



All of our unique Pinball Machines are handmade in CANADA, and as such, each machine is one of a kind. We use the finest materials and processes available to build each machine, however there are certain things outside of our control. Overtime, your machine can show signs of wear. Balls should be replaced at the first sign of imperfections on the ball surface. All the rubbers on the playfield should be replaced at the first sign of wear.

Our Plastic to Post "Limited Warranty" covers every part in your new Pinball Machines for 120 days from the date of purchase written on your invoice.

Any LCD monitor, R-Boards or Raspberry Pi will be covered for 1 year from the date of delivery written on your invoice.

What is not covered? Unauthorised service calls, loss of income, negligence, misuse, abuse, alteration, modification, rust, warping, damage caused by electrical surge, intrusion of any liquid, fire, theft, Acts of God, improper repair, installation, testing and improper electrical connections, damaged caused by converting game from one region to another.



Warranty coverage applies to the original owner only.

During the warranty period, if a part fails, we will replace or repair the part.

After the warranty period end, please feel free to contact us for replacement parts or visit our website at [www.pinballadventures.com](http://www.pinballadventures.com).

*Pinball Adventures Team*

**DON'T LIKE  
PUNS?  
WAIT TIL YOU  
SEA MINE**





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**BARREL ROLL**

# Terms and Conditions

The following Terms and Conditions of Sale applies to all items and games we sell, and the Purchaser (Buyer) agrees to all terms below by making any purchase from Pinball Adventures, website or its authorized representatives / distributors:

## **One Year Limited Warranty:**

Our 120 Year Limited Warranty, which includes new products, covers telephone diagnosis and repair and replacement of defective parts for up to 120 days after you receive your machine. This warranty does not cover abuse or misuse or any item that is moved or repaired without authorization by Pinball Adventures.

## **Product Set Up:**

Please note that some items including our pinball machines require some assembly. Most items sold by us also require a small amount of “etup time” which instructions are provided and on our website. We cannot be held responsible for any damage to items due to improper setup. In the event that setup is provided by Pinball Adventures or its authorized representatives, we assume no responsibility for damage to the item or the premises in which the items is being delivered. This includes damage to walls, doors, doorways, flooring, and any other places where such damage might occur during deliver and setup.

## **Delivery Times:**

Pinball Adventures or its authorized representatives makes no guarantee, expressed or implied, on the delivery time of any products sold. Any estimates given are subject to change and are dependent on time and method of payment, product availability, and turnaround times of shipping companies. The shipping address provided by the customer must be accessible by an 18 wheeler semi-truck. If the customer provides a shipping address that is not accessible, any auxiliary charges incurred must be paid by the customer. The customer is responsible for knowing the dimensions of the products being ordered and to insure the delivery location is accessible. If a customer is unable to receive an item due to inaccessibility and it is returned, it will be considered a refusal to take delivery and will be subject to a partial refund according to the Returns and Cancellations Policy below.

## **Product Inspection:**

We advise that you immediately unpack items upon receipt to inspect for any possible damage and to follow the directions posted on the product packaging. You must do this in the presence of the shipper and note any damage on the shipper’ paperwork. If any damage is present, you must also immediately contact us to make a report. Minor damage including small scratches and nicks may be present on the item and represent normal wear from product packaging and transit. This damage does not warranty refusal of delivery or a product return.

**Prices:**

Prices published by us or quoted by our representatives may be changed at any time without notice. Due to fluctuating market conditions, written quotations expire automatically 24 hours from the date issued and subject to change or termination with verbal or written notice during that period. All quotations and prices are subject to adjustment on account of new specifications, modifications, quantities, shipment methods or other terms and conditions which are not part of the original price quotation.

**Returns and Cancellations:**

We make arrangements to prepare items for shipment as soon as they are ordered. Therefore, orders must be cancelled in writing via email to [sales@pinballadventures.com](mailto:sales@pinballadventures.com) within 24 hours of purchase to receive a full refund. Cancellations and returns authorized by Pinball Adventures or its authorized representatives will be subject to up to 25% restocking fees and the cost of shipping and return shipping. Refusal to take delivery of products will result in a refund of 50% of the purchase price, minus applicable shipping and storage costs.

**Legal Fees:**

We have the right to collect from purchasers all reasonable costs and expenses incurred in collection of any sums owed by Purchaser and we shall not be obligated to make any further deliveries to Purchaser. Such reasonable costs and expenses shall include, but not be limited to, reasonable attorney's fees.

**AGREEMENT TO TERMS:**

The purchaser (Buyer) confirms that they have read, and agrees to, all terms, conditions and store policies listed in this document.

**The Purchaser (Buyer) agrees that this agreement and all transactions hereunder, or any dispute or controversy arising out of, relating to, or in connection with any purchase, transaction, agreement, or its interpretation, with Pinball Adventures or its authorized representatives shall be governed by the laws of the British Columbia, Canada, all cases will be filed, conducted and heard within the province of British Columbia, Canada.**





New re-engineered Vari-Target allowing 6 values, only six because Seven ate Nine!



Getting the skill shot is no Choke, Oops! I mean no joke, relax! It's just a GAG!



Keep pressing the PUNS, to get the factory back online! Did you hear about the dollar factory next door, Never mind! It doesn't make cents.

LEPRECHAUN  
GAME  
CLOVER



Whoever hired that Leprechaun was pressing their LUCK!! Now he's gone crazy. If we don't catch him it will be GAME CLOVER!

PUNS



If the factory goes seven days without a pun, it makes one weak. Help us collect 50 puns to get the factory up and running.

**Pinball**  
**ADVENTURES**  
[www.pinballadventures.com](http://www.pinballadventures.com)

**CASEY NEEDS YOUR HELP!!**

INTERACTIVE  
SMOKESTACK

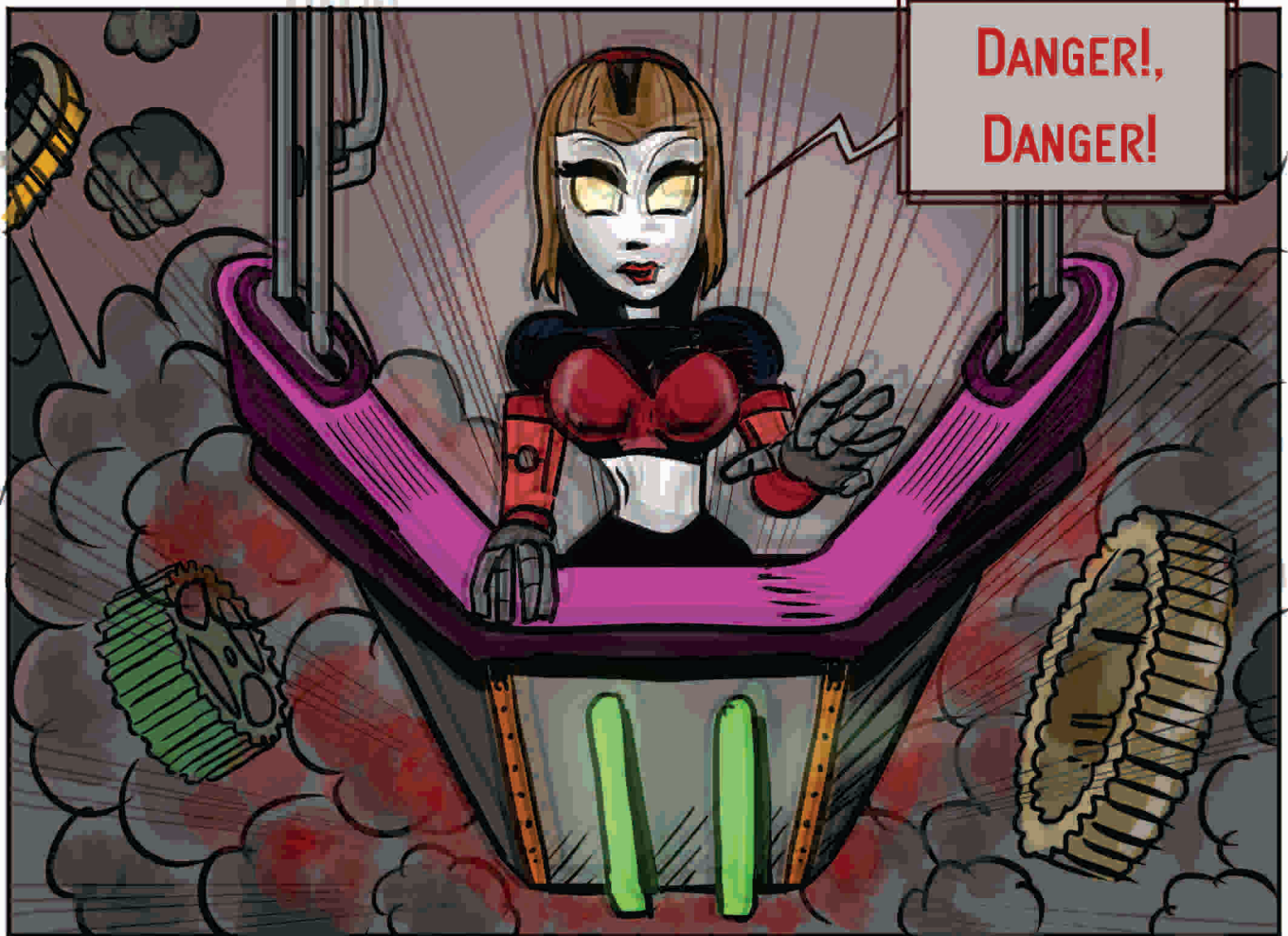
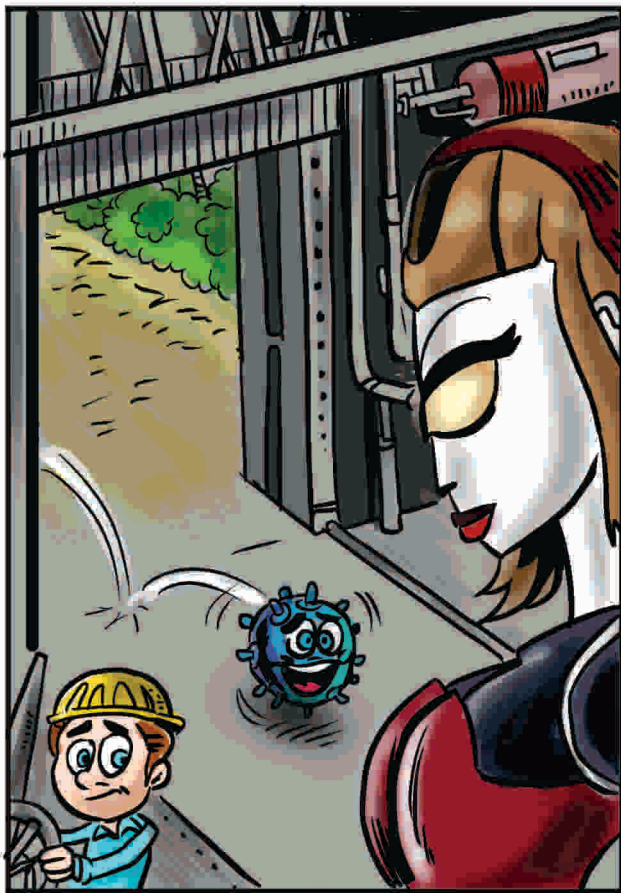
**DANGER! DANGER!  
EVACUATE  
IMMEDIATELY!!!**

"OH NO THERE'S BEEN  
AN EXPLOSION IN  
THE PUNNY FACTORY !!  
CASEY NEEDS YOUR HELP  
TO GATHER UP ALL THE  
PUNS BEFORE THE BIG  
BOSS GETS BACK."

**PUNNY  
FACTORY**  
2520

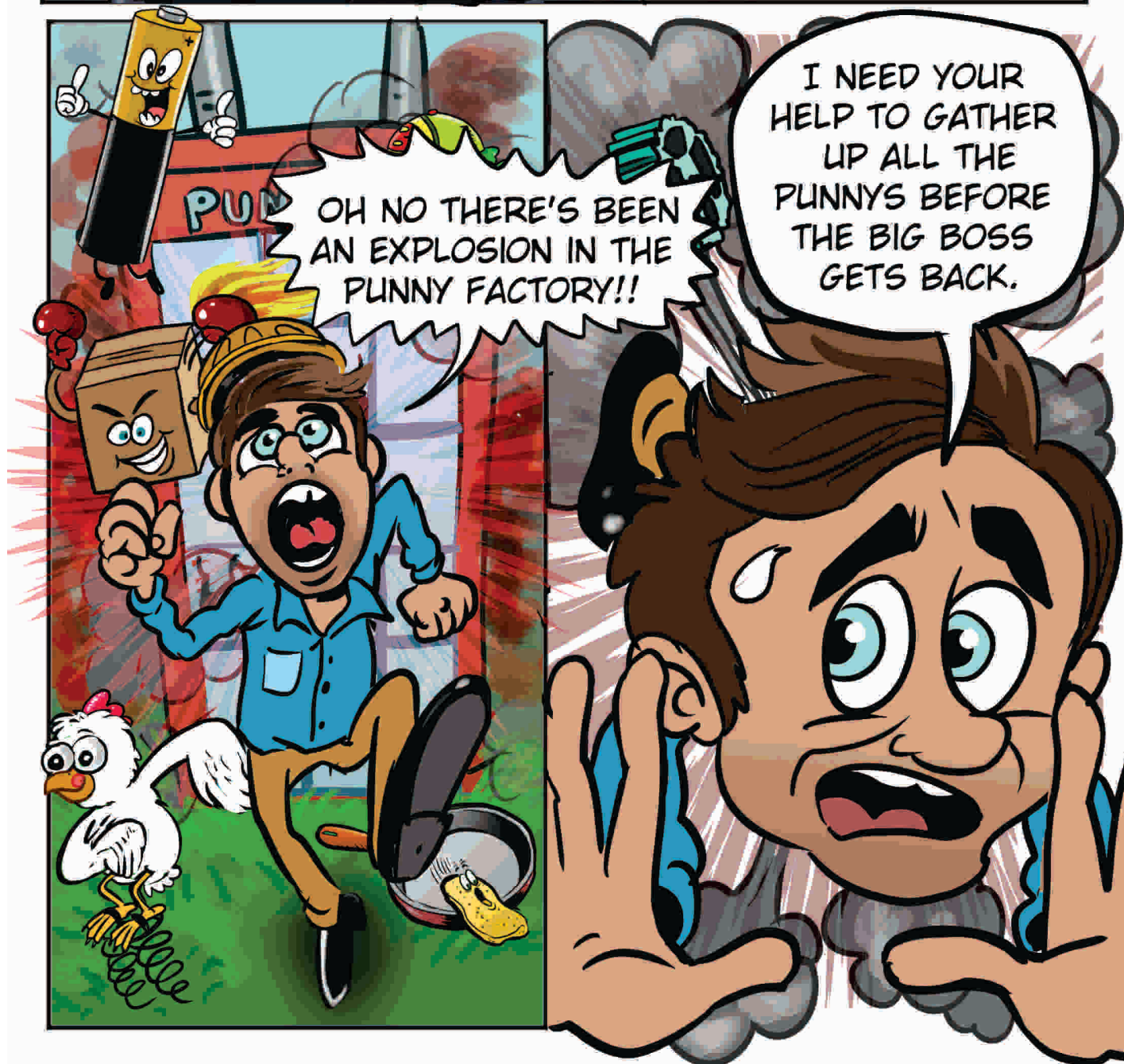
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ADVENTURES**  
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EVACUATE  
IMMEDIATELY



OH NO THERE'S BEEN  
AN EXPLOSION IN THE  
PUNNY FACTORY!!

I NEED YOUR  
HELP TO GATHER  
UP ALL THE  
PUNNYS BEFORE  
THE BIG BOSS  
GETS BACK.



# Punny Factory Shots and Rules

The main goal of the game is to collect 50 Punnys and restore the factory. To collect a Punny, the Player must hit the blue side targets to spell PUNNY FACTORY and then enter the Punny Press.

## Game Features

- Free Game
- Tilt
- Ball Save
- Skillshot
- Lane Selection
- Score Multiplier
- Multi-ball Modes
- Extra Ball
- Kickback Relight
- Vari-Target: Punny Press Logo
- Food Drive Frenzy
- It's a Joke Countdown!
- Catch the Factory Leprechaun
- Secret Video Mode



## Get a Free Game

At the end of each game, there is an animation of a sea mine with bubbles that float above containing random numbers. When the bubbles burst, if the final number matches the last umbers on your score, you win a free game.

## Tilt

There are two tilt telling the player not to shake the game. After the third warning, the game will shutdown and will not restart until the ball has drained back into the bottom trough. This requires a tilt bob (provided) which must be manually installed by the owner.

## Ball Save

Restart your ball if the drains within 15 seconds after starting. The time window can be adjusted in setting.

## **Skillshot**

At the start of every new ball, there is a lit inline letter in the GAG lanes for a skillshot. The selected lane can be changed with either flipper button. If the ball passes through a line with a lit letter, then extra points are earned.

## **GAG Rollover and Multiplier**

During normal play, when a ball rolls through a GAG lane it lights the corresponding letter. Light up all three letters in GAG to receive successive multiplier bonuses of 2x to 5x. GAG lights can be rotated by either flipper.

## **Top Right Target**

Hitting the top-right target next to the upper right pop bumper will award the next letter in PUNNY FACTORY.

## **“Punny Factory” Multi-Ball**

Multi-ball will activate after the first Punny is passed. After that, it activates on every ten Punnys pressed, up to and including the 40th Punny. The 50th Punny wins the game.

The objective during multi-ball is to obtain the Super Jackpot. Each of the three drop-targets in front of the press will give you a Jackpot, then hit the vari-target to collect the Super Jackpot. After that, the drop-targets are reset and the player can go for the Super jackpot again until one ball is drained. Multi-ball ends when the player loses one ball.

## **“Fix the Leak” Multi-ball**

Hit all of the yellow targets and enter the center press to start “Fix the Leak” multi-ball. The player must hit both side orbits to collect two Jackpots, then shoot the vari-target for the Super Jackpot. “Fix the Leak” multi-ball stops once one of the balls is drained and only happens once per round.

## **“It’s a Joke” Countdown**

Collect the bottom in and out-lanes to spell the word JOKE to start the “It’s a Joke” countdown. Lit letter can be alternated with either flipper button. Once the letters are all lit, a points countdown will appear on screen. Shoot with the left or right orbits to collect the remaining countdown points and activate the “Restart the Generator” multi-ball.

## **"Restart the Generator " Multi-ball**

During this multi-ball, the player must first hit all of the yellow targets to collect four Jackpots. Then hit all the three center targets, then the vari-target to collect a Super Jackpot.

## **Extra Ball**

Press three Punnys to light the extra ball, when go through the A in GAG lanes to collect it.

## **Kickback Relight**

This is one of six awards received for hitting all six positions of the vari-target. This can also be achieved after completing the "It's a Joke" Countdown and "Restart the Generator" multi-ball modes.

## **Vari-Target Punny Press Looping**

Hit all six positions of the vari-target to enable "Punny Press Looping". Enter the press as many times as you can in the time allotted to gather points. The first loop scores 500k and increases by 250k until a maximum looping score of 1.5m

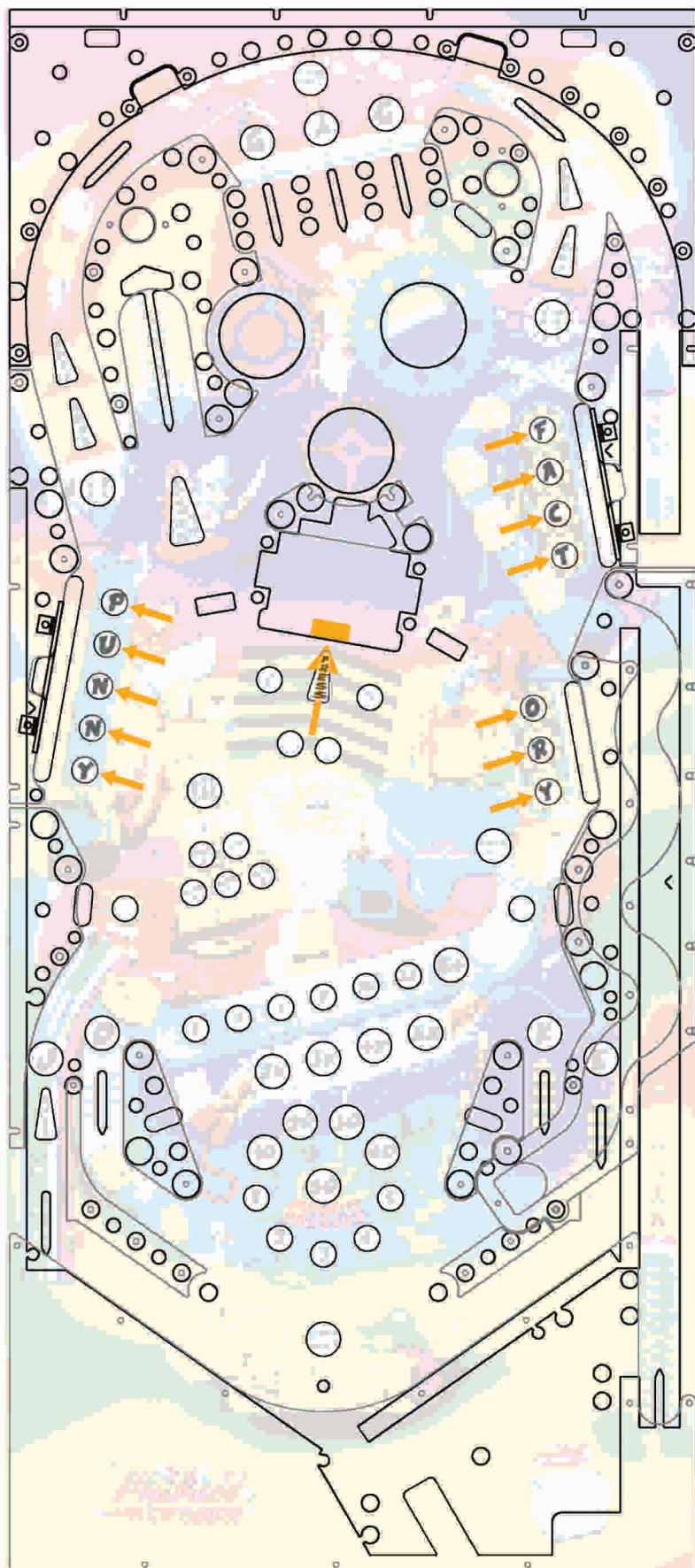
## **Food Frenzy**

Shoot the left or right orbits to collect the next letter in the word BURGER. Once spelled, this starts the Food Drive Frenzy. Continue to loop through the orbits scoring 500k the first time, then increasing by 250k until a maximum looping score of 2m.

## **Catch the Factory Leprechaun**

Hit the chasing green light that bounces around the PUNNY and FACTORY targets to start "Catch the Factory Leprechaun". The player needs to hit the left, right, and center drop targets in order and finally the vari-target to catch the leprechaun.

# **CATCH THE LEPRECHAUN**



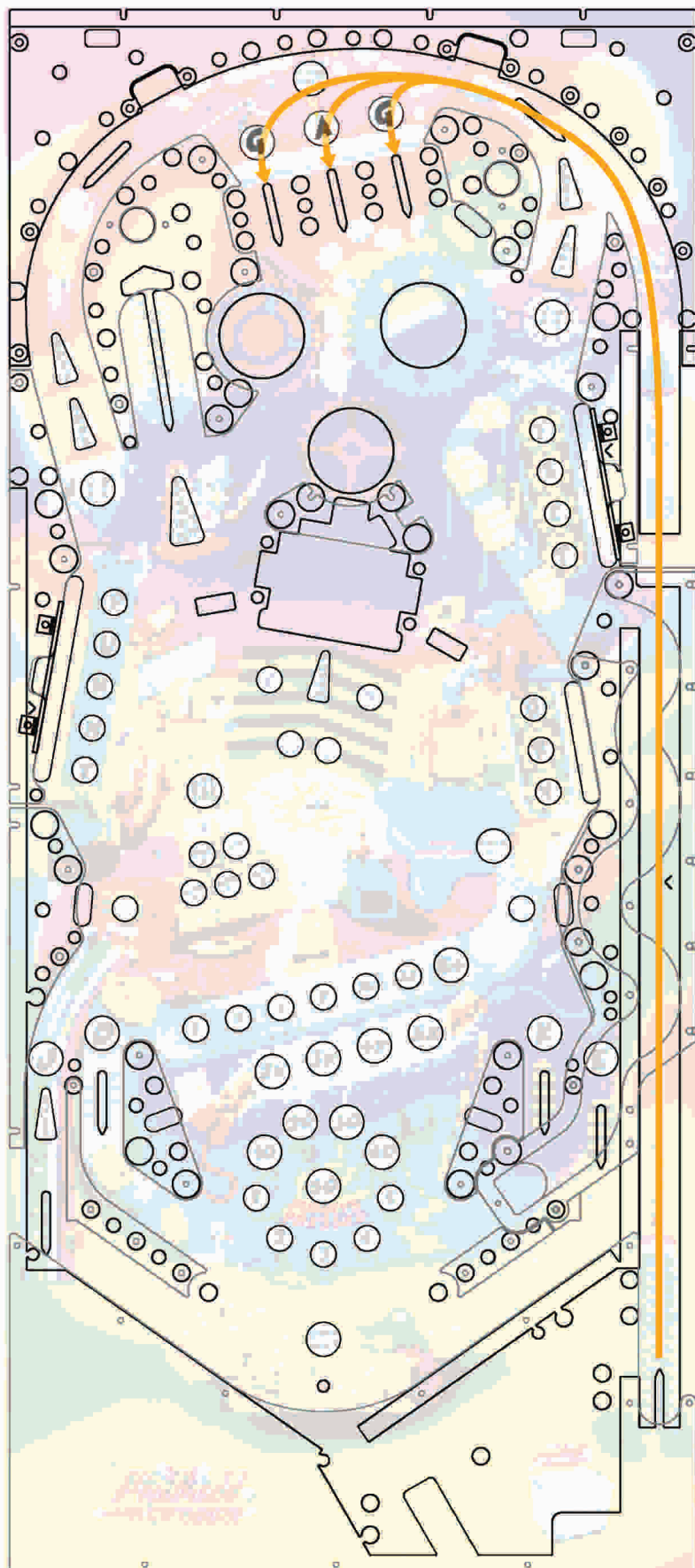
## Playfield Shots: Factory Targets & Punny Press

The main goal of the game is to collect 50 Punnys and restore the factory.

To collect a Punny, the player must hit the side targets to spell PUNNY FACTORY, then enter the Punny Press in the center.



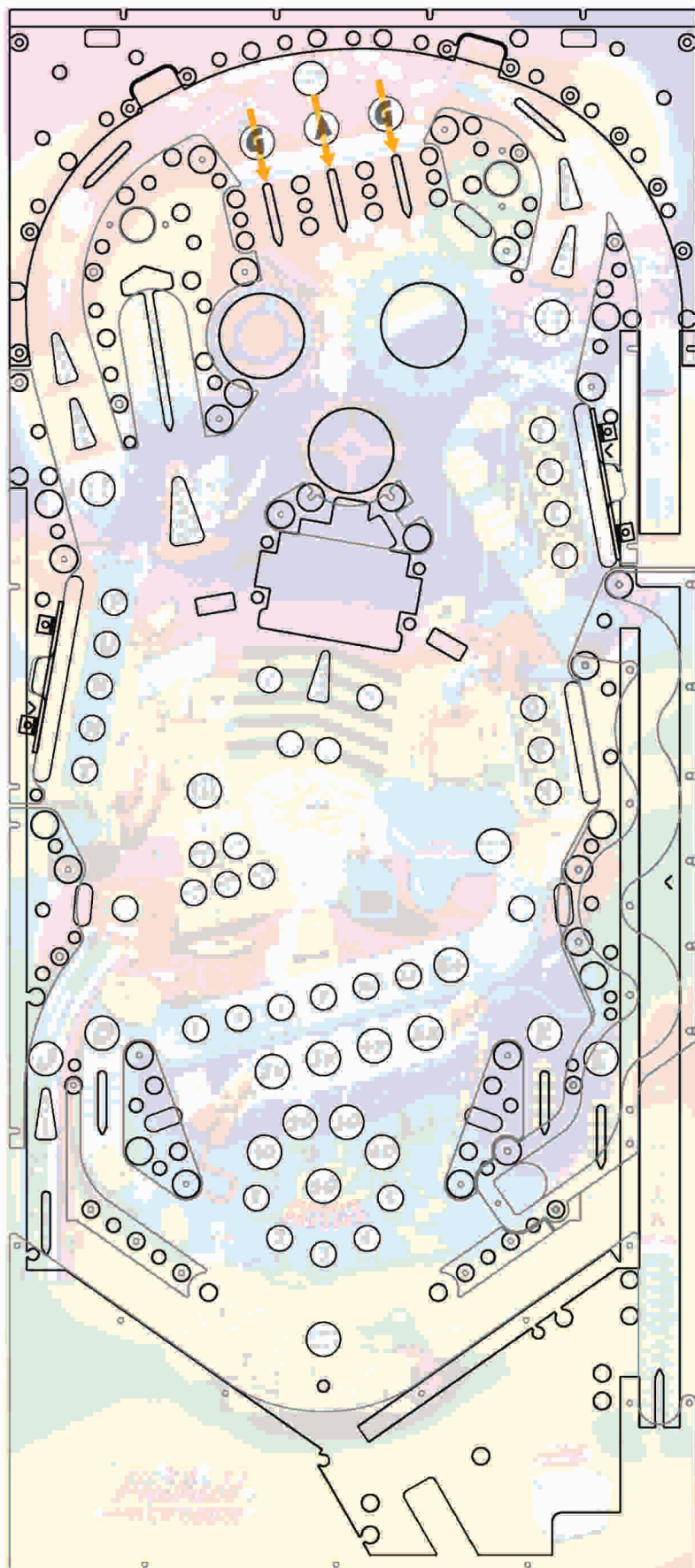
**AWWW SHUCKS**



## Punny Factory Shots: Skillshot

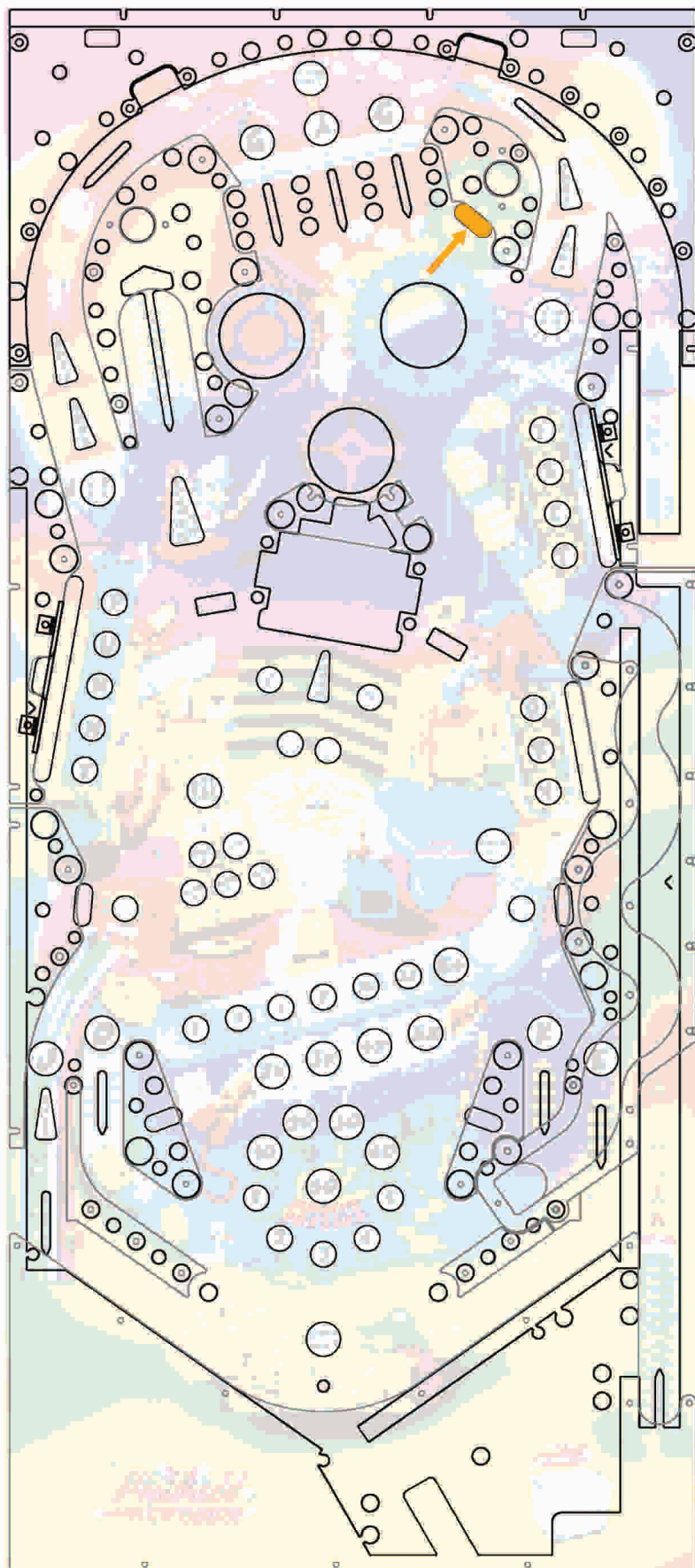
At the start of every new ball, there is a lit letter in the 'GAG' lanes for a skillshot. The selected lane can be changed using the flipper buttons.

Extra points are earned if the ball passes through a lane with a lit letter.



