PiXLWAV

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

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

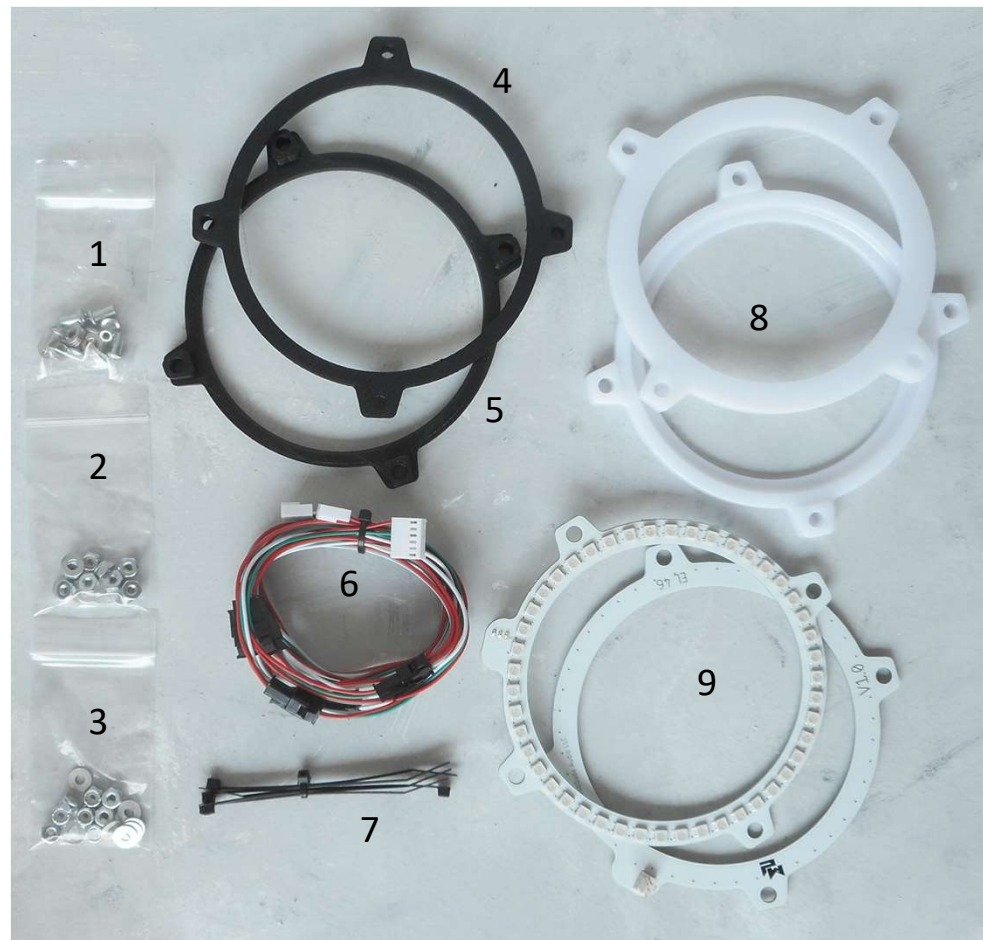# PixlWav Spike-2 Expression Speaker Light Upgrade Kit Instructions

PIXLWAV

If you have non-PW or non-PinWoofer speakers (such as the Kenwood KFC-1366), please review the addendum at the end of this document before starting.

Kit Components

(Note that you will have a few mounting components left over after the install is complete.)

1. Quantity 8 each, #8 Flat Washers & #6-32 x 3/8" Binding Screws

2. Quantity 8 each, #6 Flat Washers & #6-32 Nylon Locking Nuts

3. Same as 2.

4. Quantity 2, 0.1" Speaker Mounting Spacers

5. Quantity 2, 0.2" Speaker Mounting Spacers

6. Wiring Harness

7. Cable Ties

8. Polycarbonate Injection Molded Diffuser Mounts

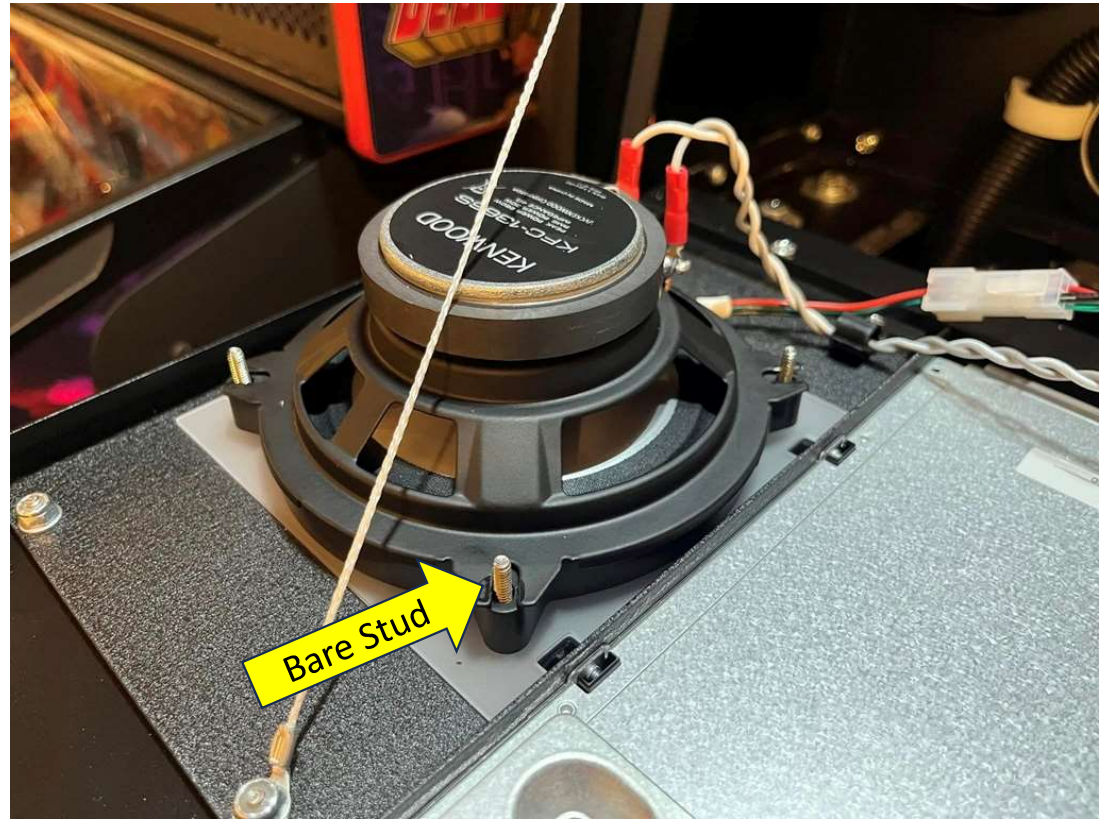9. Quantity 2, LED Illuminator Rings

PIXLWAY

Deinstall Stern Speaker Lights - 1

- Shown is a typical speaker, installed on the Stern Speaker Light Ring.

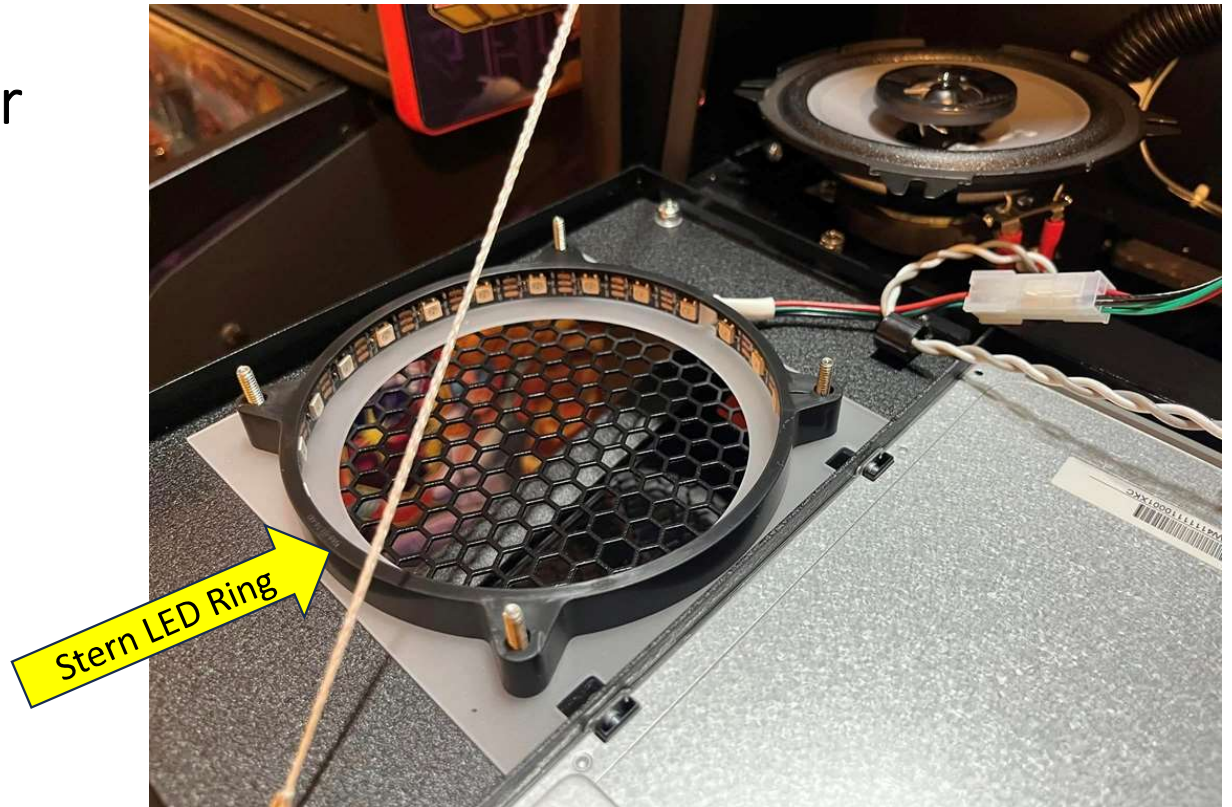- There are 4 nuts and washers securing the speaker.

