

# ALGAR



## INSTRUCTION BOOKLET

This booklet provides game operation, bookkeeping, game adjustment, and diagnostic procedures for ALGAR. For installation and special maintenance information refer to the blue-covered game manual. For detailed information refer to Williams Solid State Flipper Maintenance Manual.

### SPECIAL CONSIDERATIONS WHEN REPLACING CIRCUIT BOARDS

#### CPU Board

1. For memory protection feature, revision level 6 CPU Boards (batteries located on lower right corner of board) must be used. Revision level 4 CPU Boards equipped with IC14 and IC26 sockets may be used but the memory protection feature is lost.
2. Must be equipped with green-labeled ALGAR game ROM and green-labeled flipper ROMs.
3. Jumper J3 must be connected and J4 removed.

#### Sound Board

1. Must be equipped with two fuse clips.
2. Must be jumpered for ROM operation and be equipped with Sound ROM 4.

#### Power Supply Board

1. Fuse F4 (10A SB) for flipper solenoids must be installed.

#### Display Boards

Model C 8363 Master Display and 7-digit Slave Displays required.

**LANE CHANGE** is a trademark of Williams Electronics, Inc.

## GAME OPERATION

\*Indicates adjustable features

**Game Over Mode** - Turn game ON; player scores show zero, high score to date\* alternates with player 1 score, player 1 up lamp flashes, game over lamp lights, all playfield lamps except for credit lamp cycle in attract mode.

**Credit Posting** - Insert coin; knocker sounds, number of credits displayed. If maximum credits\* exceeded by coin or high score to date\*, credits are posted correctly, coin lockout de-energized until remaining credits are below maximum. No credits may be won and coins are rejected while lockout is energized.

**Game Start** - Push credit button; start-up tune played, ball served, credit display reduced by one, player 1 up lamp flashes until first scoring switch is made, ball in play shows 1. Pushing credit button before ball 2 displayed allows additional players.

**Bonus** - Bonus is advanced by making any "K-O-R-A" rollover, drop target when flashing, left inside rollover, or right outlane. The bonus multiplier is advanced by spotting "K-O-R-A" or making the right return gate when lit. Making the eject hole opens and lights the return gate. Making the eject hole or the left inside rollover spots a "K-O-R-A" lamp. The "K-O-R-A" lamps rotate by operating the right flipper (*LANE CHANGE™* Feature).

**Drop Target 3-Banks** - Making target stops associated arrow from flashing. Lighting all six arrows steadily scores and advances the Bonus lamps (10,30,50, and 100 times 1,000). Lighting arrows with "100" lit lights eject hole for Extra Ball. Making either 3-bank lights loop shot for 2X.

**Loop Shot** - Making loop shot for loop gate and loop lane switches lites spinners alternately and scores and advances loop lane lamps (10-60 times 1,000). Making loop shot with "60" lit lights outlanes alternately for Special. The spinners alternate with time and the outlane Specials alternate with each 10 point score.

**Chamber** - Driving captive ball against Chamber target scores highest flashing value and lights ball shooter to score 50,000 and to release balls in Chamber.

**Memory** - Partial spotting of "K-O-R-A", drop target arrows, loop lane lamps\*, drop target 3-bank bonus\*, and bonus multipliers\* below 5X.

**Extra Ball** - Maximum of one\* Extra Ball per ball. Making eject hole when lit for Extra Ball awards Extra Ball and resets Drop Target 3-Banks bonus lamps.

**Tilts** - Ball in play tilted on first closure of Playfield and Ball Roll tilts and third\* closure of Plumb Bob. Slam Tilt returns game to game over.

**End of Game** - Match Digits\* appears in ball in play display, \*credit awarded for match. Exceeding high score to date awards\* three credits. Match, High Score to Date, and Game Over sounds made as appropriate. Balls released from eject holes and are placed on ball ramp before new game can be started.

## BOOKKEEPING AND EVALUATION TOTALS

(Functions 01-12)

1. In game over mode, set alternate-action switch to AUTO-UP (out) and depress ADVANCE pushbutton. Test 04 is indicated in number of credits display, Function 00 in ball in play display, and game identification in Player 1 display.
2. Operate the ADVANCE pushbutton to display each function on the ball in play display (see Table 1) and record each total from Player 1 display. (To review a total that has been advanced past, set alternate-action switch to MANUAL-DOWN (in) and operate the ADVANCE pushbutton.)
3. Calculate the following if desired:  
$$\% \text{ Paid Credits} = \text{Function 04} \div \text{Function 08}$$
4. Turn the game OFF and back ON to return to game over mode.
5. To change current High Score to Date to value of Function 13, momentarily depress HIGH SCORE RESET pushbutton.
6. To zero Functions 01-11, see page 7

## GAME ADJUSTMENT PROCEDURE

(Functions 13-35)

*Coin door must be open to change settings.*

1. In game over mode, set alternate-action switch to AUTO-UP (out) and depress ADVANCE pushbutton. Test 04 is indicated in number of credits display, Function 00 in ball in play display, and game identification in Player 1 display.
2. To **raise** Function number in ball in play display, operate ADVANCE pushbutton with switch set to AUTO-UP (in). To **lower** Function number operate ADVANCE with it set to MANUAL-DOWN (out).
3. With desired Function indicated in ball in play display, **raise** value in player 1 display by operating credit button with switch set to AUTO-UP (out); **lower** value by operating credit button with it set to MANUAL-DOWN (in). Value left of Player 1 display is new setting. For values see Table 1 and (for pricing) Table 2.
4. Repeat steps 2 and 3 until all required adjustments have been made.
5. Turn game OFF and back ON to return to game over mode.
6. To restore factory settings **and** zero audit totals, see page 7.

