PINsub Installation Manual

Version 1.2 August 06, 2015

Version 1.3 February 14, 2021

This manual covers the following product kits:

PinPAC 4 SPIKE, Spike2	**PINsub_SPIKE**
PinPAC 2 SAM	**PINsub_SAM**
PinPAC 2 WHITESTAR	**PINsub_WS**
PinPAC 1 WPC95	**PINsub_WPC95**
PinPAC 1 DCS	**PINsub_DCS**
PinPAC 1 DM	**PINsub_DM**

## Contents

1. Warnings and Agreements

Welcome! 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 and subwoofer sound levels 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 yourself to a metal surface on your machine before touching the electronics inside it.

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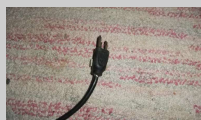
Playfield Propping: Pinnovators highly advises following Playfield propping instruction for your pinball machine. These instructions are typically found inside the Operators manual for each machine. Failure to follow these instructions can cause fatal injuries or even Death. Pinnovators also recommends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

2. Preparation
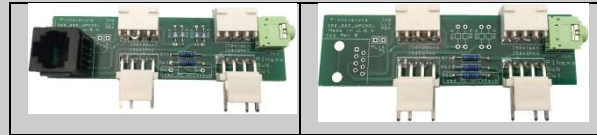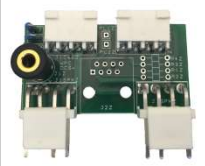
Unplug the Pinball Machine!

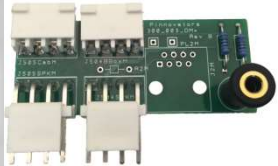Next remove the back glass on the system to expose the System circuit boards. Tron is shown below as an example.

3. What's included in the Kits

Interface Cable and adapter come with all PINsub kits but is an optional accessory with headphone kits.

One Velcro tie is included to hold the cable to the leg of the machine.

PinPAC 4 SPIKE Kit or	PINsub_SPIKE kit

PinPAC 2 SAM Kit	PINsub_SAM kit

PinPAC 2 WHITESTAR Kit	PINsub_WHITESTAR kit

PinPAC 1 WPC95 Kit	PINsub_WPC95 kit
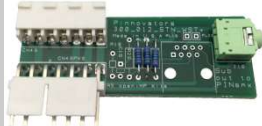
PinPAC 1 DCS Kit	PINsub_DCS kit

PinPAC 1 DM Kit	PINsub_DM Kit

4. Requirements:

The Machine must have one of the following Sound / CPU boards:

- Stern Spike
- Stern SAM
- Stern Whitestar
- Williams/Bally WPC95
- Williams/Bally DCS
- Williams/Bally DM

Please visit IPDB.ORG to learn what system your machine has.

5. Back Box Installation Stern SPIKE, Spike 2 systems

Locate the speaker connectors shown by in the picture below. Remove the speaker connector from the main CPU board by carefully rocking the connector while pulling it out.

Plug the 3.5mm cable end into the green female connector on the Pinnovators Back Box Board.

Using the 12 foot 3.5mm to 3.5mm supplied cable; drop the cable through the bottom of the Back Box and into the main cabinet. Locate the air vent located under the cabinet. Press up on the screen just enough to allow the cable to exit the system.
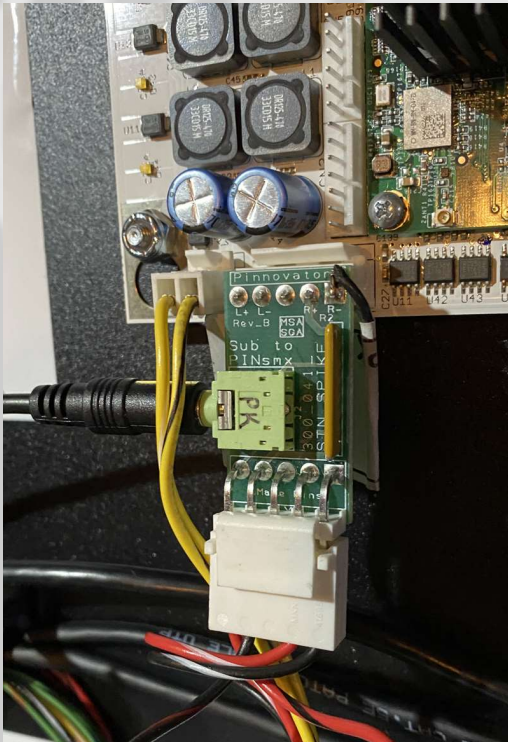

