**Make a Short, Low Voltage-Drop Power Cable for HF Rig use at Park - Dave Wilkie, K6EV April 2022**

**Introduction.**

The purpose of this GOTAhams project is to provide some exposure to simple wire stripping, crimping, soldering, heat shrink application and related tools while producing a shortened DC power cable that would be useful with most modern HF rigs for use at a park with a LiFePo4 battery that produces around 13.2V rather than the 14.4V of auto electrical systems. Minimizing voltage drop with heavy short wire is desirable. The $20 group-buy cost per person is a few cents LESS per kit than was actually spent on materials, tax and shipping.

The project will proceed in a couple of phases. Specialized tools are required for crimping so unless you are willing to pay around 45 dollars for a powerpole crimper, 30-40 dollars for a decent butt splice crimper and 75 dollars or more for a specialized crimper for the JST connector used at the radio end (plus soldering irons, etc.) please take your time and work using the available tools. Tools are not available for loan.

Please proceed in the order shown. Please check with the instructor before crimping or inserting terminals to make sure you have orientation correct and will not waste material. Of particular concern is the supply of JST type connectors which is very limited globally at present. We have very few spare pins. If you start to have trouble, consider letting the instructor crimp those contacts for you or you might have a fair expense and worse delay waiting for replacement parts.

The instructions illustrate touch-up soldering of the terminals at the powerpole and JST ends. Technically this is not needed and adds some risk of damage during assembly from excess heat. If you wish you can assemble these connections 'crimp only'. Discuss this with the instructor. When soldering these terminals it is important that you use a medium size solder pencil. Do NOT apply heat for a long time or you will begin to melt the insulation on your wire. If in doubt, STOP, ASK and wait for the part to cool completely, at least. Please be patient as we help others. Apply heat to the terminal with a clean tinned iron at full operating temperature. Melt a modest amount of solder ONTO the terminal NOT onto the tip of the iron. DO NOT apply excess solder – this is only auxiliary to the crimp and a solder blob will probably ruin the function of the contact even if it does not run onto the mating surface. Again, if re-attempting, wait until the terminal is COLD before trying again or you will overheat the wire insulation.

For the butt-splice in the middle of the cable there is a considerably larger object to heat up. In this case, using much higher capacity soldering gun will heat the intended location far more quickly and alow us to apply solder within a few seconds and then remove heat quickly – before high heat propagates far down the wire. So for this joint you will use a 100 Watt plus gun or iron. A smaller iron will do MORE damage. Speed is your friend, within reason. ALWAYS USE ROSIN CORE SOLDER FOR ELECTRONICS – NEVER ACID CORE.

The kit parts are in two bags. The smaller internal bag is for phase 2 – the application of the JST connector and the final assembly. Do not open that bag until ready and DO NOT CRUSH any of the contents of the bags. The terminals are delicate. Do NOT dump out your bag. You will lose parts. Remove only the parts needed for the step in process and seal the zipper lock on the bag.

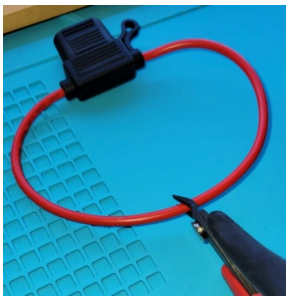
Please ask ANY questions at any time, and again, please be patient. If you are totally new at a step I suggest you let me demonstrate on one wire color or terminal and then you do the second. Follow these instructions and build and use this cable at your own risk – this is a courtesy project and is without warranty of any kind.

73, Dave, K6EV – K6EV@ARRL.NET

**Step 1: Add Powerpoles to Fuseholders.**

This will be done twice, once for the RED fuseholder (+12) side and once for the BLACK (Ground).

Remove one fuseholder (whichever color you wish to start with) from your bag and remove one powerpole terminal. Reseal the bag anytime you remove parts. Do not lose the terminal.

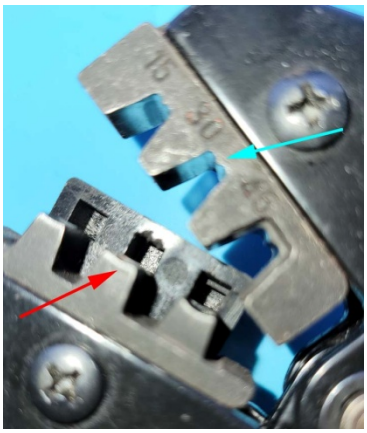


Cut the fuseholder wire loop exactly in the center as shown so that one half of the wire protrudes from each end.

Strip the wire end closest to the 'hinge loop' end of the fuse rubber cover such that just enough wire is exposed to allow it to be inserted into the powerpole terminal but leave no bare wire exposed. While the wire on the fuseholder is size `12AWG', it is stranded wire. Most wire strippers are labeled for solid wire which is slightly smaller. To avoid cutting strands use one size larger to strip the wire. Because wire gauges are stated such that smaller numbers = bigger wire, the next size up on the stripper will be that for #10AWG wire. Use the #10 size opening to strip the wire.

Take a close look at the terminal. Note a couple of things. The round 'barrel' shaped region that will cromp onto the wire has a barely visible 'slit'. This will fold down onto the wire during crimping if correctly oriented towards the 'gull wing' section of the crimp die described below.

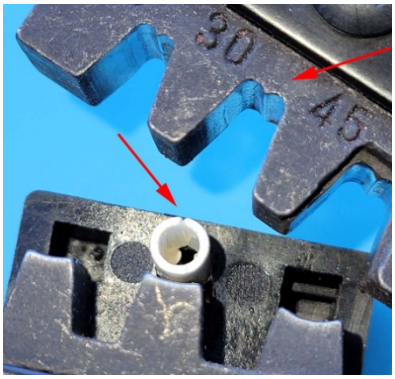
Also note the tip of the terminal. It has a slight downward curve just at the tip. The bottom surfaceof the terminal (the flat part and the bottom of the barrel as resting on the blue mat in this photo) must rest on the bottom of the crimp die – the side pointed to by the red arrow in the photo below. The upper part of the barrel, with the slit, must face up into the gull wings in the die pointed at by the light blue arrow.




Now take a close look at the crimper for powerpole terminals. It has 3 openings and we are using the medium opening. Contacts are, unfortunately, identified by supposed 'current rating'. So the smallest size is called a 15 amp terminal, the medium is called a 30 amp terminal and the largest is called a 45 amp terminal. But in reality, the contact surfaces are the same. What varies is how fat a wire guage each terminal accommodates. So think the the small as a 16-18 guage terminal, the medium as a 12-14 guage terminal and the largest as a 10guage terminal. Your fuseholder has 12awg wire so we are using the medium terminal – which is easier to use than the largest size as the medium has a circulary 'tube' style opening for the wire (a closed barrel) and better contains the wire prior to crimping. The slightly thick stranded wire is a tight fit so don't be alarmed if a couple strands don't tuck in. We can trim those off neatly with nippers.

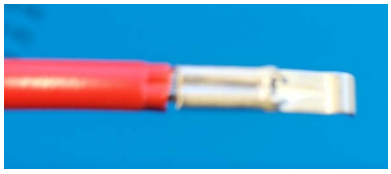
Looking at the photo above, notice that the light blue arrow is pointing at the top surface of the crimp die and that the die has a bit if a 'gull wing' shape. That is intended to cause the sides of the crimp portion of the terminal to fold in on each other like wings from either side. Make sure the tine tips point up into this gull wing when inserting the terminal. As already noted, the flat part of the terminal sits towards the red arrow and the flat tip itself goes into the deep 'pocket' you see in the wall of the crimper.

