

STERN

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I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Using flat washers under bolt heads, bolt back box to cabinet. Feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Insert connectors so they are completely seated on printed circuit board assemblies.

On all games there are some items that must be checked after shipment. Making these visual inspections may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable connectors may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switches should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

1. Check wiring of transformer to correspond to location voltage.
2. Check the transformer for any foreign material shorting across wiring lugs.
3. Check that fuses are firmly seated and making good contact.
4. Check wire on coils for proper soldering. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
5. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
6. Check for any wires that may have become disconnected.
7. Check that all cable connectors are completely seated on printed circuit board assemblies.
8. Check that cables are clear of all moving parts.

Check adjustment of the three (normally open) tilt switches:

1. Plumb bob tilt on left side of cabinet near front door.
2. Ball tilt above plumb bob tilt. Insert the smaller ball (gold 15/16" dia.) into ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.
3. Panel tilt on bottom of playfield panel.

NOTE

TO PROTECT SOLID STATE COMPONENTS
BEFORE TOUCHING ANY COMPONENT IN THE
BACK BOX, DISCHARGE ANY POSSIBLE STATIC
BUILD-UP BY TOUCHING ANY GROUND
CIRCUIT, e.g. SIDE ARMOR, GROUND BRAID.

II. ROUTINE MAINTENANCE ON LOCATION

Self tests, which are programmed into the design of the game, are very helpful. As with any solid state piece of equipment the three prong grounding receptacle is an important piece part of the game, that must not be tampered with and must be used properly.

MPU MODULE SELF-TEST:

During power-up, the MPU assembly tests itself, which can visibly be seen by the flashing of a LED on the board. When the game is turned on, the LED will flash, have a pause, flash again, a longer pause, then flash five more times and then will be dimly lit. Accompanying each flash is one note (total of seven), this indicates proper MPU game operation conditions.

GAME SELF-DIAGNOSTIC TESTS:

Pressing the Self-Test button inside the coin door activates the game into its "Self-Diagnostic Test."

1. BURN IN TEST - All outputs tested.
2. FEATURE LAMPS - All feature lamps will flash on and off continuously, determining any burnt lamps.
3. DISPLAYS - Each digit on all displays will cycle from 0 thru 9, then a number 8 will shift left to right. This test will recycle continuously.
4. SOLENOIDS - Each solenoid will be energized, one at a time, in a continuous sequence. (Holding both flipper buttons "in" during this test will cause the flipper coils to be energized). The number appearing on the "Player Score" display is the same as the number assigned to the solenoid and also the same transistor number on the SDU board. The sound of a solenoid pulling-in as a number appears indicates proper operation (providing transistor is being used), the absence of a solenoid sound shows a fault. If sound is absent, see Solenoid I.D. page in book for help in Solenoid Identification. (After the solenoids are tested, the game sounds are tested.)
5. SWITCHES - The MPU will look at each switch assembly for stuck contacts. *(Flipper Button and flipper End of Stroke switches are not included). If there are any stuck, the lowest number encountered is flashed on the Player Score displays. The number remains until the fault is corrected. See Switch I.D. page in book for help in switch identification. Other numbers may follow if more stuck contacts are present. If there are no stuck switches, the "Match/Ball in Play" display flashes '0'. DO NOT BURNISH OR FILE GOLD PLATED SWITCH CONTACTS.
6. GAME LEVELS AND BOOKKEEPING FUNCTIONS: - Pressing the Self-Test button eighteen more times causes the MPU to step thru the game levels and bookkeeping functions and finally to repeat the power-up test. To bypass these functions, turn the game off, then on. The game is now ready to play, after the MPU Self-Test.

CONTACT SWITCH ADJUSTMENTS

All contact switches should be adjusted to have a gap 1/16" in the open position, and have .010" overtravel closed. All contact switches (except for flipper buttons & flipper end of stroke switches) are gold plated to resist corrosion and, **SHOULD NOT BE FILED OR BURNISHED**. If contacts have dirt or dust on them, a clean piece of paper should be used to clean them, by closing the contacts and wiping gently.

FLIPPER BUTTON & FLIPPER SWITCHES ONLY. Tarnish or pitted contacts can be corrected with a contact file followed by a burnishing tool. Severely pitted contact must be replaced as an assembly.

PLAYFIELD

Stern playfields have a durable long life playing finish. Its life expectancy, as well as playing appeal can be greatly extended by periodic cleaning. Inspect and hand polish the ball with a clean cloth. A chipped ball must be replaced, as it will ruin the finish on the playfield. (DO NOT USE WATER IN LARGE QUANTITIES, HIGHLY CAUSTIC CLEANERS, ABRASIVE CLEANERS OR CLEANING PADS ON THE PLAYFIELD SURFACE).

ELECTRONIC PIN BALL GAME

DISPLAY DRIVER ASSEM'S:-

1ST, 2ND, 3RD & 4TH PLAYERS, CREDITS
AND MATCH/BALL IN PLAY.

(SEE BACK-RACK GLASS FOR LOCATIONS)

