USING PROM

25A-127-E1A6 (U1)
25A-127-E2A6 (U2)

25A-127-E5A6 (U5)
25A-127-E6A6 (U6)

STAR GAZER



STERN® *ELECTRONICS, INC.*
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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

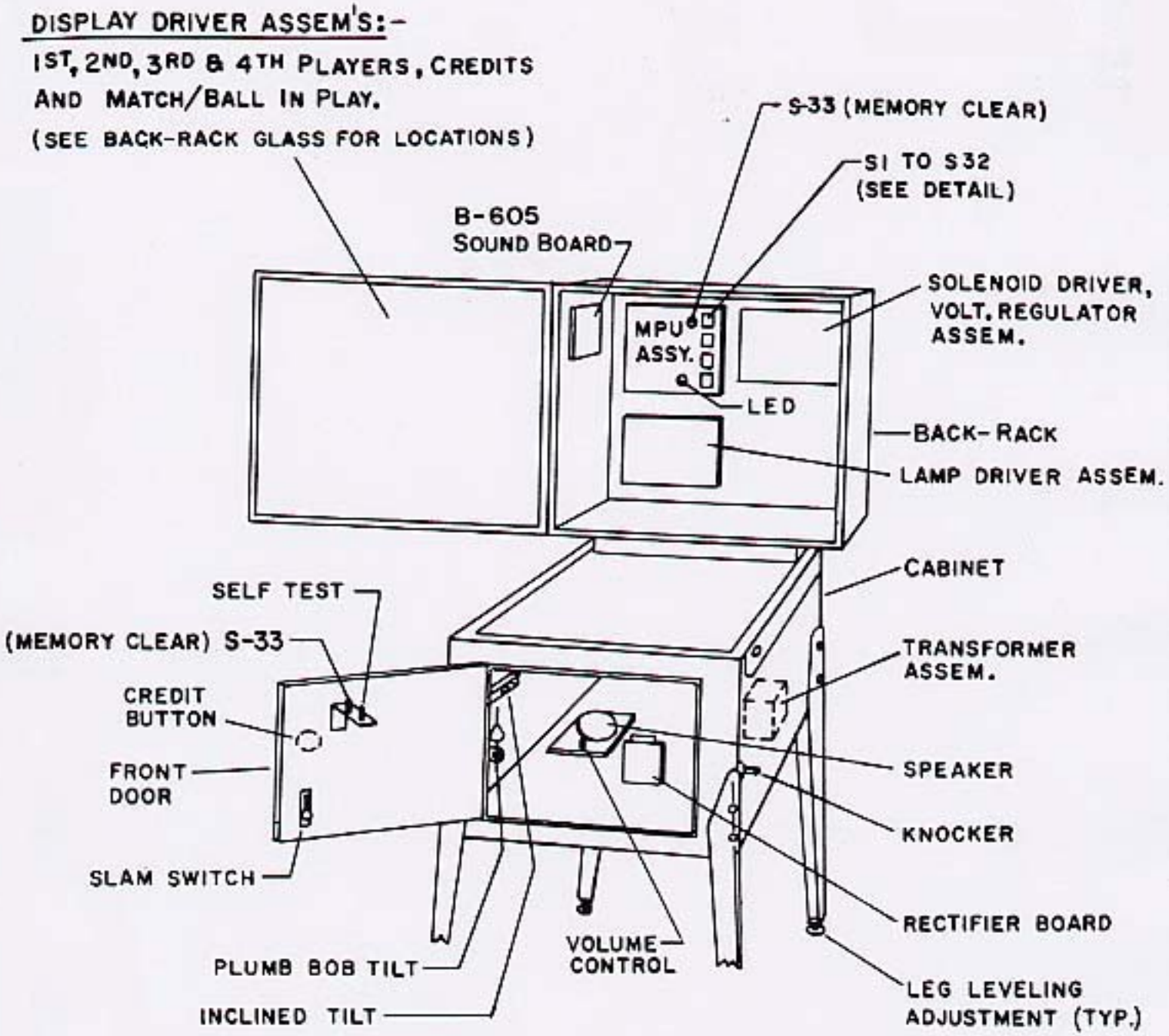
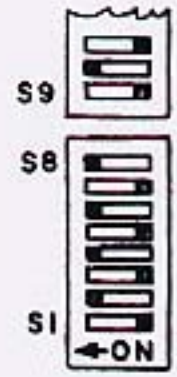


FIGURE 1



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 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	lashing 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	N/U	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

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 pusing 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	720,000	860,000
2nd Level	1,440,000	1,480,000
3rd Level	_____	_____
High Score To Date	2,360,000	2,500,000

VI. FEATURE OPERATION & SCORING

To help explanation, playfield switches involved will be called out. See "Switch Identification" (Pg. 18) for location of playfield switches.

BONUS SCORE FEATURE

Game starts at O. Maximum bonus 48,000

BONUS ADVANCEMENT

Pl. Sw. No.	Location	Advance Bonus
10, 11, 17, 18	Top Lft. Stand-up Targets	Each Target 1,000
19, 20, 21, 31, 32, 38	Top Rt. Stand-up Targets	Each Target 1,000
39, 40	Lower Right Stand-up Targets	Each Target 1,000
36	Right Rollover	Advances 1,000 by Spotting Zodiac Target. (See Note #1)
37	Left Rollover	

Spotting Zodiac target and bonus advancement can be made by hitting all three targets down on lower two drop banks. (See adjustment on MPU Sw. #29)

BONUS MULTIPLIER

Pl. Sw. No.	Location	Advance Multiplier
22, 23, 24	Lower Left Bank Drop Targets	Will Advance When All Three Targets Are Hit (to 10x Max.)
28, 29, 30	Right Bank Drop Targets	

BONUS COLLECTED

Outhole Switch - #33. When the ball enters the "Outhole", the "Bonus Score" (times the multiplier) is collected. The "Bonus" and the "Bonus Multiplier" are retained from ball to ball.