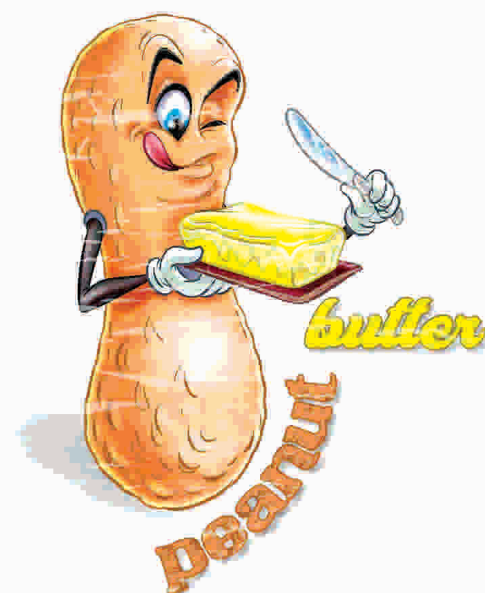
## Playfield Shots: GAG Rollover & Multiplier

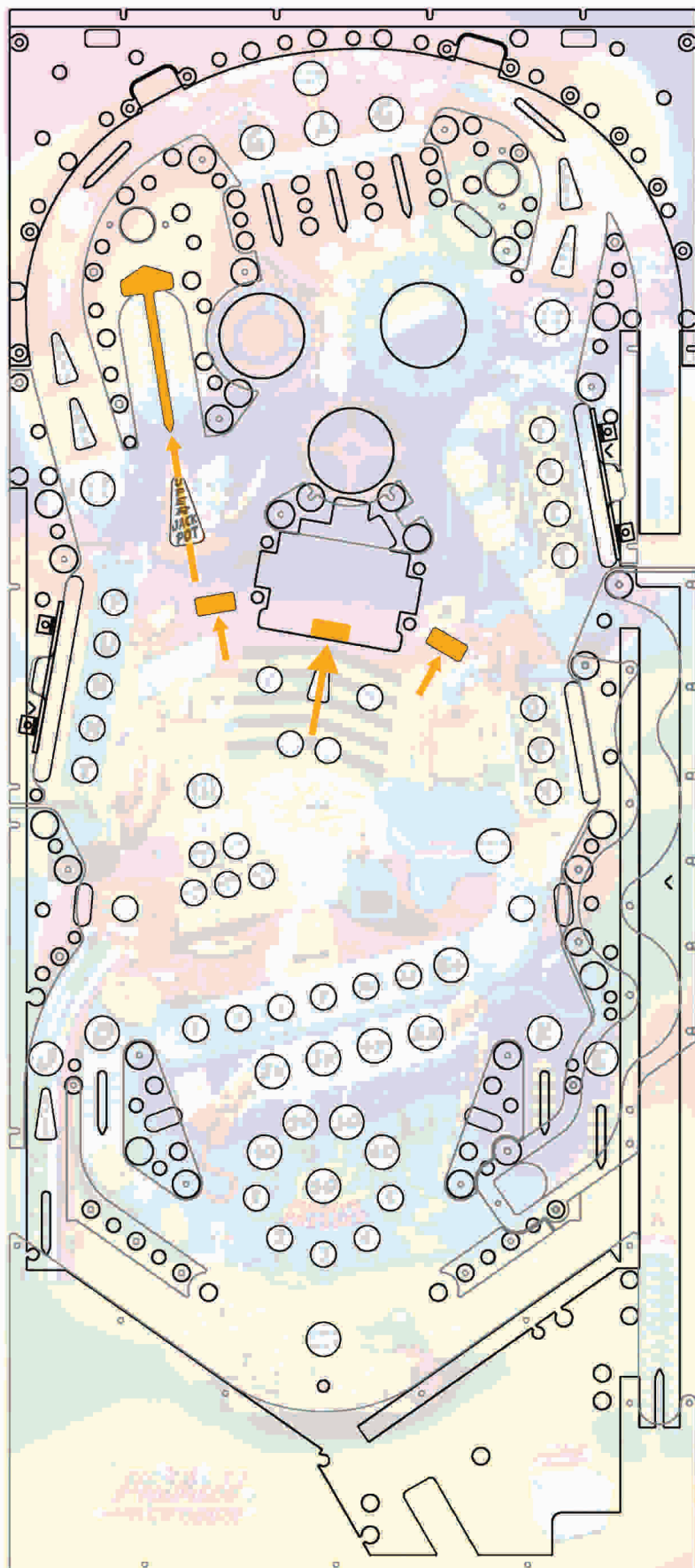
During normal play, when a ball rolls through a 'GAG' lane it will light a corresponding letter. Light up all three 'GAG' letters to receive successive multiplier bonuses of 2x to 5x. Lit 'GAG' letters can be changed using the flipper buttons.



## Playfield Shots: Top-Right Target

Hitting the top-right target next to the upper right pop bumper will award the next missing letter for spelling PUNNY FACTORY.



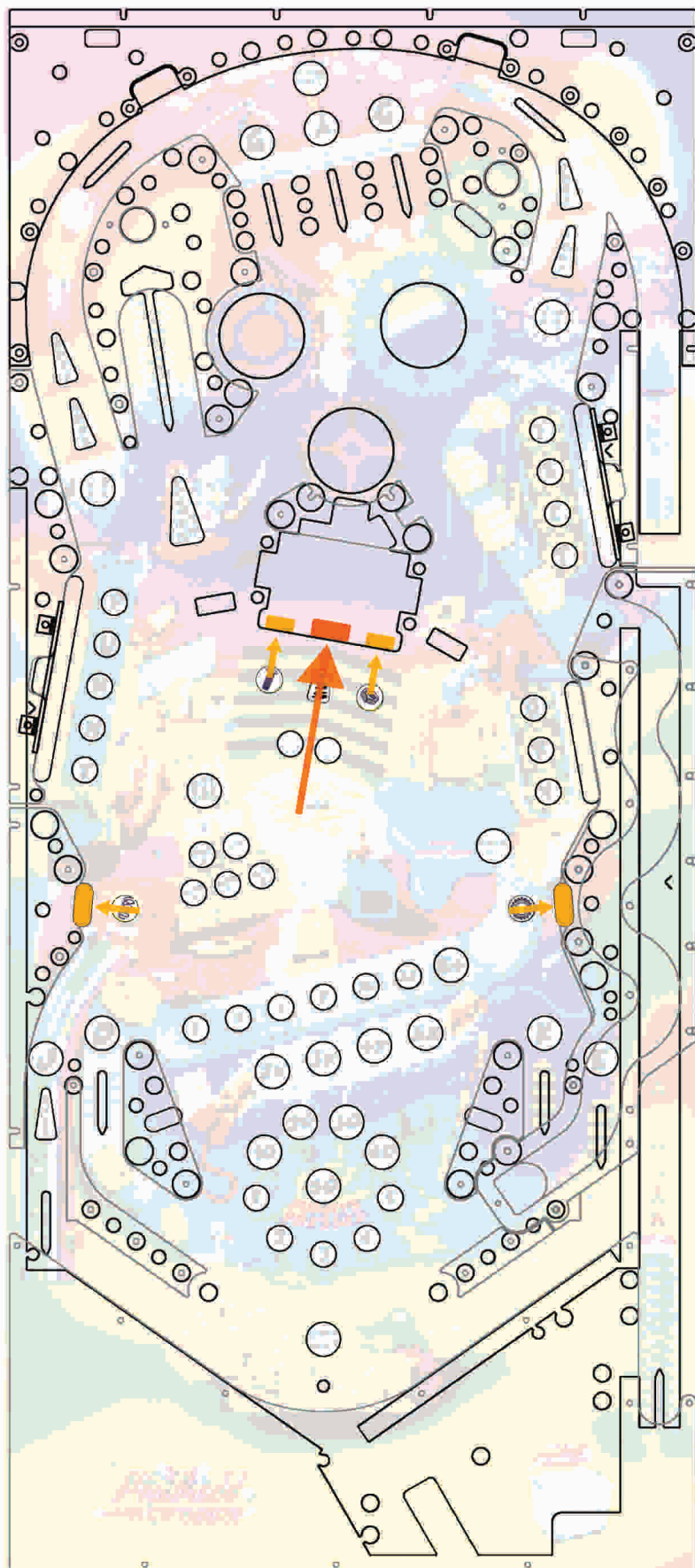


## Playfield Shots: 'Punny Press' Multi-ball

Multi-ball will activate after the first Punny is pressed. After the first, it will activate every ten Punnys pressed, up to and including the 40th Punny. The 50th Punny wins the game.

The objective during multi-ball is to obtain the "Super Jackpot". Each of the three drop-targets in front of the press will give a "Jackpot". After getting those, hit the vari-target to collect the "Super Jackpot".

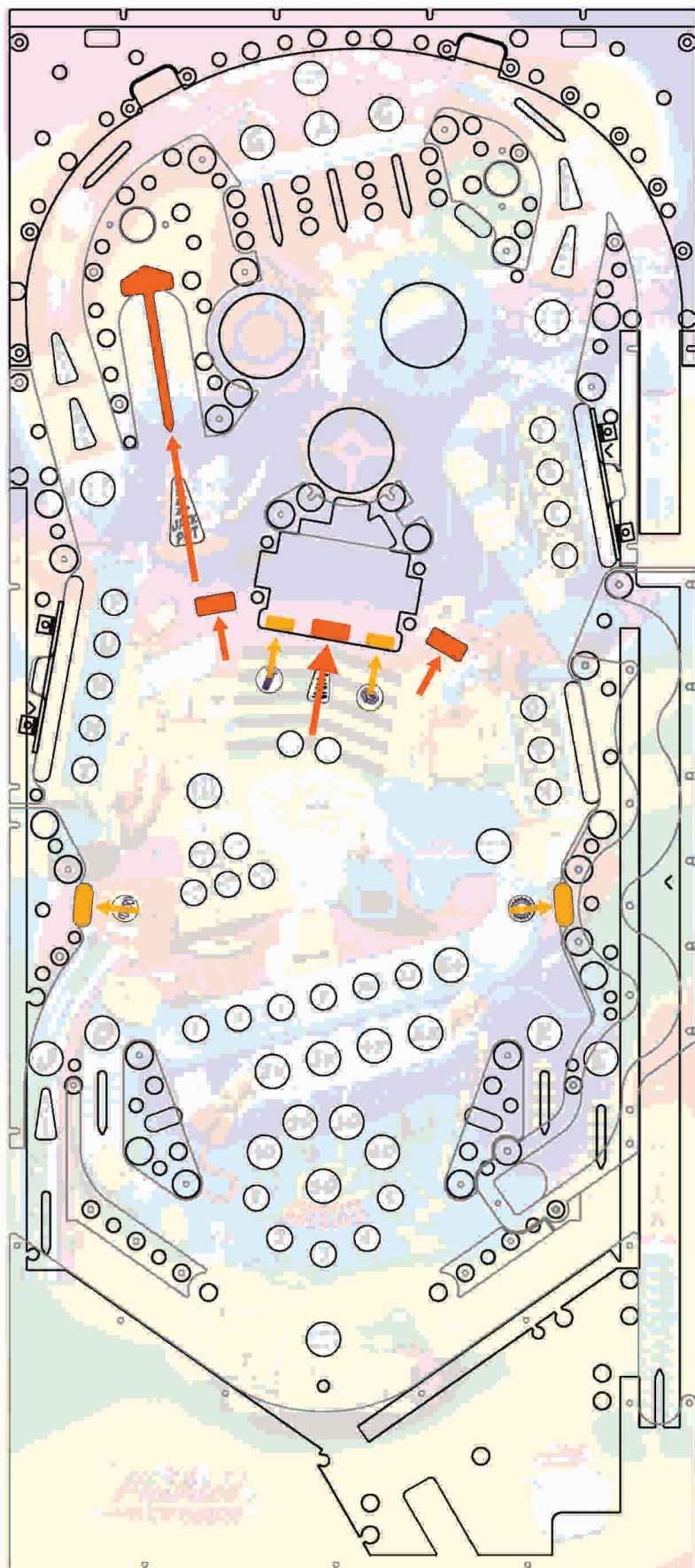
Once collected, the drop-targets will reset and the player can go for the "Super Jackpot" again until a ball is drained. Multi-ball ends when the player loses one ball.



## Playfield Shots: 'Fix the Leak' Multi-ball

Hit the bottom left, bottom right, and press targets, then enter the press to start 'Fix the Leak' multi-ball. The player must hit both orbits to collect two "Jackpots", then shoot the vari-target for the "Super Jackpot".

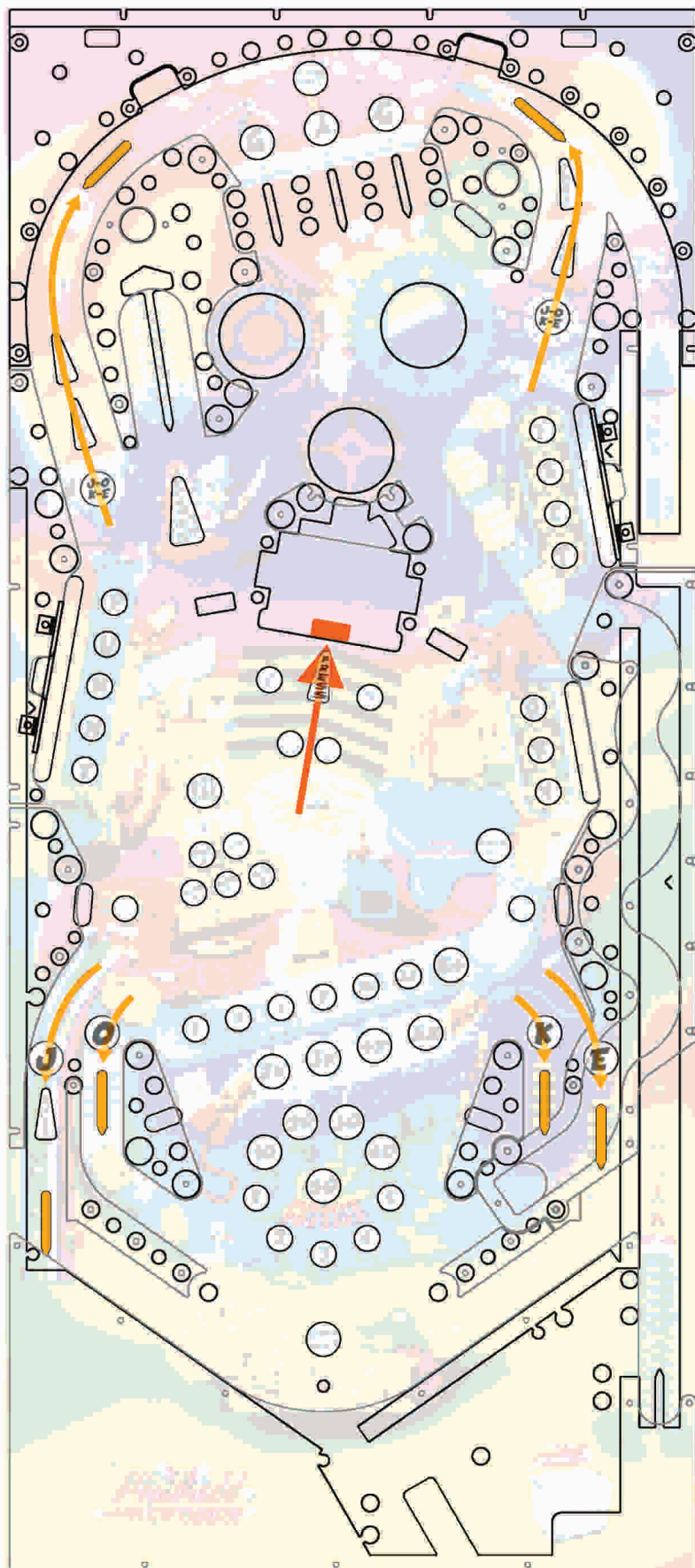
'Fix the Leak' multi-ball ends when the player loses one ball and only occurs once per round.



## Playfield Shots: 'Restart the Generator' Multi-ball

During this multi-ball, the player must first hit all bottom left, bottom right, and press targets to collect four "Jackpots".

After, they need to hit all the three center drop-targets and finally the vari-target to collect a "Super Jackpot".

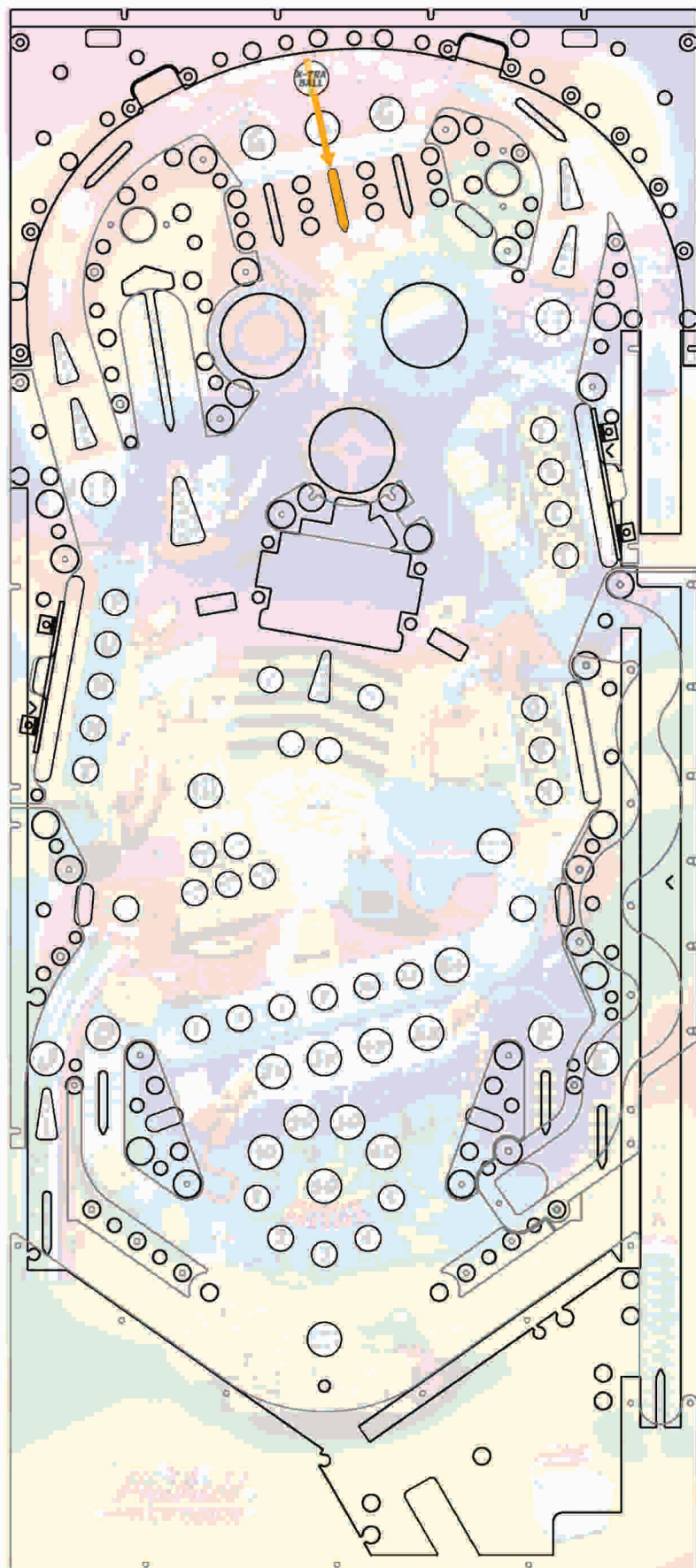


## Playfield Shots: 'It's a Joke' Countdown

Collect the bottom in and out-lanes to spell the word 'JOKE' to start the 'It's a Joke' countdown. Lit 'JOKE' letters can be changed using the flipper buttons.

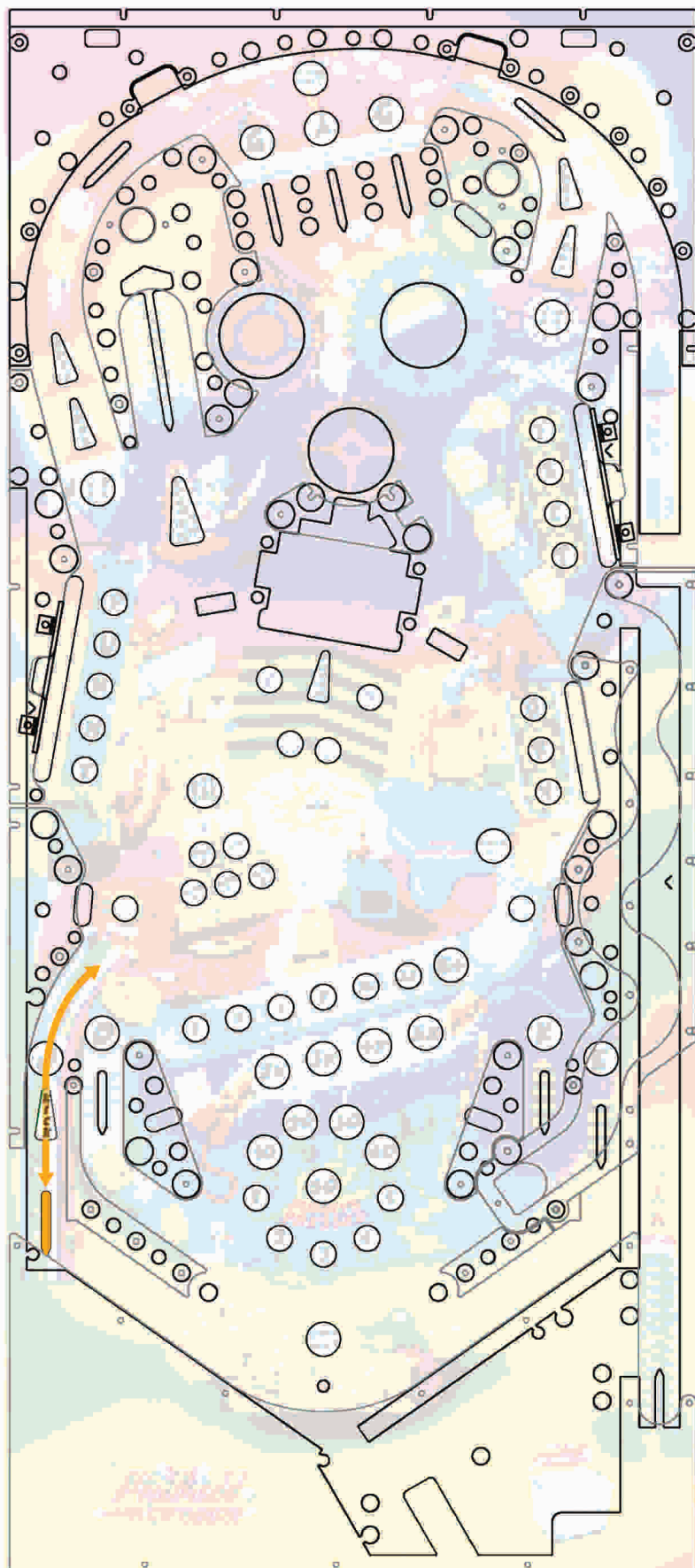
Once the letters are all lit, a point countdown will appear on screen. Shoot either the left or right orbits to collect the countdown points and activate "Restart the Generator" multi-ball.





## Playfield Shots: Extra Ball

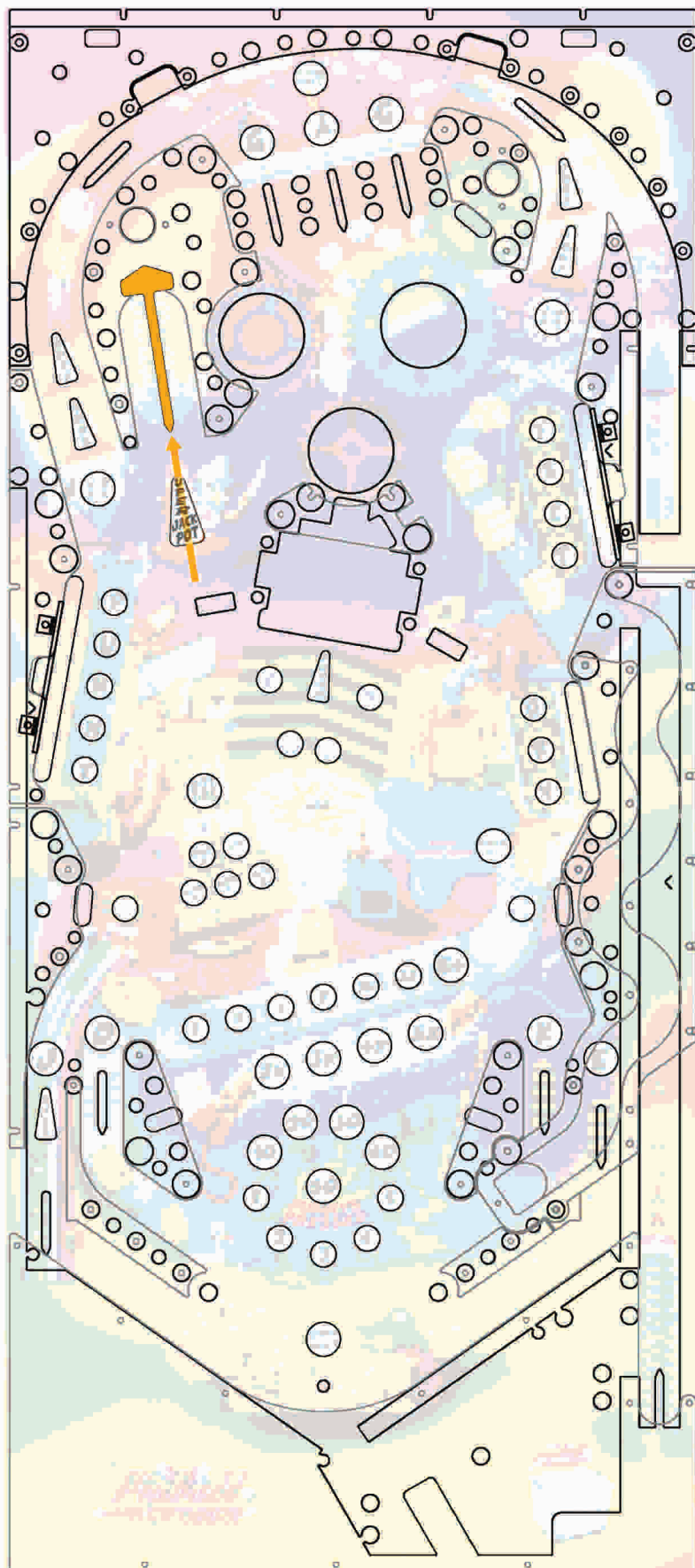
Press three Punnys to light the extra ball.  
Then go through the center 'A' lane in the  
'GAG' lanes to collect it.



## Playfield Shots: Kickback & Left Outlane

This is one of six rewards received for hitting all six positions on the vari-target.

This can also be achieved after completing the 'It's a Joke' countdown and 'Restart the Generator' multi-ball modes.

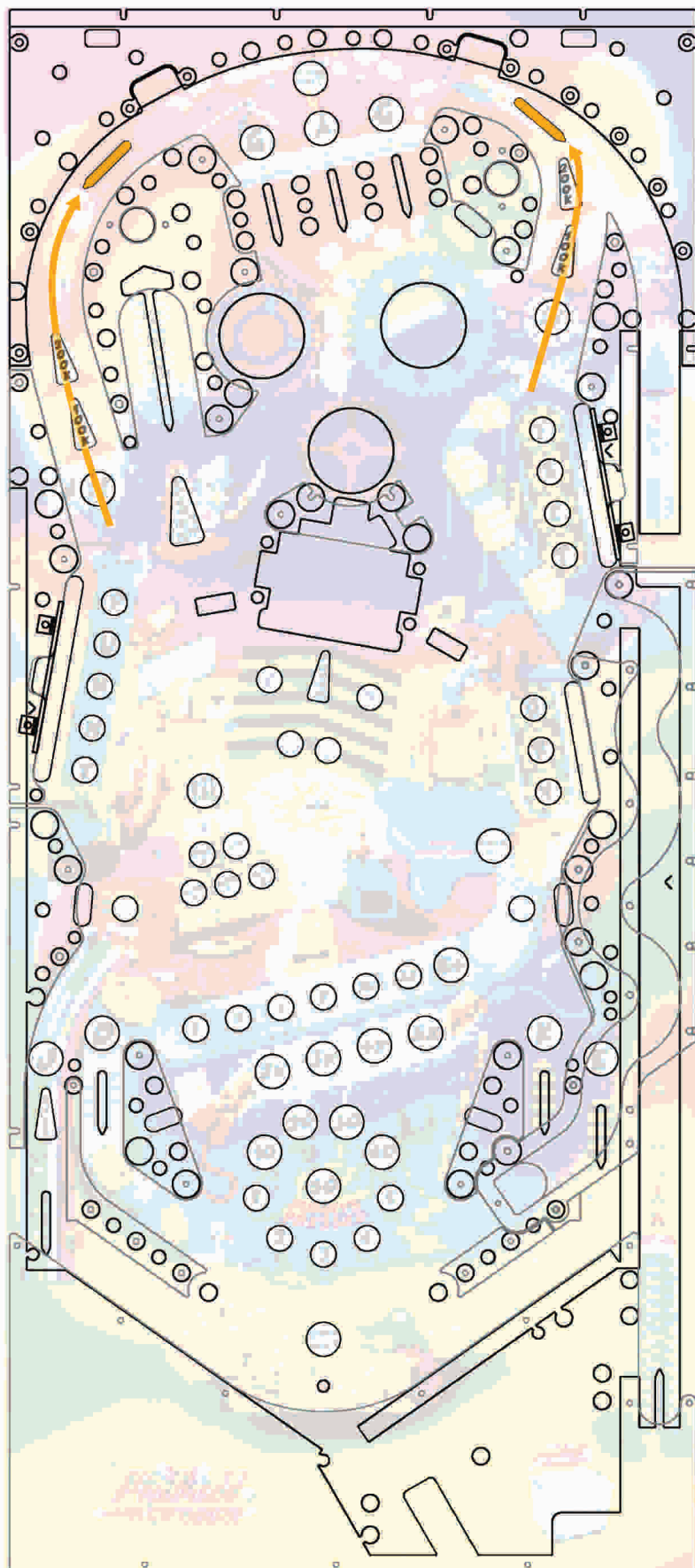


## Playfield Shots: VariTarget Reward & Punny Press Looping

Hit all six positions of the vari-target to enable 'Punny Press Looping'.

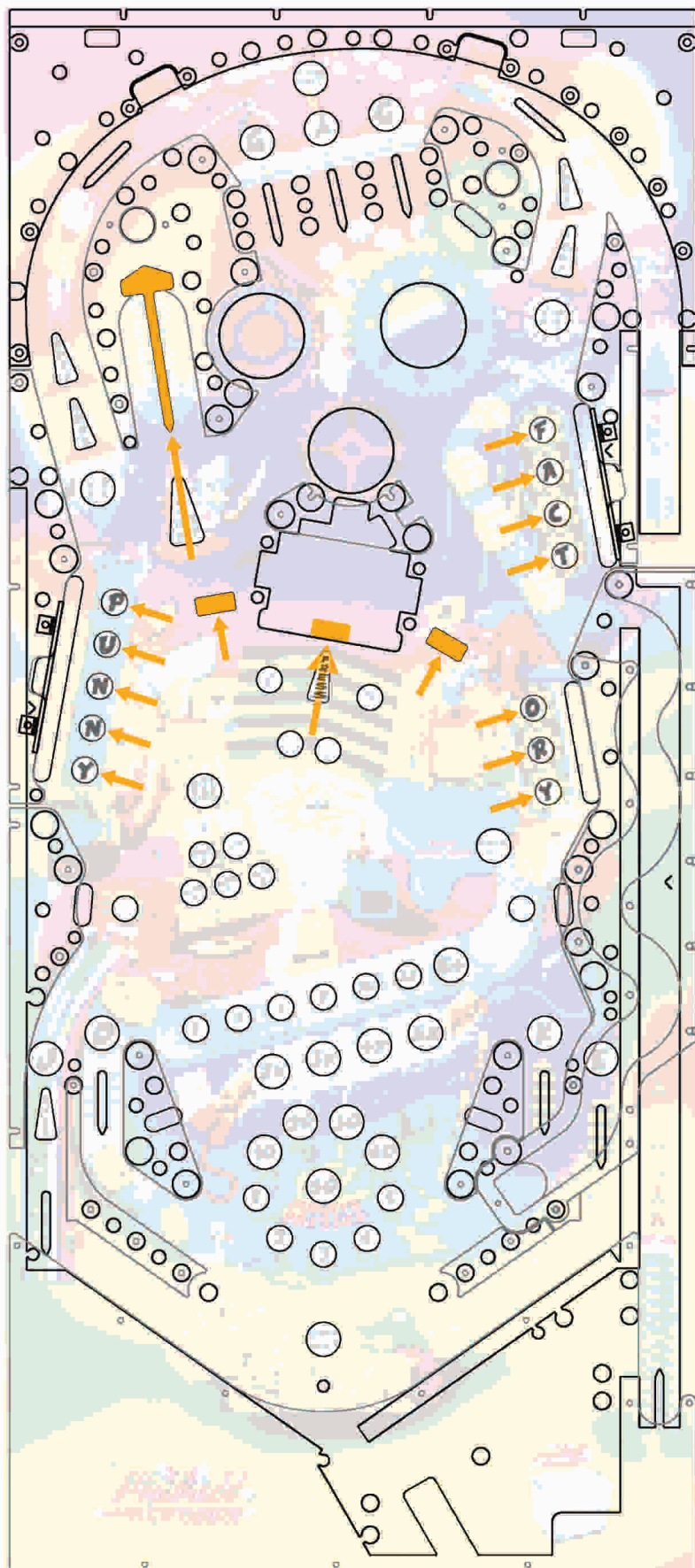
Then, enter the press as many times as possible in the time allotted to gather points.

