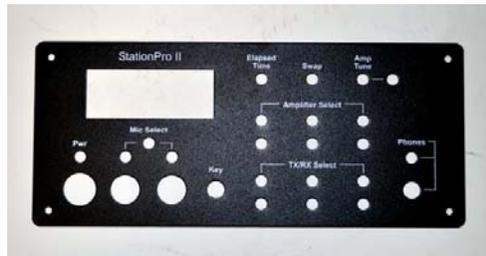


Black Front Panel Upgrade Instructions

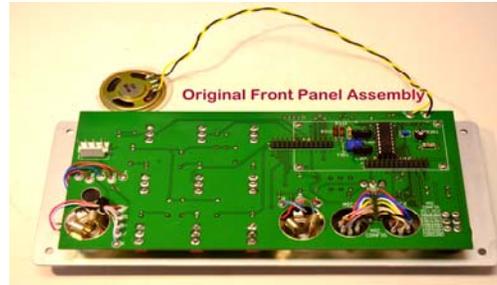


Here are the directions for upgrading your SP-II with a new black front panel with white lettering. Approximate time estimates for each step are shown, but can vary depending on experience. The main parts of the procedure are (1) removing the power switch from the back panel PCB, (2) cleaning solder off the 16 pin microphone header and power switch pads, (3) trimming the microphone wires and soldering them to the PCB header. None of this is difficult but take your time and proceed systematically, following the instructions closely.

Necessary Tools and Parts:

- screwdriver (phillips and flat-headed)
- Nut driver set, to tighten nuts without scratching the front panel
- Exacto knife or single-edged razor blade.
- Small-tipped soldering pencil and thin (1/32" maximum diameter) solder
- Desoldering tool (preferred) or Solder-Wick, for cleaning solder off PCB pads
- Isopropyl (rubbing) alcohol for cleaning flux off PCB pads
- Long-nose pliers, tweezers, and small wire-cutters
- Magnifying glass
- Replacement SP-2 power switch (Mouser p/n 103-4024-EV, about \$3)

1. Remove the original front panel from the SP-II (five minutes)
 - remove four black screws from front panel
 - unplug both ribbon cables (P301 and P307) and 4-wire cable (P302) from front panel PCB
 - slide the speaker from the enclosure, leaving the wires attached to the PCB
 - Lift the front panel/PCB/speaker away from the SP-2



2. Make a chart of the Mic Config header wires on the front panel PCB, so you can keep track of which wire goes where. (five minutes)

MIC HEADER PINOUTS		
HEADER	MIC1 PIN	MIC2 PIN
MIC+	8	8
PTT	6	6
MIC-	7	7
FN1	4	4
FN2	3	3
FN3	2	2
FN4	1	1
GND	5	5

3. Now remove the wires from the header pads. *Important: don't try simply to unsolder the wires from the pads, because you're likely to fray the ends of the wires when they slide out of the pads, which will make them hard to reinstall. Also, you're likely to melt back the wire insulation.* It's best instead to follow the following foolproof procedure (ten minutes)

-clip the wires from the Mic Config header, leaving 1/16 inch (approx) stub sticking out of each pad



- bend the wires out of the way and then use tweezers (or longnose pliers) and a small-tipped soldering iron to remove the stubs. You'll clean the solder from the vacated pads in a later step.

4. Loosen the nuts on the two mic jacks and remove them (with the wires attached) from the front panel. Then, strip and twist tightly the free end of the wires to a length of 1/16 to 1/8 in and tin lightly. Don't make the stripped ends any longer than 1/8 in, or the wires may not be long enough to reach the pads when the new front panel is installed. (25 minutes)



5. Remove all the nuts and washers that are on the front face of the panel. There are 10 small nuts (on the switches), 2 nuts on the phone jacks, and 1 nut on the key jack (13 nuts, 2 washers in all). *Hint: the nut on the Mic Select switch is slightly smaller than the ones on the other momentary toggle switches, so keep track of it.* Don't do anything yet with the power switch nut. (five minutes)

6. Now you will remove the power switch. To remove it, it will almost certainly be necessary to destroy the switch, which is why a replacement is specified above. Follow these steps exactly, so you won't damage the PCB. (twenty minutes)

- Find your new replacement power switch and inspect it closely. Notice that the rear terminals are attached to a plastic insert that is retained in the main body of the switch by clips that snap into thin slots on opposite sides of the switch body. Once you've identified the slots, then set the new switch aside.

