



# **INSTRUCTION BOOKLET**

This booklet provides game operation, bookkeeping, game adjustment, diagnostic, and self-test procedures for WARLOK. For installation and special maintenance information refer to the blue-covered game manual.

### SPECIAL CONSIDERATIONS WHEN REPLACING CIRCUIT BOARDS

#### CPU Board

- 1. Revision level 7 CPU Boards (batteries located on lower left corner at board) of later boards must be used.
- 2. Must be equipped with blue-labeled Flipper ROMs and Warlok Game ROMs.
- 3. Jumpers W3, W10, W11, W14, W17, W19, W20, and W22 must be connected. Jumpers W4, W9, W12, W15, W16, W18, W21, and W23 must be removed. With the exception of W25, (Factory Setting Jumper) all other jumpers are not changed.

#### **Driver Board**

Must be equipped with zero-ohm resistors or wire jumpers (W9-W16) in place of switch matrix drive series resistors R204-R211.

#### Sound Board

Must be jumpered for ROM operation and be equipped with Sound ROM 14. (Jumpers W2, W5, W7, W9, W10, W12, and W15 connected; W3, W4, W6, W8, W11, and W13 removed).

### **Power Supply Board**

- 1. Model D 8345 board required (equipped with relay).
- 2. Fuse F4 (10A SB) for flipper solenoids must be installed.

#### Display Boards

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

### **Game Operation**

Game Over Mode - Turn game ON; player 1 score shows 00; all player scores alternate the high score to date, Game Over lamp lights. All playfield lamps cycle in attract mode.

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

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

\*Indicates adjustable features.

Lane Change is a trademark of Williams Electronics, Inc.

**Bonus Lamps** - The BONUS lamps are lit by hitting drop targets (1, 2, 3) which light the BONUS lamps in sequence from left to right in the corresponding row (1, 2, 3). As the BONUS lamps are lit in sequence in a row, the bonus points are as follows: 1,000, 2,000, 3,000, 4,000, 5,000, 6,000 and 7,000 points.

When three BONUS lamps are lit in a column (note there are seven columns), there is a possibility for an extra ball to be provided when the center target of a drop target bank is hit.

When all of the BONUS lamps are lit, the lamps for DOUBLE SCORE, EXTRA BALL, and drop target SPECIAL are lit.

**Double Score Lamp** - When the DOUBLE SCORE lamp is lit, 14,000 points are scored each time a drop target is hit.

Extra Ball Lamps - EXTRA BALL lamps are lit when the same number of BONUS lamps are lit in each row. EXTRA BALL lamps light alternately between the center drop targets of the three drop target banks and the top left target. Hitting either of the lower kickers or the left spinner will also rotate the EXTRA BALL lamps. Orbit Shot EXTRA BALL lights after making the ORBIT SHOT 3 times.

**Drop Target Special Lamps** - Drop target SPECIAL lamps are lit when all the BONUS lamps are lit. When the top right spinner or the lower kicking rubbers are hit, the SPECIAL drop target lamps light alternately at center drop targets 1, 2, and 3.

Orbit Shot - For each ORBIT SHOT (from left spinner to right spinner) successive earnings are 20,000 points, 40,000 points, 70,000 points, extra ball, and special. After SPECIAL is scored, ORBIT SHOT scores 70,000.

Spinner Lamps - When drop target bank #1 is struck down, the top left spinner lamp lights. When drop target bank #2 is struck down, the lower right spinner lamp lights. When drop target bank #3 is struck down, the top right spinner lamp lights.

Spot #3 Target Lamps - SPOT #3 TARGET lamps are lit at the beginning of the game. When the SPOT #3 TARGET switch is lit, 7,000 points are scored and a target in the drop target bank 3 will fall and light BONUS lamp in row 3.

X-Y-Z Lanes - Spotting lane lamps X-Y-Z increases bonus multiplier in 1X steps from 1X to 10X. Operating right flipper (LANE CHANGE™ feature) alternates lit lane lamps.

