

USING PROM

25A-116-E1B 20 (U1)

25A-116-E2B 20 (U2)

25A-116-E5B 20 (U5)

25A-116-E8B 20 (U6)



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 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 two (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 the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.

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

Sell 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 SDJ 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)

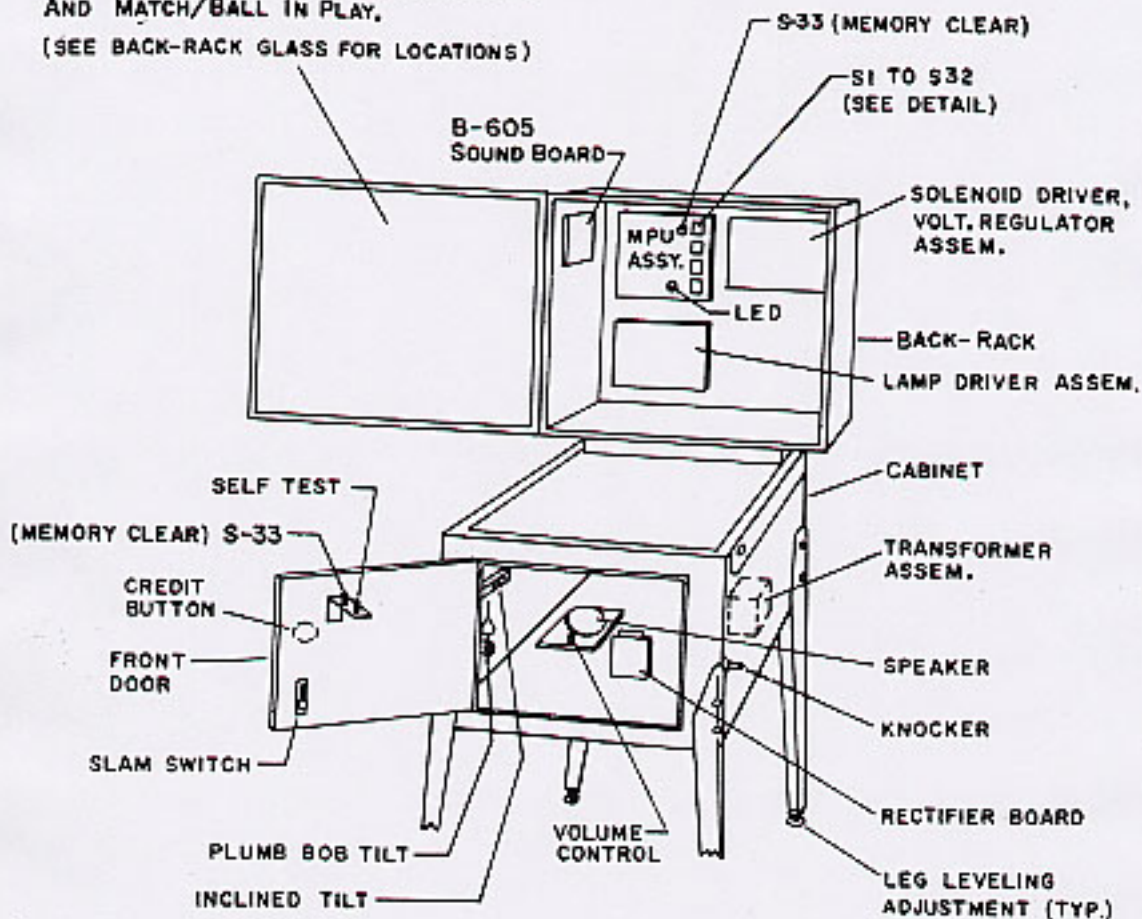


FIGURE 1



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 lites 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 10,000.

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 0 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	Total Extra Balls Awarded	00 to 999999
19th	14	Total Playfield Special Awards	00 to 999999
20th	15	Total 100,000 Points Awarded	00 to 999999
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

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—	1,000,000	1,520,000
2nd Level—	1,760,000	3,100,000
3rd Level—	_____	_____
High Score To Date	2,300,000	3,600,000

VI. FEATURE OPERATION & SCORING

To help explanation, playfield switches involved will be called out. See "Switch Identification" (Pg. 16) for location of playfield switches.

BONUS SCORE FEATURE:

Game starts with 10,000. Maximum bonus 100,000.

BONUS ADVANCEMENT

Sw. No.	Location	Advance Bonus
28-29-30	Middle Rt. 3-Bank Drop Target	Each Target 10,000
38-37	2 Middle Return Lanes	Each Lane 10,000
34-35	2 Outlanes	Each Lane 30,000
21 Thru 24	1 Thru 5 Drop Target (See 1 Thru 5 Drop Target-Times Down Adjustable)	Down in Sequence With Yellow Lite On Will Advance to Maximum Bonus of 100,000

BONUS MULTIPLIER

Sw. No.	Location	Advance Multiplier
25-26-27	Top 3-Bank (See Top 3-Bank-Times Down Adjustable)	Will Advance to what lite is on When All Targets Down
28-29-30	Rt. Middle 3-Bank	2nd Time Down Increase "X" Lite Come On — Will Advance to Next Multiplier When All Targets Down

BONUS COLLECTED:

Playfield switch - #31, upper left side roll-over lane. When "1 Thru 5 Drop Target Bank" has been hit in sequence with the blue lite on, switch - #31 will award the bonus times the multiplier. The bonus times the multiplier will then retain its status.

Outlane switch - #33. When the ball enters the "Outlane", the "Bonus Score" (times the multiplier) is collected. The "Bonus" resets to 10,000 and the "Bonus Multiplier" can be adjusted to retain bonus from ball to ball or to reset and start fresh for each ball. MPU Switch - #24 controls this — Retain "ON" position, Reset "OFF".

