

BARRACORA

INSTRUCTION BOOKLET

This booklet provides game operation, bookkeeping, game adjustment, diagnostic, and self-test procedures for BARRACORA. 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. 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 blue-labeled 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 4. (Jumpers W3, W5, W7, W9, W10, W12, and W15 connected; W2, 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

*Indicates adjustable features.

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 - Three balls must be resting on ball ramp or ball shooter switches (maximum of one ball in ball shooter trough) before game will start. Push credit button, startup tune played, ball served, credit display reduced by 1, player 1 score flashes 00 until first scoring switch is made, ball in play display shows 1. Pushing credit button before ball 2 allows additional players.

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Bonus Advance - One advance for top lane rollovers, flipper return lane rollovers, and outlane rollovers. Making B-A-RR and A-C-O-R-A drop targets in sequence spots lamps in the BARRACORA lane. Making the lane rollover awards one advance for each lit letter. With bonus at maximum (29,000), 1,000 points is scored in lieu of each bonus advance. Completing the B-A-RR or A-C-O-R-A drop target bank advances the Bonus Multiplier from 2X through 5X. Completing both drop target banks advances Super Bonus Multiplier from 2X through 5X. When the bonus is collected it is equal to the Super Bonus Multiplier times the Bonus Multiplier times the accrued Bonus (up to 25 times the accrued Bonus).

Top Lanes - Making a top rollover switch lights the 1, 2, or 3 lamp. If the respective 1, 2, or 3 lamp affected is already lit, the 4, 5, or 6 lamp directly underneath is lit. The right flipper *Lane Change*[™] switch rotates the 1, 2, and 3 lamps from right to left and the left flipper *Lane Change* switch rotates the 4, 5, and 6 lamps from left to right. Lighting lamps 1, 2, and 3 advances the lower eject hole lamps (30,000, 60,000, & 90,000) and lighting lamps 4, 5, and 6 advances the upper right bull's-eye target values (20,000, 40,000, & Extra Ball). Completing lamps 1, 2, 3, 4, 5, and 6 lights the upper eject hole to collect the bonus. Note that if you collect the bonus from this eject hole the bonus collected will be the Super Bonus Multiplier times the Bonus Multiplier times the bonus, and only the bonus multipliers will not reset.

Multi-Ball[™] **Play** - Completing the B-A-RR drop target bank lights the lower eject hole lock arrow and completing the A-C-O-R-A drop target bank lights the upper eject hole lock arrow. Making the lower eject hole when the lock arrow lamp is lit initiates 2-ball *Multi-Ball* play. With both eject hole lock arrows lit, the first ball must be locked in the upper eject hole and the next ball in the lower eject hole for 3-ball *Multi-Ball* play. If the first ball is locked in the lower eject hole, only 2-ball *Multi-Ball* play is achieved. If the ball in play drains while a ball is locked in the upper eject hole, the locked ball is released and played out.

Target Bonus - The left bull's-eye target advances the Target Bonus and the right bull's-eye target advances the Target Bonus multiplier value. Making the horseshoe shot scores the Target Bonus and resets the bonus lamps. If the lit bonus and multiplier lamps are lined up, they are not reset until collected twice.

Bonus Ball - A bonus ball will be awarded to the player with the highest score out of 2 or more players for 30* seconds of extra play.

Memory - Drop targets and all lamp features except regular bonus multipliers.

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.

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 ADVANCE 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. To return to game over, set the switch to AUTO-UP and depress ADVANCE.
 - a. 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

