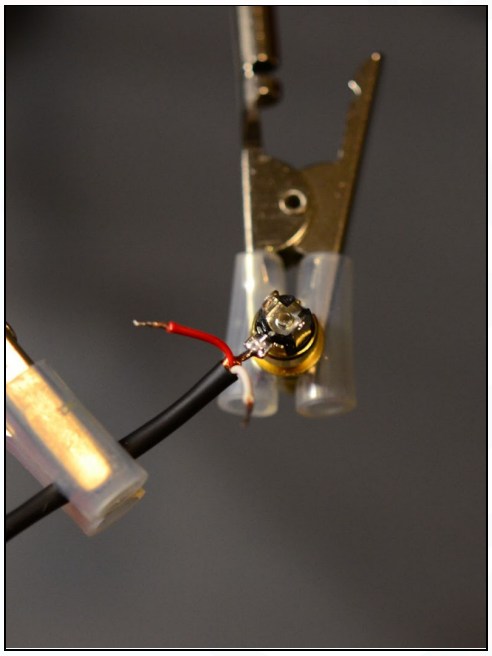
BUILD GUIDE

Stickless Mini MS DIY



Difficulty: **2/5 (Beginner - Intermediate)**

Build time: **60 - 120 min.**

Beginner Tip: **Google is your friend! There are many tutorials on soldering, cable testing, and all of the other DIY essentials in this guide.**

Pro Tip: **Click on any photo in this guide to view the high-res, full sized image!**

What's Included

PART 1 - CABLE

- **1x** Mogami W2697 Mini Balanced Mic Cable
- **1x** Rean Neutrik Mini XLR-F Connector
- **1x** Neutrik 90* 3.5mm TRS Connector

PART 2 - MIC

- **1x** Mini MS DIY Mic Body
- **1x** Mini MS DIY Mic Capsule Sled
- **1x** M3 Screw
- **1x** Primo EM406N - Mid Mic Capsule
- **1x** Primo EM283 - Side Mic Capsule
- **1x** Mini XLR Panel Mount

Required Tools

Click on the linked items below if you need one and want a suggestion! Links are to Amazon U.S., but feel free to use whatever retailer you would like.

- 1.5mm Allen/Hex key[1]
- Soldering Iron
- Solder
- Wire Snipper/Flush Cutter
- Wire Strippers with 14, 24, & 28 AWG[2]
- Hot glue gun or clear super-glue/Gorilla glue

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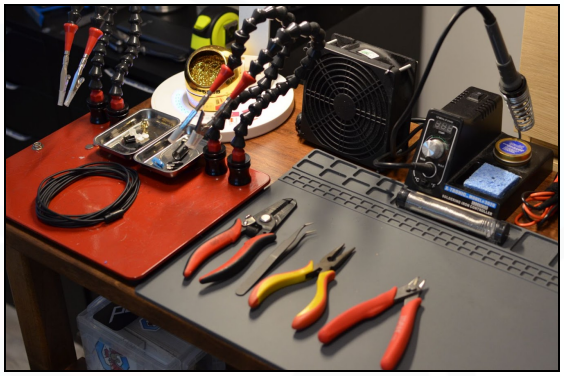
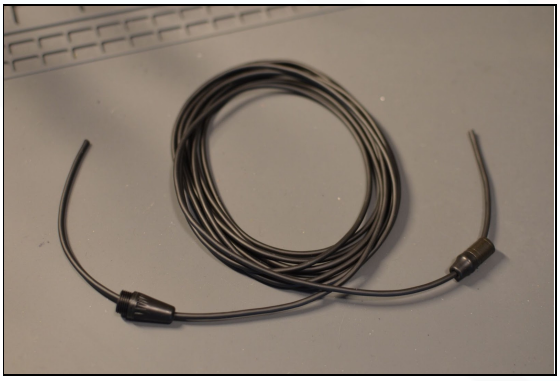
[1] *1.5mm keys often come packaged with mic blimps and lyres. Otherwise, if you don't have a set or multi-tool with metric Allen/Hex keys, this is a good excuse to get one. Alternatively, you can sometimes find single-sized hex keys at local electronics, hobby supply, or general hardware shops.*

[2] *I could not find a single set of strippers that would cover this wide range, but these should work if you're careful. :)*



A Temporarily Clean Workbench

1.1 - Included Cable Parts



1.2 - Strain-Relief Collars

Not Technically Necessary But Nice-To-Have Tools

- Multimeter or Audio Cable Tester
- Precision Tweezers
- Long/Needle Nose Pliers
- Solder/Fume Extraction Fan
- Helping Hands[3]
- Soldering Mat Work Surface

