

# Magic



## 'Stern

**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:**

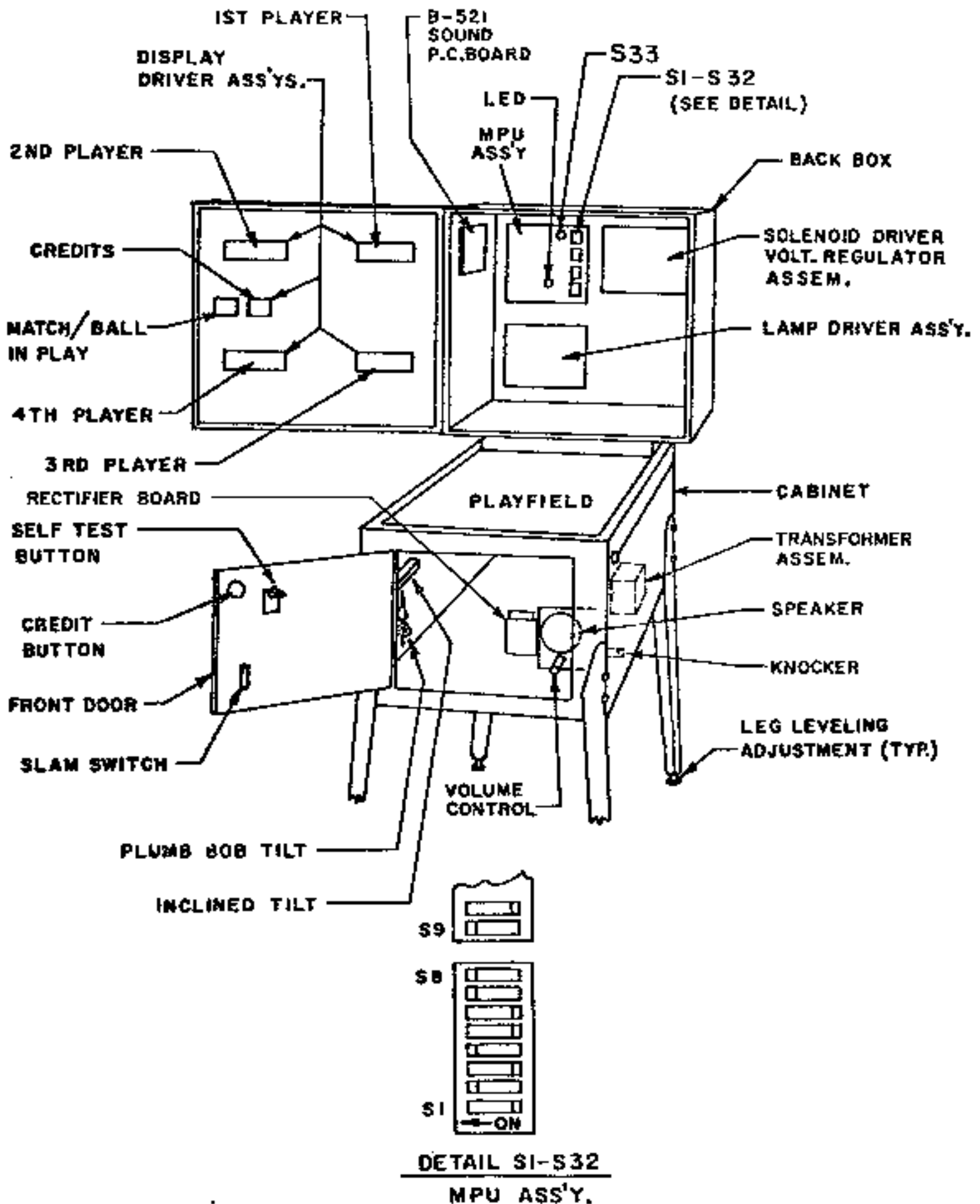
1. Plumb bob tilt on left side of cabinet near front door.
2. Ball tilt above plumb bob tilt. Insert the smaller ball (gold 15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.
3. Panel tilt on bottom of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

# ELECTRONIC PIN BALL GAME

Figure 1



## II. GENERAL GAME OPERATION

### PLACE BALL INTO PLAYFIELD BY OUTHOLE:

When the ball is placed in the out-hole, the machine will automatically start the game. The ball will be placed in the out-hole and the machine will start the game. The ball will be placed in the out-hole and the machine will start the game.

