Installing MIDI interface in a later PRO/DGX with orange pushbuttons.   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 later version of the PRO DGX, with the orange buttons, which has a hinged top cover like the OMNI.   There is another version of the instructions for earlier units.

1) Remove the screws and tip up the top cover.   Locate the screws through the bottom which hold the keyboard assembly in place. You will need to remove these, while preventing the keyboard assy from moving. Remove the keyboard assy and flip it over so that you can unplug the two ribbon cables to separate it from the rest of the synth. Unplug the two cables indicated below. One corner of the DIP plug is flat and matches a flat on the socket to indicate the correct orientation.   You can mark them if you want to make sure you get them back properly.
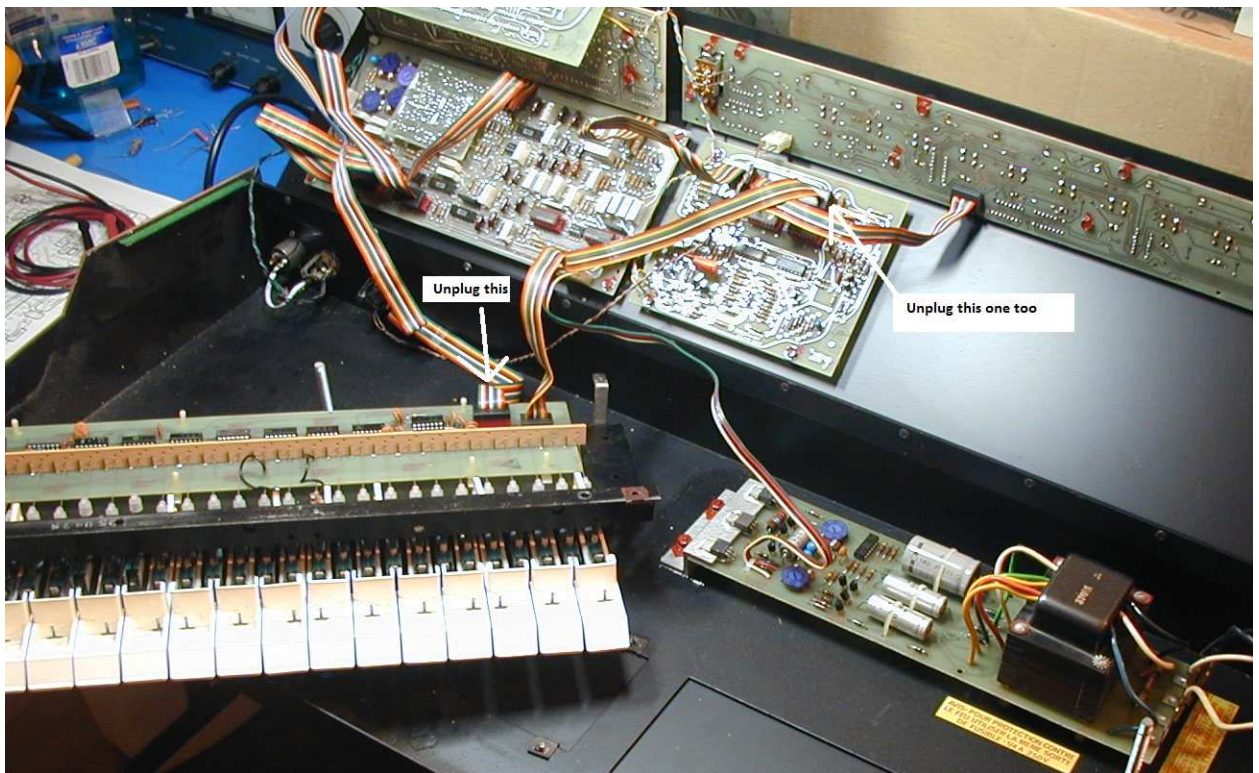
2) Set the rest of the synthesizer aside, and place the keyboard assembly by itself on your work surface.   Place the supplied ribbon cable as shown in the photo below and plug it onto the MIDI board, with the pin 1 red stripe closer to you. (This photo was taken after the wiring was finished, but shows the position of the pcb and cable when wiring it up)   The MIDI board will eventually be located behind the keyboard assy in the synthesizer, and to the left of the power supply, so make sure you leave the wires long enough to reach.