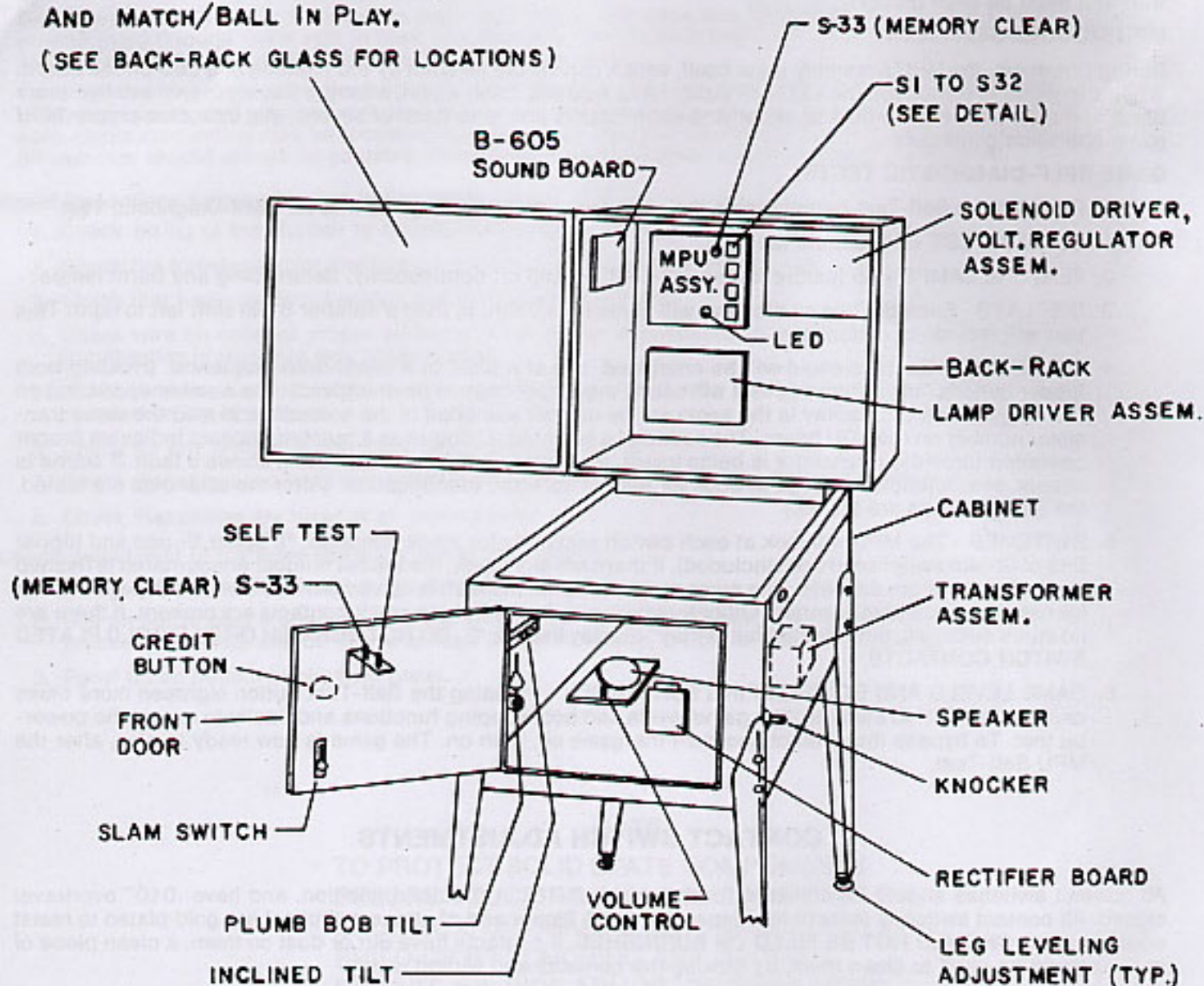


FIGURE 1



DETAIL S1-S32
MPU ASS'Y.

III. GENERAL GAME OPERATION

PLACE BALL INTO PLAYFIELD BY OUTHOLE:

COIN GAME. Coin should be rejected. Plug in line cord. (For proper game operation grounding circuit must be used). Move power ON-OFF toggle switch at bottom right front corner of cabinet to "ON" position. Seven singular tones will be heard to indicate game-readiness. Feature lights will flash in a programmed attract mode, "HIGH SCORE" lite is lit, player displays flash high score to date, numbers 1 to 7 will display from right to left, all 7's will flash, "HIGH SCORE" lite goes off, previous played scores are flashed, "Coin lock-out coil" is energized and game is ready for play. Coin Game. The game should accept the coin and post credits for coins accepted (*). Pressing the credit button on the door will reset drop targets and cause the outhole kicker to move the ball to the shooter lane. The first player display will flash 00.

One player is registered each time the credit button is pressed (one to four can play). The credits are reduced by one each time the credit button is pressed until the credits are reduced to zero. (Credit button is in-operative after 4 players are registered). Shooting the ball initiates play.

When the ball enters the outhole, the bonus score is added to the player's score. The player-up and/or ball in play on the back box is advanced one position. The bonus score starts at ** points. The outhole kicker moves the ball to the shooter lane and play is resumed. This continues until each player has played the allowable number of balls per game (3 or 5). At this time the "Game Over" light becomes lit. A random "Match" number appears and the "Match" light becomes lit. If the match number is the same as the last two digits in the player's score a free game can be awarded (*).

Extra ball won during the course of the game is played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play is not advanced for extra ball play. Bonus score is added to the player's score, the bonus is reset to ** and the bonus multiplier earned is restored (memory) or reset (*) before the game moves the extra ball for play.

At the end of the game, a "High Game" is flashed on all players scores. If the "High Game" is beat, this feature (*) can award up to 3 free games.

Tilting while playing the game results in loss of the ball in play. The flippers, thumper-bumper, etc., go "dead". Bonus score is not added. The purpose of the tilt penalty is to discourage the player from jostling the machine in an attempt to prolong play. Game action becomes normal after the outhole kicker moves the ball to the shooter lane.

Slamming the machine results in the loss of the game. All feature lights go out and the game becomes "dead" through a built-in time delay circuit. The purpose of the time delay circuit is to discourage abuse of the machine. After the delay, the "Game Over" light lites "Shoot Again" lite flashes and the game is ready for play. The time delay occurs anytime one of the slam switches is made to contact.

There is a slam switch on the front door, one on the tilt board. (Any number of slam switches could be installed by the operator, to meet his individual requirement). The switch should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing gap between contacts will make the switch more sensitive. Opening the gap will reduce sensitivity.

*Some tunes and features can be disabled by operator if so desired.

**Bonus starts at 0

See back box adjustments.

IV. SELF TEST AND BOOKKEEPING FUNCTIONS

The game is designed to help the operator perform certain diagnostic tests as well as accounting functions as follows:

IV. A. SELF TEST

TEST SWITCH PUSH NUMBER	BALL/MATCH DISPLAY	DESCRIPTION
1st		Burn in test - all outputs tested
2nd		Lamp test - all feature lamps on and off
3rd		Display test - all digits display 000000 thru 999999 then an 8 shifts from left to right
4th		Solenoid test - continuous sequence of solenoids pulsed with solenoid driver transistor, "Q" number displayed
5th	Flashing O if all switches open	Switch test - switch I.D. No. displays if closed

IV. B. BOOKKEEPING FUNCTIONS

TEST SWITCH PUSH NUMBER	BALL/MATCH DISPLAY	DESCRIPTION	DISPLAYS
6th	01	1st Threshold (High Score)	
7th	02	2nd Threshold (High Score)	
8th	03	3rd Threshold (High Score)	
9th	04	Current High Game Threshold	
10th	05	Current Credits	00 to 40
11th	06	Total Plays	00 to 999999
12th	07	Total Replays	00 to 999999
13th	08	Total times high score is passed	00 to 999999
14th	09	Number of coins thru Chute No. 2	00 to 999999
15th	10	Number of coins thru Chute No. 1	00 to 999999
16th	11	Number of coins thru Chute No. 3	00 to 999999
17th	12	Total balls played	00 to 999999
18th	13	No. of Top Bank wow	00 to 999999
19th	14	No. of 8 Bank wow	00 to 999999
20th	15	Total Playfield Special Awards	00
21st	16	Total level 1 passed	00 to 999999
22nd	17	Total level 2 passed	00 to 999999
23rd	18	Total level 3 passed	00 to 999999

FIGURE 1

V. FRONT DOOR GAME ADJUSTMENTS:

HIGH SCORE FEATURE ADJUSTMENTS:

The game is designed to award a "Extra Ball" or "Free Game" (option) at three score levels. (See High Score Feature). The recommended levels are listed below.

Any level from 10,000 or 9,990,000 can be set, as desired. It is possible to reset or turn off (00) any or all of the levels, if desired.

1. Push and release Self-Test button at one second intervals six times or until number 01 appears on the Match/Ball in Play display.
2. The number on the Player Score Displays is the first score level*. It can be increased, if desired, by holding the credit button in. To decrease the score level, reset to '00', and then hold the credit button in. Release the credit button when the desired High Score appears. Note that the level changes 10,000 points at a time. If the number '00' is left on the displays, the high score feature is eliminated for that level.
3. Repeat steps 1 and 2 for the second and third high score levels. The number '02' and '03' on the Match/Ball-in-Play display are for the second and third levels, respectively.

HIGH GAME TO DATE FEATURE:

The game is designed to award up to 3 free games (option) when "High Score to Date" is beat. For the recommended, factory preset level, see below.