- Now find the same slots on the old power switch, which is now the only thing securing the original front panel to the PCB. With wire cutters, clip the outside edge of the switch body, just above the two retaining slots. The goal is to free the insert, so that it can slide out of the main switch body.



- With a small flat-bladed screwdriver, pry the insert out of the switch body. It should come out easily (with its six terminals still soldered to the PCB). Now separate the front panel from the PCB. You may have to nudge one or more of the LEDs with a small flat-bladed screwdriver to free them from their bezels, but they

should come loose easily. *Hint: do this over a table, because the washers on the toggle switches will probably fall off the switches when you remove the panel and you don't want to lose them.*

-Remove and set aside the nine plastic bezels on the front panel LED holes. If one or two of the retaining clips on the back of the bezels break off when you remove them, it doesn't matter. Once installed, they aren't going anywhere.

-Now you need to remove the plastic part of the power switch insert from the back side of the PCB, leaving the insert's terminals still soldered to the PCB pads. You can pry the plastic off with a flat-bladed screwdriver, or chip away at it with wire cutters. A soldering iron will soften the plastic, but don't overdo the heat.

-Grip the front end of each terminal (the side closest to the front panel) with longnose pliers while you melt the solder on the PCB pad. Pull with the longnose pliers and each terminal will easily slide out of the pad.

7. Clean the solder off all the PCB pads on the Mic Header and the power switch, so you'll be able to insert wires and the new switch terminals into the pads. Use solder wick, a solder-sucker, or a desoldering tool to do this. Be especially careful to clean all the solder from the power switch pads, because the terminals are a tight fit into the holes. When you're done, clean the flux residue off the PCB pads with isopropyl (rubbing) alcohol or flux remover. (5-15 minutes, depending on what desoldering aid you're using.)



8. Finally, it's time to attach the new front panel to the PCB. Follow these steps: (fifteen minutes)

-Attach the new power switch to the front panel, but leave the nut slightly loose so you can rotate the switch to align the terminals with the PCB pads. *Hint: the switch has no preferred up-down orientation. It goes in either way.*

- Attach the mic jacks (with leads attached) to the front panel. The jacks install from the front of the panel, with the lockwasher and nut on the rear. The key on the inside front of the jacks points down, toward the bottom edge of the panel. The key is a little hard to see, but it's there! Tighten the nut on each jack securely.

-Make sure the LED leads protruding from the PCB aren't bent. Straighten them if necessary.

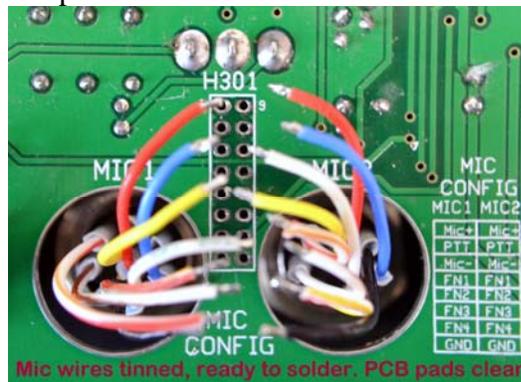
-Set the PCB down on your workbench with the toggle handles facing up. Then, make sure the rear nut on each switch is finger tightened all the way to the switch body and slide the ten lockwashers on top of the toggle switches.

-Lower the new front panel onto the PCB. Make sure the wires from the mic jacks feed through the cutouts on the PCB, and that the LEDs fit into their mating bezels. Also, rotate the power switch if necessary so its terminals are positioned exactly in line with their mating PCB pads.