SPECIAL:

"Special" can be awarded by means of 3 switches, side ball kicker switch - #32 and the two outlane switches - #34 and #35.

SPECIAL COLLECTED:

Sw. No.	Location	Award
#32	Side Ball Kicker	To receive SPECIAL award the "3 Star Bank" targets must be hit lighting the "3 REDSTARS"
34-35	2 Outlanes	To receive SPECIAL award the "1 Thru 5 Drop Target" has to be hit in sequence when the "RED" lite is on.

SPECIAL ADJUSTMENTS

1) Side Kicker Lane	See retain "3 Star Bank Award," SW-#23, Pg. 14
2) Outlane	See "5 Bank Star Award," SW-#29, Pg. 14.

HIGH SCORE FEATURE

1) Replay	MPU SWITCH-#6 ON
2) Times Awarded	MPU SW-#22 ON
1 Per Game	MPU SW-#22 OFF
1 Per Ball	

AWARD

	MPU SWITCH
No Award	31 OFF
Extra Ball	31 ON
100,000	32 OFF
Replay	32 ON

EXTRA BALL:

"Extra Ball" can be awarded by means of 4 switches, the Spinner Sw. - #9 behind the 3 Star Bank, the Stand-Up target Sw. - #10 by the thumper bumpers and the two Inner Return Lane Sws. - #39-38.

EXTRA BALL COLLECTED

Sw. No.	Location	Award (Lites Extra Ball)
9	Spinner behind the 3 Star Bank	When the 3 amber star lites are lined up — the Extra Ball lite on either side of the Spinner lites.
10	STAND-UP target by THUMPER BUMPERS	When the middle right 3 Bank EXTRA BALL lite is on and all targets are hit, the EXTRA BALL lite by the Stand-Up Target lites.
39-38	Inner RETURN LANES	When the "1 Thru 5 Bank" LITE EXTRA BALL LANE lite is on and the targets are hit in sequence the EXTRA BALL lane lites lite alternately.

EXTRA BALL ADJUSTMENTS

1) HIGH SCORE	EXTRA BALL	SW.-#6 OFF (See following ADD-A-BALL feature)
2) EXTRA BALL LITE LIMIT	1 Per Ball 1 Per Game	SW.-#17 OFF (See Note) SW.-#17 ON (See Note)
3) EXTRA BALL AWARD	EXTRA BALL 100,000 Points	SW.-#30 ON (See Note) SW.-#30 OFF
4) SPECIAL AWARD	EXTRA BALL	SW.-#31 OFF SW.-32 ON

NOTE: After the "EXTRA BALL" has been awarded and the "EXTRA BALL" lite is lit again, it will award 100,000 points.

ADD-A-BALL (HIGH SCORE THRESHOLD & SPECIAL STACKING-MEMORY)

Stacking of Add-A-Balls can be programmed to allow 1, 3 or 5 to be stored in memory when HIGH SCORE THRESHOLD is programmed to give an extra ball when SPECIAL is programmed to give extra ball. It will be stacked only at this time.

MAXIMUM STACKED	ADD-A-BALL MPU SWITCHES			
	#5	#6	#13	#17
1	OFF	OFF	OFF	ON
3	ON	OFF	OFF	ON
5	ON	OFF	ON	ON

LEFT SPINNER (SW.-#4)

Scores 1,000, Scores 3,000 when 3 BLUE STARS are lined up. (See Note #1)

RIGHT SPINNER (SW.-#5)

Scores 1,000, Scores 3,000 when 3 YELLOW STARS are lined up. (See Note #1)

EXTRA BALL SPIN-TARGET (SW.-#8)

Scores 3,000 for each spin. Awards EXTRA BALL or 100,000 when lit. (See Note #1)

STAND-UP TARGET (SW.-#10)

Scores 5,000. Awards EXTRA BALL or 100,000 when lit.

SLING-SHOOTS (SWS.-#11-15-16)

All Score 10. (See Note #1)

THUMPER BUMPERS (SWS.-#12, #13 & #14)
Scores 1,000 on 3 ball, 100 on 6 ball. (See Note #1)

3 STAR BANK (SWS.-#17-18-19)

Each target scores 2,000. When all targets down and two colors are matched an additional 20,000 is scored. When all targets down and three colors are matched an additional 40,000 is scored plus following award.

	ALL TARGETS DOWN AND 3 STARS MATCHED AWARD
RED ***	Right kicker SPECIAL lite
YELLOW ***	Right spinner 3,000 lite
BLUE ***	Left spinner 3,000 lite
AMBER ***	EXTRA BALL spin target

See page 14 for MPU adjustment, SWITCH 23.

1 THRU 5 BANK (SWS.-#20-21-22-23-24)

Each target scores 500 or 5,000 when lit. Targets have to be hit down in sequence to receive lit award. If all targets have been hit down but not in sequence, upon resetting those that when hit in sequence will go down (program).

Hitting targets in sequence when the

GREEN LITE ON:	Scores 20,000 and lites COLLECT BONUS LANE
YELLOW LITE ON:	Scores 30,000 and will advance the bonus to its maximum (100,000)
AMBER LITE ON:	Scores 40,000 and lites Inner EXTRA BALL return lane (programmed to alternate)
RED LITE ON:	Scores 50,000 and lites SPECIAL by outlanes (programmed to alternate)

See Page 14 for MPU adjustment, SWITCH 29.

TOP 3 BANK TARGET (SWS.-#25-26-27)

Each target scores 500. All targets down score and award corresponding value lit.

See page 12 for MPU adjustment, SWITCH 14.

