



PinPAC1/PinPAC2/5 Installation Manual Now with PinPAC2 MAC installation.

Version 3.3 May 25, 2022



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Warnings and Agreements

Welcome! The PinPAC Pinball Person Audio Controller has been designed for simplicity of installation! As with any Pinball Machine modification and add on kit there is a required level of expertise for the installation. If you are not proficient in basic pinball parts installation we recommend having our kit installed by someone who is proficient with the basics of pinball repair. Pinnovators requires our kit be installed by an experienced Pinball service technician with basic electrical skills. As with any electrical piece of equipment a danger does exist and you must agree to not hold Pinnovators responsible for any injury, damages, etc. before continuing.

Sound Levels: Pinnovators recommends running your headphone sound level at a safe level to prevent long term hearing loss. For a good example of recommend sound levels, we recommend following suggestions given by major audio equipment manufacturers such as Apple and their Ipod.

phys.org/news80304823.html

www.macworld.com/article/1060274/hearingprotection.html

ESD: We recommend always discharging the headphone cable by touching it to an exposed metal part of the pinball machine before plugging it into the machine.

Power Cord: ALWAYS UNPLUG THE POWER CORD for safety when working on your pinball machine!



Playfield Propping: Pinnovators highly advises following Playfield propping instruction for your pinball machine. These instructions are typically found inside the Operators manual for each machine. Failure to follow these instructions can cause fatal injuries or even Death. Pinnovators also recommends having an assistant hold a propped playfield in the up position when servicing under the playfield.

1. What's included in the PinPAC1 and 2 Kits

PinPAC1, 2, PP2MAC, PP5 Front Panels	
Back Box Board (Specific to the kit ordered)	
Interface Cable	

2. Requirements:

- A. The Pinnovators PinPAC1 and 2 systems require a Dollar Bill Acceptor slot on the machine's Coin door in the upper location (PP1) or lower location (PP2 Sterns only).
- B. The Machine must have a sound board / MPU system shown in the Back Box Installation section below. Please visit IPDB.ORG to learn what system your machine has. Pinnovators.com now provides a list of pinball systems we have a kit for.

3. Preparation

Unplug the Pinball Machine!



Next remove the back glass on the system and open the light board to expose the System circuit boards. Star Trek The Next Generation is shown below as an example.



330_003_ WPC_DM WPC-Dot Matrix (Example Machines: T2 and Twilight Zone)

The sound board is the upper center board on a Twilight Zone.



4. Back Box Installation

Pinnovators offers many kits for five of the most popular pinball systems as of the writing of this document.

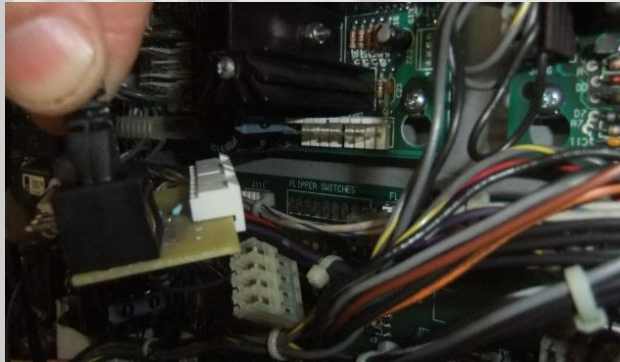
Ref	Pinnovators Part Number	Description
1	330_003_ WPC_DM	WPC-Dot Matrix
2	330_004_ WPC_DCS	WPC_DCS
3	330_005_ WPC_95	WPC_95
4	330_012_ STN_WST	Stern Whitestar +modified
5	330_013_ STN_SAM	Stern S.A.M. Board System

We will cover the basic installation of the 330_003_ WPC_DM WPC-Dot Matrix kit in the following section and we will include an addendum for the Back Box Board you purchase at the end of this manual.

