



Game Manual



WARNING!

STOP AND READ – UNPLUGGING BOARD CONNECTORS WHILE THE MACHINE IS POWERED ON CAN, AND MOST LIKELY WILL, DESTROY THE BOARD! THIS IS NOT COVERED UNDER AMERICAN PINBALL'S WARRANTY AND YOU WILL BE RESPONSIBLE FOR ALL ASSOCIATED REPAIR COSTS. NO EXCEPTIONS.

WWW.AMERICAN-PINBALL.COM

PART NUMBER: VHR-DOC0022-00

LIMITED WARRANTY.....

American Pinball Inc. ("Seller") warrants only the original purchaser of its products that the items listed below are free of defects in material & workmanship under normal use and service for the specified warranty period. Warranties are non-transferable.

COVERAGE

The limited warranty covers defective workmanship and materials as follows:

1. All parts of the pinball machine, excluding standard plastic, bumper post, rubber rings and wear & tear parts for **90 days** from the date of invoice or shipment by distributor.
2. The LCD monitor for 1 year from the date of invoice or shipment by distributor.

CONDITIONS

The **original purchaser** must register the Limited Warranty by completing the Product Registration Form on the American Pinball Website within 15 days of receipt:

<https://www.american-pinball.com/support/register/>

In the event that warranty parts or service help is required the game owner must open a **Service Ticket** <https://www.american-pinball.com/support/service/>

www.americanpinball.com/support/service/ or call 1-833-API-HELP.

Service-related questions can be sent via e-mail to service@american-pinball.com.

Defective parts need to be sent to American Pinball at the purchaser's expense, if the defective parts cannot be removed, the entire Pinball Machine will need to be returned to the Distributor for repair or replacement. All parts must be properly packaged with an RMA tag/Service ticket and returned freight prepaid to the Sellers facility.

EXCLUSIONS

The Limited Warranty does not cover service, labor or shipping and handling. Damage, wear and or breakage not caused by defective materials or workmanship shall not be covered by the warranty. Damage incurred during shipping and handling shall not be covered by the warranty.

DISCLAIMER OF IMPLIED WARRANTY

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.

DISCLAIMER OF DAMAGE

This warranty does not apply to any parts damaged due to improper handling or due to improper installation, usage or alteration. In no event shall the Seller be held liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages or any other losses incurred by the customer regarding the purchase of an AMERICAN PINBALL, INC. product.



CAUTIONS, WARNINGS & NOTICES

CAUTION! FOR SAFETY AND RELIABILITY, DO NOT SUBSTITUTE PARTS, EQUIPMENT OR ADD GAME CIRCUITRY MODIFICATIONS. SUCH MODIFICATIONS MAY ADVERSELY AFFECT GAME PLAY OR CAUSE INJURIES AND MAY RESULT IN VOIDING OF THE WARRANTY. ALWAYS TRANSPORT PINBALL GAMES WITH THE HINGED BACKBOX IN THE FOLDED POSITION. CONTACT AUTHORIZED SERVICE PERSONNEL BEFORE PERFORMING ANY REPAIR. ANY SUCH REPAIRS SHOULD BE DONE WITH THE LINE VOLTAGE DISCONNECTED. FOR SERVICING TIPS, REFERENCE THE USER MANUAL OR CONTACT AMERICAN PINBALL INC. TECHNICAL SUPPORT. SUBSTITUTION OF PARTS AND EQUIPMENT MAY VOID FCC TYPE ACCEPTANCE.

WARNING! EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A “CLASS A” COMPUTING DEVICE. PURSUANT TO SUBPART J OF PART 15 OF THE FCC RULES AND REGULATIONS. FCC RULES ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST RF ENERGY WHEN OPERATED IN A COMMERCIAL ENVIRONMENT. OPERATION IN A PRIVATE RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT ITS OWN EXPENSE WOULD BE REQUIRED TO TAKE WHATEVER MEASURES TO CORRECT SUCH INTERFERENCE.

WARNING! OPENING THE COIN DOOR EXPOSES HIGH VOLTAGE PARTS IN THE GAME, AND DIRECT CONTACT TO THESE HIGH VOLTAGE PARTS CAN LEAD TO SERIOUS OR FATAL INJURIES. THIS EQUIPMENT IS TO BE SERVICED BY TRAINED PROFESSIONALS ONLY.



COMPLIANCE, LEGAL AND WARNINGS

Radio Frequency Interference Notice

CABLE HARNESS PLACEMENT AND GROUND STRAP ROUTING have been designed to keep RF radiation and conduction within levels accepted by FCC rules.

DO NOT ALTER WIRING OR GROUND STRAPPING. Position wiring and ground strap back to their original position if they become loose or are removed for service.

LEGAL

Legends of Valhalla and all related characters are trademarks of API, Inc. MAGIC GLASS and this manual are trademarks of American Pinball. Any reproductions or modifications are illegal.

WARNINGS

Only American Pinball authorized parts are to be used. Using ANY unauthorized parts will void all warranties and may cause injury to persons or property.

All servicing of equipment must be completed by competent personnel. Pinball machines are complex and present an electrical shock hazard. Not following these guidelines can be fatal.

DOCUMENT REVISION HISTORY

VHR-DOC0022-00	May 4, 2021	Initial Draft
	Oktober 19, 2021	Production Release
		Final Release of Document

All information in this manual is accurate at time of release and is subject to change without notice. Check <https://www.american-pinball.com/support/> for any and all updates to this manual.

REGIONAL CONTACTS

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General questions

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Service or Warranty requests

Service@americanpinball.com

833-API-HELP

 API Tech Tip Videos

https://www.youtube.com/channel/UC9_k0XRo6lbeyeOuQy4Hseg/videos



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OVERVIEW

ABOUT THE MANUAL

This manual details the integral aspects of the pinball machine.

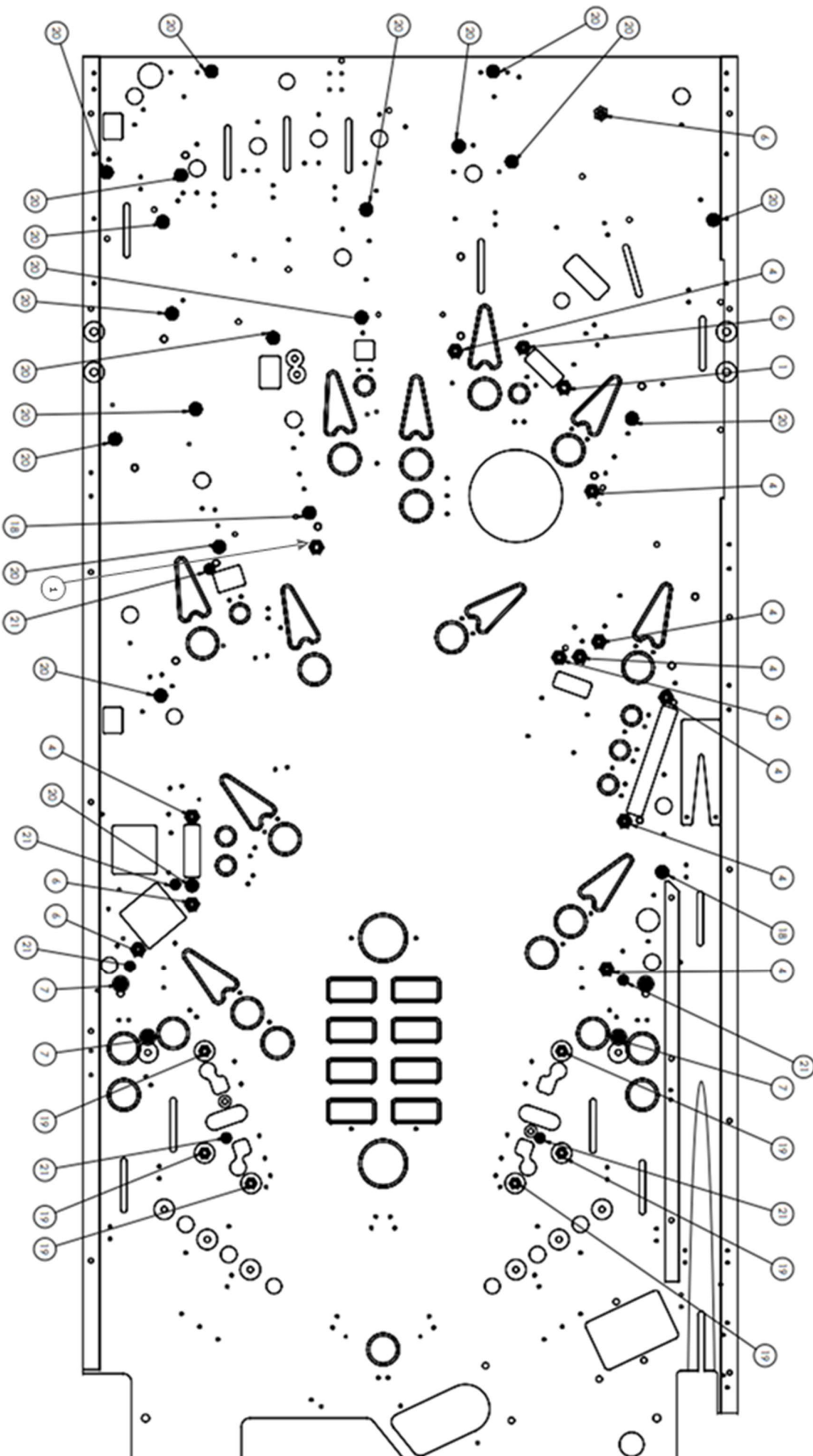
The following chapters are included in this manual.

Chapter	Title
Chapter 1	Overview
Chapter 2	Unpacking Instructions
Chapter 3	API Cockpit / Service Information
Chapter 4	Code Update / Game Logs / USB
Chapter 5	Game Rules

Table 1-1 Commonly used terms in the Service Manual documentation.

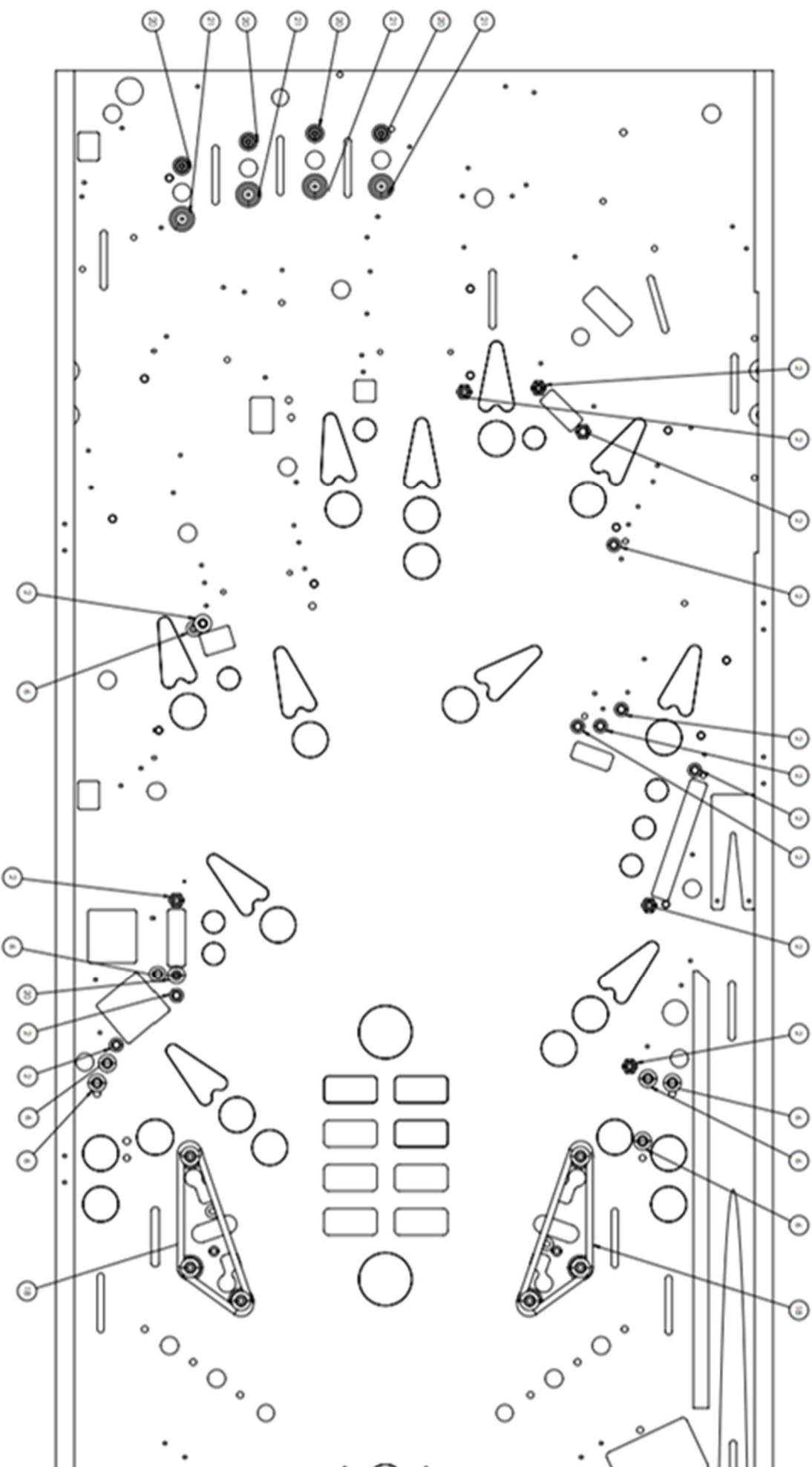
Term	Description
ADJ	Abbreviation for the adjustment menu, when certain settings are adjusted/configured
AUD	Abbreviation for the audit menu, where audits can be run for the machine.
DIAG	Abbreviation for the diagnostic menu, where diagnostics can be run for the machine.
Plumb Bob Tilt	Weighted tilt assembly on the inside left of the cabinet.
P3-ROC Board	Designed to control all the real-time signaling on a pinball machine. Note: The documentation for the P3-ROC Boards is available at American-pinball.com/support
UTIL	Abbreviation for the utility menu, where utilities can be run for the machine.

