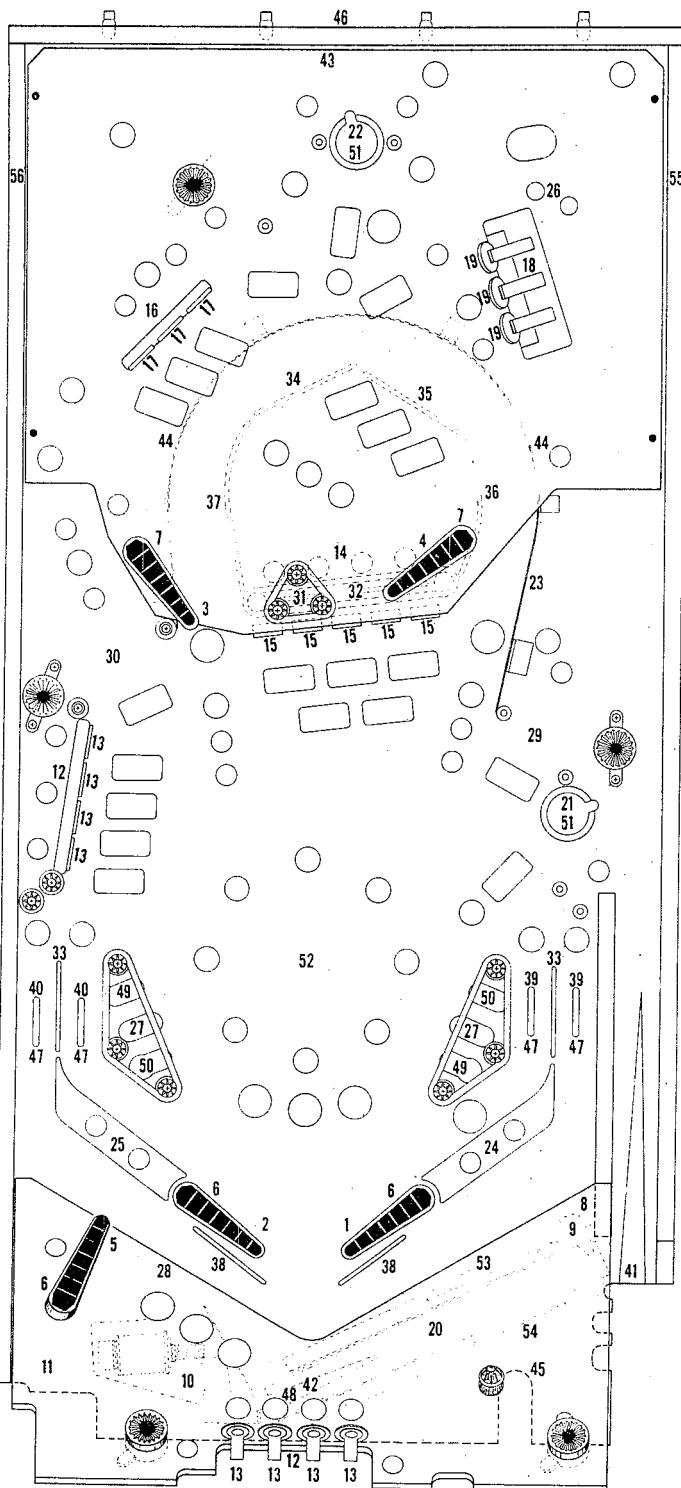


**NOTE:**

OIL IS LUBRICANT USED  
IN STEPS 1 & 2.

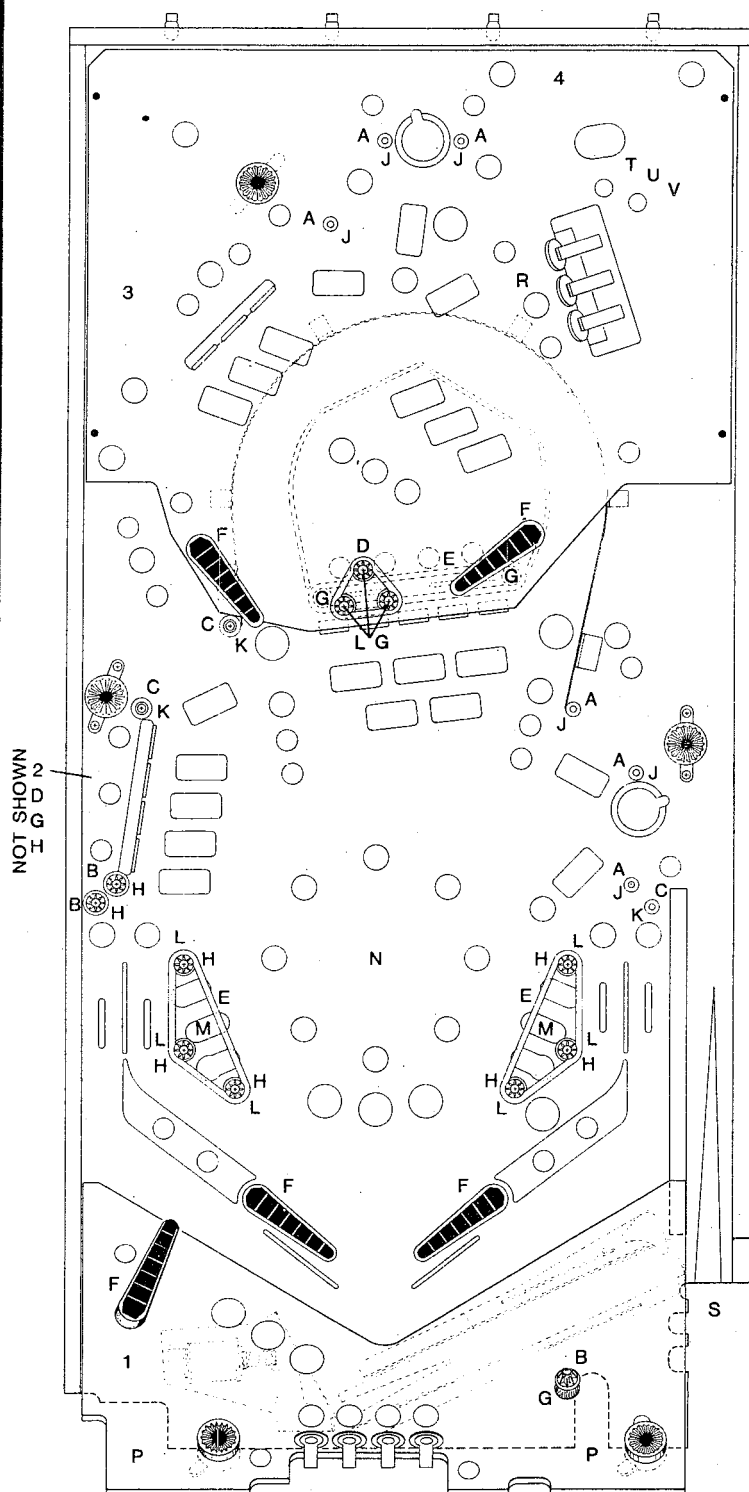
GREASE IS LUBRICANT USED  
IN STEPS 3, 4 & 5

**FIGURE B. PLAYFIELD ASSEMBLY—TOP VIEW WITH PARTS LIST**



| ITEM | DESCRIPTION                                  | PART NUMBER     |
|------|----------------------------------------------|-----------------|
| 1    | FLIPPER ASSEMBLY: DOUBLE SWITCH RIGHT        | AC70-00023-0100 |
| 2    | FLIPPER ASSEMBLY: DOUBLE SWITCH LEFT         | AC70-00023-0200 |
| 3    | FLIPPER ASSEMBLY: DOUBLE SWITCH LEFT W/EXT.  | A365-05020-0001 |
| 4    | FLIPPER ASSEMBLY: SINGLE SWITCH RIGHT W/EXT. | A365-05030-0001 |
| 5    | FLIPPER ASSEMBLY: SINGLE SWITCH RIGHT        | A365-05030-0002 |
| 6    | FLIPPER W/SHAFT: BLUE                        | 0365-04800-0002 |
| 7    | FLIPPER W/SHAFT: BLUE                        | 0365-04800-0012 |
| 8    | MULTI-BALL KICKER ASSEMBLY                   | AH01-00027-0000 |
| 9    | MULTI-BALL KICKER                            | AH01-00028-00XF |
| 10   | TOP MOUNTED BALL RETURN KICKER ASSEMBLY      | A360-00234-0000 |
| 11   | KNOCKER ASSEMBLY                             | A360-00235-0000 |
| 12   | TARGET & BRACKET ASSEMBLY: BLUE              | A365-R0306-F112 |
| 13   | TARGET W/SWITCH ASSEMBLY: BLUE               | A365-R0300-0002 |
| 14   | DROP TARGET ASSEMBLY: 5 UNIT SIDE-BY-SIDE    | A365-05550-0001 |
| 15   | TARGET W/DECAL: YELLOW                       | A365-05501-0002 |
| 16   | TARGET & BRACKET ASSEMBLY: GREEN             | A365-R0307-F114 |
| 17   | TARGET W/SWITCH ASSEMBLY: GREEN              | A365-R0300-0004 |
| 18   | TARGET & BRACKET ASSEMBLY: YELLOW            | A365-00H07-0035 |
| 19   | TARGET W/SWITCH ASSEMBLY: YELLOW             | A365-R0300-0003 |
| 20   | MULTI-BALL TROUGH ASSEMBLY                   | A365-00347-0000 |
| 21   | SAUCER ASSEMBLY: EJECT LEFT                  | A365-05320-0002 |
| 22   | SAUCER ASSEMBLY: EJECT RIGHT                 | A365-05310-0002 |
| 23   | SCOOP ASSEMBLY                               | A365-06400-0001 |
| 24   | BALL GUIDE ASSEMBLY: FLIPPER RIGHT           | A365-07300-0003 |
| 25   | BALL GUIDE ASSEMBLY: FLIPPER LEFT            | A365-07300-0004 |
| 26   | BALL STOP ASSEMBLY: START GATE               | A365-07550-0001 |
| 27   | SLINGSHOT KICKER ASSEMBLY                    | A967-00059-0000 |
| 28   | BOTTOM ARCH EXTENSION                        | 0365-04500-0001 |
| 29   | RAMP ENTRANCE PLATE: RIGHT                   | 0365-04600-0003 |
| 30   | RAMP ENTRANCE PLATE: LEFT                    | 0365-04600-0004 |
| 31   | BALL GUIDE WIRE FORM: 1-3/8" (34.9MM)        | 0365-00151-1375 |
| 32   | BALL GUIDE WIRE FORM: 1-7/8" (47.6MM)        | 0365-00151-1875 |
| 33   | BALL GUIDE WIRE FORM: 2-5/8" (66.6MM)        | 0365-00151-2625 |
| 34   | BALL GUIDE WIRE FORM: 3-1/4" (76MM)          | 0365-00151-3250 |
| 35   | BALL GUIDE WIRE FORM: 3-3/4" (95.2MM)        | 0365-00151-3750 |
| 36   | BALL GUIDE WIRE FORM:                        | 0365-03700-0001 |
| 37   | BALL GUIDE WIRE FORM:                        | 0365-03700-0002 |
| 38   | BALL GUIDE WIRE FORM: 2-3/8" (60.3MM)        | 0360-00175-5300 |
| 39   | WIRE FORM W/BACKET ASSEMBLY                  | A365-06310-0004 |
| 40   | WIRE FORM W/BACKET ASSEMBLY                  | A365-06320-0004 |
| 41   | WIRE FORM W/BACKET ASSEMBLY                  | A365-06320-0003 |
| 42   | WIRE FORM W/BACKET ASSEMBLY                  | A365-06320-0005 |
| 43   | WIRE FORM W/BACKET ASSEMBLY                  | A365-06310-0002 |
| 44   | MICRO SWITCH W/BACKET ASSEMBLY               | A365-06900-0013 |
| 45   | GATE ASSEMBLY W/BACKET & WIRE FORM           | A365-06100-0017 |
| 46   | SWITCH ASSEMBLY: ROLLOVER                    | A020-00095-0311 |
| 47   | SWITCH ASSEMBLY: ROLLOVER                    | A020-00095-0301 |
| 48   | SWITCH ASSEMBLY: OUTHOLE                     | A020-00095-0401 |
| 49   | SWITCH ASSEMBLY: SLINGSHOT                   | A360-00230-0000 |
| 50   | SWITCH ASSEMBLY W/DIODE                      | A360-00239-0000 |
| 51   | SWITCH ASSEMBLY: EJECT                       | A020-00095-0601 |
| 52   | PLAYFIELD MYLAR                              | 0365-00H07-1009 |
| 53   | 4 POSITION DETECTOR BOARD ASSEMBLY           | B084-91894-B000 |
| 54   | 4 POSITION EMITTER BOARD ASSEMBLY            | B084-91895-B000 |
| 55   | PLAYFIELD GUIDE: RIGHT                       | 0H05-00149-01XF |
| 56   | PLAYFIELD GUIDE: LEFT                        | 0H05-00149-02XF |

**FIGURE C. PLAYFIELD ASSEMBLY—TOP VIEW WITH RAMPS,  
RUBBER RINGS & POSTS PARTS LIST**



#### RAMPS

|                                     |                 |
|-------------------------------------|-----------------|
| 1 FRONT PLATFORM VACUUM FORM        | 0365-00H07-1015 |
| 2 LEFT SIDE BALL RUNWAY VACUUM FORM | 0365-00H07-1017 |
| 3 REAR LOWER NETWORK RAMP           | 0365-00H07-1020 |
| 4 REAR UPPER NETWORK RAMP           | 0365-00H07-1021 |

#### RUBBER RINGS

|                                                  |                 |
|--------------------------------------------------|-----------------|
| A BUMPER: POST, WHITE RUBBER, I.D. .09" (2.3MM)  | 0017-00041-0633 |
| B BUMPER: POST, WHITE RUBBER, I.D. .31" (7.9MM)  | 0017-00041-0637 |
| C BUMPER: WHITE RUBBER, I.D. .23" (5.8MM)        | 0017-00041-0641 |
| D BUMPER: POST, WHITE RUBBER, I.D. 1.5" (31.7MM) | 0017-00041-0644 |
| E BUMPER: POST, WHITE RUBBER, I.D. 2.5" (63.5)   | 0017-00041-0646 |
| F FLIPPER RUBBER: YELLOW                         | 0017-00041-0653 |

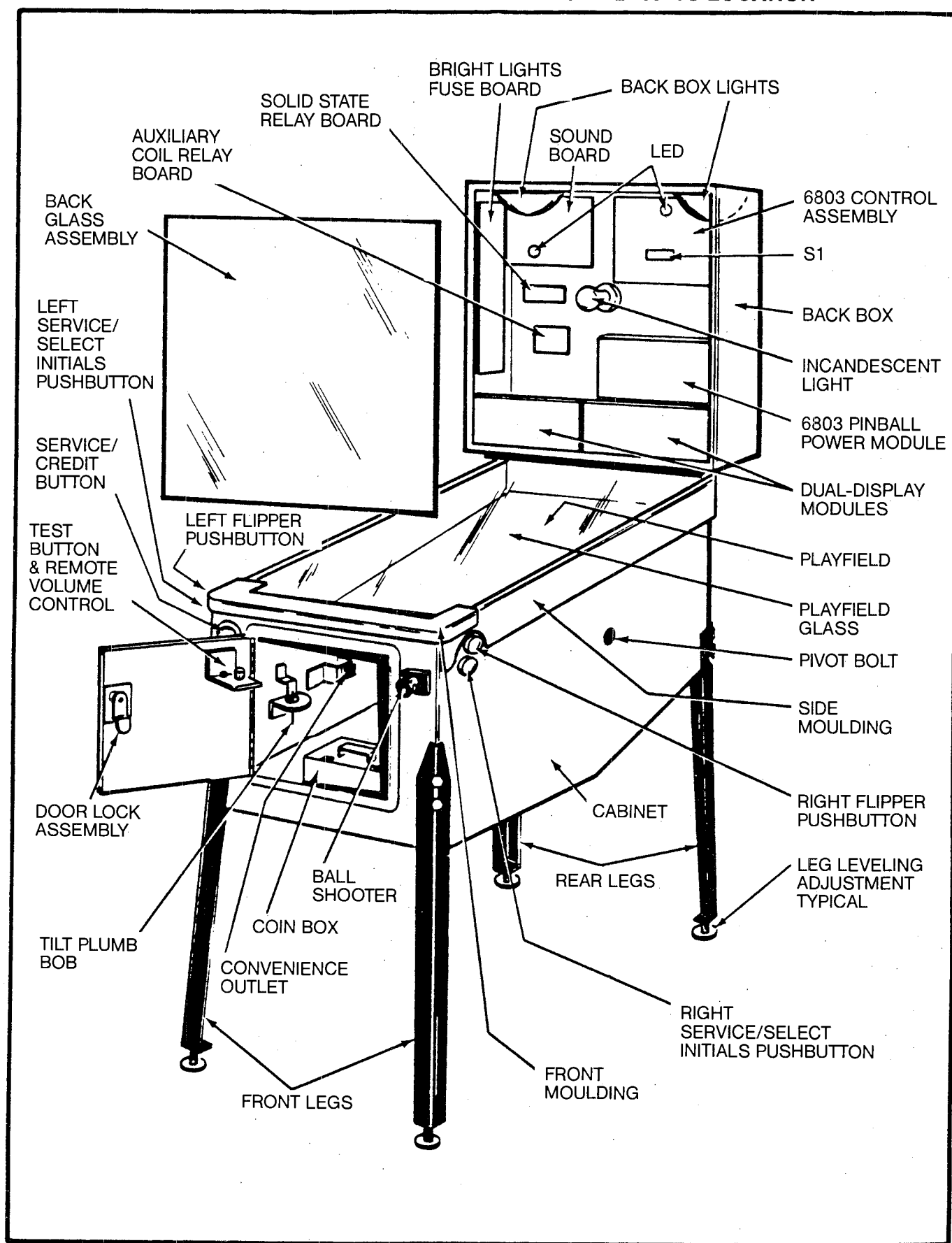
#### POSTS

|                                         |                 |
|-----------------------------------------|-----------------|
| G POST: GREEN, L=1.020" (25.9MM)        | 0017-00042-0712 |
| H POST: GREEN, L=1.205" (30.6MM)        | 0017-00042-0714 |
| J POST: BUMPER, #10-32 X 7/16" (11.1MM) | 0365-00700-00XF |
| K POST: 3/8" DIA. X 1-3/16" (9.5MM)     | 0365-00980-0000 |

#### MISCELLANEOUS PARTS

|                              |                 |
|------------------------------|-----------------|
| L NYLON ACORN NUT #5         | 0017-00009-0302 |
| M SLINGSHOT MYLAR SHIELD     | 0017-00091-0071 |
| N PLAYFIELD MYLAR            | 0365-00H07-1009 |
| P BLACKWATER 100 DECALS      | 0365-00H07-1025 |
| R MEAN MOON ROCK SCENERY     | 0365-00H07-1028 |
| S BALL SHOOTER DECAL         | 0365-00H07-1031 |
| T LAMP FILTER: RED RUBBER    | 0365-17041-0001 |
| U LAMP FILTER: YELLOW RUBBER | 0365-17041-0003 |
| V LAMP FILTER: GREEN         | 0365-17041-0004 |

**FIGURE D. BLACKWATER 100 PINBALL GAME PARTS LOCATION**



## SECTION 8 SERVICE HINTS

### TABLE OF CONTENTS

| DESCRIPTION                                                                        | PAGE |
|------------------------------------------------------------------------------------|------|
| CLEANING THE PLAYFIELD ASSEMBLY .....                                              | 8-2  |
| SERVICING THE PLAYFIELD ASSEMBLY—SEMI-UPRIGHT & UPRIGHT<br>POSITIONS .....         | 8-2  |
| SERVICING THE PLAYFIELD ASSEMBLY—RETURN TO PLAY POSITION .....                     | 8-2  |
| SERVICING THE REAR PLATFORM ASSEMBLY .....                                         | 8-4  |
| SERVICING THE FRONT PLATFORM (BOTTOM ARCH) ASSEMBLY .....                          | 8-4  |
| SERVICING THE FRONT PLATFORM (BOTTOM ARCH) ASSEMBLY—RETURN TO PLAY POSITION .....  | 8-4  |
| 6803 CONTROL BOARD ERROR DETECTION SUB-ROUTINE .....                               | 8-5  |
| FIXED "TWO PLAYERS PER GAME" MODE FOR ONE AVAILABLE DISPLAY<br>DRIVER MODULE ..... | 8-6  |

### LIST OF ILLUSTRATIONS

| FIGURE | DESCRIPTION                                                      | PAGE |
|--------|------------------------------------------------------------------|------|
| A      | PLAYFIELD—SEMI-UPRIGHT & UPRIGHT POSITIONS .....                 | 8-3  |
| B      | SECURING THE FRONT PLATFORM (BOTTOM ARCH) TO THE PLAYFIELD ..... | 8-5  |

## CLEANING THE PLAYFIELD

The *Bally-Midway* Playfield has an improved “tuff-coat” finish with excellent wearing properties. Life expectancy of the Playfield as well as play appeal, can be extended by periodic cleaning.

### **DO**

*Bally-Midway* recommends that you clean the Playfield with Wildcat #125 (Wildcat Chemical Company, 1349 East Seminary Drive, Fort Worth, Texas 76115, 817-924-8321). Wildcat #125 is a combination cleaner and polish. *Bally-Midway* has tried and tested this product and found it to be very effective. If Wildcat #125 is not available, *Bally-Midway* suggests that you ask your Distributor to order it.

Inspect and hand polish the ball in a clean cloth. A chipped ball must be replaced. If not, it will ruin the finish on the Playfield in a short period of time.

### **DON'T**

Do not use water in large quantities, highly caustic cleaners, abrasive cleaners and cleaning pads on the Playfield, or allow a wax or polish build-up. Waxes yellow with age and spoil play appeal.

## SERVICING THE PLAYFIELD—SEMI-UPRIGHT & UPRIGHT POSITIONS

To provide access for servicing the Playfield, in the SEMI-UPRIGHT or UPRIGHT position, the following procedure is recommended. For additional information, see FIGURE A on page 8-3.

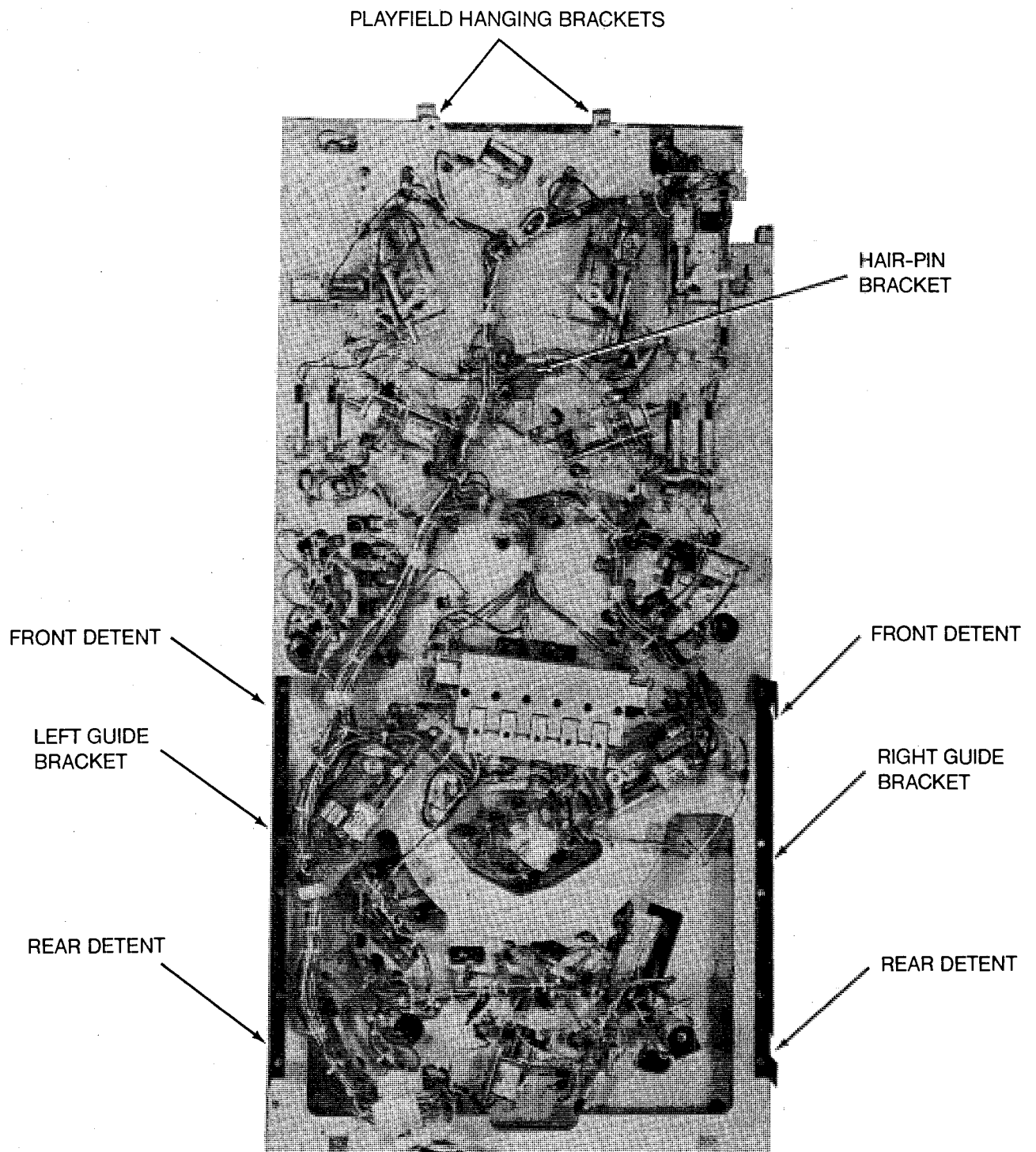
1. Lift up the Playfield by the bottom arch extension (above the outhole) until the rear bottom edge of the Playfield rests against the bottom of the cabinet.
2. Continue lifting and pulling the Playfield up, vertically, to ensure that the guide brackets on the Playfield are clear of the hinge-pins on the sides of the cabinet. When the guide brackets are clear the hinge-pins, pull the Playfield towards you. As you pull on the Playfield, the guide brackets will slide on the hinge-pins.
3. Continue to pull the Playfield out until the rear detents on the guide brackets engage on the hinge-pins. This will position the Playfield in the SEMI-UPRIGHT service position.
4. To position the Playfield in the full UPRIGHT position, continue lifting and rotating the Playfield until it rests against the Backbox.

## SERVICING THE PLAYFIELD—RETURN TO PLAY POSITION

The following procedure is recommended to return the Playfield to the play position.

1. Lower Playfield to the SEMI-UPRIGHT service position, resting on the Hair-Pin bracket.
2. Hold the Back-Board with one hand and hold the Playfield with the other hand.
3. Lift the rear of the Playfield approximately 1" to disengage the rear guide bracket detents from the hinge-pins. Next, slide the Playfield toward the rear of the cabinet. In this position, the Playfield is resting on the non-dented areas of the guide brackets.
4. Continue sliding the Playfield toward the rear of the cabinet until the “playing” position detents on the guide brackets engage on the hinge-pins.
5. Lower the Playfield front end into the playing position. Ensure that the Playfield hanging brackets fully engage into the slots in the cabinet Front Rail Assembly.

FIGURE A. PLAYFIELD IN SEMI-UPRIGHT POSITION & UPRIGHT POSITION



## SERVICING THE REAR PLATFORM ASSEMBLY

When the Playfield is lifted up in the FULL UPRIGHT service position, all important Rear Platform Assembly components are accessible through cut-outs in the Playfield. For additional information, refer to **SERVICING THE PLAYFIELD—SEMI-UPRIGHT & UPRIGHT POSITIONS** on page 8-2 and, also, Figure A on page 8-3.

## SERVICING THE FRONT PLATFORM (BOTTOM ARCH) ASSEMBLY

The following procedure is recommended to service the REAR PLATFORM ASSEMBLY on the Playfield. For additional information, see Figure B on page 8-5, to locate items (1) through (8).

1. Position the Playfield in the SEMI-UPRIGHT service position by resting the Hair-Pin Bracket, located on the bottom of the Playfield, onto the cabinet Front Rail Assembly. For additional information, refer to **SERVICING THE PLAYFIELD—SEMI-UPRIGHT & UPRIGHT POSITION** and, also, Figure A on page 8-3.
2. To remove the entire Front Platform Assembly, disconnect the two (2) Front Platform Cable Assembly connectors from the two (2) Playfield Cable Assembly connectors.

**NOTE:** Before disconnecting the connectors, it is advisable to identify or tag the mating connectors to ensure that the connectors are properly connected when re-connected.

3. Remove the metal bumper post hold-down stud (1) and remove the rail hold-down screw (2).
4. Remove the Ball Runway Ramp hold-down screws (3) and (4), and pull the Ball Runway Ramp slightly to the right to gain access to the Playfield hold-down screw (5).
5. Remove the Playfield hold-down screws (5), (6), (7) and (8), along with their washers.
6. Lift up the right side of the Front Platform Assembly, and pull the Platform to the right so that the left side of the Platform cannot damage the Ball Runway Ramp, as the Platform Assembly is being removed.

## SERVICING THE FRONT PLATFORM (BOTTOM ARCH) ASSEMBLY— RETURN TO PLAY POSITION

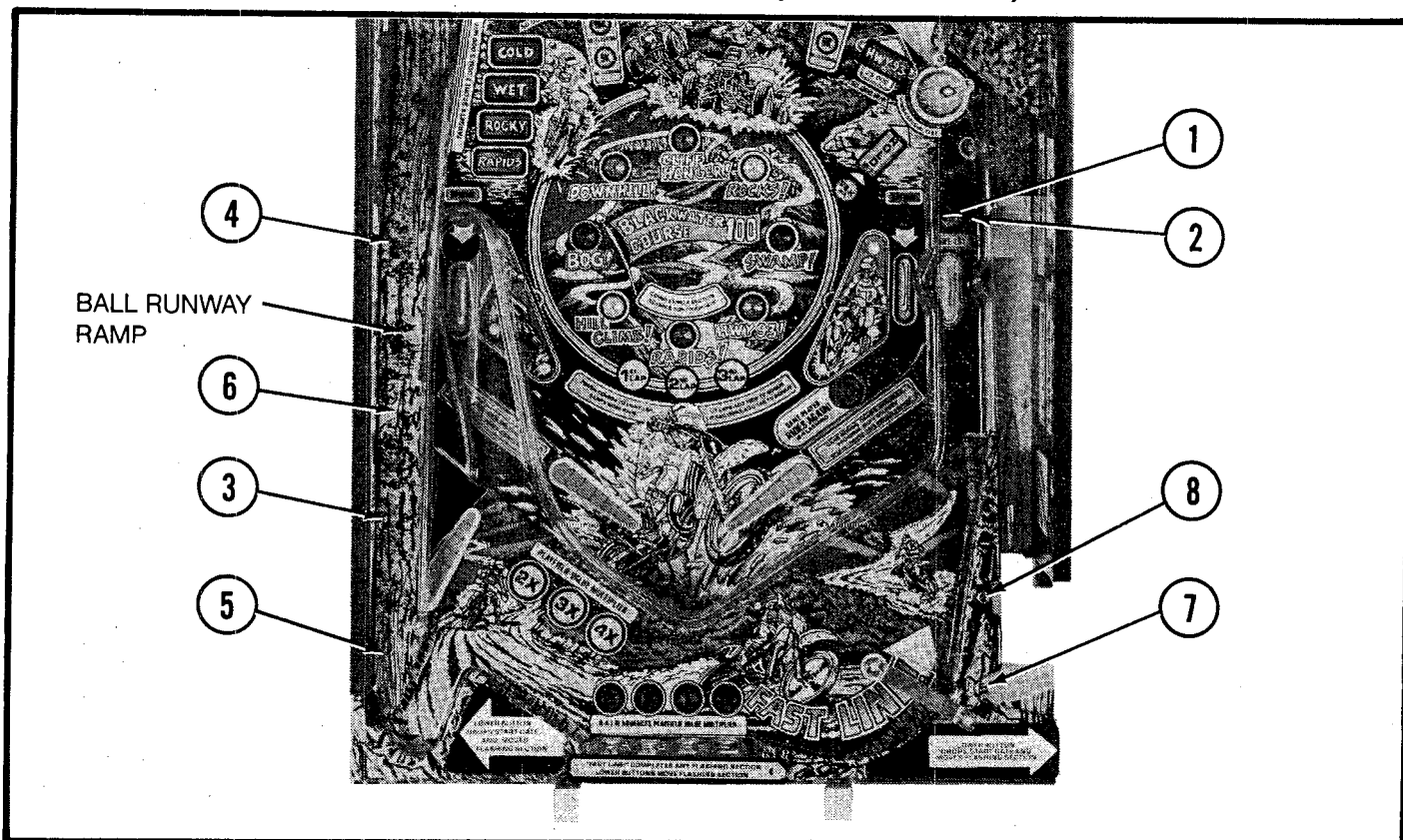
The following procedure is recommended to return the Front Platform Assembly to the Play Position.

1. Carefully, guide the left side of the Platform Assembly under the Ball Runway Ramp before seating the assembly onto the Playfield.
2. Pull the Ball Runway Ramp slightly to the right and install the Playfield hold-down screw (5), along with its washer.
3. Install the Playfield hold-down screws (6), (7) and (8), along with their washers.
4. Install the rail hold-down screw (2).
5. Install the metal bumper post hold-down stud (1).

**NOTE 1:** Any feature lamp socket assembly or general illustration lamp socket assembly can be accessed by removing the lamp socket assembly screw.

**NOTE 2:** *Bally-Midway* recommends that when the Platform Assembly has been returned to its Play Position, the ALL LAMPS and SWITCH tests be performed to ensure that the components on the Platform Assembly are functioning properly.

**FIGURE B. SECURING THE FRONT PLATFORM (BOTTOM ARCH) TO THE PLAYFIELD**



## **CONTROL BOARD ERROR DETECTION SUB-ROUTINE**

*Bally-Midway* has installed a new sub-routine to detect CMOS RAM error or battery failure on the 6803 Control Board Assembly.

When an error occurs, a "1" will be added in the "units" digit of the High Score To Date total, each time an error occurs. This condition will also be displayed if the program has been changed to that of another game program. This is accomplished by comparing the EPROM version number in the EPROM with the previously stored EPROM version number in CMOS RAM.

When an error occurs or new EPROMs are installed on the Control Board Assembly, the following events will occur the next time the game is powered up.

1. ACCOUNT CLEARED will be displayed. This indicates that all "accounting data" registers have been reset to zero (0).
2. INSTALL FACTORY will be displayed. This indicates that all "game features" have been reset to the Factory Recommended Settings.
3. The High Score To Date "units" digit is incremented by "1." If the High Score To Date score was 6,000,000 before the game was powered up, it will now display 6,000,001 when the game is powered up.

6,000,000

6,000,001

4. When the game is powered up, the EPROM version I.D. number is written into CMOS RAM.

**NOTE:** The RAM error can only be cleared by holding the left and right coin switches closed while the game is powering up. This is a "quick" procedure to clear all "accounting data" and reset the game to Factory Recommended Settings.

## FIXED "TWO PLAYERS PER GAME" MODE FOR ONE AVAILABLE DISPLAY DRIVER MODULE

The system in this game is designed for reasonably normal operation when one Display Driver Module is damaged and unusable. To use only one Display Driver Module, the game must be adjusted to operate in a "Two Players Per Game" mode.

"Reasonably normal operation" is defined as a means of providing a maximum of two (2) players per game information to be able to play the game. During the Game Play Mode, only the following information is displayed, entirely, on the left Display Driver Module.

CURRENT GAME BALL IN PLAY  
PLAYER #1 GAME SCORE  
PLAYER #2 GAME SCORE

During the Attract Mode, only the HIGH SCORE TO DATE for players 1 & 2, is displayed, entirely, on the left Display Driver Module.