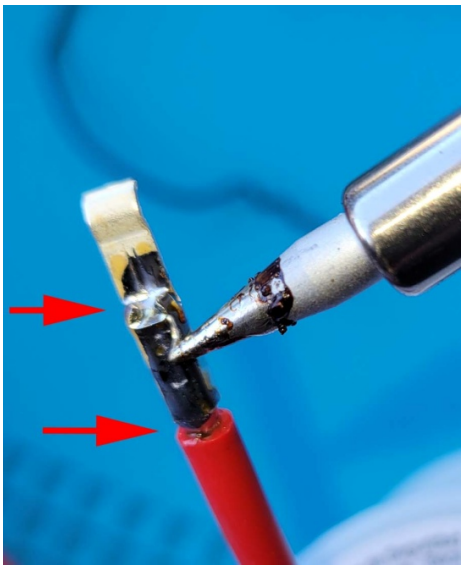
This is a ratcheting crimper. Once you begin to close it past a certain point it will NOT release until you fully complete the crimp. (There is a release if it gets jammed). Typically you will insert the terminal FIRST, then partially close the crimper – not enough to bend the terminal but just enough to loosely hold it. Then you insert the stripped wire FULLY into the terminal and crimp.




Here is another view of the crimper, but this time with a terminal inserted but the crimper has not yet begun to close. The upper arrow again points to the gull wing and the lower arrow points to the slit in the terminal and shows that it is properly oriented towards the gull wing feature.


Here you see the stripped wire inserted into the terminal. With the strip depth correct it should insert right up till the insulation touches the terminal, or very nearly so. Once you are at this point you need to make very sure the wire doesn't fall out and then close the crimper and squeeze it VERY firmly until you are sure you've crimped the terminal. I usually give it an extra squeeze before I retract the handles. The result is shown below.





If you wish to add durability by touching up the terminal with solder, take the following steps. It is important to avoid long application of heat. Hold the terminal in a soft vice such that solder will NOT run down onto the mating surface of the contact. Apply only a little solder and ensure it flows onto the wire bundle, not just the outside of the terminal. Stop well before you melt insulation. Consider allowing the instructor to demonstrate. Use FINE diameter solder.

Solder must not into the area above the top red arrow. Once the terminal is hot you should be able to quickly feed a little solder into the hole that the upper red arrow is pointing to.

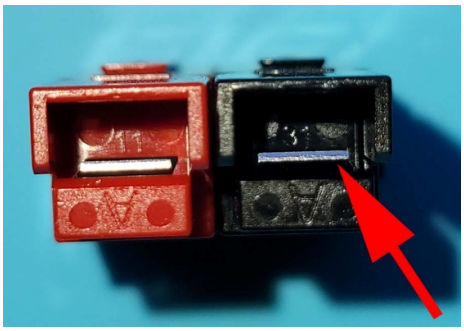
Do not allow the insulation to melt back significantly from the wire in the area of the lower red arrow. This will happen QUICKLY if you are having trouble. STOP and ask.

Repeat the process above so that you have a power pole terminal properly applied to ONE end of each fuseholder.

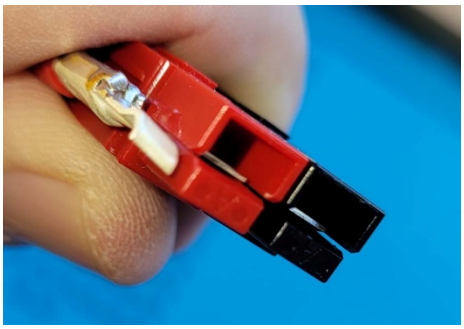
**STEP 2 – Inserting terminals into the Powerpole Housing.**

From your kit bag, remove the black and red powerpole housing and re-seal the bag.

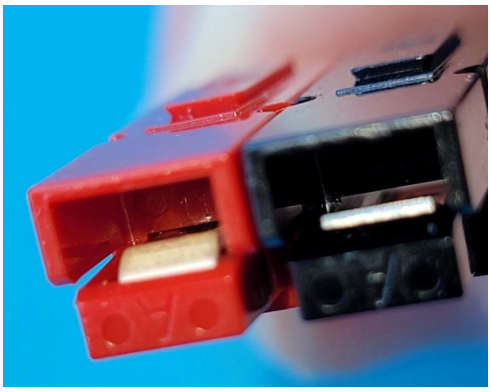
The same size housings are used for all 3 terminal sizes. Housings containing any of the 3 size terminals can mate with housings containing any of the 3 sizes. (There are much larger families of powerpole connectors but we are referring to the PP45 series only, as commonly used for ham radio). We have provided you with a pre-joint black/red pair of housings. If using loose housings, make SURE you join them with the correct housing on left and right or you will apply reverse power to your equipment and destroy it. Let's look at the housings.



This is a peek into the business ends of the housings BEFORE ANY TERMINALS are inserted. The metal you see is NOT a terminal. It is a spring that provides support to the terminal and plays a role in latching the terminal into position. The red arrow points to one of these springs. The wire and terminal enter the housing from the back side, the side facing down onto the blue mat in this photo. This picture shows the front side, the portion that mates with other powerpole connectors.



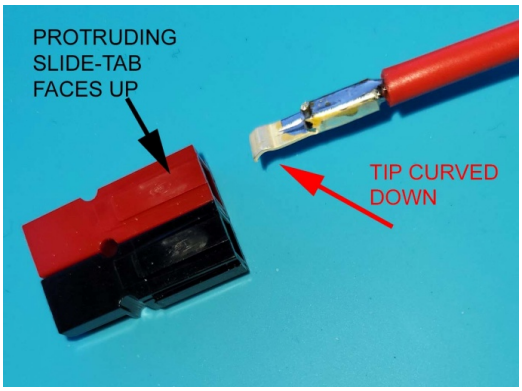
The photo at the left shows the same empty housing pair with a wire-mounted terminal held along side illustrating the orientation it will have after being properly inserted into the housing. The bent down 'tip' of the terminal will slip over, hide and grab onto the spring we saw earlier.



This is the same terminal pair after a wire mounted contact contact has been inserted into the RED housing. You can see the downward lip of the terminal is hiding the flat spring that we saw above in the red housing. The black housing is still empty.

It should be obvious that you never insert the terminals until after they are crimped onto wires. You can't crimp them after they are in there and, while they CAN be extracted, they are often damaged in the process.

IN this view, also notice the slightly raised dovetail molded into the plastic on the top surfaces of both the red and black terminals. If we could see the bottom surface in this view we would see a corresponding 'groove'.




In this view we are preparing to insert a terminal. Red wire into red housing. (DO NOT MIX THEM). The tab or dovetail is on the top surface of the housing. The tip of the terminal has it's little downward curve towards the bottom. The insulation comes right up close to the terminal and will not leave bare wire exposed after insertion. This is ready to insert. Push firmly and it should slide in and 'click' into place.


This terminal has been fully inserted. There is NO exposed metal. The appearance from the front should be that of the earlier photo where we showed a contact after it was inserted.

Use the illustrations above to insert the terminal from your red fuseholder into the red housing, and from the black fuseholder into the black housing. Feel free to have the instructor demonstrate one if you have not done this before.