MIDDLE RIGHT 3 BANK (SWS.-#28-29-30)

Each target scores 1,000 and advance bonus 10,000. All targets down 1st time lites increase "X" lite, 2nd time down awards additional 15,000, steps up bonus multiplier and lites "Extra Ball Target lite". 3rd time down awards 40,000 (15,000 and 25,000) steps up bonus multiplier and lites "EXTRA BALL" lite by stand-up target. All targets down there after score 40,000 bonus and step up bonus multiplier.

ROLL-OVER WIRE—UPPER LEFT (SW.-#31)

Scores 10,000 and spots next lit numbered target on 1 Thru 5 Bank. When "COLLECT BONUS" lite is on, bonus times bonus multiplier will be collected. (See 1 Thru 5 Bank)

BALL KICKER (SW.-#32)

Scores 25,000 and spots next lit numbered target on 1 Thru 5 Bank. When "SPECIAL" (See "Feature Operation" SPECIAL and 3 STAR BANK) lite is on, will award SPECIAL.

OUTLANES (SWS.-#34-35)

Scores 25,000 and advances bonus 30,000. When "SPECIAL" (See "Feature Operation" Special and 1 Thru 5 Bank) lite is on will award SPECIAL.

MIDDLE RETURN LANES (SWS.-#36-37)

Scores 5,000 and advances bonus 10,000.

INNER RETURN LANES (SWS.-#38-39)

Scores 10,000 and spots next lit numbered target on 1 Thru 5 Bank. When "EXTRA BALL" (See "Feature Operation" EXTRA BALL and 1 Thru 5 Bank) lite is on award will be given.

10 POINT (SW.-#40)

Scores 10.

NOTE #1 Alternates SPECIAL and EXTRA BALL lites at bottom of Playfield.

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 Fig. 3).

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 load 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.**

CHEETAH SWITCH ASSIGNMENT

32	}	Special Award
31		
30		EXTRA BALL LITE AWARD
29		5 BANK LITE START AWARD
28	}	COIN CHUTE #1
27		
26		
25		
24		BONUS MULTIPLIER RESET
23		RETAIN ARCH BANK AWARD
22		SPECIAL REPLAY LIMIT
21		MATCH FEATURE
20		CREDIT DISPLAY
19	}	MAXIMUM CREDITS
18		
17		EXTRA BALL LITE LIMIT
16	}	HIGH GAME TO DATE FEATURE
15		
14		TOP BANK 2X LITE
13		MAXIMUM ADD-A-BALL
12	}	COIN CHUTE #2
11		
10		
9		
8		BACKGROUND SOUND
7		BALL PER GAME
6		HIGH SCORE FEATURE
5		ADD-A-BALL (MEMORY)
4	}	COIN CHUTE #3
3		
2		
1		

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

Add-a-ball MPU Game adjustment SWS-#5, 13 & 17 can keep in memory 3 or 5 "ADD-A-BALLS". This feature will store in memory when the "SPECIAL" or "THRESHOLD" is set to award "EXTRA BALL".

ADD-A-BALL (MEMORY)
ON (SW-#17 MUST BE ON)
OFF

SWITCH 5
ON (USE SW-#13 FOR
OFF AMOUNT)

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

SWITCH 6
OFF (SEE SWS-#5 & 13)
ON

BALL PER GAME:

NO. OF BALL PER GAME
3
5

SWITCH 7
OFF
ON

BACKGROUND SOUND:

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

SOUND
OFF
ON

SWITCH 8
OFF
ON

MAXIMUM ADD-A-BALLS:

With MPU Game Adjustment SW-#5 turned to "ON" position, this switch adjustment allows either 3 or 5 "Add-a-Balls" to be stored in memory.

MAXIMUM ADD-A-BALLS
3 Maximum
5 Maximum

SWITCH 13
OFF
ON

TOP BANK 2X LITE:

Game can be adjusted to have the 2X lite by the top three bank to be ON at the start of the game or to start without the 2X lite to be lit.

TOP BANK 2X LITE
Game starts with 2X lite on
Game starts with 2X lite off

SWITCH 14
ON
OFF

HIGH GAME 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 game 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	SWITCH	
Novelty	16	15
1 Free Game	OFF	OFF
2 Free Games	OFF	ON
3 Free Games	ON	OFF
	ON	ON

EXTRA BALL LITE LIMIT:

The number of "EXTRA BALLS" made per game can be limited as follows:

EXTRA BALL	SWITCH 17
1 Per Ball (POSITION FOR ADD-A-BALL MEMORY)	ON (SEE NOTE)
1 Per Game	OFF

NOTE:
With switch in "ON" position, after the "EXTRA BALL" has been awarded for the ball in play, and "EXTRA BALL" lite is lit again, it will award 100,00 points.

MAXIMUM CREDITS:

The Maximum credits accepted by the machine limits the number of games that can be accumulated by coinage, by winning replays or both. The maximum number of credits are adjustable by means of switches 18, and 19. Four credit limits are available. Switch settings are listed below:

MAXIMUM CREDITS	SWITCHES	
10	19	18
15	OFF	OFF
25	OFF	ON
40	ON	OFF
	ON	ON

CREDIT DISPLAY:

CREDIT DISPLAY	SWITCH 20
YES	ON
NO	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 a player's score a free game is awarded. The MATCH feature creates an incentive to play.

MATCH	SWITCH 21
ON	ON
OFF	OFF

NO. OF SPECIALS:

The number of specials per game can be limited as follows::

REPLAYS	SWITCH 22
1 Per Ball	OFF
1 Per Game	ON

RETAIN 3 STAR BANK AWARD:

Awards received by lining up the three same color star lines by the "3 STAR BANK" can be retained from ball to ball or can be adjusted to start fresh for each ball.

3 STAR BANK	SWITCH 23
Retained from Ball to Ball	ON
Awards for Ball in Play Only	OFF

BONUS MULTIPLIER RESET:

Bonus multiplier received during the course of the game can be retained from ball to ball or can be adjusted to start fresh for each ball.

