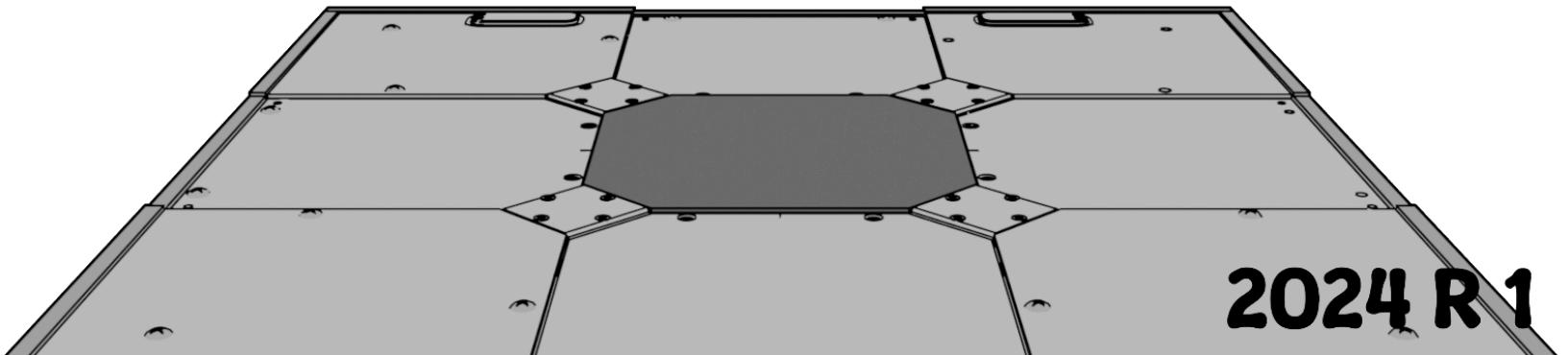


Barkus Pad 1.4

Manual



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BARKUS PAD 1.4 MANUAL

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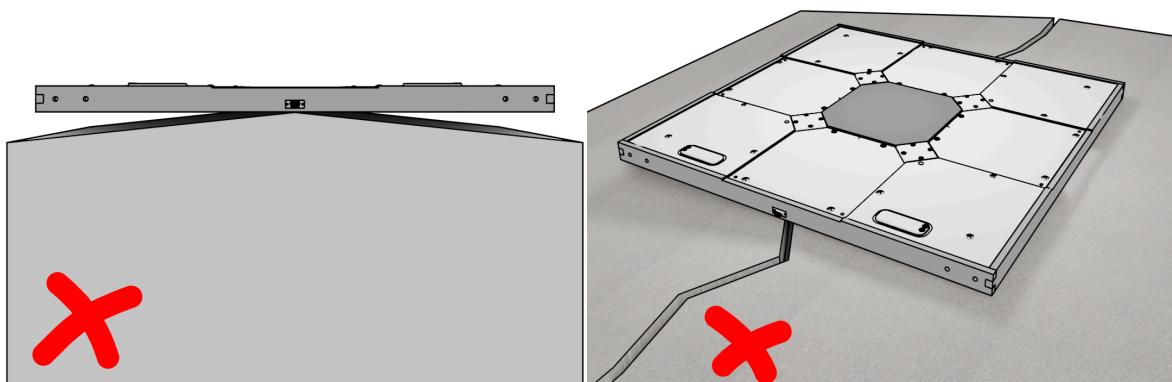
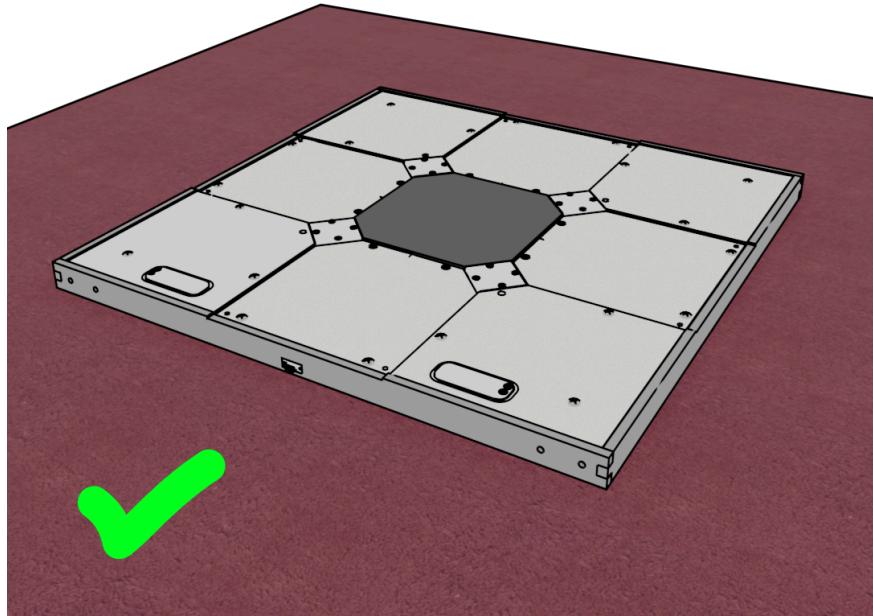
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SETUP:

1. Flooring Requirements

For optimal performance and longevity of your dance pad, it's essential to place it on a suitable surface. Here's what you need to know:

- Flat Surface: Ensure the flooring is level and flat. Uneven surfaces can cause wobbling, leading to stress on the pad frame and inaccurate sensor readings.
- Avoid Cracked Concrete: Flooring like cracked concrete can worsen wobbling and potentially bend the frame over time.
- Carpet or Foam Exercise Mat: The best surfaces for your pad are carpet or a foam exercise mat laid on level ground. These provide stability and minimize movement during use, enhancing your gaming experience.



2. Controller Connection

Connecting your dance pad to the controller and computer is simple, but there are a few important steps to follow:

- **DB9 Cable Connection:** Plug one end of the DB9 cable into the pad and the other end into the controller.
- **USB-C Connection:** Connect the USB-C cable from the back of the controller to your computer.
- **Avoid Cable Hazards:** Be mindful of cable placement to prevent tripping or snagging during gameplay. If there's a risk of tripping, avoid fully screwing in the connector screws on the DB9 cable. This allows the cable to disconnect without tugging on anything.

3. Doubles Setup

If you're setting up a doubles configuration for your dance pad, follow these steps for proper installation:

1. Loosely Screw In Both Sides:

Begin by loosely screwing in both sides of the setup. This initial step provides flexibility for adjustments later in the process.

2. Tighten the Non Slotted Side of the Bracket Into One Pad Second:

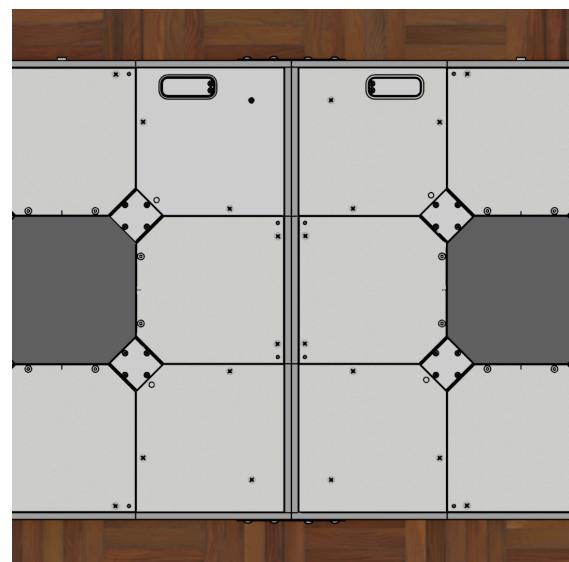
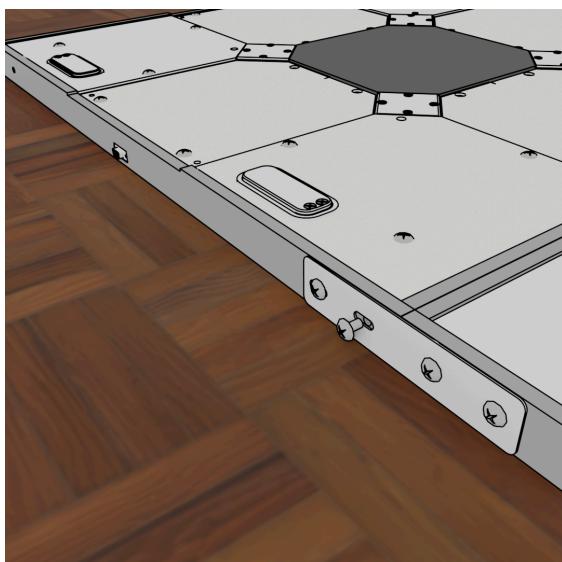
Next, tighten the non slotted side of the bracket into one of the pads.