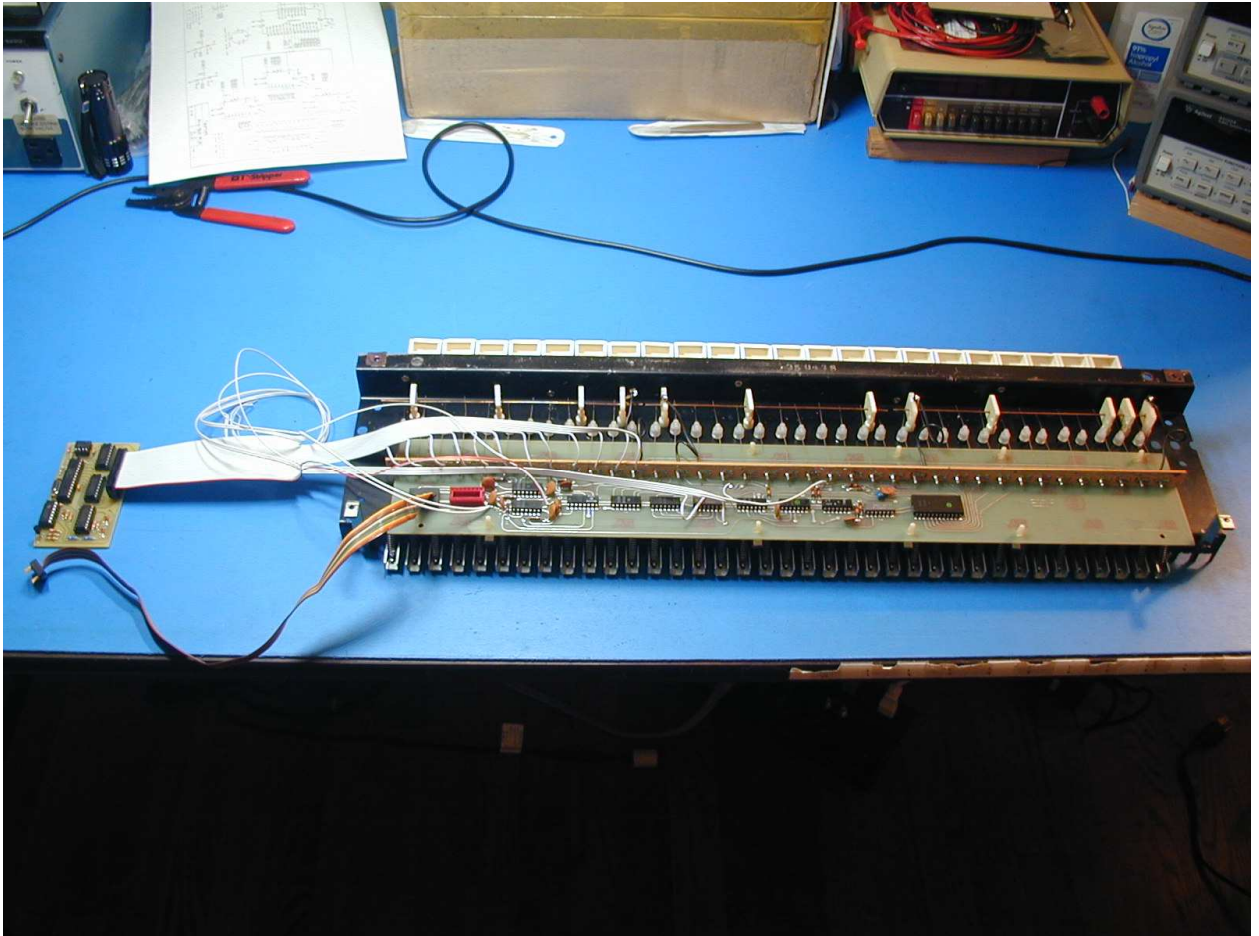

3) Pin 1 of the connector connects to the wire with the red stripe on it. Pin 2 connects to the next wire, and so on. There are 26 wires in all.   Three signals appear twice in the cable, at each end: +5V, ground, and -15V. Use both wires for these signals, twisting the ends together after you have stripped 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 4" at the connector end with all 26 wires still joined.   (Make sure you have counted correctly before pulling the groups apart) 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 shorter.   Keep the wires away from any keyboard parts that move when keys are pressed. (Note: This photo was taken with the earlier version of the PRO/DGX, so it shows the connector much closer to the keyboard assembly than on the later model. The wiring to the keyboard pcb is exactly the same.)
