DIRTY MARTINI

PASSIVE VIDEO MIXER

BUILD GUIDE

V1 - MARCH 2024

HERZLICH LABS

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INTRODUCTION

Thank you for choosing a DIRTY MARTINI DIY KIT - this build guide will help you in your endeavor to successfully build your new passive video mixer - I recommend you read the build guide before starting your build, and I suggest leaving everything in the bags they came in until you are instructed to retrieve something from them. The DIRTY MARTINI is not a difficult build, but you can avoid potential pitfalls by following and familiarizing yourself with the build process before beginning.

SAFETY

Building electronics is a fun and rewarding hobby, but just as you practice basic safety procedures while cooking, so should you practice basic safety precautions in your workshop. Below are some recommendations on measures you should take while working:

- **Your soldering iron is dangerously hot.** When not in use, be sure to put it somewhere where it will not fall or roll away, and where you are not at risk of snagging the cable and making it fall on something, or yourself, as you work.

- **Be mindful of toxic chemicals and fumes.** I recommend using lead-free solder, working in a well-ventilated area to dissipate fumes, and if you opt to use leaded solder, be sure to wash your hands after soldering, and do not eat or drink in your work area.

- **Wear adequate eye-protection.** A good pair of safety glasses will not obstruct your vision, will be comfortable to wear for extended periods of time, can be had for less than €9 and will, most importantly, protect your eyes from injury. Hot solder can spit, and trimmed leads can turn into projectiles, both of which can cause irreversible damage to your eyes. Make it a habit to wear safety glasses while working.

You are responsible for your own safety while working – so please don't e-mail me if you decided squinting your eyes while trimming LED leads was a sufficient alternative to a pair of safety glasses and end up in the emergency room. With proper health and safety precautions, you can look forward to practicing your hobby for many years to come.

EQUIPMENT

You will need some basic hand tools and, ideally, some proficiency with them to successfully complete this project. If you need to buy tools, or if your tools are not up to the task, I recommend buying the best quality tools you can afford - it will serve you best in the long run, and you will not have to continuously upgrade every time a cheap tool breaks or proves insufficient.

I have added some tool suggestions in parenthesis, but please note I have no commercial interest in recommending one tool over another, this is only to help other people find tools they will be happy to use for years to come. You will need:

- A temperature-controlled soldering iron
- Needle-nosed pliers (Engineer PS-01)
- Low-profile side cutter (Knipex 78 71 125 ESD w/ lead catch)
- Good quality lead-free solder
- Safety glasses (Bollé Silpsi)
- Cyanoacrylate glue

The following tools are not strictly necessary, but will prove useful:

- Knurled nut driver (Xicon 382-0006)
- Socket wrenches (Bahco SL25)
- A decent multimeter
- Anti-static tweezers
- Reverse ceramic tweezers
- Solder braid and liquid flux
- Desoldering pump (Engineer SS-02)

These tools will all prove useful in countless other DIY projects – if you do not own some or any of the tools above, try reaching out to friends or even local hackerspaces, who will more than likely be happy to lend you the tools. Alternatively, you can of course also buy the tools you need, especially if you think you will build more DIY projects in the future.

DESIGN NOTES

The concept of a "dirty video mixer" was originally popularized by video artist Karl Klomp, who designed and shared schematics for many DIY video circuits as part of his body of work. The schematics have long disappeared from the internet, but in video art circles the term dirty video mixer and the name Karl Klomp are iconic.

Video art has a long history prior to Karl Klomp, but his work has no doubt attracted countless people to video art – when Karl Klomp published his schematics, analog video was already quite old, and digital video technologies were rapidly on the rise. Today, analog video is practically dead, long surpassed by ever increasing resolutions of digital video. Unfortunately, digital video has the disadvantage of not taking weird instructions too well – if you mess with a digital video signal and knock out the 1s and 0s, your monitor will refuse to display it outright. Analog video does not have this sensitivity – while analog video does consist of several components that must be present for a video signal to be present, you get a lot more leeway in messing them up before a monitor will no longer display a signal.