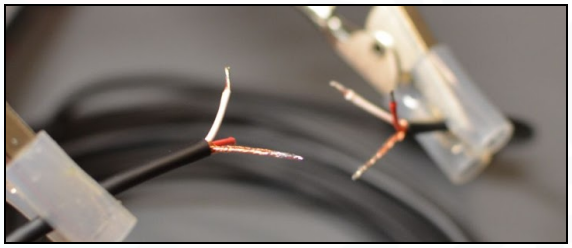
Assembly Instructions

PART 1 - CABLE

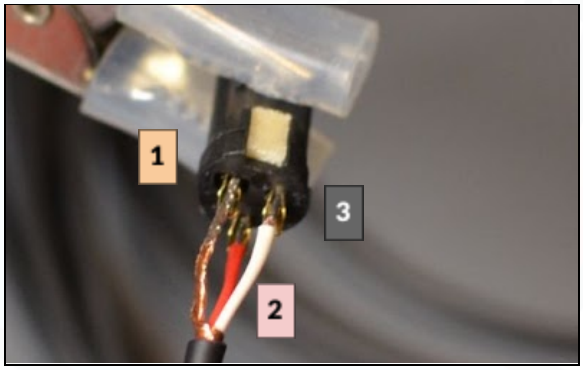
1. Start by removing the Mogami cable and connector pieces from the cable parts bag.
    - The **3.5mm TRS connector** includes: the TRS jack, the long and slim strain-relief collar, a white alignment guide, and two L-shaped metal pieces.
    - The **Mini XLR connector** includes: the black metal body labeled 'REAN', the mini XLR plug, the short and cone-shaped strain-relief collar, a black alignment guide, and a blue alignment guide. The mini XLR plug is often located inside of the metal body, and can simply be pushed out through the open back-end with a pen or pencil. The blue alignment guide will not be used, so you can set it aside.
2. Place the two strain-relief collars on the ends of the cable, with the open side of each one facing towards the end of the cable.

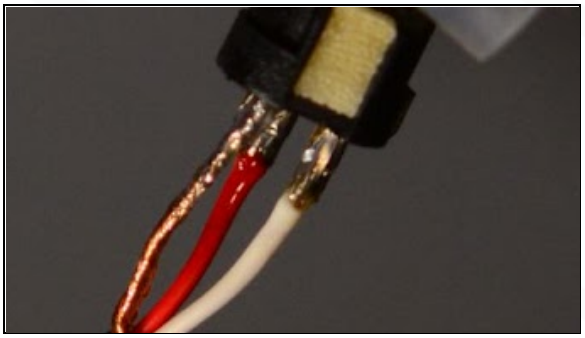
[3] *These ones that have a base and movable arms are SO much better than the crappy little metal ones with a bar.*

