

# TRIDENT

by Stern



**STERN**

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## I. INSTALLATION

### Assemble the game as follows:

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

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

### Visual inspections before plugging in line cord:

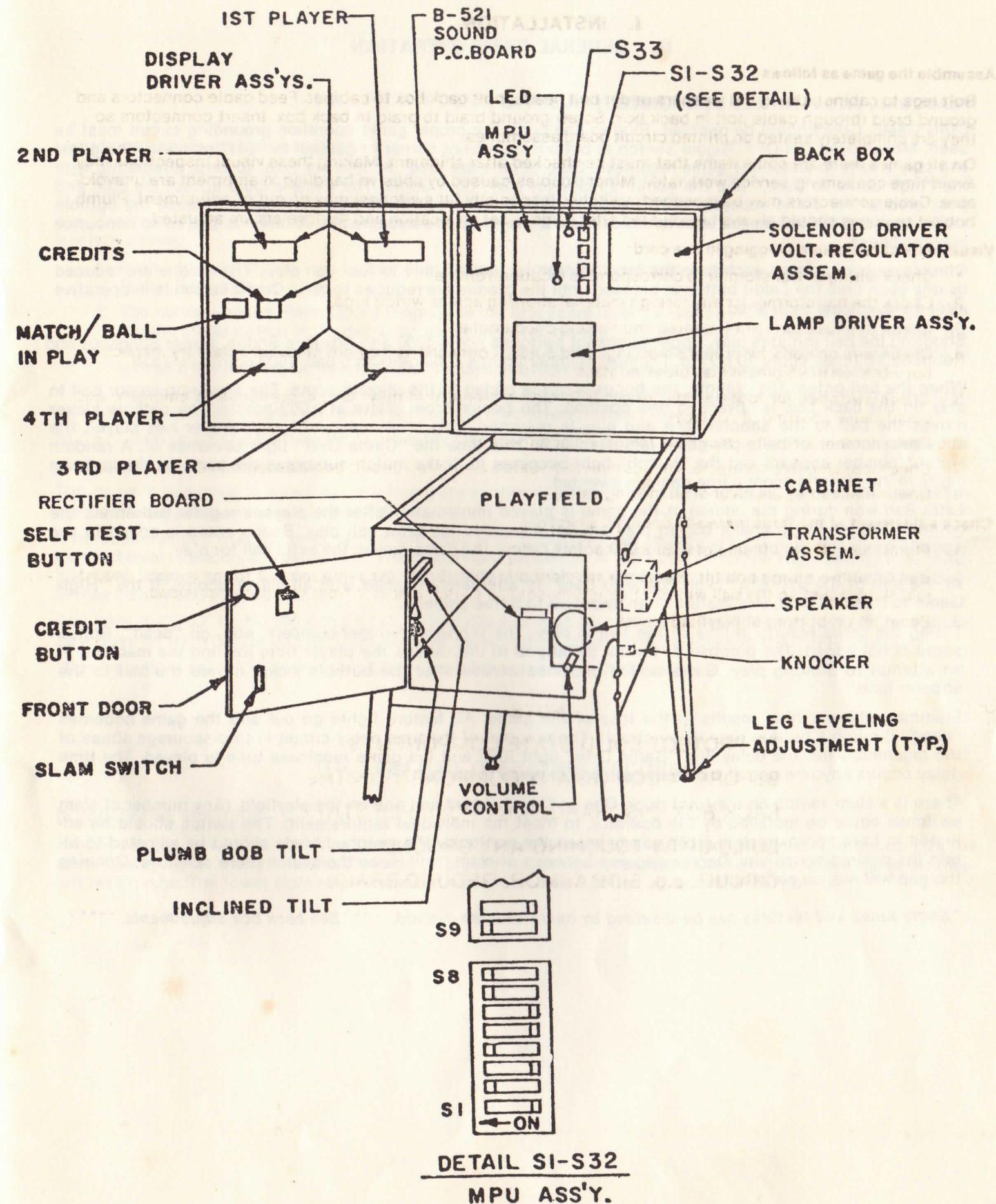
1. Check wiring of transformer to correspond to location voltage.
2. Check the transformer for any foreign material shorting across wiring lugs.
3. Check that fuses are firmly seated and making good contact.
4. Check wire on coils for proper soldering. Cold solder connections may not show up in factory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

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

1. Plumb bob tilt on left side of cabinet near front door.
2. Ball tilt above plumb bob tilt. Insert the smaller ball (gold 15/16" dia.) into 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.