Unfortunately, this tends to require a way to interpret analog video, which typically means getting an old school tube television. CRT's are holy relics to video art nerds and retro gamers, and have in recent years commanded ever higher prices on the used market. The truth of the matter is, probably just about any CRT you can find for cheap will do, preferably coupled with a tripod and a camera to capture your beautiful video creations. Sadly, digital outputs will not do in the world of dirty mixing.

The reason is, essentially, that when doing dirty video mixing, we are muddling up and confusing the video signals. Color space, horizontal and vertical position and timings blend into each other, and the television tries as best it can to interpret what's going on. The results are usually as beautiful as they are interesting.

The Dirty Martini differentiates itself from other dirty mixers by making the mixer pot a slide pot, akin to a DJ crossfader, and includes four inputs rather than two. This is incredibly useful for hot-swapping video signals during a performance, and creating uninterrupted and ever evolving video performances. Additionally, two KILL switches allow you to interrupt and glitch out the signal at will, emulating a broken cable being wiggled vigorously.

You may have bought this kit because you have a budding interest in video art, VJ'ing or video synthesis – perhaps you already own lots of equipment, and the Dirty Martini will serve as a live mixing nexus. Whatever the case may be, I hope you have a fantastic time with the Dirty Martini, and make beautiful video compositions with it.

Have fun, and happy building.

BOM

Component	Designator	Qty
1K slide pot	U1	1
RCA jack	J1, J2, J3, J4, J5	5
Momentary switch	SW3, SW4	2
Latching switch	SW1, SW2	2
M3 spacer		5
M3 nut		5
M3 bolt		5
M3 brass bolt		5
M2 brass spacer		2
M2 brass bolt		2

BUILD GUIDE

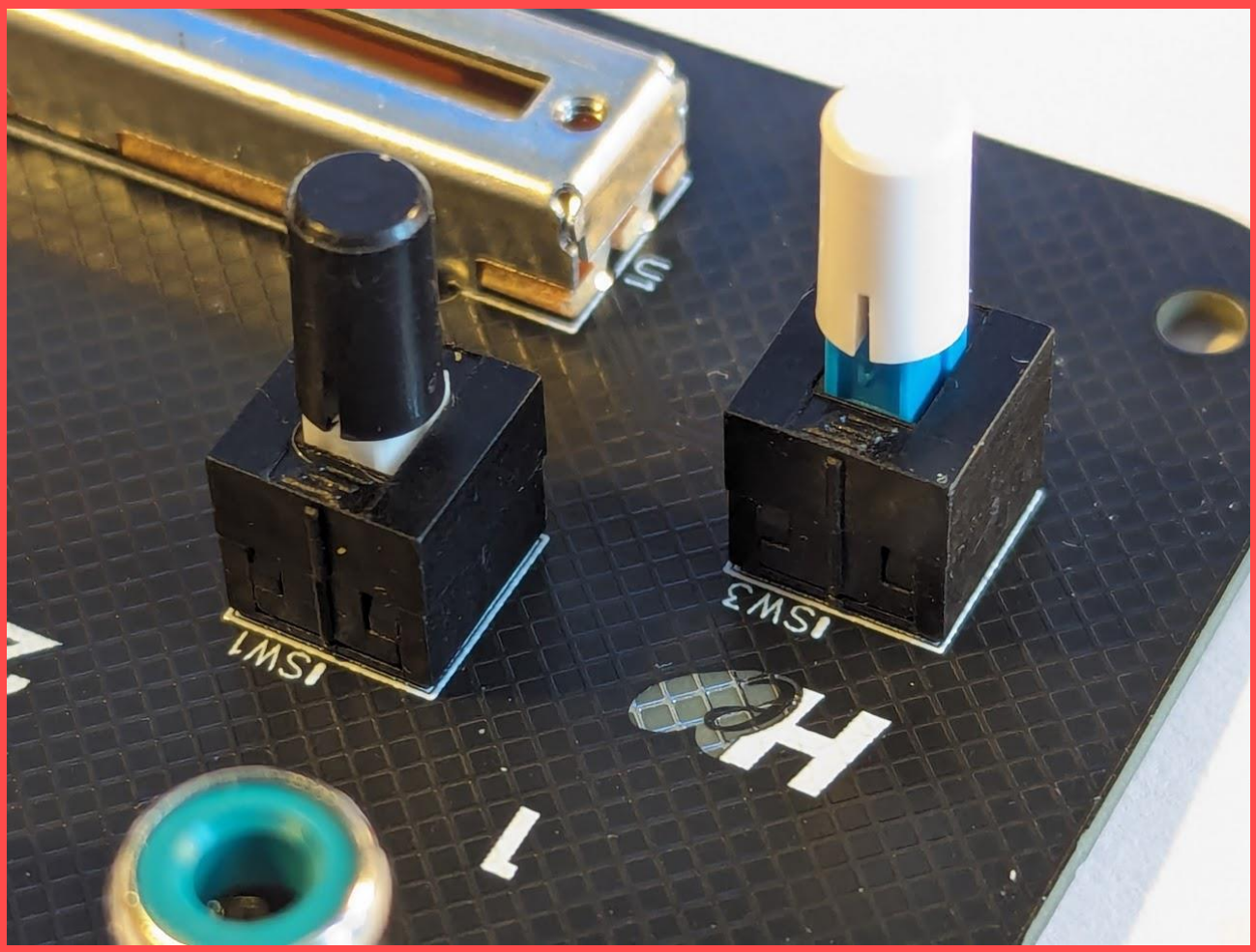
Let's get down and dirty. The Dirty Martini is not a difficult build, even for an inexperienced builder it should not pose particularly challenging, provided you follow the instructions in this guide carefully. You can do that, right? You're not just skim-reading this part and looking at the pictures, are you? Good, I'm glad, I knew you were a good DIY'er!

