PINWOOFER

Take your time, follow the instructions, relax, and enjoy yourself!

WARNING: Perform installation with your pinball machine turned off and unplugged from AC power.

PinWoofer Spike PowerWave Plus Amplifier Installation Instructions

Foreword and Resources

This document should be reviewed in all cases for a general overview of your new PowerWave Amplifier Install and general placement of kit components.

This document contains vital information that may not be covered elsewhere.

Review your order and determine which components are included in your kit.

Below are links to the most common installation documents and videos.

PowerWave Plus:

Amplifier Installation Video Link: https://youtu.be/43fLPXMrViY

Backbox Speaker Plates:

Instruction link: https://pinwoofer.com/content/PW-525-PLATE-Instructions.pdf

Video Link: https://youtu.be/GJnpu82xjMI

Backbox Speakers:

Stern OEM Speaker Light Kit Spacers:

Instruction Link: https://pinwoofer.com/content/PW-Spike-2-Stern-Speaker-Light-Spacer-Instructions.pdf

Pro / Premium 4in to 5.25in Mounting Rings:

Instruction Link: https://pinwoofer.com/content/PW-4in-to-5.25in-Interposer-Instructions.pdf

Video Link: https://youtu.be/dPsXrWMtu2I

Limited Edition or upgraded 5.25in plate Mounting Rings:

Instruction Link: https://pinwoofer.com/content/PW-5.25in-Spacer-Instructions.pdf

Video Link: https://youtu.be/LZZj4DkKDGc

Cabinet Speaker:

Instruction Link: https://pinwoofer.com/content/PW-8in-Standard-Cabinet-Speaker-Instructions.pdf

Video Link: https://youtu.be/CvRlMDqpq60

Speaker Preparation

- If you are installing new backbox speakers, remove the existing backbox speakers now.

- If you are installing a new cabinet woofer, remove the existing cabinet woofer now.

- Install your new cabinet woofer as shown.

Remove Existing
Backbox Speakers

Remove Existing
Cabinet Woofer, install
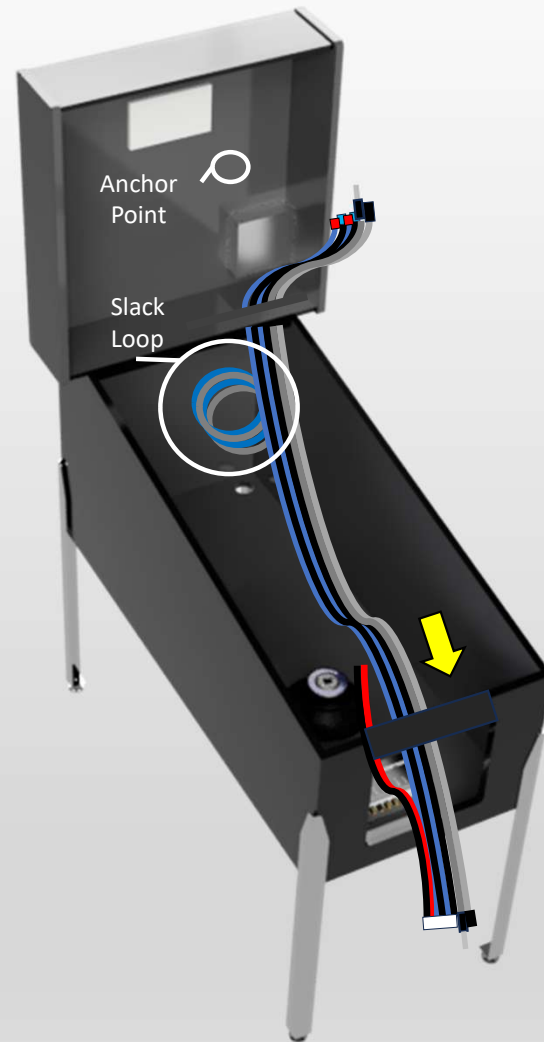New Cabinet Woofer

1

PINWOOFER

Amplifier Placement

- Remove the Coin Box and replace it with the amplifier resting as shown.

- Do not attach the mounting screws at this time. Wait until you've first tested your new audio system.

- Since the PinWoofer Amplifier will be a permanent fixture in your pinball machine, it is recommended that you utilize the provided screws and mount the amplifier to the cabinet floor.

- Utilizing the screws allows for the machine to be transported without removing the amplifier.

- Alternatively, a high-bond double-sided tape can be used to secure the amplifier to the Cabinet Floor, or adhesive hook and loop pads. In this case, please remove amplifier before transport.

Harness Routing

- Unplug the machine from AC Power.

- Open the Coin Door.

- Remove the Playfield Glass.

- Lift the Playfield and prop it up.

- Remove the backglass and lower the Speaker Panel. (Speaker Panel is not shown.)

- Feed the Amplifier End of the PinWoofer Harness down and through the rectangular hole in the right side of the backbox, into the cabinet, then route the remainder down the interior of the cabinet and through the Coin Door opening as shown.

