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SPY HUNTER

Parts and Operating Manual



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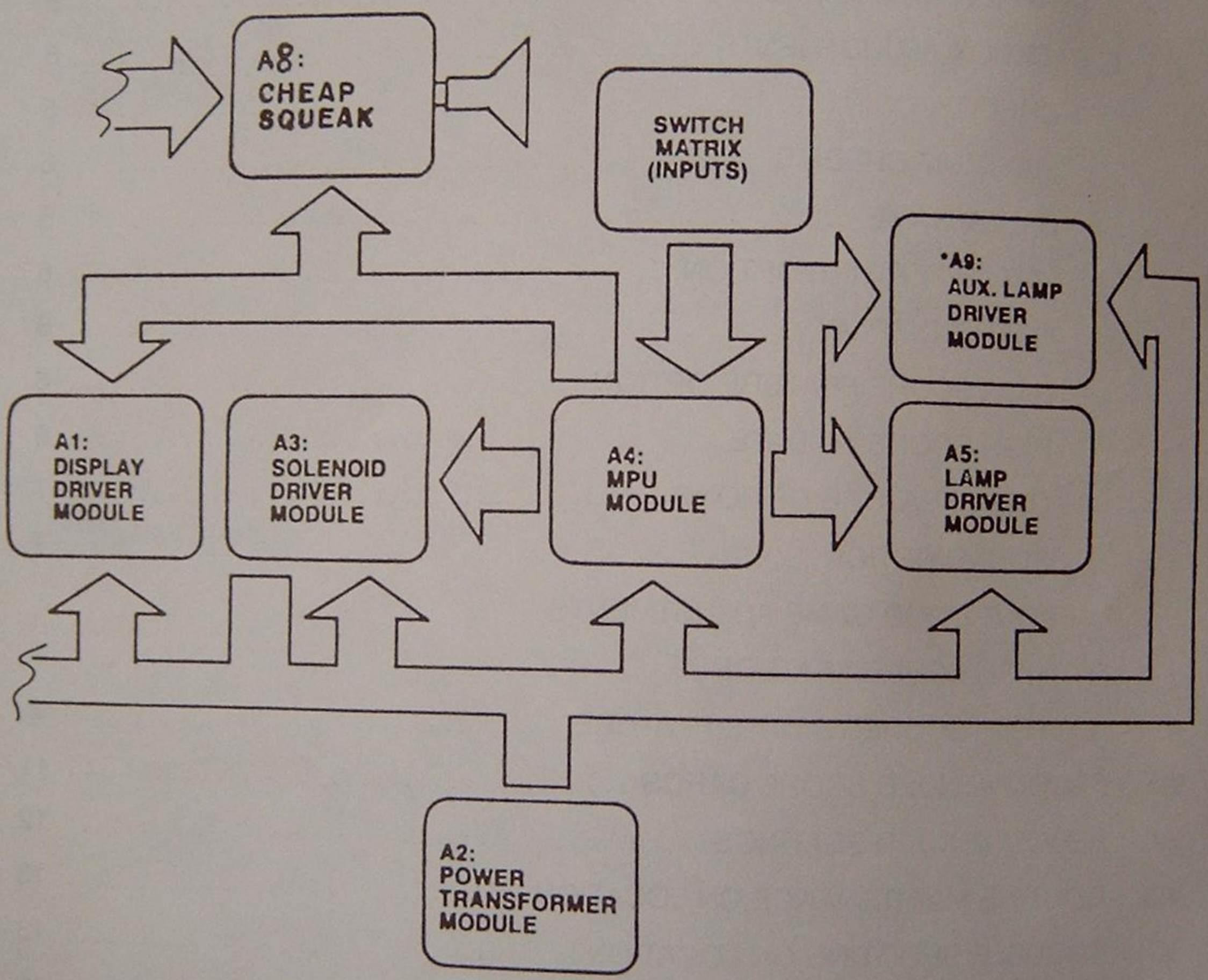
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Installation and General Game Operation Instructions

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BLOCK DIAGRAM—ELECTRONIC PINBALL GAME



A2:
POWER
TRANSFORMER
MODULE

I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Bolt back box to cabinet. Use flat washers under bolt heads. Gently feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Carefully and fully insert connectors on printed circuit assemblies.

On all games there are certain items that should be checked after shipment. These are visual inspections which 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 switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

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

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

1. Panel tilt on bottom of playfield panel.
2. Plumb bob tilt on left side of cabinet near front door.
3. Ball tilt above plumb bob tilt. Insert the smaller ball (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.

TRANSFORMER CONNECTION INSTRUCTIONS

REFER TO POWER SUPPLY SCHEMATIC IN GAME MANUAL FOR TABLE "A"

115 VAC, 2-8, 3-6, 7-10
120 VAC, 2-8, 4-6, 7-11
220 VAC, 4-8, 7-9
240 VAC, 4-8, 7-11

PART OF POWER TRANSFORMER MODULE A2, LOCATED IN LOWER CABINET

II. GENERAL GAME OPERATION

Place ball into playfield by outhole.

Coin game. Coin should be rejected. Plug in line cord. Move power ON-OFF master switch at bottom right front corner of cabinet to 'ON' position. The game will play a power-up tune to announce game-readiness. Drop targets are reset, scores are set to zero, alternating with the 'High Score to Date,' and the game is ready for play. Coin game. The game should accept the coin and post credits* for coins accepted (adjustable). Pressing the credit button on the door will cause the outhole kicker to serve the ball to the shooter alley. The 1st player-up lite is lit. A game-up tune* is played to announce play-readiness.

One player is posted each additional 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.

Shooting the ball initiates play.

The game awards all points earned by the player. If spinner is turning and scoring when the ball hits a target, the spinner and the target scores are awarded.

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

Extra balls won during the course of the game are played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play on the back box are not advanced for extra ball play. Bonus score is added to the player's score before the game serves the extra ball for play.

Scoring over 10,000,000 gives "High Score to Date" award.
At the end of the game, a 'High Score to Date' is alternately flashed with all 4 player scores. If the 'High Score to Date' is beat, this feature* awards free games.

Tilting the game results in loss of a ball. The flippers, thumper-bumpers, etc., go 'dead.' Bonus points are not scored. 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 ball kicker assembly serves the ball to the shooter alley.

Slamming the machine results in loss of the game. All feature lights go out, the game goes 'dead,' and a time delay occurs. The purpose of the time delay is to discourage unnecessary abuse of the machine. After the delay, the 'Game Over' light lights and the power-up tune is played. The time delay occurs anytime one of the slam switches is made to contact. There are two factory installed slam switches, one on the front door, and one on the left side of the cabinet. (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 the 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. See Back Box Adjustments.

NOTE: Scoring and feature units will differ from game to game.

III. BOOKKEEPING FUNCTIONS

The game is designed to help the operator perform certain accounting functions. The game can display the number of total plays and replays (free games). It can display the number of coins dropped down each coin chute. The bookkeeping functions are displayed on all player score displays simultaneously. An identification number, 05 to 15, appears on the Match/Ball in Play window as follows:

05— 00 to— 40 = Current Credits
*06— 10000 to—99999 = Total Plays (Payed & Free Games)
*07— 10000 to—99999 = Total Replays (Free Games)
08— 00 to—99999 = Game Percentage
09— 00 to—99999 = Total times 'High Score to Date' is beat
*10— 10000 to—99999 = Coins Dropped thru Coin Chute #1
*11— 10000 to—99999 = Coins Dropped thru Coin Chute #2**
*12— 10000 to—99999 = Coins Dropped thru Coin Chute #3**
*13— 00 to—99999=Number of Specials awarded from Playfield Specials Only
*14— 00 to—99999=Number of minutes of Game Play (Total)
*15— 00 to—99999=Number of Service Credits

The game displays the first bookkeeping entry if the Self-Test button (See Fig. III) on the inside of the front door is pressed ten times. Alternately push and release the Self-Test button at one second intervals. The number 05 appears in the 'Match/Ball in Play' window. Current credits appear on the player score displays. Each additional press of the button causes the next entry to be displayed.

After the data in each bookkeeping register is recorded, it can be set to zero simply by pressing switch button S33, located on A4, the MPU module in the back box (See Fig. III), or by pressing the Coin Chute #3 switch. Any or all registers can be cleared by alternating between the Self-Test button and the switch button S33 on the MPU module or Coin Chute #3 switch. The operator is given this option as a possible convenience and can elect to use or not use it as his needs direct.

Pressing the button 5 more times causes the game to play the power-up tune and light the Game Over light.

Service credits are designed to allow the serviceman to test the game under actual play conditions without disturbing the bookkeeping records that reside at identification numbers 06, 07, 10, 11 and 12.

To obtain Service Credits, push and release the Self-Test switch until identification number 05 appears in the 'Match/Ball in Play' window. Hold in the Credit button until the desired number of Service Credits (up to five) appears on the player score displays.

NOTE: If, upon accessing identification number 05, a number of credits greater than five is displayed, pressing the credit button has no effect.

Identification number 15 is reserved as a record of the total number of Service Credits obtained.

*The 10,000 level is pre-set at the factory; can be set to zero, initially, if desired.

**If Coin Chute is not used in game, number displayed (if other than 00) on Player Score displays has no significance.

NOTE: If "Total Play" register is reset to zeroes then "Total Replays" register should also be reset to zeroes to maintain the game percentage value.

"SPY-HUNTER" PINBALL GAME—OA17

Feature Operations & Scoring

A) Shooter Lane Feature:
A ball delivered to the shooter tip will start the shooter lane lights strobing downward at an increasing rate. A ball going over the shooter lane switch (once per ball) will award the lit value:
1st light = 10,000 points 2nd light = 25,000 points *3rd light = 50,000 points & opens Free Ball Gate

*If F.D.S. #14 is OFF (See "G" Below), the 3rd light will also qualify the Bonus Saucer (See "G" Below).

NOTE: F.D.S.—Denotes fixed DIP Switch on MPU Module.

B) Roll-over Button Feature:
Initially, hitting a roll-over button scores 3,000 points and lights its corresponding light. Then hitting a lit roll-over button will score 1,000 points. The outhole scores 10,000 points for each lit roll-over button light. Lighting all nine roll-over button lights awards the lit value: 90,000—Extra Ball—Special

Memory Control: F.D.S. #6—ON—Values are recalled each ball OFF—Values are reset each ball

Initial Setting: F.D.S. #7—ON—Values start at Extra Ball OFF—1st time lights 90,000

End Setting: F.D.S. #8—ON—Value stays on Special, once reached OFF—After one Special, value reverts and stays on 90,000

NOTE: a) Hitting any of the top roll-over buttons will flash all of the General Illumination Lights.
b) Right flipper button is a roll-over button change feature. Player has control over placement of lit roll-over button lights.

C) Top Targets Feature:
Hitting a lit target scores 3,000 points and advances the light to the next target. Hitting an unlit target scores 1,000 points. Hitting three or four lit targets (see "D"—Boop-Ball Feature" F.D.S. #21 below) lights the Boop-Ball Arrow.

Completing seven lit targets: 1st time—lights 70,000 2nd time—lights 140,000 3rd & each additional time—SPECIAL

Outhole scores 10,000 points for each lit target. Boop-Ball target must be hit when Boop-Ball Arrow is lit to advance target lights.

D) Boop-Ball Feature (in one ball):
Hitting the Boop-Ball target scores 5,000 points and advances the Top Target lights. It scores the lit Boop-Ball Bonus Value when the Boop-Ball Arrow is flashing.

Boop-Ball Arrow Control: F.D.S. #21—ON—3 lit top targets turn on the Boop-Ball Arrow OFF—4 lit top targets turn on the Boop-Ball Arrow

Hitting the Boop-Ball Target when the Boop-Ball Arrow is lit scores:
1st time —25,000 points and lights "Playfield Scores Doubled"
2nd time—50,000 points and lights "Playfield Scores Tripled"
3rd time —100,000 points and Special
4th & each additional time—100,000 points

Playfield Scores are doubled when "Playfield Scores Doubled" is lit, tripled when "Playfield Scores Tripled" is lit. Boop-Ball related scores, values and features reset ball-to-ball.

E) Drop Target Feature:
Each drop target scores 500 points. Knocking down all drop targets scores and advances lit value. Outhole scores lit drop Target Value.

Note: Drop Targets also open the free ball gate if F.D.S. #14 is off—See "G" below.

F.D.S. #14—ON—D.T.'s do not open gate OFF—D.T.'s open gate

Drop Target Special:

F.D.S. #15	#16	Special on with
ON	ON	40,000
OFF	ON	50,000
ON	OFF	60,000
OFF	OFF	70,000

Center Bonus Value: F.D.S. #22—ON—Drop Target advances the Center Bonus Value OFF—No advance

Bonus Saucer Control (this switch applicable only if F.D.S. #14—OFF, see "G" below):
F.D.S. #23—ON— Drop Targets qualify Bonus Saucer to collect Center Bonus Value (light next to Center Bonus Value lights).
OFF— Drop Targets do not qualify.

Drop Target Values Control: F.D.S. #24—ON—Values in memory OFF—No memory

F) "SHOT" Targets Feature:
Hitting a flashing target scores 5,000 points and lights that target. Hitting a lit target scores 2,000 points. Lighting all "SHOT" targets lights the spinner to score 1,000 points and the "25,000 SHOT" arrow. Hitting all "SHOT" targets when the "25,000 SHOT" arrow is lit scores 25,000 points. Spinner and "25,000 SHOT" arrow lights reset when a ball enters the Bonus Saucer. "SHOT" target lights reset every ball.

G) Game Style Feature (Center Bonus Values): There are two versions of game play:

MATCH BONUS FEATURE Version A
F.D.S. #14-ON

1. **Center Bonus Values:**
   a. Spinner advances spinner lites.
   b. Spinner lites must match lit Center Bonus Value.
   c. Collect in Bonus Saucer, if matched.

If Center Bonus Value & Spinner
2. Match, then
   a. gate opens
   b. bonus multiplier advanced
   c. Center Bonus Value collected
3. "SHOT" targets lite spinner.
4. Drop Targets score lit value (and adv. Center Bonus Value if F.D.S. #22-ON, see "E").
5. Skill Shot opens gate.