Secure the cable into the nylon cable clamp to protect the cable from being pulled out. The nylon cable clamp does not have to be removed to get the wire into it. The clamp can be slightly stretched open.

Insert the original Speaker cable on to the pins of the Back Box Board.
Insert the Back Box Board into the speaker connectors on the sound card as shown above. 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!

Reassemble the Back Box.

6. Back Box Installation Stern SAM

Locate the speaker connectors shown by the red arrows in the picture. Remove the speaker connector from the main CPU board by carefully rocking the connector while pulling it out:

Plug supplied Pinnovators cable into the RJ45 jack on the new Back Box Board Connector (non PINsub kits only).
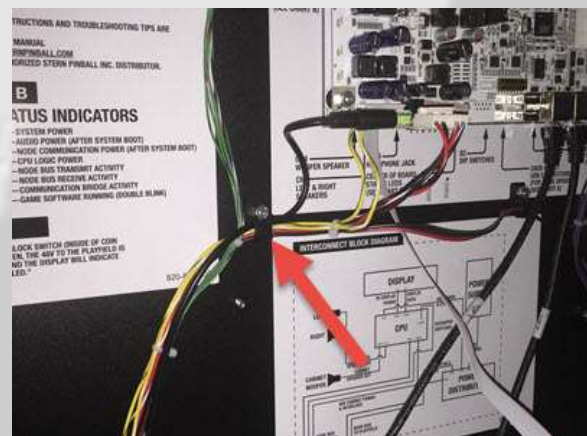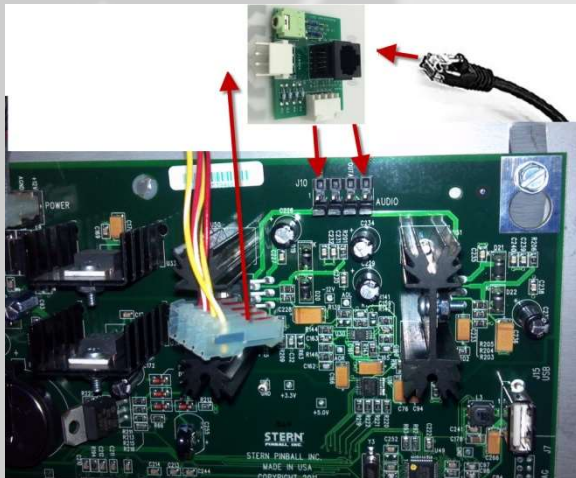

Insert the Back Box Board into the speaker connectors on the sound card as shown above. Make sure it's fully inserted and aligned properly. ALIGNMENT is CRITICAL! You may damage your sound board if the connector is not properly aligned. Check it twice!

Note: The SAMsub kit will not have the black RJ45 connector loaded so you will not have an RJ45 cable. The cable is part of the Pinnovators headphone kit.

Insert the original Speaker cable on to the pins of the Back Box Board.

Using the 12 foot 3.5mm to 3.5mm supplied cable, poke the cable through the air vent located above the main CPU board as shown below.

Secure the cable into the nylon cable clamp to protect the cable from being pulled out. The nylon cable clamp does not have to be removed to get the wire into it. The clamp can be slightly stretched open.

Plug the 3.5mm cable end into the green female connector on the Pinnovators Back Box Board.

Insert the original Speaker cable on to the pins of the Back Box Board.


Reassemble the Back Box.