- Leave approximately 12in (about a 4in to 5in circular loop) of slack at the position shown. This will provide enough extra cabling to allow the backbox to be closed later without stressing the harness.

- After you've made all backbox connections, and using a cable tie, anchor the wiring harness to a wire loom near the right-hand side of the backbox. Doing so "pins" the wire harness in the backbox so that the slack loop will be taken up if the backbox is lowered to its closed position.

Anchor Point

Slack Loop

3

PINWOOFER

Power Connection

- Unplug the 5-Pin Factory Connector from CN7.

- Plug the 5-Pin Factory Connector into the PinWoofer Power Board.

- Plug the PinWoofer Harness 2-Pin Power Connector into the Power Board.

- Plug the Power Board into CN7.

- Secure Harness Power Cable Wiring to nearby Wire Looms and use Cable Ties to relieve any cable tension on the Power Board.
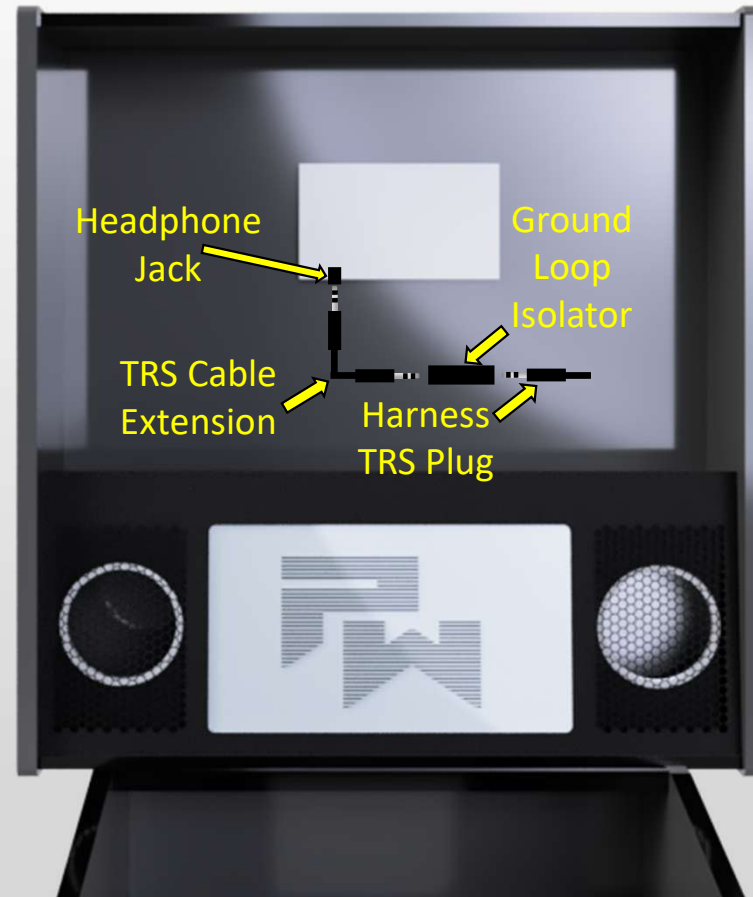
Power Connector

Spike Power Board

CN7

PINWOOFER

4

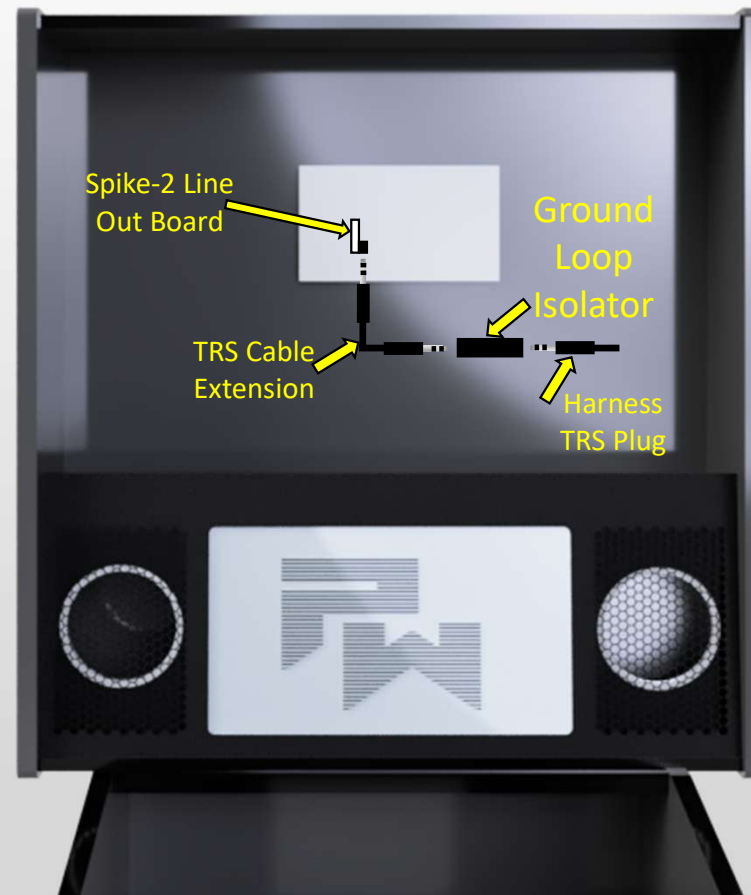# Spike (a.k.a "Spike-1" Audio Connection

- The original Spike titles include:
  - Game of Thrones
  - Ghostbusters
  - Heavy Metal
  - KISS
  - Primus
  - Supreme
  - Wrestlemania

- If your title is not listed above, proceed to the Spike-2 instructions on the next slide.