QUALIFY BONUS FEATURE Version B
F.D.S. #14-OFF

1. **Center Bonus Values:**
   a. Spinner does not advance spinner lites.
   b. Spinner lites are used as "Bonus Saucer Qualified" lites.
   c. Collect in Bonus Saucer if qualified.

If Bonus Saucer is
2. Qualified, then
   a. (see #3 below)
   b. (see #4 below)
   c. Center Bonus Value collected.
3. "SHOT targets lite spinner and qualify Bonus Saucer.
4. Drop Targets score lit value and open free ball gate, and adv. Center Bonus Value if F.D.S. #22-ON (see "E"). Bonus Saucer is also qualified if F.D.S. #23-ON (see "E") and advance bonus multipliers.
5. Skill Shot opens gate and qualifies Bonus Saucer.

In both versions, collecting the Center Bonus Values in the Bonus Saucer will advance to the next value.

H) **Spinner Feature (only if F.D.S. #14-ON, see "G" above):**
Spinner scores 100 points if lit. Spinner is lit by hitting "SHOT" targets.

Spinner Lites Control:

F.D.S. #30 ON # of Spinner Lites	Center Bonus Value at	F.D.S. #30 OFF # of Spinner Lites
4	25	4
4	50	4
3	75	3
3	100	3
2	125	1
2	150	1
2	200	1
2	SPL	1

I) **Free Ball Gate Feature**
In addition to opening the Free Ball gate with a skill shot (see "A" above), the Free Ball gate can be opened during the play of the ball depending upon the game version selected (see "G" above).

Game Version
F.D.S. #14—ON—Free Ball Gate opens when Spinner & Center Bonus Values are matched.
OFF—Free Ball Gate opens when Drop Targets are knocked down.
Free Ball Gate closes when ball goes through either lane (scores 100 points).

J) **Miscellaneous Scoring:** Thumper Bumper . . . . . 100 points
Sling Shot . . . . . 10 points
Rebound . . . . . 10 points

K) **SPECIAL REPLAY/X-BALL/NOVELTY MODES**
Self-test positions 16 and 17 give the operator flexibility to award a replay ball or score (Novelty) when a special is scored. A combination of X-Ball, Novelty can be obtained through the following chart.

Self-test position 16	Set to "03"	Set to "02"	Set to "01"
Playfield X-Balls and Specials	AWARD	AWARD	AWARD
Agent GK Special	REPLAY	X-BALL	50,000
Missile Target Special	REPLAY	X-BALL *	50,000
Spy Hunter Bonus Special	REPLAY	X-BALL *	50,000
Weapons Warehouse Special	REPLAY	*	50,000
Drop Target Special	REPLAY	X-BALL *	50,000
Weapons Warehouse X-Ball	X-BALL	X-BALL**	25,000
Self-test position 17	Set to "03"	Set to "02"	Set to "01"
	AWARD	AWARD	AWARD
Scoring Thresholds	REPLAY	X-BALL	25,000

*50,000 if same player shoot again is lit.
**25,000 if same player shoot again is lit.

SPY-HUNTER'S SECRET CODE FDS14*

When players "break the code" of this pinball playfield and become proficient at high scores and specials, you have a weapon in your SPY-HUNTER'S ARSENAL to combat that, a flick of a switch option of changing the style of play from a random bonus feature to a skill bonus feature.

2 styles of play—at the flick of a switch—from random to skill or from skill to random.

When players need a new challenge, you can throw a "SMOKE SCREEN" at them from SPY-HUNTER'S SECRET CODE; at just the flick of a switch, the random bonus feature changes to a skill bonus feature, insuring extended player interest.

*The secret "code" of SPY HUNTER is Fixed Data Switch #14, which changes the style of play from a random bonus feature to a skill bonus feature and vice versa.

V. GAME ADJUSTMENTS

A. Playfield Panel Post Adjustments:
Posts that control left and right outlane opening on panel can be removed to make access to outlanes easier or harder for ball to enter. See Figure II.

Easier entry will decrease playing time and scoring (conservative).
Harder entry will increase playing time and scoring (liberal).

B. Back Box Game Adjustments:
Each game has thirty-two switches located on A4, the MPU module, located in the back box, that allow play to be customized to the location. See Figure III. Credits per coin, maximum credits, credit display, balls per game, match feature, high game feature, special award and melody are selectable by means of the 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" toggle position is marked on the assembly. **Turn off power before making adjustments.**

Credits/Coin Adjustments:
The credits per coin are selectable by means of S17-S20 for coin chute #2 (Center). The switch settings and resultant credits/coin are as follows:

S20	S19	S18	S17	Credits/Coin
OFF	OFF	OFF	OFF	Same as Coin Chute #1 Settings
OFF	OFF	OFF	ON	1/1 Coin
OFF	OFF	ON	OFF	2/1 Coin
OFF	OFF	ON	ON	3/1 Coin
OFF	ON	OFF	OFF	4/1 Coin
OFF	ON	OFF	ON	5/1 Coin
OFF	ON	ON	OFF	6/1 Coin
OFF	ON	ON	ON	7/1 Coin
ON	OFF	OFF	OFF	8/1 Coin
ON	OFF	OFF	ON	9/1 Coin
ON	OFF	ON	OFF	10/1 Coin
ON	OFF	ON	ON	11/1 Coin
ON	ON	OFF	OFF	12/1 Coin
ON	ON	OFF	ON	13/1 Coin
ON	ON	ON	OFF	14/1 Coin
ON	ON	ON	ON	15/1 Coin

The credits given are selectable by means of switches 1-5 incl., for coin chute #1 and switches 9-13 incl., for coin chute #3. Thirty-one different credit ratios are available for each coin chute. The switch settings and resultant credits/coin are listed below.

CREDITS/COIN ADJUSTMENTS

COIN CHUTE	SWITCHES					CREDITS	CREDITS	CREDITS	CREDITS	CREDITS	TOTAL CREDITS/COINS
#1 (HINGE SIDE)	5	4	3	2	1						
OR #3	13	12	11	10	9						
(RIGHT SIDE)	OFF	OFF	OFF	OFF	OFF	1/1 Coin					
	OFF	OFF	OFF	OFF	ON	2/1 Coin					
	OFF	OFF	OFF	ON	OFF	3/1 Coin					
	OFF	OFF	OFF	ON	ON	4/1 Coin					
	OFF	OFF	ON	OFF	OFF	5/1 Coin					
	OFF	OFF	ON	OFF	ON	6/1 Coin					
	OFF	OFF	ON	ON	OFF	7/1 Coin					
	OFF	OFF	ON	ON	ON	8/1 Coin					
	OFF	ON	OFF	OFF	OFF	9/1 Coin					
	OFF	ON	OFF	OFF	ON	12/1 Coin					
	OFF	ON	OFF	ON	OFF	14/1 Coin					
	OFF	ON	OFF	ON	ON	1/2 Coins*					
	OFF	ON	ON	OFF	OFF	2/2 Coins*					
	OFF	ON	ON	OFF	ON	3/2 Coins*					
	OFF	ON	ON	ON	OFF	4/2 Coins*					
	OFF	ON	ON	ON	ON	5/2 Coins*					
	ON	OFF	OFF	OFF	OFF	6/2 Coins*					
	ON	OFF	OFF	OFF	ON	7/2 Coins*					
	ON	OFF	OFF	ON	OFF	8/2 Coins*					
	ON	OFF	OFF	ON	ON	9/2 Coins*					
	ON	OFF	ON	OFF	OFF	12/2 Coins*					
	ON	OFF	ON	OFF	ON	14/2 Coins*					
	ON	OFF	ON	ON	OFF	1/1st Coin	2/2nd Coin				3/2
	ON	OFF	ON	ON	ON	0/1st Coin*	1/2nd Coin	1/3rd Coin	1/4th Coin		3/4
	ON	ON	OFF	OFF	OFF	0/1st Coin*	1/2nd Coin	0/3rd Coin**	2/4th Coin		3/4
	ON	ON	OFF	OFF	ON	1/1st Coin	1/2nd Coin	1/3rd Coin	2/4th Coin		5/4
	ON	ON	OFF	ON	OFF	1/1st Coin	2/2nd Coin	1/3rd Coin	3/4th Coin		7/4
	ON	ON	OFF	ON	ON	1/1st Coin	2/2nd Coin	2/3rd Coin	2/4th Coin		7/4
	ON	ON	ON	OFF	OFF	0/1st Coin***	0/2nd Coin***	1/3rd Coin			1/3
	ON	ON	ON	OFF	ON	0/1st Coin**	0/2nd Coin**	0/3rd Coin**	1/4th Coin		1/4
	ON	ON	ON	ON	OFF	0/1st Coin****	0/2nd Coin****	0/3rd Coin****	0/4th Coin****	1/5th Coin	1/5
	ON	ON	ON	ON	ON	0/1st Coin***	0/2nd Coin***	1/3rd Coin	0/4th Coin****	1/5th Coin	2/5

*No Credits until 2nd coin is dropped.
**No Credits until 4th coin is dropped.
***No Credits until 3rd coin is dropped.
****No Credits until 5th coin is dropped.

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 is selectable by means of switches 25 and 26. Four credit limits are available. Switch settings are listed below.

MAXIMUM CREDITS	SWITCHES 26	25
10	OFF	OFF
15	OFF	ON
25	ON	OFF
40	ON	ON

BALLS PER GAME:

# BALLS /GAME	SWITCHES 32	31
5	OFF	ON
4	ON	OFF
3	OFF	OFF
2	ON	ON

MATCH FEATURE:

When the Match Feature is ON, a random number appears on 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 28
ON	ON
OFF	OFF

CREDIT DISPLAY:

CREDITS DISPLAYED	SWITCH 27
YES	ON
NO	OFF

HIGH SCORE FEATURE:

The game is designed to award an Extra Ball or Free Game at each of the two or three score levels. See Front Door Game Adjustments.

AWARD	SELF TEST POSITION 16	SELF TEST POSITION 17
REPLAY	SET TO "03"	SET TO "03"
EXTRA BALL	SET TO "02"	SET TO "02"
NOVELTY	SET TO "01"	SET TO "01"
NO AWARD	SET TO "00"	SET TO "00"

For combinations of replay/X-ball/Novelty Modes see page 4A "K. Special Replay/X-ball/Novelty Modes"

HIGH SCORE TO DATE OR OVER 10,000,000 SCORE FEATURE:

The game is designed to award free games as an option if high score to date is beat or player exceeds 10,000,000 points. 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. Recommended setting is underlined.

HIGH SCORE TO DATE FEATURE	SELF TEST POSITION 19
No Award	SET TO "00"
One Credit	SET TO "01"
Two Credits	SET TO "02"
Three Credits	SET TO "03"

State and local laws may regulate the use of the above features, and they have been designed to allow for appropriate adjustment in order to conform to such requirements.

SOUND OPTION

The game is designed to make several tones and noises to announce power-up, game-up, etc. The tones are intended to attract attention to the game and increase game usage. The tones are controlled by pressing Self-Test button until the #18 shows on the match/ball in display. Now pulse relay button to desired sound setting.

Setting "00"
Most switches associated chimes without feature background.

Setting "01"
Playfield switches associated chimes with background.

Setting "02"
Most scoring will have a noise effect without background.

Setting "03"
Most scoring all will have a noise effect with background.

GAME FEATURE OPTIONS:

Weapon Values Adjustment:		
Liberal	SW 6 ON	Weapon Values are Recalled.
Conservative	SW 6 OFF	Weapon Values are Reset.
Game Start Weapon Values Adjustment:		
Liberal	SW 7 ON	Completing Weapons first time scores Extra Ball.
Conservative	SW 7 OFF	Completing Weapons first time lights 90,000 light.
Weapon Values Special Adjustment:		
Liberal	SW 8 ON	More than 1 special can be collected.
Conservative	SW 8 OFF	Only 1 special can be collected.
Game Style Adjustment:		
Random Bonus	SW 14 ON	Spinner lights must match "Spy-Hunter" bonus to collect.
Qualified Bonus	SW 14 OFF	"Spy-Hunter" bonus must be qualified to collect.

Drop Target Special Adjustment:

Liberal	SW 15 ON	SW 16 ON	Special comes on with 40,000.
Medium	SW 15 OFF	SW 16 ON	Special comes on with 50,000.
Semi-Medium	SW 15 ON	SW 16 OFF	Special comes on with 60,000.
Conservative	SW 15 OFF	SW 16 OFF	Special comes on with 70,000.

Double/Triple Playfield Values Adjustment:		
Liberal	SW 21 ON	"Missile" arrow comes on every 4th target of "Agent G.K."
Conservative	SW 22 OFF	"Missile" arrow comes on every 5th target of "Agent G.K."
"Spy-Hunter" Bonus Advance Adjustment:		
Liberal	SW 22 ON	Drop Targets Advance "Spy Hunter" Bonus Value.
Conservative	SW 22 OFF	No Advance.

Bonus Saucer Qualified Adjustment:
(NOTE: Only if qualified bonus feature is selected—SW 14 OFF)

Liberal	SW 23	Drop targets qualify bonus saucer to collect "Spy-Hunter" bonus.
Conservative	SW 23	Drop targets do not qualify bonus saucer.
Drop Target Values Adjustment:		
Liberal	SW 24 ON	Drop target values in memory.
Conservative	SW 24 OFF	Drop target values reset.

Spinner Lights Adjustment:
(NOTE: Only Random Bonus Feature is selected—SW 14 ON)

Liberal	SW 24 ON	4, 3, 2 Spinner Lights.
Conservative	SW 30 OFF	4, 3, 1 Spinner Lights.

(SEE BELOW:)

Spy Hunter Bonus Value	# of Spinner Lights SW 30-ON	SW 30-OFF
25	4	4
50	4	4
75	3	3
100	3	3
125	2	1
150	2	1
200	2	1
SPL	2	1

C. FRONT DOOR GAME ADJUSTMENTS

High Score Feature Adjustments:

The game is designed to award an extra ball (option) of a free game at each of three score levels. The recommended levels are on the score card in the game.

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

1. Push and release Self-Test button (See Figure III) at one second intervals approximately six times or until identification number 01 appears on the 'Match/Ball in Play' display.