## II. 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. The game will play a tune to announce game-readiness. Drop targets are reset, scores are reset to zero, alternating with the "high Game 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 move the ball to the shooter lane. The 1st player-up lite becomes lit. A tune\* is played to announce play-readiness.

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 player's are registered.

Shooting the ball initiates play, Upper Slingshot switches score 1000 and Advance Bonus. Lower Slingshot and Rebound switches score 10 points. Thumper-Bumper scores 100 points in 5 ball, 1000 points in 3 ball.

When the ball enters the outhole, the bonus score is added to the players score. The player-up and/or ball in play on the back box is advanced one position. The bonus score starts at 2,000 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 (adjustable). 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 is 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 are not advanced for extra ball play. Bonus score is added to the player's score and the bonus is set to 2,000 points before the game moves the extra ball for play.

At the end of the game, a "High Game to Date" is alternately flashed with all player scores. 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, thumper-bumpers, 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 and the game readiness tune is played. 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 and one on the playfield. (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 weighed 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 is so desired. \*\*\* See back box adjustments. \*\*\*\*

## 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 Stationary Targets (upper right) are hit, middle slingshots are made or lower left return lane. The lower right return lane and outlane scores 3 bonus advances (3,000 points).

**DROP TARGET ASSEMBLY:**

Start: 2 targets up — upper 2X lite on, targets down, lites lower 2X lite (for award) and top hole for possible 10,000.

1st time: 3 targets up — upper 3X lite on, targets down lites lower 3X lite (for award) and top hole for possible 20,000.

2nd time: 4 targets up — upper 4X lite on, targets down lites lower 4X lite (for award) and top hole for possible 30,000.

3rd time: 5 targets up — upper 5X lite on, targets down lites lower 5X lite (for award).

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

Each additional time 5 targets up upper special lite on.

All targets down score special (adjustable).

Each time the ball enters the outhole the feature resets to 2 targets.

**TOP EJECT POCKETS:**

Scores 5,000 points, each time the Drop Targets are down the Eject Pocket value increases. Each time the ball enters the outhole the feature resets.

**UPPER LEFT ROLLOVER LANE:**

Scores 100 points and advances lower left return lane

1st time: lites 4,000 lite  
2nd time: lites 6,000 lite  
3rd time: lites 8,000 lite

Each time the ball enters the outhole the feature resets.

**STATIONARY TARGETS:**

Scores 1,000 points and advances bonus.

LIGHTING: White target lites left spinner white lite for additional 400 points  
Green target lites right spinner green lite for additional 400 points  
Amber target lites left spinner amber lite for additional 400 points  
Yellow target lites right spinner yellow lite for additional 400 points  
Purple target lites 1,000 points purple lite alternating between the left and right spinner

Lighting all five targets, lites right return lane for extra ball and upper right special lite. Lighting all five targets second time scores special.

Each time the ball enters the outhole the feature resets.

**SPINNER FEATURE:**

Left Spinner scores 200 points  
Plus 400 points additional after the white stationary target is hit  
400 points additional after the amber stationary target is hit

Right Spinner scores 200 points  
Plus 400 points additional after the green stationary target is hit  
400 points additional after the yellow stationary target is hit

Both spinners score 1,000 points additional after the purple stationary target is hit (the purple lite alternates between both spinners after lighting). Both Spinners reset to 200 points each time the ball enters the outhole.

**THUMPER BUMPERS:**

Thumper Bumpers score 1,000 points on 3 ball and 100 points on 5 ball game.

**SLINGSHOTS:**

Upper Slingshots score 1,000 points and advance bonus (1 advance).

Lower Slingshots score 10 points.