**Bottom Out Lane Special Lamps** - When bonus multiplier reaches 7X\*, the bottom out lane SPECIAL lamps light. They alternately light when top right spinner, top left spinner, or bottom kicking rubbers are hit.

Collect Bonus Lane - Each time a drop target bank is struck down, a lamp for 10,000 points is lit in the COLLECT BONUS lane. The green COLLECT BONUS lamp lights when all drop targets are struck down.

### Lamps on Memory

- (1) ORBIT SHOT SCORE\*
- (2) BONUS MULTIPLIER\*
- (3) X-Y-Z LANES

Tilt - Ball in play tilted on first closure of ball roll tilt and third\* closure of plumb bob and playfield tilts. Slam tilt returns game to Game Over mode.

End of Game - Match Digits\* appear 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. A new game cannot be started with more than one ball in the ball shooter trough; excess balls must be returned to playfield and drain to rest on ball ramp switches.

\*Indicates adjustable features.

### **BOOKKEEPING AND GAME EVALUATION**

(Functions 01-17)

- 1. Set AUTO-UP/MANUAL-DOWN switch to AUTO-UP and depress ADVANCE pushbutton. Test 04 is indicated in the credits display, Function 00 in Match display, and Game Identification in Player 1 display.
- 2. Operate the ADVANCE pushbutton to display Functions 01 thru 04 on the Match display (See Table 1) and record the corresponding totals (number of coins and total paid credits) from the Player 1 display. (To review a total that has been advanced past, set switch to MANUAL-DOWN and operate the ADVANCE pushbutton).
- 3. Operate the ADVANCE pushbutton to display Functions 05, 06, and 07 in the Match display and record the corresponding free credit totals from the Player 1 display.
- 4. Operate the ADVA NCE pushbutton to display Function 08 in the Match display. Total credits is indicated in the Player 1 display, total free credits in the Player 2 display, and percentage of free credits in the Player 4 display.
- 5. Operate the ADVANCE pushbutton to display Function 09 thru 12 in the Match display and record the corresponding totals from the Player 1 display.
- 6. Operate the ADVANCE pushbutton to display Functions 13 thru 17 in the Match display and record the corresponding totals from the Player 2 display.
- 7. With switch set to MANUAL-DOWN operate ADVANCE to display Function 50 in the Match Display. From Function 50 you can return to game over or zero audit totals and return to game over. Perform step 8.a. or 8.b. as desired.
- 8. a. To return to game over, set the switch to AUTO-UP and depress ADVANCE.
  - b. **To zero audit totals** and return to game over set switch to AUTO-UP, operate the credit button to display 35 in the Player 1 display, and depress ADVANCE.

Table 1. Audit Totals

	DESCRIPTION				
FUNCTION	PLAYER 1	PLAYER 2	PLAYER 4		
00	Game Identification (2516 1)		<del>-</del>		
01	Coins, Left chute		_		
	(closest to coin door hinge)		. —		
02	Coin, center chute	-			
03	Coin, right chute		_		
04	Total Paid Credits	_	_		
05	Special Credits	_	_		
06	Replay Score Credits		_		
07	Match Credits	_	_		
08	Total Credits	Free Credits	% Free Credits		
09	Total Extra Balls	_			
10	Ball Time in Minutes	_	_		
11	Total Balls Played	-	<del></del>		
12	Current High Score	_			
	to Date				
13	Backup High Score	High Score to Date	_		
	to Date	Credits Awarded			
14	Replay 1 Score	Times exceeded	_		
15	Replay 2 Score	Times exceeded			
16	Replay 3 Score	Times exceeded	_		
17	Replay 4 Score	Times exceeded	_		

### GAME ADJUSTMENT PROCEDURE

(Functions 13-41)