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After the player's regular ball enters the out-hole, the machine will start the game. The ball will be placed in the out-hole and the machine will start the game.

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\*\*\* See back box adjustments. \*\*\*

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Extra Ball won during the course of the game is played immediately after the regular ball is placed in the out-hole. The player-up and/or ball in play are not advanced for extra ball play. The ball will be placed in the out-hole and the machine will start the game.

At the end of the game, a "High Game to Date" light is alternately lit. If the "High Game to Date" is beat, this feature can award up to 3 free games.

Tilting the game results in loss of the ball in play. The flippers, bumpers, and ball in play are not advanced for extra ball play. The ball will be placed in the out-hole and the machine will start the game.

Slamming the machine results in the loss of the game. All features are disabled through a built-in time delay circuit. The purpose of the tilt delay is to discourage abuse of the machine. After the delay, the "Game Over" light lites and the machine will start the game.

There is a slam switch on the front door. One on the tilt board and one on the out-hole. The switches could be installed by the operator, to meet his individual requirements. The gap between the contacts should be adjusted to have approximately 1/16" gap between the contacts. The ball will be placed in the out-hole and the machine will start the game.

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

### III. FRONT DOOR GAME ADJUSTMENTS:

#### HIGH SCORE FEATURE ADJUSTMENTS:

The game is designed to award an extra ball or a free game (option) at three score levels. (See High Score Feature in game book). The recommended levels are on the score card on the game.

Any level from 10,000 or 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 at one second intervals five 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.

NOTE: Only One Extra Ball Can Be Achieved Per Ball In Play.

#### HIGH GAME TO DATE FEATURE:

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

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 Adjustment, Steps 1 and 2. Continue pushing the Self-Test button until the number '04' appears on the Match/Ball-in-Play display and then do Step 2.

Any level from '00' to 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 positioning switches to the "OFF" position.

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

### IV. FEATURE OPERATION & SCORING

#### BONUS SCORE FEATURE:

A bonus score of 1,000 to 19,000 may be scored. The game starts with 1,000 bonus score. The bonus score is advanced by 1,000 every time the ball goes thru one of the top rollover lanes, hits one of the stationary targets, top thumper bumper, goes thru one of the inner return lanes, or hits center rollover. The upper left rollover and both outlanes score 3 bonus advances (3,000 points).

**SPINNER FEATURE:**

Left Spinner scores 200 points

Plus 400 points additional after the "M" is spotted,  
400 points additional after the "I" stationary target is hit

Right Spinner scores 200 points

Plus 400 points additional after the "G" is spotted,  
400 points additional after the "C" stationary target is hit

Both spinners score 1,000 points additional after the "A" rollover lane is made (lite alternates between both spinners after lighting). Both spinners reset to 200 points each time the ball enters the outhole.

**THUMPER BUMPERS:**

Top Thumper Bumper scores 1,000 and advance bonus.

Bottom (2) Thumper Bumpers score 1,000 points on 3 ball and 100 points on 5 ball game.

**RETURN LANES:**

Right & Left Return Lanes score 2,000, or lit Value (Lane value increased by lower rollover) and 1 Bonus Advance.

**OUTLANES:**

Left Outlanes scores 5,000 points & 3 Bonus Advances.

Right Outlane scores 5,000 points & 3 Bonus Advances and Special when lit (by advancing drop target thru 2X, 3X, 4X,) (adjustable).

**SLINGSHOTS:**

Slingshots score 10 points.

**COLLECT BONUS:**

When the ball enters the outhole or eject pocket the bonus is collected and then the bonus is reset to 1,000.

