

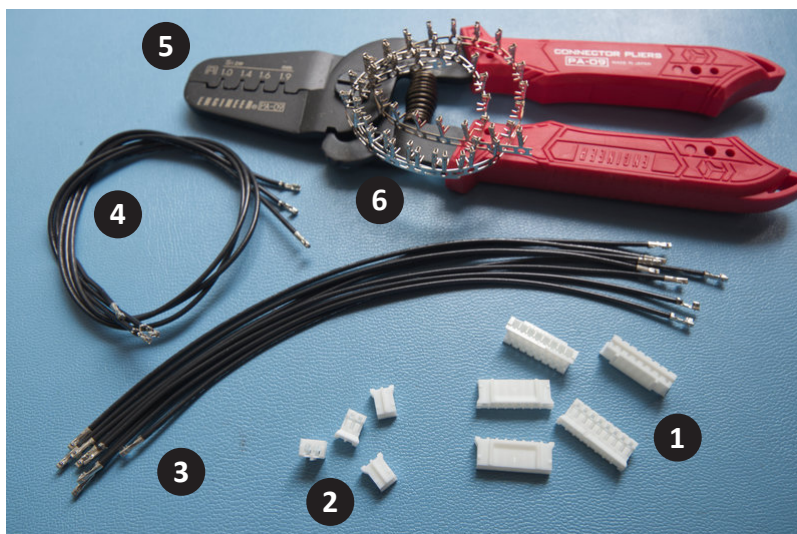


Technical Note

Gloria Connectors

This is a guide for creating connector cables for Gloria 4, 3.2 and 3. The focus is on a simple, quick procedure suitable for low volume repairs.

Materials



1. PHR-8 connector housing, JST Sales. The cable between the connector board and main board uses two of these. DigiKey 455-1189-ND.
2. PHR-2 connector housing, JST Sales. The cable from the battery compartment uses one of these. The cable to the speaker also uses one of these. DigiKey 455-1165-ND.
3. ASPHSPH24K152 6" lead, 24 AWG, socket-socket, JST Sales. The cable between the connector board and main board uses eight of these wires. DigiKey 455-3082-ND.

4. ASPHSPH24K305 12" lead, 24 AWG, socket-socket, JST Sales. The cable from the battery compartment uses one of these wires. The cable to the speaker also uses one of these. DigiKey 455-3083-ND.
5. Engineer PA-09 Crimp Tool. Optional. Use for making custom wire lengths / colors. Available on Amazon.
6. SPH-002T-P0.5L connector terminals, JST Sales. Optional. Use for making custom wire lengths / colors. DigiKey 455-2148-1-ND.

For convenience, the DigiKey catalog numbers are included for easy ordering at <https://www.digikey.com>, but the components are also available from other electronics distributors.

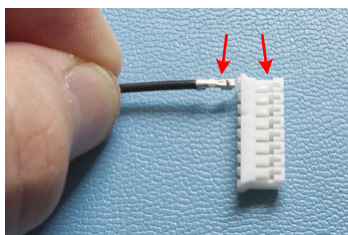
Main Board Connector Cable

You will need two PHR-8 connector housings and eight 6" leads. The socket at each end of the leads snaps into place when inserted into the connector housings.

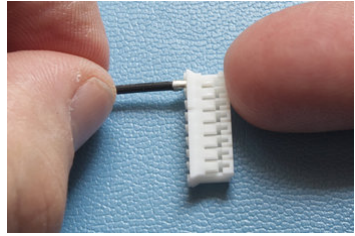


The eight leads connect directly in a straight line between the two connectors, as shown above.

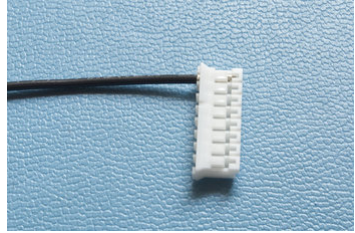
Begin by inserting the socket at the end of one of the leads into the first hole in a connector housing. There is a tiny retainer clip that snaps into a slot on the connector.