Optional: Discuss with the instructor how loose powerpole housings are joined into pairs and locked in place.

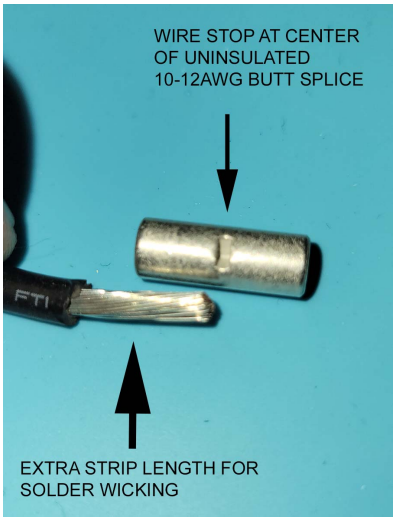
**STEP 3 – BUTT SPLICES OF FUSEHOLDER TO DOUBLED UP WIRE**

In this step we will couple the remaining end of the black 12AWG fuseholder to a PAIR of 24 inch black 14AWG conductors. And ditto for the red fuseholder. You may ask why we did not use wire heavier than 14AWG. The reason is that the JST connector (the radio end connector) where we will end up does not come with standard terminals that can accommodate wire greater than 14AWG. By using a PAIR of 14AWG stranded conductor we have similar performance to that of very heavy 10AWG wire and make best use of the connectors. The two 14AWG conductors will squeeze into one half of a 12-10 size butt splice and our 12AWG fuseholder is fine on the other side.

Here again, we could go 'crimp only'. But this butt splice will see wear/tear/temperature changes, etc. We are going to crimp it and then use a large soldering iron to get some solder in there. We never solder before crimping because solder is soft. And because the solder will just crack and will not be welded to the but splice tube itself.

In this case we won't worry so much about a LITTLE melting or retraction of insulation from near the butt splice because we are going to have some nice thick heat shrink tubing to re-insulate the whole area. Even so, the use of a high power iron will get the splice hot QUICKLY before too much of that can happen.

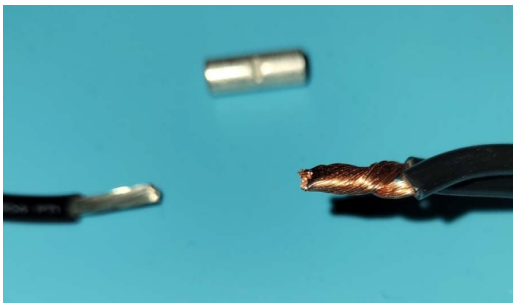
So that you don't lose parts, we'll do one color at a time. From your kit bag, please remove both 2 foot pieces of red and black "zip cord" wire about 24 inches long each. Also remove two pieces of heatshrink tubing about 1.5 to 2 inches long, of the same color as the first wire polarity you are going to work on (black or red – the photos below show black). One piece will be a larger diameter than the other piece. Also remove one un-insulted butt splice. The photos below can help you identify these items.



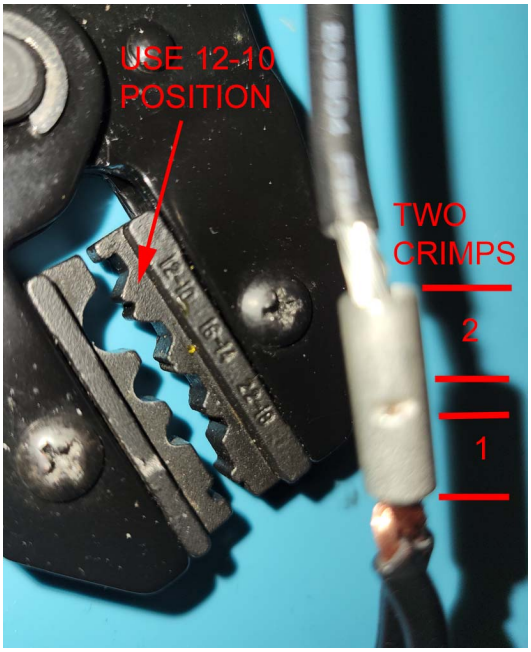

As illustrated at the left, strip the free end of the fuseholder wire for a distance about double the distance from the end of the butt splice tube to it's center stop. We want a little exposed bare wire after crimping to assist with reflowing solder down into the splice. This is #12 STRANDED wire so use the #10 position on most strippers.

Strip one end of ALL FOUR conductors of your zip cord (red and black) about the same distance. This is #14 STRANDED wire so use the #12 position on most strippers.

On the zip cord side, only for you first color, twist together the matching colors. (i.e. twist together the stripped ends of the black wires as shown below. It may fight you a little bit but as soon as you have them stripped you can slide them into one end of the butt connector.



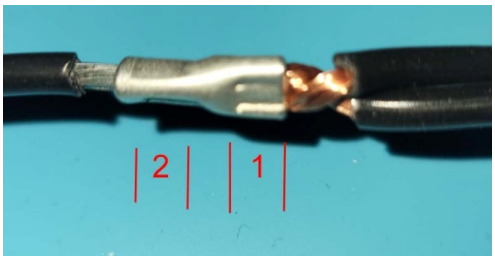
Your two slightly different diameters (but matching color) of heatshrink should look like this. 1.5 to 2 inches long each. Slide both pieces onto the free end of the stripped fuseholder of matching color and get them as far away from the butt joint as possible –right up against the fuse holder. We don't want them exposed to the heat of soldering. The result will look like this after the free end of the fuseholder wire is also slid into the butt joint.



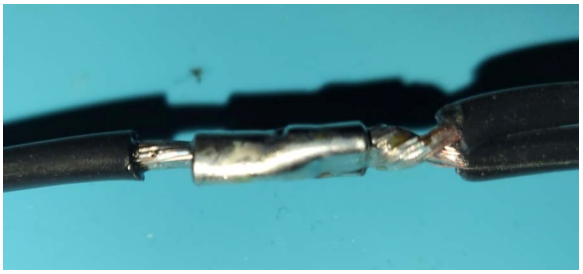

Lets take a short look at the crimper we'll use on the butt joint. It is heavier and has a lot of leverage, needed to crush that metal barrel.

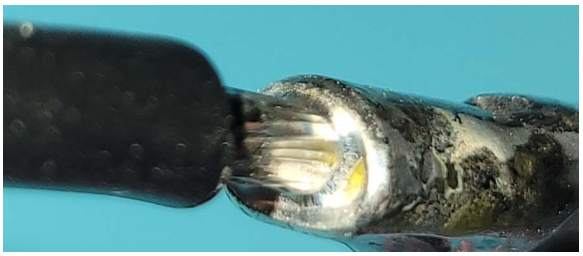
Think of the butt joint barrel as TWO halves separted by tht little wire-stop dimple in the center. We will crimp it twice, one on each end. Do the end with the doubled-up wires first so you don't have to keep fighting to keep them from falling out. We'll be using the largest of the 3 positions on this tool, the size for 12-10 uninsulated terminals. The barrel should be slid in so that one end gets crushed, but not the dimple in the center. The picture at the left illustrates these areas.

There are other types of butt joints that are easier to use, including some preloaded with low temperature solder that melts with a heat gun. But we have heavy wires here and want a lot of mechanical strength and durability. This cable is strong.