### Coin door must be open to change settings.

- 1. Set AUTO-UP/MANUAL-DOWN switch to AUTO-UP and depress the ADVANCE pushbutton. Test 04 is indicated in the Credits display, Function 00 in Match display, and game identification in Player 1 display.
- 2. To raise Function number in Match display, operate ADVANCE pushbutton with switch set to AUTO-UP. To lower Function number, operate ADVANCE with switch set to MANUAL-DOWN.
- 3. With desired Function indicated in Match display, **raise** value in player 1 display by operating credit button with switch set to AUTO-UP; **lower** value by operating credit button with switch set to MANUAL-DOWN. Value left in Player 1 display is the new setting. For values see Table 2, and for pricing Table 3.
- 4. Repeat steps 2 and 3 until all required adjustments have been made.
- 5. Operate ADVANCE until Function 50 is indicated in Match display. From Function 50 you can return to game over or **restore factory settings**. Perform step 6 or 7 as desired.
- 6. To return to game over, depress ADVANCE with switch set to AUTO-UP.
- 7. To restore factory settings and zero audit totals:
  - a. Operate Credit button with switch set to AUTO-UP until 45 is indicated in Player 1 Display.
  - b. Depress ADVANCE. The game returns to Test 04, Function 00.
  - c. Set switch to MANUAL-DOWN and depress ADVANCE to indicate Function 50.
  - d. Set switch to AUTO-UP and depress ADVANCE.

### RESETTING HIGH SCORE TO DATE

- 1. Using game adjustment procedure, set Function 13 to the desired reset value.
- 2. Depress HIGH SCORE RESET pushbutton.

### **FACTORY AUDIT TOTALS**

(Functions 42-49)

The factory audit functions are not assigned.

Table 2. Game Adjustments

FUNCTION	DESCRIPTION	NOTES	*FACTORY SETTING
13	Backup High Score to Date (HSTD Credits Awarded)	1	2,500,000
14	Replay 1 Score [Times exceeded]	2	1,000,000
15	Replay 2 Score [Times exceeded]	2	2,000,000
16	Replay 3 Score [Times exceeded]	2	0
17	Replay 4 Score [Times exceeded]	2	0
18	Maximum Credits	3	30
19	Standard and Custom Pricing Control	4	01/02
20	Left Coin Slot Multiplier	4	01/09
21	Center Coin Slot Multiplier	4	04/45
22	Right Coin Slot Multiplier		01/18
23	Coin Units Required for Credit		02/05
24	Coin Units Bonus Point		04/45
25	Minimum Coin Units	4	00
26	Match: 00 = Match ON; 01 = Match OFF		00
27	Special: 00 = Awards Credit; 01 = No Special; 02 = Awards Points		00
28	Replay Scores: 00 = Awards Credit; 01 = Awards Extra Ball		00
29	Maximum Plumb Bob Tilts	-	03
30	Number of Balls (03 or 05)	-	03
31	Background Sound: 00 = OFF; 01 = ON	-	01
32	Memory on Orbit Shot Bonus: 00 = OFF; 01 = ON	-	01
33	Memory on Bonus Multiplier: 00 = OFF; 01 = ON	-	01
34	Upper 3 Bank Remote Drop: 00 = First Time Only; 01 = Remote Drop always	5	01
35	Outlane Specials Lit at: $00 = 7X$ ; $01 = 8X$ ; $02 = 9X$ ; $03 = 10X$	-	00
36	Not Used	-	00
37	Not Used	-	00
38	Not Used	-	00
39	Not Used	-	00
40	High Score Credits	1	03
41	Maximum Extra Balls at one time (00 = No Extra Ball)	-	07

- Second Factory Setting value is with jumper W25 on CPU Board connected.
- [ ] Description in brackets shown in Player 2 Display.
- 1. Function 13 may be set to any multiple of 100,000 points. Setting Function 40 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.
- 2. 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.
- 3. Setting Maximum Credits (Function 18) to zero places the game in a free play mode.
- 4. With Function 19 set to 00, Functions 20-25 must be set manually. Refer to Table 2 for eight standard pricing schemes (selected by values of 01-08 for Function 19) and custom pricing values. For straight quarter play, set Function 19 to 00, Function 23 to 01 and Function 24 to 00. All other pricing functions should remain at their factory settings.
- 5. When lit, flipper return lanes and Upper Left Target will drop Upper 3-Bank targets.