2. The number on the Player Score Displays is the score level.* It can be increased, if desired, by holding the credit button in. To decrease the score level, hold the credit button in and depress and rlease the Self-Test button. Release the credit button when the desired number 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 score levels. The identification numbers '02' and '03' on the Match/Ball in Play display are for the second and third levels, respectively.

High Score to Date and 10,000,000 Feature:

The game is designed to award free games when 'High Score to Date' is beat, or if the player exceeds 10,000,000 points.

It is recommended that the level, which will build with 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 Adjustment, Steps 1 and 2. Continue pushing the Self-Test button until the identification 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 is turned off by self test position 19 as discussed under 'Back Box Game Adjustments.'

SELF TEST SETUP FOR 16-19:

To set up positions 16-19 push and release self test button till 16 shows on match/ball in play. Now pulse replay button for recommended setup from "00" thru "03." Repeat for positions 17, 18 or 19.

SOUND

In addition to game sounds, there is also a Master Volume Control located on the front door. (refer to page 10)

Please note that these module volume controls should be adjusted prior to setting the control on the front door.

*Can be quickly set to '00' by pressing S33 on the MPU assembly in the back box or Coin Chute switch #3. (See Figure III.)

SPY HUNTER
RUBBER PARTS

A.	17-41-633	(16) POST
B.	17-41-637	(7) POST
C.	17-41-641	(3) POST
D.	17-41-642	(1) I.D. ¾"
E.	17-41-643	(1) I.D. 1"
F.	17-41-645	(1) I.D. 2"
G.	17-41-646	(5) I.D. 2½"
H.	17-41-653	(2) FLIPPER YELLOW

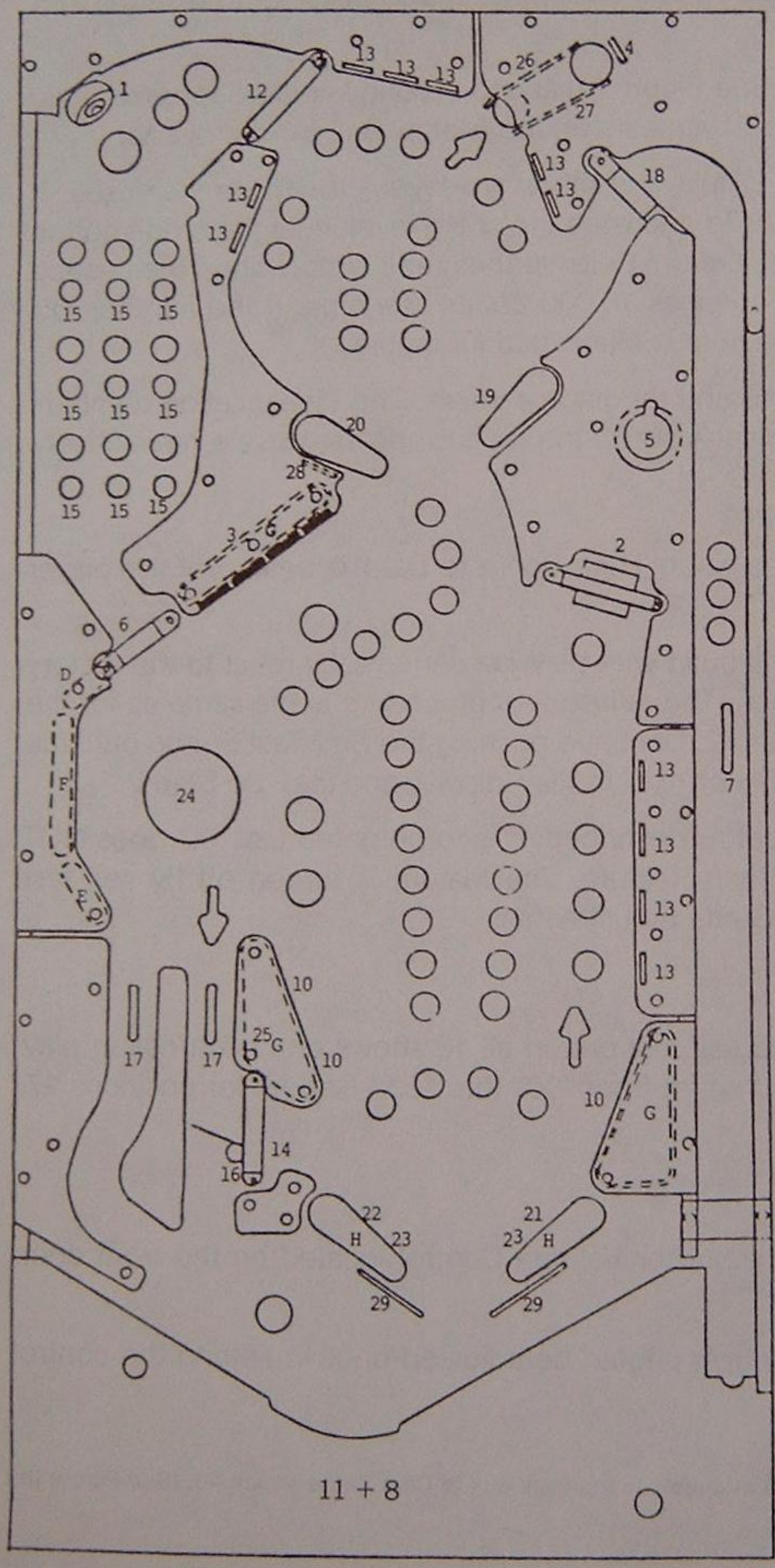


FIGURE II

PANEL TOP PARTS

1. Ball Rebound Assy. AA17-00023-0000
2. Spinner & Gate Assy. AA17-00025-0000
3. Drop Target Assy.—4—Target AA17-00026-0000
4. SW, Diode, & Capacitor Assy. AA17-00027-0000
5. Eject Hole Assy. A331-00035-0000
6. Side Gate & Wire Assy. A360-00212-0000
7. Wire Actuator Assy.—Right A360-00215-0000
8. Wire Actuator Assy. A360-00217-0000
9. Top Mounted Kicker Ball Rtn A360-00234-0000
10. Switch & Diode Assy. A360-00239-0000
11. Switch & Diode Assy. A360-00241-0000
12. Ball Gate—Wire Assy. A360-00297-0000
13. SW., Diode, & Cap Assy.—Target A360-00603-0005
14. Ball Gate & Wire Assy. A371-00040-0000
15. Switch & Diode Assy. A390-00023-0000
    Rollover Button 0017-00042-0681
16. Free Gate Relay Assy. A390-00032-0000
17. Wire Actuator Assy.—Left A390-00044-0100
18. Gate Bracket Assy. A391-00027-0000
19. Flipper & Shaft Assy.—RT Black A391-00050-0100
20. Flipper & Shaft Assy.—LT Black A391-00052-0100
21. Flipper Unit Assy. DBL SW R A391-00054-0100
22. Flipper Unit Assy. DBL SW L A391-00054-0200
23. Mold Flipper Assy.—WHT—Purch. A967-00031-0000
24. Thumper Bumper Assy. A967-00053-0000
25. Slingshot Kicker Coil Assy. A967-00059-0000
26. Ball Guide Wire 3⅝" 0A17-00102-0000
27. Ball Guide Wire 3⅝" 360-00175-1800
28. Ball Guide Wire 1¼" 360-00175-4600
29. Biffer Wire 2⅜" Long 360-00175-5300

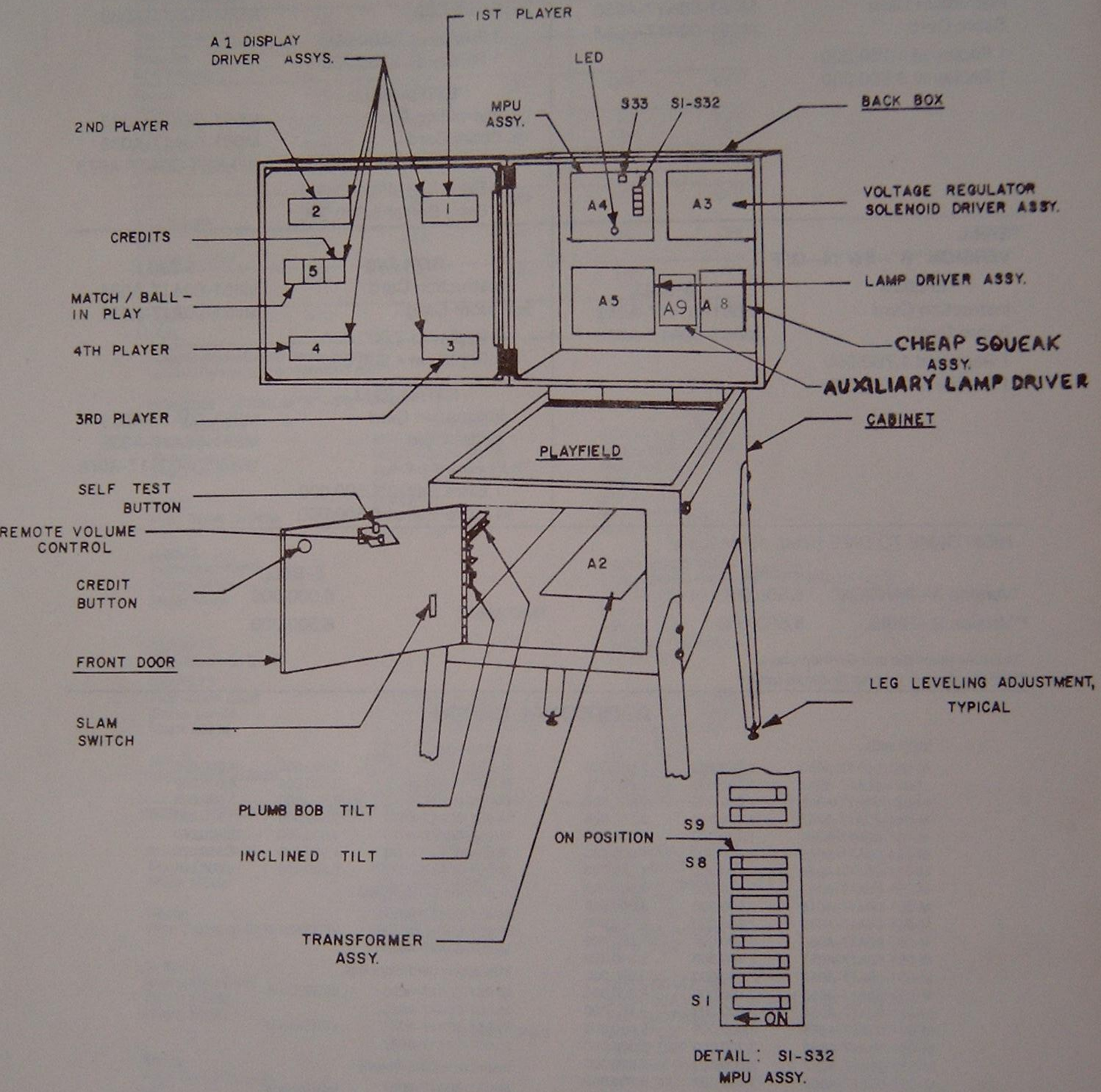


FIGURE III. ELECTRONIC PIN BALL MACHINE

RECOMMENDED

Instructions, Score Cards and High Score Feature Settings to be used on
Spy Hunter 0A17

***RANDOM**
VERSION "A"—SW 14—ON

REPLAYS	3-BALL
Instruction Card	M051-00A17-A030
Score Card	M051-00A17-A038

1 Replay at 1,700,000
1 Replay at 3,500,000

REPLAYS	5-BALL
Instruction Card	M051-00A17-A031
Score Card	M051-00A17-A039

1 Replay at 2,800,000
1 Replay at 4,900,000

EXTRA BALL	
Instruction Card	M051-00A17-A033
Score Card	M051-00A17-A039 W/M051-00A17-A073

1 Extra Ball at 3,500,000
1 Extra Ball at 5,000,000

****SKILL**
VERSION "B"—SW 14—OFF

REPLAYS	3-BALL
Instruction Card	M051-00A17-A083
Score Card	M051-00A17-A038

1 Replay at 1,700,000
1 Replay at 3,500,000

REPLAYS	5-BALL
Instruction Card	M051-00A17-A084
Score Card	M051-00A17-A039

1 Replay at 2,800,000
1 Replay at 4,900,000

EXTRA BALL	
Instruction Card	M051-00A17-A088
Score Card	M051-00A17-A039 W/M051-00A17-A076

1 Extra Ball at 4,500,000
1 Extra Ball at 5,500,000

HIGH GAME TO DATE (reset periodically)

	3-BALL	5-BALL
*Version A—RANDOM	5,000,000	6,000,000
**Version B—SKILL	5,500,000	6,500,000

*Includes domestic and German games
**Includes foreign (but not German) games

ADDITIONAL CARDS

REPLAYS		
M-051-00A17-A040	1,000,000	2,500,000
M-051-00A17-A041	1,200,000	2,700,000
M-051-00A17-A042	1,400,000	2,900,000
M-051-00A17-A043	1,500,000	3,100,000
M-051-00A17-A044	1,800,000	3,400,000
M-051-00A17-A045	1,800,000	4,000,000
M-051-00A17-A046	2,000,000	4,300,000
M-051-00A17-A047	2,300,000	4,500,000
M-051-00A17-A048	2,500,000	4,800,000
M-051-00A17-A049	2,800,000	4,900,000
M-051-00A17-A050	2,000,000	5,000,000
M-051-00A17-A051	2,400,000	5,500,000
M-051-00A17-A052	2,800,000	5,800,000
M-051-00A17-A053	3,100,000	6,000,000
M-051-00A17-A054	3,500,000	6,100,000
M-051-00A17-A055	3,000,000	5,000,000
M-051-00A17-A056	3,200,000	5,300,000
M-051-00A17-A057	3,200,000	5,500,000
M-051-00A17-A064	3,400,000	5,700,000
M-051-00A17-A065	3,600,000	5,900,000
M-051-00A17-A066	3,800,000	6,100,000
M-051-00A17-A067	4,000,000	6,100,000
M-051-00A17-A068	4,200,000	6,300,000
M-051-00A17-A069	4,400,000	6,500,000
M-051-00A17-A070	4,600,000	6,800,000

EXTRA BALL		
M-051-00A17-A071	3,000,000	4,000,000
M-051-00A17-A072	3,500,000	4,500,000
M-051-00A17-A073	3,500,000	5,000,000
M-051-00A17-A074	3,500,000	5,500,000
M-051-00A17-A075	4,000,000	5,000,000
M-051-00A17-A076	4,500,000	5,500,000
M-051-00A17-A077	5,500,000	6,000,000

Instruction Cards Replay

M-051-00A17-A081	
M-051-00A17-A082	VERSION B
M-051-00A17-A083	

Instruction Card Extra Ball

M-051-00A17-A033	VERSION A
M-051-00A17-A085	
M-051-00A17-A086	VERSION B
M-051-00A17-A087	

Instruction Card Novelty

M-051-00A17-A034	VERSION A
M-051-00A17-A035	
M-051-00A17-A036	VERSION A & B
M-051-00A17-A037	
M-051-00A17-A089	
M-051-00A17-A090	VERSION B
M-051-00A17-A091	
M-051-00A17-A092	

SPY HUNTER PINBALL
0A17
RECOMMENDED SWITCH SETTINGS

		*RANDOM—VERSION "A"		**SKILL—VERSION "B"	
		3 Ball	5 Ball	3 Ball	5 Ball
Recall Weapon Values	#6	ON	ON	ON	ON
Weapon Start Values	#7	ON	OFF	ON	OFF
Weapon End Values	#8	ON	ON	OFF	OFF
Game Version	#14	ON	ON	OFF	OFF
D.T. Special	#15 #16	OFF ON	ON OFF	OFF ON	ON OFF
Boop-Ball Hits	#21	ON	ON	ON	ON
D.T. Adv. Values	#22	ON	OFF	OFF	OFF
D.T. Qualify Saucer	#23	OFF	OFF	ON	OFF
D.T. Recall	#24	ON	ON	ON	ON
# Spin Lights	#30	ON	ON	OFF	OFF

*Includes domestic and German games.
**Includes foreign (but not German) games.