## DIAGNOSTIC PROCEDURES

(Display Digits, Lamp, Solenoid, and Switch Tests)

1. In game over mode, set alternate-action switch to MANUAL-DOWN (in) and depress ADVANCE. All displays should go blank.
2. Momentarily depress ADVANCE and set switch to AUTO-UP (out). Display Digits test is performed.
3. Momentarily depress ADVANCE. Test 01 is indicated on number of credits display and Lamp Test is performed.
4. Set toggle switch to MANUAL-DOWN and momentarily depress ADVANCE. Test 02 is indicated on number of credits display and solenoid 01 on the ball in play display; solenoid 01 is pulsed by driver board.
5. Operate ADVANCE to pulse each solenoid (see Figure 3).
6. Set toggle switch to AUTO-UP and momentarily depress ADVANCE. Test 03 is indicated on number of credits display and stuck switches on ball in play display.
7. See Figure 4. Operate switches; switch number is indicated on ball in play display.
8. Turn game OFF and back ON to return to game over mode.
9. To set up Auto-Cycle Mode (Display Digits, Lamp, and Solenoid Tests) see page 7.

Table 1. Game Adjustments

| FUNCTION | DESCRIPTION                                                                                                                                                                                                                                     | NOTES | FACTORY SETTING |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------|
| 00       | Game Identification                                                                                                                                                                                                                             | 1     | 1499 1          |
| 01       | Coins, Left Chute (Closest to coin door hinge)                                                                                                                                                                                                  | 1     | —               |
| 02       | Coins, Center Chute                                                                                                                                                                                                                             | 1     | —               |
| 03       | Coins, Right Chute                                                                                                                                                                                                                              | 1     | —               |
| 04       | Total Paid Credits                                                                                                                                                                                                                              | 1     | —               |
| 05       | Total Specials                                                                                                                                                                                                                                  | 1     | —               |
| 06       | Total Replay (Extra Ball) Scores                                                                                                                                                                                                                | 1     | —               |
| 07       | Match and High Score to Date Credits                                                                                                                                                                                                            | 1     | —               |
| 08       | Total Credits                                                                                                                                                                                                                                   | 1,2   | —               |
| 09       | Total Extra Balls                                                                                                                                                                                                                               | 1,3   | —               |
| 10       | Total Ball Time in Minutes                                                                                                                                                                                                                      | 1     | —               |
| 11       | Total Number of Balls Played                                                                                                                                                                                                                    | 1     | —               |
| 12       | Current High Score to Date                                                                                                                                                                                                                      | 4     | *               |
| 13       | Backup High Score to Date                                                                                                                                                                                                                       | 5     | *               |
| 14       | Replay 1 Score                                                                                                                                                                                                                                  | 6     | *               |
| 15       | Replay 2 Score                                                                                                                                                                                                                                  | 6     | *               |
| 16       | Replay 3 Score                                                                                                                                                                                                                                  | 6     | 0               |
| 17       | Replay 4 Score                                                                                                                                                                                                                                  | 6     | 0               |
| 18       | Maximum Credits                                                                                                                                                                                                                                 | 7     | 20              |
| 19       | Standard and Custom Pricing Control (00-07)                                                                                                                                                                                                     | 8     | 02              |
| 20       | Left Coin Slot Multiplier                                                                                                                                                                                                                       | 8     | 01              |
| 21       | Center Coin Slot Multiplier                                                                                                                                                                                                                     | 8     | 04              |
| 22       | Right Coin Slot Multiplier                                                                                                                                                                                                                      | 8     | 01              |
| 23       | Coin Units Required for Credit                                                                                                                                                                                                                  | 8     | 01              |
| 24       | Coin Units Bonus Point                                                                                                                                                                                                                          | 8     | 00              |
| 25       | High Score Credits                                                                                                                                                                                                                              | 5     | 03              |
| 26       | Match/Multiple Extra Ball<br>00 = Match ON, 1 Extra Ball per Ball<br>01 = Match OFF, 1 Extra Ball per Ball<br>10 = Match ON, Multiple Extra Ball<br>11 = Match OFF, Multiple Extra Ball                                                         | —     | 00              |
| 27       | Special<br>00 = Awards Credit<br>01 = Awards Extra Ball<br>02 = Awards Points                                                                                                                                                                   | —     | 00              |
| 28       | Scoring Awards<br>00 = Credits at Replay Score<br>01 = Extra Ball at Replay Score                                                                                                                                                               | —     | 00              |
| 29       | Maximum Plumb Bob Tilts (1-9)                                                                                                                                                                                                                   | —     | 03              |
| 30       | Number of Balls (03 or 05)                                                                                                                                                                                                                      | —     | 03              |
| 31       | 3-Banks<br>00 = No target bonus memory, "10" lamp not lit initially<br>01 = Target bonus on memory, "10" lamp not lit initially<br>10 = No target bonus memory, "10" lamp lit initially<br>11 = Target bonus on memory, "10" lamp lit initially | —     | 11              |
| 32       | Loop Shot<br>00 = No lane lamp memory, "10" lamp not lit initially<br>01 = Lane lamps on memory, "10" lamp not lit initially<br>10 = No lane lamp memory, "10" lamp lit initially<br>11 = Lane lamps on memory, "10" lamp lit initially         | —     | 11              |
| 33       | Extra Ball Lamp<br>00 = No Extra Ball<br>01 = Lit once per ball when 3-Banks 100,000 collected<br>02 = Lights each time 3-Banks 100,000 collected                                                                                               | —     | 01              |
| 34       | Background Sound<br>00 = Background Sound OFF<br>01 = Background Sound ON                                                                                                                                                                       | —     | 01              |
| 35       | Bonus Multiplier<br>00 = No lamp memory<br>01 = Lamps below 5x on memory                                                                                                                                                                        | —     | 01              |