Table 3. Standard and Custom Price Settings

COIN DOOR			:	Ŧ	FUNCTION	z		
MECHANISM	CREDITS	19	20	21	22	23	24	25
Twin-Quarter	1/25¢, 3/50¢, 7/\$1	00	03	12	03	02	12	8
Quarter, Dollar, Quarter	1/25¢, 3/50¢, 7/\$1 coin only	8	03	4	03	05	8	8
,	1/25¢, 7/\$1 coin only	8	10	0.	01	10	8	8
	1/25¢, 3/50¢, 6/\$1	8	10	ষ	10	10	05	8
	1/25¢, 6/\$1 coin only	8	10	8	10	10	8	8
	1/25¢, 5/\$1	8	10	ষ	01	10	Ŗ	8
	2/50¢, 5/\$1	8	10	ঽ	10	10	8	05
	1/25¢, 5/\$1 coin only	8	10	05	10	10	8	8
	-1/25¢, 4/\$1	6	10	ষ	10	01	8	8
	2/50¢, 4/\$1	8	0	g	10	10	8	05
	•1/50¢, 2/75¢, 3/4 x 25¢	9	63	15	03	3	15	8
	4/\$1 or 5 x 25¢							
	1/50¢, 3/\$1, 4/\$1.25	8	63	12	03	Ŗ	15	8
	1/50¢, 3/\$1, 7/\$2	8	12	48	12	14	%	81
	•1/50¢, 3/\$1, 6/\$2	03	5	3	01	07	B	8
	1/50¢	8	10	8	0	03	8	8
IDM, 5DM, 2DM	-1/1DM, 3/2DM, 10/5DM	02	8	45	18	<b>S0</b>	45	00
	2/IDM, 5/2DM, 14/5DM	8	13	65	<b>5</b> 6	02	65	00
20-Cent, 50-Cent	1/20¢, 3/50¢	8	ક	90	15	05	00	00
1 Franc, 10 Franc, 5 Franc	•1/2F, 3/5F only, 8/10F only	3	10	91	90	05	90	00
l	•1/25¢, 4/1G	90	10	8	<b>1</b> 0	10	8	00
1 Guilder,	1/25¢, 5/1G	00	10	00	8	10	8	00
Twin 100 Yen	2/100Y	00	03	00	70	10	00	00
1 Franc or	1/1F, 3/2F	00	10	10	10	10	00	00
Twin-1 Franc	I/IF	8	10	10	10	10	00	8
5 Franc,	•1/5F, 2/10F	40	10	8	03	<b>6</b>	8	8
10 Franc	-1/10F	80	01	96	05	07	90	8
Twin-2 Franc	•1/2F	03	10	ষ্ট	10	10	8	8
10, 20 Franc	-1/10F, 2/20F	0.2	01	8	05	10	8	8
Twin-1 Sucre	1/3S, 2/5S	00	0.5	00	05	02	00	90
	price settings by adjusting only Function 19. For other price settings, set Function 19 to 00 and set Functions 20 through 25 to the	ice settings,	set Functio	n 19 to 00	and set Fu	inctions 20	through 2	5 to the
values indicated in the chart.								

### DIAGNOSTIC PROCEDURES

### **Display Digits Test**

- Set AUTO-UP/MANUAL-DOWN switch to MANUAL-DOWN and depress ADVANCE. Displays should indicate all 0's.
- 2. Set the switch to AUTO-UP. Displays should sequence from all 0's thru all 9's. Comma segments should come on when odd digits are displayed.
- 3. To stop cycling, set switch to MANUAL-DOWN. Operate ADVANCE pushbutton to step through the tests one number at a time. Set switch to AUTO-UP to resume cycling.