1.3 - Stripping the cable…



1.5 - Tinning the shielding & conductors…

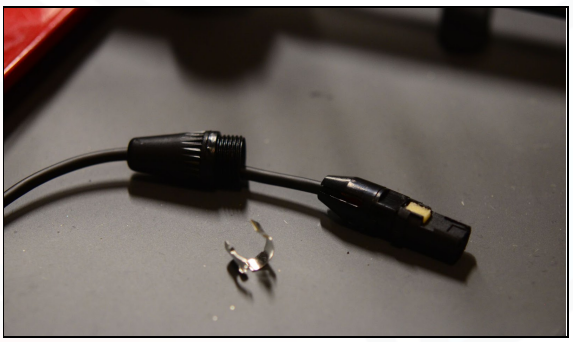




1.6 - Soldering the Mini XLR connector…

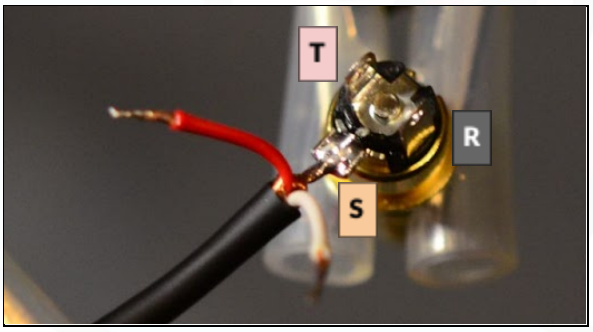
3. Strip roughly 13mm off the ends of the cable, exposing the copper shielding and two conductors inside (don't worry about going +/- a couple of mm on this). I've found that 14AWG is a pretty close stripping size.
4. Twist the copper shielding and separate it from the red and white conductors. Then, strip approximately 3-4mm from the ends of the red and white conductors using ~24AWG strippers.
5. After stripping, tin the ends of each conductor and the end of the twisted shielding. You only need to tin the last 3-4mm of the twisted shielding; don't tin the full length (or it will end up being difficult to maneuver when we solder it to the cable connectors).
6. Speaking of which… let's solder the Mini XLR connector! Make sure you solder the connector onto the side with the correct strain-relief collar. The Mini XLR connector has a more cone-shaped strain-relief collar (the elongated one is for the 3.5mm TRS connector). Solder the shielding and each of the two conductors using the following pin-out diagram. The pin numbers on the conductor are small and barely-legible, so hold the connector closely to a light to see!

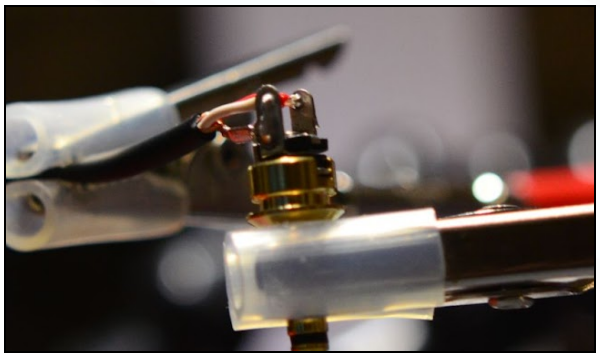
Pin #	Cable Part
1	Copper Shielding (Gnd.)
2	Red Conductor (+ / Mid)
3	White Conductor (- / Side)



1.7 - Assembling the Mini XLR connector...

1.9 - Assembling the Mini XLR connector...

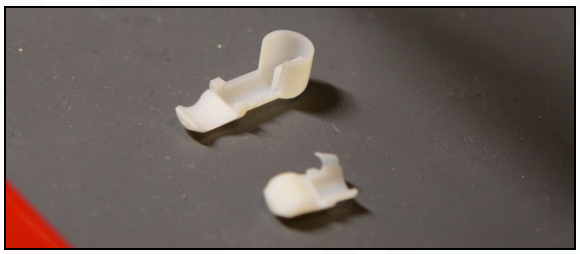




1.10 - Soldering the 3.5mm TRS connector...

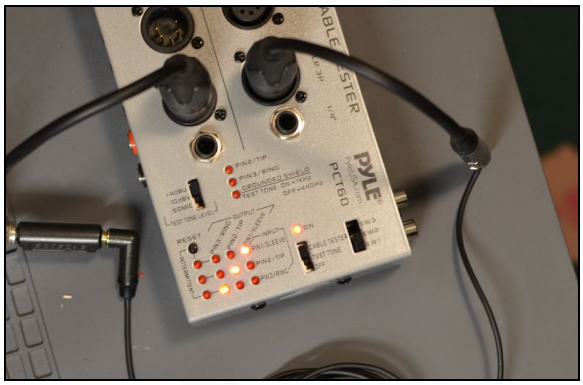
7. Time to assemble the Mini XLR connector housing! Take the black plastic alignment guide and slide it onto the cable through the open slit running along its side. Make sure the cone-shaped end faces towards the strain-relief collar. Slide the alignment guide up towards the soldered pins so that the flat side lines up with the small piece of white/yellow foam. You'll see that one particular alignment fits best, as there are small plastic stems that slide into place.
8. (Optional) Clip the metal ring between the black plastic piece and the main body of the connector. This can be used to connect the copper shielding to the chassis of the connector, particularly when soldered together. But honestly... don't stress about it, the cable will work just fine if you can't get it to align correctly or skip this step entirely. :)
9. Finish assembling the Mini XLR connector by sliding the metal tubing over the end of the body. Screw the strain-relief collar into the metal tubing and you're done!
10. Let's solder the 3.5mm TRS Connector to the cable. Start with the copper shielding by soldering it to the stem on the TRS connector. You'll want to solder it quite close to the cable, then snip off any overhang (so that the red and white conductors can reach the tip and ring posts). Then solder the tip and sleeve by passing the tinned ends through the holes and soldering to the stems!