It is recommended that the level, which will build with game play, be periodically reset to the factory recommended level to encourage game play. The adjustment procedure is the same as for the High Score Feature Adjustments, Steps 1 and 2. Continue pushing the Self-Test button until the number '04' appears on the Match/Ball-in-Play display and then do Step 2.

Any level from '00' to 9,990,000 can be set as described. It is to be noted that '00' does not turn off the feature, as it does on High Score feature. The feature can be turned off by positioning the correct MPU switches.

*Can be quickly set to '00' by pressing S33 on the MPU assembly in the back box or front door.

RECOMMENDED SETTING

	3 BALL	5 BALL
1st Level	620,000	860,000
2nd Level	1,200,000	1,800,000
3rd Level	—	—
High Score	—	—
To Date	2,000,000	2,600,000

VI. FEATURE OPERATION AND SCORING

BONUS SCORE FEATURE

Game starts at 0. Maximum bonus 45,000.

BONUS ADVANCEMENT

PL. SW. NO.	LOCATION	ADVANCE BONUS
10, 12, 14, 16 9, 11, 13, 15	Upper Left 4 Bank Lower Left 4 Bank	Object number (1-8) x 1,000
17	Top Dead Bumper	Advances object number (1-7) x 1,000 by spotting lit 1-7 drop targets. (See Note #1)
27, 28	Two Return Lanes	
34	Left Lane Kick Out Hole	Advances object number (1-8) x 1,000 by spotting lit 1-8 drop targets.
38, 39	Left Lane Middle & Top Switches	Advances object number (6-8) x 1,000 by spotting lit 6-8 drop targets when a captured ball is in the kick out hole.

BONUS MULTIPLIER

PL. SW. NO.	LOCATION	ADVANCE MULTIPLIER
18, 19, 20 22, 23, 24	Center 3 Bank Right 3 Bank	Hitting all 3 targets down in either bank increases multiplier by 1x (7x max.). (See Note #2)

When 6x or 7x are made, bonus multiplier resets to 2x for the next ball.

BONUS COLLECTED (Outhole Pl. Sw. No. 33)

When the ball enters the outhole, bonus score (times the multiplier) is collected. The bonus resets to 0.

SUPER BONUS

Can be lit for next ball in play by making object No. 8 or No. 9 (See MPU Sw. 30). Super bonus (77,000 pts.) is collected when ball enters the outhole (Pl. Sw. 33) and Super Bonus lite is lit.

THREE BALL FEATURE

Making Object No. 9 or capturing all 3 balls will release all captured balls for play.

SPECIAL

"Special" can be awarded by means of 7 switches (2-8 drop targets Pl. Sw. No. 11-16).

SPECIAL COLLECTED

PL. SW. NO.	LOCATION	AWARD
10-16	Left Drop Targets (2-8)	To receive "Special" Object No. 9 must be made, all 8 drop targets must be hit, and flashing "Special" object target (2-8) must be hit.

SPECIAL AWARD AND ADJUSTMENTS

"Special" can be adjusted to award five different awards (See MPU Sw. 22, 23, 24)

"Special" can also be adjusted so there is only one Special per ball of one or more Specials per ball.

WOW

"Wow" can be collected by means of 12 switches; 1-8 drop targets (Pl. Sw. 9-16) and the outer drop targets of (2) 3 banks (Pl. Sw. 18, 20, 22, 24)

WOW COLLECTED

PL. SW. NO.

9-16

LOCATION

Left Drop Target Bank

AWARD (to receive Wow)

Object No. 8 or 9 (See MPU Sw. 29) must be made and flashing Wow object target (1-8) must be hit.

18, 20

Outer Drop Targets
Center 3 Bank

22, 24

Outer Drop Targets
Right 3 Bank

Multiplier must be advanced to 6x or 7x (See MPU Sw. 31) and lit drop target must be hit when the blue Wow lite is lit.

WOW AWARDS AND ADJUSTMENTS

"Wow" can be adjusted to award three different awards (See MPU Sw. 22, 23, 24)

Eight bank Wow lites can be adjusted to turn on by hitting either lit Object No. 9 target or Object No. 8 target (See MPU Sw. 29)

(2) 3 bank Wow lites can be adjusted to turn on when multiplier is advanced to either 6x and 7x or 7x alone. (See MPU Sw. 31)

SHOOT AGAIN

Can be awarded by means of 12 switches; 1-8 drop targets (Pl. Sw. 9-16) and outer drop targets of (2) 3 banks (Pl. Sw. 18, 20, 22, 24).

SHOOT AGAIN COLLECTED

"Shoot Again" can be collected by hitting Wow or Special targets when lit (See MPU Sw. 22, 23, 24), the High Score feature on game (See MPU Sw. 6), and by capturing ball in left lane kick out hole (Pl. Sw. No. 34) or left lane middle switch (Pl. Sw. No. 38).

REPLAY

HIGH SCORE

- High Score
1) Replay
2) Shoot Again

MPU SWITCH 6

ON
OFF

OUTHOLE (Pl. Sw. No. 33)

Collects bonus (times bonus multiplier). Resets bonus to 0.

SLING SHOTS (Pl. Sw. No. 29 & 30)

Scores 10 points. (See Note 1)

LOOP ROLL UNDER (Pl. Sw. No. 4)

Scores 3,000. Advances Loop target value.

LOOP DROP TARGET (Pl. Sw. No. 21)

Collects Loop value and resets Loop value.

"ADVANCE SPINNER TO END" STAND-UP TARGET (Pl. Sw. No. 35)

Scores 7,000 and advances spinner to top value.

CENTER 3 DROP TARGET BANK (Pl. Sw. No. 18, 19, 20)

Each target scores 1,000 or 7,000 when pink lite is lit (See Note 1). Hitting all three targets adds one multiplier x (See Note 2). Hitting lit outer drop target when blue Wow lite is lit awards Wow. Hitting indicated targets increases spinner value (See MPU Sw. 17). (See Note 3).

RIGHT 3 DROP TARGET BANK (Pl. Sw. No. 22, 23, 24)

Each target scores 1,000 or 7,000 when pink lite is lit (See Note 1). Hitting all three targets adds one multiplier x (See Note 2). Hitting lit outer drop targets when blue Wow lite is lit awards Wow. Hitting indicated targets increases spinner value (See MPU Sw. 17). (See Note 3).

SPINNER (Pl. Sw. No. 5)

Each spin scores 100 or highest lit value (See Note 1). Any spin resets value.

POP BUMPER (Pl. Sw. No. 31)

Scores 100 or highest lit value on spinner. (See Note 1).

OUTLANES (Pl. Sw. No. 25 & 26)

Scores 3,000. Collects and resets loop value when lit. (See Note 1)

RETURN LANES (Pl. Sw. No. 27 & 28)

Scores 500. Spots lit object number and advances bonus when lit. (See Note 1)

LEFT TWO 4 DROP TARGET BANK (Pl. Sw. No. 9-16)

Scores target object number (1-8) x 1,000. Hitting lit object number (1-8) advances bonus and lites next object number. Lighting object number 5 makes left lane kick-out hole capture ball. Hitting all eight targets in 1-8 order as they are lit, lites flashing object No. 9 target and flashing Wow lite (See MPU Sw. 29). Hitting all targets down again lites flashing "Special" lite and excludes target No. 1 from play. Hitting all targets down again excludes target No. 2 from play and so on. Hitting flashing object No. 9 target lites Super Bonus for next ball in play (See MPU Sw. 30).