SPECIAL

"Special" can be awarded by means of rt. three drop target bank or two outlanes

SPECIAL COLLECTED

Pl. Sw. No.	Location	Award
28, 29, 30	Right Three Drop Targets	To receive "Special" award all 12 Zodiac targets must be hit 2, 3, or 4x's (See Special Adjustments)
34, 35	2 Outlanes	To receive "Special" award all 12 Zodiac targets must be hit 2, 3, or 4x's (See Special Adjustments)

SPECIAL ALTERNATION

1) Three "Special" positions alternate	MPU SW. #23 ON
2) Target bank "Special" position stays on, outlanes alternate	MPU SW. #23 OFF

SPECIAL ADJUSTMENT

Determines when "Special" can be awarded for completing Zodiac ring.

	MPU SW. 22	24
2nd time	OFF	OFF
2nd time	ON	OFF
3rd time	OFF	ON
4th time	ON	ON

AWARD

	MPU SW. 31	32
No award	OFF	OFF
Extra Ball	OFF	ON
100,000 points	ON	OFF
Replay	ON	ON

REPLAY

HIGH SCORE

1) Replay	MPU SW. #6 ON

EXTRA BALL

Extra ball can be awarded by means of the center target in the lower left bank drop targets only **(pl. Sw. 23)**

EXTRA BALL COLLECTED

Pl. Sw. No.	Location	Award (Lites Extra Ball)
23	Lower Left Bank Drop Targets	When All 12 Zodiac Targets Have Been Lit

EXTRA BALL ADJUSTMENTS

1) High SCORE	EXTRA BALL	MPU SW. #6 OFF
2) SPECIAL AWARD	EXTRA BALL	MPU SW. #31 OFF SW. 32 ON
3) EXTRA BALL, LITE LIMIT	Lite Alternates Lite Stays On	MPU SW. #17 OFF MPU SW. #17 ON
4) EXTRA BALL LITE CONTROL	No Extra Ball	MPU SW. #30 OFF

LEFT SPINNER (Pl. SW. #4)

Scores 200 each spin or 2,000 when lit. (See Note #1)

RIGHT SPINNER (Pl. SW. #5)

Scores 200 each spin or 2,000 when lit. (See Note #1)

CENTER SPINNER (Pl. SW. #9)

Scores 200 or lit value (See Left Upper Bank)

LEFT UPPER BANK (Pl. SW. No. 25, 26, 27)

Each drop target scores 1,000. Hitting one target stops flashing lite determining value of points awarded and value of Center Spinner, hitting all three targets awards points.

FLASHING VALUE LITE SPEED
Control flashing lite speed as Zodiac targets are hit.

FLASHING LITE SPEED	MPU SWITCH #55
fast	OFF
slow	ON

NOTE 1 Alternates SPOT ZODIAC TARGET and LITE RIGHT/LEFT SPINNER lites at bottom of playfield

THUMPER BUMPER (Pl. Sw. No. #12, 13, 14)
Scores 1,000 points

SLING SHOTS (Pl. Sw. No. #15)
Scores 10 points.

LEFT ROLLOVER (Pl. Sw. No. #37)
Scores 2,000 points and spots next zodiac target when white lite is lit or lites right spinner multiplier when yellow lite is lit.

RIGHT ROLLOVER (Pl. Sw. No. #36)
Scores 2,000 points and spots next zodiac target when white lite is lit or lites left spinner multiplier when yellow lite is lit.

LEFT OUTLANE (Pl. Sw. No. #35)
Scores 5,000 and awards "Special" when special lite is lit.

RIGHT OUTLANE (Pl. Sw. No. #34)
Scores 5,000 and awards "Special" when special lite is lit.

ZODIAC TARGET VALUE (Pl. Sw. No. #10, 11, 17-21, 31, 32, 38-40)
Each target scores 1,000 when hit and advances bonus 1,000. Zodiac target value can be increased by hitting all twelve zodiacs targets. Each time all twelve targets have been hit the zodiac target value will increase by 1,000 (to a 4,000 max.).

RIGHT BANK DROP TARGETS (Pl. Sw. No. 28, 29, 30)
Each target scores 1,000. All three targets down increase bonus multiplier. All three targets down while red Special lite is lit awards Special.

LOWER LEFT BANK DROP TARGETS (Pl. Sw. No. #22, 23, 24)
Each target scores 1,000. All three targets down increase bonus multiplier. When center target is hit when "Extra Ball" is on, an Extra Ball is awarded.