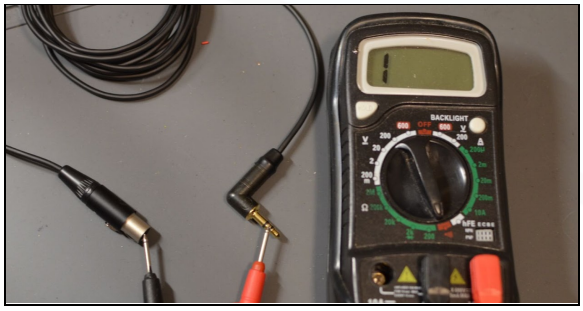
TRS	Cable Part
Sleeve (S)	Copper Shielding (Gnd.)
Tip (T)	Red Conductor (+ / Mid)
Ring (R)	White Conductor (- / Side)



1.11 - Release your anger. Break it. Now.

1.12 - Assembling the 3.5mm TRS connector…





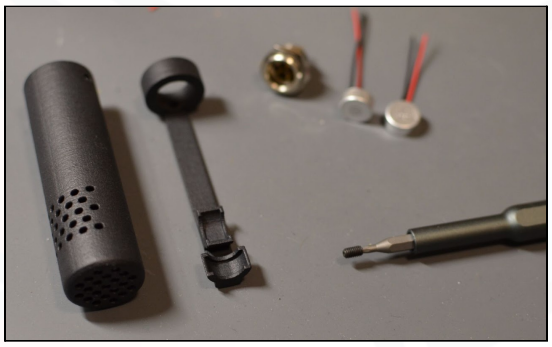
1.13 - Testing the cable!

11. This next one is easy! Take the white plastic separator and snap the smaller half off. You can either twist it until the little connection breaks or you can use snippers if you're feeling fancy. We only care about the half with the "cup".
12. Finish assembling the cable by placing the plastic separator, cup-side-down, over the soldered stems. Make sure that the red and white conductors are split by the small divider inside of the cup; this will help prevent shorts. Then place the two L-shaped metal halves over the end of the white plastic separator so that the screw threads point towards the strain-relief collar. Slide the strain-relief collar up to the threads then screw it into the two L-shaped pieces; this should securely close the TRS connector.
13. (Optional[4]) Test the cable! You can either use a multimeter or an audio cable tester (with the appropriate adapters) to confirm that the ground and both conductors are properly connected, without shorts or intermittent drops in signal.

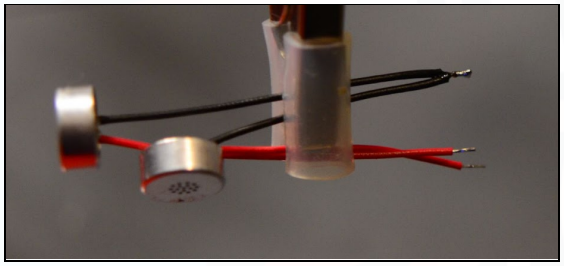
    If this is your first time testing a cable with a multimeter, there should be a mode on the dial/knob specifically for testing continuity. When you make a successful connection, most multimeters will make a rather charming beep!

… and now for the fun part!

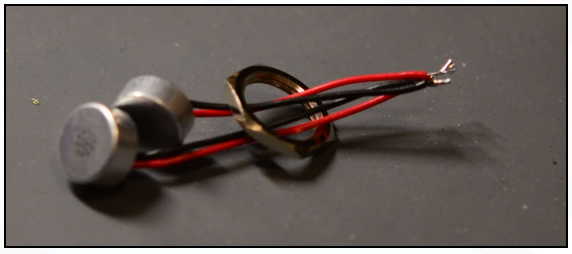
[4] *Testing the cable is optional, but if you finish assembling the microphone and it's not working as expected… Well, let's just say you will feel better knowing that at least one part works. But let's not worry about that for now :)*



2.1 - Included mic parts!

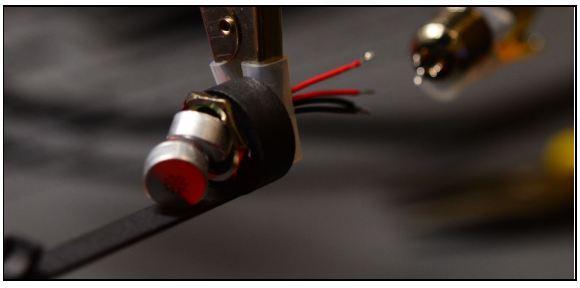


2.3 - Prepping the mid and side capsules…



2.4 - "I love nuts. I'm for nuts. I am nuts."

