



A.u.S. SPIELGERÄTE GMBH
 SCHEYDGASSE 48, AT 1210 WIEN
 ☎ +43 (0) 1 271 66 00 65 FAX +43 (0) 1 271 66 00 75
 🌐 www.aus.at ✉ verkauf@aus.at

THE BEATLES

SERVICE AND OPERATION MANUAL



WARNING

IMPORTANT HEALTH WARNING: PHOTOSENSITIVE SEIZURES - A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns. Even people with no history of seizures of epilepsy may have an undiagnosed condition that can cause "photosensitive epileptic seizures" due to certain visual images, flashing lights or patterns. Symptoms can include lightheadedness, altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, momentary loss of awareness, and loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

IMMEDIATELY STOP PLAYING AND CONSULT A DOCTOR IF YOU EXPERIENCE ANY OF THESE SYMPTOMS.

ATTENTION! IMPORTANT WARRANTY INFORMATION

The electronics system, node network architecture, mechanical devices and associated software control systems in this pinball machine are designed to work with genuine Stern Pinball accessories and devices.

Installation of non-authorized accessories, lamps, LED's, motors or other devices or modification of electro-mechanical devices may damage the system and will void your warranty.

Stern Pinball machines are assembled in Elk Grove Village, Illinois, USA. Stern Pinball has inspected each game element to ensure it meets our quality standards.

Each pinball machine has unique characteristics that make it a one-of-a-kind American made product. Each will have variations in appearance resulting from differences in the machine's particular wood parts, individual printed art and mechanical assemblies. No playfield is perfectly flat and varies depending on the season. Game play will result in playfield dimpling as the harder steel ball contacts the wood and coating; over time multiple dimples will blend to make them less noticeable. Normal plastic insert crazing (tiny stress cracks) and ghosting (small cloudy areas around insert edges) are often seen in pinball machines, due to a combination of plastic mold stress, pushing of inserts into purposely undersized holes, and heating and breaking of inserts' plastic "skin" when the playfield is sanded.

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Games configured for North America operate on 60 cycle electricity only. These games will not operate in countries with 50 cycle electricity (Europe, UK, Australia).



MANUAL #780-50K8-00

THE BEATLES GOLD #500-55K8-01

THE BEATLES PLATINUM #500-55K7-01

THE BEATLES DIAMOND #500-55K9-01

1-800-KICKERS - parts.service@sternpinball.com
 www.sternpinball.com - facebook.com/sternpinball

TABLE OF CONTENTS

| | |
|--|----------|
| 1. Setup and Moving | 3 |
| 1.1 First-Time Setup Instructions..... | 3 |
| 1.2 Adjustments Menu | 6 |
| 1.3 Transporting the Game | 7 |
| 1.4 Maintenance | 8 |
| 1.5 Maintenance Kits | 8 |
| 1.6 Common Parts..... | 8 |
| 2. SPIKE System and Node Guide | 9 |
| 2.1 SPIKE System Overview | 9 |
| 2.2 Node Bus Cabling | 9 |
| 2.3 System Power | 9 |
| 2.4 SPIKE Node Addresses | 9 |
| 2.5 SPIKE Node Programming..... | 10 |
| 2.6 SPIKE System Terminology | 10 |
| 2.7 Common SPIKE Node Boards..... | 10 |
| 3. Light, Switch, and Driver Reference... 11 | |
| 3.1 SPIKE Node Boards..... | 11 |
| 3.2 Driver Reference | 12 |
| 3.3 Switch Reference | 14 |
| 3.4 Light Reference..... | 18 |
| 3.5 Motor Reference | 22 |
| 4. Electronic Pinouts and Schematics.... 23 | |
| 4.1 SPIKE-2 CPU Node 0 | 23 |
| 4.2 Cabinet Node 1 | 27 |
| 4.3 Lower Playfield 48V Driver Pinout Node 8 | 28 |
| 4.4 Mid Upper Playfield 48V Driver Pinout Node 9 | 29 |
| 4.5 Trough Serial Opto Receiver Extension 8a | 30 |
| 4.6 Trough Serial Opto Transmitter | 30 |
| 4.7 Lower Center LED Board 8b..... | 30 |
| 4.8 Drop Target 2 LED Board 8c | 31 |
| 4.9 Drop Target 1 LED Board 8d..... | 31 |
| 4.10 Main Center LED Board 9a | 32 |
| 4.11 Dual Motor Driver..... | 32 |

| | |
|---|-----------|
| 4.12 Right LED Board | 33 |
| 4.13 Half Curve LED Board - Left | 33 |
| 4.14 Half Curve LED Board - Right..... | 33 |
| 4.15 Main Power Supply..... | 33 |
| 4.16 Power Distribution Board..... | 34 |
| 4.17 Power Plug Wiring..... | 34 |
| 5. Parts Reference..... | 35 |
| 5.1 Playfield Rubber Parts | 35 |
| 5.2 Rubber Size Chart..... | 35 |
| 5.3 Playfield Assemblies, Top | 36 |
| 5.4 Playfield Assemblies, Bottom | 37 |
| 5.5 Backbox Parts..... | 38 |
| 5.6 Speaker Panel Parts | 38 |
| 5.7 Cabinet Parts | 39 |
| 5.8 Ball Shooter Assembly..... | 40 |
| 5.9 Auto Launch Assembly | 40 |
| 5.10 Ball Trough Assembly..... | 41 |
| 5.11 Slingshot Assembly..... | 41 |
| 5.12 Flipper Assembly, Left..... | 42 |
| 5.13 Flipper Assembly, Right | 42 |
| 5.14 Pop Bumper Assembly | 43 |
| 5.15 Right Upper Flipper Assembly w/ Cut Foot | 44 |
| 5.16 Magnetic Spinning Disc Assembly | 44 |
| 5.17 3-Bank Drop Target Assembly | 45 |
| 5.18 4-Bank Drop Target Assembly | 45 |
| 5.19 Left Spinner Assembly | 46 |
| 5.20 Right Spinner Assembly..... | 46 |
| 5.21 Single Opto & Bracket Assembly..... | 47 |
| 5.22 Double Opto & Bracket Assembly | 47 |
| 5.23 Back Panel Assembly | 47 |
| 6. Specifications | 48 |
| 6.1 Game Dimensions..... | 48 |
| 6.2 Warranty..... | 49 |
| 6.3 Warnings, Compliance, and Legal Notices..... | 49 |

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1. SETUP AND MOVING

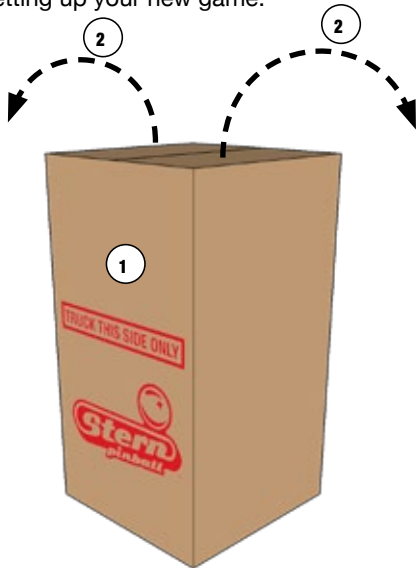
1.1 FIRST-TIME SETUP INSTRUCTIONS

Your brand new Stern Pinball Machine is carefully packed for safety and security. For your safety, exercise caution and use the correct tools and sufficient help when setting up your new game.

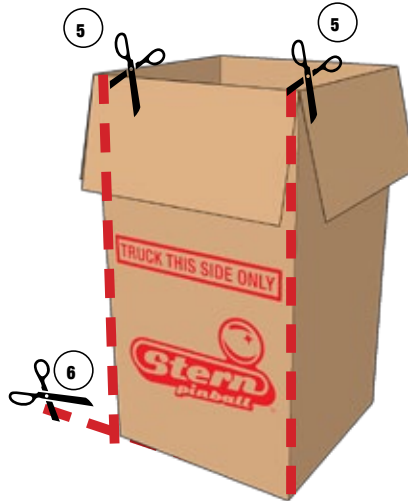
TOOLS REQUIRED

- 5/8" Socket Wrench
- Utility Knife
- Snips
- An Assistant

CAUTION: AT LEAST TWO (2) PEOPLE ARE REQUIRED TO MOVE AND MANEUVER THE GAME. USE PROPER MOVING EQUIPMENT AND EXTREME CARE WHILE HANDLING. STERN PINBALL MACHINES WEIGH OVER 250LBS BOXED.



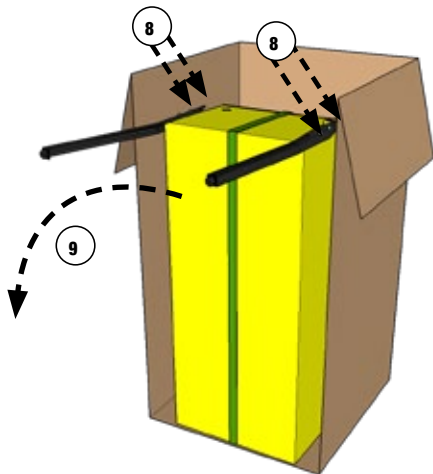
1. Locate the side labeled "TRUCK THIS SIDE ONLY". The bottom of the game faces this side.
2. Open the top box flaps by pulling hard in an upward motion on each flap. If the flaps are taped, cut the tape first, taking care to avoid the box staples.



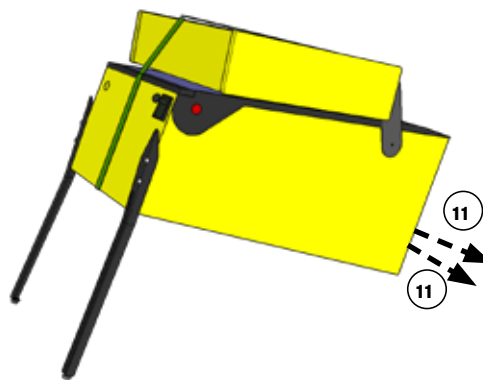
3. Remove the four (4) foam pieces and two (2) narrow box tubes which contain the four (4) identical legs with levelers.
4. DO NOT CUT STRAPPING YET. Keep backbox secured in the down position.
5. With the utility knife, carefully cut down the left and right corners of the box.



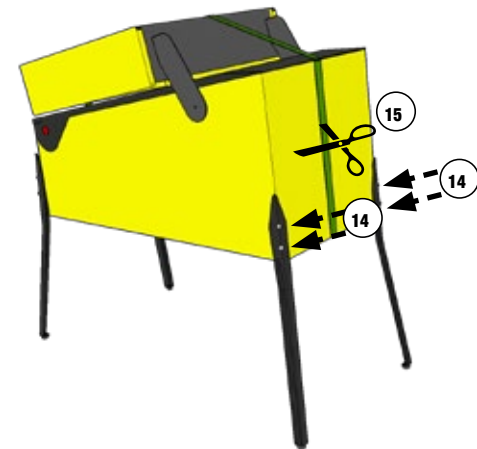
6. Let the face fall forward and remove the entire side by carefully cutting the bottom.
7. With the game still in its folded position, use a 5/8" wrench to loosen and remove the 2 leg bolts on each side of the front cabinet. Ensure the leg levelers are screwed all the way into the legs.



8. Install front legs using the bolts removed from the cabinet. Secure tightly.
9. Have someone help you carefully set the game down on the front legs.



10. Set aside the open box.
11. With a 5/8" socket wrench, loosen and remove the 2 leg bolts on each side of the rear cabinet, 4 total.



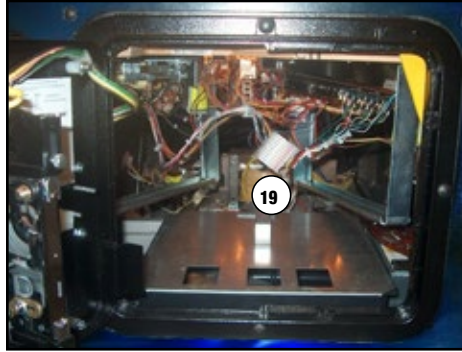
12. Using supports or two people, prop the rear of the cabinet up.
13. Ensure the rear leg levelers are screwed all the way into the legs.
14. Install rear legs using the 4 bolts removed from step 11.



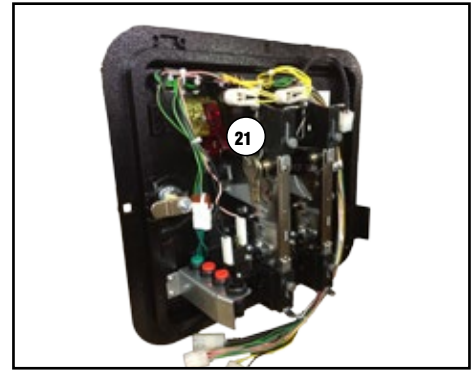
FIRST-TIME SETUP CONTINUED



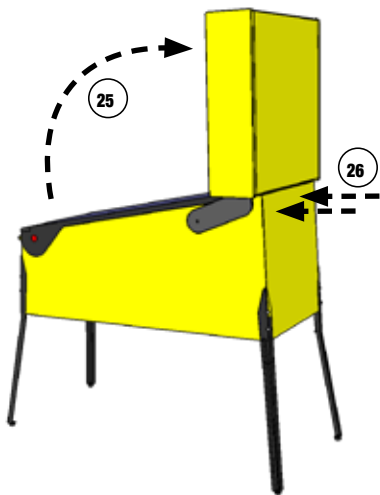
- 15. Cut nylon strapping and remove protective strap corner guards.
- 16. Locate the factory keys, either on the shooter rod or taped to the playfield glass.
- 17. Using snips, cut the tie-wrap securing the keys if required. One set of keys is for the front coin door, the other set of keys is for accessing components in the backbox.



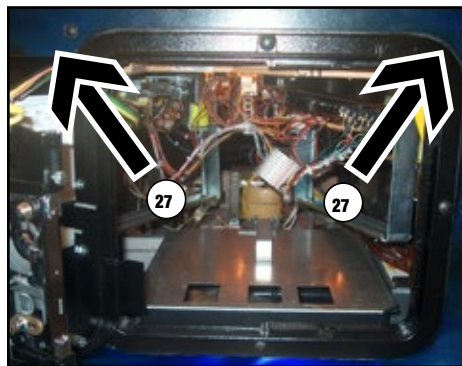
- 18. Open the front coin door.
- 19. Reach into the game and remove the retaining clip at the rear of the cash box.
- 20. Remove the cash box lid by sliding it toward you.



- 21. Store the backbox keys, if desired, on the metal hook located in the coin door.
- 22. Locate and remove the pinballs, plumb bob, and backbox bolts from the cash box.
- 23. Replace the cash box lid and retaining clip for future use.



- 24. Locate the two (2) backbox bolts in the cash box.
- 25. Carefully raise backbox to upright position while ensuring that cables are not pinched.
- 26. Use the 5/8" wrench to install the two (2) backbox bolts to secure the backbox as indicated on the back of the cabinet.



- 27. Reach inside the cabinet and lift the two latches located on either side of the coin door.
- 28. Remove the front top molding.



- 29. Remove the playfield glass by sliding it toward you and carefully place it in a safe location. Remove all playfield shipping tie downs, shipping blocks, and packing foam, and follow any game-specific unpacking instructions included in the playfield, if present.

CAUTION: PLAYFIELD GLASS IS MADE FROM HIGH-STRENGTH TEMPERED GLASS. TEMPERED GLASS IS SENSITIVE TO EXTREME TEMPERATURE SHIFTS AND CORNER NICKS, WHICH CAN CAUSE THE GLASS TO FAIL CATASTROPHICALLY. TAKE CARE TO STORE THE GLASS ON A SOFT, ROOM-TEMPERATURE SURFACE AND PREVENT THE CORNERS FROM BEING DAMAGED.

FIRST-TIME SETUP CONTINUED

30. If pinballs were already installed into the lower ball trough, remove them before lifting the playfield.
31. Grasp the lower arch between the flippers, and firmly but gently pull directly up to raise the playfield 8 to 12 inches.
32. While holding the playfield up, pull the playfield toward you until the two playfield supports are over the front edge of the cabinet.
33. Rest the playfield on the front edge of the cabinet.
34. Raise the playfield and rest it against the backbox.
35. Visually inspect all cabinet cables and connector terminations; ensure no wires or cables are pinched and that cable harnesses are not pulled tight.
36. Locate the plumb bob in the parts bag in the cash box.
37. Slide plumb bob onto the hanger wire. Note: the vertical position of the plumb bob affects tilt sensitivity - higher makes the game more sensitive to tilting.
38. Tighten the thumb screw finger-tight.
39. Install the correct number of pinballs. Refer to the decal on the lock down assembly for the correct number of pinballs.

LOCATING, LEVELING, AND FINAL SETUP

1. Select a location that is indoors, out of direct sunlight, and climate controlled. Excessive moisture/humidity can cause long-term damage to your game.
2. Adjust the front or rear levelers as necessary to position the playfield level bubble, located on the front right of the playfield next to the shooter lane, to float between the two (2) black lines. This will place the playfield at the recommended 6.5° pitch. Playfield angles greater than 6.5° can be achieved by turning out the rear leg leveler(s) for increased difficulty and faster gameplay.
3. Use a pinball to roll down the center of the playfield for side-to-side leveling, or use an external bubble level, digital level, or smartphone level app.
4. Plug into a grounded outlet and check for proper operation through DIAGNOSTICS.
5. Check the coin door: With the door closed, insert coins to verify proper operation.
6. Play game: Check for satisfactory operation and adjust game volume (push the Red Buttons inside the Coin Door).
7. If desired, perform any game diagnostics, game adjustments, and pricing settings at this time.



SPIKE PINBALL SOFTWARE UPDATE INSTRUCTIONS

1. Obtain game software update file (filename ends in “.spk”) from www.sternpinball.com or from authorized Stern distributor.
2. Place game software update file (“.spk”) in root directory of a blank FAT32-formatted USB flash drive
3. Use backbox power switch to turn off game
4. Plug in USB flash drive to CPU board USB connector (CN20 or CN21). Refer to www.sternpinball.com
5. Turn on game
6. The game will automatically begin software update
7. Select the correct .spk update file from list.
8. Press Enter on the service switches to start update
9. When the display indicates “Update Complete”, turn off game
10. Remove USB flash drive from CPU board
11. Turn game on to complete the update and play pinball!
12. Detailed instructions and troubleshooting tips are available in the game manual, www.sternpinball.com and authorized Stern distributors.



1.2 ADJUSTMENTS MENU

STANDARD ADJUSTMENTS

Perform the below steps to review the adjustments.

Enter the Service Menu, then enter the Standard Adjustments Menu.

Press SELECT. Press BACK to exit or escape at any time.

Press [>]. Go to the ADJ icon. Press SELECT.

Go to the S.P.I. icon. Press SELECT.

| ID | Adjustment Name | Default Setting |
|----|-----------------------|-----------------|
| 1 | REPLAY TYPE | AUTO |
| 2 | REPLAY PERCENTAGE | 10% |
| 3 | REPLAY AWARD | CREDIT |
| 4 | REPLAY LEVELS | 1 |
| 5 | AUTO REPLAY START | 20,000,000 |
| 6 | DYNAMIC REPLAY START | 60,000,000 |
| 7 | REPLAY LEVEL #1 | 15,000,000 |
| 8 | REPLAY LEVEL #2 | 30,000,000 |
| 9 | REPLAY LEVEL #3 | 45,000,000 |
| 10 | REPLAY LEVEL #4 | 60,000,000 |
| 11 | REPLAY BOOST | YES |
| 12 | SPECIAL LIMIT | 1 |
| 13 | SPECIAL PERCENTAGE | 10% |
| 14 | SPECIAL AWARD | CREDIT |
| 15 | FREE GAME LIMIT | 5 |
| 16 | EXTRA BALL LIMIT | 5 |
| 17 | EXTRA BALL PERCENTAGE | 25% |
| 18 | GAME PRICING | USA 11 |
| 19 | MATCH PERCENTAGE | 9% |
| 20 | MATCH AWARD | CREDIT |
| 21 | BALLS PER GAME | 3 |
| 22 | TILT WARNINGS | 2 |
| 23 | TILT DEBOUNCE | 1000 |
| 24 | CREDIT LIMIT | 30 |
| 25 | ALLOW HIGH SCORES | YES |
| 26 | HIGH SCORE AWARD | CREDIT |
| 27 | GRAND CHAMPION AWARDS | 1 |
| 28 | HIGH SCORE #1 AWARDS | 1 |
| 29 | HIGH SCORE #2 AWARDS | 0 |
| 30 | HIGH SCORE #3 AWARDS | 0 |
| 31 | HIGH SCORE #4 AWARDS | 0 |
| 32 | GRAND CHAMPION SCORE | 75,000,000 |
| 33 | HIGH SCORE #1 | 55,000,000 |
| 34 | HIGH SCORE #2 | 40,000,000 |
| 35 | HIGH SCORE #3 | 30,000,000 |
| 36 | HIGH SCORE #4 | 25,000,000 |
| 37 | HSTD INITIALS | 3 INITIALS |

FEATURE ADJUSTMENTS

Each table has feature adjustments specific to the characteristics of that game. To access feature adjustments enter the Service Menu and then enter the Adjustments Menu.

Press SELECT to access the Service Menu. Press BACK to exit or escape at any time.

Press [>]. Go to the ADJ icon. Press SELECT.

STANDARD ADJUSTMENT #1 appears with the adjustment name flashing. While the adjustment name is flashing press [<] [>] to move between adjustments.

To change the adjustment setting press SELECT. While the adjustment setting is flashing, press [<] [>] repeatedly until the desired setting appears. Press the SELECT button to “install” the change. The adjustment comment (bottom line) will indicate if the factory default setting is selected or will display INSTALLED if the change is not a factory default setting.

| ID | Adjustment Name | Default Setting |
|----|---------------------------------------|-----------------------|
| 38 | HSTD RESET COUNT | 2000 |
| 39 | FREE PLAY | NO |
| 40 | LANGUAGE | ENGLISH |
| 41 | PLAYER LANGUAGE SELECT | YES |
| 42 | CUSTOM MESSAGE | ON |
| 43 | KNOCKER VOLUME | NORMAL |
| 44 | GAME START | NO |
| 45 | GAME RESTART | YES |
| 46 | BALL SAVE TIME | 0:05 |
| 47 | TIMED PLUNGER | OFF |
| 48 | FLIPPER BALL LAUNCH | OFF |
| 49 | COINDOOR BALL SAVER | OFF |
| 50 | COMPETITION MODE | NO |
| 51 | FAST BOOT | YES |
| 52 | Q24 OPTION | COIN METER |
| 53 | TICKET DISPENSER | NO |
| 54 | PLAYER COMPETITION MODE | YES |
| 55 | LOCATION ID | 0 |
| 56 | GAME ID | 0 |
| 57 | TIME FORMAT | 12-HOUR |
| 58 | COIN INPUT DELAY | 30 |
| 59 | LOST BALL RECOVERY | YES |
| 60 | COINDOOR DISABLE TILT | NO |
| 61 | COINDOOR OPEN NODE BUS POWER | NO |
| 62 | PLAY ATTRACT TUTORIAL VIDEOS | YES |
| 63 | EXTERNAL VOLUME KNOB FUNCTION | HEADPHONE VOLUME ONLY |
| 64 | MUTE CABINET WHEN HEADPHONES DETECTED | YES |
| 65 | GI LED BRIGHTNESS | 100% |
| 66 | GI LED MAX BRIGHTNESS | 255 |
| 67 | INSERT LED BRIGHTNESS | 100% % |
| 68 | INSTER LED MAX BRIGHTNESS | 255% |
| 69 | FLASHER LED BRIGHTNESS | 100% |
| 70 | FLASHER LED MAX BRIGHTNESS | 255 |
| 71 | ATTRACT MODE BACKBOX BRIGHTNESS | 100% |
| 72 | GAMEPLAY BACKBOX BRIGHTNESS | 100% |
| 73 | COINDOOR OPEN BACKBOX BRIGHTNESS | 2% |

Go to the game icon. Press SELECT.

FEATURE ADJUSTMENT #1 appears with the adjustment name flashing. With the adjustment name flashing press [<] [>] to move between adjustments. Feature adjustments are changed similarly to standard adjustments using the SELECT button to choose options and the [<] [>] buttons to cycle through available settings.

1.3 TRANSPORTING THE GAME

When transporting the game, such as in the back of a truck or with a hand truck, the game's backbox must be secured to prevent damage to the side rails.

1. SECURE THE BACKBOX

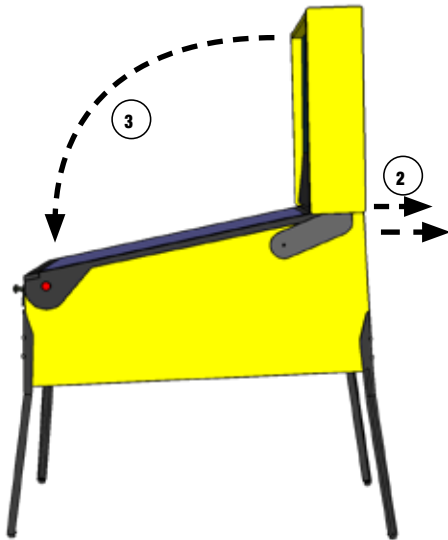
1. Ensure that the pinballs are removed from the playfield, and secure any free-moving mechanisms that may get damaged in transport

TOOLS REQUIRED ⓘ

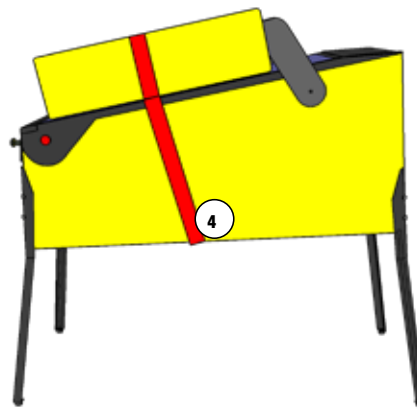
- STRAP (500LB OR GREATER)
- AN ASSISTANT
- HAND TRUCK

CAUTION ⚠

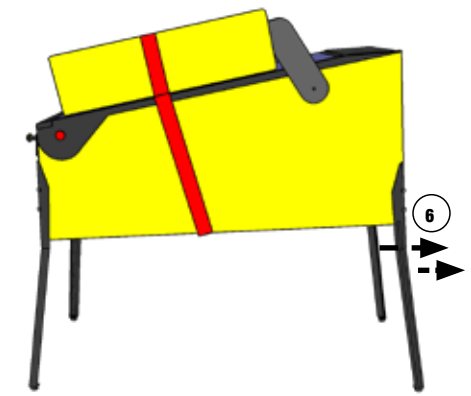
NEVER TRANSPORT THE GAME IN A MOVING VEHICLE WITH THE BACKBOX RAISED! TWO PEOPLE ARE REQUIRED TO REMOVE THE LEGS!



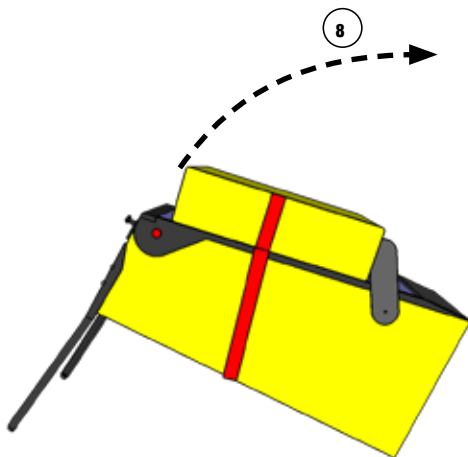
2. Remove the backbox securing bolts
3. Carefully lower the backbox onto the side rails. Use a piece of cardboard or suitable padding between the backbox and the game.



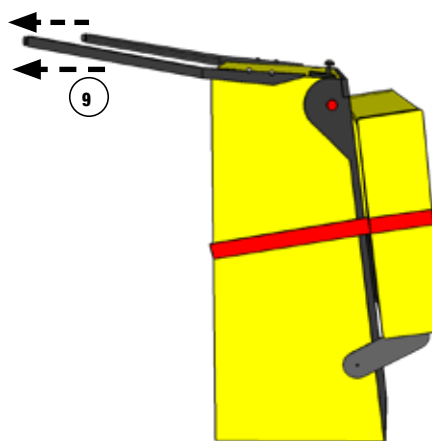
4. Securely strap the back box to the game
5. The game may be transported with the legs on. If the legs must be removed, follow the remaining steps.



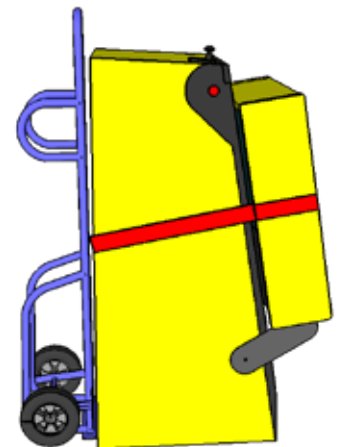
6. Remove the legs, rear legs first. Use a stool or a friend to support the rear of the game.
7. Rest the rear of the game on the ground.



8. Stand the game up on its back.



9. Remove the front two legs.



10. Secure all loose parts and transport with a hand truck in the upright position.



1.4 MAINTENANCE

REGULAR MAINTENANCE - (MONTHLY/500 GAMES)

- Remove the playfield glass
- Enter the software diagnostics menu, start lamp test, then clean and wax the playfield.
- While cleaning the playfield, identify and repair malfunctioning lights, loose parts, cracked plastics and worn rubber parts.
- While in diagnostics, enter the switch test (Select the "SW" icon, then "TEST" icon).
- Use a pinball to actuate all switches and verify the correct switch registers with the switch test.
- The game will play a sound to confirm the switch.
- Lift the playfield and inspect all assemblies for loose parts, broken wires or excessive wear. Look at the bottom of the cabinet for any parts that may have worked loose, then find the source.
- Check all coin door mechanisms and bill acceptor (if installed) for proper operation
- Play the game to ensure all coils and features are working
- Check the playfield to ensure it is level and set to the proper pitch using the bubble level on the right side wood rail.
- Check game audits: Replay % and Ball Time and note abnormal values which can indicate problems.
- Ensure game volume is set appropriately for the location.
- Clean both sides of the playfield glass and reinstall.
- Check and clean pinballs and replace if excessively worn or scuffed. Dirty pinballs accelerate game wear.

OVERHAUL MAINTENANCE - (5000 GAMES)

- Verify latest game software is installed
- Check flippers for excessive wear. Excessive flipper sloppiness (vertical or horizontal) or weakness indicates a flipper rebuild is required.
- Clean machine inside and out and check leg levelers for free operation.
- Visual check for loose or broken playfield and cabinet parts and repair as necessary.
- Electrical check: Plug into grounded outlet and check for proper operation through DIAGNOSTICS.
- Replace worn or dirty rubbers.
- Replace pinballs.
- Check all playfield switches with a pinball.
- Check all settings (refer to manual for factory settings).
- Check coin door: With door closed, insert coins to verify proper operation.
- Check for proper adjustment of the plumb bob tilt.
- Play game: Check for satisfactory operation.

