

A Cable Sheath Stripper, Version 3.3

By R. G. Sparber

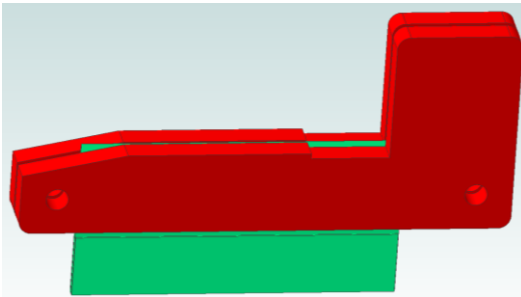
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Conclusion



I collaborated with many readers during this development. After reading their insights, I built this version of the cable sheath stripper.

[Here](#) is a video showing a version without the recess that exposes only about ½” of the blade.



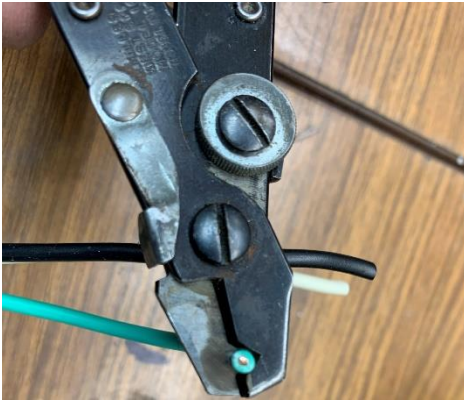
I then evolved the design a little more. This tool can cut the cable sheath radially and axially. The razor blade can be slid along the major axis of the tool to adjust how much of the blade is exposed for axial cutting.

Confused? [Here is a video.](#)

I found that a length of bicycle innertube fits nicely around the tool to keep the cutting edges away from the outside world.

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Background



An excellent design stands the test of time. I've had these wire strippers for many decades. When adjusted correctly, it cuts through almost all of the insulation but does not touch the conductor. By pulling along the wire, the remaining insulation is torn through.



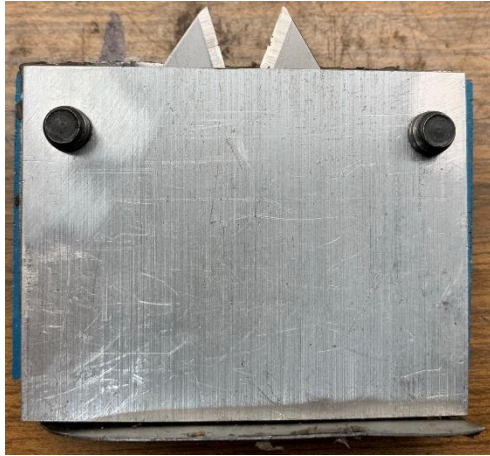
The business end of this tool consists of two V-shaped cutters. They accommodate a wide range of wire sizes.



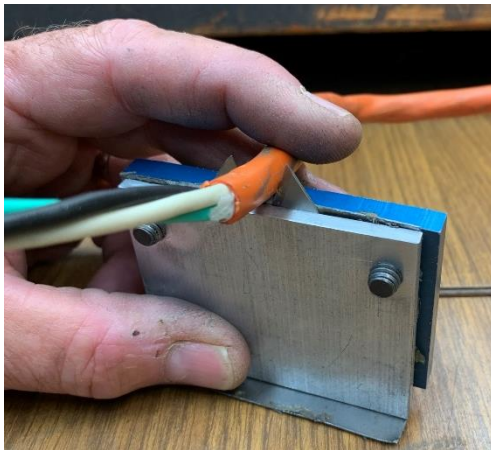
Yes, there are limits to this range. Trying to strip off the sheath of a cable tends to nick the wires inside. Yet, the basic idea of a V-shaped cutter is still a great idea. I just need to extend it.

Much of engineering consists of extending an existing idea. There is even a legal term for this, which you can find in patent applications – “advancing the art.”

The Journey



Fail fast. Yes, I knew the V-shaped blade was a good idea, but that doesn't mean my version is worth a damn. I had no interest in crafting a beautiful tool that was garbage. Instead, I sifted through my junk drawer to find pieces that called out to me. Then I visited my drawer holding box cutter blades. Here is the best looking face of the resulting tool.