7. Back Box Installation Stern WHITESTAR

Locate the speaker connectors shown by the upper red arrow in the picture. Remove the speaker connector from the main CPU board by carefully rocking the connector while pulling it out:

Plug supplied Pinnovators cable into the RJ45 jack on the new Back Box Board Connector (non PINsub kits only).
Insert the Back Box Board into the speaker connectors on the sound card as shown above. 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!
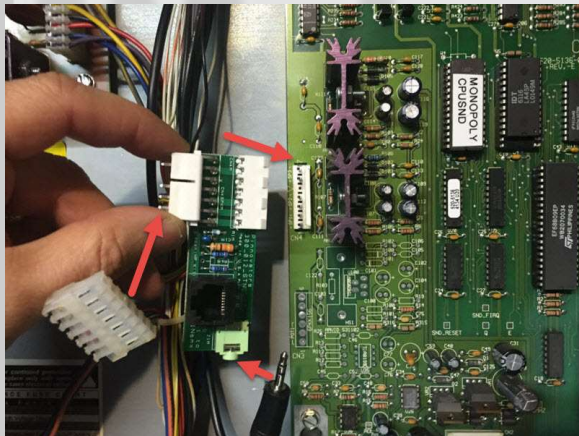
Note: The PINsub_WHITESTAR kit will not have the black RJ45 connector loaded so you will not have an RJ45 cable. The cable is part of the Pinnovators headphone kit.

Insert the original Speaker cable on to the pins of the Back Box Board.

Plug the 3.5mm cable end into the green female connector on the Pinnovators Back Box Board.
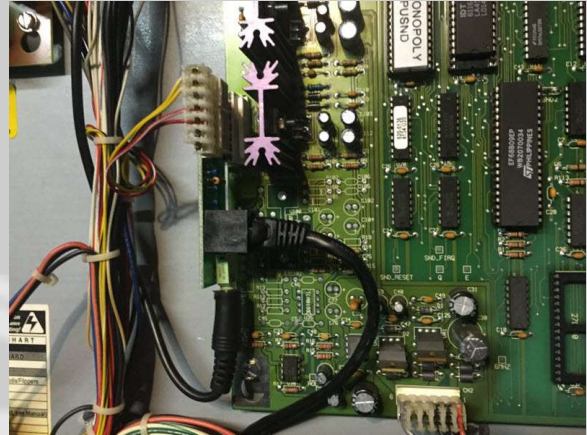
Using the 12 foot 3.5mm to 3.5mm supplied cable, poke the cable through the air vent located above the main CPU board as shown below.

Secure the cable into the nylon cable clamp to protect the cable from being pulled out. The nylon cable clamp does not have to be removed to get the wire into it. The clamp can be slightly stretched open.

Reassemble the Back Box.

8. Back Box Installation Williams/Bally WPC95 Systems

Locate the speaker connectors shown by the upper red arrows in the picture. Remove the speaker connector from the main CPU board by carefully rocking the connector while pulling it out:

Plug supplied Pinnovators cable into the RJ45 jack on the new Back Box Board Connector (non PINsub kits only).
 Insert the Back Box Board into the speaker connectors on the sound card as shown above. 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!
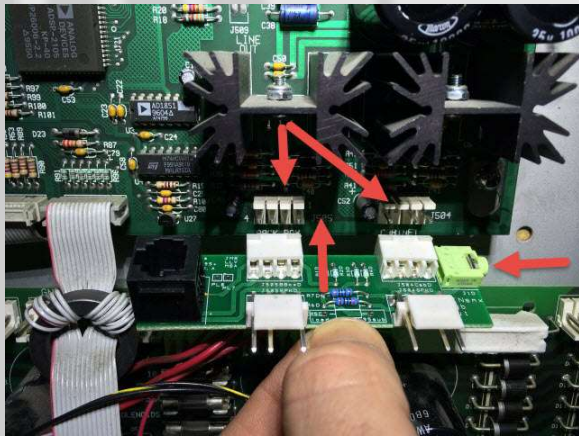
Note: The PINsub_WPC95 kit will not have the black RJ45 connector loaded so you will not have an RJ45 cable. The cable is part of the Pinnovators headphone kit.

 Insert the original Speaker cables on to the pins of the Back Box Board.

Plug the 3.5mm subwoofer cable end into the green female connector on the Pinnovators Back Box Board.