COMMON PINBALL TOOLS

- Common nut drivers (1/4", 5/16", 11/32", 3/8")
- Phillips screwdriver
- Standard Allen wrench/Hex key set
- 5/8" Socket with ratchet
- Adjustable wrench (5/8" & 9/16")
- 6" Torpedo Level (or use a pinball)
- Flashlight or headlamp
- Soldering Iron (60w with flat tip), lead-free solder
- Wire cutter
- Wire stripper
- Long nose ("needle nose") pliers

1.5 MAINTENANCE KITS

| Description | Part Number |
|--|---|
| The Beatles Maintenance Kit 8 oz pinball playfield wax (Novus # 2) (675-0003-01) Standard Pinball (260-5000-00) Cleaning Cloth All Playfield Rubber Rings Spare Fuses | 502-6002-K8 |
| The Beatles Deluxe Maintenance Kit All standard kit items, plus: Flipper rebuild kits, Left and Right (500-6307-10,-00) | 502-6003-K8 |
| The Beatles Playfield Plastics Kit | 803-5000-K8 |
| The Beatles Playfield Decals Kit | 802-5000-K8 [All] |
| The Beatles Backbox Decal Left | 820-78K8-01 [Gold] 820-78K7-01 [Platinum] 820-78K9-01 [Diamond] |
| The Beatles Backbox Decal Right | 820-78K8-02 [Gold] 820-78K7-02 [Platinum] 820-78K9-02 [Diamond] |
| The Beatles Cabinet Decal Left | 820-78K8-03 [Gold] 820-78K7-03 [Platinum] 820-78K9-03 [Diamond] |
| The Beatles Cabinet Decal Right | 820-78K8-04 [Gold] 820-78K7-04 [Platinum] 820-78K9-04 [Diamond] |
| The Beatles Cabinet Decal Front | 820-78K8-05 [Gold] 820-78K7-05 [Platinum] 820-78K9-05 [Diamond] |
| The Beatles Playfield, Bare | 830-5100-K8 |
| The Beatles Gold Translite | 830-8427-K8 |
| The Beatles Platinum Translite | 830-8427-K7 |
| The Beatles Diamond Mirror Backglass | 830-8426-K9 |

1.6 COMMON PARTS

| Description | Part Number |
|--|-------------|
| 8 oz Pinball Playfield wax (Novus # 2) | 675-0003-01 |
| Standard Pinball, 1-1/16 in | 260-5000-00 |
| Flipper Rebuild Kit Left (Standard) | 500-6307-10 |
| Flipper Base Plate Kit Left | 515-6617-01 |
| Flipper Rebuild Kit Right | 500-6307-00 |
| Flipper Base Plate Kit Right | 515-6617-00 |

2. SPIKE SYSTEM AND NODE GUIDE

2.1 SPIKE SYSTEM OVERVIEW

The SPIKE Pinball system is a rugged, distributed, and embedded platform custom-designed for the rigors of the pinball machine environment. SPIKE takes advantage of modern technologies to deliver an immersive pinball experience that supports modern features, reduces cabling, and increases serviceability and reliability.

A Stern Pinball machine based on the SPIKE system will have at least two nodes networked together with the SPIKE node bus, a custom industrial pinball control bus that is designed around industry standards and optimized for the pinball environment. The primary CPU node is networked to one or more input/output nodes over standard Category 5 UTP (unshielded twisted pair) ethernet cabling.

There are five primary types of nodes that are found in the game.

- CPU node (Node 0) - The primary node that controls other nodes in the system. Contains the primary game software for the system and provides SPIKE node bus power for other nodes.
- Cabinet 48V node (Node 1) - Specialized node with specific inputs and outputs for coin doors, tilt mechanisms, and other bottom-cabinet devices.
- 48V playfield node - Controls high power devices such as coils and flashers, and also supports a few switch and low-power outputs. Powered by the system 48V power supply.
- Light and switch node - High-density switch and low-power LED outputs, bus-powered from the node bus. These boards contain as many as 32 switch inputs and light outputs.
- Node extensions - These sub-nodes add additional low-power input and outputs to a specific Power or I/O node and are connected with simple serial bus.

2.2 NODE BUS CABLING

The SPIKE node bus utilizes standard Ethernet-style RJ45 8-pin modular jacks, and off-the-shelf Category 5e or better ethernet cabling. The node bus is electrically different from Ethernet and does not utilize Ethernet or TCP/IP protocols or signaling standards. SPIKE nodes are not compatible with standard computer networking equipment.

CAUTION: Plugging a SPIKE Node or CPU board into a standard Ethernet port may damage one or both devices and void your warranty.

2.3 SYSTEM POWER

The SPIKE System is powered from an 48V DC power supply bus. Each SPIKE node converts this voltage to lower voltages required by the node and its specific components. A SPIKE 48V node typically controls high-power outputs such as game coil mechanisms and high-brightness LEDs. These powered nodes are supplied directly with 48V system power. SPIKE standard I/O nodes are low-power nodes that read switch inputs and output to standard-brightness LEDs. Standard I/O nodes use the node bus power, which is supplied by the main CPU node over the node bus modular jack connectors.

2.4 SPIKE NODE ADDRESSES

Each SPIKE node has a unique address ranging from 0 to 15. Not all addresses are used in all games. Nodes can be of the same part number, so the address is specified on the DIP switches on each node. When replacing a node, be certain that the correct address is set. Nodes can have 3-position and 4-position DIP switches. Refer to the appropriate table to set the address for each type of Node. The correct address for a node can be found in the SPIKE node reference section of the manual or in the game diagnostic software. Address 0 is reserved for the backbox CPU node, where the game software resides. Address 1 is reserved for the cabinet node, located inside the coin door. These two nodes do not have DIP switches as their address is not configurable.

| Address | 1 | 2 | 3 |
|---------|-----|-----|-----|
| 8 | OFF | OFF | OFF |
| 9 | OFF | OFF | ON |
| 10 | OFF | ON | OFF |
| 11 | OFF | ON | ON |
| 12 | ON | OFF | OFF |
| 13 | ON | OFF | ON |
| 14 | ON | ON | OFF |
| 15 | ON | ON | ON |

SPIKE node addresses for nodes with 3-position DIP switches. Addresses 0-7 are not used by SPIKE nodes with 3-position DIP switches.

| Address | 1 | 2 | 3 | 4 |
|---------|-----|-----|-----|-----|
| 8 | OFF | OFF | OFF | OFF |
| 9 | OFF | OFF | ON | OFF |
| 10 | OFF | ON | OFF | OFF |
| 11 | OFF | ON | ON | OFF |
| 12 | ON | OFF | OFF | OFF |
| 13 | ON | OFF | ON | OFF |
| 14 | ON | ON | OFF | OFF |
| 15 | ON | ON | ON | OFF |

SPIKE node addresses for nodes with 4-position DIP switches. Addresses 0-7 are reserved for fixed-function nodes and do not require configuration.

SPIKE SYSTEM AND NODE GUIDE CONTINUED

2.5 SPIKE NODE PROGRAMMING

The SPIKE nodes are smart nodes that have on-board processors and run embedded code. The nodes are programmed automatically by the CPU node whenever software updates are installed to the CPU. When replacing a node, the CPU node will detect and update the node to the latest software with no user intervention. Always replace nodes with the power to the game turned OFF.

2.6 SPIKE SYSTEM TERMINOLOGY

MULTI GENERAL ILLUMINATION LIGHTING

General Illumination Lighting is two or more lights powered by one control source. These are often a number of LEDs connected in parallel and the system controls these as one large LED. A missing LED will not affect these circuits, however a shorted LED can cause the entire string of LEDs to turn off.

SINGLE LIGHTS

Single lights and LEDs are direct-controlled from SPIKE node boards. A common power source is grounded by individual transistors to turn individual LEDs on and off. Groups of LEDs, usually by node connector, share a common power source, so if a group of LEDs is out, check the wiring for the power source.

FLASHERS

SPIKE games treat flashers the same as single LEDs that draw more power. Flashers are controlled from the same circuits that power regular lights.

DRIVERS

A driver is a circuit that controls a high power-device such as a coil, magnet, or motor. Each device has a common 48V power source that is then connected to ground by a dedicated control transistor. Each driver is protected against shorting, static electricity, and over-current conditions. Take caution as 48V is always present on a device even when it is not energized.

OPTOS

Certain types of optical switches (“optos”) require external signal conditioning. For these optos, they will interface to a SPIKE node via an opto signal conditioning board. Other optical switches connect directly to the Spike node board.

System Protections

CAUTION: Unless explicitly directed by an Authorized Stern Repair technician, perform ALL work on your pinball machine with the power disabled!

INPUT/OUTPUT PROTECTIONS

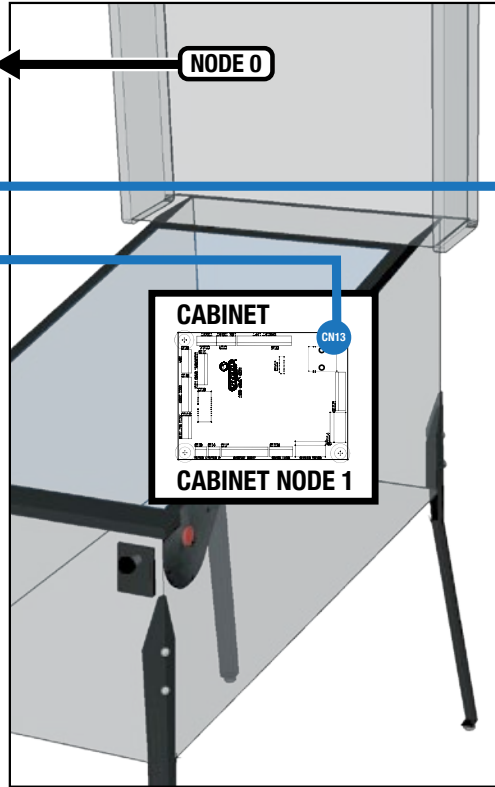
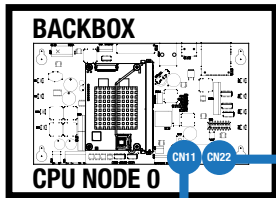
SPIKE features built-in short-circuit, static electricity, and other protections to maximize reliability. If an LED, coil or other device shorts, it will be disabled but will not shut down the entire system in most circumstances. Groups of LEDs, coils, and switches often share common power supplies or other circuits, so it is possible that a bad device will affect the group of related devices and require removal or repair to fix the group. The system diagnostics will inform the technician of shorted or otherwise malfunctioning devices whenever possible. While the system is protected against permanent damage, it is strongly recommended to repair or replace these bad components as soon as possible to minimize downtime and maximize game earnings.

2.7 COMMON SPIKE NODE BOARDS

| Description | Type | Part Number |
|---------------------------------------|-----------|-------------|
| SPIKE CPU Node | Node | 509-1003-01 |
| Cabinet Node | Node | 520-6967-72 |
| Playfield 48V Core-Driver Node | Node | 520-7017-72 |
| Trough Serial Opto Receiver Extension | Extension | 520-7001-00 |

3. LIGHT, SWITCH, AND DRIVER REFERENCE

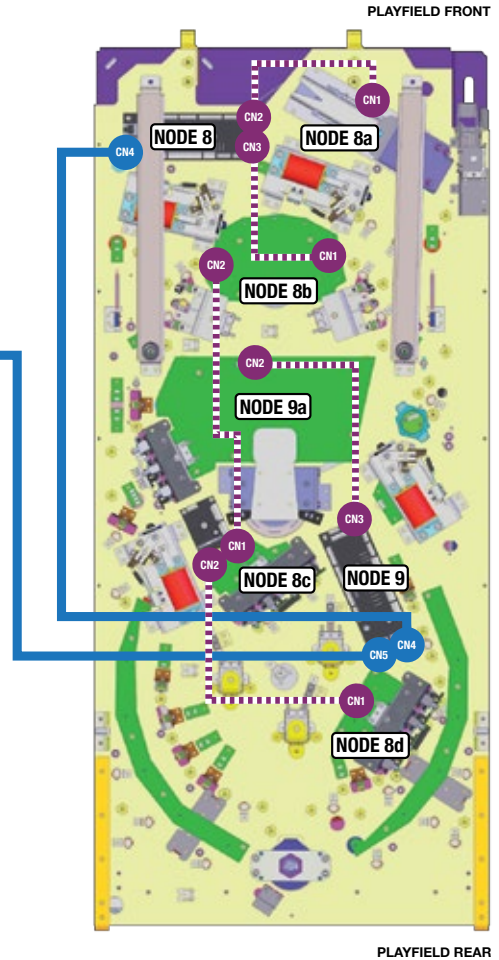
THE BEATLES



Node Bus Cable (RJ45)
604-5004-08-XX

Serial Data Cable
036-8054-XX

When replacing node boards, ensure DIP address switches are set correctly!



3.1 SPIKE NODE BOARDS

| ID | DIP Address | Description | Location | Part Number |
|--------|-----------------|---------------------------------------|-----------------|-------------|
| Node 0 | n/a | SPIKE 2 CPU Node | Backbox | 509-1003-01 |
| Node 1 | n/a | Cabinet Node | Cabinet | 520-6967-72 |
| Node 8 | OFF-OFF-OFF-OFF | Playfield 48V Core-Driver Node | Lower Playfield | 520-7017-72 |
| 8a | n/a | Trough Serial Opto Receiver Extension | Playfield | 520-7001-00 |
| 8b | n/a | Lower Center LED Board | Playfield | 520-8067-00 |
| 8c | n/a | Drop Target 2 LED Board | Playfield | 520-8064-00 |
| 8d | n/a | Drop Target 1 LED Board | Playfield | 520-8063-00 |
| Node 9 | OFF-OFF-ON-OFF | Playfield 48V Core-Driver Node | Playfield | 520-7017-72 |
| 9a | n/a | Main Center LED Board | Playfield | 520-8066-00 |



3.2 DRIVER REFERENCE

| ID | Name | Node | Connector | Ret. Pin | Ret. Wire | Voltage | V+ Pin | V+ Color | Location | Type | Address | Part Number |
|----|--------------------|------|-----------|----------|-----------|---------|--------|----------|-----------|----------------|---------|-------------|
| 1 | Trough | 8 | CN8 | 7 | ORG GRY | 48V | 1-4 | GRY ORG | Playfield | Coil - 27-1500 | 8-DR-1 | 090-5004-ND |
| 2 | Auto Plunger | 8 | CN8 | 9 | ORG WHT | 48V | 1-4 | GRY ORG | Playfield | Coil - 26-1200 | 8-DR-4 | 090-5044-ND |
| 3 | Left Flipper | 8 | CN8 | 6 | ORG YEL | 48V | 1-4 | GRY ORG | Playfield | Coil - 23-1500 | 8-DR-5 | 090-5062-ND |
| 4 | Right Flipper | 8 | CN8 | 5 | ORG GRN | 48V | 1-4 | GRY ORG | Playfield | Coil - 23-1500 | 8-DR-0 | 090-5062-ND |
| 5 | Left Slingshot | 8 | CN8 | 11 | ORG BLU | 48V | 1-4 | GRY ORG | Playfield | Coil - 26-1200 | 8-DR-3 | 090-5044-ND |
| 6 | Right Slingshot | 8 | CN8 | 10 | ORG VIO | 48V | 1-4 | GRY ORG | Playfield | Coil - 26-1200 | 8-DR-2 | 090-5044-ND |
| 7 | Shaker Motor | 1 | CN16 | 1 | BLU | 48V | 5 | RED | Cabinet | Motor | 1-DR-0 | 041-5029-04 |
| 8 | Up Left Flipper | 8 | CN7 | 3 | YEL BLK | 48V | 1 | GRY ORG | Playfield | Coil - 25-1400 | 8-DR-6 | 090-5067-ND |
| 9 | Up Right Flipper | 8 | CN7 | 4 | YEL BRN | 48V | 1 | GRY ORG | Playfield | Coil - 25-1400 | 8-DR-7 | 090-5067-ND |
| 10 | Left 3 Bank Drop | 8 | CN7 | 2 | YEL RED | 48V | 1 | GRY ORG | Playfield | Coil - 25-1240 | 8-DR-8 | 090-5034-ND |
| 11 | Left Pop Bumper | 9 | CN8 | 10 | ORG BLK | 48V | 1-4 | GRY BRN | Playfield | Coil - 26-1200 | 9-DR-2 | 090-5044-ND |
| 12 | Right Pop Bumper | 9 | CN8 | 11 | ORG BRN | 48V | 1-4 | GRY BRN | Playfield | Coil - 26-1200 | 9-DR-3 | 090-5044-ND |
| 13 | Magnet-Record | 9 | CN8 | 5 | BRN RED | 48V | 1-4 | GRY BRN | Playfield | Coil - 22-650 | 9-DR-0 | 511-5065-ND |
| 14 | Center 4 Bank Drop | 9 | CN8 | 6 | BLU BRN | 48V | 1-4 | GRY BRN | Playfield | Coil - 25-1240 | 9-DR-5 | 090-5034-ND |
| 15 | Magnet-Top | 9 | CN7 | 3 | BRN BLK | 48V | 1 | GRY BRN | Playfield | Coil - 22-650 | 9-DR-6 | 511-5065-ND |
| 16 | | | | | | | | | | | | |
| 17 | Right 4 Bank Drop | 9 | CN8 | 7 | BLU RED | 48V | 1-4 | GRY BRN | Playfield | Coil - 25-1240 | 9-DR-1 | 090-5034-ND |
| 18 | | | | | | | | | | | | |
| 19 | Top Pop Bumper | 9 | CN8 | 9 | ORG RED | 48V | 1-4 | GRY BRN | Playfield | Coil - 26-1200 | 9-DR-4 | 090-5044-ND |
| 20 | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | Coin Meter | 1 | CN3 | 2 | BLK | 12V | 1 | RED | Cabinet | Digital Out | 1-DR-2 | 500-9946-00 |
| 34 | Ticket Meter | 1 | CN4 | 2 | BLK | 12V | 1 | RED | Cabinet | Digital Out | 1-DR-3 | 500-9946-00 |
| 35 | Ticket Dispenser | 1 | CN11 | 3 | | 12V | 1 | | Cabinet | Digital Out | 1-DR-4 | |

Continued on next page...



DRIVER REFERENCE CONTINUED

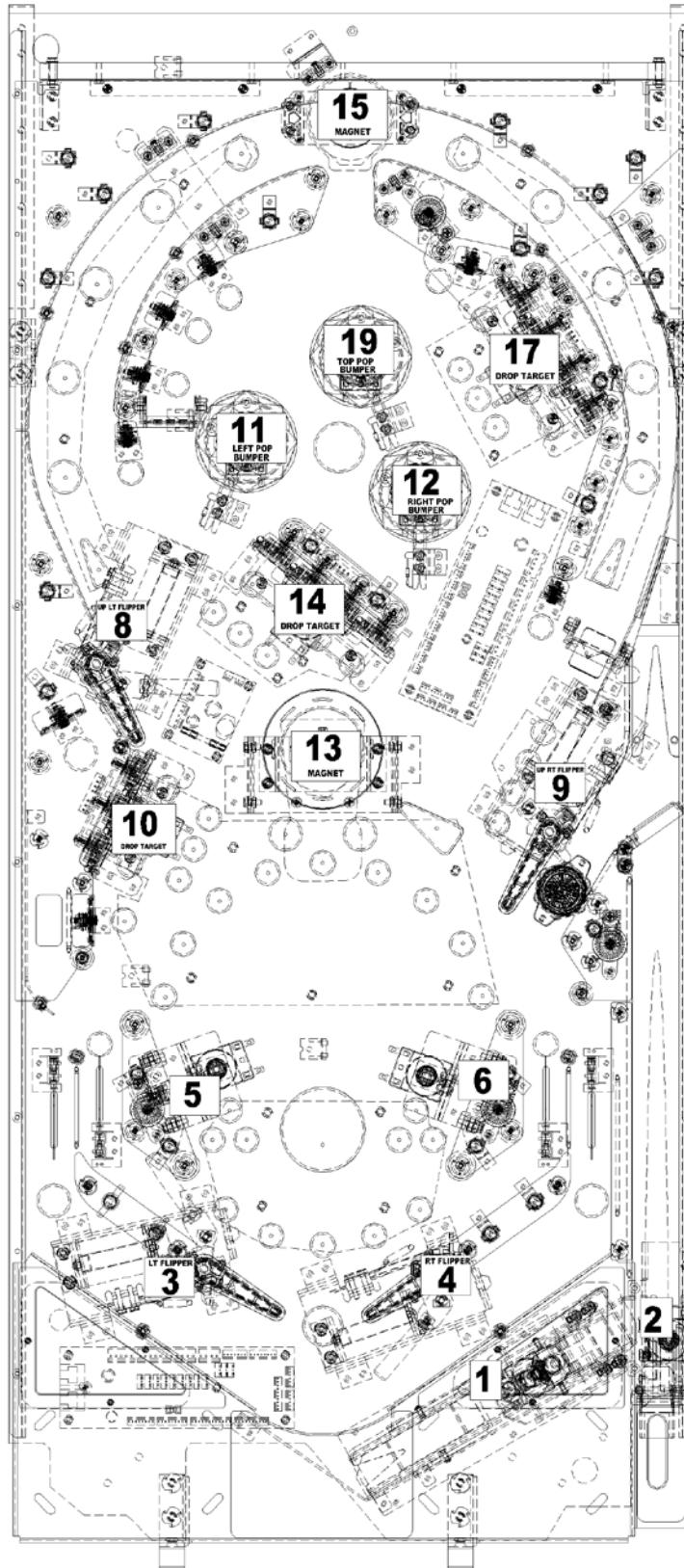


Figure 3.2.1. Playfield driver locations (top view).



3.3 SWITCH REFERENCE

| ID | Name | Node | Node Ext | Conn. | Input Pin | Input Wire | GND Pin | Ground Wire | Location | Type | Address | Part Number |
|----|---------------------------------|------|----------|-------|-----------|------------|---------|-------------|-----------|--------------|---------|----------------------------------|
| 1 | Left Outlane | 8 | - | CN11 | 4 | LGN RED | 11-12 | BLK ORG | Playfield | Rollover | 8-SW-17 | 500-9935-03 |
| 2 | Left Return Lane | 8 | - | CN11 | 5 | LGN ORG | 11-12 | BLK ORG | Playfield | Rollover | 8-SW-18 | 500-9935-03 |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 5 | Right Return Lane | 8 | - | CN11 | 6 | LGN YEL | 11-12 | BLK ORG | Playfield | Rollover | 8-SW-19 | 500-9935-03 |
| 6 | Right Outlane | 8 | - | CN11 | 7 | LGN BLU | 11-12 | BLK ORG | Playfield | Rollover | 8-SW-20 | 500-9935-04 |
| 7 | Left Slingshot | 8 | - | CN10 | 4 | GRY BLU | 8 | BLK GRN | Playfield | Leaf | 8-SW-30 | 180-5231-00 |
| 8 | Right Slingshot | 8 | - | CN10 | 3 | GRY VIO | 8 | BLK GRN | Playfield | Leaf | 8-SW-29 | 180-5231-00 |
| 9 | Left Flipper Button | 8 | - | CN9 | 4 | GRY BRN | 7 | BLK GRN | Cabinet | Leaf | 8-SW-25 | 180-5164-01 |
| 10 | Right Flipper Button | 8 | - | CN9 | 3 | GRY RED | 7 | BLK GRN | Cabinet | Leaf | 8-SW-24 | 180-5164-01 |
| 11 | Left Flipper EOS | 8 | - | CN10 | 6 | GRY YEL | 9 | BLK GRN | Playfield | Leaf | 8-SW-16 | 180-5149-00 |
| 12 | Right Flipper EOS | 8 | - | CN10 | 5 | GRY GRN | 9 | BLK GRN | Playfield | Leaf | 8-SW-31 | 180-5149-00 |
| 13 | Up Left Flipper Button | 8 | - | CN9 | 6 | VIO | 8 | BLK VIO | Playfield | Leaf | 8-SW-27 | 180-5164-01 |
| 14 | Up Right Flipper Button | 8 | - | CN9 | 5 | VIO WHT | 8 | BLK VIO | Playfield | Leaf | 8-SW-26 | 180-5164-01 |
| 15 | Trough 6 | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-32 | 520-5344-00 tx 520-7001-00 rx |
| 16 | Trough 5 | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-33 | 520-5344-00 tx 520-7001-00 rx |
| 17 | Trough 4 | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-34 | 520-5344-00 tx 520-7001-00 rx |
| 18 | Trough 3 | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-35 | 520-5344-00 tx 520-7001-00 rx |
| 19 | Trough 2 | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-36 | 520-5344-00 tx 520-7001-00 rx |
| 20 | Trough 1 | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-37 | 520-5344-00 tx 520-7001-00 rx |
| 21 | Trough Jam | 8 | 8a | CN14 | - | | - | | Playfield | Opto | 8-SW-38 | 520-5344-00 tx 520-7001-00 rx |
| 22 | Shooter Lane | 8 | - | CN10 | 2 | GRY WHT | 7 | BLK GRN | Playfield | Rollover | 8-SW-28 | 180-5157-01 |
| 23 | Up Left Flipper EOS | 8 | - | CN12 | 8 | PNK BLK | 10 | BLK RED | Playfield | Leaf | 8-SW-14 | 180-5149-00 |
| 24 | Up Right Flipper EOS | 8 | - | CN12 | 9 | PNK BRN | 10 | BLK RED | Playfield | Leaf | 8-SW-15 | 180-5149-00 |
| 25 | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | |
| 28 | Lower Left Target | 8 | - | CN12 | 6 | WHT GRN | 10 | BLK RED | Playfield | Leaf, Target | 8-SW-12 | 515-9784-00-00 |
| 29 | Left 3 Bank Drop Left | 8 | - | CN11 | 8 | LGN VIO | 11/12 | BLK ORG | Playfield | Opto | 8-SW-21 | 520-5252-13 |
| 30 | Left 3 Bank Drop Center | 8 | - | CN11 | 9 | LGN GRY | 11/12 | BLK ORG | Playfield | Opto | 8-SW-22 | 520-5252-13 |
| 31 | Left 3 Bank Drop Right | 8 | - | CN11 | 10 | LGN WHT | 11/12 | BLK ORG | Playfield | Opto | 8-SW-23 | 520-5252-13 |
| 32 | Super Jackpot Target | 8 | - | CN12 | 7 | WHT BLU | 10 | BLK RED | Playfield | Leaf, Target | 8-SW-13 | 515-9784-00-00 |
| 33 | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | |
| 35 | Center 4 Bank Drop Left | 9 | - | CN9 | 3 | LGN ORG | 7 | BLK BLU | Playfield | Opto | 9-SW-24 | 520-5252-14 |
| 36 | Center 4 Bank Drop Left Center | 9 | - | CN9 | 4 | LGN YEL | 7 | BLK BLU | Playfield | Opto | 9-SW-25 | 520-5252-14 |
| 37 | Center 4 Bank Drop Right Center | 9 | - | CN9 | 5 | LGN BLU | 7 | BLK BLU | Playfield | Opto | 9-SW-26 | 520-5252-14 |
| 38 | Center 4 Bank Drop Right | 9 | - | CN9 | 6 | LGN VIO | 7 | BLK BLU | Playfield | Opto | 9-SW-27 | 520-5252-14 |
| 39 | | | | | | | | | | | | |
| 40 | Right Orbit Target | 9 | - | CN11 | 10 | TAN | 11/12 | BLK GRY | Playfield | Leaf, Target | 9-SW-23 | 515-9785-00-00 |
| 41 | Spinner Right Orbit | 9 | - | CN11 | 8 | TAN VIO | 11/12 | BLK GRY | Playfield | Opto | 9-SW-21 | 511-2739-00 tx 511-2739-01 rx |
| 42 | Skill Shot Rollover | 9 | - | CN11 | 9 | TAN WHT | 11/12 | BLK GRY | Playfield | Opto | 9-SW-22 | 520-6824-0X |
| 43 | | | | | | | | | | | | |

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SWITCH REFERENCE CONTINUED

| ID | Name | Node | Node Ext | Conn. | Input Pin | Input Wire | GND Pin | Ground Wire | Location | Type | Address | Part Number |
|----|--------------------------------|------|----------|-------|-----------|------------|---------|-------------|-----------|--------------|---------|----------------------------------|
| 44 | Target 1 | 9 | - | CN12 | 5 | WHT YEL | 10 | BLK WHT | Playfield | Leaf, Target | 9-SW-11 | 515-9783-00-00 |
| 45 | Target 2 | 9 | - | CN12 | 6 | WHT GRN | 10 | BLK WHT | Playfield | Leaf, Target | 9-SW-12 | 515-9783-00-00 |
| 46 | Target 3 | 9 | - | CN12 | 7 | WHT BLU | 10 | BLK WHT | Playfield | Leaf, Target | 9-SW-13 | 515-9783-00-00 |
| 47 | Target 4 | 9 | - | CN12 | 8 | WHT VIO | 10 | BLK WHT | Playfield | Leaf, Target | 9-SW-14 | 515-9783-00-00 |
| 48 | | | | | | | | | | | | |
| 49 | Left Orbit Target | 9 | - | CN12 | 9 | WHT GRY | 10 | BLK WHT | Playfield | Leaf, Target | 9-SW-15 | 515-9785-00-00 |
| 50 | Left Pop Bumper | 9 | - | CN10 | 2 | GRY BLK | 7/8/9 | BLK BLU | Playfield | Leaf | 9-SW-28 | 180-5232-00 |
| 51 | Right Pop Bumper | 9 | - | CN10 | 3 | GRY BRN | 7/8/9 | BLK BLU | Playfield | Leaf | 9-SW-29 | 180-5232-00 |
| 52 | Top Pop Bumper | 9 | - | CN10 | 4 | GRY RED | 7/8/9 | BLK BLU | Playfield | Leaf | 9-SW-30 | 180-5232-00 |
| 53 | | | | | | | | | | | | |
| 54 | | | | | | | | | | | | |
| 55 | Right 4 Bank Drop Left | 9 | - | CN11 | 4 | TAN ORG | 11/12 | BLK GRY | Playfield | Opto | 9-SW-17 | 520-5252-14 |
| 56 | Right 4 Bank Drop Left Center | 9 | - | CN11 | 5 | TAN YEL | 11/12 | BLK GRY | Playfield | Opto | 9-SW-18 | 520-5252-14 |
| 57 | Right 4 Bank Drop Right Center | 9 | - | CN11 | 6 | TAN GRN | 11/12 | BLK GRY | Playfield | Opto | 9-SW-19 | 520-5252-14 |
| 58 | Right 4 Bank Drop Right | 9 | - | CN11 | 7 | TAN BLU | 11/12 | BLK GRY | Playfield | Opto | 9-SW-20 | 520-5252-14 |
| 59 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | Spinner Left | 9 | - | CN10 | 5 | GRY ORG | 7/8/9 | BLK BLU | Playfield | Opto | 9-SW-31 | 511-2739-00 tx 511-2739-01 rx |
| 62 | Left Orbit Opto | 9 | - | CN12 | 2 | WHT BRN | 10 | BLK WHT | Playfield | Opto | 9-SW-8 | 515-0215-00 tx 515-0215-01 rx |
| 63 | Top Magnet Opto | 9 | - | CN12 | 3 | WHT RED | 10 | BLK WHT | Playfield | Opto | 9-SW-9 | 515-0215-00 tx 515-0215-01 rx |
| 64 | Right Orbit Opto | 9 | - | CN12 | 4 | WHT ORG | 10 | BLK WHT | Playfield | Opto | 9-SW-10 | 515-0215-00 tx 515-0215-01 rx |
| 65 | | | | | | | | | | | | |
| 66 | | | | | | | | | | | | |
| 67 | | | | | | | | | | | | |
| 68 | | | | | | | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | | | | | | | | |
| 73 | Start Button | 1 | - | CN6 | 10 | GRY | 5 | BLK WHT | Cabinet | Micro | 1-SW-11 | 180-5174-00 |
| 74 | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | Left Coin | 1 | - | CN5 | 9 | PNK BRN | 3 | BLK | Cabinet | Micro | 1-SW-16 | |
| 77 | Right Coin | 1 | - | CN5 | 7 | PNK ORG | 3 | BLK | Cabinet | Micro | 1-SW-18 | |
| 78 | Center Coin | 1 | - | CN5 | 8 | PNK RED | 3 | BLK | Cabinet | Micro | 1-SW-17 | |
| 79 | Fourth Coin | 1 | - | CN5 | 6 | | - | | Cabinet | - | 1-SW-19 | |
| 80 | Fifth Coin | 1 | - | CN5 | 5 | | - | | Cabinet | - | 1-SW-20 | |
| 81 | Tilt Pendulum | 1 | - | CN6 | 7 | WHT | 5 | BLK WHT | Cabinet | Plumb Bob | 1-SW-14 | 516-0007-00 |
| 82 | Sixth Coin | 1 | - | CN9 | 5 | | - | | Cabinet | - | 1-SW-21 | |
| 83 | Ticket Notch | 1 | - | CN11 | 5 | | - | | Cabinet | - | 1-SW-8 | |
| 84 | Slam Tilt | 1 | - | CN5 | 4 | LGN RED | 3 | BLK | Cabinet | - | 1-SW-22 | |
| 85 | | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |

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SWITCH REFERENCE CONTINUED

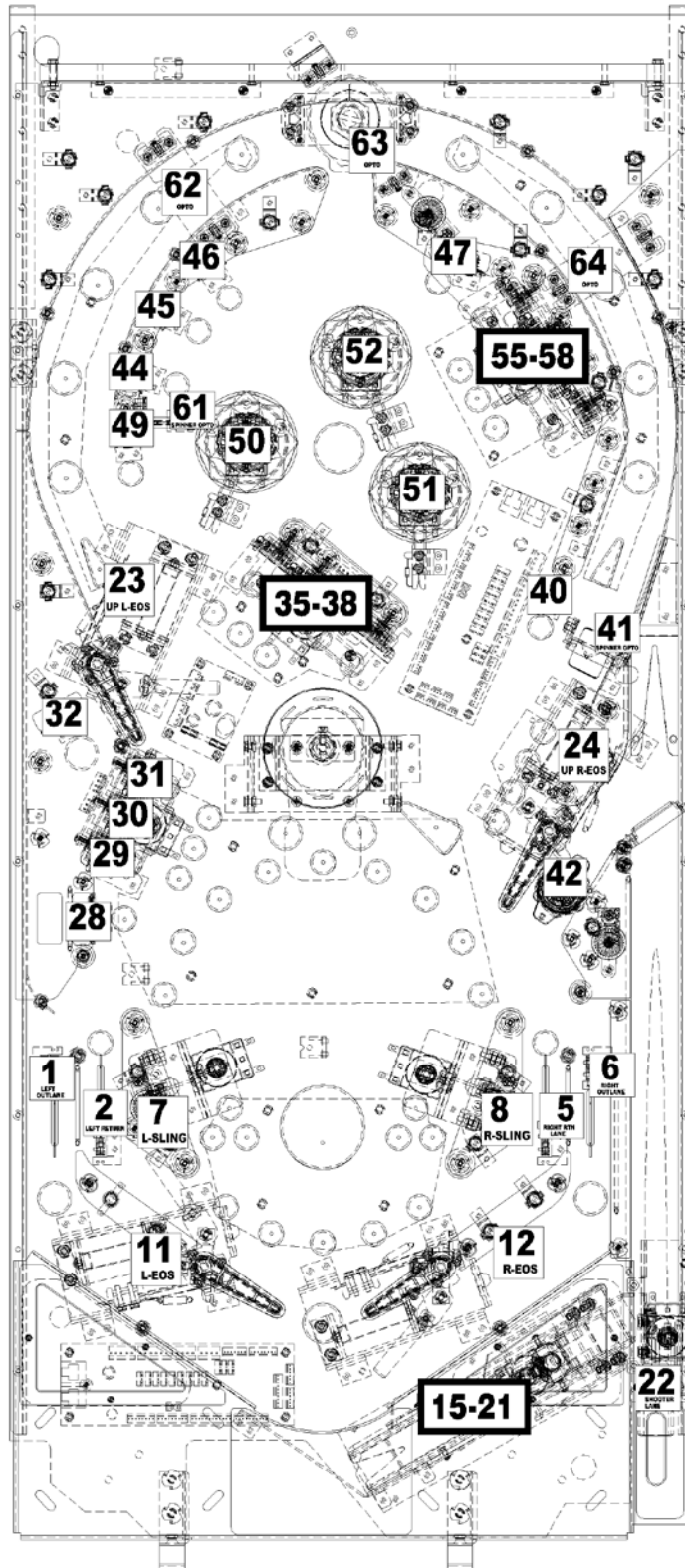


Figure 3.3.1. Playfield switch locations (top view).

Continued on next page...

SWITCH REFERENCE CONTINUED

| ID | Name | Node | Node Ext | Conn. | Input Pin | Input Wire | GND Pin | Ground Wire | Location | Type | Address | Part Number |
|-----|----------------------------|------|----------|-------|-----------|------------|---------|-------------|-----------|------|---------|-------------|
| 90 | | | | | | | | | | | | |
| 91 | | | | | | | | | | | | |
| C1 | DIP 1 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-0 | - |
| C10 | Service Plus | 0 | - | CN25 | 3 | LGN VIO | 6 | BLK | Coin Door | | 0-SW-9 | 180-5192-02 |
| C11 | Service Minus | 0 | - | CN25 | 2 | LGN BLU | 6 | BLK | Coin Door | | 0-SW-10 | 180-5192-02 |
| C12 | Service Back | 0 | - | CN25 | 1 | LGN BLK | 6 | BLK | Coin Door | | 0-SW-11 | 180-5192-00 |
| C17 | Headphone Detect | 0 | - | - | - | - | - | - | Coin Door | | 0-SW-16 | - |
| C18 | Headphone Kit Cable Detect | 0 | - | CN3 | 5 | BLK | 4 | BLK | CPU Node | | 0-SW-17 | - |
| C19 | Volume Encoder 1 | 0 | - | CN3 | 6 | WHT | 1 | DRAIN | CPU Node | | 0-SW-18 | - |
| C2 | DIP 2 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-1 | - |
| C20 | Volume Encoder 2 | 0 | - | CN3 | 7 | GRN | 1 | DRAIN | CPU Node | | 0-SW-19 | - |
| C24 | DC Sense | 0 | - | CN7 | 4 | GRY RED | 1 | BLK | - | | 0-SW-23 | - |
| C3 | DIP 3 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-2 | - |
| C4 | DIP 4 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-3 | - |
| C5 | DIP 5 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-4 | - |
| C6 | DIP 6 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-5 | - |
| C7 | DIP 7 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-6 | - |
| C8 | DIP 8 | 0 | - | - | - | - | - | - | CPU Node | | 0-SW-7 | - |
| C9 | Service Select | 0 | - | CN25 | 4 | LGN GRY | 6 | BLK | Coin Door | | 0-SW-8 | 180-5192-04 |

3.4 LIGHT REFERENCE

| ID | Name | Node | Node Ext. | Conn. | Ret. Pin | Ret. Wire | Src. Pin | Src. Wire | Location | Type | Light Color | Address | Part Number |
|----|----------------------------|------|-----------|-------|----------|-----------|----------|-----------|-----------|-------------|-------------|---------|-------------|
| 1 | Coin Enable | 1 | - | CN8 | 6 | BLK GRY | 2 | GRY RED | Coin Door | Digital Out | | 1-LP-0 | |
| 2 | Start Button | 1 | - | CN6 | 3 | YEL BRN | 1 | RED | Cabinet | Feature | White | 1-LP-2 | 113-5071-00 |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | Left Outlane | 9 | a | CN6 | 6 | ORG YEL | 1/2 | RED | Playfield | Feature | White | 9-LP-59 | 520-5307-00 |
| 12 | Left Inlane | 9 | a | CN6 | 7 | ORG GRN | 1/2 | RED | Playfield | Feature | White | 9-LP-60 | 520-5307-00 |
| 13 | Shoot Again | 9 | a | CN6 | 8 | ORG BLU | 1/2 | RED | Playfield | Feature | White | 9-LP-61 | 520-5307-00 |
| 14 | Right Inlane | 9 | a | CN6 | 9 | ORG VIO | 1/2 | RED | Playfield | Feature | White | 9-LP-62 | 520-5307-00 |
| 15 | Right Outlane | 9 | a | CN6 | 10 | ORG GRY | 1/2 | RED | Playfield | Feature | White | 9-LP-63 | 520-5307-00 |
| 16 | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | |
| 18 | All My Loving-R | 8 | b | - | LED5 | - | - | - | Playfield | Feature | RGB | 8-LP-18 | 520-8067-00 |
| 19 | All My Loving-G | 8 | b | - | LED5 | - | - | - | Playfield | Feature | RGB | 8-LP-19 | 520-8067-00 |
| 20 | All My Loving-B | 8 | b | - | LED5 | - | - | - | Playfield | Feature | RGB | 8-LP-20 | 520-8067-00 |
| 21 | Drive My Car-R | 8 | b | - | LED6 | - | - | - | Playfield | Feature | RGB | 8-LP-21 | 520-8067-00 |
| 22 | Drive My Car-G | 8 | b | - | LED6 | - | - | - | Playfield | Feature | RGB | 8-LP-22 | 520-8067-00 |
| 23 | Drive My Car-B | 8 | b | - | LED6 | - | - | - | Playfield | Feature | RGB | 8-LP-23 | 520-8067-00 |
| 24 | I Should've Known Better-R | 8 | b | - | LED4 | - | - | - | Playfield | Feature | RGB | 8-LP-15 | 520-8067-00 |
| 25 | I Should've Known Better-G | 8 | b | - | LED4 | - | - | - | Playfield | Feature | RGB | 8-LP-16 | 520-8067-00 |
| 26 | I Should've Known Better-B | 8 | b | - | LED4 | - | - | - | Playfield | Feature | RGB | 8-LP-17 | 520-8067-00 |
| 27 | Ticket To Ride-R | 8 | b | - | LED2 | - | - | - | Playfield | Feature | RGB | 8-LP-9 | 520-8067-00 |
| 28 | Ticket To Ride-G | 8 | b | - | LED2 | - | - | - | Playfield | Feature | RGB | 8-LP-10 | 520-8067-00 |
| 29 | Ticket To Ride-B | 8 | b | - | LED2 | - | - | - | Playfield | Feature | RGB | 8-LP-11 | 520-8067-00 |
| 30 | It Won't Be Long-R | 8 | b | - | LED3 | - | - | - | Playfield | Feature | RGB | 8-LP-12 | 520-8067-00 |
| 31 | It Won't Be Long-G | 8 | b | - | LED3 | - | - | - | Playfield | Feature | RGB | 8-LP-13 | 520-8067-00 |
| 32 | It Won't Be Long-B | 8 | b | - | LED3 | - | - | - | Playfield | Feature | RGB | 8-LP-14 | 520-8067-00 |
| 33 | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 36 | 1 | 8 | b | - | LED14 | - | - | - | Playfield | Feature | White | 8-LP-29 | 520-8067-00 |
| 37 | 2 | 8 | b | - | LED15 | - | - | - | Playfield | Feature | White | 8-LP-30 | 520-8067-00 |
| 38 | 3 | 8 | b | - | LED16 | - | - | - | Playfield | Feature | White | 8-LP-31 | 520-8067-00 |
| 39 | | | | | | | | | | | | | |
| 40 | 1K Bonus | 9 | a | - | LED46 | - | - | - | Playfield | Feature | White | 9-LP-55 | 520-8066-00 |
| 41 | 2K Bonus | 9 | a | - | LED45 | - | - | - | Playfield | Feature | White | 9-LP-54 | 520-8066-00 |
| 42 | 3K Bonus | 9 | a | - | LED41 | - | - | - | Playfield | Feature | White | 9-LP-50 | 520-8066-00 |
| 43 | 4K Bonus | 9 | a | - | LED21 | - | - | - | Playfield | Feature | White | 9-LP-30 | 520-8066-00 |
| 44 | 5K Bonus | 9 | a | - | LED19 | - | - | - | Playfield | Feature | White | 9-LP-28 | 520-8066-00 |
| 45 | 6K Bonus | 9 | a | - | LED17 | - | - | - | Playfield | Feature | White | 9-LP-26 | 520-8066-00 |
| 46 | 7K Bonus | 9 | a | - | LED15 | - | - | - | Playfield | Feature | White | 9-LP-22 | 520-8066-00 |
| 47 | 8K Bonus | 9 | a | - | LED14 | - | - | - | Playfield | Feature | White | 9-LP-21 | 520-8066-00 |
| 48 | 9K Bonus | 9 | a | - | LED13 | - | - | - | Playfield | Feature | White | 9-LP-20 | 520-8066-00 |

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LIGHT REFERENCE CONTINUED

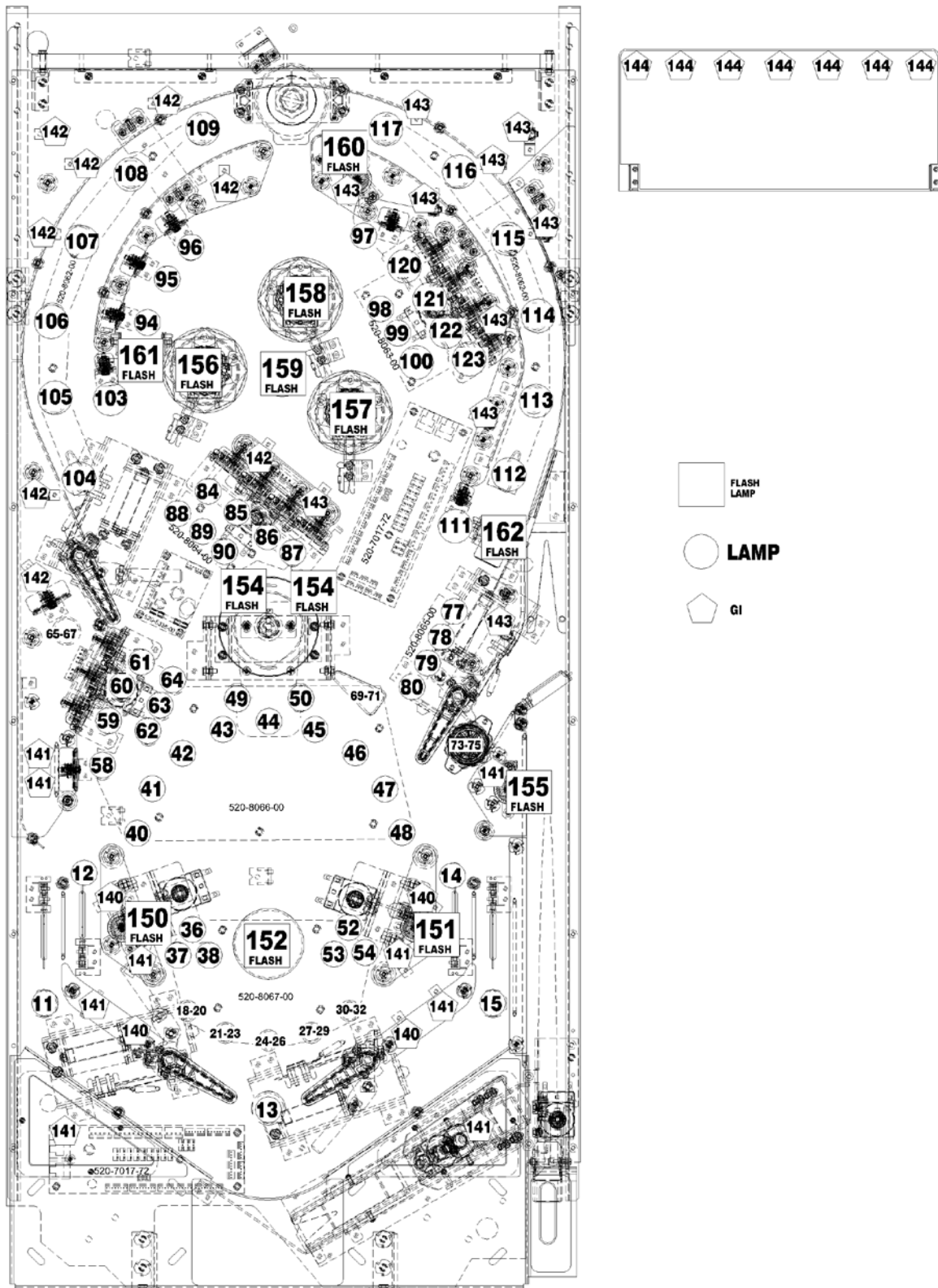


Figure 3.4.1. Playfield light locations (top view).

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LIGHT REFERENCE CONTINUED

| ID | Name | Node | Node Ext. | Conn. | Ret. Pin | Ret. Wire | Src. Pin | Src. Wire | Location | Type | Light Color | Address | Part Number |
|----|----------------------------------|------|-----------|-------|----------|-----------|----------|-----------|-----------|---------|-------------|---------|-------------|
| 49 | 10K Bonus | 9 | a | - | LED20 | - | - | - | Playfield | Feature | White | 9-LP-29 | 520-8066-00 |
| 50 | 20K Bonus | 9 | a | - | LED18 | - | - | - | Playfield | Feature | White | 9-LP-27 | 520-8066-00 |
| 51 | | | | | | | | | | | | | |
| 52 | 1X Bonus | 8 | b | - | LED8 | - | - | - | Playfield | Feature | White | 8-LP-25 | 520-8067-00 |
| 53 | 2X Bonus | 8 | b | - | LED7 | - | - | - | Playfield | Feature | White | 8-LP-24 | 520-8067-00 |
| 54 | 4X Bonus | 8 | b | - | LED1 | - | - | - | Playfield | Feature | White | 8-LP-8 | 520-8067-00 |
| 55 | | | | | | | | | | | | | |
| 56 | | | | | | | | | | | | | |
| 57 | | | | | | | | | | | | | |
| 58 | Mystery | 9 | a | - | LED44 | - | - | - | Playfield | Feature | White | 9-LP-53 | 520-8066-00 |
| 59 | (F)AB | 9 | a | - | LED43 | - | - | - | Playfield | Feature | White | 9-LP-52 | 520-8066-00 |
| 60 | F(A)B | 9 | a | - | LED42 | - | - | - | Playfield | Feature | White | 9-LP-51 | 520-8066-00 |
| 61 | FA(B) | 9 | a | - | LED38 | - | - | - | Playfield | Feature | White | 9-LP-47 | 520-8066-00 |
| 62 | Advance Loops 1 Lt 3Bank | 9 | a | - | LED40 | - | - | - | Playfield | Feature | White | 9-LP-49 | 520-8066-00 |
| 63 | Advance Multipliers X Lt 3Bank | 9 | a | - | LED39 | - | - | - | Playfield | Feature | White | 9-LP-48 | 520-8066-00 |
| 64 | Score Bonus Lt 3Bank | 9 | a | - | LED22 | - | - | - | Playfield | Feature | White | 9-LP-31 | 520-8066-00 |
| 65 | Super Jackpot-R | 9 | a | CN6 | 3 | RED ORG | 1/2 | RED | Playfield | Feature | White | 9-LP-56 | 520-5333-00 |
| 66 | Super Jackpot-G | 9 | a | CN6 | 4 | GRN ORG | 1/2 | RED | Playfield | Feature | White | 9-LP-57 | 520-5333-00 |
| 67 | Super Jackpot-B | 9 | a | CN6 | 5 | BLU ORG | 1/2 | RED | Playfield | Feature | White | 9-LP-58 | 520-5333-00 |
| 68 | | | | | | | | | | | | | |
| 69 | Jackpot-R | 9 | a | - | LED16 | - | - | - | Playfield | Feature | White | 9-LP-23 | 520-8066-00 |
| 70 | Jackpot-G | 9 | a | - | LED16 | - | - | - | Playfield | Feature | White | 9-LP-24 | 520-8066-00 |
| 71 | Jackpot-B | 9 | a | - | LED16 | - | - | - | Playfield | Feature | White | 9-LP-25 | 520-8066-00 |
| 72 | | | | | | | | | | | | | |
| 73 | Skill Shot Rollover-R | 9 | - | CN14 | 2 | RED BRN | 7/8 | YEL | Playfield | Feature | White | 9-LP-7 | 520-6824-0X |
| 74 | Skill Shot Rollover-G | 9 | - | CN14 | 3 | GRN BRN | 7/8 | YEL | Playfield | Feature | White | 9-LP-6 | 520-6824-0X |
| 75 | Skill Shot Rollover-B | 9 | - | CN14 | 4 | BLU BRN | 7/8 | YEL | Playfield | Feature | White | 9-LP-5 | 520-6824-0X |
| 76 | | | | | | | | | | | | | |
| 77 | John Spinner | 9 | a | CN1 | 7 | RED WHT | 1/2/3 | RED | Playfield | Feature | White | 9-LP-12 | 520-8065-00 |
| 78 | Paul Spinner | 9 | a | CN1 | 6 | RED GRY | 1/2/3 | RED | Playfield | Feature | White | 9-LP-11 | 520-8065-00 |
| 79 | George Spinner | 9 | a | CN1 | 5 | RED VIO | 1/2/3 | RED | Playfield | Feature | White | 9-LP-10 | 520-8065-00 |
| 80 | Ringo Spinner | 9 | a | CN1 | 4 | RED BLU | 1/2/3 | RED | Playfield | Feature | White | 9-LP-9 | 520-8065-00 |
| 81 | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | |
| 83 | | | | | | | | | | | | | |
| 84 | (F)OUR | 8 | c | - | LED5 | - | - | - | Playfield | Feature | White | 8-LP-36 | 520-8064-00 |
| 85 | F(O)UR | 8 | c | - | LED4 | - | - | - | Playfield | Feature | White | 8-LP-35 | 520-8064-00 |
| 86 | FO(U)R | 8 | c | - | LED3 | - | - | - | Playfield | Feature | White | 8-LP-34 | 520-8064-00 |
| 87 | FOU(R) | 8 | c | - | LED2 | - | - | - | Playfield | Feature | White | 8-LP-33 | 520-8064-00 |
| 88 | Advance loops 2 Cntr 4Bank | 8 | c | - | LED6 | - | - | - | Playfield | Feature | White | 8-LP-37 | 520-8064-00 |
| 89 | Advance Multipliers X Cntr 4Bank | 8 | c | - | LED7 | - | - | - | Playfield | Feature | White | 8-LP-38 | 520-8064-00 |
| 90 | Score Bonus Cntr 4Bank | 8 | c | - | LED8 | - | - | - | Playfield | Feature | White | 8-LP-39 | 520-8064-00 |
| 91 | | | | | | | | | | | | | |
| 92 | | | | | | | | | | | | | |
| 93 | | | | | | | | | | | | | |
| 94 | John Pop Target | 9 | a | CN4 | 4 | BLU YEL | 1/2/3 | RED | Playfield | Feature | White | 9-LP-32 | 520-5307-00 |
| 95 | Paul Pop Target | 9 | a | CN4 | 5 | BLU GRN | 1/2/3 | RED | Playfield | Feature | White | 9-LP-33 | 520-5307-00 |
| 96 | George Pop Target | 9 | a | CN4 | 6 | BLU | 1/2/3 | RED | Playfield | Feature | White | 9-LP-34 | 520-5307-00 |
| 97 | Ringo Pop Target | 9 | a | CN4 | 7 | BLU VIO | 1/2/3 | RED | Playfield | Feature | White | 9-LP-35 | 520-5307-00 |

Continued on next page...



LIGHT REFERENCE CONTINUED

| ID | Name | Node | Node Ext. | Conn. | Ret. Pin | Ret. Wire | Src. Pin | Src. Wire | Location | Type | Light Color | Address | Part Number |
|-----|--------------------------------|------|-----------|-------|----------|-----------|----------|-----------|-----------|---------|-------------|---------|--|
| 98 | Advance loops 3 Rt 4Bank | 8 | d | - | LED6 | - | - | - | Playfield | Feature | White | 8-LP-45 | 520-8063-00 |
| 99 | Advance Multipliers X Rt 4Bank | 8 | d | - | LED7 | - | - | - | Playfield | Feature | White | 8-LP-46 | 520-8063-00 |
| 100 | Score Bonus Rt 4Bank | 8 | d | - | LED8 | - | - | - | Playfield | Feature | White | 8-LP-47 | 520-8063-00 |
| 101 | | | | | | | | | | | | | |
| 102 | | | | | | | | | | | | | |
| 103 | Left Orbit Target | 9 | a | CN5 | 3 | BRN ORG | 1/2 | RED | Playfield | Feature | White | 9-LP-40 | 520-5307-00 |
| 104 | Left Orbit 2X | 9 | a | CN5 | 4 | BRN YEL | 1/2 | RED | Playfield | Feature | White | 9-LP-41 | 520-8062-00 |
| 105 | Left Orbit 1 | 9 | a | CN5 | 5 | BRN GRN | 1/2 | RED | Playfield | Feature | White | 9-LP-42 | 520-8062-00 |
| 106 | Left Orbit 2 | 9 | a | CN5 | 6 | BRN BLU | 1/2 | RED | Playfield | Feature | White | 9-LP-43 | 520-8062-00 |
| 107 | Left Orbit 3 | 9 | a | CN5 | 7 | BRN VIO | 1/2 | RED | Playfield | Feature | White | 9-LP-44 | 520-8062-00 |
| 108 | Left Orbit 4 | 9 | a | CN5 | 8 | BRN GRY | 1/2 | RED | Playfield | Feature | White | 9-LP-45 | 520-8062-00 |
| 109 | Left Orbit 5 | 9 | a | CN5 | 9 | BRN WHT | 1/2 | RED | Playfield | Feature | White | 9-LP-46 | 520-8062-00 |
| 110 | | | | | | | | | | | | | |
| 111 | Right Orbit Target | 9 | a | CN1 | 8 | GRN RED | 1/2/3 | RED | Playfield | Feature | White | 9-LP-13 | 520-5307-00 |
| 112 | Right Orbit 2X | 9 | a | CN1 | 9 | GRN YEL | 1/2/3 | RED | Playfield | Feature | White | 9-LP-14 | 520-8062-00 |
| 113 | Right Orbit 1 | 9 | a | CN1 | 10 | GRN | 1/2/3 | RED | Playfield | Feature | White | 9-LP-15 | 520-8062-00 |
| 114 | Right Orbit 2 | 9 | a | CN1 | 11 | GRN BLU | 1/2/3 | RED | Playfield | Feature | White | 9-LP-16 | 520-8062-00 |
| 115 | Right Orbit 3 | 9 | a | CN1 | 12 | GRN VIO | 1/2/3 | RED | Playfield | Feature | White | 9-LP-17 | 520-8062-00 |
| 116 | Right Orbit 4 | 9 | a | CN1 | 13 | GRN GRY | 1/2/3 | RED | Playfield | Feature | White | 9-LP-18 | 520-8062-00 |
| 117 | Right Orbit 5 | 9 | a | CN1 | 14 | GRN WHT | 1/2/3 | RED | Playfield | Feature | White | 9-LP-19 | 520-8062-00 |
| 118 | | | | | | | | | | | | | |
| 119 | | | | | | | | | | | | | |
| 120 | (1)964 | 8 | d | - | LED5 | - | - | - | Playfield | Feature | White | 8-LP-44 | 520-8063-00 |
| 121 | 1(9)64 | 8 | d | - | LED4 | - | - | - | Playfield | Feature | White | 8-LP-43 | 520-8063-00 |
| 122 | 19(6)4 | 8 | d | - | LED3 | - | - | - | Playfield | Feature | White | 8-LP-42 | 520-8063-00 |
| 123 | 196(4) | 8 | d | - | LED2 | - | - | - | Playfield | Feature | White | 8-LP-41 | 520-8063-00 |
| 124 | | | | | | | | | | | | | |
| 125 | | | | | | | | | | | | | |
| 126 | | | | | | | | | | | | | |
| 127 | | | | | | | | | | | | | |
| 128 | | | | | | | | | | | | | |
| 129 | | | | | | | | | | | | | |
| 130 | | | | | | | | | | | | | |
| 131 | | | | | | | | | | | | | |
| 132 | | | | | | | | | | | | | |
| 133 | | | | | | | | | | | | | |
| 134 | | | | | | | | | | | | | |
| 135 | | | | | | | | | | | | | |
| 136 | | | | | | | | | | | | | |
| 137 | | | | | | | | | | | | | |
| 138 | | | | | | | | | | | | | |
| 139 | Coin Door Gl | 1 | - | CN5 | 2 | YEL | 1 | YEL-WHT | Coin Door | G.I. | White | 1-LP-1 | 112-5033-08 |
| 140 | Lower Playfield Gl 1 | 8 | - | CN15 | 5 | RED BLK | 1 | YEL RED | Playfield | G.I. | White | 8-LP-0 | 112-5034-WW |
| 141 | Lower Playfield Gl 2 | 8 | - | CN15 | 6 | WHT BLK | 2 | YEL BLK | Playfield | G.I. | White | 8-LP-1 | 112-5034-WW 520-7000-00(Bot.Arch) 520-5307(x2) |
| 142 | Playfield Upper Gl Left | 9 | - | CN15 | 5 | RED BLK | 1 | YEL RED | Playfield | G.I. | White | 9-LP-0 | 112-5034-WW |

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LIGHT REFERENCE CONTINUED

| ID | Name | Node | Node Ext. | Conn. | Ret. Pin | Ret. Wire | Src. Pin | Src. Wire | Location | Type | Light Color | Address | Part Number |
|-----|--------------------------|------|-----------|-------|-------------|-----------|----------|-----------|-----------|-------|-------------|---------|-------------|
| 143 | Playfield Upper GI Right | 9 | - | CN15 | 6 | WHT BLK | 2 | YEL BLK | Playfield | G.I. | White | 9-LP-1 | 112-5034-WW |
| 144 | Back Panel GI | 9 | - | CN15 | 7 | GRN BLK | 3 | YEL GRN | Backpanel | G.I. | White | 9-LP-2 | 112-5034-WW |
| 145 | | | | | | | | | | | | | |
| 146 | | | | | | | | | | | | | |
| 147 | | | | | | | | | | | | | |
| 148 | | | | | | | | | | | | | |
| 149 | | | | | | | | | | | | | |
| 150 | Left Sling Flash | 8 | b | CN4 | 3 | ORG | 1 | RED | Playfield | Flash | White | 8-LP-28 | 520-7000-00 |
| 151 | Right Sling Flash | 8 | b | CN3 | 3 | ORG | 1 | RED | Playfield | Flash | White | 8-LP-26 | 520-7000-00 |
| 152 | Drum Flash (x3) | 8 | b | - | LED10/11/12 | | - | - | Playfield | Flash | White | 8-LP-27 | 520-8067-00 |
| 153 | | | | | | | | | | | | | |
| 154 | Record Flash (x2) | 8 | c | CN3 | 3 | ORG | 1 | RED | Playfield | Flash | White | 8-LP-32 | 520-7000-00 |
| 155 | Up Right Flipper Flash | 9 | a | CN7 | 3 | ORG | 1 | RED | Playfield | Flash | White | 9-LP-8 | 520-7000-00 |
| 156 | Left Pop Flash | 9 | a | CN4 | 8 | BRN BLK | 1/2/3 | RED | Playfield | Flash | White | 9-LP-36 | 520-8059-00 |
| 157 | Right Pop Flash | 9 | a | CN4 | 9 | BRN | 1/2/3 | RED | Playfield | Flash | White | 9-LP-37 | 520-8059-00 |
| 158 | Top Pop Flash | 9 | a | CN4 | 10 | BRN RED | 1/2/3 | RED | Playfield | Flash | White | 9-LP-38 | 520-8059-00 |
| 159 | Pop Flash | 9 | a | CN4 | 11 | ORG BLK | 1/2/3 | RED | Playfield | Flash | White | 9-LP-39 | 113-5045-08 |
| 160 | Top Magnet Flash | 8 | d | CN3 | 3 | ORG | 1 | RED | Playfield | Flash | White | 8-LP-40 | 520-7000-00 |
| 161 | Left Spinner Flash | 9 | - | CN14 | 6 | ORG BRN | 7/8 | YEL | Playfield | Flash | White | 9-LP-3 | 520-7000-00 |
| 162 | Right Spinner Flash | 9 | - | CN14 | 5 | ORG WHT | 7/8 | YEL | Playfield | Flash | White | 9-LP-4 | 520-7000-00 |
| 163 | | | | | | | | | | | | | |
| 164 | | | | | | | | | | | | | |
| 165 | | | | | | | | | | | | | |
| 166 | | | | | | | | | | | | | |
| 167 | | | | | | | | | | | | | |
| 168 | | | | | | | | | | | | | |
| 169 | | | | | | | | | | | | | |