- Plug one end of TRS Cable Extension into the CPU Node Board Headphone Jack.

- Plug the other end of the TRS Cable Extension into the Ground Loop Isolator.

- Plug the Harness TRS Plug (from the PinWoofer Harness) into the Ground Loop Isolator.

- You will need to increase the service menu headphone volume (to about 75% to 100% of maximum) when the installation is complete.

- Secure Harness Audio Cable Wiring to nearby Wire Looms and use Cable Ties to relieve any cable tension on the Spike CPU Node Board.

Headphone Jack

Ground Loop Isolator

TRS Cable Extension

Harness TRS Plug

5

PINWOOFER

Spike-2 Audio Connection

- Plug the Spike-2 Line Out Board to the CN5 / CN3 header pair.

- Plug the TRS Cable Stub (from the Ground Loop Isolator) into the Mini-Jack on the Spike-2 Line Out Board.

- Plug the Harness TRS Plug (from the PinWoofer Harness) into the Ground Loop Isolator.

- Secure Harness Audio Cable Wiring to nearby Wire Looms and use Cable Ties to relieve any cable tension.

- "Early" Spike-2 Titles (Iron Maiden and prior) may have a 6-Pin Header at CN5. If applicable, please review the below document for notes on your Line Out Board installation:
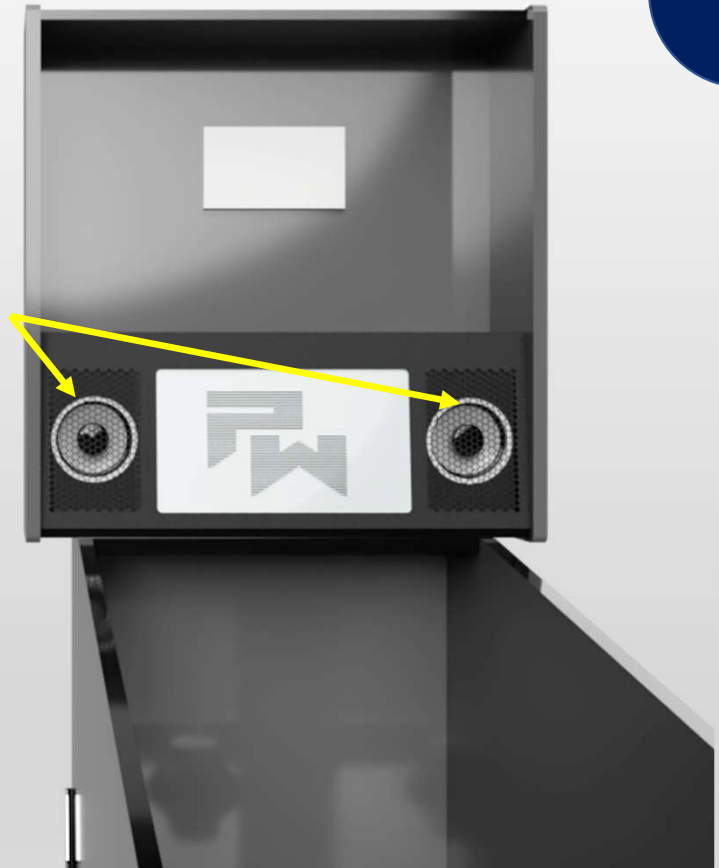
https://pinwoofer.com/content/PW-PowerWavePlus-Spike-2-6-pin-Versus-7-pin-CN5-Header.pdf