**RECOMMENDED SETTING**

	<b>3 BALL</b>	<b>5 BALL</b>
1st Level -	360,000	540,000
2nd Level -	520,000	680,000
3rd Level -	—	—
High Score TO DATE	700,000	800,000
Instruction Card	12B-2-115-22	12B-2-115-22A

**DROP TARGET:**

Start: Upper 2X lite on, targets down, lites lower 2X lite (for award) and scores 5,000

1st time: Upper 3X lite on, targets down, lites lower 3X lite (for award) and scores 10,000

2nd time: Upper 4X lite on, targets down, lites lower 4X lite (for award) and scores 20,000

3rd time: Upper 5X lite on, targets down, lites lower 5X lite (for award) and scores 30,000

NOTE: 2nd or 3rd reset (adjustable) will lite lower right outlane for Special.

Each additional time targets up upper special lite on, all targets down score special (adjustable).

Each time the ball enters the outhole the feature resets.

End targets score 1,000, Middle target scores 500.

**EJECT POCKET:**

Collects Bonus & Multiplier, Bonus then resets to 1,000, Retains Multiplier. Each time the ball enters the outhole the feature resets.

**ROLLOVER BUTTONS:**

Upper Left Rollover

Scores 3,000 and 3 Bonus Advance, lites for possible Extra Ball after spotting Magic.

Center Rollover

Scores 1,000 and Advance Bonus.

Lower Rollover Button

Scores 1,000 and Increase Value of return lanes.

**STATIONARY TARGETS & TOP ROLLOVER LANES:**

Scores 1,000 points and advance bonus.

LIGHTING: "M" target or lane lites left spinner lite for additional 400 points

"G" target or lane lites right spinner lite for additional 400 points

"I" target lites left spinner lite for additional 400 points

"C" target lites right spinner lite for additional 400 points

"A" rollover lane lites 1,000 point lite alternating between the left and right spinner.

Spotting "Magic" lites left upper rollover for extra ball.

Spotting "Magic" second time scores special.

Each time the ball enters the outhole the feature resets.

## V. 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 Figure 2.

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 Figure 1. Credits per coin, maximum credits, credit display, balls per game, match feature, high game feature, special award and melody are selectable by means of switches. The switches 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. MAKE ADJUSTMENTS BEFORE TURNING POWER BACK ON.**

MPU SWITCH ASSIGNMENT	
1 thru 5	Coin Chute No. 2 (Center)
6	High Score
7	Ball Per Game
8	Tone Melody
9 thru 13	Coin Chute No. 3 (Right)
14	N/U
15-16	High Game To Date
17 thru 19	Max. Credits
20	Credit Display
21	Match Feature
22	N/U
23	Extra Ball Lane
24	Outlane Special On
25	Target Special
26	Outlane Special
27	Extra Ball Alternation
28 thru 30	Coin Chute No. 1
31-32	Special Award



**1. 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.

<b>AWARD</b>	<b>SWITCH 6</b>
EXTRA BALL	OFF
REPLAY	ON

**2. BALL PER GAME:**

<b>No. of BALLS PER GAME</b>	<b>SWITCH 7</b>
5	ON
3	OFF

**3. MELODY OPTION:**

The game is designed to play melodies to announce power-up, credit, etc. Some tunes are adjustable by Switch 8.

<b>GAME MELODY</b>	<b>SWITCH 8</b>	<b>MELODY</b>
POWER-UP.....	ON	Full Melody
"	OFF	Full Melody
COIN.....	ON	Full Melody
"	OFF	2 Tones Only
CREDIT BUTTON.....	ON	Full Melody
"	OFF	2 Tones Only
GAME OVER.....	ON	Full Melody
"	OFF	Full Melody

**4. 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.

	<b>SWITCH</b>	
	<b>18</b>	<b>15</b>
<b>NOVELTY</b>	OFF	OFF
1 FREE GAME	OFF	ON
2 FREE GAMES	ON	OFF
3 FREE GAMES	ON	ON

**5. 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 17, 18, and 19. Eight credit limits are available. Switch settings are listed below:

<b>MAXIMUM CREDITS</b>	<b>SWITCHES</b>		
	<b>19</b>	<b>18</b>	<b>17</b>
5.....	OFF	OFF	OFF
10.....	OFF	OFF	ON
15.....	OFF	ON	OFF
20.....	OFF	ON	ON
25.....	ON	OFF	OFF
30.....	ON	OFF	ON
35.....	ON	ON	OFF
40.....	ON	ON	ON

6. CREDIT DISPLAY:

CREDITS DISPLAY  
YES YES  
NO

SWITCH 20  
ON  
OFF

7. MATCH FEATURE:

When the MATCH FEATURE is On, a random number appears in the "MATCH/BALL in PLAY" window and the word MATCH is illuminated. If the number matches the tens digit in a player's score a free game is awarded. The MATCH feature creates an incentive to play.

MATCH  
ON  
OFF

SWITCH 21  
ON  
OFF

8. EXTRA BALL:

This option can be adjusted as follows:

NO EXTRA BALL (BYPASS)  
AWARD EXTRA BALL

SWITCH 23  
OFF  
ON

9. OUTLANE SPECIAL:

Special Lite on After 2nd Target Reset  
Special Lite on After 3rd Target Reset

SWITCH 24  
OFF  
ON

10. TARGET SPECIAL:

The numbers of replays made after Drop Target resets 4 times can be adjusted as follows:

OPENED ENDED  
1 SPECIAL PER BALL

SWITCH 25  
OFF  
ON

11. OUTLANE SPECIAL:

The numbers of replays made after lighting the special in the outlane can be adjusted as follows:

OPEN ENDED  
1 SPECIAL PER BALL

SWITCH 26  
OFF  
ON

12. EXTRA BALL ALTERNATION:

When Extra Ball lane is lit or Extra Ball lane & Special lane are on it they can be adjusted as follows:

CONSTANT ON  
(No Alternation)  
ALTERNATE ON AND OFF  
(Inner Lane Alternating With Outlane)

