Building a Connector Cable for Sega 32X   by sonic412781

After some time building these cables and selling them on Ebay, I've decided to write step-by-step instructions on how to build one yourself. You'll need a few tools to do this; if you don't have everything on the list, you won't be able to complete it properly. The cost of making one of these cables depends on what tools you have (I already had all the tools and materials necessary, except for the connector pieces). For me, the average cost for building each cable was about $3.00 as of when I wrote this. You'll have to do some research if you want to determine for yourself what the cost of each cable will be.

What You Need:
Light-duty soldering iron (I prefer Weller WP25 - 25 watt) with long pointed tip and soldering stand
12" Cat5 ethernet cable (UTP, 4 pairs)
(2)9-pin miniDIN male connectors
Small needlenose pliers
Large needlenose pliers
(2)Small flat-head precision screwdrivers
Soldering flux (I used Oatey no.95)
Solder (either electrical or 40/60, rosin core)
X-Acto knife
Small wire cutters (about 1/4" blade length)
Good soldering skills and steady hands :)
Continuity tester or digital multimeter
(For model 1 Genesis: one of the miniDIN connectors needs to be replaced with a 8-pin DIN connector; see Wiring section for alternate wiring)

The miniDIN connector should have the following parts:
-Notched metal shield
-(2)Plastic shield holders
-Outer sleeve
-Connector pin assembly (black cylinder with the pins in it)
The DIN connector should have the following parts:
-(2)Metal shield halves (one has a flanged end for holding the cable in place); fits together to wrap around the connector pin assembly)
-Outer sleeve
-Connector pin assembly

Preparatory steps (see diagram A for reference):
1) Plug in your soldering iron. Make sure it's in its protective solder stand while it's warming up; you don't want anything catching on fire.
2) Use the metal shield to measure where to cut the outer jacket of the Cat5 cable, and use the Xacto knife to strip the outer jacket away from the wires inside. Do each end like this.
3) Pull out the silk-looking string that's inside, you won't need it.
4) Slide the two outer sleeves from the connectors onto the cable so that the narrow flexible ends are butted up against each other. (It's important to do this now, as you won't be able to fit them onto the wire after the next step)
5) Bend each pair of wires 90 degrees outwards (should look like a plus-sign after you're done) There should be four different colors: yellow, blue, brown, and green, each with a solid wire and a white-striped wire.
6) Un-twist each pair of wires, and straighten them out as best as you can.

The wires should now be in a spider-leg arrangement. If you compare them both looking straight down at them at the same time, you'll notice that two of the colors are going to have to "swap sides."

7) Bend one pair of wires to the opposite side, and vice versa to the wires on that side. When you're done with this, the wire colors will be in the same order reading one direction or the other. Example: starting from the top left wire and going clockwise; Blue, Lt.Blue, Lt. Yellow, Yellow, Lt. Green, Green, Brown,

Lt.Brown, on both ends. The color arrangement may be different, but the pattern should be the same on both wires.
8)Trim about 1/8" off of each wire using the Xacto knife.

The cable itself is now ready for soldering. But first, the connector assembly pieces need prepped:

9) Remove pin X from the miniDIN pin assembly. DO NOT remove pin X from the DIN connector if you're building one for the original Genesis; the pins are too big to pull out. The way I removed pin X is, I trimmed the narrow part of the pin about 1/16" from the base and squeezed it out using my small pliers (putting one blade on top of the pin stub and one blade on the bottom of the base). If you do it this way, don't squeeze too hard or at the wrong angle or the pin stub might bend. An alternate way of removing it is pulling it out by gripping the big end with the small pliers and the base with the large pliers, but that might break off the pin inside the base or ruin your pliers (that's how I ruined mine).

(If you're building a model 1 Genesis cable, you may also remove pins 1 and 2, as you won't be needing these pins. This is entirely optional, as long as you don't solder any wires onto them.)