STEP 1: Populating the PCB

It is good practice to always populate your circuit board with the lowest clearance components first. In this case, the lowest clearance component is our slide potentiometer. Pop it right in on the side of the board with the silkscreen indicating the shape of the potentiometer, it should only be able to go in one way.

Holding the potentiometer in place, flip the board and solder one of the pins in place. Inspect the board, and verify that the potentiometer is flush with the board – if not, reheat the solder joint and press the potentiometer flat against the board as you let the joint cool. This procedure is applicable to most electronics DIY, so keep it in mind as you go!

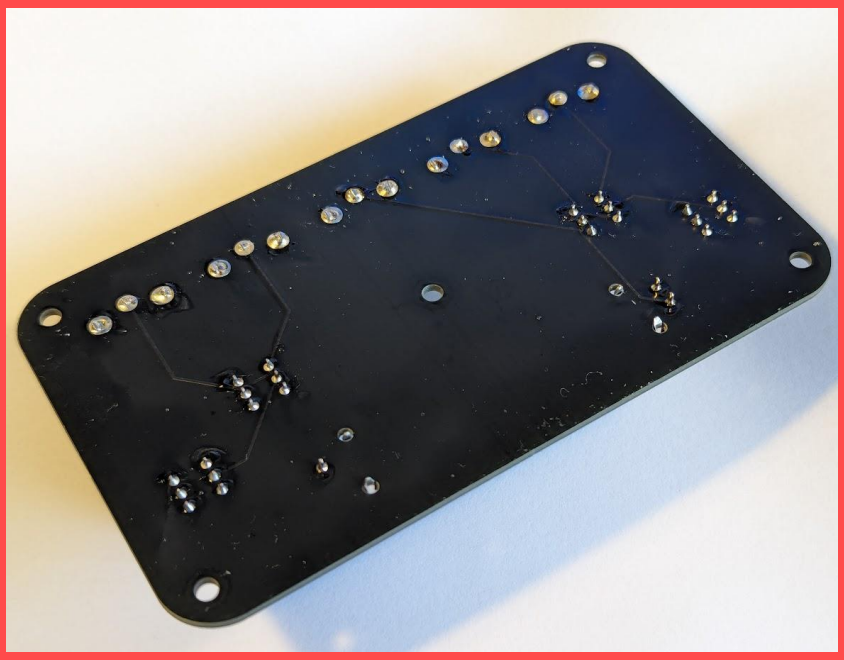
Next, install the momentary and latching switches one at a time. The KILL switches are momentary, and the 1/2 and 3/4 switches are latching – the little rib on the switches should point up, as indicated on the silkscreen of the circuit board. It is important to get this orientation right. The rib and the correct orientation can be see in the picture below.