Figure 1-1 Post Locations



Part#	Item#	Playfield Posts	Quantity
PST0004-00	1	5/16" PLAIN HEX SLEEVE POST - PLAIN	2
PST0004-02	4	5/16" HEX SLEEVE POST W/ 8-32 THREADED TOP	9
PST0004-03	6	5/16" HEX SLEEVE POST W/ 8-32 TAP	4
PST0002-00	7	10-32 MINIPOST FULL THREAD	4
PST0001-00	18	1.06 CLEAR PLAIN POST W/ 8-32 HOLE	20
PST0003-00	19	8-32 POST FASTENING SCREW BUTYRATE MTG	6
PST0003-02	20	8-32 POST FASTENING WOOD SCREW MTG	19
PST0002-02	21	10-32 MINI POST-STEEL WOOD SCREW	5

Figure 1-2 Rubber Ring Location



Part#	Item#	Playfield Rubber Rings	Quantity
RBR0005-01	2	0.26 ID X 0.5 OD x 1.06 POST SLEEVE	14
RBR0003-01	6	7/16" OD MINI-POST RUBBER - BLACK	7
RBR0001-12	18	2-1/2" ID RUBBER RING - BLACK	2
RBR0001-02	20	3/16" ID RUBBER RING - BLACK	5
RBR0001-04	21	5/16" ID RUBBER RING - BLACK	4
RBR0002-01		1-1/2" FLIPPER RUBBER - BLACK	3

UNPACKING INSTRUCTIONS

UNPACKING

In order to fully enjoy your pinball machine in the manner it was designed, please adhere to the following unpacking instructions.

CAUTION! THE GAME WEIGHS IN EXCESS OF 250 LBS. AT LEAST TWO PEOPLE ARE REQUIRED TO UNPACK AND MANEUVER THE MACHINE.

TOOLS REQUIRED FOR UNPACKING

A pair of scissors or a utility knife is all you will need.

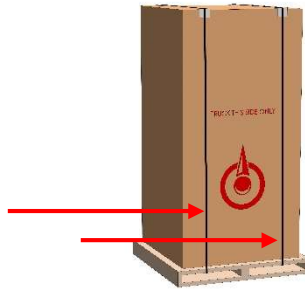
To unpack: Your pinball machine should appear in the following corrugated box.

Figure 2-1 Authorized American Pinball Box.

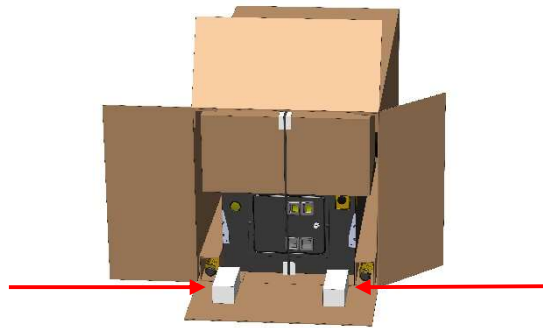


UNPACKING CONTINUED

Using a pair of scissors or utility knife, carefully cut the bands highlighted with the red arrows.

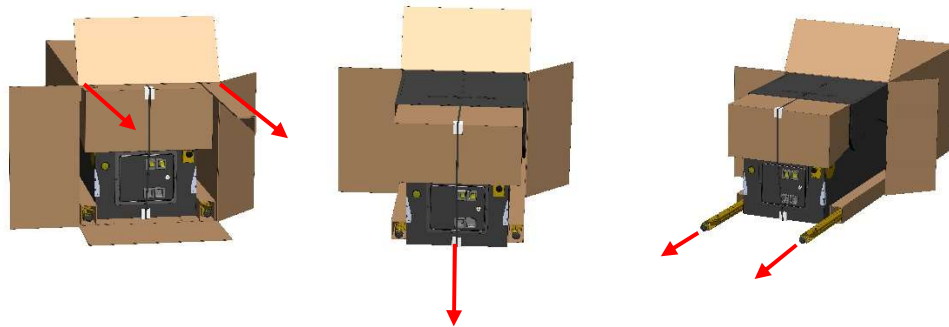


Lay the box down on the “TRUCK THIS SIDE ONLY” side. Remove the 2 pieces of Styrofoam and fold the flap under or cut the whole flap off the box.



Remove the 2 top corner protectors highlighted in the picture (left) and pull out the game by the center strap (center). Next remove the 4 legs from the bottom corner protectors (right).

DO NOT CUT THE CENTER STRAP AROUND THE GAME YET

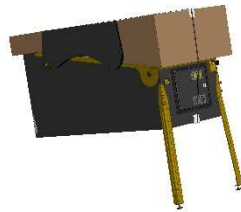


UNPACKING CONTINUED

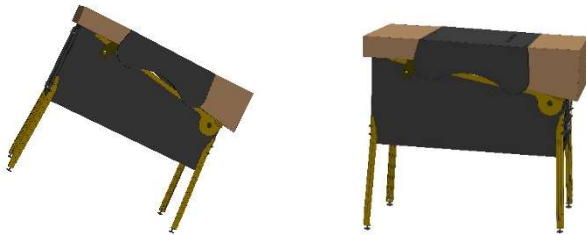
Slide the game completely out of the box (left), and carefully stand the game up (center). Cut the shrink wrap by the front legs and install the legs with the supplied hardware (right).



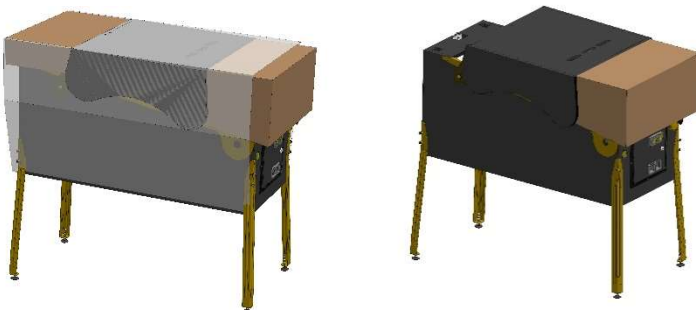
Lay the game down and cut away the shrink wrap covering the rear leg mounting area.



Carefully lift the game up. Install the 2 rear legs with the included hardware. Stand the game up on all 4 legs once rear legs are installed.



Cut and remove the center band, all the stretch wrap as well as the 2 cardboard protectors for the front and back.

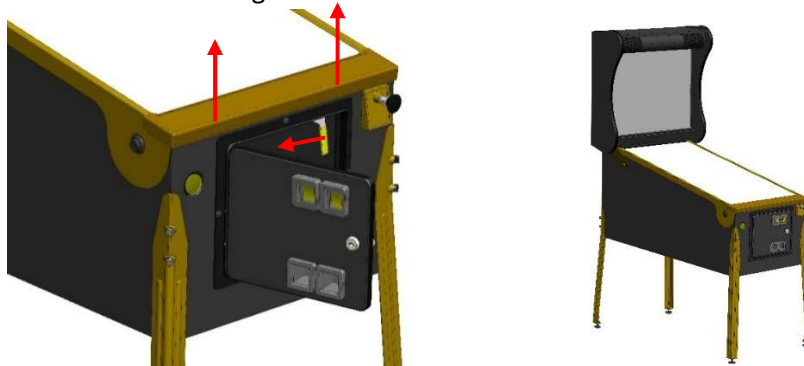


UNPACKING CONTINUED

Lift the head and insert the supplied 5/16" hex wrench into the lock mechanism and turn clockwise to lock.



Remove the keys from the ball shooter rod. One set is for the back box, the other set is for the front coin door. Open the coin door and move the lockbar handle to the left and pull up on the lockbar. Remove the film from the lockbar. Pull the glass off and follow the instructions under the glass.



LEVELING YOUR AMERICAN PINBALL MACHINE

Your game is designed to sit at **6.5 degrees**. However, depending on the floor, you may have to adjust so that the game is properly leveled left to right and or at the proper pitch. With the leg levelers all the way in (no threads showing below the leg) the game will sit approximately at 6 degrees.

Phone Applications for leveling:

iPhone: PinGuy <https://apps.apple.com/de/app/pinguy/id782973821>



 Video showing how to use: <https://www.youtube.com/watch?v=SiM7aMlOCjc>



Android: Pinball Leveler https://play.google.com/store/apps/details?id=com.nottud.pinballleveller&hl=en_US&gl=US



Service Menu

Legends of Valhalla SERVICE MENU

This chapter includes service menu settings. The service menu accesses the following settings for optimal play and maintenance.

- Tests
- Settings
- Statistics
- Utilities
- Health Meter


Before You Begin

- Have you unpacked your pinball machine and set it up according to the instructions in the manual?
- Have you downloaded the most current code from American Pinball's Support site? <https://www.american-pinball.com/support/updates/>

 Video showing how to update the gamecode: https://youtu.be/_n4-7ZSH3UE



- Have you registered your game? <https://www.american-pinball.com/support/register/>
Games must be registered prior to receiving any warranty parts

 Video showing how to register your game: <https://youtu.be/LsoqXcbKzE>



Note: Settings are occasionally updated. Please refer to American Pinball's Support site for the most current documentation.

API COCKPIT

The service menu contains tests for all the electrical and mechanical functions within the game.


 Video showing how to use the service menus: <https://youtu.be/nKcwKNGNhCw>



Figure 3-1 Service Menu



Table 3-1 Service Menu Icons




<p>Tests</p>		<p><u>This includes tests in the following areas</u></p> <ul style="list-style-type: none"> • Switches • Coils • LEDs • Displays
<p>Settings</p>		<p><u>This includes adjustments in the following settings</u></p> <ul style="list-style-type: none"> • Standard Adjustment Settings • Replay Adjustment Settings • Coil Adjustment Settings • Sound Adjustment Settings • Feature Adjustment Settings • Pricing Adjustment Settings • Presets
<p>Statistics</p>		<p><u>This includes audits for the following statistics</u></p> <ul style="list-style-type: none"> • Basic Statistics • Feature Statistics • Standard Statistics • Game Time Statistics • Earning Statistics • Score Breakdown Statistics

Table 3-1

Service Menu Continued


<p>Utilities</p>		<p><u>This includes information for the following utilities</u></p> <ul style="list-style-type: none"> • Clear Balls • Statistic Clear • Date and Time Set • Restoration of Default Settings
<p>Health Meter Green</p>		<p><u>The Health Meter Provides a Quick Analysis of the Overall State of The Game</u></p> <p>Game has no issues</p>
<p>Health Meter Yellow</p>		<p>Game may have switch issues. If the game hasn't seen a switch hit in 30 games, it will call attention to it. Go to TESTS – SWITCH TEST</p>
<p>Health Meter Red</p>		<p>Game may have missing balls</p>

TESTS

The test menu includes several diagnostic tests for assuring that your machine is operating properly. The Test Menu provides tests for the following items.