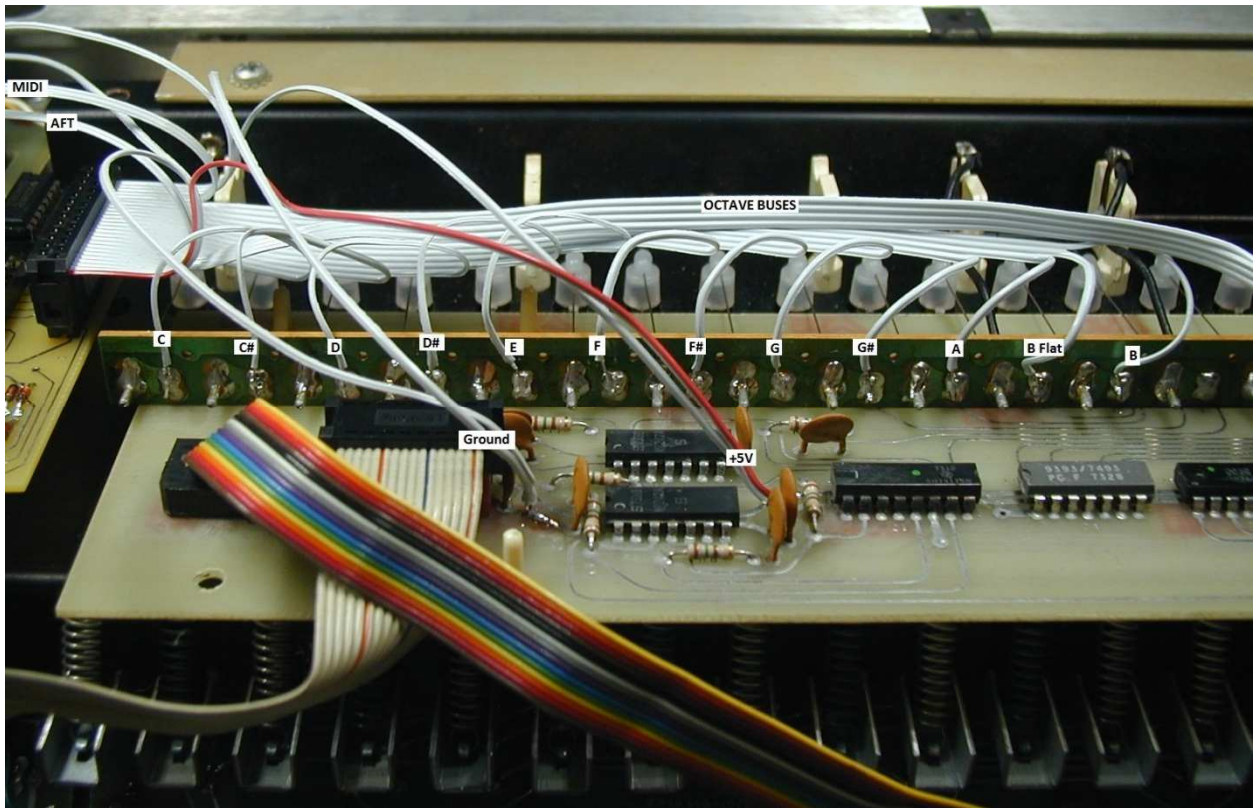
6) Connect the 4 octave bus wires next, as in the photo below.   Three of them connect to eyelets on the pcb.   If possible, remove the solder from the eyelet first, then cut the wire to length, strip off about 3/16" of insulation and insert the bare end into the eyelet so that it sticks through the 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.