The following procedure must be performed to adjust the game for the "Two Players Per Game" mode.

1. Power the game up.

**NOTE 1:** When the left Display Driver Module is not working properly, exchange it with the right Display Driver Module before proceeding.

**NOTE 2:** Before exchanging or replacing Display Driver Modules, see the **WARNING** for Troubleshooting On Location on page 9-4.

2. Turn power OFF and remove the damaged Display Driver Module.

**NOTE:** Before exchanging or replacing Display Driver Modules, see the **WARNING** for Troubleshooting On Location on page 9-4.

3. Turn power ON. Simultaneously, hold in the lower left cabinet button on the front cabinet while pressing the Credit/Start and Test buttons with the left index finger and thumb, respectively. This action will cause the game to enter the Test Mode and, at the same time, adjust the game to a limit of "Two Players Per Game."
4. Press the Test button again to return the game to the Game Play Mode.

The above procedure prevents the system from entering the "Three Players Per Game" mode or the "Four Players Per Game" mode, regardless of how many credits the player attempts to add to the game.

To discontinue the fixed "Two Players Per Game" mode, perform the following procedure.

1. Turn the game OFF and re-install the repaired Display Driver Module or install a new Module.

**NOTE:** Before exchanging or replacing Display Driver Modules, see the **WARNING** for Troubleshooting On Location on page 9-4.

2. Turn the game ON and enter the Test Mode by pressing the Test button on the Coin Door Assembly.
3. Select the GAME SET-UP category with the lower right cabinet button.
4. Press the Credit/Start button to open this category's directory.
5. Select the MAXIMUM PLAYERS register in the directory with the lower right cabinet button.
6. Press the Credit/Start button to open the register.
7. Select the 4 PLAYERS register with the lower right cabinet button.
8. Press the Credit/Start button to lock-in the 4 PLAYERS register value.
9. Press the Test button to exit the Test Mode.

**NOTE:** Anytime the FACTORY RESET condition occurs, the game will revert back to the "Four Players Per Game" mode.

# **SECTION 9** **TROUBLESHOOTING ON LOCATION** **TABLE OF CONTENTS**

| <b>DESCRIPTION</b>                                               | <b>PAGE</b> |
|------------------------------------------------------------------|-------------|
| POWER-UP .....                                                   | 9-2         |
| 6803 CONTROL BOARD ASSEMBLY POWER-UP TEST SEQUENCE .....         | 9-2         |
| LAMPS .....                                                      | 9-3         |
| ALL LAMPS TEST SEQUENCE .....                                    | 9-3         |
| SINGLE LAMPS TEST SEQUENCE .....                                 | 9-3         |
| DISPLAYS .....                                                   | 9-4         |
| DISPLAY DRIVER MODULE SEGMENT TEST PATTERN .....                 | 9-4         |
| COILS & SOLENOIDS .....                                          | 9-5         |
| GENERAL ILLUMINATION LAMPS .....                                 | 9-6         |
| FLIPPER SOLENOIDS .....                                          | 9-7         |
| SOUND .....                                                      | 9-8         |
| SOUND BOARD ASSEMBLY SELF-TEST PROCEDURE .....                   | 9-8         |
| SWITCHES .....                                                   | 9-9         |
| 4 POSITION & 4 POSITION EMITTER P.C. BOARDS TEST PROCEDURE ..... | 9-9         |

## **LIST OF ILLUSTRATIONS**

| <b>FIGURE</b> | <b>DESCRIPTION</b>                                                                         | <b>PAGE</b> |
|---------------|--------------------------------------------------------------------------------------------|-------------|
| A             | PLAYFIELD ASSEMBLY: TOP VIEW WITH COIL, SOLENOID<br>& SWITCH ASSIGNMENT NUMBER TABLE ..... | 9-10        |
| B             | PLAYFIELD ASSEMBLY: TOP VIEW WITH FEATURE LAMP<br>ASSIGNMENT NUMBER TABLE .....            | 9-11        |

## **GAME WON'T POWER-UP**

Game does not complete the power-up sequence (i.e., Displays functioning and Playfield lights are flashing) when power is turned on and the general illumination lamps are lit.

### **ACTION TO TAKE:**

- A. Check Fuses on the Power Module Assembly.
- B. Turn power OFF and open the Backbox. Locate the LED (Light Emitting Diode) on the 6803 Control Board Assembly. For additional information, see the 6803 CONTROL BOARD POWER-UP TEST SEQUENCE below.
- C. If the +5VDC and the +14VDC are present on the Control Board Assembly, the game performs a self-diagnostic test. **When no problems are encountered, the game powers-up immediately without flashing the LED on the Control Board Assembly.** When a problem is detected, the LED will flash the appropriate number of times for each diagnostic test passed. (i.e., If the LED only flashes three [3] times, U4 is probably defective, using the Table of power-up sequences below.

### **CONTROL BOARD POWER-UP TEST SEQUENCE**

1st Flash—Determines if the internal RAM of the Microprocessor U1 is good.

2nd Flash—Determines if the program ROM U2 is good.

3rd Flash—Determines if the program ROM U3 is good.

4th Flash—Determines if the CMOS RAM U4 is good.

5th Flash—Tests the U8 PIA-0.

6th Flash—Tests the U7 PIA-1.

7th Flash—Determines if the internal display interrupt generator U1 is good.

8th Flash—Verifies U8 & U12 operation of the Phase B switched illumination voltage.

**NOTE:** Fuse F5 on the Power Module Assembly protects the Phase B signal to the Control Board Assembly for U8 & U12.

9th Flash—Verifies U1, U11 & U12 operation of the Phase A switched illumination voltage.

**NOTE:** Fuse F4 on the Power Module Assembly protects the Phase A signal to the Control Board Assembly for U1, U11 & U12.

- D. If the LED does not come on or does not flash, or flashes, but less than 9 times, turn power OFF. Check the fuses and if the fuses are good, replace the 6803 Control Board Assembly.

### **CAUTION**

The replacement 6803 Control Board Assembly **must** have the same part number or incorrect operation of the game will be the result! For additional information, see the Parts List for the Control Board Assembly on pages 10-13 thru 10-15 and the EPROM Listing on page 10-39.

- E. Turn power ON. If the game is operating correctly, it is now ready for play. If the game does not operate correctly, contact the *Bally-Midway* Field Service Department.

## **LAMPS ARE ALWAYS ON OR ALWAYS OFF DURING GAME PLAY**

### **ACTION TO TAKE:**

- A. With the power ON, select the LAMP TEST from the GAME CHECK-UP category with the lower right cabinet button.

**NOTE:** When pressed, the lower right cabinet button advances to the next test and the lower left cabinet button backs-up to the previous test.

- B. Press the Credit/Start button to start the test.

There are two (2) Lamp Test Sequences. The first test is the ALL LAMPS test and the second test sequence is the SINGLE LAMP test. For additional information, refer to the FEATURE LAMP ASSIGNMENT ILLUSTRATION on page 9-11 for the lamp sequence.

### **ALL LAMPS TEST SEQUENCE**

When the test is started, all feature lamps will flash on and off. The lamps will continue to flash on and off until the test is exited or another test is selected.

### **SINGLE LAMP TEST SEQUENCE**

When the test is started, the first lamp in the Test Sequence will flash on and off. After a few seconds, the first lamp will turn off and the next lamp in the Test Sequence will flash on and off. This Test Sequence will continue for all of the feature lamps until the test is exited or another test is selected.

- C. If the lamps are flashing correctly, the game is ready for play.

**NOTE:** The Single Lamp Test Sequence can be stopped by pressing either the lower right or the lower left cabinet button. When pressed, the right button advances to the next lamp in the test and the left button backs-up to the previous lamp in the test.

- D. Carefully raise the Playfield or open the Backbox to gain access to the lamp(s).

**NOTE:** Before raising the Playfield, refer to the SERVICE HINTS on page 8-2, for SERVICING THE PLAYFIELD IN THE SEMI-UPRIGHT & UPRIGHT POSITIONS and, refer to SERVICING THE REAR PLATFORM ASSEMBLY on page 8-4 and servicing the FRONT PLATFORM ASSEMBLY on page 8-4.

- E. Before replacing lamps that do not flash on and off, check the wiring to the lamp socket(s). If the wiring appears to be correct, replace the lamps that do not flash on and off.

- F. If all of the lamps are now flashing on and off, the game is ready for play. If the lamps are not flashing on and off, replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, see the **CAUTION** on page 9-2.

- G. Turn power ON and repeat Steps A and B. If all the lamps are flashing on and off, the game is ready for play. If the lamps do not flash on and off, contact the *Bally-Midway* Field Service Department.

## IMPROPER DISPLAY DIGITS

- I. Display digits improper on one (1) or several, but less than all Display Driver Modules.

One (1) or several segments are always off, the digits are "mottled" (spotted), or several segments or digits are always on.

### **ACTION TO TAKE:**

- A. With the power ON, select the DISPLAY TEST from the GAME CHECK-UP category with the lower right cabinet button.

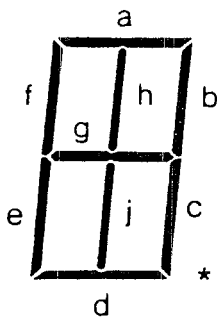
**NOTE:** When pressed, the lower right cabinet button advances to the next test and the lower left cabinet button backs-up to the previous test.

- B. Press the Credit/Start button to start the test.

If the Displays are operating correctly, the segments in the left digit in the left Display Driver Module, will turn on as indicated in the following Display Driver Module Segment Test Pattern.

### **DISPLAY DRIVER MODULE SEGMENT TEST PATTERN**

#### DISPLAY CHARACTER SEGMENT DESIGNATION



#### DISPLAY CHARACTER SEGMENT

f  
a  
b  
c  
d  
e  
g  
h & j

#### SEGMENT CYCLING PATTERN

1  
2  
3  
4  
5  
6  
7  
8

**NOTE:** \* = The comma segment is not tested during the DISPLAY TEST. Verification of operation can be seen during the game play or when the game is in the Attract Mode.

- C. If the segments are correct in the digit, press the lower right cabinet button to advance to the next digit in the Display Driver Module. If the segments are correct, continue to press the lower right cabinet button to test the segments in each digit on the Display Driver Modules.
- D. If the segments are correct, the game is ready for play. If the segments are incorrect in any Display Driver Module, replace the Module.

### **WARNING**

**High Voltage** is supplied to the Display Driver Modules from the Power Supply Module. After turning power OFF, **wait** a minimum of 30 seconds for the High Voltage to drain (bleed) off before replacing or servicing the Display Driver Modules.

- E. Turn power ON and repeat Steps A and B. If the segments are operating correctly, the game is ready for play. If the segments are not operating correctly, contact the *Bally-Midway* Field Service Department.

II. All Display Driver Modules have improper display patterns.

Digits are always on or off, or the segments are always on or off, in all Modules.

**ACTION TO TAKE:**

- A. With power ON, select the DISPLAY TEST from the GAME CHECK-UP category with the lower right cabinet button. If the Displays are operating correctly, perform the Segment Test Pattern described in category I, Step A and B, on page 9-4.
- B. Press the Credit/Start button to start the test.
- C. If the Displays are operating correctly, the game is ready for play. If the Displays are not operating correctly, replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, refer to the **CAUTION** on page 9-2.

- D. Turn power ON and repeat category II, Steps A and B. If the Displays are operating correctly, the game is ready for play. If the Displays are not operating correctly, contact the *Bally-Midway* Field Service Department.

III. One or several Displays always off.

**ACTION TO TAKE:**

- A. With power ON, select the DISPLAY TEST from the GAME CHECK-UP category with the lower right cabinet button.
- B. Press the Credit/Start button to start the test.
- C. If the first digit is operating correctly, continue to press the lower right cabinet button to test each Display Driver Module.
- D. If the Test Pattern is correct, the game is ready for play. If the Test Pattern is incorrect, turn power OFF and replace the defective Display Driver Module.

**NOTE:** Before replacing the Display Driver Module, refer to the **WARNING** on page 9-4.

- E. Turn power ON and repeat Steps A and B. If the Display Driver Module(s) are operating correctly, the game is ready for play. If the Displays are not operating correctly, contact the *Bally-Midway* Field Service Department.

**COIL(S) OR SOLENOID(S) NOT OPERATING CORRECTLY**

- I. One (1) or more Coils or Solenoids do not energize (pulse on) during game play. For additional information, refer to the COIL & SOLENOID ASSIGNMENT NUMBER ILLUSTRATION on page 9-10.

**ACTION TO TAKE:**

- A. With power ON, select the COIL TEST from the GAME CHECK-UP category with the lower right cabinet button.

**NOTE:** When pressed, the lower right cabinet button advances to the next test and the lower left cabinet button "backs-up" to the previous test.

- B. Press the Credit Start button to start the test.

When the test is started, the SINGLE COIL test will be displayed, the first Coil or Solenoid in the Test Sequence will momentarily pulse on, then off. Also, the name of each Coil or Solenoid, I.D. number, output number, connector number and pin number, are displayed as each one is tested. This information remains displayed until the test is exited.

**NOTE:** Press the lower right cabinet button to advance to the next Coil or Solenoid in the test, and press the lower left cabinet button to pulse the same Coil or Solenoid in the test.

C. Continue the COIL TEST until all Coils or Solenoids have been tested.

**NOTE 1:** If the majority of the Coils or Solenoids do not operate correctly, check the Playfield fuse to see if it's blown. The fuse is located on the bottom of the Playfield, near the Flipper Assemblies. See the **NOTE** in Step D before proceeding.

**NOTE 2:** The General Illumination lamp circuitry and the Flipper Solenoid circuitry are tested during the COIL TEST. For additional information, see GENERAL ILLUMINATION LAMPS on this page and see FLIPPER SOLENOIDS on page 9-7.

D. Carefully raise the Playfield to gain access to the Coils or Solenoids, and inspect the wiring.

**NOTE:** Before raising the Playfield, see the SERVICE HINTS on pages 8-2 through 8-5.

E. If a lead wire is broken off, repair it and repeat Step C.

F. If the Coil or Solenoid is operating correctly, the game is ready for play. If the wiring is correct and the Coil or Solenoid does not operate, turn the game OFF and replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, see the **CAUTION** on page 9-2.

### **NO GENERAL ILLUMINATION LAMPS**

The General Illumination Lamp Test is performed during the COIL TEST. The lamps are controlled by the Auxiliary Coil Driver P.C. Board Assembly. The board is located on the bottom of the Playfield. For additional information, refer to the GENERAL ILLUMINATION LAMP LOCATION note with the FEATURE LAMP ASSIGNMENT NUMBER ILLUSTRATION on page 9-11.

#### **ACTION TO TAKE:**

A. Repeat category I, Steps A, B and C. The General Illumination lamps will turn off, and then turn back on, during the COIL TEST when output port number 14 is tested.

B. If the lamps turn off, and then back on, the General Illumination Circuitry is operating correctly. If the lamps do not turn off or are always off, raise the Playfield to gain access to the Auxiliary Coil Driver P.C. Board Assembly.

**NOTE:** Before raising the Playfield, see the SERVICE HINTS on pages 8-2 through 8-5.

C. Press the lower left cabinet button and observe if the relay is energizing on the P.C. board. If the relay is working, check to see if the lamps are blown, and replace those that are blown.

D. Repeat Step C. If the lamps turn off, then on, the circuitry is operating correctly. If the lamps do not turn off or are always off, replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, see the **CAUTION** on page 9-2.

E. Repeat Steps A, B and C. If the lamps turn off, and then on, the circuitry is operating correctly. If the lamps do not turn off or do not turn on, contact the *Bally-Midway* Field Service Department.

## **NO FLIPPER SOLENOIDS**

The Flipper Solenoid Test is performed during the COIL TEST. The Solenoids are controlled by the K1 relay on the 6803 Control Board Assembly. For additional information, refer to the COIL & SOLENOID ASSIGNMENT NUMBER ILLUSTRATION on page 9-10.

### **ACTION TO TAKE:**

- A. Repeat category I, steps A, B and C. The Flipper Solenoids will not energize when the K1 relay energizes on the Control Board Assembly, when output port 15 (Flipper Test) is tested.
- B. Press the lower left cabinet button to energize the K1 relay. Press the cabinet Flipper buttons while the K1 relay is energized. If the Flipper Solenoids operate correctly, the game is ready for play. If the Solenoids do not operate correctly, raise the Playfield and inspect the wiring to the Solenoids.

**NOTE:** Before raising the Playfield, see the SERVICE HINTS on pages 8-2 through 8-5.

- C. If the wiring is correct, replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, see the **CAUTION** on page 9-2.

- D. Repeat Steps A, B and C. If the Coils or Solenoids are operating correctly, the game is ready for play. If they do not operate correctly, contact the *Bally-Midway* Field Service Department.

### **II. Coils or Solenoids always on.**

Some Coils and Solenoids are designed to be energized (on) momentarily rather than continuously. Those that are designed to be energized momentarily, are subject to being damaged when energized continuously.

**Limit** the troubleshooting on time to **one minute with power ON** and **five minutes with power off**. Repeat this process as required and replace any Coils or Solenoids that are damaged.

When troubleshooting Coil and Solenoid circuits, **be advised** that a constantly energized momentary duty Coil or Solenoid, will “**blow**” the Playfield fuse in a few seconds. To avoid replacing the fuse repeatedly, isolate the faulty Coil or Solenoid circuit as soon as power is turned on.

### **ACTION TO TAKE:**

- A. With power ON, select the COIL TEST from the GAME CHECK-UP category with the lower right cabinet button.

**NOTE:** When pressed, the lower right cabinet button advances to the next test and the lower left cabinet button backs-up to the previous test.

- B. Press the Credit/Start button to start the test.

When the test is started, the SINGLE COIL test will be displayed, the first Coil or Solenoid in the Test Sequence will momentarily pulse on, then off. Also, the name of each Coil and Solenoid, I.D. number, output port number, connector number and pin number, is displayed as each one is tested. This information remains displayed until the test is exited.

**NOTE:** Press the lower right cabinet button to advance to the next Coil or Solenoid in the test, and press the lower left cabinet button to pulse the same Coil or Solenoid in the test.

- C. Continue the COIL TEST until all Coils or Solenoids have been tested.
- D. If the Coils or Solenoids are operating correctly, the game is ready for play. If they are not operating correctly, raise the Playfield to gain access to the Coils or Solenoids.
- E. Carefully raise the Playfield to gain access to the Coils or Solenoids, and inspect the wiring.

**NOTE:** Before raising the Playfield, see the SERVICE HINTS on pages 8-2 through 8-5.

- F. If a lead wire is broken off, repair it and repeat Step C.
- G. If the Coil or Solenoid is operating correctly, the game is ready for play. If the wiring is correct and the Coil or Solenoid does not operate correctly, turn the game OFF and replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, see the **CAUTION** on page 9-2.

- H. Repeat Steps A, B and C. If the Coils or Solenoids are operating correctly, the game is ready for play. If they are not operating correctly, turn the game OFF and contact the *Bally-Midway* Field Service Department.

### **NO SOUND**

#### **ACTION TO TAKE:**

- A. With power ON, select the SWITCH TEST from the GAME CHECK-UP category with the lower right cabinet button.
- B. Press the Credit/Start button to start the test.
- C. Turn the Volume Control POT (Potentiometer) on the front door to the maximum counter-clockwise (left) position.
- D. Operate any switch on the Playfield. When the switch is operated, a sound will be heard. If no sound is heard, check to ensure that the speaker lead wire is connected to speaker terminal J2-2 and the speaker return wire is connected to terminal J2-1.
- E. Repeat Step D. If sound is heard, the game is ready for play. If no sound is heard, check the fuses on the Power Module Assembly.
- F. Turn power OFF and open the Backbox. Locate the LED (Light Emitting Diode) on the Sound Module Assembly. For additional information, see the SOUNDS DELUXE BOARD SELF-TEST SEQUENCE below.

### **SOUNDS DELUXE BOARD SELF-TEST SEQUENCE**

- 1<sup>st</sup> Flash—Determines if the ROM U11 is good.
- 2<sup>nd</sup> Flash—Determines if the ROM U12 is good.
- 3<sup>rd</sup> Flash—Determines if the ROM U13 is good.
- 4<sup>th</sup> Flash—Determines if the ROM U14 is good.
- 5<sup>th</sup> Flash—Determines if the RAM's U9 & U10 are good.
- 6<sup>th</sup> Flash—Test the PIA U7.

- G. Turn power ON. The LED must flash 6 times to indicate that the Sound Module is good. The correct sequence of flashes are: "flash, pause, flash, then flash four (4) more times." The LED goes out after the 6<sup>th</sup> flash.
- H. If the LED does not come on when the game is powered up, or flashes less than 6 times, turn power OFF and replace the Sound Module Assembly.

### **CAUTION**

The replacement Sound Module Assembly **must** have the same part number or incorrect operation will be the result! See the Parts List for the Sound Module Assembly on pages 10-20 thru 10-22 and the ROM/EPROM Listing on page 10-39.

- J. Turn power ON and repeat Steps A, B, C and D. If sound is heard, the game is ready for play. If no sound is heard, contact the *Bally-Midway* Field Service Department.

## **SWITCHES DO NOT SCORE**

### **ACTION TO TAKE:**

- A. Turn power ON and select the SWITCH TEST from the GAME CHECK-UP category with the lower right cabinet button. For additional information, refer to the SWITCH ASSIGNMENT NUMBER ILLUSTRATION on page 9-10.
- B. Press the Credit/Start button to start the test.
- C. If no switches are stuck or held closed, ALL SWITCHES OPEN is displayed. If any switch is stuck or held closed, the name of the switch will be displayed.
- D. Carefully raise the Playfield to gain access to the switches.

**NOTE:** Before raising the Playfield, see the SERVICE HINTS on pages 8-2 through 8-5.

- E. Visually inspect the Switch Assembly. If the contacts are closed, adjust them to a 1/16" gap between the switch contacts. If ALL SWITCHES OPEN is displayed after the adjustment is made, the game is ready for play. If the name of the switch is displayed after inspection and adjustment, turn power OFF.
- F. Replace the 6803 Control Board Assembly.

**NOTE:** Before replacing the Control Board Assembly, see the **CAUTION** on page 9-2.

- G. Repeat Steps A, B and C. If ALL SWITCHES OPEN is displayed, the game is ready to play. If the name of the switch is displayed, contact the *Bally-Midway* Field Service Department.

## **4 POSITION DETECTOR & 4 POSITION EMITTER P.C. BOARDS TEST PROCEDURE**

CHECK FU1 or PLAYFIELD FUSE message is displayed during the game play and the Playfield Fuse is not blown. This message is a clue that the Detector and/or Emitter P.C. boards are not functioning properly. This condition is usually resolved by touching up the solder connections on the P.C. boards.

### **ACTION TO TAKE:**

To test the integrity of the 4 Position Detector & Emitter P.C. boards, enter the Test Mode and select the GAME CHECKUP category. Next, using either lower cabinet push-button, select the SWITCH TEST. The following procedure is recommended to test the boards.

- A. Place all four (4) balls into the Ball Trough Assembly. The following messages will be displayed in sequence.

First message = BALL TROUGH 3 CLOSED  
Second message = BALL TROUGH 2 CLOSED  
Third message = BALL TROUGH 1 CLOSED

**NOTE:** Three (3) of the games balls are used to play the game and the fourth ball is used as an index ball. The fourth ball is not detected by the P.C. boards, but the three (3) game balls are detected.

The P.C. Board Assemblies do not use the fourth detector and emitter; however, the boards are designed to be interchangeable with games that require three (3) or four (4) detectors and emitters.

These messages will continue to display in the same sequence until the test is exited or a problem exist. It is advisable to test the P.C. boards with the four (4) balls and without them. If the messages do not display in the sequence as described above with the balls installed or if any of these messages appear with the balls removed, perform the following checks.

- B. Wiggle (shake) the connectors and check the components on the P.C. boards to ensure that they are making good contact with the board and connectors. DO NOT pull on the cable wires to disconnect connectors. Touch up any cold solder connections if necessary.
- C. If the correct messages are displayed, the P.C. boards are functioning properly.
- D. If the messages do not display in the sequence described in Step A, contact the *Bally-Midway* Field Service Department.

**FIGURE A. PLAYFIELD ASSEMBLY: TOP VIEW WITH COIL, SOLENOID  
& SWITCH ASSIGNMENT NUMBER TABLE**

○ **BLACKWATER 100 (#0H07)  
SWITCH ASSEMBLY IDENTIFICATION TABLE**

**SELF TEST #      SEQUENCE**

|    |                      |
|----|----------------------|
| 1  | FAST LINE            |
| 2  | SAUCER RIGHT         |
| 3  | SAUCER LEFT          |
| 4  | GATE 1               |
| 5  | DOWNHILL RAMP        |
| 6  | HILL CLIMB RAMP      |
| 7  | LEFT TOP LOOP        |
| 8  | RIGHT TOP LOOP       |
| 9  | TUNNEL RIGHT         |
| 10 | TUNNEL LEFT          |
| 11 | OUTLANE RIGHT        |
| 12 | OUTLANE LEFT         |
| 13 | FLIPPER LANE RIGHT   |
| 14 | FLIPPER LANE LEFT    |
| 15 | BIG                  |
| 16 | BAD                  |
| 17 | BOG                  |
| 18 | COLD                 |
| 19 | WET                  |
| 20 | ROCKY                |
| 21 | RAPIDS               |
| 22 | ROCKS                |
| 23 | MOON                 |
| 24 | MEAN                 |
| 25 | RAIN 'R'             |
| 26 | RAIN 'A'             |
| 27 | RAIN 'I'             |
| 28 | RAIN 'N'             |
| 29 | SHOOTER LANE         |
| 30 | OUTHOLE              |
| 31 | DROP TARGET 1        |
| 32 | DROP TARGET 2        |
| 33 | DROP TARGET 3        |
| 34 | DROP TARGET 4        |
| 35 | DROP TARGET 5        |
| 36 | SLINGSHOT LEFT       |
| 37 | SLINGSHOT LEFT       |
| 38 | SLINGSHOT RIGHT      |
| 39 | SLINGSHOT RIGHT      |
| 40 | CLIFF HANGER         |
| 41 | HIGHWAY 93 RAMP      |
| 42 | BALL TROUGH 3        |
| 43 | BALL TROUGH 2        |
| 44 | BALL TROUGH 1        |
| 45 | LOWER LEFT CABINET*  |
| 46 | UPPER LEFT CABINET*  |
| 47 | LOWER RIGHT CABINET* |
| 48 | UPPER RIGHT CABINET* |
| 49 | CREDIT*              |
| 50 | TILT*                |
| 51 | COINS LEFT**         |
| 52 | COINS RIGHT**        |

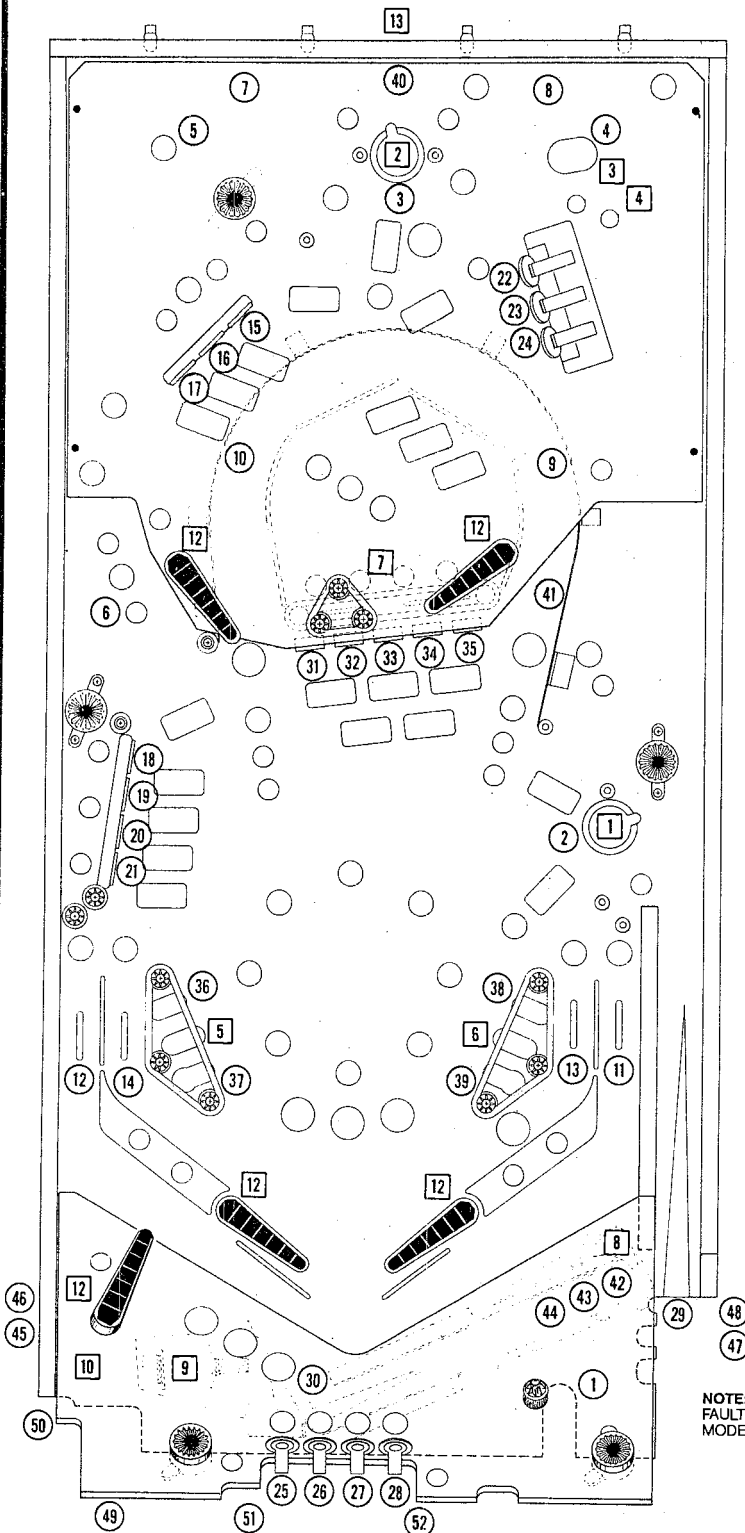
\* = CABINET ASSEMBLY SWITCH  
\*\* = DOOR ASSEMBLY SWITCH

□ **BLACKWATER 100 (#0H07)  
COIL & SOLENOID IDENTIFICATION TABLE**

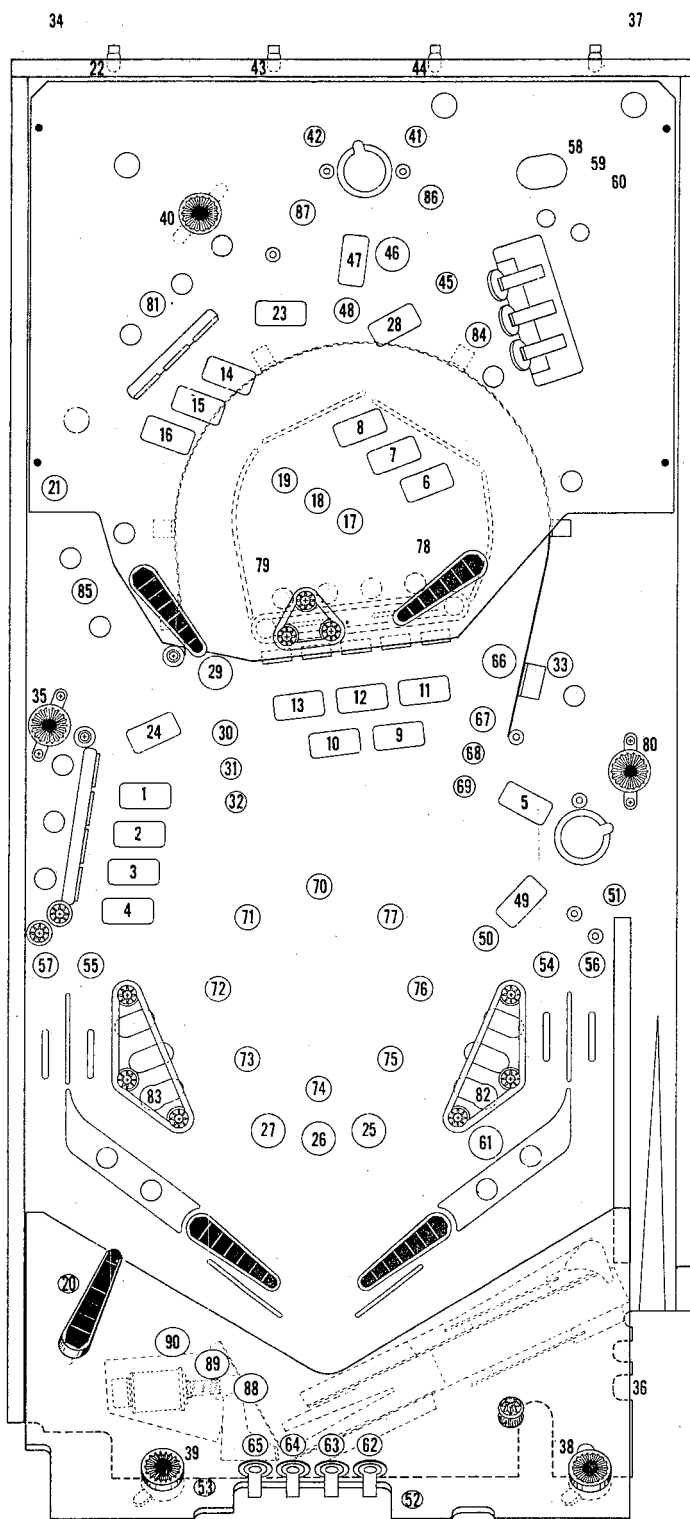
**SELF TEST #      SEQUENCE**

|    |                        |
|----|------------------------|
| 1  | SAUCER RIGHT           |
| 2  | SAUCER TOP             |
| 3  | GATE DOWN              |
| 4  | GATE RAISE             |
| 5  | SLINGSHOT LEFT         |
| 6  | SLINGSHOT RIGHT        |
| 7  | DROP TARGET RESET      |
| 8  | EJECT SHOOTER          |
| 9  | OUTHOLE                |
| 10 | KNOCKER                |
| 11 | GEN. ILLUMINATION LAMP |
| 12 | FLIPPERS               |
| 13 | INCANDESCENT CONTROL   |

**NOTE:** THE SEQUENCE NUMBER SHOWN HERE ARE USED AS AN AID IN LOCATING FAULTY SWITCHES, COILS OR SOLENOIDS AND ARE NOT DISPLAYED IN THE TEST MODE.