Spike-2 Line Out Board

Ground Loop Isolator

TRS Cable Extension

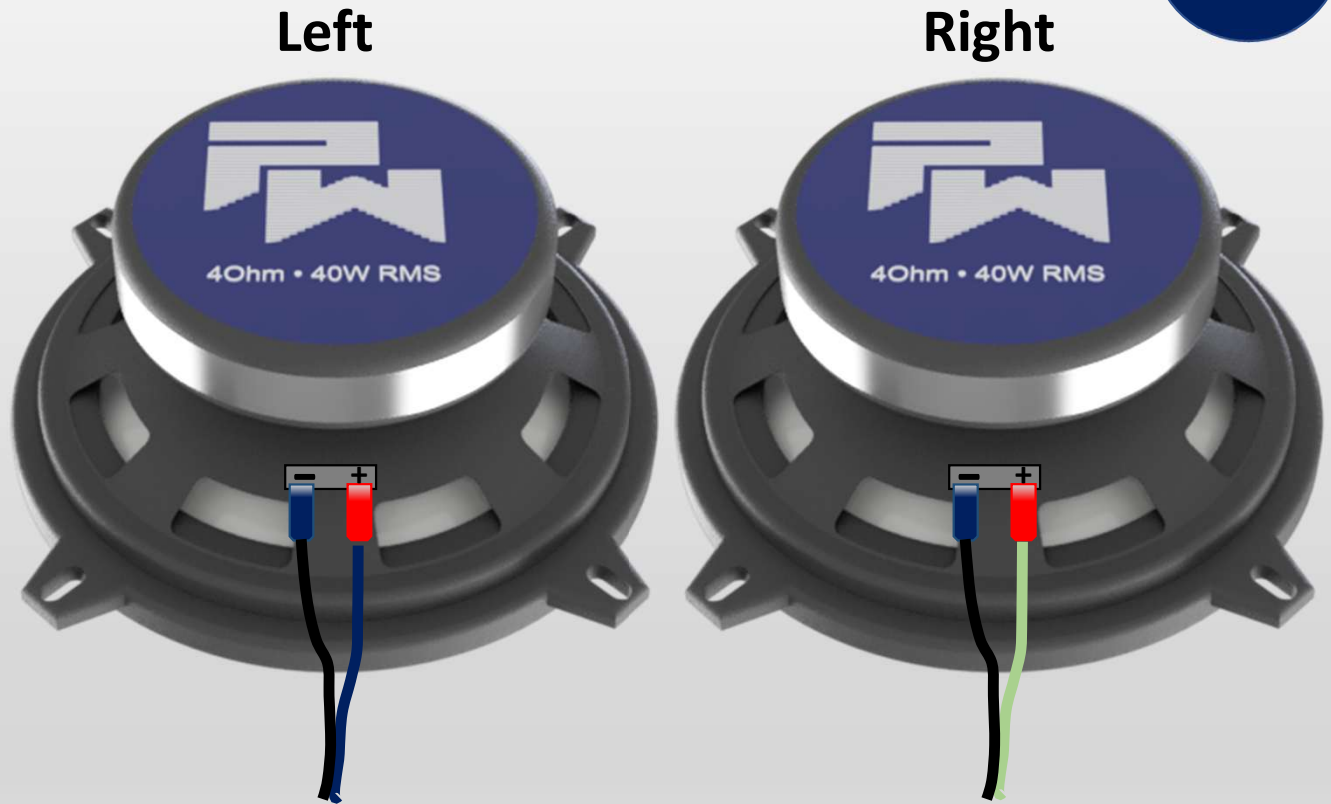Harness TRS Plug

PINWOOFER

Install New Backbox Speakers

- If you have new backbox speakers, install them now.
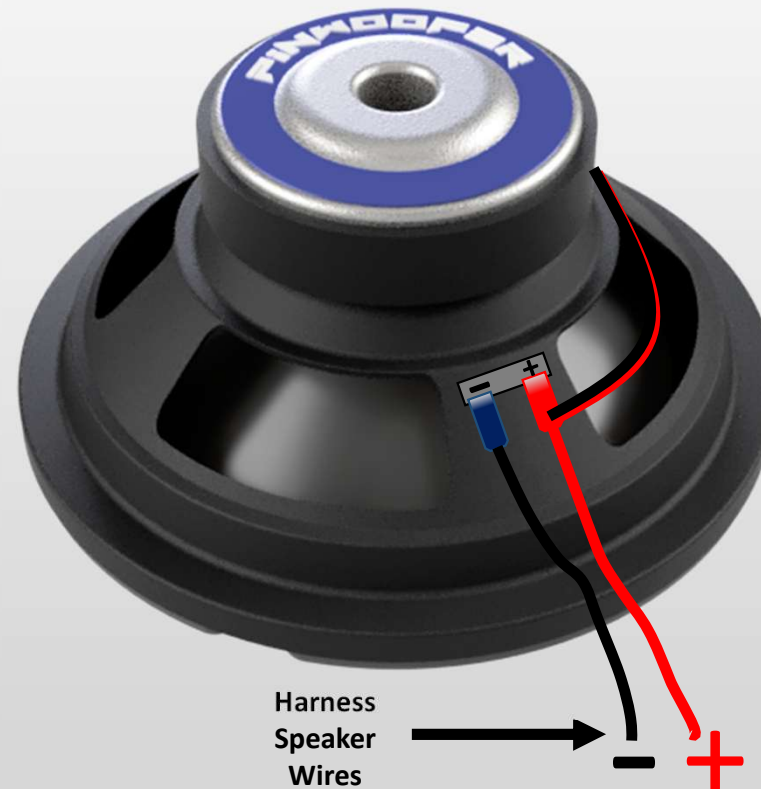
Install New
Backbox Speakers

PINWOOFER

Connect Backbox Speakers

- Connect the Blue/Black Speaker Wire Pair on the PinWoofer Harness to the left-hand side speaker terminals:
    - Connect the Blue wire to "+" Terminal
    - Connect the Black wire to "-" Terminal

