Installing PRO/DGX or Pro Soloist MIDI interface. R Grieb 9/08/2017

Please read these instructions before purchasing the MIDI interface, to make sure you are comfortable performing the necessary steps. Note: These instructions apply to the Pro Soloist and the earlier version of the PRO/DGX, which have a removable bottom cover. There is a different set of instructions for the later PRO/DGX version which has a hinged top cover like the OMNI.

1) Place a towel or soft cloth on your work surface to protect the synth, then place it upside-down, with the back panel facing you, and remove the bottom cover. If it's a Pro Soloist, you may want to flip all preset and after-touch switches down first. Place something soft under each end piece to prop the front of the instrument up, so that the bottom is level.

2) Locate the hardware for mounting the MIDI board. A 1" 6-32 machine screw holds the board in place, replacing the keyboard mounting screw closer to the rear at the low keys end of the keyboard metal frame. (There are four keyboard mounting screws, two at each end) One or two spacers are placed around the screw, between the MIDI board and the black metal keyboard frame. For the PRO/DGX, I used a 3/8" nylon spacer, and for the Pro Soloist, I used two ¼" spacers, as a little more height was needed. There are usually washers underneath the key frame, which could possibly move after you remove the original mounting screw. Loosen, but do not remove the original screw until you have the 1" machine screw inserted into the MIDI board, and the spacer(s) in place and ready for mounting. You want to reduce the chance that the (now) loose washer underneath the key frame will fall down, as this would require you to remove the entire keyboard assembly to get it (and the three others) back in place. Mount the MIDI board, making sure the underside is not touching anything.

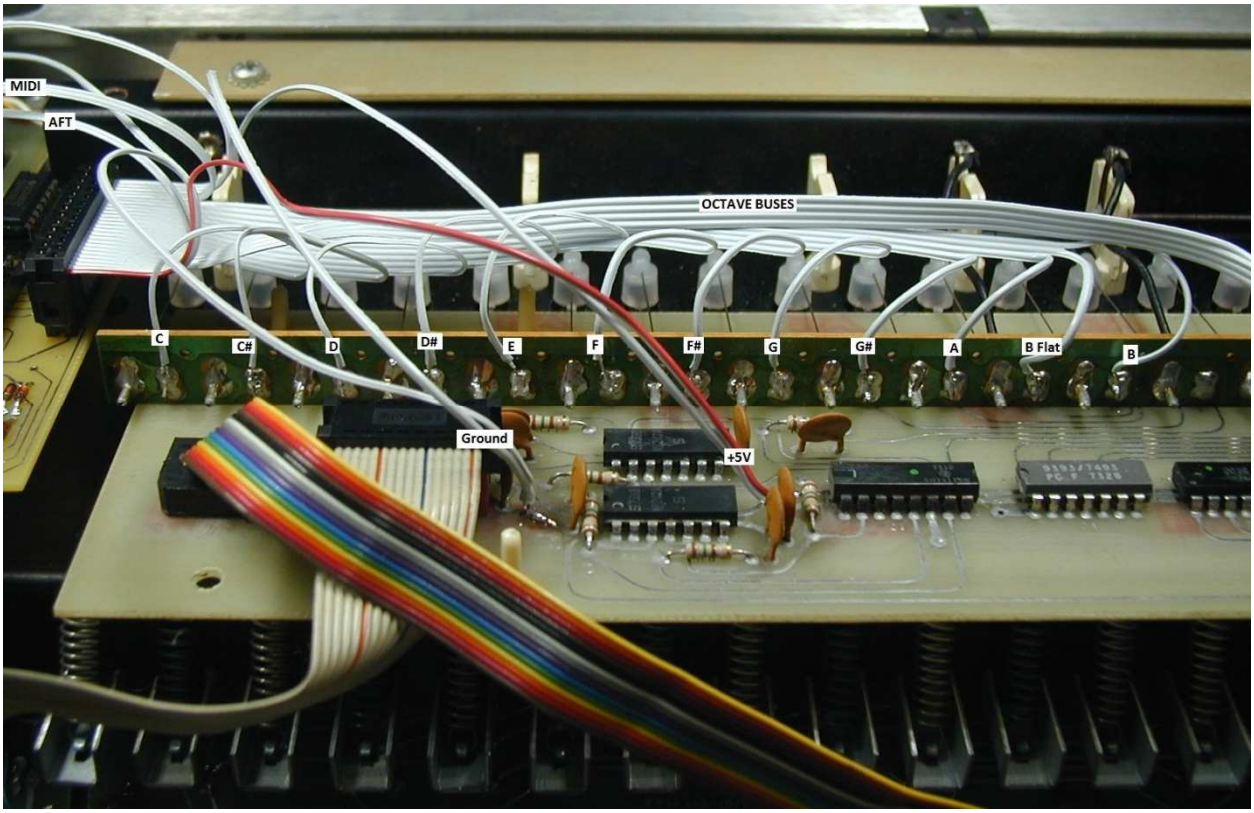
3) Plug the ribbon cable female connector onto the male header. Place the connector so that it is resting on top of the header, with the holes lined up correctly. Then with one finger under the pcb and your thumb on top of the connector, with one hand on each end of the connector, squeeze the connector down onto the header. Pin 1 of the connector connects to the wire with the red stripe on it. Pin 2 connects to the next wire, and so on. There are 26 wires in all. Three signals appear twice in the cable, at each end: +5V, ground, and -15V. Use both wires for these signals, twisting the ends together after you have stripped off the insulation.