- Start tightening all the nuts, which will gradually draw the PCB closer to the front panel. Use a nut driver if possible, so you don't scratch the pretty black finish. Flat washers go under the nuts for the key and 1/4 inch headphone jack. As you tighten the nuts, push the PCB so the power switch pads slide over the power switch terminals. They're a tight fit. Note that the PCB doesn't slide fully over the terminals. (When properly positioned, there is roughly 1/32 inch of exposed terminal above the body of the switch.) Don't solder the pads, yet.

9. Now you will solder the microphone wires to the Mic Config header pads. If you're using teflon-insulated hookup wire, this is pretty easy. If not, then you're going to have to be careful not to melt the insulation when you solder the wires. Here is the procedure (45 minutes): *HINT: If you haven't already done so, this would be a good time to download and read "W8ZR's Wiring Tips for Builders," from the "Download Files" section of the StationPro website. The writeup deals specifically with the microphone header wiring.*

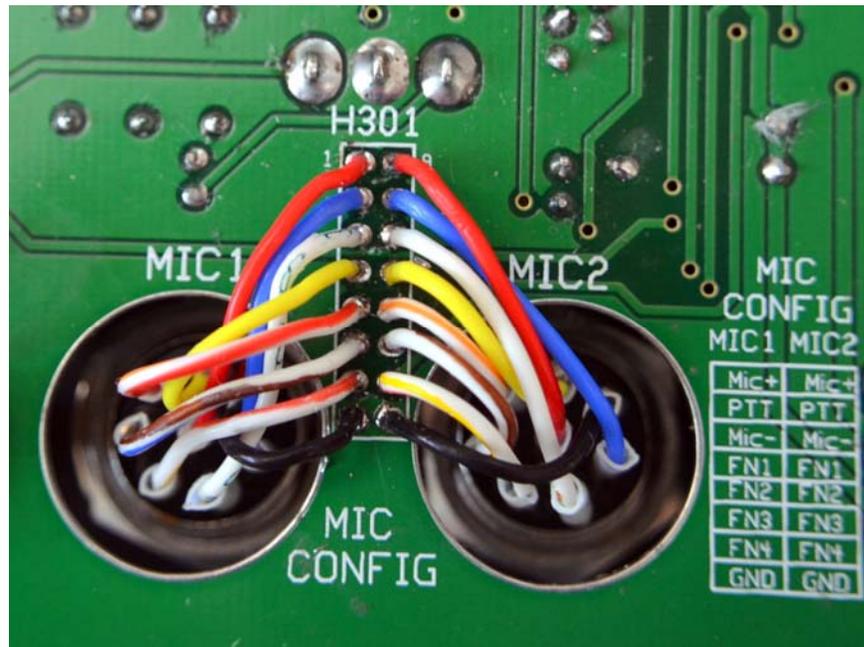
- Bend and dress the tinned ends of each mic wire so that its end is positioned near its pad, as in the below photo. Double-check to make sure the wires are going where they belong. This is also a good time to make certain the tinned end of each wire fits into its pad. If it doesn't then retin it.



-First solder the bottom (GND) wires to the bottom pads. These pads are connected to the ground plane of the PCB and will therefore require extra heat

for the solder to flow. Tug on each wire when you're done to make sure it isn't loose and that the solder isn't balled up on the wire.

-Now systematically solder the remaining mic wires to each pad, moving toward the top end (MIC+) of the header. *Important: You MUST use a fine-tipped soldering iron and small diameter solder, or you'll end up with a mess. Here's what the final result should look like.*



10. Tighten the plastic nut on the power switch (finger tight is adequate) and then solder the six power switch terminals to their PCB pads.

11. You have now completed the new front panel assembly. Check to make sure all the wires are soldered and that everything looks neat and professional. If necessary, redo any questionable connections.(two minutes)

12. Install the new front panel assembly into your SP-II controller, making sure that the ribbon connectors are centered properly on their headers, and that the 4-wire connector to J302 isn't reversed. Now you're done, so take a minute to admire how classy your station looks with its new StationPro panel. Congratulations! (5 minutes)