The first loop scores 500k and increases by 250k until a maximum looping score of 1.5m



## Playfield Shots: Food Drive Frenzy

Shoot the left or right orbits to collect the next letter in the word 'BURGER'. Once spelled, this starts 'Food Drive Frenzy'. Continue going through the orbits scoring 500k the first time, then increasing by 250k until a maximum looping score of 2m



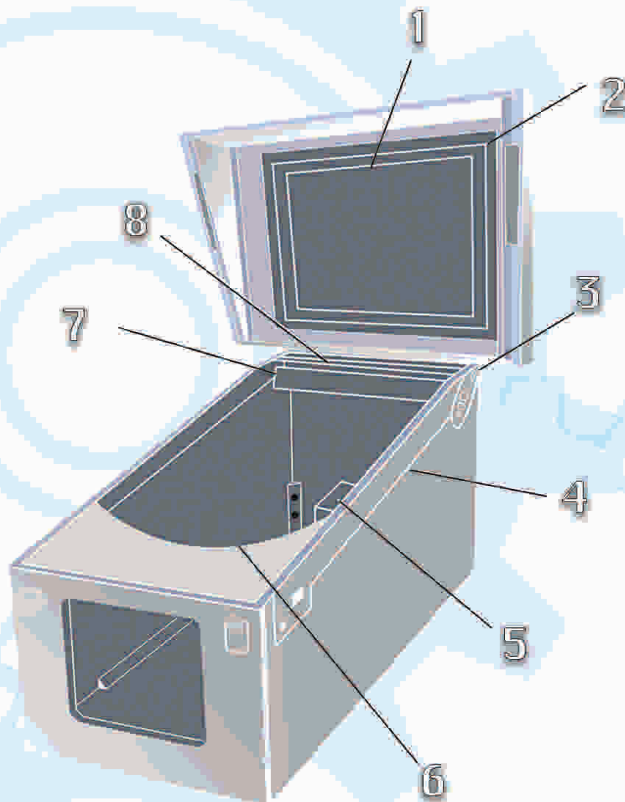
## Playfield Shots: Catch the Factory Leprechaun

Hit the green light that bounces around the "PUNNY" and "FACTORY" targets to start 'Catch the Factory Leprechaun'.

Once started, hit the left, right, and center drop-targets in order and finally the vari-target to catch the leprechaun.



# METAL PARTS

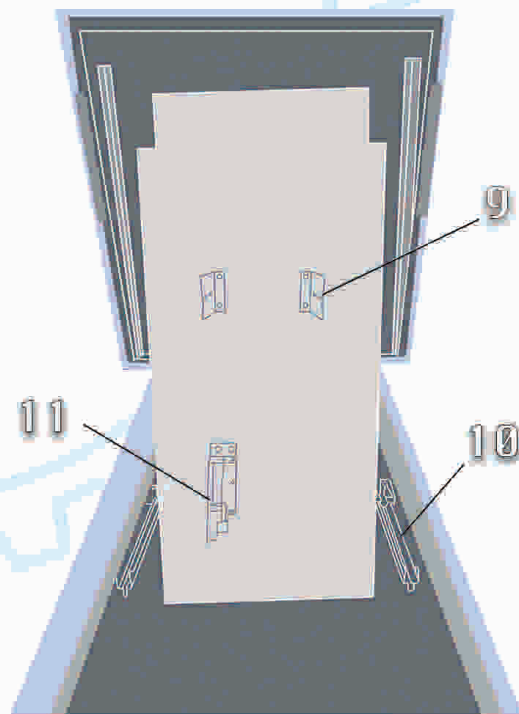


## ON TOP

1. Metal Back Plate
2. Light Plate
3. Back Box Hinges (L,R)
4. Side Rails (L,R)
5. Shooter Lane Kick Out
6. Metal Apron
7. Playfield Back Wall
8. Back Glass Trim

## UNDER

9. Playfield Support Bracket
10. Pivot Lift Bracket
11. Vari Target



# METAL PARTS

## OUTSOURCED

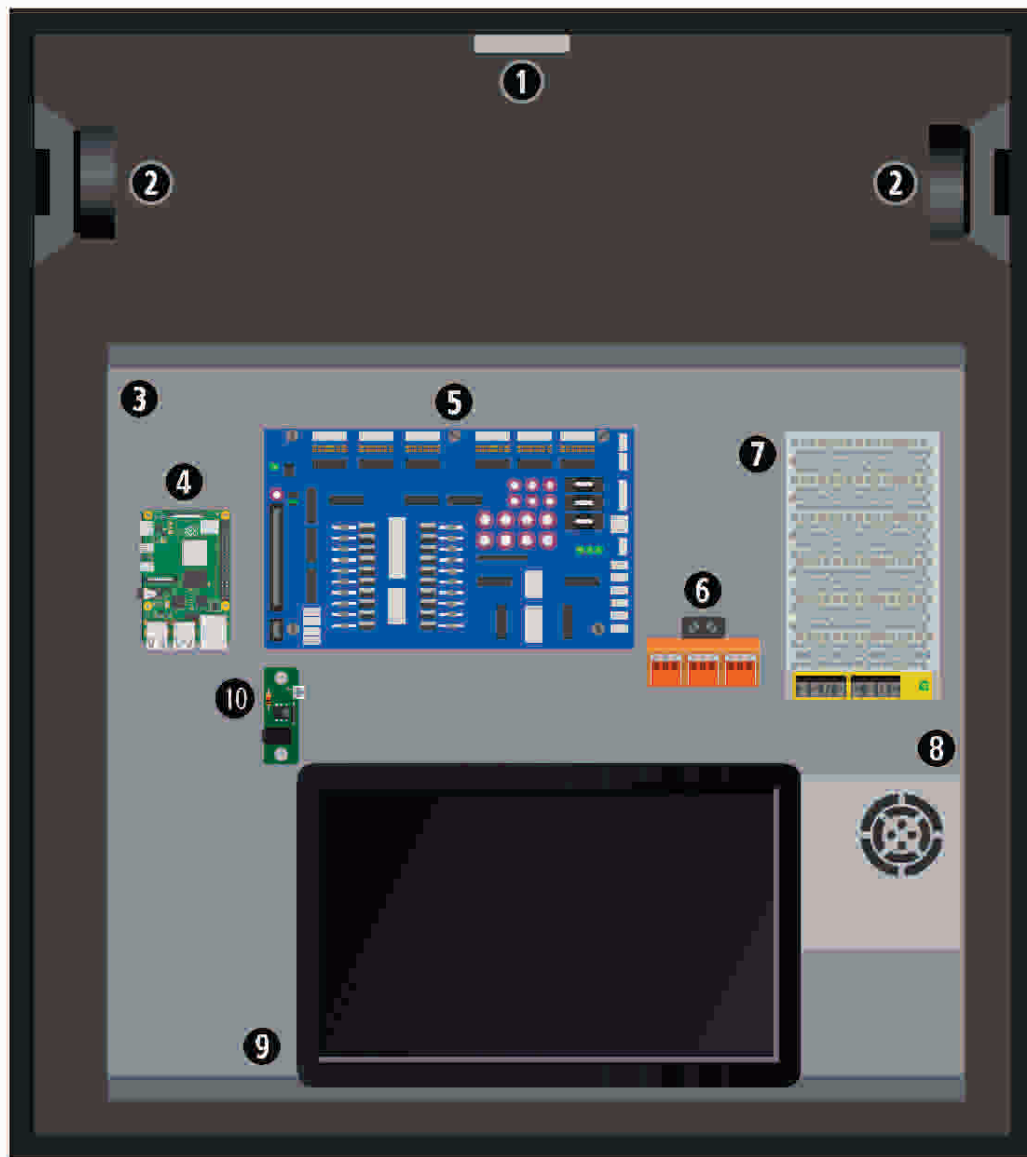


- 1. Shooter Rod
- 2. Shooter Rod Assembly
- 3. Shooter Rod Back Plate
- 4. Legs
- 5. Lock Down Bar
- 6. Receiver

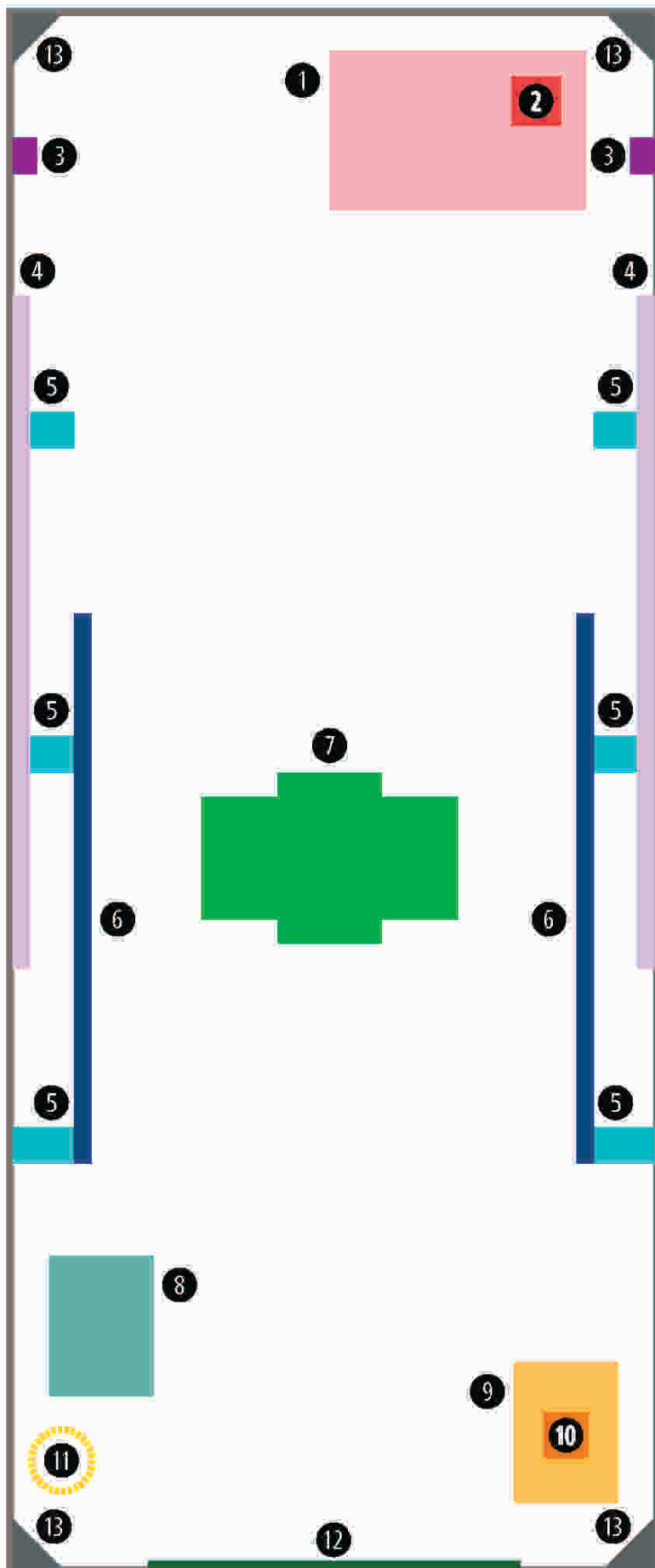
- 7. Coin Door
- 8. Lock and Cam
- 9. Back Glass Handles
- 10. Tilt Bob
- 11. Coffin Lock
- 12. Speaker Panels

Products may vary from photos shown

# Cabinet Head Items



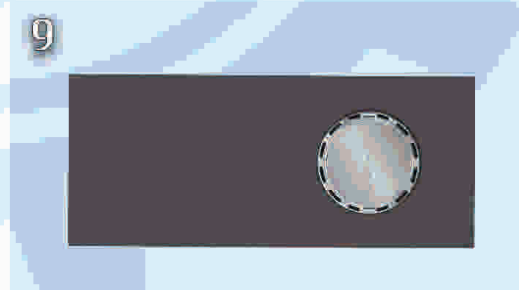
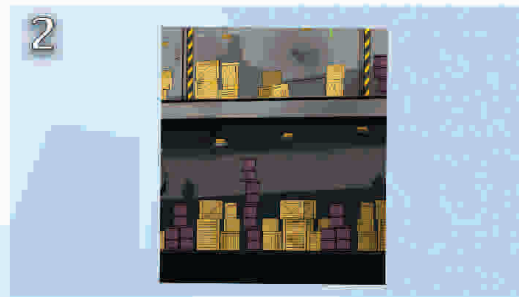
- |                           |  |
|---------------------------|--|
| 1 Top Acrylic Lock        | 6 AC junction connectors (Possible shock hazard if opened) |
| 2 Left and Right Speakers | 7 Power Supply (+5v / +12v; 100 W)                         |
| 3 Backplate               | 8 Power Supply (+48v; 350 W)                               |
| 4 Raspberry Pi            | 9 Display & Arm Mount                                      |
| 5 Rboard                  | 10 Smoke Machine Trigger Board                             |



# Cabinet Floor Items

- 1 AC box with electrical outlet  
(Possible shock hazard if opened)
- 2 C14 power socket (inside box, with 10A fast-blow fuse)
- 3 Playfield Rest Brackets (1x per side)
- 4 Playfield Rails (1x per side)
- 5 Cable Guides/Arm brackets (3x per side)
- 6 Playfield Arm (3x per side)
- 7 Sound Amplifier
- 8 Cabinet Switch Box
- 9 Power Switch Box  
(Possible shock hazard if opened)
- 10 Power Switch (inside box)
- 11 Tilt Bob (may not be present; normally installed by owner)
- 12 Coin Door
- 13 Leg Brackets (4x / in each corner)

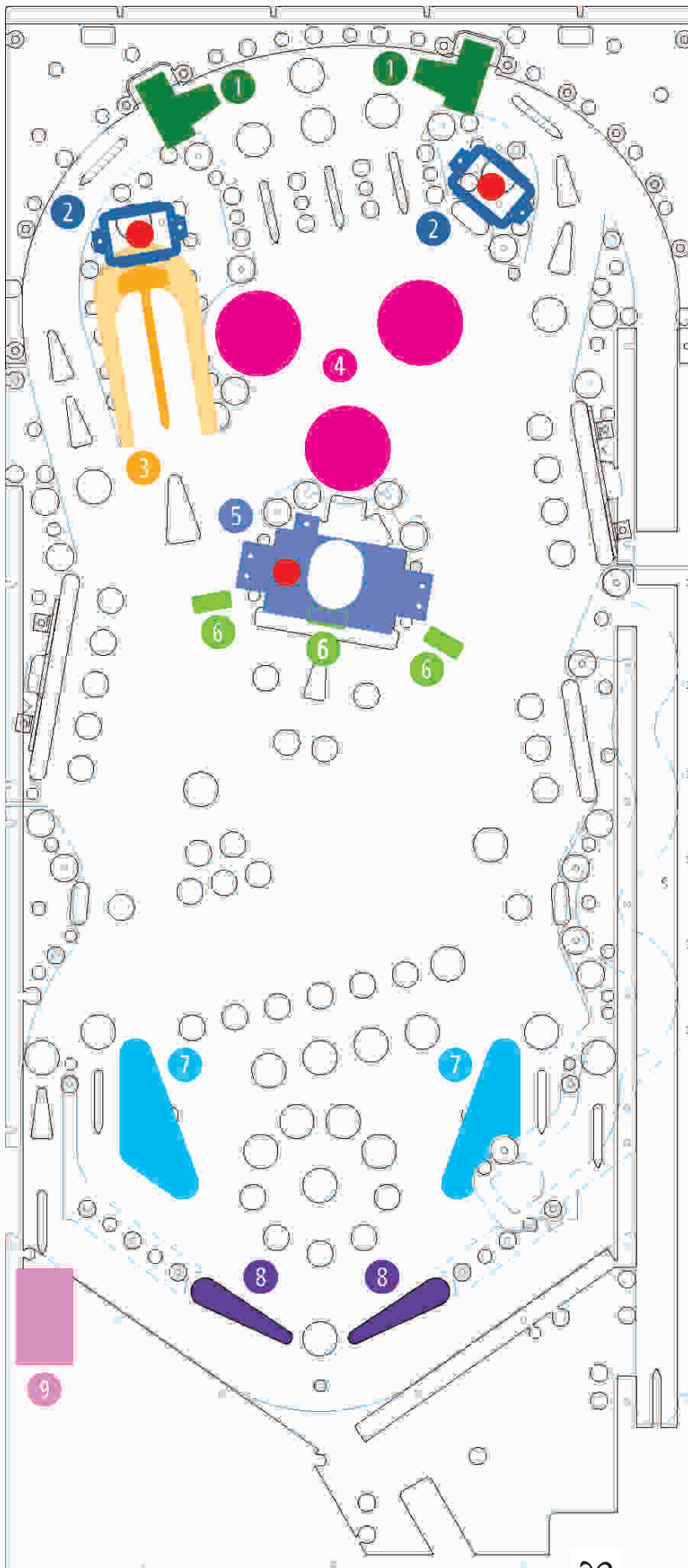
# CABINET GRAPHICS



1. Outside Front
2. Inside Back
3. Inside Left
4. Outside Left
5. Inside Right

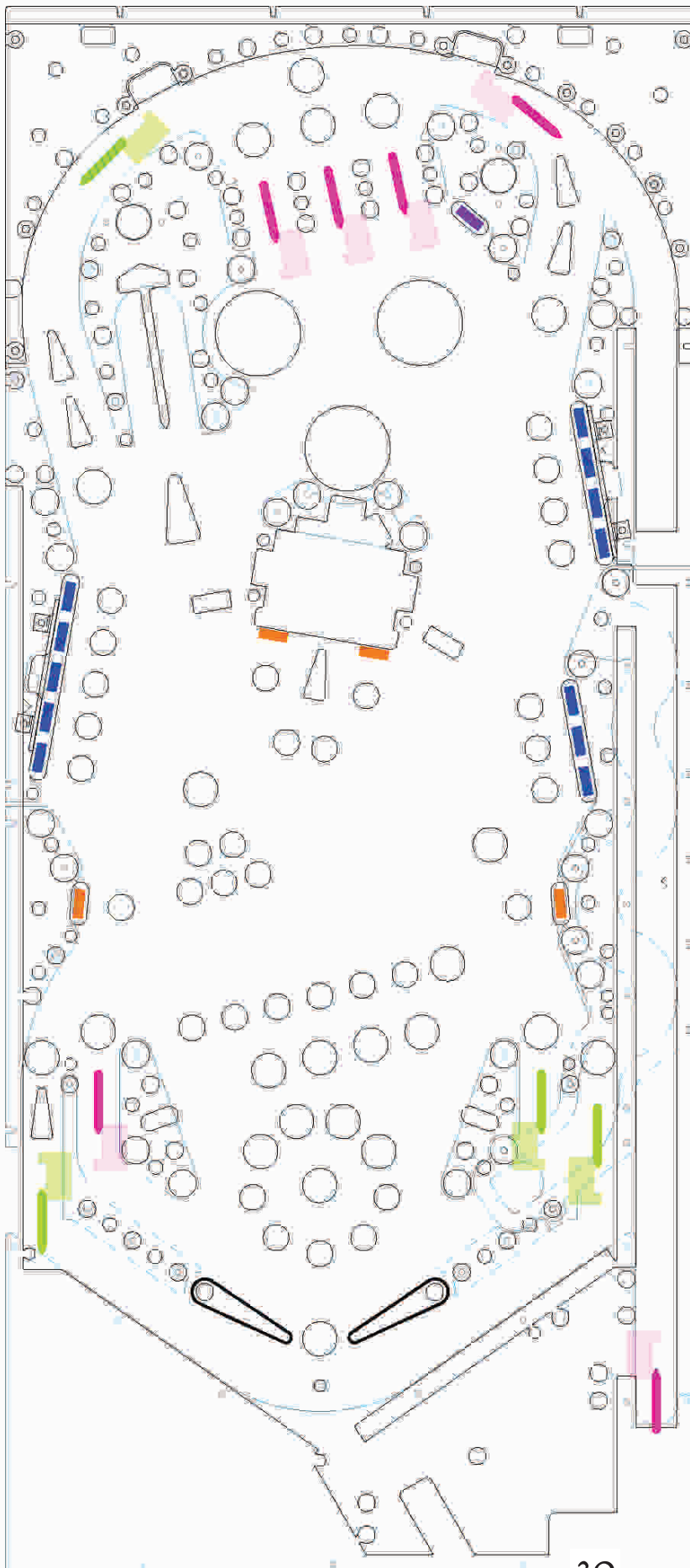
6. Outside Right
7. Head Piece left
8. Head Piece Right
9. Inside Bottom

# Playfield Features



- 1 Left & Right Orbit Doors
- 2 Left & Right Transformers  
(each with red flasher inside)
- 3 Vari-Target
- 4 (3x) Pop Bumpers
- 5 Press  
(with red flasher on top)
- 6 Left, Center, & Right Drop Targets
- 7 Left & Right Sling
- 8 Left & Right Flippers
- 9 Kickback

# Playfield Standalone Switches



(6x) - Rollover Switch (Left)



(4x) - Rollover Switch (Right)



(12x) - Target Switch

(Main Colour, usually blue)



(4x) - Target Switch

(Secondary Colour, usually orange)

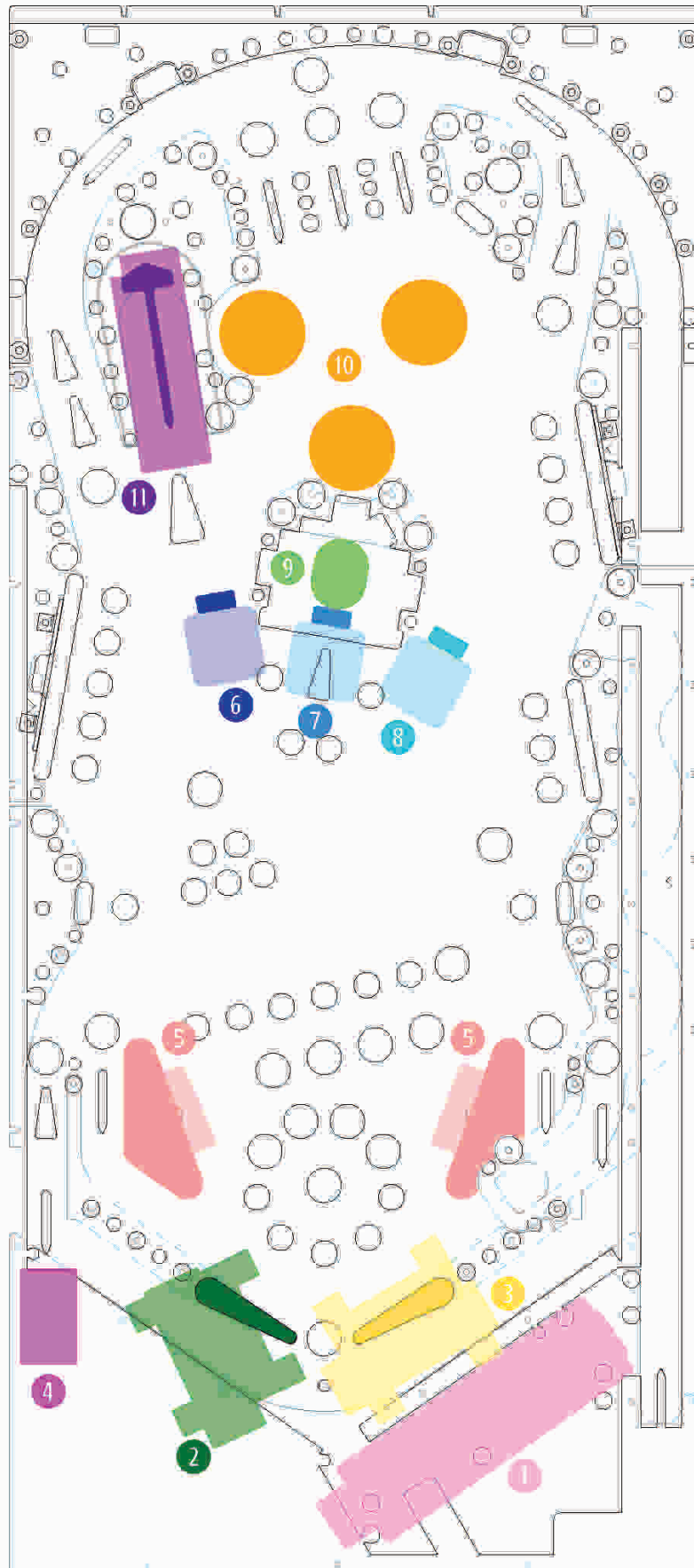


(1x) - Target Switch

(Accent Colour, usually purple)

Note that there are also switches on each of the mechanisms.

# Playfield Mechanisms

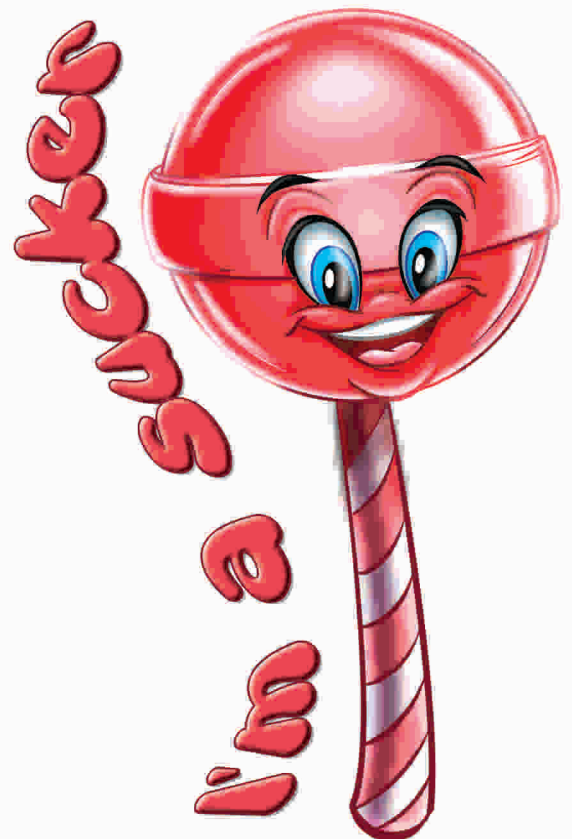
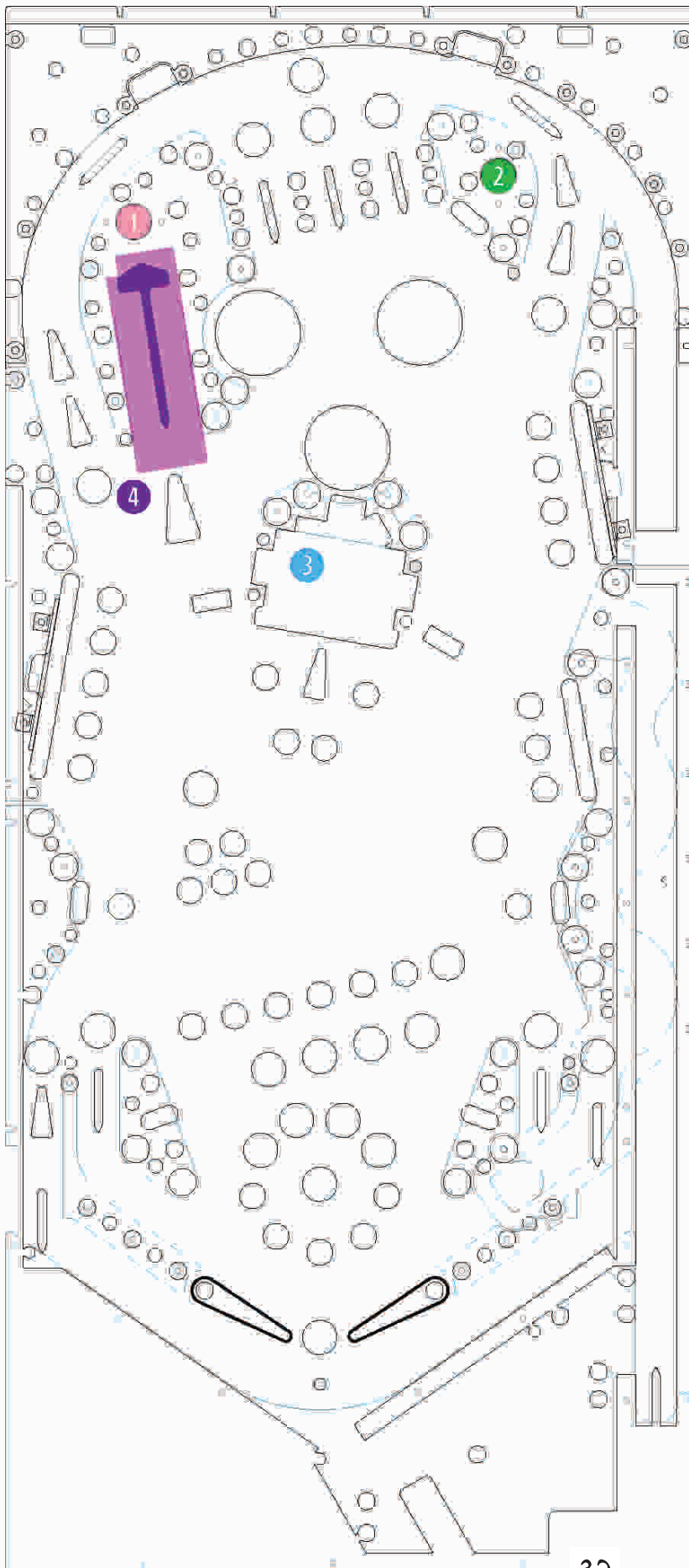


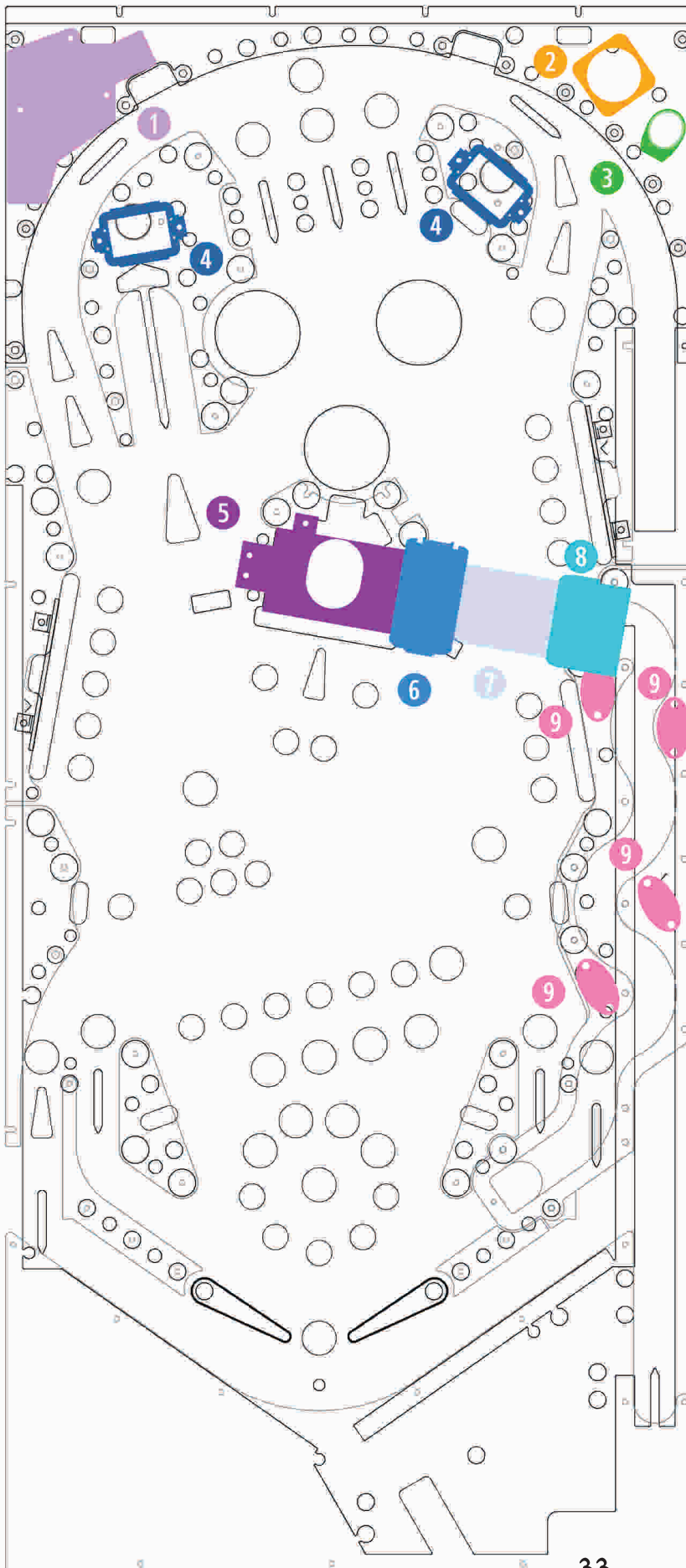
- 1 Trough
- 2 Left Flipper
- 3 Right Flipper
- 4 Kickback
- 5 (2x) - Sling
- 6 Left Drop Target
- 7 Center Drop Target
- 8 Right Drop Target
- 9 Popper
- 10 (3x) Pop Bumper
- 11 Vari-Target

# Playfield Outputs

First three outputs are 12v flashers

- 1 Red Flasher  
(Inside left transformer model/toy)
- 2 Red Flasher  
(Inside right transformer model/toy)
- 3 Red Flasher  
(On top of press model/toy)
- 4 Vari-Target Reset  
Technically part of a mechanism,  
but it is wired as a 12v output