- Switches
- Coils
- LEDs
- Display

Table 3-2 Test Menu Icons

Switches	
Coils	
LEDs	
Display	

To Access the Test Menu

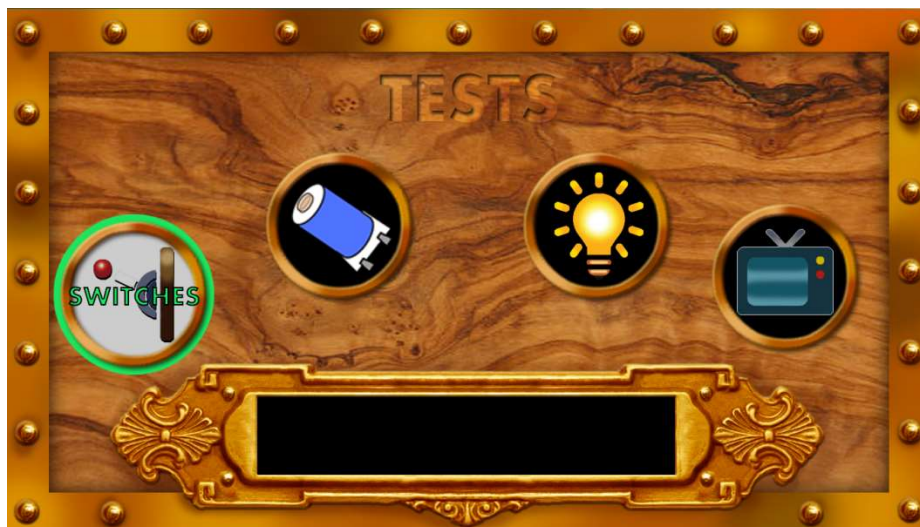
1. Power on the machine
2. Open the coin door
3. Press the black MENU SELECT button to access the service mode

Figure 3-2 Service Menu Navigation Buttons



4. Press the red +/- buttons to move to icons and menu selections.
5. Press the MENU/SELECT button to enter or test the selection

Figure 3-3 Test Menu



6. Use either the flipper buttons or the red +/- coin door buttons to navigate the tests.

Table 3-3 API Cockpit Navigation

API Cockpit Button	Flipper Button Equivalent	Functionality
Green	Press right and left flipper button simultaneously	<ul style="list-style-type: none"> • Back one level • Exit
Red (+)	Right flipper	<ul style="list-style-type: none"> • Increases through menu by one • Advance to the right or down
Red (-)	Left flipper	<ul style="list-style-type: none"> • Decrease through menu by one • Advance to the left or up
Black	Start	<ul style="list-style-type: none"> • Menu Enter • Select current choice

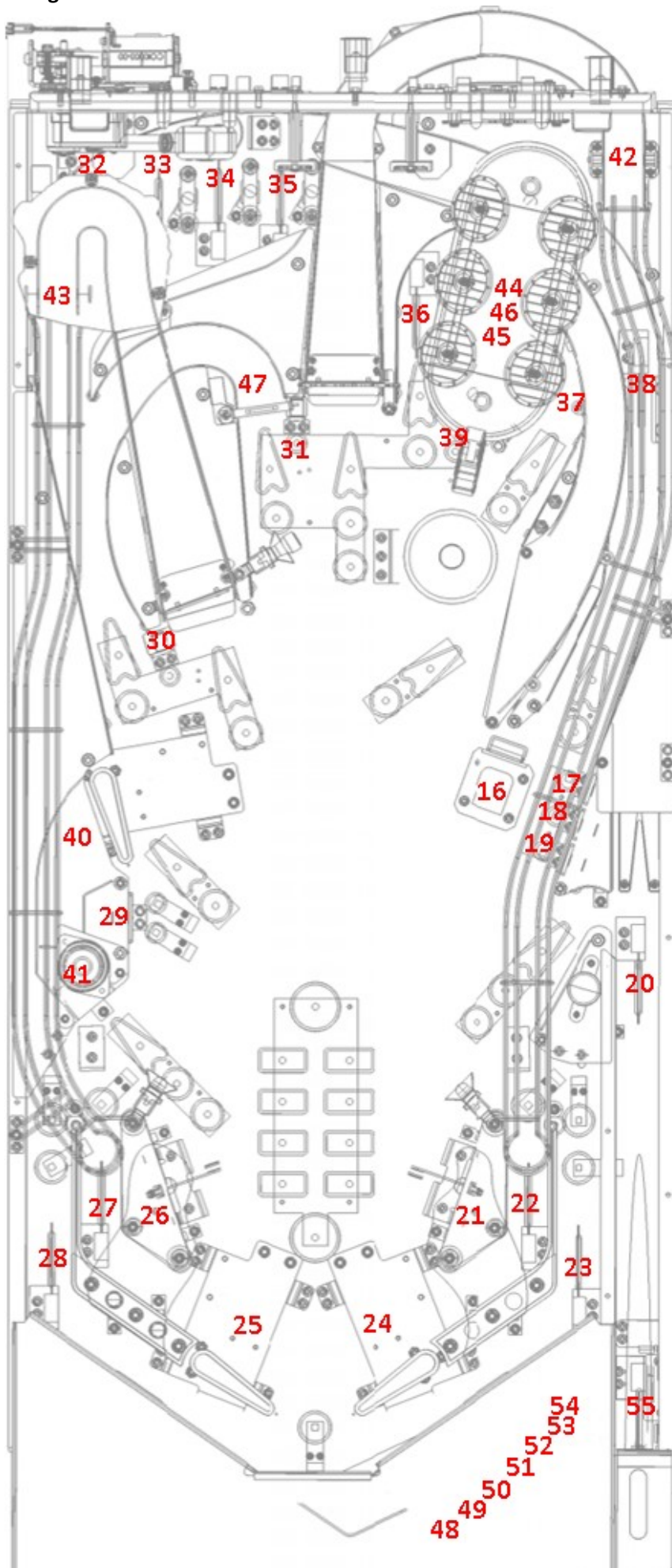
SWITCH TESTING

The Switch Test screen shows all the switches, grouped by their boards, there are 16 individual switches per board and are displayed in columns. That means all the switches in one column are all on the same switch board. Each switch board has 2 groups of 8 switches and each group of 8 switches will all share the same primary wire color. Opto switches do not share a primary wire color. All contact switches (micro, standup and rollover) will have a brown background when open. The background color will change to bright green when made. Opto switches will be dark green when they are open, and the background will change to bright green when detecting a ball. A switch with a red background indicates a switch that has not been made in a while and should be checked to ensure it is working properly.

Figure 3-4 Switch Testing Menu

SWITCH TESTING				
Trough 1	Blood Target	Target Light	Unused	Board: 4 Slot: 0
Trough 2	Left Ramp Standup	Target Ship	Unused	Board: 4 Slot: 1
Trough 3	Spinner	Target Locks	Exit	Board: 4 Slot: 2
Trough 4	Center Ramp Standup	Drop Target	Down	Board: 4 Slot: 3
Trough 5	Under Ship Standup	Right Ramp Enter	Up	Board: 4 Slot: 4
Trough 6	Upper Loop Right	Ship Lock 1	Enter	Board: 4 Slot: 5
Trough Eject	Upper Loop Left	Ship Lock 2	Slam Tilt	Board: 4 Slot: 6
Shooter Lane	Center Ramp Enter	Coin 1	Unused	Board: 4 Slot: 7
Left Outlane	Left Orbit	Coin 2	Right Flipper	Board: 4 Slot: 8
Left Return Lane	Left Ramp Enter	Coin 3	Left Flipper	Board: 4 Slot: 9
Right Return Lane	AX(E)	Coin 4	Start Button	Board: 4 Slot: 10
Right Outlane	A(X)E	Coin 5	Tilt	Board: 4 Slot: 11
Left Slingshot	(A)XE	Coin 6	Middle Flipper	Board: 4 Slot: 12
Right Slingshot	Unused	Unused	Action Button	Board: 4 Slot: 13
Scoop	Right Orbit	Unused	EOS L NA	Board: 4 Slot: 14
VUK Subway	Right Shooter Lane	Unused	EOS R NA	Board: 4 Slot: 15

Figure 3-5 PLAYFIELD SWITCH MAP



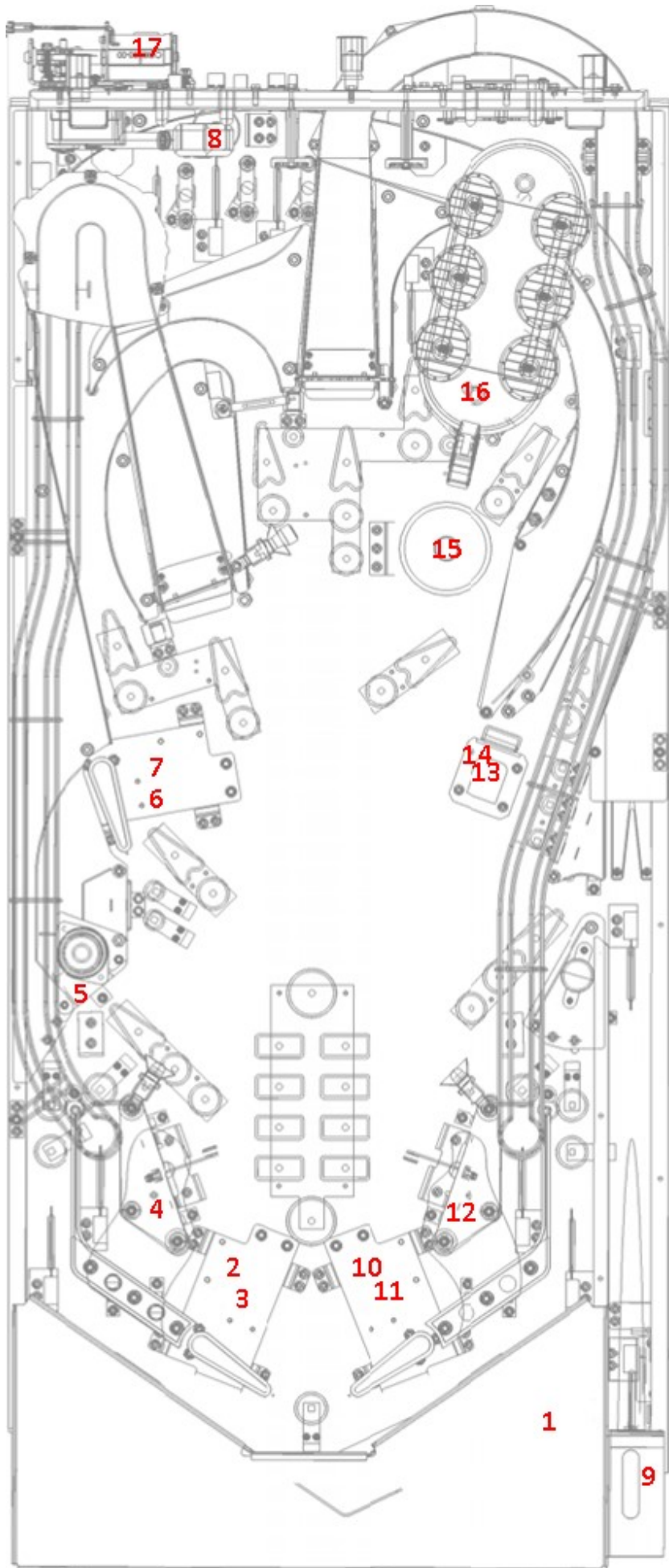
0	Left Flipper Button	32	Left Orbit
1	Right Flipper Button	33	(A)x(e)
2	Action Button	34	a(X)e
3	Enter	35	ax(E)
4	Exit	36	Upper Loop Left
5	Down	37	Upper Loop Right
6	UP	38	Right Orbit
7	Tilt	39	Ship Standup
8	Start Button	40	Subway
9	Interlock/Door open	41	Scoop
10	Coin #1	42	Center Ramp Enter
11	Coin #2	43	Left Ramp Entry
12	Dollar Bill Acceptor	44	Right Ramp Enter
13	Coin #4	45	Ship Lock 1
14	Coin #5	46	Ship lock 2
15	Left Upper Flipper	47	Spinner