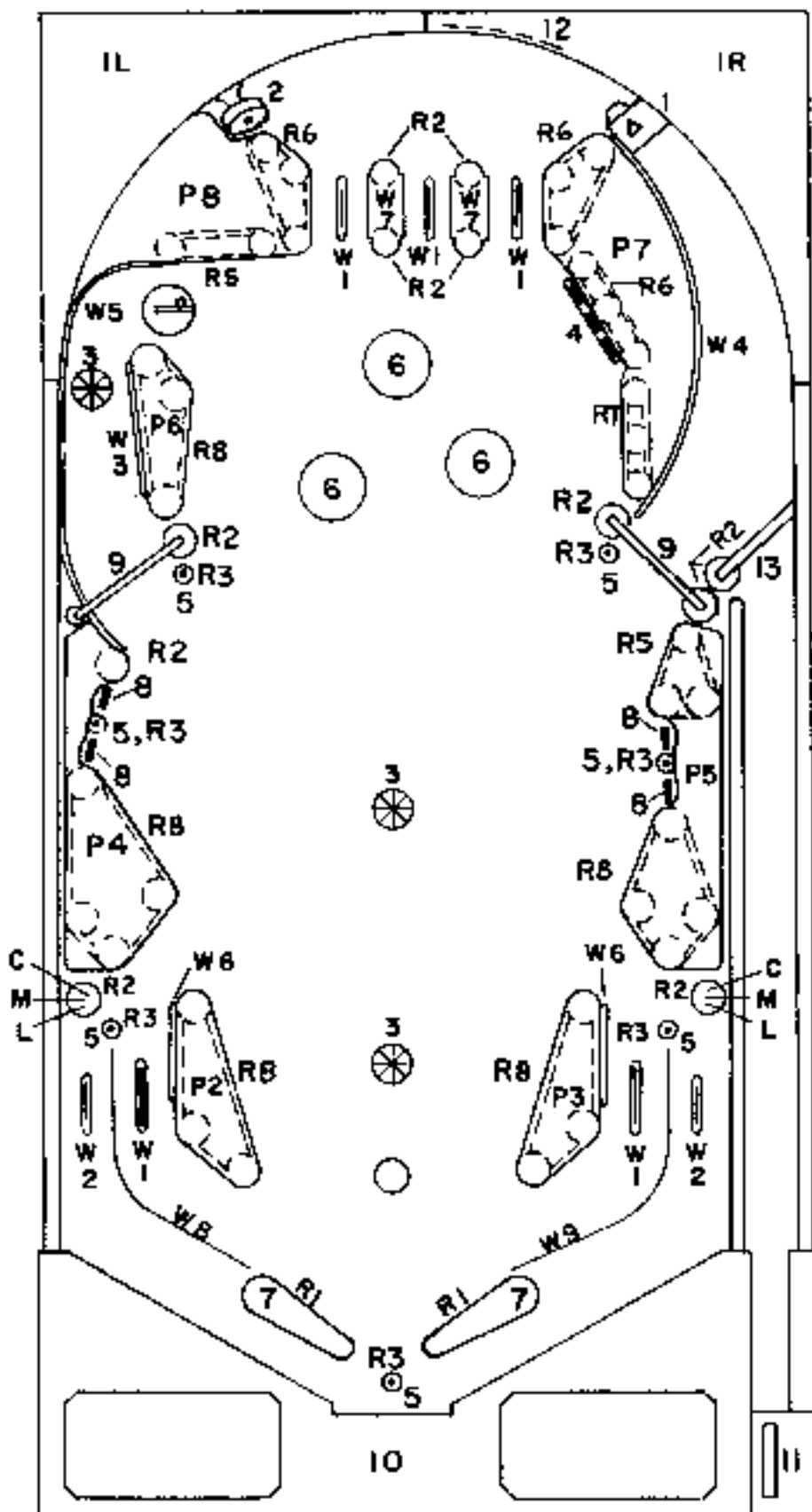
SWITCH 27  
OFF  
ON

13. SPECIAL AWARD:

Award received when hitting the rotating "Special" lite on the Stationary Targets, when Special light is lit can be adjusted as follows:

AWARD	SWITCHES	POSITION
FREE BALL	31	ON
	32	OFF
FREE GAME	31	OFF
	32	ON
100,000 POINTS	31	OFF
	32	OFF
FREE BALL & FREE GAME	31	ON
	32	ON

# MAGIC - PLAYFIELD CHART



## RUBBER RINGS

R1-7A-121	R5-7A-120-125
R2-7A-120-031	R6-7A-120-150
R3-7A-125	R7-7A-120-200
R4-7A-120-031	R8-7A-120-250

## BALL GUIDES & ROLL-OVERS

W1-A-149	W6-6A-101
W2-6A-235	W7-4A-121
W3-6A-140	W8-6A-219
W4-B-603	W9-6A-227
W5-B-604	

## PLAYFIELD PLASTIC SHIELDS

TOP ARCH SET 13C-115-1R & 1L  
 PLAYFIELD SET 13A-115-2 To -7  
 (P2 To P7)

## OTHER PARTS

1. BALL GATE A-104-R1
2. REBOUND RUBBER A-105
3. ROLL-OVER BUTTON 4B-241
4. BANK TARGET D-580-3B
5. BALL GUIDE POST 2A-200
6. THUMPER CAP 13A-24-B
7. FLIPPER & SHAFT A-193
8. TARGET ASSEM. A-481-2
9. SPIN TARGET A-563-3
10. INSTRUCTION PLATE 14B-3-1
11. SHOOTER GAUGE 14A-2-4
12. TOP ARCH RAIL 6B-222
13. ANTI-RETURN GATE A-471