BONUS MULTIPLIER	SWITCH 24
RETAIN	ON
RESET	OFF

5 BANK START AWARD:

Build up award on "5 BANK" can be adjusted to start with no lite on or to start with "20,000 Collect Bonus" lite on.

5 BANK START AWARD	SWITCH 29
NO LITE	OFF
20,000 COLLECT BONUS	ON

EXTRA BALL AWARD:

Award received when "EXTRA BALL" lite is on can be adjusted to give the "EXTRA BALL" or to award "100,000 Points".

EXTRA BALL AWARD	SWITCH 30
EXTRA BALL	ON (SEE NOTE)
100,000 Points	OFF

NOTE:

SEE "EXTRA BALL LITE LIMIT", (SW-# 17)

SPECIAL AWARD:

Award received when "Special" lite is lit.

AWARD	SWITCHES	
No Award	31	32
Extra Ball	OFF	OFF
100,000 Points	OFF	ON
Replay	ON	OFF
	ON	ON

PARTS LIST CHEETAH

MISCELLANEOUS	PART NUMBER
TRANSFORMER (DOMESTIC OR EXPORT)	16B-6
TRANSFORMER & RECTIFIER BOARD	B-43B-2
BULBS (#44)	BA-101
U1	25A-116-E1B 20
U2	25A-116-E2B 20
U5	25A-116-E5B 20
U6	25A-116-E6B 20
ASSEMBLY COINS	
COIN LOCKOUT	C-36-5300
DROP TARGET (4)	C1-34-3400
3 DROP TARGET RESET (3)	B-27-2300
5 DROP TARGET RESET	B-24-1600
FLIPPER	J-25-475/34-3400
KNOCKER	N-26-1200
OUTHOLE KICKER	— JX-26-1200
THUMPER BUMPER (3)	J-26-1200
SLINGSHOTS (2)	J-26-1500
LANE KICKER	J-26-2300
MODULES	
LAMP DRIVER	B-431
DISPLAY DRIVER (4)	A-845
MATCH/BALL IN PLAY DISPLAY	A-434
SOLENOID DRIVER/VOLTAGE REGULATOR	B-432-FJ
MPU (FOR GAME CHIPS SEE MISCELLANEOUS ABOVE)	C-802
RECTIFIER BOARD	A-430
SOUND MODULE	C-605
PLAYFIELD PARTS	SEE PLAYFIELD DIAGRAM

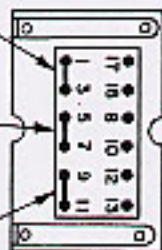
STERN 16B-6 TRANSFORMER WIRING CONNECTION INSTRUCTIONS

115/120V., 50/60 Cycle Input.
 Variator - Soldered to Line Filter on Left Side of Cabinet
 Must be Stern Part No. 25A-18-1.

Solder Lugs 1 & 3
 Together. Solder Heavy
 Red Wire To Lug 1

120V
 Solder Lugs 5 & 7
 Together. Solder Heavy
 Yellow Wire To Lug 5

115V
 Solder Lugs 9 & 11
 Together. Solder Heavy
 Yellow Wire To Lug 9



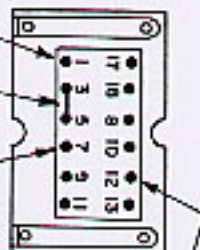
220/240V., 50/60 Cycle Input.
 Variator - Soldered to Line Filter on Left Side of Cabinet
 Must be Stern Part No. 25A-18-2.