Finally, solder in the RCA jacks. There will be four green and one red RCA jack in your kit – they are functionally identical, but I use the red jack to indicate the output in this case, plus, the colors are meant to remind you of the olive in a dirty martini cocktail.

Little details aside, be sure the jacks are installed nice and flush before you continue. Once they are all in place, you are done soldering: pat yourself on the back, wash your hands, ventilate your work area and breathe a sigh of relief!

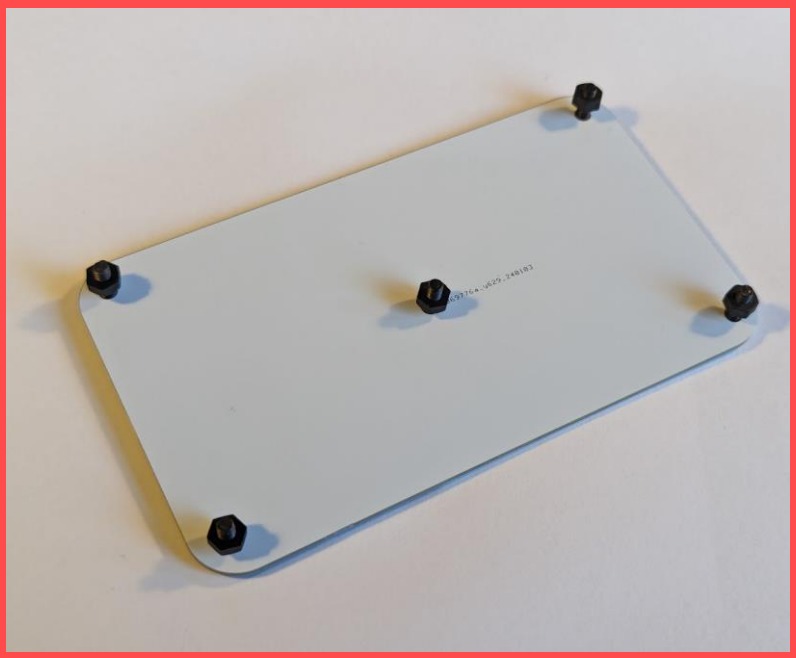
Now, grab your flush cutters and trim down the RCA jack leads on the reverse of the board. They do not need to be perfectly flat against the board, but they should be trimmed close to it at the very least. The picture below is what you should see when you have reached this stage.