- Connect the Green/Black Speaker Wire Pair on the PinWoofer Harness to the right-hand side speaker terminals:
    - Connect the Green wire to "+" Terminal
    - Connect the Black wire to "-" Terminal

Left

Right

4Ohm • 40W RMS

4Ohm • 40W RMS

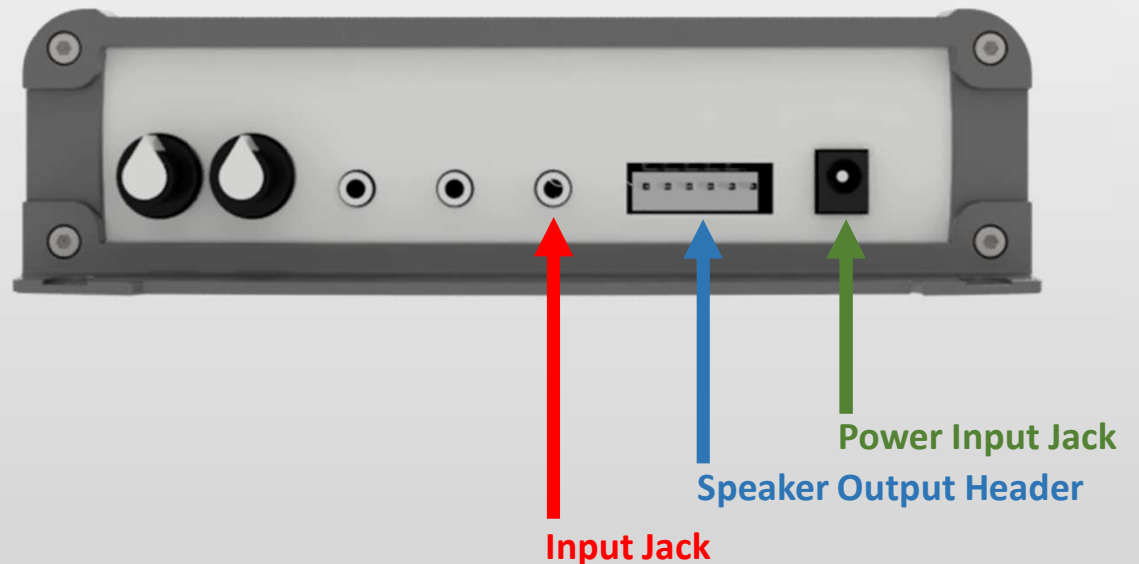PINWOOFER

Connect Cabinet Speaker

- Do not alter the factory wires present on your new Cabinet Speaker.

- Connect the Red / Black Speaker Wire Pair on the PinWoofer Harness to your Cabinet Speaker Terminals:
    - Connect the RED wire to "+" Terminal
    - Connect the BLK wire to "-" Terminal

Harness Speaker Wires

Amplifier to Harness Connections

- Insert the Power Plug into the **Power Input Jack**.

- Plug the 6-Pin Molex Connector into the **Speaker Output Header**. (The Connector tab locks should be facing upward.)

- Insert the TRS Male Min-Plug into the **Input Jack**.