Solder Heavy Red Wire
 To Lug 1

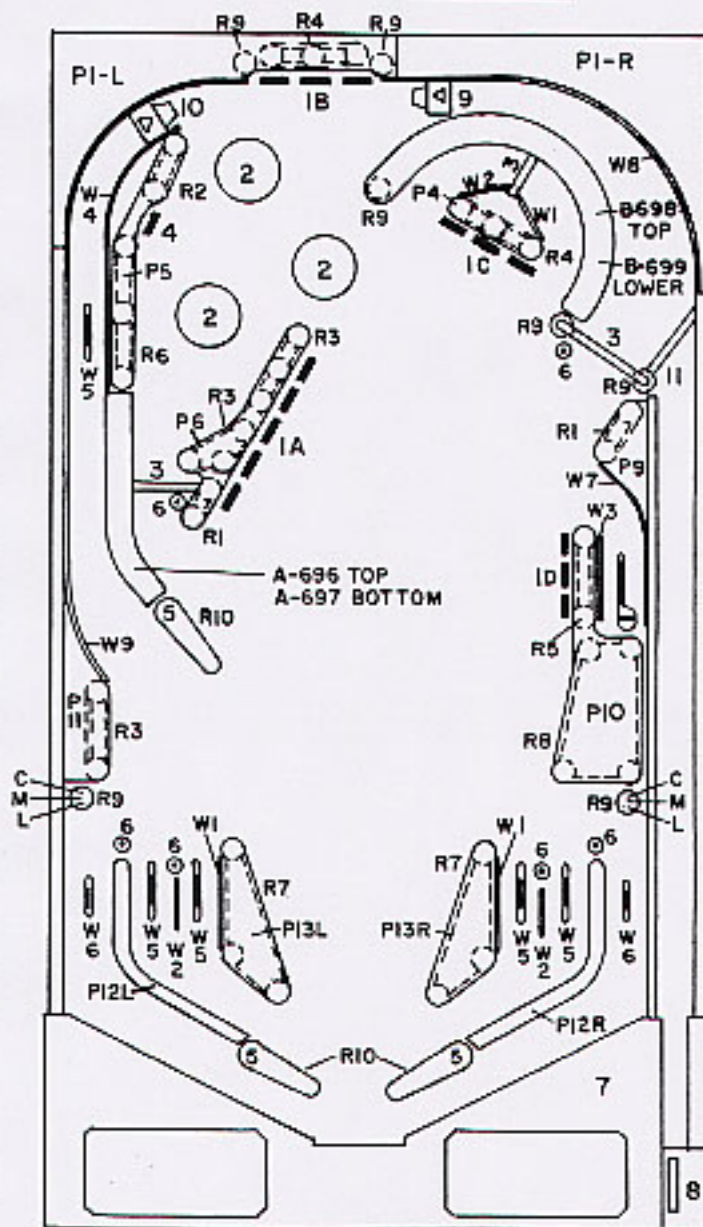
Solder Lugs 3 & 5
 Together

240V
 Solder Heavy Yellow
 Wire To Lug 7

220V
 Solder Heavy Yellow
 Wire To Lug 12



**PLAYFIELD CHART
CHEETAH**



POST ADJUSTMENT:

C-CONSERVATIVE
M-MEDIUM
L-LIBERAL

RUBBER RINGS

- R1-7A-120-100
- R2-7A-120-125
- R3-7A-120-150
- R4-7A-120-175
- R5-7A-120-200
- R6-7A-120-225
- R7-7A-120-275
- R8-7A-120-350
- R9-7A-135
- R10-7A-121-1

BALL GUIDES & ROLL-OVERS

- | | |
|-------------|----------|
| W1-6A-101 | W6-A-583 |
| W2-6A-101-G | W7-A-689 |
| W3-6A-101-K | W8-C-693 |
| W4-6A-265 | W9-C-694 |
| W5-A-149 | |

PLASTIC SHIELDS

Top arch pair 13C-116-1R & 1L
Others: 13A-116-2 to -13
(P1 to P13)

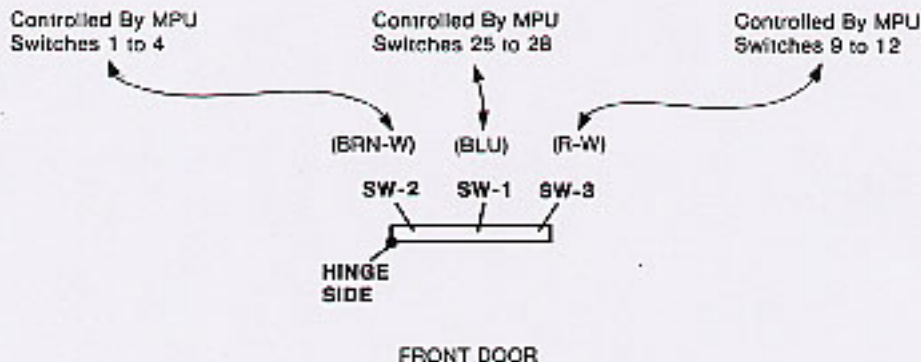
MISC. PARTS & ASSEMBLIES

- 1A-5-Bank Dr. Target
- D-64B-5A-1 (Targets Alone)
- 13A-35-1 to -5)
- 1B-3-Bank Dr. Target
- D-560-3F-2 (Targets Alone)
- 13A-20-3)
- 1C-3-Bank Dr. Target
- D-560-3F-2 (Target Alone)
- 13A-11-BL)
- 1D-3-Bank Dr. Target
- D-560-3F-1 (Target Alone)
- 13A-20-1
- 2-Thumper Cap 13A-38
- 3-Spin Target Assem. A-563-4
(Target & Wire Only 14A-7-3)
- 4-Target Assem. A-461-2Y
- 5- Flipper & Shaft Assem.
A-703-Y
- 6-Ball Guide Post 2A-200
(Rubber Ring 7A-125)
- 7-Instruction Plate 14B-5-1
- 8-Shooter Gauge 14A-2-5
- 9-Ball Gate Assem. A-611-R
- 10-Left Gate Assem. A-611-L
- 11-Anti-Return Gate A-471

