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Otaku's Boris Hack

Here is another great hack from Otaku!

Hacking a Boris skull for an external sound source:

Read this entire instruction before starting. Use care when stripping the Boris cable wires –the copper wires are very light gauge and can be easily cut off.

Tools and parts needed:

 Phillips screwdriver	 10 ohm resistor (1/2 or 1 watt, Radio Shack p/n 271-151)
 Soldering iron	 10K ohm linear taper potentiometer (Radio Shack p/n 271-1715)
 Wire cutter/stripper	 1/8" male mono plug (Radio Shack p/n 274-286)
 100uF capacitor (Radio Shack p/n 272-1028)	 Two short pieces (~4") of 20 – 26 gauge insulated wire

Attach the 1/8" connector to the microbone cable:

1. Cut the microbone wire, leaving a few inches on the bone. Set the bone aside. On the cable attached to the skull, strip off about an inch of the outer black insulation to expose the bare copper wires (ground wires) and the inner red insulation. Twist the bare wires together and strip off the red inner insulation. Twist these wires together. Tin the twisted wires with solder.

2. Remove the plastic cover from the connector and slide it onto the cable. Solder the red insulated wires to the center pin tab on the connector, and solder the ground wires to the outer shell tab. Check to be sure that no wires are shorting across the tabs, then twist the connector cover onto the connector plug.

Attach the resistor to the speaker wires:

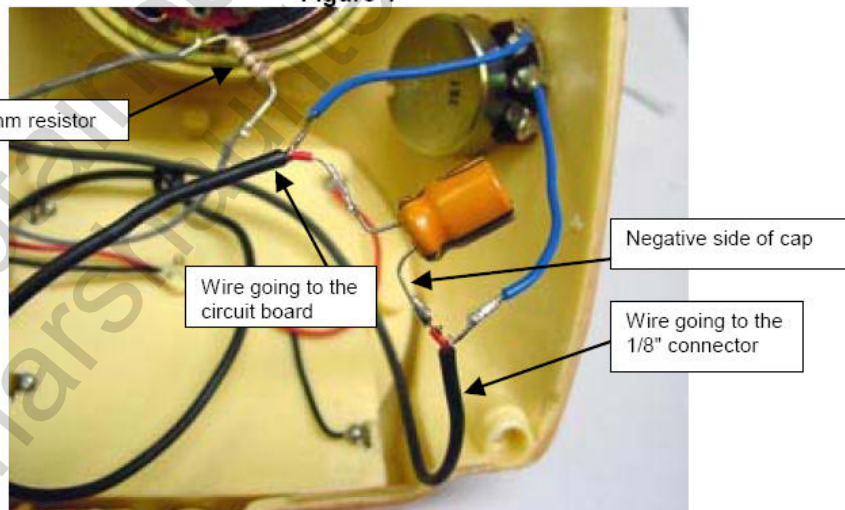
3. Remove the 4 screws that hold the back of the skull. Carefully remove the back cover.
4. You'll see two gray wires going to the speaker terminals. De-solder the wires from the speaker terminals and solder the 10-ohm resistor between the wires. This resistor replaces the Boris speaker. Tape the soldered connections to prevent shorting.

Attach the capacitor and potentiometer:

5. Find the hole where the microbone cable comes into the skull. Carefully pull about 10" of the cable into the skull to give yourself some slack to work with. Do not pull the cable off of the circuit board. Cut the cable at about the midpoint, leaving about 5" of cable inside the skull. Strip both ends of the cable where you made the cut as described in Step 1 and tin the wires with solder.

Figure 1

6. The 100 uF capacitor must be wired to the correct polarity. Look on the capacitor shell and you'll see a stripe printed with "minus" or "negative" symbols. That side of the cap is the negative side. The



negative wire of the capacitor must be soldered to the red- insulated wire that goes to the 1/8" connector. Solder the positive wire of the capacitor to the red-insulated wire that goes to the circuit board. See Figure 1.