16	Drop Target	48	Ball Through 1
17	Target "Light"	49	Ball Through 2
18	Target "ship"	50	Ball Through 3
19	Target "locks"	51	Ball Through 4
20	Right shooter Lane	52	Ball Through 5
21	Right slingshot	53	Ball Through 6
22	Right inlane	54	Ball Through Jam
23	Right outlane	55	Shooter Lane

24	Right Flipper EOS
25	Left Flipper EOS
26	Left Slingshot
27	Left Return Lane
28	Left Outlane
29	Blood Rage Target
30	Left Ramp Standup
31	Center Ramp Standup

Figure 3-6

PLAYFIELD COIL MAP



1	Trough Kick
2	Left Flipper Main
3	Left Flipper Hold
4	Left Slingshot
5	Scoop
6	Upper Flipper Main
7	Upper Flipper Hold
8	Upper Magnet
9	Auto Plunger
10	Right Flipper Main
11	Right Flipper Hold
12	Right Slingshot
13	Drop Target
14	Drop Target Trip
15	Ship Magnet
16	Ship Post
17	Thor's Hammer

Table 3-4 Fuse Table

Fuse Name	Fuse Rating	Voltage	Type	Fuse Voltage
Coil Driver	6.3 Amp	48 VDC	5x20 Slow Blow	250 Volt
	6.3 Amp	48 VDC	5x20 Slow Blow	250 Volt
Main Fuse	6 Amp (US) 3 Amp (EU)	120 VAC OR 230 VAC	3AG Slow Blow	250 Volt
Add On Board F1	4 Amp	12 VDC	5x20 Slow Blow	250 Volt
Add On Board F2	5 Amp	48 VDC	5x20 Slow Blow	250 Volt
RGB/Flasher - PCB00053	4 Amp	5/12VDC	5x20 Slow Blow	250 Volt
RGB - PCB00040-01	4 Amp	5 VDC	5x20 Slow Blow	250 Volt

COIL TESTING

To test the coils, you must pull out on the High-Power Interlock switch, just inside the coin door – bottom left – White Knob. While in TESTS - Coil TEST, highlight the coil you want to test, then press the black enter button on the coin door or Start button on the cabinet.

Note: The power is a momentary pulse, not the full strength you would experience in gameplay.

Flipper hold - you need to hold the flipper bat up with one hand and tap the test button rapidly.

Shaker motor – tap the test button rapidly.

Magnet – hold a ball next to the magnet and hit the test button.

LED TESTING

When first entering LED Test, all LED's flash on the playfield, rotating through red, green, blue and white.

You also can walk through the LED's one-by-one. LED testing is designed to follow the playfield in a logical sequence.

DISPLAY & SOUND TEST

The main display proceeds through a series of colors (red, green and blue) and a test pattern. The test also exercises the stereo speaker system at the same time.

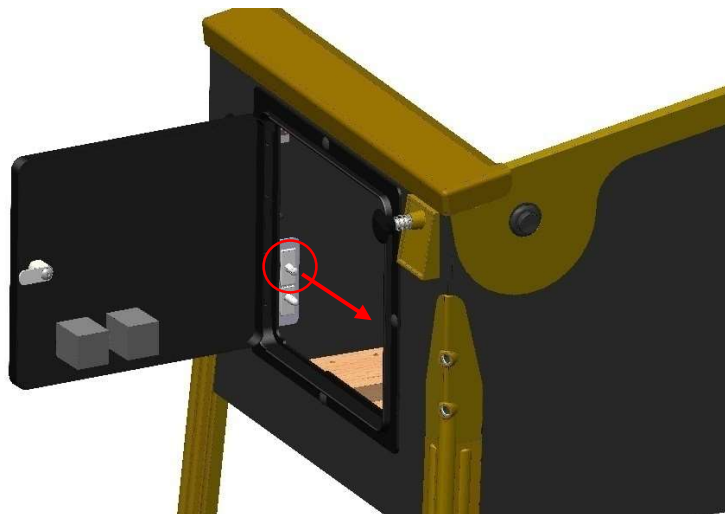
COIL INTERLOCK SWITCH

ATTENTION....

THIS GAME IS EQUIPPED WITH AN INTERLOCK SWITCH FOR THE COIL VOLTAGE.

THE INTERLOCK SWITCH DISABLES THE COIL VOLTAGE WHEN THE DOOR IS OPEN.

INTERLOCK SWITCH NEEDS TO BE PULLED OUT TO ENGAGE COIL VOLTAGE WHEN DOOR IS OPEN FOR COILS TO WORK.



COIL ADJUSTMENT SETTINGS

Coil settings allow you to control the “strength” of the various mechanisms on the playfield.

To access Coil settings



1. Power on the machine.
2. Open the coin door
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to select the settings icon.
5. Press the MENU SELECT button to enter the settings section.
6. Use the red +/- buttons to page through the different settings to the coil settings.
7. Press the green BACK EXIT button to return to the previous menu.

COIL SETUP

Individual coil strength can be adjusted to enhance game play to your preference.

CAUTION! *Increasing coil strength can create undesirable results such as broken plastics as well as expedited playfield wear. Increased coil strength wear and tear is not covered under our warranty. Keep coil strength as low as possible.*

Table 3-5 Coil Adjustment Settings

Note: all default settings are highlighted **green**. They turn white when changed.

Coils:

Berzerker Drop Target	options: [5-30]	default: 10
Left Slingshot	options: [1-35]	default: 12
Right Slingshot	options: [1-35]	default: 12
Auto Fire	options: [1-35]	default: 15
LWR L Flipper Main	options: [1-46]	default: 34
LWR R Flipper Main	options: [1-46]	default: 34
Mid Flipper	options: [1-46]	default: 26
Scoop	options: [5-25]	default: 10
Trough Kicker	options: [1-46]	default: 18

FEATURE ADJUSTMENT SETTINGS

Feature settings address conditions that are specific to the game.

To access Feature settings



1. Power on the machine.
2. Open the coin door
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to select the settings icon.
5. Press the MENU SELECT button to enter the settings section.
6. Use the red +/- buttons to page through the different settings to the feature settings.
7. Press the green BACK EXIT button to return to the previous menu.

Table 3-6 Feature Adjustment Settings

Note: all default settings are highlighted **green**. They will turn white when changed.

Features:

Ball Save Timer		default 12
Color GI		default ENABLED
Combos Fire Thor's Hammer		default ENABLED
Extended Light Shows		default DISABLED
Knocker Usage		Credit/Match
Physical Ball Locks		default ENABLED
Playtime Handicap	options: [0-251]	default DISABLED
Pulse Kraken Magnet at Ship Exit	options: [25-125]	default DISABLED
R-A-I-D-Completions to start RAID	options: [20-61]	default: 20

COIN DOOR AND DOLLAR BILL ACCEPTOR INFORMATION

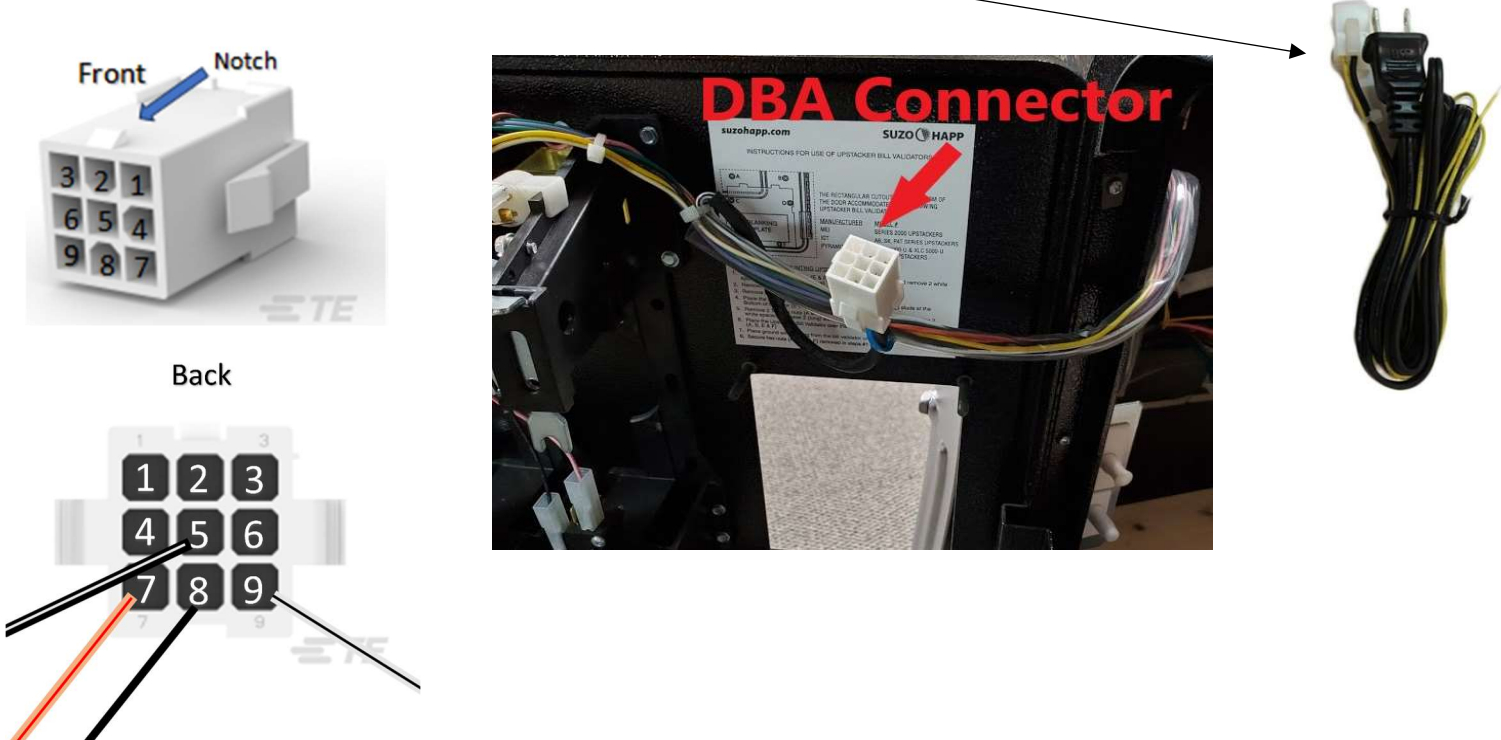
Dollar Bill Acceptor (DBA)

Any standard up stacker DBA with a bill cassette of 500 or less, operating at 12 Volts DC can be used.

Description	Part number
US Coin Door	PUR0001-00
European Coin Door (*not included w/ door)	PUR0007-00
*European Coin Door Cable	WCA0036-00
*European Interface Board	PCB0024-00


Coin door lights are **12 volts**

Note: you can make a 120v bill acceptor work by getting an MEI 01-12-139 converter plug and tapping into a coin switch.




Wire Color	Pin Location
Black wire w/ white stripe = 12v DC HOT (power)	Pin 5
Pink wire w/ red stripe = Credit Relay Pulse/N.O.	Pin 7
Black wire = Credit Relay (Common)	Pin 8
White wire w/ black stripe = 12v DC Return (Ground)	Pin 9

Coin door receptacle

Male 0.062" Molex pins = 02-06-2103 

Receptacle = 172161-1 Mate-N-Loc

DBA Mating plug

Female 0.062" Molex pins = 02-06-1103 

Plug = 172169-1 Mate-N-Lock



PRICING ADJUSTMENT SETTINGS

Pricing adjustment settings address settings related to game unit value, free play and currency management.

Pricing establishes the game unit of value, which should be the lowest denomination of currency based on coin door configuration.

To access Pricing settings



1. Power on the machine.
2. Open the coin door.
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to select the setting icon.
5. Press the MENU SELECT button to enter the setting selection.
6. Use the flipper buttons to page through the different settings to the pricing settings.
7. Press the green BACK EXIT button to return to the previous menu.

The **“Unit Value”** must be set to the lowest denomination that the game will accept.