### POST ADJUSTMENT

C - CONSERVATIVE  
 M - MEDIUM  
 L - LIBERAL

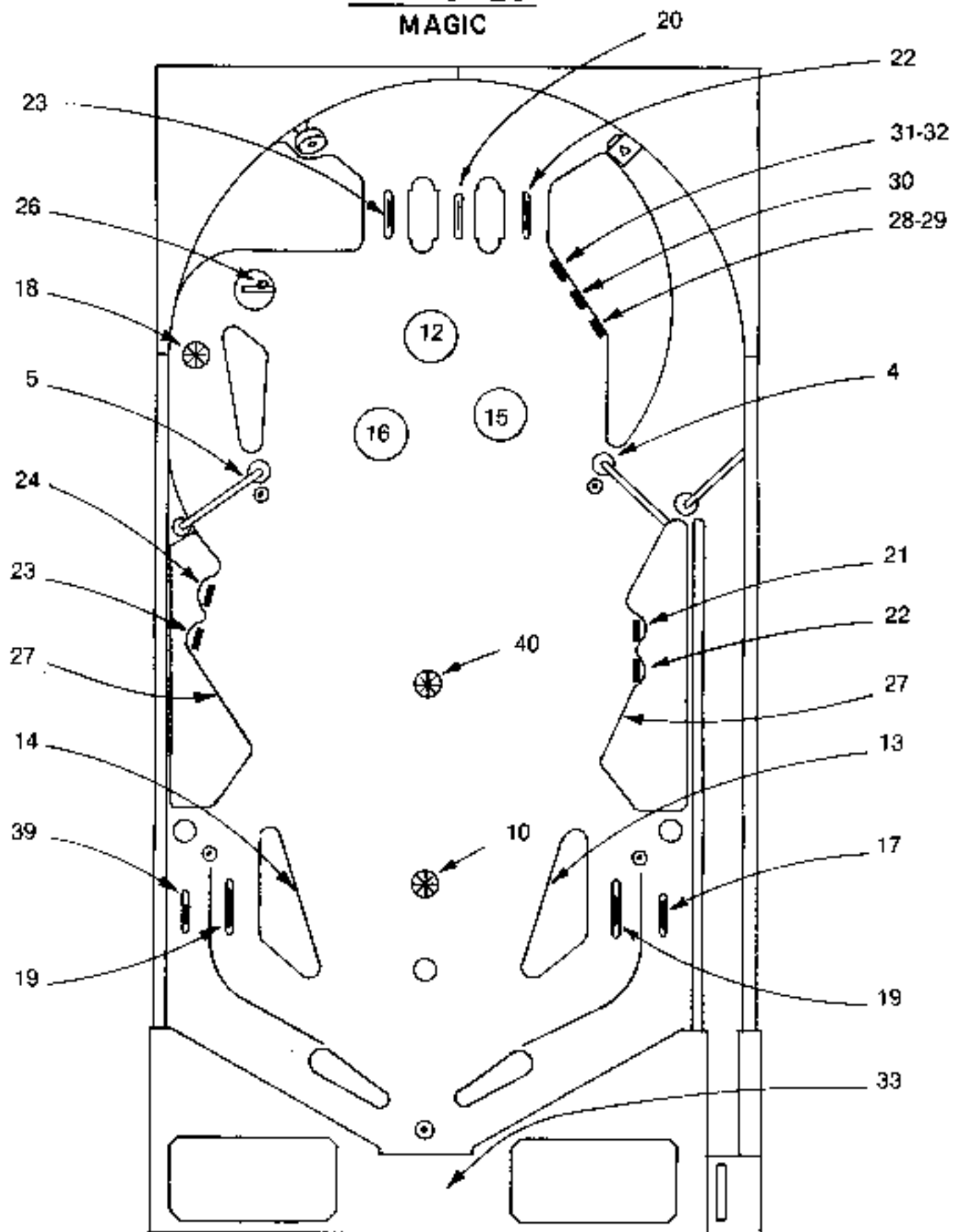
**MAGIC**  
**SWITCH IDENTIFICATION**  
**Self Test Display Numbers**