Figure 2

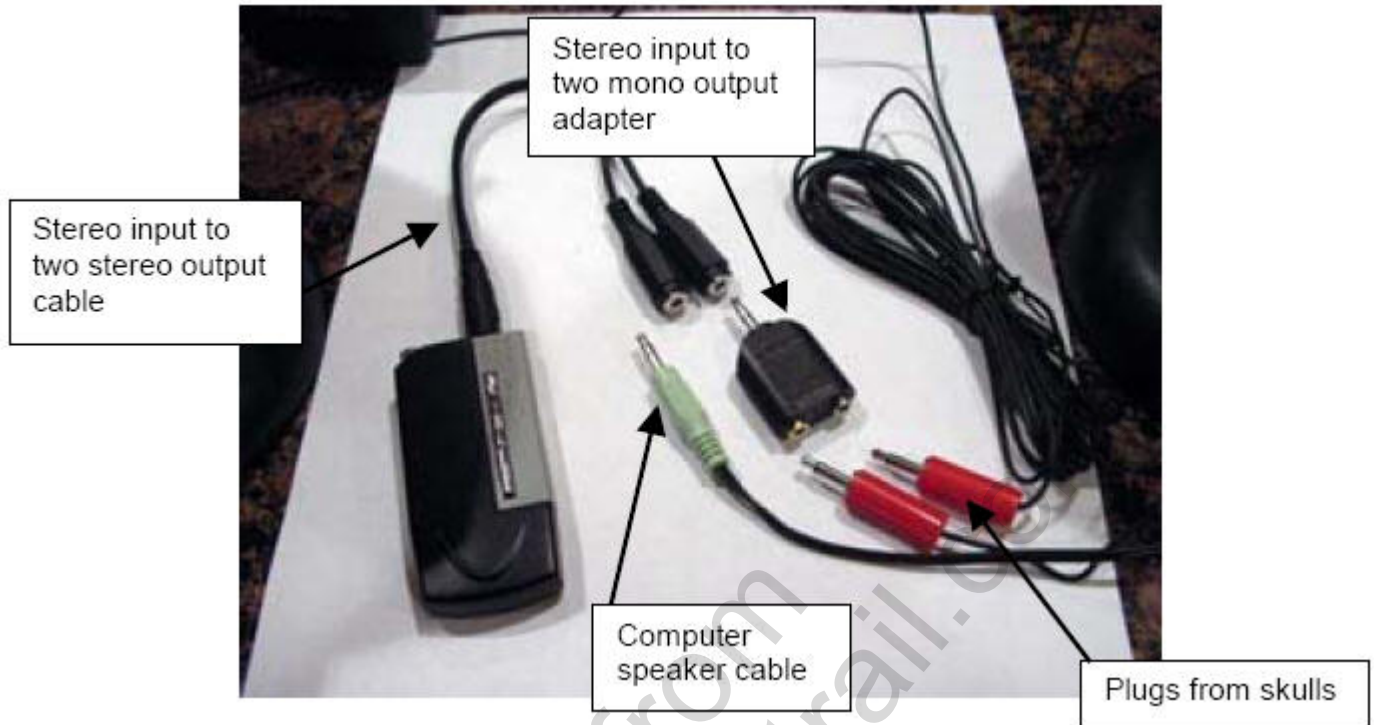
7. Solder the two 4" pieces of wire to the ground wires of the microbone cable as shown. Install the 10K ohm Potentiometer in the skull:



8. Pick a location in the right-hand side of the skull back cover to install the pot. Drill a 5/16" hole through the skull. See Figure 2.

The shaft on the pot is longer than needed. You can cut it to the length you want with a hacksaw. Be careful not to damage the pot.

9. Install the pot and tighten the nut. Solder the two short wires to the pot, one wire on the center tab and the other on either of the two remaining tabs. Cover the bare wire areas with tape or secure the wires to the inside of the cover so that they won't rattle around and cause a short.
10. Take a close look at the wiring to be sure it matches the pictures. Replace the cover on the skull. That's it – you're done.
11. Get a cable or adapter that splits a stereo signal into two mono channels, left and right. You'll need one that has two 1/8" mono jacks. Plug the cable into your stereo sound source, and plug Boris into one of the mono jacks and a set of computer speakers into the other jack. Turn on the sound, and adjust the Boris jaw action with the potentiometer.



13. If you want to have two Boris skulls talking from the same stereo soundtrack, use the setup pictured here:
14. This setup splits the stereo output from the source into two identical stereo signals. One signal goes to the computer speakers. The other gets split into two mono channels that go to the two skulls. The cable is Radio Shack p/n 42-2570 and the adapter is p/n 274-375. You can probably find better prices at a computer supply store. Note – be sure to use amplified speakers. Your sound source may not have enough gain to run a Boris and a passive speaker.