This is what we might have after crimping and before soldering. No effort has been made to 'line up' the crimps on each side. You'll have your hands full just making sure the wire doesn't slide out before you crimp. The photo illustrates the areas of crimp #1 and crimp #2.





Now gently clamp the wire in a soft vice to hold the crimped but joint up the air (you don't want to burn the vice). Use padded jaws and don't crush the insulation – you don't need the vise very tight. Use medium weight solder, diameter of .050 to .062 inch.

Using a 100 watt soldering gun, apply head to the joint and melt solder into it and ensure solder flows onto the exposed wire – it will wick naturally into the joint. You don't need (or want) huge blobs of solder – this is just reinforcing and sealing the crimped area. Be sure to keep that heatshrink AWAY from the splice. Cool the joint as SOON AS POSSIBLE.

When done, if you look into the ends of the butt splice you should see some solder has flowed into it.


As soon as the joint is COLD, slide the smaller diameter piece of heatshrink tubing away from the fuseholder and over the joint. It should be long enough to cover all the exposed wire and overlap onto the wire insulation. Center it. Keep the other piece OUT OF THE WAY back towards the fuseholder.

Use a heat gun to shink the tubing on to the joint, heating the tubing from all sides and down it's length but keeping the heat AWAY from the unshrunk piece of larger tubing. Incidentally, the tubing we are using has a 3:1 shrink ratio so it can become 1/3 of it's original diameter. Some tubing only has a 2:1 ratio. This tubing is also thicker walled AND contains a built in adhesive inner layer that will cement it to the wire as it cools. Just to prevents cuts we are going to use two layers.

So after the first piece is COLD, slide the larger piece right on top of it, centered again. Heat it and shink it into place. Your result should look something like the photo below.


The finished result for 'black' side.

Now repeat the process for the other color.

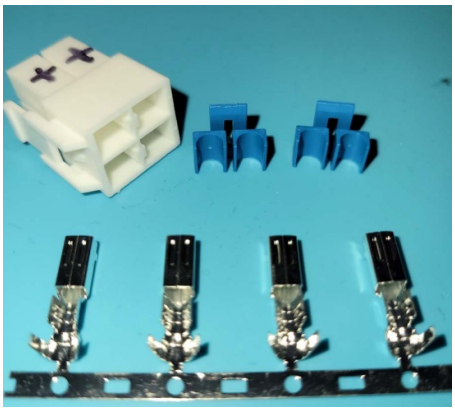
**This is a GOOD place to take a break, completing the cable in a 2nd session.**

**STEP 4: PREPARATION FOR JST TERMINALS AND INTRODUCING THE CONNECTOR**

As one of our final steps we are going to shrink on some small bands of heatshrink tubing to keep the 'pair' of red/black 24 inch wires from flopping around. We don't want to shrink them yet but we are going to put them on the cable now because it will become harder after we crimp on terminals. So locate 3 pieces of large diameter heat shrink tubing in your kit. Each piece is only about ½ inch long and is large diameter. In some kits all 3 pieces are RED. In some kits all 3 pieces are BLACK. IT doesn't matter. Just fine them and slip them over the free end of the 4 conductors and slide them way up out of the way, towards the butt splice. If you want you can put a piece of tape on the cable to keep them from sliding back down. Shrinking them will be one of our final steps.

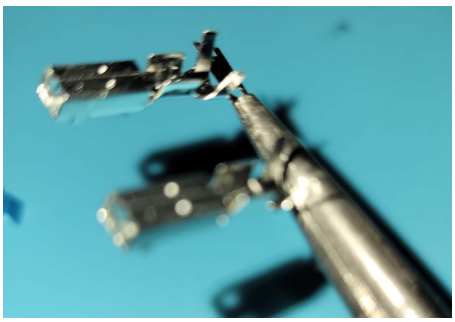
The installation of the JST terminals and housings is the most complicated part of the assembly. PLEASE ask the instructor to look at your progress before you crimp, install terminals, etc. It is also true that you may never again have to install exactly this type of connector, so if you want, the instructor can take you through a lot of it. At the same time, it is good experience. It is suggested that you let the instructor do a crimp or two. Remember WE DO NOT HAVE VERY MANY SPARE TERMINALS – THEY ARE IN SHORT SUPPLY AND COULD ONLY BE PURCHASED IN CONJUNCTION WITH HOUSINGS. ALSO, ALL FOUR WIRES THAT WILL PLUG INTO THE JST CONNECTORS NEED TO BE THE SAME LENGTH. If you succeed with 3 but mess up the 4$^{th}$, we may have to cut the other 3 terminals off and start over. So measure twice and cut once.

Let's take a look at one JST connector kit. These parts will be in the inner bag.

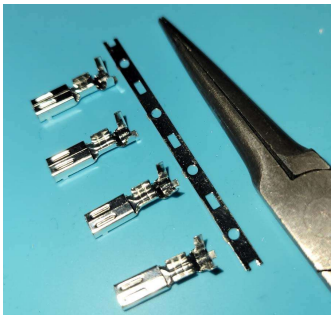



This is how they arrive, except that we've labeled the housings with + signs for the red wires and – signs for the black. Polarity is very important and hard to correct if you insert the wires in the wrong order. The ejection process for these contacts is NOT reliabile. Once they are in they want to stay there. Again, measure twice and cut once.

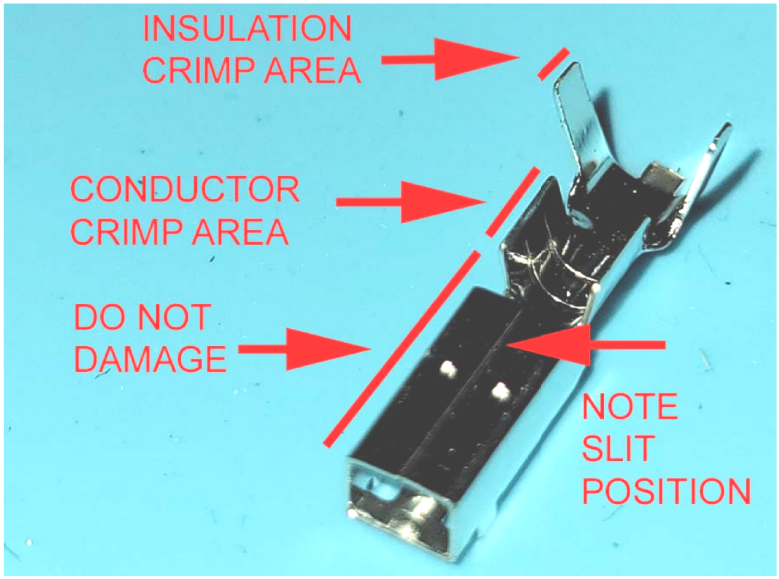
We have four terminals, one outer housing and two clip on accessory wire clamps (blue). The view shown of the white housing is showing the back side of it where we stick the wires and terminals into it.



Because our supply of terminals is tight, we took the liberty of pre-separating the individual terminals from their carrier strip. This is done by holding the strip rigidly in needle noise pliers and wiggling the terminals till they fall off. The carrier strip is discarded.



This is what results. You have the 4 loose terminals. Let's take a close look at one terminal. There are three primary areas of interest.