Table 3-7 Price Table

Desired Coinage	Set “Pricing Plan”
25 cents per game	1 unit = 1 credit
25 cents per game or 2 games for 75 cents	1 unit for 1 credit, 2 for 3
50 cents per game	2 units for 1 credit
50 cents per game or 5 games for 2 dollars	2 units for 1 credit, 4 for 3
50 cents per game or 5 games for 3 dollars	2 units for 1 credit, 5 for 3
50 cents per game or 5 games for 2 dollars	2 units for 1 credit, 8 for 5
75 cents per game or 3 games for 2 dollars	3 units for 1 credit, 8 for 3
75 cents per game	3 units for 1 credit
1 dollar per game (default setting)	4 units for 1 credit
1 dollar per game or 3 games for 2 dollars	4 units for 1 credit, 8 for 3
1 swipe per game	1 swipe for 1 credit
Overseas Options	Set “Pricing Plan”
	10 units for 1 credit
	15 units for 1 credit
	20 units for 1 credit
	10 units for 1 credit, 20 for 3
	10 units for 1 credit, 40 for 5

Table 3-8 Pricing Adjustment Settings

Pricing:

Free Play	options: ['On','Off']	default: 'Off'
Unit Value	options: [.1, .2, .25, .5, 1]	default: .25
Pricing Plan	options: 1 Unit = 1 Credit 2 Units for 1 Credit 3 Units for 1 Credit 4 Units for 1 Credit 2 Units for 1 Credit, 4 for 3 2 Units for 1 Credit, 8 for 5	
	4 Units for 1 Credit, 8 for 3 1 Unit for 1 Credit, 2 for 3 10 Units for 1 Credit 10 Units for 1 Credit, 20 for 3 10 Units for 1 Credit, 40 for 5	default: '4 Units for 1 Credit'
	15 Units for 1 Credit 20 Units for 1 Credit 2 Units for 1 Credit, 5 for 3 4 Units for 1 Credit, 20 for 6 1 Swipe for 1 Credit	
Currency	options: ['Dollar', 'Euro', 'Pound', 'Kroner']	default: 'Dollar'
Coin Slot 1 Units	options: [1-21]	default: 1
Coin Slot 2 Units	options: [1-21]	default: 1
Bill Changer	options: [1-21]	default: 1
Coin Slot 4 Units	options: [1-21]	default: 1
Coin Slot 5 Units	options: [1-21]	default: 1
Credits	options: [0-99]	default: 0
Max Service Credits	options: [0-99]	default: 30

REPLAY ADJUSTMENT SETTINGS

To access Replay Settings



1. Power on the machine.
2. Open the coin door.
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to select the settings icon.
5. Press the MENU SELECT button to enter the settings section.
6. Use the red +/- buttons to page through the different settings to the replay setting.
7. Press the green BACK EXIT button to return to the previous menu.

Table 3-9 **Replay Adjustment Settings**

Name	Description	Value
Automatic Replay Percentaging	Whether the game software should periodically adjust Replay Award Level 1 to maintain replays at the frequency specified by Replay Percentage. Requires "Replay Levels" to be set to 1.	Options: On/Off Default: On
Replay Award Level 1	Specifies the point total required to receive an award that is defined in Replay Award Type	Options: 20M-250M Increments: 10M Default: 20M
Replay Award Level 2	Specifies the point total required to receive an award that is defined in Replay Award Type	Options: 20M-250M Increments: 10M Default: 100M
Replay Award Level 3	Specifies the point total required to receive an award that is defined in Replay Award Type	Options: 20M-250M Increments: 10M Default: 150M
Replay Award Level 4	Specifies the point total required to receive an award that is defined in Replay Award Type	Options: 20M-250M Increments: 10M Default: 250M
Replay Type	Specifies the type of replay awarded to the player.	Options: Free Game, Extra Ball, Points, Off Default: Free Game
Replay Levels	Specifies how many replay levels are active	Options: 1-5 Default: 1
Replay Boost	Specifies the amount of points that each replay value will be increased. After each game in which a replay is earned, all replay levels are increased by the defined replay boost amount. For any game in which a replay was not won, the amount is reduced by the boost amount. For example, if three games in a row earn a replay, each replay amount is set to the original value + (3* boost value). If on the next game the replay is not earned, it drops to original value+ (2* boost value).	Options: 1M, 50M Increments: 1M Default: 5M

SOUND ADJUSTMENT SETTINGS

Sound settings allow you to control the volume level in the game.

To access Sound Settings



1. Power on the machine.
2. Open the coin door.
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to select the settings icon.
5. Press the MENU SELECT button to enter the settings section
6. Use the flipper buttons to page through the different settings to the sound setting.
7. Press the green BACK EXIT button to return to the previous menu.

Table 3-10 Sound Adjustment Settings

Name	Description	Value
Initial Volume	Specifies the initial volume	Options: 1 to 11 Default: 6
Music volume offset		Options: -0.4 to +0.4 Default: 0.4

Amplifier settings

The amplifier is located within the backbox and should not need adjustment.

Reference Settings:

Sub volume = 3/4 clockwise turn

Cross Over = Full clockwise turn

Treble = +8


Bass = +8

Volume = 6



HOW TO CREATE A CUSTOM MESSAGE



 Video showing how to create a custom message for the attract screen: <https://youtu.be/8fpDKsQIHA4>

1. Create a PNG image, 1366x768 with whatever you want on it.
Name the file *custom_message* and put that file on a USB stick (with no game code) see the section “Code Update” for information on how to format your USB stick to FAT 32.
2. go into Settings->Standard and set ‘Custom Message’ to ‘On’.
3. Insert the USB stick into the USB extension cable inside the coin door on the right side, after several seconds you will get a screen with green type that says, ‘audits copied . . .’ power cycle game.
4. After you power cycle, use the flipper buttons to cycle through the screens to see the message.
5. If the image didn’t take and all of the above steps have been followed, try step 3 again.

STANDARD ADJUSTMENTS SETTINGS

Standard adjustments address global options, such as the number of balls per game, tilt settings and replay award settings.

To access Standard Adjustment Settings



1. Power on the machine.
2. Open the coin door.
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to select the settings icon.
5. Press the MENU SELECT button to enter the settings section.
6. Use the red +/- buttons to page through the different settings to the standard adjustment.
7. Press the green BACK EXIT button to return to the previous menu.

Table 3-11 Standard Adjustments

Attract Mode Music	options: ['On','Off']	default: 'On'
Attract Mode Sounds	options: ['On','Off']	default: 'Off'
Balls Per Game	options: [1-6]	default: 3
Color Display X Offset	Offset for X axis	default 0
Color Display Y Offset	Offset for Y axis	default -70
Custom Message	options: ['On','Off']	default: 'Off'
Debug	Developer tool	default 10
Game Restart	Holding start button for 5 seconds after ball 1	default True
Inactive Switch Warning		default 5

PRESETS

The Preset feature allows you to load a profile setting. There are 8 presets available.

Note: Presets are subject to change. Refer to American Pinball's Support page for the most current listings of Presets.

To access Presets



1. Power on the machine.
2. Open the coin door.
3. Press the MENU SELECT button to access the service mode.
4. Press the red +/- button to access the settings icon.
5. Press the MENU SELECT button to enter settings selection.
6. Use the flipper buttons to page through the different settings to the preset settings.
7. Press the green BACK EXIT button to return to the previous menu.

Table 3-12 Presets

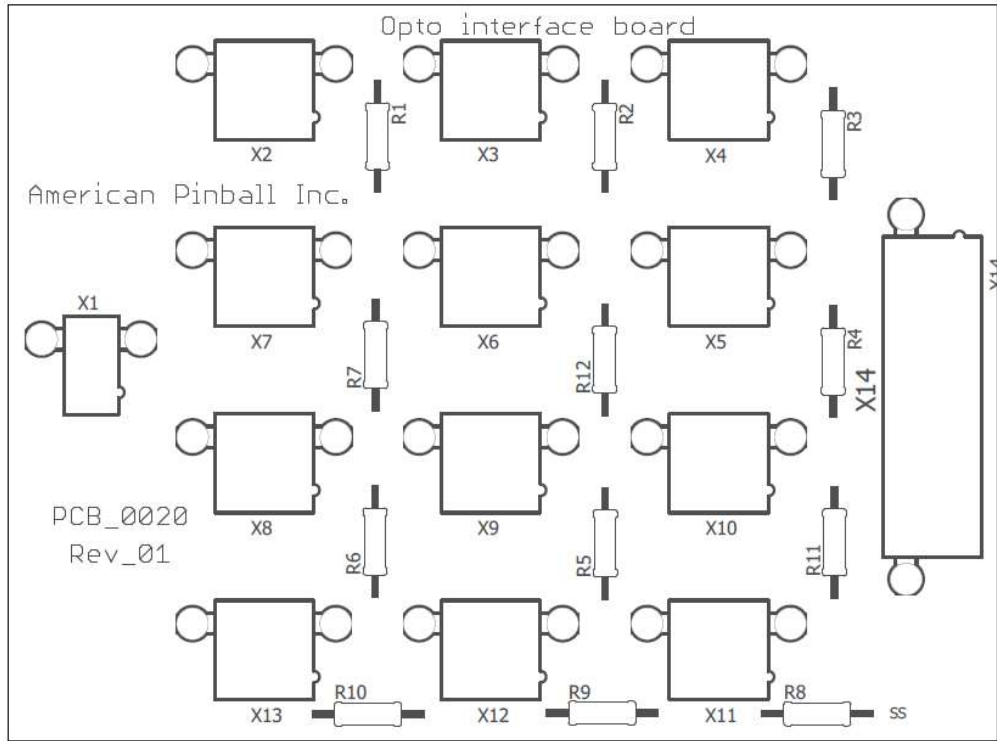
	Preset: Extra Easy	Preset: Extra	Preset: Easy	Preset: Medium	Preset: Hard	Preset: Competition	Preset: Home	Preset: Location
STANDARD								
Attract Mode Sounds	On	On	On	On	On	On	On	On
Attract Mode Music	Off	Off	Off	Off	Off	Off	Off	Off
Tile Warnings	2	2	2	2	2	2	2	2
Game Restart	True	True	True	True	False	False	True	False
Balls Per Game	3	3	3	3	3	3	3	3
Maximum Extra Balls	2	2	2	2	2	2	2	2
Max Initials Length	3	3	3	3	3	3	3	3
PRICING								
Free Play	On	On	On	On	On	On	On	Off
FEATURES								
Combos Fire Thor's Hammer	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Physical Ball Locks	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
Playtime Handicap	Enabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Pulse Kraken Magnet	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
RAID Completions start RAID	15	15	15	25	25	20	20	20
Shield of gods escapes to start RAGE (cont)	2	2	2	8	8	4	4	4
Viking Cheering	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Ball Save	20	20	20	0	0		12	12
Color GI	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
REPLAY								
Replays	Enabled		Disabled	Disabled	Disabled	Disabled	Enabled	Enabled
Replay Award Type	Extra Ball	Extra Ball	Extra Ball	Replay	Off	Off	Extra Ball	Replay
Replay Type	Fixed	Fixed	Fixed	Incremental		Off	Fixed	Incremental
Replay Levels	1	1	1	1		0	1	1