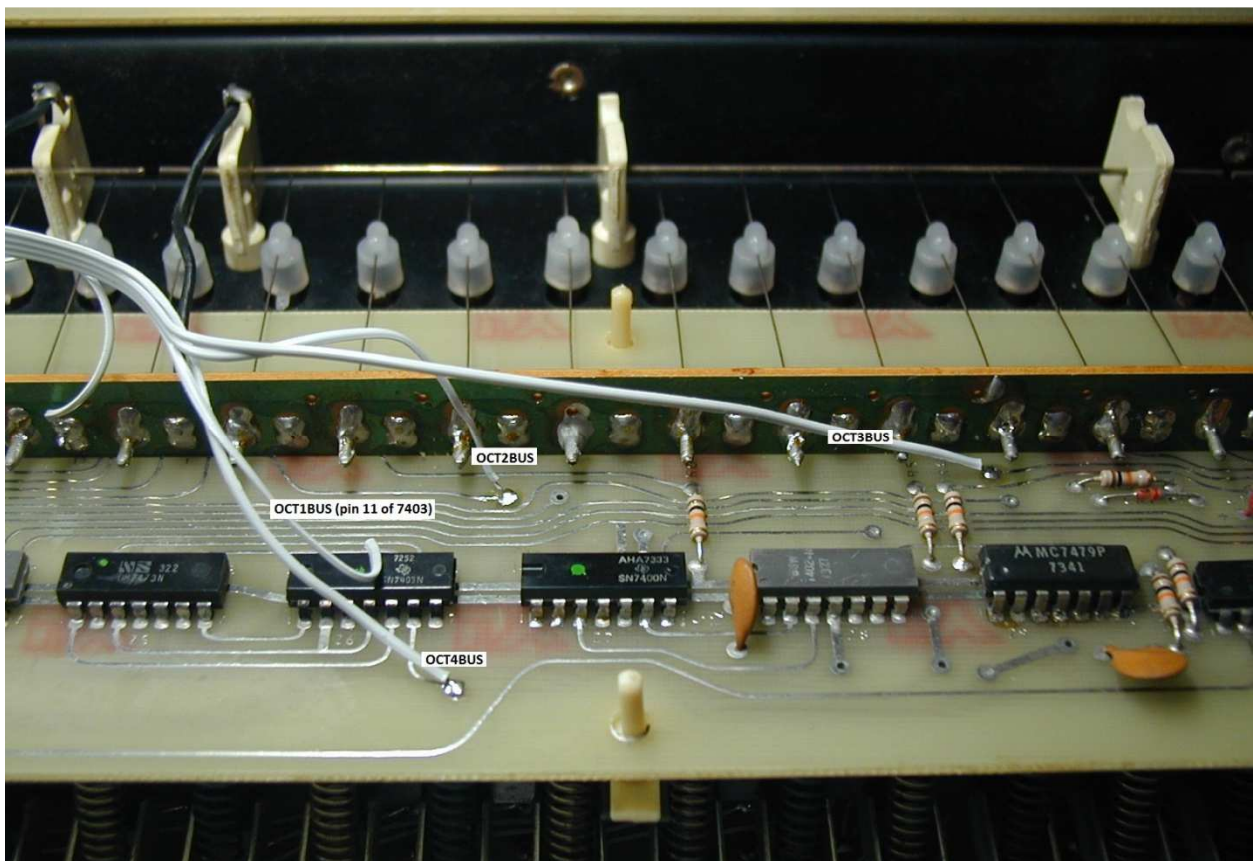

7) Solder the +5V and ground wires (two each, with the ends twisted together) onto the appropriate pcb traces, as shown in a previous photo.

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 below.