Nut and Washer

Deinstall Stern Speaker Lights - 2

- Remove the nuts and washers to reveal the bare studs.

Bare Stud

Deinstall Stern Speaker Lights - 3

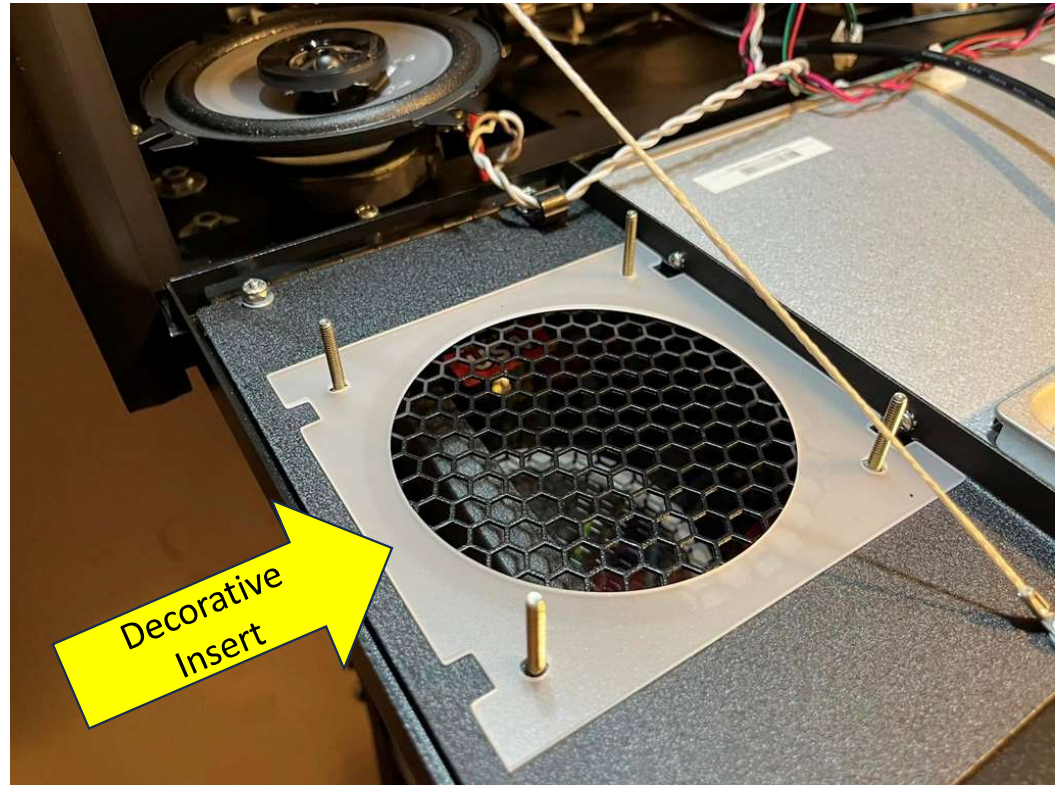- Remove the speaker.

Stern LED Ring

PIXLWRX

Deinstall Stern Speaker Lights - 4
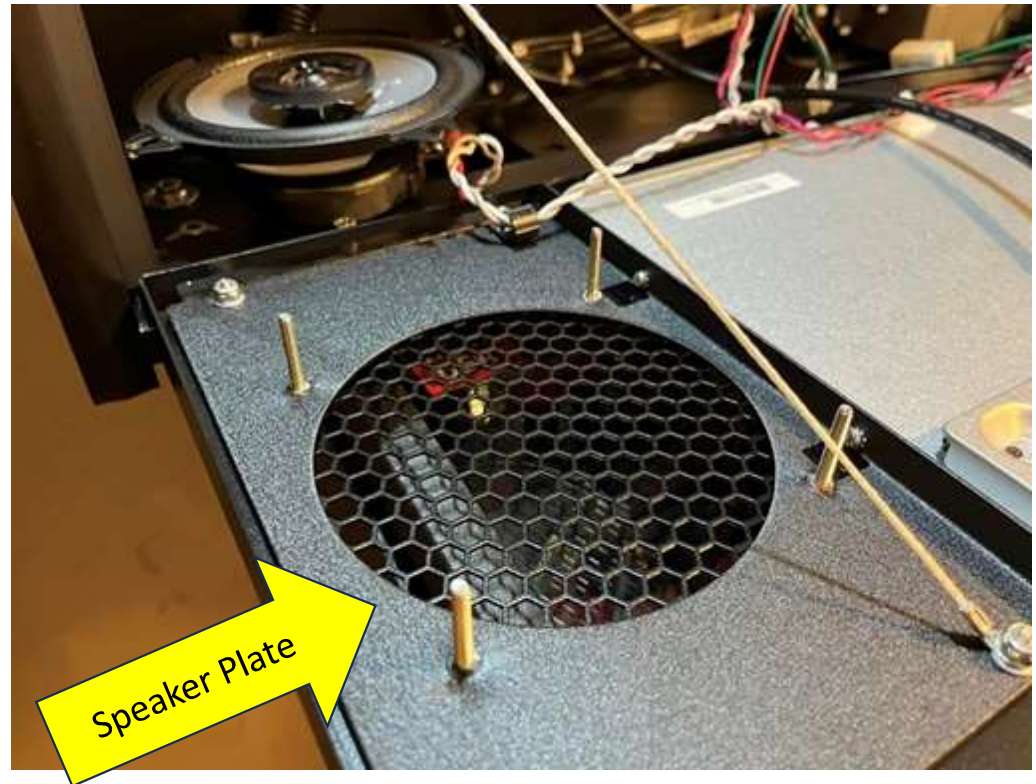
- Remove the Stern LED Ring.

Notes:

- You may have a decorative insert as shown.

- You can keep your decorative insert installed if you choose. If your insert is colored or highly opaque, it will influence the light transmitted by your new PixlWav LED Diffusers. Meaning, the color / opacity of your insert may tend to dominate the color field or brightness.

- Your new PixlWav Diffusers provide light transmission of all colors and are recommended to be used stand-alone.

- Decide if you will keep your decorative inserts or use only the PixlWav color neutral mounting diffusers.