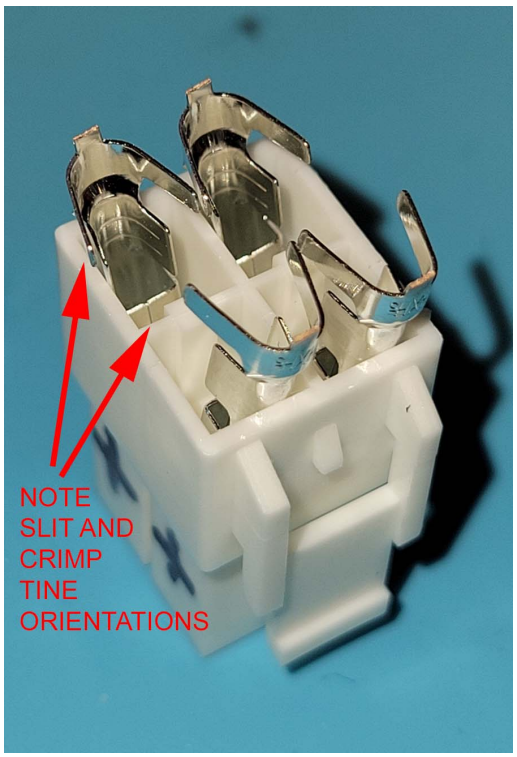

The front area, labled 'do not damage' in our photo is what we want to stay away from. Never let your crimping or other tool get a grip on that area. Deform it only slightly and the terminal is trash. The middle area is the conductor crimp area. The tines or vertical walls on each side will be crimped onto the bare wire of the conductor. Notice the 'slit' along the top surface of the box portion of the terminal. It faces up, just like the crimp tines. This is a useful identifier when thinking about orientation and we will show this with photos.

It is REALLY important that:

1. The terminal be positioned in the crimper so that the NOTHING forward of the leading edge of the conductor crimp tines is within the crimping die. The front edge of those tines should be flush with the face of the crimp die.
2. The tines must face up into the 'gull wing' area of the crimp die, so that they get neatly folded over into each other during crimping.
3. The terminals must be slide into the housing in a very specific orientation to one another or you will have a ruined terminal and ruined housing. Details follow.
4. If electing to 'back up' the crimp with solder, it is essential that no solder enter the do-not-damage area and it is essential that we solder quickly so as to not destroy the insulation on the wire.
5. Stripping length is important. Too much and wire will interfere with the front end of the terminal. Too little and we won't get good contact.
6.


On the subject of orientation, here is a photo looking into the business end of a fully assembled connector. The two red wires feed the terminals on the right and the two black wires feed the two on the left.

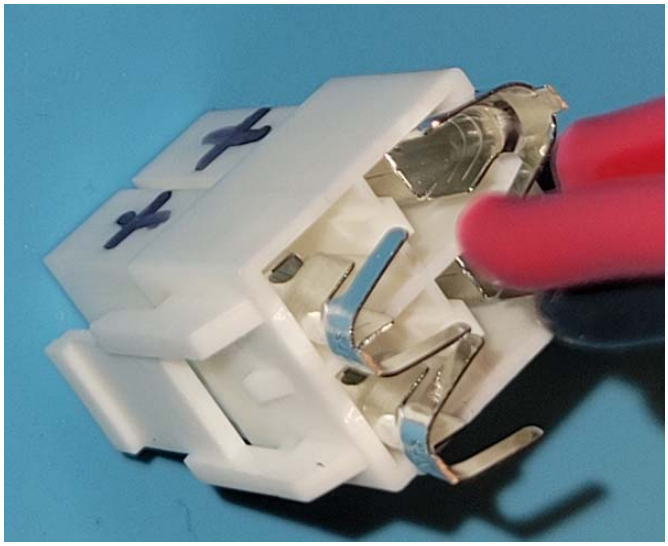
Look at the right half. Note that the 'slits' in the contacts are facing one another. Simlarly on the left half. The next photo will show what this means when it comes time to insert wires and terminals.




This is a view from the wire insertion side. The red wires are go on the left (note the plus signs marked on the connector housing) and the black wires to the right.

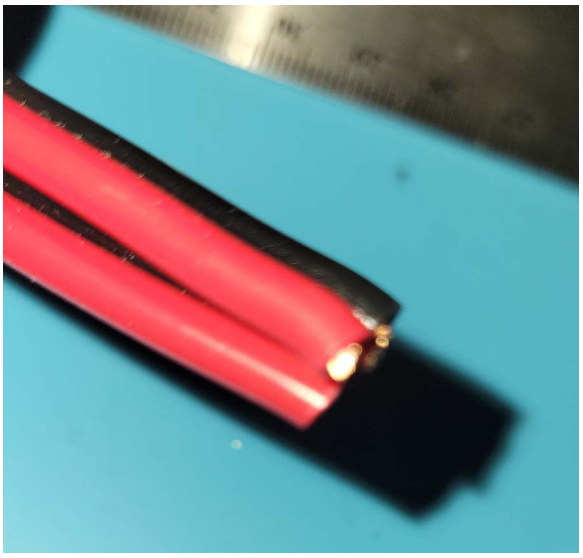
In order to get the slits to 'face each other', it is necessary that the crimp tines will 'face each other. We haven't fully inserted these terminals as we'd never get them back out but this illustrates the mandatory final orientation. The faces of the crimps of the two red wires must face each other. Ditto on the negative/black side. You'll need to pay close attention to this photo when the time comes to slide your terminals/wires into this housing.

Below is a similar view but we suspend the unstrapped/unstrapped ends of the 2 read and two black wires above the terminals.

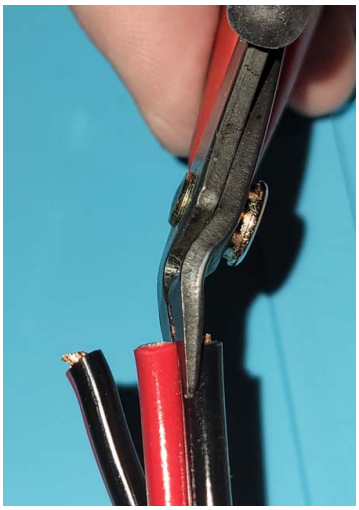


Enough introduction. Production steps follow below.

**STEP 5: JST CRIMPING**

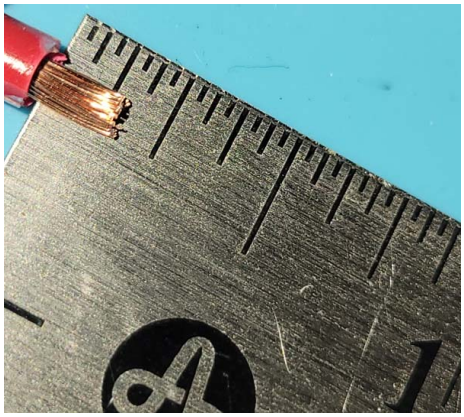


Start by carefully trimming your four 14awg conductors to equal length. Use a pair of nippers to just start to separte the ends.