I rest my cable in the V and rotate it about 180°. Then I lift the cable away from the blades and slightly flex it at the cut. This breaks the remaining sheath off. The excess sheath then slides off of the wires. To my surprise, it worked nicely.



Inside the tool is a collection of scrap metal. The blue piece of anodized plate is $\frac{1}{4}$ inch thick and happened to have those two holes. Below it is a piece of $\frac{1}{8}$ th inch aluminum strap. I used the blue plate as a template to drill the holes in the strap using a #4 drill. Then I tapped the strap $\frac{1}{4}$ -20. The last piece is thin steel sheet metal that was about the right size. I used the strap as my template to drill the two holes and then opened them out to pass $\frac{1}{4}$ -20 screws. The sheet metal was clamped between the other two plates, and the end bent over.



Positioning the blades was a cut-and-try effort. This is one area for improvement on the final tool.

Notice that the bottom corners of the blades align with the bottom edge of the plate.



The sheet metal goes on next. It provides a stop, so the blades don't slide out the bottom as they are being adjusted. A lip on the bottom edge of the plate would do the same job.



The top plate goes on next. The stack is secured with two 1/4-20 screws. When loose, I can pivot the two blades to get the spacing correct. Then I lock them down.

This is definitely not a tool you want to toss into your toolbox or pocket. The exposed blades are nasty. The finished tool would benefit from a cover over the sharp bits.



With input from Doug Lough, the design quickly evolved to be safer and able to accommodate a range of cable diameters. The two box cutter blades have been replaced by a razor blade which extends beyond the edges of the plates by a little less than the thickness of the sheath.

To use this version, I put the cable over the blade and hold it down with my thumb while I rotate the cable 360°.

Although the danger of the blade has been reduced, I still plan to add a cover so the tool can be safely stored in a toolbox.

Suggestions from Collaborators

In reaction to my first iteration:

- Doug Lough
 - the set up time for different size cable would drive an electrician crazy.
 - it needs to be mounted solidly to a base in order to use it safely, no electrician is going to run his wire over to a central location and then back to the wall or ceiling that he is going to call home. Therefore portability would be the key so you would have to make a pocket sized version.
 - most electricians have become adept at using razor knives or inexpensive strippers and are not going to pay the \$30 for an additional tool to carry when they already have the cheap tool in their bags.
 - If you could come up with a hand held version the the V-blade could extend out at preset intervals for different sized cables and the retract completely you might have something.
- John Herrmann
 - It does look a bit intimidating and dangerous for the fingers. Guess ya just gotta use caution.
 - Alignment/placement of the blades looks like it can be tricky - especially since the blade spacing will have to be customized for each diameter cable. Maybe drill & tap the aluminum plate for 2 screws to go into the notches of one blade. Then drill & tap one hole for the other blade to pivot around. When it looks good, tighten that screw. The screw won't hard-locate the blade, but it should hold it in place while the two plates are screwed together. The plate opposite the aluminum one will have to have clearance holes for the screw heads. You do have somewhat of an alignment aid with the sheet metal, but it can still be somewhat tricky to try to hold spacing/alignment until the two halves are screwed together.
 - Might it be possible to add a bar, pivoted at one end, located atop the ends of the blades, with which to push down on the cable. That might be a finger saver.
 - It might be worthwhile to add a V notch to the two plates, so that when rotating the cable, it doesn't move sideways (too far against one of the blades, and you might cut too deeply).

- Andrew Ayers
 - An idea for safety - and maybe it could be improved upon somehow:
 - Bore a hole thru the middle, thru both plates - maybe about an inch in diameter.
 - Add some short pins or something to allow a repeatable positioning of the blades and pivoting. Maybe some simple scribed lines for certain cable sheath thickness or something?
 - Now, you would have to pass the cable thru a hole - that might be a deal-breaker, so that's an improvement avenue.
 - It still wouldn't be perfectly safe, but it could be put into a pocket...
 - If you wanted to make it adjustable, maybe something like an iris mechanism could be done (yeah - talk about complex - ok forget that idea)... [it is a wild idea but just needs to be tamed!]