Decorative Insert

Deinstall Stern Speaker Lights - 5

- Shown is the exposed speaker plate if the decorative insert has been removed.
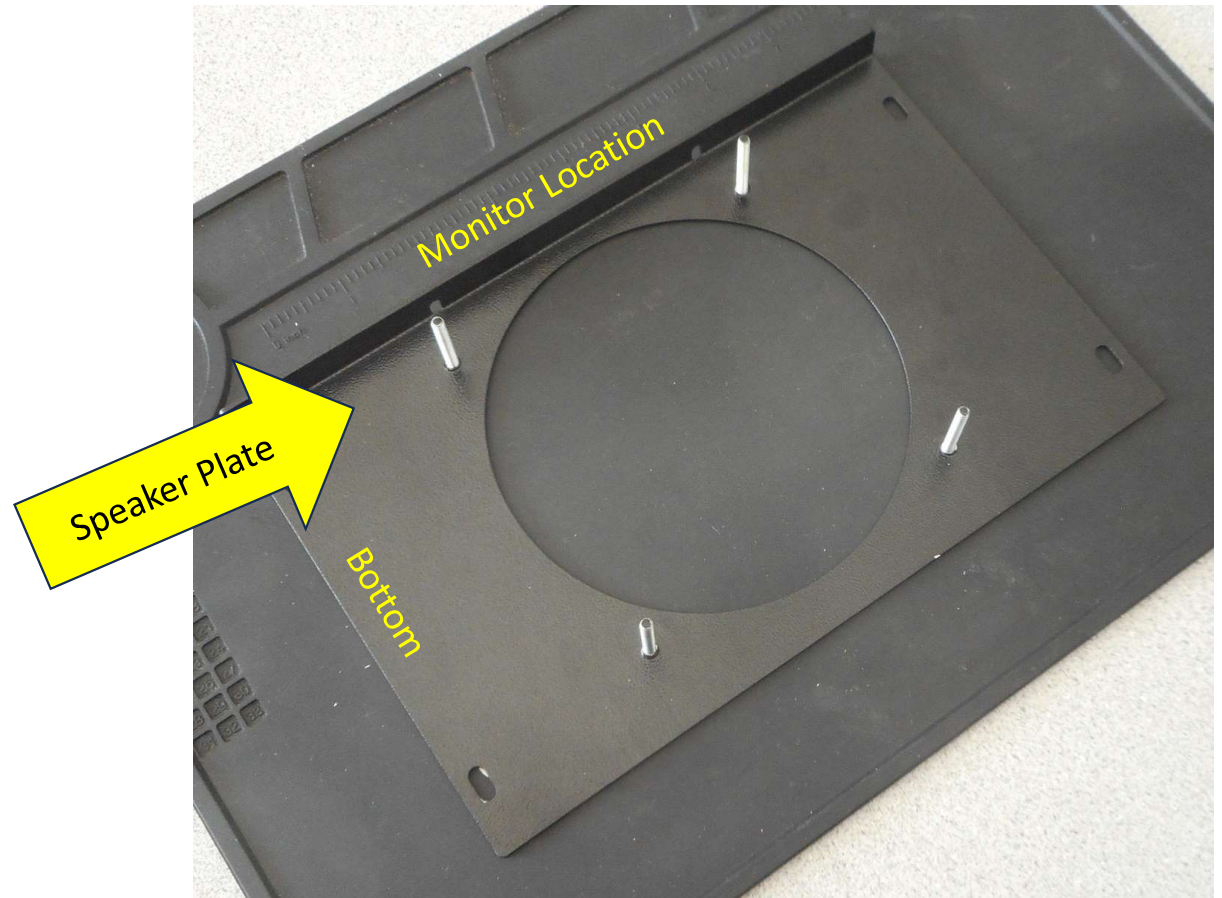

Speaker Plate

Install Slides - Foreword

- The following installation slides are shown with the plate removed (and "on the table", so to speak) for ease of illustration and clarity.

- It is not required that you remove your speaker plate(s) from the machine. Feel free to perform your install with your speaker plates in the machine.

- Finally, there are two possible methods to mount your speakers. The choice is up to you. There are adequate parts for each scenarios:

    1. Using a decorative insert: Slides "Using a Decorative Insert [1-10]" below.

    2. Without a decorative insert **(this is the recommended method):** Slides "Without a Decorative Insert [1-7]" below.
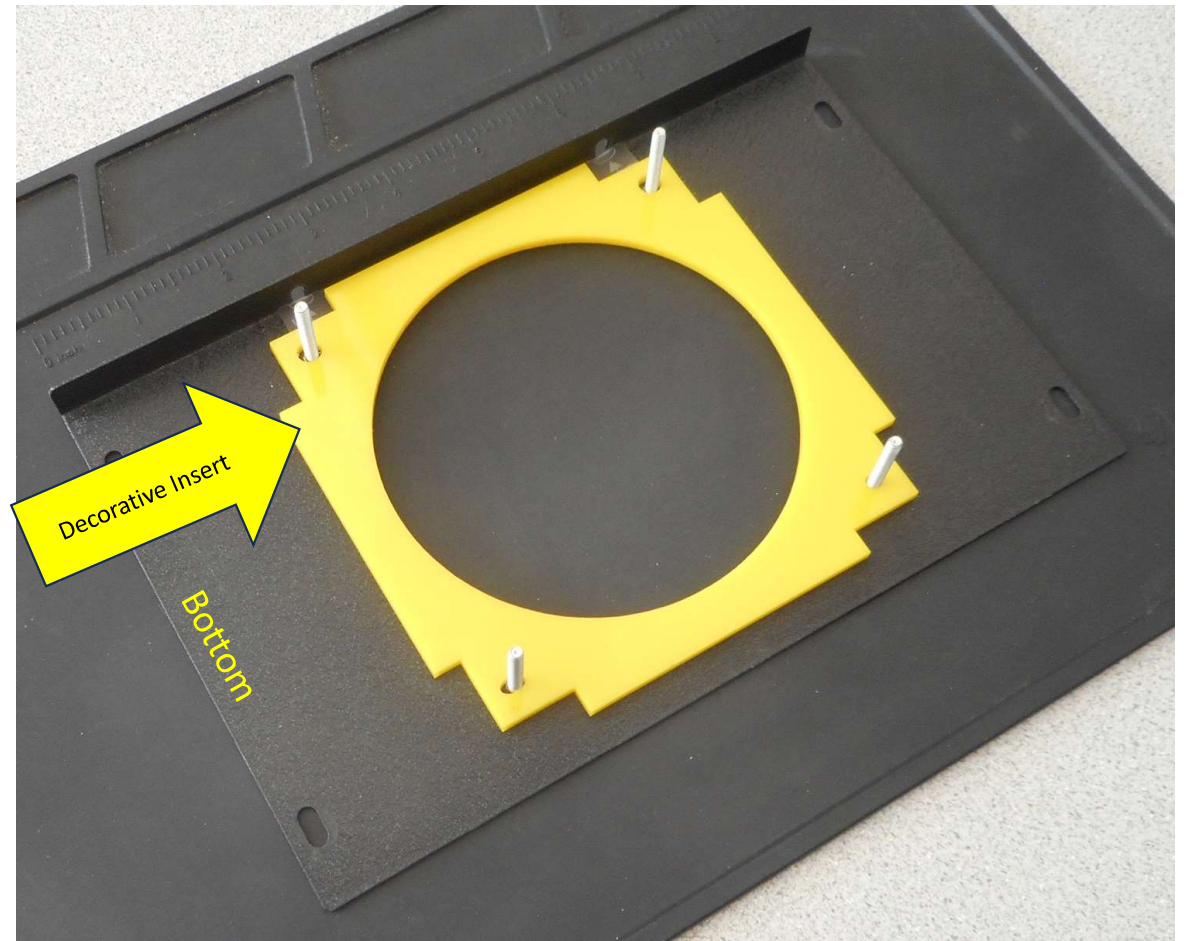
PiXLWY

Using a Decorative Insert - 1

- Shown is an unpopulated Speaker Plate.

- This is the Left-Hand Speaker Plate as viewed from the front of the machine.

- The monitor location is shown for reference.

- The bottom of the Speaker Panel is shown for reference.

- Installation for the Right-Hand side will be the same as the left as shown in the following slides, but accounting for the change of side.

Using a Decorative Insert - 2

- Decorative Inserts vary greatly. This example uses a Stern LE model. Yours may differ; this is OK.

- Place the decorative Insert on the Speaker Plate Studs as shown.
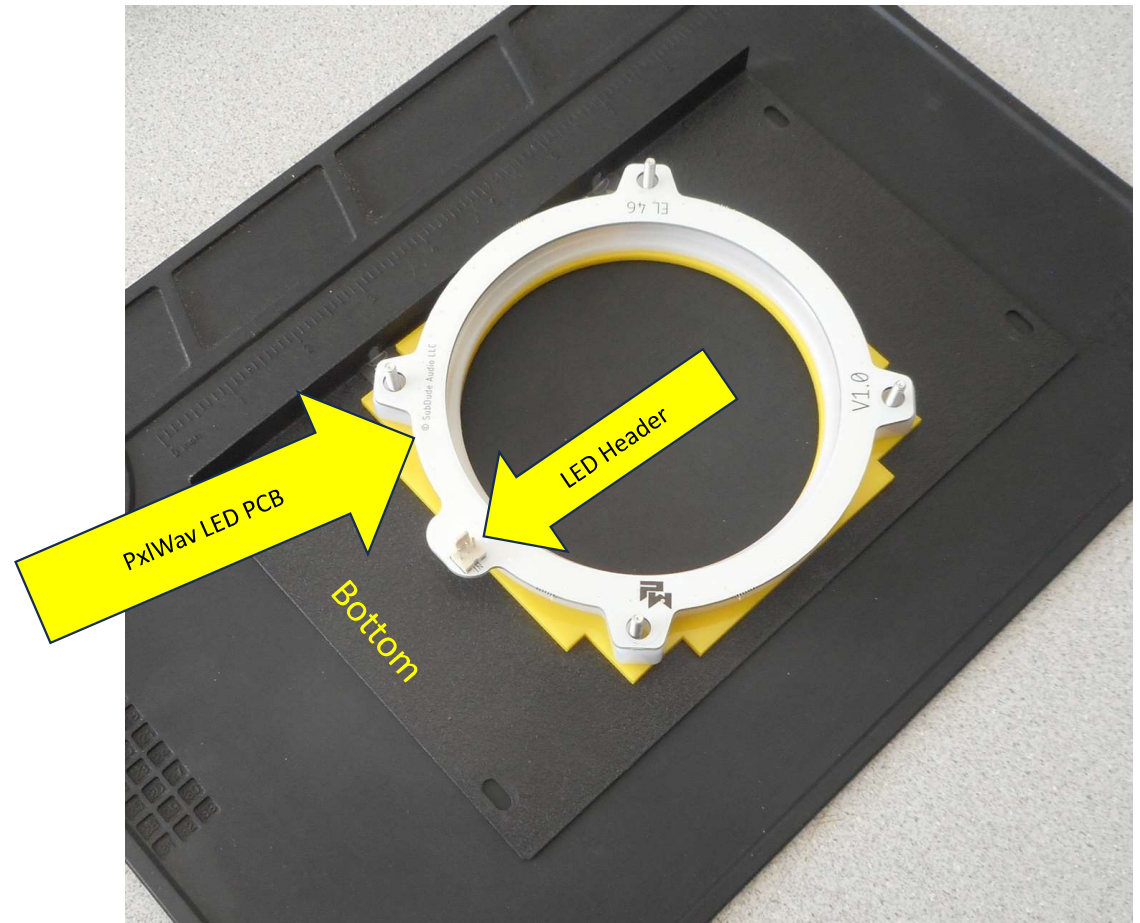
Decorative Insert