**LEFT RETURN LANE:**

Left return lane scores 2,000 points and a bonus advance. The value is increased to a possible 4,000, 6,000, 8,000 by making the rollover switch in the upper left lane.

This feature resets after the ball enters the outhole.

**RIGHT RETURN LANE & EXTRA BALL FEATURE:**

Scores 3,000 and 3 Bonus Advances and extra ball when all five stationary targets have been spotted.

**RIGHT OUTLANE & SPECIAL:**

Scores 5,000 and 3 Bonus Advances plus Special when lit (Special is lit by advancing drop targets thru 2X, 3X, 4X, 5X) (adjustable).

**COLLECT BONUS:**

When the ball enters the bonus is reset to 1,000.

| RECOMMENDED SETTING |         |         |
|---------------------|---------|---------|
|                     | 3 BALL  | 5 BALL  |
| 1st Level -         | 360,000 | 540,000 |
| 2nd Level -         | 520,000 | 680,000 |
| 3rd Level -         | —       | —       |
| High Score          |         |         |
| To Date             | 700,000 | 800,000 |

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.

| AWARD      | SWITCH 6 |
|------------|----------|
| EXTRA BALL | OFF      |
| REPLAY     | ON       |

2. BALL PER GAME:

| No. of BALLS PER GAME | SWITCH 7 |
|-----------------------|----------|
| 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.

| GAME MELODY        | SWITCH 8 | MELODY       |
|--------------------|----------|--------------|
| 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.

| SWITCH       |     |
|--------------|-----|
| 16           | 15  |
| NOVELTY      | OFF |
| 1 FREE GAME  | OFF |
| 2 FREE GAMES | ON  |
| 3 FREE GAMES | OFF |
|              | 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;

| MAXIMUM CREDITS | 19  | SWITCHES | 18  | 17  |
|-----------------|-----|----------|-----|-----|
| 5 .....         | OFF | OFF      | OFF | OFF |
| 10 .....        | OFF | OFF      | OFF | ON  |
| 15 .....        | OFF | ON       | ON  | OFF |
| 20 .....        | OFF | ON       | ON  | ON  |
| 25 .....        | ON  | OFF      | OFF | OFF |
| 30 .....        | ON  | OFF      | ON  | ON  |
| 35 .....        | ON  | ON       | ON  | OFF |
| 40 .....        | ON  | 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 (by use of the playmore post) 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)