**FIGURE B. PLAYFIELD ASSEMBLY: TOP VIEW WITH FEATURE LAMP ASSIGNMENT NUMBER TABLE**



**FEATURE LAMP ASSIGNMENT NUMBERS**

| <u>SEQUENCE</u> | <u>DESCRIPTION</u>   | <u>SEQUENCE</u> | <u>DESCRIPTION</u>    |
|-----------------|----------------------|-----------------|-----------------------|
| 1               | COLD                 | 46              | SPECIAL TEST          |
| 2               | WET                  | 47              | TOP SAUCER 2          |
| 3               | ROCKY                | 48              | TOP SAUCER 1          |
| 4               | RAPIDS               | 49              | RIGHT SAUCER 2        |
| 5               | HIGHWAY 93 JUMP      | 50              | RIGHT SAUCER 1        |
| 6               | ROCKS                | 51              | DOWNHILL 7            |
| 7               | MOON                 | 52              | DOWNHILL 6            |
| 8               | MEAN                 | 53              | DOWNHILL 5            |
| 9               | SWAMP                | 54              | RETURN RIGHT          |
| 10              | SUCKIN               | 55              | RETURN LEFT           |
| 11              | BIKE                 | 56              | OUTLANE RIGHT         |
| 12              | ENDIN                | 57              | OUTLANE LEFT          |
| 13              | NEVER                | 58              | START RED             |
| 14              | BIG                  | 59              | START YELLOW          |
| 15              | BAD                  | 60              | START GREEN           |
| 16              | BOGS                 | 61              | SPSA (SHOOT AGAIN)    |
| 17              | BONUS 4X             | 62              | RAIN "N"              |
| 18              | BONUS 3X             | 63              | RAIN "I"              |
| 19              | BONUS 2X             | 64              | RAIN "A"              |
| 20              | DOWNHILL 4           | 65              | RAIN "R"              |
| 21              | DOWNHILL 3           | 66              | TUNNEL RIGHT 4        |
| 22              | DOWNHILL 2           | 67              | TUNNEL RIGHT 3        |
| 23              | DOWNHILL 1           | 68              | TUNNEL RIGHT 2        |
| 24              | HILL CLIMB           | 69              | TUNNEL RIGHT 1        |
| 25              | LAP 3                | 70              | CLIFF SECTION         |
| 26              | LAP 2                | 71              | DOWNHILL SECTION      |
| 27              | LAP 1                | 72              | BOGS SECTION          |
| 28              | CLIFF HANGER         | 73              | HILL CLIMB SECTION    |
| 29              | TUNNEL LEFT 4        | 74              | RAPIDS SECTION        |
| 30              | TUNNEL LEFT 3        | 75              | HIGHWAY 93 SECTION    |
| 31              | TUNNEL LEFT 2        | 76              | SWAMP SECTION         |
| 32              | TUNNEL LEFT 1        | 77              | ROCKS SECTION         |
| 33              | HIGHWAY 93 BRITE     | 78              | SWAMP BRITE RIGHT     |
| 34              | BACKBOX LEFT         | 79              | SWAMP BRITE LEFT      |
| 35              | RAPIDS BRITE         | 80              | RIGHT SAUCER BRITE    |
| 36              | SHOOTER BRITE        | 81              | BOGS BRITE            |
| 37              | BACKBOX RIGHT        | 82              | SLINGSHOT RIGHT BRITE |
| 38              | FAST LANE BRITE      | 83              | SLINGSHOT LEFT BRITE  |
| 39              | BOTTOM FLIPPER BRITE | 84              | ROCKS BRITE           |
| 40              | DOWNHILL BRITE       | 85              | HILL CLIMB BRITE      |
| 41              | TOP SAUCER RIGHT     | 86              | RIGHT TOP LOOP        |
| 42              | TOP SAUCER LEFT      | 87              | LEFT TOP LOOP         |
| 43              | CLIFF 3              | 88              | RAIN 4X               |
| 44              | CLIFF 2              | 89              | RAIN 3X               |
| 45              | CLIFF 1              | 90              | RAIN 2X               |

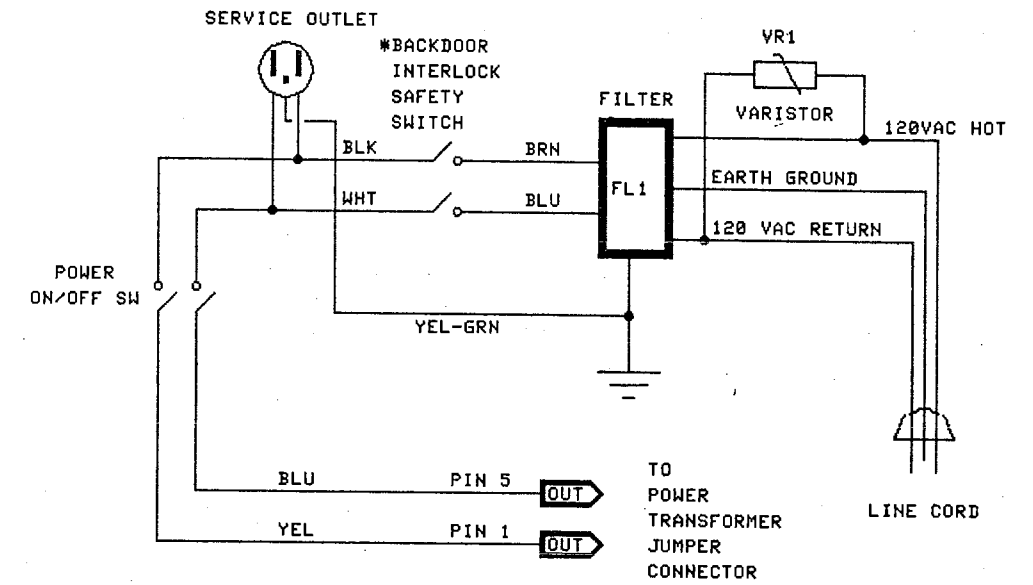
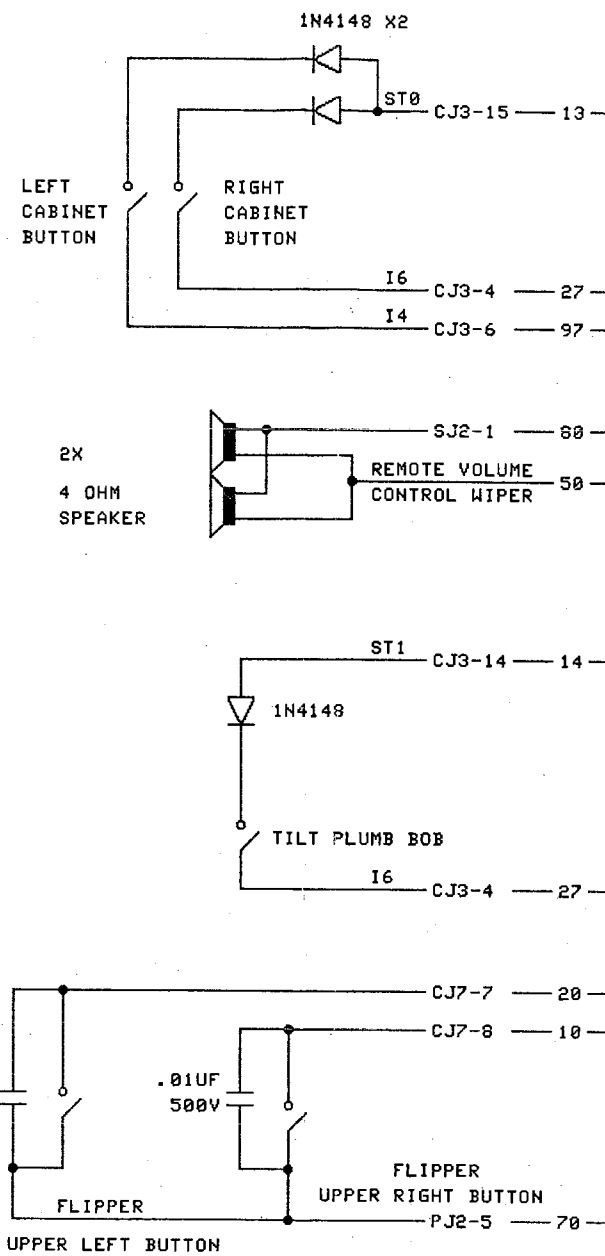
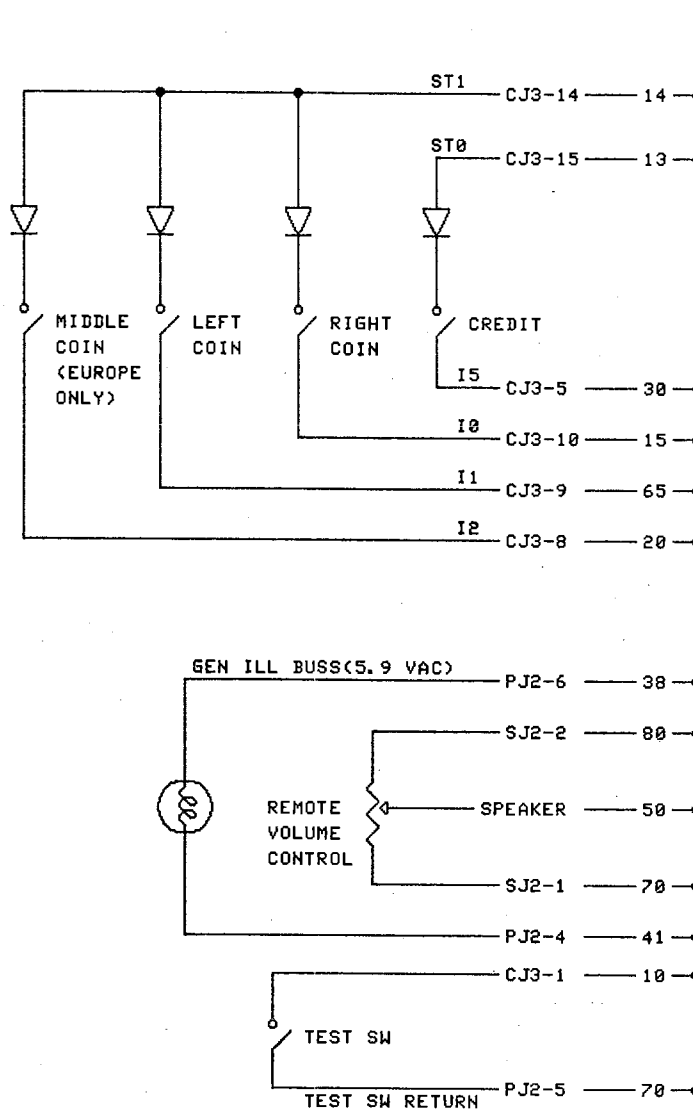
**NOTE:** THERE ARE 21 GENERAL ILLUMINATION LAMP LOCATIONS IDENTIFIED WITH A "SHADED CIRCLE" ON THE ILLUSTRATION.



**SECTION 10**  
**COMPONENT LAYOUTS, SCHEMATICS & WIRING DIAGRAMS**  
**TABLE OF CONTENTS**

| DESCRIPTION                                                          | PAGE  |
|----------------------------------------------------------------------|-------|
| WIRING DIAGRAM—CABINET .....                                         | 10-2  |
| WIRING DIAGRAM—PLAYFIELD .....                                       | 10-3  |
| WIRING DIAGRAM—BACKBOX .....                                         | 10-6  |
| 6803 PINBALL POWER MODULE P.C. BOARD—COMPONENT LAYOUT .....          | 10-9  |
| 6803 PINBALL POWER MODULE P.C. BOARD—SCHEMATIC .....                 | 10-12 |
| 6803 CONTROL P.C. BOARD—COMPONENT LAYOUT .....                       | 10-13 |
| 6803 CONTROL P.C. BOARD—SCHEMATIC .....                              | 10-17 |
| PINBALL SOUND P.C. BOARD—COMPONENT LAYOUT .....                      | 10-23 |
| PINBALL SOUND P.C. BOARD—SCHEMATIC .....                             | 10-26 |
| DUAL DISPLAY P.C. BOARD—COMPONENT LAYOUT .....                       | 10-29 |
| DUAL DISPLAY P.C. BOARD—SCHEMATIC .....                              | 10-32 |
| BRIGHT-LIGHTS FUSE P.C. BOARD—COMPONENT LAYOUT & SCHEMATIC .....     | 10-33 |
| SOLID STATE RELAY P.C. BOARD—COMPONENT LAYOUT & SCHEMATIC .....      | 10-34 |
| AUXILIARY COIL DRIVER P.C. BOARD—COMPONENT LAYOUT & SCHEMATIC .....  | 10-35 |
| FOUR POSITION EMITTER P.C. BOARD—COMPONENT LAYOUT & SCHEMATIC .....  | 10-36 |
| FOUR POSITION DETECTOR P.C. BOARD—COMPONENT LAYOUT & SCHEMATIC ..... | 10-37 |
| ROM/EPROM LIST .....                                                 | 10-39 |

COIN DOOR



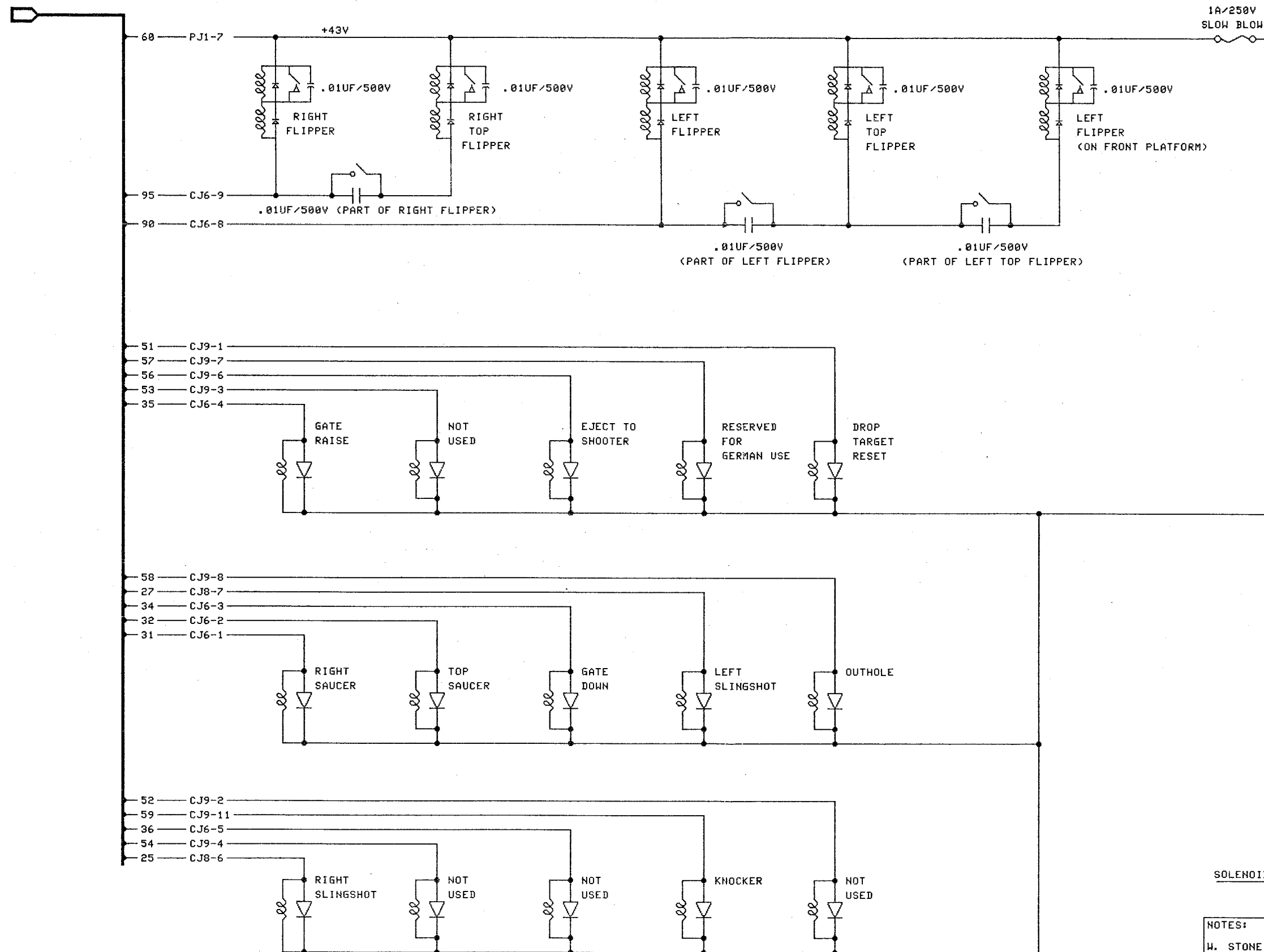
CABINET OUT TO BACK BOX

\* OPTIONAL - NOT USED IN ALL GAMES

| COLOR CODE |            |
|------------|------------|
| 1=RED      | 7=ORANGE   |
| 2=BLUE     | 8=BLACK    |
| 3=YELLOW   | 9=GRAY     |
| 4=GREEN    | 0=NO TRACE |
| 5=WHITE    | 11-VIOLET  |
| 6=BROWN    |            |

| CABINET |                       |
|---------|-----------------------|
| NOTES:  | BALLY MIDWAY MFG. CO. |
| H STONE | BLACK WATER           |
| 3/23/88 | CABINET DIAGRAM       |
|         | M051-00H07-A003       |
|         | SHEET 1 OF 1          |
|         | REV B                 |

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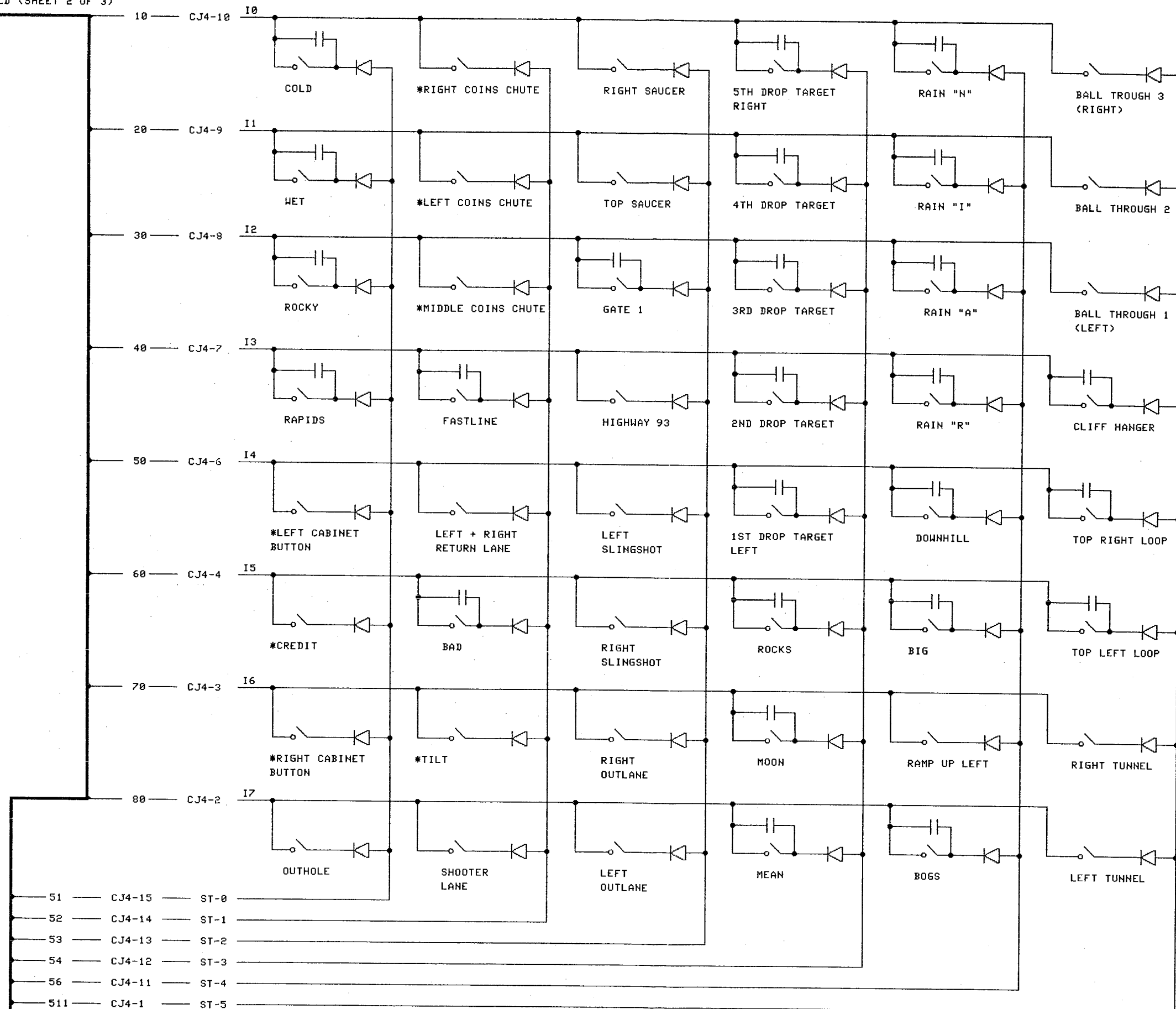


## COLOR CODE

- 1♦ RED
- 2♦ BLUE
- 3♦ YELLOW
- 4♦ GREEN
- 5♦ WHITE
- 6♦ BROWN
- 7♦ ORANGE
- 8♦ BLACK
- 9♦ GRAY
- 0♦ NO COLOR
- 11♦ VIOLET

## SOLENOIDS

|          |                       |
|----------|-----------------------|
| NOTES:   | BALLY MIDWAY MFG. CO. |
| W. STONE | BLACK WATER           |
| 3/23/88  | PLAYFIELD DIAGRAM     |
|          | M051-00H07-A005       |
|          | SHEET 1 OF 3          |
|          | REV D                 |



TO J5 PIN 3 — BLK 1 GND  
 KEY — 2  
 A084-91895-B000  
 4 POS. EMITTER PCB  
 3 N/U  
 TO J5 PIN 1 — RED 4 +5V

OPTIC BALL SENSOR BOARDS

TO J4 PIN 1 — WHT-VIO 1 STROBE  
 2 N/U  
 TO J4 PIN 8 — YEL 3 TROUGH 1 (LEFT)  
 A084-91894-B000  
 4POS. DETECTOR PCB  
 KEY — 4  
 TO J4 PIN 9 — BLU 5 TROUGH 2 (MIDDLE)  
 TO J4 PIN 10 — RED 6 TROUGH 3 (RIGHT)

## COLOR CODE

1-RED 6-BROWN  
 2-BLUE 7-ORANGE  
 3-YELLOW 8-BLACK  
 4-GREEN 9-GRAY  
 5-WHITE 0-NO TRACE  
 11-VIOLET

NOTE 1. ALL SWITCH DIODES ARE 1N4148

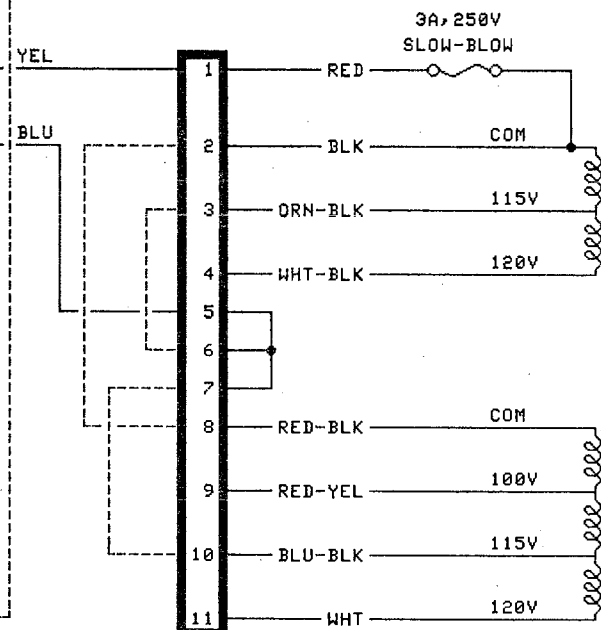
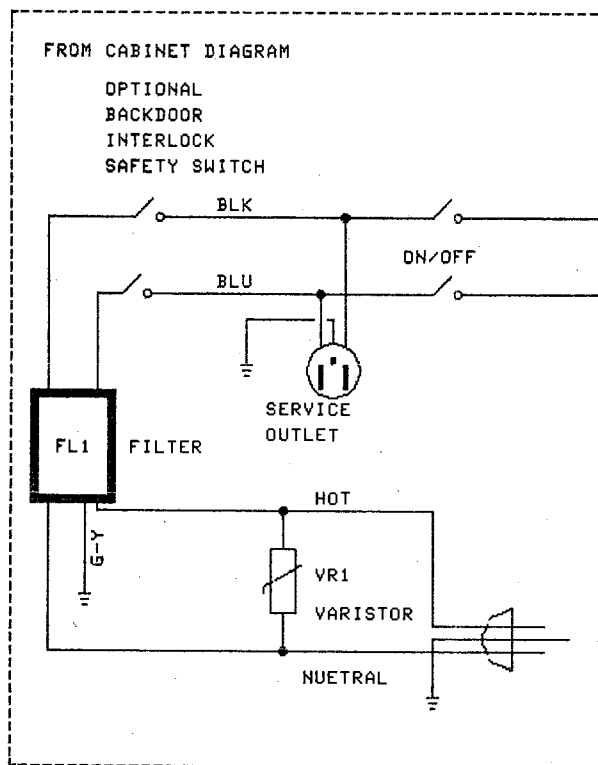
NOTE 2. \* INDICATES NOT USED ON PLAYFIELD. DRAWING ONLY TO SHOW RESPECTIVE CABINET SWITCH POSITION IN SWITCH MATRIX.

NOTE 3. ALL CAPACITORS ARE .05MF, 25V

## PLAYFIELD SWITCHES

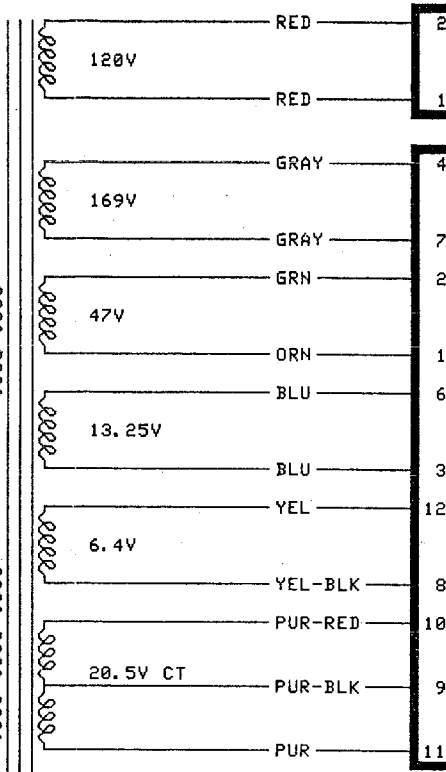
|          |                       |
|----------|-----------------------|
| NOTES:   | BALLY MIDWAY MFG. CO. |
| W. STONE | BLACK WATER           |
| 3/23/88  | PLAYFIELD DIAGRAM     |
|          | M051-00H07-A005       |
|          | SHEET 2 OF 3          |
|          | REV D                 |





SHOWN JUMPERED FOR 115V

NOTE: SEE TABLE "A" FOR  
JUMPER OPTIONS.



TO  
POWER MODULE  
J5

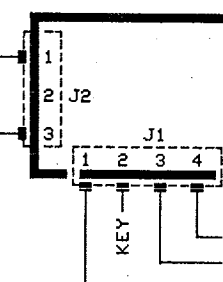
PHASE C

FOR PLAYFIELD AND  
BACKBOX BRIGHT LIGHTS

PHASE D

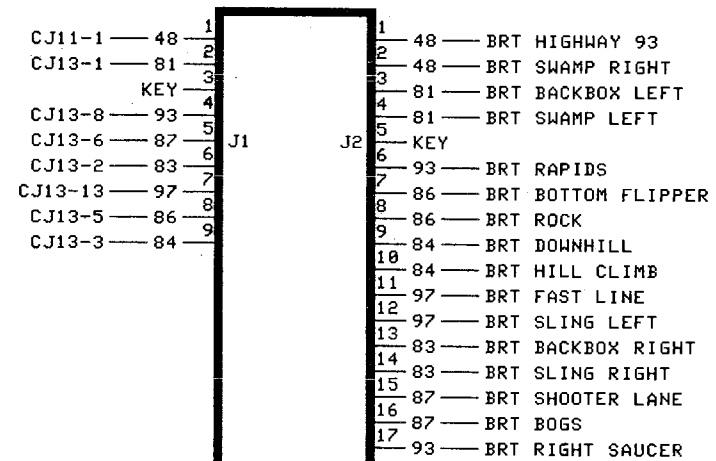
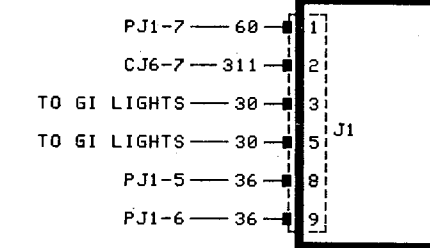
TO POWER MODULE (PJ6-1)  
INSERT PIN INTO CONNECTOR

34W LIGHT BULB  
BACK BOX ILLUMINATION



SOLID STATE RELAY  
A084-91878-A000

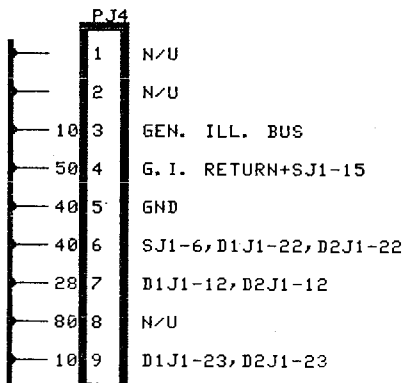
AUX. COIL DRIVER BOARD  
A088-91902-A000



FUSE BOARD  
A088-91901-A000

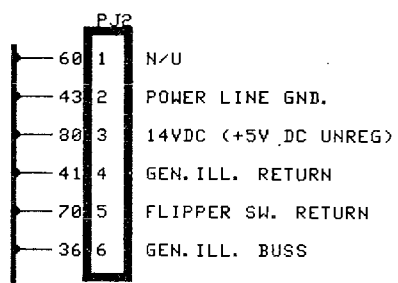
POWER DISTRIBUTION

NOTE: PJ1-PJ4 ARE PART OF  
POWER MODULE.

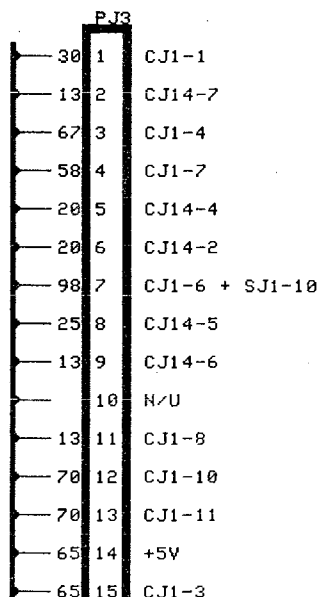


WITHIN BACKBOX  
(SHEET 3 OF 3)

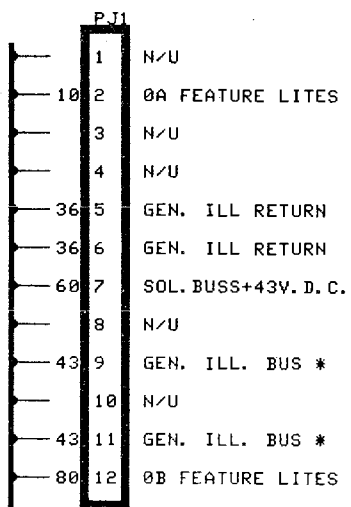
BACKBOX (SHEET 1 OF 3)



TO CABINET



TO CONTROLLER (IN BACKBOX)  
(SHEET 2 OF 3)



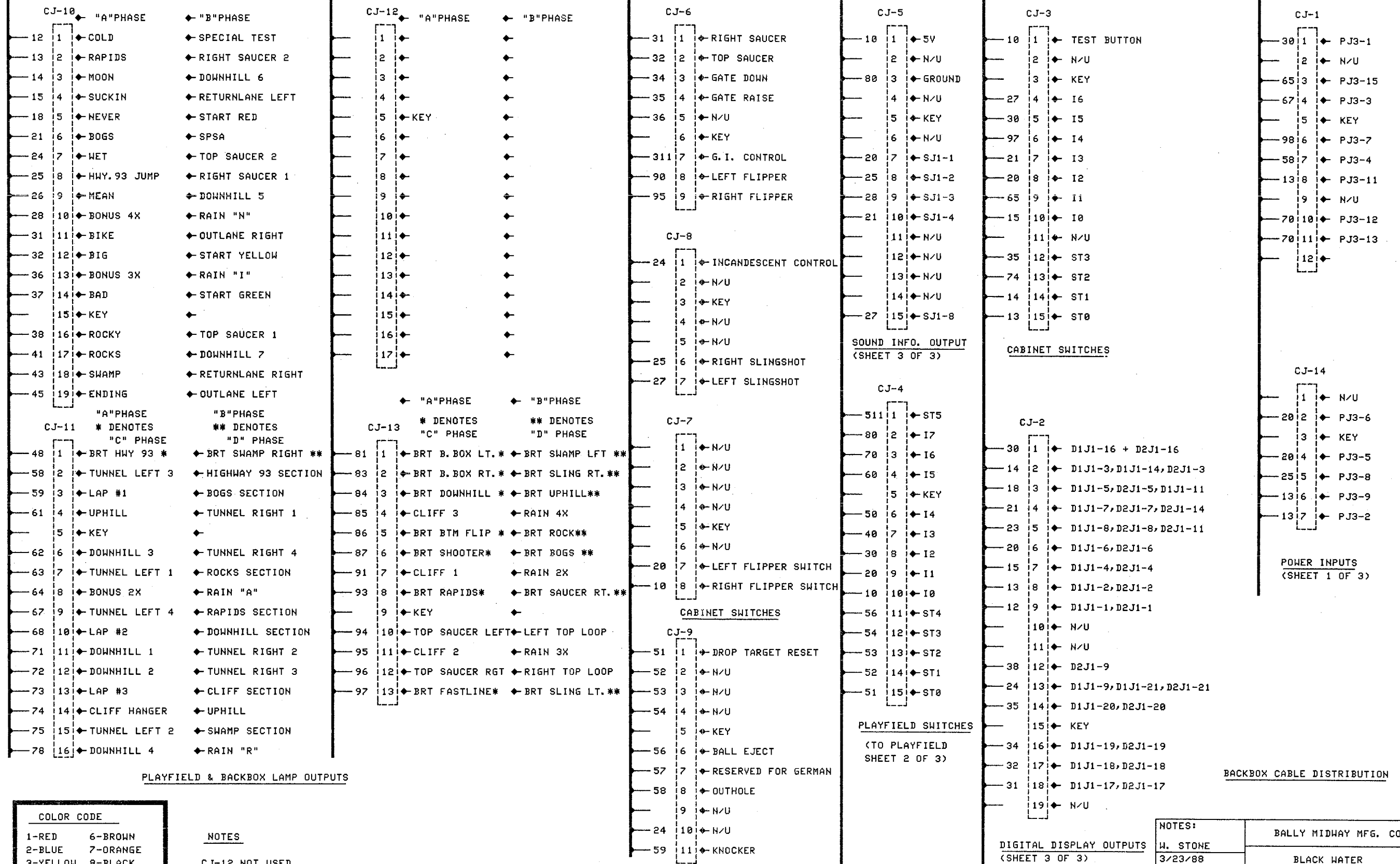
TO PLAYFIELD

\* = 30 GI LAMPS

| TABLE "A"              |  |
|------------------------|--|
| 115VAC, 2-8, 3-6, 7-10 |  |
| 120VAC, 2-8, 4-6, 7-11 |  |
| 220VAC, 4-8, 7-9       |  |
| 240VAC, 4-8, 7-11      |  |

| COLOR CODE |            |
|------------|------------|
| 1-RED      | 6-BROWN    |
| 2-BLUE     | 7-ORANGE   |
| 3-YELLOW   | 8-BLACK    |
| 4-GREEN    | 9-GRAY     |
| 5-WHITE    | 0-NO TRACE |
|            | 11-VIOLET  |

|          |                       |
|----------|-----------------------|
| NOTES:   | BALLY MIDWAY MFG. CO. |
| W. STONE | BLACK WATER           |
| 3/23/88  | BACKBOX               |
|          | M051-00H07-A006       |
|          | SHEET 1 OF 3          |
|          | REV B                 |