VII. CREDIT/COIN AND GAME ADJUSTMENTS

A. Playfield Post Adjustments:

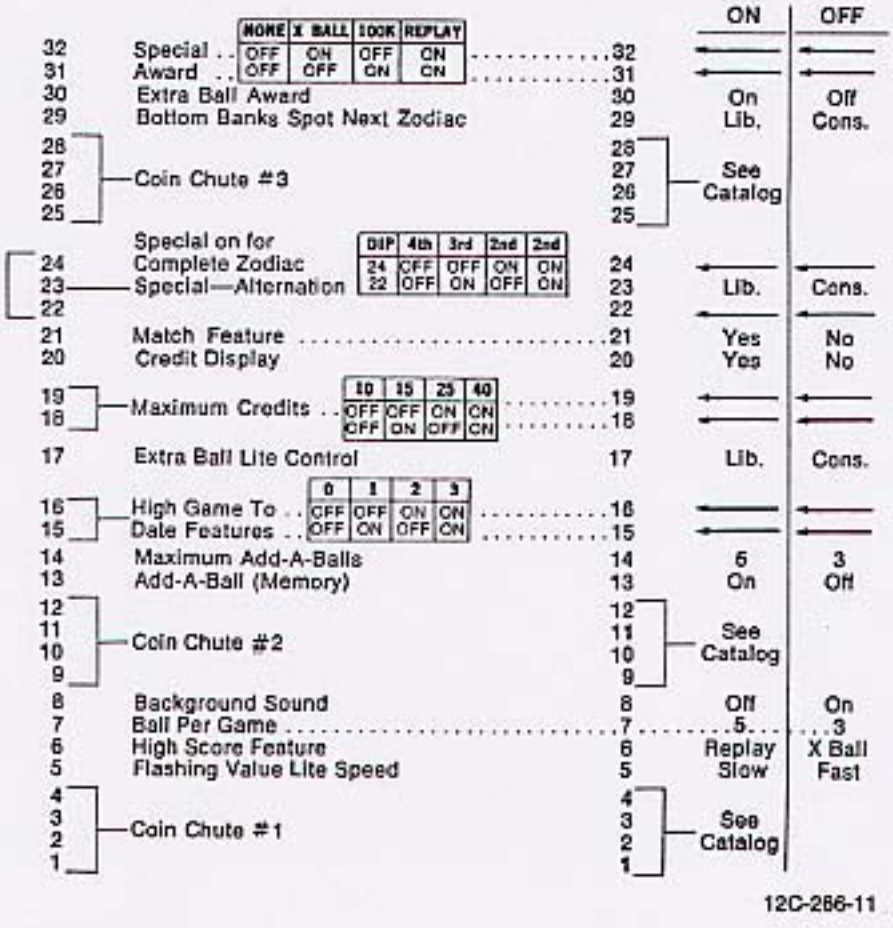
Posts that control left and right outlane openings on playfield can be moved to make access to outlanes conservative or liberal for ball to enter. (See Fig. 3).

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 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.

STAR GAZER SWITCH ASSIGNMENT



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)	4	3	2	1		
SWITCH No. 2 (BRN-WHITE)	12	11	10	9		
SWITCH No. 3 (RED-WHITE)	28	27	26	25	**CREDITS**	**COIN**
	OFF	OFF	OFF	OFF	1	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

FLASHING VALUE LITE SPEED:

Controls flashing lite speed as Zodiac targets are hit.

FLASHING LITE SPEED	MPU SWITCH 5
Fast	OFF
Slow	ON

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	MPU SWITCH 6
Extra Ball	OFF
Replay	ON

BALL PER GAME:

NO. OF BALL PER GAME	MPU SWITCH 7
3	OFF
5	ON

BACKGROUND SOUND:

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

SOUND	MPU SWITCH 8
OFF	ON
ON	OFF

ADD-A-BALL (MEMORY):

This adjustment can store in memory 3 or 5 "Add-A-Balls."

ADD-A-BALL (MEMORY)	MPU SWITCHES	
	13	14
1 Only	OFF	
3	ON	OFF
5	ON	ON

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	MPU SWITCHES 16	15
Novelty	OFF	OFF
1 Free Game	OFF	ON
2 Free Games	ON	OFF
3 Free Games	ON	ON

EXTRA BALL LITE CONTROL:

Can be set to alternate on and off or on all the time.

EXTRA BALL LITE	MPU SWITCH 17
Alternate (Conservative)	OFF
Stays On (Liberal)	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	MPU SWITCHES 19	18
10	OFF	ON
15	OFF	OFF
25	ON	OFF
40	ON	ON

CREDIT DISPLAY:

CREDIT DISPLAY	MPU 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 player's score a free game is awarded. The MATCH feature creates an incentive to play.

MATCH	MPU SWITCH 21
ON	ON
OFF	OFF

SPECIAL ALTERNATION:

Controls position of special lite.

	MPU SWITCH 23
All three positions alternate (Conservative)	ON
Target Bank position stays on, outlanes alternate (Liberal)	OFF

ZODIAC SPECIAL ADJUSTMENT:

Determines when special can be awarded for completing ZODIAC ring

SPECIAL WHEN RING IS COMPLETED	MPU SWITCHES	
	22	24
2nd Time	OFF	OFF
2nd Time	ON	OFF
3rd Time	OFF	ON
4th Time	ON	ON

BOTTOM BANKS SPOT NEXT ZODIAC TARGET:

Spotting next ZODIAC target by hitting all three drop targets on either lower bank can be turned on or off.

SPOT NEXT ZODIAC TARGET	MPU SWITCH 29
Yes (Liberal)	ON
No (Conservative)	OFF

EXTRA BALL WHEN LIT AWARD:

This feature can be turned on or off.

EXTRA BALL LITE	MPU SWITCH 30
ON	ON
OFF	OFF

SPECIAL AWARD:

Award received when "Special" lite is lit.