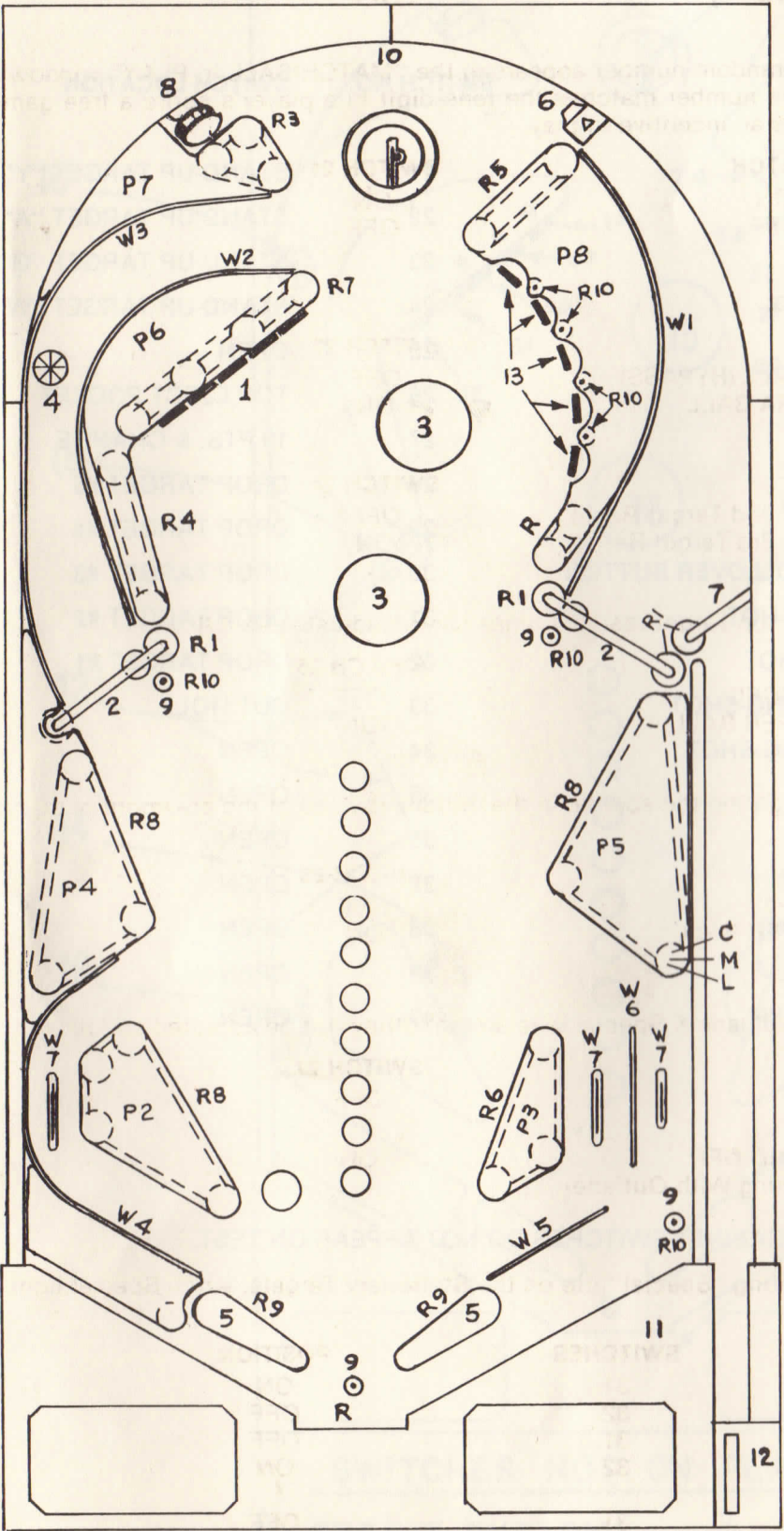
SWITCH 27  
OFF  
ON

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<br>POINTS        | 31       | OFF      |
|                          | 32       | OFF      |
| FREE BALL &<br>FREE GAME | 31       | ON       |
|                          | 32       | ON       |

TRIDENT — Playfield Parts



RUBBER RINGS

- R1-7A-120-031
- R2-7A-120-100
- R3-7A-120-125
- R4-7A-120-150
- R5-7A-120-225
- R6-7A-120-250
- R7-7A-120-300
- R8-7A-120-350
- R9-7A-121
- R10-7A-125