\*To be determined.

## Notes:

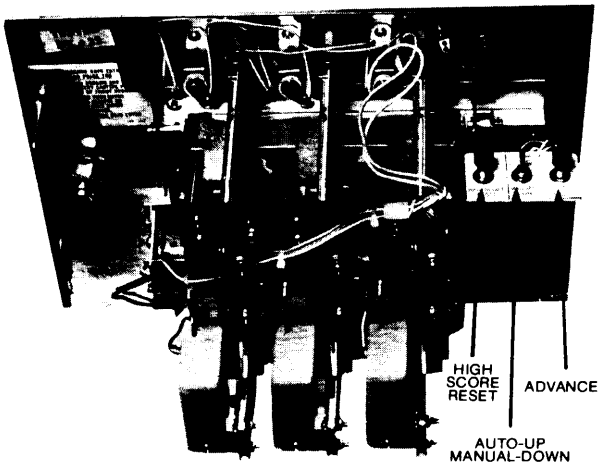
1. Functions 00-11 cannot be changed from the coin door; however, Functions 01-11 can be set to zero as described on page 7.
2. Total Credits (Function 08) is the sum of Function 04 and as applicable, Functions 05, 06, and 07.
3. Total Extra Balls (Function 09) is the sum of the game extra ball feature and Functions 05 and 06, as applicable.
4. Current High Score to Date (Function 12) can be changed to the value of the Backup High Score to Date (Function 13) by operating the HIGH SCORE RESET switch while in the game over mode.
5. Function 13 may be set to any multiple of 100,000 points. Setting Function 25 to zero with Function 13 set to any score but zero permits the High Score to Date feature to operate but no credits are awarded.
6. Functions 14-17 (Replay Scores) may be set to any multiple of 100,000 points. Setting a function to zero disables the replay score point. **Always disable the Replay 4 level first, the Replay 3 level second, etc. The replay levels must be set with ascending values.**
7. Setting Maximum Credits (Function 18) to zero places the game in a **free play mode**.
8. With Function 19 set to 00, Functions 20-24 must be set manually. Refer to Table 2 for seven standard pricing schemes (selected by values of 01-07 for Function 19) and custom pricing values.