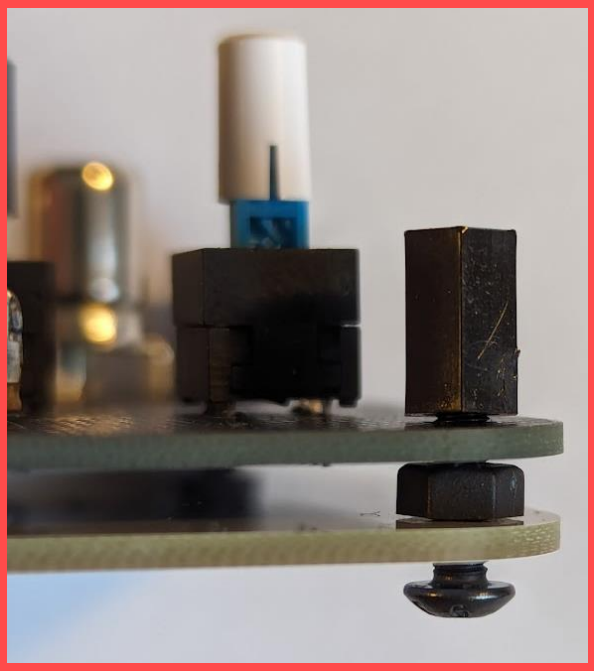
STEP 2: Mechanical assembly

At this point, you are technically ready to go, but the exposed underside of your circuit board will not enjoy being placed on something like a metal table quite yet. We will now fix that, completing the mechanical assembly of the Dirty Martini.

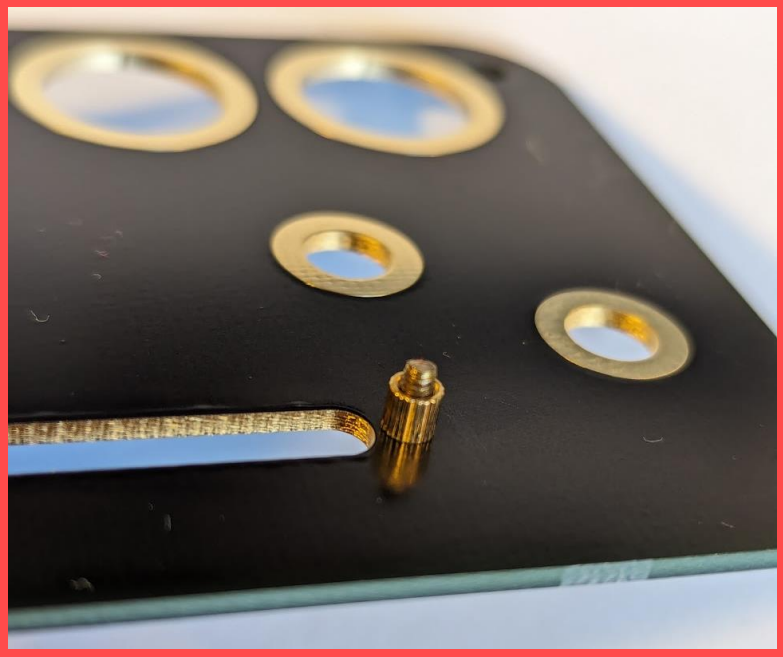
Insert the M3 bolts through the bottom panel, and screw a nut unto each of them. You may tighten the nuts against the panel before you proceed, with finger strength is plenty sufficient in this case.



Next, place the circuit board on top of the nuts and bolts. It will slip right over. Then, take the standoffs, and screw them down firmly with finger tightness once again The illustration on the right allows you to see what the assembly should look like so far.



Now, take the top panel, and insert the M2 brass bolts in the small holes on each side of the slot for the potentiometer. Bolt them down by using the M2 brass spacers – you do not need to tighten this connection yet. The image below illustrates the procedure.



Place the top panel on the circuit board assembly, aligning the M2 bolts with the potentiometer. Using a flathead screwdriver, carefully tighten the bolts into the slide potentiometer. You should now have reached the state seen in the photo below.

Finally, insert and tighten the remaining five M3 brass bolts to keep the front panel securely in place, and attach the slide potentiometer cap. Double check that everything is tight, flush and that the potentiometer can slide smoothly and freely, and you're all done.

STEP 3: Time to do some dirty mixing

Well done! You assembled the Dirty Martini, and you are now ready to do some truly dirty video mixing. Get your old CRT monitor out of storage, find a VHS machine or two, build a couple of DIY video samplers like the Recur, get a downscaler to make digital video from your PC into analog signals, and get MIXING – stirred, shaken, I don't care, as long as you get out there and produce beautiful video art!

SUPPORT

Sometimes things go wrong - that's OK! If you have run into trouble while building your module, and you can't seem to get yourself out of trouble, you can reach out to lb@herzlich.technology for assistance. Please send well lit, high resolution photos of your PCBs to help me investigate and identify the problem with you.

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