Using the 12 foot 3.5mm to 3.5mm supplied cable, poke the cable through the air vent located above the main CPU board as shown below. Loosen the screws on the vent to allow the cable to exit.

Secure the cable into the nylon cable clamp to protect the cable from being pulled out. The nylon cable clamp does not have to be removed to get the wire into it. The clamp can be slightly stretched open.
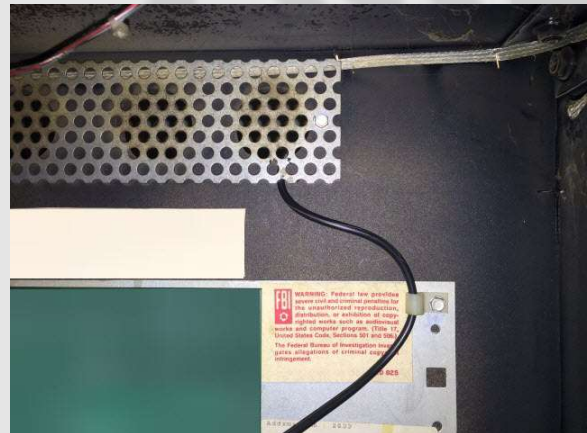

Reassemble the Back Box.

9. Back Box Installation Williams/Bally DCS Systems

Locate the speaker connectors shown by the upper red arrows in the picture. Remove the speaker connector from the main CPU board by carefully rocking the connector while pulling it out:

Plug supplied Pinnovators cable into the RJ45 jack on the new Back Box Board Connector (non PINsub kits only).
Insert the Back Box Board into the speaker connectors on the sound card as shown above. 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!
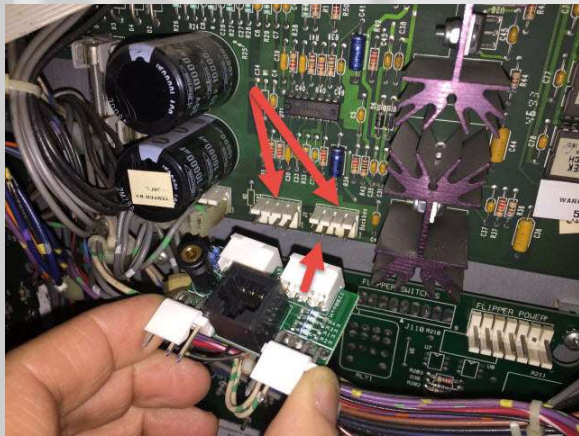
Note: The PINsub_DCS kit will not have the black RJ45 connector loaded so you will not have an RJ45 cable. The cable is part of the Pinnovators headphone kit.
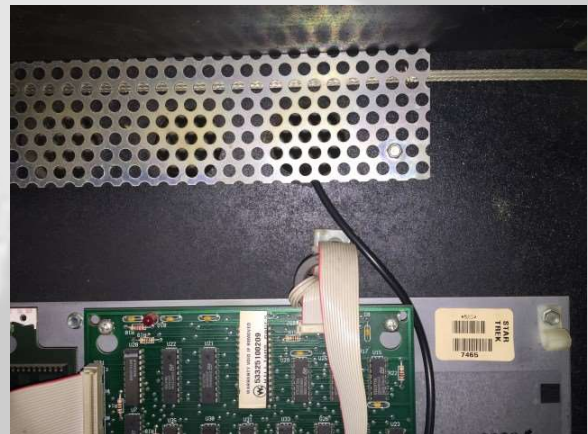
Insert the original Speaker cables on to the pins of the Back Box Board.

Plug the 3.5mm subwoofer cable end into the green female connector on the Pinnovators Back Box Board.

Using the 12 foot 3.5mm to 3.5mm supplied cable, poke the cable through the air vent located above the main CPU board as shown below. Loosen the screws on the vent to allow the cable to exit.

Secure the cable into the nylon cable clamp to protect the cable from being pulled out. The nylon cable clamp does not have to be removed to get the wire into it. The clamp can be slightly stretched open. (Cable not shown in clamp below)


Reassemble the Back Box.