3. Push the Two Pads Together:

After securing one side of the bracket, push the two pads together. Ensure they are aligned correctly.

4. Tighten the Slotted Side:

Finally, tighten the slotted side of the bracket. This step completes the setup by securely fastening both pads together, providing a stable and durable doubles configuration.



CONTROLLER USAGE

Overview: Setting Sensor Values

Before diving into gameplay, it's crucial to understand how to adjust sensor sensitivity on your pad. Here's an overview to get you started:

Understanding Sensor Sensitivity:

Each tile on the pad corresponds to a column on the control box. As pressure is applied to a tile, the respective column on the control box moves upwards. Once it surpasses a certain point (the "blip" in the middle), an input is sent to the computer, registering the tile as pressed. By adjusting the position of this blip, known as the sensitivity threshold, you can control how much pressure is needed to trigger a tile press. Lower sensitivity requires less pressure, while higher sensitivity demands more.

Controls: Familiarize yourself with the control box's functions:

Knob Press:

Selects or deselects a column for adjustment.

Knob Rotation:

While a column is selected: Moves the sensitivity threshold bar up and down.

While no column is selected: Moves the selection cursor left and right.

Recommended Settings:

If you're unsure where to start, aim to set the sensitivity threshold in the middle and go from there.

Settings Screen Overview

In the settings menu of your dance pad controller, you can fine-tune various parameters to optimize performance and customize your gaming experience. Here's a detailed explanation of each setting:

1. Refresh:

This setting controls the delay in milliseconds (MS) between each screen refresh. A refresh rate of 20 corresponds to a 50Hz refresh rate. Adjusting this setting can impact the responsiveness and smoothness of the display.

2. Release Thresh:

Specifies how much force, less than the input threshold, is required before the button the sensor controls is released. Higher values help mitigate jitter input issues by providing a buffer before the release action occurs.

3. Press Thresh:

Determines how much force, more than the input threshold, is needed before the button the sensor controls is pressed. Higher values can also assist in minimizing jitter input issues by ensuring a stronger input signal is required for button activation.

4. Poll Tester:

When set to 0, the poll tester is disabled. Setting it to 1 activates the poll tester, rendering the pad inoperable while active. This tool allows you to monitor the polling rate of the pad, ensuring it operates at the desired frequency. Stable operation should ideally show a 1000Hz polling rate at 100% stability. Any drop in stability below 100% may result in noticeable performance issues.

5. Save Settings:

The controller automatically saves settings every 10 seconds. However, if autosave is disabled, you can manually save settings using this option.

6. Reset All:

Resets all settings to their default values. To activate, click three times consecutively.

7. Inputs:

Specifies the number of input channels your pad has. For instance, if your pad has 6 sensors, set this value to 6.

8. Pin Remap:

Allows you to remap input pins for customization or compatibility purposes. Navigate to this menu to adjust input pins based on your pad's configuration. The top number corresponds to the output channel whose input pin you are changing, while the bottom number represents the input pin selection. Useful for older or custom pads.