# Playfield Models / Toys

1 Crates



2 Cone



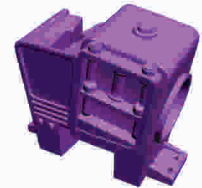
3 Hat



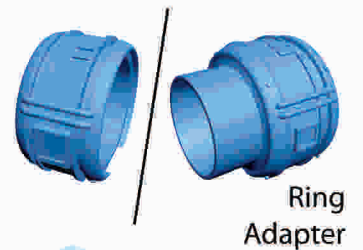
4 (2x) Transformer



5 Press



6 Ring



7 Tube



8 Tube End



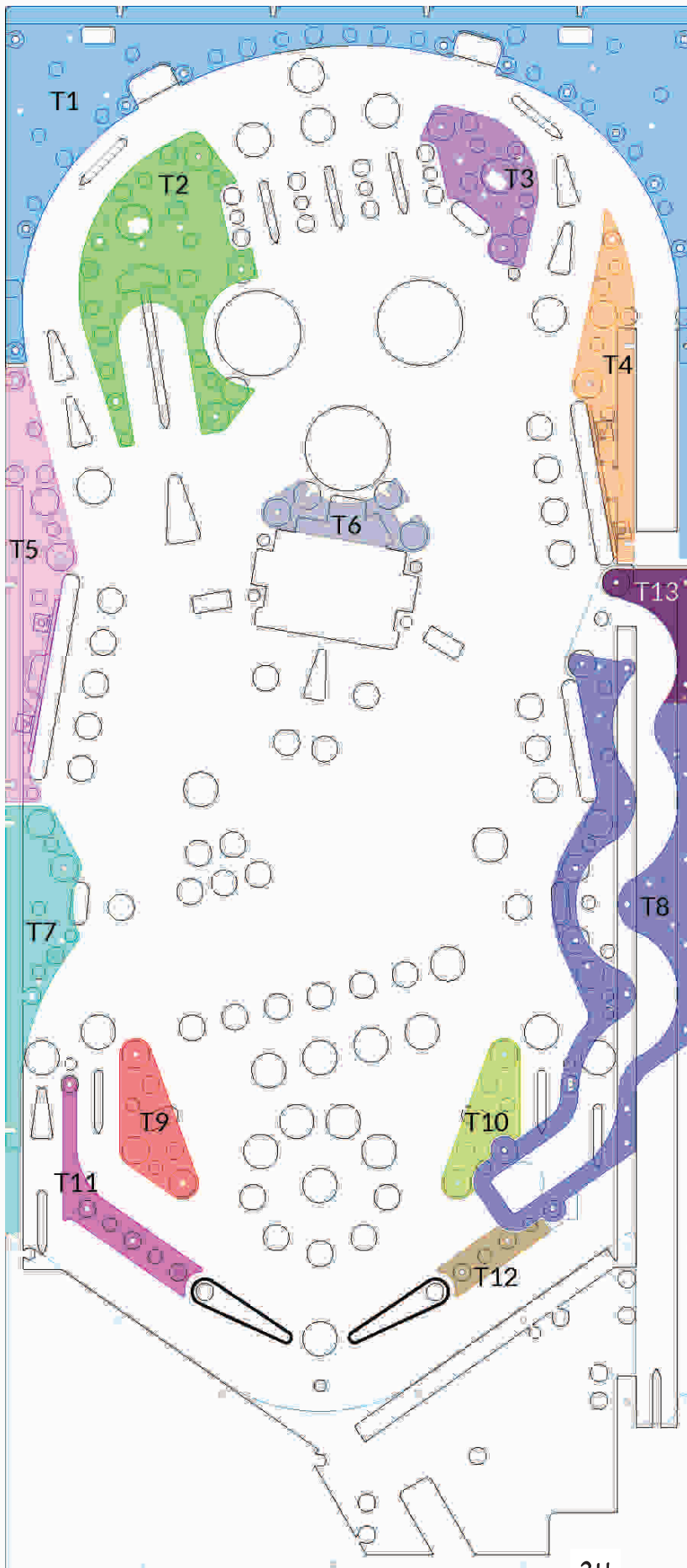
9 (4x)



Barrel  
Top Leak



Barrel  
Bottom Leak



# Top Level Acrylic

T1 - Top / "Danger Arch"

T2 - vTarget top

T3 - "Green Gear"

T4 - "Mr Fork"

T5 - "Mr Hotdog"

T6 - "Small Danger"

T7 - "Kickback"

T8 - "Squiggly"

T9 - Left Sling

T10 - Right Sling

T11 - Left Flipper / "Exit"

T12 - Right Flipper / "Arrow"

T13 - "Squiggly Arrow"  
(This actually goes on top of T8)

# Bottom Level Acrylic

B1 - Top Left Corner

B2 - Top Right Corner / "Ramp"

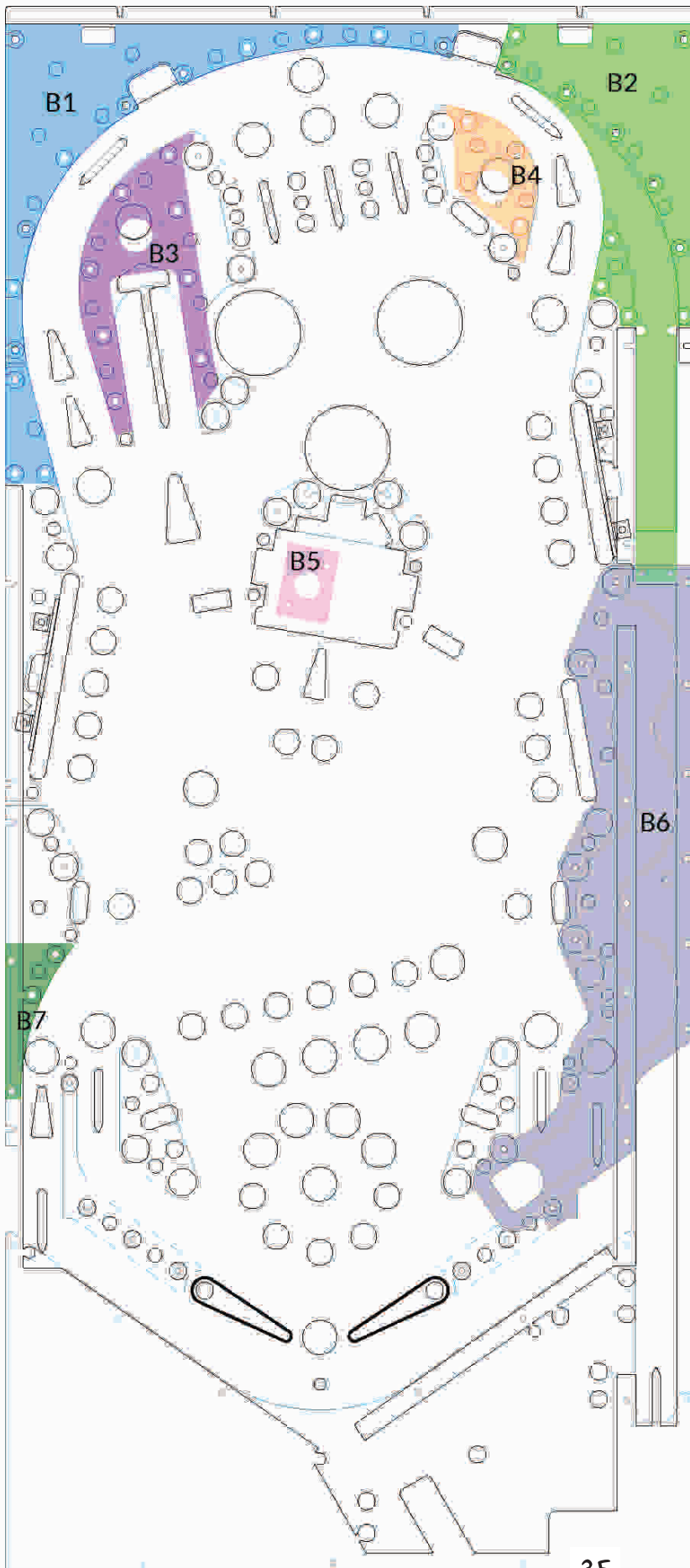
B3 - vTarget lower

B4 -top right lower

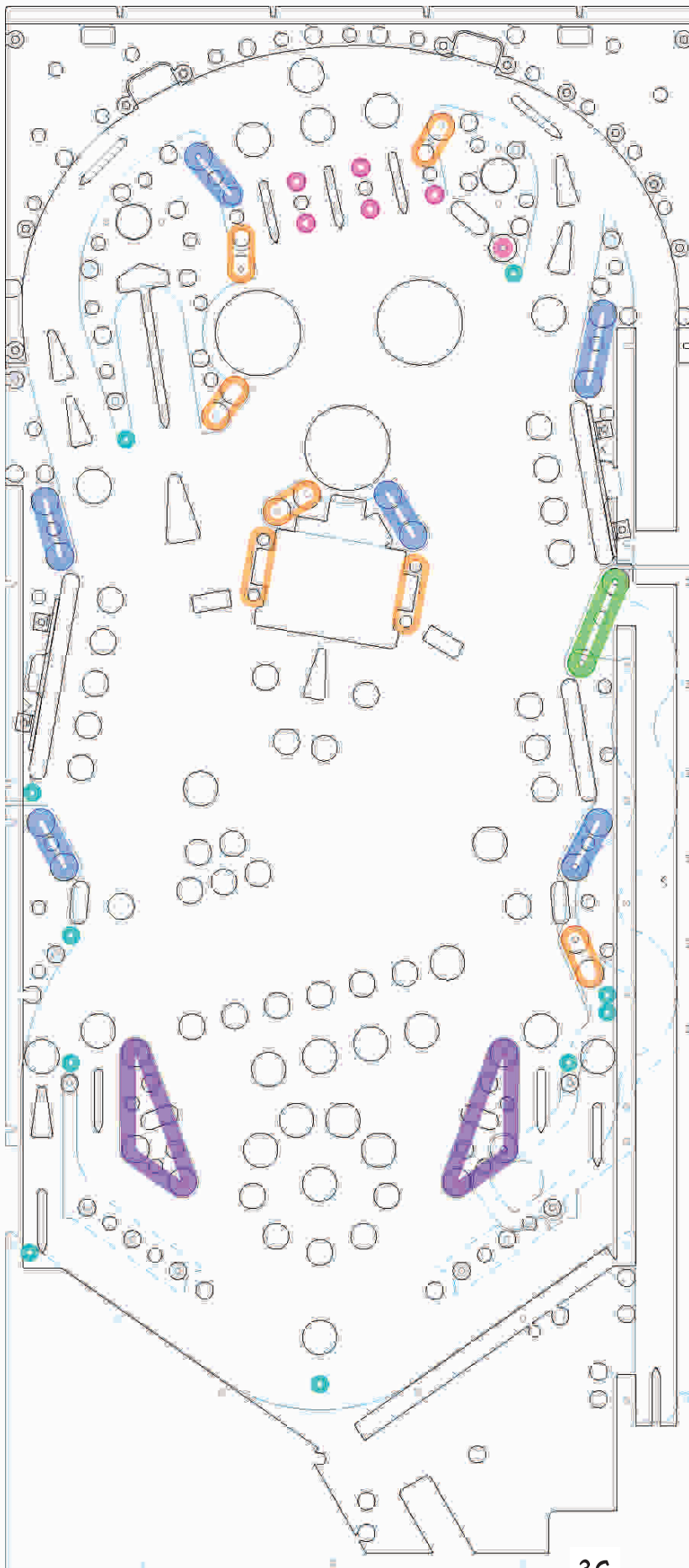
B5 press light base

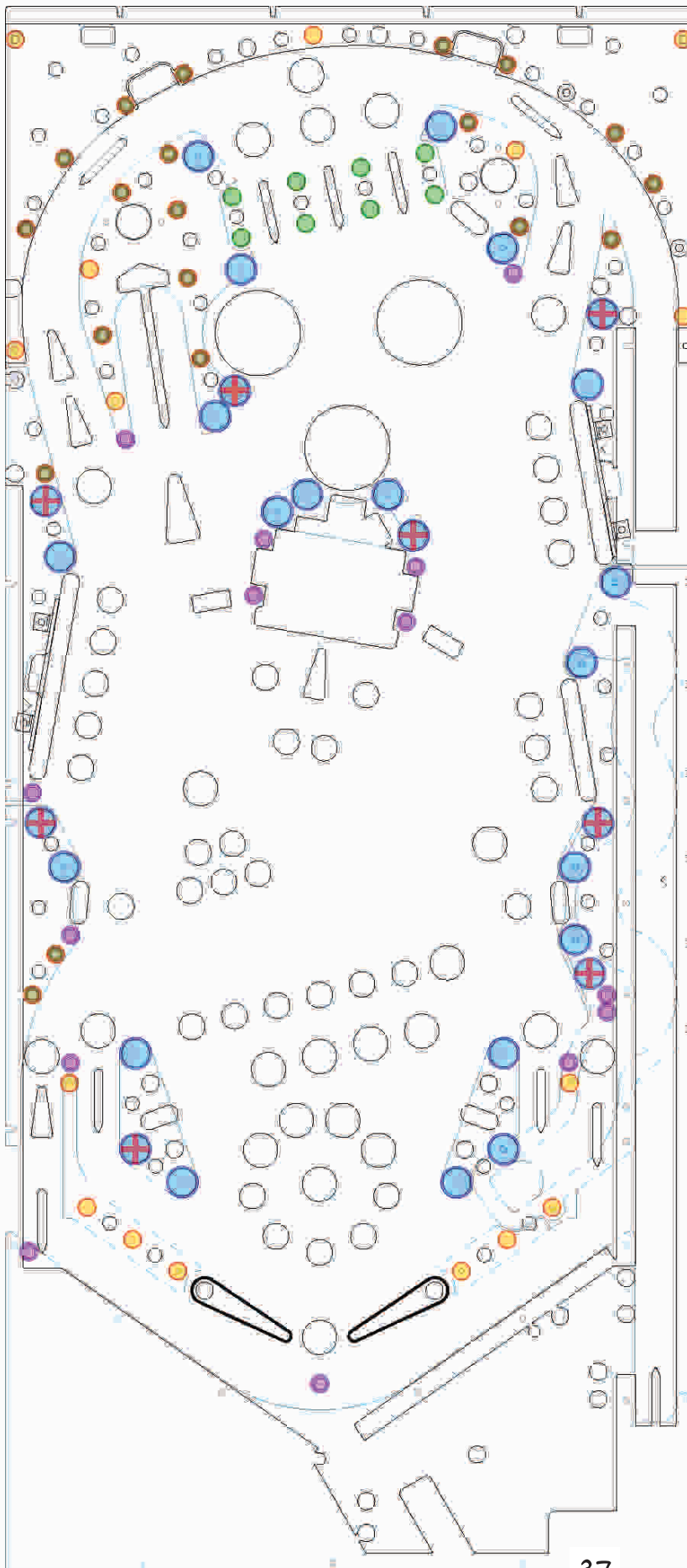
B6 - "under squiggly"

B7 - "under kickback"



# Rubber Rings

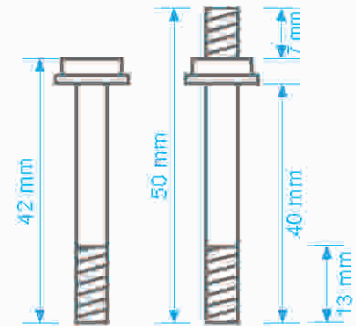




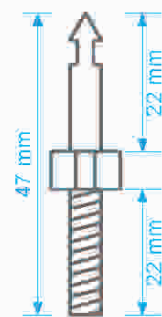
## Posts & Threaded Inserts

- (16x) added threaded inserts (must be large brass inserts)
- (20x) added threaded inserts (large brass inserts or optionally smaller silver inserts)
- (28x) blue posts
- (8x) skinny blue posts
- (14x) spiky bolts
- + post secured with a flat head

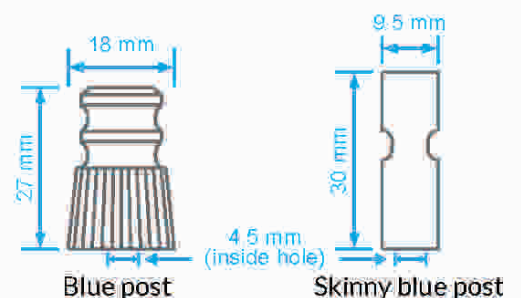
Most posts use a "2 level" screw (right) while a few marked one use a "flat head" (left)



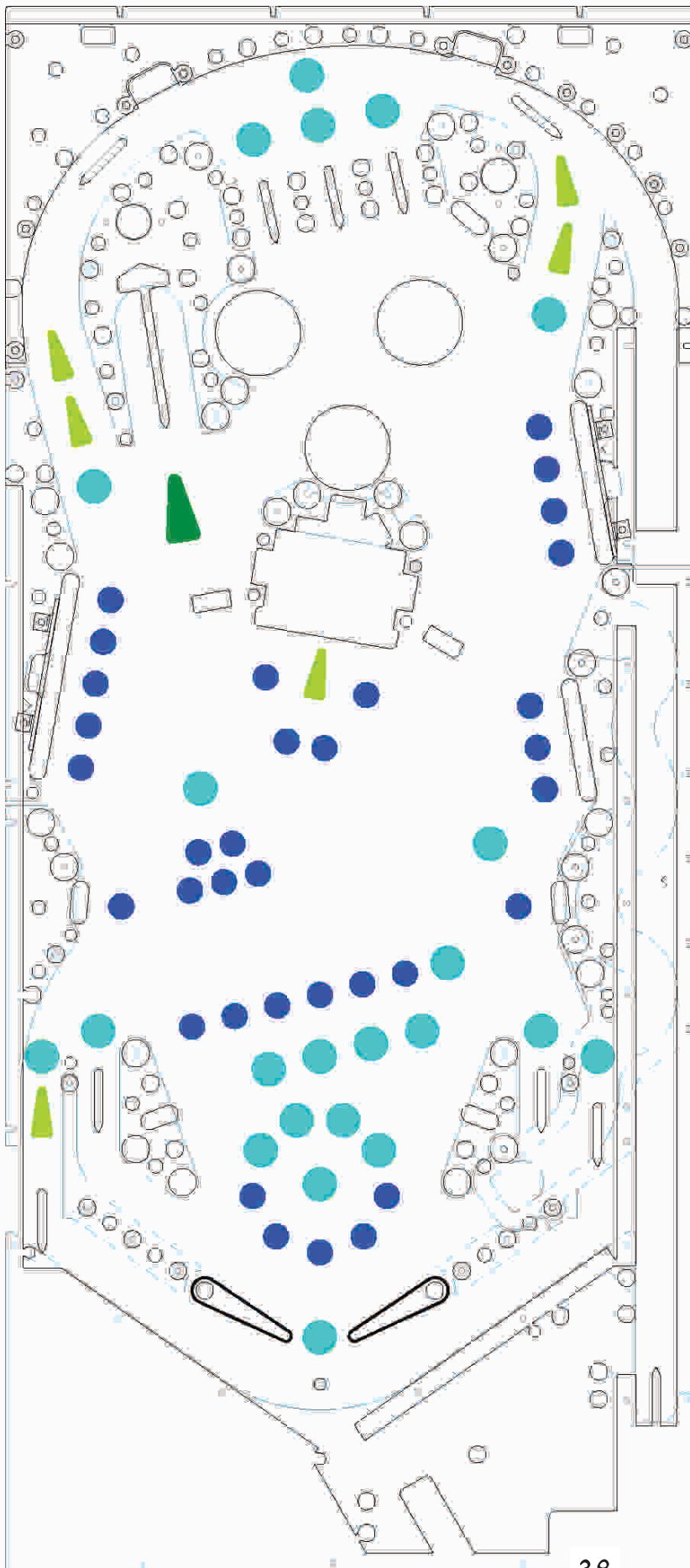
6-32 thread  
(held in playfield with threaded insert)







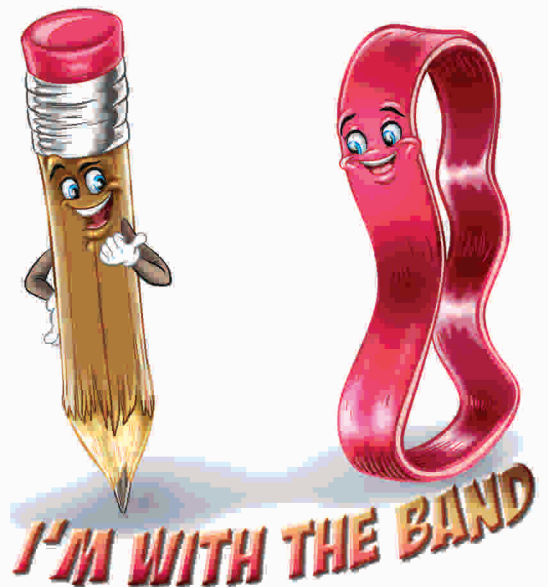
10-32 thread  
(held in playfield with locking nut)



# Playfield Inserts



-  (34x) small circle
-  (23x) large circle
-  (6x) small triangle
-  (1x) large triangle



# Playfield Switch PCBs and Wiring

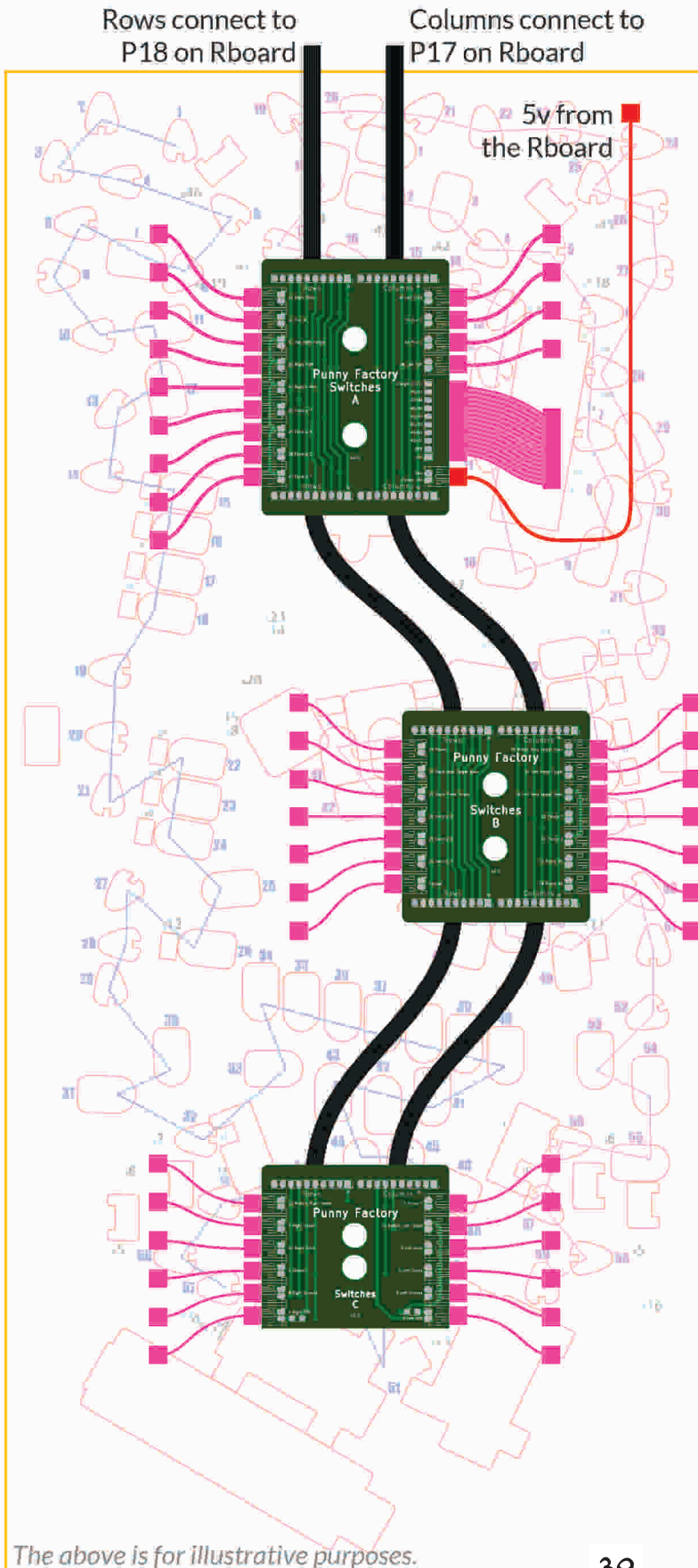
The playfield switches are connected to the Rboard via switch matrix (made up of six columns and eight rows).

However, most of the complexity of the column/row connections per switch are contained within the switch pcbs (printed circuit boards).

Instead, the column/row connections from the Rboard connect through the switch pcbs A, B, and C.

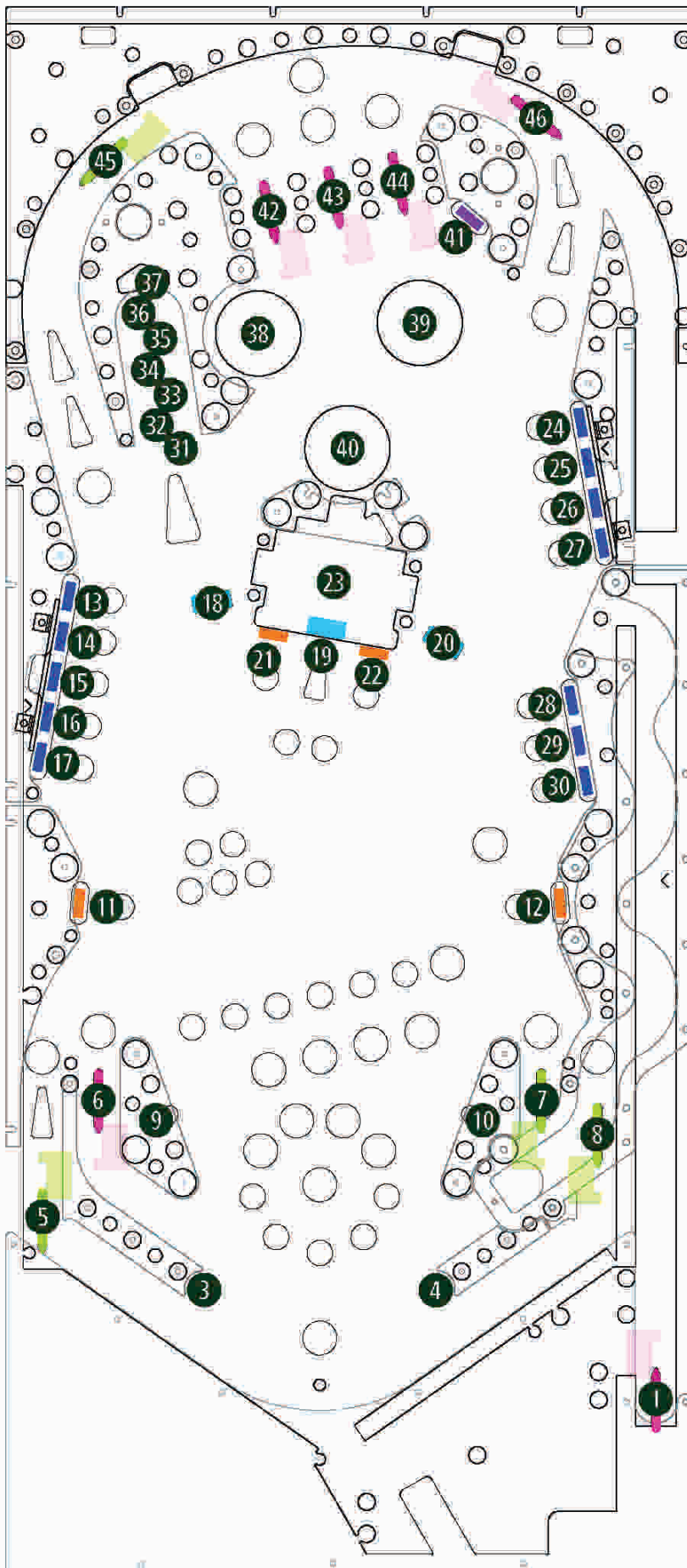
Then each playfield switch has an id/label and is simply directly connected to one of these boards at a spot with a similar id/label (shown in pink).

There is one larger cable that connects all of the vari-target switches to switch board A and a 5v connection (shown in orange) that is used to supply 5v to the vari-target.



# Playfield Switch Locations

These names and ids also correspond to the "Switch Test" output in the service menu.



- 1 - Shooter
- 3 - LeftEOS
- 4 - RightEOS
- 5 - LeftOutLane
- 6 - LeftInLane
- 7 - RightInLane
- 8 - RightOutLane
- 9 - LeftSling
- 10 - RightSling
- 11 - BottomLeftTarget
- 12 - BottomRightTarget
- 13 - Punny\_P
- 14 - Punny\_U
- 15 - Punny\_N1
- 16 - Punny\_N2
- 17 - Punny\_Y
- 18 - LeftDropTargetDown
- 19 - MiddleDropTargetDown
- 20 - RightDropTargetDown
- 21 - LeftPressTarget
- 22 - RightPressTarget
- 23 - Popper
- 24 - Factory\_F
- 25 - Factory\_A
- 26 - Factory\_C
- 27 - Factory\_T
- 28 - Factory\_O
- 29 - Factory\_R
- 30 - Factory\_Y
- 31 - VariTarget\_Reset
- 32 - VariTarget\_1
- 33 - VariTarget\_2
- 34 - VariTarget\_3
- 35 - VariTarget\_4
- 36 - VariTarget\_5
- 37 - VariTarget\_6
- 38 - LeftPOP
- 39 - RightPOP
- 40 - BottomPOP
- 41 - TopRightTarget
- 42 - Pun\_P
- 43 - Pun\_U
- 44 - Pun\_N
- 45 - LeftOrbit
- 46 - RightOrbit

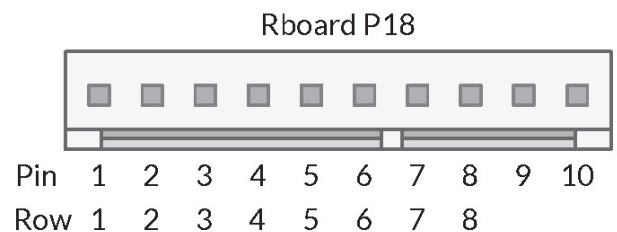
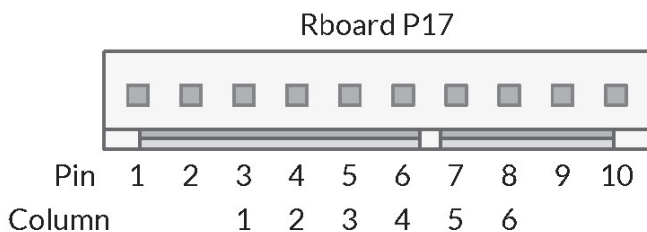
# Playfield Switch Matrix

The playfield switches are connected in a switch matrix made up of six columns and eight rows. The table below shows which column and row each switch is connected to.

|                  | Column 1<br>(P17-3)         | Column 2<br>(P17-4) | Column 3<br>(P17-5)           | Column 4<br>(P17-6)          | Column 5<br>(P17-7)              | Column 6<br>(P17-8)             |
|------------------|-----------------------------|---------------------|-------------------------------|------------------------------|----------------------------------|---------------------------------|
| Row 1<br>(P18-1) | (45)<br>LeftOrbit           | (46)<br>RightOrbit  | (38)<br>LeftPOP               | (13)<br>Punny_P              | (17)<br>Punny_Y                  |                                 |
| Row 2<br>(P18-2) | (31)<br>VariTarget<br>Reset | (42)<br>Pun_P       | (39)<br>RightPOP              | (14)<br>Punny_U              | (18)<br>LeftDrop<br>TargetDown   | (22)<br>RightPress<br>Target    |
| Row 3<br>(P18-3) | (32)<br>VariTarget_1        | (43)<br>Pun_U       | (40)<br>BottomPOP             | (15)<br>Punny_N1             | (21)<br>LeftPress<br>Target      | (20)<br>RightDrop<br>TargetDown |
| Row 4<br>(P18-4) | (33)<br>VariTarget_2        | (44)<br>Pun_N       | (41)<br>TopRightTarget        | (16)<br>Punny_N2             | (19)<br>MiddleDrop<br>TargetDown | (23)<br>Popper                  |
| Row 5<br>(P18-5) | (34)<br>VariTarget_3        | (24)<br>Factory_F   | (25)<br>Factory_A             | (11)<br>BottomLeft<br>Target | (1)<br>Shooter                   | (3)<br>LeftEOS                  |
| Row 6<br>(P18-6) | (35)<br>VariTarget_4        | (26)<br>Factory_C   | (27)<br>Factory_T             | (5)<br>LeftOutLane           | (10)<br>RightSling               | (4)<br>RightEOS                 |
| Row 7<br>(P18-7) | (36)<br>VariTarget_5        | (28)<br>Factory_O   | (29)<br>Factory_R             | (6)<br>LeftInLane            | (7)<br>RightInLane               |                                 |
| Row 8<br>(P18-8) | (37)<br>VariTarget_6        | (30)<br>Factory_Y   | (12)<br>BottomRight<br>Target | (9)<br>LeftSling             | (8)<br>RightOutLane              |                                 |

## Playfield Switch Connection Headers

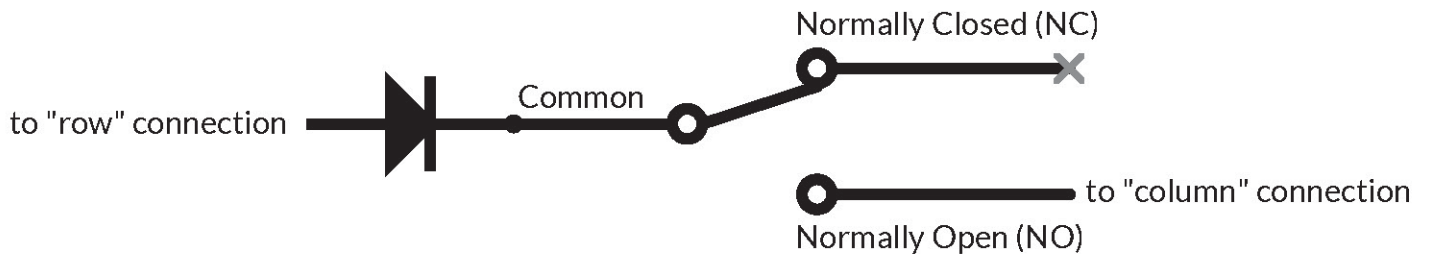
These show the pinout for the RBoard headers P17 (switch matrix columns) and P18 (switch matrix rows)



# General Switch Wiring

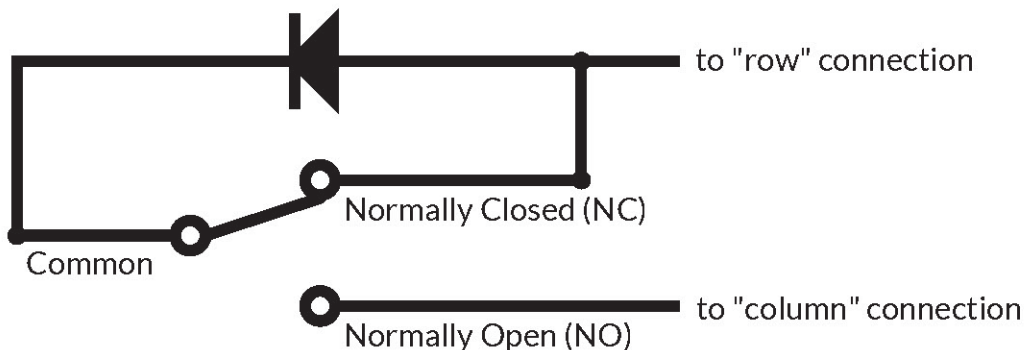
All switches have diodes whose cathodes point to the "column" side/connection. The diode can be almost any common diode (ex: 1N4004, 1N1518, SR1100)

For example:



Some switches may already have a diode between the "common" and "normally closed" pins to provide mechanical support for the diode. Since the "normally closed" side is not used, they should electrically be equivalent.