FUNCTION	DESCRIPTION		
	PLAYER 1	PLAYER 2	PLAYER 4
00	Game Identification (2510 1)	—	—
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	—	—
12	Current High Score to Date	—	—
13	Backup High Score to Date	High Score 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	1,200,000
15	Replay 2 Score [Times exceeded]	2	2,500,000
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 (00-08)	4	01/02
20	Left Coin Slot Multiplier	4	01/09
21	Center Coin Slot Multiplier	4	04/45
22	Right Coin Slot Multiplier	4	01/18
23	Coin Units Required for Credit	4	01/05
24	Coin Units Bonus Point	4	00/45
25	Minimum Coin Units	4	00
26	Match: 00 = Match ON; 01 = Match OFF	-	00
27	Special: 00 = Awards Credit; 01 = Awards Extra Ball or Bonus Ball; 02 = Awards Points	-	01
28	Replay Scores: 00 = Awards Credit; 01 = Awards Extra Ball or Bonus Ball	-	00
29	Maximum Plumb Bob Tilts	-	03
30	Number of Balls (03 or 05)	-	03
31	Bull's-Eye 20,000, 40,000 Lamps; 01 = Not reset when collected 00 = Reset when collected	-	01
32	Background Sound: 00 = ON, 01 = OFF	-	00
33	Bonus Ball Timing 01-99 Seconds (00=disabled)	-	30
34	Not Used	-	
35	Target Bonus: 00 = 2x/5,000 lit initially. 01 = Not lit initially.	-	00
36	Not Used.		
37	Not Used.		
38	Not Used.		
39	Not Used		
40	High Score Credits	1	03
41	Maximum Extra Balls at one time (00 = No Extra Ball)	-	04

* Second Factory Setting value is with jumper W25 on CPU Board connected.

[] Description in brackets shown in Player 2 Display.

- 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.
- 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.
- Setting Maximum Credits (Function 18) to zero places the game in a **free play mode**.
- 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.

RECOMMENDED REPLAY LEVELS CREDIT

3-Ball: 1,200,000; 2,500,000*

5-Ball: 2,800,000; 4,800,000

EXTRA BALL

3-Ball: 600,000; 1,800,000

5-Ball: 1,000,000; 2,500,000

*Factory Setting

DIAGNOSTIC PROCEDURES

Display Digits Test

1. 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

1. 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

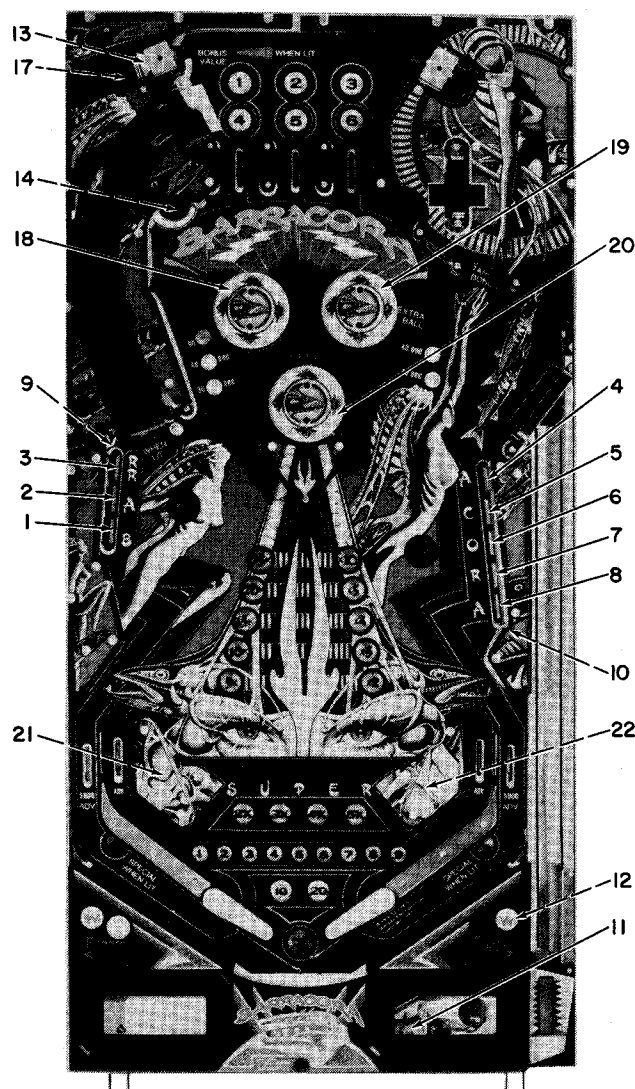
From Sound Test depress ADVANCE with the switch set to AUTO-UP. Test 01 should be indicated in the Credits display and all multiplexed lamps should flash.