LEFT LANE TOP SWITCH (Pl. Sw. No. 39)

Spots all numbers. Advances bonus by spotting lit object number (6-8) and releases all three balls in to play.

LEFT LANE MIDDLE SWITCH (Pl. Sw. No. 38)

Spots all numbers. Advances bonus by spotting lit object number (6-8) and captures ball when another ball is captured in the kick out hole.

LEFT LANE KICK OUT HOLE (Pl. Sw. No. 34)

Spots all numbers. Advances bonus by spotting lit object number (1-8) and captures ball after object No. 5 is lit.

LEFT LANE LOWER SWITCH (Pl. Sw. No. 32)

Scores 3,000 and advances loop target value.

TOP DEAD BUMPER (Pl. Sw. No. 17)

Scores 500. Advances bonus by spotting lit object target when bumper is lit.

BALL SHOOTER LANE SWITCH (Pl. Sw. No. 40)

Determines whether a ball is in ball shooter lane.

NOTE 1

Slingshots, spinner and pop bumpers control the percentage of time dead bumper, two return lanes, two outlanes and (2) 3 bank lites are on. The percentage of times top dead bumper and two return lanes are lit can be adjusted. (See MPU Sw. 13)

NOTE 2

Game can be adjusted so making all drop targets in both 3 banks adds one multiplier x (See MPU Sw. 14)

NOTE 3

Top (2) 3 banks reset only after all targets in both 3 banks have been hit. When MPU Sw. 14 is in the ON position, only (1) 3 bank resets at random. When MPU Sw. 14 is in the OFF position both 3 banks reset.

NINE BALL SWITCH ASSIGNMENTS

		ON	OFF
32	Special Limit	1 or more	per ball
31	3 Bank "WOW" Lites On	6X	7X
30	Bank "Super Bonus" Lites On	8 Ball	9 Ball
29	Bank "WOW" Lites On When 8 Ball or 9 Ball Hit	8 Ball	9 Ball
28	Coin Chute #3	See Or On Of	Catalog Label Side Cabinet
27			
26			
25			
24	See Below	See Below	
23			
22			
21			
20	Match Features	On	Off
19	Display Credits	On	Off
18	Maximum Credit	←	←
17		←	←
16	3 Bank Two Outside or Center Target Advance Spinner Value	Lib.	Cons.
15		Outside Targets	Center Targets
14	High Score to Date Feature	←	←
13		←	←
12	Multiplier Step-Up Spot Number Target Lite	1 (3) Bank	2 (3) Bank
11		Lib.	Cons.
10	Coin Chute #2	See Or On Of	Catalog Label Side Cabinet
9			
8	Background Sound	On	Off
7	Ball Per Game	5	3
6	High Score Feature	Replay	X-Ball
5	Add-A-Ball	On	Off
4	Coin Chute #1	See Or On Of	Catalog Label Side Cabinet
3			
2			
1			

MPU SW. # 22	ON	ON	ON	ON	OFF	OFF	OFF	OFF
# 23	ON	ON	OFF	OFF	ON	ON	OFF	OFF
# 24	ON	OFF	ON	OFF	ON	OFF	ON	OFF
WOW AWARD	SPSA	70K	70 K	40 K	SPSA	70 K	SPSA	40 K
SPECIAL AWARD								
MPSU SW. # 32 OFF	(1)	(1)	(1)	(1)	(1)	(1)	(1)	NO AWARD
# 5 ON or OFF	REPLAY	REPLAY	SPSA	SPSA	130 K	130 K	90 K	
MPU SW. # 32 ON	(2)	(2)	(1)	(1)	UNLTD.	UNLTD.	UNLTD.	
# 5 OFF	REPLAY	REPLAY	SPSA	SPSA	130 K	130 K	90 K	NO AWARD
MPU SW. # 32 ON	(2)	(2)	(3)	(3)	UNLTD.	UNLTD.	UNLTD.	NO AWARD
	REPLAY	REPLAY	SPSA	SPSA	130 K	130 K	90 K	

SPSA = SAME PLAYER SHOOT AGAIN
K = X's 1.000

VII. CREDIT/COIN AND GAME ADJUSTMENTS

A. Playfield Post Adjustments:

Posts that control left and right outlane openings on playfield can be moved to make access to outlanes conservative or liberal for ball to enter. (See Page 14).

Conservative entry will decrease playing time and scoring.
Liberal entry will increase playing time and scoring.

B. Back Box Game Adjustments:

Each game has thirty-two switches located on the MPU module, located in the back box, that allows play to be customized to the location. (See Fig. 1). Credits per coin, maximum credits, credit display, balls (3 or 5) per game, match feature, high game feature, special award, maximum extra balls and background sound are selectable by means of switches. The switches are contained in four sixteen lead packages numbered S1-8, S9-16, S17-24, and S25-32 for easy identification. The "On" position is marked on the assembly. TURN OFF POWER BEFORE MAKING ADJUSTMENTS. MAKE ADJUSTMENTS BEFORE TURNING POWER BACK ON.

CREDITS/COIN ADJUSTMENTS:

The credits given are selectable by means of MPU switches. Sixteen credit ratios are available. The MPU switch settings and resultant credits/coin are as follows:

CREDITS/COIN ADJUSTMENTS SWITCHES

(SWITCH No. 1 (BLU) LEFT	4	3	2	1		
SWITCH No. 2 (BRN-WHITE) CENTER	12	11	10	9		
SWITCH No. 3 (RED-WHITE) RIGHT	28	27	26	25		
					CREDITS	COIN
OFF	OFF	OFF	OFF	OFF	1	1
OFF	OFF	OFF	ON	ON	2	
OFF	OFF	ON	OFF	OFF	3	
OFF	OFF	ON	ON	ON	4	
OFF	ON	OFF	OFF	OFF	5	
OFF	ON	OFF	ON	ON	6	
OFF	ON	ON	OFF	OFF	7	
OFF	ON	ON	ON	ON	10	
ON	OFF	OFF	OFF	OFF	14	

				CREDITS	COINS	SEQUENCE OF CREDITS PER COIN			
						1	2	3	4
ON	OFF	OFF	ON	1	2	0	1		
ON	OFF	ON	OFF	3	2	1	2		
ON	OFF	ON	ON	5	2	0	5		
ON	ON	OFF	OFF	7	2	0	7		
ON	ON	OFF	ON	3	4	0	1	0	2
ON	ON	ON	OFF	5	4	1	1	1	2
ON	ON	ON	ON	7	4	1	2	1	3

If two or three coin chutes are adjusted the same for multiple coins, credits will increase as if dropped in same chute.

Credit sequence will reset when:

- 1) credit button is pressed
- 2) any points are scored

ADD-A-BALL (MEMORY):

This adjustment can store up to 3 Balls in memory "ADD-A-BALL"

ADD-A-BALL (MEMORY)

YES

NO

MPU SWITCH 5

ON

OFF

HIGH SCORE FEATURE:

The game is designed to award an Extra Ball or Free Game at one, two or three high score levels. See Front Door Game Adjustments.