4) Separate the ribbon cable into six signal groups. An easy way to do this is to make a small cut, maybe 1/4", between the conductors at the free end of the cable with scissors, and then pull them apart carefully, leaving about 1.5" at the connector end with all 26 wires still joined. The signal groups are (starting from the pin 1 end of the cable, which is closest to you):

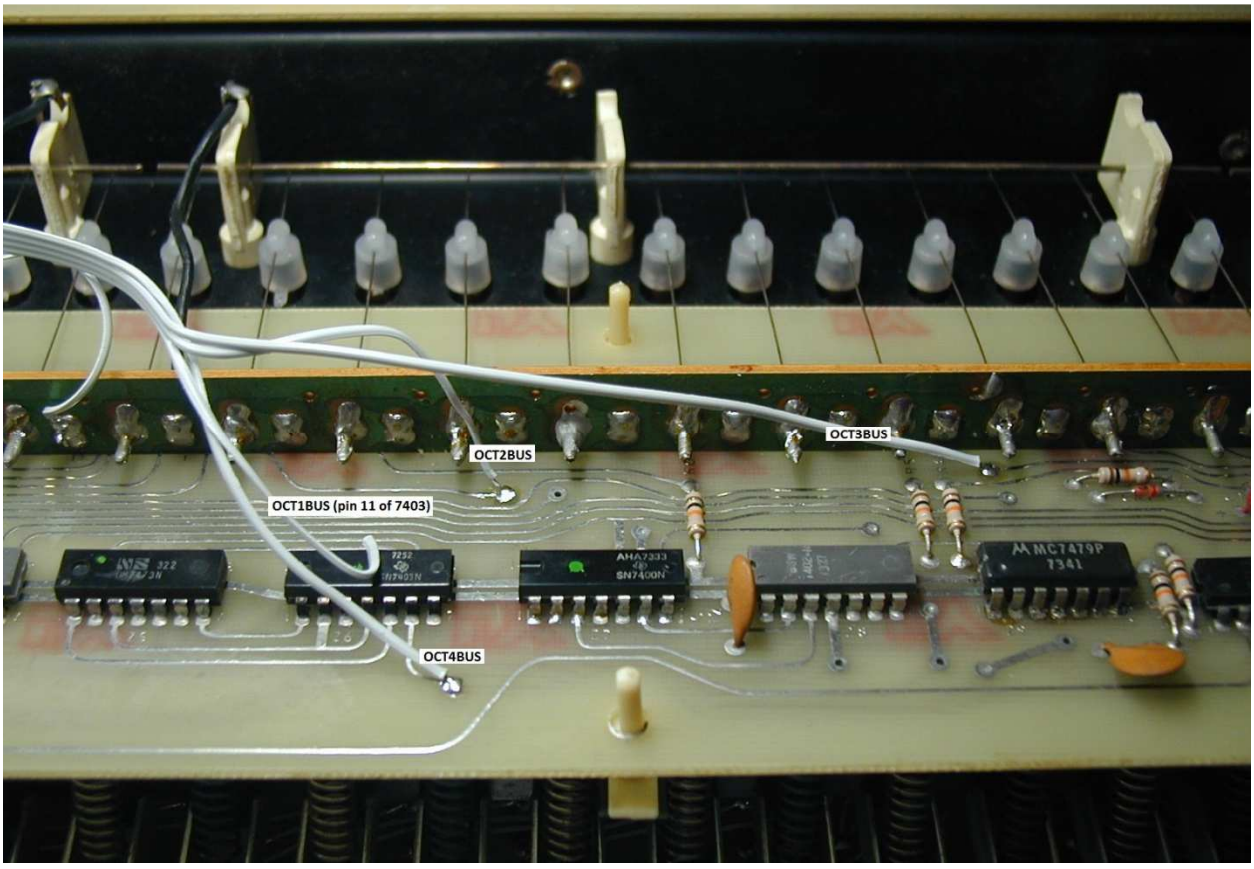
   A) 3 Power supply wires, 1-3
   B) 2 After-touch wires, 4-5
   C) 4 Octave bus wires, 6-9
   D) 12 Key wires, 10-21
   E) 2 MIDI wires, 22-23
   F) 3 Power supply wires, 24-26