9. Smoothing:

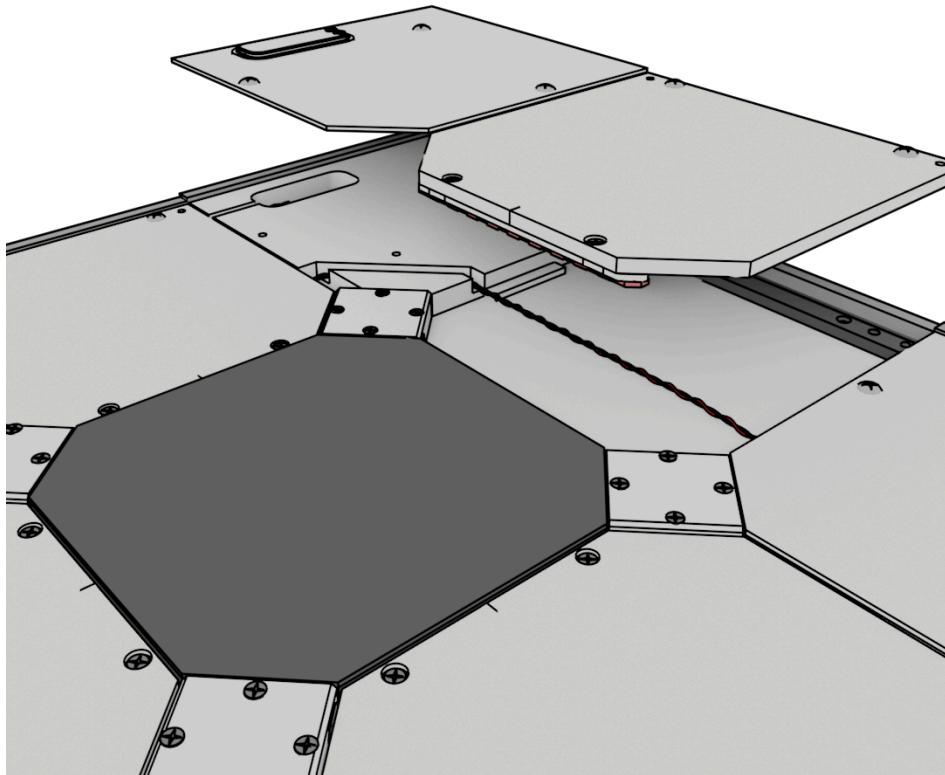
Enables Weighted Moving Average (WMA) sensor value smoothing. This feature helps mitigate mis-inputs caused by low sensitivity or vibrations during gameplay, ensuring a smoother gaming experience.

MAINTENANCE AND TROUBLESHOOTING

Replacing a Sensor

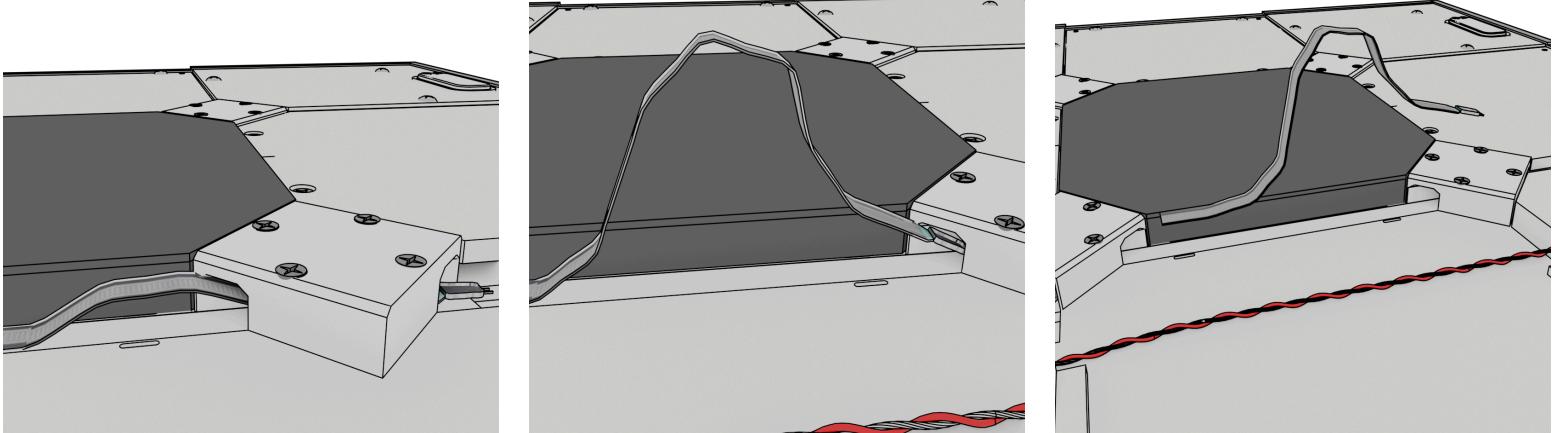
If you encounter issues with a sensor on your dance pad, follow these steps to repair it:

1. Identify the Faulty Sensor: Examine the pad to determine which sensor needs replacing. For example, if the right tile sensor is faulty, you'll need to remove the right step tile and the top right tile.
2. Remove Tiles: Carefully remove the tiles covering the faulty sensor by unscrewing the two large phillips head screws at the outside edge of the step tile tile, and the 4 screws surrounding the corner tile.

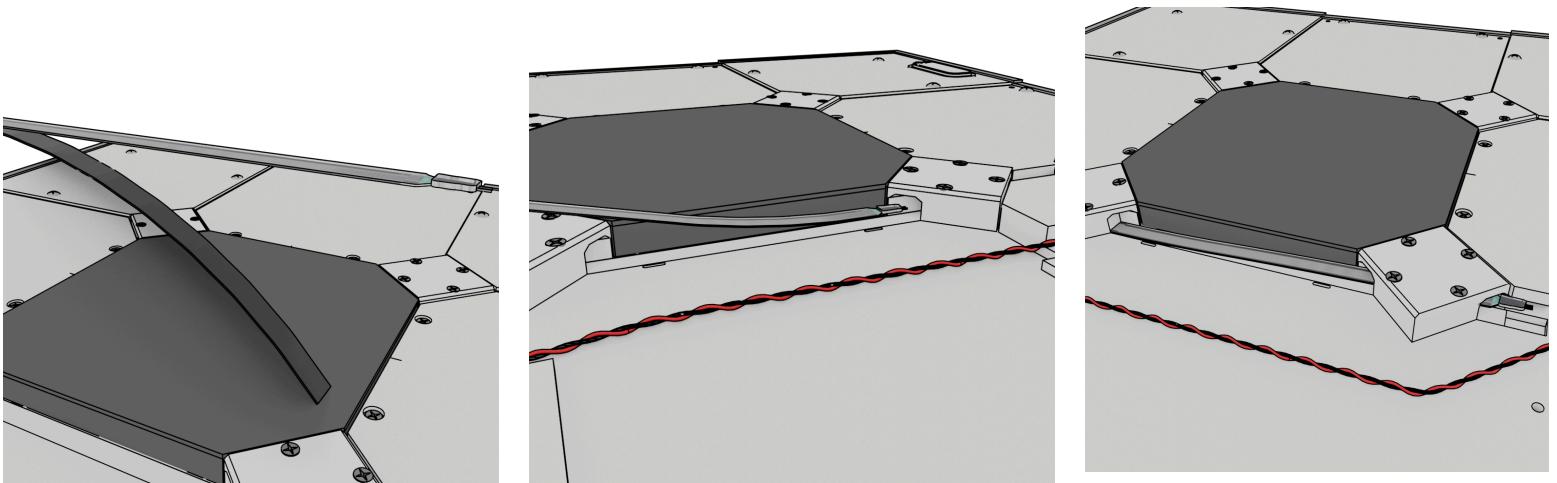


3. Disconnect the Sensor: Once the tiles are removed, disconnect the faulty sensor from the connector.

- 4. Peel off the Sensor:** Gently peel the faulty sensor off the pad base, taking care not to damage any of the wiring.
- 5. Prepare the New Sensor:** Peel off the backing strip covering the adhesive of the new sensor.