Reacting to the second iteration, which has the razor blade slightly peaking out:

- Doug Lough
 - I suggested a swing-away cover, and received back: What if the swing away cover only opened partially? Creating a V in relation to the blade. This would allow the cover to hold the sheathing against the blade, and the operator would just have to spin it around the cable. One hand on the cable, one hand spinning the tool. And less likely to cut fingers.
 - What if the blade was angled very slightly so that the farther down the V it would be shallower, and the farther up, larger diameter, the blade would cut slightly deeper.
- You could add some additional recesses over the blade in that same block, so that it could be used with other sizes of cable. Either that or one larger recess with inserts to incrementally reduce its size to suit smaller cables. (Gregg Kricorissian)

After carefully studying all of these great insights and suggestions, I came up with a new version of the tool.



I hold the cable in the corner of the tool and rotate the cable one full turn. This was easier than rotating the tool.

I can slide the cutting edge inside the tool for storage.



The cutter is a sandwich made up of a bottom, threaded plate, the razor, a matching top plate with through holes, and two 6-32 screws. The plates were sized to permit the razor to extend out no more than 0.025 inches.

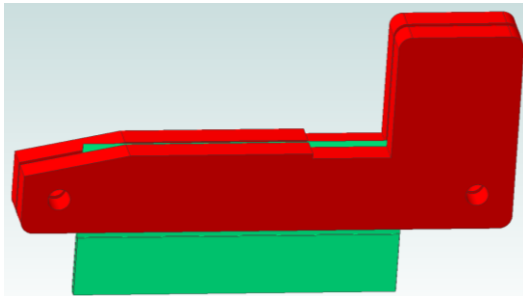
I started with two pieces of 1/8 inch thick aluminum strap 2-inches wide. With the razor down on one of the pieces, I marked my two holes so they would clear. Then I stacked up the two pieces and drilled through with a #32. The bottom plate was tapped 6-32 while the top plate was opened out with a #25.

After deburring, I ran my tap through the bottom plate's holes. Using the razor as a guide, I scribed were to saw so I would expose about 1/32 inch of the edge. Then I marked the vertical line.

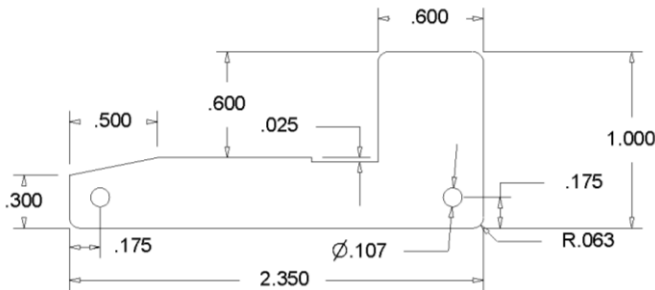
With the two plates locked together with the screws, I sawed both plates at the same time. I then used my 1-inch wide belt sander to true and smooth the cuts.



John Herrmann watched the video and suggested modifying the body so only about 1/2 inch of the blade is exposed. The tool is now even better.



After seeing a comment on homemadetools.net about a commercial tool, I decided it would be useful to cut the sheath axially. In this version, the corner of the razor blade is exposed. By sliding the razor blade along the major axis, I can adjust the corner's exposure.



I started with two pieces of 1/8" x 1" aluminum strap. After sawing off one piece 2.35", I used it as a gauge to saw my second piece. After deburring, I stacked them up in my drillpress vise and drilled my two holes using a #32 drill. One piece was tapped 6-32 and the

other piece was drilled out with a #27. Once deburred, I bolted the two pieces together with 1/4" screws. The hole on the left is close to the sloped section so pick screws with small heads. Socket Head Cap Screws would be ideal.

With the two pieces bolted together, saw out the top part. The 0.025" recess was filed out. Then round the outer corners.

Notice that when slitting the sheath axially, the corner of the razor blade cuts while the cable bends around the 0.6 x 0.6 part of the tool. I chose this because otherwise there wouldn't be much vertical stop for the cable when cutting radially.

I welcome your comments and questions.

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