Table 3-13 Switch Table

Cabinet Switch Board 0- PCB0021-02																
J9 Add-On Board	Return 1 Pin 2	Return 2 Pin 3	Return 3 Pin 4	Return 4 Pin 5	Return 5 Pin 6	Return 6 Pin 7	Return 7 Pin 8	Return 8 Pin 9								
Ground	WHT Leaf 0	BLK 0	WHT Leaf 1	BRN 1	WHT Leaf 2	RED 2	WHT Push 3	ORG 3	WHT Push 4	YEL 4	WHT Push 5	GRN 5	WHT Push 6	BLU 6	WHT N/A 7	VIO 7
BLK-pin 10	Left Flipper button		Right Flipper button		Action Button		Enter		Exit		Down		Up		Tilt	
J8 Add-On Board	Return 1 Pin 2	Return 2 Pin 3	Return 3 Pin 4	Return 4 Pin 5	Return 5 Pin 6	Return 6 Pin 7	Return 7 Pin 8	Return 8 Pin 9								
Ground	GRY Push 8	BLK 8	GRY Push 9	BRN 9	GRY Micro 10	RED 10	GRY Micro 11	ORG 11	GRY Opto 12	YEL 12	GRY Opto 13	GRN 13	GRY Leaf 14	BLU 14	GRY Leaf 15	VIO 15
BLK-pin 10	Start Button		Interlock/Dooropen		Coin #1		Coin #2		Dollar Bill Acceptor		Coin #4		Coin #5		Left Upper flipper	
SW-16 Board 1 - Dipswitch 1 ON																
J2 Bank A	Return 1 Pin 2	Return 2 Pin 3	Return 3 Pin 4	Return 4 Pin 5	Return 5 Pin 6	Return 6 Pin 7	Return 7 Pin 8	Return 8 Pin 9								
Ground	ORG Micro 16	BLK 16	ORG S/U 17	BRN 17	ORG S/U 18	RED 18	ORG S/U 19	GRY 19	ORG Micro 20	YEL 20	ORG Leaf 21	GRN 21	ORG Micro 22	BLU 22	ORG Micro 23	VIO 23
BLK-pin 10	Drop Target		target Light		target ship		target locks		right shooter lane		right slingshot		right in lane		right outlane	
J6 Bank B	Return 1 Pin 2	Return 2 Pin 3	Return 3 Pin 4	Return 4 Pin 5	Return 5 Pin 6	Return 6 Pin 7	Return 7 Pin 8	Return 8 Pin 9								
Ground	VIO leaf 24	BLK 24	VIO leaf 25	BRN 25	VIO leaf 26	RED 26	VIO Micro 27	ORG 27	VIO Micro 28	YEL 28	VIO S/U 29	GRN 29	VIO S/U 30	BLU 30	VIO S/U 31	GRY 31
BLK-pin 10	Right flipper EOS		Left flipper EOS		Le ft Slingshot		Left Return Lane		Left Outlane		Blood Rage Target		Left Ramp Standup		Cntr Ramp Standup	
SW-16Board 2- Dipswitch 2 ON																
J2 Bank A	Return 1 Pin 2	Return 2 Pin 3	Return 3 Pin 4	Return 4 Pin 5	Return 5 Pin 6	Return 6 Pin 7	Return 7 Pin 8	Return 8 Pin 9								
Ground	GRN Micro 32	BLK 32	GRN Micro 33	BRN 33	GRN Micro 34	RED 34	GRN Micro 35	ORG 35	GRN Micro 36	YEL 36	GRN Micro 37	GRY 37	GRN Micro 38	BLU 38	GRN S/U 39	VIO 39
BLK-pin 10	Left Orbit		(A)xe		a(X)e		ax(E)		Upper loop left		Upper loop Right		Right Orbit		Ship Standup	
J6-Bank A X14-opto	Return 1 Pin2 on SW-16 Pin3-Plug-X2 opto	Return 2 Pin3 on SW-16 Pin4-Plug-X3 opto	Return 3 Pin4 on SW-16 Pin5-Plug-X4 opto	Return 4 Pin5 on SW-16 Pin6-Plug-X5 opto	Return 5 Pin6 on SW-16 Pin7-Plug-X6 opto	Return 6 Pin7 on SW-16 Pin8-Plug-X7 opto	Return 7 Pin8 on SW-16 Pin9-Plug-X8 opto	Return 8 Pin9 on SW-16								
Ground	YEL Opto 40	BLK 40	YEL Opto 41	BRN 41	YEL Opto 42	RED 42	YEL Opto 43	ORG 43	YEL Opto 44	GRY 44	YEL Opto 45	GRN 45	YEL Opto 46	BLU 46	YEL Micro 47	VIO 47
BLK-pin 10 Pin1 -opto	Subway		Scoop		Center Ramp Enter		Left Ramp Entry		Right Ramp Enter		Ship Lock 1		Ship Lock 2		Spinner	
SW-16 Board 3 - Dip switch 1,2 ON																
J2 Bank A	Return 1 Pin 2	Return 2 Pin 3	Return 3 Pin 4	Return 4 Pin 5	Return 5 Pin 6	Return 6 Pin 7	Return 7 Pin 8	Return 8 Pin 9								
Ground	BLU Opto 48	BLK 48	BLU Opto 49	BRN 49	BLU Opto 50	RED 50	BLU Opto 51	ORG 51	BLU Opto 52	YEL 52	BLU Opto 53	GRN 53	BLU Opto 54	GRY 54	BLU Micro 55	VIO 55
BLK-pin 10	Ball Trough 1		Ball Trough 2		Ball Trough 3		Ball Trough 4		Ball Trough 5		Ball Trough 6		Ball Trough Jam		Shooter Lane	

Fig 3-7

Opto Board Connectors

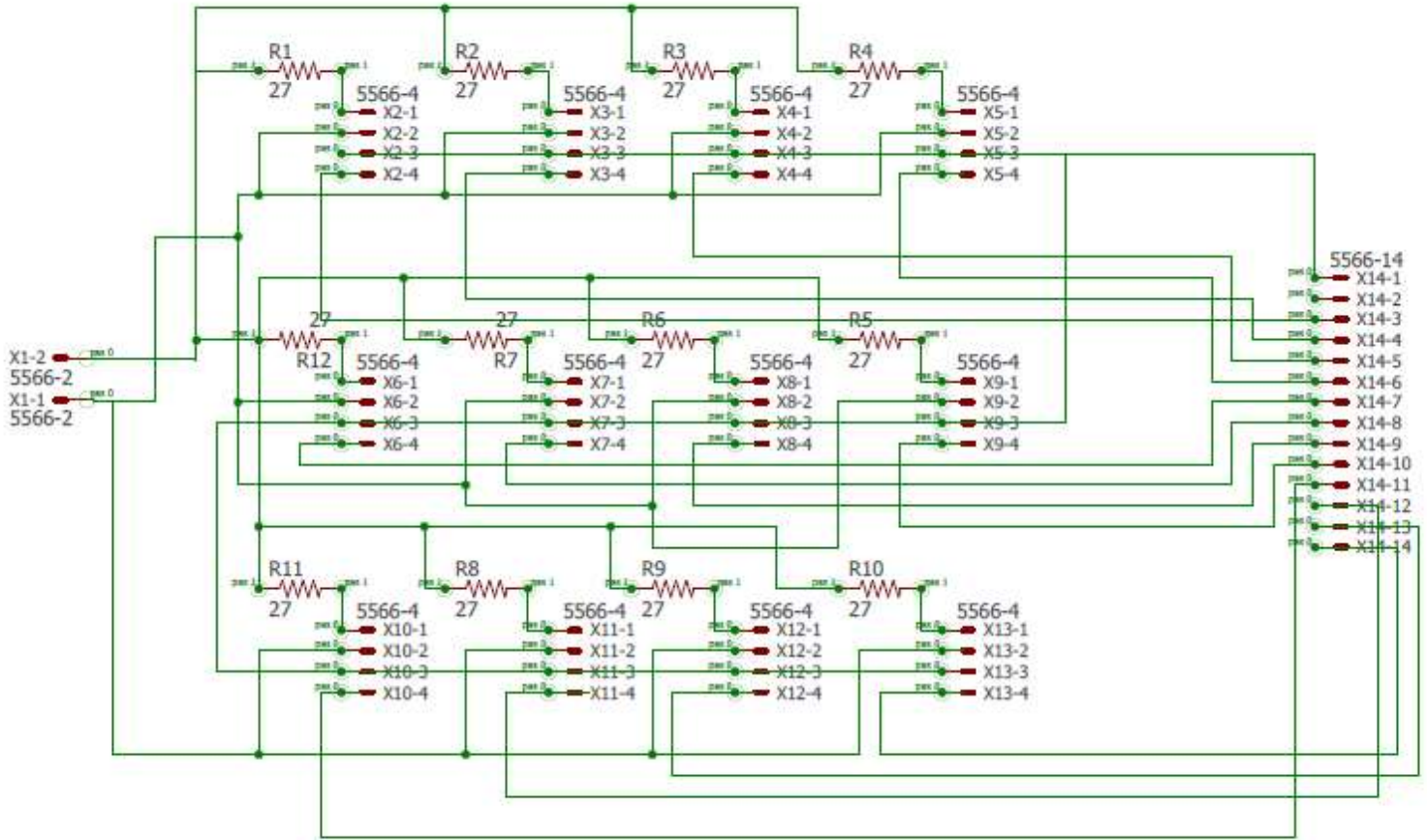


X1	Power Connection
X2	Subway
X3	Scoop
X4	Center Ramp Enter
X5	Left Ramp Entry
X6	Right Ramp Enter
X7	Ship Lock 1
X8	Ship Lock 2
X14	SW-16 Board 2 – J6

See Fig 3-5 For the Switch Location Map

Fig 3-8

Opto Board Schematic



Switch Theory

Mechanical Switch

All mechanical switch lines are “Active Low” 0 VDC (Logic Ground) when active (Made).
Normally open state (12 VDC) (Not Made).

Optos

All opto switch lines are “Active High” (12 VDC) when active (Made).
Normally open state 0 VDC (Logic Ground) (Not Made).

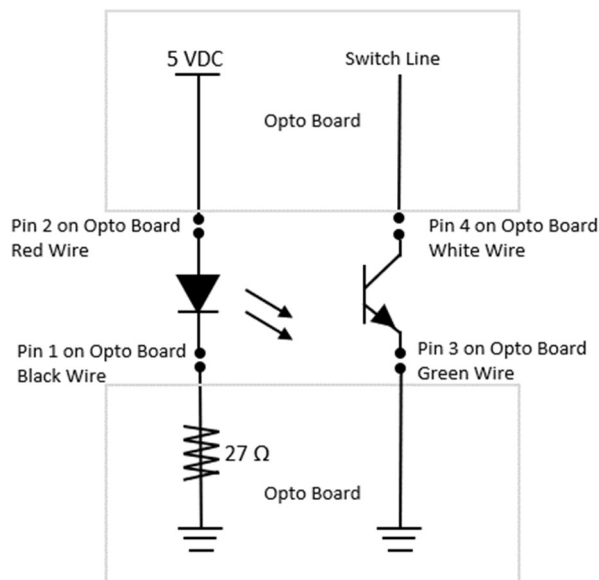


Table 3-14 Coil Table

Add-on board PCB0021_02		Coil Locations						Q = Transistor IRL540N									
		BRN +	BLK -			RED +	BLK -										
48v Power	J10 - Pin2	J10 - Pin3	J10 - Pin4	J10 - Pin5	J11 - Pin3	J11 - Pin4	J11 - Pin5	J11 - Pin6									
	Not Used	Knocker	Not Used	Not Used	Thor's Hammer	Not Used	Not Used	Not Used									
	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15									
Add-on board PCB0021_02		Aux Locations						Q = Transistor DMN3404L-7									
		BLK -	YEL +	BLK -	GRY +	BLK -	ORG +										
12v Power	J1	J2	J3	J4	J5	J6	J7										
	Start Button	Backbox LED	Shaker Motor	Not Used	Not Used	Not Used	Not Used										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7										
Dip Switch 2,3,8 ON		PD-16 Coil Locations						Q = Transistor IRL540N									
		GRY	BLK	GRY	BRN	GRY	RED	GRY	ORG	GRY	YEL	GRY	GRN	GRY	BLU	GRY	VIO
48v Power BankA - J7	Pin#1	Pin#3	Pin#4	Pin#5	Pin#6	Pin#7	Pin#8	Pin#9									
	Trough Kick	Left Flipper Main	Left Flipper Hold	Left Slingshot	Scoop	Upper flipper Main	Upper flipper Hold	Upper Magnet									
J3 + ORG	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8									
		VIO	BLK	VIO	BRN	VIO	RED	VIO	ORG	VIO	YEL	VIO	GRN	VIO	BLU	VIO	GRY
48v Power BankB - J11	Pin#1	Pin#2	Pin#4	Pin#5	Pin#6	Pin#7	Pin#8	Pin#9									
	Auto Plunger	Rt Flipper Main	Rt Flipper Hold	Right Slingshot	Berzerker drop target	Berzerker Drop trip	Ship Magnet	Ship post									
J4 + VIO	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16									