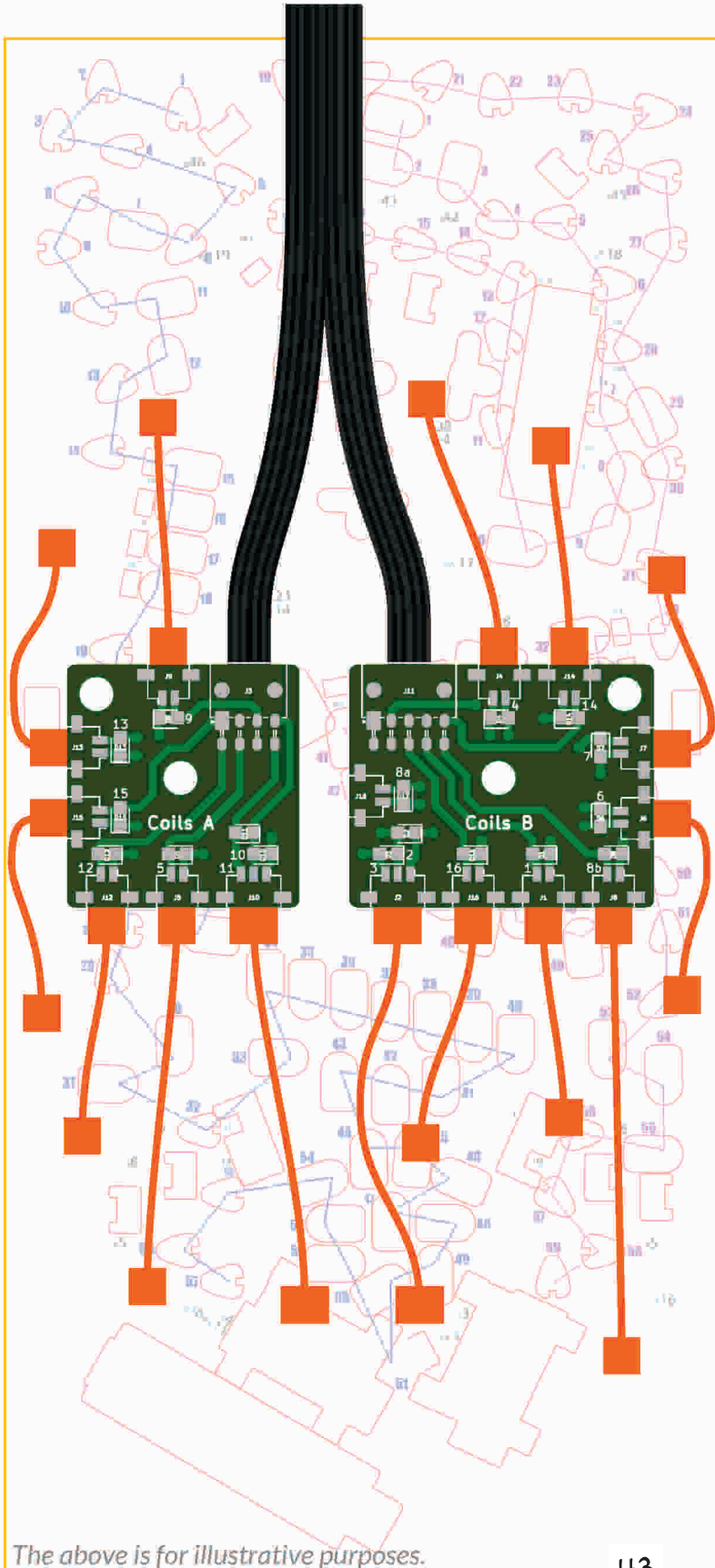
For example:



For switches that connect to ground directly (ex: cabinet/trough switches") replace "column" with ground (GND).

# Playfield High-Power Coil PCBs & Wiring

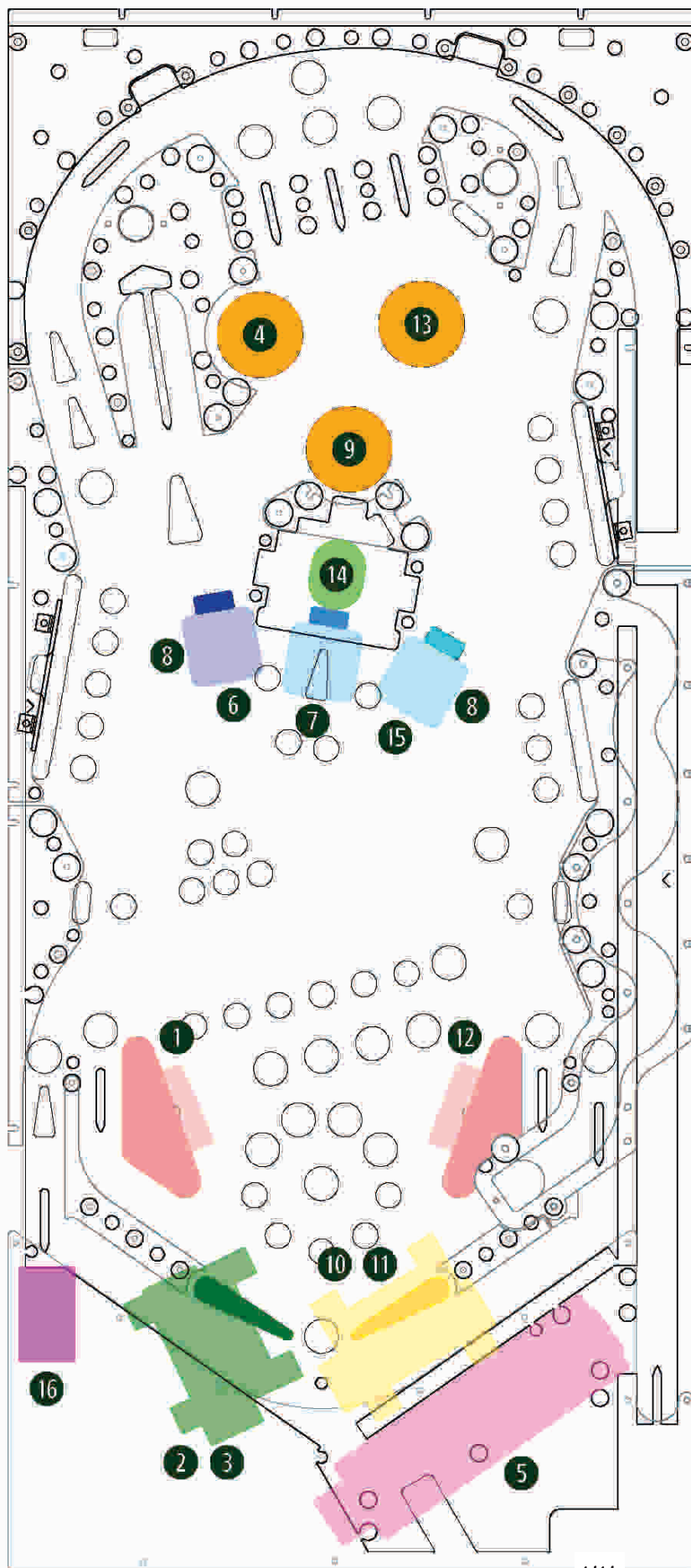
Coils connect to P16 on Rboard



The high power (+48v) coil connections go from the Rboard to two pcbs where each coil is directly connected to.

The only exception is the vari-target reset coil (lower power) which is put on the 'playfield output' header.

*Note that the Rboard's connector pin numbering and coil numbering are different.*



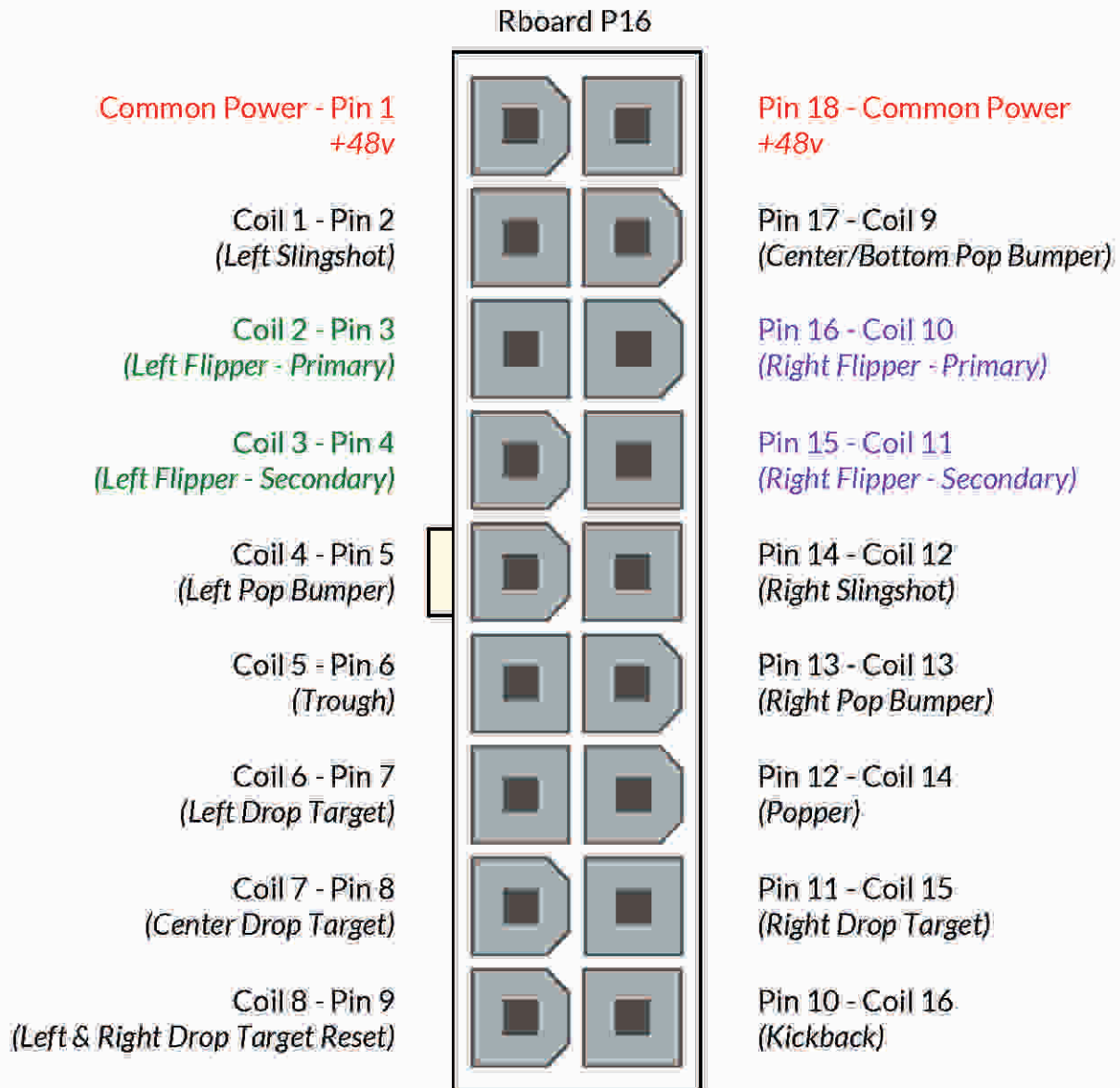
# Playfield High-Power (+48v) Coil Locations

The locations of the coils as well as numbering are shown here.

- 1 Left Slingshot
- 2 Left Flipper (primary)
- 3 Left Flipper (secondary)
- 4 Left Pop Bumper
- 5 Trough
- 6 Left Drop Target
- 7 Center Drop Target
- 8 Left & Right Drop Target Reset
- 9 Center/Bottom Pop Bumper
- 10 Right Flipper (primary)
- 11 Right Flipper (secondary)
- 12 Right Slingshot
- 13 Right Pop Bumper
- 14 Popper
- 15 Right Drop Target
- 16 Kickback

# General High-Power Coil Header Pinout

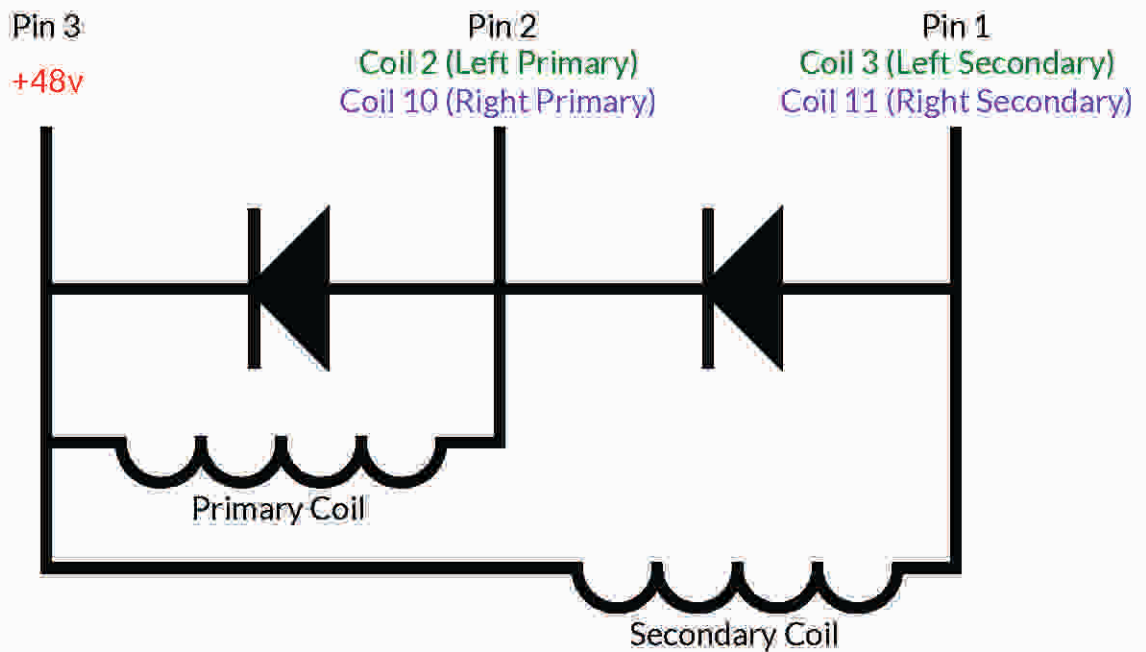
Below is the pinout of the P16 header on the Rboard. All the high power 48v coils (save for the vai-target reset, which is lower power) are connected to this header through the two coil boards on the bottom of the playfield.



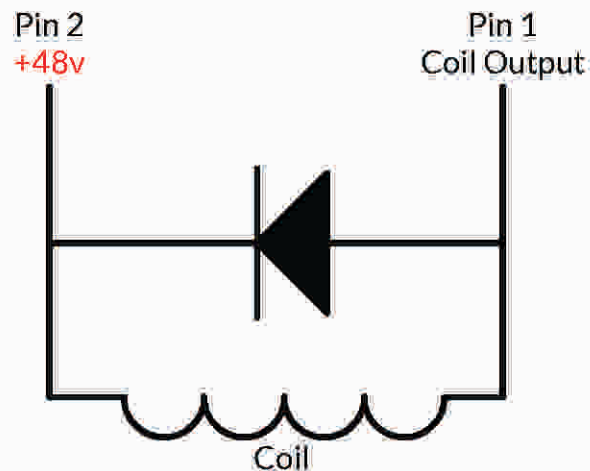
# General Coil Wiring

Generally coils are wired in this fashion:

## Flipper Coils (Double Coils)

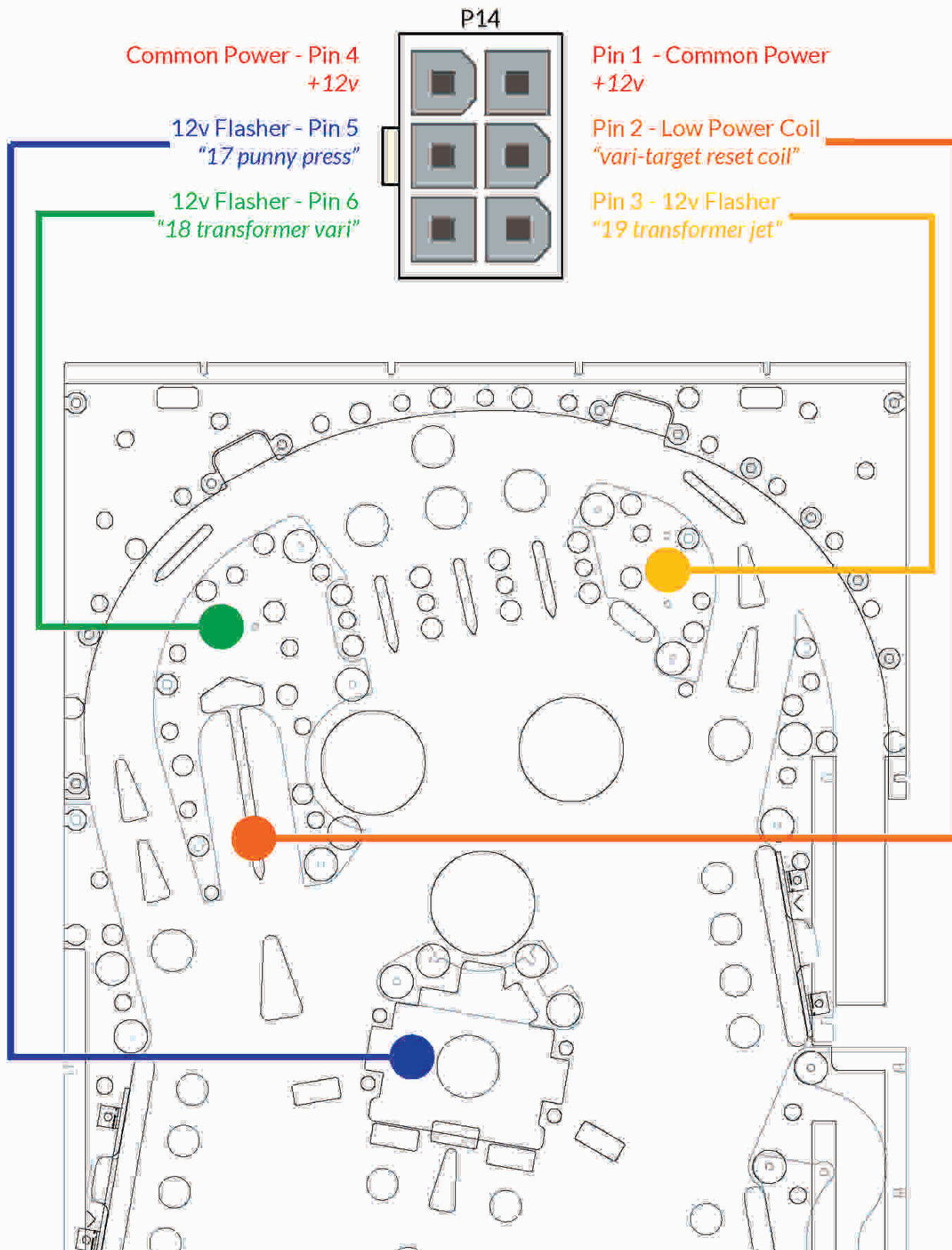


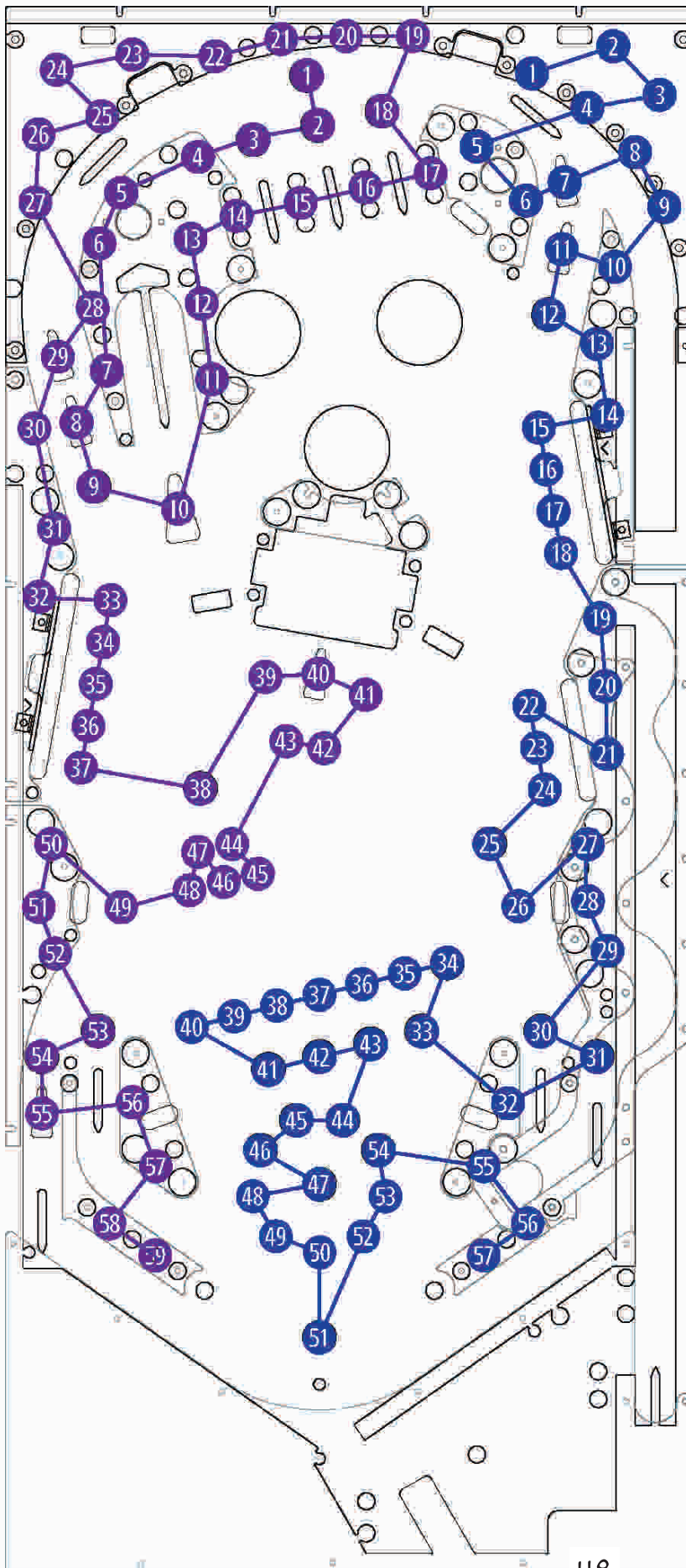
## Single Coils



# Playfield Outputs

General low-power 12v outputs on the playfield include the vari-target reset coil as well as three flashers. Their locations are shown below as well as how they are connected to P15 on the Rboard.





# LED Strand Wiring Location and Order

Two WS2811 LED Strands

These are +12v (power) and +5v (data) 8mm WS2811 LED strands. They plug into the connectors P1 and P2 at the top right of the controller board (rboard).

*Top Connector*

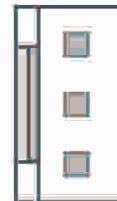
P1 - "RGB1" - 59 LEDs

*Bottom Connector*

P2 - "RGB2" - 57 LEDs

## Rboard P1 and P2 Connector Pinout

P1/P2



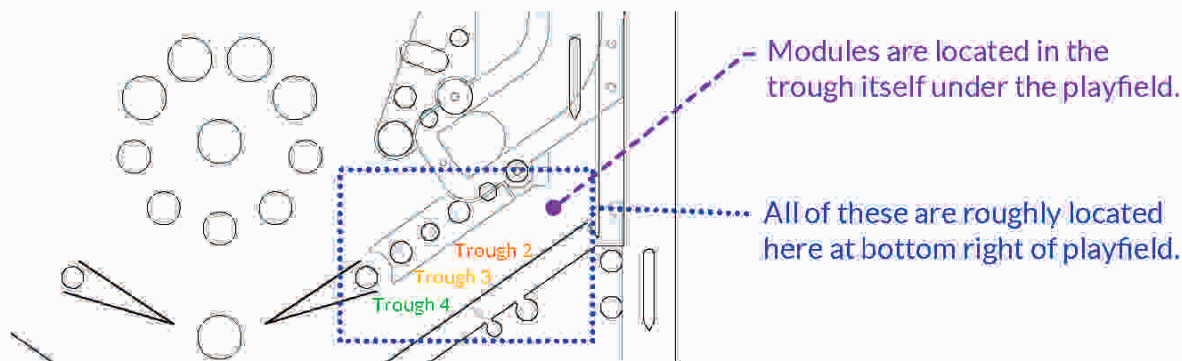
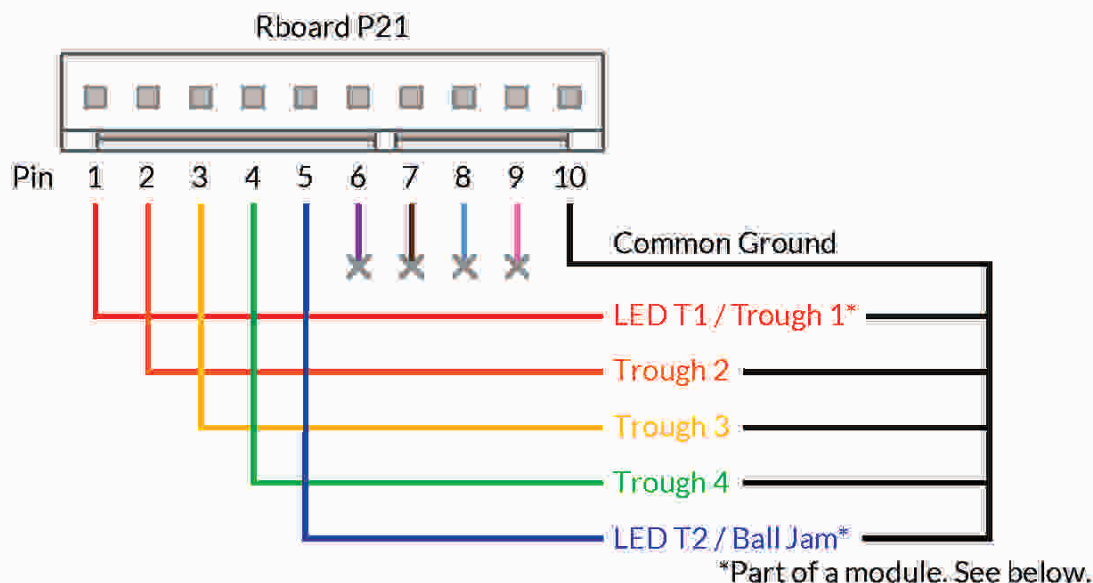
Pin 1 / +12 vdc

Pin 2 / LED Data

Pin 3 / Ground

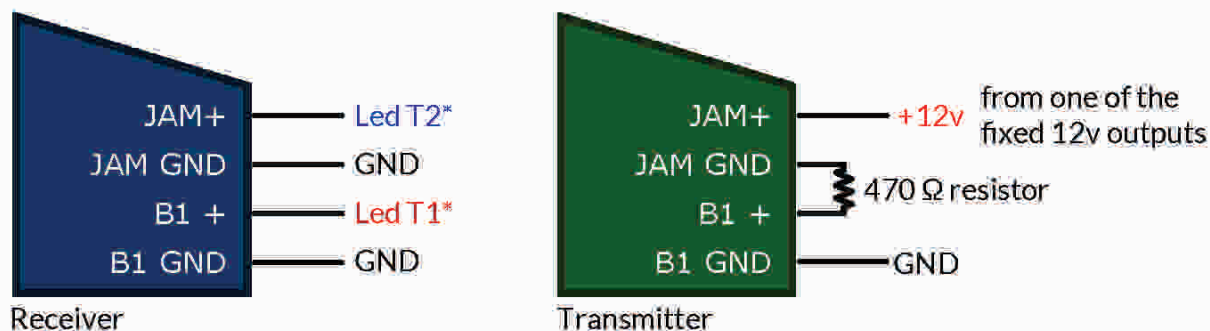
# Trough Switch Connections

The trough is connected to P21 on the Rboard. Although, there is a small board between the trough itself and this header that the various cables plug into, electrically it is the same as shown below (the small board is just for handling the various different types of physical connectors).



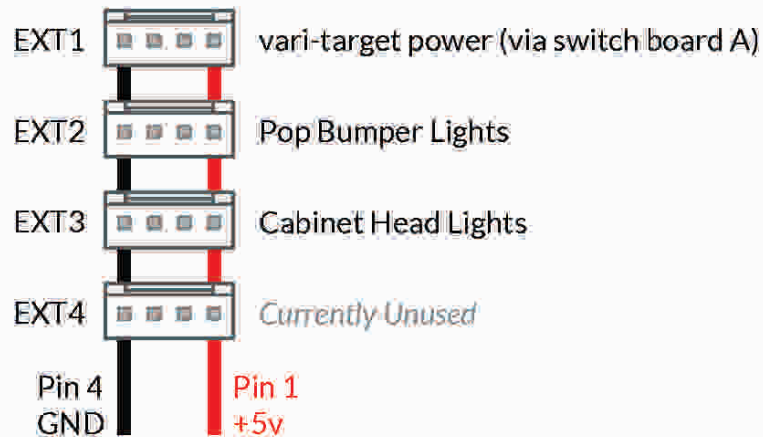
## IR Transmitter/Receiver Modules

These two modules are located on the trough.

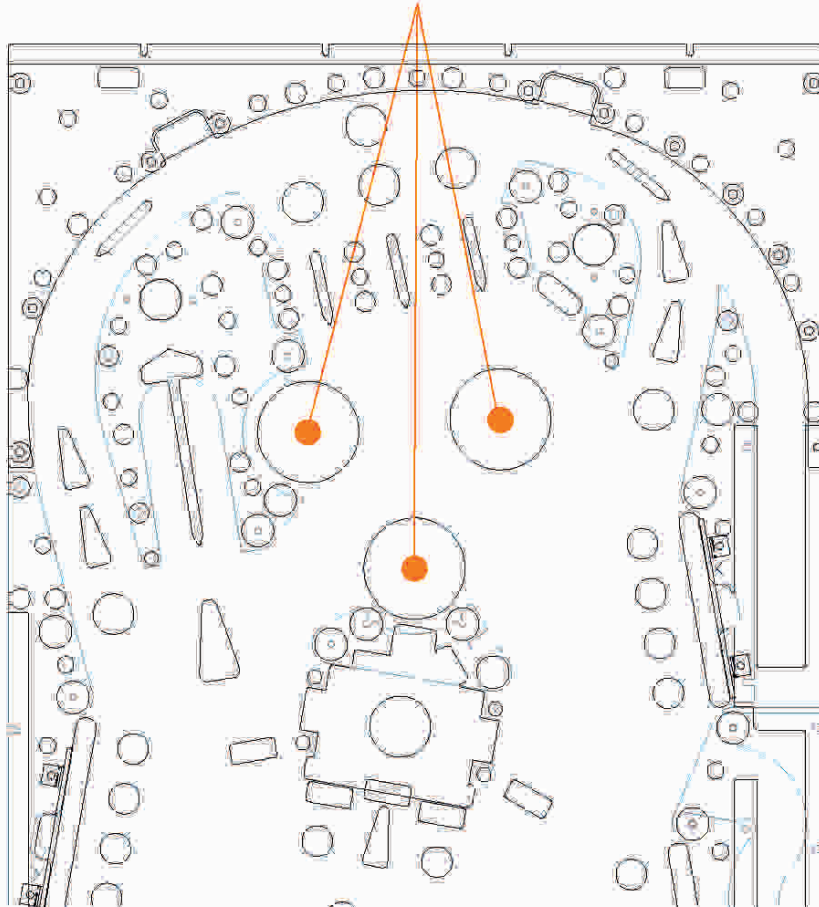


# Fixed 5v Supply

The Pop bumper's lights and vari-target requires a fixed 4v supply. There are four headers on the Rboard that can supply this. They are labelled below as well in the same manner as above.