BALL GUIDES & ROLL-OVERS

- W1-B-517
- W2-B-518
- W3-B-519
- W4-B-562
- W5-6A-101-C
- W6-6A-101-F
- W7-A-149

PLASTIC SHIELDS

- TRIDENT SET 13A-110-1 TO- 8  
(P1 TO P8)
- TOP ARCH SET 13C- 28-R & L

MISCELLANEOUS PARTS

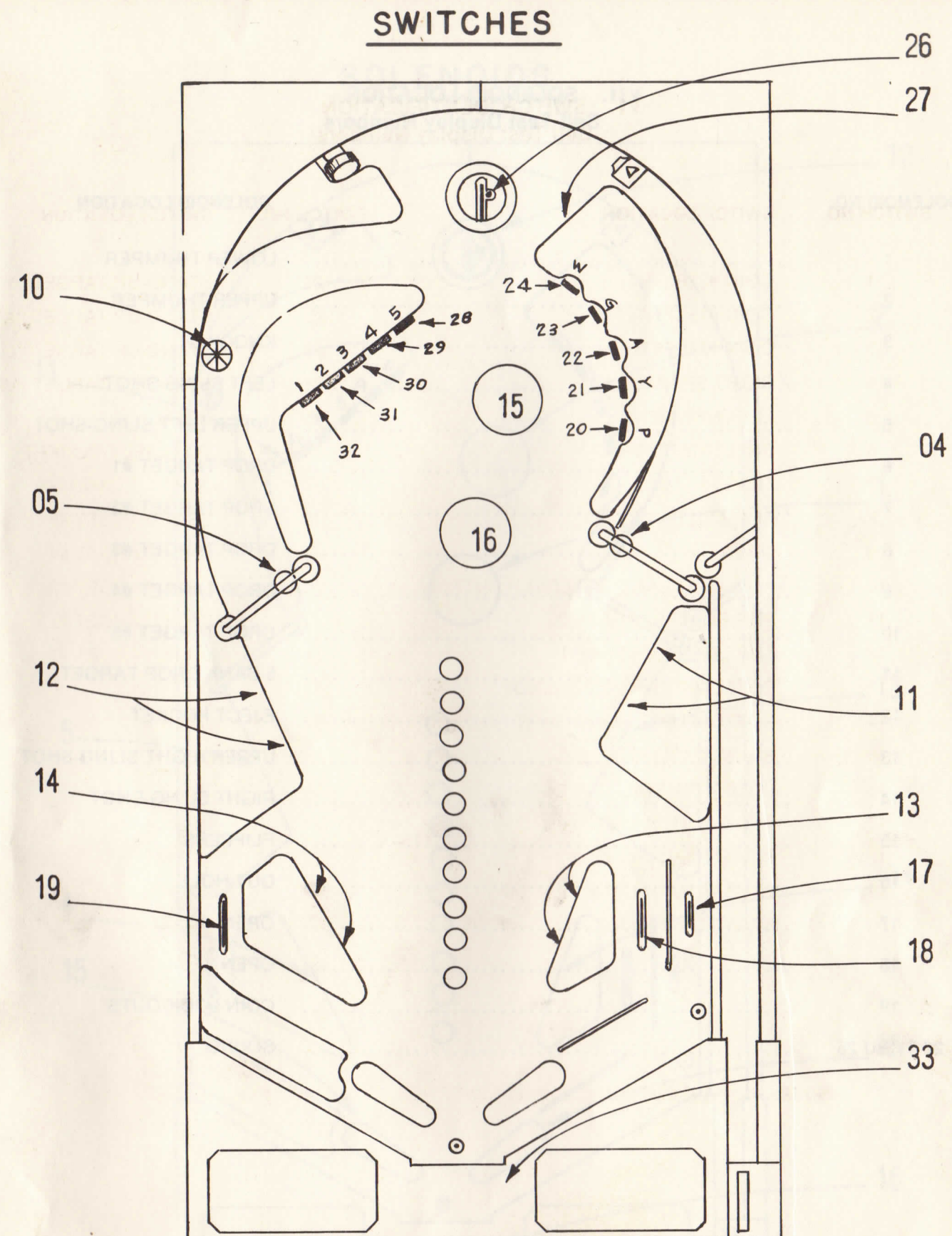
- 1. 5-BANK TARGET D-548-5L-1
- 2. SPIN TARGET A-563-3
- 3. THUMPER CAP 13A-27
- 4. ROLL-OVER BUTTON 4B-275
- 5. FLIPPER & SHAFT A-193
- 6. BALL GATE ASS'Y A-104-R
- 7. ANTI-RETURN GATE A-471
- 8. REBOUND RUBBER A = 105
- 9. BALL GUIDE POST 2A-200
- 10. TOP ARCH RAIL 6B-222
- 11. INSTRUCTION PLATE 14B-1-3
- 12. SHOOTER GAUGE 14A-2-2
- 13. TARGET ASS'Y A-461