AWARD

Extra Ball

Replay

MPU SWITCH 6

OFF

ON

BALL PER GAME:**NO. OF BALL PER GAME**

3

5

MPU SWITCH 7

OFF

ON

BACKGROUND SOUND:

The background sound during game play can be controlled as follows:

SOUND

OFF

ON

MPU SWITCH 8

ON

OFF

SPOT NUMBER TARGET LITE:

Spotting Next Number Target Lite on 8 Bank can be achieved by hitting Top Dead Bumper or rolling Ball over either Right or Left Return Lanes when lit. Switch regulates percentage of times lite is on.

SPOT NUMBER TARGET LITE

Liberal

Conservative

MPU SWITCH 13

ON

OFF

MULTIPLIER ADVANCE:

Game can be adjusted so 1 (3) Bank or 2 (3) Banks can advance Multiplier.

MULTIPLIER ADVANCE

2 (3) Bank Target

1 (3) Bank Target

MPU SWITCH 14

OFF

ON

HIGH SCORE TO DATE FEATURE:

The game is designed to award up to 3 free games as an option of high score to date is beat. Each time this happens, the winning score becomes the new high score to beat. This score is displayed on all 4 player score displays at the end of each game as an incentive to play.

AWARD

Novelty

1 Free Game.....

2 Free Games

3 Free Games.....

MPU SWITCHES

16

15

OFF

OFF

OFF

ON

ON

OFF

ON

ON

SPINNER VALUE:

Advancement of spinner value can be adjusted by hitting either two outside Targets or Center Target on two Top "3" Banks.

ADVANCE SPINNER

Outside Target (Liberal)
Center Target (Conservative)

MPU SWITCH 17

OFF
ON

MAXIMUM CREDITS:

The maximum credits accepted by the machine limits the number of games that can be accumulated by coining, by winning replays or both. The maximum number of credits are adjustable by means of switches 18 and 19. Four credit limits are available.

MAXIMUM CREDITS

10

15.....

25

40.....

MPU SWITCHES

19

OFF

OFF

ON

ON

18

OFF

ON

OFF

ON

CREDIT DISPLAY:**CREDIT DISPLAY**

YES

NO

MPU SWITCH 20

ON

OFF

MATCH FEATURE:

When the Match Feature is On, a random number appears in the "Match/Ball in Play" window and the word Match is illuminated. If the number matches the tens digit in player's score a free game is awarded. The Match Feature creates an incentive to play.

MATCH

ON

OFF

MPU SWITCH 21

ON

OFF

"SPECIAL" AND "WOW" AWARD:

MPU SWITCHES #22, 23 and 24 Control what Award will be given. See Following Chart.

MPU SW. #22	ON	ON	ON	ON	OFF	OFF	OFF	OFF
#23	ON	ON	OFF	OFF	ON	ON	OFF	OFF
#24	ON	OFF	ON	OFF	ON	OFF	ON	OFF
WOW AWARD	SPSA	70K	70 K	40 K	SPSA	70 K	SPSA	40 K
SPECIAL AWARD								
MPSU SW. #32 OFF	(1)	(1)	(1)	(1)	(1)	(1)	(1)	NO AWARD
#5 ON or OFF	REPLAY	REPLAY	SPSA	SPSA	130 K	130 K	90 K	
MPU SW. #32 ON	(2)	(2)	(1)	(1)	UNLTD.	UNLTD.	UNLTD.	NO AWARD
#5 OFF	REPLAY	REPLAY	SPSA	SPSA	130 K	130 K	90 K	
MPU SW. #32 ON	(2)	(2)	(3)	(3)	UNLTD.	UNLTD.	UNLTD.	NO AWARD
	REPLAY	REPLAY	SPSA	SPSA	130 K	130 K	90 K	

SPSA = SAME PLAYER SHOTS AGAIN
K = X's 1,000

8 BANK "WOW" LITES:

This feature can be turned on by hitting either Lit 8 Ball target or Lit 9 Ball Target.

8 BANK "WOW" LITES

Hitting 8 Ball Target
When Lit
Hitting 9 Ball Target
When Lit

MPU SWITCH 29

ON

OFF

8 BANK "SUPER BONUS" LITE:

This feature can be turned on by hitting either Lit 8 Ball Target or Lit 9 Ball Target.

8 BANK "SUPER BONUS" LITE

Hitting 8 Ball Target
When Lit
Hitting 9 Ball Target
When Lit

MPU SWITCH 30

ON

OFF

3 BANK "WOW" LITES:

The top two Banks "WOW" lites can be turned on when either 6X or 7X are lit in the Multiplier or 7X is lit.

3 BANK "WOW" LITES

6X or 7X
7X

MPU SWITCH 31

ON

OFF

SPECIAL LIMIT:

The number of Specials per game can be Limited as follows:

SPECIAL LIMIT

1 or more Per Ball
1 Per Ball

MPU SWITCH 32

ON

OFF

PARTS LIST **NINE BALL #125**

MISCELLANEOUS	PART NUMBER
Transformer (Domestic or Export)	16B-6
Transformer & Rectifier	B-438-4
Bulb, #44	8A-101
U1	25A-125-E1E48
U2	25A-125-E2E48
U5	25A-125-E5E48
U6	25A-125-E6E48
Dead Bumper	A-578-2

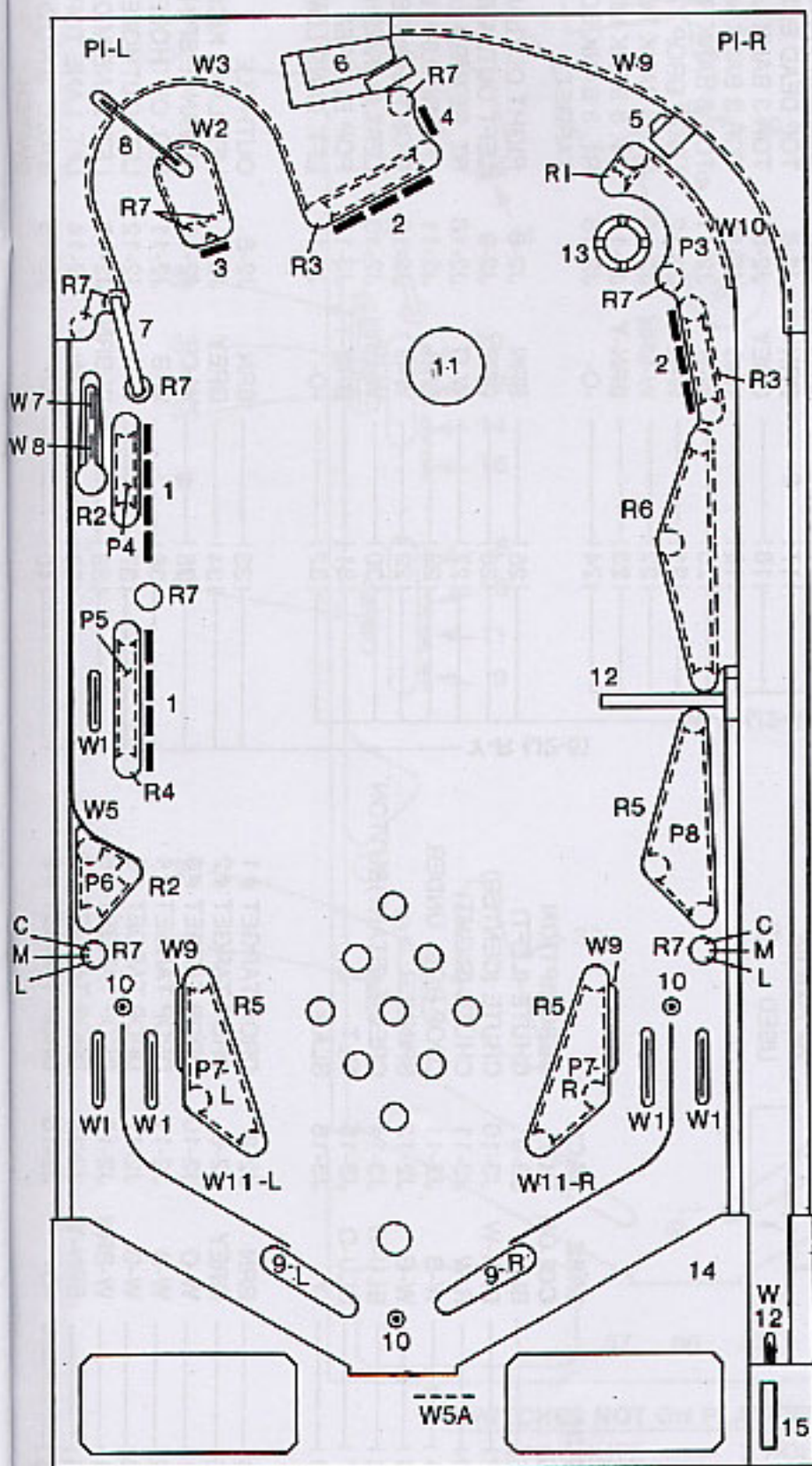
ASSEMBLY COILS	
Coin Lockout	C-36-5300
Drop Target (Programmable) (7)	C1-34-3400
Drop Target (8) Bank	B-24-1600
Drop Target (3) Bank (2)	B-27-2300
Flippers (2)	J-25-475/34-4500
Lane Kicker	J-28-2300
Outhole Kicker	J-26-1200
Slingshot (2)	J-26-1600
Stand-Up Target	J-26-1200
Thumper Bumper	J-26-1200