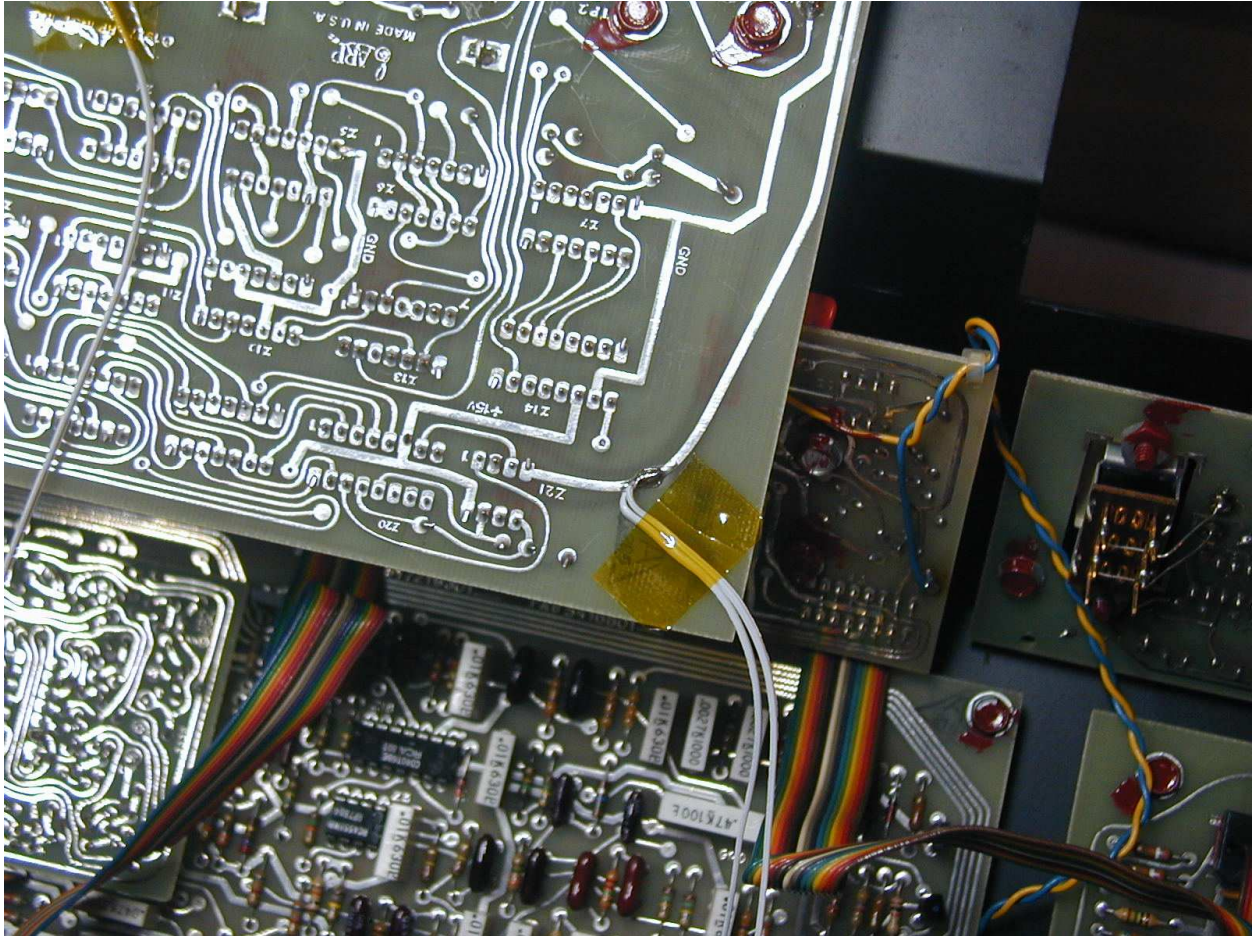
9) Attach the after-touch wires to the same pcb connection points on board A as the after-touch wires coming from the keybed, so that they are wired in parallel. There is no polarity, so you can connect them either way. The later version of the PRO/DGX used a connector for the after-touch signals, with no chance to tack solder wires at the same place on the pcb, but