Fig 3-9

Cabinet Circuit Boards Assembly

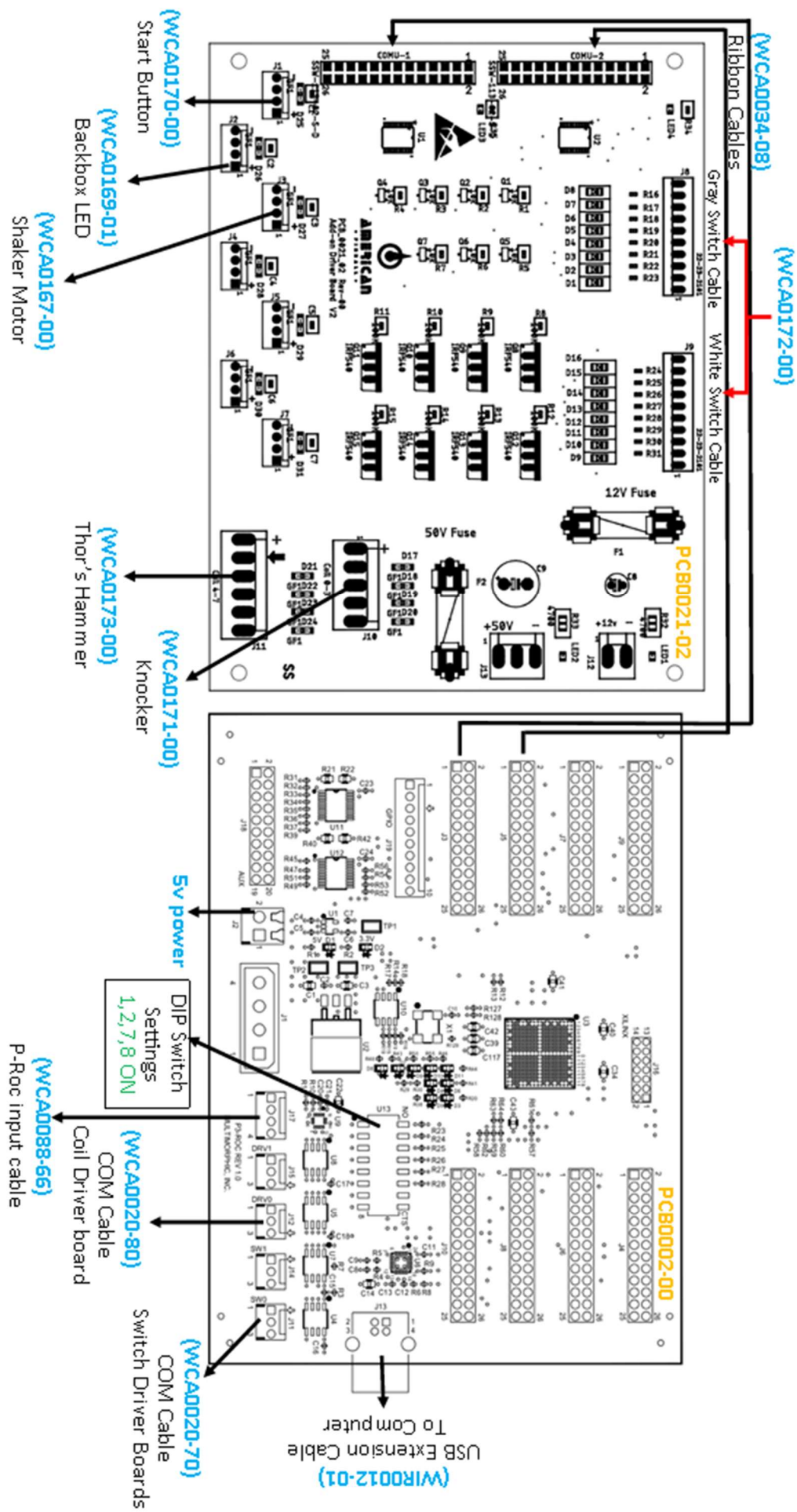
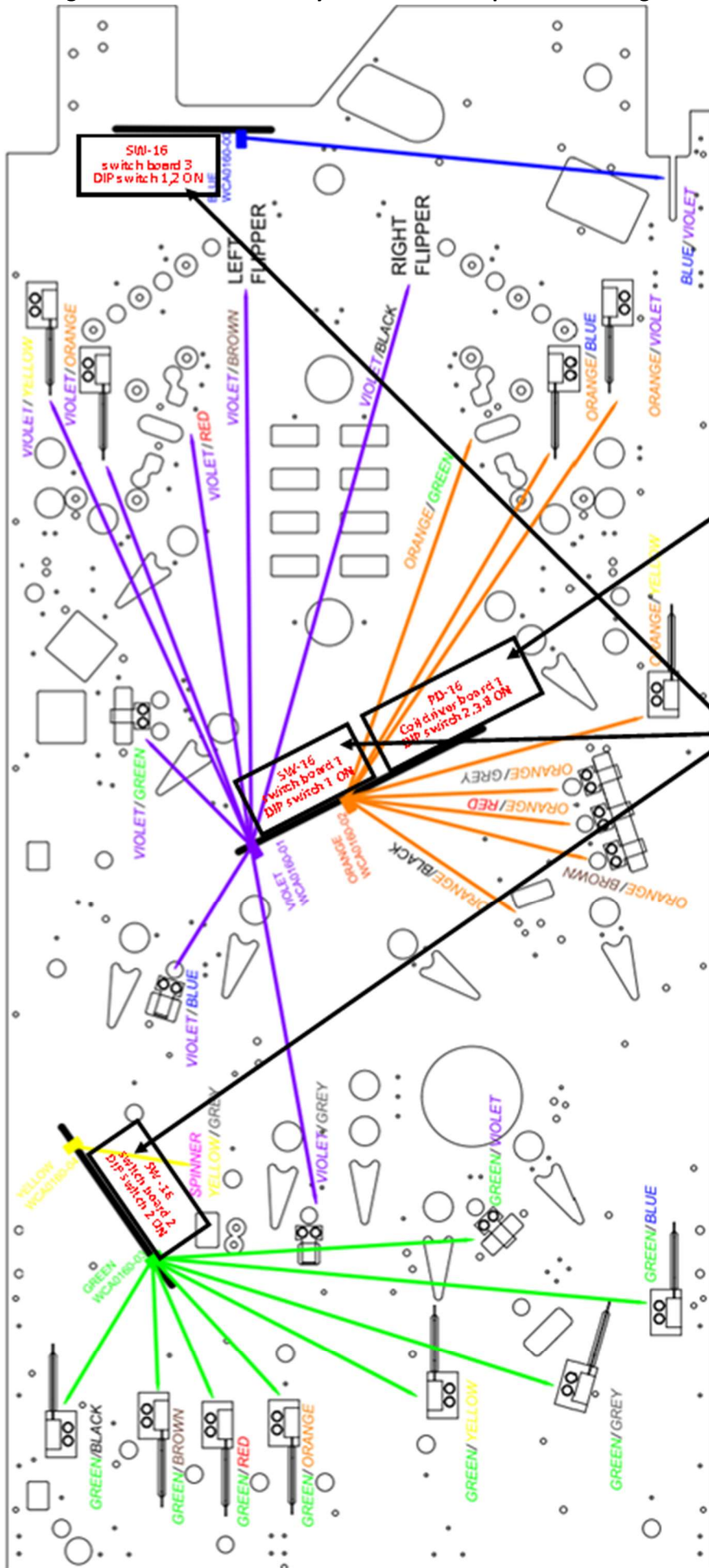


Fig 3-10 Bottom Playfield PCBs and Dip Switch Settings



Multimorphic PD-16 Coil Driver Board



Multimorphic SW-16 Switch Driver Board



Fig 3-11

Power Distribution

Pinball Power System Diagram V1.02

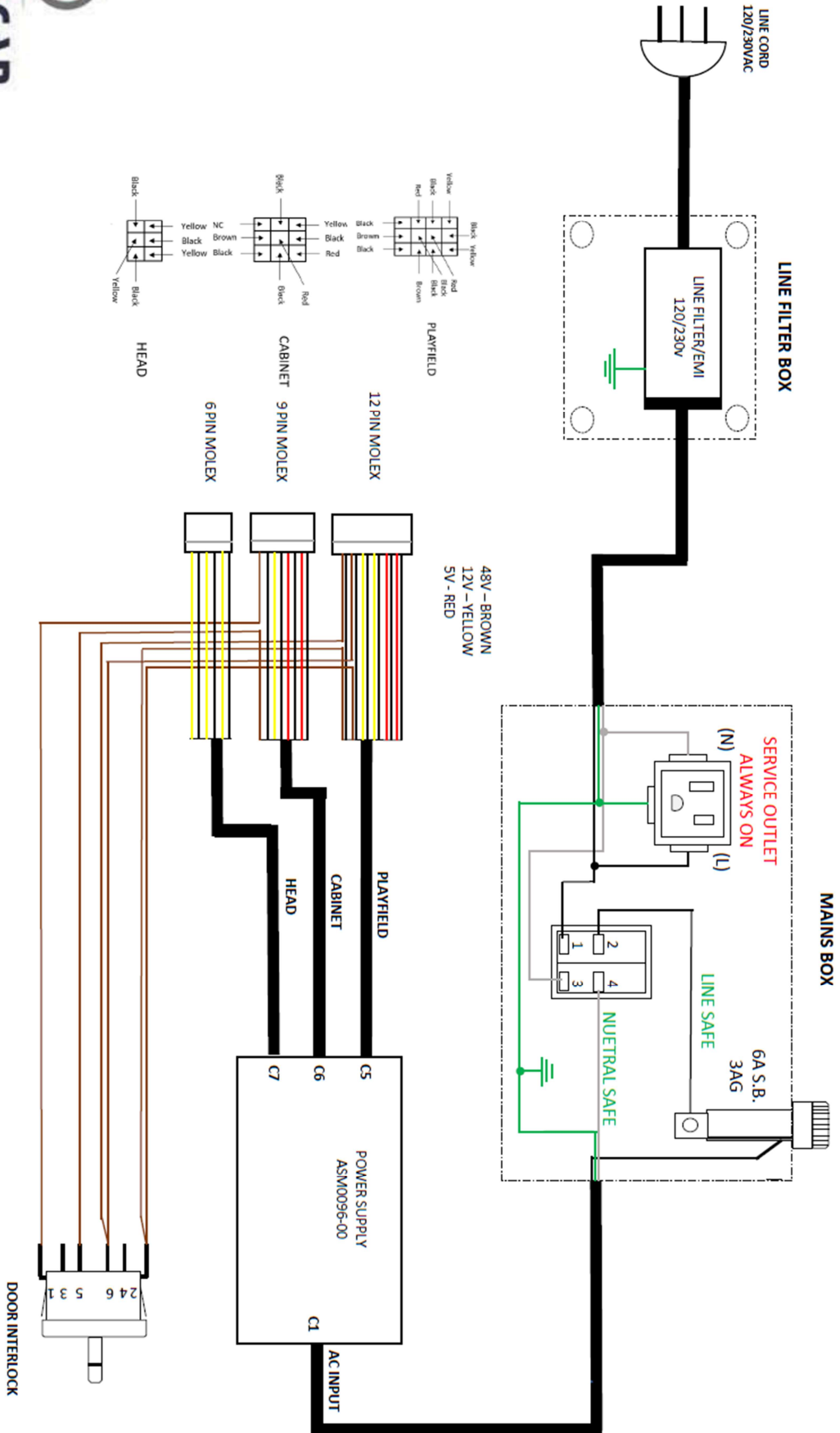
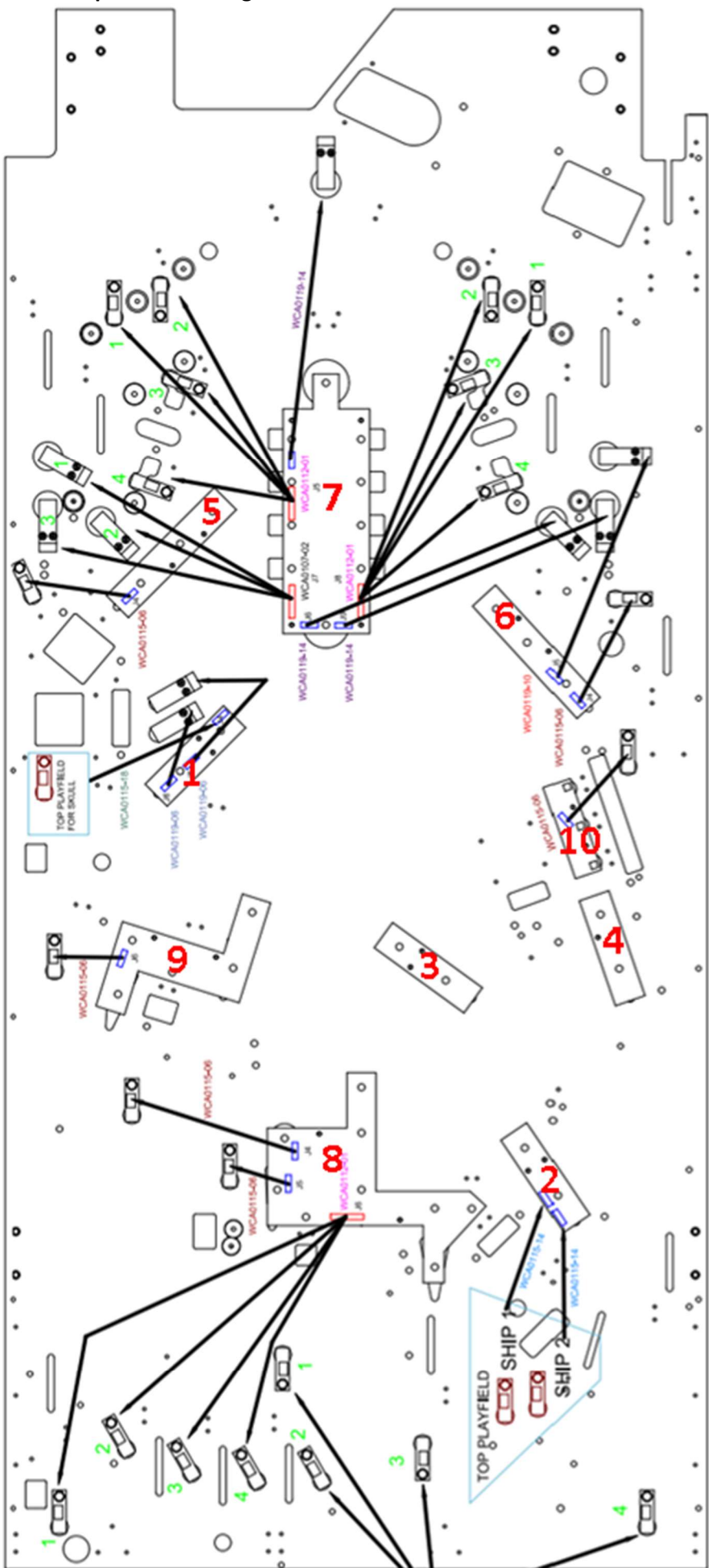