Locate the speaker connectors shown by the red arrows in the picture. Remove two speaker connectors by carefully rocking the connectors while pulling them out:



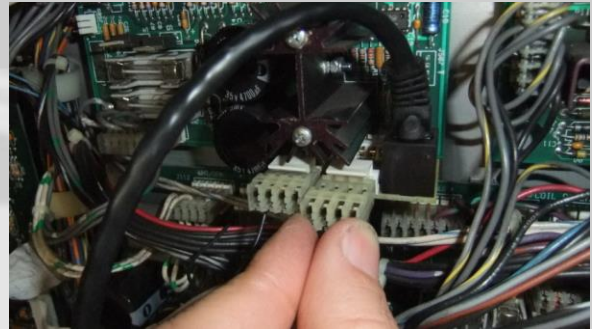
Plug supplied Pinnovators cable into the RJ45 jack on the Back Box Board Connector.



Insert the Back Box Board into the speaker connectors on the sound card as shown below. Make sure it's fully inserted and aligned properly. **ALIGNMENT is CRITICAL! You may damage your sound board if the connector is not properly aligned. Check it twice!**



Insert the original Speaker cables on to the pins of the Back Box Board. Note: the connectors can go on either set of pins without causing damage and will function properly.



Route the cable into the cable harness clip as shown.

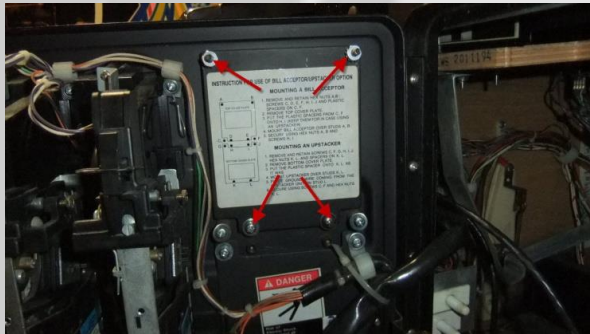


Feed the remaining cable down the bottom of the Back Box and into the cabinet.

Reassemble the Back Box.

5. Coin Door Installation PinPAC1:

Remove Dollar Bill Acceptor blank plate by unbolting the two or four nuts as shown and / or the two screws below as shown. Note: Save the washers. The washers are used to properly space the length of the screw. Some coin doors have four threaded studs attached to the coin door. The PinPAC1 Universal plate will fit most coin doors and can be secured using the original hardware.



Insert the PinPAC1 plate as shown below. Position the ESD ground wire (the green wire) under the nearest available threaded stud. Fasten with the original hardware.



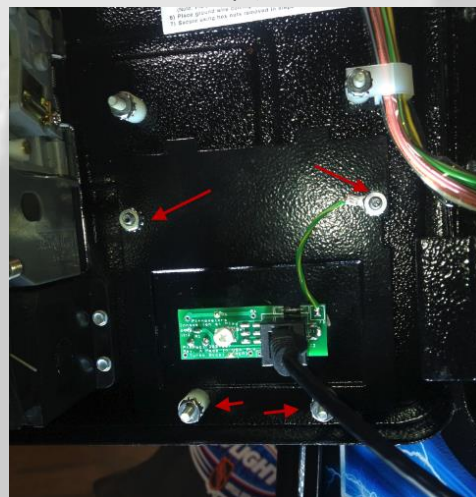
6. Coin Door Installation PinPAC2:

PinPAC2MAC see addendum below.

Remove Dollar Bill Acceptor blank plate by unbolting the two or four nuts as shown and / or the two screws below as shown. Note: Save the washers. The washers are used to properly space the length of the screw. Some coin doors have four threaded studs attached to the coin door. The PinPAC2 Universal plate will fit Stern coin doors.