Table 2. Standard and Custom Price Settings

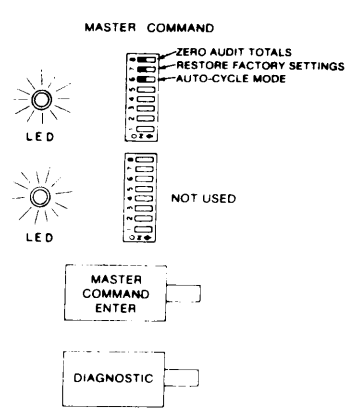
| COIN DOOR<br>MECHANISM                   | CREDITS                                                                                                                                                                                 | FUNCTION |    |    |    |    |    |  |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|----|----|----|----|--|
|                                          |                                                                                                                                                                                         | 19       | 20 | 21 | 22 | 23 | 24 |  |
| Twin-Quarter<br>Quarter, Dollar, Quarter | 1/25¢, 3/50¢, 7/\$1                                                                                                                                                                     | 00       | 03 | 12 | 03 | 02 | 12 |  |
|                                          | 1/25¢, 3/50¢, 7/\$1 coin only                                                                                                                                                           | 00       | 03 | 14 | 03 | 02 | 00 |  |
|                                          | 1/25¢, 7/\$1 coin only                                                                                                                                                                  | 00       | 01 | 07 | 01 | 01 | 00 |  |
|                                          | 1/25¢, 3/50¢, 6/\$1                                                                                                                                                                     | 00       | 01 | 04 | 01 | 01 | 02 |  |
|                                          | 1/25¢, 6/\$1 coin only                                                                                                                                                                  | 00       | 01 | 06 | 01 | 01 | 00 |  |
|                                          | 1/25¢, 5/\$1                                                                                                                                                                            | 00       | 01 | 04 | 01 | 01 | 04 |  |
|                                          | 1/25¢, 5/\$1 coin only                                                                                                                                                                  | 00       | 01 | 05 | 01 | 01 | 00 |  |
|                                          | 1/25¢, 4/\$1                                                                                                                                                                            | 02       | 01 | 04 | 01 | 01 | 00 |  |
|                                          | 1/50¢, 2/75¢, 3/4 x 25¢,<br>4/\$1 or 5 x 25¢                                                                                                                                            | 05       | 03 | 15 | 03 | 04 | 15 |  |
|                                          | 1/50¢, 3/\$1                                                                                                                                                                            | 01       | 01 | 04 | 01 | 02 | 04 |  |
| IDM, 5DM, 2DM                            | 1/50¢                                                                                                                                                                                   | 00       | 01 | 04 | 01 | 02 | 00 |  |
|                                          | 1/1DM, 3/2DM, 10/5DM                                                                                                                                                                    | 03       | 09 | 45 | 18 | 05 | 45 |  |
|                                          | 2/1DM, 5/2DM, 14/5DM                                                                                                                                                                    | 00       | 13 | 65 | 26 | 05 | 65 |  |
|                                          | 1/20¢, 3/50¢                                                                                                                                                                            | 00       | 06 | 00 | 15 | 05 | 00 |  |
|                                          | 1/2F, 3/5F only, 8/10F only                                                                                                                                                             | 04       | 01 | 16 | 06 | 02 | 00 |  |
|                                          | 1/25¢, 4/1G                                                                                                                                                                             | 06       | 01 | 00 | 04 | 01 | 00 |  |
|                                          | 1/25¢, 5/1G                                                                                                                                                                             | 00       | 01 | 00 | 04 | 01 | 04 |  |
|                                          | 1/50Y, 2/100Y                                                                                                                                                                           | 07       | 01 | 00 | 02 | 01 | 00 |  |
|                                          | 1/1F, 3/2F                                                                                                                                                                              | 00       | 01 | 01 | 01 | 01 | 02 |  |
|                                          | 1/1F                                                                                                                                                                                    | 00       | 01 | 01 | 01 | 01 | 00 |  |
| 5 Franc,<br>10 Franc                     | 1/5F, 2/10F                                                                                                                                                                             | 07       | 01 | 00 | 02 | 01 | 00 |  |
|                                          | 1/10F                                                                                                                                                                                   | 00       | 01 | 00 | 02 | 02 | 00 |  |
|                                          | 1/2F                                                                                                                                                                                    | 02       | 01 | 04 | 01 | 01 | 00 |  |
|                                          | 1/10F, 2/20F                                                                                                                                                                            | 07       | 01 | 00 | 02 | 01 | 00 |  |
|                                          | 1/3S, 2/5S                                                                                                                                                                              | 00       | 02 | 00 | 02 | 05 | 00 |  |
|                                          | •Indicates standard price settings by adjusting only Function 19. For other price settings, set Function 19 to 00 and set Functions 20 through 24 to the values indicated in the chart. |          |    |    |    |    |    |  |

**RESETTING AUDIT TOTALS AND ADJUSTMENTS;  
INITIATING AUTO-CYCLE MODE**

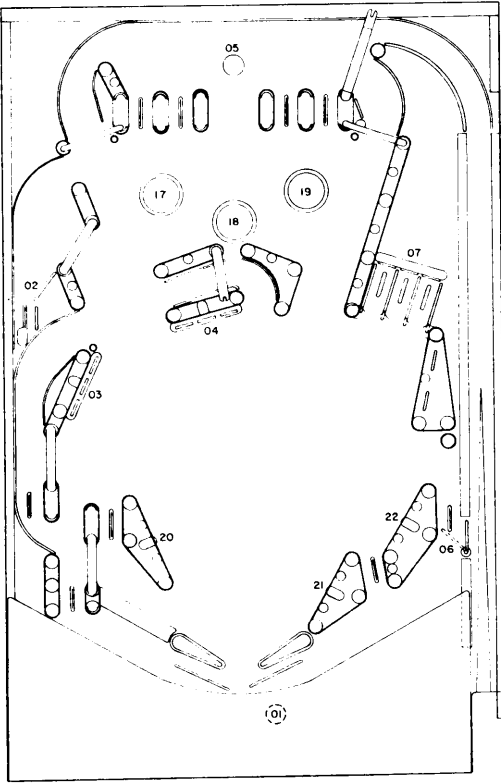
1. In game over mode, set the alternate-action switch to **MANUAL-DOWN** ( in) and momentarily depress the **ADVANCE** pushbutton. All displays should go blank.
2. Remove the backglass and unlatch and open the insert door.
3. Set all switches on the **MASTER COMMAND** slide switch to **OFF** (move to the right).
4. Set switch on **MASTER COMMAND** switch to **ON** (move to left):
  - a. To zero audit totals (Functions 01-11) set switch 8 to **ON**.
  - b. To restore factory settings **and** zero audit totals, set switch 7 to **ON**. *Coin Door must remain open to restore factory settings.*
  - c. For Auto-Cycle Mode set switch 6 to **ON**.
5. Momentarily depress **MASTER COMMAND ENTER** pushbutton. The LEDs should blink once.
6.
  - a. After zeroing audit totals turn game **OFF** and **ON** to return to game over mode.
  - b. After restoring factory settings, turn game **OFF** and **ON** **twice** to return to game over mode.
  - c. To initiate Auto-Cycle Mode, set alternate-action switch to **AUTO-UP** (out) and momentarily depress the **ADVANCE** pushbutton. Each cycle of this mode sequences through display digits test, flashes all multiplexed lamps 64 times and pulses each solenoid. To terminate the Auto-Cycle mode and go to game over, turn the game **OFF** and **ON**.