10) Using the small wire cutters, trim about 1/8" off of the plastic shield holders. This allows for a more secure connection when plugged in. This is how I did it: take the one with the raised dot on it, put the wire cutters right above this dot, then make small cuts to cut off the top portion (make sure the cut is parallel with the top edge), pair it up with the other half (the one with the holes), use it as a guide to cut the other piece the same way. When you're finished, the new top edges on both pieces should be flush with each other.
11) Put a small amount of soldering flux into each hole of the connector pin assembly; you'll have to use something sharp, like a needle or paper clip. Dip the end of whatever pointy object you're using into the soldering flux and spread it into each hole, making sure it covers the sides of the hole. Try not to get any on the outside of the pins; this may cause solder bridging on the pins, which is a pain-in-the-butt to fix.
12) By this time, the soldering iron should be hot enough to solder with. Put a little bead of solder into each of the pins; this is what will hold the wires in place.

Prepping the DIN connector and shields (model 1 cable):
1) Cut pins 5 and 3 as close to the base as possible.
2) Put a little bit of soldering flux on the pin stubs and the base of the pins that were cut off.
3) Put a bead of solder on the pins.
4) The pins will now need to be re-soldered on a little bit closer to the edge of the base. (This is done so that the connector will fit into the Genesis' AV OUT port)
5) Put a little bit of flux on the inside of the (miniDIN) shield where the little tab is (see Diagram C).
6) Hold the shield with one of the pliers so that it doesn't burn you, then put a small bead of solder where the flux was put.
7) Repeat steps 5 and 6 for the DIN connector shield, but the flux must be put on one of the tabs that grip the cable and hold it in place.

Now it's time to start the buildin'!

Wiring:
1) Dip each of the wires into the soldering flux. You don't need that much flux on the wires, just enough to coat the copper.
2) Model 1: Make sure that pins 5 and 3 are spaced as shown in Diagram A. Solder each wire into the pins, making sure the colors of the wires match up with each of the pin numbers (like brown connecting with both pin 4's, lt. brown connecting with both pin 3's, etc.) Remember not to use pins 1 and 2, as you don't need these pins. You'll need to hold the connector pin base with the large pliers while soldering (hold the pliers between your legs, and use your hands to hold the small pliers and the soldering iron; this is where the steady hands come into play), and solder a pair onto one connector, then solder the same colors onto the other connector, and go back and forth like that; this way, it's easier to make sure the same color goes into the same pin numbers. Whatever wire is used to connect pin G will need to have the jacket stripped all the way to where the outer jacket was cut (do both ends like this); steps 4 and 6 will explain

why. On the miniDIN end, that wire will need to connect to the metal shield where the solder bead was placed in step 6 of "Prepping the DIN Connector."(step 6) Once all the wires are connected, you should have one wire left over. Cut this wire off using the wire cutters and set it aside; you will need it for the next step. *-Jump to step 4-*