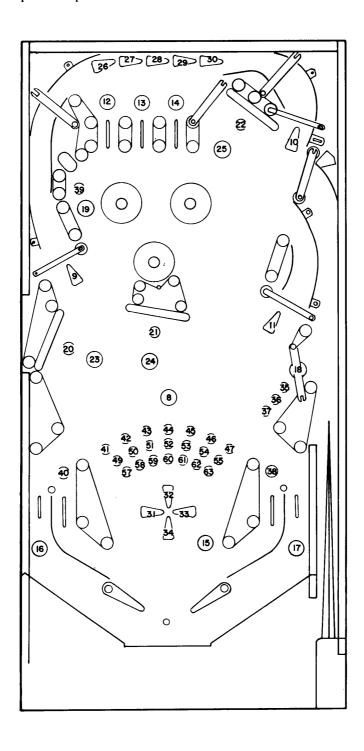
### **Sound Test**

7

- From Display Digits Test depress ADVANCE with the switch set to AUTO-UP. Test 00 should be indicated
  in the Credits display and the Match display should sequence from 00 thru 06. Different sounds should be
  produced for 00, 01, 02, 03, and 04.
- 2. To continuously pulse a single sound, set the toggle switch to MANUAL-DOWN. Operate ADVANCE pushbutton to sequence through sounds one at a time. Set toggle switch to AUTO-UP to resume sequencing.

## Lamp Test

From Sound Test depress ADVANCE with the switch set to AUTO-UP. Test 01 should be indicated in the Credits display and all multiplexed lamps should flash.

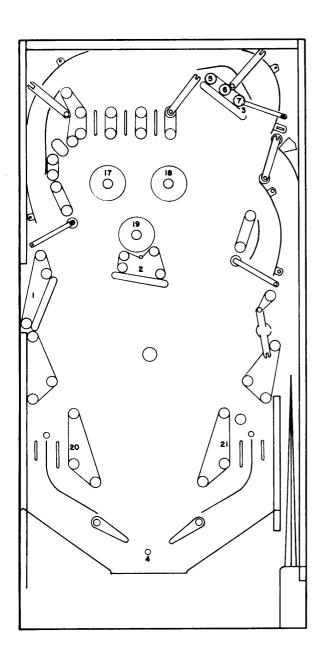


Î

Figure 1. Lamp Matrix

### Solenoid Test

- From Lamp Test depress ADVANCE with the switch set to AUTO-UP. Test 02 should be indicated in the Credits display. The Match display sequences from 01 thru 25. Corresponding solenoids 01 thru 24 are pulsed. Flipper relay is de-energized with subtest 25.
- 2. To continuously pulse a single solenoid set switch to MANUAL-DOWN. Operate ADVANCE pushbutton sequence through the solenoids one at a time. Set switch to AUTO-UP to resume sequencing.



Sol. No.	Function
01	Left Drop Target Bank Reset
02	Center Drop Target Bank Reset
03	Upper Drop Target Bank Release
04	Outhole
05	Upper Drop Target Left Reset
06	Upper Drop Target Center Reset
07	Upper Drop Target Right Reset
08	General Illumination Relay
09	Not Used
10	Not Used
11	Not Used
12	Not Used
13	Not Used
14	Not Used
15	Knocker
16	Coin Lockout
17	Left Jet Bumper
18	Right Jet Bumper
19	Center Jet Bumper
20	Left Kicker
21	Right Kicker
22	Not Used