# DIGITAL DISPLAY MODULES-D1 & D2

PLYR 1&2

PLYR 3&4

SOUND MODULE

D1J1

D2J1

SJ1

|     |        |    |
|-----|--------|----|
| 12  | CJ2-9  | 1  |
| 13  | CJ2-8  | 2  |
| 14  | CJ2-2  | 3  |
| 15  | CJ2-7  | 4  |
| 18  | CJ2-3  | 5  |
| 20  | CJ2-6  | 6  |
| 21  | CJ2-4  | 7  |
| 23  | CJ2-5  | 8  |
| 24  | CJ2-13 | 9  |
| KEY | KEY    | 10 |
| 18  | CJ2-3  | 11 |
| 28  | PJ4-7  | 12 |
| N/U | N/U    | 13 |
| 14  | CJ2-2  | 14 |
| N/U | N/U    | 15 |
| 30  | CJ2-1  | 16 |
| 31  | CJ2-18 | 17 |
| 32  | CJ2-17 | 18 |
| 34  | CJ2-16 | 19 |
| 35  | CJ2-14 | 20 |
| 24  | CJ2-13 | 21 |
| 40  | PJ4-6  | 22 |
| 10  | PJ4-9  | 23 |
| N/U |        | 24 |

|     |        |    |
|-----|--------|----|
| 12  | CJ2-9  | 1  |
| 13  | CJ2-8  | 2  |
| 14  | CJ2-2  | 3  |
| 15  | CJ2-7  | 4  |
| 18  | CJ2-3  | 5  |
| 20  | CJ2-6  | 6  |
| 21  | CJ2-4  | 7  |
| 23  | CJ2-5  | 8  |
| 38  | CJ2-12 | 9  |
| KEY | KEY    | 10 |
| 23  | CJ2-5  | 11 |
| 28  | PJ4-7  | 12 |
| N/U | N/U    | 13 |
| 21  | CJ2-4  | 14 |
| N/U | N/U    | 15 |
| 30  | CJ2-1  | 16 |
| 31  | CJ2-18 | 17 |
| 32  | CJ2-17 | 18 |
| 34  | CJ2-16 | 19 |
| 35  | CJ2-14 | 20 |
| 24  | CJ2-13 | 21 |
| 40  | PJ4-6  | 22 |
| 10  | PJ4-9  | 23 |
| N/U |        | 24 |

|    |    |        |
|----|----|--------|
| 20 | 1  | CJ5-7  |
| 25 | 2  | CJ5-8  |
| 28 | 3  | CJ5-9  |
| 21 | 4  | CJ5-10 |
| 5  |    | N/U    |
| 40 | 6  | PJ4-6  |
| 7  |    | N/U    |
| 27 | 8  | CJ5-15 |
| 9  |    | N/U    |
| 98 | 10 | PJ3-7  |
| 11 |    | KEY    |
| 12 |    | N/U    |
| 13 |    | N/U    |
| 14 |    | N/U    |
| 50 | 15 | PJ4-4  |

SJ2

|   |   |
|---|---|
| 2 | 1 |
|---|---|

88 70

BACKBOX (SHEET 3 OF 3)

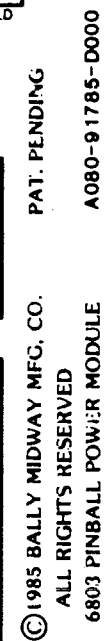
TO BACKBOX (PAGE 2 OF 3)

DISPLAY MODULES & SOUND MODULE

| COLOR CODE |              |
|------------|--------------|
| 1 - RED    | 6 - BROWN    |
| 2 - BLUE   | 7 - ORANGE   |
| 3 - YELLOW | 8 - BLACK    |
| 4 - GREEN  | 9 - GRAY     |
| 5 - WHITE  | 0 - NO TRACE |
|            | 11 - VIOLET  |

|          |                       |
|----------|-----------------------|
| NOTES:   | BALLY MIDWAY MFG. CO. |
| W. STONE |                       |
| 3/23/88  |                       |
|          | BLACK WATER           |
|          | BACKBOX               |
|          | M051-00H07-A006       |
|          | SHEET 3 OF 3 REV B    |

26 MAR 88 14:49 / USER/HES/BIKE/BACKBOX 3.DRAW



10-9

6803 PINBALL POWER MODULE  
A084-91785-D000  
M051-00C53-D001

DESIGNATION LIST

| <u>DESIGNATION</u> | <u>DESCRIPTION</u>         |
|--------------------|----------------------------|
| C1                 | 11,000uf 20V ELEC.         |
| P/O C1             | TY-WRAP                    |
| P/O C1             | SOLDER LUG                 |
| P/O C1             | WIRE 20AWG                 |
| C2                 | 160uf 350V ELEC.           |
| P/O C2             | TY-WRAP                    |
| C3                 | 2uf 25V ELEC.              |
| C4, C5             | .1uf 25V CER.              |
| C6, C7             | .01uf 500V CER.            |
| R1                 | 600 OHM 10W                |
| R2                 | 100K 1W 5%                 |
| R3                 | 2.2 OHM 1/4W 5%            |
| R4                 | 100 OHM 1/2W 5%            |
| R5                 | 22K 1/2W 5%                |
| R6                 | 100K 1/4W 5%               |
| R7                 | 390 OHM 1/4W 5%            |
| R8                 | 1.2K 1/4W 5%               |
| R9                 | 82K 1/2W 5%                |
| R10                | 8.2K 1/4W 5%               |
| VR1                | 0 - 25K 1/4W POT.          |
| D1 - D4            | MR751                      |
| D5 - D9            | IN4004                     |
| D10                | IN5275A ZENER              |
| BR1                | KBPC-35-02-W               |
| P/O BR1            | BRIDGE SPACER              |
| O1                 | 2N3584                     |
| P/O Q1             | SHIELD                     |
| P/O Q1             | HEX SPACER                 |
| P/O Q1             | 6-32 X 5 SCREW             |
| P/O Q1             | 6-32 X 12 SCREW            |
| P/O Q1             | LOCKWASHER EXT.            |
| P/O Q1             | LOCKWASHER INT.            |
| P/O Q1             | FLAT WASHER                |
| P/O Q1             | 6-32 HEX NUT               |
| P/O Q1             | LABEL - CAUTION HIGH VOLT. |
| P/O Q1             | HEATSINK 2                 |
| P/O Q1             | INSULATOR TO-66            |
| Q2, Q3             | 2N3440                     |
| P/O Q2, Q3         | INSULATOR TO-5             |
| P/O Q3             | HEATSINK 3                 |
| U1                 | 78H05C REG.                |
| P/O U1             | 6-32 X 12 SCREW            |
| P/O U1             | 6-32 HEX NUT               |
| P/O U1             | LOCKWASHER EXT.            |
| P/O U1             | FLAT WASHER                |
| P/O U1             | HEATSINK 1                 |
| P/O U1             | INSULATOR TO-3             |
| VA1                | VARISTOR                   |

| <u>DESIGNATION</u> | <u>DESCRIPTION</u>        |
|--------------------|---------------------------|
| JW1 - JW16         | ZERO OHM RES. JUMPER      |
| TP1 - TP10         | TEST POINTS               |
| F1*                | 5 AMP 3AG FUSE            |
| F2                 | 3/4 AMP 3AG FUSE          |
| F3                 | 6 AMP 3AG FUSE            |
| F4, F5             | 8 AMP 3AG FUSE            |
| F6, F7             | 15 AMP 3AG FUSE           |
| F8                 | 3/16 AMP 8AG FUSE         |
| FC1A - FC3B, FC8A  | FUSE CLIPS                |
| FC8B               |                           |
| FC4A - FC7B        | FUSE CLIPS                |
| J1                 | 12 PIN M-N-L CONN. FEMALE |
| J2                 | 6 PIN M-N-L CONN. MALE    |
| J3                 | 15 PIN M-N-L CONN. MALE   |
| J4                 | 9 PIN M-N-L CONN. MALE    |
| J5                 | 12 PIN M-N-L CONN. MALE   |
| J6                 | 2 PIN M-N-L CONN. MALE    |
| 6803 POWER MODULE  | P.C. BOARD                |

4-23-86 REV. 1.0 FIXED R2, R6

\* TWO FLIPPER GAMES ONLY - SEE SCHEMATIC

6803 PINBALL POWER MODULE  
A084-91785-D000  
M051-00C53-D001

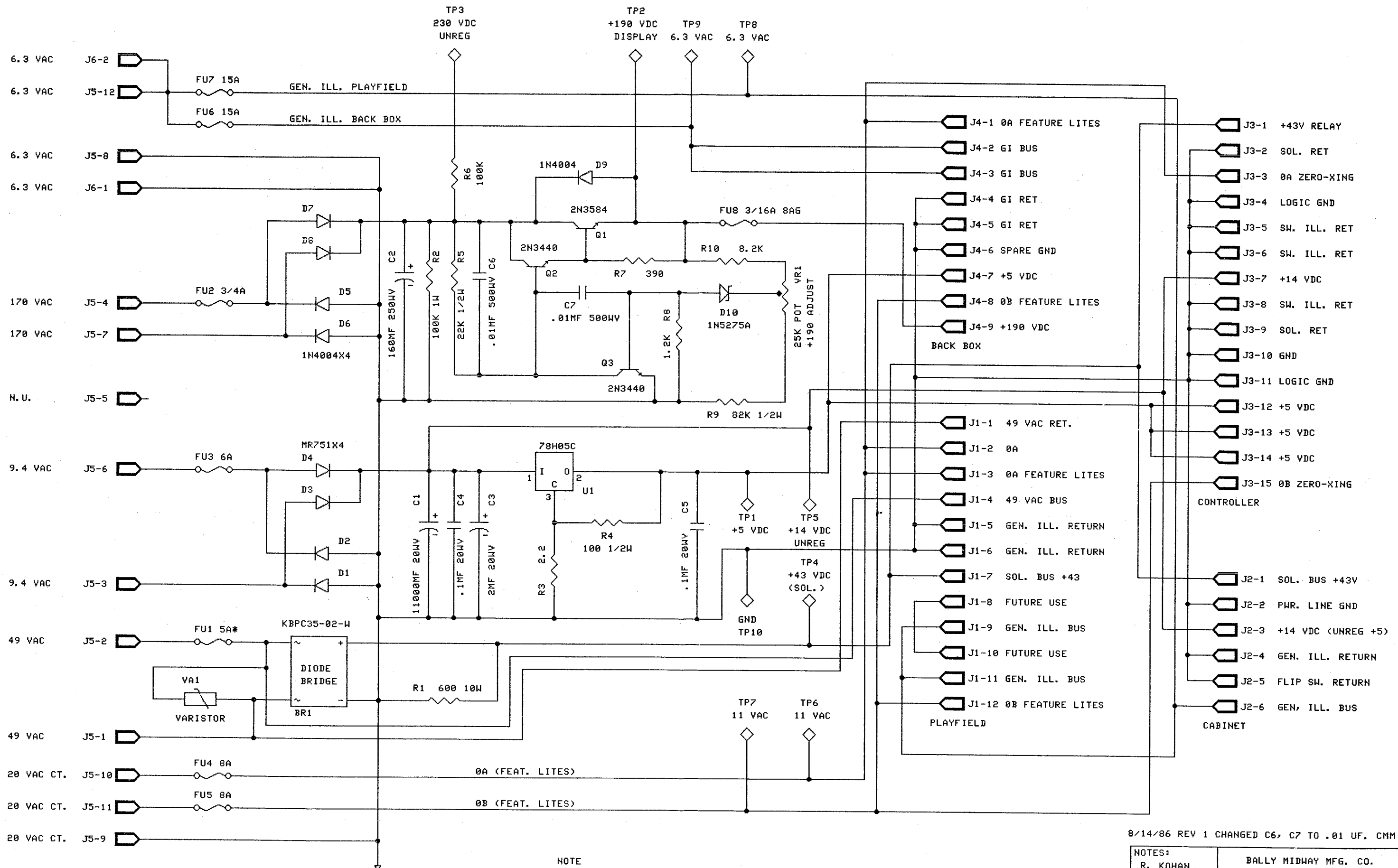
CROSS REFERENCE LIST

| <u>DESCRIPTION</u>       | <u>QTY.</u> | <u>DESIGNATION NO.</u>  | <u>PART NOS.</u> |
|--------------------------|-------------|-------------------------|------------------|
| .01UF 500V CER.          | 2           | C6,C7                   | 0360-00800-0013  |
| .1UF 25V CER.            | 2           | C4,C5                   | 0360-00800-0026  |
| 2UF 25V ELEC.            | 1           | C3                      | 0360-00800-0019  |
| 160UF 350V ELEC.         | 1           | C2                      | 0360-00800-0020  |
| 11,000UF 20V ELEC.       | 1           | C1                      | 0360-00800-0024  |
| 2.2 OHM 1/4W 5%          | 1           | R3                      | 100E-00005-0003  |
| 100 OHM 1/2W 5%          | 1           | R4                      | 100E-00006-0021  |
| 390 OHM 1/4W 5%          | 1           | R7                      | 100E-00005-0049  |
| 600 OHM 10W 10%          | 1           | R1                      | 100E-00002-0049  |
| 1.2K 1/4W 5%             | 1           | R8                      | 100E-00005-0063  |
| 8.2K 1/4W 5%             | 1           | R10                     | 100E-00005-0086  |
| 22K 1/2W 5%              | 1           | R5                      | 100E-00006-0065  |
| 82K 1/2W 5%              | 1           | R9                      | 100E-00006-0072  |
| 100K 1/4W 5%             | 1           | R6                      | 100E-00005-0115  |
| 100K 1W 5%               | 1           | R2                      | 100E-00007-0037  |
| 0-25K 1/4W POT           | 1           | VR1                     | 0360-00804-0004  |
| MR 751                   | 4           | D1-D4                   | 103E-00003-0016  |
| 1N4004                   | 5           | D5-D9                   | 103E-00003-0005  |
| 1N5275                   | 1           | D10                     | 103E-00001-0027  |
| KRPC-35-02-W             | 1           | BR1                     | 103E-00005-0005  |
| 2N3440                   | 2           | Q2,Q3                   | 104E-00003-0002  |
| 2N3584                   | 1           | Q1                      | 104E-00005-0002  |
| 78H05C REG               | 1           | U1                      | 0360-00803-0021  |
| VARISTOR METAL OXIDE 60V | 1           | VA1                     | 115E-00001-0002  |
| TY-WRAP                  | 4           | P/O C1,C2               | 0017-00042-0048  |
| ZERO OHM RES. JUMPER     | 16          | JW1-JW16                | 117E-00001-0001  |
| TEST POINTS              | 10          | TP1-TP10                | 0017-00007-0131  |
| SOLDER LUG               | 2           | P/O C1                  | 0017-00021-0257  |
| JUMPER WIRE 20AWG        | 2           | P/O C1                  | 0017-00033-0448  |
| INSULATOR T0-3           | 1           | P/O U1                  | 0017-00042-0119  |
| INSULATOR T0-5           | 2           | P/O Q2,Q3               | 0017-00042-0151  |
| INSULATOR T0-66          | 1           | P/O Q1                  | 0017-00042-0158  |
| HEX SPACER               | 2           | P/O Q1                  | 0017-00042-0248  |
| SHIELD                   | 1           | P/O Q1                  | 0365-00952-0000  |
| HEATSINK 1               | 1           | P/O U1                  | 112E-00001-0003  |
| HEATSINK 2               | 1           | P/O Q1                  | 112E-00001-0002  |
| HEATSINK 3               | 1           | P/O Q3                  | 112E-00001-0004  |
| BRIDGE SPACER            | 1           | P/O BR1                 | 118E-00001-0001  |
| 6-32 X 12 SCREW          | 4           | P/O Q1,U1               | 0017-00101-0132  |
| 6-32 X 5 SCREW           | 2           | P/O Q1                  | 0017-00101-0555  |
| 6-32 HEX NUT             | 4           | P/O Q1,U1               | 0017-00103-0005  |
| LOCKWASHER INT.          | 4           | P/O Q1,                 | 0017-00104-0008  |
| LOCKWASHER EXT.          | 4           | P/O Q1,U1               | 0017-00104-0009  |
| FLAT WASHER              | 4           | P/O Q1,U1               | 0017-00104-0106  |
| FUSE CLIP                | 8           | FC1A-FC3B,<br>FC8A,FC8B | 0017-00071-0033  |
| FUSE CLIP                | 8           | FC4A-FC7A               | 0017-00071-0034  |
| 3/16 AMP 8AG FUSE        | 1           | F8                      | 0017-00003-0206  |
| 3/4 AMP 3AG FUSE         | 1           | F2                      | 0017-00003-0010  |
| 5 AMP 3AG FUSE           | 1           | F1*                     | 0017-00003-0175  |
| 6 AMP 3AG FUSE           | 1           | F3                      | 0017-00003-0008  |

CROSS REFERENCE LIST

| <u>DESCRIPTION</u>        | <u>QTY.</u> | <u>DESIGNATION NO.</u> | <u>PART NOS.</u> |
|---------------------------|-------------|------------------------|------------------|
| 8 AMP 3AG FUSE            | 2           | F4,F5                  | 0017-00003-0387  |
| 15 AMP 3AG FUSE           | 2           | F6,F7                  | 0017-00003-0011  |
| 12 PIN M-N-L CONN. FEMALE | 1           | J1                     | 0017-00021-0532  |
| 6 PIN M-N-L CONN. MALE    | 1           | J2                     | 0017-00021-0424  |
| 15 PIN M-N-L CONN. MALE   | 1           | J3                     | 0017-00021-0434  |
| 9 PIN M-N-L CONN. MALE    | 1           | J4                     | 0017-00021-0425  |
| 12 PIN M-N-L CONN. MALE   | 1           | J5                     | 0017-00021-0426  |
| 2 PIN M-N-L CONN. MALE    | 1           | J6                     | 0017-00021-0488  |
| 6803 POWER MODULE P.C.B.  | 1           |                        | A080-91785-D000  |

\* TWO FLIPPER GAMES ONLY - SEE SCHEMATIC

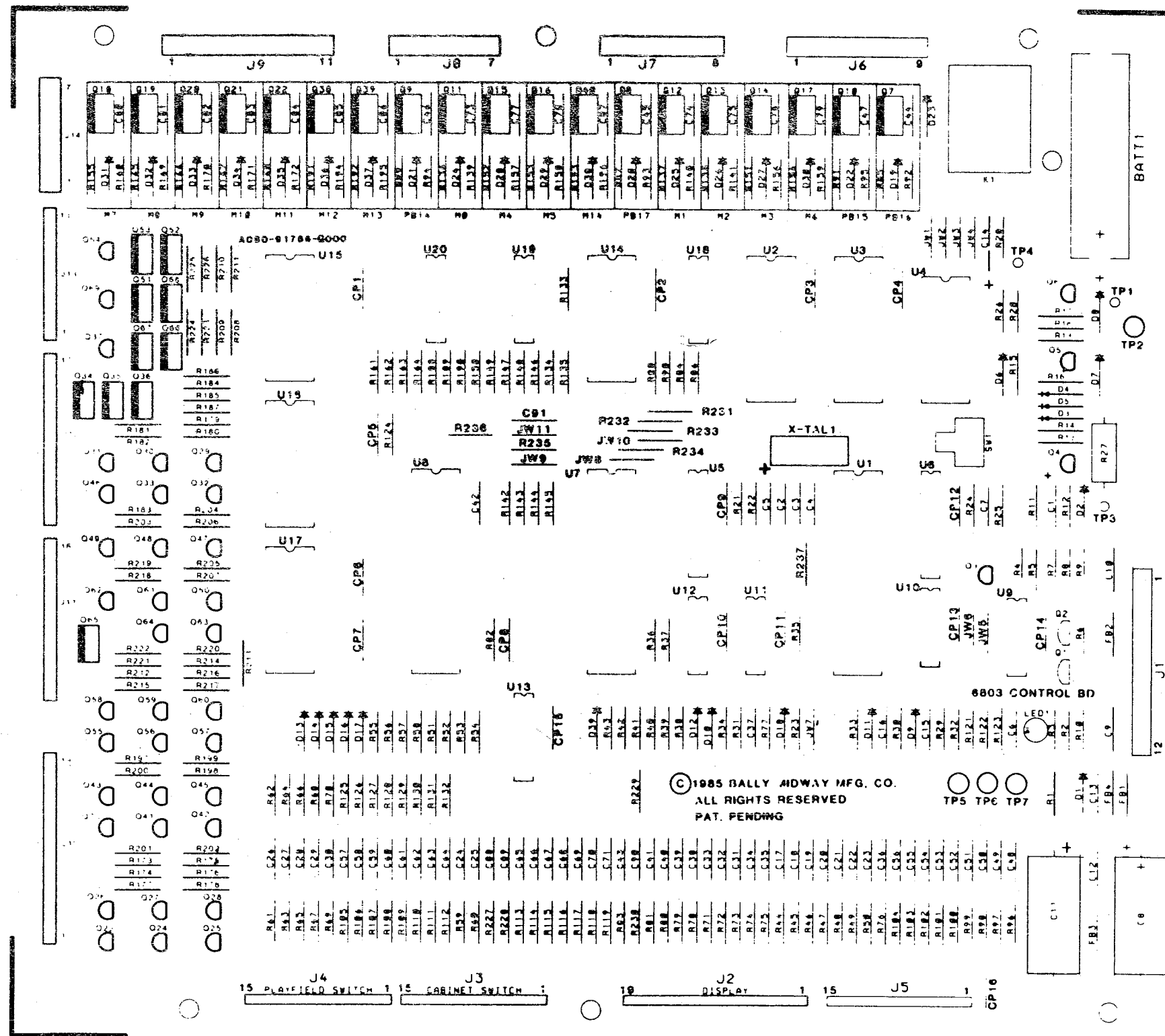


NOTE

\* WHEN 3FLIPPERS ARE USED FU1 SHOULD BE 6AMP  
WHEN 4FLIPPERS ARE USED FU1 SHOULD BE 7AMP

8/14/86 REV 1 CHANGED C6, C7 TO .01 UF. CMM

|          |                         |
|----------|-------------------------|
| NOTES:   | BALLY MIDWAY MFG. CO.   |
| R. KOHAN |                         |
| 1PER     | 6803 PINBALL PWR MODULE |
| 03/11/86 | SCHEMATIC DRAWING       |
|          | A084-91785-D000         |
|          | M051-00C53-D002         |



THIS DWG IS CONFIDENTIAL & PROPERTY OF MIDWAY MFG CO

| DIM. TOLERANCES           |  | FIRST USED ON |    | MIDWAY MFG. CO.        |       |
|---------------------------|--|---------------|----|------------------------|-------|
| UNLESS OTHERWISE SPEC.    |  | DRN           | CL | DATE                   | SCALE |
| CONCENTRICITY T.I.R. .002 |  | MECH CHK      |    | 04/08/86               |       |
| FRACTIONAL .002           |  | MATL          |    |                        |       |
| DECIMAL .005              |  | ELEC CHK      |    |                        |       |
| HOLE DIA. .002-.000       |  | FINISH        |    |                        |       |
| ANGLE .002-.000           |  |               |    |                        |       |
| DO NOT SCALE DWG.         |  |               |    |                        |       |
|                           |  |               |    | REVISIONS              |       |
|                           |  |               |    | PART NO                |       |
|                           |  |               |    | M05-1-00-C-5-3-G-0-0-3 |       |

**6803 CONTROL BOARD**  
**A084-91786-G000**  
**M051-00C53-G003**

CROSS REFERENCE LIST

| <u>DESCRIPTION</u> | <u>QTY.</u> | <u>DESIGNATION NO.</u>   | <u>PART NOS.</u> |
|--------------------|-------------|--------------------------|------------------|
| 27pf 50V CER.      | 2           | C2, C3                   | 0360-00800-0052  |
| 47pf 50V CER.      | 1           | C7                       | 0360-00800-0027  |
| 390pf 50V CER.     | 25          | C24-C30, C57-C71         | 0360-00800-0001  |
|                    |             | C88-C90                  |                  |
| 470pf 1KV CER.     | 27          | C17-C23, C31-C36,        | 0307-00800-0008  |
|                    |             | C38-C41, C48-C56, C91    |                  |
| .002uf 1KV CER.    | 19          | C44-C47, C73-C87         | 0360-00800-0012  |
| .003uf 1KV CER.    | 1           | C43                      | 0360-00800-0025  |
| .01uf 50V CER.     | 24          | C6, C9, C10, C12, C13    | 0365-00800-0014  |
|                    |             | C15, C16, C42, CP1-CP16  |                  |
| .05uf 16V CER.     | 1           | C37                      | 0360-00800-0006  |
| .1uf 50V CER.      | 1           | C4                       | 0360-00800-0058  |
| 4.7uf 25V TANT     | 2           | C5, C14                  | 0360-00800-0008  |
| 6.8uf 25V TANT     | 1           | C1                       | 0360-00800-0048  |
| 470uf 16V ELEC     | 1           | C8                       | 0360-00800-0022  |
| 470uf 25V ELEC     | 1           | C11                      | 0360-00800-0024  |
| 82 OHM 1/4W 5%     | 1           | R9                       | 100E-00005-0031  |
| 100 OHM 1/4W 5%    | 1           | R8                       | 100E-00005-0033  |
| 110 OHM 1/4W 5%    | 1           | R83                      | 100E-00005-0034  |
| 120 OHM 1/4W 5%    | 21          | R24, R85, R87, R89,      | 100E-00005-0035  |
|                    |             | R91, R121, R136-R138,    |                  |
|                    |             | R151-R155, R165-R168,    |                  |
|                    |             | R191-R193                |                  |
| 270 OHM 1/4W 5%    | 1           | R28                      | 100E-00005-0044  |
| 330 OHM 1/4W 5%    | 23          | R92-R95, R139-R141,      | 100E-00005-0047  |
|                    |             | R156-R160, R169-R172,    |                  |
|                    |             | R194-R196, R231-R234     |                  |
| 470 OHM 1/4W 5%    | 9           | R96-R104                 | 100E-00005-0051  |
| 560 OHM 1/4W 5%    | 1           | R1                       | 100E-00005-0054  |
| 680 OHM 1/4W 5%    | 1           | R25                      | 100E-00005-0056  |
| 750 OHM 1/4W 5%    | 1           | R19                      | 100E-00005-0057  |
| 910 OHM 1/4W 5%    | 1           | R18                      | 100E-00005-0059  |
| 1K 1/4W 5%         | 3           | R3, R29, R32             | 100E-00005-0061  |
| 1.2K 1/4W 5%       | 60          | R44-R50, R59-R61, R63,   | 100E-00005-0063  |
|                    |             | R65, R67, R69, R71-R76   |                  |
|                    |             | R78-R82, R105-R119, R122 |                  |
|                    |             | R133-R135, R146-R150,    |                  |
|                    |             | R161-R164, R188-R190,    |                  |
|                    |             | R227, R228, R230, R236   |                  |
| 1.5K 1/4W 5%       | 1           | R20                      | 100E-00005-0065  |
| 2K 1/4W 5%         | 46          | R123, R173-R187          | 100E-00005-0068  |
|                    |             | R197-R226                |                  |
| 2.7K 1/4W 5%       | 2           | R2, R6                   | 100E-00005-0071  |
| 3K 1/4W 5%         | 1           | R17                      | 100E-00005-0073  |
| 3.3K 1/4W 5%       | 18          | R21-R23, R35, R51-R58,   | 100E-00005-0074  |
|                    |             | R124, R142-R145, R235    |                  |
| 3.9K 1/4W 5%       | 4           | R84, R86, R88, R90       | 100E-00005-0077  |
| 4.7K 1/4W 5%       | 8           | R36-R43                  | 100E-00005-0079  |
| 5.6 1/4W 5%        | 1           | R16                      | 100E-00005-0082  |

CROSS REFERENCE LIST

| <u>DESCRIPTION</u>   | <u>QTY.</u> | <u>DESIGNATION NO.</u> | <u>PART NOS.</u> |
|----------------------|-------------|------------------------|------------------|
| 7.5 1/4W 5%          | 1           | R5                     | 100E-00005-0085  |
| 9.1 1/4W 5%          | 1           | R4                     | 100E-00005-0087  |
| 10K 1/4W 5%          | 4           | R12, R13, R30, R33     | 100E-00005-0088  |
| 15K 1/4W 5%          | 2           | R31, R34               | 100E-00005-0092  |
| 39K 1/4W 5%          | 1           | R7                     | 100E-00005-0102  |
| 47K 1/4W 5%          | 2           | R10, R11               | 100E-00005-0104  |
| 56K 1/4W 5%          | 14          | R62, R64, R66, R68     | 100E-00005-0106  |
|                      |             | R70, R125-R132, R229   |                  |
| 62K 1/4W 5%          | 1           | R15                    | 100E-00005-0107  |
| 82K 1/4W 5%          | 1           | R14                    | 100E-00005-0112  |
| 100K 1/4W 5%         | 2           | R26, R237              | 100E-00005-0115  |
| 270K 1/4W 5%         | 1           | R77                    | 100E-00005-0126  |
| 82 OHM 1W 10%        | 1           | R27                    | 100E-00007-0014  |
| IN958B ZENER         | 1           | D1                     | 103E-00001-0002  |
| IN4004               | 20          | D19-D38                | 103E-00003-0005  |
| IN4148               | 13          | D3, D6, D9-D18, D39    | 103E-00002-0005  |
| IN4606               | 5           | D2, D4, D5, D7, D8     | 103E-00002-0006  |
| 2N3904               | 3           | Q2, Q4, Q6             | 104E-00001-0006  |
| 2N4403               | 2           | Q3, Q5                 | 104E-00002-0006  |
| 2N5060               | 35          | Q23-Q33, Q37, Q41-Q50, | 104E-00015-0001  |
|                      |             | Q54-Q64, Q69, Q70      |                  |
| 2N5305               | 1           | Q1                     | 104E-00007-0003  |
| MCR106-1             | 10          | Q34-Q36, Q51-Q53       | 0360-00802-0009  |
|                      |             | Q65-Q68                |                  |
| SE9302               | 19          | Q7-Q22, Q38-Q40        | 0360-00802-0008  |
| 4011                 | 1           | U11                    | 0360-00803-0010  |
| 4502                 | 1           | U13                    | 0360-00803-0005  |
| 4514B                | 3           | U15-U17                | 0360-00803-0013  |
| 4584                 | 1           | U12                    | 0066-090RX-XXDX  |
| 6116 RAM             | 1           | U4                     | 0365-00803-0013  |
| 6803 MPU             | 1           | U1                     | 0360-00803-0048  |
| 6821 PIA             | 2           | U7, U8                 | 0360-00803-0017  |
| 74LS04               | 1           | U10                    | 0A15-00803-0010  |
| 74LS10               | 1           | U9                     | 0A89-00803-0007  |
| 75LS154              | 1           | U14                    | 0360-00803-0024  |
| 74HCT245             | 1           | U5                     | 0365-00803-0014  |
| 74LS373              | 1           | U6                     | 0A89-00803-0006  |
| CA3081               | 3           | U18-U20                | 0360-00803-0007  |
| 3.580 MHz CRYSTAL    | 1           | XTAL-1                 | 109E-00001-0003  |
| LED GREEN            | 1           | LED 1                  | 0017-00007-0131  |
| TEST POINTS          | 7           | TP1-TP7                | 0017-00007-0131  |
| SWITCH P.B.          | 1           | SW1                    | 0017-00032-0038  |
| BATTERY 3.6V         | 1           | BATT-1                 | 0017-00003-0172  |
| ZERO OHM RES. JUMPER | 5           | JW2, JW4, JW6, JW8,    | 117E-00001-0001  |
|                      |             | JW10                   |                  |
| RELAY 48VDC          | 1           | K1                     | 114E-00001-0011  |
| 40 PIN I.C. SOCKET   | 3           | XU1, XU7, XU8          | 110E-00001-0011  |
| 28 PIN I.C. SOCKET   | 2           | XU2, XU3               | 110E-00001-0010  |
| 24 PIN I.C. SOCKET   | 1           | XU4                    | 110E-00001-0007  |
| FERRITE BEAD         | 4           | FR1-FR4                | 0316-00804-0002  |