Power Input Jack

Speaker Output Header

Input Jack

PINWOOFER
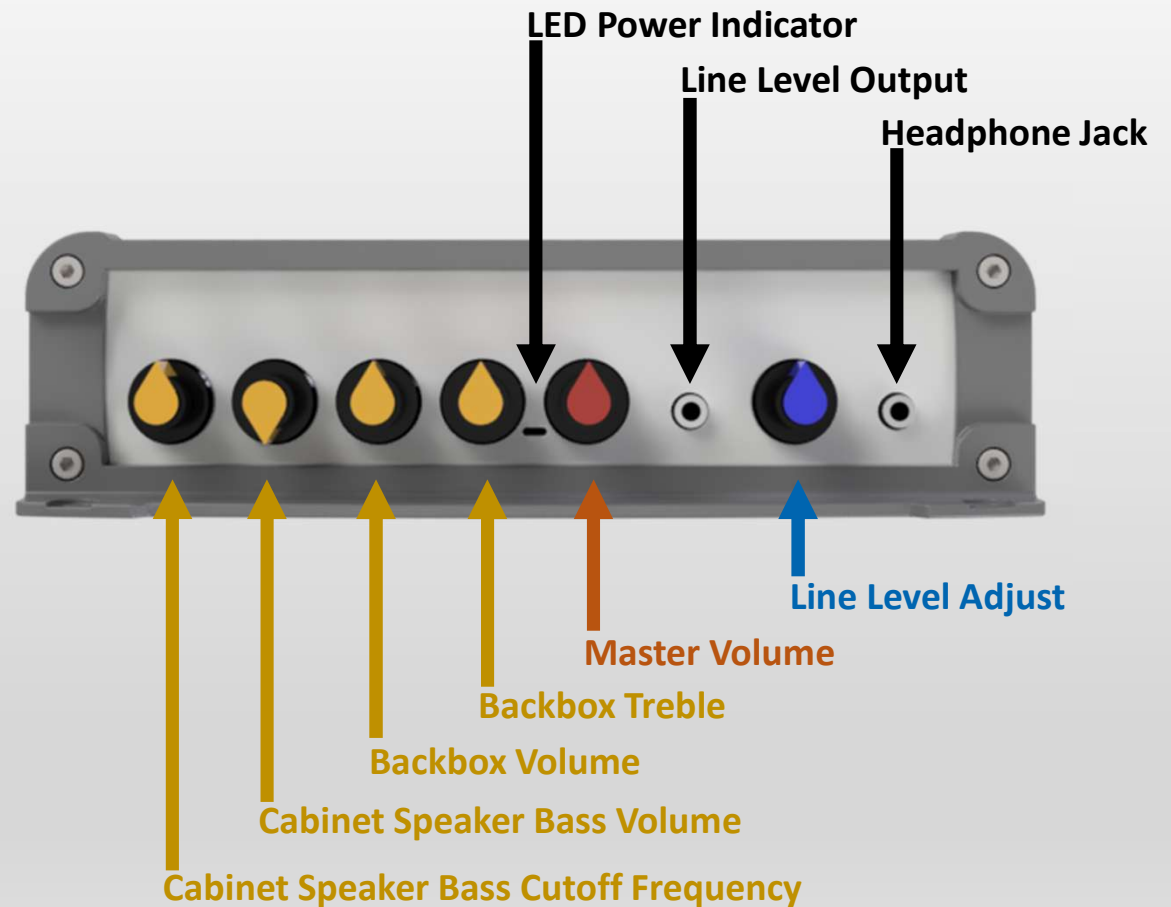
AMPLIFIER OVERVIEW

Top View of PowerWave Plus

AMPLIFIER OVERVIEW

Before first powering on your PowerWave Plus Amplifier, adjust the controls as shown:

- **"Bass Vol" (Cabinet Speaker Bass Volume) set to max, or "6 o'clock"**
- **All other controls set to mid-deflection, or "12 o'clock"**

LED Power Indicator

Line Level Output

Headphone Jack

Line Level Adjust

Master Volume

Backbox Treble

Backbox Volume

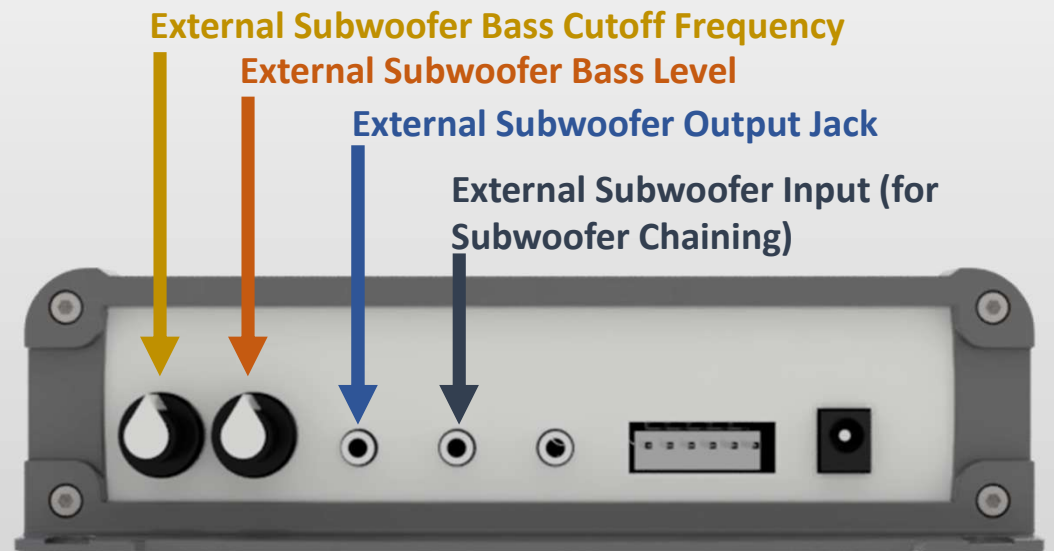**Cabinet Speaker Bass Volume**

Cabinet Speaker Bass Cutoff Frequency

PINWOOFER

15

External Subwoofer - Amplifier Features

- The **External Subwoofer Bass Cutoff Frequency** Control adjusts the output low-pass filter.

- The **External Subwoofer Bass Level** Control adjusts the bass output level.

- The **External Subwoofer Output Jack** is used to connect the amplifier external subwoofer output signal to the external subwoofer signal input.

- The **External Subwoofer Input** is used to interconnect multiple PowerWave(x) Amplifiers, from multiple machines, and chain their subwoofer signals into one external subwoofer.