Post Adjustment  
C - Conservative  
M - Medium  
L - Liberal

# **VI. SWITCH IDENTIFICATION** Self Test Display Numbers

| SWITCH NO. | SWITCH LOCATION                | SWITCH NO. | SWITCH LOCATION     |
|------------|--------------------------------|------------|---------------------|
| 1          | COIN #3 (RIGHT)                | 21         | STAND-UP TARGET "Y" |
| 2          | COIN #1 (CENTER)               | 22         | STAND-UP TARGET "A" |
| 3          | COIN #2 (LEFT)                 | 23         | STAND-UP TARGET "G" |
| 4          | RIGHT SPINNER                  | 24         | STAND-UP TARGET "W" |
| 5          | LEFT SPINNER                   | 25         | OPEN                |
| 6          | CREDIT BUTTON                  | 26         | TOP EJECT POCKET    |
| 7          | TILTS                          | 27         | 10 PTS. & CHANGE    |
| 8          | SLAM TILT                      | 28         | DROP TARGET #5      |
| 9          | OPEN                           | 29         | DROP TARGET #4      |
| 10         | ADV. LEFT LANE ROLLOVER BUTTON | 30         | DROP TARGET #3      |
| 11         | TOP RIGHT SLING-SHOT           | 31         | DROP TARGET #2      |
| 12         | TOP LEFT SLING-SHOT            | 32         | DROP TARGET #1      |
| 13         | BOTTOM RIGHT SLING-SHOT        | 33         | OUT HOLE            |
| 14         | BOTTOM LEFT SLING-SHOT         | 34         | OPEN                |
| 15         | RIGHT THUMPER                  | 35         | OPEN                |
| 16         | LEFT THUMPER                   | 36         | OPEN                |
| 17         | RIGHT OUTER LANE               | 37         | OPEN                |
| 18         | RIGHT RETURN LANE              | 38         | OPEN                |
| 19         | LEFT RETURN LANE               | 39         | OPEN                |
| 20         | STAND-UP TARGET "P"            | 40         | OPEN                |