# DESIGNATION LIST

| <u>DESIGNATION</u> | <u>DESCRIPTION</u> | <u>DESIGNATION</u> | <u>DESCRIPTION</u> | <u>DESIGNATION</u> | <u>DESCRIPTION</u> | <u>DESIGNATION</u> | <u>DESCRIPTION</u>   |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
| C1                 | 6.8UF 25V TANT.    | R28                | 270 OHM 1/4W 5%    | R165 - R168        | 120 OHM 1/4W 5%    | U15 - U17          | 4514B                |
| C2,C3              | 27PF 50V CER.      | R29                | 1K 1/4W 5%         | R169 - R172        | 330 OHM 1/4W 5%    | U18 - U20          | CA3081               |
| C4                 | .1UF 50V CER.      | R30                | 10K 1/4W 5%        | R173 - R187        | 2K 1/4W 5%         | XTAL-1             | 3.580 MHZ CRYSTAL    |
| C5                 | 4.7UF 25V TANT.    | R31                | 15K 1/4W 5%        | R188 - R190        | 1.2K 1/4W 5%       | LED 1              | LED GREEN            |
| C6                 | .01UF 50V CER.     | R32                | 1K 1/4W 5%         | R191 - R193        | 120 OHM 1/4W 5%    | TP1 - TP7          | TEST POINTS          |
| C7                 | 47PF 50V CER.      | R33                | 10K 1/4W 5%        | R194 - R196        | 330 OHM 1/4W 5%    | SW1                | SWITCH P.B.          |
| C8                 | 470UF 16V ELEC.    | R34                | 15K 1/4W 5%        | R197 - R226        | 2K 1/4W 5%         | BATT-1             | BATTERY 3.6V         |
| C9,C10             | .01UF 50V CER.     | R35                | 3.3K 1/4W 5%       | R227,R228          | 1.2K 1/4W 5%       | JW2                | ZERO OHM RES. JUMPER |
| C11                | 470UF 25V ELEC.    | R36 - R43          | 4.7K 1/4W 5%       | R229               | 56K 1/4W 5%        | JW4                | ZERO OHM RES. JUMPER |
| C12,C13            | .01UF 50V CER.     | R44 - R50          | 1.2K 1/4W 5%       | R230               | 1.2K 1/4W 5%       | JW6                | ZERO OHM RES. JUMPER |
| C14                | 4.7UF 25V TANT.    | R51 - R58          | 3.3K 1/4W 5%       | R231 - R234        | 330 OHM 1/4W 5%    | JW8                | ZERO OHM RES. JUMPER |
| C15,C16            | .01UF 50V CER.     | R59 - R61          | 1.2K 1/4W 5%       | R235               | 3.3K 1/4W 5%       | JW10               | ZERO OHM RES. JUMPER |
| C17 - C23          | 470PF 1KV CER.     | R62                | 56K 1/4W 5%        | R236               | 1.2K 1/4W 5%       | K1                 | RELAY 48V DC         |
| C24 - C30          | 390PF 50V CER.     | R63                | 1.2K 1/4W 5%       | R237               | 100K OHM 1/4W 5%   | XU1,XU7,XU8        | 40 PIN IC SOCKET     |
| C31 - C36          | 470PF 1KV CER.     | R64                | 56K 1/4W 5%        | D1                 | 1N958B             | XU2, XU3           | 28 PIN IC SOCKET     |
| C37                | .05UF 16V CER.     | R65                | 1.2K 1/4W 5%       | D2                 | 1N4606             | XU4                | 24 PIN IC SOCKET     |
| C38 - C41          | 470PF 1KV CER.     | R66                | 56K 1/4W 5%        | D3                 | 1N4148             | FB1 - FB4          | FERRITE BEAD         |
| C42                | .01UF 50V CER.     | R67                | 1.2K 1/4W 5%       | D4,D5              | 1N4606             | J1                 | 11 - .045 SQ. PINS   |
| C43                | .003UF 1KV CER.    | R68                | 56K 1/4W 5%        | D6                 | 1N4148             | J2                 | 18 - .025 SQ. PINS   |
| C44 - C47          | .002UF 1KV CER.    | R69                | 1.2K 1/4W 5%       | D7,D8              | 1N4606             | J3                 | 14 - .025 SQ. PINS   |
| C48 - C56          | 470PF 1KV CER.     | R70                | 56K 1/4W 5%        | D9 - D18           | 1N4148             | J4                 | 14 - .025 SQ. PINS   |
| C57 - C71          | 390PF 50V CER.     | R71 - R76          | 1.2K 1/4W 5%       | D19 - D38          | 1N4004             | J5                 | 14 - .025 SQ. PINS   |
| C73 - C87          | .002 1KV CER.      | R77                | 270K 1/4W 5%       | D39                | 1N4148             | J6                 | 8 - .045 SQ. PINS    |
| C88 - C90          | 390PF 50V CER.     | R78 - R82          | 1.2K 1/4W 5%       | Q1                 | 2N5305             | J7                 | 7 - .045 SQ. PINS    |
| C91                | 470PF 1KV CER.     | R83                | 110 OHM 1/4W 5%    | Q2                 | 2N3904             | J8                 | 6 - .045 SQ. PINS    |
| CP1 - CP16         | .01 50V CER.       | R84                | 3.9K 1/4W 5%       | Q3                 | 2N4403             | J9                 | 10 - .045 SQ. PINS   |
| R1                 | 560 OHM 1/4W 5%    | R85                | 120 OHM 1/4W 5%    | Q4                 | 2N3904             | J10                | 18 - .025 SQ. PINS   |
| R2                 | 2.7K 1/4W 5%       | R86                | 3.9K 1/4W 5%       | Q5                 | 2N4403             | J11                | 17 - .025 SQ. PINS   |
| R3                 | 1K 1/4W 5%         | R87                | 120 OHM 1/4W 5%    | Q6                 | 2N3904             | J12                | 16 - .025 SQ. PINS   |
| R4                 | 9.1K 1/4W 5%       | R88                | 3.9K 1/4W 5%       | Q7 - Q22           | SF9302             | J13                | 12 - .025 SQ. PINS   |
| R5                 | 7.5K 1/4W 5%       | R89                | 120 OHM 1/4W 5%    | Q23 - Q33          | 2N5060             | J14                | 5 - .045 SQ. PINS    |
| R6                 | 2.7K 1/4W 5%       | R90                | 3.9K 1/4W 5%       | Q34 - Q36          | MCR 106-1          | P/O BATT-1         | TY-WRAP              |
| R7                 | 39K 1/4W 5%        | R91                | 120 OHM 1/4W 5%    | Q37                | 2N5060             | 6803 CONTROL BD.   | P.C. BOARD           |
| R8                 | 100 OHM 1/4W 5%    | R92 - R95          | 330 OHM 1/4W 5%    | Q38 - Q40          | SE9302             |                    |                      |
| R9                 | 82 OHM 1/4W 5%     | R96 - R104         | 470 OHM 1/4W 5%    | Q41 - Q50          | 2N5060             |                    |                      |
| R10,R11            | 47K 1/4W 5%        | R105 - R119        | 1.2K 1/4W 5%       | Q51 - Q53          | MCR 106-1          |                    |                      |
| R12,R13            | 10K 1/4W 5%        | R121               | 120 OHM 1/4W 5%    | Q54 - Q64          | 2N5060             |                    |                      |
| R14                | 82K 1/4W 5%        | R122               | 1.2K 1/4W 5%       | Q65 - Q68          | MCR 106-1          |                    |                      |
| R15                | 62K 1/4W 5%        | R123               | 2K 1/4W 5%         | Q69,Q70            | 2N5060             |                    |                      |
| R16                | 5.6K 1/4W 5%       | R124               | 3.3K 1/4W 5%       | U1                 | 6803               |                    |                      |
| R17                | 3K 1/4W 5%         | R125 - R132        | 56K 1/4W 5%        | U4                 | 6116 RAM           |                    |                      |
| R18                | 910 OHM 1/4W 5%    | R133 - R135        | 1.2K 1/4W 5%       | U5                 | 74HCT245           |                    |                      |
| R19                | 750 OHM 1/4W 5%    | R136 - R138        | 120 OHM 1/4W 5%    | U6                 | 74LS373            |                    |                      |
| R20                | 1.5K 1/4W 5%       | R139 - R141        | 330 OHM 1/4W 5%    | U7,U8              | 6821               |                    |                      |
| R21 - R23          | 3.3K 1/4W 5%       | R142 - R145        | 3.3K 1/4W 5%       | U9                 | 74LS10             |                    |                      |
| R24                | 120 OHM 1/4W 5%    | R146 - R150        | 1.2K 1/4W 5%       | U10                | 74LS04             |                    |                      |
| R25                | 680 OHM 1/4W 5%    | R151 - R155        | 120 OHM 1/4W 5%    | U11                | 4011               |                    |                      |
| R26                | 100K 1/4W 5%       | R156 - R160        | 330 OHM 1/4W 5%    | U12                | 4584               |                    |                      |
| R27                | 82 OHM 1W 10%      | R161 - R164        | 1.2K OHM 1/4W 5%   | U13                | 4502               |                    |                      |
|                    |                    |                    |                    | U14                | 74LS154            |                    |                      |

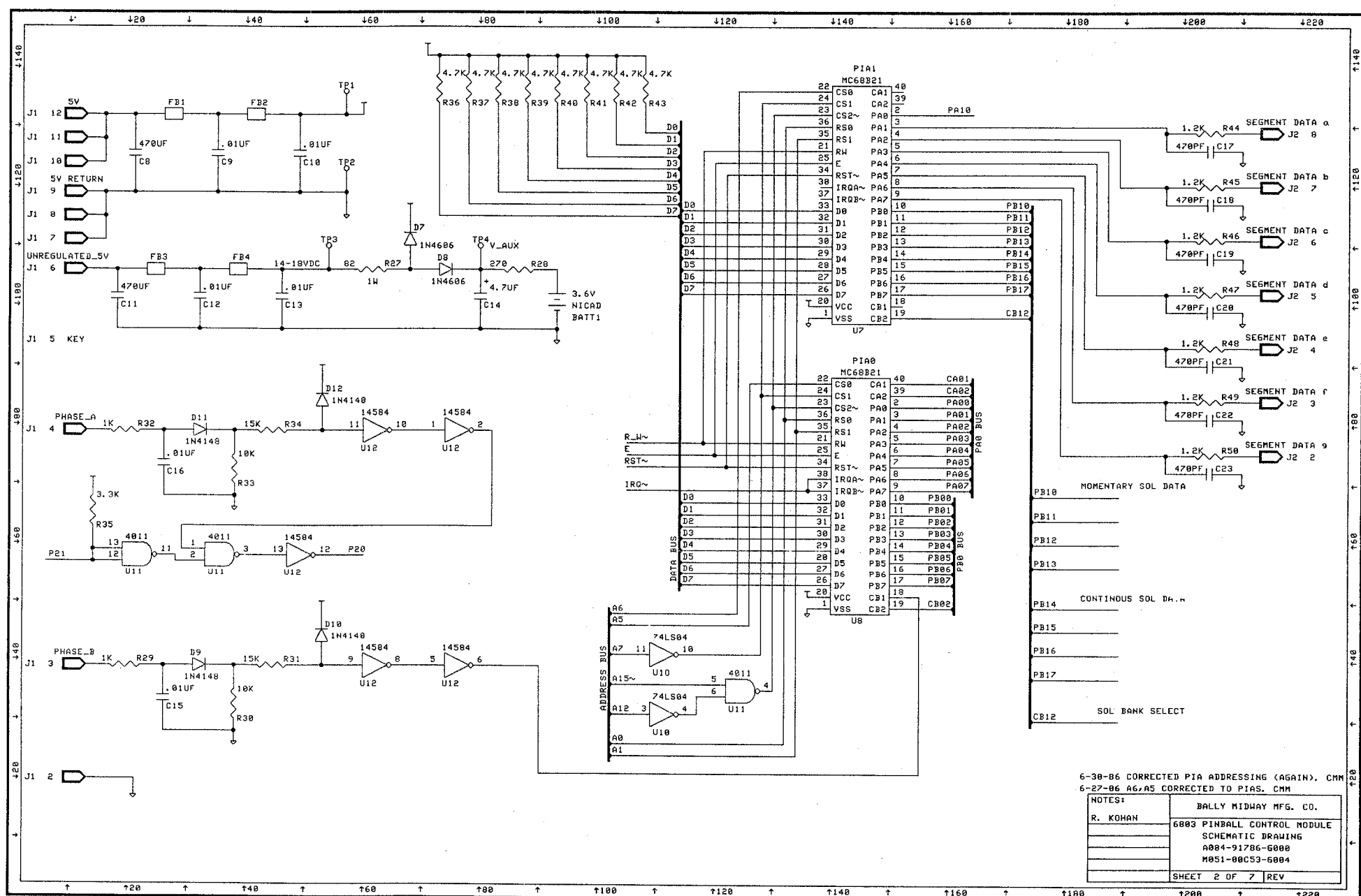
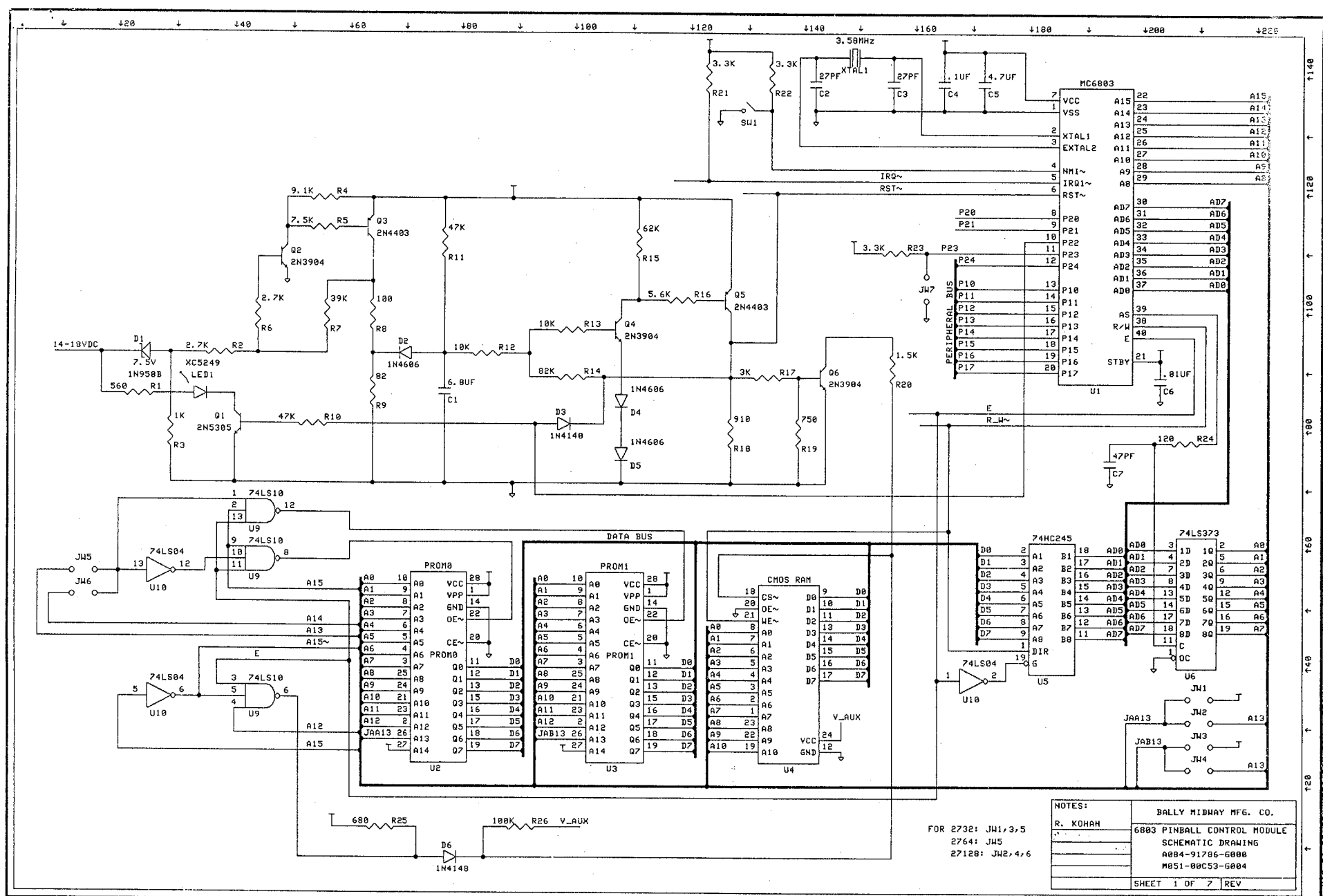
6803 CONTROL BOARD  
A084-91786-G000  
M051-00C53-G003

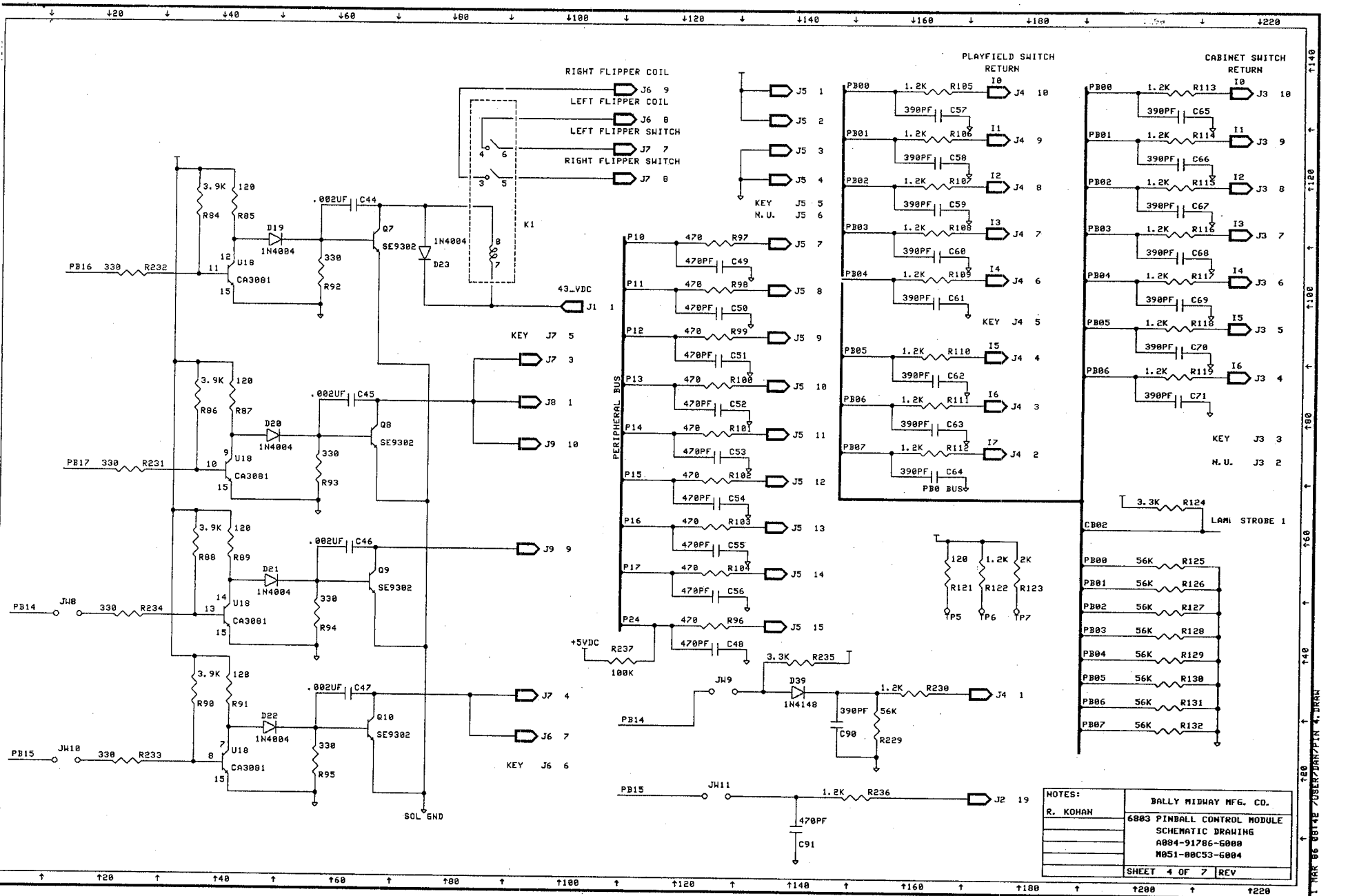
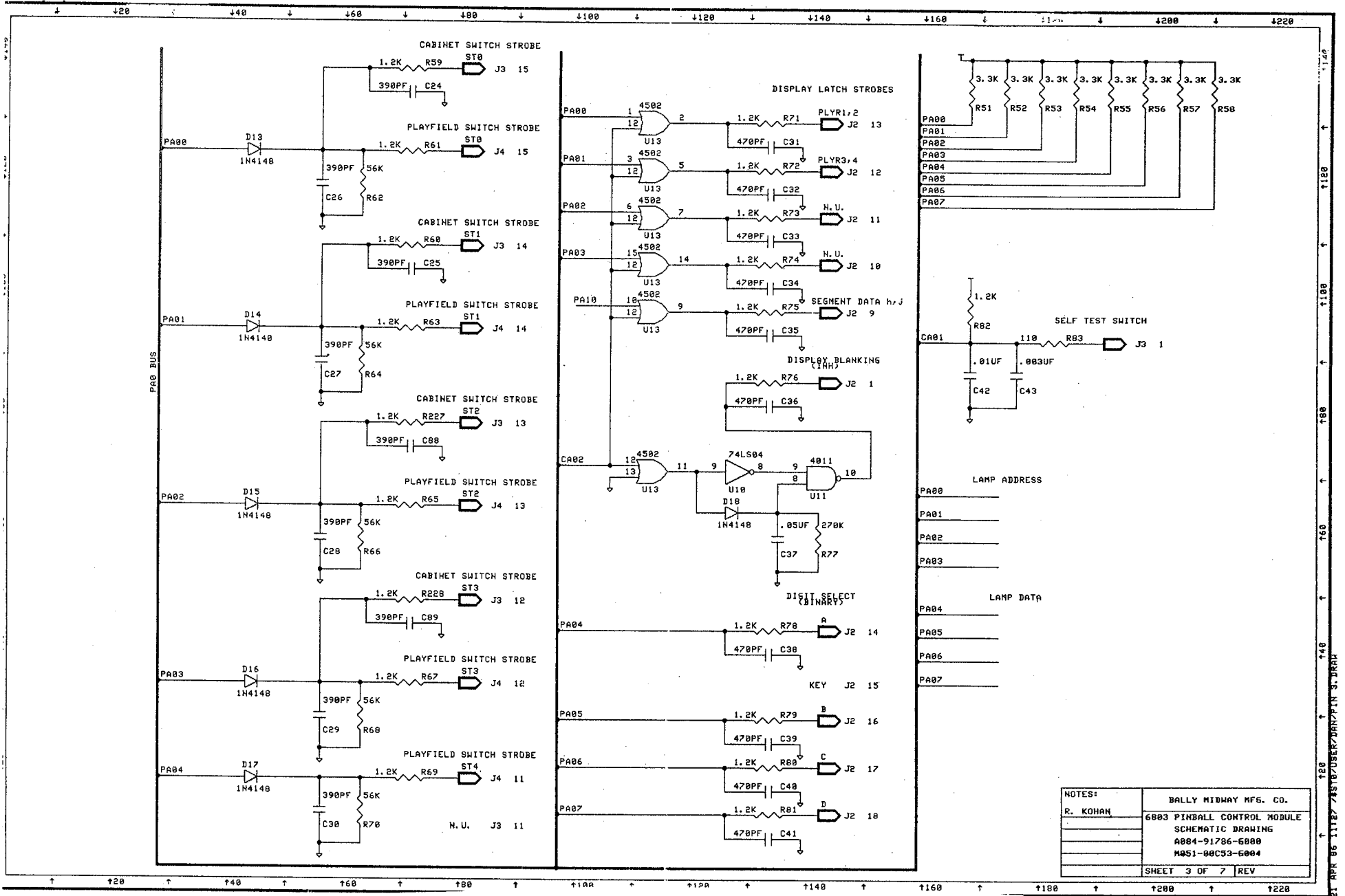
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M051-000C53-G003

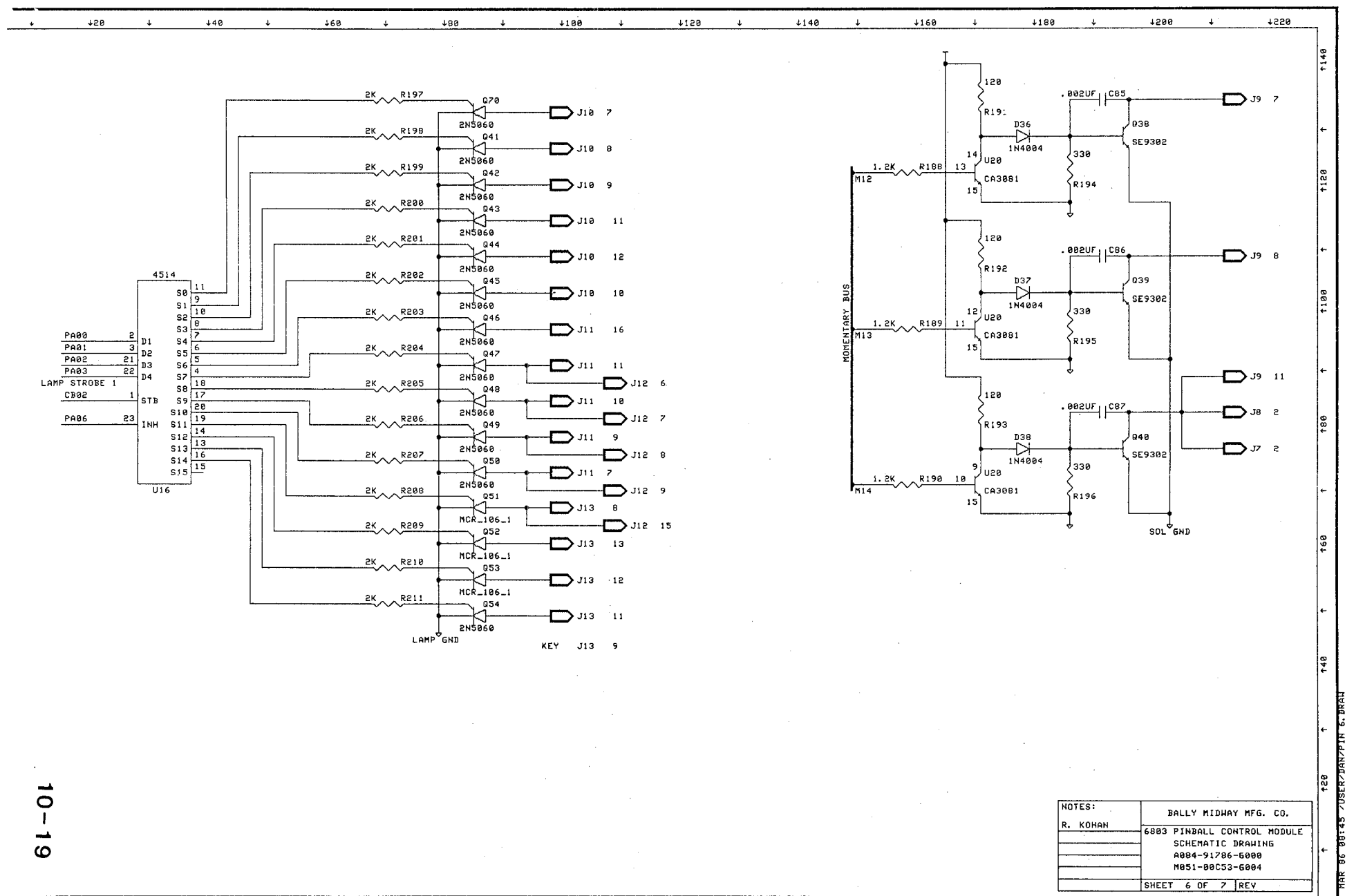
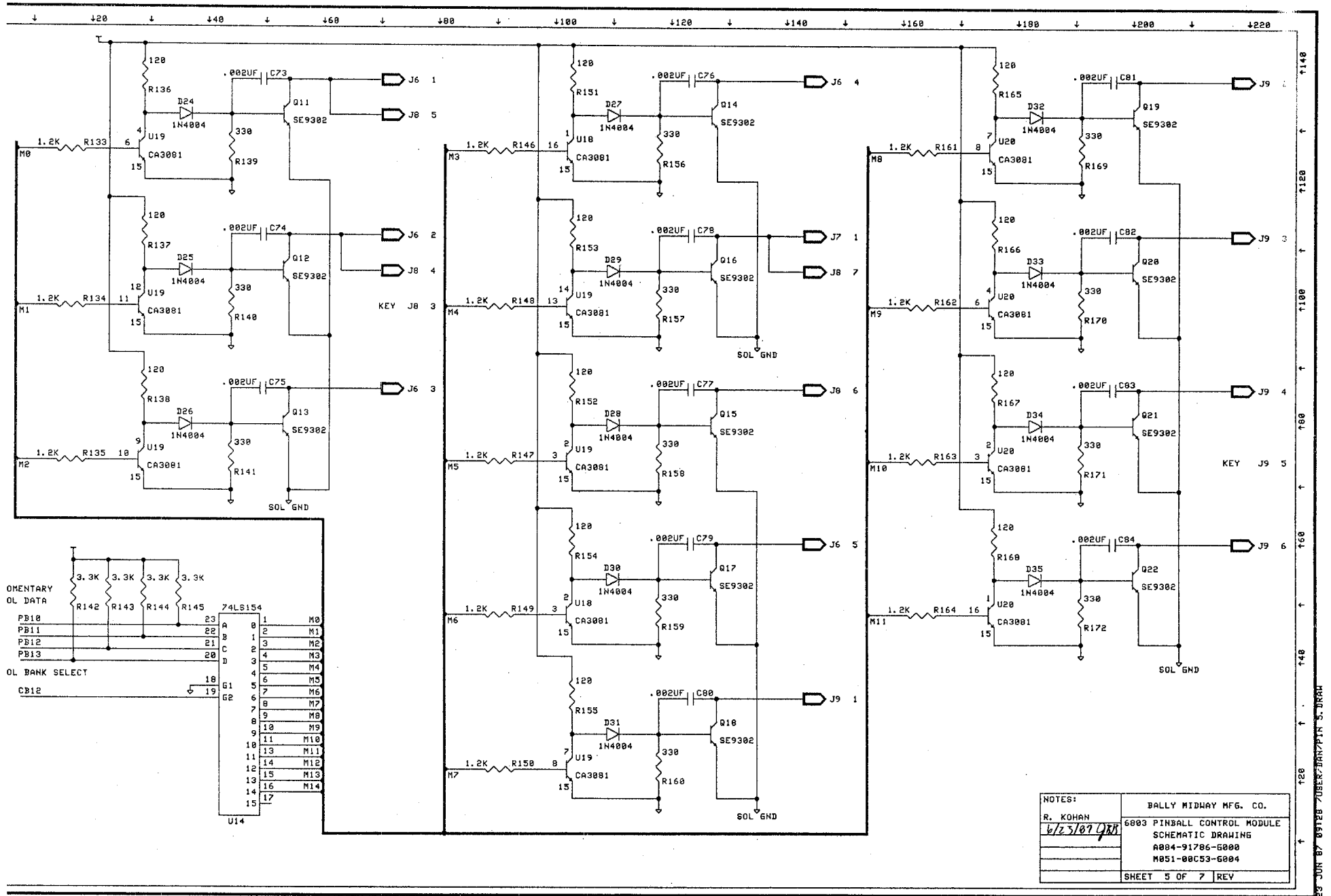
CROSS REFERENCE LIST

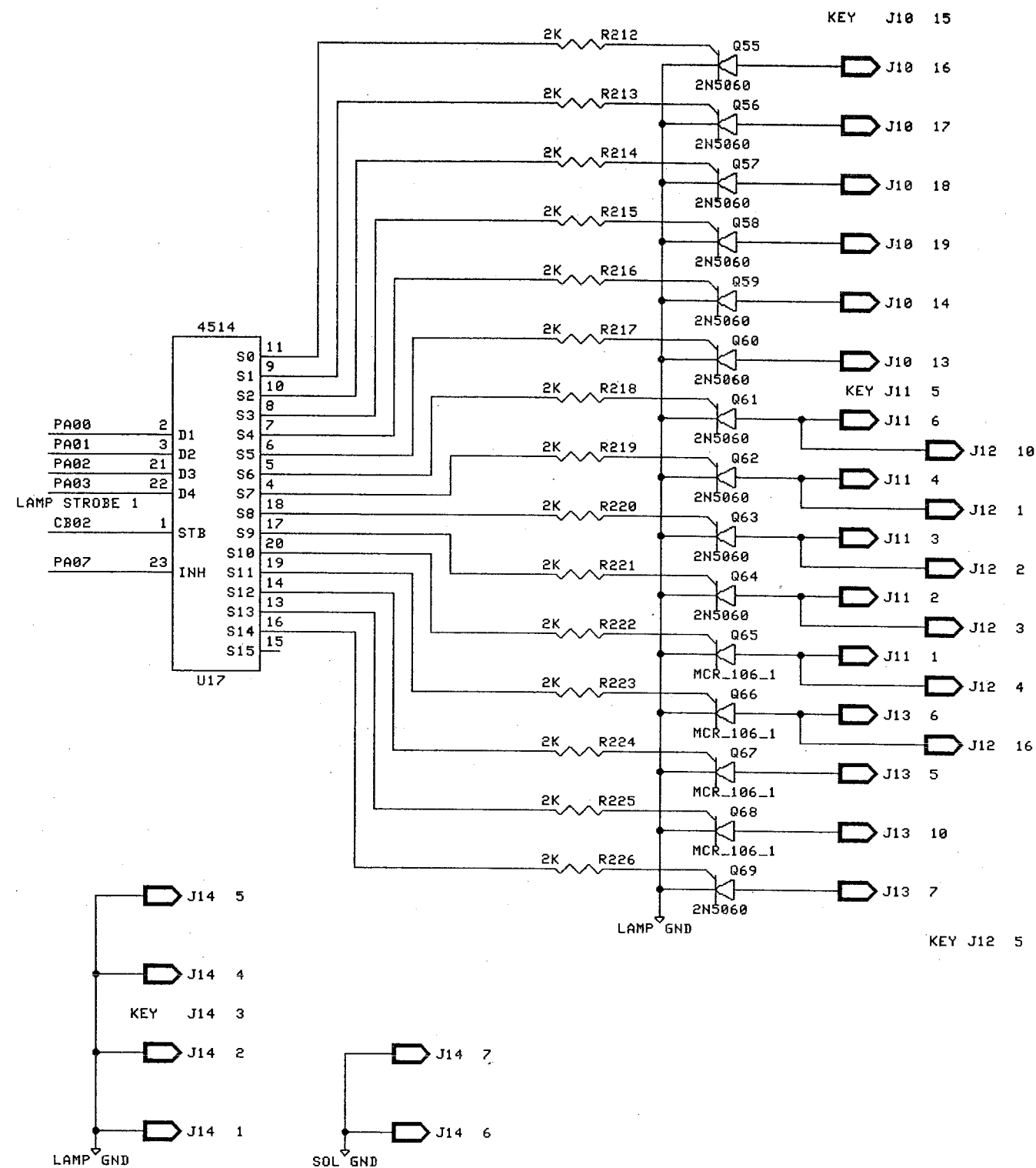
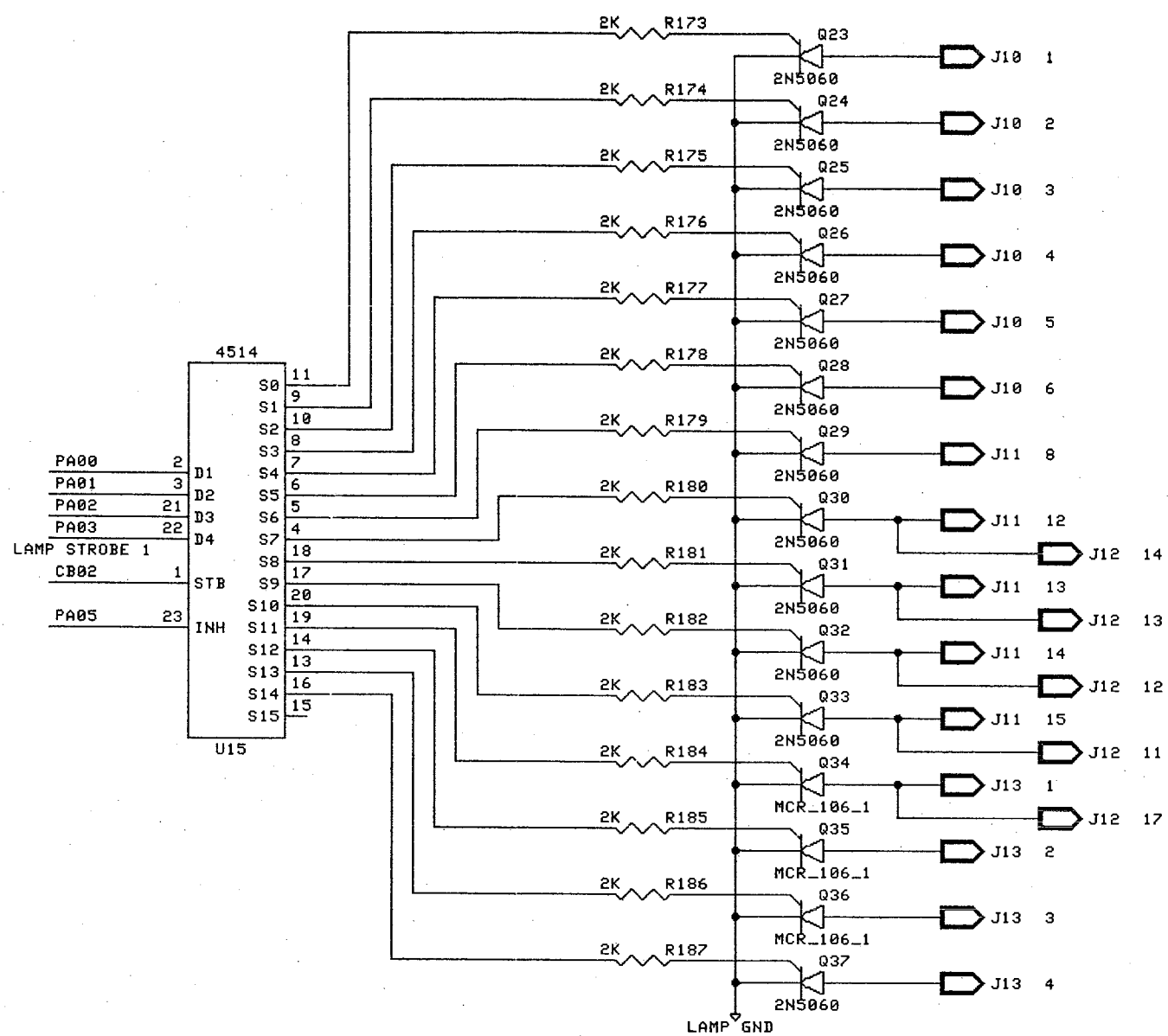
| <u>DESCRIPTION</u> | <u>QTY.</u> | <u>DESIGNATION NO.</u>                | <u>PART NOS.</u> |
|--------------------|-------------|---------------------------------------|------------------|
| .025 SQ. PINS      | 123         | J2, J3, J4, J5, J10,<br>J11, J12, J13 | 0304-00804-0009  |
| .045 SQ. PINS      | 47          | J1, J6, J7, J8, J9, J14               | 0304-00804-0010  |
| TY-WRAP            | 1           | P/O BATT-1                            | 0017-00042-0622  |
| P.C. BOARD         | 1           | 6803 CONTROL BOARD                    | A080-91786-G000  |

4-23-86 REV. 1.0 Fixed Part Number for 470PF Cap.