External Subwoofer Bass Cutoff Frequency
External Subwoofer Bass Level
External Subwoofer Output Jack
External Subwoofer Input (for Subwoofer Chaining)

PINWOOFER

16

ADJUSTMENTS

- **After installation, turn the machine olink orllow the below startup procedure:**
  1. Set the service Menu Volume (using coin door volume buttons) between 15 and 25.
  2. In the machine's menu set all audio settings to default:
     SERVICE MENU → VOL → FEAT ADJ → HIGH/LOW SHELF (DEF) = OFF
     SERVICE MENU → VOL → FEAT ADJ → Backbox Speaker Impedance = 8 Ohm
     SERVICE MENU → ADJ → FEAT ADJ → SPEECH ATTENUATION = 0
     SERVICE MENU → ADJ → FEAT ADJ → MUSIC ATTENUATION = 0
  3. "SERVICE MENU" values above can be revisited later, after making adjustments to the amplifier.
  4. Set the amplifier dials as shown on the previous pages.
  5. It is possible that the starting amplifier settings from 4. above may not be optimum for your hearing.
  6. Be confident in rotating the dials to any position that sounds good to you but be aware that radical departures from the starting settings can result in a poor outcome.
  7. Further adjust the amplifier controls by starting a game or alternating the volume up/down buttons. Some titles continue playing (or start playing sounds when you enter the VOL menu during a game).
  8. Note that there may be a high voltage lock-out switch (a white pin) on the coin door that needs to be constantly depressed or pulled out to lock in the on position.
  9. Your final adjustments may leave the dials in different positions. This is perfectly fine as long as you have achieved your desired results.
  10. As needed, return to the menu to make adjustments to the audio settings.
  11. Many titles have suggested initial settings at PinWoofer.com in the blog. Visit our blog at the below link, or search the game title in the upper right-hand corner of the web page.
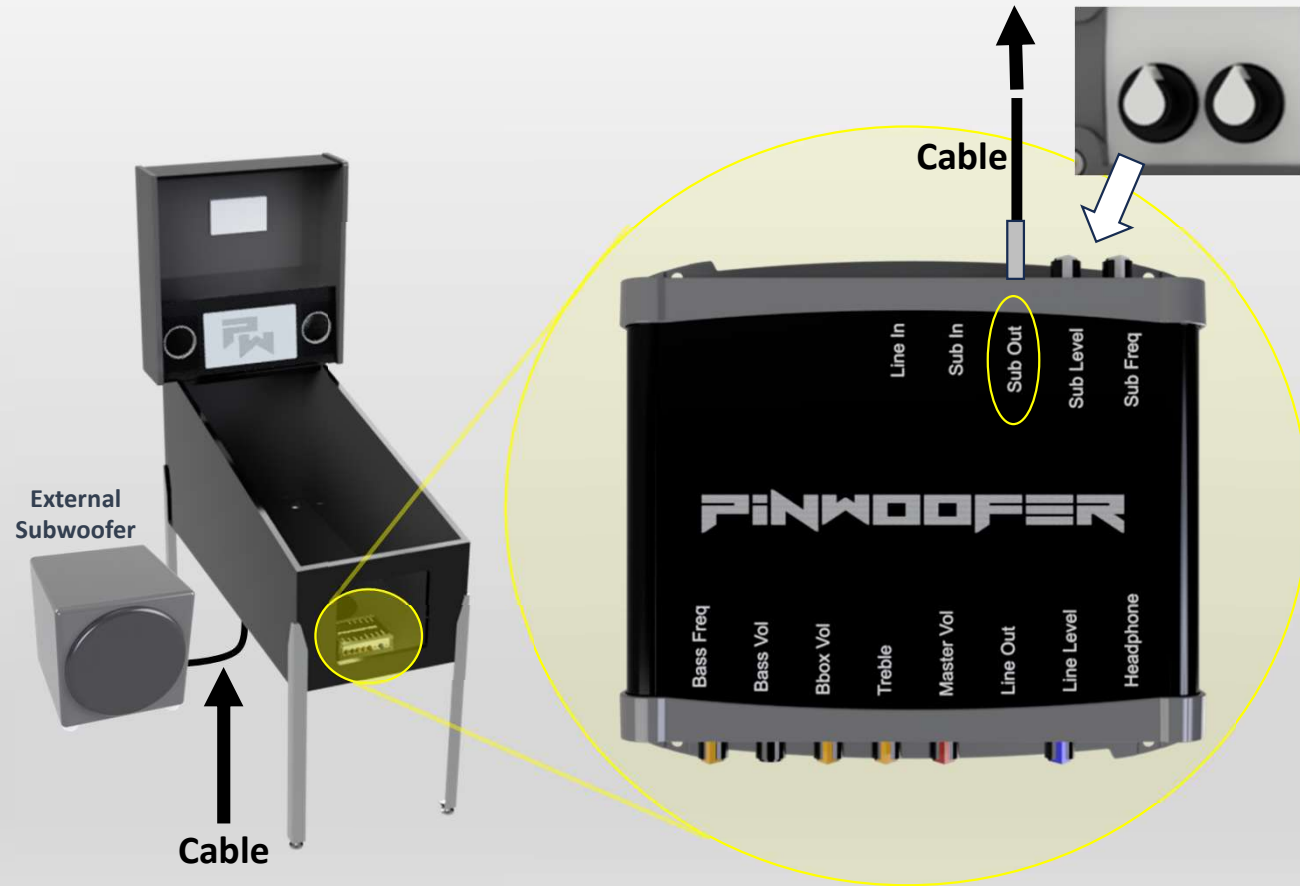
     https://pinwoofer.com/blog/

PINWOOFER

EXTERNAL SUBWOOFER

Connecting one Machine to an External Subwoofer

- Typical connection
- Using a 12ft or longer TRS Stereo Male Mini-Plug to RCA Stereo Male:
  - Plug the TRS plug into the "Sub Out" Jack on the PW Amplifier
  - Route the External Subwoofer end of the cable through and down one of the ventilation holes. (You will need to pry up the grille enough to allow for the cable to exit the cabinet.)
  - Plug the RCA Male connectors to the input jacks on the external subwoofer
- Prior to turing on the machine and External Subwoofer, set the "Sub Level" and "Sub Freq" to mid-deflection as shown.