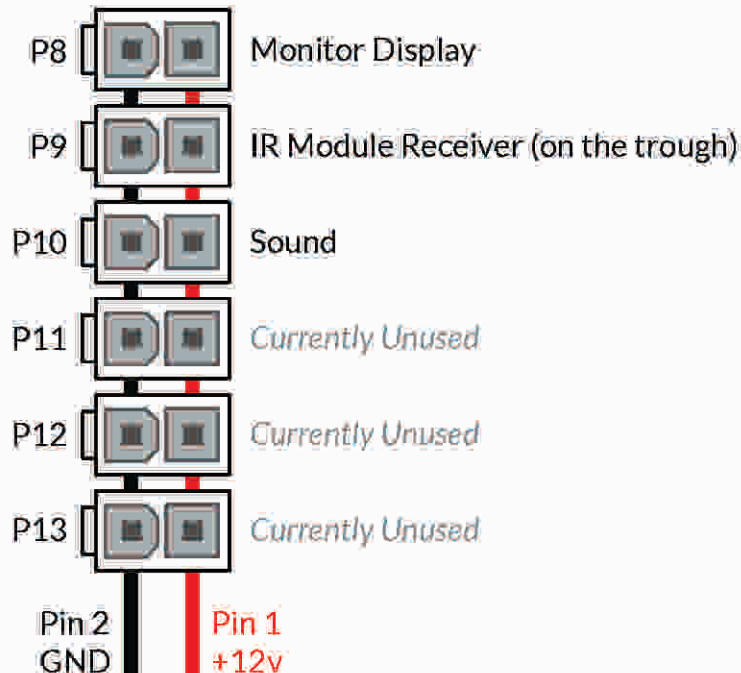


Pop Bumper lights are located here



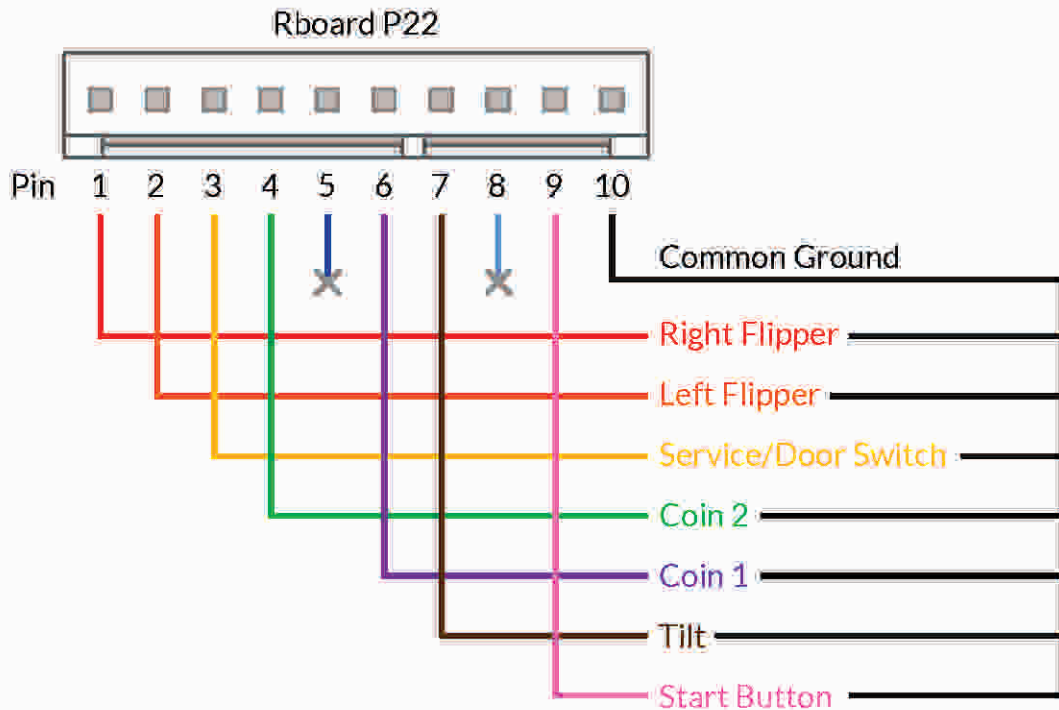
# Fixed 12v Supply

Various parts require a fixed 12v supply. There are several headers on the Rboard that can supply this. They are labelled below as well as what they are connected to.



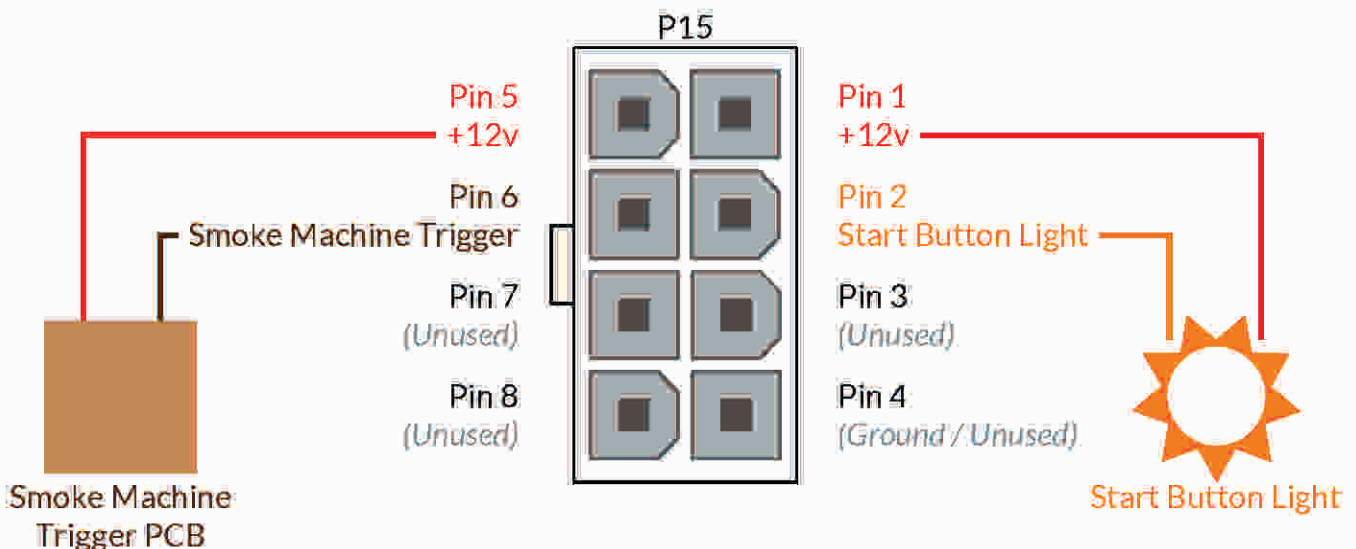
# Cabinet Switch Connections

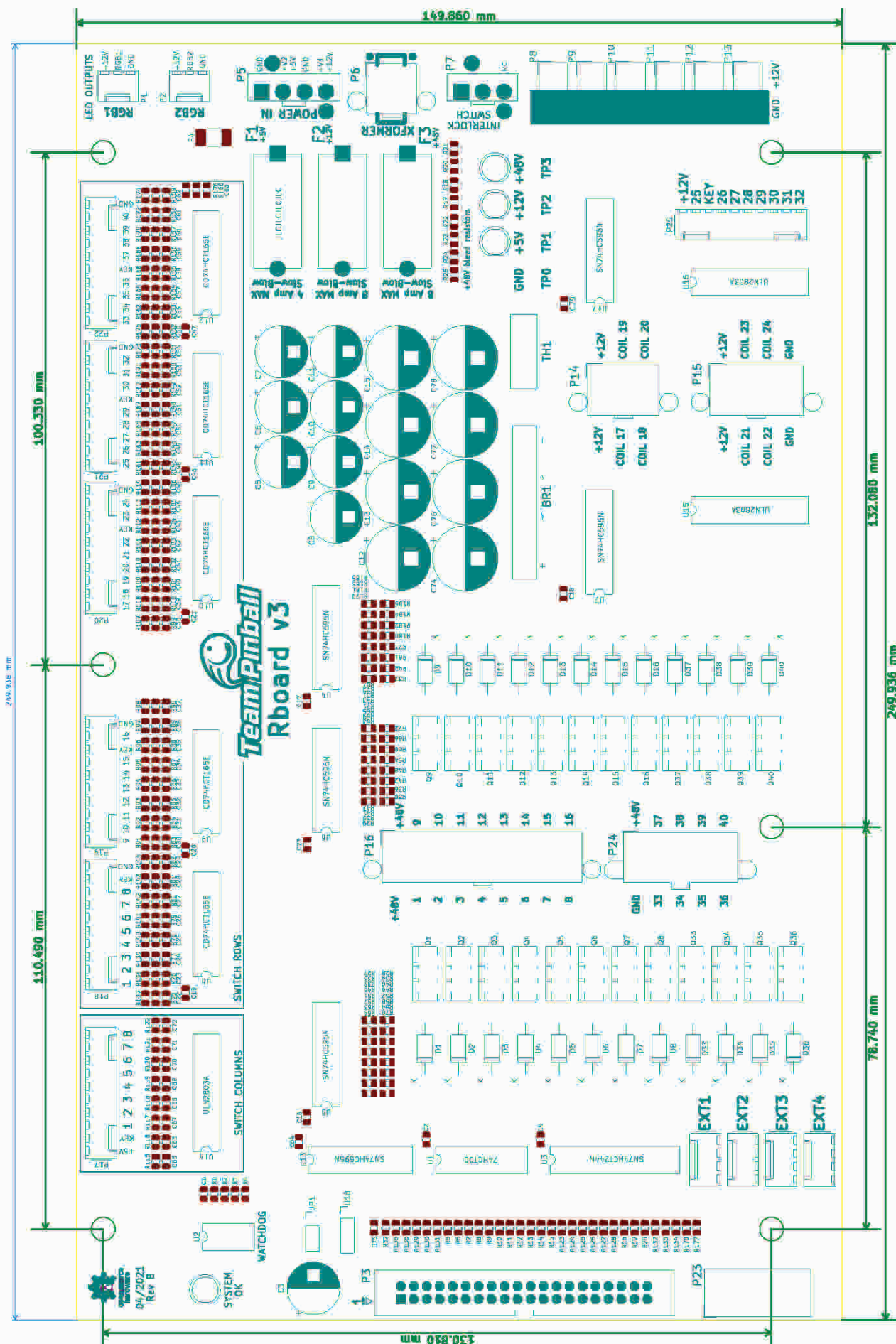
There are seven switches on the cabinet for the game. They are connected to the header P22 on the Rboard. The pinout of the header is shown below.

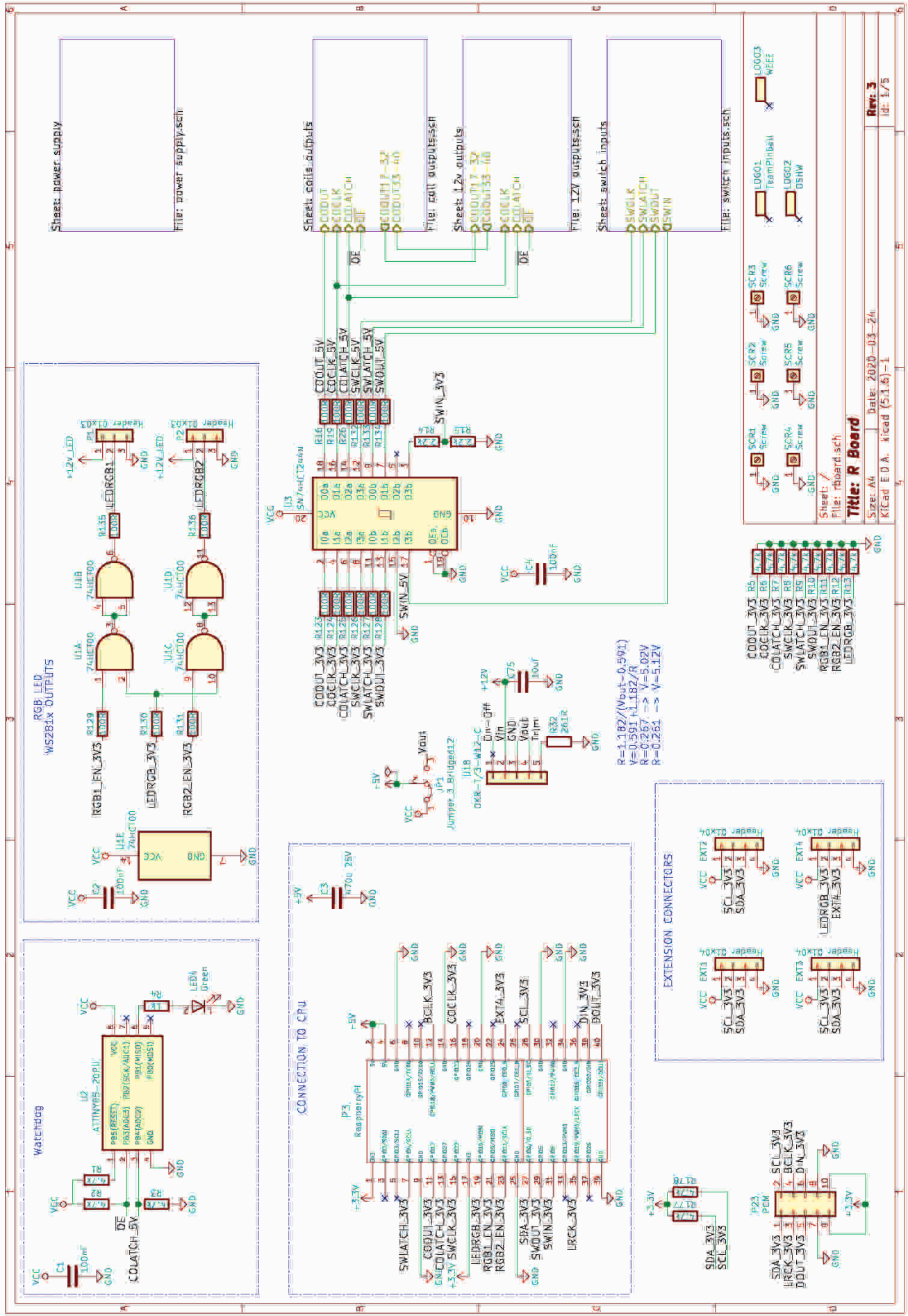


# Cabinet Output Connections

There are two cabinet outputs which is the start button light and smoke machine trigger (if used). It is connected to P15 on the Rboard. The header pinout is shown below.







Sheet: power supply

File: power supply.sch

Sheet: coils outputs

File: coils outputs.sch

Sheet: 12v outputs

File: 12v outputs.sch

Sheet: switch inputs

File: switch inputs.sch

COOUT\_3V3 B5  
COCLK\_3V3 B6  
COLATCH\_3V3 B7  
SWCLK\_3V3 B8  
SWLATCH\_3V3 B9  
SWOUT\_3V3 B10  
RGB1\_EN\_3V3 B11  
RGB2\_EN\_3V3 B12  
LEDRGB\_3V3 B13

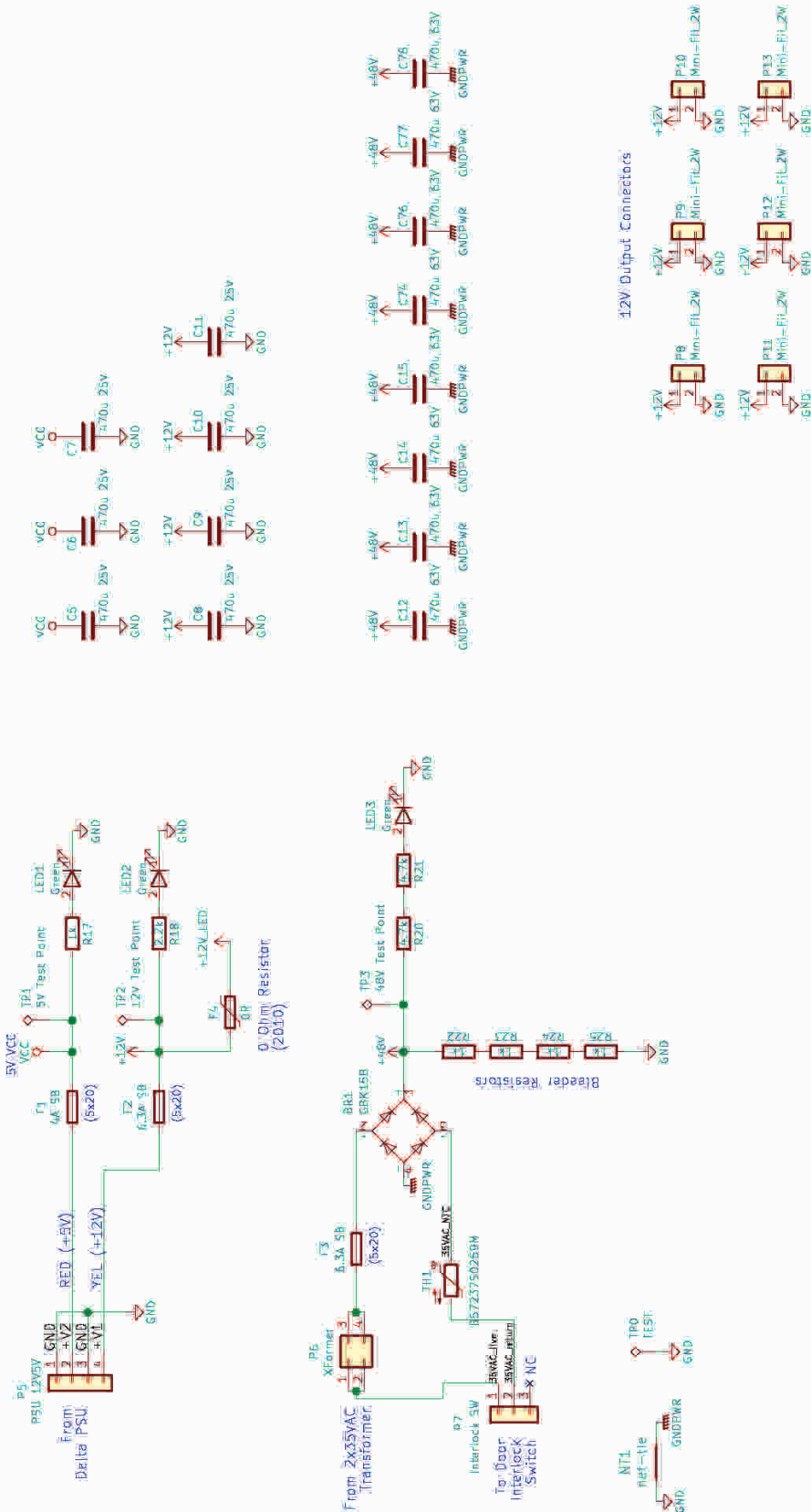
SCR1 Screw  
SCR2 Screw  
SCR3 Screw  
SCR4 Screw  
SCR5 Screw  
SCR6 Screw  
GND1 GND  
GND2 GND  
GND3 GND

LOG01 TeamPinBall  
LOG02 USHW  
LOG03 WEE

Sheet: /  
Title: R Board  
Size: A4  
Date: 2020-03-24  
Kifad E.D.A. klead (5.1.6)-1

Rev: 3  
Id: 1/5

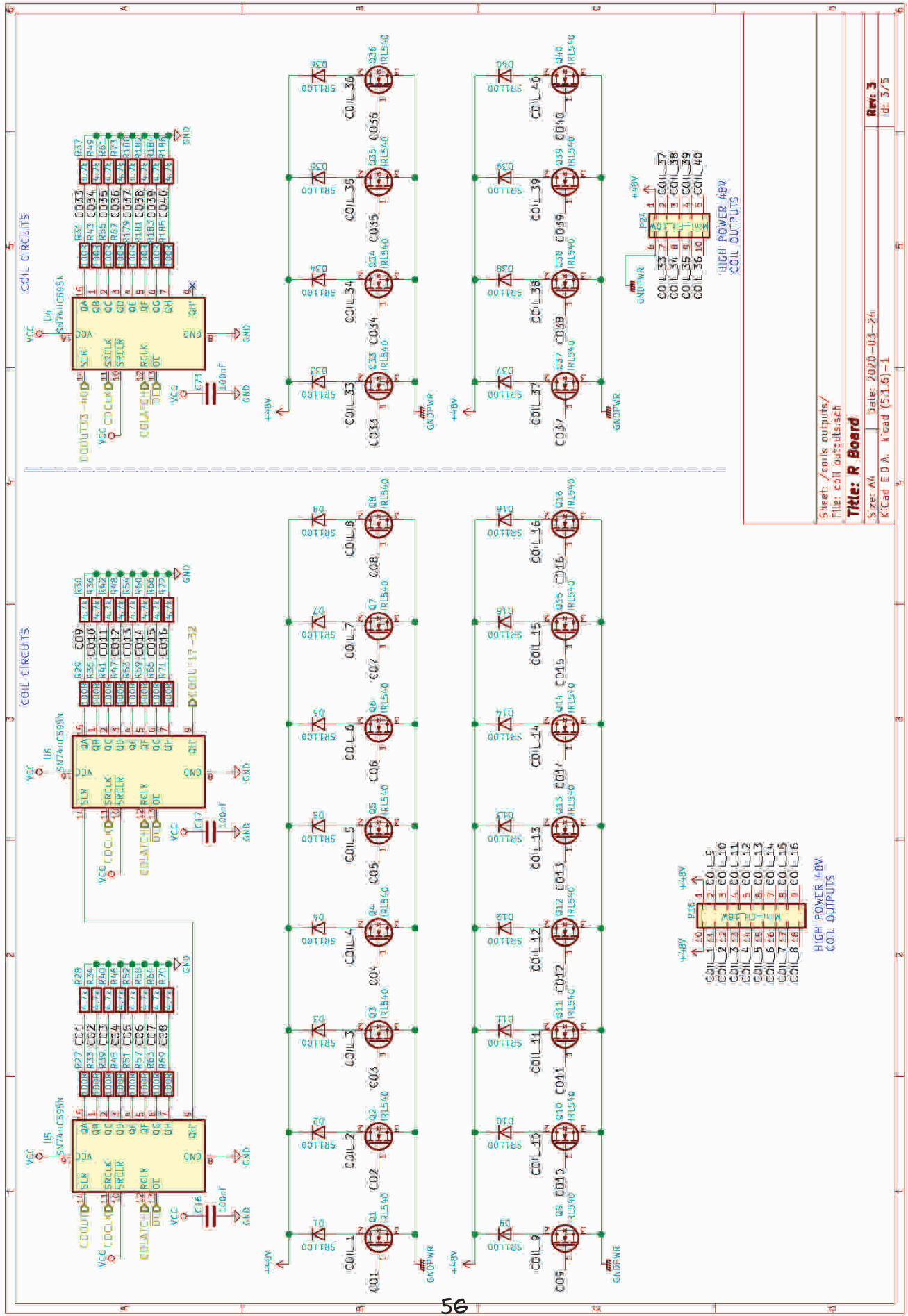
# POWER SUPPLIES.



Sheet: /power supply/  
File: power supply.sch

Title: R Board

Size: A4  
Kicad E.D.A. kicad (5.1.45) - L  
Date: 2020-03-24  
Rev: 3  
Id: 2/5

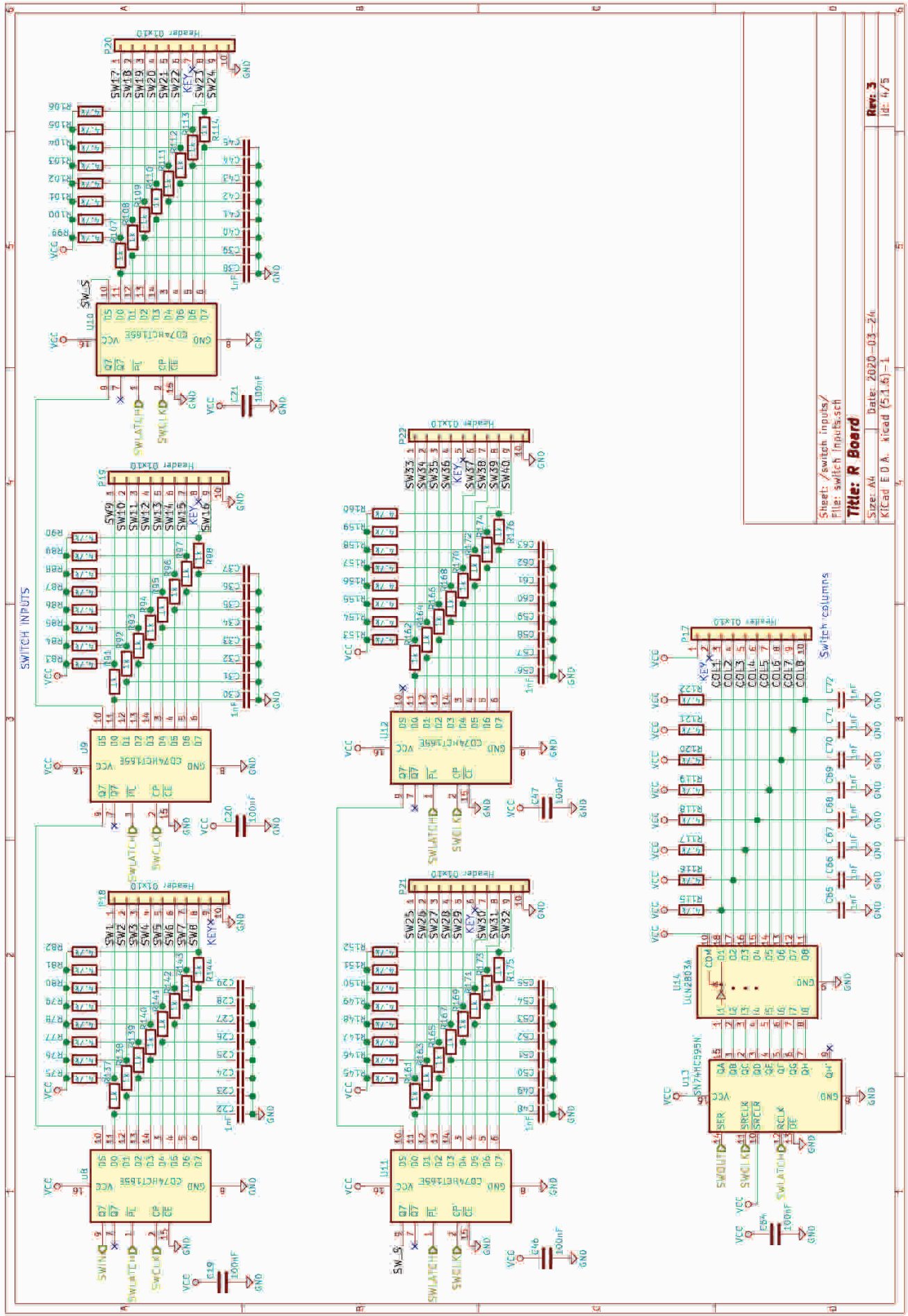


Sheet: /coils outputs/  
File: coil\_outputs.sch

Title: R Board

Size: A4  
Kicad E.D.A. kicad (5.1.4) - L

Rev: 3  
Id: 3/5

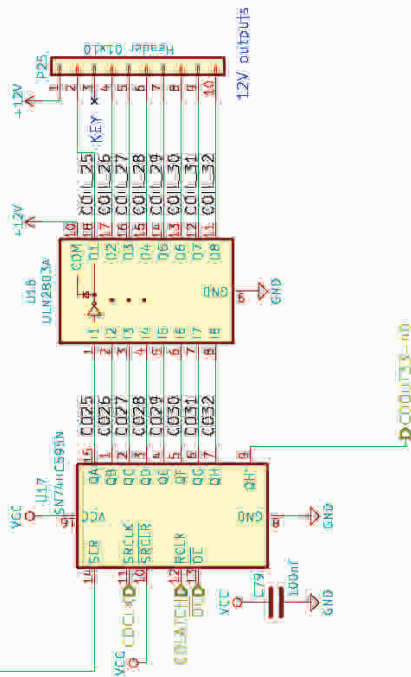
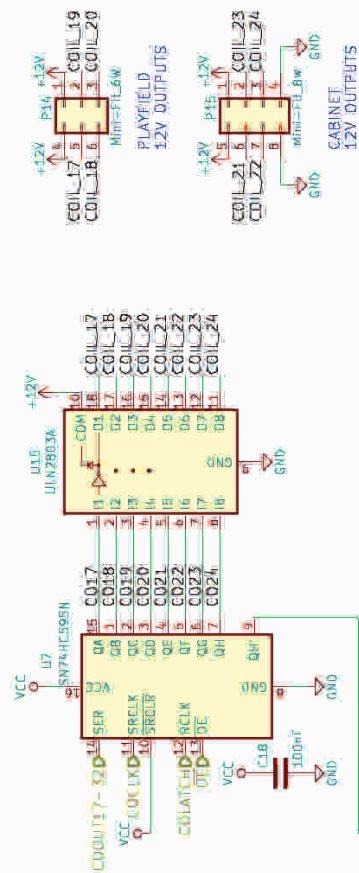


Sheet: /switch inputs/  
File: switch inputs.sch

Title: R Board

Size: A4 Date: 2020-03-24  
Kicad E.D.A. kicad (5.1.6) - L

Rev: 3  
Id: 4/5



Sheet: 12v outputs/  
File: 12v outputs.sch

Title: R Board

Size: A4 Date: 2020-03-24  
Kicad E D A. kicad (5.1.6) - L

Rev: 3  
Id: 5/5

# Service Menu Items

Select/Cycle through various options with Left/Right and "Start" button to confirm/trigger action or enter sub-menu.

## Test

- all lamp - automatically cycles all LEDs: off, white, red, green, blue
- single lamp - manually cycle through each LED
- switch test - shows which switches are activated in real time
- coil test - used to trigger each coil one at a time for testing purposes

- |                      |                         |
|----------------------|-------------------------|
| ↳ bottom jet         | ↳ left flipper hold     |
| ↳ right flipper      | ↳ left jet              |
| ↳ right flipper hold | ↳ trough                |
| ↳ bottom jet         | ↳ left drop target up   |
| ↳ right flipper      | ↳ middle drop target up |
| ↳ right flipper hold | ↳ drop target down      |
| ↳ right sling        | ↳ popper                |
| ↳ right jet          | ↳ right drop target up  |
| ↳ left sling         | ↳ kickback              |
| ↳ left flipper       | ↳ variTarget reset      |

- coil power - used to set coil power time/strength

- |                 |                |
|-----------------|----------------|
| ↳ bottom jet    | ↳ left flipper |
| ↳ right flipper | ↳ left jet     |
| ↳ right sling   | ↳ trough       |
| ↳ right jet     | ↳ popper       |
| ↳ left sling    |                |

- flasher test - manually cycle through fixed flashing lights

- ↳ 17 punny press
- ↳ 19 transformer jet
- ↳ 18 transformer vari

- smoke test - select time in increments of 100ms

## Audits

- avg game time
- avg ball time
- total earnings
- total games played
- total balls played

**FISHTANK**



## Setting

- factory setting reset - select yes/no
- reset high score - select yes/no
- set ball number - select 3 to 6 balls (currently set to 3)
- reset earning - select yes/no
- reset credit - select yes/no
- vari target
  - ↳ switch contact - use if using physical contact switches
  - ↳ opto - use if using optocoupler sensors (which have inverted signals)
- ball saver - select 4 to 15 seconds (currently set to 10)
- video mode - select disabled/enabled (currently set to 'disabled')

## Pricing

- match possibility - set 0 to 90% (currently set to 50%)
- coin setup
  - ↳ left coin - select 10p, 20p, 50p, £1, or £2 (currently set to £2)
  - ↳ right coin - select 10p, 20p, 50p, £1, or £2 (currently set to £1)
  - ↳ unit per credit - select 0 to 100 (currently set to 100)
  - ↳ bonus credit to value - select 0 to 100 (currently set to 0)
  - ↳ when give bonus credit - select 0 to 200 (currently set to 200)
  - ↳ country currency - select UK, EU, USA, Canada, Sweden, Australia, or Other (currently set to UK)
  - ↳ Preinstalled Pricing
    - UK £1 1 Tier £2 2 Tier
    - UK £1 1 Tier £2 3 Tier
    - EU €1 1 Tier €2 2 Tier
    - EU €1 1 Tier €2 2 Tier
    - USA 0.75c 1 Tier \$2 3 Tier
    - USA \$1 1 Tier \$2 2 Tier
    - USA \$1 1 Tier \$2 3 Tier
    - Canada \$1 Tier \$2 2 Tier
    - Canada \$1 Tier \$2 3 Tier
    - Sweden 10kp 1 Tier 20kp 2 Tier
    - Sweden 10kp 1 Tier 20kp 3 Tier
    - Australia \$1 1 Tier \$2 2 Tier
    - Australia \$1 1 Tier \$2 3 Tier
    - Custom
- set free play - select yes/no

## Sound Test

- sound test

## USB

- USB update
- export log



## POWERED GAMING SUBWOOFER WITH SATELLITE SPEAKER OUTPUTS

Model: GS2.1



**Description:** The Dayton Audio GS2.1 is a compact, powered subwoofer with a matching passive radiator for low frequency bass from a small enclosure. This subwoofer comes equipped with a built-in amplifier that not only powers the subwoofer, but also powers a pair of full-range speakers via stereo binding posts. Bass levels can be adjusted to your liking and overall volume can be controlled with the master volume knob. An attractive removeable fabric grill makes the GS2.1 ideal for the most discreet installations.