Figure 2. Playfield Solenoid Locations and Solenoid Chart

Table 4. Solenoid Connections

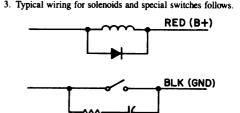
SOL. NO.	FUNCTION	WIRE COLOR	CONNECTIONS	DRIVER TRANS.	SOLENOID PART NO.
01	Left Drop Target Bank Reset	GRY-BRN	2P11-4, 8P3-1	Q15	SA3-23-850-DC
02	Center Drop Target Bank Reset	GRY-RED	2P11-5, 8P3-2	Q17	SA3-23-850-DC
03	Upper Drop Target Bank Release	GRY-ORN	2P11-7, 8P3-3	Q19	SA6-24-750-DC
04	Outhole	GRY-YEL	2P11-8, 8P3-4	Q21	SA-23-850-DC
05	Upper Drop Target Left Reset	GRY-GRN	2P11-9, 8P3-5	Q23	SA5-24-750-DC
06	Upper Drop Target Center Reset	GRY-BLU	2P11-3, 8P3-6	Q25	SA5-24-750-DC
07	Upper Drop Target Right Reset	GRY-VIO	2P11-2, 8P3-7	Q27	SA5-24-750-DC
08	General Illumination Relay	GRY-BLK	2P11-1, 3P7-1	Q29	5580-09555
09	Not Used	BRN-BLK	2P9-9, 7P1-17	Q31	SA2-23-850-DC
10	Not Used	BRN-RED	2P9-7, 8P3-10	Q33	_
11	Not Used	BRN-ORN	2P9-1, 8P3-11	Q35	
12	Not Used	BRN-YEL	2P9-2, 8P3-12	Q37	_
13	Not Used	BRN-GRN	2P9-3, 8P3-13	Q39	
14	Not Used	BRN-BLU	2P9-4, 7P1-3	Q41	
15	Knocker	BRN-VIO	2P9-5, 7P1-17	Q43	_
16	Coin Lockout	BRN-GRY	2P9-6, 7P1-18, 7P2-4	O45	SM-29-1000-DC
*17	Left Jet Bumper	BLU-BRN	2P12-7, 8P3-17	Q2	SG-23-850-DC
*18	Right Jet Bumper	BLU-RED	2P12-4, 8P3-18	Q4	SG-23-850-DC
*19	Center Jet Bumper	BLU-ORN	2P12-3, 8P3-19	Q6	SG-23-850-DC
*20	Left Kicker	BLU-YEL	2P12-6, 8P3-20	Q8	SG1-23-850-DC
*21	Right Kicker	BLU-GRN	2P12-8, 8P3-21	Q10	SG1-23-850-DC
22	Not Used	BLU-BLK	2P12-9, 7P1-22	Q12	_
l	Right Flipper	BLU-VIO	2P12-1, 7P1-7	_	SFL-19-400/
					30-750-DC
	Left Flipper	BLU-GRY	2P12-2, 7P1-9	-	SFL-19-400/ 30-750-DC

#### \*NOTES:

- 1. Special switch connections for solenoids 17 through 21 are as follows:
  - -ORN-BRN--2P13-5, 8P3-24
  - -ORN-RED-2P13-3, 8P3-25 -ORN-BLK-2P13-2, 8P3-26

  - —ORN-YEL—2P13-4, 8P3-27 —ORN-GRY—2P13-8, 8P3-28
- Flipper button connections are as follows:

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

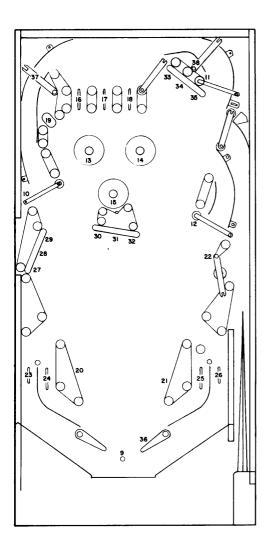


### Switch Test

- From Solenoid Test depress ADVANCE with the switch set to AUTO-UP. Test 03 should be indicated in the Credits display and any stuck switches in the Master display. As stuck switch(es) is displayed a sound is produced. The display continuously cycles through the stuck switches and as they are opened, the number is removed from the sequence. When all switches are open, the Match display is blank and the sounds stop.
- 2. If all switches in a row are displayed, first verify that all are open and then check for a short to ground on the row wire.
- 3. Operate switches; a sound is produced and switch number is momentarily indicated in the ball in play display. If two switches in a row are indicated with one switch closed, check for a short between the column wires; for multiple indication check column wire for short to ground. If two switches in a column are indicated with one switch closed, check for short between row wires.