Bottom

PIXLWNK

Using a Decorative Insert - 3

- Place a PixlWav Injection Molded Polycarbonate Diffuser Ring on the Decorative Insert as shown.

PxlWav Injection Molded Polycarbonate Diffuser Ring

Bottom

Using a Decorative Insert - 4

- Place a PixlWav LED PCB over the Diffuser as shown.

- The LEDs face into the Diffuser Pocket / Shelf.

- The LED Header's final position must be located towards the bottom of the Speaker Panel after installed. Please consider this orientation and commit to it before proceeding.

Using a Decorative Insert - 5

- Place a Thin Spacer over the Speaker Plate Studs and the LED PCB.
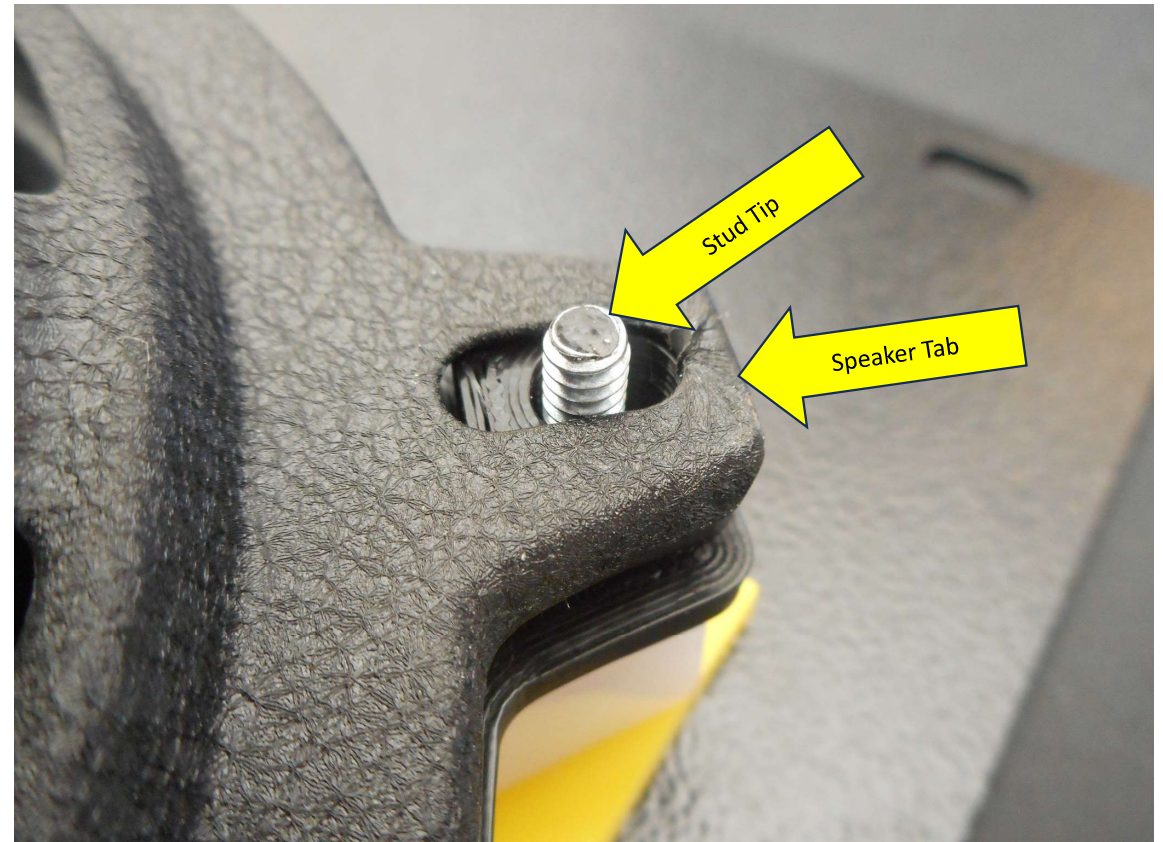

Thin Spacer

Bottom

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Using a Decorative Insert - 6

- Place a Speaker over each Speaker Plate Stud oriented as shown.

- Note the location of the Speaker Terminals and the LED Header.

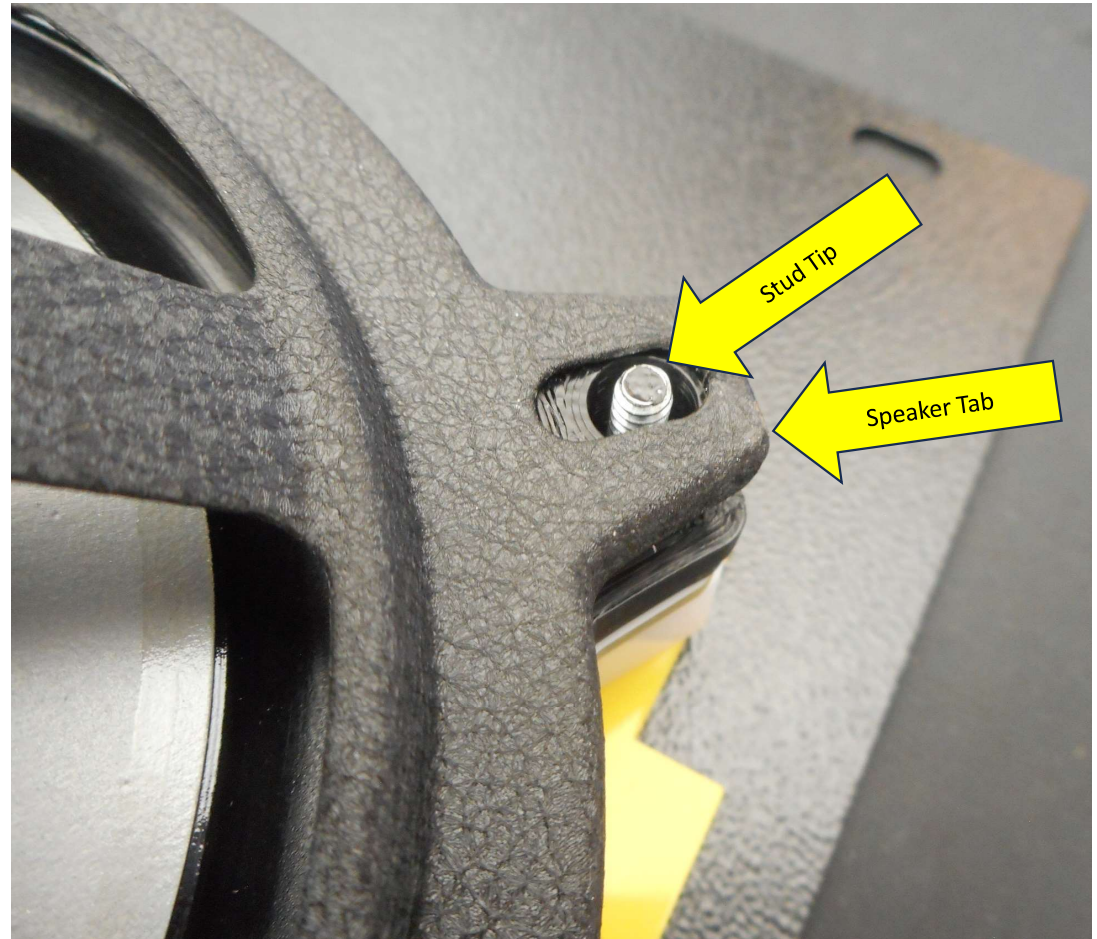Speaker Terminals

LED Header

Bottom

Using a Decorative Insert - 7

- Examine the Speaker Plate Stud.

- If the Stud Tip extends beyond the Speaker Tab as shown in the image, switch to the Thick Spacer.

- If the threads are flush to, or below the speaker Tab, keep the thin spacer in play.