MODULES	
Lamp Driver	B-431
7 Digit Display Assembly	A-645
Match/Ball In Play Display	A-434
MPU (FOR E PROMS SEE MISCELLANEOUS ABOVE)	C-602
Rectifier Board	A-430
Solenoid Driver/Voltage Regulator	B-432
Sound Module	C-605

PLAYFIELD PARTS

SEE PLAYFIELD DIAGRAM

NINE BALL PLAYFIELD PARTS



GAME ADJUSTMENT

C-CONSERVATIVE
M-MEDIUM
L-LIBERAL

RUBBER RINGS

R1-7A-120-100
R2-7A-120-150
R3-7A-120-175
R4-7A-120-225
R5-7A-120-275
R6-7A-120-350
R7-7A-135

BALL GUIDES & ROLL-OVERS

W1-A-149	W6-A-791
W2-A-783	W7-A-793
W3-B-784	W8-A-794
W4-C-785	W9-6A-101
W5-B-786	W10-6A-278
W5A-A-764	W11-6A-279-L&R
	W12-A-793

PLASTIC SHIELDS

Top Arch Set 13C-125-1L & 1R
Nine Ball Set 13C-125-2 to 9
(P1 to P9)

MISC. PARTS & ASSEMBLIES

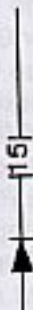
1. 8 Bank Drop Target D-548-9B
(Targets Alone 13A-45-B)
2. 3 Bank Drop Target D-580-3J
(Targets Alone 13A-11-R & B)
3. 1 Drop Target C-383-3
(Target Alone A-382-1)
4. Stand-Up Target A-721-L1
5. Ball Gate Assembly A-611-R
6. Rebound Bumper Assembly A-790
7. 1 Way Gate Assembly A-471
(Wire Alone 6A-211)
8. Roll-Under Gate Assembly A-791
(Wire Alone 6A-264)
9. Flipper Assembly B-634-R-Y and
B-634-L-Y (Right & Left)
(Rubber Ring 7A-121-Y)
10. Ball Guide Post 2A-200
(Rubber Ring 7A-125)
11. Thumper Cap 13A-43
12. Spin Target Assembly A-792
(Target & Wire Only 14A-11-1)
13. Bumper Cap 13A-44
14. Instruction Plate 14B-3-6
15. Shooter Gauge 14A-2-10

SWITCH I.D. NINE BALL

SWITCH
SYMBOL



SWITCH
NO.



SWS. #1, 2, & 3 NO DIODE
ALL OTHER SWITCHES USE
DIODE IN4004



SYMBOL IF
.05 CAP IS
USED

SWITCH NO.	WIRE COLOR	JACK NO.	DESCRIPTION
1	BLU	J3-9	CHUTE (LEFT)
2	BRN-W	J3-10	CHUTE (CENTER)
3	R-W	J3-11	CHUTE (RIGHT)
4	W-B	J2-11	LOOP ROLL UNDER
5	W-G	J2-12	SPINNER
6	BLU-W	J3-14	CREDIT (START) BUTTON
7	BLU-O	J3-15	TILT
8	-Y-	J3-16	SLAM
9	BRN	J2-8	DROP TARGET #1
10	GREY	J2-9	DROP TARGET #2
11	W-O	J2-10	DROP TARGET #3
12	W-B	J2-11	DROP TARGET #4
13	W-G	J2-12	DROP TARGET #5
14	W-BRN	J2-13	DROP TARGET #6
15	BRN-Y	J2-14	DROP TARGET #7
16	-O-	J2-15	DROP TARGET #8

SWITCH NO.	WIRE COLOR	JACK NO.	DESCRIPTION
17	BRN	J2-8	TOP DEAD BUMPER
18	GREY	J2-9	TOP 3 BANK LFT. TARGET
19	W-O	J2-10	TOP 3 BANK MID. TARGET
20	W-B	J2-11	TOP 3 BANK RT. TARGET
21	W-G	J2-12	LOOP DROP TARGET
22	W-BRN	J2-13	RT. 3 BANK TOP TARGET
23	BRN-Y	J2-14	RT. 3 BANK MID TARGET
24	-O-	J2-15	RT. 3 BANK BOTTOM TARGET
25	BRN	J2-8	RIGHT OUTLANE
26	GREY	J2-9	LEFT OUTLANE
27	W-O	J2-10	RT. RETURN LANE
28	W-B	J2-11	LFT. RETURN LANE
29	W-G	J2-12	RIGHT SLINGSHOT
30	W-BRN	J2-13	LEFT SLINGSHOT
31	BRN-Y	J2-14	POP BUMPER
32	-O-	J2-15	LFT. LANE LOWER SWITCH
33	BRN	J2-8	OUTHOLE
34	GREY	J2-9	LFT. LANE KICK-OUT HOLE
35	W-O	J2-10	ADVANCE SPINNER TO END
36	W-B	J2-11	MID. OUTHOLE SWITCH
37	W-G	J2-12	LFT. OUTHOLE SWITCH
38	W-BRN	J2-13	LFT. LANE MID. SWITCH
39	BRN-Y	J2-14	LFT. LANE TOP SWITCH
40	-O-	J2-15	BALL SHOOTER LANE SWITCH

W-BLU (J2-3)

W-Y (J2-4)