SWITCH NO.	SWITCH LOCATION	SWITCH NO.	SWITCH LOCATION
1	COIN CHUTE	21	#1 STAND-UP TARGET (RIGHT)
2	COIN CHUTE	22	#2 STAND-UP TARGET (RIGHT)
3	COIN CHUTE	23	UPPER ROLL-OVER (RIGHT) & STAND-UP TARGET #1 (LEFT)
4	SPIN TARGET (RIGHT)	24	#2 STAND-UP TARGET (LEFT)
5	SPIN TARGET (LEFT)	25	OPEN
6	CREDIT BUTTON	26	KICKER (SAUCER)
7	TILTS	27	(2) 10-PTS. & CHANGE
8	SLAM & VIB. TILTS	28 & 29	#3 DROP TARGET
9	OPEN	30	#2 DROP TARGET
10	ROLL-OVER BUTTON (LOWER)	31 & 32	#1 DROP TARGET
11	OPEN	33	OUT-HOLE
12	CENTER THUMPER	34	OPEN
13	RIGHT SLING-SHOT	35	OPEN
14	LEFT SLING-SHOT	36	OPEN
15	RIGHT THUMPER	37	OPEN
16	LEFT THUMPER	38	OPEN
17	RIGHT OUT-LANE	39	LEFT OUTER LANE
18	ROLL-OVER BUTTON (LEFT)	40	ROLL-OVER BUTTON (CENTER)
19	RETURN LANES (RIGHT & LEFT)		
20	UPPER ROLL-OVER (CENTER)		