*Figure 1. Coin Door Diagnostic Switches*



*Figure 2.  
Master Command  
Settings Switch*



**SOL.**

**NO. FUNCTION**

- |    |                                  |
|----|----------------------------------|
| 01 | Ball Release                     |
| 02 | Ball Shooter                     |
| 03 | Left 3-Bank Drop Targets Reset   |
| 04 | Center 3-Bank Drop Targets Reset |
| 05 | Eject Hole                       |
| 06 | Ball Return Gate                 |
| 07 | Chamber Reset                    |
| 08 | Not Used                         |
| 09 | Sound                            |
| 10 | Sound                            |
| 11 | Sound                            |
| 12 | Sound                            |
| 13 | Sound                            |
| 14 | Credit Knocker                   |
| 15 | Not Used                         |
| 16 | Coin Lockout                     |
| 17 | Left Jet Bumper                  |
| 18 | Center Jet Bumper                |
| 19 | Right Jet Bumper                 |
| 20 | Left Kicker                      |
| 21 | Right Inside Kicker              |
| 22 | Right Outside Kicker             |

*Figure 3. Playfield Solenoid Locations and Solenoid Chart*

*Table 3. Solenoid Connections*

| SOL. NO. | FUNCTION                         | WIRE COLOR | CONNECTIONS          | DRIVER TRANS. | SOLENOID PART NO.        |
|----------|----------------------------------|------------|----------------------|---------------|--------------------------|
| 01       | Ball Release                     | GRY-BRN    | 2P11-4, 8P3-17       | Q15           | SA-23-850-DC             |
| 02       | Ball Shooter                     | GRY-RED    | 2P11-5, 8P3-18       | Q17           | SG-23-850-DC             |
| 03       | Left 3-Bank Drop Targets Reset   | GRY-ORN    | 2P11-7, 8P3-19       | Q19           | SA3-23-850-DC            |
| 04       | Center 3-Bank Drop Targets Reset | GRY-YEL    | 2P11-8, 8P3-20       | Q21           | SA3-23-850-DC            |
| 05       | Eject Hole                       | GRY-GRN    | 2P11-9, 8P3-21       | Q23           | SA3-23-850-DC            |
| 06       | Ball Return Gate                 | GRY-BLU    | 2P11-3, 8P3-22       | Q25           | SZ-35-4000-DC            |
| 07       | Chamber Reset                    | GRY-VIO    | 2P11-2, 8P3-23       | Q27           | SA4-23-850-DC            |
| 08       | Not Used                         | GRY-BLK    | 2P11-1, 8P3-24       | Q29           | —                        |
| 09       | Sound                            | BRN-BLK    | 2P9-9, 10P3-3        | Q31           | —                        |
| 10       | Sound                            | BRN-RED    | 2P9-7, 10P3-2        | Q33           | —                        |
| 11       | Sound                            | BRN-ORN    | 2P9-1, 10P3-5        | Q35           | —                        |
| 12       | Sound                            | BRN-YEL    | 2P9-2, 10P3-4        | Q37           | —                        |
| 13       | Sound                            | BRN-GRN    | 2P9-3, 10P3-7        | Q39           | —                        |
| 14       | Credit Kicker                    | BRN-BLU    | 2P9-4, 7P1-16        | Q41           | SA-23-850-DC             |
| 15       | Not Used                         | BRN-VIO    | 2P9-5, 8P3-1         | Q43           | —                        |
| 16       | Coin Lockout                     | BRN-GRY    | 2P9-6, 7P1-18, 7P2-4 | Q45           | SM-35-4000-DC            |
| *17      | Left Jet Bumper                  | BLU-BRN    | 2P12-7, 8P3-11       | Q2            | SG-23-850-DC             |
| *18      | Center Jet Bumper                | BLU-RED    | 2P12-4, 8P3-12       | Q4            | SG-23-850-DC             |
| *19      | Right Jet Bumper                 | BLU-ORN    | 2P12-3, 8P3-13       | Q6            | SG-23-850-DC             |
| *20      | Left Kicker                      | BLU-YEL    | 2P12-6, 8P3-14       | Q8            | SG-23-850-DC             |
| *21      | Right Inside Kicker              | BLU-GRN    | 2P12-8, 8P3-15       | Q10           | SG-23-850-DC             |
| *22      | Right Outside Kicker             | BLU-BLK    | 2P12-9, 8P3-16       | Q12           | SG-23-800-DC             |
| *        | Right Flipper                    | BLU-VIO    | 7P1-8, 8P3-3         | —             | SFL-19-400/<br>30-750-DC |
| *        | Left Flipper                     | BLU-GRY    | 7P1-10, 8P3-4        | —             | SFL-19-400/<br>30-750-DC |