- 4. If proper indications are obtained in Test 03 but matrix problem is suspected in game play, disconnect lamp connectors 2P5 and 2P7. Recheck in game play. Perform CPU Self-Test if problem remains. If problem is cleared, check for short between lamp matrix and jet bumper mounting brackets.
- 5. Shorted diodes can cause "rectangle" switch problems. For example, consult the switch matrix chart and visualize a situation where the drop target switches, nos. 30 & 31 are down. If the ball makes the upper right "roll under" switch no. 38, a shorted diode on switch no. 30 would cause a playfield tilt. Note that the faulty switch is diagonally opposite the invalidly indicated switch.

Switch



#### No. Function \*(Score) 01 Plumb Bob Tilt Ball Roll Tilt 02 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 Spinner (10/2,000) Upper Right Spinner (10/2,000) 11 12 Lower Right Spinner (10/2,000) 13 Left Jet Bumper (1,000) 14 Right Jet Bumper (1,000) 15 Center Jet Bumper (1,000) "X" (1,000) "Y" (1,000) \*\*16 \*\*17 "Z" (1,000) \*\*18 †19 Top Left Target 20 Left Kicker (10) 21 Right Kicker (10) Right Ball Exit (Note 2) 22 Left Outlane (15,000, Special) 23 24 Left Flipper Return Lane (1,000, Note 1) Right Flipper Return Lane (1,000, Note 1) 25 26 Right Outlane (15,000, Special) +27 Left Drop Target Bank - Left +28Left Drop Target Bank - Center +29Left Drop Target Bank - Right Center Drop Target Bank - Left +30Center Drop Target Bank - Center +31 Center Drop Target Bank - Right +32Upper Drop Target Bank - Left +33Upper Drop Target Bank - Center +34Upper Drop Target Bank - Right +35 36 Lane Change™ ‡37 Left Upper Rollunder **‡38** Right Upper Rollunder Playfield Tilt 40-64 Not Used NOTE 1: (7,000 and spots #3 Drop Target.) NOTE 2: (1,000/10,000 × No. of Drop Target Banks comp., if all three are complete then scores

30,000 and Collect Bonus.)

\*\* Making all three, "X", "Y", and "Z" advances Bonus

‡ Making "Orbit Shot" left to right scores lit value/

+ All Drop Targets score (1,000-7,000 or 14,000) Center Targets also light for (Extra Ball, Special)

\* Second value is for "when lit".

† Scores (1,000, Note 1, Extra Ball)

Multiplier

value advance.

Figure 3. Playfield Switch Locations and Switch Chart

Figure 4. Switch Matrix

### **INITIATING AUTO-CYCLE MODE**

- Set AUTO-UP/MANUAL-DOWN switch to AUTO-UP and depress ADVANCE pushbutton. Test 04 is indicated in Credit display and Function 00 in Match Display.
- 2. Set switch to MANUAL-DOWN and depress ADVANCE to indicate Function 50 in the Match Display.
- 3. Set switch to AUTO-UP and operate Credit button to indicate 15 in Player 1 Display.
- 4. Depress ADVANCE pushbutton to start Auto-Cycle mode. Each cycle of this mode sequences thru the Display Digits Test, Sound Test (00), Lamp Test (01), and Solenoid test (02).
- 5. To terminate the test and return to game over, turn the game OFF and back ON.

### CPU BOARD SELF-TEST

Depress the DIAGNOSTIC pushbutton on the left side of the CPU Board. The following indications are provided. With 0 indication the game returns to the game over mode.

- 0 Test Passed
- 1 IC13 RAM Faulty
- 2 IC16 RAM Faulty
- 3 IC17 ROM 2 Faulty
- 4 IC17 ROM 2 Faulty
- 5 IC20 ROM 1 Faulty 6 - IC14 Game ROM 1 Faulty
- 7 IC26 Game ROM 0 Faulty
- 8 IC19 CMOS RAM or Memory Protect Circuit Faulty
- 9 Coin-door closed, Memory Protect Circuit Faulty, or IC19 CMOS RAM Faulty.

Note that "0" remaining after power turn-on indicates CPU Board lockup.

### SOUND BOARD SELF-TEST

Depress DIAGNOSTIC pushbutton on the top of the Sound Board. Several electronic sounds should be produced. This sequence of sounds is repeated until the game is turned OFF and back ON.

"Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."