External Subwoofer

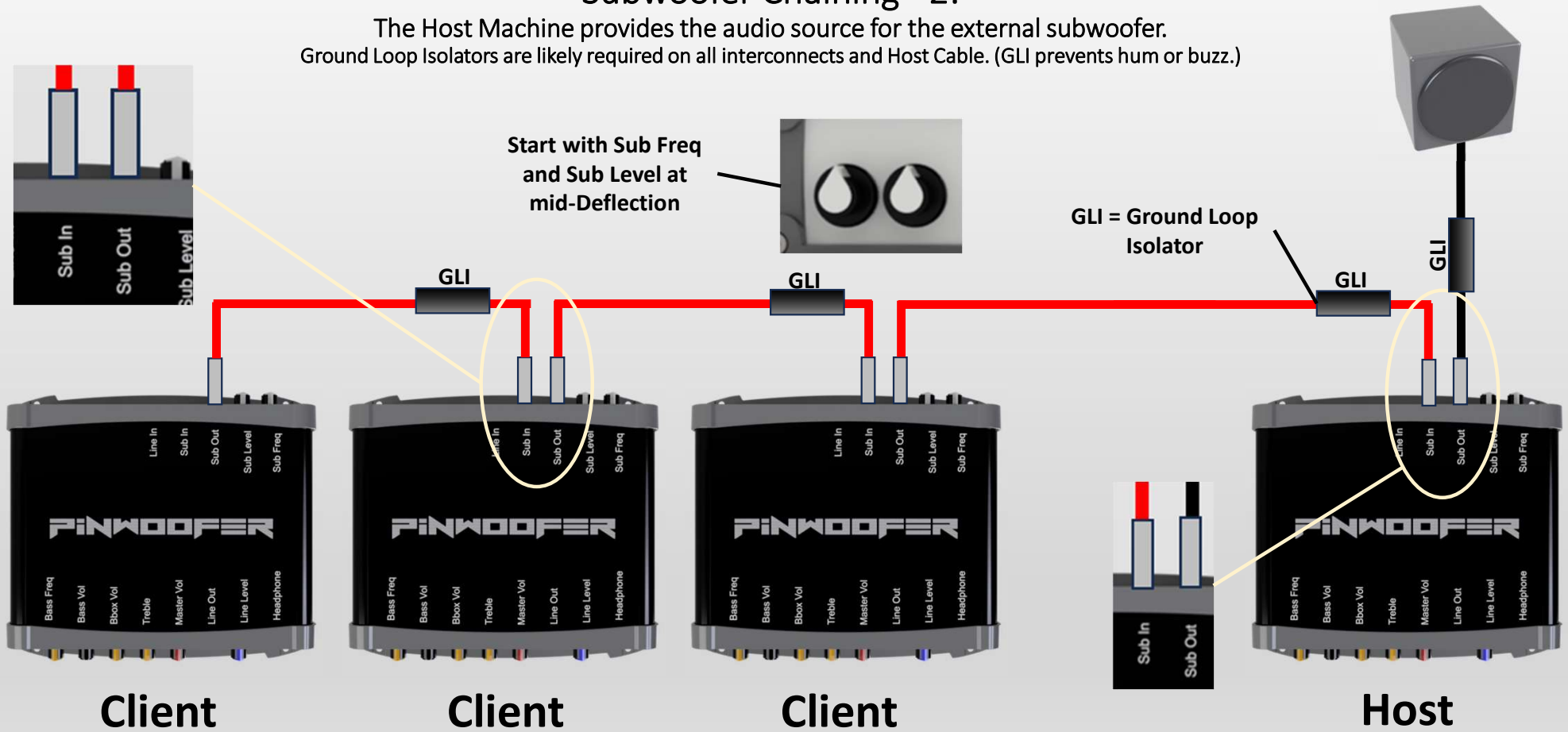**Cable**

Cable

PINWOOFER

EXTERNAL SUBWOOFER

Subwoofer Chaining - 2:
The Host Machine provides the audio source for the external subwoofer.
Ground Loop Isolators are likely required on all interconnects and Host Cable. (GLI prevents hum or buzz.)

Start with Sub Freq and Sub Level at mid-Deflection

GLI = Ground Loop Isolator

GLI

GLI

GLI

GLI

Client

Client

Client

Host

PINWOOFER

PINWOOFER

End of Document