

16-2006-101
March 1989

ATLANTIS

Operations
and
Parts Information
Manual

Bally
MIDWAY



ROM Summary

6803 CPU A084-91786-G000 Memory & Jumper Combinations

Game Name	Game No.	Released	U2	U3	Jumpers
Eight Ball Champ	0B38	Aug 1985	Not Used	0838-00803-0005	2,4,6,8,10
Beat The Clock	0C70	Nov 1985	Not Used	0C70-00803-0005	2,4,6,9,10
Lady Luck	0E34	Feb 1986	Not Used	0E34-00803-0005	2,4,6,8,10
Motor Dome	0E14	May 1986	E14A-42AAE-BX40	E14A-42AAE-CX4D	2,4,6,8,10
Black Belt	0E52	Jul 1986	0E52-00803-0001	0E52-00803-0002	2,4,6,8,10
Special Force	0E47	Sep 1986	0E47-00803-0004	0E47-00803-0005	2,4,6,9,10
Strange Science	0E35	Dec 1986	0E35-00803-0001	0E35-00803-0002	2,4,6,9,10
City Slicker	0E79	Feb 1987	0E79-00803-0002	0E79-00803-0003	2,4,6,9,10
Hard Body	0E94	Mar 1987	E94A-12601-0000	E94A-12602-0000	2,4,6,9,10
Party Animal	0H01	May 1987	H01A-12601-0000	H01A-12602-0000	2,4,6,9,10
Heavy Metal	0H03	Jun 1987	H03A-12601-0000	H03A-12602-0000	2,4,6,9,10
Dungeons & Dragons	0H06	Oct 1987	H06A-12601-0000	H06A-12602-0000	2,4,6,9,10
Escape From Lost World	0H05	Jan 1988	H05A-12601-0000	H05A-12602-0000	2,4,6,9,10
Blackwater 100	0H07	Mar 1988	H07A-12601-0000	H07A-12602-0000	2,4,6,8,10
Truck Stop	2001	Oct 1988	H08A-12601-0000	H08A-12602-0000	2,4,6,9,10
Atlantis	2006	Feb 1989	2006-12601-0000	2006-12602-0000	2,4,6,9,10

Note: See BALLY-MIDWAY Service Bulletin dated December 26, 1985, summarized below...

Subject: BEAT THE CLOCK and subsequent pinball games.

Symptom: LED flashes eight times, but game fails to power up.

Cause: Starting with BEAT THE CLOCK, game 300, the U3 program was modified for internal testing.

Cure: Current boards include a 100K ohm, 1/4-watt pullup resistor. This runs between the +5-volt bus and pin 12 of microprocessor U1.

ATLANTIS COIL TABLE

SOL NO.	SOLENOID DESCRIPTION	SOL TYPE	WIRE COLOR	CONNECTIONS		SOLENOID PART NUMBER
				CONTROL BOARD	DRIVER TRANSISTOR	
01	Right Slingshot	Momentary	White-Red	CJ9-1	Q18	A365-00067-0029
02	Left Bumper	Momentary	Yellow-White	CJ6-4	Q14	A365-00067-0006
03	Drop Target Reset	Momentary	Yellow-Blue	CJ6-2	Q12	A365-00067-0019
04	Right Bumper	Momentary	Blue-White	CJ8-6	Q15	A365-00067-0006
05	Middle Bumper	Momentary	Blue-Orange	CJ8-7	Q16	A365-00067-0006
06	Left Slingshot	Momentary	Yellow-Brown	CJ6-5	Q17	A365-00067-0029
07	Popper Kicker	Momentary	Yellow-Red	CJ6-1	Q11	A365-00067-0029
08	Ramp Lift	Momentary	Yellow-Green	CJ6--3	Q13	A365-00067-0006
09	Ball Eject	Momentary	White-Brown	CJ9-6	Q22	A365-00067-0006
10	Outhole	Momentary	White-Black	CJ9-8	Q39	A365-00067-0006
11	Knocker*	Momentary	White-Gray	CJ9-11	Q40	A365-00067-0006
12	Submarine Eject	Momentary	Yellow-Violet	CJ6-7	Q10	A365-00067-0006
13	Not Used	Continuous	Blue-Green	CJ9-10	Q8	--
14	Flipper Enabling Relay	Continuous	--	--	Q7	114E-00001-0011
15	Drain Plug	Momentary	White-Blue	CJ9-2	Q19	A365-00067-0006
16	Ramp Down	Momentary	White-Yellow	CJ9-3	Q20	SM-28-900-DC
17	Saucer	Momentary	White-Green	CJ9-4	Q21	A365-00067-0006
18	Reserved for German	Momentary	White-Orange	CJ9-7	Q38	--
19	Not Used	Continuous	White-Violet	CJ9-9	Q9	--
FLIPPER DESCRIPTION		WIRE COLORS & CONNECTORS				
20	Left Flipper	Gray: CJ6-8				FL-11630
21	Right Flipper	Gray-White: CJ6-9				FL-11630

NOTES:

- For continuous solenoid 19, install jumper JW8. Remove jumper JW9.
- To use switch strobe at CJ4-1, install jumper JW9. Remove jumper JW8.
- To use extra display at CJ2-19, install jumper JW11. Remove jumper JW10.
- *Knocker is located in the backbox.