we can find the same circuit points and connect there, as shown in the photo. (Note some units may have a 470 ohm resistor between the J8 connector and the corresponding "T" wire attachment point. Don't worry about this)
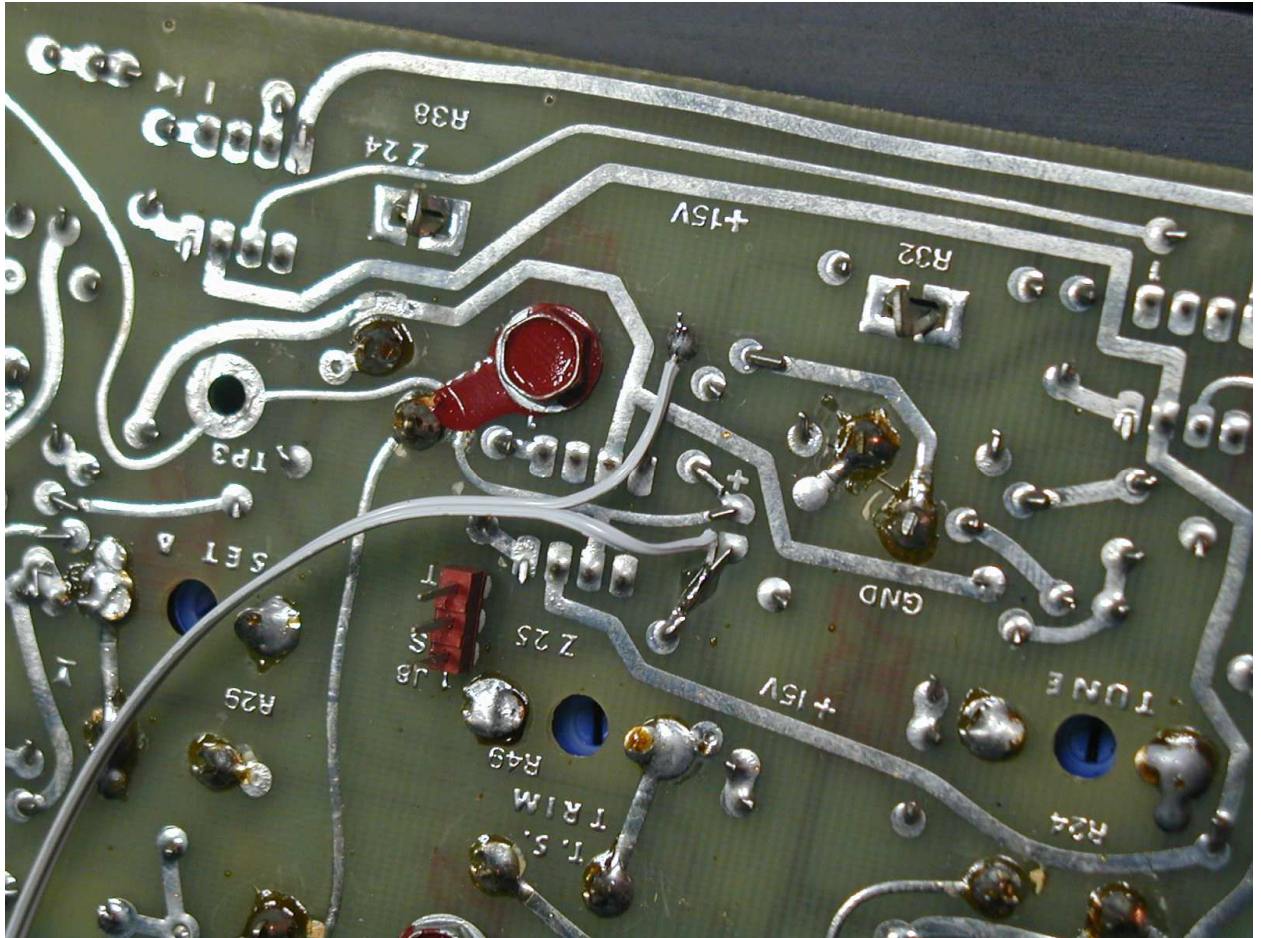
10) Connect the two MIDI wires to pins 4 and 5 of a female MIDI jack. MIDI jack pin numbering is shown on the MIDI board schematic diagram.