3.5 MOTOR REFERENCE

| ID | Name | Node | Node Ext. | Conn. | Ret. Pin | Ret. Wire | Src. Pin | Src. Wire | Location | Type | Light Color | Address | Part Number |
|----|----------|------|-----------|-------|----------|-----------|----------|-----------|-----------|-------|-------------|---------|-------------|
| 1 | Motor A0 | 8 | - | CN14 | 5 | BRN | 7/8 | YEL | Playfield | Motor | - | 8-LP-4 | 520-5338-00 |
| 2 | Motor A1 | 8 | - | CN14 | 4 | BRN RED | 7/8 | YEL | Playfield | Motor | - | 8-LP-5 | 520-5338-00 |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

4. ELECTRONIC PINOUTS AND SCHEMATICS

4.1 SPIKE-2 CPU NODE 0

509-1003-01

DIRECT SWITCH MAPPING (CN25)

The coin-door diagnostic switches are connected directly to the CPU node via the Cabinet Node. Note that both the CPU and Cabinet nodes are required for diagnostic switch operation.

| ID | Name | Conn. | Input Pin | Input Wire | GND Pin | Ground Wire | Location | Type | Address | Part Number |
|-----|----------------|-------|-----------|------------|---------|-------------|-----------|------|---------|-------------|
| C1 | DIP 1 | - | - | - | - | - | CPU Node | | 0-SW-0 | - |
| C2 | DIP 2 | - | - | - | - | - | CPU Node | | 0-SW-1 | - |
| C3 | DIP 3 | - | - | - | - | - | CPU Node | | 0-SW-2 | - |
| C4 | DIP 4 | - | - | - | - | - | CPU Node | | 0-SW-3 | - |
| C5 | DIP 5 | - | - | - | - | - | CPU Node | | 0-SW-4 | - |
| C6 | DIP 6 | - | - | - | - | - | CPU Node | | 0-SW-5 | - |
| C7 | DIP 7 | - | - | - | - | - | CPU Node | | 0-SW-6 | - |
| C8 | DIP 8 | - | - | - | - | - | CPU Node | | 0-SW-7 | - |
| C9 | Service Select | CN25 | 1 | LGN-GRY | 11 | BLK-WHT | Coin Door | | 0-SW-9 | 180-5192-04 |
| C10 | Service Plus | CN25 | 2 | LGN-VIO | 11 | BLK-WHT | Coin Door | | 0-SW-10 | 180-5192-02 |
| C11 | Service Minus | CN25 | 3 | LGN-BLU | 11 | BLK-WHT | Coin Door | | 0-SW-11 | 180-5192-02 |
| C12 | Service Back | CN25 | 4 | LGN-BLK | 11 | BLK-WHT | Coin Door | | 0-SW-12 | 180-5192-00 |

CONNECTORS

| ID | Connector Type | Description |
|------|----------------------|--|
| CN1 | 5-Pin .156" Header | Backbox 2-channel amplified speaker out |
| CN2 | 3-Pin .100" Header | Console Port |
| CN3 | 7-Pin .100" Header | Headphone connector |
| CN4 | 2-Pin .156" | Cabinet 1-channel amplified speaker out |
| CN5 | 7-Pin .100" Header | Line In/Out |
| CN6 | 34 Pin 2.00mm Header | LCD display connector |
| CN7 | 5-Pin .156" Header | 48V supply from main power supply |
| CN8 | 6-Pin .100" Header | SPI Serial |
| CN9 | USB | USB connector - for software updates, audit dumps, and expansion modules |
| CN9 | USB | USB connector - for software updates, audit dumps, and expansion modules |
| CN10 | HDMI | HDMI Out |
| CN11 | RJ45 | SPIKE node bus - to cabinet node N1 |
| CN12 | RJ45 | SPIKE node bus - To Topper accessory Kit |
| CN13 | SD CARD | SD Card connector |
| CN14 | 5-Pin .100" Header | LCD Backlight |
| CN15 | 3-Pin .100" Header | Backbox Light |
| CN16 | 4-Pin .100" Header | 3.3v / 5v / 12v |
| CN17 | ETHERNET | ETHERNET connector |
| CN21 | SATA Header | SATA connector |
| CN22 | RJ45 | SPIKE node bus - to playfield node |
| CN25 | 12-Pin .100" Header | Dedicated switch inputs - service, volume switches |

COMPONENTS

| ID | Name |
|----------------|---|
| S1 | DIP Switches |
| S2 | Reset Switch |
| SD CARD (CN13) | For system SD card. Note: only to be removed if instructed to by Stern Service. |
| BT1 | BR1225 3V Lithium battery for game clock between power cycles |

STATUS LEDs

| LED ID | Name | Color | Description |
|----------|--------------------------------------|-------|--|
| 48V | +48V Supply In | Red | ON: Main system power is connected. OFF: No 48V system power. Check power supply connections, cables, and fuses. |
| 3.3V | +3.3V Logic | Red | ON: Logic power supply is good. OFF: Logic power supply bad, call tech support. |
| 5V | +5V Logic | Red | ON: Logic power supply is good. OFF: Logic power supply bad, call tech support. |
| 12V | +12V Backbox Illumination | Red | ON: Back box LED power good. OFF: Backbox LED power bad, call tech support. |
| VA | +30V Audio | Red | ON: Audio power supply is good. OFF: Audio power supply off, call tech support. |
| VNB | +9V Node Bus | Red | Power for the Node bus. ON: Power for node bus good. OFF: Power to node bus not detected, call tech support. |
| 5V (CPU) | +5V Logic | Red | ON: Logic power supply is good. OFF: Logic power supply bad, call tech support. |
| SDIO ACT | Not Used | Red | Should remain unlit as it is not currently used. |
| STATUS | CPU Heartbeat, System Status | Red | Double blink ~1/2 second: Good, Processor running. OFF: Processor not running, call tech support. |
| μSD ACT | Activity indicator for micro SD Card | Red | Should blink rapidly when reading or writing to micro SD card. |
| D23 | Netbridge Status | Red | Should blink once every ~1/2 second. |



SPIKE-2 CPU NODE 0 CONTINUED

AUDIO PINOUTS

| ID | Type | Pin | Description | Minimum Impedance | Max Power (RMS) |
|-----|--------------------|-----|--------------------------|-------------------|-----------------|
| CN1 | .156" 5-pin Header | 1 | Speaker Right Ground (-) | 4 Ohms | - |
| | | 2 | Speaker Right (+) | 4 Ohms | 20W |
| | | 3 | n/c | - | - |
| | | 4 | Speaker Left Ground (-) | 4 Ohms | - |
| | | 5 | Speaker Left (+) | 4 Ohms | 20W |
| CN3 | .100" 7-pin Header | 1 | n/c | - | - |
| | | 2 | L-HP | 16 Ohms | 15 mW |
| | | 3 | R-HP | 16 Ohms | 15 mW |
| | | 4 | n/c | - | - |
| | | 5 | Headphone Detect | - | - |
| | | 6 | Headphone vol + | - | - |
| | | 7 | Headphone vol - | - | - |
| CN4 | .156" 2-pin Header | 1 | Woofer Ground (-) | 8 Ohms | - |
| | | 2 | Woofer Out (+) | 8 Ohms | 40W |
| CN5 | .100" 7-pin Header | 1 | n/c | - | - |
| | | 2 | L-IN | 30K Ohms | 0.6VRMS |
| | | 3 | R-IN | 30K Ohms | 0.6VRMS |
| | | 4 | n/c | - | - |
| | | 5 | L-OUT | 10K Ohms | 1.5V |
| | | 6 | R-OUT | 10K Ohms | 1.5V |
| | | 7 | Woofer Line Out | 10K Ohms | 1.5V |

COUNTRY CODES (DIP S2)

| Country | DIP S2 | | | | | | | |
|----------------|--------|-----|-----|-----|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| USA | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| Austria | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| Australia | ON | OFF | ON | ON | OFF | OFF | OFF | OFF |
| Belgium | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF |
| Canada 1 | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF |
| Canada 2 | OFF | ON | OFF | ON | ON | OFF | OFF | OFF |
| China | OFF | OFF | ON | ON | ON | OFF | OFF | OFF |
| Croatia | OFF | ON | ON | OFF | ON | OFF | OFF | OFF |
| Denmark | ON | OFF | OFF | ON | OFF | OFF | OFF | OFF |
| Finland | ON | OFF | ON | OFF | OFF | OFF | OFF | OFF |
| France | OFF | ON | ON | OFF | OFF | OFF | OFF | OFF |
| Germany | ON | ON | ON | OFF | OFF | OFF | OFF | OFF |
| Greece | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| Italy | OFF | OFF | OFF | ON | OFF | OFF | OFF | OFF |
| Japan | ON | OFF | ON | OFF | ON | OFF | OFF | OFF |
| Middle East | ON | ON | ON | OFF | ON | OFF | OFF | OFF |
| Netherlands | OFF | OFF | ON | OFF | OFF | OFF | OFF | OFF |
| New Zealand | OFF | OFF | OFF | OFF | ON | OFF | OFF | OFF |
| Norway | OFF | ON | OFF | ON | OFF | OFF | OFF | OFF |
| Portugal | ON | OFF | OFF | OFF | OFF | ON | OFF | OFF |
| Russia | ON | OFF | OFF | ON | ON | OFF | OFF | OFF |
| S. Africa | OFF | OFF | ON | OFF | ON | OFF | OFF | OFF |
| Spain | OFF | ON | OFF | OFF | ON | OFF | OFF | OFF |
| Sweden | ON | ON | OFF | ON | OFF | OFF | OFF | OFF |
| Switzerland | OFF | OFF | ON | ON | OFF | OFF | OFF | OFF |
| Taiwan | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |
| United Kingdom | OFF | ON | ON | ON | OFF | OFF | OFF | OFF |

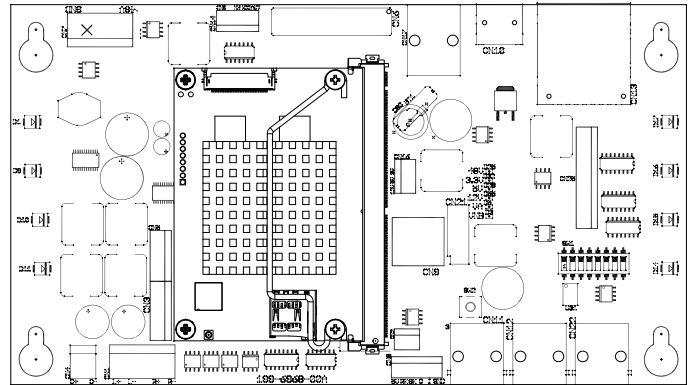


Figure 4.1.1. SPIKE 2 CPU Node connector detail.

COIN DOOR SERVICE SWITCH WIRING

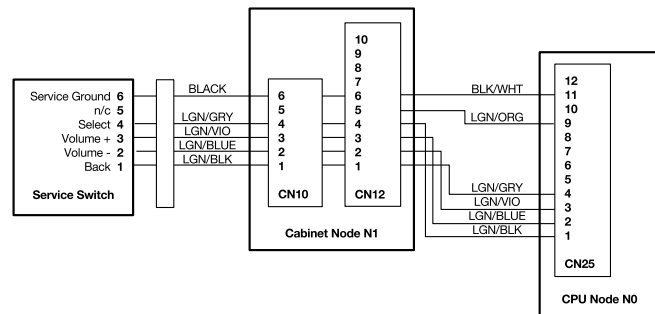


Figure 4.1.2. Service switch wiring. Note that the Cabinet Node must be present and CN10 and CN12 connected for the Coin Door Service Switches to function correctly.



USA & INTERNATIONAL (NON-EURO) STANDARD PRICING SELECT TABLE

| CPU/SOUND PCB DIP SWITCH SW1 SETTING | | COUNTRY SETTING OPTION(S) | COIN MECHANISMS (SWITCHES) COINS THRU ... SLOT: | | | | PRICING SCHEME Number of Plays (Credits) for Price Amount Shown See "Appendix J" for Coin Cards Examples & Info! | Requires SPI Coin Card(s) Part Number |
|--------------------------------------|-----------------|---------------------------|--|--------|-------|------|--|--|
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | LEFT | CENTER | RIGHT | 4TH | | |
| ON | 1 2 3 4 5 6 7 8 | USA 1 | 0.25 | 1.00 | 0.25 | | USD // UNITED STATES DOLLAR // [\$] | |
| OFF | 1 2 3 4 5 6 7 8 | USA 2 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 3 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 4 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 5 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 6 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 7 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 8 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 9 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 10 | | | | | | |
| | 1 2 3 4 5 6 7 8 | USA 11 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | AUSTRALIA 1 | 0.20 | 1.00 | 2.00 | | AUD // AUSTRALIAN DOLLARS // [SAUS] | |
| OFF | 1 2 3 4 5 6 7 8 | AUSTRALIA 2 | | | | | | |
| | 1 2 3 4 5 6 7 8 | AUSTRALIA 3 | | | | | | |
| | 1 2 3 4 5 6 7 8 | AUSTRALIA 4 | | | | | | |
| | 1 2 3 4 5 6 7 8 | AUSTRALIA 5 | | | | | | |
| | 1 2 3 4 5 6 7 8 | AUSTRALIA 6 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | CANADA 1 [25¢ door] | 0.25 | 0.25 | 1.00 | 2.00 | CAD // CANADIAN DOLLARS // [\$CAN] | |
| OFF | 1 2 3 4 5 6 7 8 | CANADA 2 [dollar door] | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | CROATIA | 1 | 2 | 5 | | HRK // CROATIAN KUNA // [kuna] | |
| ON | 1 2 3 4 5 6 7 8 | DENMARK 1 | 1 | 5 | 10 | 20 | DKK // DANISH KRONER // [Kr] | |
| OFF | 1 2 3 4 5 6 7 8 | DENMARK 2 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | JAPAN 1 | 100 | | 100 | | JPY // JAPANESE YEN // [¥] | |
| OFF | 1 2 3 4 5 6 7 8 | JAPAN 2 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | MIDDLE EAST | token | | token | | TOKEN // Middle East currency used to buy token // [TOKEN] | |
| ON | 1 2 3 4 5 6 7 8 | NEW ZEALAND 1 | 1 | | 2 | | NZD // NEW ZEALAND DOLLAR // [\$NZD] | |
| OFF | 1 2 3 4 5 6 7 8 | NEW ZEALAND 2 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | NORWAY 1 | 10 | 5 | 20 | | NOK // NORWEGIAN KRONE // [Kr] | |
| OFF | 1 2 3 4 5 6 7 8 | NORWAY 2 | | | | | | |
| | 1 2 3 4 5 6 7 8 | NORWAY 3 | | | | | | |
| | 1 2 3 4 5 6 7 8 | NORWAY 4 | | | | | | |
| | 1 2 3 4 5 6 7 8 | NORWAY 5 | | | | | | |
| | 1 2 3 4 5 6 7 8 | NORWAY 6 | | | | | | |
| | 1 2 3 4 5 6 7 8 | NORWAY 7 | | | | | | |
| | 1 2 3 4 5 6 7 8 | NORWAY 8 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | RUSSIA | 10 | 5 | 1 | | RUB // RUSSIAN RUBLE // [Ruble] | |
| ON | 1 2 3 4 5 6 7 8 | SO. AFRICA 1 | 0.50 | 1.00 | 1.00 | 1.00 | ZAR // SOUTH AFRICAN RAND // [R] | |
| OFF | 1 2 3 4 5 6 7 8 | SO. AFRICA 2 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | SWEDEN 1 | 1 | 5 | 10 | | SEK // SWEDISH KRONOR // [kr] | |
| OFF | 1 2 3 4 5 6 7 8 | SWEDEN 2 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | SWITZERLAND 1 | 1 | 2 | 5 | | CHF // SWISS FRANCS // [Sfr] | |
| OFF | 1 2 3 4 5 6 7 8 | SWITZERLAND 2 | | | | | | |
| ON | 1 2 3 4 5 6 7 8 | TAIWAN | 10 | | 10 | | TWD // TAIWANESE DOLLAR // [TWD] | |
| ON | 1 2 3 4 5 6 7 8 | UK 1 | 0.10 | 0.50 | 1.00 | 0.20 | GBP // UNITED KINGDOM POUNDS // [£] | |
| OFF | 1 2 3 4 5 6 7 8 | UK 2 | | | | | | |
| | 1 2 3 4 5 6 7 8 | UK 3 | | | | | | |
| | 1 2 3 4 5 6 7 8 | UK 4 | | | | | | |
| | 1 2 3 4 5 6 7 8 | UK 5 | | | | | | |
| | 1 2 3 4 5 6 7 8 | UK 6 | | | | | | |

HIGHLIGHTED = Factory Default

HIGHLIGHTED = Not Shown on Coin Card



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EURO SUMMARY & INTERNATIONAL (EURO) STANDARD PRICING SELECT TABLE

| CPU/SOUND PCB DIP SWITCH SW1 SETTING | | COUNTRY SETTING OPTION(S) | COIN MECHANISMS (SWITCHES) COINS THRU ... SLOT: | | | | PRICING SCHEME Number of Plays (Credits) for Price Amount Shown See "Appendix J" for Coin Cards Examples & Info! | | | | Requires SPI Coin Card(s) Part Number |
|--|-----------------|---------------------------------|--|--------|-------|-------------------------|--|--------|--------|--------|---|
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | LEFT | CENTER | RIGHT | 4TH | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | S E E B E L O W | Euro 1 | 0.50 | 1.00 | 2.00 | 0.20 <i>optional</i> | 1/0.50 | | | | 755-5401-01-Y |
| OFF | S E T T I N G S | Euro 2 | | | | | 1/0.50 | 2/1.00 | 3/1.50 | 5/2.00 | 755-5401-02-Y |
| | | Euro 3 | | | | | 1/0.50 | | 3/1.00 | | 755-5401-03-Y |
| | | Euro 4 | | | | | 1/0.50 | 2/1.00 | 3/1.50 | 6/2.00 | 755-5401-04-Y |
| | | Euro 5 | | | | | 1/0.50 | 3/1.00 | 4/1.50 | 7/2.00 | 755-5401-05-Y |
| | | Euro 6 | | | | | 2/0.50 | | | | 755-5401-06-Y |
| | | Euro 7 | | | | | 1/1.00 | 2/2.00 | 3/3.00 | 5/4.00 | 755-5401-07-Y |
| | | Euro 8 | | | | | 1/1.00 | | 3/2.00 | | 755-5401-08-Y |
| | | Euro 9 | | | | | 1/1.00 | | 2/1.50 | 3/2.00 | 755-5401-09-Y |
| | | Euro 10 | | | | | 1/1.00 | | 3/2.00 | 7/3.00 | 755-5401-10-Y |
| | | Euro 11 | | | | | 1/1.00 | | 4/2.00 | | 755-5401-11-Y |
| | | Euro 12 | | | | | 2/1.00 | 4/2.00 | 6/3.00 | 9/4.00 | 755-5401-12-Y |

For a different Euro Pricing Scheme (other than Factory Default listed below), scroll through Standard Adjustment 18: Euro 1-12 or CUSTOM* for new setting (reference above Euro 1-12 Summary). Keep the Country Dip Switch Setting the same as listed below.

| | | | | | | | | | | | |
|------|-----------------|---------------------|--------|--------|--------|--------|--------------------------------------|--------|--------|--------|---------------|
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | AUSTRIA Euro 9 | | | | | 1/1.00 | 2/1.50 | 3/2.00 | | 755-5401-09-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | BELGIUM Euro 1 | | | | | 1/0.50 | | | | 755-5401-01-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | FINLAND Euro 8 | | | | | 1/1.00 | 3/2.00 | | | 755-5401-08-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | FRANCE Euro 10 | | | | | 1/1.00 | 3/2.00 | 7/3.00 | | 755-5401-10-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | GERMANY 1 | | | | | 1/0.50 | | | | 755-5401-01-Y |
| OFF | ▼ | GERMANY 2 | | | | | 1/0.50 | 2/1.00 | 3/1.50 | 5/2.00 | 755-5401-02-Y |
| | | GERMANY 3 | 1/0.50 | 2/1.00 | 3/1.50 | 6/2.00 | 755-5401-04-Y | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | GREECE Euro 8 | | | | | 1/1.00 | 3/2.00 | | | 755-5401-08-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | | 0.50 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | ITALY 1 | | | | | 1/0.50 | | | | 755-5401-01-Y |
| OFF | ▼ | ITALY 2 | 1/1.00 | 3/2.00 | | | 755-5401-08-Y | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | NETHERLANDS Euro 3 | | | | | 1/0.50 | 3/1.00 | | | 755-5401-03-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | | 0.50 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | PORTUGAL | | | | | 1/0.50 | | | | 755-5401-01-Y |
| OFF | ▼ | | | | | | | | | | |
| Pos. | 1 2 3 4 5 6 7 8 | Default Highlighted | 0.50 | 1.00 | 2.00 | | EUR // EUROPEAN UNION EUROS // [€] | | | | |
| ON | ▲ | SPAIN Euro 8 | | | | | 1/1.00 | 3/2.00 | | | 755-5401-08-Y |
| OFF | ▼ | | | | | | | | | | |

HIGHLIGHTED = Factory Default

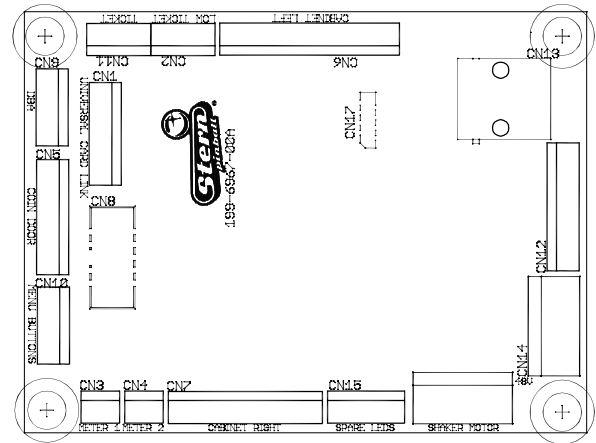
HIGHLIGHTED = Not Shown on Coin Card



4.2 CABINET NODE 1

520-6967-72

| ID | Type | Pin | Description | Wire Color |
|-----|--|-----|-------------------------|------------|
| CN1 | .100" 8-Pin Header Universal Card Link | 1 | 12V | - |
| | | 2 | Coin 1 | - |
| | | 3 | Meter 1 | - |
| | | 4 | N/C | - |
| | | 5 | Notch | - |
| | | 6 | Coin Enable | - |
| | | 7 | Ticket Enable | - |
| | | 8 | Ground | - |
| CN2 | .100" 5-Pin Header low ticket | 1 | Ground | - |
| | | 2 | Ticket Low sw. | - |
| | | 3 | Key | - |
| | | 4 | Ticket Low | - |
| | | 5 | 5V Out | - |
| CN3 | .100" 3-Pin Header Meter 1 | 1 | Meter 12V (+) | RED |
| | | 2 | Meter (-) | BLK |
| | | 3 | N/C | - |
| CN4 | .100" 3-Pin Header Meter 2 | 1 | Meter 12V (+) | RED |
| | | 2 | Meter (-) | BLK |
| | | 3 | N/C | - |
| CN5 | .100" 9-Pin Header | 1 | 5V Out | YEL/WHT |
| | | 2 | Coin LED Out | YEL |
| | | 3 | Ground | BLK |
| | | 4 | Slam Tilt In | LGN/RED |
| | | 5 | Coin 5 | PNK/GRN* |
| | | 6 | Coin 4 | PNK/YEL* |
| | | 7 | Coin 3 | PNK/ORN* |
| | | 8 | Coin 2 | PNK/RED* |
| | | 9 | Coin 1 | PNK/BRN* |
| CN6 | .100" 14-Pin Header Cabinet Left | 1 | 5V LED Power | RED |
| | | 2 | Start 2 LED | YEL-RED |
| | | 3 | Start 1 LED | YEL-BRN |
| | | 4 | Spare LED | - |
| | | 5 | Ground | BLK-WHT |
| | | 6 | Spare Left | - |
| | | 7 | Tilt Input | WHT |
| | | 8 | Door Open | - |
| | | 9 | Start 2 Switch | GRY-WHT |
| | | 10 | Start 1 Switch | GRY |
| | | 11 | N/C | - |
| | | 12 | N/C | - |
| | | 13 | N/C | - |
| | | 14 | N/C | - |
| CN7 | .100" 12-Pin Header Cabinet Right | 1 | 5V LED Power | - |
| | | 2 | Plunge 2 LED | - |
| | | 3 | Plunge 1 LED | - |
| | | 4 | Spare LED 2 | - |
| | | 5 | Ground | - |
| | | 6 | Spare Right In | - |
| | | 7 | Plunge 2 Switch | - |
| | | 8 | Plunge 1 Switch | - |
| | | 9 | N/C | - |
| | | 10 | N/C | - |
| | | 11 | N/C | - |
| | | 12 | N/C | - |
| CN8 | .100" 10-Pin Header dual row. Electronic Coin Mech | 1 | Ground | - |
| | | 2 | 12V | - |
| | | 3 | Coin 5 | - |
| | | 4 | Coin 6 | - |
| | | 5 | N/C | - |
| | | 6 | Coin Enable/Inhibit (+) | - |
| | | 7 | Coin 1 | - |
| | | 8 | Coin 2 | - |
| | | 9 | Coin 3 | - |
| | | 10 | Coin 4 | - |

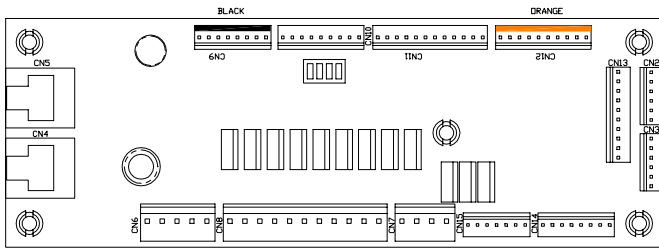


| | | | | |
|------|---|----|------------------------------|---------|
| CN9 | .100" 6-Pin Header Dollar Bill Acceptor | 1 | Coin Enable/DBA Inhibit (-) | - |
| | | 2 | Coin Enable/DBA Inhibit (+) | - |
| | | 3 | Key | Key |
| | | 4 | DBA 12V | - |
| | | 5 | Coin 6 / DBA Credit | - |
| | | 6 | Ground | - |
| CN10 | .100" 6-Pin Header Service Switch In | 1 | Service Back (To Coindoor) | LGN-BLK |
| | | 2 | Service Down (To Coindoor) | LGN-BLU |
| | | 3 | Service Up (To Coindoor) | LGN-VIO |
| | | 4 | Service Select (To Coindoor) | LGN-GRY |
| | | 5 | Key | Key |
| | | 6 | Service Ground (To Coindoor) | BLK |
| CN11 | .100" 5-Pin Header Ticket Dispenser | 1 | 12V | RED |
| | | 2 | N/C | - |
| | | 3 | Ticket Dispenser Enable | WHT |
| | | 4 | Ground | BLK |
| | | 5 | Ticket Dispenser Notch | BLU |
| CN12 | .100" 10-Pin Header CPU Direct Switches | 1 | Service Back (To CPU) | LGN-BLK |
| | | 2 | Service Down (To CPU) | LGN-BLU |
| | | 3 | Service Up (To CPU) | LGN-VIO |
| | | 4 | Service Select (To CPU) | LGN-GRY |
| | | 5 | Power Present | LGN-ORG |
| | | 6 | Service Ground (To CPU) | BLK-WHT |
| | | 7 | N/C | - |
| | | 8 | N/C | - |
| | | 9 | N/C | - |
| | | 10 | N/C | - |
| CN14 | .156" 5-Pin Header Power Input | 1 | Ground | BLK |
| | | 2 | Key | Key |
| | | 3 | N/C | - |
| | | 4 | N/C | - |
| | | 5 | 48VDC In | GRY-YEL |
| CN15 | .100" 6-Pin Header Spare LED's | 1 | 5V LED Power | - |
| | | 2 | Key | Key |
| | | 3 | Spare LED 3 | - |
| | | 4 | Spare LED 4 | - |
| | | 5 | Spare LED 5 | - |
| | | 6 | Spare LED 6 | - |
| CN16 | .156" 5-Pin Header Shaker Motor | 1 | Shaker Motor (-) | BLU |
| | | 2 | Shaker Motor (-) | - |
| | | 3 | Shaker Motor (+) | - |
| | | 4 | Key | Key |
| | | 5 | Shaker Motor (+) | RED |
| | | | *Varies by country model | |