When connecting individual wires, refer to the schematic diagram for the pin/wire number of each signal. Double check to make sure you have the correct wire before you cut it to length. There is also a table at the end of this document showing the signal positions in the cable. Note: The three power supply wires are in mirrored order at the two ends of the cable, so that if the cable is plugged in backwards, these connections will still be correct.

5) Connect the 12 key wires to the vertical pcb strip that holds the key contact wires, as shown in the photo below. Cut each wire to length, being careful not to cut it too short, then strip about 3/16" of insulation from the end and tin the wire with solder. Then tack solder it onto the pcb next to where the key contact wire attaches. (not at the contact wire) Pin 10 of the ribbon cable is C, pin 11 is C sharp, 12 is D, etc. Use the low octave of key connections to keep the wires short. Keep the wires away from any keyboard parts that move when keys are pressed.

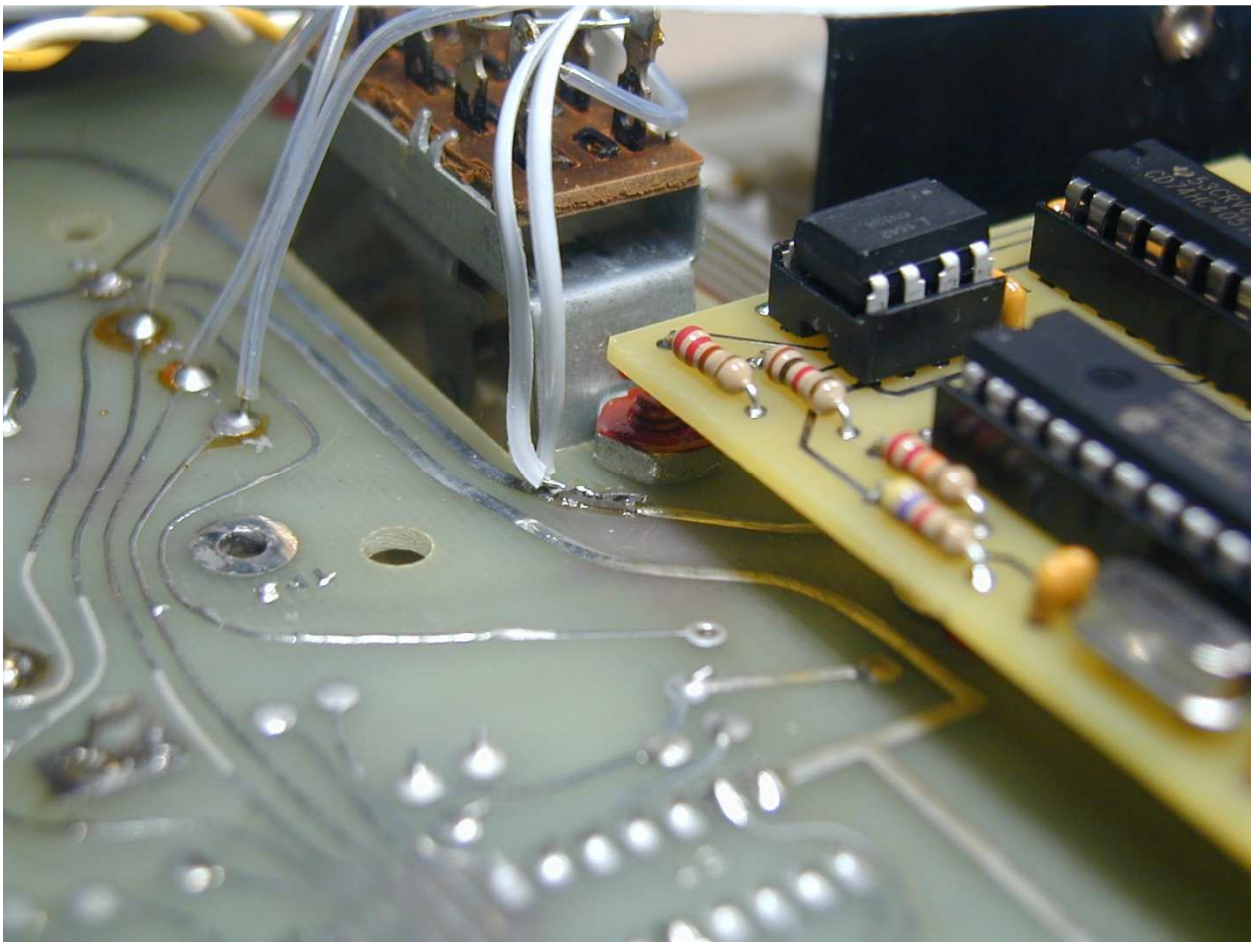


6) Connect the 4 octave bus wires next, as in the photo below. Three of them connect to eyelets on the pcb. If possible, remove the solder from the eyelet first, then cut the wire to length, strip off about 3/16” of insulation and insert the bare end into the eyelet so that it sticks through the pcb, then solder it in place. There is no eyelet for the OCT1BUS signal. I suggest attaching it directly to pin 11 of the 7403 IC. Normally I do not like to solder directly to IC pins on the top side of the board, but here it seems to be the best option. Make sure the wire is not touching either adjacent pin, and try not to apply heat for longer than necessary, to avoid damaging the IC. The octave bus signals are also connected to the four black wires soldered to the bus bar copper contacts. I was concerned that the copper contact could break off if the ribbon cable wire was attached there and someone yanked on it. Attaching the wires at the pcb seems safer to me.