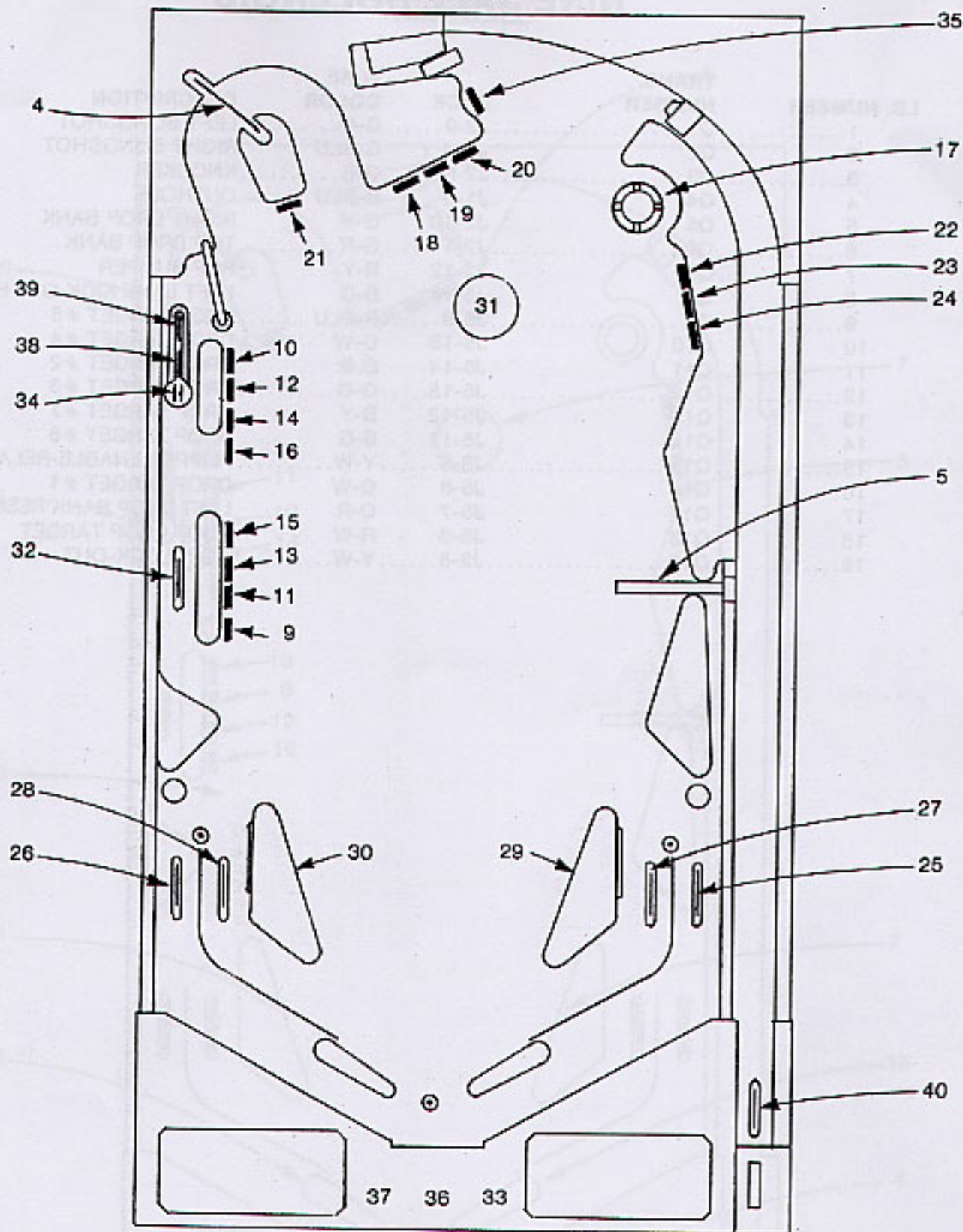
Y-R (J2-5)

R-Y (J3-3)

W-R (J2-1)

BRN-W (J2-2)

SWITCHES NINE BALL



SWITCHES NOT ON PLAYFIELD:

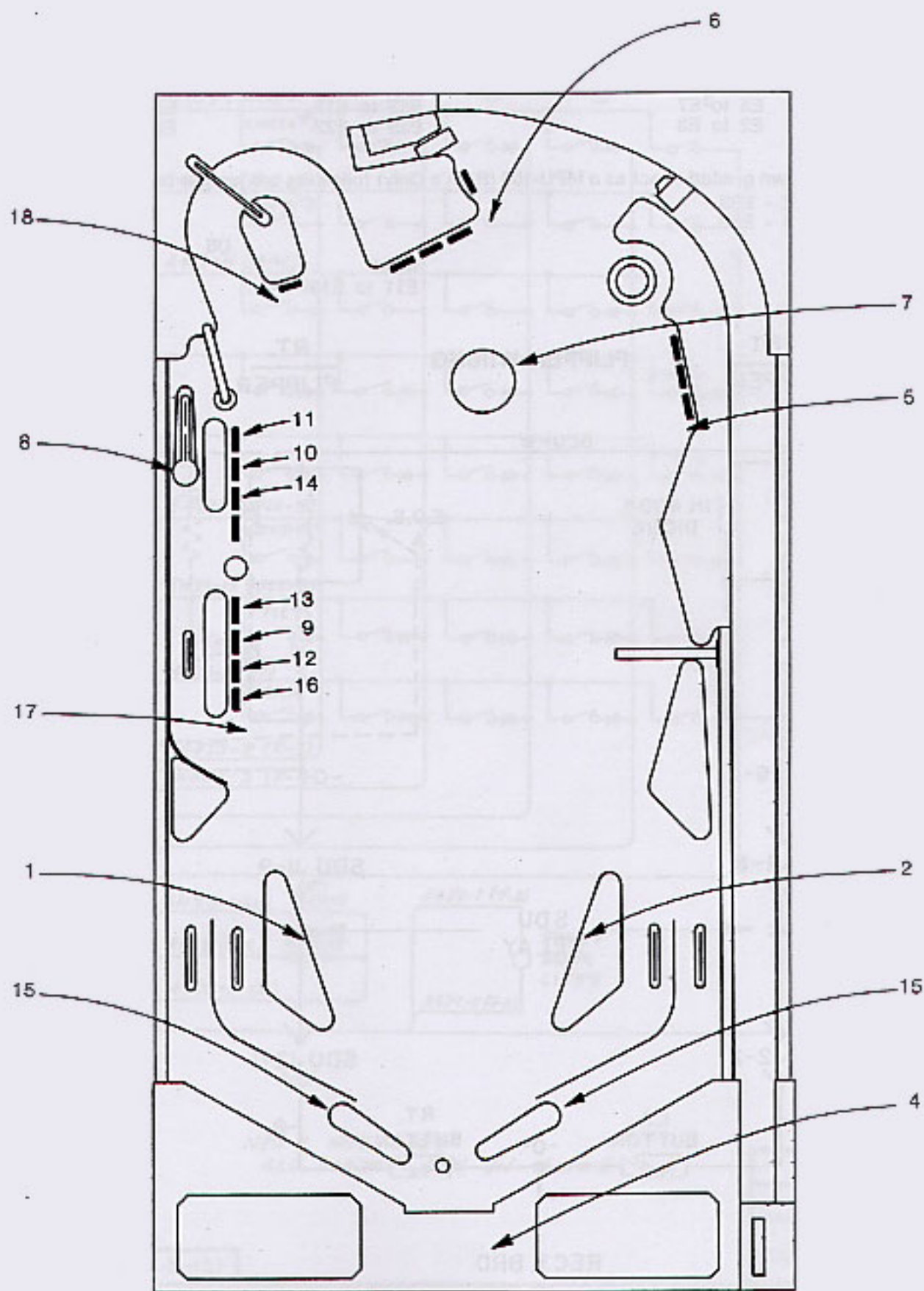
- | | |
|-----------------|--------------|
| 1 *LEFT CHUTE | 7 ROLL-TILT |
| 2 *CENTER CHUTE | 7 PENDULUM |
| 3 *RIGHT CHUTE | 8 TILT BOARD |
| 6 CREDIT BUTTON | 8 DOOR |