Registers and Options Table

Category	Register Directory			
	Player #1 & 2 Displays	Player #3 & 4 Displays	See Notes	Register Description
Game Status	Total coins	XXXXXXXX	1	Total, all chutes
	Games played	XXXXXXXX	1	Number of games
	Replays awarded	XXXXXXXX	1	Number of replays
	Replays percent	XX	1	Percent of replays
	Avg game time	XX XX	1	Minutes: seconds
	Balls played	XXXXXXXX	1	Number of heats
	X-balls awarded	XXXXXXXX	1	Number of extra balls
	X-ball percent	XX	1	Percent extra balls awarded
	Avg ball time	XX XX	1	Minutes: seconds
	Clear account	NO**	2	Clear accounting data
Replay Status	Level 1 special	XXXXXXXX	1	No. of 1st Threshold specials awarded
	Level 2 special	XXXXXXXX	1	No. of 2nd Threshold specials awarded
	Level 3 special	XXXXXXXX	1	No. of 3rd Threshold specials awarded
	High score spcl	XXXXXXXX	1	No. of high score specials awarded
	Playfield special	XXXXXXXX	1	No. of playfield specials awarded
	Match special	XXXXXXXX	1	No. of match feature specials awarded
Scoring Status	Level 1 score	XXXXXXXX	3	Set and display first award level
	Level 2 score	XXXXXXXX	3	Set and display second award level
	Level 3 score	XXXXXXXX	3	Set and display third award level
	High score =	XXXXXXXX	3	Set high score replay level
	Times HS beaten	XXXXXXXX	1	Times point total exceeded high score
	Level 1 percent	XX	1	% of first level replays awarded
	Level 2 percent	XX	1	% of second level replays awarded
	Level 3 percent	XX	1	% of third level replays awarded
	Target percent	XX	4	Enter desired % replays awarded for reaching first threshold level
Coin Status	Left coins =	XXXXXXXX	1	No. of coins through left coin chute
	Middle coins =	XXXXXXXX	1	No. of coins through middle coin chute
	Right coins =	XXXXXXXX	1	No. of coins through right coin chute
	Total coins =	XXXXXXXX	1	Total coins through all chutes
	Bonus credits	XXXXXXXX	1	No. of bonus credits awarded
Coin Setup***	Left XX Coin	YY CRDT, ZZ BONS	10	Left coin chute setup
	Middle XX Coin	YY CRDT, ZZ BONS	10	Middle coin chute setup
	Right XX Coin	YY CRDT, ZZ BONS	10	Right coin chute setup

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

**Factory Setting.

***See Coin Setup Procedure examples

Category	Register Directory			
	Player #1 & 2 Displays	Player #3 & 4 Displays	See Notes	Register Description
Misc. Information	Total Time =	XXXXXXX	1	Time (in minutes) that the game is powered up. Starts when the game is ready for play.
Game Setup	Factory setting	No**	2	Reset to factory selected options
	Credit limit =	10**	5	Set credit limit from 1 through 40
	Balls allowed	03**	5	Number of balls allowed (1-5)
	Levels award	Replay**	6	Set award for exceeding thresholds
	Special award	Replay**	6	Set award for Feature Specials
	HiScore award	3 Replay**	7	Set award for exceeding high score
	Bkground sound	On**	8	Provide background music
	Match percent	10**	5	Set allowed match percent, 00-10%
	Display credits	Yes**	2	Display credits when game is over
	No limit replay	Yes**	2	Allow more than 1 special per player
	Free play	No**	2	NO = coins, or YES = Free Play Mode
	Tilt warning	01**	5	Number of tilt warnings (0 through 3)
	Attract sounds	On**	8	Attract sound in Game-Over Mode
Game Checkup	Slingshots	On**	8	Activate slingshots
	Game options	Medium**	9	Set difficulty level
	Maximum players	04**	5	Number of players allowed (1-4)
	All lamps			Flashes playfield lamps.
	Single lamps			Lamps flash sequentially until you press either lower flipper button. Advance to next lamp in test by pressing lower right flipper button. Press lower left flipper button to back up to previous test.
	Display Test			Continuously cycles through all segments of a selected digit in either display module. Press the right flipper button to advance to the next digit to the right. Press the left flipper button to back up one digit.
Game Checkup	Coil Test			To advance to the next solenoid, press the right flipper button. To test the same solenoid, press the left flipper button.
	Program version			Program version of U2 and U3
	Switch Test			Game displays name of stuck switch

NOTES:

1. Feature can only be reset to 00.
2. Feature can only be changed to YES (enabled) or NO (disabled).
3. Feature can be changed in .100,000 point steps.
4. Feature has a value from 00 through 20. If this setting is 00, self-percentaging feature is off (disabled).
5. Feature can be changed in unit steps.
6. Feature can be changed to REPLAY, XBALL, POINTS or NOTHING.
7. Feature can be changed to 3 REPLAYS, 2 REPLAYS, 1 REPLAY or NOTHING.
8. Feature can be changed to ON (enabled) or OFF (disabled).
9. Feature can be changed to XX-EASY, X-EASY, MEDIUM, HARD, X-HARD or XX-HARD.
10. Coin value XX buys YY credits. The game awards bonus credits when the player buys ZZ credits.