Fig 3-12

LED board configuration and Dip Switch Settings

RGB Dip Switches and Cable Locations




PCB#	Dip setting	inserts
1 PCB0054-00	2,4,6 ON	mammian axe, arrow
2 PCB0054-00	1,2,3,6 ON	Club, arrow
3 PCB0054-00	4,6 ON	war hammer, arrow
4 PCB0054-00	1,4,6 ON	Spear, arrow
5 PCB0055-00	1,3,6 ON	mystery, extra ball, arrow
6 PCB0055-00	2,3,6 ON	Special, Ulfbert sword, arrow
7 PCB0056-00	N/A	Valhalla, Ragnarok, weapons, conquest, army, destroyer of legends, combos, god of thunder, war on land, war at sea
8 PCB0057-00	N/A	long bow, broad axe, start rampage, dagger, arrows
9 PCB0058-00	N/A	cross bow, light weapon, arrows
10 PCB0059-00	1,2,4,6 ON	light, ship, locks

HOW TO UPDATE GAME CODE

Please have the following items available before performing a code update:

- A FAT 32 formatted 2.0 USB drive with at least 8 GB of storage
- Latest version of game code, which can be downloaded from <https://www.american-pinball.com/support/updates/> your computer.

 Video showing how to update gamecode: <https://youtu.be/n4-7ZSH3UE>



WARNING! OPENING THE COIN DOOR EXPOSES HIGH VOLTAGE PARTS IN THE GAME, AND DIRECT CONTACT TO THESE HIGH VOLTAGE PARTS CAN LEAD TO SERIOUS OR FATAL INJURIES. THIS EQUIPMENT IS TO BE SERVICED BY TRAINED PROFESSIONALS ONLY.



How To download code to a Microsoft Windows PC

1. Go to www.american-pinball.com/support/updates/
2. Compare the game version on your machine (in service menu status box) to the most current version available on the site.
3. If your machine is running the most current version of code, enjoy your game! Otherwise, proceed to the next step.
4. Insert a formatted USB drive with at least 8GB of storage into your computer.
5. From File Explorer, right click on the USB drive.
6. Select Format Drive FAT 32.

How To download code to a MAC

1. Go to www.american-pinball.com/support/updates/
2. Compare the game version on your machine to the most current version available on the site.
3. If your machine is running the most current version of code, enjoy your game! Otherwise, proceed to the next step.
4. Insert a formatted USB drive with at least 8GB of storage into your computer.
5. Open Disk Utility.
6. Select USB Drive.
7. Select Erase.
8. Select Format FAT 32.

How To update code

1. Copy the update package (.pkg) code file to the USB drive.
2. Open the coin door and locate the USB extension cable on the inside-side of the cabinet below the flipper switch.
3. Insert the USB drive with the code update package into the USB extension cable.
4. If the game is powered off, turn on (USB can be inserted with power on).
The game will recognize the USB drive and will provide a message on the monitor stating that you have 5 seconds to remove the USB drive or the machine will begin the update process. Takes about 10 min.
5. When the code update process is complete an "Update Complete" message appears. Remove the USB drive from the USB extension cable.
6. Power cycle the game.
7. Enjoy your updated game!

Note: The code version is shown on the home page of the service menu.

Collecting Game Logs

To assist in game development and troubleshooting, American Pinball may ask for a copy of the game logs. Make sure your game's Date and Time are set correctly in the Utilities menu so you can note the date and time the error occurred.

How to copy game logs

1. Open the coin door and locate the USB extension cable on the inside-side of the cabinet below the flipper switch.
2. Insert a **blank** USB drive into the USB extension cable.
3. If the game power is turned off, turn on.
4. Wait for the completion screen on the monitor and remove the USB drive.
5. Power cycle the game.
6. Email the files to service@americanpinball.com, include the date and time of the error along with a detailed description of what's going on.

Legends of Valhalla GAME RULES

Main Objectives

Battle 16 gods and monsters and face Ragnarok. On the way you can complete 8 tasks (center inserts) and battle ODIN in Valhalla.

Overview of Gameplay

1. Spelling God of Thunder (top lanes) increases your bonus multiplier and awards a weapon
2. Bottom in-lanes spell R-A-I-D. Spelling RAID also adds a warrior to your raiding party.
3. Left ramp lights a random weapon shot. Collect the weapons to open additional battles.
4. 16 traditional modes – 4 in each of the 4 tiers increasing in difficulty and profitability. Number of weapons needed for each tier:
 - a. Tier 1 – 1 weapon needed
 - b. Tier 2 – 2 weapons needed
 - c. Tier 3 – 5 weapons needed
 - d. Tier 4 – 9 weapons needed

Once all battles are played you face RAGNAROK where you take everyone from Valhalla back to earth and destroy everything.
5. Skill shots:
 - a. Regular skill shot with lane change - plunge the ball to one of the top God of Thunder lanes. Skill shot adds points.
 - b. Hands free skill shot - awards a weapon and increases the end of ball bonus multiplier.
 - c. Super Skill shot is awarded off plunge around orbit and directly into right ramp. God of Thunder task is awarded and a combo
6. "Blood Rage" via the target on the left - lights the left and right outlane drain save. Additional Blood Rage sequences start War of the Clans hurry-up.
7. Three mid right targets light locks. Balls are "locked" via the upper ramp shot to the ship.
 - a. Other Stand-Up Targets – two ramp targets and the ship target. Hitting all of them starts war on land.
 - b. JOTNAR = RAMPS
 - c. TROLLS = LOOPS
 - d. DWARVES = SPINNERS
 - e. Berzerker rises at the start of each hurry-up. Hit him and add time, he falls down and pops up 2 seconds later for another chance.
8. COMBOS - unique combos are coded:
 - a. COMBOS are available anytime throughout the game. Combos build a COMBO JACKPOT that cashes out every 20 combos. COMBO task is lit at 10 combos.
 - b. Left loop to Center ramp
 - c. Left ramp to Center ramp
 - d. Right ramp to Center ramp
 - e. Left loop to Left ramp
 - f. Left ramp to left return to Right loop
 - g. Left loop to right loop to spinner to Right ramp
 - h. Center ramp to right return to Left ramp
 - i. Right ramp to Left orbit
 - j. Left ramp to left return to Right ramp MB ONLY
 - k. Left ramp > Right ramp > Center ramp MB ONLY

9. Raiding Party - once you collect enough warriors there is another mini-wizard mode. Shoot the ball into the ship to begin a raiding party. 3 ball multiball. Map in the display shows you the town you are raiding. Shots are color coded for each town. Raid all 11 towns if you can. Raid continues until you are in single ball play. These are the locations you RAID: Vinland, Greenland, Iceland, Faroer, Shetland, Scandinavia, York, Dublin, Normandy, Miklagard and Kiev.
10. Rampage – Spell Rampage by hitting the center ramp.
 - a. Timer starts, all shots are lit.
 - b. Hitting a shot awards 1X for the shot and restarts timer. Hitting another shot awards 1X for that shot and restarts the timer. If you hit a shot twice, award 2X and restart timer. 3X for 3rd shot and that shot is solid and worth 3X. Try to complete all shots 3 times before timer runs out.
11. Scoop – during battles adds time. When lit pops up battle select (battle select also pops up if right shooter lane is lit). Scoop awards MYSTERY when MYSTERY INSERT is lit.
12. Escape the Kraken mini mode –

During regular game play, hit 10 full upper-inner loops to start the mode. This is a countdown mode beginning at 25 million points and ending when score or time is 0. Goal is to escape the kraken by hitting the ship target. The kraken will whip his tail (pulse the magnet) every 1 second so you need quick reflexes to score the shot and get past his fury. You'll also hear him roar one of 5 random roars every tail whip. A grand roar awaits those that escape.

For advanced players during the mode, a full upper inner loop from left to right will add 5 seconds to the clock, while a full upper inner loop from right to left will add 2.5million to the countdown score. Keep looping and build up your time and jackpot then fire the target!
13. DOUBLE SCORING – 6 right ramp shots through the ship enable double scoring for 30 seconds.
14. EXTRA BALL - Completing 4, or 10 BATTLES lights extra ball. Also available as a rare MYSTERY AWARD. Extra ball redeemed at the scoop.
15. Valkyries – a Valkyrie is summoned after 5 combos. Use the Valkyrie during battles to score the next shot in the battle, or complete the battle if you are battling Dearg Due. Valkyries are also awarded at 6,8,12 and 14 battles played and as a MYSTERY AWARD.
16. War of the Clans (a hurry-up available when you hit the second round of BLOODRAGE targets and have the outlane ball saves lit) 1 of 3 random awards is available at the start. Hit the green lit shots to collect. (Awards are WEALTH, WEAPONS or WARRIORS)

Hit the BERZERKER during the hurry-up to get a new pattern of shots
You have 12 seconds. Available during regular game play only
17. RAGE – a multiball event where you destroy villages. Qualify: enable shield of the gods (outlane ball save) by hitting 2 blood rage targets, then score 4 outlane saves (shield of the gods resets each time) to move the blood level on the axe in the display. When the axe is filled, RAGE begins!
18. TASKS
 - WEAPONS – Collect 9 weapons to complete this task
 - ARMY – Add 10 warriors to your RAIDING party
 - COMBOS – Collect 10 combos (over 20 possible combos available)
 - WAR ON LAND – Battle several land beings (Jotnar, trolls, dwarves)
 - CONQUEST – Collect all 8 qualities of a Viking (instant info has shot details)
 - DESTROYER OF LEGENDS – BATTLE 4 of the 16 LEGENDS
 - GOD OF THUNDER – achieve 3X bonus (top rollovers) or Super-Skill-shot
 - WAR AT SEA – start a war at sea multiball (3 balls locked in the ship or virtual)

SKILL SHOTS (3)

- a. Regular skill shot with lane change - plunge the ball to one of the top God of Thunder lanes. Skill-shot adds points.
- b. Hands free skill shot - awards a weapon and increases the end of ball bonus multiplier.
- c. Super-Skill-shot is awarded off plunge around orbit and directly into right ramp. God of Thunder task is awarded and a combo.

Multiball Modes (10)

(5) battles are multiball battles

(2) Sea multiball battles at the ship

Raiding party

RAGE

Ragnarok final wizard mode

Wizard Modes (2)

- VALHALLA

Collect all 8 of the center insert tasks to light Valhalla, start by hitting the scoop or shooter lane.

- RAGNAROK

Endure all 16 battles and face RAGNAROK. start by hitting the scoop or shooter lane.



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