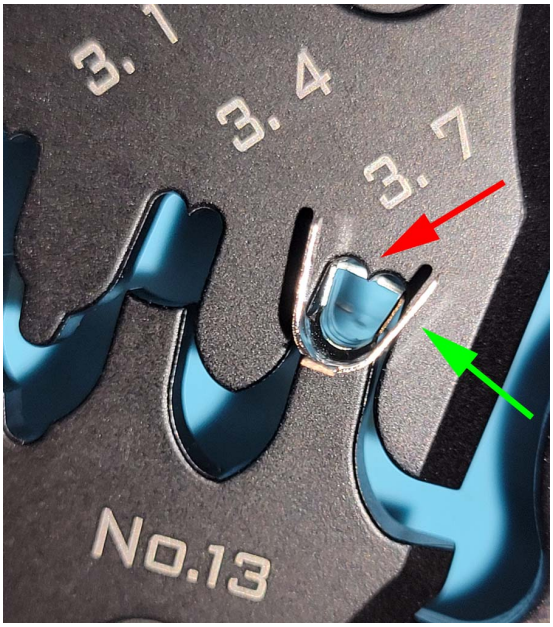



Once you have ¼ inch free you ought to be able to pull the conductors apart. Separate them for about 3 to 3.4 inches so that you have 4 discrete conductors for that length. Don't use nippers or cutters for more than about ¼ inch as you will damage the insulation.


The ideal strip length on these 4 wires will bring bare wire forward to JUST the front edge of the conductor crimping tines as illustrated at the left while leaving a solid section of insulation for the insulation gripping tines to grab onto. On a ruler, this means stripping just over 1/8 inch from each wire. This is STRANDED #14 so use the #12 position on most strippers.



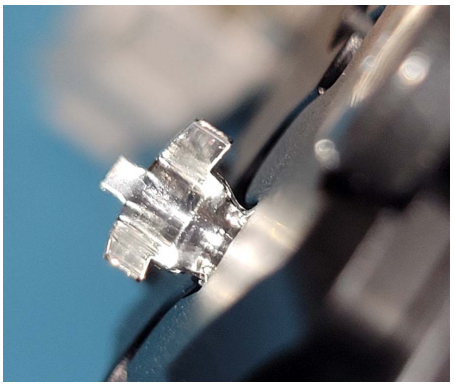
You will be crimping each terminal TWICE. Once on the conductor tines and once, much more gently, on the inslation tines.  You don't want to cut and destroy the insulation so take it easy.




The photo at the left illustrates several things. Here we see the crimp die that we will be using.  The red arrow points to the 'gull wing' section that the tines on the terminal should point into and which curls them over during the crimp. The bottom of the terminal rests in the rounded saddle below.  Here we see a terminal installed (without wire) such that the conductor crimp section is in the die and the taller insulation crimp tines are NOT in the die but are plainly visible outside the tool.

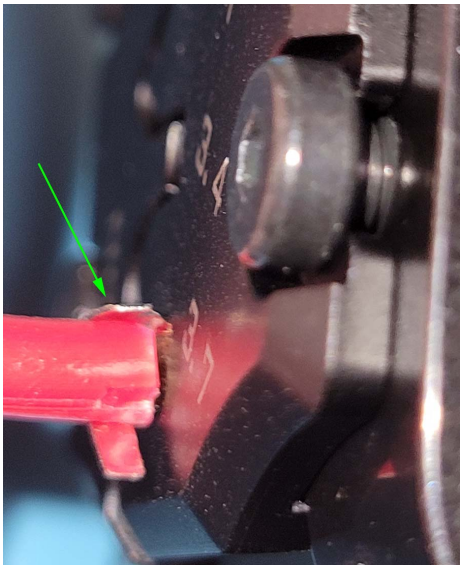
The green arrow points to those insultion tines and, by the way, you can see that by default they are spread too far apart for this tool. (It's only the $75 dollar tool, not the $700 dollar tool).  Later we will have to narrow those up so they can be inserted for crimping.

It is very important that, on the other side that we cannot see here, the 'box' of the front of the connector is COMPLETELY beyond the crimp die and won't be crushed or deformed at all.

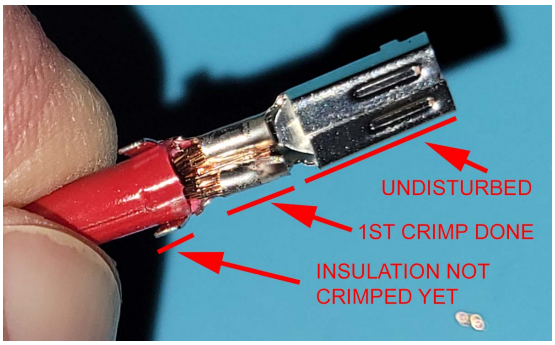


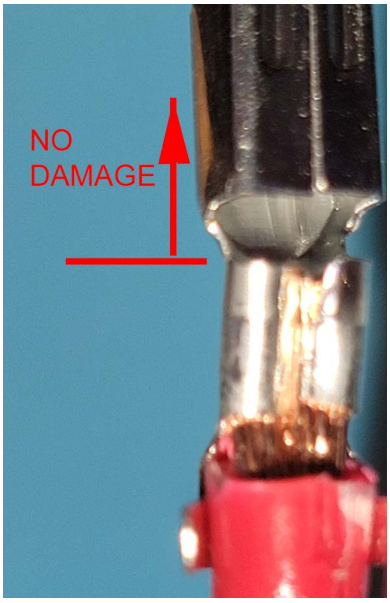
Here is another view down the face of the die. You can see that the insulation tines are outboard.

Below you can see a properly stripped wire inserted into the terminal in this same crimp position.  The insulation is within the region of the insulation tines as indicated by the green arrow. The stripped conductor region is within the crip die and conductor crimp tines ready to be crimped.  Give a fairly firm sqeeze on the crimping too to assure the tines close.



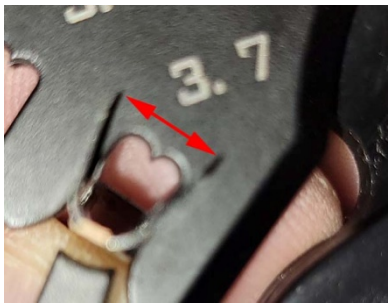
Below is the result after the crimp on the conductor tines. The insualtion portion remains uncrimped so far.

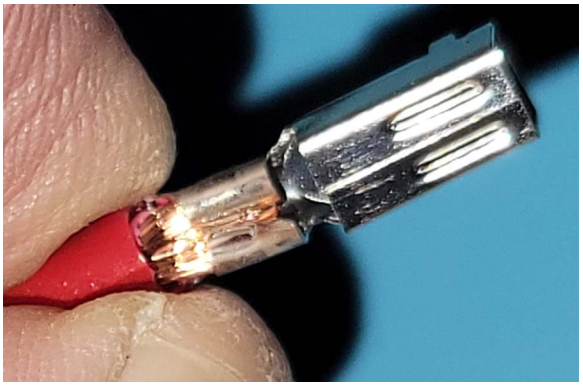




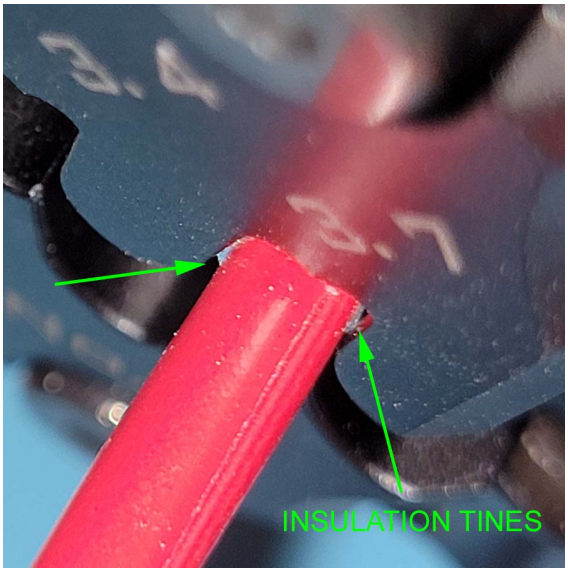

Here is a closeup of the crimp area. There is no damage or deformation to the front end of the terminal because the terminal was positioned in the crimp die such that the spot indicated by the horizontal red line was exactly flush to the back face of the crimp die.