**Uses:** The primary use for the GS2.1 would be in casino or arcade-style gaming machines as their primary audio system. Other uses include desktop gaming, built-in audio for kiosk displays, and any other compact audio installations that would benefit from a small subwoofer that can also power your satellite speakers.

### Features:

- Compact sleek design for discrete 2.1 audio installations or powering small speaker systems
- Plenty of power at 2 x 15W + 1 x 30W subwoofer
- Matched active/passive subwoofer system support the low end while satellite speakers can be directly connected to the onboard 5-way binding posts
- Mounting brackets and the included grounding wire making installing this system into new or existing gaming designs simple
- Install the amp under a desk or remove the mounting brackets to use on top of a desk. An included rubber pad prevents transfer of vibrations to the mounting surface
- Separate bass and volume knobs allow independent adjustments to the low and full-range frequencies
- Easily connect to any audio source using the 3.5mm AUX jack. 15V 4A power supply is sold separately



## Technical Specifications:

|                         |   |
|-------------------------|---|
| Model                   | GS2.1   |
| Description             | Gaming Subwoofer with 2.1 Amplifier   |
| Woofer                  | 2.5" high-excursion woofer with matching passive radiator   |
| Finish                  | Black vinyl   |
| Full range output power | 15W RMS x 2   |
| Subwoofer output power  | 30W RMS   |
| Input                   | 3.5 mm AUX jack   |
| DC power input          | 15V, 4A (Sold Separately)   |
| Max SPL (calculated)    | 97 dB   |
| Response                | Subwoofer: 50-150 Hz<br>Full-range outputs: 150 Hz - 20 kHz   |
| THD+N                   | <0.2%   |
| Tuning frequency        | 74 Hz   |
| Dimensions              | 3-7/8" H x 8-1/4" W x 4" D<br>4-1/4" H* x 8-1/4" W x 5-1/2" D**<br>*Includes grill **Includes mounting brackets |

Note: Grill is removable, non-see-through cloth

Note: Includes 7" grounding wire with ring terminals



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Last Revised: 10/5/2021

## Specifications

### Model

DSC40 DS Series 4" Coax

### Speaker Design

2 - Way

Woofer [in, mm]

4, 100

Mid [in, mm]

n/a

Tweeter [in, mm]

1/2, 13

Rated Impedance [ $\Omega$ ]

4

Peak Power (watts, per ANSI/CTA-2031-A)

120

Recommended Amplifier Power (watts RMS)

30

Sensitivity [1W, 1m]

88

Frequency Response [Hz]

60-20k

Mounting Hole Diameter [in, mm]

3-3/4, 95

Top Mount Depth [in, mm]

1 13/16, 46

Bottom Mount Depth [in, mm]

2 1/16, 52

Tweeter Protrusion [in, mm]

0

Grilles

Yes

Tweeter Magnet Material

Neodymium

Tweeter Dome Material

PEI (polyether imide)

Tweeter Design

Balanced dome

Woofer Cone Material

Polypropylene

Woofer Surround Material

Polyester foam



## Common Issues (and fixes)

### Hook Switch Not working

- bend the metal hook part so it clears the plastic mounting bracket (should hear a soft click)
- bend the metal hook part so it comes up far enough above the playfield surface for the ball to activate it

### Coil Does not Fire

- multimeter test the coil - should read ~11ohms on the big 'green' ones

### Sling Machine Gun Firing

- the rubber band might be too tight, stretch it out gently

### Flipper Slow Return to Rest Position

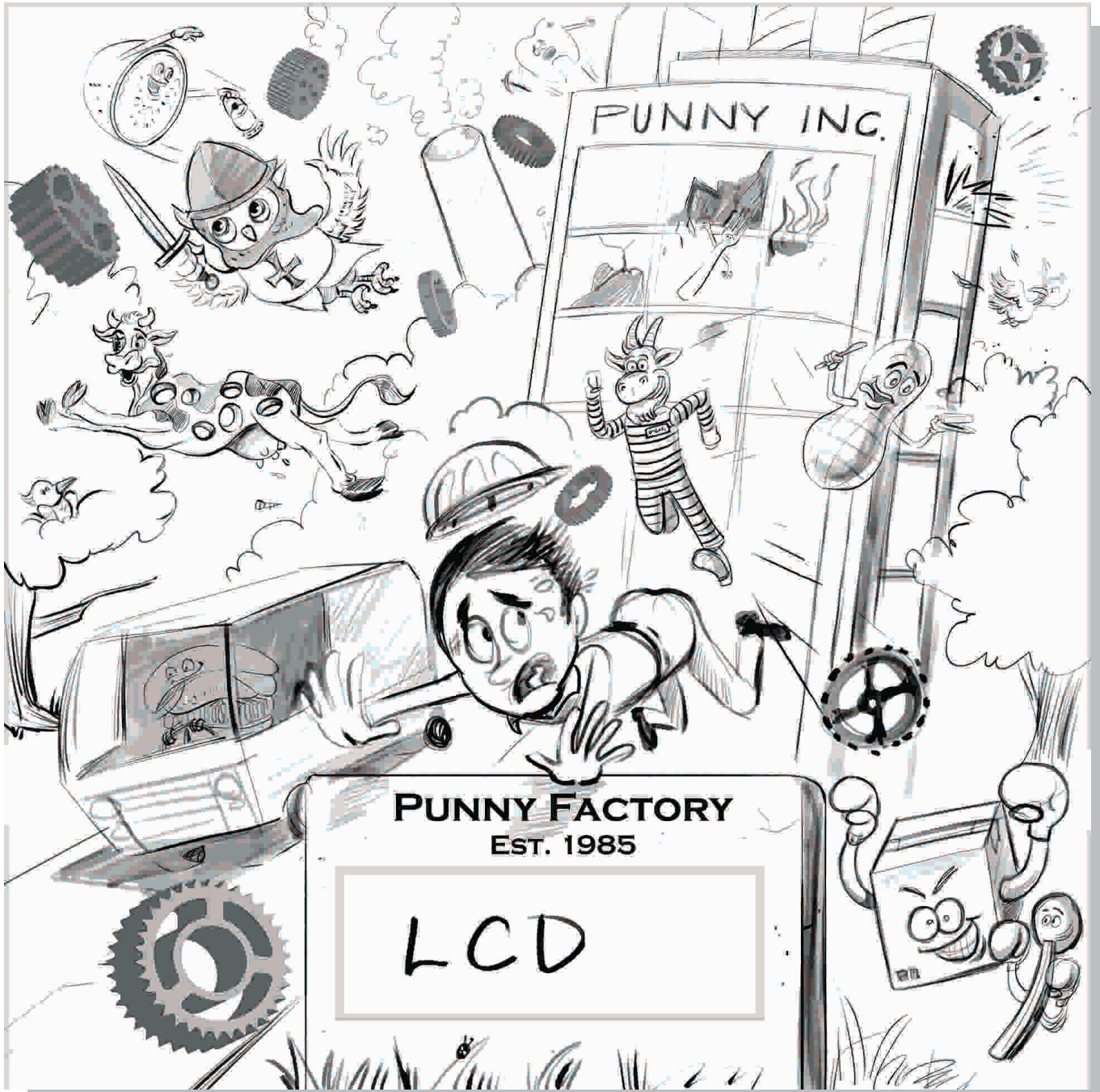
- the pivot point under the flipper (plastic sleeve vs the metal housing) is most likely rubbing up against the bottom of the playfield, adding friction. Lower it so it has 1mm of clearance from the bottom

### Drop Target Not Going Down

- check the sticker is fully adhered and not coming off in the corners

### V-Target

- reset coil seemingly not triggering - coil might be too far from the latching
- can test this by moving the latch closer by hand and triggering



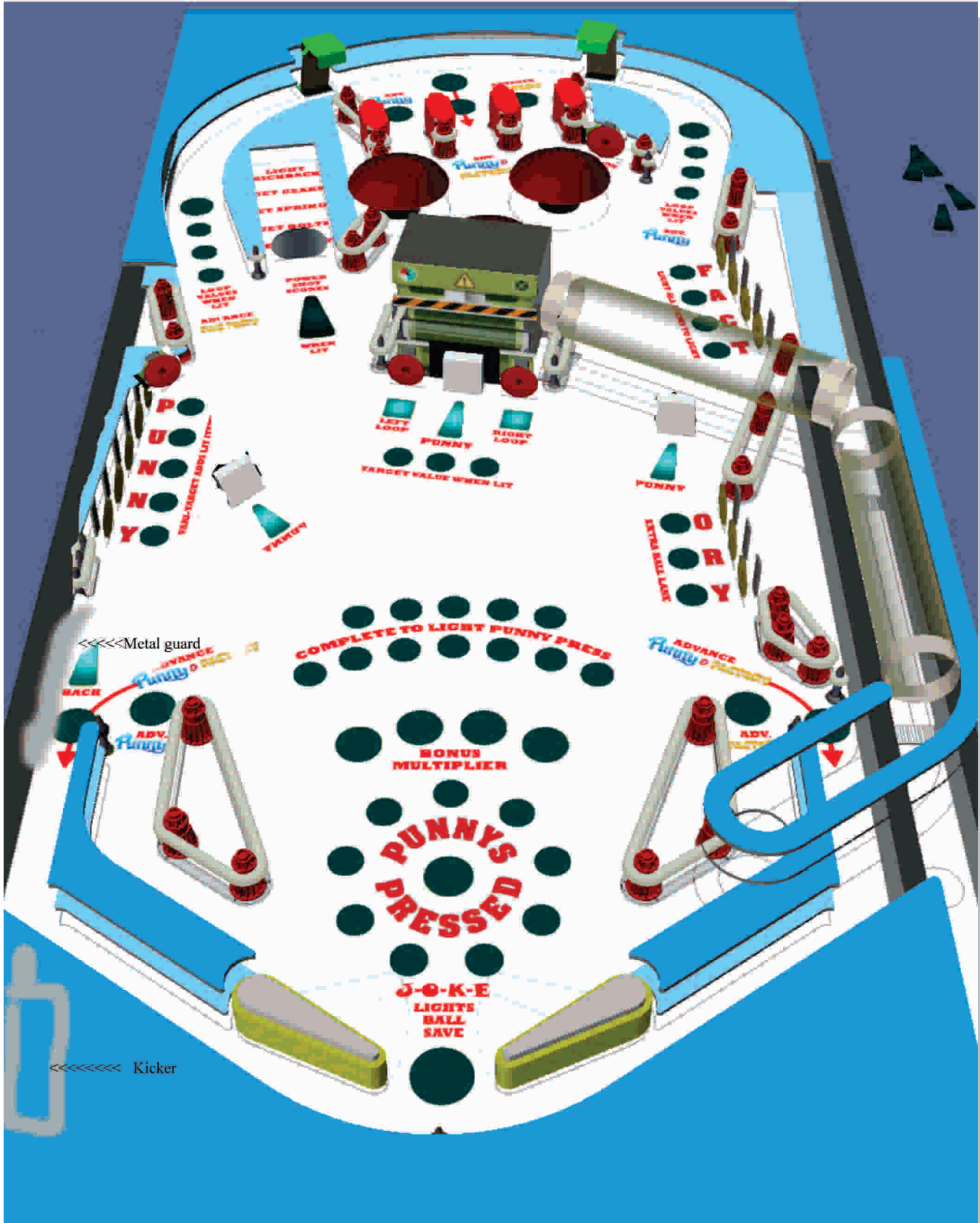


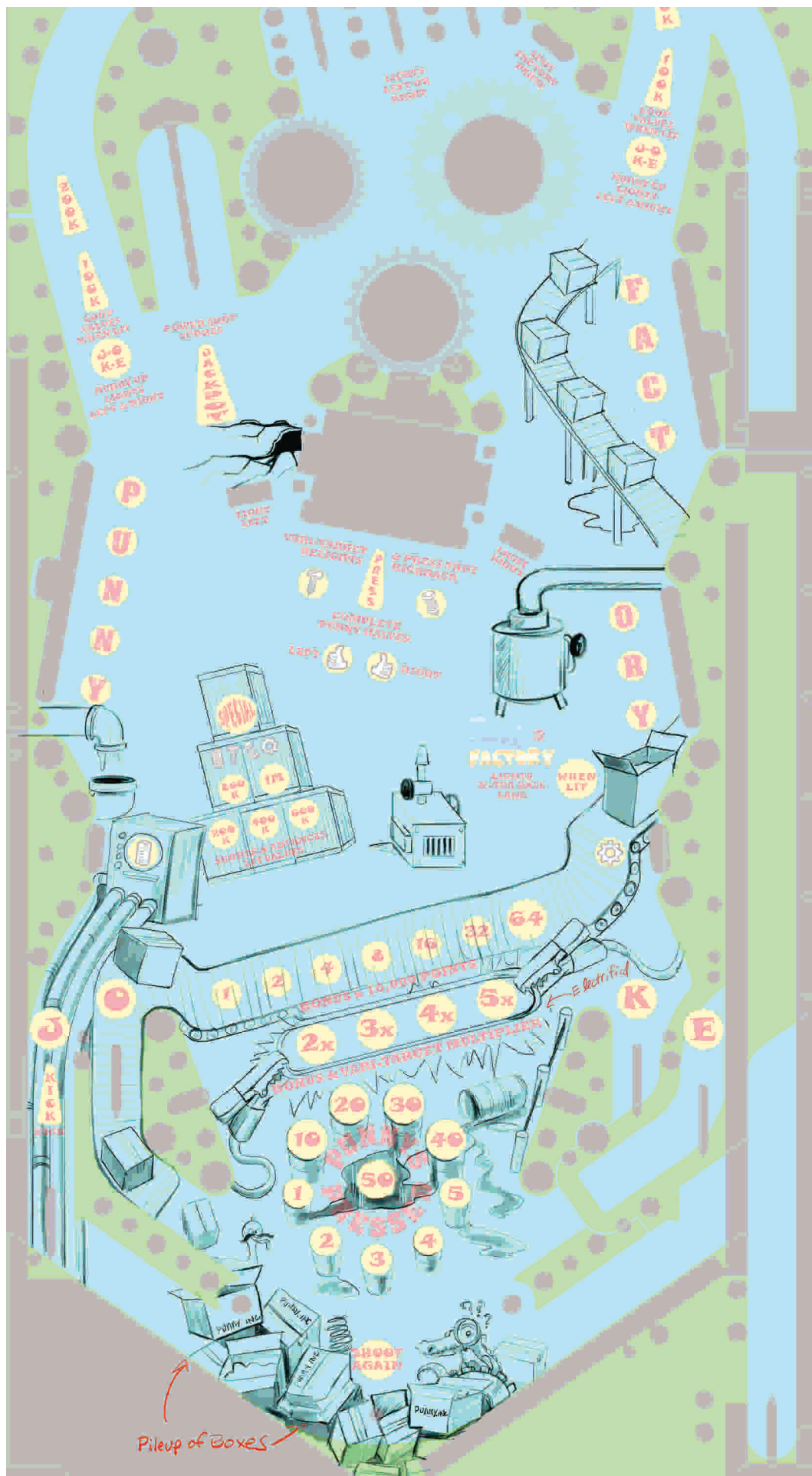




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ART OVERLAY TEMPLATE AT 150dpi RESOLUTION

- BLUE = Visible playfield area
- GREEN = Overlay area underneath plastic
- YELLOW = Insert areas
- RED = Suggested text and scoring details

NB: Vari-target scores and bonuses will be inscribed on plastic

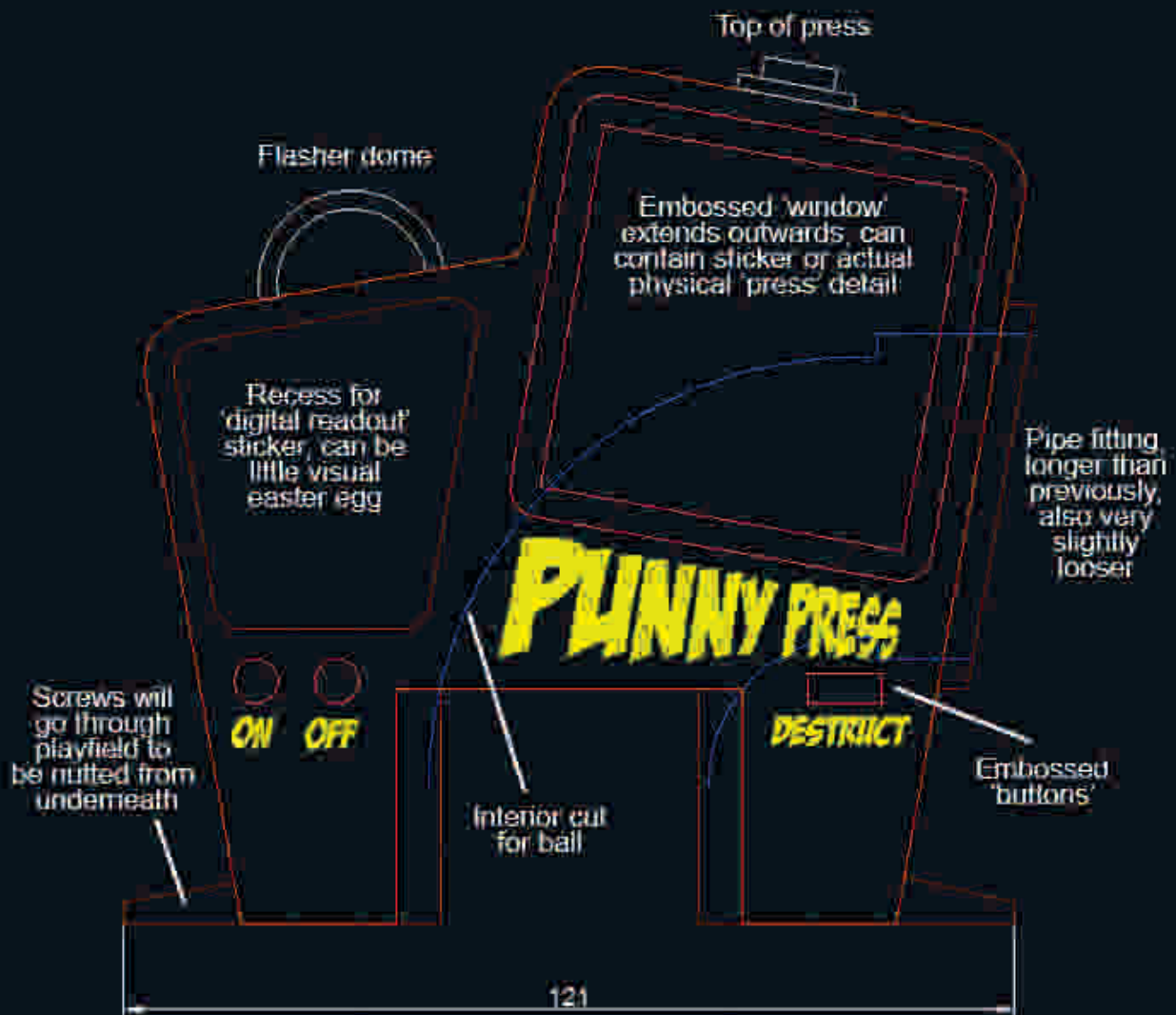
STANDUP SIGN 1



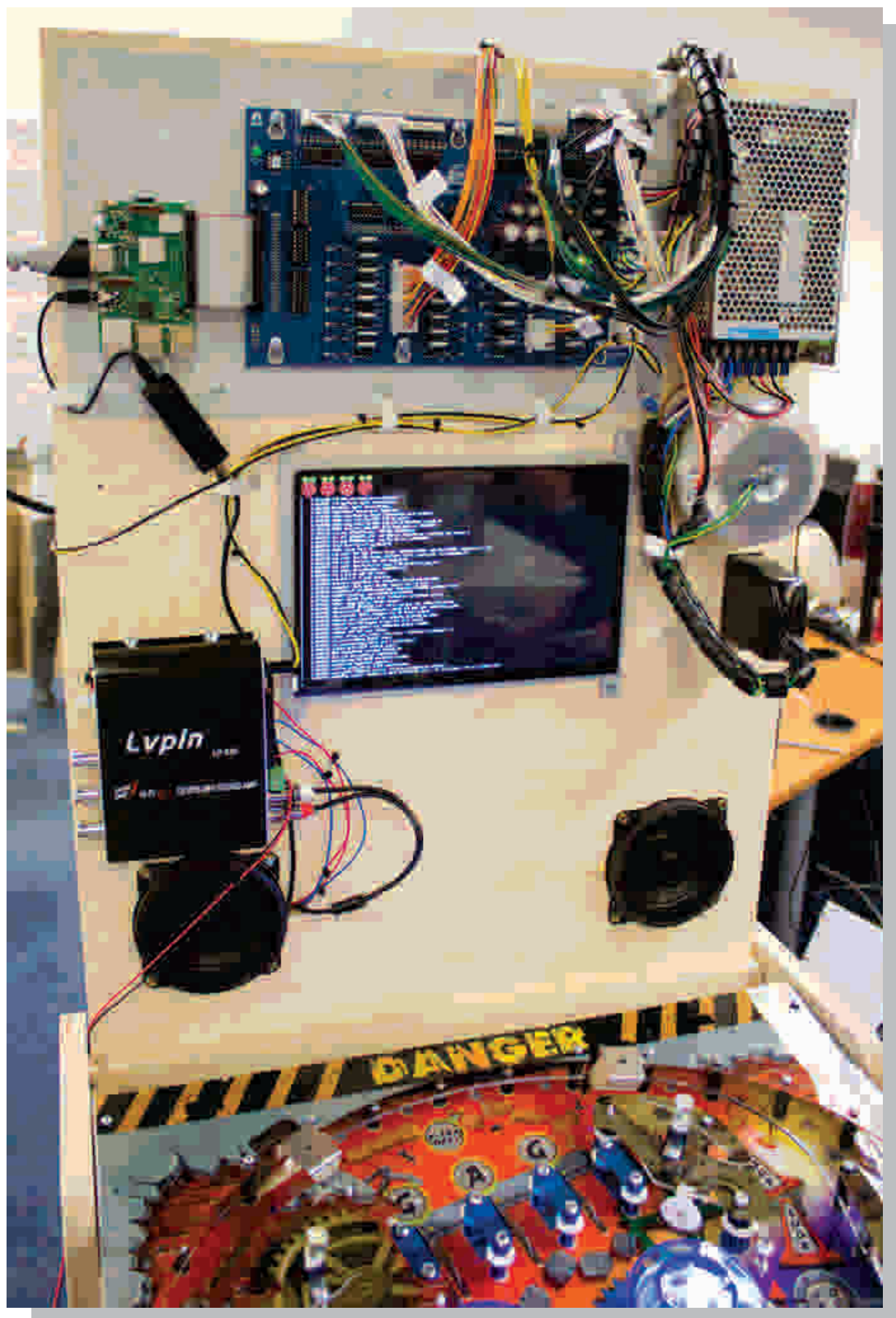
STANDUP SIGN 2

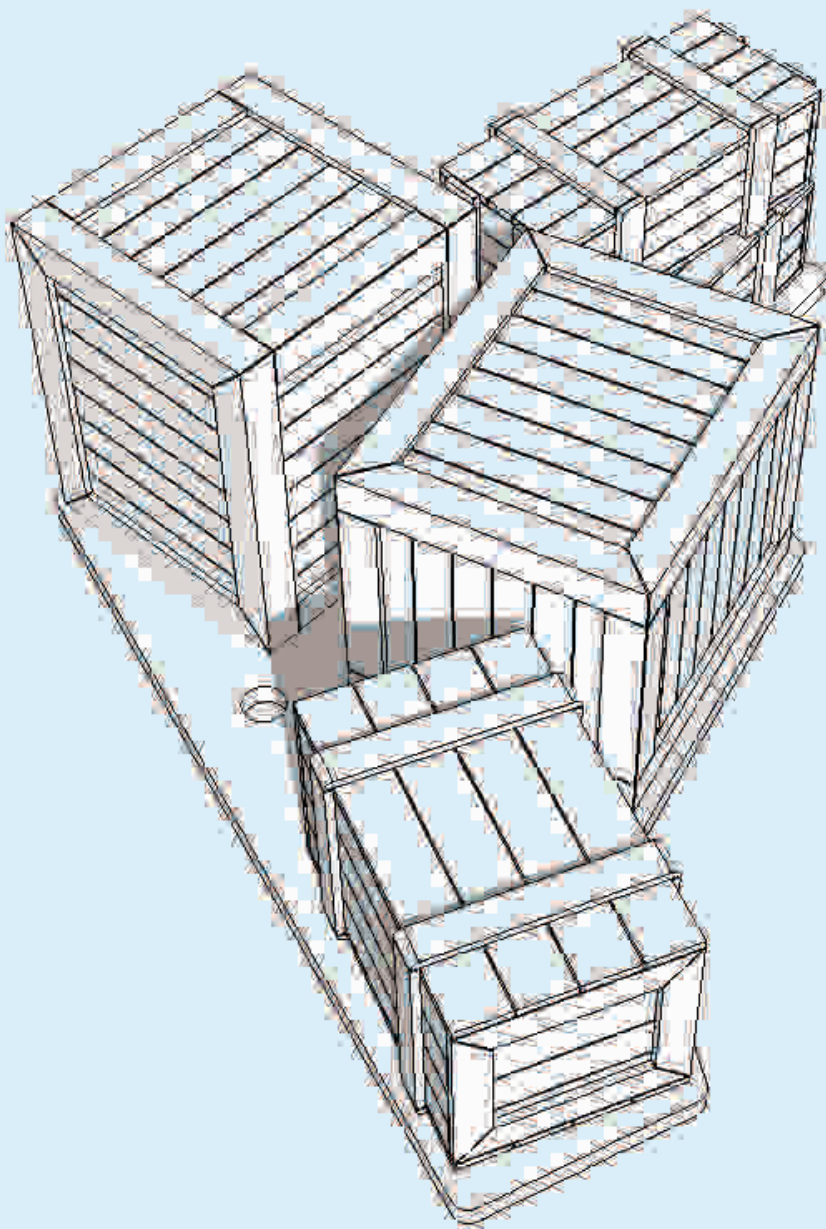


PUNNY PRESS CONCEPT WIP (drawn to scale, front view)  
Jaunty 'cartoon prop' look with angled sides and rounded corners



## PUNNY PRESS - COMPLETE PHYSICAL MODEL AND CONSTRUCTION DETAILS









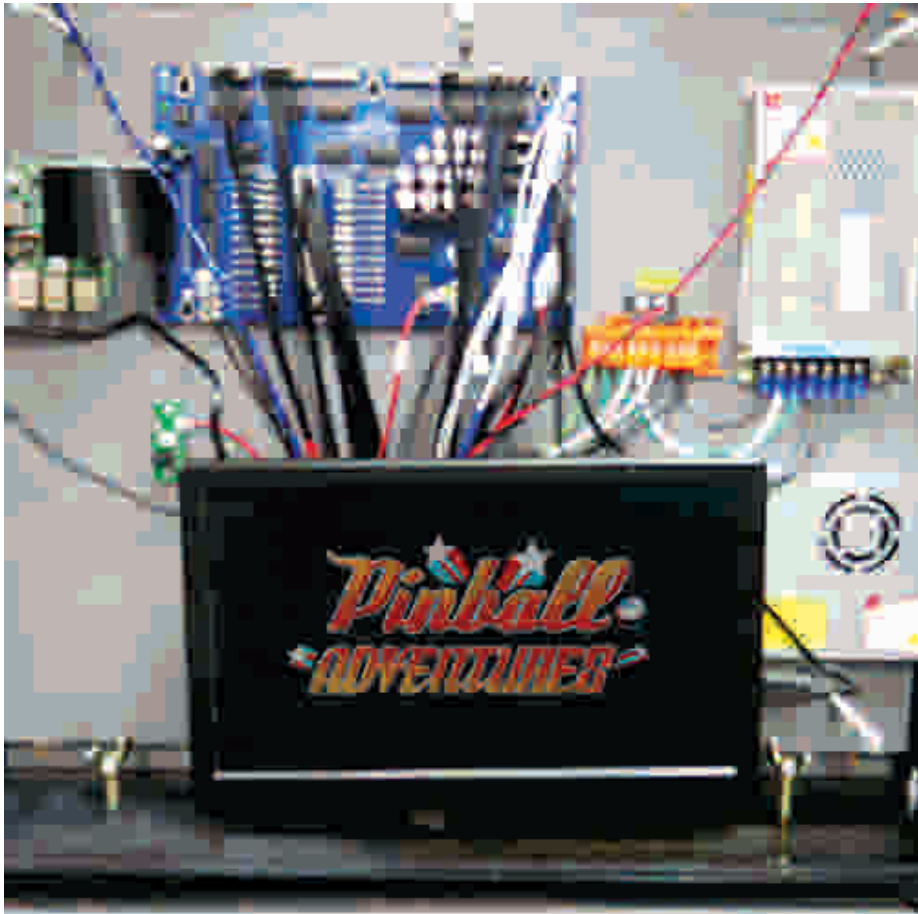










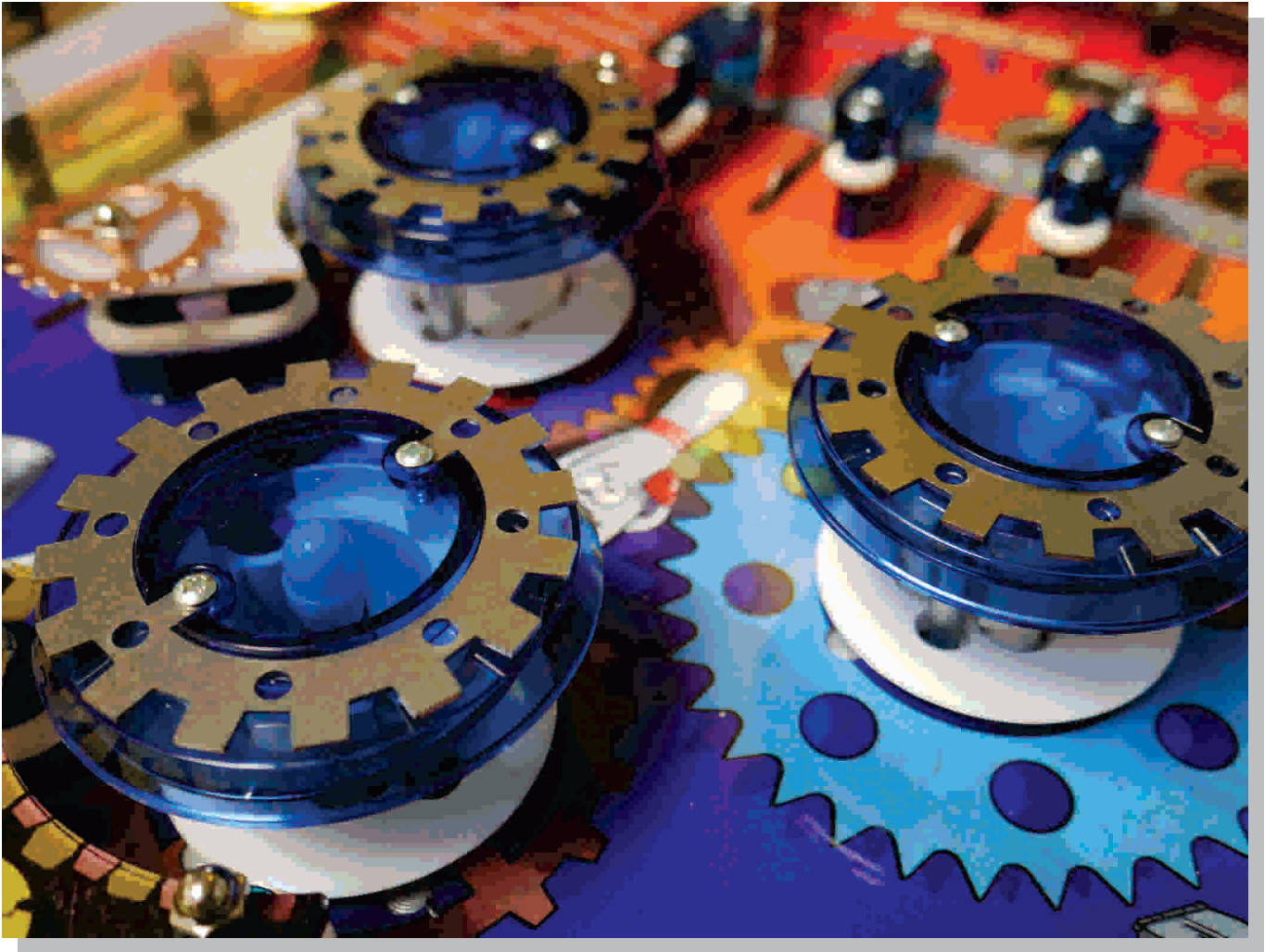




















PLAYFIELD DESIGNERS AND PROGRAMMERS



# Pinball ADVENTURES

## UNPACKING A PINBALL ADVENTURES GAME

### Tools Required:

- ☑ Safety Glasses
- ☑ Utility Knife
- ☑ Ratchet and 5/8" socket (or 5/8" wrench)

1. Set the box upright with the "FORKLIFT THIS SIDE ONLY" label facing towards you (Fig. 1a).

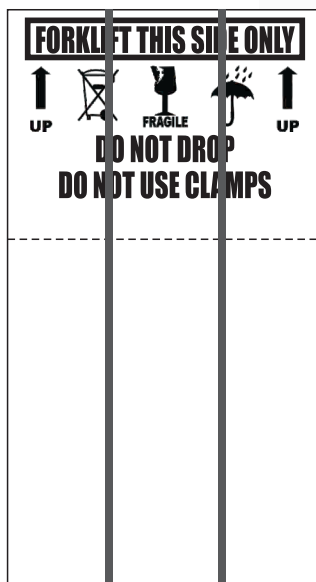


Fig. 1a The "FORKLIFT THIS SIDE ONLY" side of the box

2. Wearing safety glasses, cut the shipping bands off the box with a utility knife, then carefully lift off the top section of the box (Fig. 1b). Then remove the leg box and check for the following:

### Loose Parts List:

- |                        |                          |
|------------------------|--------------------------|
| ☑ Manual               | ☑ 4 Pinball Legs         |
| ☑ 8 Leg Bolts          | ☑ Power Cord             |
| ☑ Plumb Tilt Bob       | ☑ Allen Key              |
| ☑ Topper (if provided) | ☑ Pinballs               |
| ☑ Felt Protectors      | ☑ Free Gift              |
| ☑ Bubble Level         | ☑ Pinball Level Template |

**\*\*Please note loose parts may vary from game to game.\*\***

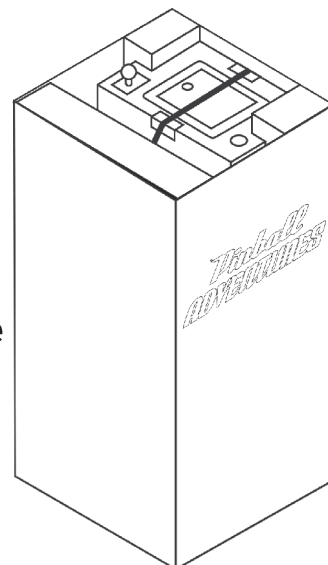


Fig. 1b Opening the shipping box

3. Carefully tip the box onto its side with “FORKLIFT THIS SIDE ONLY” facing the floor.

**IMPORTANT:** Do **NOT** cut the nylon strap. Instead, use the strap to slide the machine out from the box (Fig. 2). You can now recycle your shipping box.