4.3 LOWER PLAYFIELD 48V DRIVER PINOUT NODE 8

520-7017-72



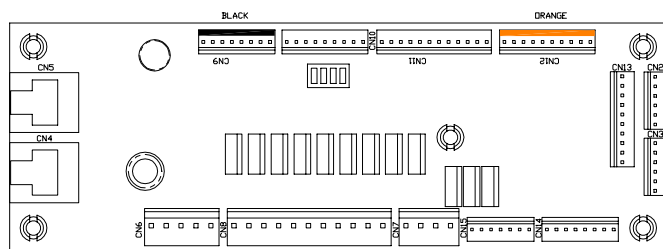
| ID | Type | Pin | Description | Wire Color |
|------|----------------------------------|-----|--------------------------|------------|
| SW1 | Address DIP | - | Node 8 - OFF-OFF-OFF-OFF | - |
| CN4 | RJ45 | - | SPIKE Node Bus | Multi |
| CN5 | RJ45 | - | SPIKE Node Bus | Multi |
| CN6 | .156" 5-Pin Header Node Power | 1 | Ground | BLK |
| | | 2 | Key | Key |
| | | 3 | N/C | - |
| | | 4 | N/C | - |
| | | 5 | 48VDC In | GRY |
| CN7 | .156" 4-Pin Header (White) | 1 | 48V Driver Power | GRY-ORG |
| | | 2 | 8-DR-8 Driver Return | YEL-RED |
| | | 3 | 8-DR-6 Driver Return | YEL-BLK |
| | | 4 | 8-DR-7 Driver Return | YEL-BRN |
| CN8 | .156 11-Pin Header (White) | 1 | 48V Driver Power | GRY-ORG |
| | | 2 | 48V Driver Power | GRY-ORG |
| | | 3 | 48V Driver Power | GRY-ORG |
| | | 4 | 48V Driver Power | GRY-ORG |
| | | 5 | 8-DR-0 Driver Return | ORG-GRN |
| | | 6 | 8-DR-5 Driver Return | ORG-YEL |
| | | 7 | 8-DR-1 Driver Return | ORG-GRY |
| | | 8 | 8-DR-8 Driver Return | - |
| | | 9 | 8-DR-4 Driver Return | ORG-WHT |
| | | 10 | 8-DR-2 Driver Return | ORG-VIO |
| | | 11 | 8-DR-3 Driver Return | ORG-BLU |
| CN9 | .100" 8-Pin Header | 1 | V+ | - |
| | | 2 | V+ | - |
| | | 3 | 8-SW-24 Switch | GRY-RED |
| | | 4 | 8-SW-25 Switch | GRY-BRN |
| | | 5 | 8-SW-26 Switch | VIO WHT |
| | | 6 | 8-SW-27 Switch | VIO |
| | | 7 | Ground | BLK-GRN |
| | | 8 | Ground | BLK VIO |
| CN10 | .100" 9-Pin Header | 1 | V+ | - |
| | | 2 | 8-SW-28 Switch | GRY-WHT |
| | | 3 | 8-SW-29 Switch | GRY-VIO |
| | | 4 | 8-SW-30 Switch | GRY-BLU |
| | | 5 | 8-SW-31 Switch | GRY-GRN |
| | | 6 | 8-SW-16 Switch | GRY-YEL |
| | | 7 | Ground | BLK-GRN |
| | | 8 | Ground | BLK-GRN |
| | | 9 | Ground | BLK-GRN |

| | | | | |
|------|--|----|----------------------|---------|
| CN11 | .100" 12-Pin Header | 1 | V+ | RED |
| | | 2 | 8-SW-26 Switch | - |
| | | 3 | 8-SW-27 Switch | - |
| | | 4 | 8-SW-17 Switch | LGN-RED |
| | | 5 | 8-SW-18 Switch | LGN-ORG |
| | | 6 | 8-SW-19 Switch | LGN-YEL |
| | | 7 | 8-SW-20 Switch | LGN-BLU |
| | | 8 | 8-SW-21 Switch | LGN-VIO |
| | | 9 | 8-SW-22 Switch | LGN-GRY |
| | | 10 | 8-SW-23 Switch | LGN-WHT |
| | | 11 | Ground | BLK-ORG |
| | | 12 | Ground | BLK-ORG |
| CN12 | .100" 10-Pin Header (Orange) | 1 | V+ | - |
| | | 2 | 8-SW-8 Switch | - |
| | | 3 | 8-SW-9 Switch | - |
| | | 4 | 8-SW-10 Switch | GRY |
| | | 5 | 8-SW-11 Switch | WHT |
| | | 6 | 8-SW-12 Switch | WHT-GRN |
| | | 7 | 8-SW-13 Switch | WHT-BLU |
| | | 8 | 8-SW-14 Switch | PNK-BLK |
| | | 9 | 8-SW-15 Switch | PNK-BRN |
| | | 10 | Ground | BLK-RED |
| CN13 | .100" 10-Pin Header | 1 | V+ | - |
| | | 2 | 8-SW-0 Switch | - |
| | | 3 | 8-SW-1 Switch | - |
| | | 4 | 8-SW-2 Switch | - |
| | | 5 | 8-SW-3 Switch | - |
| | | 6 | 8-SW-4 Switch | - |
| | | 7 | 8-SW-5 Switch | - |
| | | 8 | 8-SW-6 Switch | - |
| | | 9 | 8-SW-7 Switch | - |
| | | 10 | Ground | - |
| CN14 | .100" 8-Pin Header | 1 | Ground | BLK |
| | | 2 | 8-LP-7 Driver Return | - |
| | | 3 | 8-LP-6 Driver Return | YEL-BRN |
| | | 4 | 8-LP-5 Driver Return | BRN-RED |
| | | 5 | 8-LP-4 Driver Return | BRN |
| | | 6 | 8-LP-3 Driver Return | - |
| | | 7 | LED V+ | YEL |
| | | 8 | LED V+ | YEL |
| CN15 | .100" 7-Pin Header | 1 | LED V+ | YEL-RED |
| | | 2 | LED V+ | YEL-BLK |
| | | 3 | LED V+ | - |
| | | 4 | - | - |
| | | 5 | 8-LP-0 GI Return | RED-BLK |
| | | 6 | 8-LP-1 GI Return | WHT-BLK |
| | | 7 | 8-LP-2 GI Return | - |
| CN2 | .100" 6-Pin Header, Node Extension Bus | 1 | Ground | BLK |
| | | 2 | DIN | VIO-BLK |
| | | 3 | DOU | VIO-BRN |
| | | 4 | SCK | VIO-RED |
| | | 5 | RCK | VIO-ORG |
| | | 6 | V+ | RED |
| CN3 | .100" 6-Pin Header, Node Extension Bus | 1 | Ground | BLK |
| | | 2 | DIN | VIO-BLK |
| | | 3 | DOU | VIO-BRN |
| | | 4 | SCK | VIO-RED |
| | | 5 | RCK | VIO-ORG |
| | | 6 | V+ | RED |



4.4 MID UPPER PLAYFIELD 48V DRIVER PINOUT NODE 9

520-7017-72

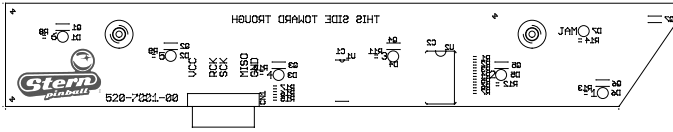


| ID | Type | Pin | Description | Wire Color |
|------|-------------------------------|-----|-------------------------|------------|
| SW1 | Address DIP | - | Node 9 - OFF-OFF-ON-OFF | - |
| CN4 | RJ45 | - | SPIKE Node Bus | Multi |
| CN5 | RJ45 | - | SPIKE Node Bus | Multi |
| CN6 | .156" 5-Pin Header Node Power | 1 | Ground | BLK |
| | | 2 | Key | Key |
| | | 3 | N/C | - |
| | | 4 | N/C | - |
| | | 5 | 48VDC In | GRY |
| CN7 | .156" 4-Pin Header (White) | 1 | 48V Driver Power | GRY-BRN |
| | | 2 | 9-DR-8 Driver Return | - |
| | | 3 | 9-DR-6 Driver Return | BRN-BLK |
| | | 4 | 9-DR-7 Driver Return | - |
| CN8 | .156" 11-Pin Header (White) | 1 | 48V Driver Power | GRY-BRN |
| | | 2 | 48V Driver Power | GRY-BRN |
| | | 3 | 48V Driver Power | GRY-BRN |
| | | 4 | 48V Driver Power | GRY-BRN |
| | | 5 | 9-DR-0 Driver Return | BRN-RED |
| | | 6 | 9-DR-5 Driver Return | BLU-BRN |
| | | 7 | 9-DR-1 Driver Return | BLU-RED |
| | | 8 | 9-DR-8 Driver Return | - |
| | | 9 | 9-DR-4 Driver Return | ORG-RED |
| | | 10 | 9-DR-2 Driver Return | ORG-BLK |
| | | 11 | 9-DR-3 Driver Return | ORG-BRN |
| CN9 | .100" 8-Pin Header | 1 | V+ | RED |
| | | 2 | V+ | - |
| | | 3 | 9-SW-24 Switch | LGN-ORG |
| | | 4 | 9-SW-25 Switch | LGN-YEL |
| | | 5 | 9-SW-26 Switch | LGN-BLU |
| | | 6 | 9-SW-27 Switch | LGN-VIO |
| | | 7 | Ground | - |
| | | 8 | Ground | BLK-BLU |
| CN10 | .100" 9-Pin Header | 1 | V+ | RED |
| | | 2 | 9-SW-28 Switch | GRY-BLK |
| | | 3 | 9-SW-29 Switch | GRY-BRN |
| | | 4 | 9-SW-30 Switch | GRY-RED |
| | | 5 | 9-SW-31 Switch | GRY-ORG |
| | | 6 | 9-SW-16 Switch | - |
| | | 7 | Ground | BLK-BLU |
| | | 8 | Ground | BLK-BLU |
| | | 9 | Ground | BLK-BLU |

| | | | | |
|------|--|----|----------------------|---------|
| CN11 | .100" 12-Pin Header | 1 | V+ | RED |
| | | 2 | 9-SW-26 Switch | - |
| | | 3 | 9-SW-27 Switch | - |
| | | 4 | 9-SW-17 Switch | TAN-ORG |
| | | 5 | 9-SW-18 Switch | TAN-YEL |
| | | 6 | 9-SW-19 Switch | TAN-GRN |
| | | 7 | 9-SW-20 Switch | TAN-BLU |
| | | 8 | 9-SW-21 Switch | TAN-VIO |
| | | 9 | 9-SW-22 Switch | TAN-WHT |
| | | 10 | 9-SW-23 Switch | TAN |
| | | 11 | Ground | BLK-GRY |
| | | 12 | Ground | BLK-GRY |
| CN12 | .100" 10-Pin Header (Orange) | 1 | V+ | RED |
| | | 2 | 9-SW-8 Switch | WHT-BRN |
| | | 3 | 9-SW-9 Switch | WHT-RED |
| | | 4 | 9-SW-10 Switch | WHT-ORG |
| | | 5 | 9-SW-11 Switch | WHT-YEL |
| | | 6 | 9-SW-12 Switch | WHT-GRN |
| | | 7 | 9-SW-13 Switch | WHT-BLU |
| | | 8 | 9-SW-14 Switch | WHT-VIO |
| | | 9 | 9-SW-15 Switch | WHT-GRY |
| | | 10 | Ground | BLK-WHT |
| CN13 | .100" 10-Pin Header | 1 | V+ | - |
| | | 2 | 9-SW-0 Switch | - |
| | | 3 | 9-SW-1 Switch | - |
| | | 4 | 9-SW-2 Switch | - |
| | | 5 | 9-SW-3 Switch | - |
| | | 6 | 9-SW-4 Switch | - |
| | | 7 | 9-SW-5 Switch | - |
| | | 8 | 9-SW-6 Switch | - |
| | | 9 | 9-SW-7 Switch | - |
| | | 10 | Ground | - |
| CN14 | .100" 8-Pin Header | 1 | Ground | - |
| | | 2 | 9-LP-7 Driver Return | RED-BRN |
| | | 3 | 9-LP-6 Driver Return | GRN-BRN |
| | | 4 | 9-LP-5 Driver Return | BLU-BRN |
| | | 5 | 9-LP-4 Driver Return | ORG-WHT |
| | | 6 | 9-LP-3 Driver Return | ORG-BRN |
| | | 7 | LED V+ | YEL |
| | | 8 | LED V+ | YEL |
| CN15 | .100" 7-Pin Header | 1 | LED V+ | YEL-RED |
| | | 2 | LED V+ | YEL-BLK |
| | | 3 | LED V+ | YEL-GRN |
| | | 4 | - | - |
| | | 5 | 9-LP-0 GI Return | RED-BLK |
| | | 6 | 9-LP-1 GI Return | WHT-BLK |
| | | 7 | 9-LP-2 GI Return | GRN-BLK |
| CN2 | .100" 6-Pin Header, Node Extension Bus | 1 | Ground | - |
| | | 2 | DIN | - |
| | | 3 | DOUT | - |
| | | 4 | SCK | - |
| | | 5 | RCK | - |
| | | 6 | V+ | - |
| CN3 | .100" 6-Pin Header, Node Extension Bus | 1 | Ground | BLK |
| | | 2 | DIN | VIO-BLK |
| | | 3 | DOUT | VIO-BRN |
| | | 4 | SCK | VIO-RED |
| | | 5 | RCK | VIO-ORG |
| | | 6 | V+ | RED |

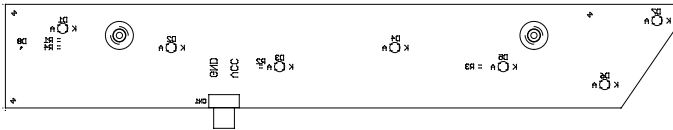


4.5 TROUGH SERIAL OPTO RECEIVER EXTENSION 8A 520-7001-00



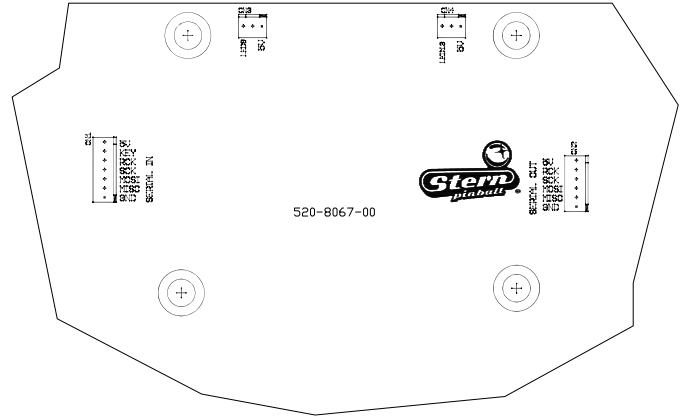
| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|--------------------|------------|
| CN1 | .100" 7-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | - |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | N/C | - |
| | | 7 | +5 VDC IN | RED |

4.6 TROUGH SERIAL OPTO TRANSMITTER 520-5344-00



| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|-------------|------------|
| CN1 | .100" 3-Pin Header | 1 | Ground | BLK |
| | | 2 | N/C | - |
| | | 3 | +5 VDC IN | RED |

4.7 LOWER CENTER LED BOARD 8B 520-8067-00

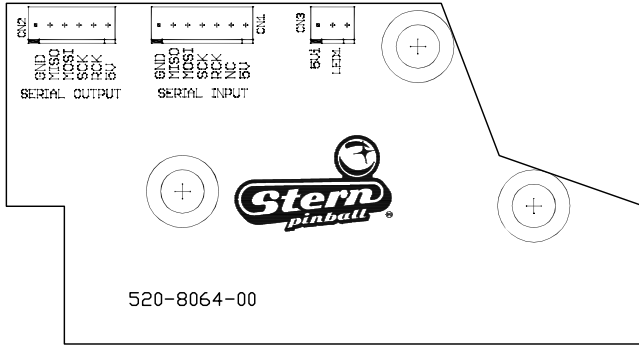


| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|--------------------|------------|
| CN1 | .100" 7-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | VIO-BRN |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | n/c | - |
| | | 7 | +5 VDC IN | RED |
| CN2 | .100" 6-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | VIO-BRN |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | V+ | RED |
| CN3 | .100" 3-Pin Header | 1 | +5 VDC | RED |
| | | 2 | n/c | - |
| | | 3 | LP-9 Light Return | ORG |
| CN4 | .100" 3-Pin Header | 1 | +5 VDC | RED |
| | | 2 | n/c | - |
| | | 3 | LP-13 Light Return | ORG |



4.8 DROP TARGET 2 LED BOARD 8C

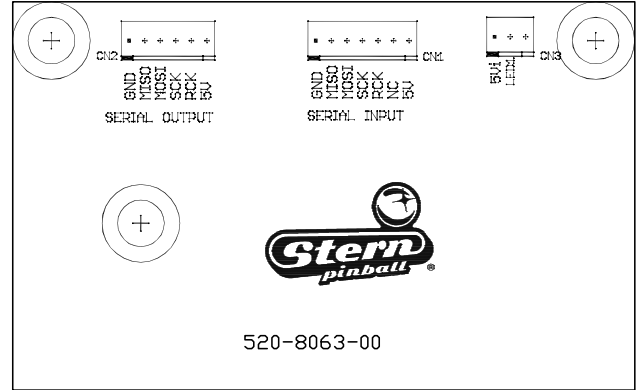
520-8064-00



| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|--------------------|------------|
| CN1 | .100" 7-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | VIO-BRN |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | n/c | - |
| | | 7 | +5 VDC IN | RED |
| CN2 | .100" 6-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | VIO-BRN |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | V+ | RED |
| CN3 | .100" 3-Pin Header | 1 | +5 VDC | RED |
| | | 2 | n/c | - |
| | | 3 | LP-1 Light Return | ORG |

4.9 DROP TARGET 1 LED BOARD 8D

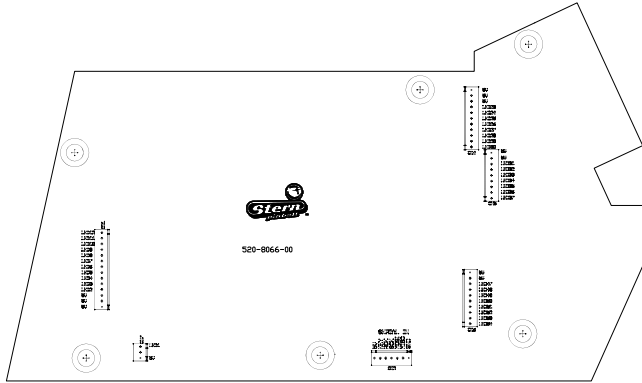
520-8063-00



| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|--------------------|------------|
| CN1 | .100" 7-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | VIO-BRN |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | n/c | - |
| | | 7 | +5 VDC IN | RED |
| CN2 | .100" 6-Pin Header | 1 | Ground | - |
| | | 2 | MISO Output Data | - |
| | | 3 | MOSI Input Data | - |
| | | 4 | SCK Serial Clock | - |
| | | 5 | RCK Register Clock | - |
| | | 6 | V+ | - |
| CN3 | .100" 3-Pin Header | 1 | +5 VDC | RED |
| | | 2 | n/c | - |
| | | 3 | LP-1 Light Return | ORG |

4.10 MAIN CENTER LED BOARD 9A

520-8066-00

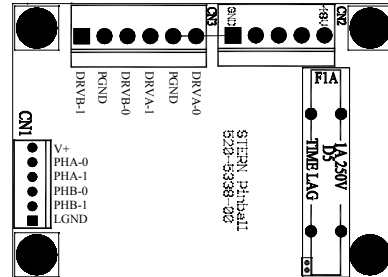


| ID | Type | Pin | Description | Wire Color |
|-----|---------------------|-----|--------------------|------------|
| CN1 | .100" 14-Pin Header | 1 | +5 VDC | RED |
| | | 2 | +5 VDC | RED |
| | | 3 | +5 VDC | RED |
| | | 4 | LP-2 Light Return | RED-BLU |
| | | 5 | LP-3 Light Return | RED-VIO |
| | | 6 | LP-4 Light Return | RED-GRY |
| | | 7 | LP-5 Light Return | RED-WHT |
| | | 8 | LP-6 Light Return | GRN-RED |
| | | 9 | LP-7 Light Return | GRN-YEL |
| | | 10 | LP-8 Light Return | GRN |
| | | 11 | LP-9 Light Return | GRN-BLU |
| | | 12 | LP-10 Light Return | GRN-VIO |
| | | 13 | LP-11 Light Return | GRN-GRY |
| | | 14 | LP-12 Light Return | GRN-WHT |
| CN2 | .100" 7-Pin Header | 1 | Ground | BLK |
| | | 2 | MISO Output Data | VIO-BLK |
| | | 3 | MOSI Input Data | VIO-BRN |
| | | 4 | SCK Serial Clock | VIO-RED |
| | | 5 | RCK Register Clock | VIO-ORG |
| | | 6 | n/c | - |
| | | 7 | +5 VDC IN | RED |
| CN3 | .100" 6-Pin Header | 1 | Ground | - |
| | | 2 | MISO Output Data | - |
| | | 3 | MOSI Input Data | - |
| | | 4 | SCK Serial Clock | - |
| | | 5 | RCK Register Clock | - |
| | | 6 | V+ | - |
| CN4 | .100" 11-Pin Header | 1 | +5 VDC | RED |
| | | 2 | +5 VDC | RED |
| | | 3 | +5 VDC | - |
| | | 4 | LP-23 Light Return | BLU-YEL |
| | | 5 | LP-24 Light Return | BLU-GRN |
| | | 6 | LP-25 Light Return | BLU |
| | | 7 | LP-26 Light Return | BLU-VIO |
| | | 8 | LP-27 Light Return | BRN-BLK |
| | | 9 | LP-28 Light Return | BRN |
| | | 10 | LP-29 Light Return | BRN-RED |
| | | 11 | LP-30 Light Return | ORG-BLK |

| | | | | |
|-----|---------------------|----|--------------------|---------|
| CN5 | .100" 9-Pin Header | 1 | +5 VDC | RED |
| | | 2 | +5 VDC | RED |
| | | 3 | LP-31 Light Return | BRN-ORG |
| | | 4 | LP-32 Light Return | BRN-YEL |
| | | 5 | LP-33 Light Return | BRN-GRN |
| | | 6 | LP-34 Light Return | BRN-BLU |
| | | 7 | LP-35 Light Return | BRN-VIO |
| | | 8 | LP-36 Light Return | BRN-GRY |
| | | 9 | LP-37 Light Return | BRN-WHT |
| CN6 | .100" 10-Pin Header | 1 | +5 VDC | RED |
| | | 2 | +5 VDC | RED |
| | | 3 | LP-47 Light Return | RED-ORG |
| | | 4 | LP-48 Light Return | GRN-ORG |
| | | 5 | LP-49 Light Return | BLU-ORG |
| | | 6 | LP-50 Light Return | ORG-YEL |
| | | 7 | LP-51 Light Return | ORG-GRN |
| | | 8 | LP-52 Light Return | ORG-BLU |
| | | 9 | LP-53 Light Return | ORG-VIO |
| | | 10 | LP-54 Light Return | ORG-GRY |
| CN8 | .100" 3-Pin Header | 1 | +5 VDC | RED |
| | | 2 | n/c | - |
| | | 3 | LP-1 Light Return | ORG |

4.11 DUAL MOTOR DRIVER

520-5338-00

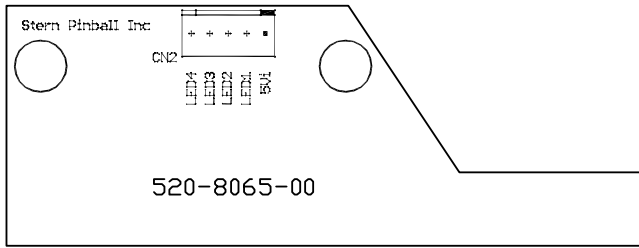


| ID | Type | Pin | Description | Wire Color |
|-----|-----------------------|-----|-------------|------------|
| CN1 | .100" 6-Pin Connector | 1 | Ground | BLK |
| | | 2 | PHB1 | - |
| | | 3 | PHB0 | - |
| | | 4 | PHA1 | BRN-RED |
| | | 5 | PHA0 | BRN |
| | | 6 | V+ | YEL |
| CN2 | .156 5-Pin Connector | 1 | GND | BLK |
| | | 2 | KEY | Key |
| | | 3 | N/C | - |
| | | 4 | N/C | - |
| | | 5 | +48 VDC IN | GRY |
| CN3 | .156 6-Pin connector | 1 | DRIVEB-1 | - |
| | | 2 | Ground | - |
| | | 3 | DRIVEB-0 | - |
| | | 4 | DRIVEA-1 | BLK |
| | | 5 | Ground | - |
| | | 6 | DRIVEA-0 | BLK |



4.12 RIGHT LED BOARD

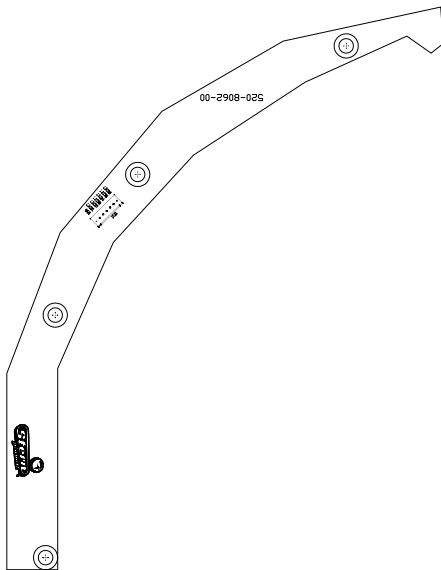
520-8065-00



| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|-------------|------------|
| CN2 | .100" 5-Pin Header | 1 | +5 VDC | RED |
| | | 2 | LED 1 | RED-BLU |
| | | 3 | LED 2 | RED-VIO |
| | | 4 | LED 3 | RED-GRY |
| | | 5 | LED 4 | RED-WHT |

4.13 HALF CURVE LED BOARD - LEFT

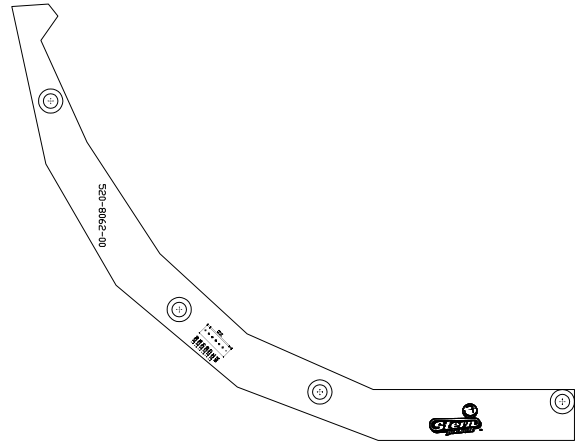
520-8062-00



| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|-------------|------------|
| CN1 | .100" 7-Pin Header | 1 | +5 VDC | RED |
| | | 2 | LED 1 | BRN-WHT |
| | | 3 | LED 2 | BRN-GRY |
| | | 4 | LED 3 | BRN-VIO |
| | | 5 | LED 4 | BRN-BLU |
| | | 6 | LED 5 | BRN-GRN |
| | | 7 | LED 6 | BRN-YEL |

4.14 HALF CURVE LED BOARD - RIGHT

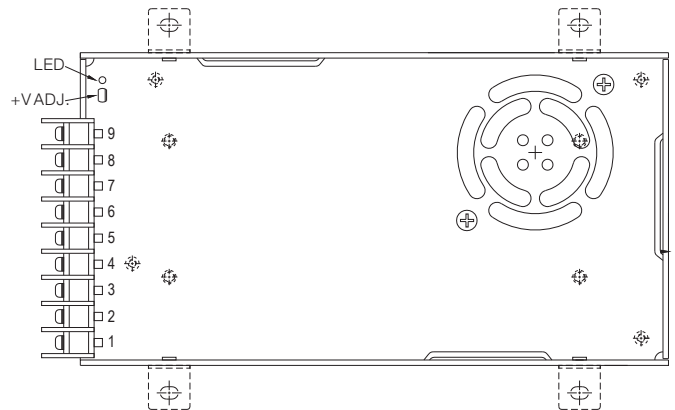
520-8062-00



| ID | Type | Pin | Description | Wire Color |
|-----|--------------------|-----|-------------|------------|
| CN1 | .100" 7-Pin Header | 1 | +5 VDC | RED |
| | | 2 | LED 1 | GRN-YEL |
| | | 3 | LED 2 | GRN |
| | | 4 | LED 3 | GRN-BLU |
| | | 5 | LED 4 | GRN-VIO |
| | | 6 | LED 5 | GRN-GRY |
| | | 7 | LED 6 | GRN-WHT |

4.15 MAIN POWER SUPPLY

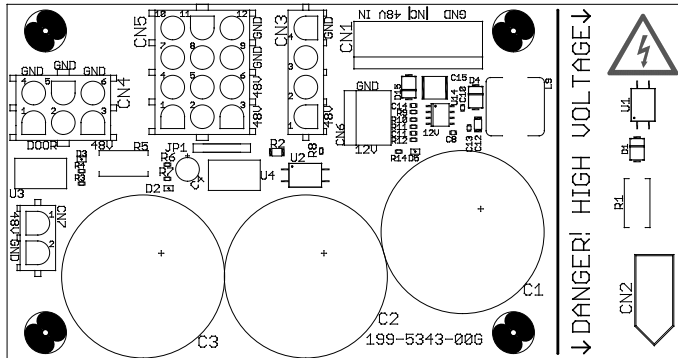
011-5003-00



| ID | Type | Pin | Description | Wire Color |
|-----|----------------|-----|--------------------|------------|
| CN1 | Screw Terminal | 1 | AC Line Hot In | BLK |
| | | 2 | AC Line Neutral In | WHT |
| | | 3 | Earth Ground In | GRN |
| | | 4 | DC Ground | BLK |
| | | 5 | DC Ground | BLK |
| | | 6 | DC Ground | BLK |
| | | 7 | +48 V System Power | GRY |
| | | 8 | +48 V System Power | GRY |
| | | 9 | +48 V System Power | GRY |



4.16 POWER DISTRIBUTION BOARD 520-5343-01



| ID | Type | Pin | Description | Wire Color |
|-----|--|-----|------------------------------|------------|
| CN1 | .156 in 7-Pin Housing Plug: 045-5259-07 Pin: 055-5331-00 Key: 060-5013-00 | 1 | +48 VDC IN | GRY |
| | | 2 | +48 VDC IN | GRY |
| | | 3 | +48 VDC IN | GRY |
| | | 4 | Key (n/c) | - |
| | | 5 | Ground | BLK |
| | | 6 | Ground | BLK |
| | | 7 | Ground | BLK |
| CN2 | .093 in 3-Pos Plug Plug: 045-5003-03 Pin: 055-5013-09 | 1 | Line In (100-240 VAC) | BLK |
| | | 2 | Neutral | WHT |
| | | 3 | Earth Ground | GRN |
| CN3 | 0.084 in 4-Pos Plug Plug: 045-5200-04 Pin: 055-5033-08 | 1 | +48 VDC to CPU Node | GRY |
| | | 2 | Door Interlock Switch Status | GRY/RED |
| | | 3 | Line Voltage Status | VIO |
| | | 4 | Ground | BLK |
| CN4 | 0.084 in 6-Pos Plug Plug: 045-5200-06 Pin: 055-5033-08 | 1 | Door Interlock Switch +48V | - |
| | | 2 | Door Interlock Switch +48V | - |
| | | 3 | Switched 48V Out (to Node 1) | GRY/YEL |
| | | 4 | Door Interlock Return Ground | - |
| | | 5 | Door Interlock Return Ground | - |
| | | 6 | Ground (to Node 1) | BLK |
| CN5 | 0.084 in 12-Pos Plug Plug: 045-5200-12 Pin: 055-5033-08 | 1 | Switched 48V Node Power | GRY |
| | | 2 | Switched 48V Node Power | GRY |
| | | 3 | Switched 48V Node Power | GRY |
| | | 4 | Switched 48V Node Power | GRY |
| | | 5 | Switched 48V Node Power | GRY |
| | | 6 | Switched 48V Node Power | GRY |
| | | 7 | Node Ground | BLK |
| | | 8 | Node Ground | BLK |
| | | 9 | Node Ground | BLK |
| | | 10 | Node Ground | BLK |
| | | 11 | Node Ground | BLK |
| | | 12 | Node Ground | BLK |
| CN6 | .156 in 3-Pos Plug Plug: 045-5259-03 Pin: 055-5331-00 (18awg) | 1 | Ground | - |
| | | 2 | Ground | - |
| | | 3 | +12VDC | - |
| CN7 | .084 2-Pos Plug Plug: 045-5200-02 Pin: 055-5033-08 | 1 | +48 VDC to CPU Node | - |
| | | 2 | Ground | - |

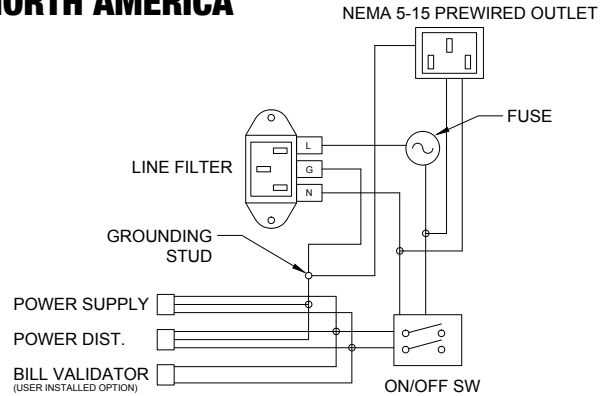
4.17 POWER PLUG WIRING

CAUTION

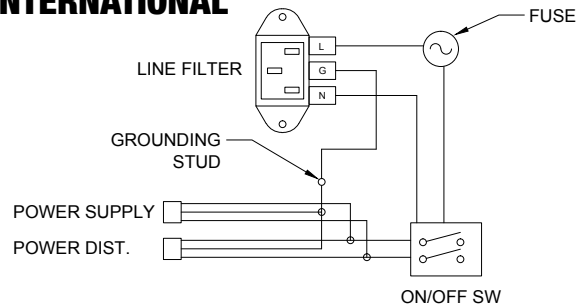
TO MAINTAIN SAFETY, GROUND WIRE FROM LINE FILTER IS TO BE MOUNTED FIRST ON GROUNDING STUD AND SECURED WITH NUT. ALL OTHER GROUNDS MAY THEN BE ATTACHED TO GROUNDING STUD.