***RANDOM VERSION "A"—SW 14—ON**

	3-BALL	5-Ball
REPLAYS		
Instruction Card	M051-00A17-A030	M051-00A17-A031
Score Cards	M051-00A17-A038	M051-00A17-A039
Major Mode	Self-Test Position 16, 17 Set to "03"	Self-Test Position 16, 17 Set to "03"
Match	SW 28 ON	SW 28 ON
High Score to Date	Self-Test Position 19 Set to "03"	Self-Test Position 19 Set to "03"
X-BALL		
Instruction Card		M051-00A17-A033
Score Cards		M051-00A17-A039 W/M051-00A17-A073
Major Mode	5 BALL ONLY	Self-Test Position 16, 17 Set to "02"
Match		SW 28 OFF
High Score to Date		Self-Test Position 19 Set to "00"
NOVELTY		
Instruction Card	M051-00A17-A034	M051-00A17-A035
Score Cards	M051-00A17-A036	M051-00A17-A037
Major Mode	Self-Test Position 16, 17 Set to "01"	Self-Test Position 16, 17 Set to "01"
Match	SW 28 OFF	SW 28 OFF
High Score to Date	Self-Test Position 19 Set to "00"	Self-Test Position 19 Set to "00"

****SKILL VERSION "B"—SW 14—OFF**

	3-BALL	5-Ball
REPLAYS		
Instruction Card	M051-00A17-A083	M051-00A17-A084
Score Cards	M051-00A17-A038	M051-00A17-A039
Major Mode	Self-Test Position 16, 17 Set to "03"	Self-Test Position 16, 17 Set to "03"
Match	SW 28 ON	SW 28 ON
High Score to Date	Self-Test Position 19 Set to "03"	Self-Test Position 19 Set to "03"
X-BALL		
Instruction Card		M051-00A17-A088
Score Cards		M051-00A17-A039 W/M051-00A17-A076
Major Mode	5 BALL ONLY	Self-Test Position 16, 17 Set to "02"
Match		SW 28 OFF
High Score to Date		Self-Test Position 19 Set to "00"
NOVELTY		
Instruction Card	M051-00A17-A091	M051-00A17-A092
Score Cards	M051-00A17-A036	M051-00A17-A037
Major Mode	Self-Test Position 16, 17 Set to "01"	Self-Test Position 16, 17 Set to "01"
Match	SW 28 OFF	SW 28 OFF
High Score to Date	Self-Test Position 19 Set to "00"	Self-Test Position 19 Set to "00"

*Includes domestic and German games.
**Includes foreign (but not German) games.

VIII. ROUTINE MAINTENANCE ON LOCATION:

Self-Test routines are written into the game design. They are particularly useful for routine maintenance. The tests are described below. The first test is automatic and occurs on power-up. This test causes the MPU module A4 to examine itself for failures. Seven flashes of an LED indicates proper operation. The second series of self-diagnostic tests causes the MPU to 'exercise' each of the other modules in such a way as to make their faults, if any, obvious. See Figure III and Page ii.

It is recommended that these tests be used several times a week to check out the games before play. If faults are discovered, they may be corrected on location if the operator has a stock of replacement modules. See "Trouble Shooting on Location."

MPU Module Self-Test:

At power on, the LED on the MPU module flashes once. (Flicker-Flash.) After a pause, it flashes six more times and goes out. A power-up tune is played to announce game readiness. This indicates proper MPU operating condition and successful completion of the power-up test.

Game Self-Diagnostic Tests:

1. Pressing the Self-Test button inside the door initiates the Self-Test routine. See Figures III and IV. All switched lamps flash off and on continuously.

2. Pressing the Self-Test button again causes each digit on each display to cycle from 0 thru 9, and repeat continuously.

3. Pressing the Self-Test button again causes each solenoid to be energized, one at a time, in a continuous sequence. Hold both flipper buttons 'in' during this test. The number appearing on the Player Score displays is the same as the number assigned to the solenoid. The sound of a solenoid pulling-in as a number appears indicates proper operation. The absence of sound is improper. If sound is absent, see Page 17 for help in Solenoid identification.

4. Pressing Self-Test button again causes the sound module to play same tune repeatedly.

5. Pressing the Self-Test button again causes the MPU to search each switch assembly for stuck contacts. If any are found, the number of the first set encountered is flashed on the Player Score displays. The number remains until the fault is cleared. See Page 17 for help in Stuck 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'.

6. Pressing the Self-Test button 20 more times causes the MPU to step thru the threshold and bookkeeping functions described previously and finally to repeat the power-up test. For more rapid exit to power-up, turn the game off, then on. The game is now ready to play.

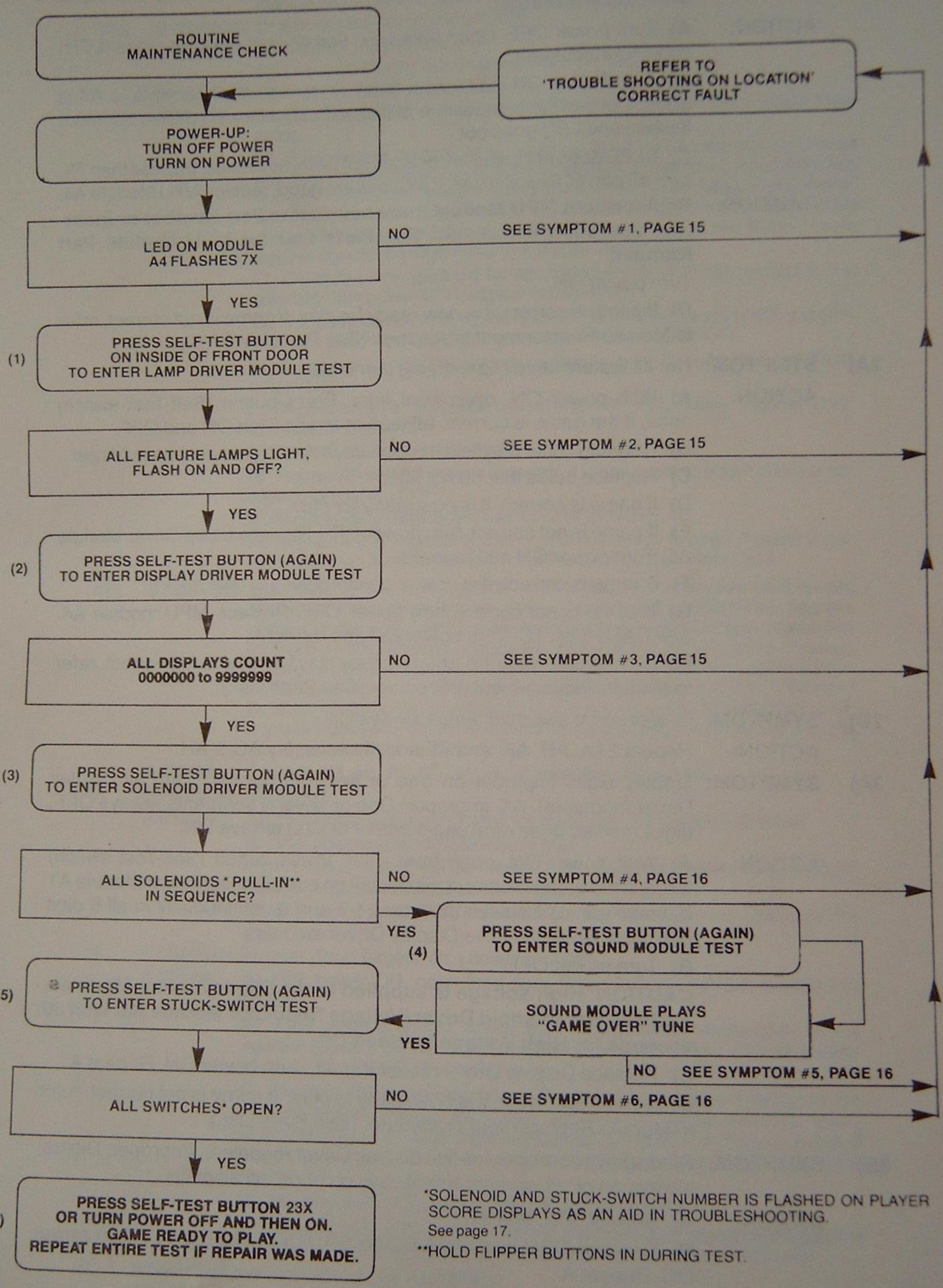
After successful completion of the Self Diagnostic Test procedure, set the game up for play. Exercise each rollover, thumper-bumper, slingshot, etc., by hand until each switch assembly on the playfield has been checked for proper operation. If actuating a switch assembly results in intermittent or no response, clean contacts by gently closing them on a clean business card or piece of paper and wiping until they wipe clean. Regap, if necessary, to 1/16". **Do not burnish or file Gold Plated Switch Contacts.**

IX. TROUBLESHOOTING ON LOCATION

The game is designed to make troubleshooting easy. Several simple procedures are given herein that cover the greatest percentage of game failures. They are written for an operator on location and require module replacement. (See Figure III) Symptoms and the action to be taken are given for each type of problem.

If the problem is more complicated and is not solved by following this procedure, more detailed procedures are available from Bally. See the Parts List for ordering information.

FIGURE IV SELF DIAGNOSTIC TEST



*SOLENOID AND STUCK-SWITCH NUMBER IS FLASHED ON PLAYER SCORE DISPLAYS AS AN AID IN TROUBLESHOOTING.
See page 17.

**HOLD FLIPPER BUTTONS IN DURING TEST.

1A) **SYMPTOM:** Game does not play power-up tune when power is turned on. General Illumination is present.

ACTION: **A)** Turn power OFF. Open back box. Locate light emitting diode (LED) on MPU module A4.

B) Turn Power ON. LED must flash 7X to indicate that module A4 is good. Correct flash sequence is flicker/flash-pause-and then six more flashes and LED goes out.

C) If LED does not come on, or does not flash, or flashes, but less than 7X, turn off power. Check fuses. If all fuses are good, replace MPU Module A4.

CAUTION: **Replacement MPU Module must have same Part Number or incorrect operation will result! See Parts List for MPU Module Part Number.**

Turn power ON.

D) If game is correct, it is now ready for play. If game is not correct, refer to Module Replacement procedure. (See Parts List.)

2A) **SYMPTOM:** Not all feature lamps light during game play.

ACTION: **A)** With power ON, open front door. Press button (Self-Test switch) once. If the game is correct, **all** feature lamps flash ON and OFF.

B) Carefully raise playfield or open back box to gain access to lamps.

C) Replace bulbs that do not flash.

D) If game is correct, it is now ready for play.

E) If game is not correct, turn power OFF. Replace Lamp Driver Module A5. Turn power ON and repeat A.

F) If game is correct, if is now ready for play.*

G) If game is not correct, turn power OFF. Replace MPU module A4. See CAUTION, 1C. Turn power ON and repeat A.

H) If game is correct, it is now ready for play.* If game is not correct, refer to Module Replacement procedure. (See Parts List.)

2B) **SYMPTOM:** One or some switched lamps always ON.

ACTION: Repeat 2AA, AB, AE, and AF and, if necessary AG & AH.

3A) **SYMPTOM:** Display digits improper on **one** or **several,** but less than all Display Driver module(s), A1. Improper: One or several segments always OFF, digits mottled or several segments or digit(s) always ON.

ACTION: **A)** With power ON, open front door. Press button (Self-Test switch) twice. If the game is correct, each digit on each Display Driver Module A1 (5 used/game) displays the count 1-9 and 0 continuously in all 6 digit positions. Note defective Display Driver modules.

B) Turn power OFF.

CAUTION: High Voltage is supplied to the Display Driver Modules, A1, from the Solenoid Driver/Voltage Regulator Module A3. Wait 30 seconds for High Voltage to Bleed Off.

C) Replace Display Driver module(s) A1. Turn power ON. Repeat A.

D) If game is correct, it is now ready to play.* If game is not correct, refer to Module Replacement procedure. (See Parts List.)

3B) **SYMPTOM:** **All** displays improper (all five display Driver modules). Improper: Digit(s) always on or off/segment(s) always on or off, all displays.