COLUMNS ROW	1	2	3	4	5	6	7	8
	YEL-BRN 2J5-8	YEL-RED 2J5-9	YEL-ORN 2J5-6	YEL-BLK 2J5-7	YEL-GRN 2J5-3	YEL-BLU 2J5-5	YEL-VIO 2J5-1	YEL-GRY 2J5-2
1 RED-BRN 2J7-1	SAME PLAYER SHOOTS AGAIN (BACKBOX)	B	"1"	SPINNER (X 1000 W/LIT)	UPPER RIGHT BULL'S-EYE TARGET 20,000	RIGHT BULL'S-EYE TARGET 2X	SUPER 5X BONUS MULTIPLIER	BONUS 4
2 RED-BLK 2J7-2	BALL IN PLAY	A	"2"	SHOOT AGAIN (PLAYFIELD)	UPPER RIGHT BULL'S-EYE TARGET 40,000	RIGHT BULL'S-EYE TARGET 3X	2X BONUS MULTIPLIER	BONUS 5
3 RED-ORN 2J7-3	TILT	RR	"3"	LOWER EJECT HOLE 30	UPPER RIGHT BULL'S-EYE TARGET EXTRA BALL W/LIT	RIGHT BULL'S-EYE TARGET 4X	3X BONUS MULTIPLIER	BONUS 6
4 RED-YEL 2J7-4	GAME OVER	A	"4"	LOWER EJECT HOLE 60	LEFT BULL'S-EYE TARGET 5,000	RIGHT BULL'S-EYE TARGET 5X	4X BONUS MULTIPLIER	BONUS 7
5 RED-GRN 2J7-5	MATCH	C	"5"	LOWER EJECT HOLE 90	LEFT BULL'S-EYE TARGET 10,000	RIGHT BULL'S-EYE TARGET 10X	5X BONUS MULTIPLIER	BONUS 8
6 RED-BLU 2J7-6	HIGH SCORE TO DATE	O	"6"	LOWER EJECT HOLE LOCK ARROW	LEFT BULL'S-EYE TARGET 15,000	SUPER 2X BONUS MULTIPLIER	BONUS 1	BONUS 9
7 RED-VIO 2J7-9	B-A-RR DROP TARGET BANK	R	LEFT SPECIAL	UPPER EJECT HOLE LOCK ARROW	LEFT BULL'S-EYE TARGET 20,000	SUPER 3X BONUS MULTIPLIER	BONUS 2	BONUS 10
8 RED-GRY 2J7-8	A-C-O-R-A DROP TARGET BANK	A	RIGHT SPECIAL	UPPER EJECT HOLE COLLECT BONUS	LEFT BULL'S-EYE TARGET 25,000	SUPER 4X BONUS MULTIPLIER	BONUS 3	BONUS 20

Figure 1. Lamp Matrix

Solenoid Test

1. 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	B Drop Target Reset
02	A Drop Target Reset
03	RR Drop Target Reset
04	A Drop Target Reset
05	C Drop Target Reset
06	O Drop Target Reset
07	R Drop Target Reset
08	A Drop Target Reset
09	B-A-RR Drop Target Bank Release
10	A-C-O-R-A Drop Target Bank Release
11	Ball Release
12	Ball Ramp Thrower
13	Upper Eject Hole
14	Lower Eject Hole
15	Bell
16	Coin Lockout
17	Upper Eject Hole Gate
18	Left Jet Bumper
19	Right Jet Bumper
20	Bottom Jet Bumper
21	Left Kicker
22	Right Kicker