REPLACE ALL FUSES WITH CORRECT CURRENT RATINGS!

NORTH AMERICA



INTERNATIONAL



LINE CORDS

| Part Number | Description |
|-------------|---------------------------------------|
| 034-6012-00 | Line Cord, 3m, 5-15P USA |
| 034-6012-01 | Line Cord, 3m, CEE77P EUROPE |
| 034-6012-02 | Line Cord, 3m, BS1363P United Kingdom |
| 034-6012-03 | Line Cord, 3m, AS-NZS4417P Australia |
| 034-6012-04 | Line Cord, 3m, CEI23-16P Italy |
| 034-6012-05 | Line Cord, 3m, SEV1011P Switzerland |
| 034-6012-06 | Line Cord, 3m, JIS8303P Japan |
| 034-6012-07 | Line Cord, 3m, SI32P Israel |
| 034-6012-08 | Line Cord, 3m, BS546P S Africa, India |
| 034-6012-09 | Line Cord, 3m, IS6538P S. India |

LINE FUSES

| Line Voltage (Region) | Fuse Current | Type | Part Number |
|----------------------------------|--------------|---------------|-------------|
| 120V (North America) | 8 A | Slow Blow MDL | 200-5000-05 |
| 220/240v (Europe, Australia, UK) | 5 A | Slow Blow MDL | 200-5000-01 |



5. PARTS REFERENCE

5.1 PLAYFIELD RUBBER PARTS

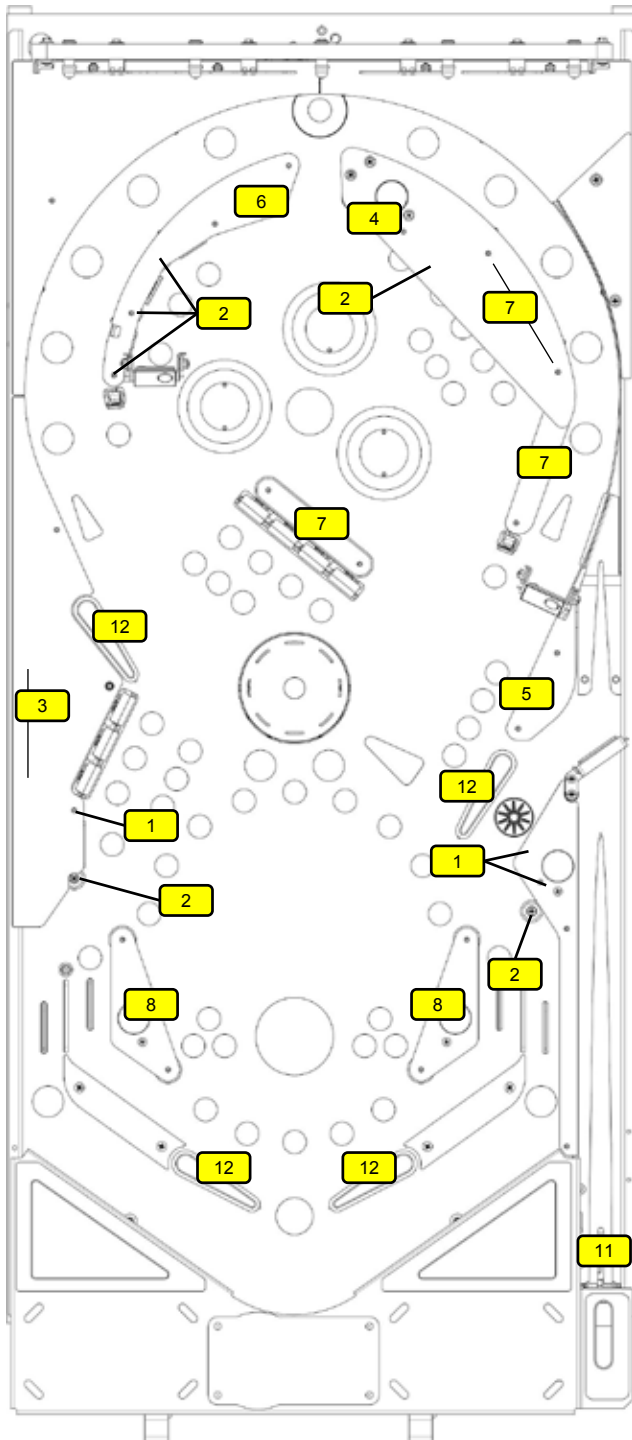


Figure 5.1.1. Rubber o-ring part locations

RUBBER O-RINGS

| ID | Qty | Size (ID) | Size (OD) | Durometer | Color | Part Number |
|----|-----|-----------|-----------|-----------|-------|-------------|
| 1 | 3 | 3/16" | | 50 | White | 545-5348-51 |
| 2 | 6 | 5/16" | | 50 | White | 545-5348-52 |
| 3 | 1 | 1" | | 50 | White | 545-5348-55 |
| 4 | 1 | 1-1/4" | | 50 | White | 545-5348-56 |
| 5 | 1 | 1-1/2" | | 50 | White | 545-5348-57 |
| 6 | 1 | 1-3/4" | | 50 | White | 545-5348-61 |
| 7 | 3 | 2" | | 50 | White | 545-5348-58 |
| 8 | 2 | 2-1/2" | | 50 | White | 545-5348-59 |

Figure 5.1.2. Rubber o-ring part numbers and usage. ID: Inner Diameter, OD: Outer Diameter, Durometer: Higher number is firmer, less bounce, and more durable.

| ID | Qty | Description | Color | Part Number |
|----|-----|-----------------------------|-------|-------------|
| 11 | 1 | Plunger Tip | Black | 545-5276-00 |
| 12 | 4 | Flipper Rubber | Red | 545-5277-22 |
| 13 | 1 | Bumper Pad (Sub assemblies) | Black | 545-5105-00 |
| 14 | 4 | Bumper Pad (Flippers) | Black | 545-5428-00 |

Figure 5.1.3. Other rubber part numbers and usage

5.2 RUBBER SIZE CHART

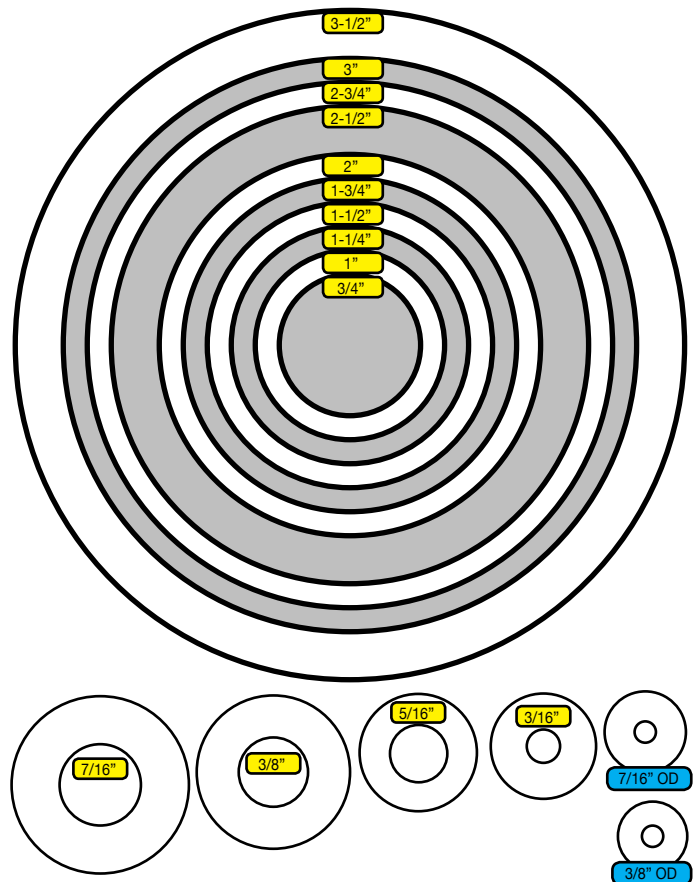
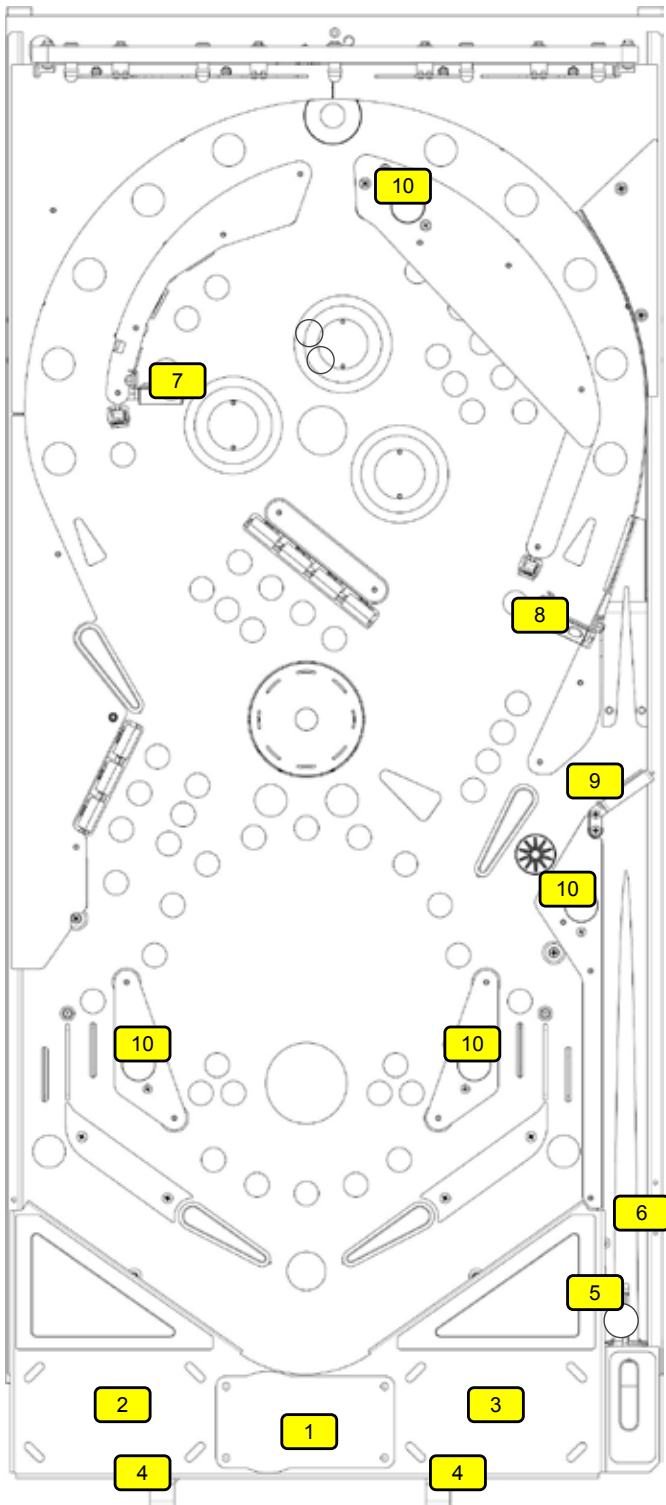


Figure 5.2.1. Rubber ring inner diameter sizing tool. Hold ring up to chart and read largest size on inside of ring. Dimensions are Inner Diameter (ID) unless otherwise noted as Outer Diameter (OD).



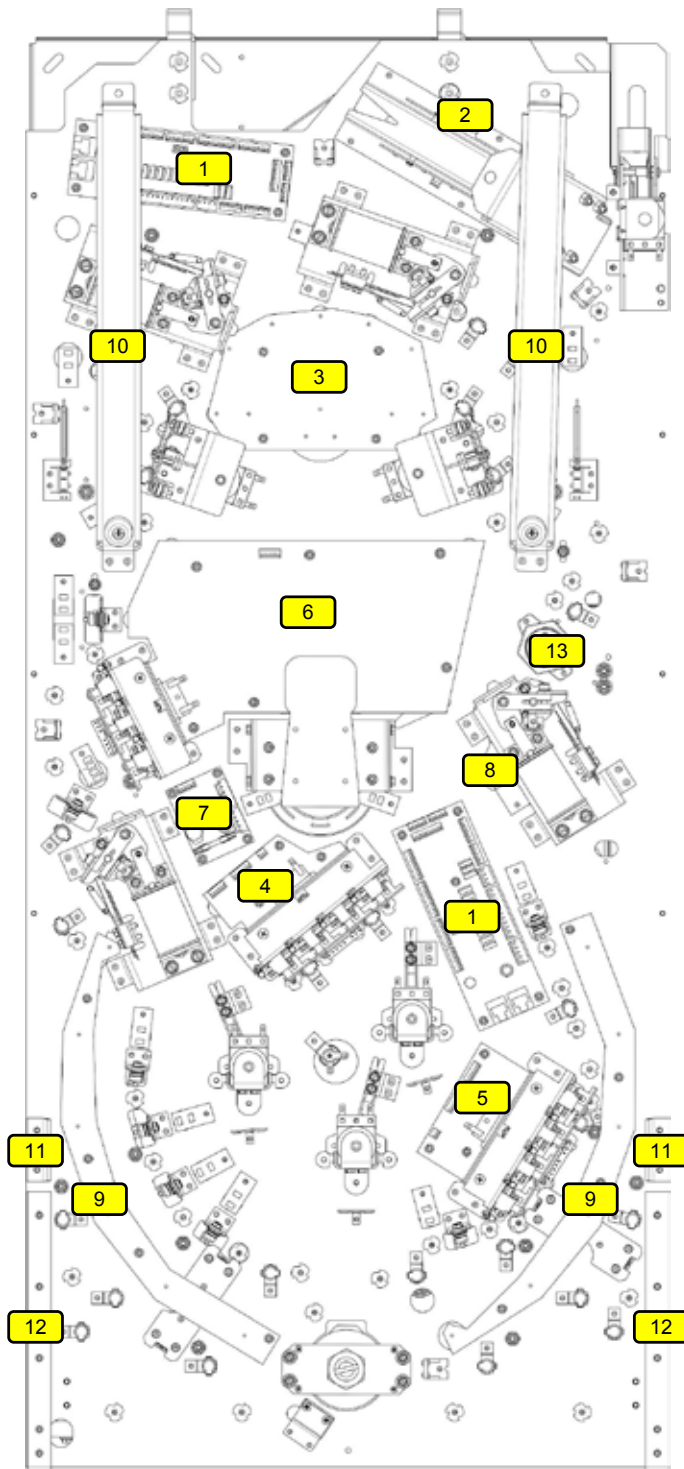
5.3 PLAYFIELD ASSEMBLIES, TOP



| ID | Part Number | Description | Qty |
|----|---------------|------------------------|-----|
| 1 | 545-5995-02 | Bottom Arch Assembly | 1 |
| 2 | 755-51K8-12-Y | Instruction Card | 1 |
| 3 | 755-5400-02-Y | Coin Card (USA) | 1 |
| 4 | 535-8385-00 | Welded Hanger Bracket | 2 |
| 5 | 260-5000-00 | Pinballs | 6 |
| 6 | 500-6815-00 | Bubble Level Assembly | 1 |
| 7 | 511-7958-00 | Left Spinner Assembly | 1 |
| 8 | 511-7959-00 | Right Spinner Assembly | 1 |
| 9 | 535-1536-00 | Wireform Gate | 1 |
| 10 | 550-5510-01 | White Flasher Dome | 4 |

Figure 5.3.1. Major playfield assemblies, Top locations.

5.4 PLAYFIELD ASSEMBLIES, BOTTOM



| ID | Part Number | Description | Qty |
|----|-------------|---------------------------------------|-----|
| 1 | 520-7017-72 | 8-Driver Node Board | 1 |
| 2 | 520-7001-00 | Trough Serial Opto Receiver Extension | 1 |
| 3 | 520-8067-00 | Lower Center LED Board | 1 |
| 4 | 520-8064-00 | Drop Target 2 LED Board | 1 |
| 5 | 520-8063-00 | Drop Target 1 LED Board | 1 |
| 6 | 520-8066-00 | Main Center LED Board | 1 |
| 7 | 520-5338-00 | Dual Motor Driver Board | 1 |
| 8 | 520-8065-00 | Right LED Board | 1 |
| 9 | 520-8062-00 | Orbit Lamp Board | 2 |
| 10 | 535-6862-05 | Rail | 2 |
| 11 | 500-5329-03 | Bracket Pivot Pin | 2 |
| 12 | 535-5988-01 | Edge Slide Bracket | 2 |
| 13 | 511-7544-00 | Star Rollover Switch | 1 |

Figure 5.4.1. Major playfield assemblies, Bottom locations.

5.5 BACKBOX PARTS

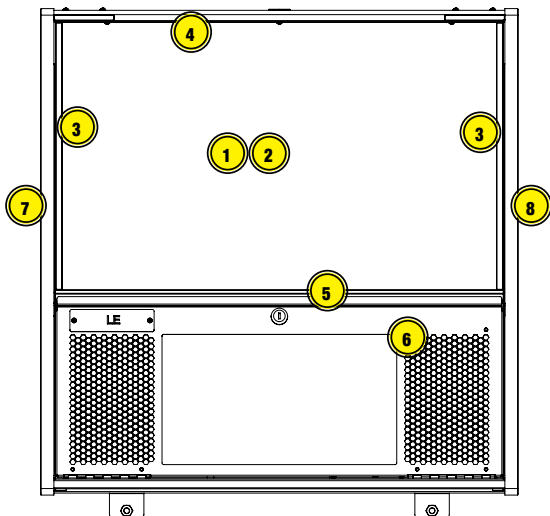


Figure 5.5.1. Backbox external assemblies and components

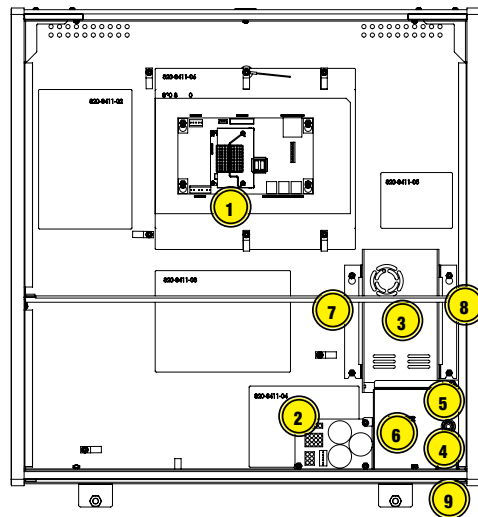


Figure 5.5.2. Backbox internal assemblies and components

EXTERNAL

| ID | Part Number | Description | Qty |
|----|-------------|--------------------------------|-----|
| 1 | 660-5052-00 | Backglass | 1 |
| 2 | 830-8427-K8 | Translite Art [Gold] | 1 |
| | 830-8427-K7 | Translite Art [Platinum] | 1 |
| | 830-8426-K9 | Mirror Backglass [Diamond] | 1 |
| 3 | 545-5018-17 | Plastic Extrusion 15-.450" | 2 |
| 4 | 545-5018-15 | Glass Channel 26" | 1 |
| 5 | 545-6313-01 | Glass Lift Channel 26" | 1 |
| 6 | 500-9996-K8 | LCD Speaker Panel Assembly | 1 |
| 7 | 820-78K8-01 | Left Backbox Decal [Gold] | 1 |
| | 820-78K7-01 | Left Backbox Decal [Platinum] | 1 |
| | 820-78K9-01 | Left Backbox Decal [Diamond] | 1 |
| 8 | 820-78K8-02 | Right Backbox Decal [Gold] | 1 |
| | 820-78K7-02 | Right Backbox Decal [Platinum] | 1 |
| | 820-78K9-02 | Right Backbox Decal [Diamond] | 1 |

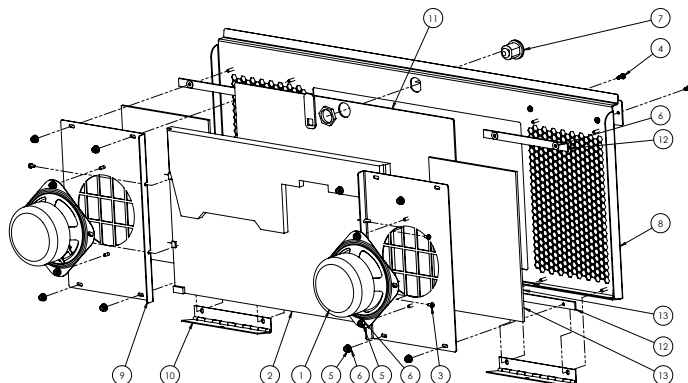
INTERNAL

| ID | Part Number | Description | Qty |
|----|-------------|---------------------------|-----|
| 1 | 509-1003-01 | CPU Node Board | 1 |
| 2 | 520-5343-01 | Power Distribution Board | 1 |
| 3 | 011-5003-00 | Power Supply 48V/500W | 1 |
| 4 | 515-9769-00 | Utility Outlet (USA) | 1 |
| 5 | 205-5001-00 | Fuse Holder-Screw in | 1 |
| | 200-5000-05 | 8A Fuse | 1 |
| 6 | 535-1130-00 | Cover AC | 1 |
| 7 | 535-1129-00 | Power supply bracket | 1 |
| 8 | 535-1129-01 | Power supply bracket | 1 |
| 9 | 180-5001-03 | Power Switch | 1 |
| | 034-6012-00 | Line Cord-3M 5-15P/C13RA* | 1 |

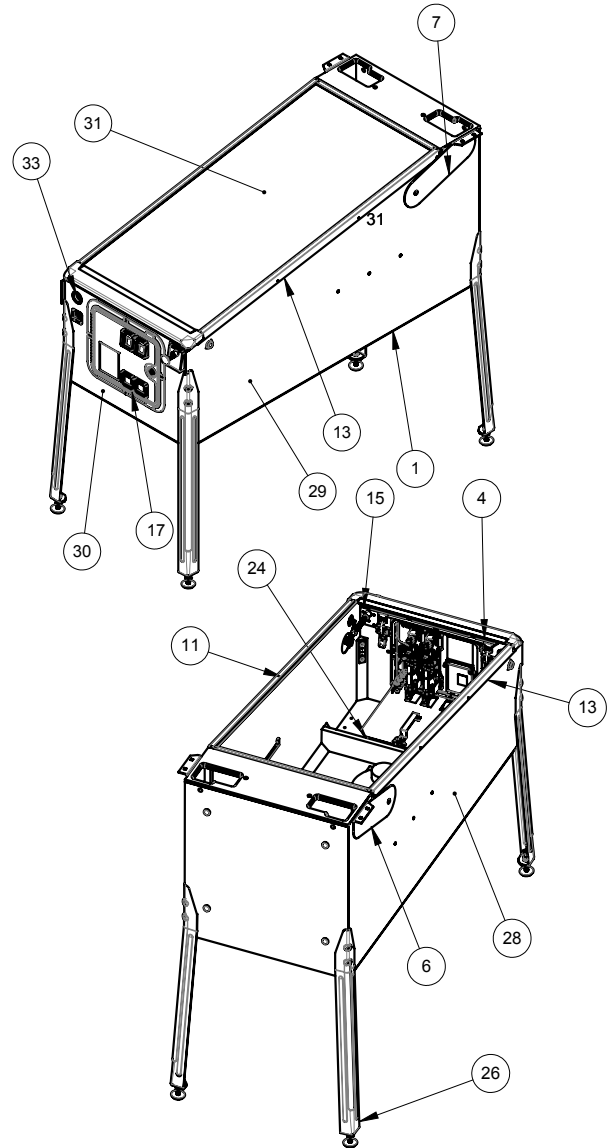
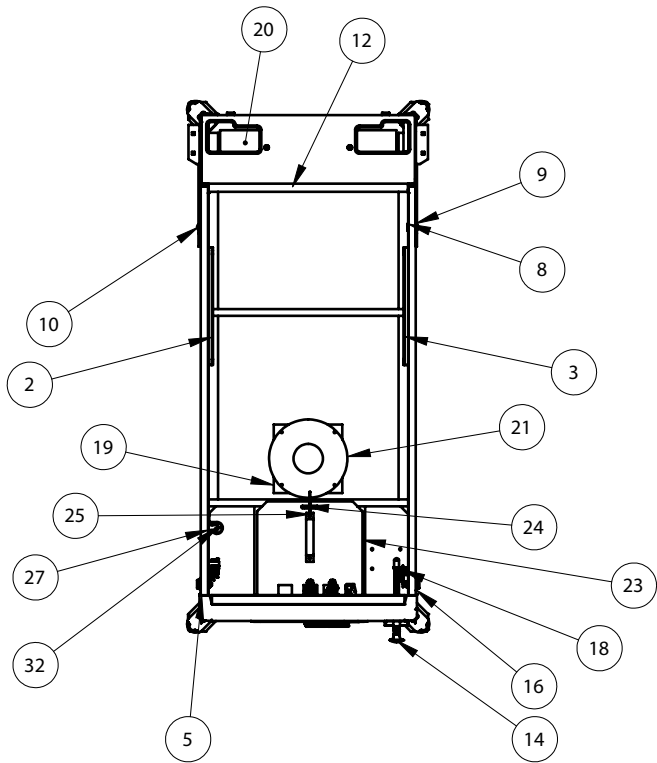
5.6 SPEAKER PANEL PARTS

500-9996-K8

| ID | Part Number | Description | Qty |
|----|----------------|--|-----|
| 1 | 031-5004-02 | Speaker | 2 |
| 2 | 116-0023-00 | 1366 x 768 Display LCD Panel | 1 |
| 3 | 237-6188-01 | Screw, M3x0.5 X 6MM PPH Sems Zinc | 4 |
| 4 | 237-6307-06 | 6-32 X 3/8" Torx Stainless Steel Screw | 2 |
| 5 | 240-5005-00 | 6-32 Nylon Stop Nut | 12 |
| 6 | 242-5001-00 | #6 Washer | 16 |
| 7 | 355-5168-00-00 | Nut: Lock w/ Cam | 1 |
| 8 | 515-9842-00 | Speaker Panel-LCD | 1 |
| 9 | 515-9843-00 | Speaker Plate | 2 |
| 10 | 515-9845-00 | Hinge, Speaker Panel, LCD | 2 |
| 11 | 545-9877-00 | LCD Window | 1 |
| 12 | 545-9877-01 | Spacer, Small - LCD Speaker Panel | 4 |
| 13 | 626-5109-00 | Speaker Foam - LCD Panel | 2 |
| | 820-1054-00 | Decal Speaker Panel | 2 |



5.7 CABINET PARTS



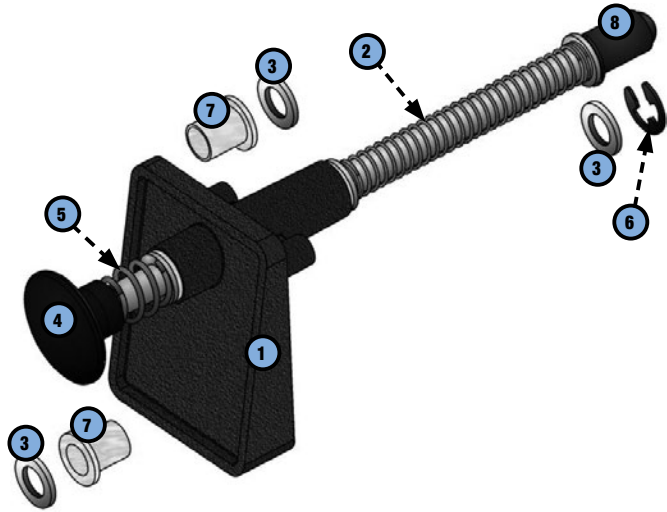
| ID | Part Number | Description | Qty |
|----|----------------|---|-----|
| 1 | 525-6013-00 | Cabinet (Plunger & Two Buttons) | 1 |
| 2 | 535-5989-00 | Slide & Pivot Bracket - Left Side | 1 |
| 3 | 535-5990-00 | Slide & Pivot Bracket - Right Side | 1 |
| 4 | 535-0399-00 | Cabinet Playfield Support Bracket | 1 |
| 5 | 500-6882-03-85 | Front Molding Assembly - Gold | 1 |
| | 500-6882-03-53 | Front Molding Assembly - Platinum | 1 |
| | 500-6882-03-95 | Front Molding Assembly - Diamond | 1 |
| 6 | 535-7999-85L | Pivot Hinge, Left - Gold | 1 |
| | 535-7999-53L | Pivot Hinge, Left - Platinum | 1 |
| | 535-7999-95L | Pivot Hinge, Left - Diamond | 1 |
| 7 | 535-7999-85R | Pivot Hinge, Right - Gold | 1 |
| | 535-7999-53R | Pivot Hinge, Right - Platinum | 1 |
| | 535-7999-95R | Pivot Hinge, Right - Diamond | 1 |
| 8 | 254-5042-00 | Spacer Nut, Hex, 1/2"OD, 1/4-20 | 2 |
| 9 | 242-5084-00 | Washer, 1/2" I.D., 3/16" THK | 2 |
| 10 | 231-5072-00 | 1/4-20 X 1/2" Carriage Bolt | 2 |
| 11 | 545-5017-00 | Plastic Channel | 2 |
| 12 | 545-9802-00 | Glass Rear Extrusion | 1 |
| 13 | 535-7297-85 | Side Armor - Gold | 2 |
| | 535-7297-53 | Side Armor - Platinum | 2 |
| | 535-7297-95 | Side Armor - Diamond | 2 |
| 14 | 500-6146-00-04 | Ball Shooter Assembly | 1 |
| 15 | 535-1689-00 | Plunger Support Plate, Notched | 1 |
| 16 | 500-5026-38 | Flipper Button Assembly (White) [Premium] | 2 |
| 17 | 501-5018-173 | Coin Door 2-Chute No Emboss | 1 |
| 18 | 180-5160-01 | Flipper Switch, Single | 2 |
| 19 | 545-5072-03 | Grill - Speaker / Vent | 1 |
| 20 | 545-5072-02 | Grill - Speaker / Vent | 1 |
| 21 | 031-5007-01 | Speaker, Cabinet 8" Round, 4 ohm | 1 |
| 22 | 545-5090-00 | Cash Box - Plastic | 1 |
| 23 | 535-5013-03 | Cash Box Cover | 1 |

| | | | |
|----|-----------------|---------------------------------|---|
| 24 | 535-7562-00 | Cash Box Lock Bracket Wire | 1 |
| 25 | 535-7772-00 | Hair Pin Clip | 1 |
| 26 | 500-5921-85 | Leg Assembly - Gold | 4 |
| | 500-5921-53 | Leg Assembly - Platinum | 4 |
| | 500-5921-95 | Leg Assembly - Diamond | 4 |
| 27 | 516-0007-00 | Tilt Assembly | 1 |
| 28 | 820-78K8-03 | Decal, Cabinet Left - Gold | 1 |
| | 820-78K7-03 | Decal, Cabinet Left - Platinum | 1 |
| | 820-78K9-03 | Decal, Cabinet Left - Diamond | 1 |
| 29 | 820-78K8-04 | Decal, Cabinet Right - Gold | 1 |
| | 820-78K7-04 | Decal, Cabinet Right - Platinum | 1 |
| | 820-78K9-04 | Decal, Cabinet Right - Diamond | 1 |
| 30 | 820-78K8-05 | Decal, Cabinet Front - Gold | 1 |
| | 820-78K7-05 | Decal, Cabinet Front - Platinum | 1 |
| | 820-78K9-05 | Decal, Cabinet Front - Diamond | 1 |
| 31 | 660-5001-00 | Playfield Glass | 1 |
| 32 | 520-6967-72 | Cabinet Node Board | 1 |
| 33 | 500-1060-44-LED | Start Button | 1 |
| | 820-78K8-XX | Cabinet Decal Replacement Set | |
| | 820-78K7-XX | | |
| | 820-78K9-XX | | |