ACTION: **A)** Repeat 3AA, and AB.

B) Replace MPU module A4. See CAUTION NOTE, 1C. Turn power ON. Repeat A.

C) If game is correct, it is now ready to play.* If game is not correct, refer to Module Replacement procedure. (See Parts List.)

3C) **SYMPTON:** One or several displays always off.

ACTION: A) Do 3AA, AB, AC, and AD.

B) Repeat 3BB and BC, if necessary.

4A) **SYMPTOM:** Solenoid(s) do(es) not pull-in during course of game.

ACTION: A) With power ON, open front door. Press button (Self-Test switch) three times.

B) If game was correct, each solenoid would be energized. A number is flashed on the Player Score displays as each solenoid is pulsed. Note any numbers that do not have the sound of a solenoid associated. See Solenoid Identification Table, Page 17 and Figure V. NOTE: If most of the playfield solenoids do not operate, check the playfield fuse to see if it is blown. It generally can be found near the flipper assemblies.

C) Carefully lift the playfield (or open the back box) to gain access to the solenoid. Turn power OFF. Inspect the solenoid.

D) If a lead is broken off, repair. Repeat A & B. If game is correct, it is now ready for play.* If solenoid wiring was correct, turn power OFF.

E) Replace Solenoid Driver/Voltage Regulator module A3. See CAUTION NOTE 3AB.

F) Repeat AA & AB. If game is correct, it is now ready to play.* If game is not correct, turn power OFF.

G) Replace Sound Module A8.

H) Repeat AA and AB if game is correct. It is now ready to play. If game is not correct, turn power OFF."

I) Replace MPU module A4. See CAUTION NOTE, 1C.

J) Repeat A & B. If game is correct, it is now ready to play.* If game is not correct, refer to Module Replacement Procedure. (See Parts List.)

4B) **SYMPTOM:** Solenoid(s) always energized—Note: if impulse solenoids (ball ejects, slingshots, thumper-bumpers, etc.) are energized continuously, they are subject to damage. Limit troubleshooting to one minute with power ON, followed by **five minutes with power OFF.** Repeat as necessary. Replace damaged solenoids. Note: When troubleshooting playfield solenoid circuits be advised that a constantly energized solenoid (i.e., Thumper Bumper) will blow the playfield fuse in a few seconds. To avoid replacing the fuse repeatedly, try to isolate the faulty solenoid circuit as soon as the game power switch is flipped on.

ACTION: Do 4AA, AB, AE, AF, AG, AH and if necessary, AI and AJ.

5) **SYMPTOM:** No Sound.

ACTION: A) With Power ON, open front door, press Self-Test switch four times.

B) Turn volume control clockwise to Max.

C) If correct, sound will be heard. If incorrect, try seating speaker lead connector (J2) and input connector (J1).

D) If correct, sound will be heard. If incorrect, refer to Module Replacement procedure."

6) **SYMPTOM:** Feature (Drop Targets, etc.) does not score.

ACTION: A) With power ON, open front door. Press button (Self-Test switch) five times.

B) If the game is correct, Match/Ball in Play display would flash '0'. If a number appears on the Player Score displays, see Switch Assembly Identification Table, Page 17 and Figure V.

C) Carefully lift the playfield. Locate the switch assembly identified from the number. Visually inspect the switch assembly. If the contacts are 'stuck', regap them to 1/16". See section under ADJUSTMENTS. Repeat A & B. If the game is correct, it is now ready to play.* If game is not correct, turn the power OFF.

D) Replace MPU module A4. See CAUTION NOTE 1, C.

E) Repeat A & B. If the game is correct, it is now ready to play.* If the game is not correct, refer to Module Replacement Procedure. (See Parts List).

7) **SYMPTOM:** Game blows fuse(s) repeatedly.

ACTION: See Module Replacement Procedure. F.O. 560-3

*Turn power On-Off switch OFF and then ON.

GAME OA17—SPY HUNTER

SOLENOID IDENTIFICATION TABLE

Self Test #	SOLENOID IDENTIFICATION
01	SAUCER
02	DROP TARGET RESET
03	THUMPER BUMPER
04	LEFT SLINGSHOT
05	OUTHOLE
06	KNOCKER
07	FREE BALL GATE
08	COIN LOCKOUT (DOOR)
09	K1 RELAY (FLIPPER ENABLE)

SWITCH ASSEMBLY SELF-TEST DISPLAY NUMBERS

Switch Self Test #	DESCRIPTION
01	REBOUND
02	LEFT "MISSILE" R.O.B.
03	CENTER "MISSILE" R.O.B.
04	RIGHT "MISSILE" R.O.B.
05	SAUCER
06	CREDIT
07	SPINNER
08	OUTHOLE
09	COIN III (RIGHT)
10	COIN I (LEFT)
11	COIN II (MIDDLE)
12	LANE CHANGE (CABINET)
13	LEFT SLING
14	THUMPER BUMPER
15	TILT
16	SLAM
17	DROP TARGET #1 (LEFT)
18	DROP TARGET #2
19	DROP TARGET #3
20	DROP TARGET #4
21	"SHOT"–"S"
22	"SHOT"–"H"
23	"SHOT"–"O"
24	"SHOT"–"T"
25	LANES (OUTLANE & RETURN LANE)
26	TOP TARGET–"A"
27	TOP TARGET–"G"
28	TOP TARGET–"E"
29	TOP TARGET–"N"
30	TOP TARGET–"T"
31	TOP TARGET–"G"
32	TOP TARGET–"K"
33	SHOOTER LANE
34	LEFT "SMOKE" R.O.B.
35	MIDDLE "SMOKE" R.O.B.
36	RIGHT "SMOKE" R.O.B.
37	BOOP-BALL TARGET
38	LEFT "OIL" R.O.B.
39	MIDDLE "OIL" R.O.B.
40	RIGHT "OIL" R.O.B.

#OA17 SPY HUNTER

○ **INDICATES SWITCH ASSEMBLY IDENTIFICATION NUMBERS**
NOTE: CABINET: 15, 16, 12
DOOR: 06, 09
10, 11, 16

□ **INDICATES SOLENOID IDENTIFICATION NUMBERS:**
NOTE: DOOR: 8
BACKBOX: 9
CABINET: 6

VECTOR SHOWING FOR EJECT SAUCER
BALL SHOULD EXIT TO RIGHT FLIPPER AS SHOWN

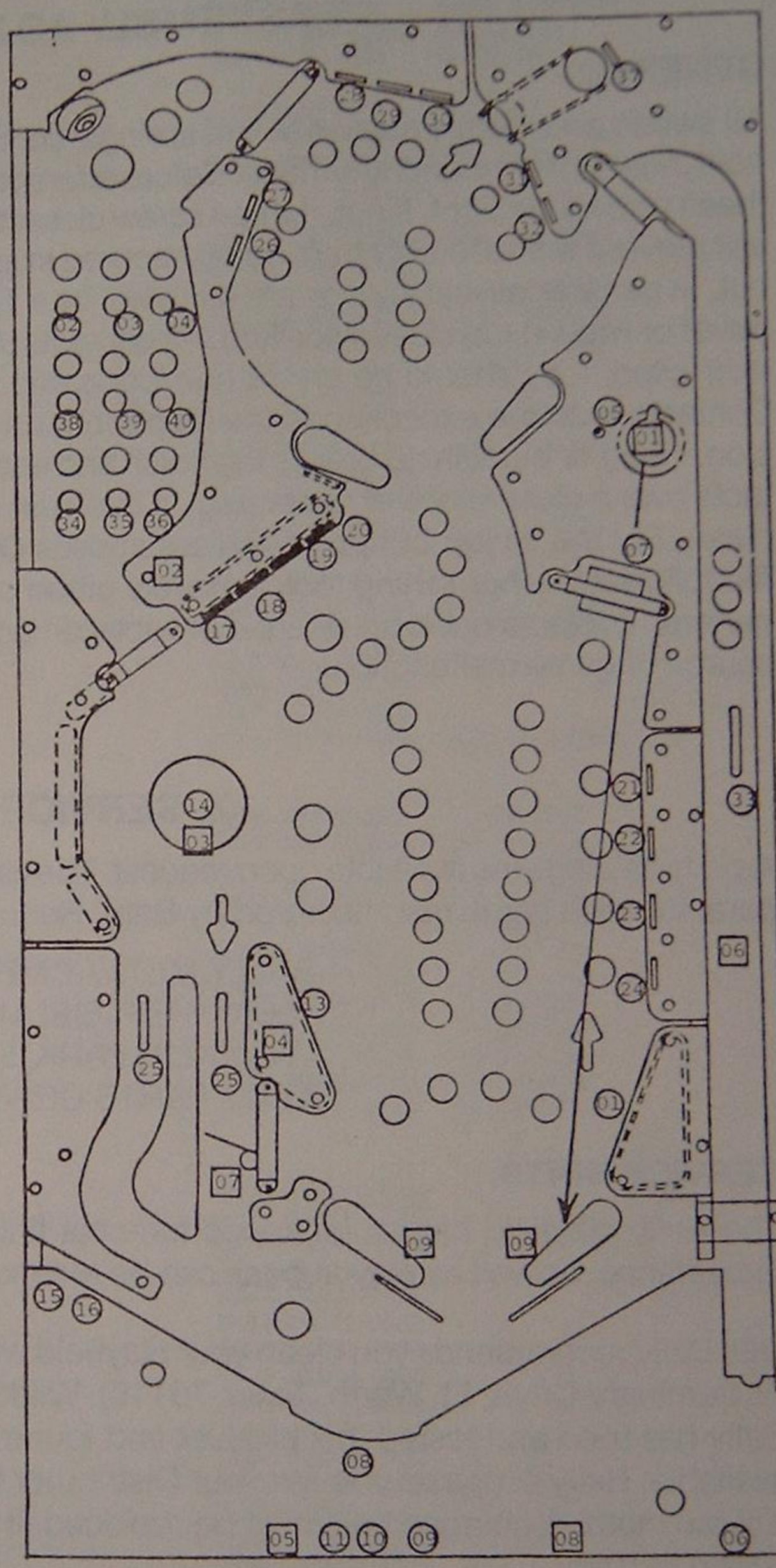


FIGURE V

ASSEMBLY ADJUSTMENTS:

GENERAL:

All switch assemblies consist of leaf springs, contacts, separators, plastic tubing and screws to hold them to the mounting surface. Before attempting to adjust a switch assembly, make sure that these screws are tight. If not, tighten screw closest to the contact end of the leaf spring first. This will prevent the assembly from being secured in such a manner that the leaf springs tend to fan out. In general, all leaf springs are adjusted for a 1/16" gap in the open position and .010" over-travel or wipe in the closed position. All contacts should be in good condition. Unless otherwise instructed, they should be dry or non-lubricated. All contacts should be free of dust and dirt. Contacts, with the exception of the flipper button switch assemblies, are plated to resist corrosion. Filing or burnishing breaks the finish and encourages corrosion. Clean by closing the contacts over a clean piece of paper (e.g., a business card) and wiping gently until the contacts are clean. For the flipper button switch assemblies **ONLY:** Tarnish can be removed with a contact file followed by burnishing tool. Severely pitted contacts must be replaced as an assembly. In general, contacts need be cleaned or replaced and adjusted only when they are found to be a source of game malfunction.

X. SERVICE PARTS:

A parts catalogue is available upon request. The catalogue is illustrated and lists all replacement parts for each game manufactured by Bally. Requests should be addressed to:

BALLY MIDWAY MFG. CO.
10601 WEST BELMONT AVENUE
FRANKLIN PARK, ILLINOIS 60131
ATTN: PARTS DEPARTMENT

SERVICE HINTS:

The Bally playfield has an improved tuff-coat finish with excellent wearing properties. Its life expectance, as well as play appeal, can be extended by periodic cleaning of the playfield.

DO: Bally recommends you clean your playfield with Wildcat #125 (Wildcat Chemical Co., 1333 W. Seminary Drive, Ft. Worth, Texas 76115). Wildcat #125 is a combination cleaner and polish. Bally has tried and tested this product and found it to be very effective. If Wildcat #125 is not available, Bally suggests you ask your Distributor to order it. Inspect and hand polish the ball in a clean cloth. A chipped ball must be replaced. It can ruin the finish on the playfield in a short period of time.

DON'T: Use water in large quantities, highly caustic cleaners, abrasive cleaners or cleaning pads on the playfield. Do not allow a wax or polish build up. Waxes yellow with age and spoil play appeal.