**\*NOTES:**

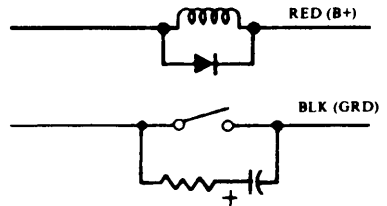
1. Special switch connections for solenoids 17 through 22 are as follows:

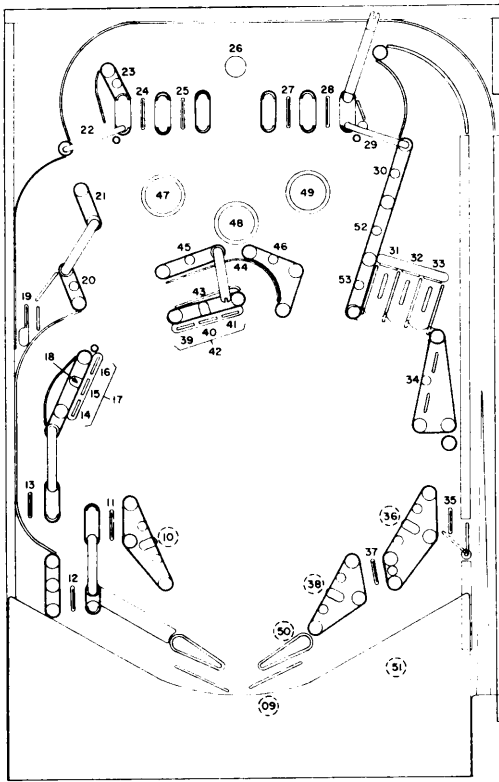
17 -- ORN-BRN -- 2P13-5, 8P3-5  
18 -- ORN-RED -- 2P13-3, 8P3-6  
19 -- ORN-BLK -- 2P13-2, 8P3-7  
20 -- ORN-YEL -- 2P13-4, 8P3-8  
21 -- ORN-GRN -- 2P13-8, 8P3-9  
22 -- ORN-BLU -- 2P13-9, 8P3-10

2. Flipper button connections are as follows:

Right -- ORN-VIO -- 2P12-1, 7P1-7  
Left -- ORN-GRY -- 2P12-2, 7P1-9

3. Typical wiring for solenoids and special switches:





# Switch

| No. | Function (Score)                                   |
|-----|----------------------------------------------------|
| 01  | Plumb Bob Tilt                                     |
| 02  | Ball Roll Tilt                                     |
| 03  | Credit Button                                      |
| 04  | Right Coin Switch                                  |
| 05  | Center Coin Switch                                 |
| 06  | Left Coin Switch                                   |
| 07  | Slam Tilt                                          |
| 08  | High Score Reset                                   |
| 09  | Outhole                                            |
| 10  | Left Kicker (10)                                   |
| 11  | Left Inside Rollover (1000)                        |
| 12  | Left Outlane (5000)                                |
| 13  | Left Loop Lane Rollover (5000/10,000 per lit lamp) |
| 14  | Left 3-Bank, Left Drop Target (1000/5000*)         |
| 15  | Left 3-Bank, Center Drop Target (1000/5000*)       |
| 16  | Left 3-Bank, Right Drop Target (1000/5000*)        |
| 17  | Left 3-Bank Drop Target Series (5000)              |
| 18  | Left 3-Bank Standup (50)                           |
| 19  | Ball Shooter (5,000/50,000)                        |
| 20  | Upper Left Standup, Lower (10)                     |
| 21  | Upper Left Standup, Upper (10)                     |
| 22  | Left Spinner (100/1000)                            |
| 23  | Top Left Standup (10)                              |
| 24  | "K" Rollover (1000)                                |
| 25  | "O" Rollover (1000)                                |
| 26  | Eject Hole (5000)                                  |
| 27  | "R" Rollover (1000)                                |
| 28  | "A" Rollover (1000)                                |
| 29  | Right Spinner (100/1000)                           |
| 30  | Upper Right Standup, Top (10)                      |
| 31  | Left Chamber Target (Highest flashing Value)       |
| 32  | Center Chamber Target (Highest flashing Value)     |
| 33  | Right Chamber Target (Highest flashing Value)      |
| 34  | Middle Right Standup (10)                          |
| 35  | Right Return Gate Rollover (1000)                  |
| 36  | Right Outside Kicker (10)                          |
| 37  | Right Outlane (5000)                               |
| 38  | Right Inside Kicker (10)                           |
| 39  | Center 3-Bank, Left Target (1000/5000*)            |
| 40  | Center 3-Bank, Center Target (1000/5000*)          |
| 41  | Center 3-Bank, Right Target (1000/5000*)           |
| 42  | Center 3-Bank, Drop Target Series (5000)           |
| 43  | Center 3-Bank Standup (50)                         |
| 44  | Loop Gate (1000/5000)                              |
| 45  | Center Left Standup (10)                           |
| 46  | Center Right Standup (10)                          |
| 47  | Left Jet Bumper (100)                              |
| 48  | Center Jet Bumper (1000)                           |
| 49  | Right Jet Bumper (1000)                            |
| 50  | Right Flipper <i>LANE CHANGE</i> Feature           |
| 51  | Playfield Tilt                                     |
| 52  | Upper Right Center Standup (10)                    |
| 53  | Upper Right Lower Standup (10)                     |