|        |                             |
|--------|-----------------------------|
| NOTES: | BALLY MIDWAY MFG. CO.       |
|        | 6803 PINBALL CONTROL MODULE |
|        | SCHEMATIC DRAWING           |
|        | A084-91786-G000             |
|        | M051-00C53-G004             |
|        | SHEET 7 OF 7 REV            |

LAMP & COIL/SOLENOID DRIVER LOCATIONS LISTING

| LAMP DRIVER NUMBER SEQUENCE |           |     |      |       |                       |
|-----------------------------|-----------|-----|------|-------|-----------------------|
| DRIVER <sup>1</sup>         | CONNECTOR | PIN | WIRE | PHASE | DESCRIPTION           |
| Q23                         | J10       | 1   | 12   | A     | COLD                  |
| Q23                         | J10       | 1   | 12   | B     | SPECIAL TEST          |
| Q24                         | J10       | 2   | 13   | A     | RAPIDS                |
| Q24                         | J10       | 2   | 13   | B     | RIGHT SAUCER 2        |
| Q25                         | J10       | 3   | 14   | A     | MOON                  |
| Q25                         | J10       | 3   | 14   | B     | DOWNHILL 6            |
| Q26                         | J10       | 4   | 15   | A     | SUCKIN                |
| Q26                         | J10       | 4   | 15   | B     | RETURN LANE LEFT      |
| Q27                         | J10       | 5   | 18   | A     | NEVER                 |
| Q27                         | J10       | 5   | 18   | B     | START RED             |
| Q28                         | J10       | 6   | 21   | A     | BOGS                  |
| Q28                         | J10       | 6   | 21   | B     | SPSA (SHOOT AGAIN)    |
| Q29                         | J11       | 8   | 64   | A     | BONUS 2X              |
| Q29                         | J11       | 8   | 64   | B     | RAIN A                |
| Q30                         | J11       | 12  | 72   | A     | DOWNHILL 2            |
| Q30                         | J11       | 12  | 72   | B     | TUNNEL RIGHT 3        |
| Q31                         | J11       | 13  | 73   | A     | LAP 3                 |
| Q31                         | J11       | 13  | 73   | B     | CLIFF SECTION         |
| Q32                         | J11       | 14  | 74   | A     | CLIFF-HANGER          |
| Q32                         | J11       | 14  | 74   | B     | HILL CLIMB SECTION    |
| Q33                         | J11       | 15  | 75   | A     | TUNNEL LEFT 2         |
| Q33                         | J11       | 15  | 75   | B     | SWAMP SECTION BRITE   |
| Q34                         | J13       | 1   | 81   | C     | BACKBOX LEFT BRITE    |
| Q34                         | J13       | 1   | 81   | D     | SWAMP BRITE LEFT      |
| Q35                         | J13       | 2   | 83   | C     | BACKBOX RIGHT BRITE   |
| Q35                         | J13       | 2   | 83   | D     | SLINGSHOT RIGHT BRITE |
| Q36                         | J13       | 3   | 84   | C     | DOWNHILL BRITE        |
| Q36                         | J13       | 3   | 84   | C     | HILL CLIMB BRITE      |
| Q37                         | J13       | 4   | 85   | A     | CLIFF 3               |
| Q37                         | J13       | 4   | 85   | B     | RAIN 4X               |
| Q41                         | J10       | 8   | 25   | A     | HIGHWAY 93 JUMP       |
| Q41                         | J10       | 8   | 25   | B     | RIGHT SAUCER 1        |
| Q42                         | J10       | 19  | 26   | A     | MEAN                  |
| Q42                         | J10       | 19  | 26   | B     | DOWNHILL 5            |
| Q43                         | J10       | 11  | 31   | A     | BIKE                  |
| Q43                         | J10       | 11  | 31   | B     | OUTLANE RIGHT         |
| Q44                         | J10       | 12  | 32   | A     | BIG                   |
| Q44                         | J10       | 12  | 32   | B     | START YELLOW          |
| Q45                         | J10       | 10  | 28   | A     | BONUS 4X              |
| Q45                         | J10       | 10  | 28   | B     | RAIN N                |
| Q46                         | J11       | 16  | 78   | A     | DOWNHILL 4            |
| Q46                         | J11       | 16  | 78   | B     | RAIN R                |
| Q47                         | J11       | 11  | 71   | A     | DOWNHILL 1            |
| Q47                         | J11       | 11  | 71   | B     | TUNNEL RIGHT 2        |
| Q48                         | J11       | 10  | 68   | A     | LAP 2                 |
| Q48                         | J11       | 10  | 68   | B     | DOWNHILL SECTION      |
| Q49                         | J11       | 9   | 67   | A     | TUNNEL LEFT 4         |
| Q49                         | J11       | 9   | 67   | B     | RAPIDS SECTION        |
| Q50                         | J11       | 7   | 63   | A     | TUNNEL LEFT 1         |
| Q50                         | J11       | 7   | 63   | B     | ROCKS SECTION         |
| Q51                         | J13       | 8   | 93   | C     | RAPIDS BRITE          |
| Q51                         | J13       | 8   | 93   | D     | RIGHT SAUCER BRITE    |
| Q52                         | J13       | 3   | 97   | C     | FAST LINE BRITE       |
| Q52                         | J13       | 3   | 97   | D     | SLINGSHOT LEFT BRITE  |
| Q53                         | J13       | 12  | 96   | A     | TOP SAUCER RIGHT      |
| Q53                         | J13       | 12  | 96   | B     | RIGHT TOP LOOP        |
| Q54                         | J13       | 11  | 95   | A     | CLIFF 2               |
| Q54                         | J13       | 11  | 95   | B     | RAIN 3X               |
| Q55                         | J10       | 16  | 38   | A     | ROCKY                 |
| Q55                         | J10       | 16  | 38   | B     | TOP SAUCER 1          |
| Q56                         | J10       | 17  | 41   | A     | ROCKS                 |
| Q56                         | J10       | 17  | 41   | B     | DOWNHILL 7            |
| Q57                         | J10       | 18  | 43   | A     | SWAMP                 |

|     |     |    |    |   |                      |
|-----|-----|----|----|---|----------------------|
| Q57 | J10 | 18 | 43 | B | RETURN LANE RIGHT    |
| Q58 | J10 | 19 | 45 | A | ENDING               |
| Q58 | J10 | 19 | 45 | B | OUTLANE LEFT         |
| Q59 | J10 | 14 | 37 | A | BAD                  |
| Q59 | J10 | 14 | 37 | B | START GREEN          |
| Q60 | J10 | 13 | 36 | A | BONUS 3X             |
| Q60 | J10 | 13 | 36 | B | RAIN I               |
| Q61 | J11 | 6  | 62 | A | DOWNHILL 3           |
| Q61 | J11 | 6  | 62 | B | TUNNEL RIGHT 4       |
| Q62 | J11 | 4  | 61 | A | HILL CLIMB           |
| Q62 | J11 | 4  | 61 | B | TUNNEL RIGHT 1       |
| Q63 | J11 | 3  | 59 | A | LAP 1                |
| Q63 | J11 | 3  | 59 | B | BOGS SECTION         |
| Q64 | J11 | 2  | 58 | A | TUNNEL LEFT 3        |
| Q64 | J11 | 2  | 58 | B | HIGHWAY 93 SECTION   |
| Q65 | J11 | 1  | 48 | C | HIGHWAY 93 BRITE     |
| Q65 | J11 | 1  | 48 | D | SWAMP BRITE RIGHT    |
| Q66 | J13 | 6  | 87 | C | SHOOTER BRITE        |
| Q66 | J13 | 6  | 87 | D | BOGS BRITE           |
| Q67 | J13 | 5  | 86 | C | BOTTOM FLIPPER BRITE |
| Q67 | J13 | 5  | 86 | D | ROCK BRITE           |
| Q68 | J13 | 10 | 94 | A | TOP SAUCER LEFT      |
| Q68 | J13 | 10 | 94 | B | LEFT TOP LOOP        |
| Q69 | J13 | 7  | 91 | A | CLIFF 1              |
| Q69 | J13 | 7  | 91 | B | RAIN 2X              |
| Q70 | J10 | 7  | 24 | A | WET                  |
| Q70 | J10 | 7  | 24 | B | TOP SAUCER 2         |

COIL/SOLENOID DRIVER NUMBER SEQUENCE

| DRIVER <sup>1</sup> | CONNECTOR | PIN | WIRE | DESCRIPTION                           |
|---------------------|-----------|-----|------|---------------------------------------|
| Q7                  | J1        | 1   | 30   | FLIPPER CONTROL RELAY K1 <sup>2</sup> |
| Q10                 | J6        | 7   | 311  | GENERAL ILLUMINATION CONTROL          |
| Q11                 | J6        | 1   | 31   | SAUCER RIGHT                          |
| Q12                 | J6        | 2   | 32   | SAUCER TOP                            |
| Q13                 | J6        | 3   | 34   | GATE DOWN                             |
| Q14                 | J6        | 4   | 35   | GATE RAISE                            |
| Q15                 | J8        | 7   | 27   | LEFT SLINGSHOT                        |
| Q16                 | J8        | 6   | 25   | RIGHT SLINGSHOT                       |
| Q18                 | J9        | 1   | 51   | DROP TARGET RESET                     |
| Q22                 | J9        | 6   | 56   | EJECT TO SHOOTER                      |
| Q38                 | J9        | 7   | 57   | RESERVED FOR GERMAN USE               |
| Q39                 | J9        | 8   | 58   | OUTHOLE                               |
| Q40                 | J9        | 11  | 59   | KNOCKER                               |

<sup>1</sup> DRIVERS NOT LISTED ARE NOT USED.

<sup>2</sup> THE FLIPPER SWITCHES ARE WIRED IN SERIES WITH THE K1 RELAY SWITCH. WHEN THE RELAY IS ENERGIZED AND EITHER FLIPPER PUSH BUTTON IS PRESSED, THE FLIPPER SOLENOIDS ENERGIZE.

WIRE COLOR CODE

|          |            |
|----------|------------|
| 1-RED    | 6-BROWN    |
| 2-BLUE   | 7-ORANGE   |
| 3-YELLOW | 8-BLACK    |
| 4-GREEN  | 9-GREY     |
| 5-WHITE  | 0-NO TRACE |

1ST NUMBER IN CODE = BODY COLOR  
2ND NUMBER IN CODE = TRACER COLOR

EXAMPLE: 80 = BLACK  
85 = BLACK/WHITE

| LAMP DESCRIPTION NAME SEQUENCE |                     |           |     |      |       |
|--------------------------------|---------------------|-----------|-----|------|-------|
| DESCRIPTION                    | DRIVER <sup>1</sup> | CONNECTOR | PIN | WIRE | PHASE |
| BACKBOX LEFT BRITE             | Q34                 | J13       | 1   | 81   | C     |
| BACKBOX RIGHT BRITE            | Q35                 | J13       | 2   | 83   | C     |
| BAD                            | Q59                 | J10       | 14  | 37   | A     |
| BIG                            | Q44                 | J10       | 12  | 32   | A     |
| BIKE                           | Q43                 | J10       | 11  | 31   | A     |
| BOGS                           | Q28                 | J10       | 6   | 21   | A     |
| BOGS BRITE                     | Q66                 | J13       | 6   | 87   | D     |
| BOGS SECTION                   | Q63                 | J11       | 3   | 59   | B     |
| BONUS 2X                       | Q29                 | J11       | 6   | 64   | A     |
| BONUS 3X                       | Q60                 | J10       | 13  | 36   | A     |
| BONUS 4X                       | Q45                 | J10       | 10  | 28   | A     |
| BOTTOM FLIPPER BRITE           | Q67                 | J13       | 5   | 86   | C     |
| CLIFF-HANGER                   | Q32                 | J11       | 14  | 74   | A     |
| CLIFF SECTION                  | Q31                 | J11       | 13  | 73   | B     |
| CLIFF 1                        | Q69                 | J13       | 7   | 91   | A     |
| CLIFF 2                        | Q54                 | J13       | 11  | 95   | A     |
| CLIFF 3                        | Q37                 | J13       | 4   | 85   | A     |
| COLD                           | Q23                 | J10       | 1   | 12   | A     |
| DOWNHILL BRITE                 | Q36                 | J13       | 3   | 84   | C     |
| DOWNHILL SECTION               | Q48                 | J11       | 10  | 68   | B     |
| DOWNHILL 1                     | Q47                 | J11       | 11  | 71   | A     |
| DOWNHILL 2                     | Q30                 | J11       | 12  | 72   | A     |
| DOWNHILL 3                     | Q61                 | J11       | 6   | 62   | A     |
| DOWNHILL 4                     | Q46                 | J11       | 16  | 78   | A     |
| DOWNHILL 5                     | Q42                 | J10       | 9   | 26   | B     |
| DOWNHILL 6                     | Q25                 | J10       | 3   | 14   | B     |
| DOWNHILL 7                     | Q56                 | J10       | 17  | 41   | B     |
| ENDING                         | Q58                 | J10       | 19  | 45   | A     |
| FAST LINE BRITE                | Q52                 | J13       | 3   | 97   | C     |
| HIGHWAY 93 BRITE               | Q65                 | J11       | 1   | 48   | C     |
| HIGHWAY 93 JUMP                | Q41                 | J10       | 8   | 25   | A     |
| HIGHWAY 93 SECTION             | Q64                 | J11       | 2   | 58   | B     |
| LAP 1                          | Q63                 | J11       | 3   | 59   | A     |
| LAP 2                          | Q48                 | J11       | 10  | 68   | A     |
| LAP 3                          | Q31                 | J11       | 13  | 73   | A     |
| LEFT TOP LOOP                  | Q68                 | J13       | 10  | 94   | B     |
| MEAN                           | Q42                 | J10       | 19  | 26   | A     |
| MOON                           | Q25                 | J10       | 3   | 14   | A     |
| NEVER                          | Q27                 | J10       | 5   | 18   | A     |
| OUTLANE LEFT                   | Q58                 | J10       | 19  | 45   | B     |
| OUTLANE RIGHT                  | Q43                 | J10       | 11  | 31   | B     |
| RAIN A                         | Q29                 | J11       | 8   | 64   | B     |
| RAIN I                         | Q60                 | J10       | 13  | 36   | B     |
| RAIN N                         | Q45                 | J10       | 10  | 28   | B     |
| RAIN R                         | Q46                 | J11       | 16  | 78   | B     |
| RAIN 2X                        | Q69                 | J13       | 7   | 91   | B     |
| RAIN 3X                        | Q54                 | J13       | 11  | 95   | B     |
| RAIN 4X                        | Q37                 | J13       | 4   | 85   | B     |
| RAPIDS                         | Q24                 | J10       | 2   | 13   | A     |
| RAPIDS BRITE                   | Q51                 | J13       | 8   | 93   | C     |
| RAPIDS SECTION                 | Q49                 | J11       | 9   | 67   | B     |
| RETURN LANE LEFT               | Q26                 | J10       | 4   | 15   | B     |
| RETURN LANE RIGHT              | Q57                 | J10       | 18  | 43   | B     |
| RIGHT SAUCER 1                 | Q41                 | J10       | 8   | 25   | B     |
| RIGHT SAUCER 2                 | Q24                 | J10       | 2   | 13   | B     |
| RIGHT SAUCER BRITE             | Q51                 | J13       | 8   | 93   | D     |
| RIGHT TOP LOOP                 | Q53                 | J13       | 12  | 96   | B     |
| ROCKS                          | Q56                 | J10       | 17  | 41   | A     |
| ROCK BRITE                     | Q67                 | J13       | 5   | 86   | D     |
| ROCKS SECTION                  | Q50                 | J11       | 7   | 63   | B     |
| ROCKY                          | Q55                 | J10       | 16  | 38   | A     |
| SHOOT AGAIN (SPSA)             | Q28                 | J10       | 6   | 21   | B     |
| SLINGSHOT LEFT BRITE           | Q52                 | J13       | 3   | 97   | D     |
| SLINGSHOT RIGHT BRITE          | Q35                 | J13       | 2   | 83   | D     |
| SHOOTER BRITE                  | Q66                 | J13       | 6   | 87   | C     |

|                    |     |     |    |    |   |
|--------------------|-----|-----|----|----|---|
| SPECIAL TEST       | Q23 | J10 | 1  | 12 | B |
| START RED          | Q27 | J10 | 5  | 18 | B |
| START GREEN        | Q59 | J10 | 14 | 37 | B |
| START YELLOW       | Q44 | J10 | 12 | 32 | B |
| SUCKIN             | Q26 | J10 | 4  | 15 | A |
| SWAMP              | Q57 | J10 | 18 | 43 | A |
| SWAMP BRITE LEFT   | Q34 | J13 | 1  | 81 | D |
| SWAMP BRITE RIGHT  | Q65 | J11 | 1  | 48 | D |
| SWAMP SECTION      | Q33 | J11 | 13 | 75 | B |
| TOP SAUCER LEFT    | Q68 | J19 | 10 | 94 | A |
| TOP SAUCER RIGHT   | Q53 | J13 | 12 | 96 | A |
| TOP SAUCER 1       | Q55 | J10 | 16 | 38 | B |
| TOP SAUCER 2       | Q70 | J10 | 7  | 24 | B |
| TUNNEL LEFT 1      | Q50 | J11 | 7  | 63 | A |
| TUNNEL LEFT 2      | Q33 | J11 | 13 | 75 | A |
| TUNNEL LEFT 3      | Q64 | J11 | 2  | 58 | A |
| TUNNEL LEFT 4      | Q49 | J11 | 9  | 67 | A |
| TUNNEL RIGHT 1     | Q62 | J11 | 4  | 61 | B |
| TUNNEL RIGHT 2     | Q47 | J11 | 11 | 71 | B |
| TUNNEL RIGHT 3     | Q30 | J11 | 12 | 72 | B |
| TUNNEL RIGHT 4     | Q61 | J11 | 6  | 62 | B |
| HILL CLIMB         | Q62 | J11 | 4  | 61 | A |
| HILL CLIMB BRITE   | Q36 | J13 | 3  | 84 | C |
| HILL CLIMB SECTION | Q32 | J11 | 14 | 74 | B |
| WET                | Q70 | J10 | 7  | 24 | A |

| COIL/SOLENOID DESCRIPTION NAME SEQUENCE |                     |           |     |      |  |
|-----------------------------------------|---------------------|-----------|-----|------|--|
| DESCRIPTION                             | DRIVER <sup>1</sup> | CONNECTOR | PIN | WIRE |  |
| DROP TARGET RESET                       | Q18                 | J9        | 1   | 51   |  |
| EJECT TO SHOOTER                        | Q22                 | J9        | 6   | 56   |  |
| FLIPPER CONTROL RELAY K1 <sup>2</sup>   | Q7                  | J1        | 1   | 30   |  |
| GATE DOWN                               | Q13                 | J6        | 3   | 34   |  |
| GATE RAISE                              | Q14                 | J6        | 4   | 35   |  |
| GENERAL ILLUMINATION                    | Q10                 | J6        | 7   | 311  |  |
| CONTROL                                 |                     |           |     |      |  |
| KNOCKER                                 | Q40                 | J9        | 11  | 59   |  |
| OUTHOLE                                 | Q39                 | J9        | 8   | 58   |  |
| RESERVED FOR GERMAN USE                 | Q38                 | J9        | 7   | 57   |  |
| SAUCER RIGHT                            | Q11                 | J6        | 1   | 31   |  |
| SAUCER TOP                              | Q12                 | J6        | 2   | 32   |  |
| SLINGSHOT LEFT                          | Q15                 | J8        | 7   | 27   |  |
| SLINGSHOT RIGHT                         | Q16                 | J8        | 6   | 25   |  |

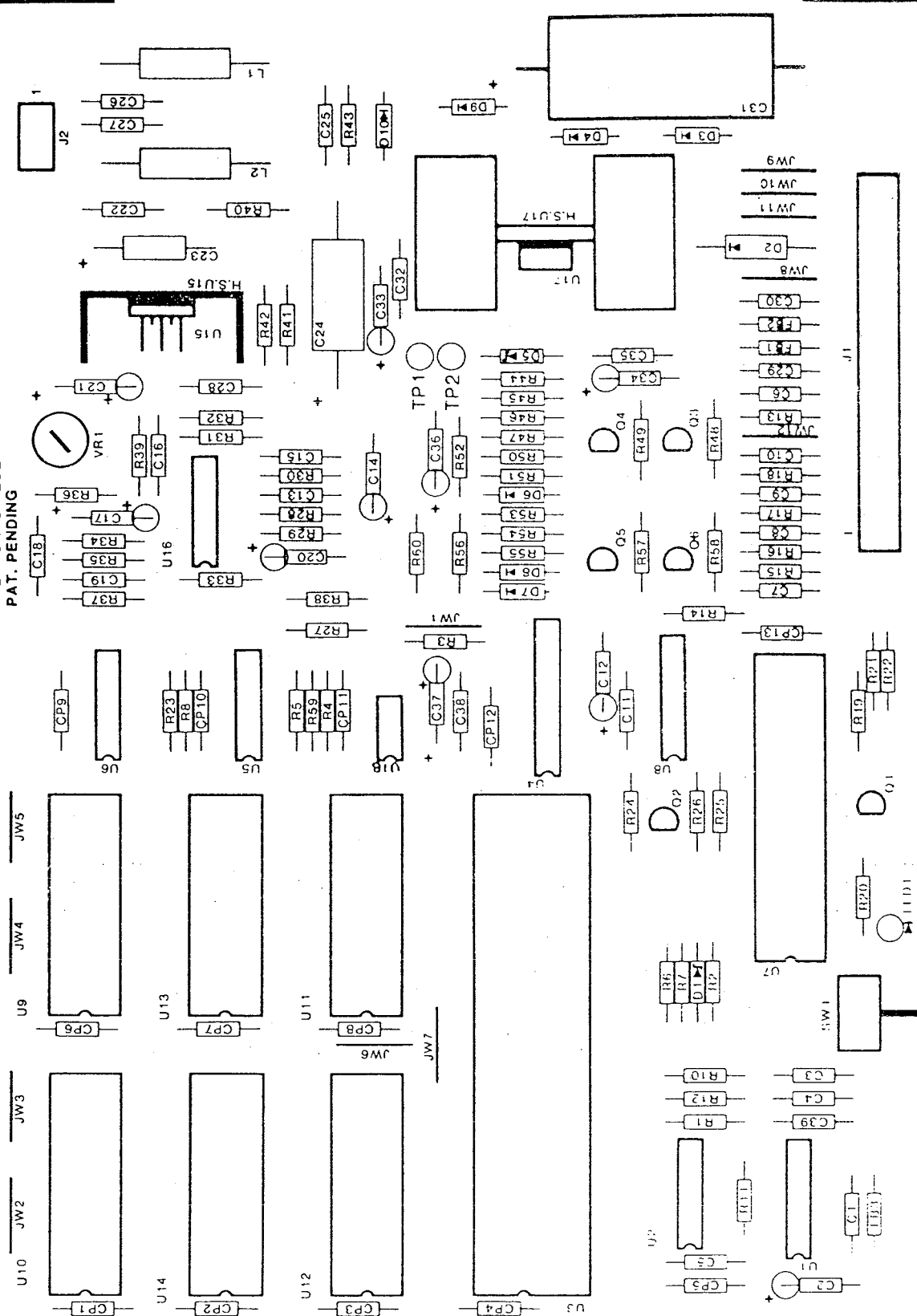
<sup>1</sup> DRIVERS NOT LISTED ARE NOT USED.

<sup>2</sup> THE FLIPPER SWITCHES ARE WIRED IN SERIES WITH THE K1 RELAY SWITCH. WHEN THE RELAY IS ENERGIZED AND EITHER FLIPPER PUSH BUTTON IS PRESSED, THE FLIPPER SOLENOIDS ENERGIZE.

| WIRE COLOR CODE                   |            |
|-----------------------------------|------------|
| 1-RED                             | 6-BROWN    |
| 2-BLUE                            | 7-ORANGE   |
| 3-YELLOW                          | 8-BLACK    |
| 4-GREEN                           | 9-GREY     |
| 5-WHITE                           | 0-NO TRACE |
| 1ST NUMBER IN CODE = BODY COLOR   |            |
| 2ND NUMBER IN CODE = TRACER COLOR |            |
| EXAMPLE: 80 = BLACK               |            |
| 85 = BLACK/WHITE                  |            |

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PAT. PENDING

A080-91864-C000



DESIGNATION LIST

| DESIGNATION | DESCRIPTION        |
|-------------|--------------------|
| CP1,CP2     | .1 UF AX CER       |
| CP3-CP13    | .01 UF AX CER      |
| C1          | .1 UF AX CER       |
| C2          | 10 UF RD TANT      |
| C3-C5       | NOT INSERTED       |
| C6          | 470 PF AX CER      |
| C7-C10      | 100 PF AX CER      |
| C11         | .01 UF AX CER      |
| * C12       | 47 UF AX ELEC      |
| C13         | 470 PF AX CER      |
| C14         | 1 UF AX TANT       |
| C15         | .01 UF AX CER      |
| C16         | 68 PF AX CER       |
| C17         | .1 UF AX TANT      |
| C18         | .001 UF AX CER     |
| C19         | 82 PF AX CER       |
| C20         | 10 UF AX TANT      |
| C21         | 1 UF AX TANT       |
| C22         | .05 UF RD CER      |
| C23         | 470 UF AX ELEC     |
| C24         | 1000 UF AX ELEC    |
| C25         | .1 UF AX CER       |
| C26,C27     | .22 UF AX CER      |
| C28-C30     | .1 UF AX CER       |
| C31         | 4700 UF AX ELEC    |
| C32         | .01 UF AX CER      |
| C33,C34     | 4.7 UF RD TANT     |
| C35         | .01 UF AX CER      |
| C36         | NOT INSERTED       |
| C37         | 10 UF AX TANT      |
| C38         | .01 UF AX CER      |
| C39         | .1 UF AX CER       |
| D1          | NOT INSERTED       |
| D2          | VR330              |
| D3,D4       | 1N4004             |
| D5-D8       | NOT INSERTED       |
| D9,D10      | 1N4004             |
| FB1-FB3     | FERRITE BEAD       |
| HS U15      | HEATSINK TO-220    |
| HS U17      | HEATSINK TO-220    |
| ICS U3      | 64 PIN I.C. SOCKET |
| ICS U4      | 20 PIN I.C. SOCKET |
| ICS U7      | 40 PIN I.C. SOCKET |
| ICS U8      | 16 PIN I.C. SOCKET |
| ICS U9-U14  | 28 PIN I.C. SOCKET |

DESIGNATION LIST

| DESIGNATION      | DESCRIPTION                  |
|------------------|------------------------------|
| INS U15, INS U17 | SIL PAD THERMAL WASHER       |
| J1,J2            | AUTO INSERT PIN TIN .045 SQ. |
| JW1-JW12         | JUMPER WIRE                  |
| L1,L2            | 10 UH INDUCTOR               |
| LED 1            | GREEN LED                    |
| MH U15           | SCREW, 6-32                  |
| MH U15           | NUT, 6-32                    |
| MH U15           | WASHER, #6 STAR              |
| MH U17           | SCREW, 4-40                  |
| MH U17           | NUT, 4-40                    |
| MH U17           | WASHER, #4 STAR              |
| Q1,Q2            | 2N5305                       |
| Q3-Q6            | NOT INSERTED                 |
| R1-R8            | 4.7K OHM 1/4W CRBN           |
| R9               | NOT USED                     |
| R10-R12          | NOT INSERTED                 |
| R13              | 10K OHM 1/4W CRBN            |
| R14              | 100K OHM 1/4W CRBN           |
| R15-R18          | 10K OHM 1/4W CRBN            |
| R19              | 47K OHM 1/4W CRBN            |
| R20              | 100 OHM 1/4W CRBN            |
| R21-R23          | 4.7K OHM 1/4W CRBN           |
| R24              | 2.7K OHM 1/4W CRBN           |
| R25              | 180 OHM 1/4W CRBN            |
| R26              | 68 OHM 1/4W CRBN             |
| R27              | 62K OHM 1/4W CRBN            |
| R28              | 120K OHM 1/4W CRBN           |
| R29              | 75K OHM 1/4W CRBN            |
| R30              | 33K OHM 1/4W CRBN            |
| R31              | 18K OHM 1/4W CRBN            |
| R32              | 33K OHM 1/4W CRBN            |
| R33              | 47K OHM 1/4W CRBN            |
| R34              | 150K OHM 1/4W CRBN           |
| R35              | 82K OHM 1/4W CRBN            |
| R36              | 150K OHM 1/4W CRBN           |
| R37              | 200K OHM 1/4W CRBN           |
| R38              | 1K OHM 1/4W CRBN             |
| R39              | 33K OHM 1/4W CRBN            |
| R40              | 430 OHM 1/4W CRBN            |
| R41              | 220 OHM 1/4W CRBN            |
| R42              | 2.2 OHM 1/4W CRBN            |

\* NOTE:  
The SOUNDS DELUXE PRINTED CIRCUIT BOARD in this game may or may not contain the capacitor C12. The absence of this capacitor will not affect the general performance of the printed circuit board. The capacitor C12 is also shown on pages 10-24 and 10-28.

|                        |  |                                              |  |
|------------------------|--|----------------------------------------------|--|
| USED ON Pinball        |  | REVISIONS                                    |  |
| NO. REQ'D              |  | Bally / MIDWAY MFG. CO.<br>FRANKLIN PK. ILL. |  |
| ASSEMBLY DRAWING       |  | PART NO.                                     |  |
| SOUNDS DELUXE P.C.B.D. |  | M051-00114-C153                              |  |
| A084-91864-C000        |  |                                              |  |

DESIGNATION LIST

| <u>DESIGNATION</u> | <u>DESCRIPTION</u> |
|--------------------|--------------------|
| R43                | 1 OHM 1/4W CRBN    |
| R44-R58            | NOT INSERTED       |
| R59                | 4.7K OHM 1/4W CRBN |
| R60                | 10K OHM 1/4W CRBN  |
| SW1                | PC MTG. SWITCH     |
| TP1,TP2            | TEST POINT         |
| U1                 | 16 MHZ COSC        |
| U2                 | 74LS74             |
| U3                 | MC68000G8 CPU      |
| U4                 | PAL16L8A-2 SDOORO  |
| U5                 | 74LS05             |
| U6                 | 74F32              |
| U7                 | MC6821             |
| U8                 | AD7533 DAC         |
| U9,U10             | RAM 2K X 8         |
| U11-U14            | ROM/EPROM          |
| U15                | TDA2002            |
| U16                | LM3900             |
| U17                | MC7805 REG.        |
| U18                | TL7705             |
| VR1                | 10K POT.           |

CROSS REFERENCE

| <u>DESCRIPTION</u> | <u>QTY.</u> | <u>DESIGNATION</u> | <u>PART NUMBER</u> |
|--------------------|-------------|--------------------|--------------------|
| 68 PF AX CER 5%    | 1           | C16                | 0360-00800-0028    |
| 82 PF AX CER 5%    | 1           | C19                | 0E47-00800-0002    |
| 100 PF AX CER      | 4           | C7-C10             | 0360-00800-0046    |
| 470 PF AX CER 10%  | 2           | C6,C13             | 0307-00800-0008    |
| .001 UF AX CER 10% | 1           | C18                | 0E47-00800-0003    |
| .01 UF AX CER 10%  | 1           | C15                | 0E47-00800-0001    |
| .01 UF AX CER      | 15          | CP3-CP13,C11,C32   | 0360-00800-0005    |
|                    |             | C35,C38            |                    |
| .05 UF RD CER      | 1           | C22                | 0360-00800-0006    |
| .1 UF AX CER       | 8           | CP1,CP2,C1,C25,    | 0360-00800-0058    |
|                    |             | C28-C30,C39        |                    |
| .22 UF AX CER      | 2           | C26,C27            | 0360-00800-0057    |
| 1 UF AX TANT       | 3           | C14,C17,C21        | 0986-00800-1400    |
| 4.7 UF RD TANT     | 2           | C33,C34            | 0360-00800-0008    |
| 10 UF AX TANT      | 3           | C2,C20,C37         | 0986-00800-0700    |
| 47 UF AX ELEC      | 1           | * C12              | 0360-00800-0042    |
| 470 UF AX ELEC     | 1           | C23                | 0360-00800-0021    |
| 1000 UF AX ELEC    | 1           | C24                | 0360-00800-0044    |
| 4700 UF AX ELEC    | 1           | C31                | 0360-00800-0023    |
| 1 OHM 1/4W CRBN    | 1           | R43                | 100E-00005-0002    |
| 2.2 OHM 1/4W CRBN  | 1           | R42                | 100E-00005-0003    |
| 68 OHM 1/4W CRBN   | 1           | R26                | 100E-00005-0029    |
| 100 OHM 1/4W CRBN  | 1           | R20                | 100E-00005-0033    |
| 180 OHM 1/4W CRBN  | 1           | R25                | 100E-00005-0039    |
| 220 OHM 1/4W CRBN  | 1           | R41                | 100E-00005-0041    |
| 430 OHM 1/4W CRBN  | 1           | R40                | 100E-00005-0050    |
| 1K OHM 1/4W CRBN   | 1           | R38                | 100E-00005-0061    |
| 2.7K OHM 1/4W CRBN | 1           | R24                | 100E-00005-0071    |
| 4.7K OHM 1/4W CRBN | 12          | R1-R8,R21-R23,R59  | 100E-00005-0079    |
| 10K OHM 1/4W CRBN  | 6           | R13,R15-R18,R60    | 100E-00005-0088    |
| 18K OHM 1/4W CRBN  | 1           | R31                | 100E-00005-0093    |
| 33K OHM 1/4W CRBN  | 3           | R30,R32,R39        | 100E-00005-0100    |
| 47K OHM 1/4W CRBN  | 2           | R19,R33            | 100E-00005-0104    |
| 62K OHM 1/4W CRBN  | 1           | R27                | 100E-00005-0107    |
| 75K OHM 1/4W CRBN  | 1           | R29                | 100E-00005-0110    |
| 82K OHM 1/4W CRBN  | 1           | R35                | 100E-00005-0112    |
| 100K OHM 1/4W CRBN | 1           | R14                | 100E-00005-0115    |
| 120K OHM 1/4W CRBN | 1           | R28                | 100E-00005-0118    |
| 150K OHM 1/4W CRBN | 2           | R34,R36            | 100E-00005-0120    |
| 200K OHM 1/4W CRBN | 1           | R37                | 100E-00005-0123    |
| 10K POT            | 1           | VR1                | 0360-00804-0024    |
| 1N4004             | 4           | D3,D4,D9,D10       | 103E-00003-0005    |
| VR330              | 1           | D2                 | 0360-00801-0007    |

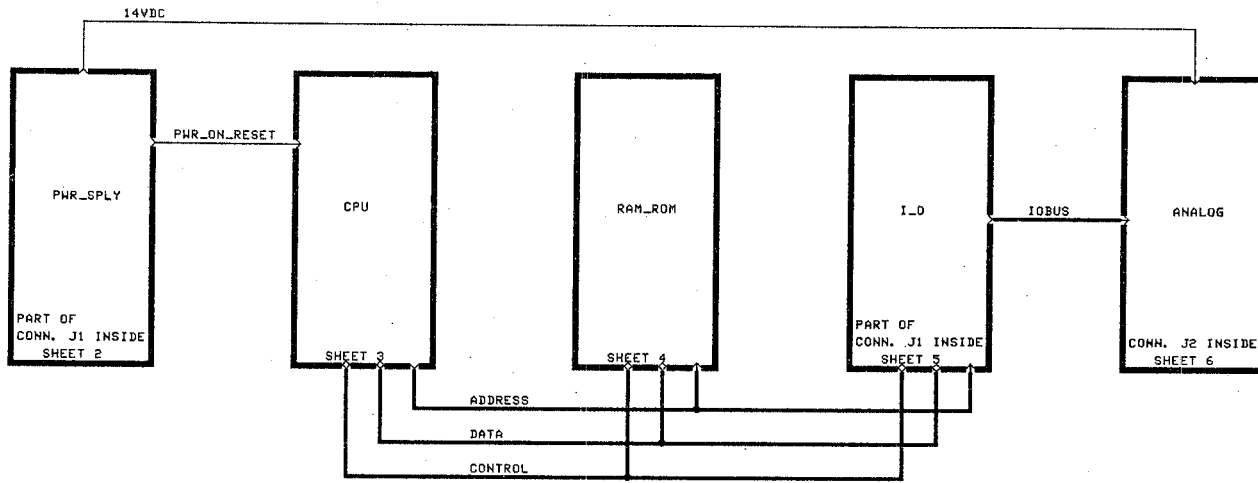
\* NOTE:  
The SOUNDS DELUXE PRINTED CIRCUIT BOARD in this game may or may not contain the capacitor C12. The absence of this capacitor will not affect the general performance of the printed circuit board. The capacitor C12 is also shown on pages 10-23 and 10-28.