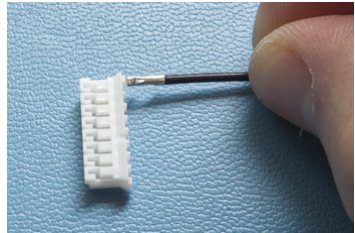
Push the wire carefully until it clicks into place. Take care, because once inserted it's difficult to remove without damaging the socket or the connector.



Insert the other end of the lead into a second connector. This connector faces the opposite direction. Make sure the orientation is correct, as shown by the pictures, with the connector slots facing up. In this example, the first lead is inserted into the top hole of each connector.



You now have the first lead installed as shown below.



Continue to add leads, one by one, inserting into successive holes in the connectors. Insert both ends of each lead before moving onto the next lead, to ensure the connections are not accidentally crossed over.

Here's an example with the first three leads installed.



Speaker Connector Cable

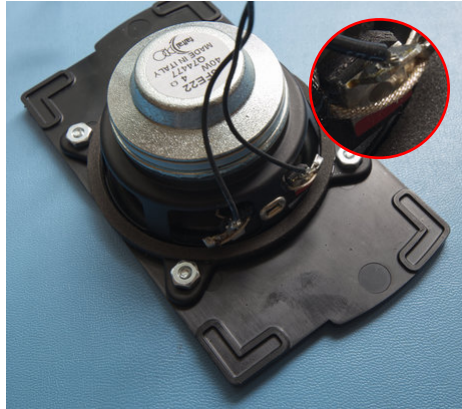
You will need one PHR-2 connector housing and one 12" lead.



Fold the lead in half and cut it at the midpoint. You now have two 6" leads with a socket at one end. Insert the lead sockets into the connector as described previously. Loosely twist the wires together.

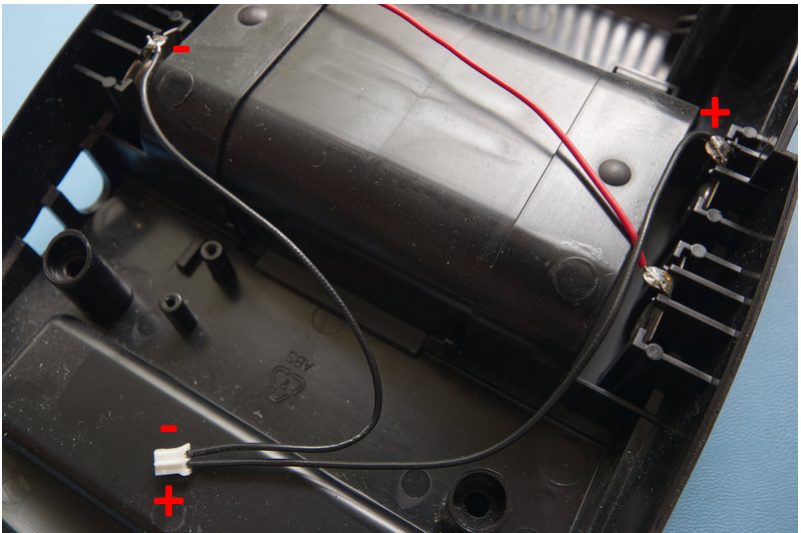
Wrap the pair of wires once around the ferrite core, as shown above. Gently pull for a snug fit. The ferrite core should end up roughly in the middle of the length of cable. The ferrite part number is Laird LFB090050-000, DigiKey 240-2135-ND.

Strip and tin the bare ends of the leads, and solder to the speaker terminals. The lead with the plus indicated above connects to the positive speaker terminal. Identify the correct lead according to the orientation ridge on one side of the connector. The Gloria 4 speaker identifies the positive terminal with red, as seen on the right-hand terminal shown below.