Second value is lit or flashing\* value.

Figure 4. Playfield Switch Locations and Switch Chart

| COLUMN<br>ROW             | 1<br>GRN-BRN<br>2J2-9      | 2<br>GRN-RED<br>2J2-8                   | 3<br>GRN-ORN<br>2J2-7                   | 4<br>GRN-YEL<br>2J2-6               | 5<br>GRN-BLK<br>2J2-5                   | 6<br>GRN-BLU<br>2J2-3                        | 7<br>GRN-VIO<br>2J2-2                         | 8<br>GRN-GRY<br>2J2-1 |
|---------------------------|----------------------------|-----------------------------------------|-----------------------------------------|-------------------------------------|-----------------------------------------|----------------------------------------------|-----------------------------------------------|-----------------------|
| 1<br>WHT-<br>BRN<br>2J3-9 | PLUMB<br>BOB<br>TILT 1     | OUTHOLE 9                               | LEFT 3-BANK<br>DROP TARGET<br>SERIES 17 | "O"<br>ROLLOVER 25                  | RIGHT<br>CHAMBER<br>TARGET 33           | CENTER<br>3-BANK<br>RIGHT<br>TARGET 41       | RIGHT<br>JET<br>BUMPER 49                     | NOT<br>USED 57        |
| 2<br>WHT-<br>RED<br>2J3-8 | BALL<br>ROLL<br>TILT 2     | LEFT<br>KICKER 10                       | LEFT 3-BANK<br>STANDUP 18               | EJECT<br>HOLE 26                    | MIDDLE<br>RIGHT<br>STANDUP 34           | CENTER<br>3-BANK<br>DROP TARGET<br>SERIES 42 | RIGHT<br>FLIPPER<br>LANE CHANGE<br>FEATURE 50 | NOT<br>USED 58        |
| 3<br>WHT-<br>ORN<br>2J3-7 | CREDIT<br>BUTTON 3         | LEFT<br>INSIDE<br>ROLLOVER 11           | BALL<br>SHOOTER 19                      | "R"<br>ROLLOVER 27                  | RIGHT<br>RETURN<br>GATE<br>ROLLOVER 35  | CENTER<br>3-BANK<br>STANDUP 43               | PLAYFIELD<br>TILT 51                          | NOT<br>USED 59        |
| 4<br>WHT-<br>YEL<br>2J3-6 | RIGHT<br>COIN<br>SWITCH 4  | LEFT<br>OUTLANE 12                      | UPPER LEFT<br>STANDUP<br>LOWER 20       | "A"<br>ROLLOVER 28                  | RIGHT<br>OUTSIDE<br>KICKER 36           | LOOP<br>GATE 44                              | UPPER<br>RIGHT<br>CENTER<br>STANDUP 52        | NOT<br>USED 60        |
| 5<br>WHT-<br>GRN<br>2J3-5 | CENTER<br>COIN<br>SWITCH 5 | LEFT<br>LOOP LANE<br>ROLLOVER 13        | UPPER LEFT<br>STANDUP<br>UPPER 21       | RIGHT<br>SPINNER 29                 | RIGHT<br>OUTLANE 37                     | CENTER<br>LEFT<br>STANDUP 45                 | UPPER<br>RIGHT<br>LOWER<br>STANDUP 53         | NOT<br>USED 61        |
| 6<br>WHT-<br>BLU<br>2J3-4 | LEFT<br>COIN<br>SWITCH 6   | LEFT 3-BANK<br>LEFT DROP<br>TARGET 14   | LEFT<br>SPINNER 22                      | UPPER<br>RIGHT<br>STANDUP<br>TOP 30 | RIGHT<br>INSIDE<br>KICKER 38            | CENTER<br>RIGHT<br>STANDUP 46                | NOT<br>USED 54                                | NOT<br>USED 62        |
| 7<br>WHT-<br>VIO<br>2J3-3 | SLAM<br>TILT 7             | LEFT 3-BANK<br>CENTER DROP<br>TARGET 15 | TOP LEFT<br>STANDUP 23                  | LEFT<br>CHAMBER<br>TARGET 31        | CENTER<br>3-BANK<br>LEFT<br>TARGET 39   | LEFT<br>JET<br>BUMPER 47                     | NOT<br>USED 55                                | NOT<br>USED 63        |
| 8<br>WHT-<br>GRY<br>2J3-1 | HIGH<br>SCORE<br>RESET 8   | LEFT 3-BANK<br>RIGHT DROP<br>TARGET 16  | "K"<br>ROLLOVER 24                      | CENTER<br>CHAMBER<br>TARGET 32      | CENTER<br>3-BANK<br>CENTER<br>TARGET 40 | CENTER<br>JET<br>BUMPER 48                   | NOT<br>USED 56                                | NOT<br>USED 64        |