Category	Register Directory	
	Player #1, 2, 3 & 4 Displays	Register Description
Help Read Me Help	AV BALL TIME IS HIGH XX YY	If average ball time is more than 60 seconds.
	AV BALL TIME IS LOW XX YY	If average ball time is less than 30 seconds.
	RAISE LEVEL 1 TO X,X00,000	The next adjustable threshold appears as X,X00,000 when both of these conditions occur: (1) "Threshold #1 Percent" exceeds "Target Percent." (2) At least 100 games have been played.
	LOWER LEVEL 1 TO X,X00,000	Adjustable threshold appears as X,X00,000 when both of these conditions occur: (1) "Threshold #1 Percent" is less than "Target Percent." (2) At least 100 games have been played.
	CHECK SWITCHS IN GAME CHECKUP	One or more playfield switches remain closed.
	SWITCH XX MAY BE OPEN	During at least five minutes of play, one switch hasn't closed.
	CHECK LEFT COINS CHUTE	Left coin switch is stuck.
	CHECK MIDDLE COINS CHUTE	Middle coin switch is stuck.
	CHECK RIGHT COINS CHUTE	Right coin switch is stuck.
	All OK	Game is okay. If the game detects a problem, assistance information appears on game displays.

COIN SETUP PROCEDURE

You may use factory settings for convenience, or price a game of pinball as you desire. Coin Setup is a simple procedure involving three settings for each coin chute. (U.S. games have two coin chutes.) Suggested settings are provided in the Pricing Table, later in this chapter.

Your coin settings alter values in the Coin Setup Category of game registers. (See the Registers and Options Table.) First you select the left or right coin chute. Then you set the cost of a game. You do this by adjusting the ratio, number of coins per number of credits (games). Finally you set the

bonus value. We'll define "bonus" in a moment. But first, let's get the hang of coin setup with a few examples...

EXAMPLE 1

You want to set the right coin chute at three credits for two coins. Also, you don't want to award any credits for the first coin.

[] 1. Enter the Coin Setup category.

[] 2. Enter the directory

[] 3. Set the directory to RIGHT, 02 COIN, 03 CREDIT and 00 BONS.

See Example	Step	Player 1 Display	Player 2 Display	Player 3 Display	Player 4 Display
1	1	RIGHT	XX COIN	YYCREDIT	XX BONS
1	2	RIGHT	02 COIN	03 CREDIT	00 BONS
2	1	RIGHT	XX COIN	YY CREDIT	XX BONS
2	2	RIGHT	01 COIN	01 CREDIT	02 BONS

EXAMPLE 2

You want to set the right coin chute at three credits for two coins. The game must award one credit for the first coin. You also desire the game to award two credits on the second coin.

BONUS CONCEPT. To achieve the Example 2 coin setting, you must specify bonus credits (XX BONS). You may specify any two-digit number. Select the number of coins that enter a coin chute before bonus is awarded. No more than one bonus credit can be awarded.

[] 1. Enter the Coin Setup category.

[] 2. Enter the directory.

[] 3. Set the directory to RIGHT, 01 COIN, 01 CREDIT and 02 BONS.

Pricing Table

*Indicates recommended setting

Country	Coin Chute		Games/Coin	Player 1 Display	Player 2 Display	Player 3 Display	Player 4 Display
	Left	Center Right					
USA	25c	- 25c	1/25, 4/\$1* (1)	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS
			1/50, 2/\$1, 4/\$1.50	LEFT RIGHT	02 COIN 02 COIN	01 CREDIT 01 CREDIT	03 BONS 03 BONS
			1/50, 2/\$1	LEFT RIGHT	02 COIN 02 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS
			1/25, 3/50, 6/\$1	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 01 CREDIT	02 BONS 02 BONS
			2/25, 8/\$1	LEFT RIGHT	01 COIN 01 COIN	02 CREDIT 02 CREDIT	00 BONS 00 BONS
Canada	25c	- \$1	1/25, 5/\$1*	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 04 CREDIT	00 BONS 04 BONS
West Germany	1DM, 2DM, 5DM		1/1, 2/2, 7/5 DM	LEFT MIDDLE RIGHT	01 COIN 01 COIN 01 COIN	01 CREDIT 02 CREDIT 07 CREDIT	00 BONS 00 BONS 00 BONS
			1/1, 2/2, 6/5 DM*	LEFT MIDDLE RIGHT	01 COIN 01 COIN 01 COIN	01 CREDIT 02 CREDIT 06 CREDIT	00 BONS 00 BONS 00 BONS
			1/1, 3/2, 9/5 DM	LEFT MIDDLE RIGHT	01 COIN 01 COIN 01 COIN	01 CREDIT 02 CREDIT 09 CREDIT	00 BONS 01 BONS 00 BONS
			1/2x1DM, 1/2, 3/5DM	LEFT MIDDLE RIGHT	02 COIN 01 COIN 01 COIN	01 CREDIT 02 CREDIT 05 CREDIT	00 BONS 00 BONS 00 BONS
			2/1, 5/2, 14/5DM	LEFT MIDDLE RIGHT	01 COIN 01 COIN 01 COIN	02 CREDIT 05 CREDIT 14 CREDIT	00 BONS 00 BONS 00 BONS
France	1F, 5F, 10F		1/1, 3/5, 7/10F*	LEFT MIDDLE RIGHT	01 COIN 01 COIN 01 COIN	01 CREDIT 03 CREDIT 07 CREDIT	00 BONS 00 BONS 00 BONS
Belgium	20F - 20F		1/20, 1/20*	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS
Switzer- land	1F - 2F		1/1, 7/2*	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 07 CREDIT	00 BONS 00 BONS
Japan	100Y - 100Y		1/100*	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS
Italy	200L - 500L		1/2x200, 3/2x500*	LEFT RIGHT	02 COIN 02 COIN	01 CREDIT 03 CREDIT	00 BONS 00 BONS
Australa	20c - 20c		1/3x20, 1/3x20*	LEFT RIGHT	03 COIN 03 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS

Pricing Table, Continued

*Indicates recommended setting

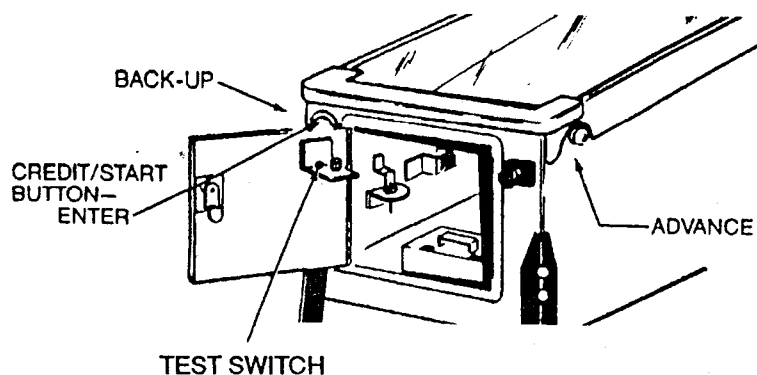
Country	Coin Chute			Games/Coin	Player 1 Display	Player 2 Display	Player 3 Display	Player 4 Display
	Left	Center	Right					
United Kingdom	10 Pence-1 Pound			1/2x10P, 6/1L*	LEFT RIGHT	02 COIN 01 COIN	01 CREDIT 06 CREDIT	00 BONS 00 BONS
Denmark	1Kroner-10Kroner			1/2x1Kr, 7/10 Kr*	LEFT RIGHT	02 COIN 01 COIN	01 CREDIT 07 CREDIT	00 BONS 00 BONS
Finland	1Markka-5 Mka			1/2x1 Mka, 3/5 Mka*	LEFT RIGHT	02 COIN 01 COIN	01 CREDIT 03 CREDIT	00 BONS 00 BONS
Norway	1Kroner-5 Kroner			1/3x1 Kr, 2/5 Kr*	LEFT RIGHT	03 COIN 01 COIN	01 CREDIT 02 CREDIT	00 BONS 00 BONS
Sweden	5 Kroner-5 Kroner			2/5 Kr*	LEFT RIGHT	01 COIN 01 COIN	02 CREDIT 02 CREDIT	00 BONS 00 BONS
Holland	1 Guilder - 1 G			1/1 G*	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS

GAME CHECKUP REGISTERS

The following registers are located in the Game Checkup category of Test Mode...

- Lamps
- Single lamps
- Display Test
- Coil Test
- Program version
- Switch Test

Except the Program Version register, these are Diagnostic Test registers. The Program Version register displays EPROM program version information. The application of each Diagnostic Test register is explained in Chapter 4. An abbreviated description of these registers is given in the Game Checkup category of the *Registers & Options Table*.



DIAGNOSTIC TESTS

Operate Diagnostic Tests as follows:

NOTICE

At any time, you can exit from Test Mode by pressing the TEST button.

[] 1. Enter the Game Checkup category's directory. Select a register by using the CREDIT button and either of the flipper buttons. The procedure is described at Steps 1 through 4 of Game Adjustments.

[] 2. When the selected register appears in the display, press the CREDIT button. Pressing CREDIT opens the register and begins tests. Until you exit the directory, flipper buttons are used in sequencing through register tests.

[] 3. When the test is completed, (except Switch Test), press the CREDIT button again. Pressing CREDIT causes the game to enter the next register. Repeating this procedure advances you to the end of the directory. The last register in the directory is Switch Test.

[] 4. After completing Switch Test, exit from the register and the directory. Do this by holding in the CREDIT button for one full second. Or exit from Test Mode by pressing the TEST button.

NOTICE

SINGLE LAMPS TEST OR COIL TEST. Holding in the right flipper button advances the display from driver to driver. Holding in the left flipper button displays drivers in reverse.

Chapter 4, Troubleshooting contains Diagnostic Test procedures for the following test registers...

- All Lamps
- Single Lamps
- Display Test
- Coil Test
- Switch Test

SELF-PERCENTAGING

Self-Percentaging is the game's ability to automatically adjust the First Replay Threshold score. This score is adjusted to attain a desired replay percentage known as Target Percent.

Self-Percentaging also applies to extra balls, when used instead of replays.

Self-Percentaging only adjusts the score level of the First Replay Threshold. Other award features aren't adjusted. The Second Replay Threshold Level and the Third Threshold Level aren't affected by Self-Percentaging.

The Self-Percentaging routine goes into effect after 200 games are played. Then the game program monitors the current replay percentage of the First Replay Threshold. If necessary, the program makes an adjustment after every 50 games.

The following registers are located in the Scoring Status category of your game's Test Mode...

- | | |
|---------------------------|-------------------|
| A.Level 1 Score | F.Level 1 Percent |
| B.Level 2 Score | G.Level 2 Percent |
| C.Level 3 Score | H.Level 3 Percent |
| D.Highest Score | I.TARGET Percent |
| E.Times High Score Beaten | |

These registers are described in this section.

FIRST, SECOND OR THIRD REPLAY THRESHOLD. To set or check the current score level of a replay threshold:

[] 1.Step through the Test Mode categories until you reach SCORING STATUS.

[] 2.To select SCORING STATUS and enter its directory, press the CREDIT button.

[] 3.The first register displayed is LEVEL 1 SCORE. You'll find similar registers entitled LEVEL 2 SCORE and LEVEL 3 SCORE. These registers display the current score levels of the first, second and replay thresholds. Choose the desired register.

[] 4.Use either flipper button to select any value from zero to 9,900,000. This value can only be changed in steps of 100,000 points.