- 6. Thread the Sensor:** Carefully thread the new sensor through the corner piece without allowing it to stick to the pad prematurely.
- 7. Align and Apply Pressure:** Align the new sensor properly on the pad base. Starting from the back, apply firm pressure to ensure the sensor adheres securely to the base.
- 8. Connect the Sensor:** Gently push the new sensor into the connector housing to



connect it securely.

9. Re-install Tiles: Once the sensor is in place, re-install the tiles that were removed earlier, making sure they fit snugly, but not too tight. If the sensor value reads high, it is likely the tile was tightened too much.

Changing Tile Graphics

Customizing the graphics on your dance pad is a great way to personalize your gaming experience. Here's how you can do it:

- 1. Remove Step Tile:** Begin by carefully removing the step tile from the pad.
- 2. Remove Clips:** Next, remove the 4 white clips holding the black chipboard and vinyl graphic in place. Take care not to damage the clips or the chipboard.
- 3. Prepare New Graphic:** Use the chipboard from the original graphic as a template to size and cut your new graphic. The new graphic should measure 11" x 9.4" to fit perfectly.
- 4. Sandwich Graphic:** Place the new graphic between the chipboard and the tile, ensuring it is centered and aligned correctly.
- 5. Reapply Clips:** Once the graphic is in position, reapply the 4 white clips to secure it in place. Make sure the clips hold the graphic firmly but without causing any damage.
- 6. Leave Ample Room:** When reapplying the clips, ensure there is ample room at the back of the tile for where it makes contact with the pad. Keeping this area clean and clear is essential for optimal pad performance.

Replacing 3D Printed Parts

If you need to replace 3D printed parts on your dance pad, follow these steps for a seamless repair process:

- 1. Access the STL Files:** Go to the provided GitHub link to access the STL files for the part you need to replace. These files contain the necessary information for 3D printing the replacement part.
- 2. Printing Instructions:** Refer to the provided print instructions attached to the STL file. These instructions contain details such as recommended print settings, orientation, and any additional considerations for printing the part.

Height Adjustment

Customizing the height of your dance pad to match the feel of popular models like LTek or Cobalt Flux is simple with these steps:

- 1.** Remove Step Tile: Start by removing the step tile from the pad. Locate the two Philips head screws at the back of the tile and unscrew them to release the tile from the pad.
- 2.** Replace Rubber Contact: Once the tile is removed, locate the red rubber contact at the front of the tile. Slide out this rubber contact and replace it with the heightened rubber contact. This process can be done without any tools, making it hassle-free.
- 3.** Add Spacer: Place the spacer on the tile mounting point at the back of the tile. This spacer will adjust the height of the tile, allowing you to achieve the desired height for your pad.
- 4.** Reattach Tile: With the heightened rubber contact and spacer in place, reattach the tile to the pad. Use the Philips head screws to secure the tile back onto the pad, ensuring a snug fit.

Sensor Reads Too High at Idle:

If your sensor is registering too high at idle, follow these steps to troubleshoot and correct the issue:

- 1.** Check Tile Tightness: Ensure that the tile is not overtightened. The mount for the tile acts like a ramp, exerting force on the sensor. Tightening the screws too much can apply excessive force to the sensor. Aim for a snug fit—tight enough to secure the tile but not too tight or loose. Tightening excessively can lead to the sensor reading too high, while leaving it too loose may cause the tile to rattle around, affecting sensor accuracy.
- 2.** Position Contact Strip: Verify that the contact strip is positioned correctly. Try adjusting the red rubber contact strip by sliding it slightly in towards the center of the tile. Position it so that it makes half contact with the base of the pad and half contact with the sensor. This balanced positioning can help in achieving optimal sensor readings.