Battery Connector Cable

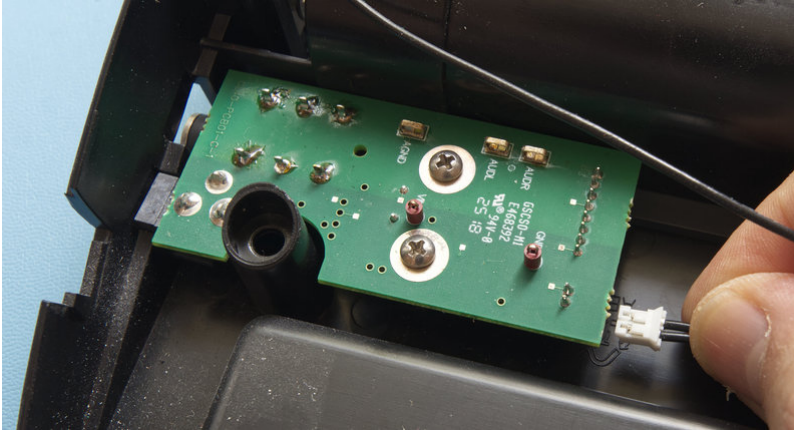
You will need one PHR-2 connector housing and one 12" lead. Fold the lead in half and cut it at the midpoint. You now have two 6" leads with a socket at one end. Insert the lead sockets into the connector as described previously.



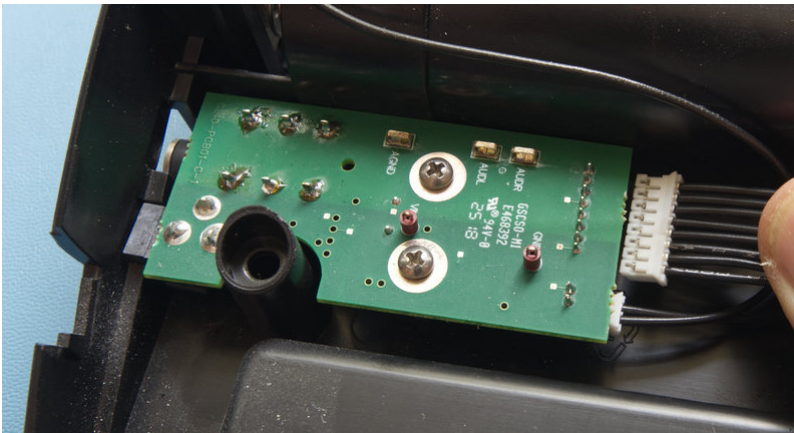
Strip and tin the bare ends of the leads, and solder to the battery terminals as shown above. ***Be sure to connect the correct polarity as shown above***, guided by the orientation

ridge on one side of the connector. Incorrect (reverse) polarity may damage the Gloria circuit boards, and may cause the batteries to burst or catch fire.

Connector Board Installation

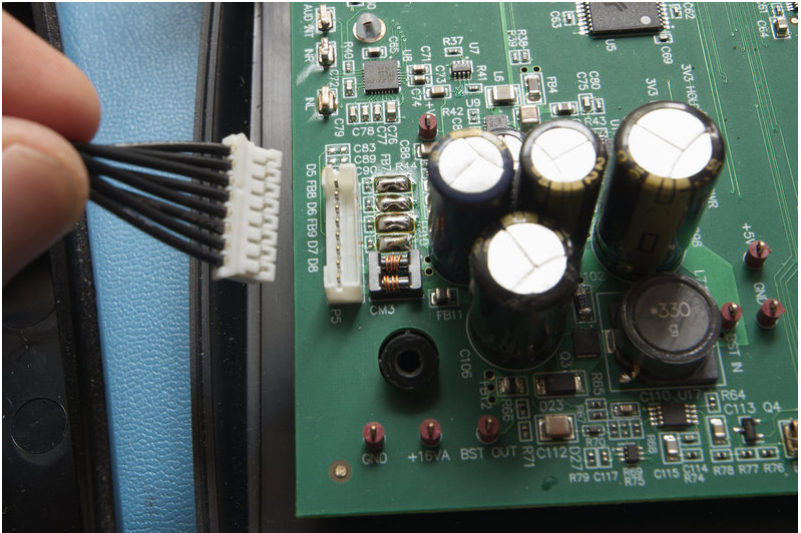


Attach the connector board to the case with two screws (#4x3/8", McMaster-Carr). Insert the battery connector to the small plug on the board. Observe the correct orientation: the ridge on the connector faces down.