5.8 BALL SHOOTER ASSEMBLY

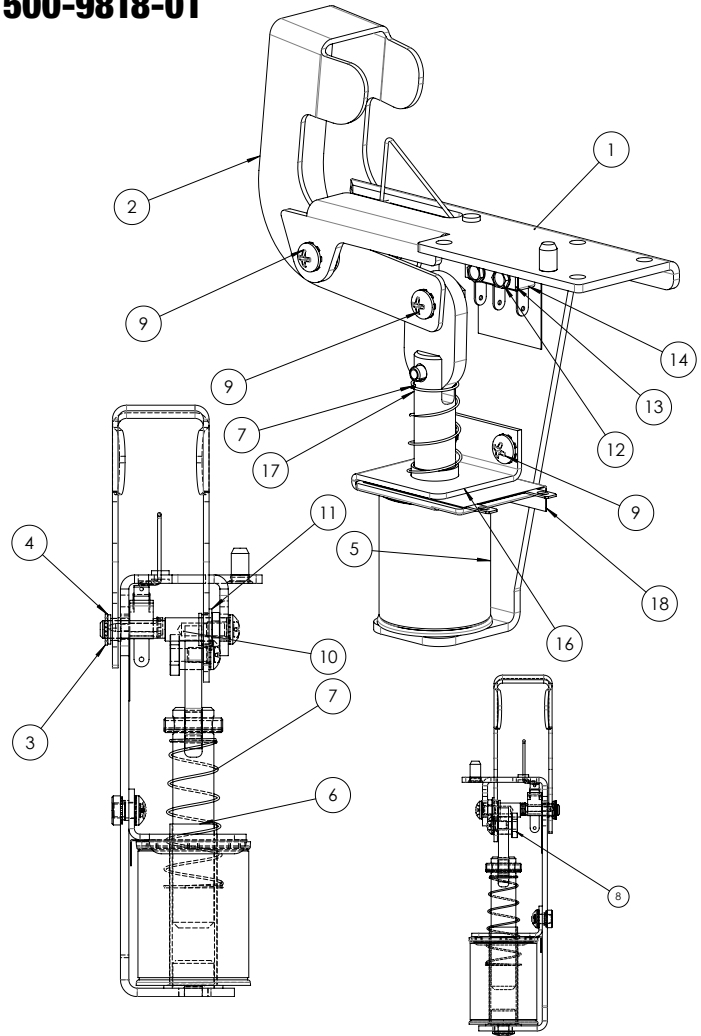
500-6146-00-04



| ID | Part Number | Description | Qty |
|----|-------------|----------------------------------|-----|
| 1 | 535-5067-02 | Housing Assembly | 1 |
| 2 | 266-5001-04 | Compressed Spring (Long) - Green | 1 |
| 3 | 242-5014-00 | Washer 3/8 ID x 5/8 OD x 1/16 | 3 |
| 4 | 515-6557-00 | Rod Assembly | 1 |
| 5 | 266-5010-00 | Compressed Spring (Short) | 1 |
| 6 | 270-5012-00 | Retaining Ring, 3/8" | 1 |
| 7 | 280-5010-00 | Bushing 3/8 ID | 2 |
| 8 | 545-5276-00 | Rubber Tip | 1 |

5.9 AUTO LAUNCH ASSEMBLY

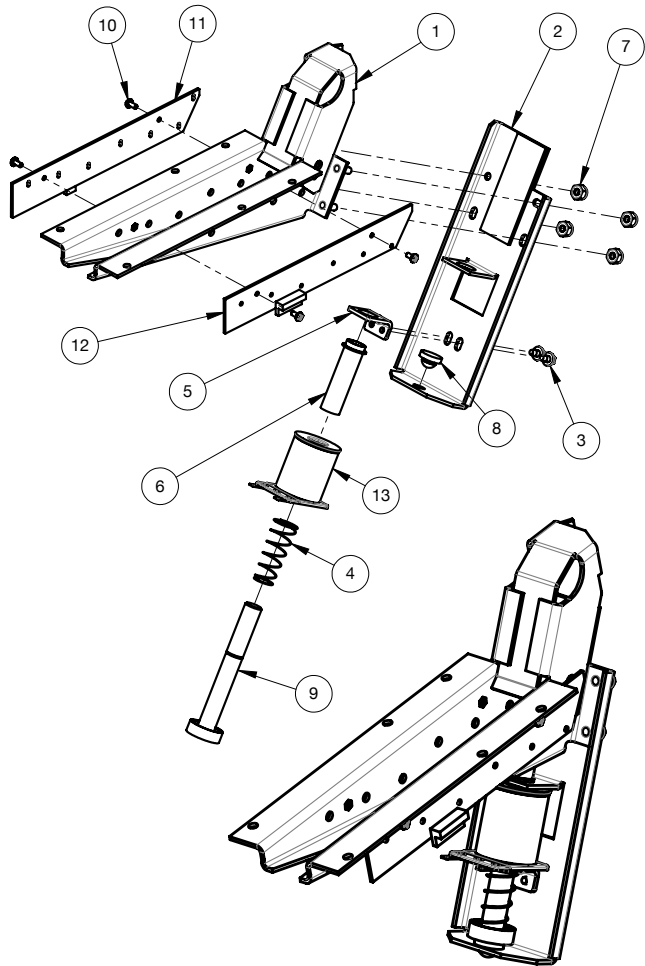
500-9818-01



| ID | Part Number | Description | Qty |
|----|-------------|----------------------------------|-----|
| 1 | 515-9689-00 | MAIN BRKT: AUTO-PLUNGER | 1 |
| 2 | 535-0728-00 | KICKER ARM, AUTO-PLUNGER | 1 |
| 3 | 270-5001-00 | RETAINING E-RING, 3/16" SHAFT OD | 1 |
| 4 | 545-5352-00 | NYLINER, 3/16" SHAFT | 1 |
| 5 | 090-5044-ND | COIL - 23-800, NO DIODE | 1 |
| 6 | 545-5411-00 | COIL SLEEVE | 1 |
| 7 | 266-5020-00 | COMPRESSION SPRING-CONICAL | 1 |
| 8 | 530-7834-00 | PIN: KICKER ARM, AUTO-PLUNGER | 1 |
| 9 | 232-5300-00 | SCREW, 8-32 X 1/4" PPH SEMS | 4 |
| 10 | 530-7835-00 | PIVOT, AUTO-PLUNGER | 1 |
| 11 | 545-5423-00 | NYLINER, 1/4" SHAFT, 4L1-FF | 1 |
| 12 | 237-5937-02 | SCREW, 2-56 X 1/2" HWH MS | 2 |
| 13 | 535-6539-00 | SWITCH BODY PROTECT PLATE | 1 |
| 14 | 180-5157-01 | SHOOTER SWITCH - SHORT ARM | 1 |
| 15 | 545-6268-00 | FISCHE PAPER | 1 |
| 16 | 535-0762-00 | COIL BRACKET-AUTOPLUNGER | 1 |
| 17 | 515-6304-03 | PLUNGER / LINK ASSEMBLY | 1 |
| 18 | 545-0762-00 | FISCHE PAPER: AUTO-LAUNCHER | 1 |

5.10 BALL TROUGH ASSEMBLY

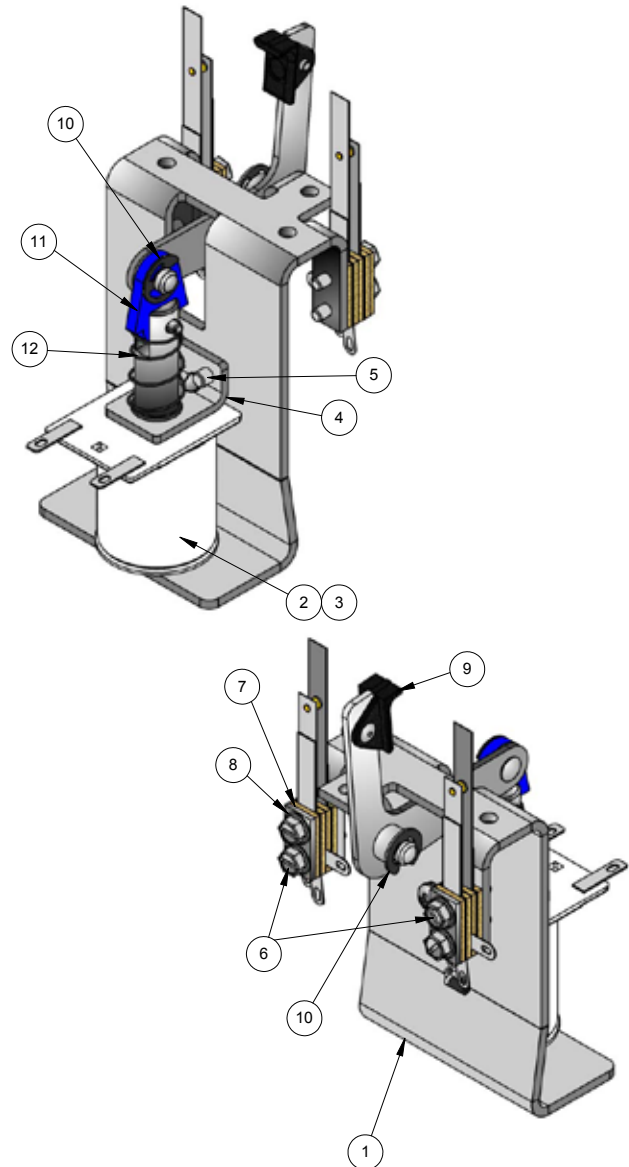
500-9820-00



| ID | Part Number | Description | Qty |
|-----|----------------|------------------------------------|---------|
| 1 | 515-7811-00 | MAIN BRKT. BALL TROUGH | 1 |
| 2 | 515-7812-00 | COIL BRACKET, BALL TROUGH | 1 |
| 3 | 237-5975-04 | SCREW, 8-32 X 1/4" HWH SWAGE SERR | 2 |
| 4 | 266-5020-00 | COMPRESSION SPRING-CONICAL | 1 |
| 5 | 535-5203-03 | COIL RETAINING BRACKET | 1 |
| 6 | 545-5076-01 | COIL SLEEVE | 1 |
| 7 | 240-5102-00 | 8-32 NYLON LOCK NUT | 4 |
| 8 | 545-5105-00 | RUBBER BUMPER | 1 |
| 9 | 515-7309-01 | PLUNGER ASSEMBLY | 1 |
| 10 | 237-5909-00 | SCREW, 4-40 X 1/4" PPH SEMS | 4 |
| 11 | 520-5344-00 | TROUGH BOARD #1 - ILED TRANSMITTER | 1 |
| 12 | 520-7001-00 | TROUGH BOARD #2 - RECEIVER | 1 |
| 13 | 090-5004-ND | COIL 27-1500 - NO DIODE | 1 |
| 98* | 605-5006-00 | SHRINK TUBING 1/8" | .42 FT. |
| 99* | 036-5611-11-F5 | CABLE TROUGH OPTOS | 1 |

5.11 SLINGSHOT ASSEMBLY

500-9920-01

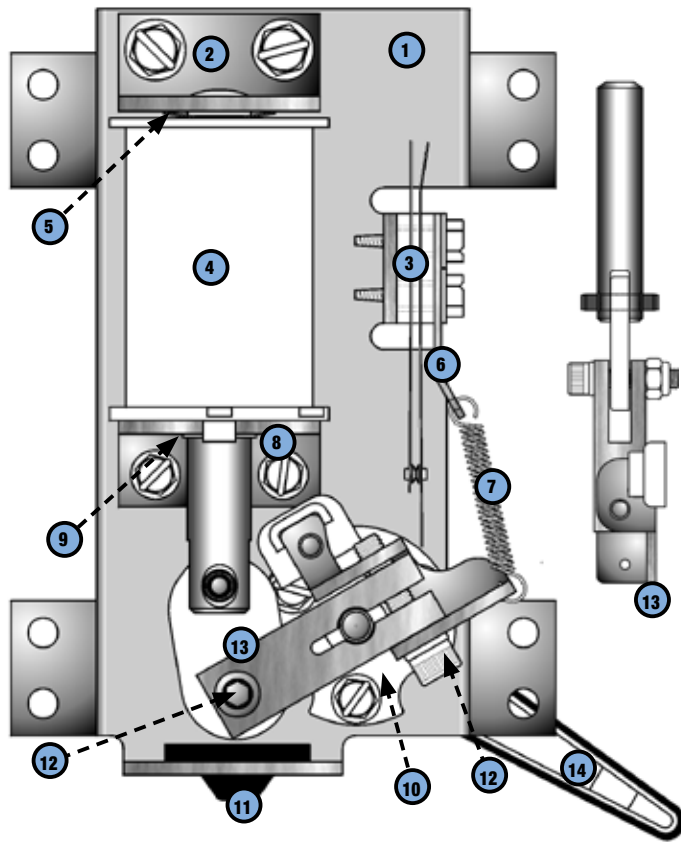


| ID | Part Number | Description | Qty |
|----|-------------|--------------------------------|-----|
| 1 | 515-5339-01 | SLINGSHOT BRACKET ASSEMBLY | 1 |
| 2 | 090-5044-ND | COIL 26-1200 - NO DIODE | 1 |
| 3 | 545-5031-00 | COIL SLEEVE | 1 |
| 4 | 535-5203-03 | COIL RETAINER BRACKET | 1 |
| 5 | 232-5301-00 | 8-32 X 3/8 PPH MS EXT SEMS ZC | 2 |
| 6 | 180-5231-00 | SWITCH SLING SHOT 2 LUG CENTER | 2 |
| 7 | 535-5045-00 | SWITCH PLATE | 2 |
| 8 | 237-5976-04 | 6-32 X 5/8 SLOT SER HWH SW | 4 |
| 9 | 515-5340-01 | ARM & TIP ASSEMBLY | 1 |
| 10 | 270-5002-00 | RETAINING RING - 1/4 DIA | 2 |
| 11 | 515-5338-00 | PLUNGER & LINK ASSEMBLY | 1 |
| 12 | 266-5020-00 | COMP SPRING CONICAL | 1 |
| 13 | 036-5604-00 | 4" GENERIC JUMPER | 2 |

5.12 FLIPPER ASSEMBLY, LEFT

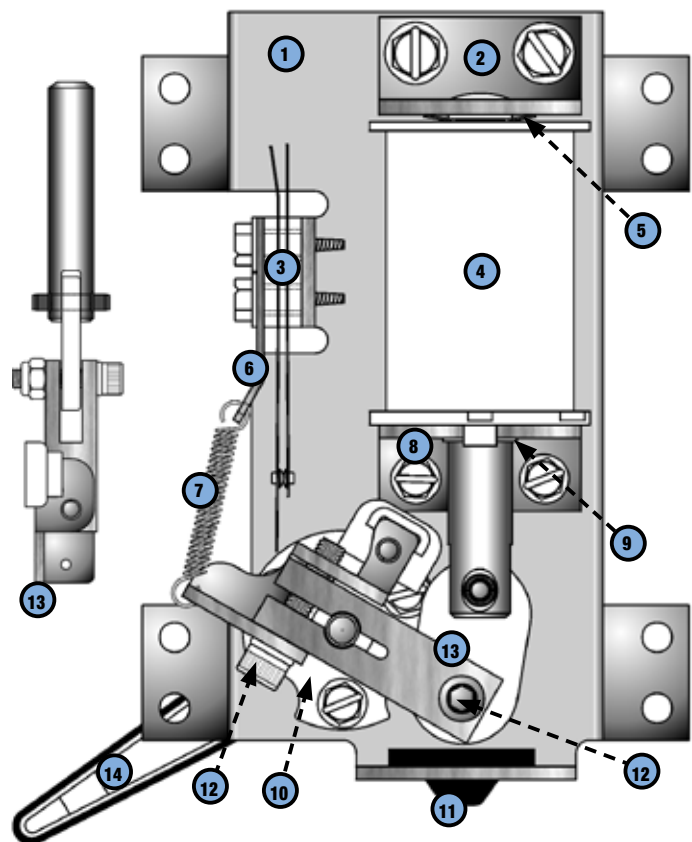
LOWER: 500-6543-15-ND

UPPER: 500-6543-17-ND



5.13 FLIPPER ASSEMBLY, RIGHT

LOWER: 500-6543-05-ND

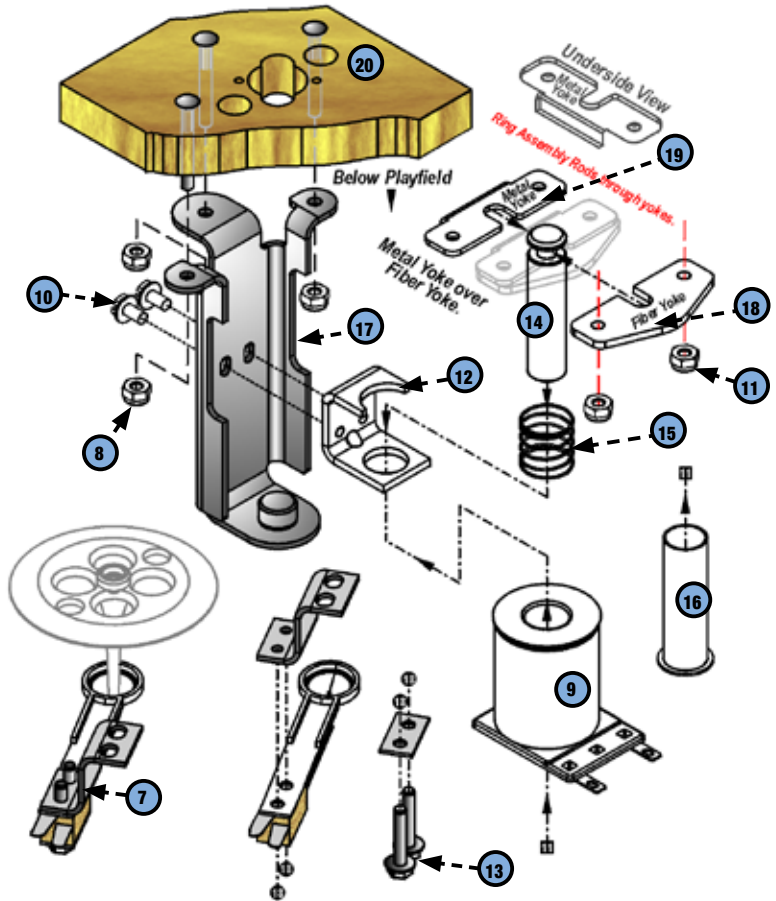
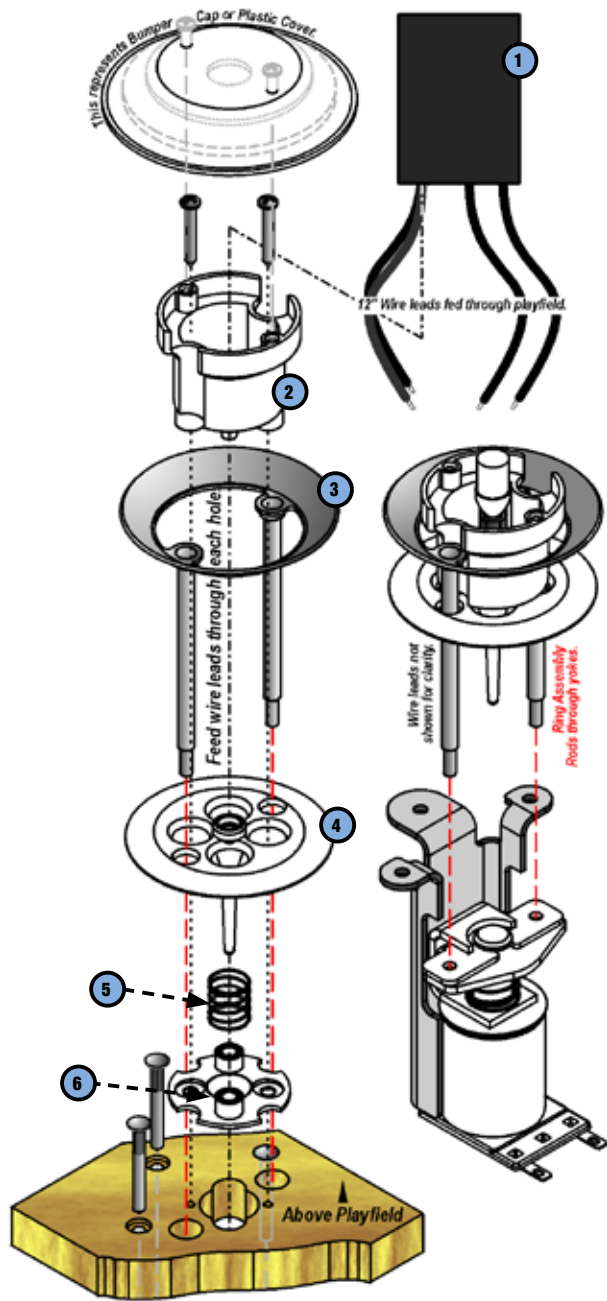


| ID | Part Number | Description | Qty |
|----|----------------|--|-----|
| 1 | 515-6617-01 | FLIPPER BASE PLATE LEFT KIT W/ BRACKET MOUNT HARDWARE | 1 |
| 2 | 515-6308-01 | COIL STOP BRACKET | 1 |
| 3 | 180-5149-00 | SWITCH - END OF STROKE N/C | 1 |
| 4 | 090-5062-ND | COIL [LOWER] | 1 |
| | 090-5067-ND | COIL [UPPER] | 1 |
| 5 | 269-5002-00 | SPRING WASHER | 1 |
| 6 | 535-7354-00 | SWITCH RETURN SPRING BRACKET | 1 |
| 7 | 265-5035-00 | SPRING FLIPPER RETURN | 1 |
| 8 | 535-7356-00 | COIL SUPPORT BRACKET | 1 |
| 9 | 545-5388-00 | COIL SLEEVE, FLIPPER | 1 |
| 10 | 545-5070-00 | FLIPPER BAT BUSHING | 1 |
| 11 | 545-5428-00 | FLIPPER BUMPER PAD | 1 |
| 12 | 237-6144-00 | SET SCREW #10-32 x 3/4" SOCKET | 2 |
| 13 | 515-7203-01 | PLUNGER/CRANK ASSEMBLY, LEFT | 1 |
| 14 | 515-5133-08-06 | FLIPPER BAT AND SHAFT* | 1 |
| | 500-6307-10 | FLIPPER REBUILD KIT, LEFT | |
| | | * Refer to game rubber chart for flipper rubber color and part number. | |

| ID | Part Number | Description | Qty |
|----|----------------|--|-----|
| 1 | 515-6617-00 | FLIPPER BASE PLATE RIGHT KIT W/ BRACKET MOUNTING HARDWARE | 1 |
| 2 | 515-6308-01 | COIL STOP BRACKET | 1 |
| 3 | 180-5149-00 | SWITCH - END OF STROKE N/C | 1 |
| 4 | 090-5062-ND | COIL | 1 |
| 5 | 269-5002-00 | SPRING WASHER | 1 |
| 6 | 535-7354-00 | SWITCH RETURN SPRING BRACKET | 1 |
| 7 | 265-5035-00 | SPRING FLIPPER RETURN | 1 |
| 8 | 535-7356-00 | COIL SUPPORT BRACKET | 1 |
| 9 | 545-5388-00 | COIL SLEEVE, FLIPPER | 1 |
| 10 | 545-5070-00 | FLIPPER BAT BUSHING | 1 |
| 11 | 545-5428-00 | FLIPPER BUMPER PAD | 1 |
| 12 | 237-6144-00 | SET SCREW #10-32 x 3/4" SOCKET | 2 |
| 13 | 515-7203-00 | PLUNGER/CRANK ASSEMBLY | 1 |
| 14 | 515-5133-08-06 | FLIPPER BAT AND SHAFT* | 1 |
| | 500-6307-00 | FLIPPER REBUILD KIT, RIGHT | |
| | | * Refer to game rubber chart for flipper rubber color and part number. | |

5.14 POP BUMPER ASSEMBLY

516-6784-XX



| ID | Part Number | Description | Qty |
|----|-------------|--------------------------|-----|
| 1 | 520-5307-03 | POP BUMPER LED MODULE | 1 |
| 2 | 545-5197-00 | BUMPER BODY | 1 |
| 3 | 515-5085-00 | RING AND ROD ASSY | 1 |
| 4 | 545-5607-00 | BUMPER SKIRT | 1 |
| 5 | 266-5048-00 | BUMPER SKIRT COMP SPRING | 1 |
| 6 | 545-5195-00 | BUMPER BASE | 1 |

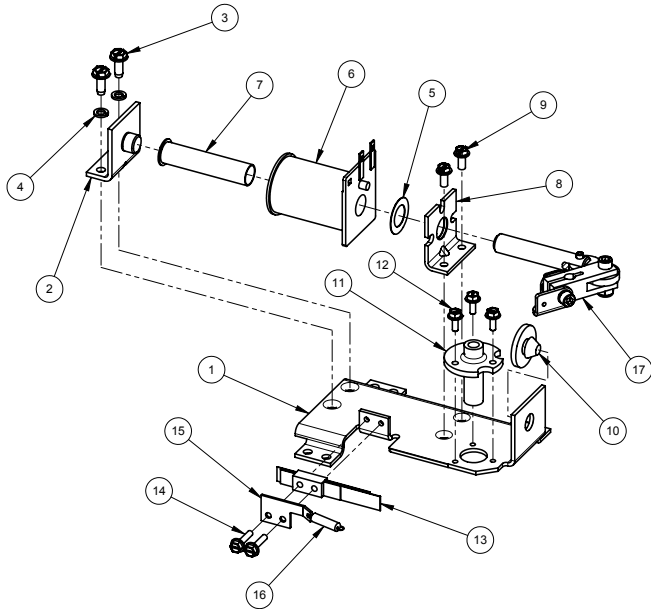
| Part Number | Description | Qty |
|----------------|--------------------------------|-----|
| 515-6459-01L | BUMPER/RING TOP ASSY, W/ LED 1 | 1 |
| 515-6459-04-ND | BUMPER BOTTOM ASSY, NO DIODE | 1 |

| ID | Part Number | Description | Qty |
|----|-------------|--|-----|
| 7 | 500-9934-01 | POP BUMPER SWITCH ASSY-2 - LUG-LEFT | 1 |
| 8 | 240-5005-00 | 6-32 NYLON STOP NUT | 3 |
| 9 | 090-5044-ND | COIL - 26-1200 | 1 |
| 10 | 237-5976-01 | #6-32 X 1/4" SHWH SWAGE ZN | 2 |
| 11 | 240-5005-00 | #6-32 NYLON STOP NUT | 2 |
| 12 | 535-7347-00 | METAL YOKE STOP | 1 |
| 13 | 234-5101-00 | * 8 X 1/2 SLT | 6 |
| 14 | 530-5348-00 | PLUNGER, POP BUMPER | 1 |
| 15 | 266-5047-00 | COMPRESSION SPRING, POP BUMPER | 1 |
| 16 | 545-5031-00 | COIL SLEEVE | 1 |
| 17 | 515-5939-00 | COIL BRACKET POP BUMPER ASSY | 1 |
| 18 | 545-5609-00 | FIBER YOKE | 1 |
| 19 | 535-7346-00 | METAL YOKE | 1 |
| 20 | 237-5957-00 | #6-32 x 1-3/16" SPIRAL FIN SHANK SCREW | 3 |



5.15 RIGHT UPPER FLIPPER ASSEMBLY W/ CUT FOOT

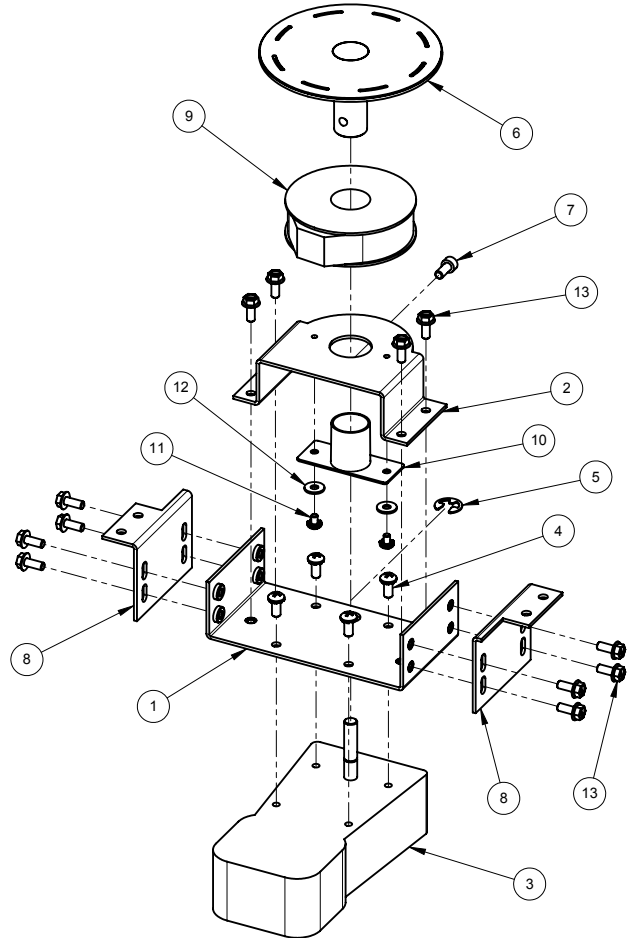
500-1141-00



| ID | Part Number | Description | Qty |
|----|-------------|---------------------------------------|-----|
| 1 | 535-1961-00 | FLIPPER BASE PLATE, RIGHT - CUT FOOT | 1 |
| 2 | 515-6308-01 | COIL STOP ASSEMBLY | 1 |
| 3 | 237-5985-01 | SCREW, 10-32 X 1/2" SLT SER HWH SWAGE | 2 |
| 4 | 244-5003-00 | #10 LOCK WASHER, SPLIT | 2 |
| 5 | 269-5002-00 | SPRING WASHER | 1 |
| 6 | 090-5067-ND | COIL - 25-1400 - NO DIODE | 1 |
| 7 | 545-5388-00 | COIL SLEEVE | 1 |
| 8 | 535-7356-00 | COIL BRACKET | 1 |
| 9 | 237-5975-00 | SCREW, 8-32 X 3/8" HWH SWAGE ZN | 2 |
| 10 | 545-5428-00 | RUBBER BUMPER | 1 |
| 11 | 545-5070-00 | FLIPPER BUSHING | 1 |
| 12 | 237-5976-02 | SCREW, 6-32 X 3/8" HWH SWAGE | 3 |
| 13 | 180-5149-00 | SWITCH, END-OF-STROKE | 1 |
| 14 | 237-5976-04 | SCREW, 6-32 X 5/8" HWH SWAGE | 2 |
| 15 | 535-7354-00 | SWITCH PLATE / SPRING RTN BRKT | 1 |
| 16 | 265-5035-00 | EXTENSION SPRING | 1 |
| 17 | 515-7203-00 | PLUNGER / CRANK ASSEMBLY | 1 |