**NOTE:** FLIPPER BUTTON CABINET SWITCHES DO NOT APPEAR ON TEST.



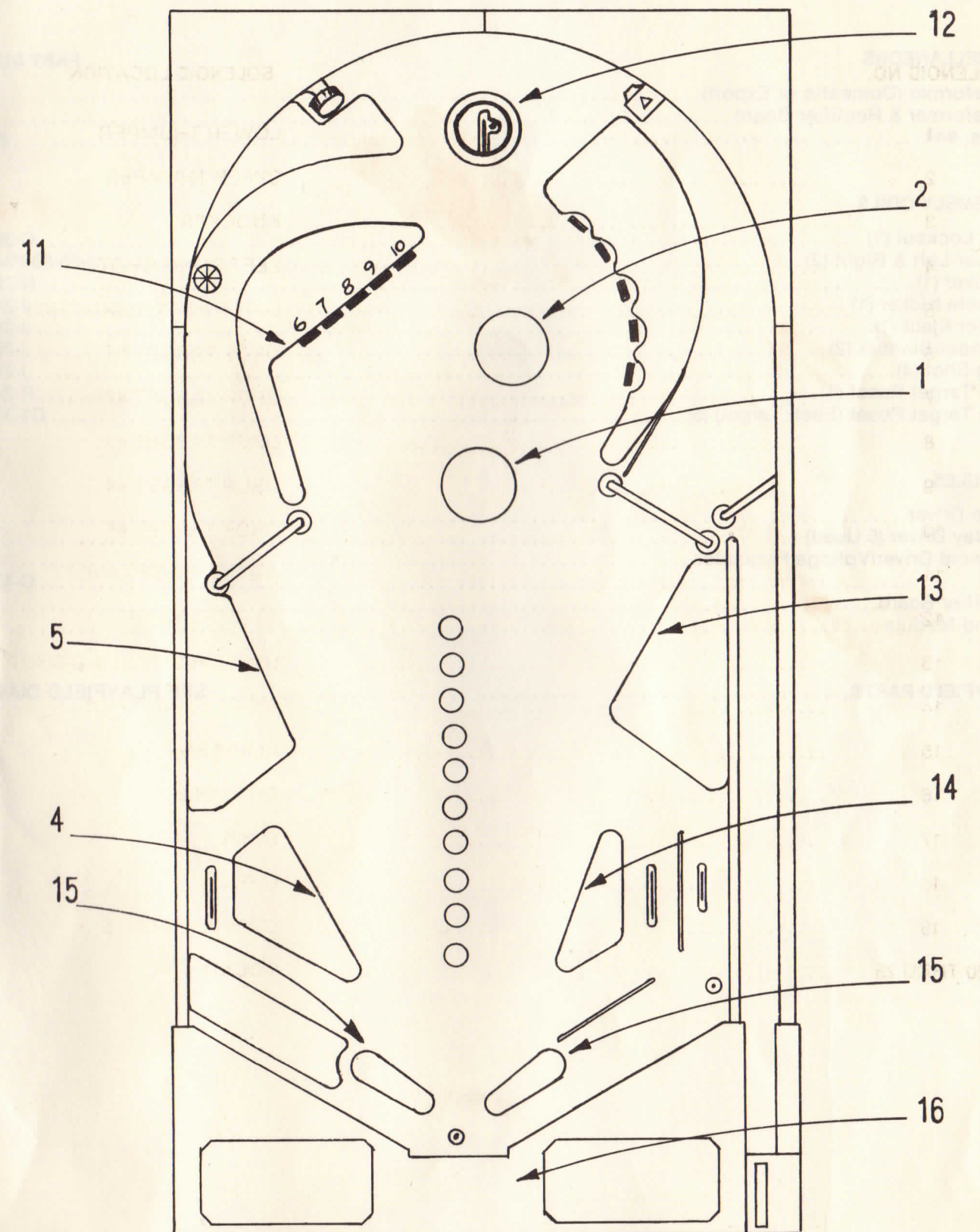
## **SWITCHES NOT ON PLAYFIELD**

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

# VII. SOLENOID LOCATION Self Test Display Numbers

| SOLENOID NO. | SOLENOID LOCATION      |
|--------------|------------------------|
| 1            | LOWER THUMPER          |
| 2            | UPPER THUMPER          |
| 3            | KNOCKER                |
| 4            | LEFT SLING-SHOT        |
| 5            | UPPER LEFT SLING-SHOT  |
| 6            | DROP TARGET #1         |
| 7            | DROP TARGET #2         |
| 8            | DROP TARGET #3         |
| 9            | DROP TARGET #4         |
| 10           | DROP TARGET #5         |
| 11           | 5-BANK DROP TARGET     |
| 12           | EJECT POCKET           |
| 13           | UPPER RIGHT SLING-SHOT |
| 14           | RIGHT SLING-SHOT       |
| 15           | FLIPPERS               |
| 16           | OUT-HOLE               |
| 17           | OPEN                   |
| 18           | OPEN                   |
| 19           | COIN LOCK-OUTS         |
| 20 THRU 25   | SOUND                  |

## SOLENOIDS



SOLENOIDS NOT ON PLAYFIELD:  
3 - KNOCKER      19 - LOCKOUTS

## VIII. PARTS LIST GAME #110 TRIDENT

### MISCELLANEOUS

### PART NUMBER

|                                        |        |
|----------------------------------------|--------|
| Transformer (Domestic or Export) ..... | 16B-3  |
| Transformer & Rectifier Board .....    | C-464  |
| Bulbs, #44 .....                       | 8A-101 |

### ASSEMBLY COILS

|                                           |                  |
|-------------------------------------------|------------------|
| Coin Lockout (1) .....                    | C-36-5600        |
| Flipper Left & Right (2) .....            | J-25-500/34-5050 |
| Knocker (1) .....                         | N-26-1200        |
| Outhole Kicker (1) .....                  | J-26-1100        |
| Saucer Eject (1) .....                    | J-28-2300        |
| Thumper-Bumper (2) .....                  | J-26-1200        |
| Sling-Shot (4) .....                      | J-26-1200        |
| Drop Target Reset (1) .....               | B-24-1600        |
| Drop Target Reset (Each Target) (5) ..... | C1-34-3400       |

### MODULES

|                                         |           |
|-----------------------------------------|-----------|
| Lamp Driver .....                       | B-431     |
| Display Driver (5 Used) .....           | A-434     |
| Solenoid Driver/Voltage Regulator ..... | B-432     |
| MPU .....                               | C-433-110 |
| Rectifier Board .....                   | A-430     |
| Sound Module .....                      | B-521     |

PLAYFIELD PARTS..... SEE PLAYFIELD DIAGRAM