Figure 2. Playfield Solenoid Locations and Solenoid Chart

Table 4. Solenoid Connections

SOL. NO.	FUNCTION	WIRE COLOR	CONNECTIONS	DRIVER TRANS.	SOLENOID PART NO.
01	Top Eject Hole	GRY-BRN	2P11-4, 8P3-1	Q15	SG-23-850-DC
01	B Drop Target Reset	GRY-BRN	2P11-4, 8P3-1	Q15	SA5-24-750-DC
02	A Drop Target Reset	GRY-RED	2P11-5, 8P3-2	Q17	SA5-24-750-DC
03	RR Drop Target Reset	GRY-ORN	2P11-7	Q19	SA5-24-750-DC
04	A Drop Target Reset	GRY-YEL	2P11-8, 8P3-4	Q21	SA5-24-750-DC
05	C Drop Target Reset	GRY-GRN	2P11-9, 8P3-5	Q23	SA5-24-750-DC
06	O Drop Target Reset	GRY-BLU	2P11-3, 8P3-6	Q25	SA5-24-750-DC
07	R Drop Target Reset	GRY-VIO	2P11-2, 8P3-7	Q27	SA5-24-750-DC
08	A Drop Target Reset	GRY-BLK	2P11-1, 8P3-8	Q29	SA5-24-750-DC
09	B-A-RR Drop Target Bank Release	BRN-BLK	2P9-9, 8P3-9	Q31	SA6-24-750-DC
10	A-C-O-R-A Drop Target Bank Release	BRN-RED	2P9-7, 8P3-10	Q33	SA6-24-750-DC
11	Ball Release	BRN-ORN	2P9-1, 8P3-11	Q35	SA3-23-850-DC
12	Ball Ramp Thrower	BRN-YEL	2P9-2, 8P3-12	Q37	SG1-23-850-DC
13	Upper Eject Hole	BRN-GRN	2P9-3, 8P3-13	Q39	SG1-23-850-DC
14	Lower Eject Hole	BRN-BLU	2P9-4, 8P3-14	Q41	SG1-23-850-DC
15	Bell	BRN-VIO	2P9-5, 7P1-17	Q43	SM-29-100-DC
16	Coin Lockout	BRN-GRY	2P9-6, 7P1-18, 7P2-4	Q45	SM-35-4000-DC
17	Upper Eject Hole Gate	BLU-BRN	2P12-7, 8P3-17	Q2	SM-35-4000-DC
*18	Left Jet Bumper	BLU-RED	2P12-4, 8P3-18	Q4	SG1-23-850-DC
*19	Right Jet Bumper	BLU-ORN	2P12-3, 8P3-19	Q6	SG1-23-850-DC
*20	Bottom Jet Bumper	BLU-YEL	2P12-6, 8P3-20	Q8	SG1-23-850-DC
*21	Left Kicker	BLU-GRN	2P12-8, 8P3-21	Q10	SG1-23-850-DC
*22	Right Kicker	BLU-BLK	2P12-9, 8P3-22	Q12	SG1-23-850-DC
	Right Flipper	BLU-VIO	7P1-8, 8P3-34	--	SFL-19-400/ 30-750-DC
	Left Flipper	BLU-GRY	7P1-10, 8P3-32	--	SFL-19-400/ 30-750-DC

***NOTES:**

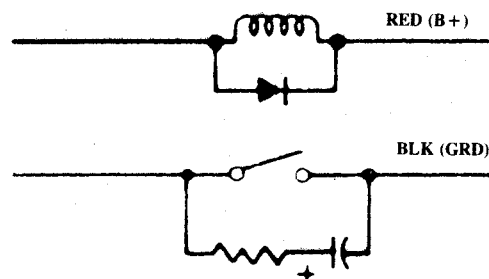
- Special switch connections for solenoids 18 through 22 are as follows:

18 -- ORN-RED -- 2P13-3, 8P3-25
 19 -- ORN-BLK -- 2P13-2, 8P3-26
 20 -- ORN-YEL -- 2P13-4, 8P3-27
 21 -- ORN-GRN -- 2P13-8, 8P3-28
 22 -- ORN-BLU -- 2P13-9, 8P3-29

- Flipper button connections are as follows:

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

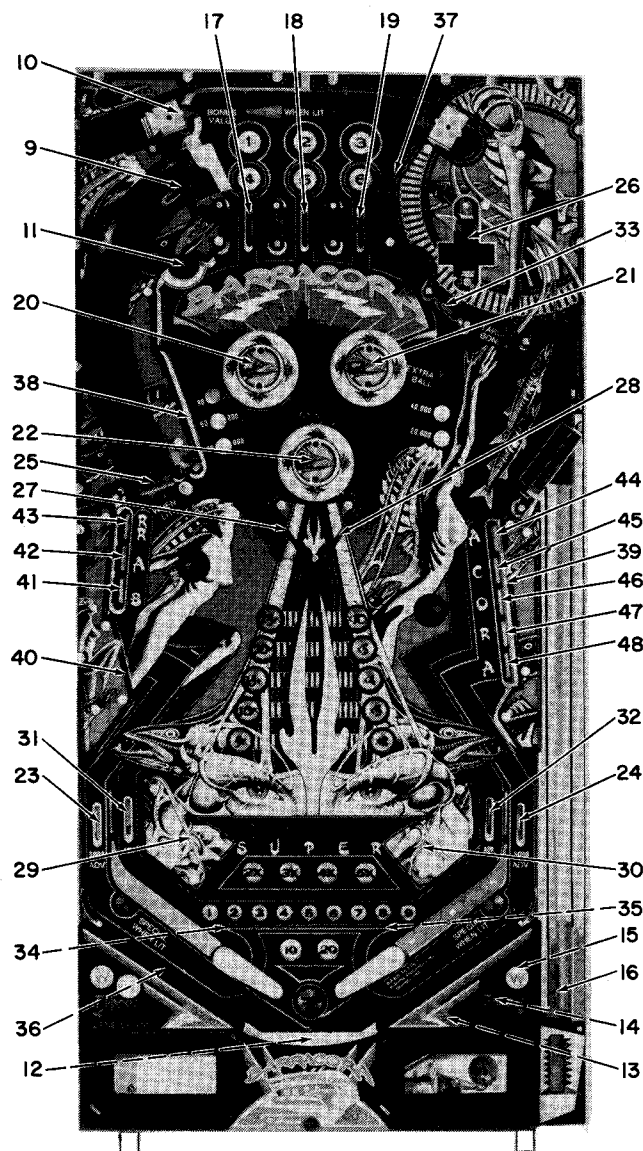
- Typical wiring for solenoids and special switches.



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.
- 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 cleared, check for short between lamp matrix and jet bumper mounting brackets.
5. Shorted diodes can cause "rectangle" switch matrix problems as follows:
The "B" target down (switch 41), the top "A" target down (switch 44), and with a ball hitting the upper right Bull's-Eye Target (switch 33), a shorted diode at switch 41 would cause switch 36 Playfield Tilt to be indicated. Note that the "rectangle" is always completed with an incorrect switch diagonally opposite from the switch with the shorted diode.



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	"BARRACORA" Lane Rollover (10,000)
10	Upper Eject Hole (10,000)
*11	Lower Eject Hole (10,000)
12	Outhole
13	Left Ball Ramp Switch
14	Center Ball Ramp Switch
15	Right Ball Ramp Switch
16	Ball Shooter Trough Rollover
17	1/4 Lane Rollover (1,000)
18	2/5 Lane Rollover (1,000)
19	3/6 Lane Rollover (1,000)
20	Left Jet Bumper (100)
21	Right Jet Bumper (100)
22	Bottom Jet Bumper (1,000)
23	Left Outside Rollover (5,000)
24	Right Outside Rollover (5,000)
25	Spinner Target (100/1,000)
26	Right Turnaround (2,000)
27	Left Bull's-Eye Target (100)
28	Right Bull's-Eye Target (100)
29	Left Kicker (10)
30	Right Kicker (10)
31	Left Inside Rollover (1,000)
32	Right Inside Rollover (1,000)
*33	Upper Right Bull's-Eye Target (10,000)
34	Left Flipper Lane Change Switch
35	Right Flipper Lane Change Switch
36	Playfield Tilt
37	Upper Right Standup (10)
38	Lower Standup (10)
39	5-Bank Standup (10)
40	Lower Left Standup (10)
41	B Drop Target (1,000)
42	A Drop Target (1,000)
43	RR Drop Target (1,000)
44	A Drop Target (1,000)
45	C Drop Target (1,000)
46	O Drop Target (1,000)
47	R Drop Target (1,000)
48	A Drop Target (1,000)

*Scores for switches 09, 11, and 33 doubled and tripled during 2- and 3-ball Multi-Ball™ play. With full bonus (29,000) 1,000 points is scored in lieu of each bonus advance.

Figure 3. Playfield Switch Locations and Switch Chart

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

Figure 5. Switch Matrix

INITIATING AUTO-CYCLE MODE

1. 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."