**NOTE:** 1. Flipper Button Cabinet Switches Do Not Appear On Test.

# SWITCHES MAGIC

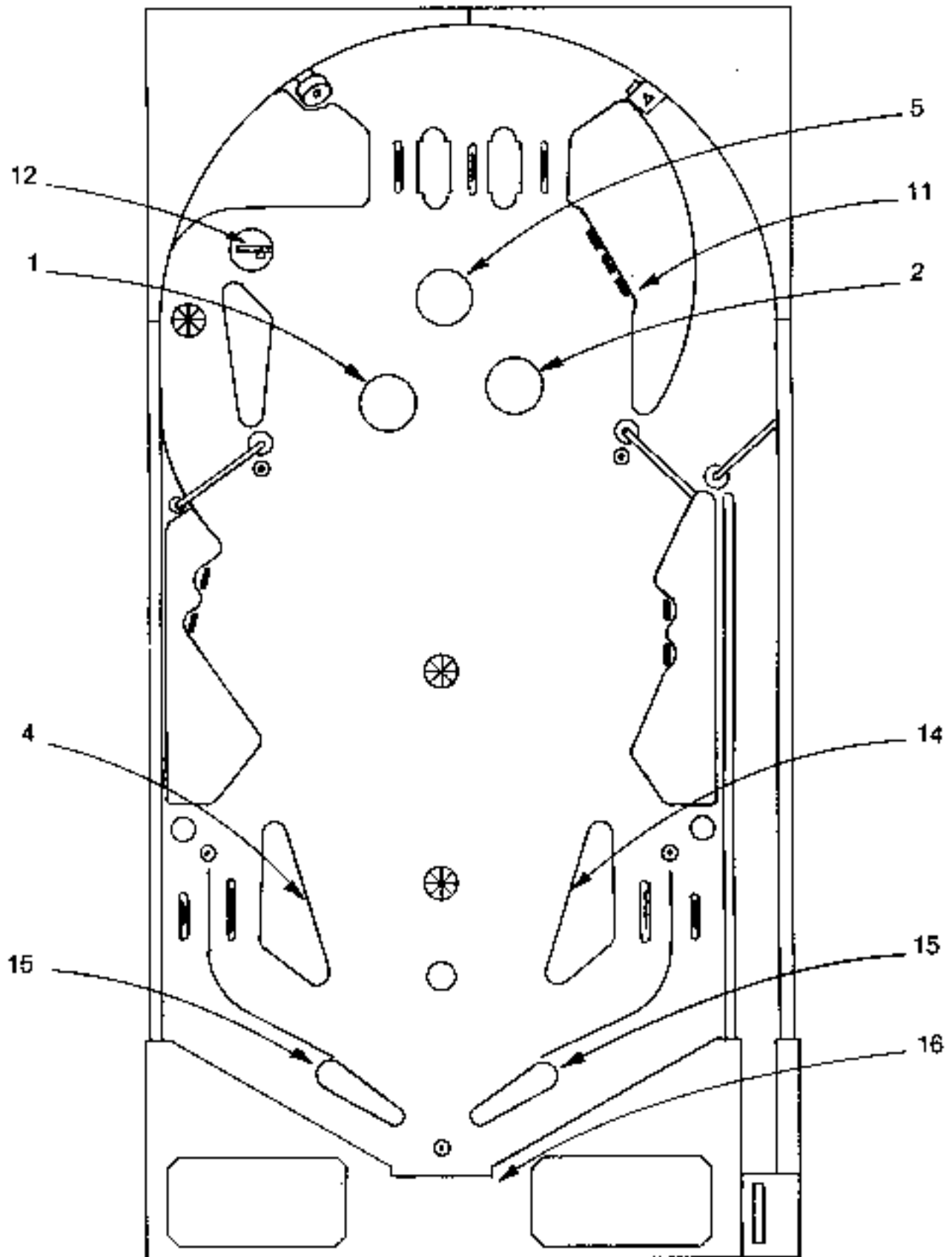


### SWITCHES NOT ON PLAYFIELD:-

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

\*SEE DRW'G. ON PAGE 11

SOLENOIDS  
MAGIC



SOLENOIDS NOT ON PLAYFIELD:

3 KNOCKER

19 LOCK-OUTS

**MAGIC  
SOLENOID IDENTIFICATION  
Self Test Display Numbers**

<b>SOLENOID NO.</b>		<b>SOLENOID LOCATION</b>
1	.....	LEFT THUMPER
2	.....	RIGHT THUMPER
3	.....	KNOCKER
4	.....	LEFT SLING SHOT
5	.....	CENTER THUMPER
11	.....	3-BANK DROP TARGET
12	.....	EJECT POCKET
14	.....	RIGHT SLING-SHOT
15	.....	FLIPPERS (ENABLE RELAY)
16	.....	OUTHOLE
19	.....	COIN LOCK-OUT
20 thru 25	.....	SOUND

**VIII. PARTS LIST  
GAME #115 MAGIC**

<b>MISCELLANEOUS</b>	<b>PART NUMBER</b>
Transformer (Domestic or Export).....	16B-3
Transformer & Rectifier Board.....	C-464
#44.....	BA-101

<b>ASSEMBLY COILS</b>	
Lockout (1).....	C-36-5600
Coil Left & Right (2).....	J-25-500/34-4500
Coil (1).....	N-26-1200
Coil Kicker (1).....	J-26-1100
Coil Eject (1).....	J-28-2300
Coil Bumper (3).....	J-26-1200
Coil Shot (2).....	J-26-1200
Coil Target Reset (1).....	B-27-2300

<b>MODULES</b>	
Driver.....	B-431
Coil Driver (5 Used).....	A-434
Coil Driver/Voltage Regulator.....	B-432
.....	C-433-112
Driver Board.....	A-430
Module.....	B-521

**FIELD PARTS** ..... SEE PLAYFIELD DIAGRAM

**MISCELLANEOUS**  
Transformer  
Transformer  
Bulbs

**ASSEMBLY COILS**  
Coin  
Flippers  
Knock  
Outlets  
Saucer  
Thumper  
Sling  
Drop

**MODULES**  
Lamp  
Display  
Solenoid  
MPU  
Rectifier  
Sound

**PLAYFIELD**