Now remember those over-size insulation tines? Time to deal with these:



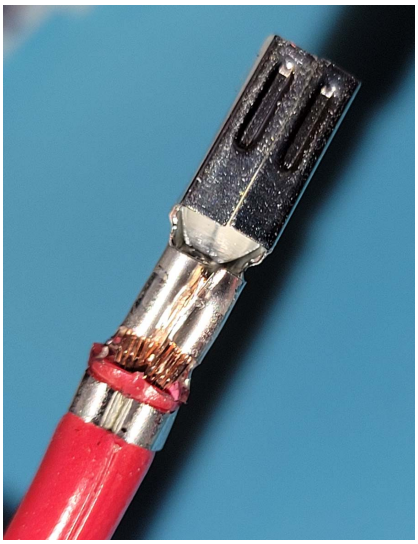



Start by just squeezing them together enough that they are basically vertical instead of being splayed apart as they were in the picture above. Here are some tired fingers giving them a gentle squeeze.



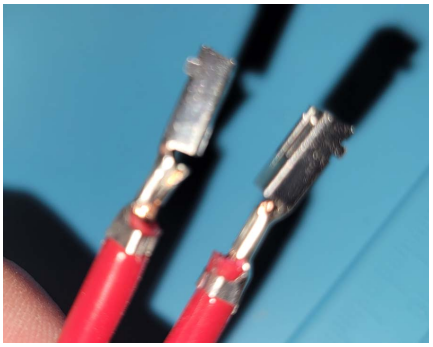

Now we ought to be able to slide the terminal (and wire) in deep enough that the rear of the insulation tines is flush with the front edge of the die. You can just see the uncrimped tines in the photo at the left, as indicated by the green arrows.

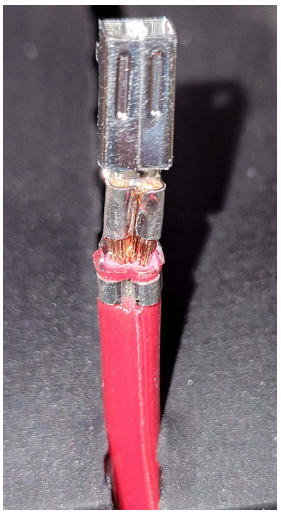
Be more gentle here – you are crimping on plastic insulation and the die is completely capable of squeezing it into non-existence.



Here is a decent result with both crimps completed and the insulation in good shape.

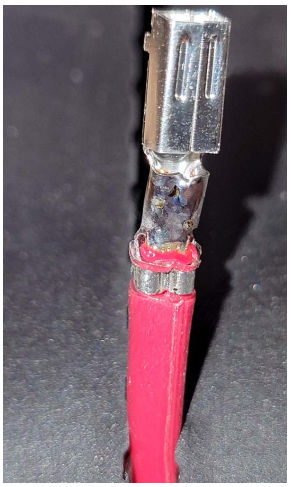
When you add the other crimp on a red wire, try to get the crips (and slits in the contacts) to roughly face each other – then you won't have to twist the wires so much to get them oriented properly into the connector later.





If you want to add backup soldering, do it as we did with the powerpoles – a modest iron but one that is fully up to temperture, be quick about it. Use thin solder. Flow a little solder onto the hot terminal. Avoid heating the terminal for more than 10 seconds or so with a tinned iron or you'll just destroy the insulation.

An OK result at the right, soldered and crimped.

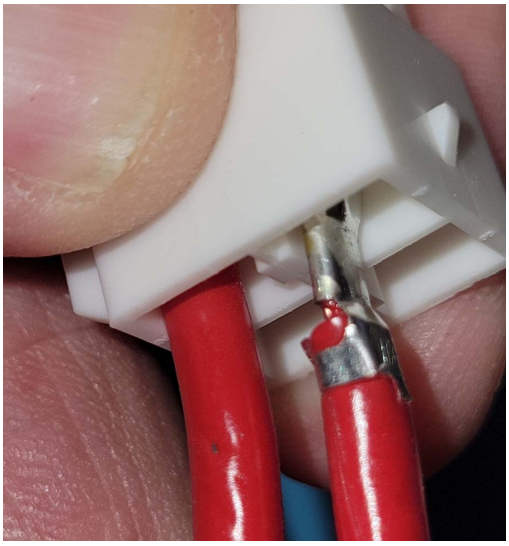


Do this for both red and both black conductors.

**STEP 6: JST TERMINAL AND WIRE INSERTION - WATCH POLARITY AND ORIENTATION CAREFULLY!!!**

Do this with the help of the instructor. Remember that we put those + and – signs on those white housings to help you. RED WIRES TO TO + BLACK GO TO -. Get that wrong and it's cut it off and buy a new connector.

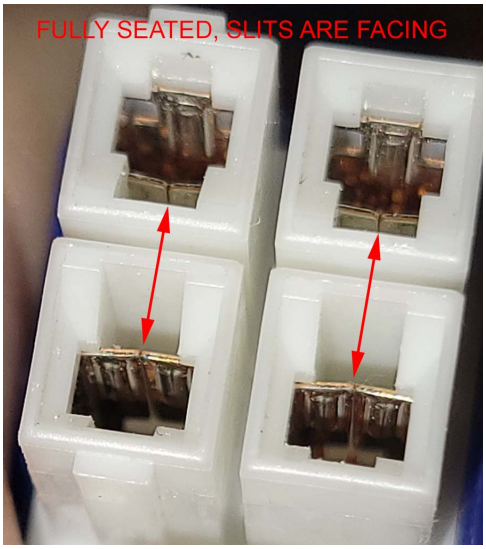
PLUS- you have to get those crimp faces and 'slits' facing each other.



In this illustration the first red wire has been inserted fully into a + slot with the crimp face and slit facing upwards towards the OTHER + position where we are about to insert a 2nd wire.

That 2nd wire is oriented such that it's crimp face and 'slit' is facing down towards the first wire position. They are mirror image of each other position wise. Consult the instructor if this is not crystal clear.

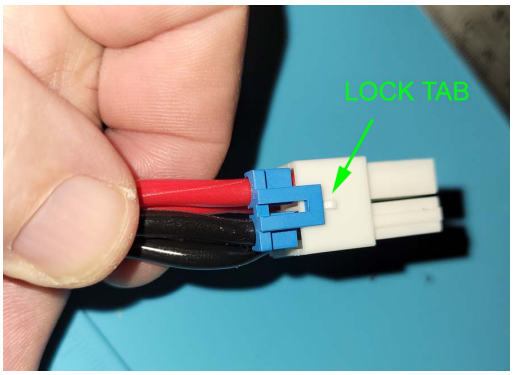
Do the same thing with the black wires.