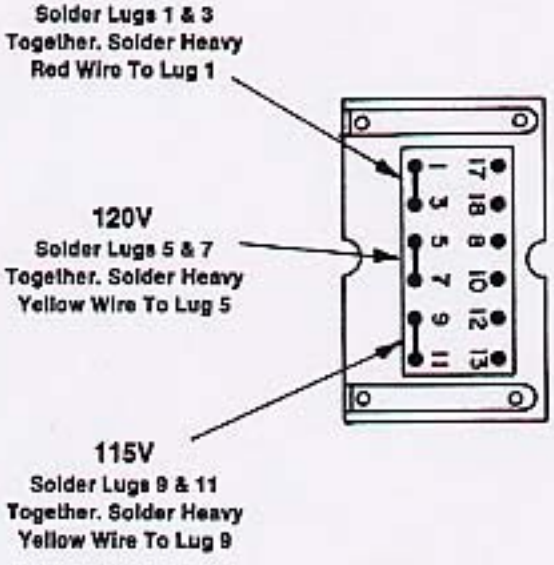
AWARD	MPU SWITCHES	
	31	32
No Award	OFF	OFF
Extra Ball	OFF	ON
100,000 Points	ON	OFF
Replay	ON	ON

PARTS LIST
STAR GAZER #127

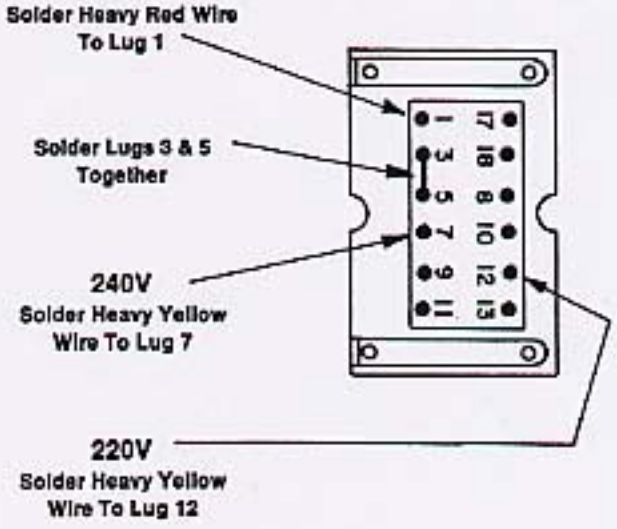
MISCELLANEOUS	PART NUMBER
Transformer (Domestic or Export)	16B-6
Transformer & Rectifier Board	B-438-2
Bulbs #44	8A-101
U1	25A-127-E1A6
U2	25A-127-E2A6
U5	25A-127-E5A6
U6	25A-127-E6A6
ASSEMBLY COILS	
Coin Lockout	C-36-5300
Flipper (L & R)	J-25-475/34-4500
Knocker	N-26-1200
Outhole Kicker (1)	JX-26-1200
Thumper Bumper (3)	J-26-1200
Slingshot (2)	J-26-1200
Drop Target Reset (3)	B-27-2300
MODULES	
Lamp Driver	B-431
Display Driver (5 Used)	C-645
Solenoid Driver/Voltage Regulator	B-432
MPU (FOR PROMS SEE MISCELLANEOUS ABOVE)	C-602
Power Supply p.c. assembly	A-430
Sound Module	C-605

STERN 16B-6 TRANSFORMER WIRING CONNECTION INSTRUCTIONS

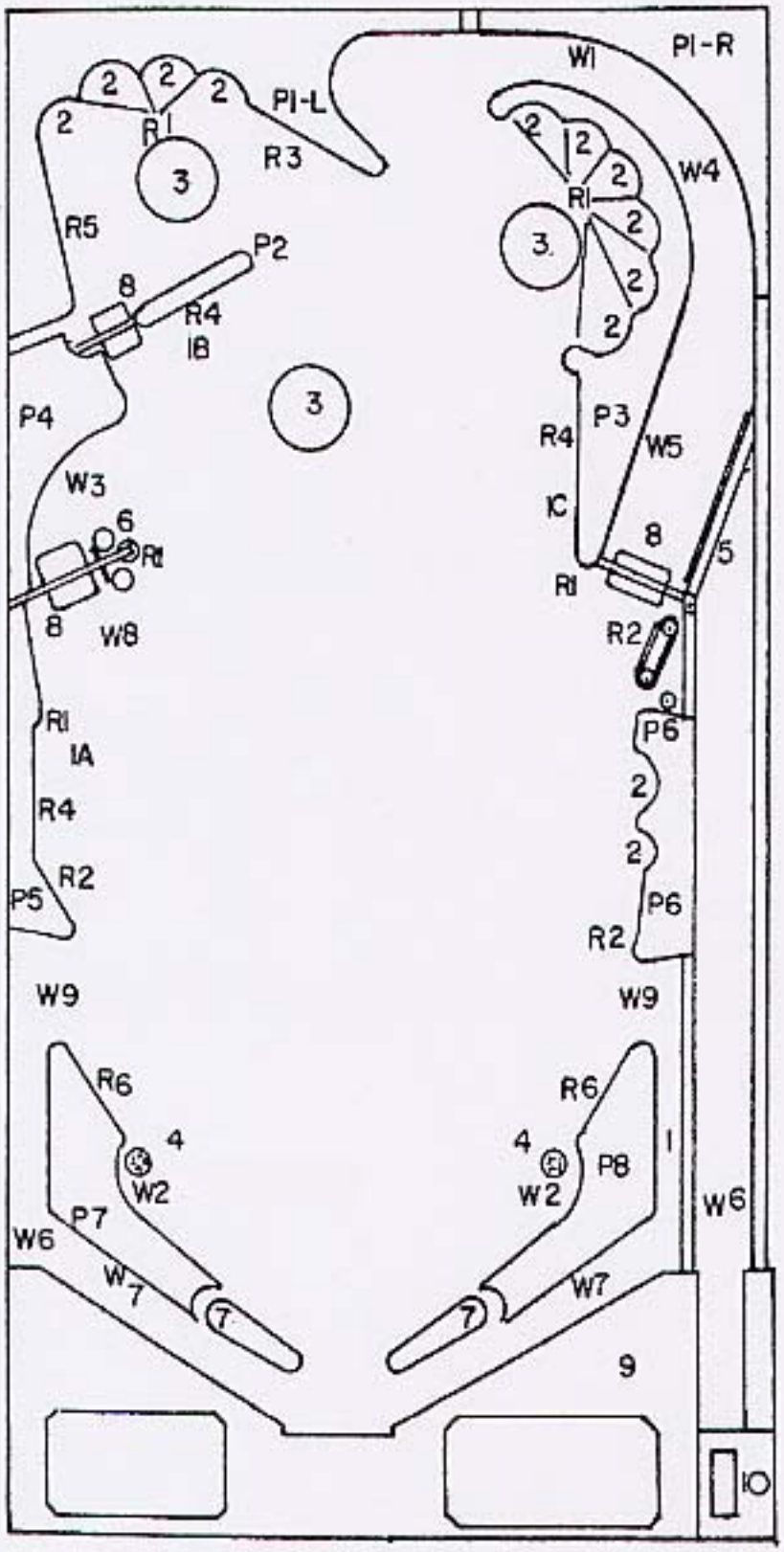
115/120V., 50/60 Cycle Input.
Varistor - Soldered to Line Filter on Left Side of Cabinet
Must Be Stern Part No. 25A-18-1.