5.16 MAGNETIC SPINNING DISC ASSEMBLY

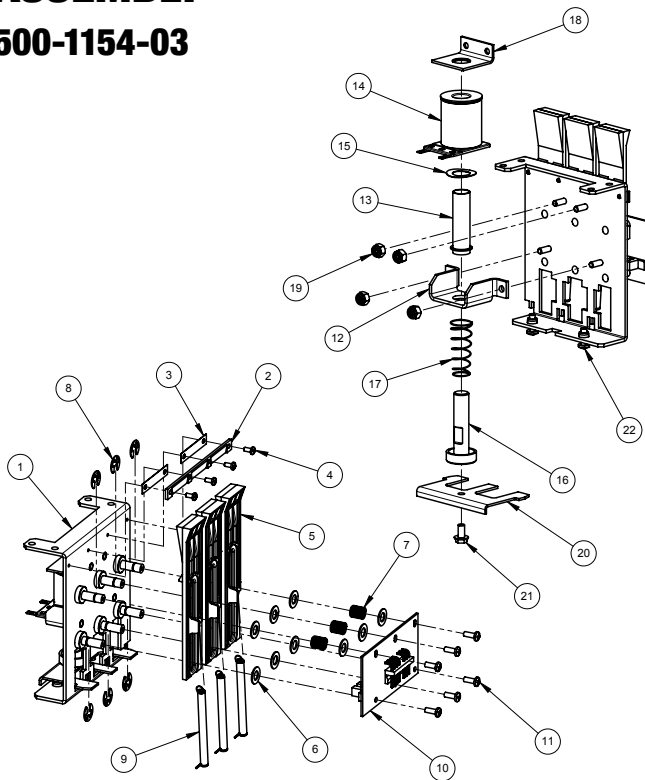
500-2468-00



| ID | Part Number | Description | Qty |
|----|-------------|-------------------------------------|-----|
| 1 | 535-5524-00 | BRACKET, MOTOR MOUNTING | 1 |
| 2 | 535-5526-00 | MOUNTING BRACKET, MAGNET | 1 |
| 3 | 511-5250-02 | MOTOR ASSEMBLY | 1 |
| 4 | 232-5301-00 | SCREW, 8-32 X 3/8" PPH SEMS | 4 |
| 5 | 270-5002-00 | RETAINING RING - 1/4" | 1 |
| 6 | 511-2750-00 | ASSEMBLY, DISK & DECAL, THE BEATLES | 1 |
| 7 | 237-5897-00 | SCREW, 8-32 X 3/8" SHCS ZINC | 1 |
| 8 | 535-5525-01 | MOUNTING FOOT | 2 |
| 9 | 511-5065-ND | MAGNET / CONNECTOR ASSY, 22-650 | 1 |
| 10 | 545-5626-00 | SLEEVE (MAGNETIC COIL) | 1 |
| 11 | 232-5209-00 | SCREW, 6-32 X 3/16" PPH SEMS | 2 |
| 12 | 242-5001-00 | #6 WASHER | 2 |
| 13 | 237-5903-00 | SCREW, 8-32 X 3/8" HWH | 12 |

5.17 3-BANK DROP TARGET ASSEMBLY

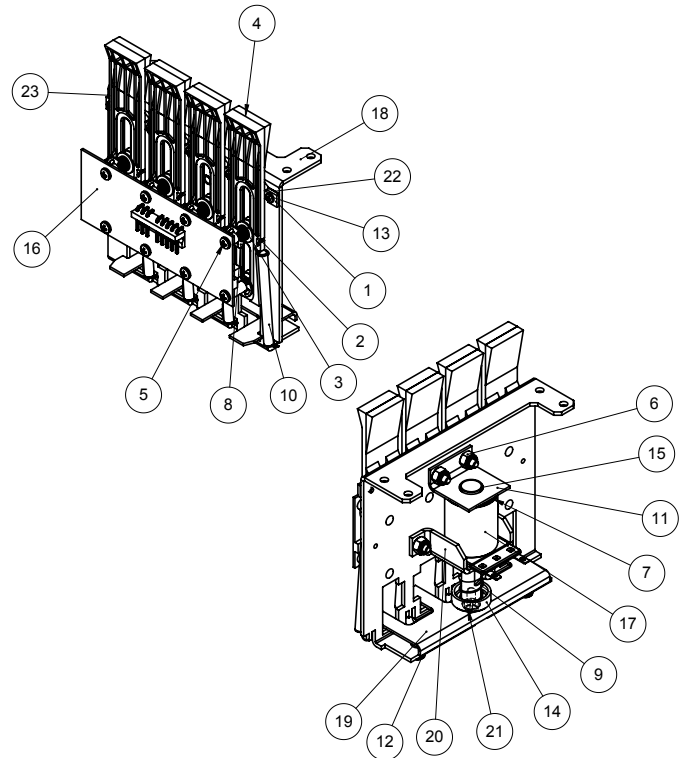
500-1154-03



| ID | Part Number | Description | Qty |
|-----|-------------|--|-----|
| 1 | 515-9926-00 | 3-BANK DROP - SMALL FOOT | 1 |
| 2 | 545-6163-03 | LEDGE, 3-BANK DROP TARGET | 1 |
| 3 | 545-6798-00 | SHIM - FICHE PAPER - D.T. SINGLE | 2 |
| 4 | 237-6169-00 | SCREW, 4-40 X 1/4 PPH MS | 4 |
| 5 | 545-6305-00 | TARGET - ROLLOVER - BLACK | 3 |
| 6 | 242-5091-00 | WASHER, 1/2 X 17/64 X .03 - DT | 9 |
| 7 | 266-5089-00 | SPRING COMPRESSION - DT | 3 |
| 8 | 270-5002-00 | RETAINING RING - 1/4" | 6 |
| 9 | 265-5003-02 | TARGET RESET SPRING | 3 |
| 10 | 520-5252-13 | 3 BANK DROP TARGET PCB-OPTO, W/ RIGHT ANGLE CONN | 1 |
| 11 | 237-5501-00 | SCREW, 6-32 X 3/8" PPH MS ZINC | 6 |
| 12 | 535-9995-01 | COIL BRACKET | 1 |
| 13 | 545-5076-01 | COIL SLEEVE | 1 |
| 14 | 090-5034-ND | COIL 25-1240 - NO DIODE | 1 |
| 15 | 269-5002-00 | SPRING WASHER | 1 |
| 16 | 530-5757-00 | PLUNGER - D.T. ASSY. | 1 |
| 17 | 266-5020-00 | COMPRESSION SPRING-CONICAL | 1 |
| 18 | 535-9959-00 | STOP BRKT | 1 |
| 19 | 240-5102-00 | 8-32 NYLON LOCK NUT | 4 |
| 20 | 535-9996-03 | LIFT BRACKET - 3 BANK | 1 |
| 21 | 237-5985-00 | SCREW, 10-32 X 3/8" HWH SWAGE | 1 |
| 22 | 237-5602-00 | SCREW, 8-32 X 1/2" PPH MS ZINC | 2 |
| 98* | 605-5006-58 | INSULATING TUBING, TARGET SWITCH / COIL 5/8" | 2 |
| 99* | 036-6248-03 | CABLE, 3" GENERIC COIL 3-PIN | 1 |

5.18 4-BANK DROP TARGET ASSEMBLY

500-7204-01

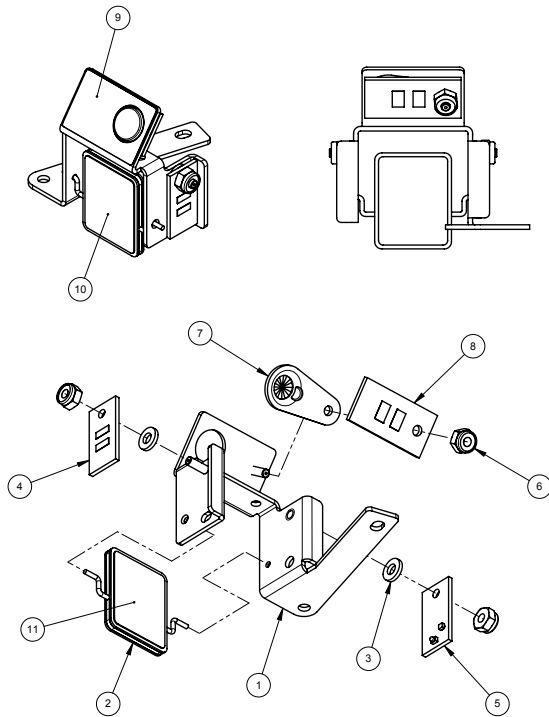


| ID | Part Number | Description | Qty |
|----|-------------|----------------------------------|-----|
| 1 | 545-6163-04 | LEDGE, 4-BANK DROP TARGET | 1 |
| 2 | 242-5091-00 | WASHER, 1/2 X 17/64 X .03 - DT | 12 |
| 3 | 266-5089-00 | SPRING COMPRESSION - DT | 4 |
| 4 | 545-6305-00 | TARGET - ROLLOVER - BLACK | 4 |
| 5 | 237-5501-00 | SCREW, 6-32 X 3/8" PPH MS ZINC | 8 |
| 6 | 240-5102-00 | 8-32 NYLON LOCK NUT | 4 |
| 7 | 269-5002-00 | SPRING WASHER | 1 |
| 8 | 270-5002-00 | RETAINING RING - 1/4" | 8 |
| 9 | 266-5020-00 | COMPRESSION SPRING-CONICAL | 1 |
| 10 | 265-5003-02 | TARGET RESET SPRING | 4 |
| 11 | 535-9959-00 | STOP BRKT | 1 |
| 12 | 237-5602-00 | SCREW, 8-32 X 1/2" PPH MS ZINC | 2 |
| 13 | 237-6169-00 | SCREW, 4-40 X 1/4 PPH MS | 5 |
| 14 | 530-5757-00 | PLUNGER - D.T. ASSY. | 1 |
| 15 | 545-5076-01 | COIL SLEEVE | 1 |
| 16 | 520-5252-14 | OPTO PCB, RT ANG CONN, 4-BANK DT | 1 |
| 17 | 090-5034-ND | COIL 25-1240 - NO DIODE | 1 |
| 18 | 515-7771-01 | DT FRAME ASSY, 4-BANK, STAR | 1 |
| 19 | 535-9996-04 | LIFT BRACKET - 4 BANK | 1 |
| 20 | 535-9995-01 | COIL BRACKET | 1 |
| 21 | 237-5985-00 | SCREW, 10-32 X 3/8" HWH SWAGE | 1 |
| 22 | 545-6798-00 | SHIM - FICHE PAPER - D.T. SINGLE | 1 |
| 23 | 545-6798-01 | SHIM - FICHE PAPER - D.T. DOUBLE | 1 |



5.19 LEFT SPINNER ASSEMBLY

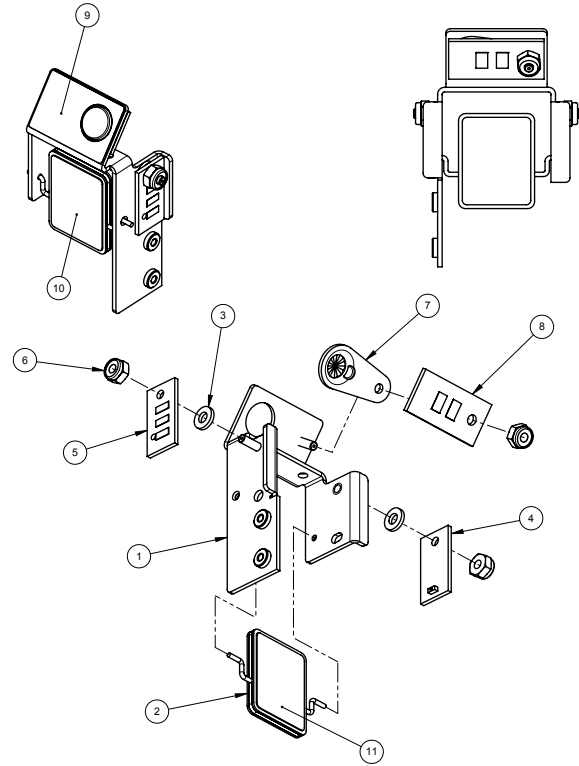
511-7958-00



| ID | Part Number | Description | Qty |
|-----|--------------|--|-----|
| 1 | 535-2029-00 | BRACKET, OPTO SPINNER, THE BEATLES | 1 |
| 2 | 515-1992-00 | SPINNER TARGET SUBASSY: NARROW, OPTO | 1 |
| 3 | 242-5079-00 | WASHER, .150 I.D. X .312 O.D. X .050 THICK | 2 |
| 4 | 511-2739-00 | ASSEMBLY, PCA IR OPTO EMITTER & CABLE | 1 |
| 5 | 511-2739-01 | ASSEMBLY, PCA IR OPTO RECEIVER & CABLE | 1 |
| 6 | 240-5005-00 | 6-32 NYLON STOP NUT | 3 |
| 7 | 550-7361-01 | MINI DOME-LED, CLEAR | 1 |
| 8 | 520-7000-00 | SINGLE FLASH LED BOARD | 1 |
| 9 | 820-1018-35 | DECAL #35, THE BEATLES | 1 |
| 10 | 820-1018-28 | DECAL #28, LEFT SPINNER FRONT, THE BEATLES | 1 |
| 11 | 820-1018-29 | DECAL #29, LEFT SPINNER BACK, THE BEATLES | 1 |
| 98* | 040-5001-00B | CABLE TIE 4" BLACK | 2 |
| 99* | 036-8068-08 | CABLE, GENERIC LP HS 8" 2P MFM | 1 |
| 11 | 820-1018-29 | DECAL #29, LEFT SPINNER BACK, THE BEATLES | 1 |

5.20 RIGHT SPINNER ASSEMBLY

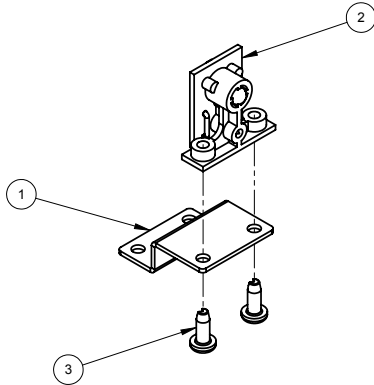
511-7959-00



| ID | Part Number | Description | Qty |
|-----|--------------|---|-----|
| 1 | 535-2030-00 | BRACKET, BG OPTO SPINNER, WITH SIGN | 1 |
| 2 | 515-1992-00 | SPINNER TARGET SUBASSY: NARROW, OPTO | 1 |
| 3 | 242-5079-00 | WASHER, .150 I.D. X .312 O.D. X .050 THICK | 2 |
| 4 | 511-2739-00 | ASSEMBLY, PCA IR OPTO EMITTER & CABLE | 1 |
| 5 | 511-2739-01 | ASSEMBLY, PCA IR OPTO RECEIVER & CABLE | 1 |
| 6 | 240-5005-00 | 6-32 NYLON STOP NUT | 3 |
| 7 | 550-7361-01 | MINI DOME-LED, CLEAR | 1 |
| 8 | 520-7000-00 | SINGLE FLASH LED BOARD | 1 |
| 9 | 820-1018-34 | DECAL #34, THE BEATLES | 1 |
| 9 | 820-1018-34 | DECAL #34, THE BEATLES | 1 |
| 10 | 820-1018-26 | DECAL #26, RIGHT SPINNER FRONT, THE BEATLES | 1 |
| 11 | 820-1018-27 | DECAL #27, RIGHT SPINNER BACK, THE BEATLES | 1 |
| 98* | 040-5001-00B | CABLE TIE 4" BLACK | 2 |
| 99* | 036-8068-08 | CABLE, GENERIC LP HS 8" 2P MFM | 1 |
| 11 | 820-1018-27 | DECAL #27, RIGHT SPINNER BACK, THE BEATLES | 1 |

5.21 SINGLE OPTO & BRACKET ASSEMBLY

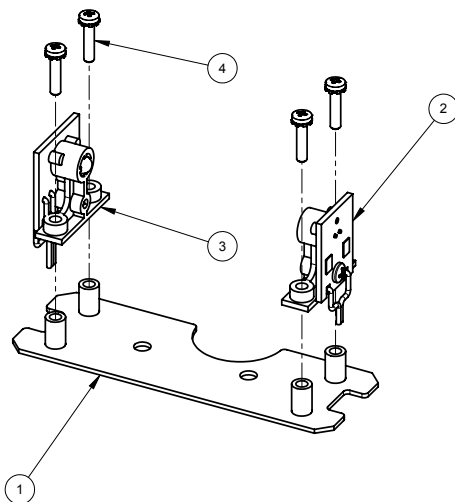
511-7960-00



| ID | Part Number | Description | Qty |
|----|-------------|----------------------------------|-----|
| 1 | 535-1916-00 | BRKT: OPTO | 1 |
| 2 | 515-0215-00 | LONG RANGE OPTO EMITTER ASSEMBLY | 1 |
| 3 | 237-5880-00 | SCREW, #6 X 3/8 PPH T-25 | 2 |

5.22 DOUBLE OPTO & BRACKET ASSEMBLY

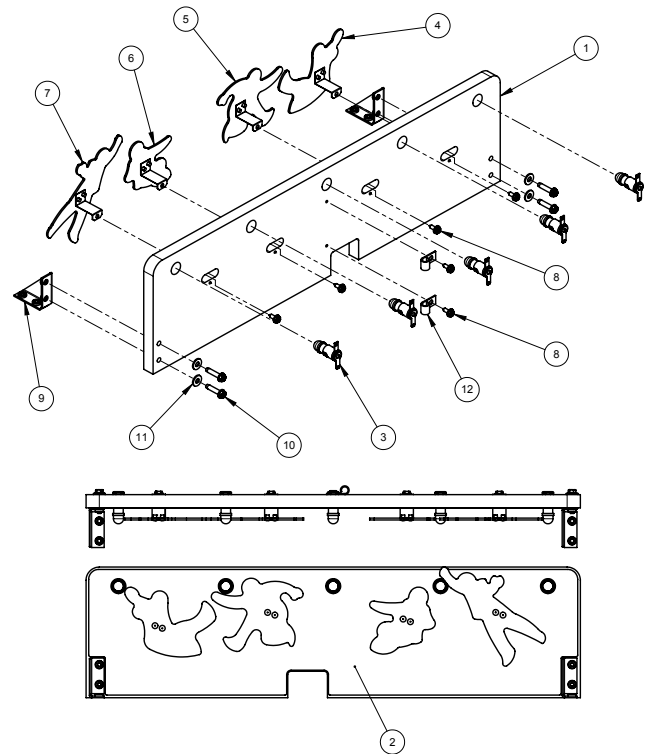
511-7939-00



| ID | Part Number | Description | Qty |
|----|-------------|-----------------------------------|-----|
| 1 | 515-1971-00 | BRKT: OPTO SWITCH, PM | 1 |
| 2 | 515-0215-00 | LONG RANGE OPTO EMITTER ASSEMBLY | 1 |
| 3 | 515-0215-01 | LONG RANGE OPTO RECEIVER ASSEMBLY | 1 |
| 4 | 237-5813-00 | SCREW, 4-40 X 1/2" PPH SEMS | 4 |

5.23 BACK PANEL ASSEMBLY

500-1123-00



| ID | Part Number | Description | Qty |
|-----|-----------------|---|---------|
| 1 | 525-1023-00 | BACK PANEL, THE BEATLES | 1 |
| 2 | 820-8623-K8B | DECAL, BACK PANEL, THE BEATLES | 1 |
| 3 | 519-5000-WW-LED | SOCKET & LED ASSY, WHITE | 5 |
| 4 | 510-7751-17 | RIVETED ASSY, PLASTIC #17 JOHN, THE BEATLES | 1 |
| 5 | 510-7751-18 | RIVETED ASSY, PLASTIC #18 RINGO, THE BEATLES | 1 |
| 6 | 510-7751-19 | RIVETED ASSY, PLASTIC #19 GEORGE, THE BEATLES | 1 |
| 7 | 510-7751-20 | RIVETED ASSY, PLASTIC #20 PAUL, THE BEATLES | 1 |
| 8 | 234-5000-00 | SCREW, #6 X 3/8" HWH | 6 |
| 9 | 535-0587-00 | BACK PANEL BRACE | 2 |
| 10 | 237-5975-02 | SCREW, 8-32 x 3/4 HWH SLOT SERR SW ZINC | 4 |
| 11 | 242-5005-00 | #8 WASHER | 4 |
| 12 | 040-5000-03 | 1/4" CABLE CLAMP | 2 |
| 97* | 631-5000-00 | STAPLE - 5/16" | 10 |
| 98* | 600-5003-00 | BRAIDED WIRE - 20 GAUGE | 1.5 FT. |
| 99* | 036-8063-14-K8 | CABLE, BACK PANEL, THE BEATLES | 1 |



6. SPECIFICATIONS

500-55K8-01

SPECIFICATIONS, MECHANICAL, GAME SETUP

| Specification | Imperial | Metric |
|---|--------------------|----------------------|
| Weight | 210 lbs | 96 kg |
| Max dimensions, leg levers extended (h, w, d) | 78 x 27.75 x 57 in | 198 x 70.5 x 145 cm |
| Minimum game dimensions (h, w, d) | 76 x 27.75 x 57 in | 193 x 70.5 x 145 cm |
| Minimum room dimensions per game (h, w, d) | 80 x 36 x 84 in | 203 x 91 cm x 214 cm |

• (h, w, d) = height, width, depth.

SPECIFICATIONS, MECHANICAL, BOXED

| Specification | Imperial | Metric |
|--------------------------------|-------------------|-------------------|
| Weight, boxed (without pallet) | 230 lbs | 105 kg |
| Box dimensions (h, w, d) | 56.5 x 31 x 31 in | 144 x 79 x 79 cm |
| Minimum dimensions (h, w, d) | 76 x 26 x 57 in | 193 x 66 x 145 cm |

• (h, w, d) = height, width, depth.

SPECIFICATIONS, ELECTRICAL

| Specification | North America - 120VAC | International - 240VAC |
|-------------------------------------|------------------------|-------------------------|
| Line Voltage, Nominal | 120 VAC | 240 VAC |
| Line Voltage Range | 90 VAC - 250 VAC | 90 VAC - 250 VAC |
| Line Frequency * | 60 Hz | 50 Hz, 60 Hz |
| Line Power, Current - attract mode | 70 W, 0.6 A @ 120 VAC | 70 W, 0.3 A @ 240 VAC |
| Line Power, Current - nominal | 360 W, 3 A @ 120 VAC | 360 W, 1.5 A @ 240 VAC |
| Line Power, Current - peak, <100 ms | 540 W, 4.5 A @ 120 VAC | 540 W, 2.25 A @ 240 VAC |

* NOTE: Games designed for 60hz operation (e.g. North America games) will not function correctly on 50hz power and vice versa.

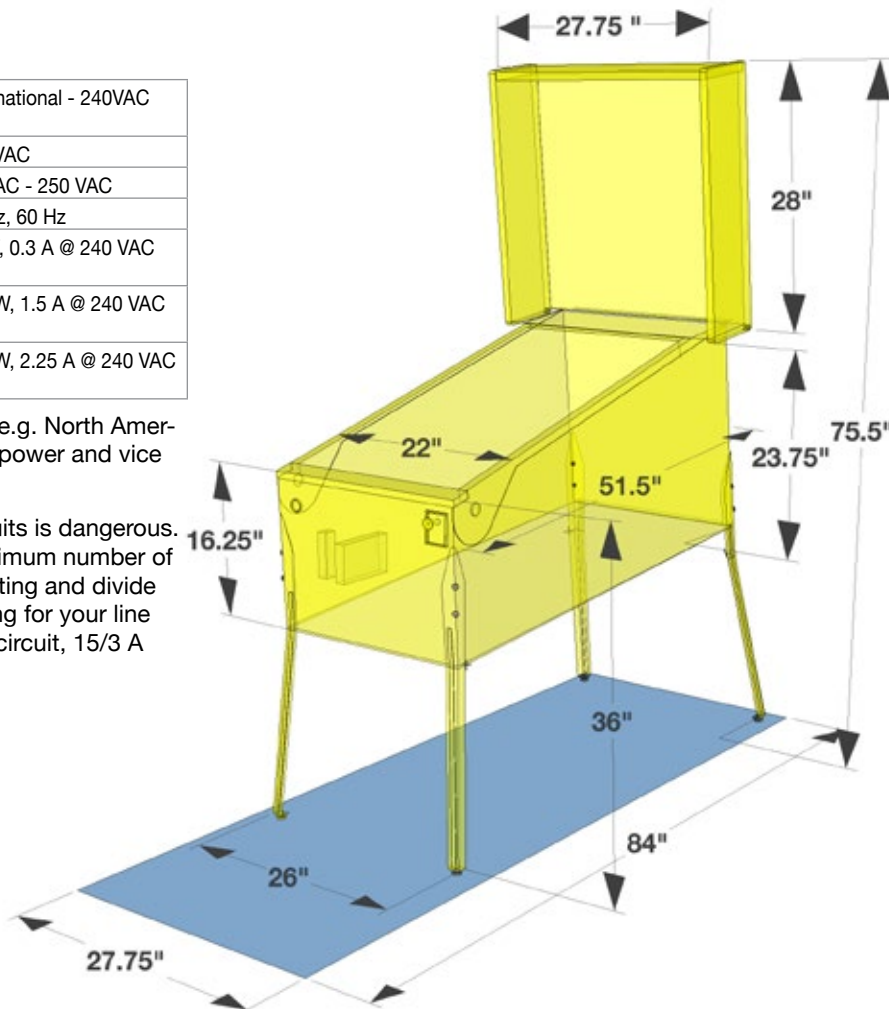
WARNING: Overloading electrical supply circuits is dangerous. Do not overload circuits. To calculate the maximum number of games for a circuit, check circuit amperage rating and divide by the game Nominal Line Power Current rating for your line voltage. For example, a 15A 120V household circuit, 15/3 A (nominal current) = 5 games maximum.

SPECIFICATIONS, ENVIRONMENT

| | Minimum | Maximum |
|------------------------------|--------------|--------------------|
| Temperature, Operating | 32 °F / 0 °C | 104°F / 40 °C |
| Temperature, Storage | 32 °F / 0 °C | 104°F / 40 °C |
| Relative Humidity, Operating | 5% | 95% non-condensing |
| Relative Humidity, Storage | 5% | 95% non-condensing |

- (a) "The appliance has to be placed in a horizontal position."
- (b) "This appliance is not to be cleaned by a Water Jet."
- (i) "Do not locate this appliance in an area where a Water Jet is used."
- (ii) "Do not clean this appliance with a Water Jet."
- (b) If the supply cord is damaged, it must be replaced in order to avoid a hazard.

6.1 GAME DIMENSIONS



6.2 WARRANTY

500-55K8-01

Stern Pinball machines are assembled in Elk Grove Village, Illinois, USA; each pinball machine has unique characteristics that make it a one-of-a-kind American-made product. Each machine will have variations in appearance resulting from differences in the machine's particular wood parts, individual silk screened art and mechanical assemblies. Stern Pinball has inspected each game element to insure it meets stringent quality and playability standards.

STERN PINBALL INC LIMITED WARRANTY

Stern Pinball Inc ("SELLER") warrants only to the initial purchaser of its products that the items listed below are free from defects in material and workmanship under normal use and service for the warranty period specified:

- Printed circuit boards (game logic): 2 months
- Dot Matrix / LCD Display: 9 months

No other parts of seller's product are warranted.

Warranty periods are effective from the initial date of shipment from seller to its authorized distributors.

Seller's sole liability shall be, at its option, to repair or replace products which are returned to seller during the warranty periods specified, provided:

1. Seller is notified promptly upon discovery by purchaser that stated products are defective.
2. Such products are properly packaged and then returned freight prepaid, to seller's plant.

This warranty does not apply to any parts damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall the seller be liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages, or any other losses incurred by the customer in connection with the purchase of a Stern Pinball Inc Product.

WARRANTY DISCLAIMER

Except as specifically provided in a written contract between seller and purchaser, there are no other warranties, express or implied, including any implied warranties of merchantability or fitness for a particular purpose.

This Game Service Manual and all other documents relating to this product, playfield components, features, rules, programming, and operation are subject to change without notice (Service Bulletins, if applicable, available through official Stern Pinball website).

ATTENTION! IMPORTANT WARRANTY INFORMATION

The electronics system, node network architecture, mechanical devices and associated software control systems in this pinball machine are designed to work with genuine Stern Pinball accessories and devices.

Installation of non-authorized accessories, lamps, LED's, motors or other devices or modification of electro-mechanical devices may damage the system and will void your warranty.

6.3 WARNINGS, COMPLIANCE, AND LEGAL NOTICES

PHOTOSENSITIVE SEIZURES HEALTH WARNING



A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns. Even people with no history of seizures of epilepsy may have an undiagnosed condition that can cause "photosensitive epileptic seizures" due to certain visual images, flashing lights or patterns. Symptoms can include lightheadedness, altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, momentary loss of awareness, and loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

IMMEDIATELY STOP PLAYING AND CONSULT A DOCTOR IF YOU EXPERIENCE ANY OF THESE SYMPTOMS.

PARTS SUBSTITUTIONS



For safety and reliability, substitute parts and equipment modifications are not recommended and may void any and all warranties. Use of Non-Stern Pinball Inc Parts or Modifications of game circuitry may adversely affect game play or game safety. Transport pinball machines with hinged backbox in the down position only! Always take great care when servicing any game. Always read the service manual before replacing or servicing components. Substitutions of parts or equipment modifications may void FCC type acceptance.

Always disconnect the line voltage before servicing. Some parts may remain energized when unplugged. Take great caution when servicing any electrical components.

FCC CLASS A SUBPART J COMPLIANCE



This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF INTERFERENCE NOTICE

The cable harness placements, ground strap routing, and other shielding have been designed to keep RF radiation and conduction within levels accepted by FCC rules. To maintain these levels, factory harness position, shielding, and ground straps must be installed in their factory locations should they become disconnected during maintenance.

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pinball®



1-800-KICKERS
 PARTS.SERVICE@STERNPINBALL.COM
 WWW.STERNPINBALL.COM
 FACEBOOK.COM/STERNPINBALL

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 MANUAL #780-50K8-00