10. Back Box Installation Williams/Bally DM Systems

Locate the speaker connectors shown by the upper red arrows in the picture. Remove the speaker connector from the main CPU board by carefully rocking the connector while pulling it out:

Plug supplied Pinnovators cable into the RJ45 jack on the new Back Box Board Connector (non PINsub kits only).
 Insert the Back Box Board into the speaker connectors on the sound card as shown above. 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!
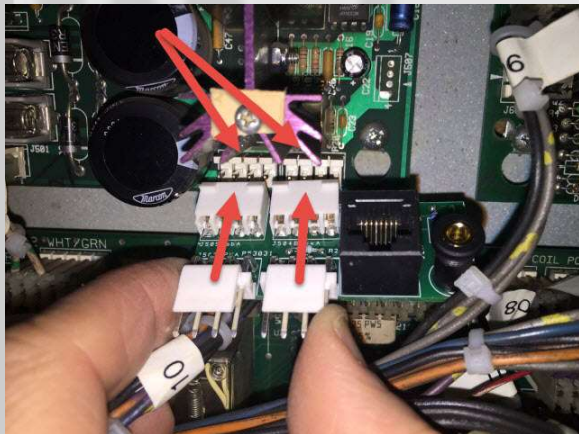
Note: The PINsub_DM kit will not have the black RJ45 connector loaded so you will not have an RJ45 cable. The cable is part of the Pinnovators headphone kit.
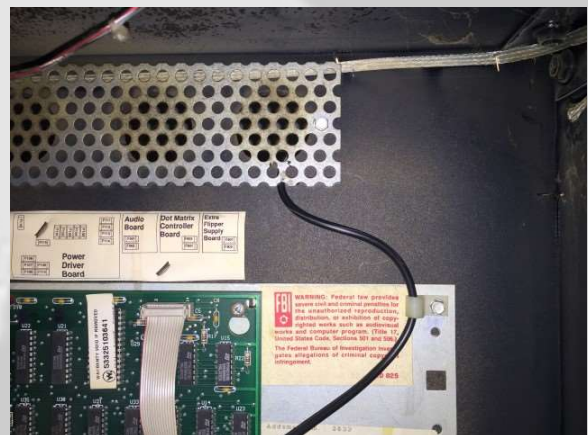
 Insert the original Speaker cables on to the pins of the Back Box Board.

Plug the 3.5mm subwoofer cable end into the green female connector on the Pinnovators Back Box Board.

Using the 12 foot 3.5mm to 3.5mm supplied cable, poke the cable through the air vent located above the main CPU board as shown below. Loosen the screws on the vent to allow the cable to exit.

Secure the cable into the nylon cable clamp to protect the cable from being pulled out. The nylon cable clamp does not have to be removed to get the wire into it. The clamp can be slightly stretched open. (Cable not shown in clamp below)

Reassemble the Back Box.

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11.   Connecting a Subwoofer

Pinnovators provides a 12 foot cable to give you the flexibility of placing your subwoofer close by to your pinball machine. The end of the cable has a 3.5mm male plug on the end. Plug this end into a subwoofer that has a 3.5mm input. Some of the Yamaha home subwoofers only have a 3.5mm input so this will work great in that situation. Smaller computer subwoofer systems will also have a 3.5mm input as shown below.

Pinnovators recommends the Polk Audio PSW10 subwoofer. This model is very affordable and produces great sound!
Use the included 3.5mm female to RCA adapter cable to connect to this speaker.

12.   Final Checkout

Power up your subwoofer!
Power up your pinball system!
Start a game!
Make sure the front panel switch on the PinPac Control panel is in the "UP" position if you have the headphone kit installed.
Verify sound can be heard from the Back Box speakers and the lower Cabinet speaker.
Adjust the subwoofer to your liking.

13.   PIN-SMX

While we have your attention! Please check out our PIN-SMX passive subwoofer mixer kit at Pinnovators.com.

The PIN-SMX allows you to connect up to four pinball machines to one subwoofer. Each input is fully isolated from the others to prevent ground loops. Each input level is fully adjustable so you can adjust each game sub level to your liking.
Enjoy your new Subwoofer kit!
The Pinnovators team.