XI. PARTS LIST

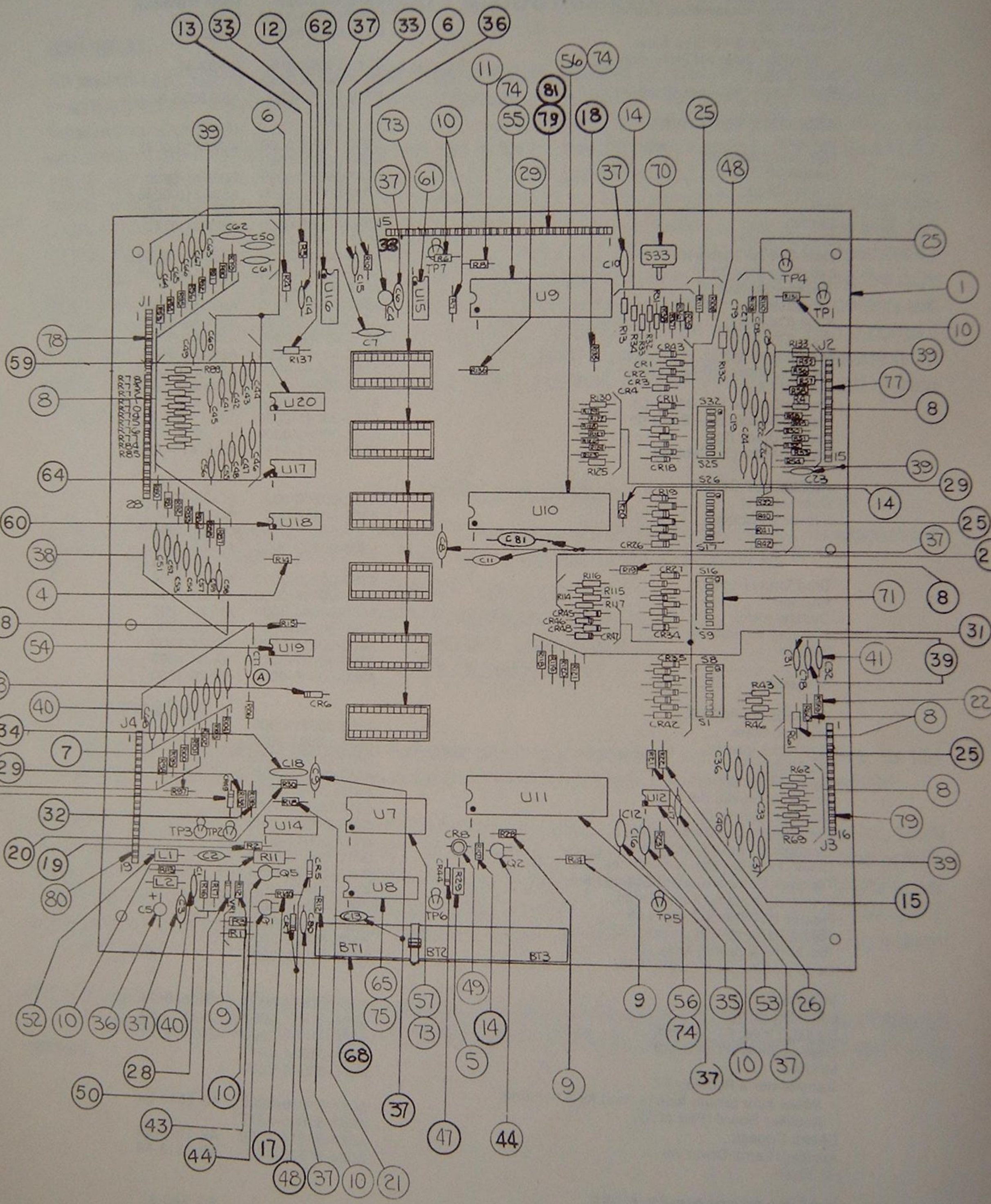
SPY-HUNTER #OA17

	MIDWAY PART NUMBER	BALLY PART NUMBER
MISCELLANEOUS		
Transformer (Domestic or Export)	MT00-00115-A000	E-122-142
Bulbs, #555	0017-0003-0484	E-125-73
Fuse, 1 Amp. 3 AG Slow Blow (Playfield Solenoid Protection)	0017-00003-0103	E-133-44
Back Glass	OA17-00903-00XF	
Ball Shooter Rod Assy. (Cabinet)	A360-00280-000	ASE-2378-5
ASSEMBLY SWITCHES		
Rebound	A360-00069-0000	ASW-A10-0047
Roll Over Button (9)	A390-00022-0000	
Saucer	A967-00075-0000	ASW-A1-0209
Credit (Door)	A360-00068-0000	ASW-A10-0046
Spinner	A360-00058-0000	ASW-A1-0151
Outhole	A360-00055-0000	ASW-A1-0143
Coin (3) (Door)	0017-00005-0195	
Lane Change (Cabinet)	A370-00078-0000	ASW-A10-0056
Left Sling Shot (2)	A360-00069-0000	ASW-A10-0047
Thumper Bumper	A967-00074-0000	
Tilt (Cabinet)	A360-00057-0000	ASW-A1-0145
Slam (Cabinet)	A360-00076-0000	ASW-A2-0073
Slam (Door)	A360-00076-0000	ASW-A2-0073
Drop Targets (4)	A360-00062-0000	ASW-A1-0168
Lanes (Outlane & Return Lane)	A360-00069-0000	ASW-A10-0047
Shooter Lane	A360-00069-0000	ASW-A10-0047
Flipper-Double Sw.—Make (2)	A365-00046-0000	
Flipper-Double Sw.—Break (2)	A365-00045-0000	
Flipper-Break (2)	A365-00045-0000	
Flipper-Make (2) (Cabinet)	A360-00071-0000	ASW-A10-0061
ASSEMBLY COILS		
Coin Lockout	A360-00208-000	FO-36-7000
Flipper (2) Bottom	A360-0045-0000	AQ-25-500/ 34-4500
Flipper (2) Top	A365-00052-0000	AQ-26-600/ 34-4500
Drop Target Reset (1)	A360-00209-0000	NO-26-1900
Knocker	A360-00046-0000	AR-26-1200
Outhole Kicker	A360-00044-0000	AN-26-1200
Thumper Bumper (1)	A360-00044-0000	AN-26-1200
Saucer	A360-00211-0000	AO-27-1300
Gate	A390-00027-0000	GA-34-4000
Slingshot	A360-00046-0000	AO-26-1200
PLAYFIELD PARTS		See Figure II
Playfield Glass	0360-00921-0000	
Playfield & Inserts	AA17-00501-00XF	
Playfield Mylar	OA17-00900-0000	
Clear Plastic Set	AA17-00012-00XF	
Screened Plastic Set	AA17-00901-00XF	
Roll-Over Button (9)	0017-00042-0681	
Drop Target-Hot Stamped (4)	AA17-00028-0000	
Thumper Bumper Cap W/Tape	AA17-00014-0000	
Collar-Thumper Bumper—Amber	0017-00042-0403	
Thumper Bumper Collar Locking Ring	0017-00042-0414	
Flipper-Hot Stamp Assy.—Right	A391-00049-0100	
Flipper-Hot Stamp Assy.—Left	A391-00051-0100	
"Shot" Target & Switch Assy. (4)	A360-00029-0000	
Top Target & Switch Assy. (7)	A360-00029-0000	
Boop-Ball Target & Switch Assy.	A967-00019-0000	
MODULES		
Lamp Driver A5	A084-91613-A000	AS-2518-23
Display Driver A1 (4 used)	A084-91617-A000	AS-2518-58
Display Driver A1 (1 used)	A084-91491-A000	AS-2518-21
MPU A4	A084-91624-AA17	
Transformer & Rectifier A2	A365-00040-0200	
(Make sure proper fuse is used for 4 flippers)		
Rectifier Board (Part of A2)	A084-91616-A000	AS-2518-54
Cheap Squeak	A084-91603-AA17	
Auxiliary Lamp Driver A9	A084-91614-A000	AS-2518-43
G1 Flash	A084-91620-A000	AS-2518-68
REPAIRS PRECEDURES/AIDES		
Module & Component Replacement		F.O. 560-3
AID (Assistance in Diagnostics) Kit, used with F.O. 560-1		KIT #485-1

MODULE COMPONENTS

SEE MODULE PARTS LIST

A082-91624-A000 MPU MODULE

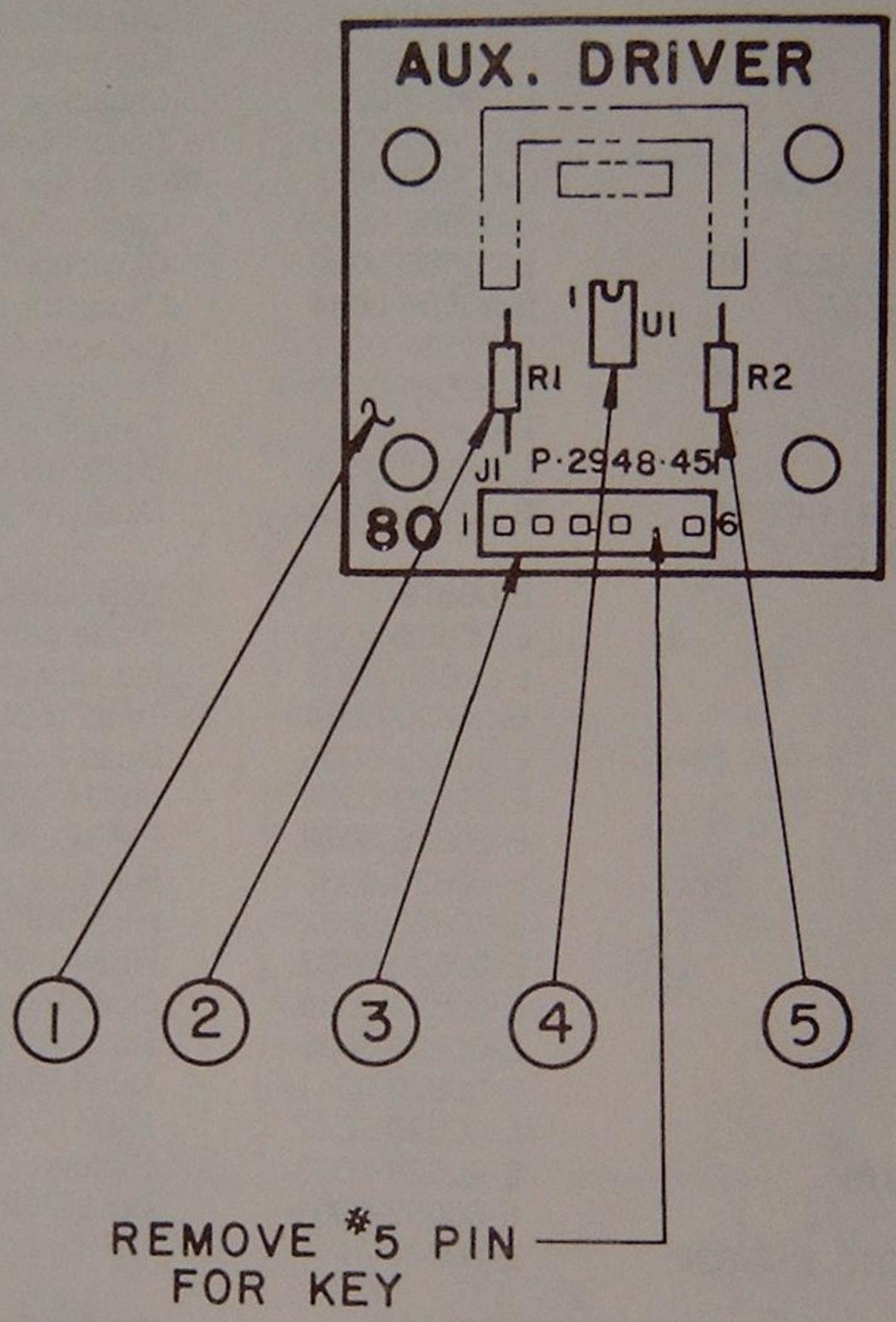


A4: MPU MODULE
COMPONENT PARTS LIST

ITEM	REFERENCE DESIGNATION	BALLY PART #	DESCRIPTION
1	A4 (see note 1)	A084-91624-AA17	MPU Module Complete.
2	A4 (see note 2)	A082-91624-A000	MPU Module less Program Memory, U1-6 incl.
3-32	See Schematic		Resistors, See schematic for value
33	C14, C15	E-00586-0067	Capacitor, 470 PFD, 1kv
34	C18	E-00586-0088	Capacitor, .05 MFD, 16V
35	C16	E-00586-0081	Capacitor, .1 MFD, 100V
36	C4, C5	E-00586-0073	Capacitor, 4.5 MFD, 25V
37	C3, C6-C13, C17, C81	E-00586-0085	Capacitor, .01 MFD, 25V
38	C79, C41-C67	E-00586-0083	Capacitor, 470 PFD, 50V
39	C19-C31, C78, C33-C40	E-00586-0082	Capacitor, 390 PFD, 50V
40	C1, C2, C68-C77	E-00586-0084	Capacitor, 820 PFD, 50V
41	C32	E-00586-0077	Capacitor, 3000 PF, 1 kv
43	Q5	E-00585-0023	Transistor PNP (MPS-3702)
44	Q1, Q2	E-00585-0031	Transistor (2N3904)
47	CR44	E-00587-0006	Diode (IN4004)
48	CR1-CR7, CR11-CR43, CR45-CR49, CR52	E-00587-0014	Diode (IN4148)
49	CR8	E-00679	LED (Green)
50	VR1	E-00598-0008	Diode Zener (8.2V, IN9598)
52	L1, L2	E-00604-0003	Inductor, 22 Micro Hy.
53	U12	E-00620-0004	Timer (555)
54	U19	E-00620-0005	Quad 2 Input (4011)
55	U9	E-00620-0028	MPU I.C. (6800)
56	U10, U11	E-00620-0029	PIA I.C. (6820)
57	U7	E-00620-0030	RAM I.C. (6810)
59	U20	E-00620-0032	HEX Buffer I.C. (14502B)
60	U14, U18	E-00620-0033	HEX Inverter (4049B)
61	U15	E-00620-0034	Quad Memory Drive (MC3459L)
62	U16	E-00620-0035	Dual Monostable (9602)
64	U17	E-00620-0041	Quad 2 Inputs (74L00N)
65	U8	E-00620-0042	RAM (C MOS, P5101L-3)
68	BT1, BT2, BT3	E-00628-0003	Battery
70	S33	E-00658-0001	Push Button Switch
71	S1-S8, S9-S16, S17-S24, S25-S32	E-00677	DIP Switch
73		E-00712	24 Pin Socket
74		E-00712-0001	40 Pin Socket
75		E-00712-0003	22 Pin Socket
77	J2	E-00715	15 Pin Wafer Connector
78	J1	E-00715-0004	28 Pin Wafer Connector
79	J3, J5	E-00715-0017	16 Pin Wafer Connector
80	J4	E-00715-0018	19 Pin Wafer Connector
81	J5	E-00715-0024	17 Pin Wafer Connector

NOTE: Order replacement memory chips U1-U6, specifying game, socket and part number stamped on chip.