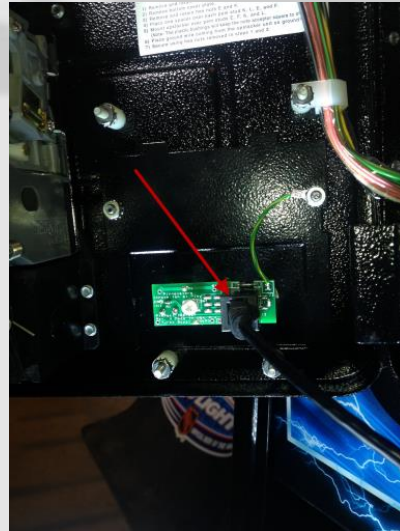
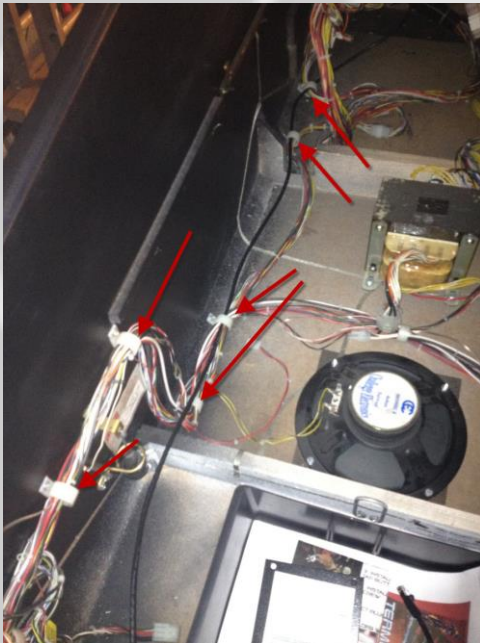


Insert the PinPAC2 plate as shown below. Position the ESD ground wire (the green wire) under the nearest available threaded stud. Fasten with the original hardware. (Note. This picture shows the cable installed but we will install at a later step.)



7. Running the cable

Using a helper, remove the playfield glass and lift up the playfield. Depending on the game, tuck the new cable into the wire harness clips as shown. Leave an extra foot of cable up at the Back Box area if you plan on folding the back box down. In some systems, the cable may not be able to be installed in the wire harness due to length and the position of the Sound board (Stern SAM). In this case, neatly place the wire on the floor of the cabinet and run it to the coin door area.



8. Coin door Final installation

Insert the end of the Interface cable into the RJ45 Connector on the PinPAC1 or 2 front control panel as shown.

Route the cable into the cable harness clip behind the door as shown. Test the door to make sure it closes properly. Adjust as necessary.

9. Final Checkout

Power up the system and start a game. Make sure the front panel switch on the PinPAC Control panel is in the "UP" position. Verify sound can be heard from the Back Box speakers and the lower Cabinet speaker. Switch the switch to the "Down" position and verify the speakers turn off. Insert headphones into the jack and verify levels in headphones can be adjusted with the volume control knob.





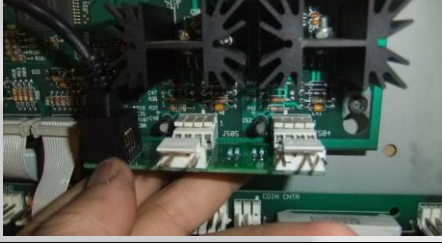


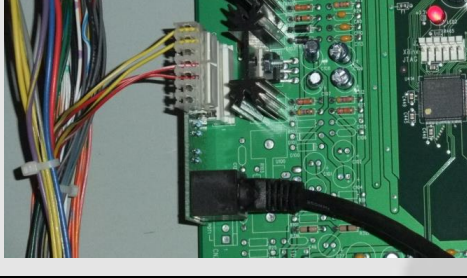

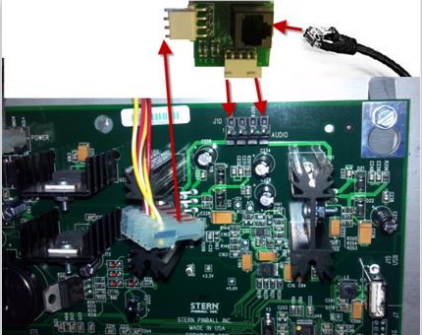


10. Back Box Boards

All backboards now come with our “subwoofer output jack” The pictures show on the next page do not show the jack but the jack will be on your board.

Please download our PINsub_Installation_Manual at <http://www.pinnovators.com/manuals/> for complete instructions on how to optional subwoofer cable.



<p>Sound Board connector location. 330_003_WPC_DM</p>	<p>Back Box Board installed with cable. Sample games: The Addams Family</p>
	
<p>330_004_WPC_DCS</p>	<p>Sample games: Star Trek The Next Generation</p>
	
<p>330_005_WPC_95</p>	<p>Sample Game: Medieval Madness</p>
	
<p>330_012_STN_WST</p>	<p>Sample Game: The Lord Of The Rings</p>
	
<p>330_013_STN_SAM Stern S.A.M.</p>	<p>Sample Game: Transformers</p>
	

11. Trim Pot Function

The PinPAC front panel board has a small trim pot mounted on the PCB only accessible when the coin door is open.