Figure 5. Switch Matrix

| COLUMN<br>ROW             | 1<br>YEL-BRN<br>2J5-8          | 2<br>YEL-RED<br>2J5-9        | 3<br>YEL-ORN<br>2J5-6 | 4<br>YEL-BLK<br>2J5-7                      | 5<br>YEL-GRN<br>2J5-3     | 6<br>YEL-BLU<br>2J5-5 | 7<br>YEL-VIO<br>2J5-1        | 8<br>YEL-GRY<br>2J5-2                       |
|---------------------------|--------------------------------|------------------------------|-----------------------|--------------------------------------------|---------------------------|-----------------------|------------------------------|---------------------------------------------|
| 1<br>RED-<br>BRN<br>2J7-1 | SAME PLAYER<br>SHOOTS<br>AGAIN | LOOP<br>LANE<br>"10"         | 2X                    | LEFT 3-BANK<br>LEFT TARGET<br>ARROW        | 3-BANKS<br>"10"<br>BONUS  | 2,000<br>BONUS        | NOT<br>USED                  | #1<br>PLAYER<br>UP                          |
| 2<br>RED-<br>BLK<br>2J7-2 | LEFT<br>SPECIAL                | LOOP<br>LANE<br>"20"         | 3X                    | LEFT 3-BANK<br>CENTER TARGET<br>ARROW      | 3-BANKS<br>"30"<br>BONUS  | 3,000<br>BONUS        | 1<br>CAN<br>PLAY             | #2<br>PLAYER<br>UP                          |
| 3<br>RED-<br>ORN<br>2J7-3 | RIGHT<br>SPECIAL               | LOOP<br>LANE<br>"30"         | 4X                    | LEFT 3-BANK<br>RIGHT TARGET<br>ARROW       | 3-BANKS<br>"50"<br>BONUS  | 4,000<br>BONUS        | 2<br>CAN<br>PLAY             | #3<br>PLAYER<br>UP                          |
| 4<br>RED-<br>YEL<br>2J7-4 | LOOP GATE<br>2X                | LOOP<br>LANE<br>"40"         | 5X                    | CENTER<br>3-BANK<br>LEFT TARGET<br>ARROW   | 3-BANKS<br>"100"<br>BONUS | 5,000<br>BONUS        | 3<br>CAN<br>PLAY             | #4<br>PLAYER<br>UP                          |
| 5<br>RED-<br>GRN<br>2J7-5 | CHAMBER<br>50,000              | LOOP<br>LANE<br>"50"         | "K"<br>ROLLOVER       | CENTER<br>3-BANK<br>CENTER TARGET<br>ARROW | NOT<br>USED               | 6,000<br>BONUS        | 4<br>CAN<br>PLAY             | TILT                                        |
| 6<br>RED-<br>BLU<br>2J7-6 | CHAMBER<br>40,000              | LOOP<br>LANE<br>"60"         | "O"<br>ROLLOVER       | CENTER<br>3-BANK<br>RIGHT TARGET<br>ARROW  | 20,000<br>BONUS           | 7,000<br>BONUS        | MATCH                        | GAME<br>OVER                                |
| 7<br>RED-<br>VIO<br>2J7-9 | CHAMBER<br>30,000              | EXTRA<br>BALL<br>WHEN<br>LIT | "R"<br>ROLLOVER       | LEFT<br>SPINNER                            | 10,000<br>BONUS           | 8,000<br>BONUS        | BALL<br>SHOOTS<br>IN<br>PLAY | SAME<br>PLAYER<br>SHOOTS<br>IN<br>(BACKBOX) |
| 8<br>RED-<br>GRY<br>2J7-8 | CHAMBER<br>RESET               | NOT<br>USED                  | "A"<br>ROLLOVER       | RIGHT<br>SPINNER                           | 1,000<br>BONUS            | 9,000<br>BONUS        | CREDITS<br>(PLAYFIELD)       | HIGH<br>SCORE                               |

Figure 6. Lamp Matrix