FIGURE 3

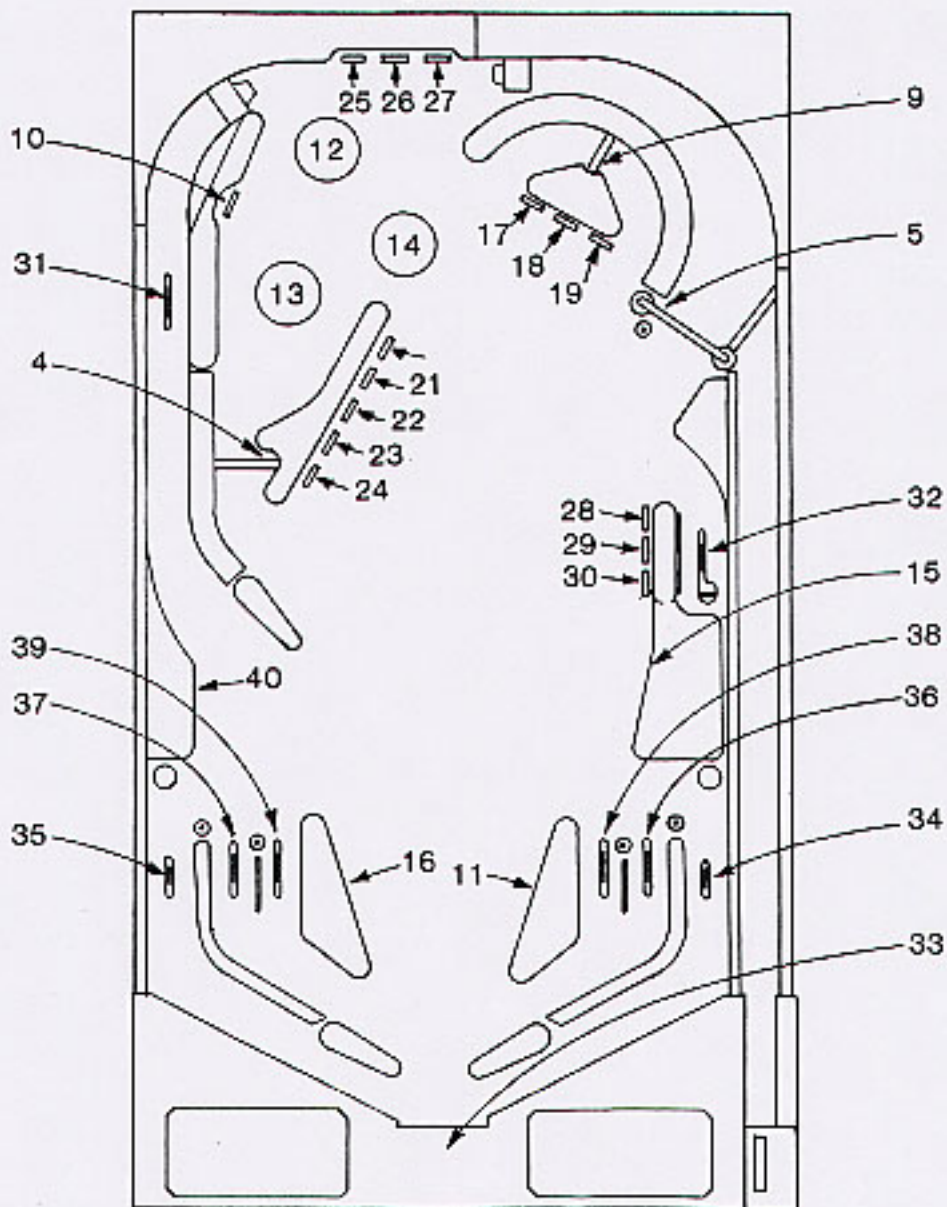
CHEETAH SWITCH IDENTIFICATION SELF TEST DISPLAY NUMBERS

SWITCH NO.	SWITCH LOCATION	SWITCH NO.	SWITCH LOCATION
1	COIN CHUTE	25 Thru 27	3-BANK DROP TARGETS (TOP)
2	COIN CHUTE		
3	COIN CHUTE		
4	LEFT SPIN-TARGET	28 Thru 30	3-BANK DROP TARGETS (RIGHT)
5	RIGHT SPIN-TARGET		
6	CREDIT BUTTON	31	ROLL-OVER WIRE (UPPER LT.)
7	TILTS	32	BALL KICKER
8	SLAM & VIB. TILTS.	33	OUT-HOLE
9	EXTRA BALL SPIN-TARGET	34	RIGHT OUT-LANE
10	STAND-UP TARGET	35	LEFT OUT-LANE
11	SLING-SHOT (LOW, RT.)	36	RIGHT RETURN LANE
12	THUMPER BUMPER (TOP)	37	LEFT RETURN LANE
13	THUMPER BUMPER (LOW)	38	RIGHT EXTRA BALL LANE
14	THUMPER BUMPER (MIDDLE)	39	LEFT EXTRA BALL LANE
15	SLING-SHOT (UPPER RT.)	40	10-POINTS
16	SLING-SHOT (LEFT)		
17 Thru 19	3-BANK DROP-TARGETS (ARCH)		
20 Thru 24	5-BANK DROP-TARGETS (LT.)		



NOTE: FLIPPER BUTTON CABINET SWITCHES DO NOT APPEAR ON TEST

**SWITCHES
CHEETAH**



SWITCHES NOT ON PLAYFIELD

- | | |
|-----------------|----------------------------|
| 1* LEFT CHUTE | 7 ROLL-TILT |
| 2* CENTER CHUTE | 7 PENDULUM |
| 3* RIGHT CHUTE | 6 TILT BOARD |
| 5 CREDIT BUTTON | 6 DOOR & PLAYFIELD
VIB. |