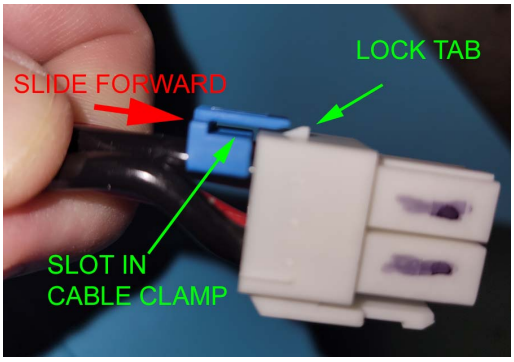

Now take a moment to ENSURE that all the connector terminals appear to be seated fully and to an equal depth and are correctly oriented.

Get this done right and you are almost done. The rest is easy.

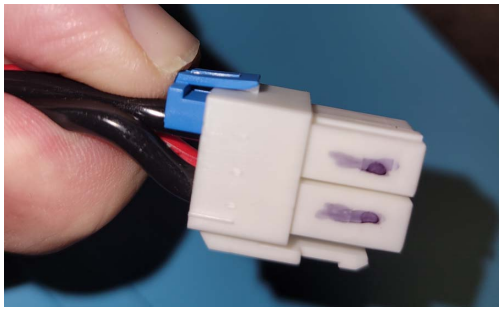
Now let's install the cable clamps.



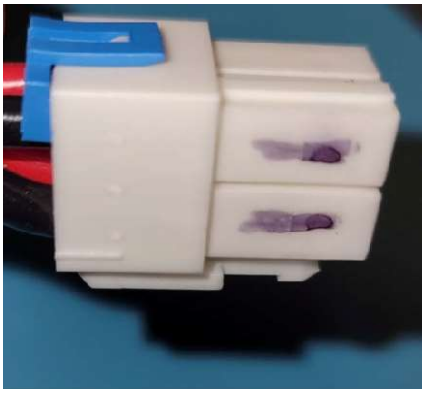

Take one of the cable clamps and work it down between a red and black wire as shown. Look at the next picture also and you'll see that you need to start out with it 'backed off' from the connector so that part of it can slide inside the connector as you slide it towards the little locking tab or tooth illustrated here.




Here you see in side view why you need to start out with it backed off. That slot in the cable clamp will accept the side wall of the white housing as we slide this to the right and eventually it will lock to the locking tab.

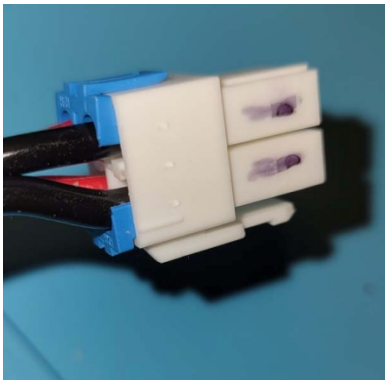


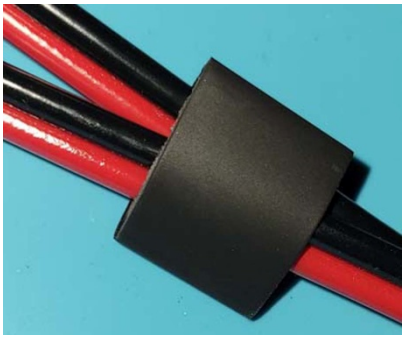
Here we are beginning to slide the cable clamp to the right and it is beginning to engage the locking tab.



Here the first cable clamp is fully engaged and has engaged the lock.

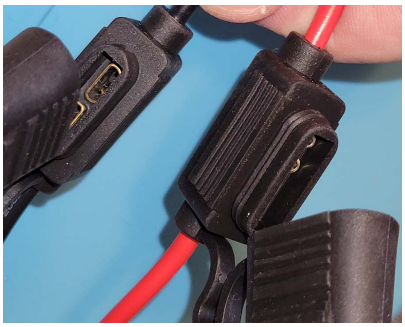
Now we need to repeat this with the 2nd one and end up with what is illustrated below. Check to



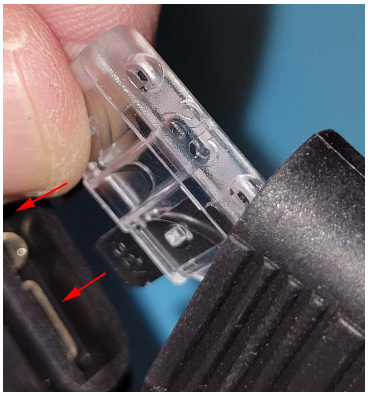


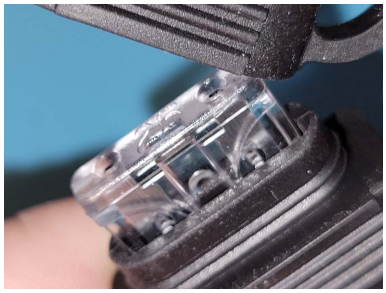
OK, remember those 3 ½ inch long pieces of heatshrink that we pushed onto our 4 conductors a while back but didn't shrink? Position those so that one is near the but splice, one is about 2 inches away from our JST connector and the third is midway between them.

Shrink them onto the cable.

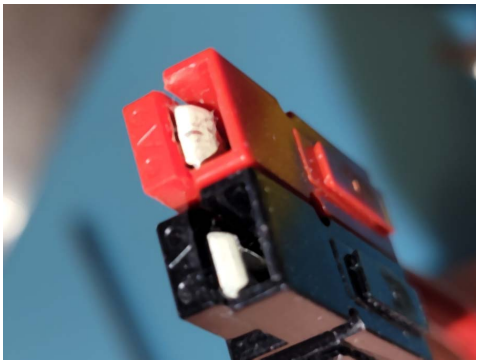


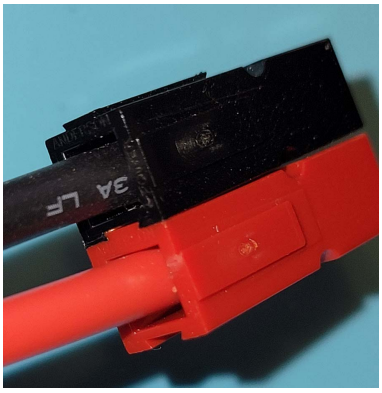
Pop open the rubber covers on the two fuse holders. Look at the terminals inside. Get the 2 25 amp fuses from your kit and install one into each holder and close the rubber caps.





Take a look at your powerpoles and verify that, through the whole cable, reds go to reds and blacks go to blacks and that there are no exposed conductors.





**STEP 7: CLOSING REMARKS**

1. You are encouraged to let your instructor look over the cable for problems. He has a tool to verify it's polarity and wiring. Do NOT plug it into a radio or battery before doing this.
2. The supplied 25Amp fuses are correct for most small modern 100W HF radios. If you have a less efficient radio for which the manufacturer requests a 30 Amp fuse, those are available from auto parts and electronic suppliers. You just need a full size ATO/ATC 30 Amp fuse.
3. This cable will NOT work with EVERY radio. Most mobile radios use different connectors (and need smaller fuses). Older HF radios may have used 6 pin Molex connectors and some used proprietary connectors.
4. Preferably you will compare the ++/-- mapping in this cable to your own existing cable before plugging in your radio, especially if it is an odd brand.
5. Use this opportunity to examine and learn how that little pain-in-the-neck locking tab on the JST connector works. We all struggle to disconnect these from radios.

Again, don't hesitate to call if you have problems. That said, the short length of this cable should minimize voltage drop when transmitting in the field from a battery, maximizing your ability to operate from that power source.