3) Model 2: Using both diagrams, solder those wires into each of the pins. Match the colors with the numbers in the diagram; for instance, lt. brown to pin 1, brown to pin 4, and so on and so forth, as shown in Diagram B. This is the order that I use to solder the pins: pins 1 and 4, then 2 and 5, then 6 and 8, then 7 and 3. You'll need to hold the connector pin base with the large pliers while soldering (hold the pliers between your legs, and use your hands to hold the small pliers and the soldering iron; this is where the steady hands come into play), and solder a pair onto one connector, then solder the same colors onto the other connector, and go back and forth like that; this way, it's easier to make sure the same color goes into the same pin numbers. *-Jump to step 6-*
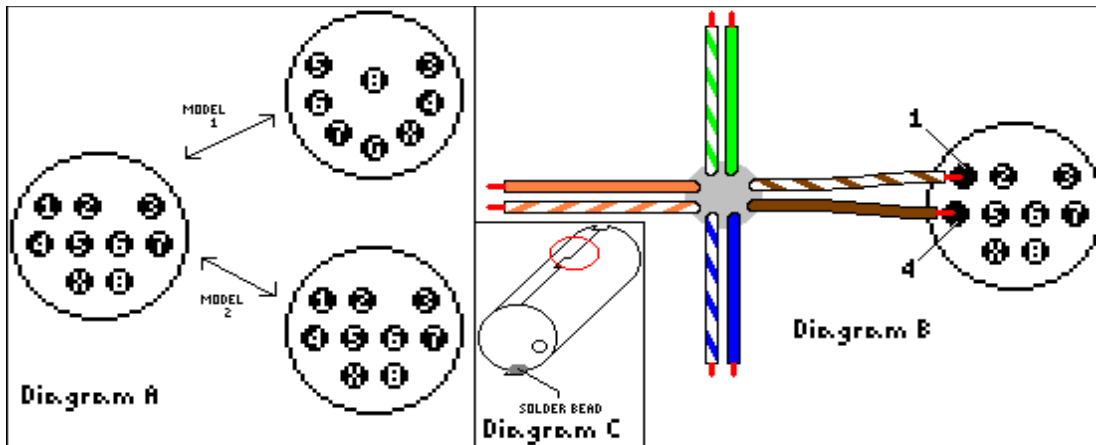
4) Seat the DIN connector assembly into the metal shield piece with the flanged end, so that the bare wire that was stripped from step 2 is facing up. Use the clipped wire to bridge the solder bead on the shield to the bare wire; connect one end of the piece of wire to the solder bead on the shield and one end to the bare wire (you'll need to put some flux on it first).

5) Set the other half of the metal shield over the bottom half; they should fit snugly. Slide the outer sleeve over the metal shield so that the tab sticking out fits into the square hole in the sleeve.

6) Use the precision screwdrivers to open the metal shield(s); insert the smaller blade (if one is smaller than the other) into the gap just enough to get the larger one in. Position the larger blade right above the bracket-looking notch (the red circle in Diagram C) and twist the screwdriver so that the edges of the blade spaces the sides of the shield. You should now have enough space to push the connector assembly through. Be sure that before you push it through that none of the connector pins are cross-bridged. Push the connector pin assembly into the shield until there is about 1/16" of space between the pin base and the bottom of the square notch on the shield. If it doesn't quite fit, widen the gap a little more (you may need a larger screwdriver blade). If you're building a model 1 cable, connect the bare wire to the solder bead (Diagram C).

7) Fit the plastic shield holder with the nub onto the metal shield where the hole is; place the narrow end over the cable's outer jacket and the wide end over the hole. It should fit securely into the hole. Fit the other half on top of it; if you did step 6 correctly, there should not be any space in between them. Once both plastic pieces are covering the shield, slide the outer sleeve over the plastic until it locks into place.

Before continuing to step 8, check that the pins are wired correctly by taking the continuity tester and connecting the leads to a certain number pin (e.g. pin 8 on each end of the cable). If the tester lights up only when it is connected to a certain number pin and no others, then it is wired correctly. Pin 1 should connect to pin 1 and no others, pin 2 should connect to pin 2 and no others, etc. The solder joints should only connect a wire to its appropriate pin, and there shouldn't be any cross-bridging. The solder should also not touch the outer metal shield, unless indicated in the above steps. If all of the pins are wired

correctly and the solder joints are not touching each other or the metal shield, then continue to step 8. If there are pins that are not connected, or if different numbered pins are connected, or if a pin appears to be connected to the metal shield (other than pin G), disassemble the connector piece, inspect your solder joints, correct any cross-bridging, add solder if and where it's needed, then reassemble and retest it.

8) Using the Xacto knife, trim the outer sleeve (on the miniDIN connector) down to where the shield holder was cut.

Congratulations! The cable is complete, and is ready to be connected to the Genesis and 32X. (If you want to test it further, you can use a copy of "Knuckles Chaotix" to test color and sound output. -Options menu-)

Legal/Contact Info:
If you find an error, or have a question on anything written in this how-to, you can email me at sonic412781@yahoo.com

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