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



STAR GAZER
PLAYFIELD PARTS



RUBBER RINGS

R1 7A-135
R2 7A-120-100
R3 7A-120-150
R4 7A-120-200
R5 7A-120-225
R6 7A-120-300
R7 7A-121-1Y

BALL GUIDES & ROLL-OVERS

W1 1C-823
W2 1A-822-L & R
W3 1A-821
W4 6A-269
W5 6A-101-M
W6 6A-101-D
W7 6A-101-L
W8 6A-101-N
W9 A-383

PLASTIC SHIELDS

TOP ARCH SET 13C-127-1L
STAR GAZER SET P5-13A-127-5
P2-13A-127-2
P3-13A-127-3
P4-13A-127-4
P6-13A-127-6
P7-13A-127-7L
P8-13A-127-7R

MISC. PARTS & ASSEMBLIES

1A 3-BANK DRP. TARG. ASS'Y D-580-3H1
1B 3-BANK DRP. TARG. ASS'Y D-580-3H2
1C 3-BANK DRP. TARG. ASS'Y D-580-3H2
INDIVIDUAL TARGETS 13A-11-B (22 to 30)
2 TARGET ASS'Y A-720-L2
3 THUMPER CAP 13A-40
4 ROLL-OVER BUTTON {4B-276-R / 4B-277-R}
5 BALL GATE ASS'Y 1A-477
6 BALL GUIDE POST 2A-200
7 FLIPPER & SHAFT ASS'Y B-634-L-Y & R-Y
8 SPIN TARGET ASS'Y A-563-15
9 INSTRUCTION PLATE 14B-3-4
10 SHOOTER GAUGE 14A-2-8

STAR GAZER
SWITCH IDENTIFICATION
SELF TEST DISPLAY NUMBERS

SWITCH NO.	SWITCH LOCATION
1	CHUTE (LEFT)
2	CHUTE (CENTER)
3	CHUTE (RIGHT)
4	SPIN TARGET (L)
5	SPIN TARGET (R)
6	CREDIT BUTTON
7	TILTS
8	SLAM & VIB. TILTS
9	SPIN TARGET (CENTER)
10	STAND-UP TARGET
11	STAND-UP TARGET
12	THUMPER (LEFT)
13	THUMPER (RIGHT)
14	THUMPER (CENTER)
15	RIGHT SLINGSHOT
16	LEFT SLINGSHOT
17	STAND-UP TARGET
18	STAND-UP TARGET
19	STAND-UP TARGET
20	STAND-UP TARGET