— Penn Jillette



2.5 - Arranging the mic internals…

PART 2 - MICROPHONE ASSEMBLY

1. Start by removing the nylon body, mini XLR panel mount, mid capsule (**Primo EM406N**; the one with the longer perpendicular leads), and side capsule (**Primo EM283**; shorter parallel leads). Then unscrew the small black grub screw from the base of the mic body using your 1.5mm allen/hex key.
2. The mic body includes two parts: an outer body and an internal "sled", a stem that serves as both a holder for the mic capsules and a mounting ring for the mini XLR panel mount. To remove the sled from the mic body, insert the small hook on the end of the provided key-shaped tool to pull it out by the inner edge of the panel mount ring.

3. Start prepping the capsules[5] by twisting the two black leads together and soldering lightly. Don't apply excess or a "blobby" amount of solder at this step, as it will make your life mildly inconvenient in Step **2.6**.

!! The order of the following steps is important !!

4. Take the hexagonal **nut** off of the panel mount, discard the locking washer, and slide the nut over the mic capsule leads.
5. Now pass the leads through the ring on the mic body's internal sled so that the capsules **and** hexagonal nut are on the inside of the sled. The leads should be sticking out the end of the ring.

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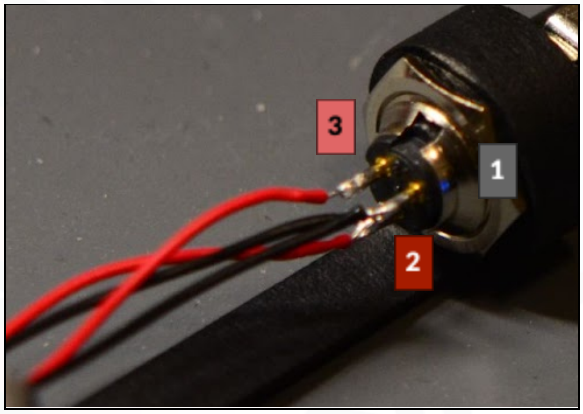
[5] *The mid and side capsules come with leads pre-soldered to the contacts on the back of each capsule. This is done to ensure that the leads are the exact length needed to fit on the sled and that excess heat isn't applied to the capsule body in assembly.*



2.6 & 2.7 - Soldering the mic capsule leads and attaching the Mini XLR panel mount…

2.8 - Gluing the capsules in place…

6. Now, with the mic capsule leads dangling out the end of the mic sled, solder the mic capsule leads to the Mini XLR panel mount. First orient the panel mount so that the solder cups at the end of the pins are facing upwards (the same direction & orientation as the picture here). Then, I recommend soldering the two black leads to pin 1 on the panel mount. After that, solder the mid capsule's red lead, the longer of the two leads, to pin 2 on the panel mount. Finally, solder the side capsule's red lead, the shorter of the red leads, to pin 3 on the panel mount[6].

Panel Mount	Mic Capsule Lead
1	Black Leads
2	Mid Lead (Primo 406N)
3	Side Lead (Primo 283)

7. Once everything is soldered, screw the panel mount into the hexagonal nut on the inside of the sled. You can use the mini XLR plug on the cable to help screw it into place without damaging the pins on the inside of the mini XLR connector. While orientation here doesn't really matter (as it only determines the direction the cable comes out of the microphone), I personally try to align either the dimple or the release button on the microphone cable with the hole for the grub screw on the sled.
8. Glue the mic capsules to the sockets/cups on the sled! The mid capsule (Primo 406N) should face forward and the side capsule (Primo 283) should face to the LEFT when pointing the microphone forward. Simply place a sizable dab of hot glue in the center of the cup then firmly press the capsule in.

[6] *Tweezers make working in this small space easier. Pass the Mid and Side wires through the panel mount hole and solder them one-at-a-time to ensure you don't mix them up!*

2.9 - Assembling and testing the finished mic!

9. Congrats! You made it to the end. Slide the sled into the mic body and then lock it into place using the grub screw. You're now ready to test the mic + cable, then get out and record something! Remember that mid-side microphones often need to be "decoded" after recording, so that the mid channel and side channel are summed into a more conventional stereo signal. There are many plugins available to do this in your DAW of choice (I personally recommend Goodhertz's free MS Matrix plugin) but for the old school recordists, you can also mimic MS decoding on a console like the good ol' days (refer to the Monitoring section on this article if you're unfamiliar with that process).

Issues? Concerns? Updates and/or recommendations for this guide?

Feel free to reach out at any time!

General inquiries and assembly instructions:

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