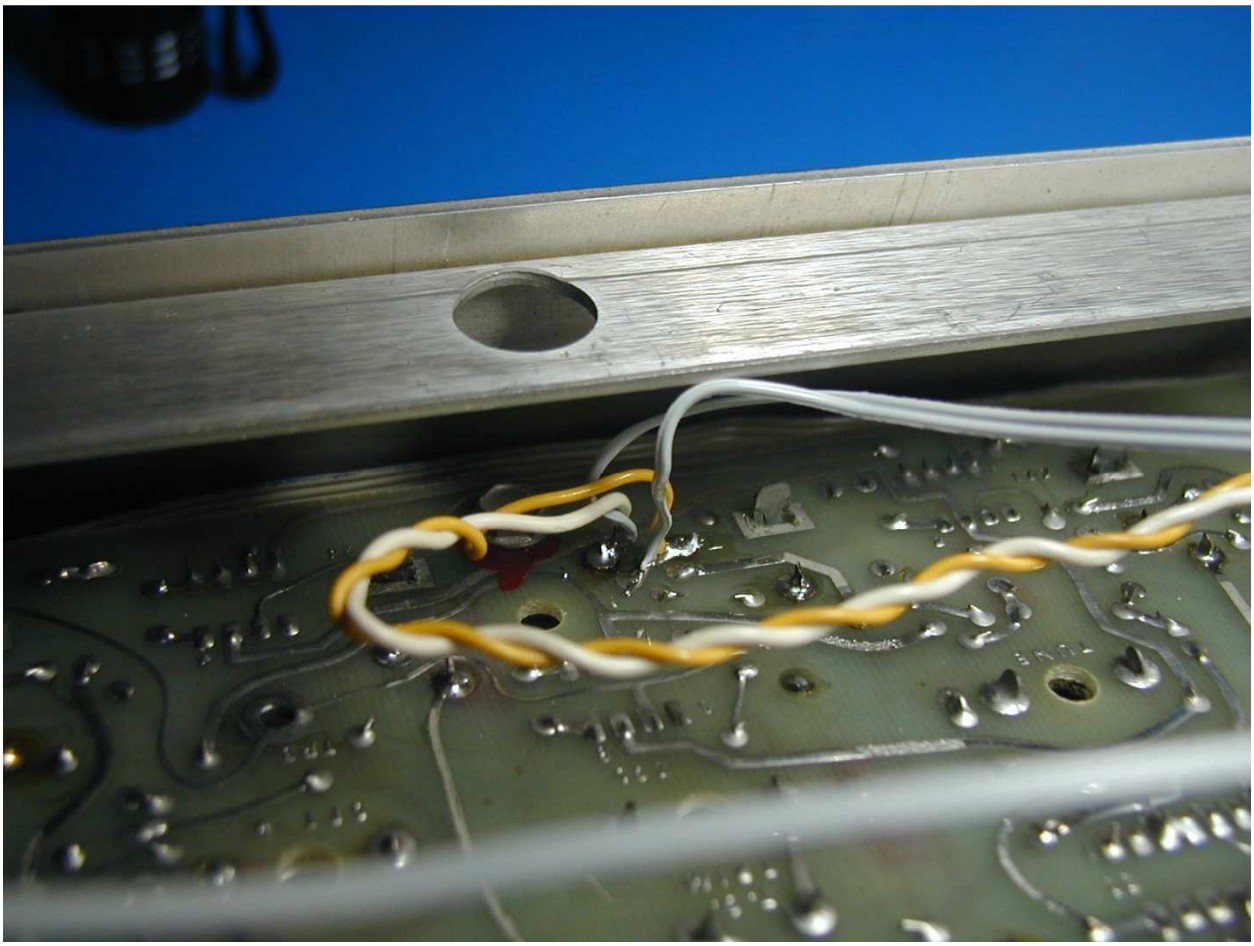


7) Solder the +5V and ground wires (two each, with the ends twisted together) onto the appropriate pcb traces, as shown in the first photo.

8) The -15V supply is not used on the keyboard pcb, so the connection point for these wires is on board A (which the after-touch wires also connect to). Connect the -15V wires to the trace shown in the next photo. This photo shows a Pro Soloist, but the -15V trace is in the same position on a PRO/DGX.



9) Attach the after-touch wires to the same pcb connection points on board A as the after-touch wires coming from the keybed, so that they are wired in parallel. There is no polarity, so you can connect them either way. This photo shows the after-touch connections on a Pro Soloist:



10) Connect the two MIDI wires to pins 4 and 5 of a female MIDI jack. MIDI jack pin numbering is shown on the MIDI board schematic diagram.

11) Before powering up the synth, measure the resistance from +5V to ground with a DMM to confirm that there is no short. On a PRO/DGX, I measured about 800 ohms after the reading stabilized. Checking -15V to ground is also a good idea, just to make sure that nothing is shorted. Here I measured about 2K ohms. These resistance values can vary depending on