[] 5.To set the desired score level, press the CREDIT button.

[] 6.Use either flipper button to exit the directory. Or press the TEST button and exit the Test Mode.

REPLAY PERCENTAGE. To adjust replay percentage for the First Replay Threshold...

[] 1.Step through the game's Test Mode until you reach the category titled SCORING STATUS.

[] 2.To select this category, press the CREDIT button and enter the category's directory.

[] 3. Select the Target Percent register in the directory with either flipper button. This register displays the desired percentage of replays to be awarded for reaching the First Replay Threshold Level.

[] 4. Suppose that you want to award a replay in 15 percent of games. Use either flipper button to select 15 percent. Then press the CREDIT button to set the percentage. The register will then display 15 percent as your goal or Target Percent.

[] 5. To exit the directory, use either flipper button. To exit Test Mode, press the TEST button.

NOTICE

When the Target Percent register is set at zero, the Self-Percentaging feature is disabled. This register defaults to 10 percent when the Factory Setting register is disabled. The Factory Setting register appears in the Game Setup category.

TOTAL REPLAY PERCENTAGE will be 10 or 15 percent higher with the addition of Match, Special and High Score credits.

FIRST, SECOND AND THIRD REPLAY THRESHOLD. To manually check the replay percentage of the three replay threshold levels...

[] 1. Step through Test Mode until you reach the category titled Scoring Status.

[] 2. Select Scoring Status and enter its directory by pressing the CREDIT button.

[] 3. Use either flipper button to select the register in the desired directory. (That is, Level 1 Percent, Level 2 Percent or Level 3 Percent.) This register displays the replay percentage awarded for reaching the desired replay threshold

level. Monitor self-percentaging progress by comparing the displayed value with Target Percent.

[] 4. To exit the directory, use either flipper button. Or press the TEST button and exit Test Mode.

ADJUSTMENT SIZE. You can determine the size of Self-Percentaging adjustments to the First Replay Threshold score. Check the difference between Target Percent and replay percentage awarded for reaching First Replay Threshold. (Target Percent is an operator entry.)

- A 10 percent or greater difference results in a 10 percent adjustment.
- A five to 10 percent difference results in a five percent adjustment.
- A difference less than five percent results in a one percent adjustment.

CLEAR ACCOUNT REGISTER. To reinitiate the Self-Percentaging process, enable the Clear Account register (enter YES).

HIGH SCORE LEVEL. To adjust the high score level at which a replay (or replays) is awarded...

[] 1. Step through the game's Test Mode until you reach the category titled Scoring Status.

[] 2. Press the CREDIT button to select Scoring Status and enter its directory.

[] 3. Use either flipper button to select the Highest Score register in the directory. This register displays the high score for which the replay level is set. High score is also known as High Score to Date, HS and HSTD.

[] 4. Use either flipper button to select any value from zero to 990,000. The Highest Score register value can only be changed in steps of 100,000 points.

[] 5. Set the desired score level by pressing the CREDIT button.

[] 6. Use either flipper button to exit the directory. Or exit Test Mode by pressing the TEST button.

HIGH SCORE LEVEL. To check the number of times the high score was exceeded...

[] 1. Step through the game's Test Mode until you reach the category Scoring Status.

[] 2. Press the CREDIT button to select this category and enter its directory.

[] 3. Use either flipper button to select the Times HS Beaten register in the directory. This register displays the number of times the high score was exceeded. This information aids you in deciding what point level the Highest Score register will contain.

[] 4. Use either flipper button to select any value from zero to 9,900,000. The Highest Score register value can be changed only in steps of 100,000 points.

[] 5. Press the CREDIT button to set the desired score level.

[] 6. Use either flipper button to exit the directory. Exit Test Mode by pressing the TEST button.

OPTION SETTINGS TABLE

	TIMERS IN SECONDS						
	XX-EASY	X-EASY	EASY	MEDIUM	HARD	X-HARD	XX-HARD
DRAIN PLUG	17	15	13	11	09	07	05
MILLION SHOT	24	21	18	15	12	09	06
DROP TARGETS	35	30	25	20	15	10	05
SPINNER	16	14	12	10	08	06	04
LEFT LOOP	08	07	06	05	04	03	02
	QUALIFY EXTRA BALL WITH POPPER VALUE						
	5K	10K	15K	20K	25K	30K	35K

OPTION SETTINGS

1) Left Loop timer locks at two seconds once Multi-Ball has been earned. It will not light up if Multi-Ball™ has been earned more than twice. If the Multi-Ball™ percentage is more than 33%, the spot sequence light will flash for two seconds when the return lanes are activated.

2) The saucer will not spot any targets once Multi-Ball™ has been earned, or if Multi-Ball™ percentage exceeds 33%.

3) The drain plug timer gets shorter with every million points earned on the score board.

4) The drop target reset timer gets shorter with the number of extra balls earned when LITES EXTRA BALL is flashing.

5) For the first fifty games, the player has to qualify for all orange, white and yellow targets. Thereafter the game will check for number of times Multi-Ball™ was earned. If this value is less than 16%, the game automatically qualifies the orange and white lock arrows. If the value is between 16% and 33%, it qualifies only the orange lock arrow. The system re-evaluates with every tenth game played.