Insert the main board connector to the large plug. Keep the wires above the battery connector wires. Observe the correct

orientation: the two ridges on the connector face down. There will be some resistance on the first connection, as the sockets on the new connector are forced into alignment by the pins on the plug. Make sure the connector is straight and even as it is inserted, so that the connectors are not accidentally bent or broken.



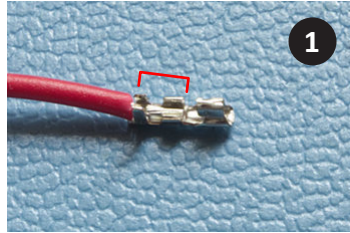
Insert the other end of the main board connector to the plug on the main board. Observe the correct orientation: the two ridges on the connector face the edge of the board.



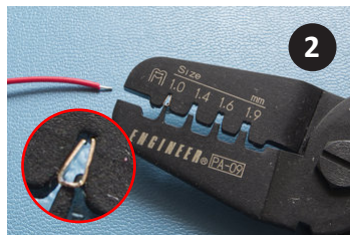
Custom Connector Leads (optional)

You will need a set of SPH-002T-P0.5L connector terminals, a PA-09 Crimp Tool, and some 24 AWG stranded wire, color to suit.

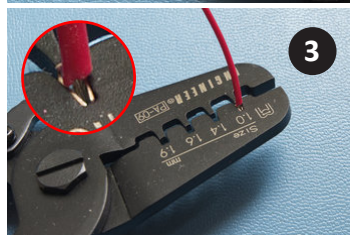
1. Strip a small section of insulation from one end of the wire, just enough to fit the crimp socket.



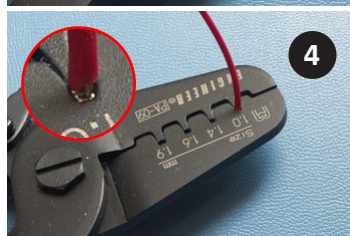
2. Insert the crimp fingers of the socket (the side facing left in the first picture) into the 1.0 mm slot of the crimp tool as shown in the second picture.



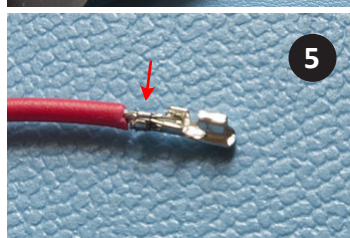
3. Insert the stripped end of the wire into the crimp fingers. Don't push the insulated part of the wire into the crimp area.



4. Squeeze the crimp tool closed firmly until the crimp fingers are fully crushed. Tug gently on the wire to make sure it's securely fastened. If the wire comes loose, discard the crimp socket and try again with a new one.



5. Open the crimp tool and carefully remove the wire and socket. Visually check to make sure the wire is crimped securely. Repeat for the other end of the wire if necessary, and install to the appropriate connector.



Additional Notes

When ordering parts from DigiKey (or other distributors) pay attention to the quantity price breakpoints. It may be cheaper to add a few more parts to reach the next breakpoint.

Shipping is often charged at a flat rate, so buying larger quantities at a time may be more cost-effective long term. See also the previous paragraph.

If you don't often do these kinds of repairs, buy more parts than you think you'll need. There will be mistakes and damaged connections along the way. It doesn't hurt to have spares. And make sure to calculate the correct multiples of each part. For example, one main board connector cable requires two connector housings and eight pre-made leads.

Making your own leads with loose connector terminals (see previous page) is cheaper than buying already prepared leads, but it's also a lot more work. And unless you have prior experience with these tiny connectors and the required tools, it's common to end up with unreliable connections that pull apart and cause unexpected short-circuits and other failures. Buying prepared leads is the best option for most people.