SOUNDS DELUXE  
A084-91864-C000  
M051-00114-C154

CROSS REFERENCE

| DESCRIPTION                     | QTY. | DESIGNATION      | PART NUMBER         |
|---------------------------------|------|------------------|---------------------|
| 2N5305                          | 2    | Q1,Q2            | 0360-00802-0012     |
| 74F32                           | 1    | U6               | 0304-00803-0059     |
| 74LS05                          | 1    | U5               | 0E47-00803-0002     |
| 74LS74                          | 1    | U2               | 0304-00803-0058     |
| AD7533 DAC                      | 1    | U8               | 0304-00803-0055     |
| 16 MHZ COSC                     | 1    | U1               | 0304-00804-0008     |
| LM3900                          | 1    | U16              | 0360-00803-0002     |
| MC6821                          | 1    | U7               | 0304-00803-0054     |
| MC680Q0 G8 CPU                  | 1    | U3               |                     |
| MC7805 REG                      | 1    | U17              | 0360-00803-0050     |
| PAL16L8A-2 SDOORO               | 1    | U4               | 0E47-00803-0001     |
| RAM 2K X 8                      | 2    | U9,U10           | 0E47-00803-0003     |
| TDA2002                         | 1    | U15              | 0360-00803-0009     |
| TL7705AC                        | 1    | U18              | 0066-447RX-XXCX     |
| ROM/EPROM                       | 4    | U11-U14          | SEE ROM/EPROM SHEET |
| FERRITE BEAD                    | 3    | FB1-FB3          | 0316-00804-0002     |
| 10 UH INDUCTOR                  | 2    | L1,L2            | 0360-00804-0031     |
| 16 PIN I.C. SOCKET              | 1    | ICS U8           | 110E-00001-0003     |
| 20 PIN I.C. SOCKET              | 1    | ICS U4           | 110E-00001-0005     |
| 28 PIN I.C. SOCKET              | 6    | ICS U9-ICS U14   | 110E-00001-0010     |
| 40 PIN I.C. SOCKET              | 1    | ICS U7           | 110E-00001-0011     |
| 64 PIN I.C. SOCKET              | 1    | ICS U3           | 110E-00001-0016     |
| HEATSINK TO-220                 | 1    | HS U15           | 112E-00001-0011     |
| HEATSINK TO-220                 | 1    | HS U17           | 0E47-00804-0001     |
| SIL PAD THERMAL WASHER          | 2    | INS U15, INS U17 | 0017-00042-0319     |
| SCREW, 6-32                     | 1    | MH U15           | 0017-00101-0339     |
| NUT, 6-32                       | 1    | MH U15           | 0017-00103-0005     |
| WASHER, #6 STAR                 | 1    | MH U15           | 0017-00104-0009     |
| SCREW, 4-40                     | 1    | MH U17           | 0017-00101-0731     |
| NUT, 4-40                       | 1    | MH U17           | 0017-00103-0002     |
| WASHER, #4 STAR                 | 1    | MH U17           | 0017-00104-0071     |
| AUTO INSERT PIN<br>TIN .045 SQ. | 16   | J1,J2            | 0304-00804-0010     |
| JUMPER WIRE                     | 12   | JW1-JW12         | 117E-00001-0003     |
| GREEN LED                       | 1    | LED 1            | 119E-00001-0001     |
| TEST POINT                      | 2    | TP1,TP2          | 0017-00007-0131     |
| PC MTG. SWITCH                  | 1    | SW1              | 0986-00804-3100     |
| PC BOARD                        | 1    | --               | A080-91864-C000     |

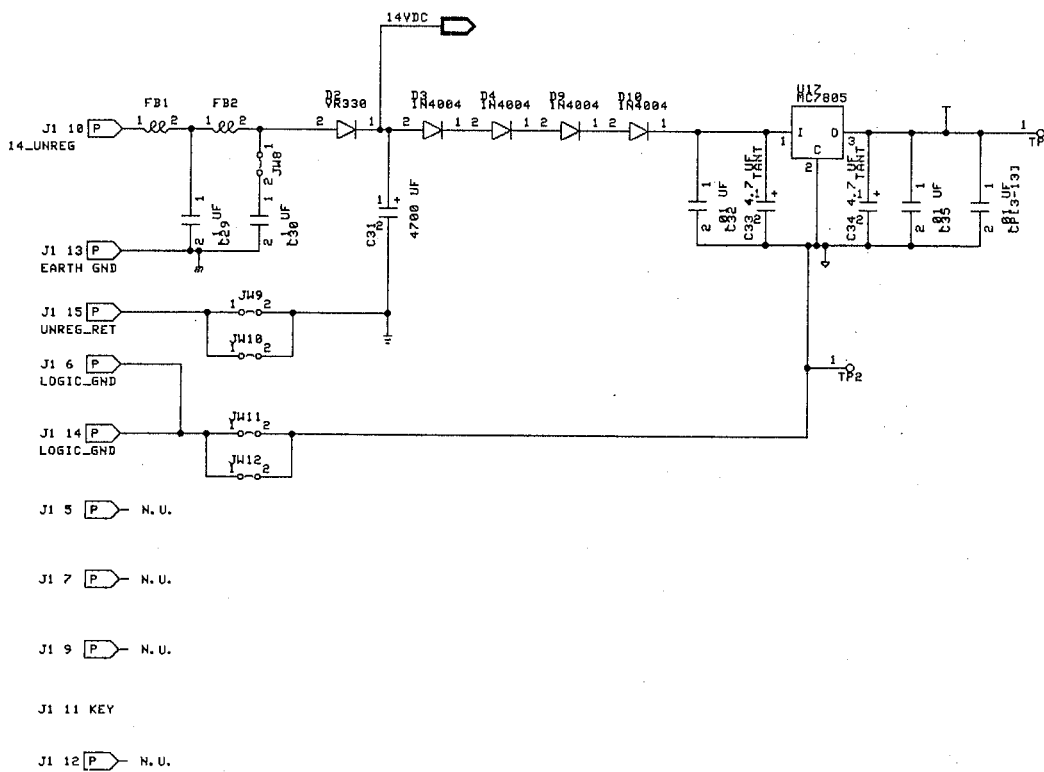
8/01/86 Rev. 1 - Changed Filter Values, C13,C15,C16,C18,C19,P39 CMM  
8/05/86 Rev. 2 - Removed D1 CMM.  
8/11/86 Rev. 3 - Added CP11-CP13 CMM.  
8/15/86 Rev. 4 - Added ICS U13, ICS U14. Fixed Desig. list U5, U6.  
Corrected qty. of Ferrite Bead

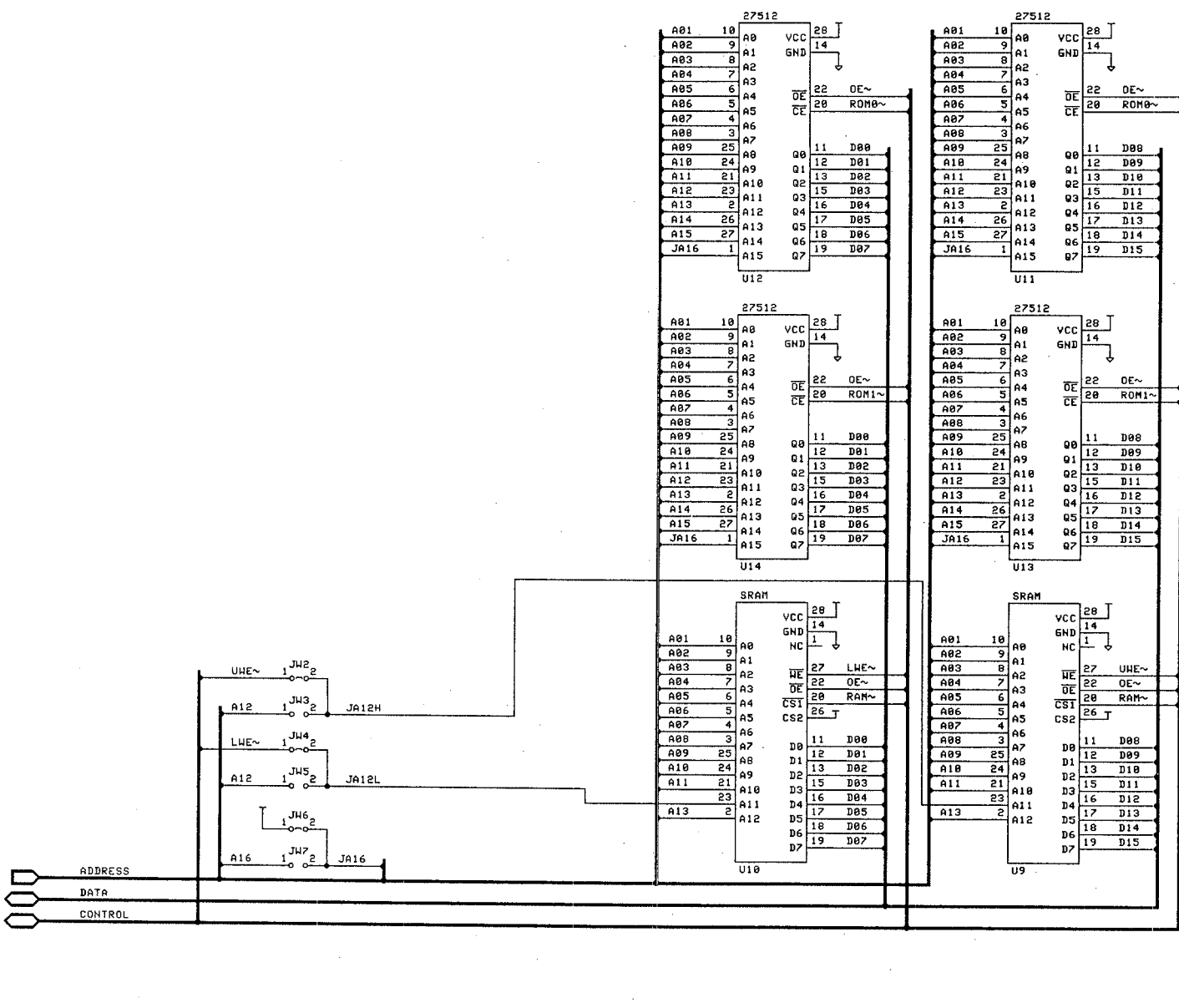
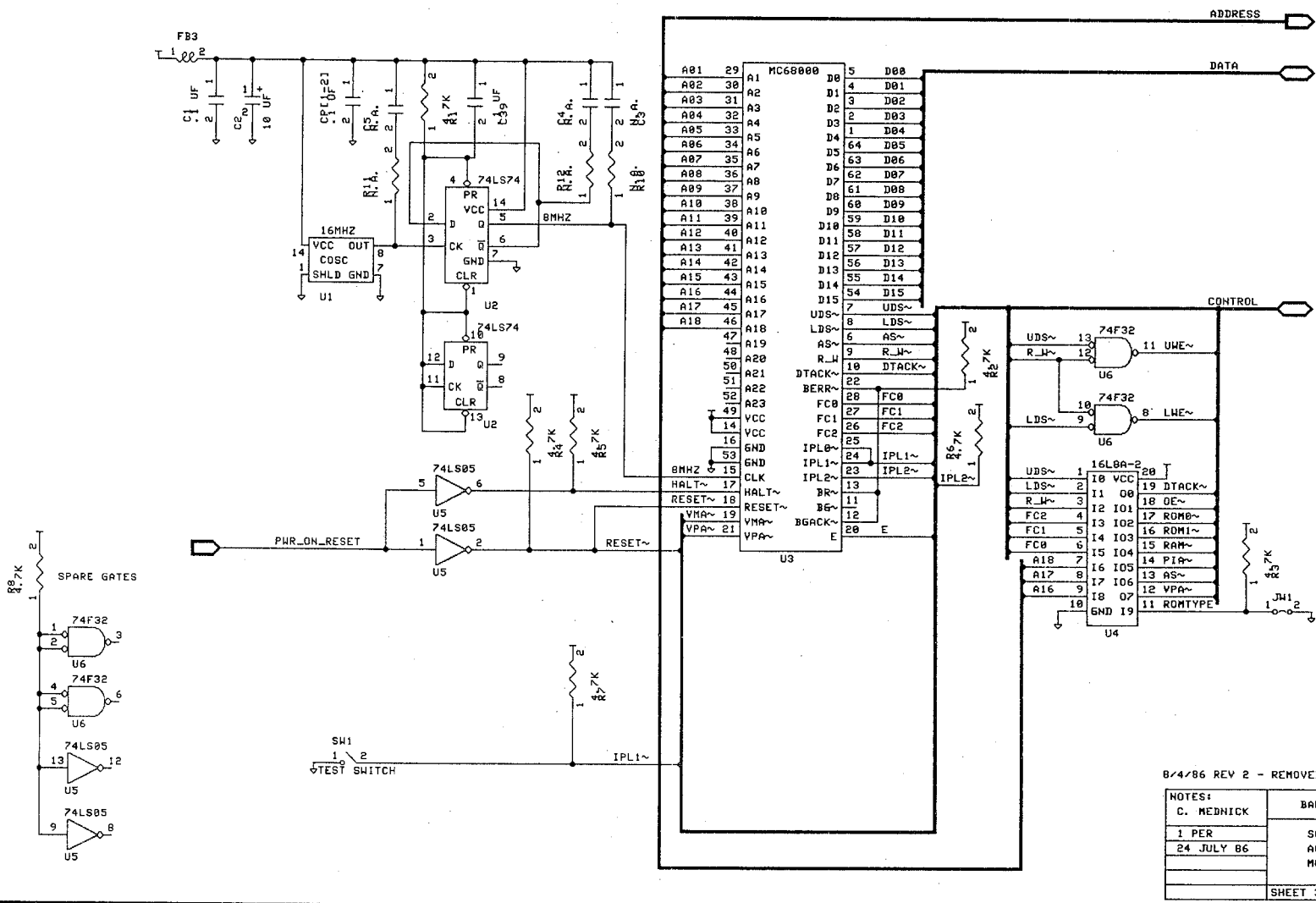


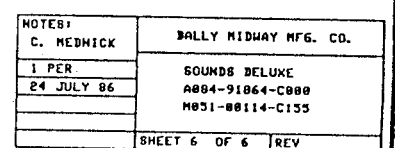
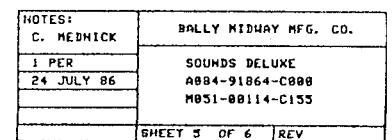
8/11/86 REV 3 - Changed Page 2. CMM  
8/4/86 REV 2 - Changed Page 3. CMM  
8/1/86 REV 1 - Changed Page 6

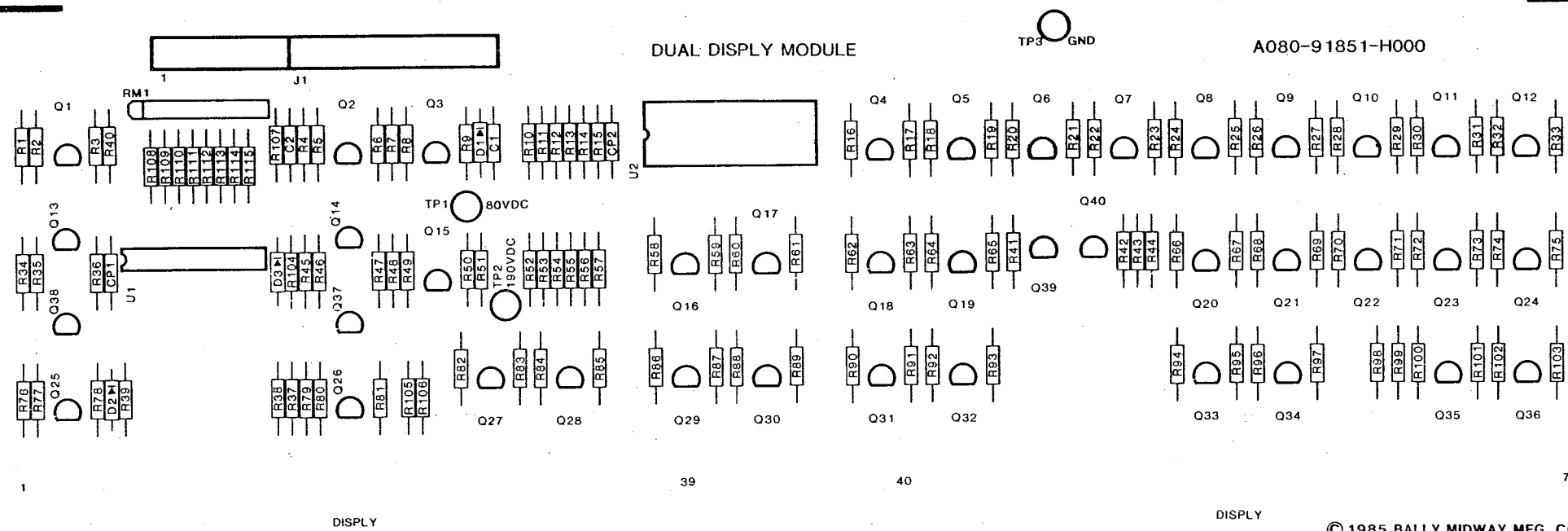
| NOTES:     | BALLY MIDWAY MFG. CO. |
|------------|-----------------------|
| C. MEDNICK |                       |
| 1 PER      | SOUNDS DELUXE         |
| 24 JULY 86 | A004-91864-C000       |
|            | M051-00114-C155       |
|            | SHEET 1 OF 6 REV      |

LAST USED: C39, CP13, D10, FB3, J2, J412, L2, R60, SW1, TP2, LED1, VR1  
NOT INSERTED: C3-C5, C36, D1, D5-D8, Q3-Q6, R10-R12, R44-R58  
NOT USED: R9









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|                                                                                                                                                                                                                                 |  |                                                                                                                                |  |                                                                                                                                            |  |                                                                                                        |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------|--|
| <b>DIM. TOLERANCES</b><br>UNLESS OTHERWISE SPEC.<br>CONCENTRICITY T.I.R. .002<br>FRACTIONAL . . . . . ± .1/64<br>DECIMAL . . . . . ± .005<br>HOLE DIA. . . . . +.002-.000<br>ANGLE . . . . . ± 1/2°<br><b>DO NOT SCALE DWG.</b> |  | FIRST USED ON <b>PINBALL</b><br>DRN <b>QBB</b> DATE <b>5/15/87</b> SCALE <b>FULL</b><br>MECH. CHK. MAT'L.<br>ELEC. CHK. FINISH |  | <b>Bally/MIDWAY MFG. CO.</b><br>FRANKLIN PARK, IL 60131<br><b>ASSEMBLY DRAWING</b><br><b>DUAL DISPLAY MODULE</b><br><b>A084-91851-H000</b> |  | <b>REL. FOR PRODUCTION</b> 5/15/87<br><b>REVISIONS</b><br>PART NO.<br><b>M-0-5-1-0-0-3-6-5-H-0-3-3</b> |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------|--|

DUAL DISPLAY MODULE  
A084-91851-H000  
M051-00365-H042 (Page 1 of 5) REV.1

### DESIGNATION LIST

| <u>DESIGNATION NO.</u> | <u>DESCRIPTION</u>      |
|------------------------|-------------------------|
| R1                     | 1.5K 1/4W 5% CARBON     |
| R2                     | 820 OHM 1/4W 5% CARBON  |
| R3                     | 300K 1/4W 5% CARBON     |
| R4                     | 1.5K 1/4W 5% CARBON     |
| R5                     | 510 OHM 1/4W 5% CARBON  |
| R6                     | 300K 1/4W 5% CARBON     |
| R7                     | 1.5K 1/4W 5% CARBON     |
| R8                     | 820 OHM 1/4W 5% CARBON  |
| R9                     | 300K 1/4W 5% CARBON     |
| R10 - R15              | 20K 1/4W 5% CARBON      |
| R16                    | 9.1K 1/4W 5% CARBON     |
| R17                    | 100K 1/4W 1% METAL FILM |
| R18                    | 2.2K 1/4W 5% CARBON     |
| R19                    | 300K 1/4W 5% CARBON     |
| R20                    | 9.1K 1/4W 5% CARBON     |
| R21                    | 100K 1/4W 1% METAL FILM |
| R22                    | 2.2K 1/4W 5% CARBON     |
| R23                    | 300K 1/4W 5% CARBON     |
| R24                    | 9.1K 1/4W 5% CARBON     |
| R25                    | 100K 1/4W 1% METAL FILM |
| R26                    | 2.2K 1/4W 5% CARBON     |
| R27                    | 300K 1/4W 5% CARBON     |
| R28                    | 9.1K 1/4W 5% CARBON     |
| R29                    | 100K 1/4W 1% METAL FILM |
| R30                    | 9.1K 1/4W 5% CARBON     |
| R31                    | 100K 1/4W 1% METAL FILM |
| R32                    | 9.1K 1/4W 5% CARBON     |
| R33                    | 100K 1/4W 1% METAL FILM |
| R34                    | 1.5K 1/4W 5% CARBON     |
| R35                    | 820 OHM 1/4W 5% CARBON  |
| R36                    | 300K 1/4W 5% CARBON     |
| R37                    | 300K 1/4W 5% CARBON     |
| R38                    | 1.5K 1/4W 5% CARBON     |
| R39                    | 1K 1/4W 5% CARBON       |
| R40                    | 100K 1/4W 5% CARBON     |
| R41                    | 100K 1/4W 5% CARBON     |
| R42                    | 1K 1/4W 5% CARBON       |
| R43                    | 1.5K 1/4W 5% CARBON     |
| R44                    | 300K 1/4W 5% CARBON     |
| R45                    | 1.5K 1/4W 5% CARBON     |
| R46                    | 820 OHM 1/4W 5% CARBON  |
| R47                    | 300K 1/4W 5% CARBON     |
| R48                    | 1.5K 1/4W 5% CARBON     |
| R49                    | 820 OHM 1/4W 5% CARBON  |
| R50                    | 300K 1/4W 5% CARBON     |
| R51                    | 100K 1/4W 1% METAL FILM |
| R52 - R57              | 2.2M 1/4W 5% CARBON     |
| R58                    | 9.1K 1/4W 5% CARBON     |

DUAL DISPLAY MODULE  
A084-91851-H000  
M051-00365-H042 (Page 2 of 5) REV. 1

## DESIGNATION LIST

| <u>DESIGNATION NO.</u> | <u>DESCRIPTION</u>      |
|------------------------|-------------------------|
| R59                    | 100K 1/4W 1% METAL FILM |
| R60                    | 100K 1/4W 1% METAL FILM |
| R61                    | 9.1K 1/4W 5% CARBON     |
| R62                    | 9.1K 1/4W 5% CARBON     |
| R63                    | 100K 1/4W 1% METAL FILM |
| R64                    | 9.1K 1/4W 5% CARBON     |
| R65                    | 100K 1/4W 1% METAL FILM |
| R66                    | 9.1K 1/4W 5% CARBON     |
| R67                    | 100K 1/4W 1% METAL FILM |
| R68                    | 9.1K 1/4W 5% CARBON     |
| R69                    | 100K 1/4W 1% METAL FILM |
| R70                    | 300K 1/4W 5% CARBON     |
| R71                    | 2.2K 1/4W 5% CARBON     |
| R72                    | 300K 1/4W 5% CARBON     |
| R73                    | 2.2K 1/4W 5% CARBON     |
| R74                    | 300K 1/4W 5% CARBON     |
| R75                    | 2.2K 1/4W 5% CARBON     |
| R76                    | 1.5K 1/4W 5% CARBON     |
| R77                    | 820 OHM 1/4W 5% CARBON  |
| R78                    | 300K 1/4W 5% CARBON     |
| R79                    | 1.5K 1/4W 5% CARBON     |
| R80                    | 820 OHM 1/4W 5% CARBON  |
| R81                    | 300K 1/4W 5% CARBON     |
| R82                    | 300K 1/4W 5% CARBON     |
| R83                    | 2.2K 1/4W 5% CARBON     |
| R84                    | 100K 1/4W 1% METAL FILM |
| R85                    | 9.1K 1/4W 5% CARBON     |
| R86                    | 300K 1/4W 5% CARBON     |
| R87                    | 2.2K 1/4W 5% CARBON     |
| R88                    | 2.2K 1/4W 5% CARBON     |
| R89                    | 300K 1/4W 5% CARBON     |
| R90                    | 300K 1/4W 5% CARBON     |
| R91                    | 2.2K 1/4W 5% CARBON     |
| R92                    | 300K 1/4W 5% CARBON     |
| R93                    | 2.2K 1/4W 5% CARBON     |
| R94                    | 300K 1/4W 5% CARBON     |
| R95                    | 2.2K 1/4W 5% CARBON     |
| R96                    | 300K 1/4W 5% CARBON     |
| R97                    | 2.2K 1/4W 5% CARBON     |
| R98                    | 10M 1/4W 5% CARBON      |
| R99                    | 1M 1/4W 5% CARBON       |
| R100                   | 300K 1/4W 5% CARBON     |
| R101                   | 2.2K 1/4W 5% CARBON     |
| R102                   | 100K 1/4W 1% METAL FILM |
| R103                   | 9.1K 1/4W 5% CARBON     |
| R104                   | 150K 1/4W 5% CARBON     |
| R105                   | 10M 1/4W 5% CARBON      |
| R106                   | 1M 1/4W 5% CARBON       |
| R107                   | 10K 1/4W 5% CARBON      |
| R108-R115              | 20K 1/4W 5% CARBON      |
| RM1                    | 100K 10 PIN SIP         |

DUAL DISPLAY MODULE  
A084-91851-H000  
M051-00365-H042 (Page 3 of 5) REV. 1

### DESIGNATION LIST

| <u>DESIGNATION NO.</u> | <u>DESCRIPTION</u>                        |
|------------------------|-------------------------------------------|
| C1                     | .01UF 500V CER.                           |
| C2                     | 100PF 50V AX. CER.                        |
| CP1, CP2               | .01UF 50V CER.                            |
| D1                     | 1M110ZS10 110V ZENER DIODE                |
| D2,D3                  | 1N4148 DIODE                              |
| Q1 - Q4                | MPS-A-42 NPN XSTR                         |
| Q5                     | 2N5401 PNP XSTR                           |
| Q6                     | MPS-A-42                                  |
| Q7                     | 2N5401                                    |
| Q8                     | MPS-A-42                                  |
| Q9                     | 2N5401                                    |
| Q10 - Q21              | MPS-A-42                                  |
| Q22 - Q24              | 2N5401                                    |
| Q25                    | MPS-A-42                                  |
| Q26                    | MPS-A-42                                  |
| Q27                    | 2N5401                                    |
| Q28                    | MPS-A-42                                  |
| Q29 - Q35              | 2N5401                                    |
| Q36 - Q40              | MPS-A-42                                  |
| U1                     | 74HC373 CMOS OCTAL LATCH                  |
| U2                     | 14514 1-16 DECODER                        |
| DISPLAY 1              | 14 DIGIT, 9 SEGMENT GAS DISCHARGE DISPLAY |
| J1                     | .025 SQ. PINS                             |
| TP1, TP2, TP3          | TEST LOOPS                                |
|                        | FOAM TAPE                                 |
|                        | BUMPER                                    |
|                        | DISPLAY MTG. CLIPS                        |
|                        | SCREWS                                    |
|                        | DISPLAY MTG. PROCEDURE                    |
|                        | DUAL DISPLAY MODULE P.C.B.                |
| M051-00365- A041       |                                           |
| A080-91851-H000        |                                           |

DUAL DISPLAY MODULE  
A084-91851-H000  
M051-00365-H042 (Page 4 of 5) REV. 1

CROSS REFERENCE LIST

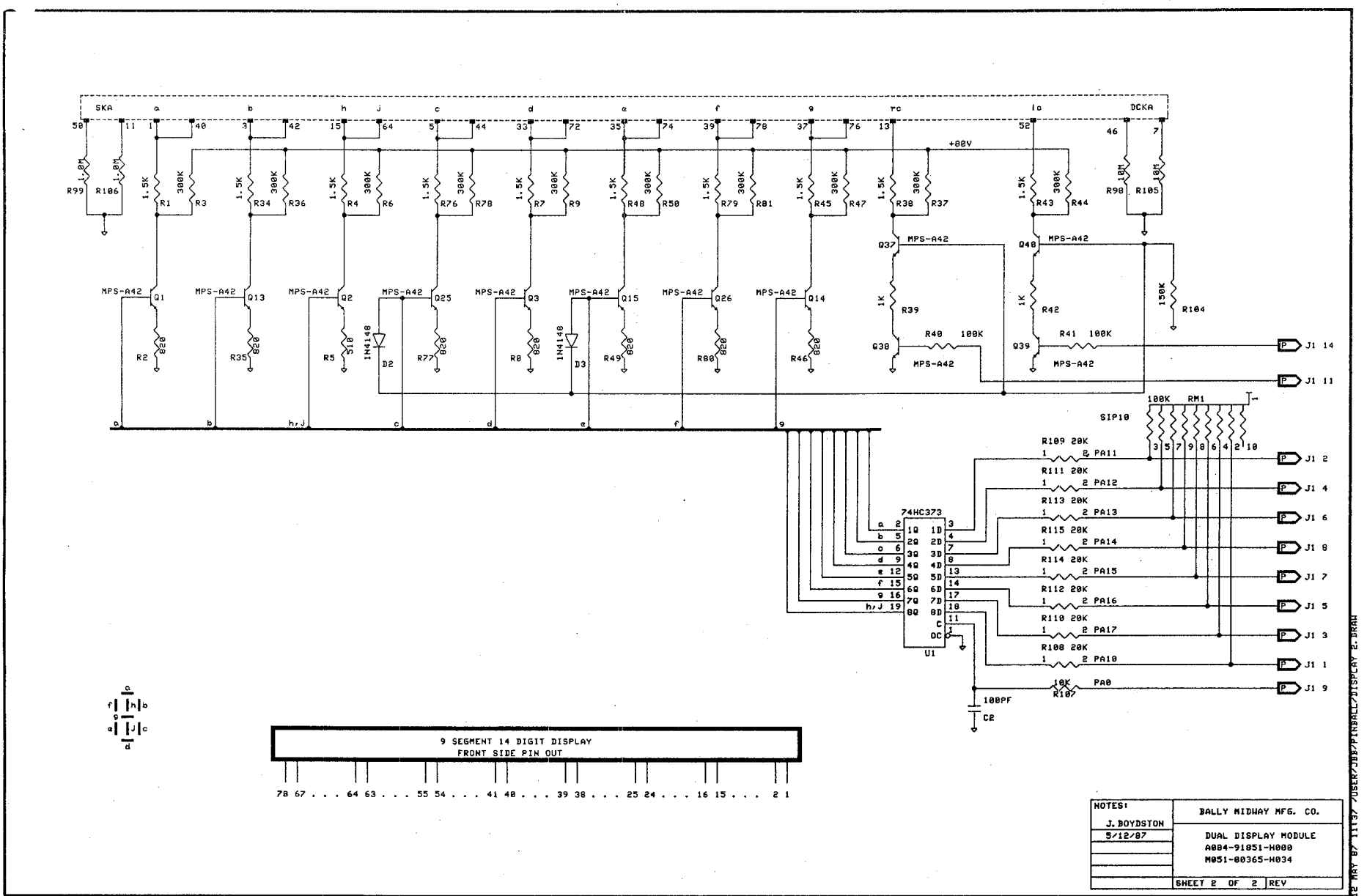
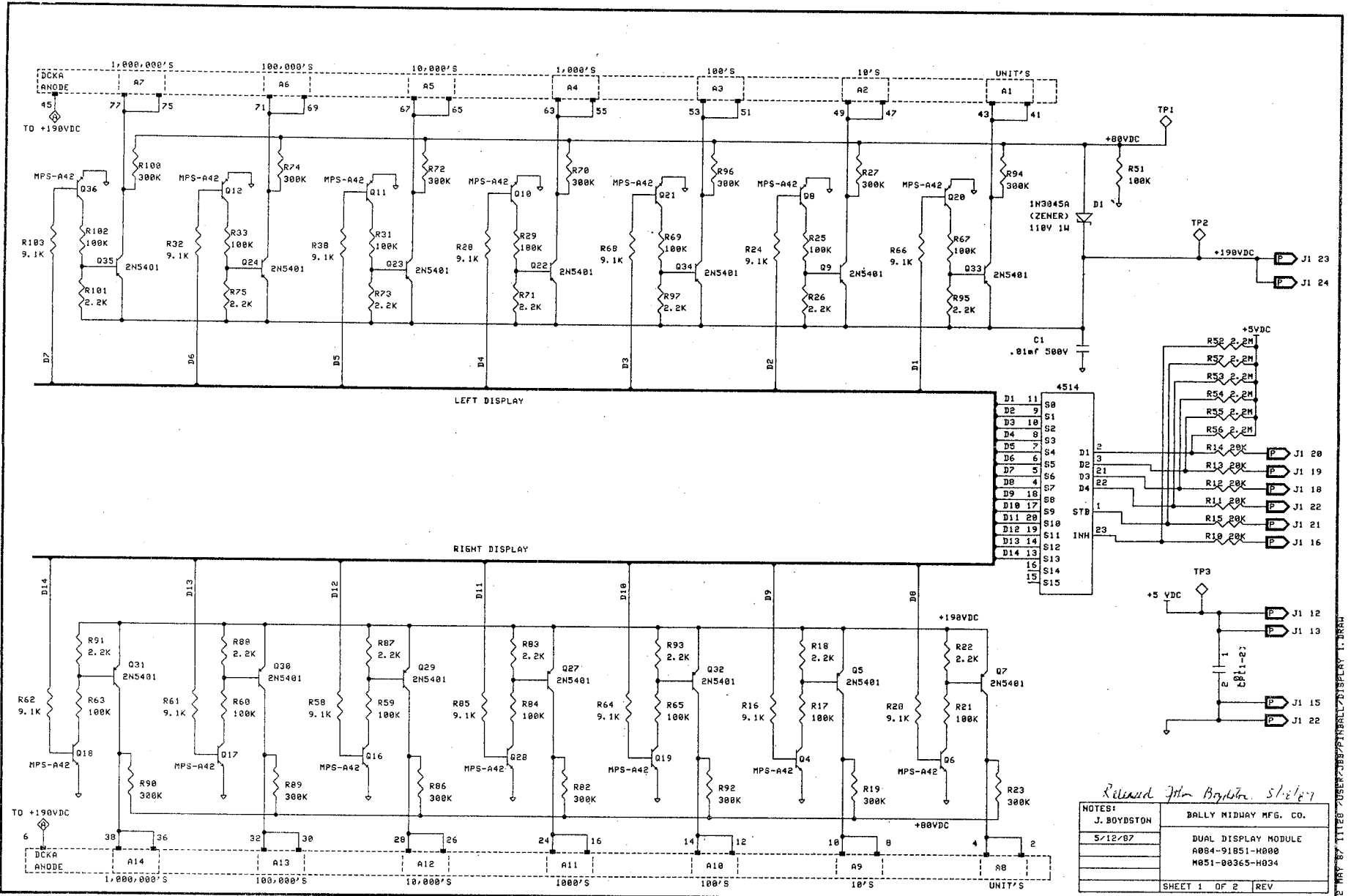
| DESCRIPTION                | QTY. | DESIGNATION NO.                                                                                                              | PART NOS.       |
|----------------------------|------|------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 510 OHM 1/4W 5% CARBON     | 1    | R5                                                                                                                           | 100E-00005-0053 |
| 820 OHM 1/4W 5% CARBON     | 7    | R2,R8,R35,R46<br>R49,R77,R80                                                                                                 | 100E-00005-0058 |
| 1K 1/4W 5% CARBON          | 2    | R39,R42                                                                                                                      | 100E-00005-0061 |
| 1.5K 1/4W 5% CARBON        | 10   | R1,R4,R7,R34,R38<br>R43,R45,R48<br>R76,R79                                                                                   | 100E-00005-0065 |
| 2.2K 1/4W 5% CARBON        | 14   | R18,R22,R26,R71<br>R73,R75,R83,R87<br>R88,R91,R93,R95<br>R97,R101                                                            | 100E-00005-0069 |
| 9.1K 1/4W 5% CARBON        | 14   | R16,R20,R24,R28<br>R30,R32,R58,R61<br>R62,R64,R66,R68<br>R85,R103                                                            | 100E-00005-0087 |
| 10K 1/4W 5% CARBON         | 1    | R107                                                                                                                         | 100E-00005-0088 |
| 20K 1/4W 5% CARBON         | 14   | R10-R15,R108-R115                                                                                                            | 100E-00005-0095 |
| 100K 1/4W 5% CARBON        | 2    | R40,R41                                                                                                                      | 100E-00005-0115 |
| 100K 1/4W 1% METAL FILM    | 15   | R17,R21,R25,R29<br>R31,R33,R51,R59<br>R60,R63,R65,R67<br>R69,R84,R102                                                        | 100E-00001-0046 |
| 150K 1/4W 5% CARBON        | 1    | R104                                                                                                                         | 100E-00005-0120 |
| 300K 1/4W 5% CARBON        | 24   | R3,R6,R9,R19,R23<br>R27,R36,R37,R44,<br>R47,R50,R70,R72,<br>R74,R78,R81,R82,<br>R86,R89,R90,R92,<br>R94,R96,R100<br>R99,R106 | 100E-00005-0127 |
| 1.0M OHM 1/4W 5% CARBON    | 2    | R52 - R57                                                                                                                    | 100E-00005-0147 |
| 2.2M OHM 1/4W 5% CARBON    | 6    | RM1                                                                                                                          | 102E-00004-0045 |
| 100K 10 PIN SIP            | 1    | R98,R105                                                                                                                     | 100E-00005-0162 |
| 10.0M OHM 1/4W 5% CARBON   | 2    | C2                                                                                                                           | 0639-00800-0003 |
| 100PF AX. CER.             | 1    | CP1,CP2                                                                                                                      | 0360-00800-0005 |
| .01UF                      | 2    | C1                                                                                                                           | 0360-00800-0013 |
| .01UF 500V                 | 1    | D2,D3                                                                                                                        | 103E-00002-0005 |
| 1N4148                     | 2    | D1                                                                                                                           | 103E-00001-0028 |
| 1M110ZS10 110V ZENER DIODE | 1    | Q5,Q7,Q9,Q22,Q23<br>Q24,Q27,Q29,Q30<br>Q31,Q32,Q33,Q34<br>Q35                                                                | 0360-00802-0006 |
| 2N5401 PNP XSTR            | 14   | Q1-Q4,Q6,Q8,Q10-<br>Q21,Q25,Q26,Q28<br>Q36-Q40                                                                               | 0360-00802-0007 |
| MPS-A-42 NPN XSTR          | 26   | U2                                                                                                                           | 0360-00803-0013 |
| 14514 1-16 DECODER         | 1    | U1                                                                                                                           | 0365-00803-0015 |
| 74HC373 OCTAL LATCH        | 1    | J1                                                                                                                           | 0304-00804-0009 |
| .025SQ. PINS               | 23   |                                                                                                                              |                 |
| 14 DIGIT, 9 SEGMENT        |      |                                                                                                                              |                 |
| GAS DISCHARGE DISPLAY      | 1    | DISPLAY 1                                                                                                                    | 119E-00002-0006 |
| TEST LOOPS                 | 3    | TP1 - TP3                                                                                                                    | 0017-00007-0131 |