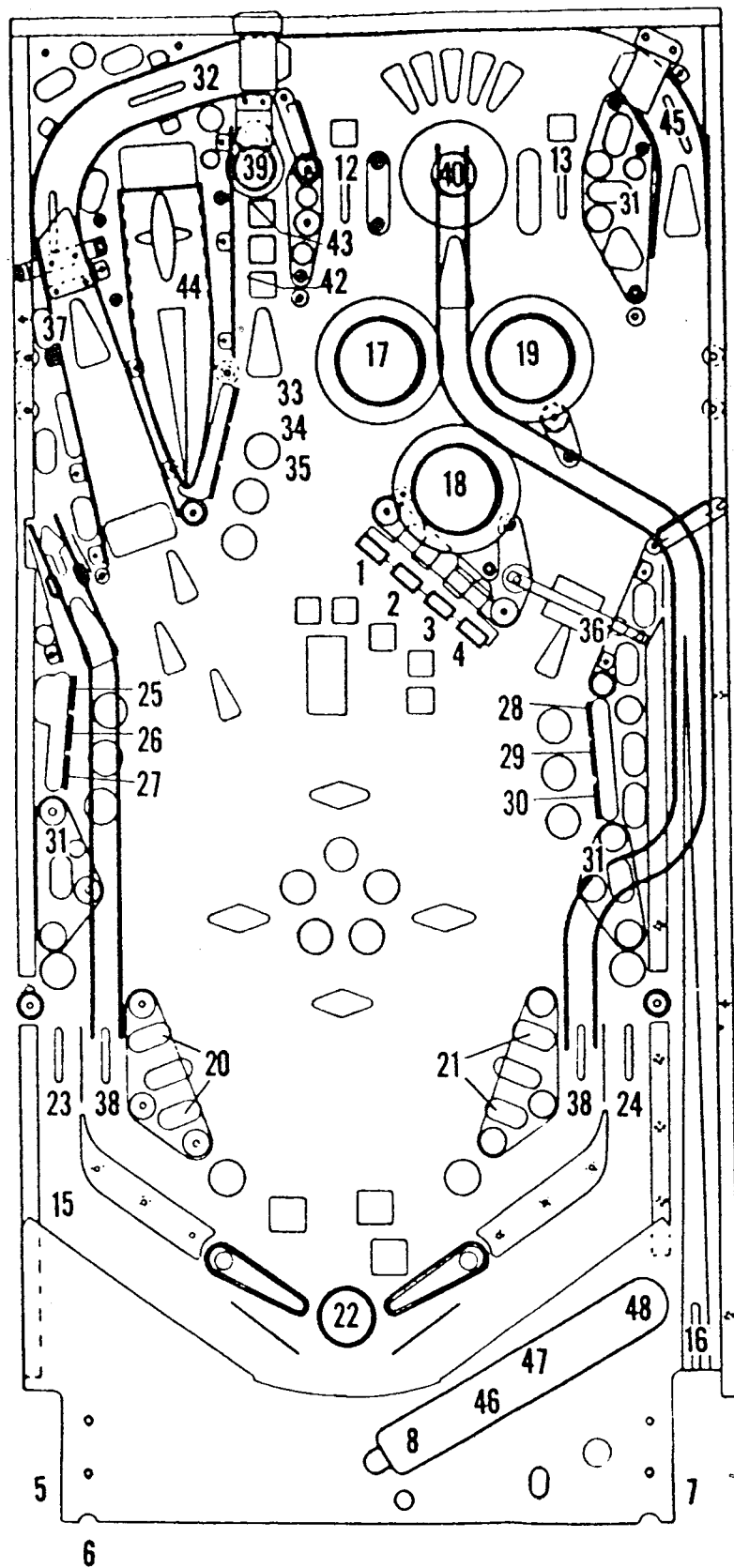
6) For the first fifty games, the Popper Hole EXTRA BALL flashes per default option selected. Thereafter the game calculates the Extra Ball percentage and adjusts "qualify Extra Ball with Popper value" accordingly.

PHASE A AND C LAMP TABLE

CJ10-1 BACKBOX RELAY RED/BLU 1	CJ10-18 BONUS 2K GRN/YEL 9	CJ10-10 BONUS 50K BLU/BLK 17	CJ11-13 POPPER 50K ORG/YEL 25	CJ11-1 BRIGHT, L TARGETS GRN/BLK 33	CJ13-12 R HOLD BONUS GRY/BRN 41
CJ10-7 RELAY RED G/S BLU/GRN 2	CJ10-4 BONUS 4K RED/WHT 10	CJ10-13 HOLD BONUS YEL/BRN 18	CJ11-10 POPPER 75K BRN/BLK 26	CJ13-1 BRIGHT, DT TIMER BLK/RED 34	CJ13-10 RETURN LANES GRY/GRN 42
CJ10-16 RELAY, WHITE G/S YEL/BLK 3	CJ10-11 BONUS 8K YEL/RED 11	CJ11-8 SAUCER 2X BRN/GRN 19	CJ11-3 POPPER 100K WHT/GRY 27	CJ13-8 BBOX BRIGHT #8 GRY/YEL 35	CJ13-4 SPINNER 1000 BLK/WHT 43
CJ10-2 TOP LANE "A" RED/YEL 4	CJ10-19 BONUS 8K GRN/WHT 12	CJ11-16 SAUCER 3X ORG/BLK 20	CJ11-14 POPPER 125K ORG/BLK 28	CJ13-6 BBOX BRIGHT #1 BLK/ORG 36	CJ13-11 SPOT SEOC ARROW GRY/WHT 44
CJ10-8 TOP LANE "B" BLU/WHT 5	CJ10-5 BONUS 10K RED/WHT 13	CJ11-6 SAUCER 5X BRN/BLU 21	CJ11-9 POPPER 150K BRN/ORG 29	CJ13-2 BRIGHT, L HOLD BONUS BLK/YEL 37	CJ13-7 HOLD BONUS GRY/RED 45
CJ10-17 JACKPOT ARROW GRN/RED 6	CJ10-12 BONUS 20K YEL/BLU 14	CJ11-12 XPLER 2X ORG/BLU 22	CJ11-2 POPPER XBALL WHT/BLK 30	CJ13-13 BBOX BRIGHT #3 GRY/ORG 38	
CJ10-3 MILLION ARROW RED/GRN 7	CJ10-14 BONUS 30K YEL/ORG 15	CJ11-11 XPLER 3X ORG/RED 23	CJ11-15 OUTLINE, LEFT ORG/WHT 31	CJ13-5 BRIGHT POPPER BLK/BRN 39	
CJ10-9 SPSA BLU/BRN 8	CJ10-6 BONUS 40K BLU/RED 16	CJ11-4 XPLER 5X BRN/RED 24	CJ11-3 OUTLINE, RIGHT BRN/YEL 32	CJ13-3 BBOX BRIGHT #5 BLK/GRN 40	