This trim pot has different functionality depending on the Back Box Board type. The main purpose was to allow the user to “Mix” the Cabinet speaker channel and the Back Box Speaker channels going into the headphones. The trim pot provides a reasonable amount of mix on most of the boards. Note that the WPC-Dot Matrix system really only has ONE channel so the trim pot can’t adjust the mix, just the overall level in the headphones.

Ref	Pinnovators Back Board Part Number	Description	Trim Pot Function
1	330_003_WPC_DM	WPC-Dot Matrix	Overall level in the headphones
2	330_004_WPC_DCS	WPC_DCS	Cabinet and Back Box mix
3	330_005_WPC_95	WPC_95	Cabinet and Back Box mix
4	330_012_STN_WST	Stern Whitestar +modified	Cabinet and Back Box mix
5	330_013_STN_SAM	Stern S.A.M. Board System	Cabinet and Back Box mix

12. Recommended Headphones.

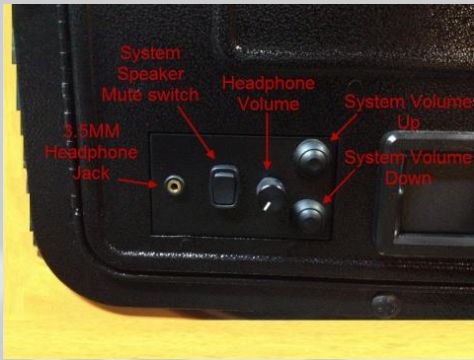
Pinnovators tested the PinPAC1 and 2 on many different headphones. Our favorite was the beats by dr. dre. We also tested a moderately priced set of headphones ~\$30 and was still blown away by how good the bass response was and how clear the treble was!

Thank your purchase of our product! We hope you get many years of service from it.

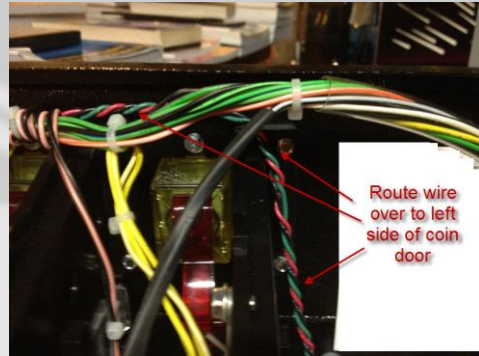
The Pinnovators Team.



13. PinPAC2MAC Installation Manual Addendum



Route the PP2MAC remote cable over the top of the coin slots as shown. Route it down to the system control panel buttons. *NOTE: The three color cable is now a flat three color ribbon cable.*



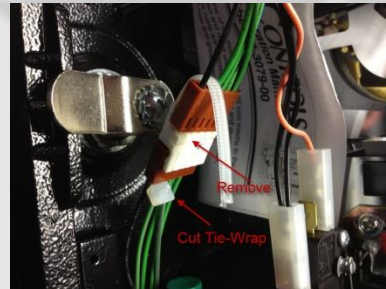
14. Requirements:

Welcome! The PinPAC2 Master Audio Controller has been designed for Stern Sam pinball machines with a connector in series with the system settings buttons AND now Whitestar/SAM systems that do NOT have an inline connector. For Export SAM systems without the connector, the adapter can be ordered from our website.

SAM Machines with inline connector:
Cut the tie-wrap as shown then disconnect the male to male jumper. Insert the PP2MAC cable connector into the two female connectors as shown below.

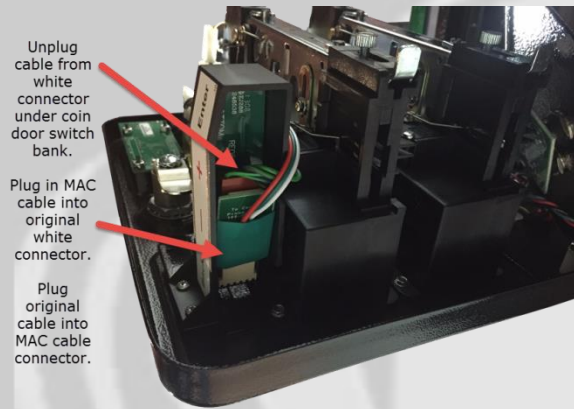
15. Coin Door cable Installation (Stern SAM systems with connector)

The Front panel should already be installed according to the installation manual included in this kit.