- Move to the next slide now.

Stud Tip

Speaker Tab

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Using a Decorative Insert - 8

- Shown is the ideal Stud Tip Depth.

- If the stud is a few millimeters below the Speaker Tab that is OK.

Stud Tip

Speaker Tab

Using a Decorative Insert - 9

- Add one #8 Flat Washer and #6-32 x 3/8" Binding Barrel Screw to one of the studs.

- Start Binding Barrel Screws one at a time by hand, ensuring that you have bit into thread but avoid forcing them.

- You may need to work the position of the speaker slightly as you hand start each screw.
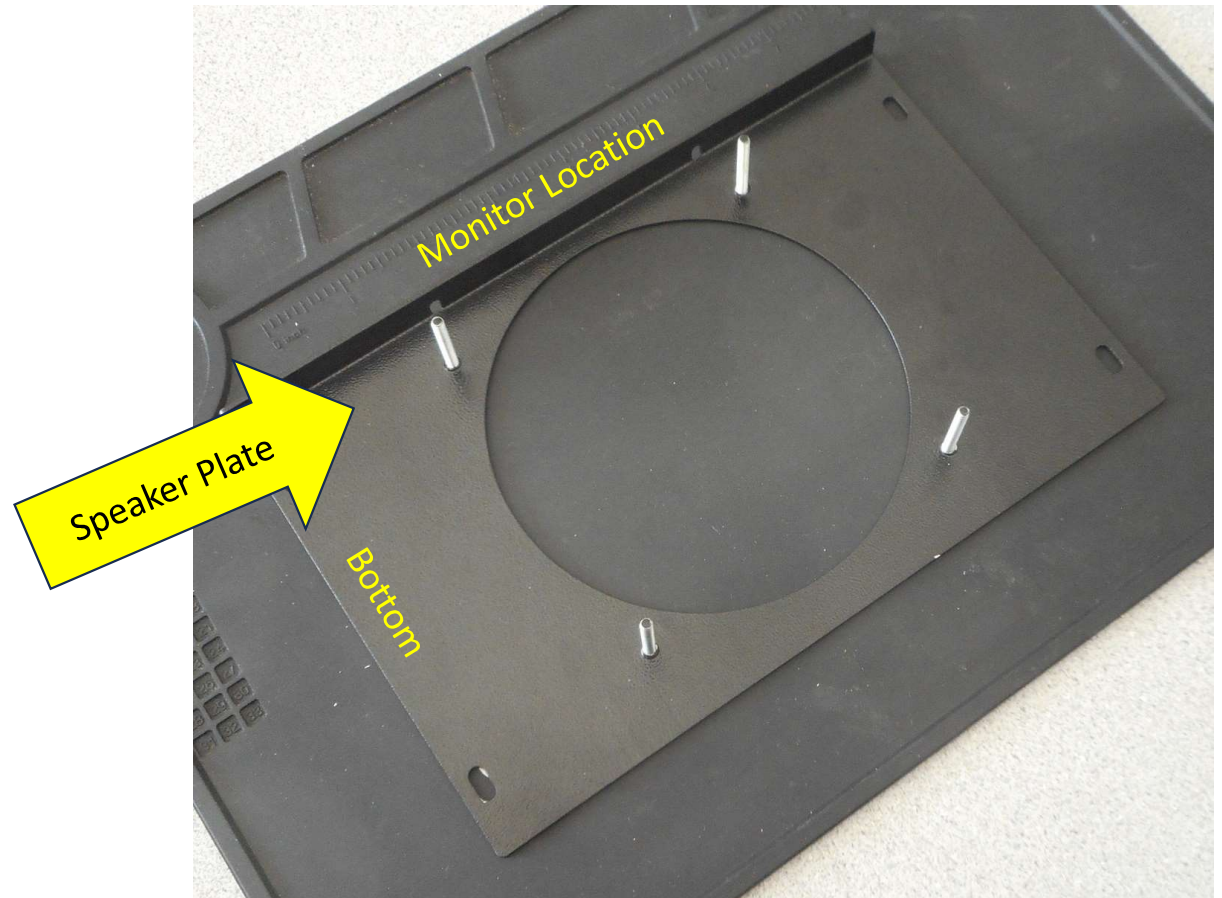
- Be patient.

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Using a Decorative Insert - 10

- Secure all Binding Barrel Screws.

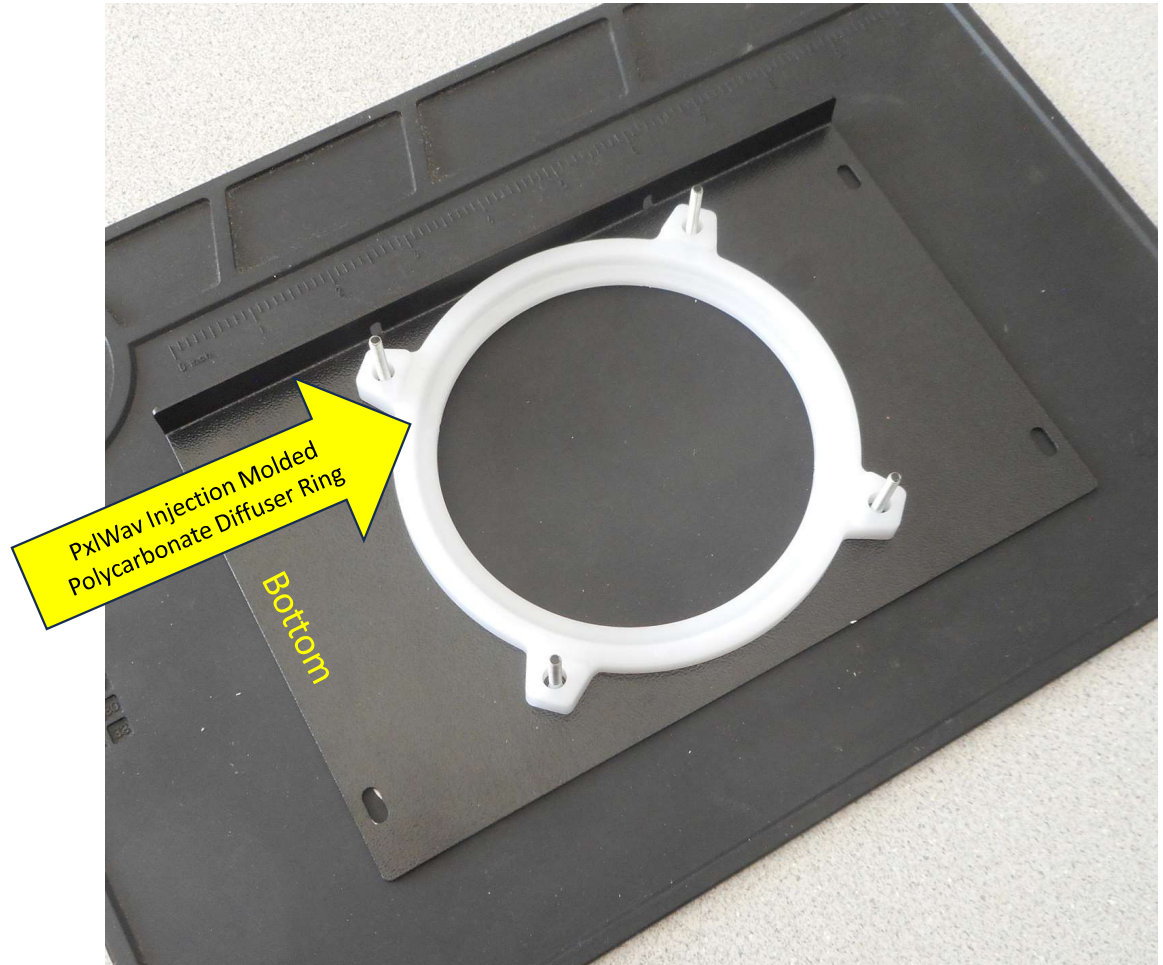- Hand tighten only, do not use excessive force.

Bottom

Without a Decorative Insert - 1

- Shown is an unpopulated Speaker Plate.

- This is the Left-Hand Speaker Plate as viewed from the front of the machine.

- The monitor location is shown for reference.

- The bottom of the Speaker Panel is shown for reference.

- Installation for the Right-Hand side will be the same as the left as shown in the following slides, but accounting for the change of side.

Monitor Location

Speaker Plate

Bottom

Without a Decorative Insert - 2

- Place a PixlWav Injection Molded Polycarbonate Diffuser Ring on the Plate Studs as shown.