PHASE B AND D LAMP TABLE

CJ10-1 BACKBOX RELAY RED/BLU 46	CJ10-18 L TARGET ORANGE GRN/YEL 54	CJ10-10 TARGET, MID. ORANGE BLU/BLK 62	CJ11-13 JACKPOT, 5 MILLION ORG/YEL 70	CJ11-1 BRIGHT, R HOLD BONUS GRN/BLK 78	CJ13-12 DRAIN FLUG GRY/BRN 86
CJ10-7 RELAY RED G/S BLU/GRN 47	CJ10-4 L TARGET, WHITE RED/WHT 55	CJ10-13 TARGET, MID. WHITE YEL/BRN 63	CJ11-10 JACKPOT, 1 MILLION BRN/BLK 71	CJ13-1 BRIGHT JACKPOT BLK/RED 79	CJ13-10
CJ10-16 RELAY WHITE G/S YEL/BLK 48	CJ10-11 L TARGET, YELLOW YEL/RED 56	CJ11-8 TARGET, MID. YELLOW BRN/GRN 64	CJ11-3 JACKPOT 15 MILLION WHT/GRY 72	CJ13-8 BRIGHT, R TARGETS GRY/YEL 80	CJ13-4
CJ10-2 RED/YEL 49	CJ10-19 R TARGET, ORANGE GRN/WHT 57	CJ11-16 DT VALUE LIGHTS LANE ORG/BLK 65	CJ11-14 JACKPOT, 2 MILLION ORG/BLK 73	CJ13-6 BRIGHT SAUCER BLK/ORG 81	CJ13-11
CJ10-8 DT RESET TIMER BLU/WHT 50	CJ10-5 R TARGET, WHITE RED/WHT 58	CJ11-6 DT VALUE LIGHTS XPLER BRN/BLU 66	CJ11-9 JACKPOT 25 MILLION BRN/ORG 74	CJ13-2 BBOX BRIGHT #2 BLK/YEL 82	CJ13-7
CJ10-17 LOCK ARROW ORANGE GRN/RED 51	CJ10-12 R TARGET, YELLOW YEL/BLU 59	CJ11-12 DT VALUE LIGHTS HOLD BON ORG/BLU 67	CJ11-2 JACKPOT 3 MILLION WHT/BLK 75	CJ13-13 BRIGHT, LANE A GRY/ORG 83	
CJ10-3 LOCK ARROW WHITE RED/GRN 52	CJ10-14 NEXT A/B LIGHTS X-BALL YEL/ORG 60	CJ11-11 DT VALUE LIGHTS X-BALL ORG/RED 68	CJ11-15 JACKPOT, 3.5 MILLION ORG/WHT 76	CJ13-5 BBOX BRIGHT #4 BLK/BRN 84	
CJ10-9 LOCK ARROW, YELLOW BLU/BRN 53	CJ10-6 BLU/RED 61	CJ11-4 DT VALUE LIGHTS MILLION BRN/RED 69	CJ11-3 JACKPOT 4 MILLION BRN/YEL 77	CJ13-3 BRIGHT, LANE B BLK/GRN 85	