MAC-TAP Board:

The pre 2021 version of the MAC kit has a small Printed Circuit board with connectors mounted to it. The PCB is inserted in line with the cable going to the coin door pushbuttons as shown below.



The new 2021 MAC-TAP board looks like this:



If your coin door does not have the inline connector shown above then please contact us for a Posi-tap adapter. Whitestar and Exported SAM systems usually do not have the connector and will need the adapter

16. Posi-Tap Adapter cables!

For Whitestar and Export SAM machines.

This optional adapter uses three Posi-Tap connectors. The Posi-tap connectors will be used to cleanly splice into the button signals for the up and down volume control.

This is a picture of the optional adapter along with a few YouTube video links showing how to install the Posi-Taps. Please watch the video first.

(Note, Pinnovators did not make the videos)

This is the Pre 2021 adapter.



This is the newer adapter (2021)

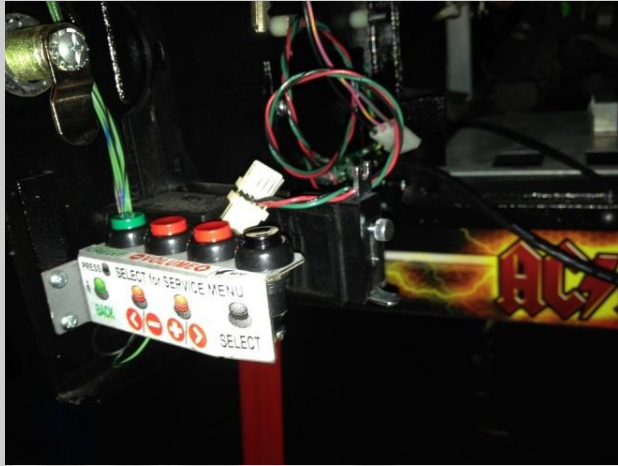


<http://www.youtube.com/watch?v=NQWYWuNbpg>

<http://www.youtube.com/watch?v=Yiimgl-Rdmw>

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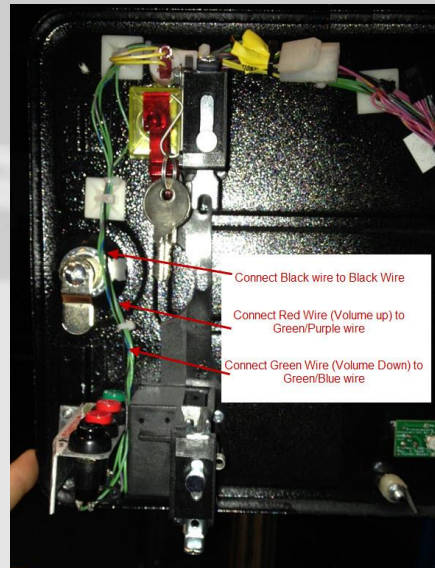
Some export Stern SAM systems do not have a connector in series with the cable going to the game adjust buttons.



Connect the Posi-Tap adapter cable for export SAM systems and Stern Whitestar system as follows:

Poisi-Tap Adapter Cable wire Pre 2021	New 2021 Posi-Tap adapter.	Wire Function	Push Button Panel cable wire:
Black	Green	Ground	Black
Red	Red	Volume Up	Green/Purple
Green	White	Volume Down	Green/Blue

This Picture show the pre 2021 wire colors for the adapter.



This is a set of pictures of the MAC installed on a Stern Monopoly game.



17. Final Checkout

Power up the system and start a new game. Make sure the front panel switch on the PinPAC Control panel is in the “UP” position. Verify sound can be heard from the system speakers.

Operate the System Volume UP button and verify the system volume increases. Operate the System Volume Down button and verify the system volume decreases.

NOTE: On Whitestar systems you will have to operate the Down button first before the Up button will respond.