*SEE DRAWG. ON SWITCH IDENTIFICATION PAGE

NINE BALL SOLENOID

I.D. NUMBER	TRANS. NUMBER	JACK	WIRE COLOR	DESCRIPTION
1.....	Q1	J2-9.....	G-O.....	LEFT SLINGSHOT
2.....	Q2	J2-4.....	G-BLU.....	RIGHT SLINGSHOT
3.....	Q3	J2-5.....	G-B.....	KNOCKER
4.....	Q4	J1-5.....	B-BLU.....	OUTHOLE
5.....	Q5	J2-10.....	G-Y.....	RIGHT DROP BANK
6.....	Q6	J2-11.....	G-R.....	TOP DROP BANK
7.....	Q7	J2-12.....	R-Y.....	POP BUMPER
8.....	Q8	J5-10.....	B-O.....	LEFT LANE KICK-OUT HOLE
9.....	Q9	J5-9.....	R-BLU.....	DROP TARGET #5
10.....	Q10.....	J5-15.....	O-W.....	DROP TARGET #4
11.....	Q11.....	J5-14.....	O-B.....	DROP TARGET #2
12.....	Q12.....	J5-13.....	O-G.....	DROP TARGET #3
13.....	Q13.....	J5-12.....	B-Y.....	DROP TARGET #7
14.....	Q14.....	J5-11.....	B-G.....	DROP TARGET #6
15.....	Q15.....	J3-5.....	Y-W.....	FLIPPER ENABLE-RELAY
16.....	Q16.....	J5-8.....	G-W.....	DROP TARGET #1
17.....	Q17.....	J5-7.....	O-R.....	LEFT DROP BANK RESET
18.....	Q18.....	J5-3.....	R-W.....	LOOP DROP TARGET
19.....	Q19.....	J2-8.....	Y-W.....	COIN LOCK-OUT

SOLENOIDS **NINE BALL**



SOLENOIDS NOT ON PLAYFIELD:
3-KNOCKER 19-LOCKOUT

MPU-200 JUMPER COMBINATIONS

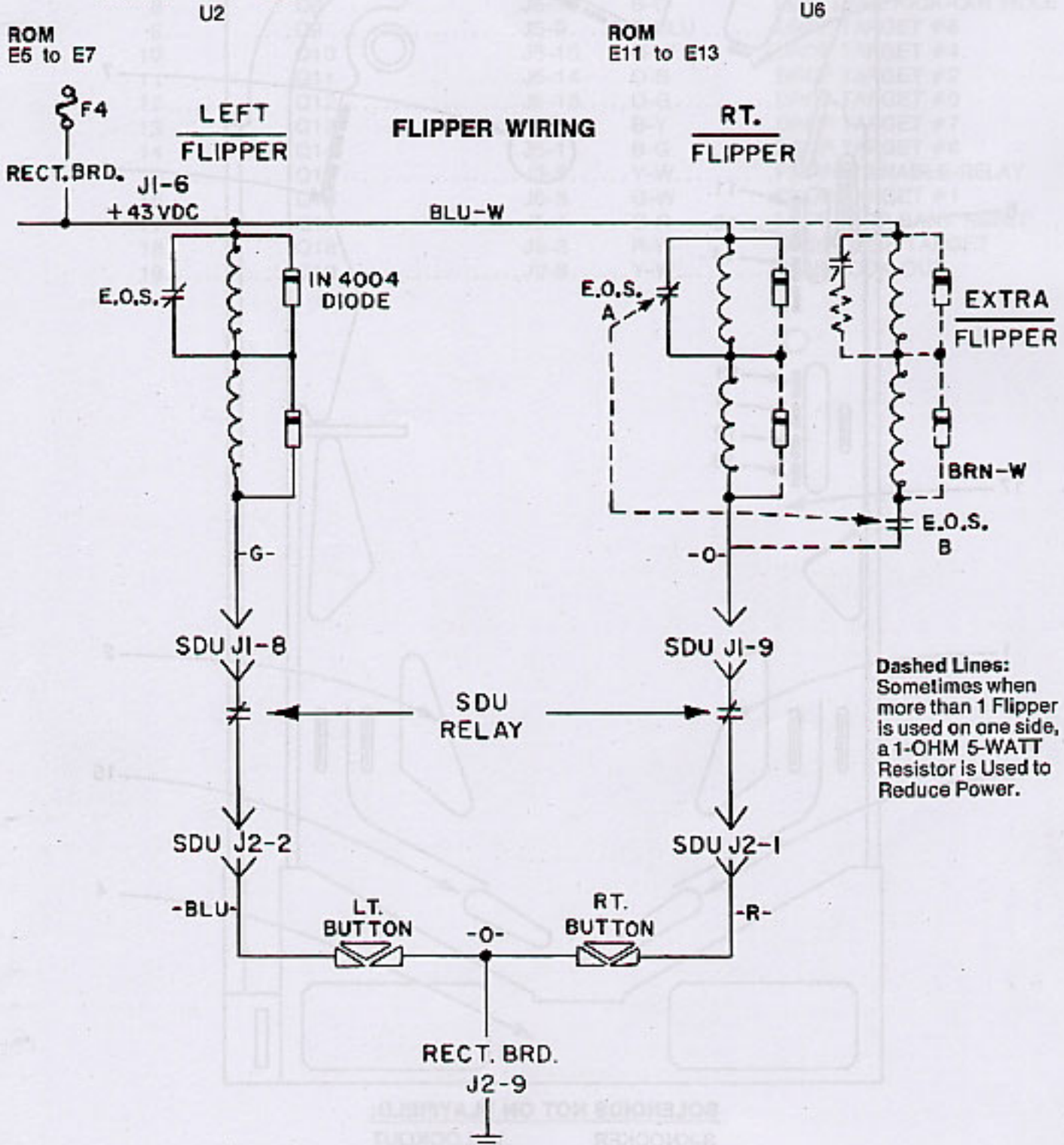
The MPU-200 can be converted to use 25A Roms or E-Proms or any combination of Roms or E-Proms. Below are listed the jumpers needed for each memory chip.

ROM Stern #25A- E9 to E8 E28 to E26	U1 E-PROMS (paper on top) E9 to E10 E28 to E27
ROM E5 to E1 E2 to E6	U2 E-PROM E5 to E7 E2 to E3

ROM E19 to E20 E29 to E31	U5 E-PROM E19 to E21 E29 to E30
ROM E13 to E12 E25 to E22	U6 E-PROM E13 to E14 E25 to E23

The MPU-200 can be down graded to act as a MPU-100 (Rom's Only) following are jumper modifications:

- Remove - E32 - E33
- Remove - E34 - E35





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