11) Place the MIDI interface board on something that will insulate it, to prevent shorting to the metal case of the synthesizer.   You need to use something with some thickness to it, so that the sharp pins on the bottom of the board do not poke through it and touch:
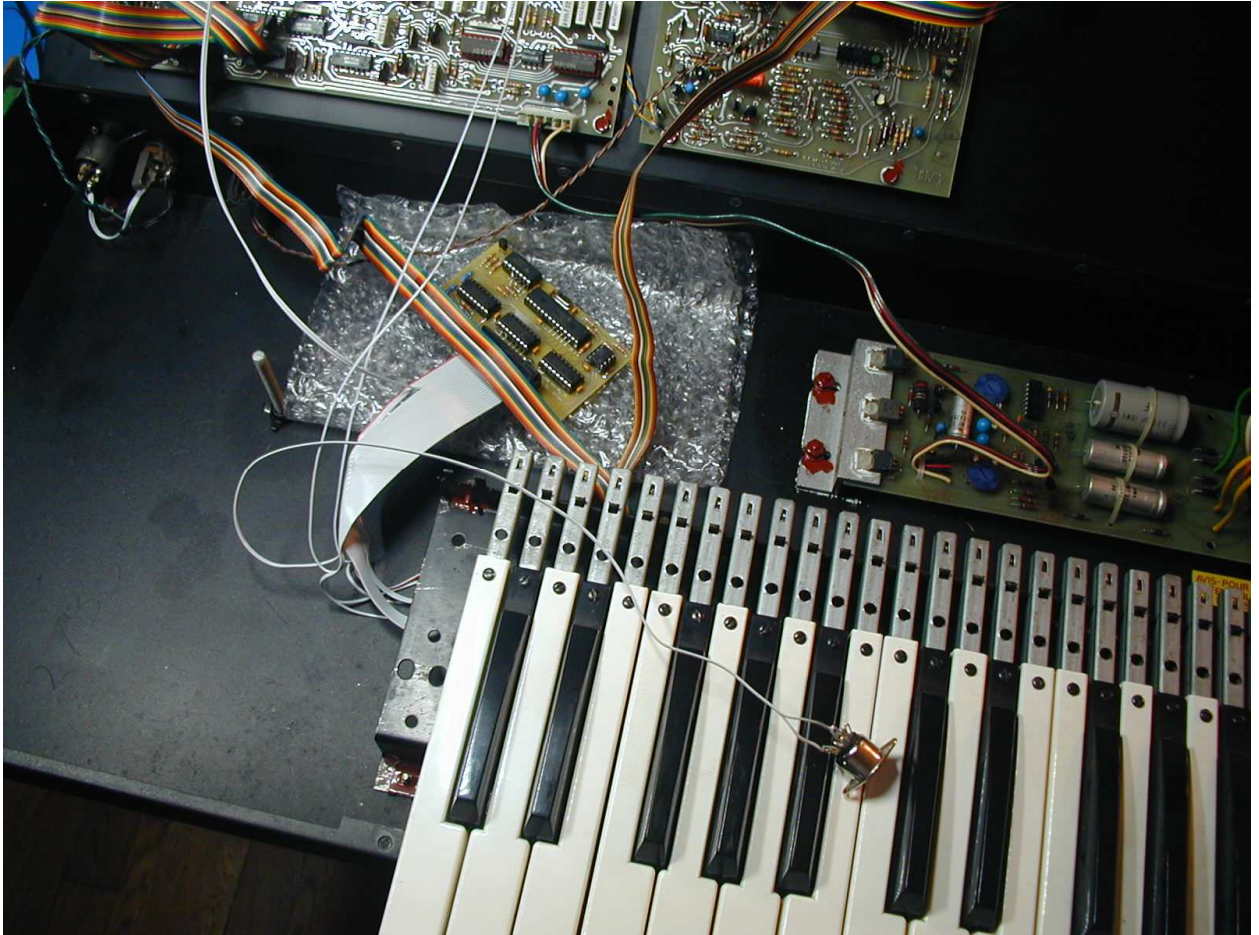
12) Before powering up the synth, measure the resistance from +5V to ground with a DMM to confirm that there is no short.   On a PRO/DGX, I measured about 800 ohms after the reading stabilized. Checking -15V to ground is also a good idea, just to make sure that nothing is shorted. Here I measured about 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 confirm continuity 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.

13) To mount the MIDI interface in the PRO/DGX, attach the threaded standoff to the aluminum plate with a 6-32 machine screw and a lock washer, then mount the MIDI board to the standoff, directly above the aluminum plate, with a second screw and lockwasher.   Then attach the aluminum plate to the bottom of the case, in the open area to the left of the power supply, with some double-stick foam.

14) Note: You may need to set the MIDI channel to match your controller to get it to work initially.

15) Once you have determined that the interface is working, you will need to decide where to mount the MIDI jack.

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