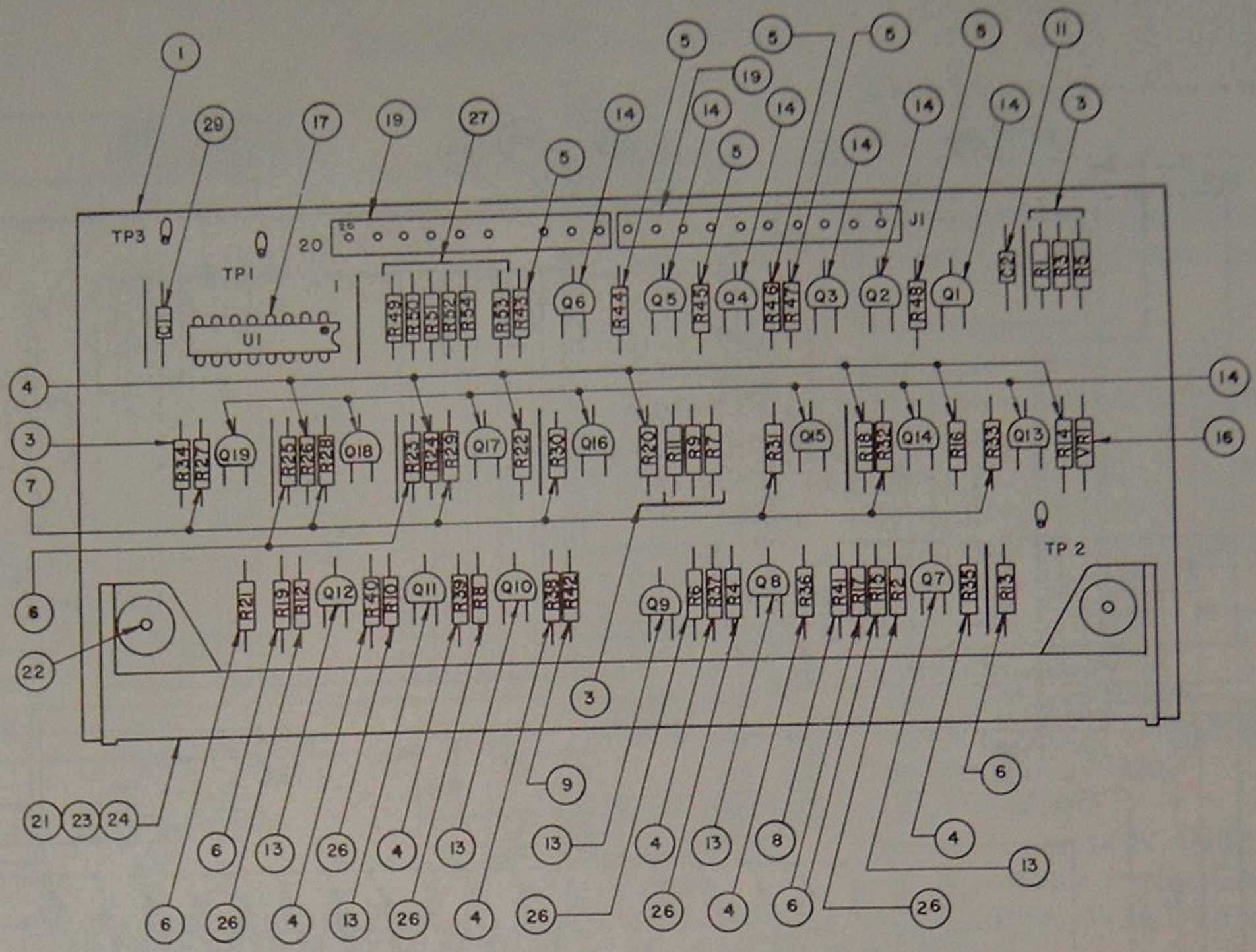
A17 Auxiliary Driver—G.I. Flasher
AS-2518-68



COMPONENTS PARTS LIST

ITEM	QTY.	REFERENCE DESIGNATION	DESCRIPTION	BALLY PART #
1	1	P-2948-451	P.C. Board	M-645-584
2	1	R1	330 Ω, 5% ¼W.	E-105-219
3	1	J1	6 Pin Wafer—KK156	E-736-6
4	1	U1	OPT./CP, MOC 3011	E-620-172
5	1	R2	10 Ω, 5%, ¼W.	E-105-306
REF.			Schematic	W-1253 b

AS-2518-21 CREDIT DISPLAY DRIVER MODULE

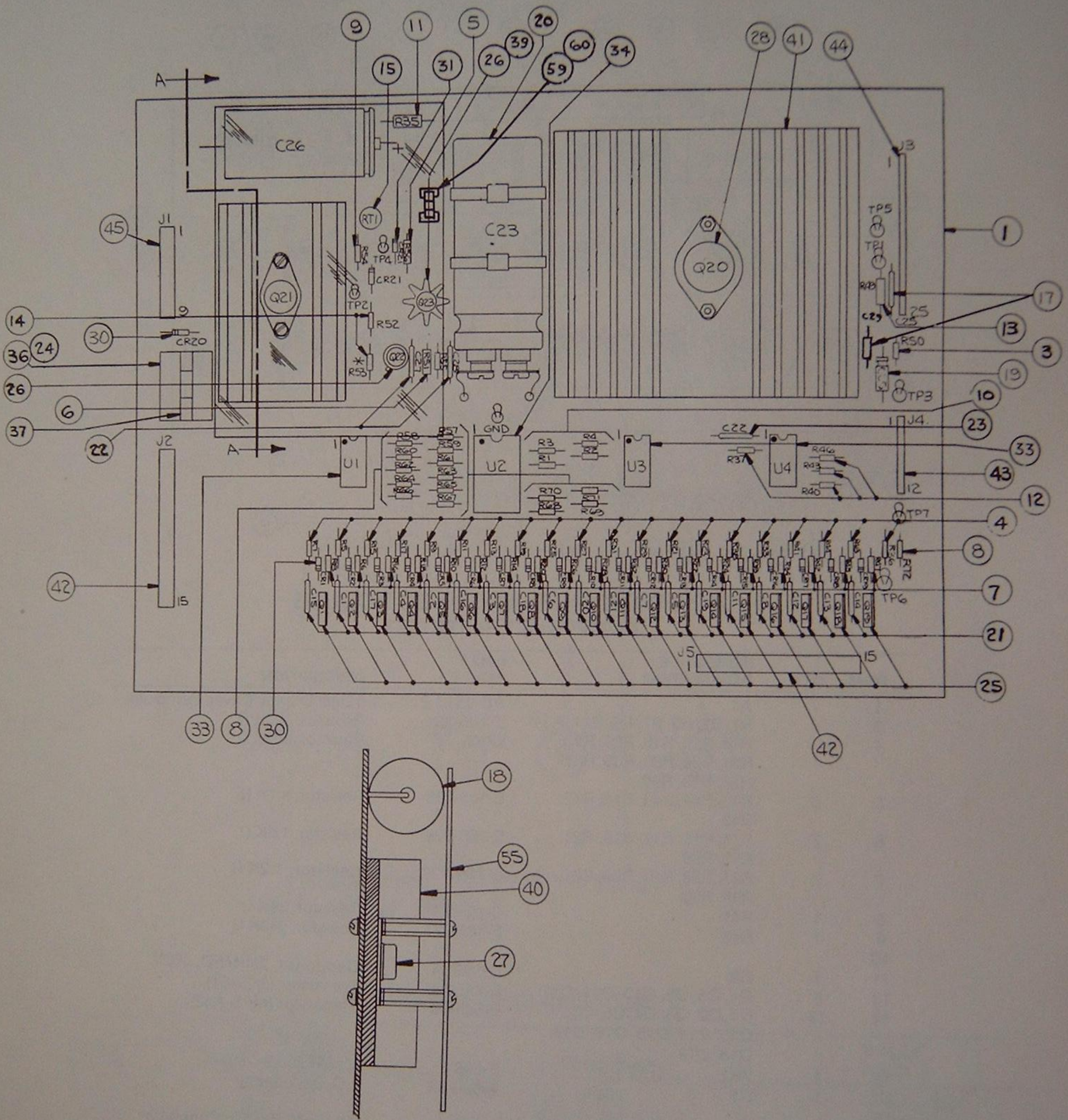


A1: 6 DIGIT DISPLAY DRIVER MODULE
COMPONENT PARTS LIST

ITEM	QTY.	REFERENCE DESIGNATION	BALLY PART #	DESCRIPTION
1	1	A1	AS-2518-21	6 Digit Display Driver, Complete
3	7	R1, R3, R5, R7, R9, R11, R34	E-105-331	Resistor, 100K Ω
4	13	R14, R16, R18, R20, R22, R24, R26, R35, R36, R37, R38, R39, R40	E-105-227	Resistor, 300K Ω
5	6	R43, R44, R45, R46, R47, R48	E-105-228	Resistor, 9.1K Ω
6	7	R13, R15, R17, R19, R21, R23, R25	E-105-229	Resistor, 1.5K Ω
7	7	R27, R28, R29, R30, R31, R32, R33	E-105-222	Resistor, 1.2K Ω
8	1	R41	E-105-231	Resistor, 39K Ω
9	1	R42	E-105-271	Resistor, 240K Ω
10				
11	1	C2	E-586-65	Capacitor, .01 MFD, 500V
13	6	Q7, Q8, Q9, Q10, Q11, Q12	E-585-32	Transistor (2N5401)
14	13	Q1, Q2, Q3, Q4, Q5, Q6, Q13, Q14, Q15, Q16, Q17, Q18, Q19	E-585-33	Transistor (MPS-A42)
16	1	VR1	E-598-7	Zener Diode, 110V
17	1	U1	E-620-38	I.C. Decoder
18				
19	2	J1	E-715-34	10 Pin Wafer Pin Connector
21	1	DS1	E-680	Digital Display Panel
22	2		M-1836	Hi-Lo Screw, W/H
23	1		P-2399	Display Mounting (Top)
24	1		P-2399-1	Display Mounting (Bottom)
26	6	R2, R4, R6, R8, R10, R12	E-105-287	Resistor, 2.2K Ω
27	6	R49, R50, R51, R52, R53, R54	E-105-242	Resistor, 20K Ω
28	As Req'd			Wire Jumper
29	1	C1	E-586-85	Capacitor, .01 MFD, 25V

NOTE: INTERCHANGEABLE WITH AS-2518-15

AS-2518-22 SOLENOID DRIVER/VOLTAGE REGULATOR MODULE



NOTE: INTERCHANGEABLE WITH AS-2518-16

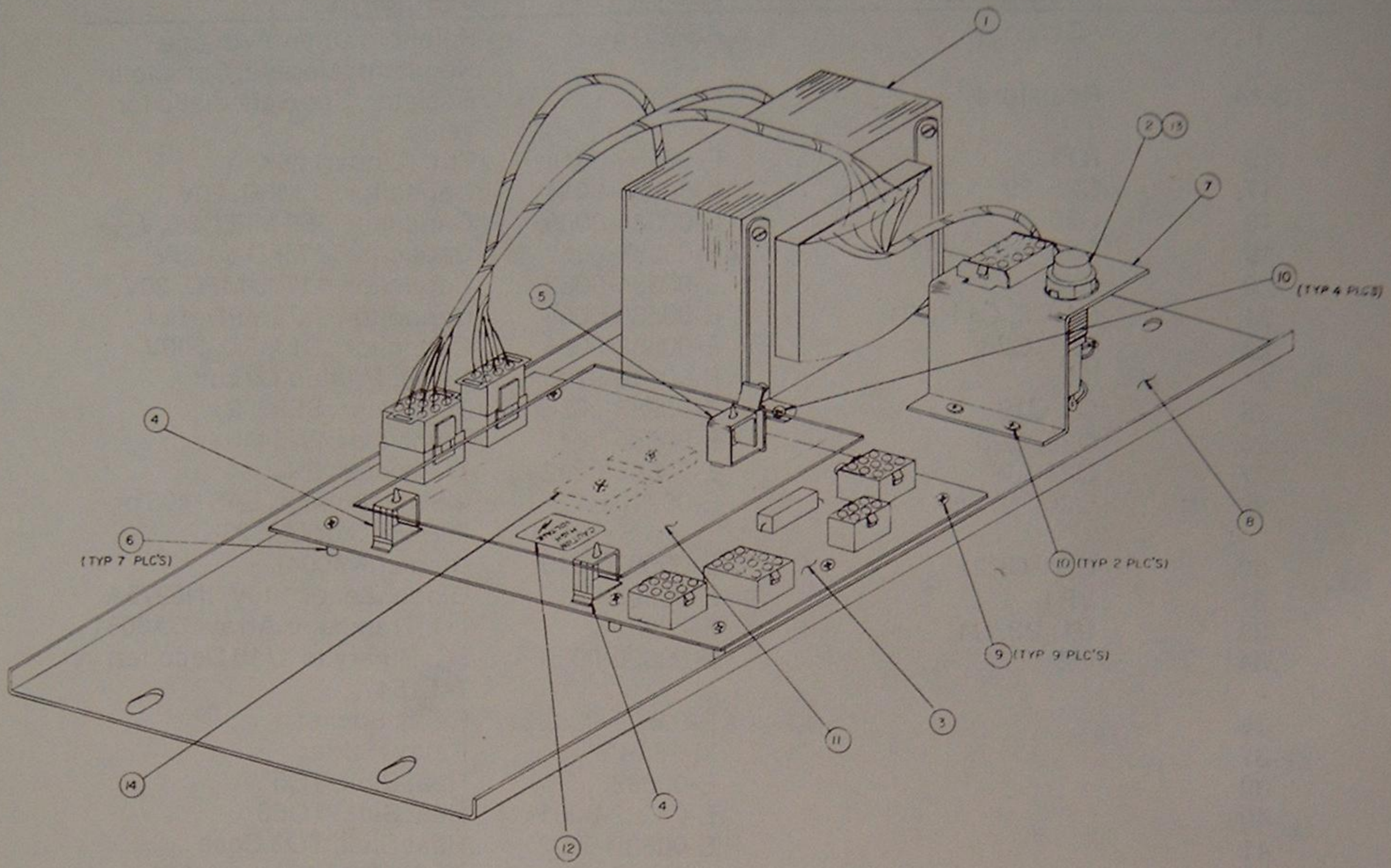
A3: SOLENOID DRIVER/VOLTAGE REGULATOR MODULE