PxlWav Injection Molded Polycarbonate Diffuser Ring
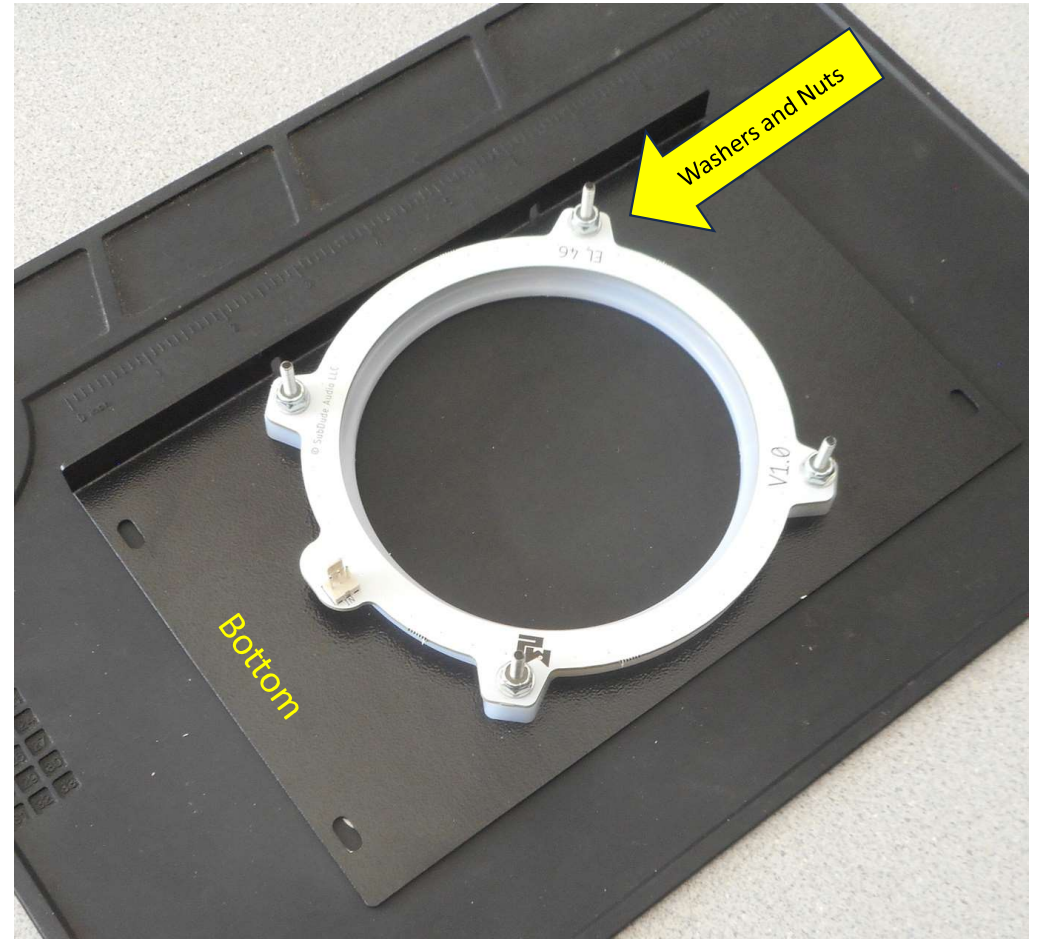
Bottom

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Without a Decorative Insert - 3

- Place a PixlWav LED PCB over the Diffuser as shown.

- The LEDs face into the Diffuser Pocket / Shelf.

- The LED Header's final position must be located towards the bottom of the Speaker Panel after installed. Please consider this orientation and commit to it before proceeding.
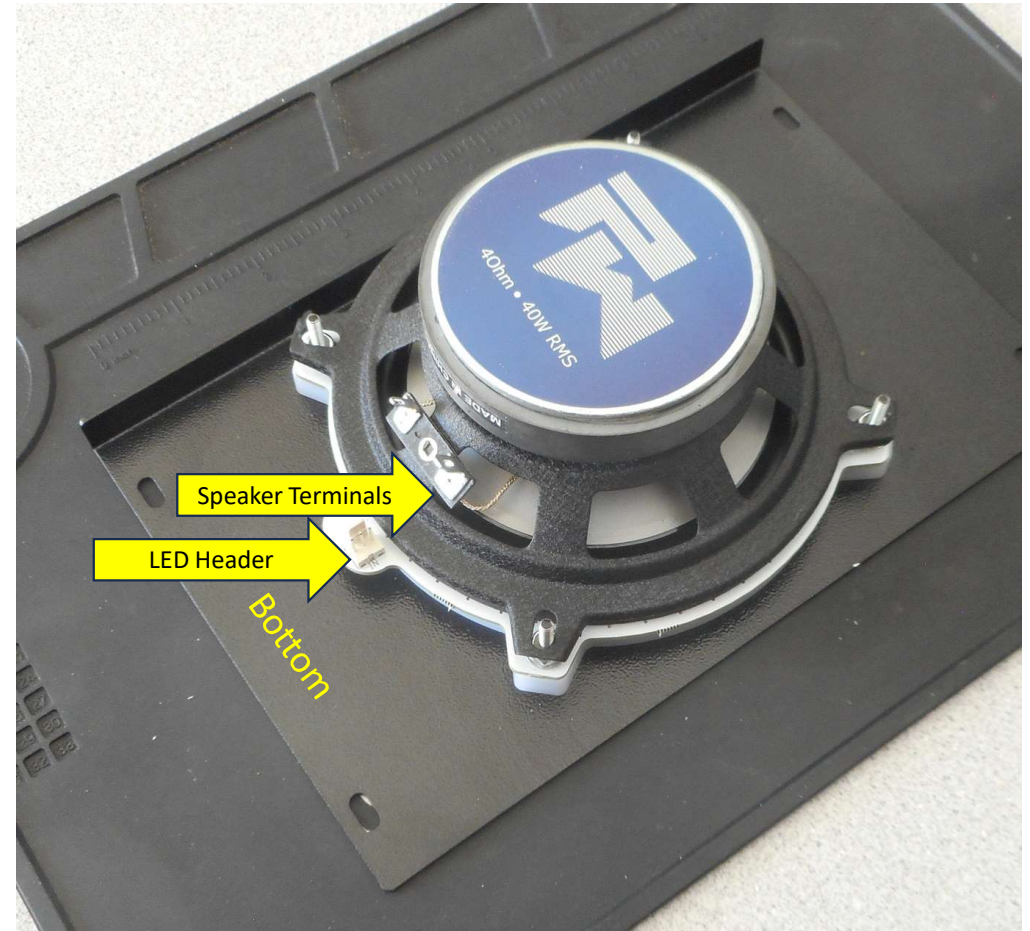

PxlWav LED PCB

LED Header

Bottom

Without a Decorative Insert - 4

- Place a #6 Flat Washer and #6-32 Locking Nut on each Speaker Plate Stud.

- Finger tighten until the Nylon Stop reaches the stud.

- **HAND TIGHTEN ONLY!** Over-tightening can result in damage to the PCB and render the LED non-functional. Do not over-tighten.

- Tighten each nut until secure.

Without a Decorative Insert - 5

- Place a Speaker over each Speaker Plate Stud oriented as shown.

- Note the location of the Speaker Terminals and the LED Header.

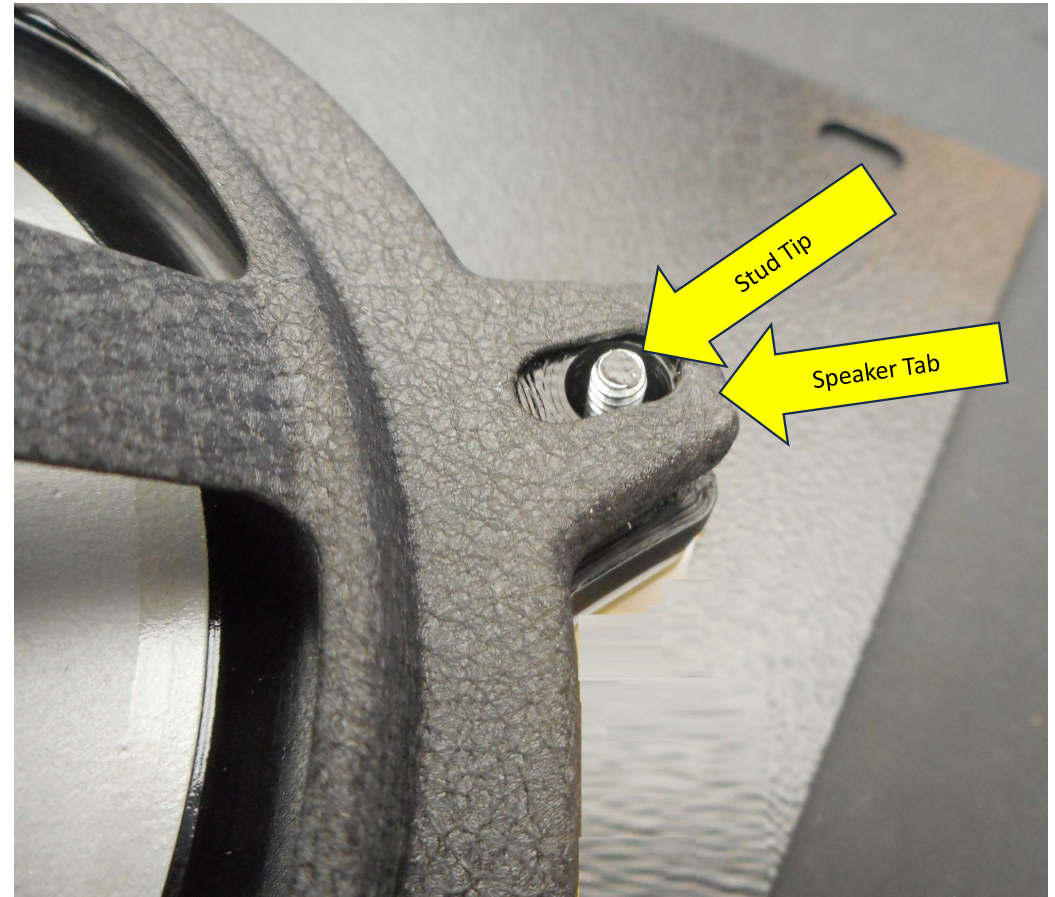Speaker Terminals

LED Header

Bottom

Without a Decorative Insert - 6

- Decorate Inserts may vary in thickness.