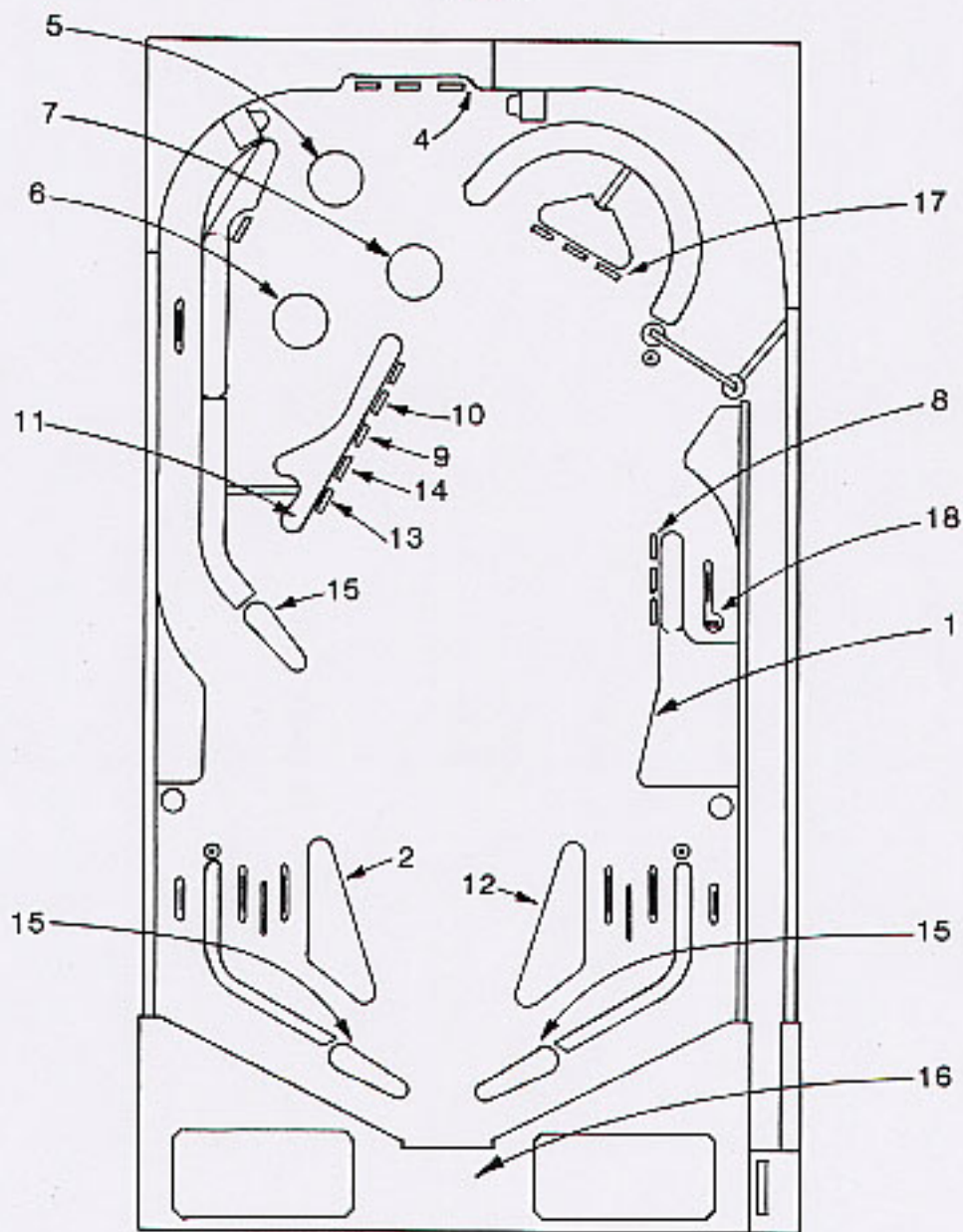
* SEE DRWG. ON SWITCH IDENTIFICATION PAGE

**CHEETAH
SOLENOID IDENTIFICATION
SELF TEST DISPLAY NUMBERS**

<u>SOLENOID NO.</u>	<u>SOLENOID LOCATION</u>
1	SLING—SHOT (UPPER RIGHT)
2	SLING—SHOT (LEFT)
3	KNOCKER
4	3-BANK DROP TARGET (TOP)
5	TOP THUMPER BUMPER
6	LOWER THUMPER BUMPER
7	MIDDLE THUMPER BUMPER
8	3-BANK DROP TARGET (RIGHT)
9	TARGET NO. 3 (5-BANK)
10	TARGET NO. 4 (5-BANK)
11	5-BANK TARGETS (RESET)
12	SLING-SHOT (LOWER RIGHT)
13	TARGET NO. 1 (5-BANK)
14	TARGET NO. 2 (5-BANK)
15	FLIPPERS (R, L, & UPPER)
16	OUT-HOLE
17	3-BANK DROP TARGET (ARCH)
18	BALL KICKER
19	COIN LOCK-OUT
20 THRU 25	ELECTRONIC SOUND

SOLENOIDS

CHEETAH



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- U1
E9 to E8
E28 to E26

E-PROMS (paper on top)
E9 to E10
E26 to E27

ROM U5
E19 to E20
E29 to E31

E-PROM
E19 to E21
E29 to E30

ROM U2
E5 to E1
E2 to E6

E-PROM
E5 to E7
E2 to E3

ROM U6
E13 to E12
E25 to E22

E-PROM
E13 to E14
E25 to E23

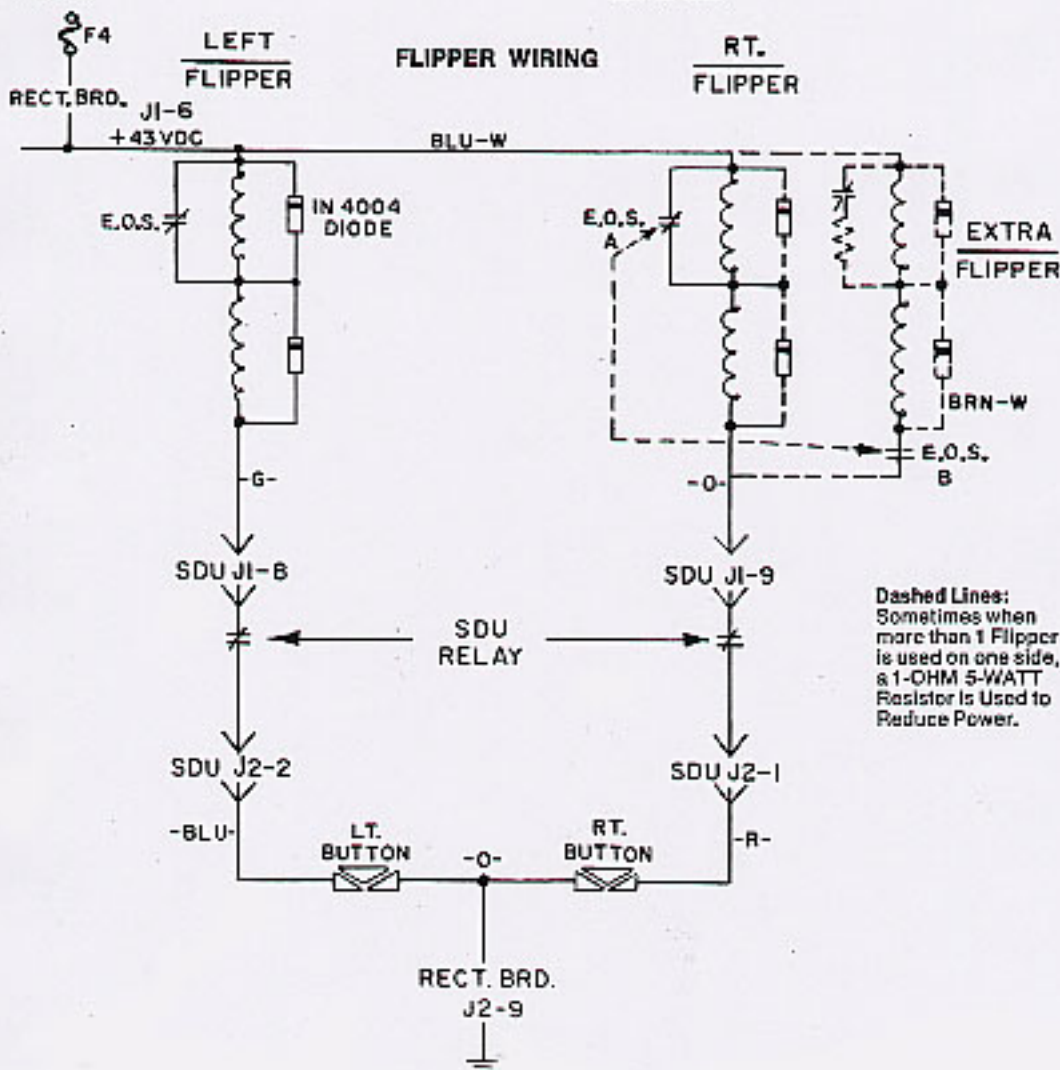
The MPU-200 can be down graded to act as a MPU-100 (Rom's Only) following are jumper modifications:

Remove - E32 - E33

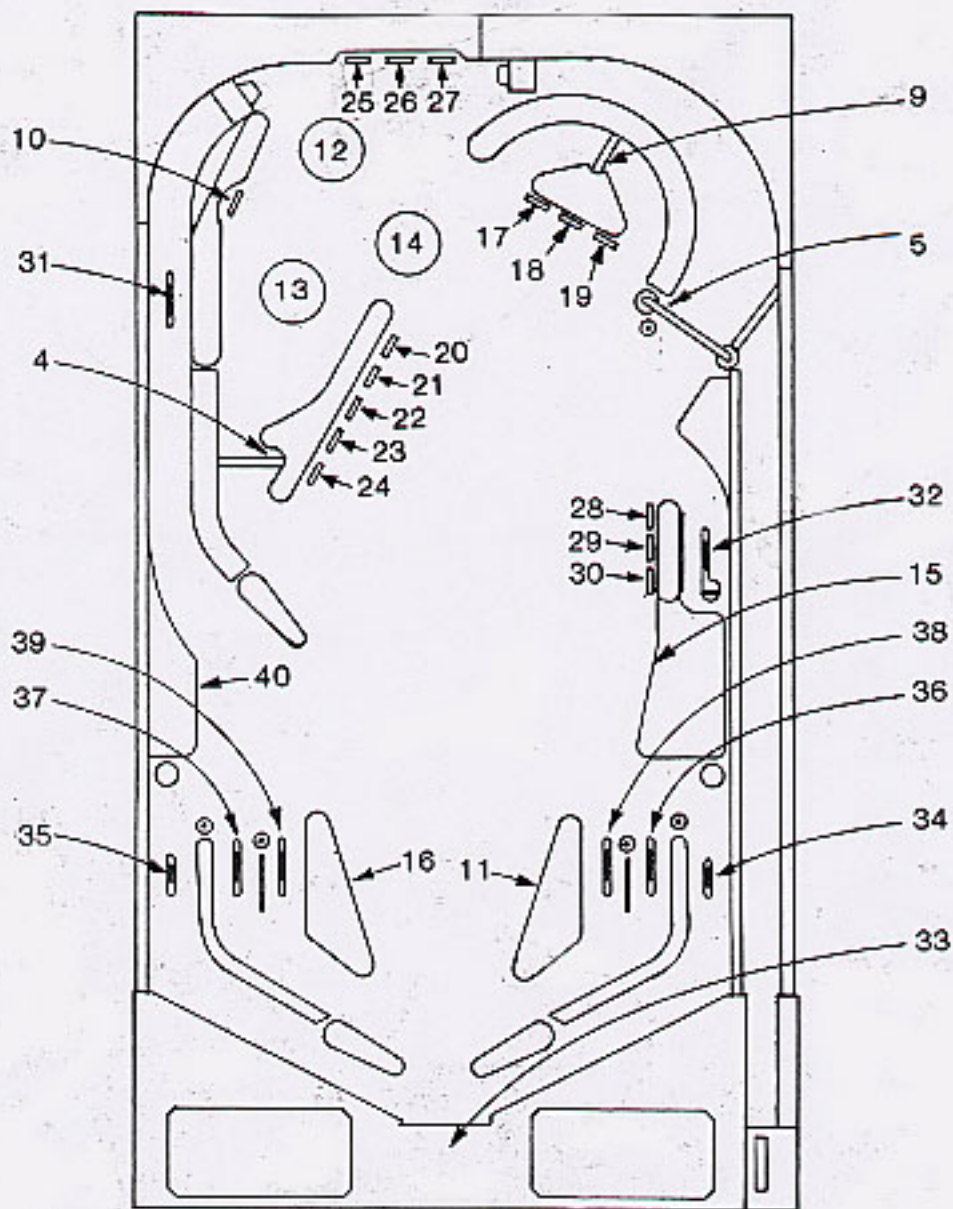
Remove - E34 - E35

ROM U2
E5 to E7

ROM U5
E11 to E13



**SWITCHES
CHEETAH**



STERN

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