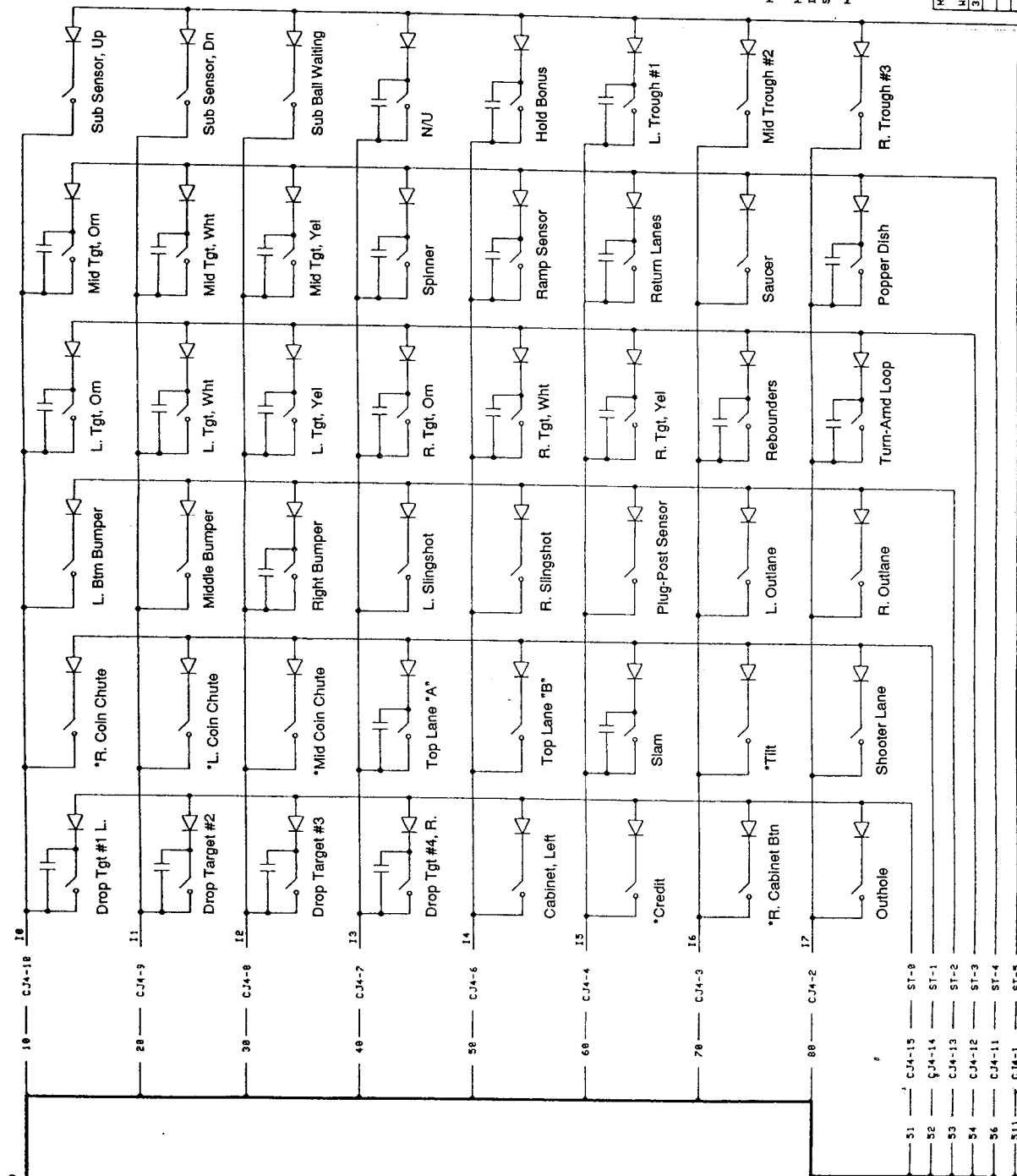
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ATLANTIS SWITCH MATRIX

COLUMN ROW	(1) STO WHT/RED CJ4-15	(2) ST1 WHT/BLU CJ4-14	(3) ST2 WHT/YEL CJ4-13	(4) ST3 WHT/GRN CJ4-12	(5) ST4 WHT/BRN CJ4-11	(6) ST5 WHT/VIO CJ4-1
(1) 10 RED CJ4-10	DROP TARGET #1, LEFT 1	COINS, RIGHT #3 9	LEFT BUMPER 17	LEFT TARGET, ORANGE 25	MIDDLE TARGET, ORANGE 33	41
(2) 11 BLUE CJ4-9	DROP TARGET #2 2	COINS, LEFT #1 10	MIDDLE BUMPER 18	LEFT TARGET, WHITE 26	MIDDLE TARGET, WHITE 34	SUB BALL LOWER 42
(3) 12 YELLOW CJ4-8	DROP TARGET #3 3	COINS, MIDDLE #2 11	RIGHT BUMPER 19	LEFT TARGET, YELLOW 27	MIDDLE TARGET, YELLOW 35	SUB BALL UPPER 43
(4) 13 GREEN CJ4-7	DROP TARGET #4, RIGHT 4	TOP LANE "A" 12	LEFT SLINGSHOT 20	RIGHT TARGET, ORANGE 28	SPINNER 36	BALL IN SUBMARINE 44
(5) 14 WHITE CJ4-6	CABINET, LEFT 5	TOP LANE "B" 13	RIGHT SLINGSHOT 21	RIGHT TARGET, WHITE 29	RAMP SENSOR 37	HOLD BONUS 45
(6) 15 BROWN CJ4-4	CREDIT 6	SLAM 14	PLUG-POST SENSOR 22	RIGHT TARGET, YELLOW 30	RETURN LANES 38	LEFT TROUGH #1 46
(7) 16 ORANGE CJ4-3	CABINET, RIGHT 7	TILT 15	LEFT OUTLANE 23	RE- BOUNDERS 31	SAUCER 39	MIDDLE TROUGH #2 47
(8) 17 BLACK CJ4-2	OUTHOLE 8	SHOOTER LANE 16	RIGHT OUTLANE 24	TURN AROUND LOOP 32	POPPER DISH 40	RIGHT TROUGH #3 48

NOTE: I = Input and ST = Strobe

Columns 7 and 8 have been omitted, since they contain null values in this matrix.



COLOR CODE

1-RED	6-BROWN
2-BLUE	7-ORANGE
3-YELLOW	8-BLACK
4-GREEN	9-GRAY
5-WHITE	10-NO TRACE
	11-VIOLET

NOTE 1. ALL SWITCH DIODES ARE 1N4148

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

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

PLAYFIELD SWITCHES

NOTES:

M. STONE

3/23/88

MIDWAY MFG. CO.

ATLANTIS

Switch Matrix

REV D