- Speaker Plate Stud lengths vary.

- Tweeter Assemblies vary and may extend into the Speaker Panel Honeycomb.

- Because of this, be ready to adjust.

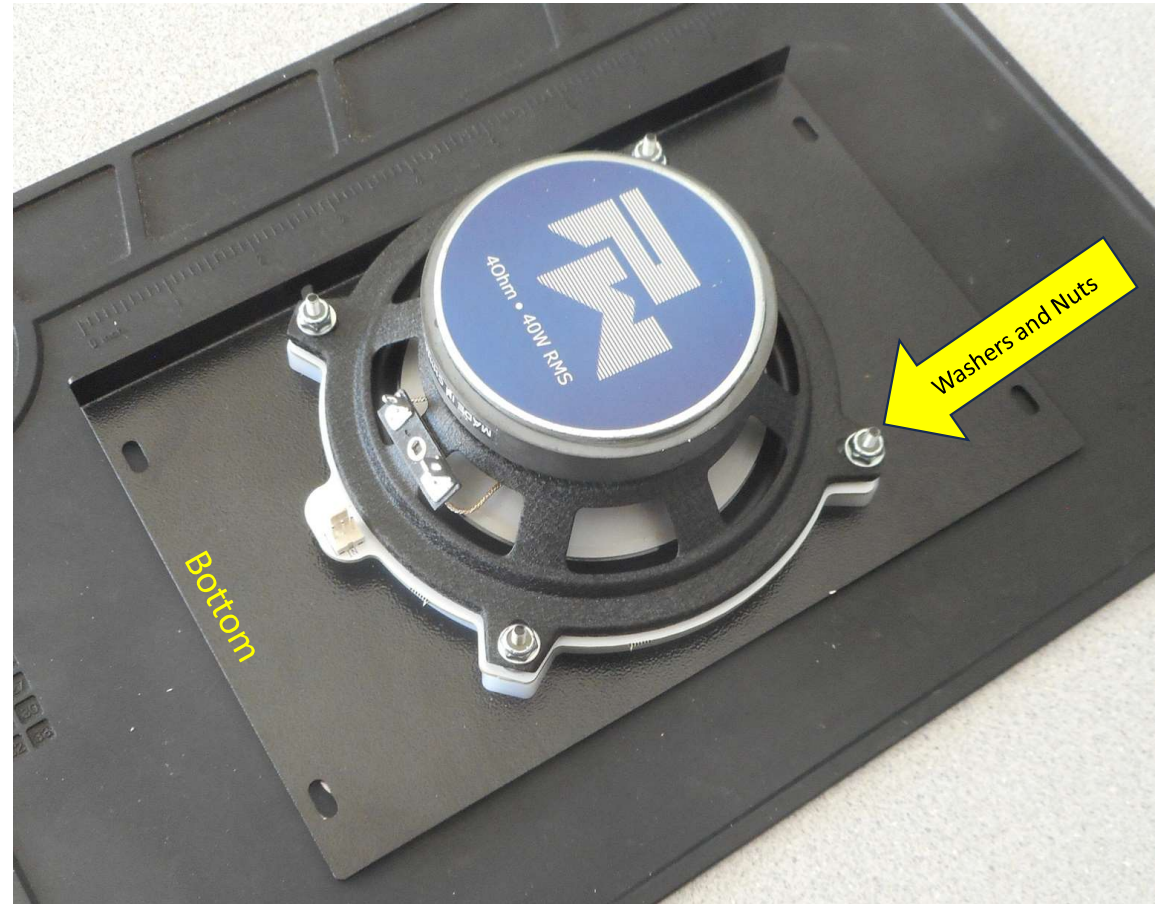**Examine the Speaker Plate Studs.**

- If you believe that there is not enough thread exposed to get a nut and washer over the stud (in the next step), you may want to use a spacer. Do not panic. Simply remove the Washers and Nuts added in step "Without a Decorative Insert - 4", and then pick up the instructions at step "Using a Decorative Insert - 5". (Of course, continue without a Decorative Insert but using the mounting steps shown.)

Otherwise, move to the next step.

Stud Tip

Speaker Tab

Without a Decorative Insert - 7

- Add a #6 Flat Washer and #6-32 Nylon Locking Nut to each stud as shown.
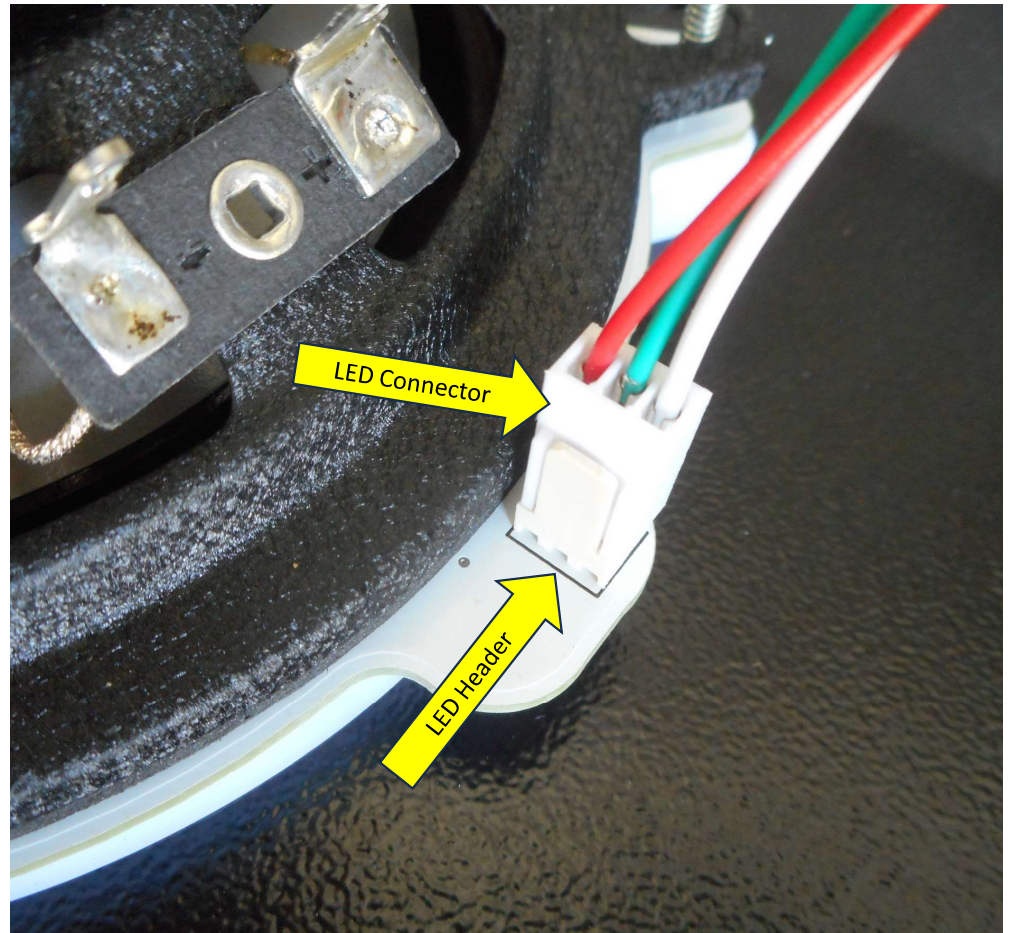
- Hand tighten, do not over-tighten.