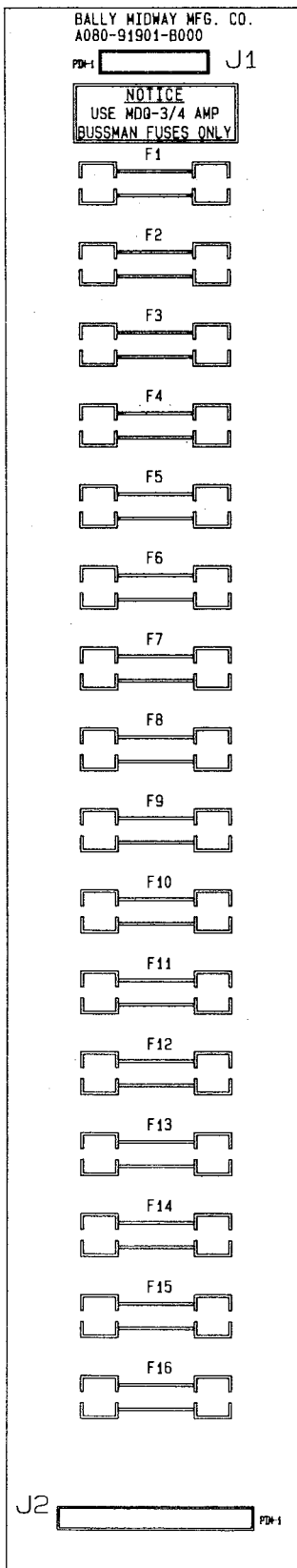
DUAL DISPLAY MODULE  
A084-91851-H000  
M051-00365-H042 (Page 5 of 5) REV. 1

CROSS REFERENCE LIST

| DESCRIPTION             | QTY. | DESIGNATION NO. | PART NOS.       |
|-------------------------|------|-----------------|-----------------|
| FOAM TAPE               | 2    |                 | 0017-00081-0289 |
| BUMPER                  | 1    |                 | 0017-00041-0598 |
| DISPLAY MTG. CLIP       | 2    |                 | 0365-00174-00XF |
| SCREW                   | 2    |                 | 0017-00101-0175 |
| DISPLAY MTG. PROCEDURE  | 1    |                 | M051-00365-A041 |
| DUAL DISPLAY MODULE PCB | 1    |                 | A080-91851-H000 |

5/20/87 REV. 1 - CORRECTION TO DISPLAY MTG. PROCEDURE PART NO. *9BB*





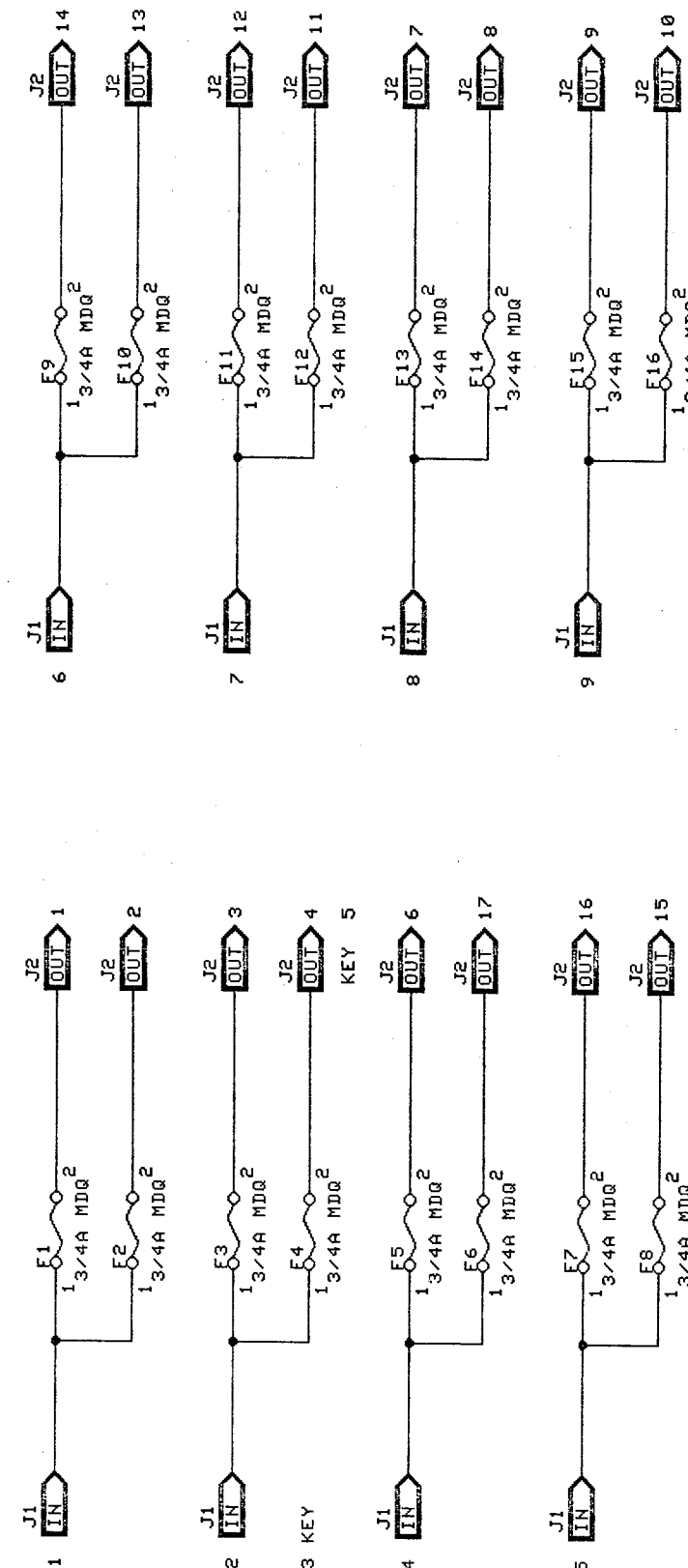
BRIGHT LIGHT FUSE BOARD  
A084-91901-B000  
M051-00114-B211

CROSS REFERENCE/DESIGNATION LIST

| DESCRIPTION             | QTY | DESIGNATION | PART NUMBER     |
|-------------------------|-----|-------------|-----------------|
| AUTO INSERT PINS .025   | 8   | J1          | 0304-00804-B000 |
| AUTO INSERT PINS .025   | 16  | J2          | 0304-00804-B000 |
| PCB FUSE CLIPS          | 32  | F1-F16      | 0017-00071-0034 |
| BRIGHT LIGHT FUSE BOARD | 1   | PCB         | A084-91901-B000 |

Released for Production  
988 2/4/86

|                          |  |                        |  |                       |  |
|--------------------------|--|------------------------|--|-----------------------|--|
| PROJECT ENG: J. BOYDSTON |  | USED ON 0365           |  | BALLY/MIDWAY MFG. CO. |  |
| DO NOT SCALE DWG.        |  | HEAT TREAT             |  | FRANKLIN PARK ILL.    |  |
| SCALE FULL               |  | NO. REQD 1 PER         |  | PART NO.              |  |
| TOLERANCES               |  | D.F.S.                 |  | M051-00114-B210       |  |
| DECIMAL +/- .005         |  | MATERIAL .062" FR-4    |  |                       |  |
| HOLE DIA. +.002-.000     |  | DATE 01/18/88          |  |                       |  |
|                          |  | FINISH                 |  |                       |  |
|                          |  | ASSEMBLY DRAWING       |  |                       |  |
|                          |  | BRIGHT LIGHTS FUSE PCB |  |                       |  |



NOTES:

Released for Production 988 2/4/86

|             |                        |
|-------------|------------------------|
| J. BOYDSTON | BALLY MIDWAY MFG. CO.  |
| 02-04-88    | BRIGHT LIGHTS FUSE PCB |
|             | A084-91901-B000        |
|             | M051-00114-B212        |
|             | SHEET 1 OF 1 REV       |

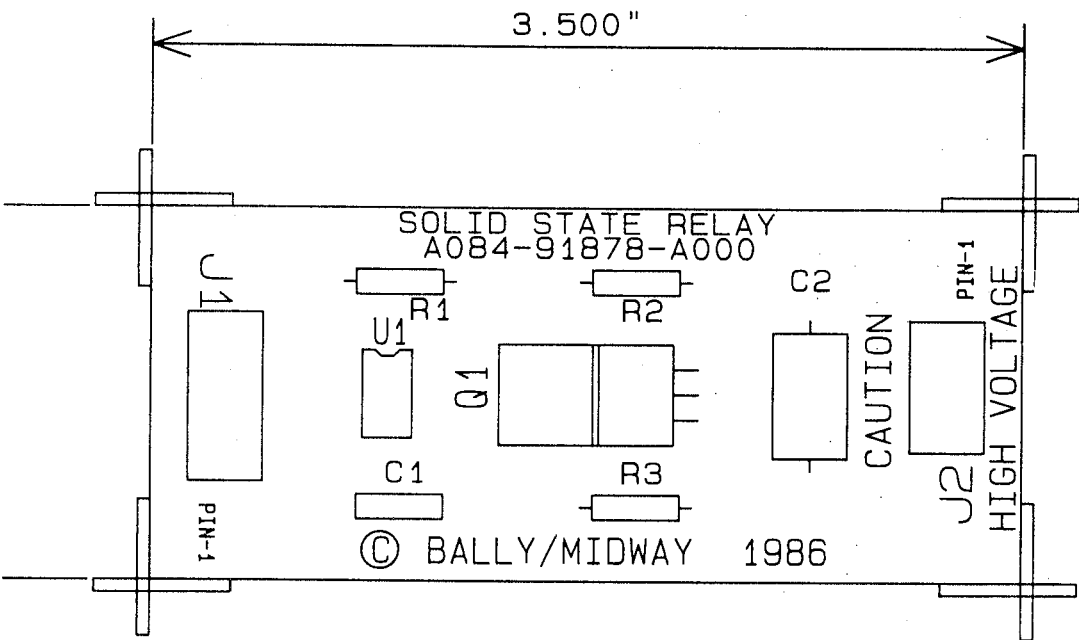
SOLID STATE RELAY  
A084-91878-A000  
M051-00114-A174

DESIGNATION LIST

| DESIGNATION NO. | DESCRIPTION               |
|-----------------|---------------------------|
| C1              | .1UF 50V AX. CER. CAP     |
| C2              | .1UF 400V POLYESTER CAP   |
| R1              | 100 OHM 1/4W 5%           |
| R2              | 180 OHM 1/4W 5%           |
| R3              | 1.8K 1/4W 5%              |
| Q1              | T2322 TRIAC               |
| U1              | MOC3031 OPTO COUPLER      |
| J1              | KK156 MACHINE INSERT PINS |
| J2              | CABLE CONNECTION          |
| PCM1-PCM4       | P.C. MTG. HARDWARE        |
| A080-91878-A000 | P.C. BOARD                |

CROSS REFERENCE LIST

| DESCRIPTION          | QTY. | DESIGNATION NO. | PART NOS.       |
|----------------------|------|-----------------|-----------------|
| .1UF 50V AX. CER.    | 1    | C1              | 0C68-00800-0005 |
| .1UF 400V POLYESTER  | 1    | C2              | 0E35-00800-0001 |
| 100 OHM 1/4W 5%      | 1    | R1              | 100E-00005-0033 |
| 180 OHM 1/4W 5%      | 1    | R2              | 100E-00005-0039 |
| 1.8K 1/4W 5%         | 1    | R3              | 100E-00005-0067 |
| T2322 TRIAC          | 1    | Q1              | 0365-00804-0019 |
| MOC3031 OPTO COUPLER | 1    | U1              | 120E-00002-0002 |
| KK156 PLUS           | 3    | J1              | 0304-00804-0010 |
| CABLE CONNECTION     | 1    | J2              | A639-00024-0000 |
| P.C. MTG. HDR W      | 4    | PCM1-PCM4       | 0017-00042-0320 |
| P.C. BOARD           | 1    | -               | A080-91878-A000 |



Released 12-2-86 RK

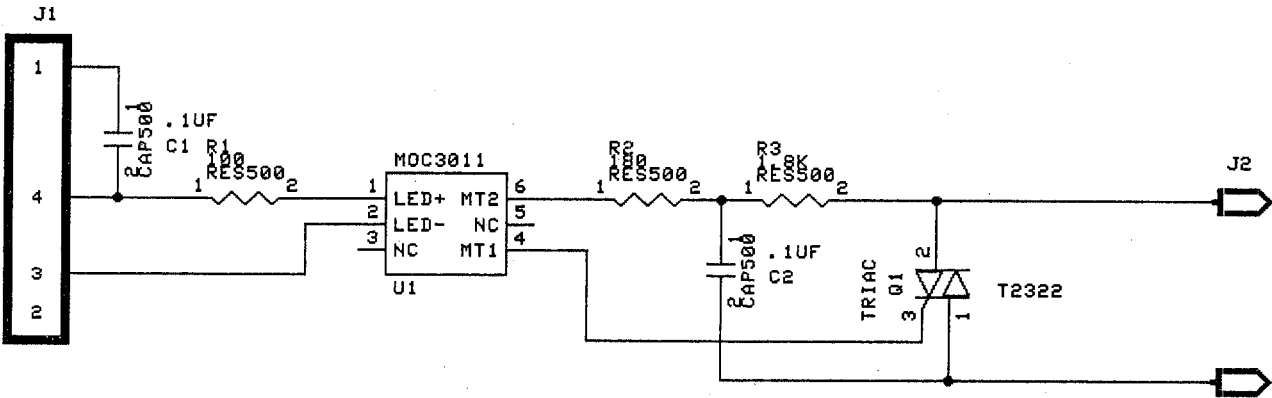
BALLY MIDWAY MFG. CO.

.062"  
FR-400

J.S.  
10/17/86

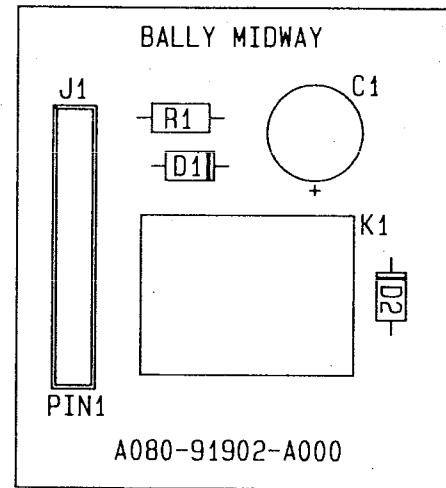
ASSEMBLY DRAWING  
SOLID STATE RELAY PC  
A084-91878-A000

M051-00114-A173



|          |                       |
|----------|-----------------------|
| NOTES:   | BALLY MIDWAY MFG. CO. |
| R. KOHAN | SOLID STATE RELAY     |
| Released | A084-91878-A000       |
| 12-2-86  | M051-00114-A175       |
|          | SHEET 1 OF 1 REV      |

86 OCT 86 10:18 /USER/KAP/STRANGE/SSR 1. DRW

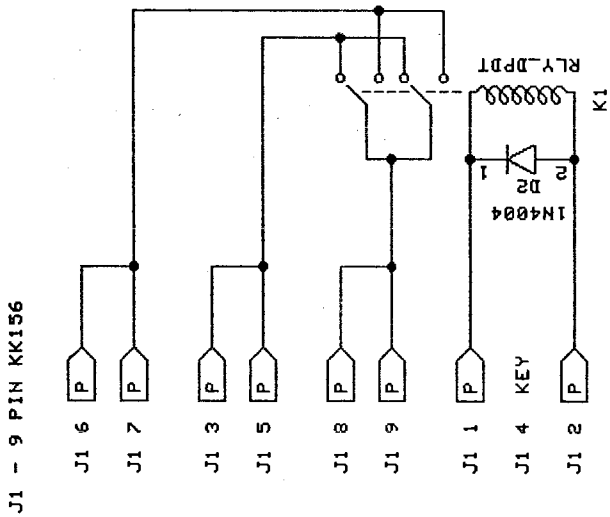


AUX COIL DRIVE  
A084-91902-A000  
M051-00114-A214

CROSS REFERENCE LIST

| DESCRIPTION         | QTY. | DESIGNATION NO. | PART NO.        |
|---------------------|------|-----------------|-----------------|
| 1N4004 DIODE        | 1    | D2              | 103E-00003-0005 |
| .045 SQ. PIN        | 8    | J1              | 0304-00804-0010 |
| RELAY               | 1    | K1              | 114E-00001-0011 |
| NOT INSERTED        | 3    | C1,D1,R1        |                 |
| AUX COIL DRIVER PCB | 1    |                 | A080-91902-A000 |

6/4/87 - Released for Production. CMM



NOT INSERTED: C1,D1,R1

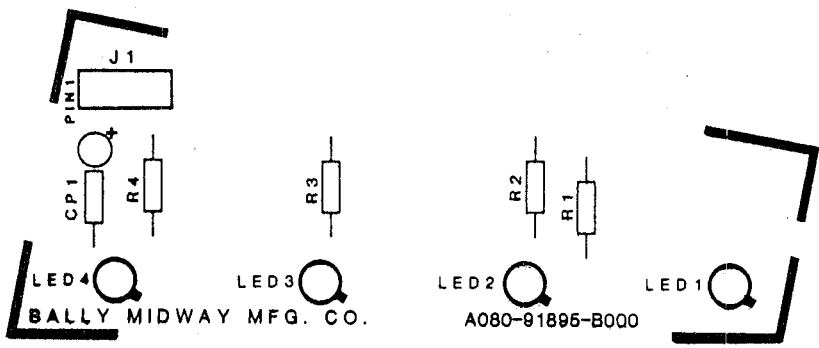
|            |                       |
|------------|-----------------------|
| NOTES:     | BALLY MIDWAY MFG. CO. |
| C. MEDNICK | AUX COIL DRIVER       |
| 6/4/87     | A084-91902-A000       |
|            | M051-00114-A215       |
|            | SHEET 1 OF 1 REV      |

|                       |          |                      |                 |
|-----------------------|----------|----------------------|-----------------|
| BALLY MIDWAY MFG. CO. |          |                      |                 |
| PROJECT ENG.          | D.B.S.   | ASSEMBLY DRAWING     | M051-00114-A213 |
| C. MEDNICK            | 05/28/87 | AUX. COIL DRIVER BD. |                 |

CROSS REFERENCE LIST

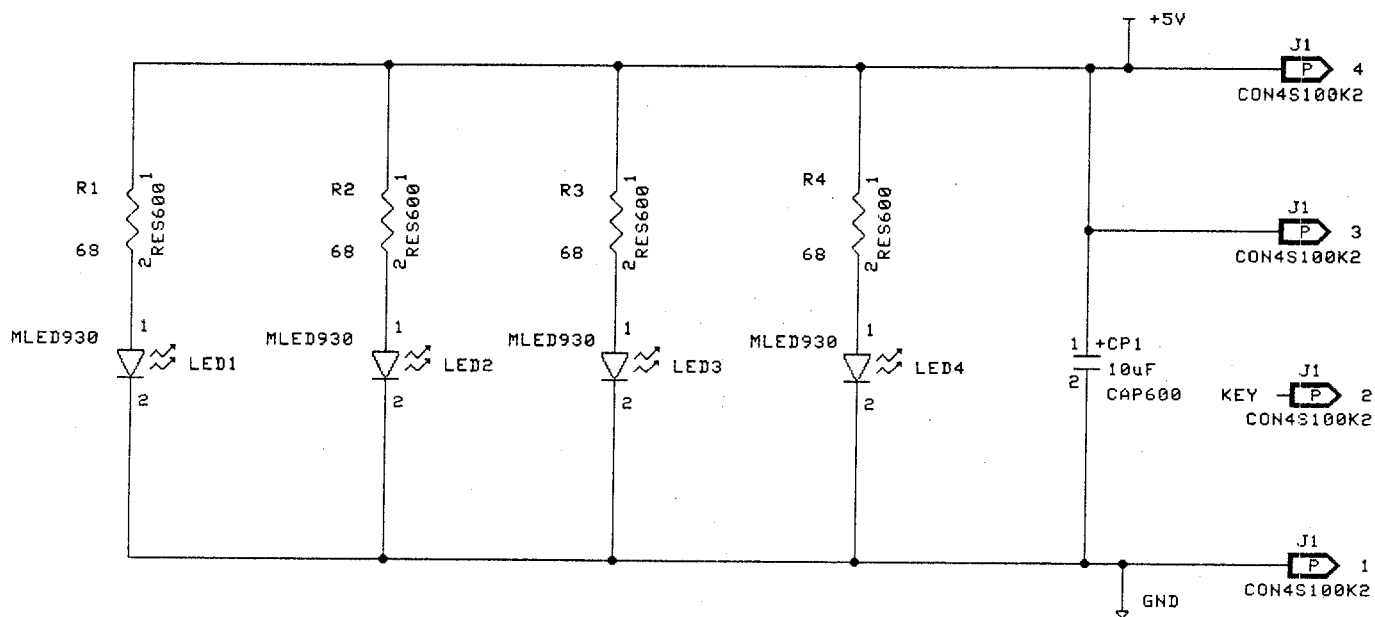
| DESCRIPTION                | QTY. | DESIGNATION NO. | PART NOS.       |
|----------------------------|------|-----------------|-----------------|
| 10MF CAP AX. TANT          | 1    | CP1             | 0986-00800-3400 |
| 68 OHM 1/2W 5%             | 4    | R1-R4           | 100E-00006-0020 |
| MLED 930 IR EMIT DIODE     | 4    | LED 1- LED 4    | 119E-00003-0004 |
| HEADER KK100 4 PIN DMIT #2 | 1    | J1              | 0017-00021-1878 |
| 4 POS. EMITTER PCB         | 1    |                 | A080-91895-B000 |

8/3/87 - RELEASED FOR PRODUCTION JBB  
8/6/87 - REV. 1 Conn. Chng. JBB



|           |             |        |
|-----------|-------------|--------|
|           |             |        |
|           |             |        |
|           |             |        |
| B         | New Release | 8/3/87 |
| REVISIONS |             |        |

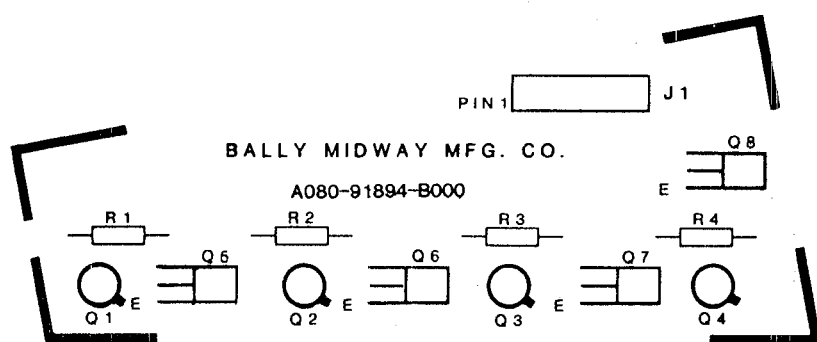
|                                     |  |                 |                                                             |                                              |                 |
|-------------------------------------|--|-----------------|-------------------------------------------------------------|----------------------------------------------|-----------------|
| PROJECT ENG: J. BOYDSTON            |  | USED ON 0 H 0 6 |                                                             | Bally / MIDWAY MFG. CO.<br>FRANKLIN PK. ILL. |                 |
| DO NOT SCALE DWG.                   |  | HEAT TREAT      | SCALE FULL                                                  | NO. REQ'D 1 PER                              |                 |
| DIM. TOLERANCES<br>UNLESS SPECIFIED |  | MAT'L.          | ASSEMBLY DRAWING<br>4-POS. EMITTER PCB<br>(A084-91895-B000) |                                              | PART NO.        |
| CONCENTRICITY T.I.R. 003            |  | FINISH          |                                                             |                                              | M051-00114-B204 |
| FRACTIONAL 1/64                     |  |                 |                                                             |                                              |                 |
| DECIMAL 0.005                       |  |                 |                                                             |                                              |                 |
| HOLE DIA. +.002 - .000              |  | DATE 8/3/87     |                                                             |                                              |                 |



|             |                        |
|-------------|------------------------|
| NOTES:      | BALLY MIDWAY MFG. CO.  |
| 8/3/87      | 4 POSITION EMITTER PCB |
| J. BOYDSTON | A084-91895-B000        |
|             | M051-00114-B206        |
|             | SHEET 1 OF 1           |
|             | REV                    |

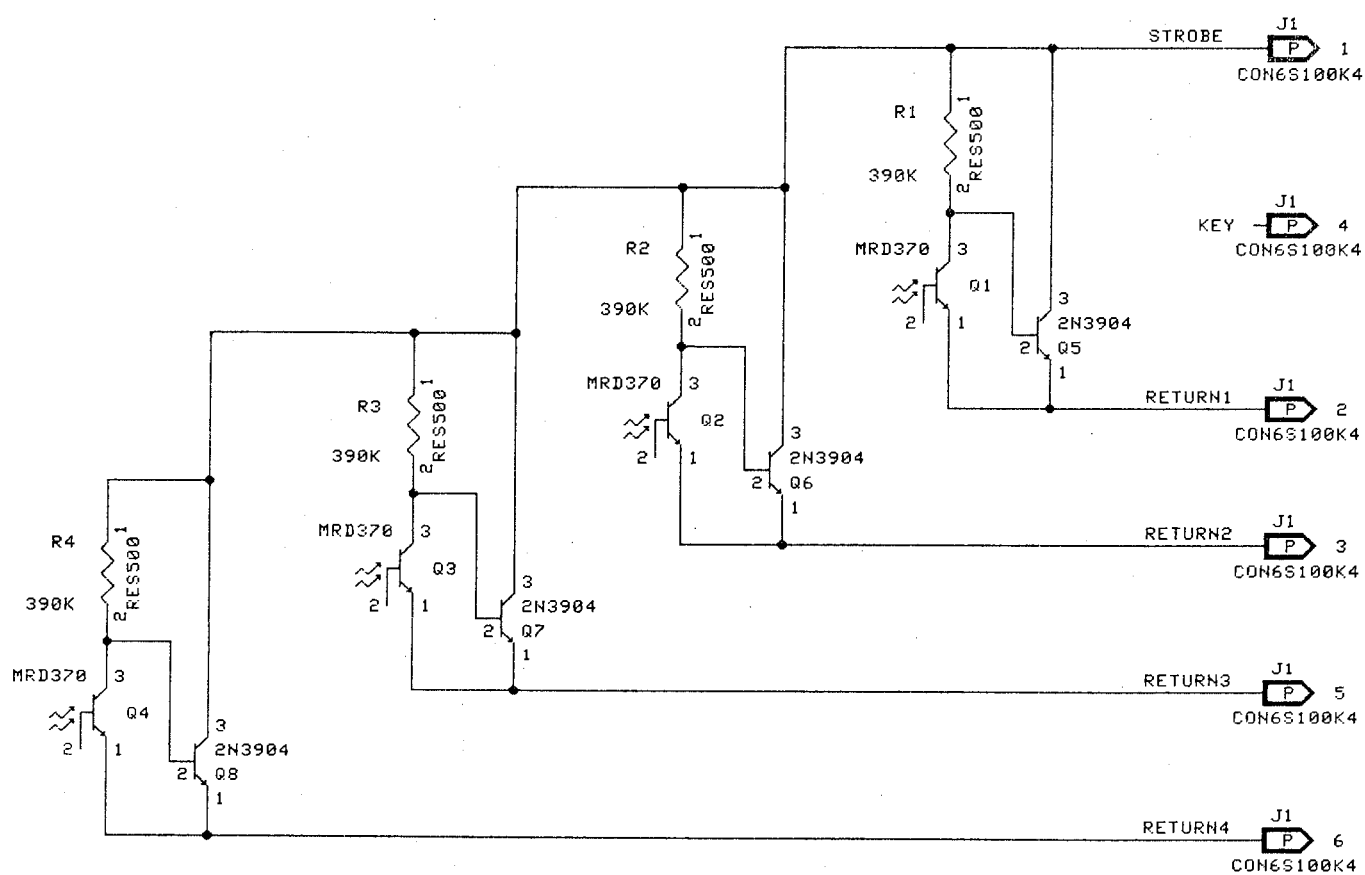
04 AUG 87 09144 70SER/088/PINBALL/0806/EMITTER 1.1.DRW

CROSS REFERENCE LIST



8/3/87 - RELEASED FOR PRODUCTION JBB  
JBB 8/6/87 - REV. 1 Conn. Chng. JBB

|                                                                                                                                  |  |                                                                            |  |                                             |  |
|----------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------|--|---------------------------------------------|--|
| PROJECT ENG: J. BOYDSTON                                                                                                         |  | USED ON OH06                                                               |  | Bally / MIDWAY MFG.CO.<br>FRANKLIN PK. ILL. |  |
| DO NOT SCALE DWG.                                                                                                                |  | NO. REQ'D 1 PER                                                            |  |                                             |  |
| DIM. TOLERANCES<br>UNLESS SPECIFIED<br>CONCENTRICITY T.I.R. .003<br>RATIONAL .001 / .004<br>DECIMAL .005<br>OLE DIA. .002 - .000 |  | HEAT TREAT<br>MAT'L.<br>FINISH                                             |  | PART NO.<br>M051-00114-B201                 |  |
| DRR. DBS<br>CRD.<br>DATE 8/13/87                                                                                                 |  | SCALE FULL<br>ASSEMBLY DRAWING<br>4-POS. DETECTOR PCB<br>(A084-91894-B000) |  |                                             |  |



|             |                         |
|-------------|-------------------------|
| NOTES:      | BALLY MIDWAY MFG. CO.   |
| 8/3/87      |                         |
| J. BOYDSTON | 4 POSITION DETECTOR PCB |
|             | A084-91894-B008         |
|             | M051-00114-B203         |
|             |                         |
|             | SHEET 1 OF 1 REV        |

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**BALLY MIDWAY'S BLACKWATER 100**  
**GAME #H07**  
**ROM/EPROM LISTING**

UNPROGRAMMED 6803 CONTROL BOARD #A084-91786-G000  
PROGRAMMED 6803 CONTROL BOARD #A084-91786-AH07

POS.    PART NUMBER  
U2    H07A-12601-0000  
U3    H07A-12602-0000

**CONTROL BOARD JUMPER WIRE CONFIGURATION**

| JUMPERS | JW1 | JW2 | JW3 | JW4 | JW5 | JW6 | JW7 | JW8 | JW9 | JW10 | JW11 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| IN      |     | X   |     | X   |     | X   |     |     | X   | X    |      |
| OUT     | X   |     | X   |     | X   |     | X   | X   |     |      | X    |

UNPROGRAMMED SOUNDS DELUXE BOARD #A084-91864-C000  
PROGRAMMED SOUNDS DELUXE BOARD #A084-91864-AH07

POS.    PART NUMBER  
U11    H07A-12603-0000  
U12    H07A-12604-0000  
U13    H07A-12605-0000  
U14    H07A-12606-0000

**SOUNDS DELUXE BOARD JUMPER WIRE CONFIGURATION**

| JUMPERS | JW1 | JW2 | JW3 | JW4 | JW5 | JW6 | JW7 | JW8 | JW9 | JW10 | JW11 | JW12 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| IN      | X   | X   |     | X   |     |     | X   | X   | X   | X    | X    | X    |
| OUT     |     |     | X   |     | X   | X   |     |     |     |      |      |      |

RELEASED FOR PRODUCTION BY: ENGINEERING    INITIAL: *YBB*    DATE: *3/30/88*  
RELEASED TO EDC BY: TECHNICAL INFORMATION    INITIAL: *GFW*    DATE: *3/31/88*  
REVISION 1: REDRAWN    INITIAL: *RW*    DATE: *5/09/88*





Bally  
MIDWAY™

# BLACKWATER 1000™