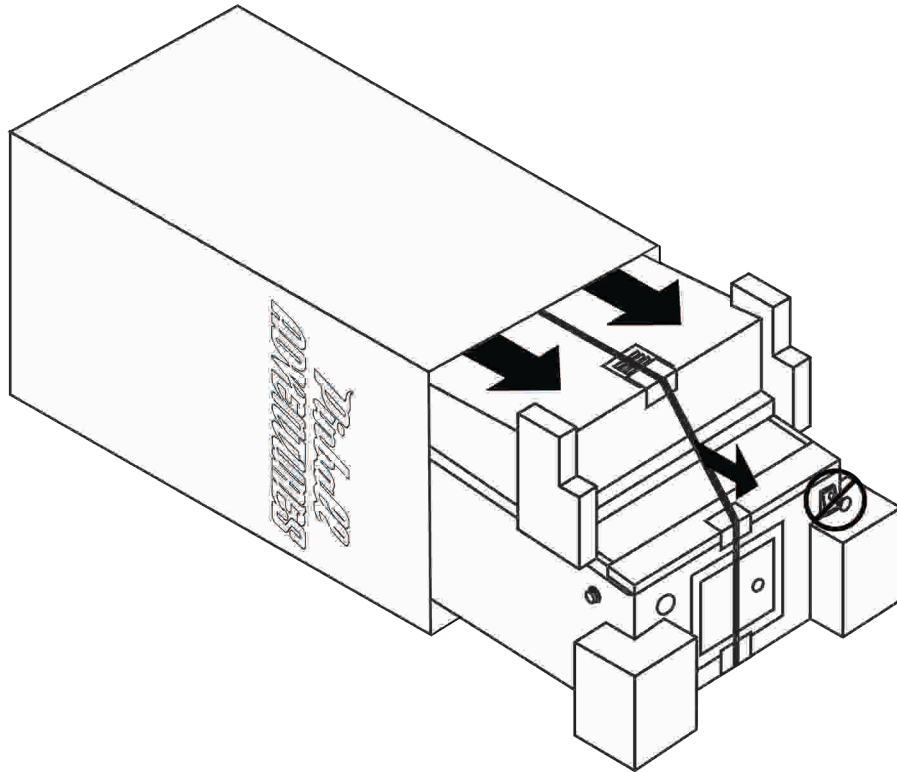


Fig. 2 Sliding the game out of the box

4. Locate all four pinball legs, adjustable tightening nuts, and table feet.
  - a. For the front feet, adjust the tightening nuts all the way to the end of each foot
  - b. For the rear feet, adjust the nut to two thirds of the way to the end
  - c. Thread each foot into each leg until the tightening nut prevents it from going farther (Fig. 3)

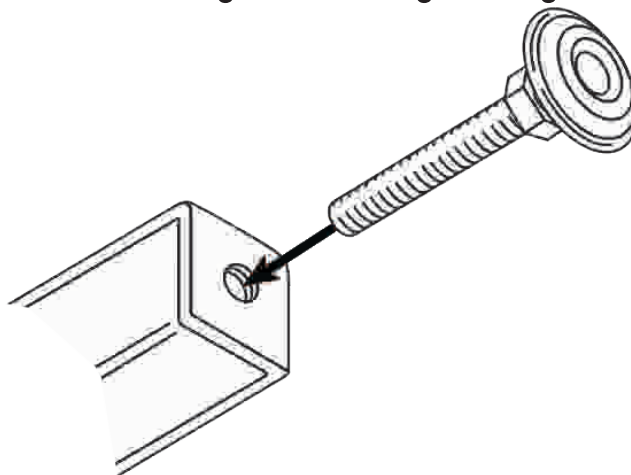


Fig. 3 Adjusting a leg leveler and tightening nut

5. Locate the four felt cabinet protectors and leg bolts from the loose parts (Fig. 4).

**IMPORTANT:** Do **NOT** rest the machine on its side, or flip the machine upside down to install the legs. To avoid damage to the cabinet head or glass, the legs must be installed in two phases, and not all at once.

6. Tip the cabinet body onto its rear so the coin door faces upward, then install the front legs
  - a. For each leg, sandwich a protector between the leg and the cabinet
  - b. Thread both leg bolts on each leg to secure it to the cabinet (Fig. 4)
  - c. Tighten each bolt firmly using a 5/8" socket or ratchet

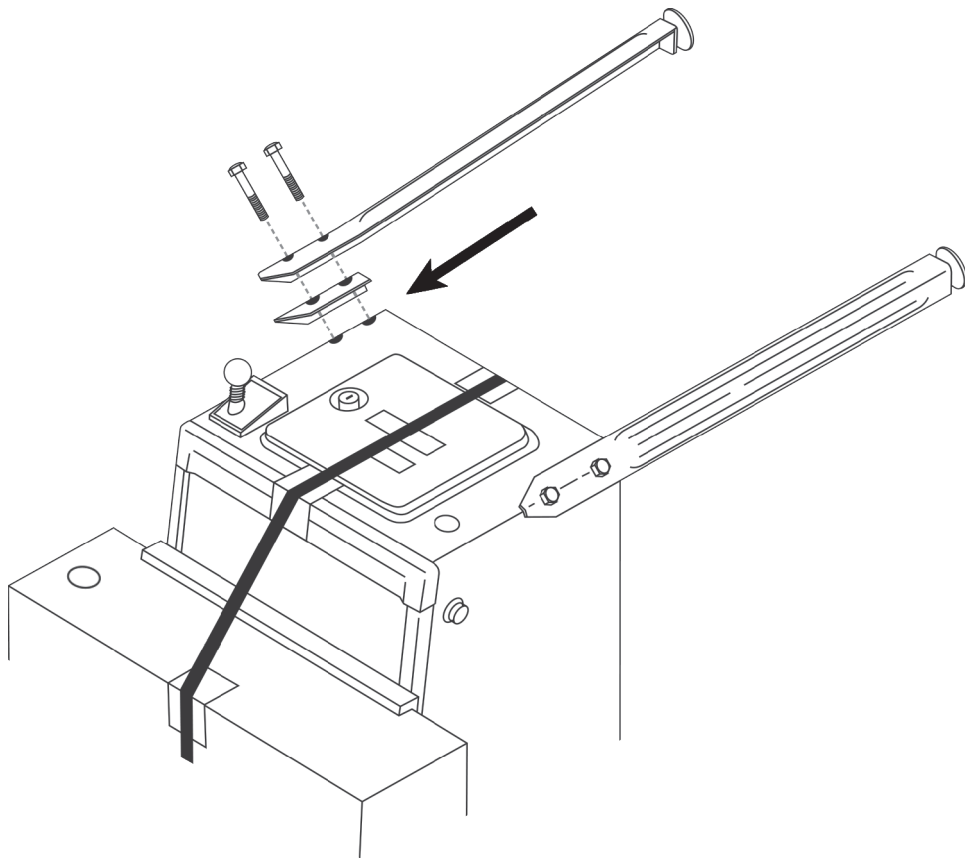


Fig. 4 Installing the front legs and cabinet protectors

- 7 With the help of at least one other person, carefully stand the cabinet body onto its front legs. Keep the rear cabinet body elevated and install the rear legs (Fig. 5).

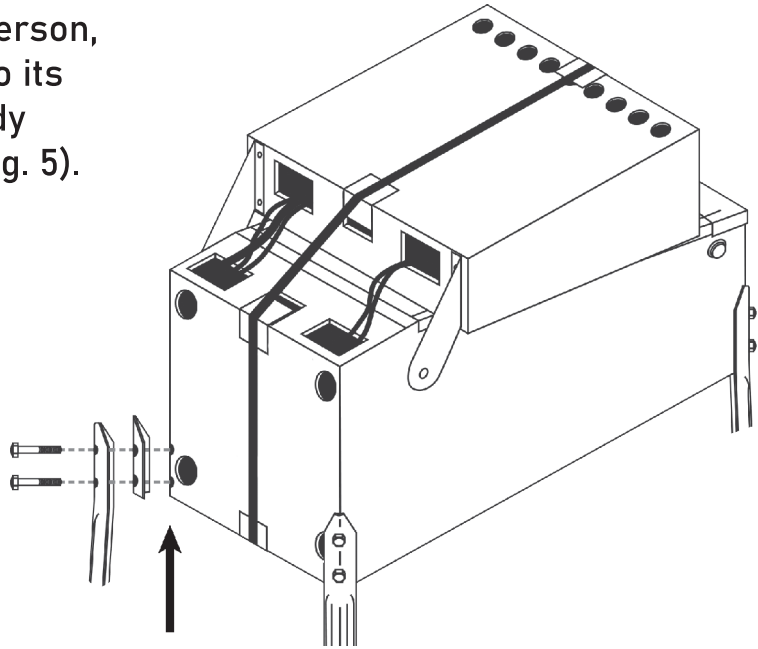


Fig. 5 Elevating rear cabinet and installing rear legs

8. With a utility knife, cut and remove the nylon strap and remainder of the packing material holding the cabinet head and body together. Then raise the cabinet head to its upright position. (Fig. 6).

**IMPORTANT:** Ensure that the cables and wires in the neck of the game do not get pinched at any time during the process.

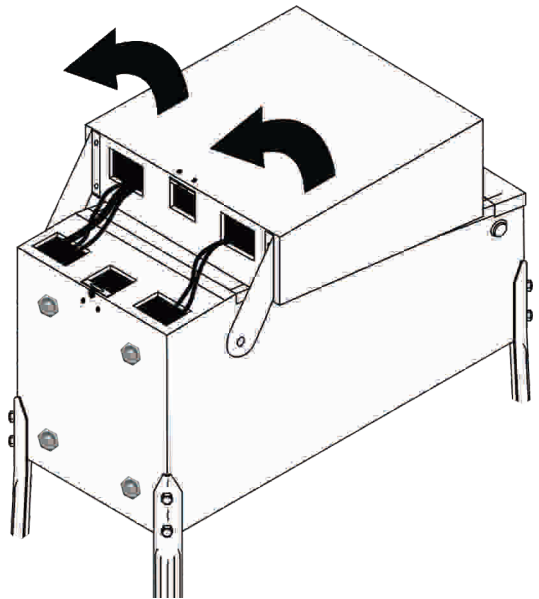


Fig. 6 Raising the cabinet head to its upright position

9. Using the large allen key, lock the cabinet head in its upright position to prevent it from falling down (Fig. 7).

**Note:** When the coffin lock is in the fully locked position, the key will not turn any further in the clockwise direction.

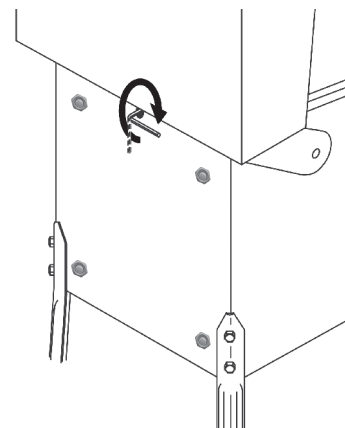


Fig. 7 Locking the backbox in the upright position

10. Install the head bolts that are recommended for additional support.

**IMPORTANT:** Do NOT slide the game. With at least one other person, lift the game instead and move the game to its intended location.



11. With a pair of wire cutters, free the coin door keys attached to the ball shooter rod located at the front right of the cabinet.



12. Remove the playfield glass:

- ① Open the coin door
- ② Slide the yellow lockdown bar lever to the left
- ③ Lift the lockdown bar straight up and out
- ④ **IMPORTANT:** Close and lock the coin door
- ⑤ Slide playfield glass off of the front of the cabinet (Fig. 8)
- ⑥ **IMPORTANT:** Tempered glass is known to shatter when placed on hard surface

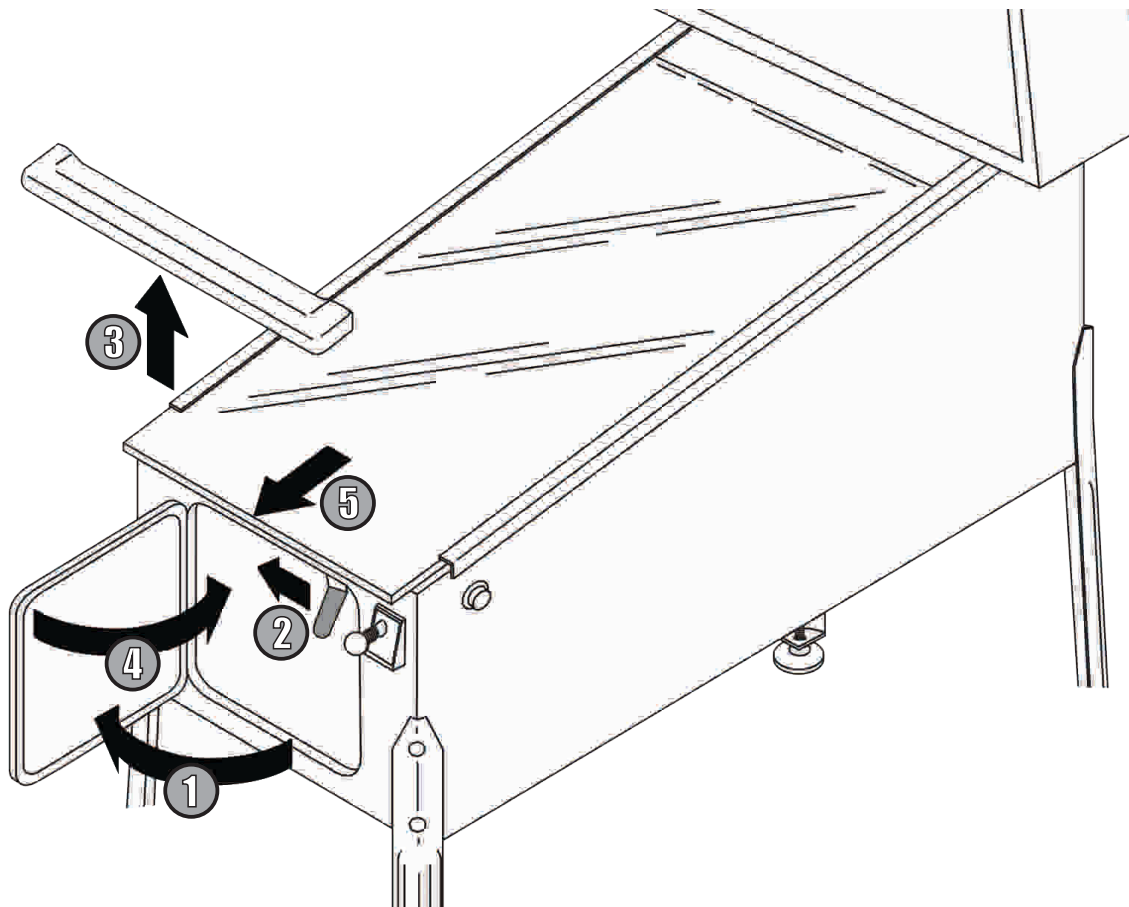


Fig. 8 Removing the playfield glass

13. Locate the pinballs from the loose parts box: load the balls into the trough, allow each ball to drain to the base of the playfield past the flippers.
14. Level the playfield surface side-to-side using the bubble level and Pinball Level Template provided. Adjust the height of the machine by tightening or loosening the nuts on each leg.

15. Locate the plumb bob weight, tilt hanger, and wing nut from the loose parts (Fig. 9).

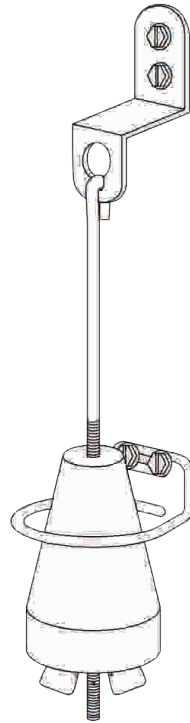


Fig. 9 Assembling plumb bob tilt mechanism

16. Hang the tilt hanger from the contact bracket mounted on the lower left inside wall of the cabinet body (Fig. 9). Then slide the weight onto the straight end of the hanger wire and thread the wing nut onto the shaft underneath it (Fig. 9).
17. Locate the power cord from the loose parts. Then plug the power cord into the socket located on the underside and at the rear of the cabinet body.
18. Power up the game, by switching the ON/OFF rocker switch that is located underneath the cabinet, just behind the right front leg. Wait for the game to boot, then test the game for proper operation and adjust the game settings as desired.
19. Reinstall the playfield glass and lockdown bar in the cabinet and your game is ready to play!



20. Lifting up the playfield to service your game (Fig. 10a, Fig. 10b & Fig. 10c).

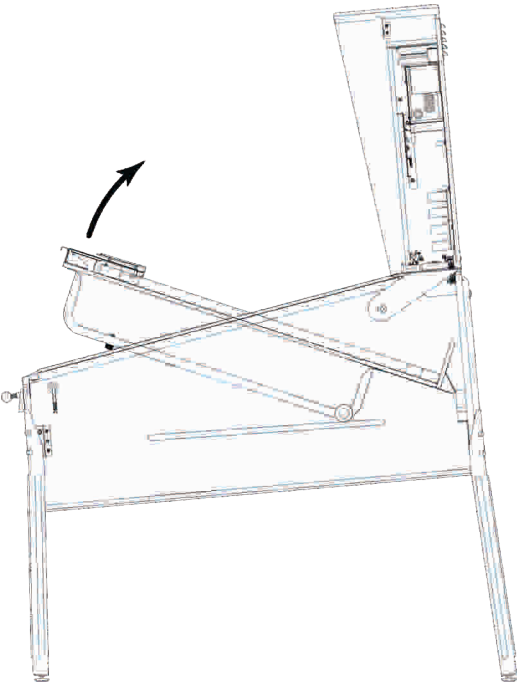


Fig. 10a Lifting the playfield upward

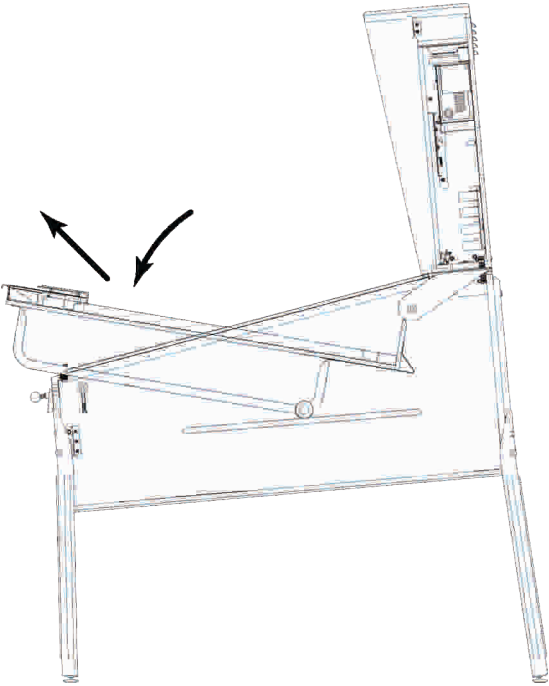


Fig. 10b Moving the playfield to position 2

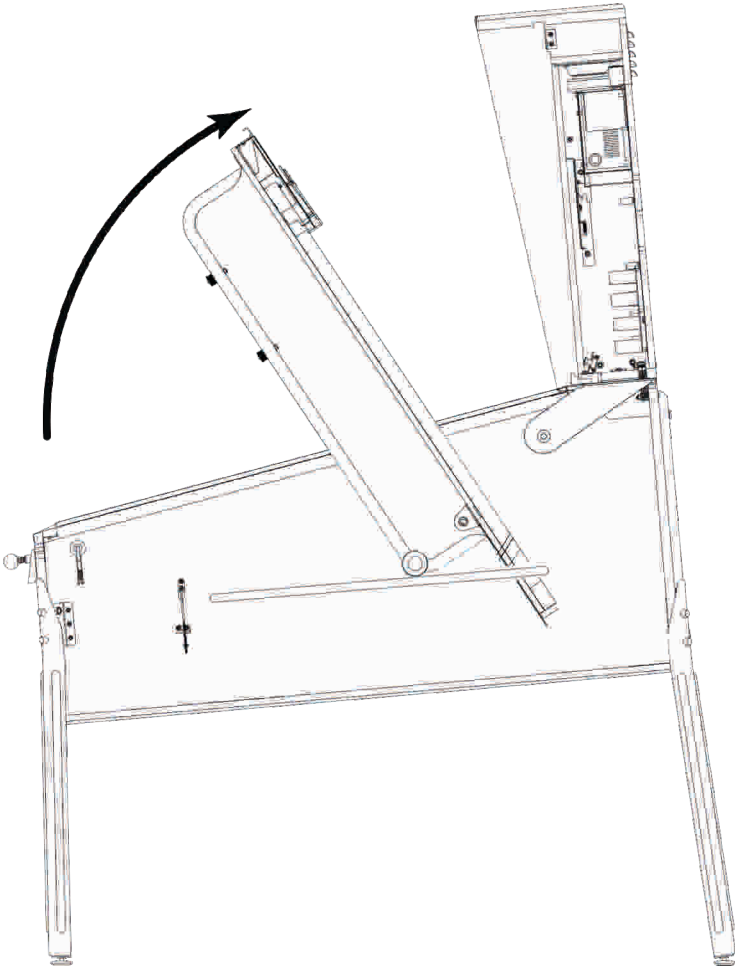
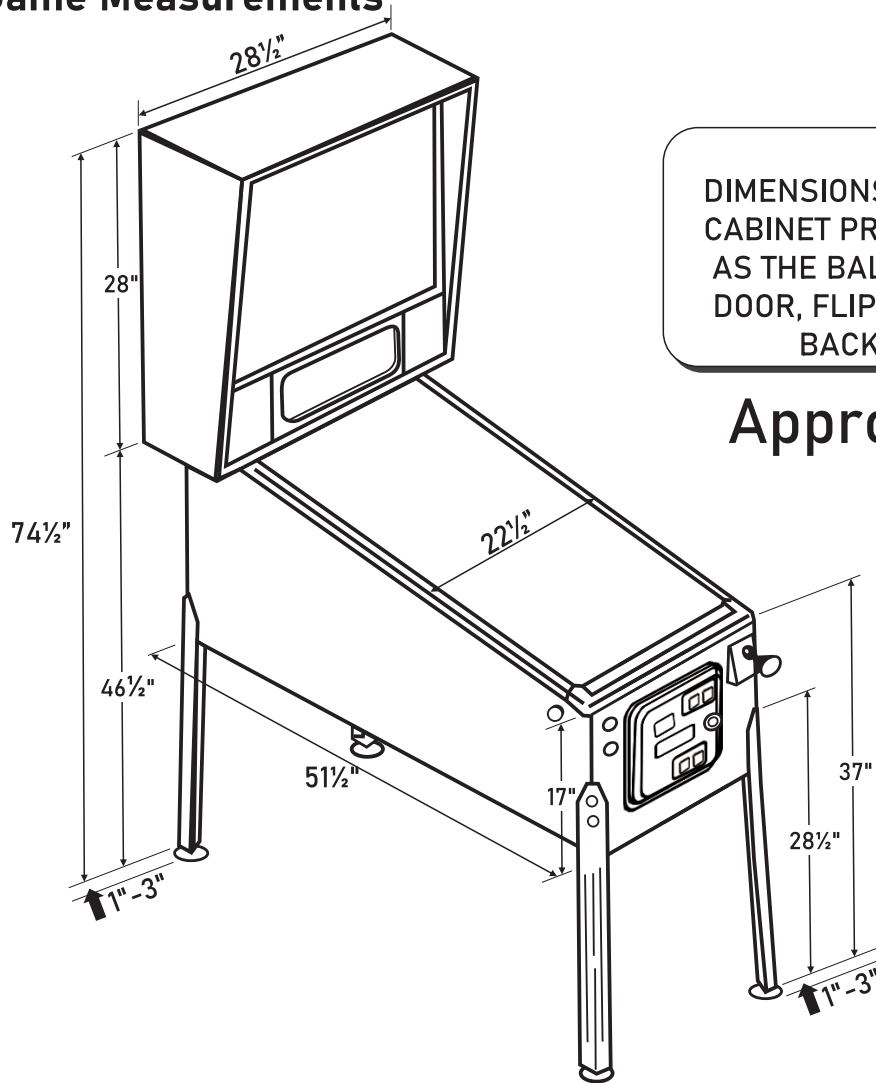


Fig. 10c Moving the playfield into secure position 3  
Lift and insert support rod into cage bracket

## Game Measurements

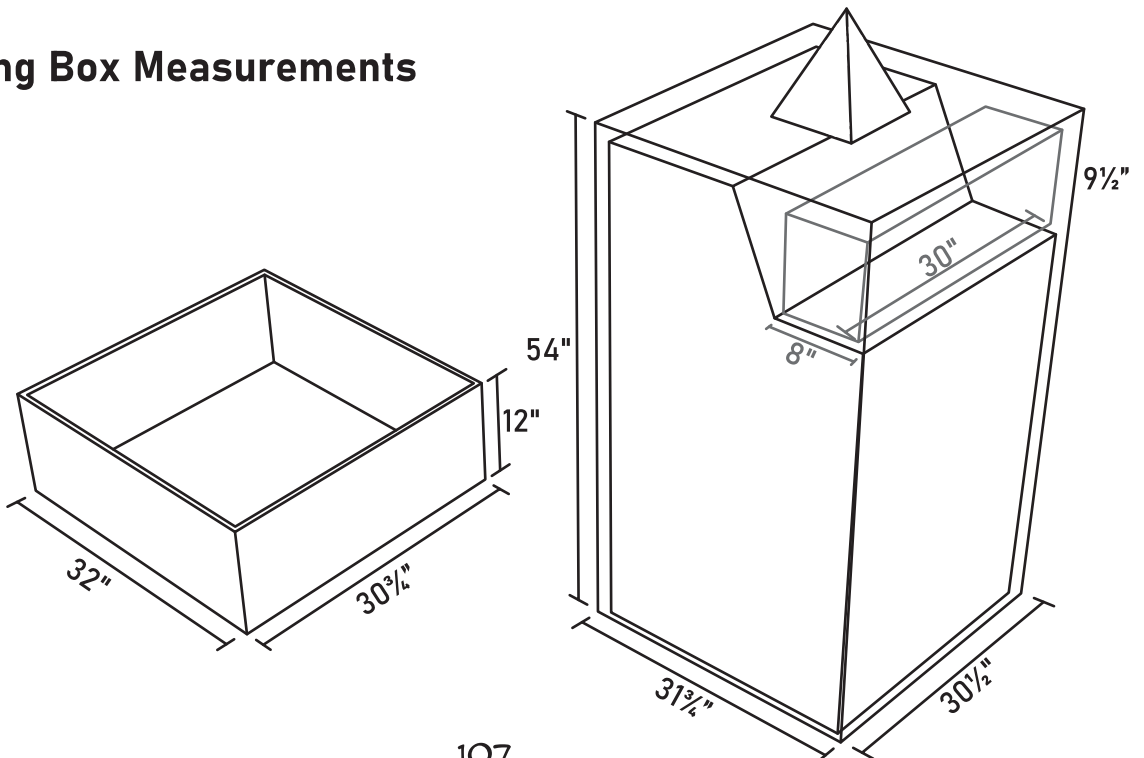


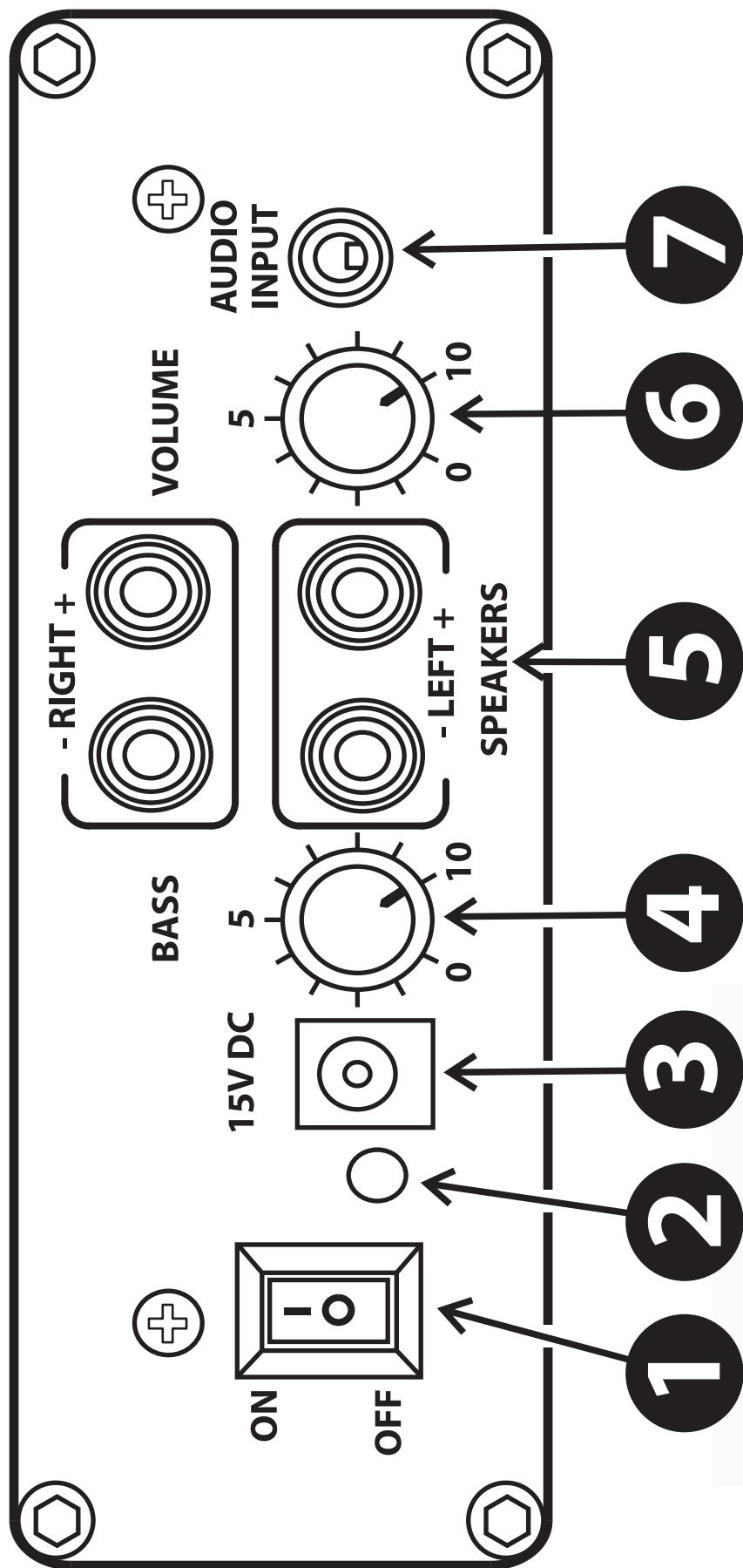
### NOTE:

DIMENSIONS DO NOT INCLUDE CABINET PROTRUSIONS, SUCH AS THE BALL SHOOTER, COIN DOOR, FLIPPER BUTTONS, OR BACKBOX LATCH.

**Approx. 250lbs**

## Shipping Box Measurements





### Controls and Connections



1. Power Switch
2. Led Indicator
3. Power Input
4. Bass Adjustment
5. Binding Posts
6. Volume Control
7. Audio Input

NOTE: Grill is removable, non-see-through cloth