the DMM you are using. You just want to make sure there isn't a short. Also measure the resistance from +5V on the MIDI board to +5V on the ARP, and -15V as well. Note that some of the IC's in the keyboard circuit do not have power where you might expect it to be. The 7400 has normal power pin placement. Pin 14 is +5V and pin 7 is ground. Of course you can always use the main connector for the power supply cable, which has the voltages labeled next to it in copper on the pcb.

12) Note: You may need to set the MIDI channel to match your controller in order to get it working at first.

13) Once you have determined that the interface is working, you will need to decide where to mount the MIDI jack. There is lots of blank space on the back panel of the Pro Soloist, but not so much on the PRO/DGX.

    Signal positions in the ribbon cable:

    26) +5V
    25) Ground
    24) -15V
    23) MIDI pin 5
    22) MIDI pin 4
    21) B Keys
    20) B Flat Keys
    19) A Keys
    18) G Sharp Keys
    17) G Keys
    16) F Sharp Keys
    15) F Keys
    14) E Keys
    13) D Sharp Keys
    12) D Keys
    11) C Sharp Keys
    10) C Keys
    9) Octave 4 bus
    8) Octave 3 bus
    7) Octave 2 bus
    6) Octave 1 bus
    5) AFT S
    4) AFT T
    3) -15V
    2) Ground
    1) +5V