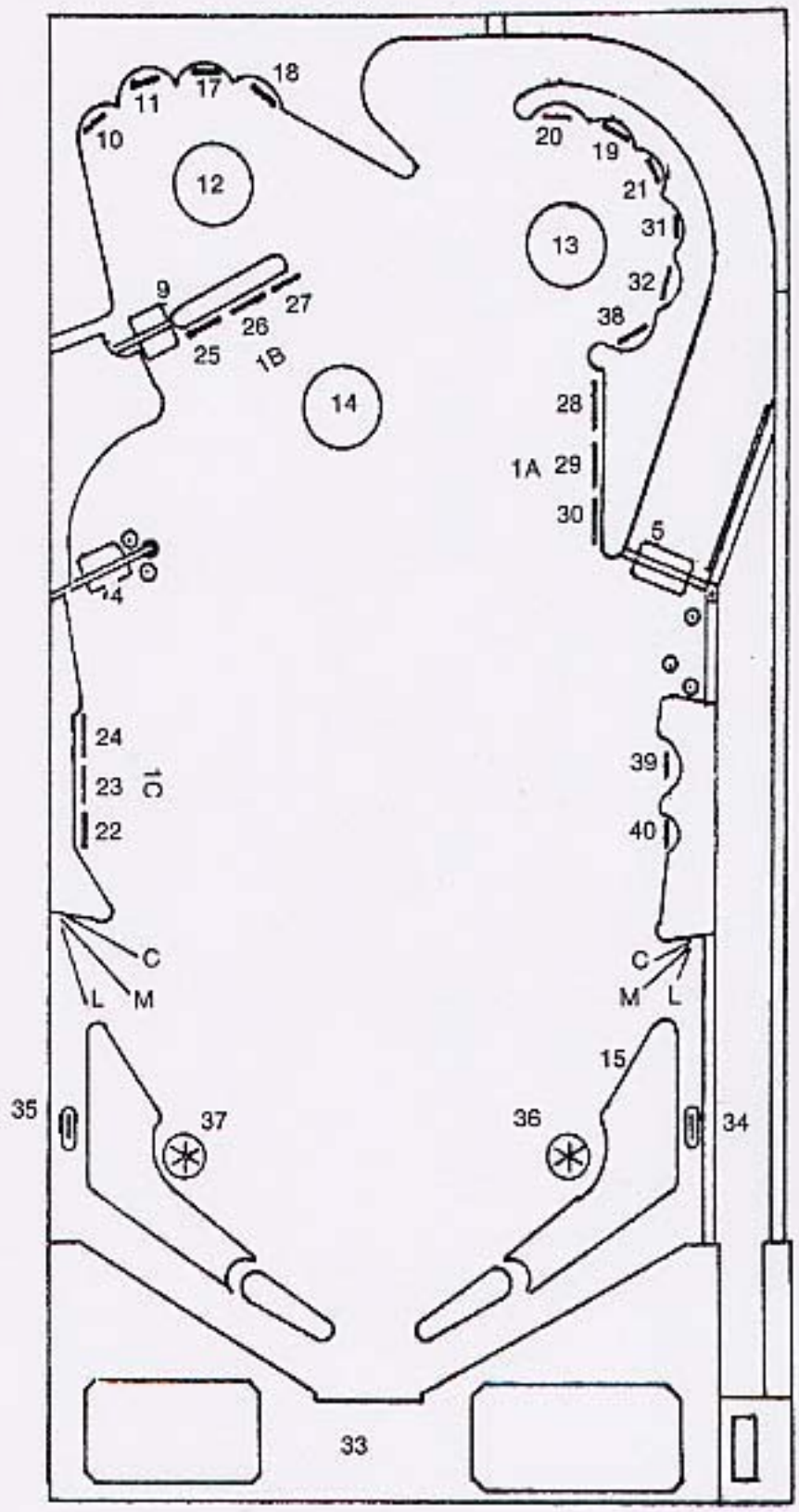
SWITCH NO.	SWITCH LOCATION
21	STAND-UP TARGET
22	BOTTOM (L) DROP TARGET
23	MIDDLE (L) DROP TARGET
24	TOP (L) DROP TARGET
25	(L) CENTER DROP TARGET
26	(M) CENTER DROP TARGET
27	(R) CENTER DROP TARGET
28	TOP RIGHT DROP TARGET
29	(M) RIGHT DROP TARGET
30	BOTTOM (R) DROP TARGET
31	STAND-UP TARGET
32	STAND-UP TARGET
33	OUT HOLE
34	RIGHT OUT LANE
35	LEFT OUT LANE
36	RIGHT ROLL-OVER BUTTON
37	LEFT ROLL-OVER BUTTON
38	STAND-UP TARGET
39	STAND-UP TARGET
40	STAND-UP TARGET

NOTE: FLIPPER BUTTON CABINET SWITCHES DO NOT APPEAR ON TEST

SWITCHES
NOT ON PLAYFIELD:

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

STAR GAZER
SWITCHES



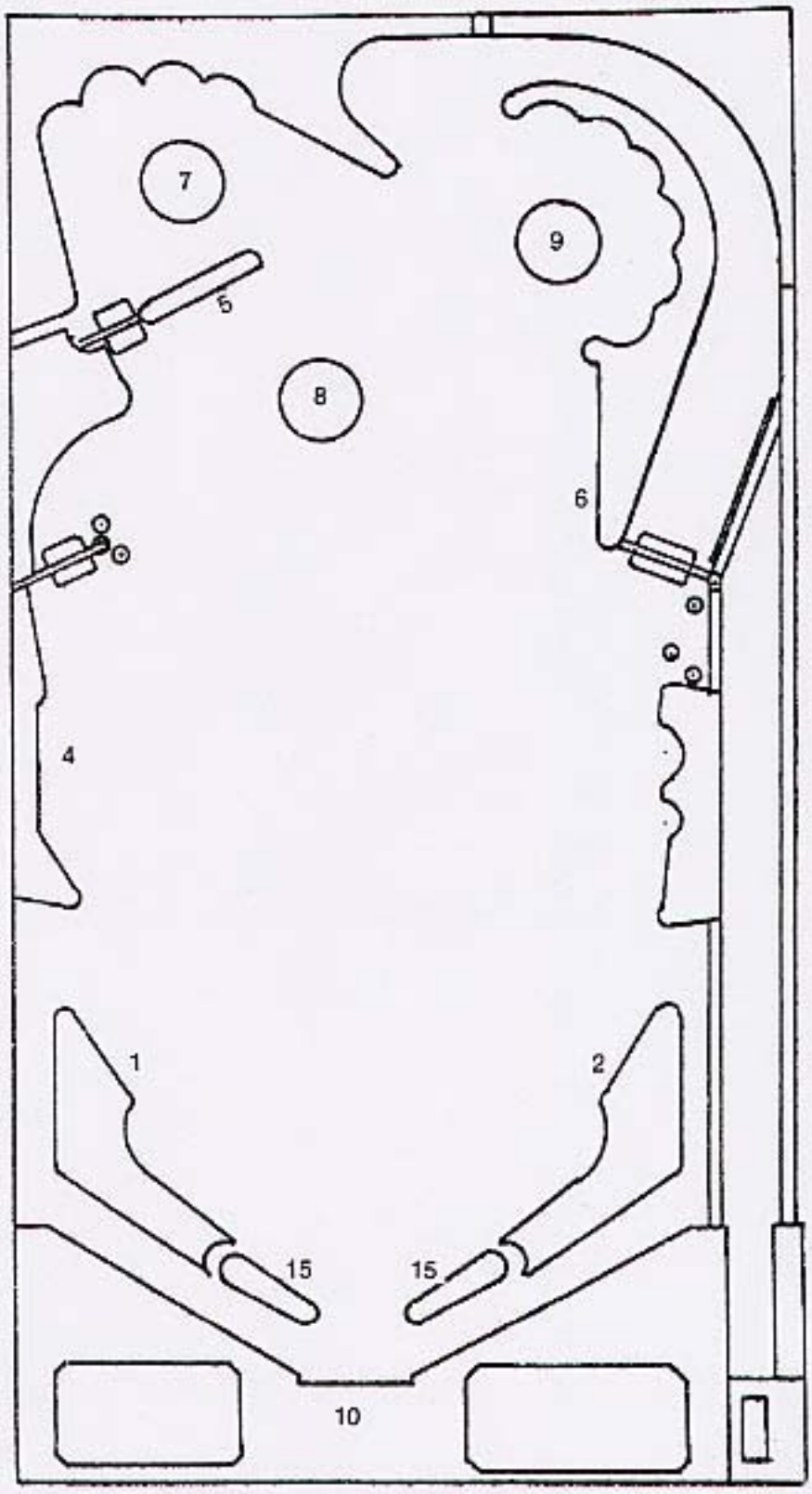
STAR GAZER
SOLENOID IDENTIFICATION
SELF TEST DISPLAY NUMBERS

SOLENOID NO.	SOLENOID LOCATION
1	LEFT SLING-SHOT
2	RIGHT SLING-SHOT
3	KNOCKER
4	LEFT DROP TARGET
5	TOP DROP BANK
6	RIGHT DROP BANK
7	LEFT THUMPER
8	MIDDLE THUMPER
9	RIGHT THUMPER
10	OUT-HOLE
11	OPEN
12	OPEN
13	OPEN
14	OPEN
15	ENABLE REPLAY
16	OPEN
17	OPEN
18	OPEN
19	COIN LOCKOUT
20 THRU 29	SOUND

SOLENOIDS
NOT ON PLAYFIELD:

3 KNOCKER
19 COIN LOCKOUT

STAR GAZER
SOLENOIDS



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

U1

ROM Stern #25A-	E-PROMS (paper on top)
E9 to E8	E9 to E10
E28 to E26	E28 to E27

U2

ROM	E-PROM
E5 to E1	E5 to E7
E2 to E6	E2 to E3

U5

ROM	E-PROM
E19 to E20	E19 to E21
E29 to E31	E29 to E30

U6

ROM	E-PROM
E13 to E12	E13 to E14
E25 to E22	E25 to E23

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

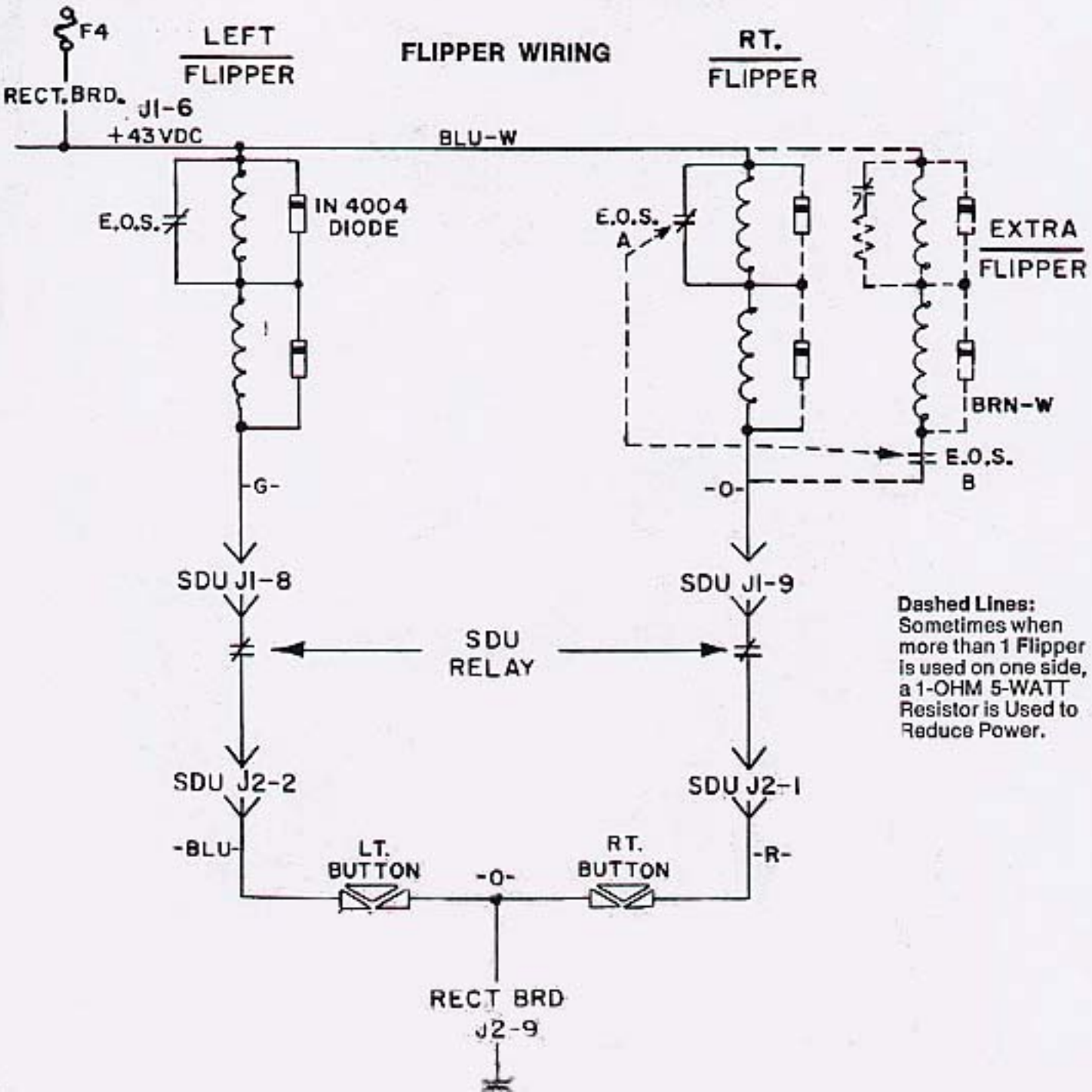
Remove - E32 - E33
Remove - E34 - E35

U2

ROM
E5 to E7

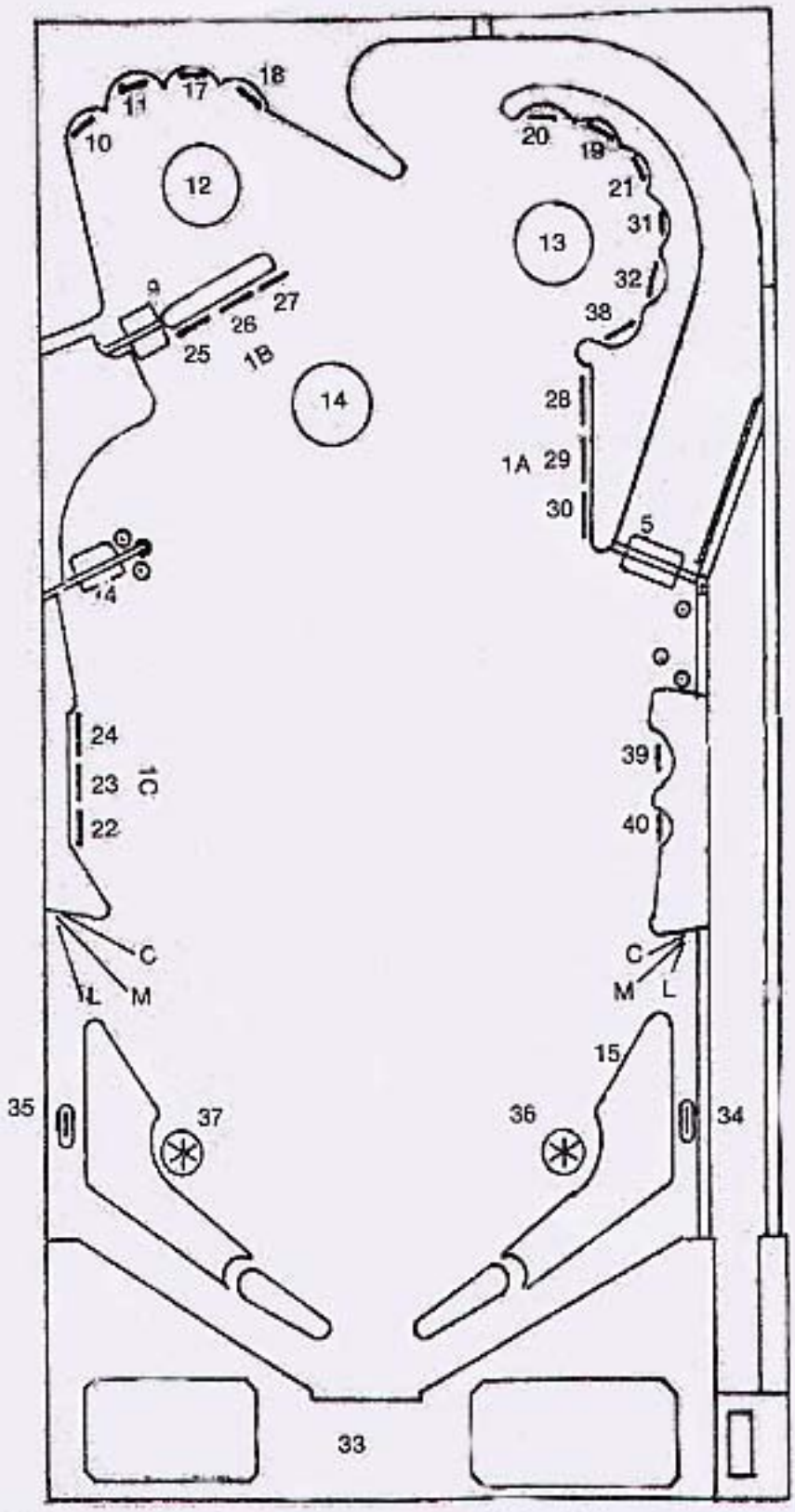
U6

ROM
E11 to E13



Dashed Lines: Sometimes when more than 1 Flipper is used on one side, a 1-OHM 5-WATT Resistor is Used to Reduce Power.

STAR GAZER
SWITCHES



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