Troubleshooting Low Polling Rate

If you're experiencing a low polling rate on your dance pad, follow these steps to analyze and potentially resolve the issue:

1. Enable Polling Rate Tester: Access the settings screen and ensure that the polling rate tester is enabled. You should see a "1" displayed to the right, indicating that the tester is active.
2. Download GamepadLA: Download the GamepadLA software, which can help you analyze the polling rate of your dance pad more comprehensively.
3. Test with GamepadLA: Use GamepadLA to test the polling rate of your dance pad. This software provides detailed information about the polling rate, allowing you to identify any issues accurately.
4. Turn Off Pad Smoothing: Try turning off pad smoothing in the settings. Sometimes, smoothing algorithms can affect the polling rate and responsiveness of the pad. Disabling this feature may improve performance.
5. Reflash Firmware or Get a New Controller Box: If the above steps do not resolve the issue, you may need to reflash the firmware of your controller box. Alternatively, if the controller box is faulty or outdated, consider replacing it with a new one to ensure optimal performance.

Pinout for Modding

If you're looking to modify your dance pad, understanding the pinout is essential. Here's a breakdown of the pinout for your reference:

- 3.3v+ (Pin 1): This pin provides a 3.3-volt power supply. It can be utilized for various purposes, such as powering sensors or additional components.
- Analog Pins (Pins 2-7): These pins are analog input pins, allowing you to connect sensors or other analog devices. They can be used to detect varying levels of input, such as pressure or position.
- Digital Pins (Pins 8-9): These pins are digital input/output pins. They can be configured to either input or output digital signals, making them versatile for connecting various digital devices or peripherals.

Updating Firmware (FW) for Modding or Troubleshooting

If you're looking to update the firmware (FW) of your dance pad, whether for modding purposes or to address issues, follow these steps to set up the Arduino IDE and upload the firmware to your NanoESP32:

- 1.** Download and Install Arduino 2.X IDE: Start by downloading and installing the Arduino Integrated Development Environment (IDE) from the official Arduino website. Ensure you choose the appropriate version for your operating system.
- 2.** Add ESP32 Board Support: Open the Arduino IDE and navigate to library manager on the left hand side,
- 3.** Install ESP32 Board Package: Navigate to Tools > Board > Boards Manager. In the Boards Manager window, search for "ESP32" and install the "Arduino esp32" board package by Arduino.
- 4.** Connect Control Box: Connect your Control Box to your computer using a USB cable. And set it to upload mode by pressing the rest button on the right side of the box twice rapidly. A light at the bottom of the box will glow green if done correctly.
- 5.** Open Firmware Sketch: Open the firmware sketch (.ino file) from the website (barkusmfg.net) in the Arduino IDE.
- 6.** Configure Upload Settings: Before uploading, ensure you have the correct settings configured under Tools. Go to Tools>USBMode and make sure TinyUSB is selected.
- 7.** Upload Firmware: Click the "Upload" button (right arrow icon) in the Arduino IDE toolbar to compile and upload the firmware to your NanoESP32. The IDE will compile the sketch and upload it to the connected NanoESP32 board.
- 8.** You are done.

PAD CONSTRUCTION

Understanding the construction of your dance pad gives insight into its durability and performance. Here's what you need to know:

- **Frame:** The frame consists of two layers of 0.75" LDF (Low-Density Fiberboard), providing stability and support. The total thickness of the pad is 1.625", ensuring a solid platform for gameplay.
- **Side Trim:** The side trim is made of 0.5" MDF (Medium-Density Fiberboard), adding reinforcement to the edges of the pad.
- **Step Tiles:** Step tiles are precision machined from $\frac{3}{8}$ acrylic, offering a smooth surface for comfortable footwork during gameplay.
- **Corner Tiles:** Corner tiles are made of 0.125" HDPE (High-Density Polyethylene), providing durability and impact resistance to withstand rigorous use.
- **Center Tile:** The center tile is constructed from 0.125" ABS (Acrylonitrile Butadiene Styrene), contributing to the overall stability of the pad.
- **Screws:** Screws used in assembly are $\frac{1}{4}$ 20 SAE size, ensuring secure attachment of components.
- **3D Printed Parts:** Various non-critical components are 3D printed using PLA+ material. This allows for ease of replacement and facilitates design changes to enhance functionality and aesthetics.