Repeat the Above Installation Process for the Right-Hand Side Speaker
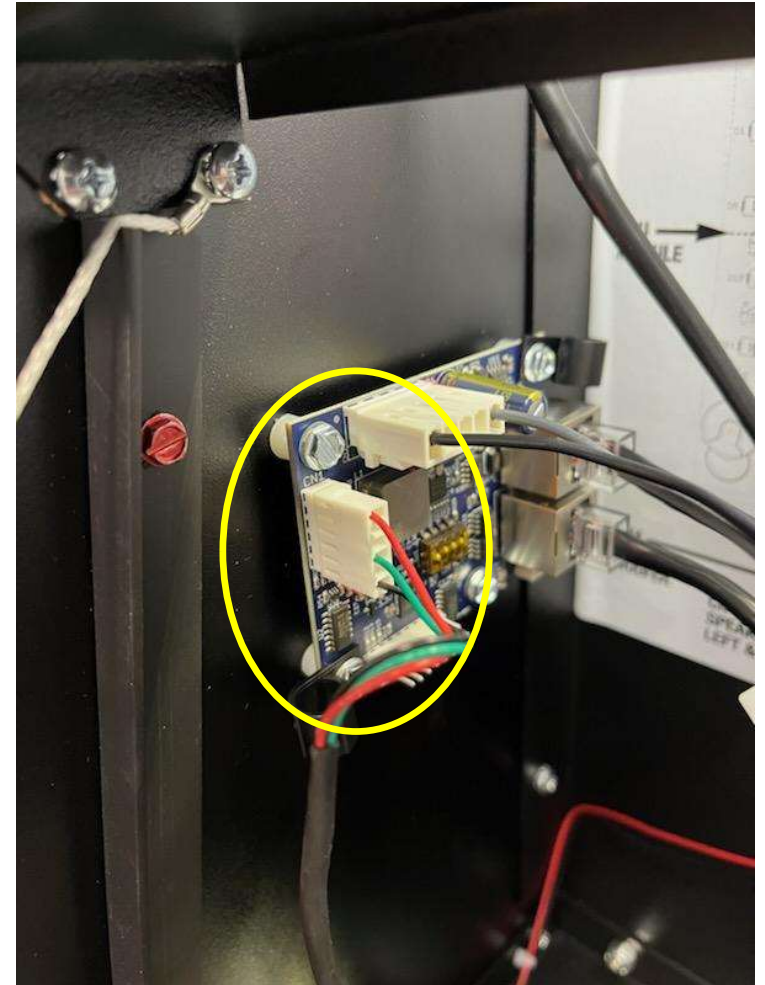
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Connect LEDs

- Plug the longer 3-wire connector to the Right-Side LED header as shown.

- Do the same with the shorter connector on the Left-Side LED.

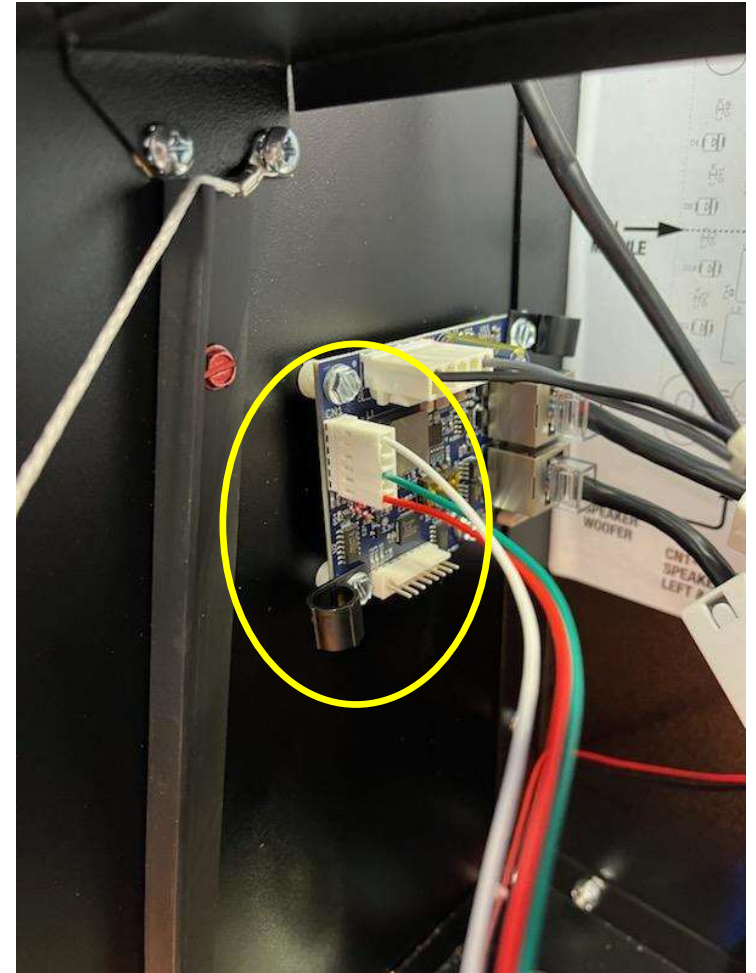LED Connector

LED Header

Native Speaker Light Connection

1. At the interior, left-side of the backbox, locate the blue expression light node board.

2. The Speaker Light Connector is circled in yellow.

3. Carefully disconnect this connector.

New Speaker Light Connection

1. Plug the supplied harness connector as shown circled in yellow.

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You Have Installed your LED Speaker Lights

Addendum - 1

- Shown to the right is a non-PW / non-PinWoofer speaker.

- For this example, the Kenwood KFC-1366S is used.

- Please read this addendum in its entirety and then return the start of this instructional document.

Addendum - 2

- This speaker has no integrated gasket for sealing the speaker to a speaker mount.

- A GAP results from mounting this speaker to the PixlWav Mounting Diffuser hardware.

- A gasket's purpose is to allow a pressure wave to develop between the front and back of the speaker which increase mid-bass levels.

- A missing gasket not only sounds "thin", but the speaker and stack-up can vibrate audibly.

- This condition cannot persist and must be addressed.
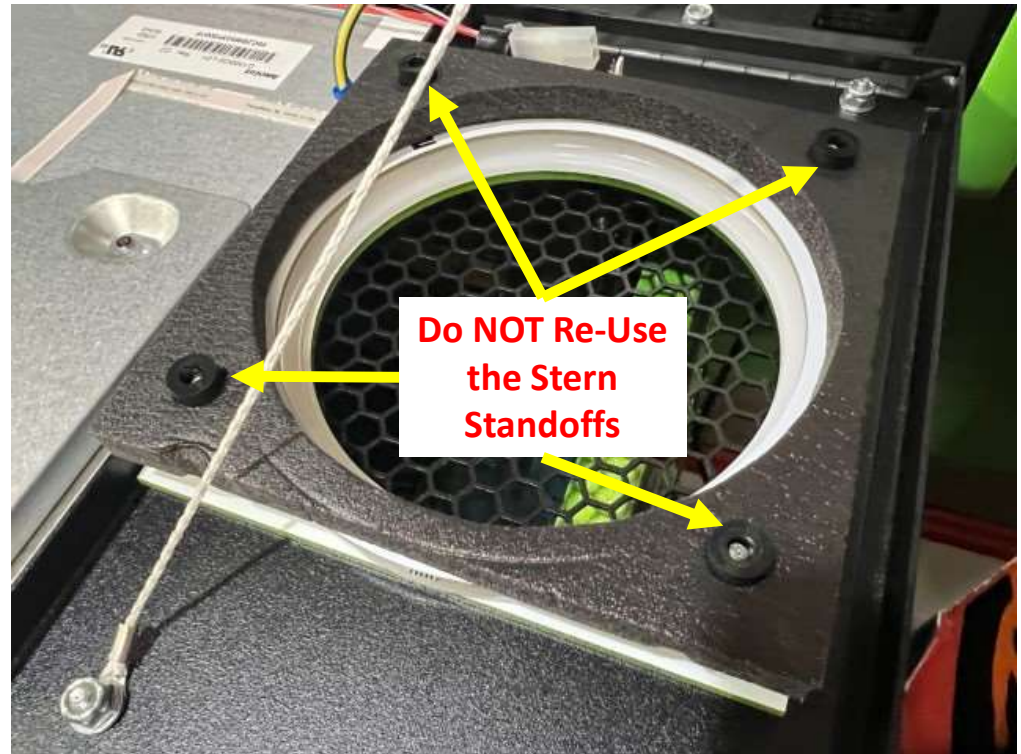

GAP

PiXLWAV

Addendum - 3

- Pictured to the right is a speaker plate with a stern 5.25in Foam Speaker Gasket.

- This is Stern part #626-5113-00.

- Stern Limited-Edition titles generally have this included as part of the factory supplied speaker panel assembly.

- If you have the Kenwood KFC-1366S (or other speaker without an integrated gasket), utilize your existing gaskets if you have them.

- Otherwise, you will need to purchase two of these before installing this speaker light kit.

- An online search of "Stern 626-5113-00" will yield several outlets.

Stern Gasket

Addendum - 4

- Included with the Limited-Edition trim are four cylindrical standoffs.

- **DO NOT** re-use these standoffs; discard them.

- Shown to the right is an error in installation; if you attempt to re-use the standoffs there will not be adequate thread remaining to re-install the factory speaker and washers/nuts.

Do NOT Re-Use the Stern Standoffs

Addendum - 5

- Secure the speaker over the PixlWav Mounting Diffuser, the supplied LED ring and the newly installed gasket.