COMPONENT PARTS LIST

ITEM	REFERENCE DESIGNATION	BALLY PART #	DESCRIPTION
1	A3	AS-2518-22	Solenoid Driver/Voltage Regulator Module, Complete
3-14	Resistors		Resistor, See Schematic for value.
15	RT1	E-00599-0014	Pot. (Linear) 25K
17	C25, 29	E-00586-0014	Capacitor, .1 MFD, 20V
18	C26	E-00586-0059	Capacitor, 160 MFD, 350V
19	C24	E-00586-0063	Capacitor, 2 MFD @ 25V
20	C23	E-00586-0062	Capacitor, 11700 MFD, 20V
21	C1-C8, C11-C21	E-00586-0064	Capacitor, .002 MFD, 1kv
22	C27, C28	E-00586-0065	Capacitor, .01 MFD, 500V
24	K1	E-00146-0795	Relay, Printed Circuit
25	Q1-Q19	E-00585-0034	Transistor, SE9302
26	Q22, Q23	E-00585-0041	Transistor, 2N3440
27	Q21	E-00585-0042	Transistor, 2N3584
28	Q20	E-00710	+5V Regulator, LAS1405 or 78H05KC or LM323K
30	CR1-CR21	E-00587-0015	Diode (IN4004)
31	VR1	E-00598-0010	Diode, Zener 140V, IN5275A
33	U1, U3, U4	E-00681	I.C. Transistor Array, CA3081
34	U2	E-00620-0039	I.C. Binary to 1/16 Decoder, 74L154
36		E-00592-0002*	Relay Socket
37		M-1839*	Relay Holder
39		E-00682	Heat Sink, TO5
40		E-00682-0001	Heat Sink, TO66
41		E-00682-0002	Heat Sink, TO3 Case
42		E-00715-0039	15 Pin Wafer Connector
43		E-00715-0016	12 Pin Wafer Connector
44		E-00715-0020	25 Pin Wafer Connector
45		E-00715-0033	9 Pin Wafer Connctor
55		M-1838	Shield-Plexiglass
59		E-00148-0021	Fuse Clips
60	F1	E-00133-0029	Fuse 8 AG-3/16 Amp.
23	C22	E-00586-0085	Capacitor, .01 MFD, 25V

*USED WITH ITEM 24, E-00146-0791, PLUG IN RELAY ONLY

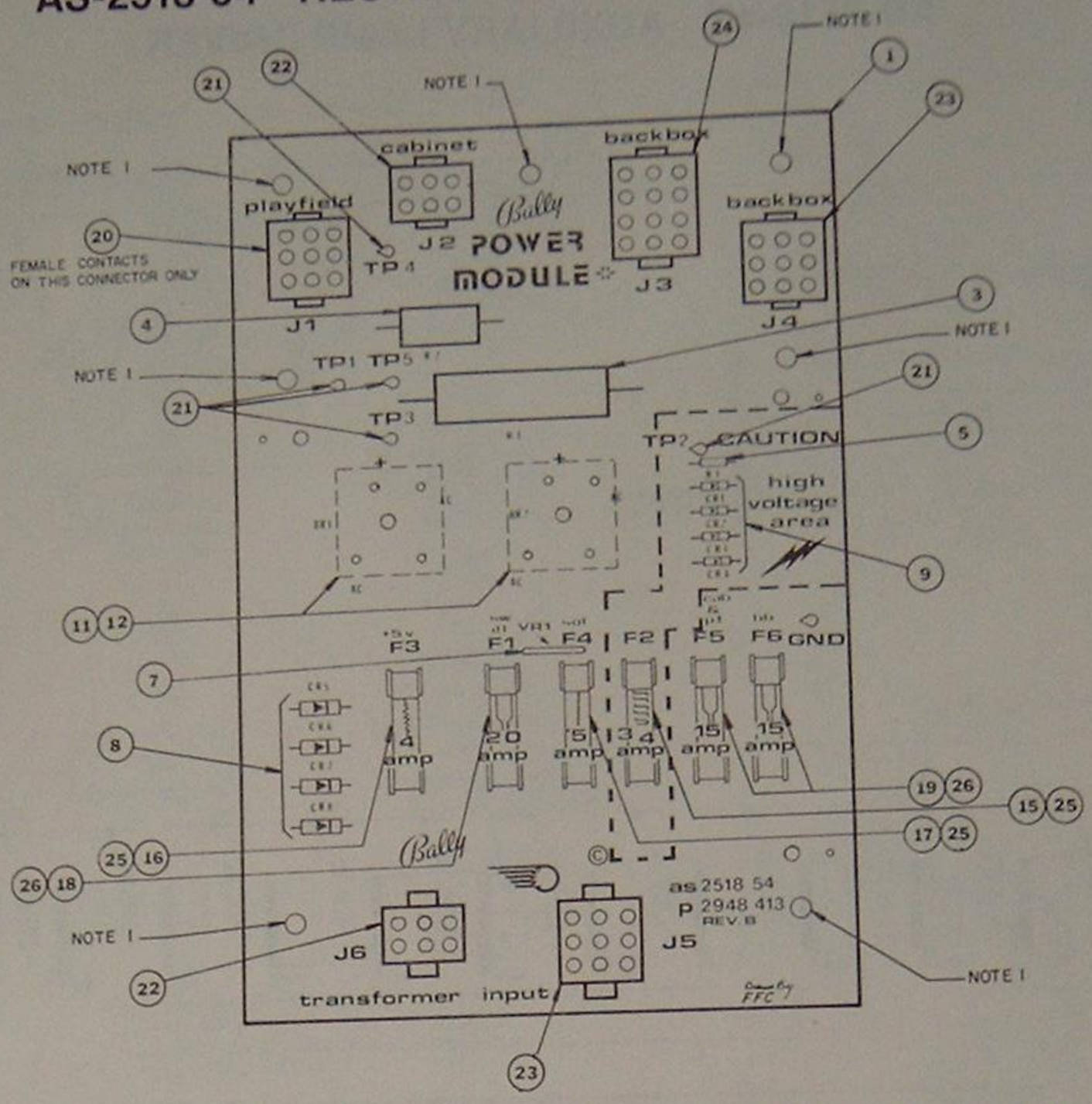
A2: POWER TRANSFORMER MODULE



COMPONENT PARTS LIST

ITEM	REFERENCE DESIGNATION	BALLY PART #	DESCRIPTION
0	A2	A365-00040-0200	Power Transformer Module, Complete
1		AS-3071-2	Transformer
2		E-148-25	Fuse Holder
3	A2	AS-2518-54	Power Module Assy.
4		M-1829-4	Hinged Support
5		M-1829-3	Edge Holder
6		M-1829-5	Spacer
7		P-6442-244b	Fuse & Connect Brkt.
8		P-6442-246	Chassis
9		RLPP-832-1812	Screw
10		RLPP-1032-1806	Screw
11		P-2692-2	Shield
12		M-469-936a	High Voltage Sticker
13		E-133-24	3A S.B. Fuse
14		M-1834	H. S. Compound
15	(not shown)	104E-00016-0014	TRIAC, MAC 38-2

AS-2518-54 RECTIFIER BOARD ASSEMBLY

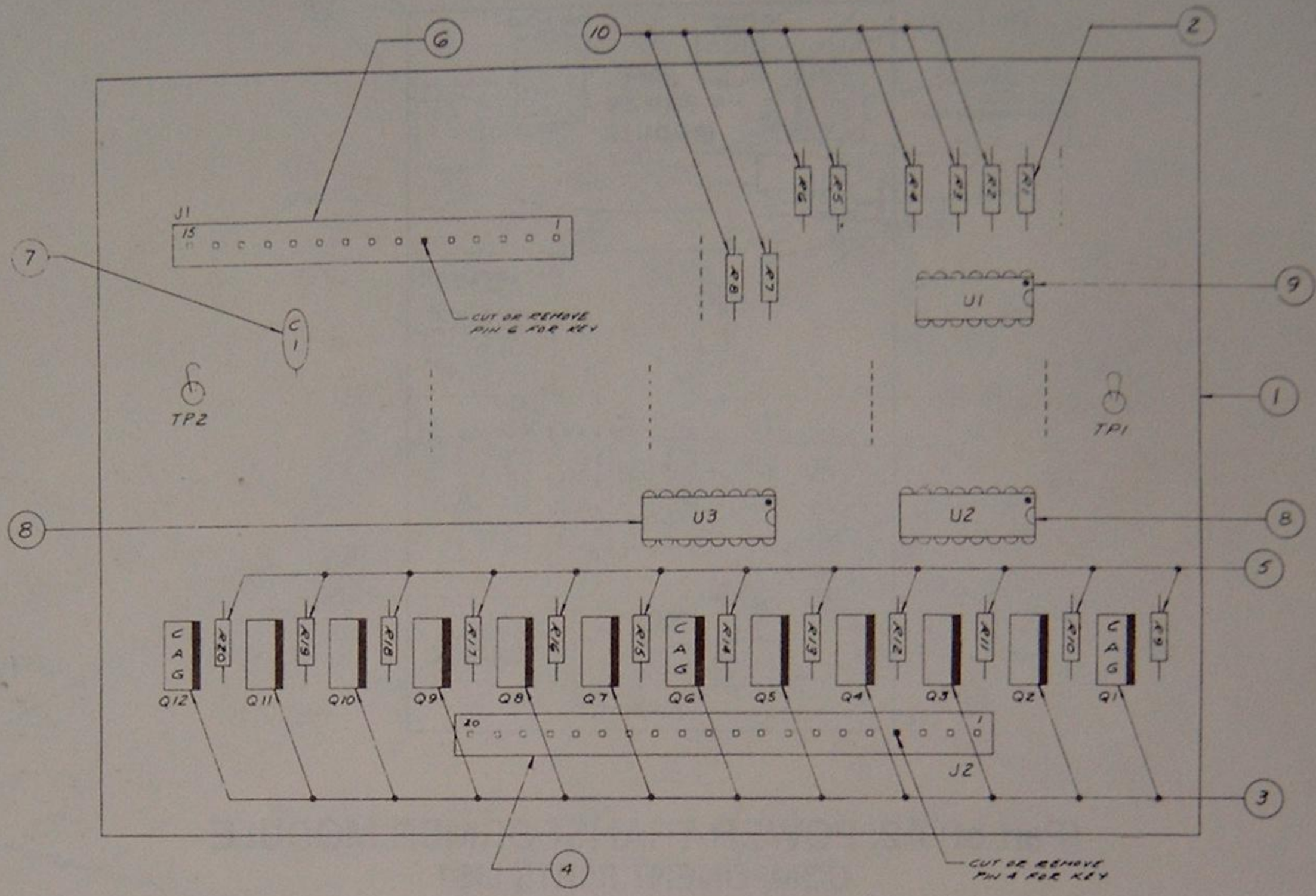


(Part of) A2: POWER TRANSFORMER MODULE
COMPONENT PARTS LIST

ITEM	REFERENCE DESIGNATION	BALLY PART #	DESCRIPTION
0	A2	A365-00040-0200	Power Transformer Module, Complete
1	P/O A2	AS-2518-54	Rectifier Board Assembly, Complete
3	R1	E-00104-0092	Resistor, 10%, 600 Ohm, 10W
4	R2	E-00104-0091	Resistor, 25 Ohm, 5W
5	R3	E-00105-0226	Resistor, 5%, 100K Ohm, ¼W
7	VR1	E-00623	Varistor
8	CR5, CR6, CR7, CR8	E-00587-22 or 24	3A Diode
9	CR1, CR2, CR3, CR4	E-00587-0015	Diode (IN4004)
10			
11	Used with BR1-2	P-1973-480	Spacer
12	BR1, BR2	E-00602-0007	Bridge Rectifier
15	F2	E-00133-0028	Fuse, ¾A, 250V, 3AG
16	F3	E-00133-0004	Fuse, 4A, 32V, 3AG
17	F4 NOTE 1	E-00133-0005	Fuse 5A, 32V, 3AG
18	F1	E-00133-0027	Fuse, 20A, 32V, 3AG
19	F5, F6	E-00133-0015	Fuse, 15A, 32V, 3AG
20	J1	E-806-9	9 CKT Socket Header
21	TP1, 2, 3, 4, 5	P-05399	Test Clip
22	J2, J6	E-805-6	6 CKT Pin Header
23	J4, J5	E-805-9	9 CKT Pin Header
24	J3	E-805-12	12 CKT Pin Header
25	F2, 3, 4	E-00148-0021	Fuse Clips
26	F1, 5, 6	E-00148-0022	Fuse Clips (Low Resistance)

NOTE 1—All games with 4 or more flippers use 7A

AS-2518-43 AUXILIARY LAMP DRIVER



A9: AUXILIARY LAMP DRIVER
COMPONENT PARTS LIST

ITEM	QTY.	REFERENCE DESIGNATION	BALLY PART NO.	DESCRIPTION
1	1	A9	AS-2518-43	Auxiliary Lamp Driver, Complete
2	1	R1	E-105-173	Resistor 2.2 Meg. Ω
3	12	Q1 Thru Q12	E-585-29	SCR MCR 106-1
4	2	J2	E-715-34	10 Pin Wafer Pin Connector
5	12	R9 Thru R20	E-105-237	Resistor 2K Ω
6	1	J1	E-715-39	15 Pin Wafer Pin Connector
7	1	C1	E-00586-0065	Capacitor .01 MFD
8	2	U3, U2	E-620-84	MC14555B Binary 1 to 4
9	1	U1	E-620-85	MC14013B Dual D Flip Flop
10	7	R2 Thru R8	E-105-242	Resistor 20K Ω

WARNING

THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.

WARNING: This equipment generates. uses. and can radiate radio frequency energy and if not and used in accordance with the instructions manual. may cause interference to radio communications. It has been tested and found to comply with the limits for a CLASS A computing device pursuant to SUBPART J of PART 15 of FCC RULES. which are designed to provide reasonable protection against such interference when operated in a commerical environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

ELECTRICAL BULLETIN: FOR ALL APPARATUS COVERED BY THE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARD C22.2 NO. 1, WHICH EMPLOYS A SUPPLY CORD TERMINATED WITH A POLARIZED 2-PRONG ATTACHMENT PLUG.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PREVENIR CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR. UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

Bally MIDWAY™

Invites You To Use

OUR **TOLL FREE** NUMBERS FOR SERVICE INFORMATION CONCERNING THIS GAME, OR ANY OTHER BALLY MIDWAY GAME YOU NOW HAVE ON LOCATION.

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VIDEO ⟶ Continental U.S. 1-800-323-7182

PINBALL ⟶ Continental U.S. 1-800-323-3555

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