

# Series Circuits

## JX-3P MIDI Upgrade Kit

### Installation Manual

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## Introduction

Thank you for purchasing the Series Circuits JX-3P MIDI Upgrade Kit, this manual explains how to install the kit in your JX-3P.

Instructions on how to use an already installed kit can be found in the separate user manual.

## Features

The JX-3P MIDI Upgrade Kit adds the following new features to your JX-3P:

- Real-time control over all JX-3P parameters with standard MIDI CC messages (from a sequencer or MIDI controller)
- Loading new patches into the JX-3P via MIDI (CC)
- Selectable MIDI receive channel (1-3)
- Velocity sensitivity (via MIDI-input, not the keyboard)

Additional features for owners of a PG-200 (or DT-200) programmer:

- Simultaneous control over the JX-3P via MIDI input and programmer
- Transmission of MIDI CC messages from programmer, for recording in sequencer, or controlling other MIDI devices

## Please Note

- This kit only works with the JX-3P (not the MKS-30).
- This kit does not change the sound of your JX-3P, it only adds new ways of controlling it.
- This kit requires soldering skills and careful following of instructions.
- This kit does not require additional parts, but tools such as a soldering iron, screwdriver, and wire strippers are required.
- Patches in the user memory will be retained after installation\*

\*Provided you follow the instructions precisely and do not short out the backup battery or RAM IC during installation.

## Precautions



### Caution

## ***READ THIS MANUAL TO COMPLETION BEFORE BEGINNING MODIFICATION***

Through this manual, you will be provided with the information to install the JX-3P MIDI Upgrade Kit safely and successfully in your Roland JX-3P synthesizer, but:

**Series Circuits cannot recommend the installation of this kit by anyone but a professional synthesizer technician.**

That is, an experienced technician operating with a business registered with their respective government. Therefore, Series Circuits cannot be held liable in any capacity for (and not limited to) any harm to you/others, or to your/their equipment (including electric shocks, fire, damage, malfunctions, and accidents involving soldering or mechanical assembly), or to the JX-3P being modified and the Series Circuits JX-3P MIDI Upgrade Kit.

### Specific warnings:

- ***Unplug the JX-3P from the wall socket before opening it, and do not power it while open.***
  - There are **potentially lethal high voltages** inside the JX-3P, please follow general mains electricity safety precautions. **The JX-3P like most vintage electronics has exposed mains connections.**
  - **Avoid directly or indirectly touching the area of the power-supply and power switch inside the JX-3P (right hand bottom side).**
- Proficient soldering skills are a **requirement**.
- Proficient synthesizer troubleshooting skills are a **requirement**.
- Take appropriate measures against static electricity (e.g., ESD wrist band). Static electricity could damage both the JX-3P MIDI Upgrade Kit and the JX-3P!
- **If you feel you don't have the required knowledge and skills, *please do not proceed.***

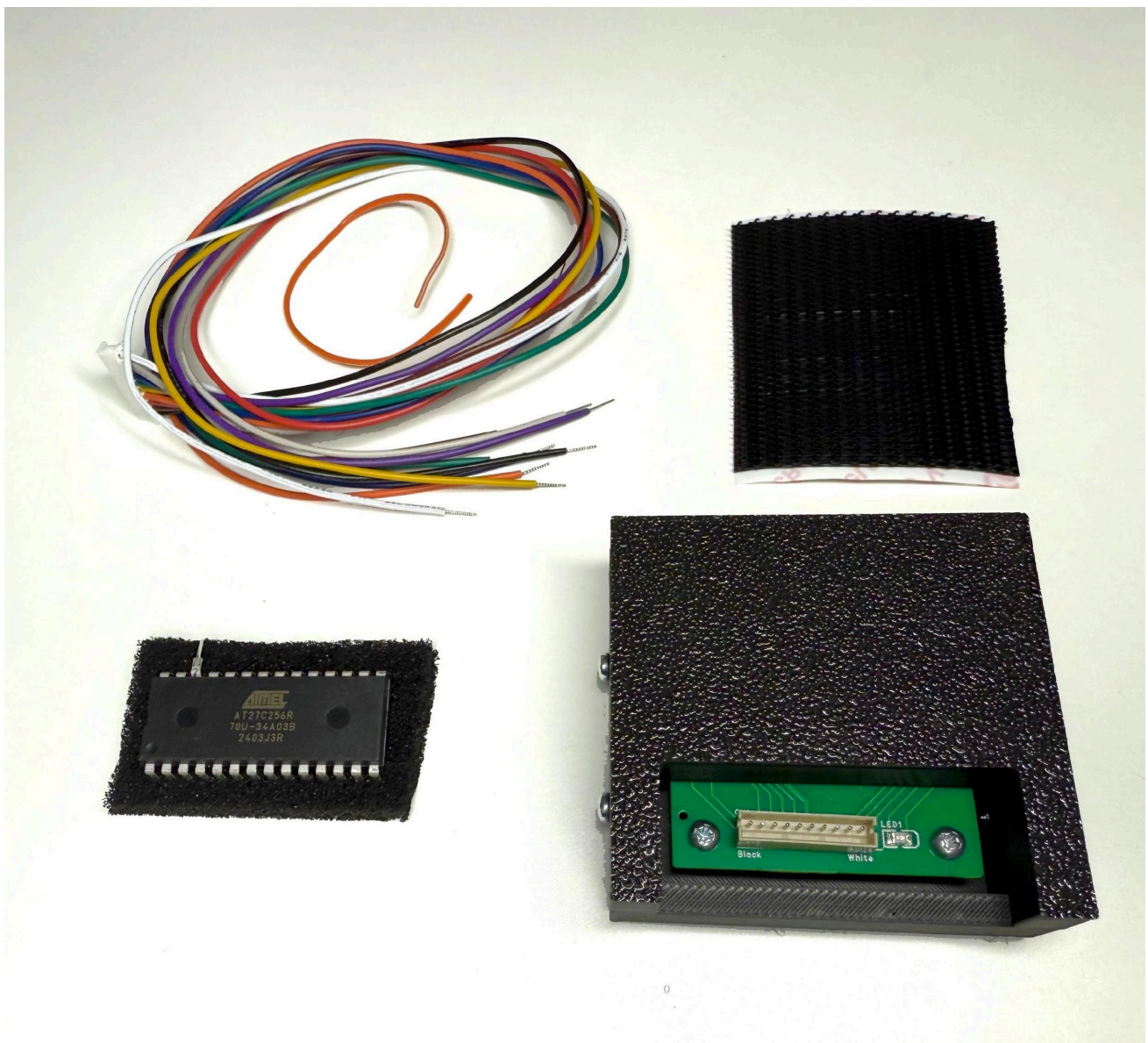
***Installing the Series Circuits  
JX-3P MIDI Upgrade Kit means  
that you accept and understand  
these terms.***



## Chapter 1 - Opening the Bag

The package contains:

- A prebuilt Merge Box (a black plastic case, with 10-pin header)
- A pre-programmed EPROM
- A 10-pole cable (rainbow coloured) with connector
- A wire link (approx. 9-10cm)
- A complementary adhesive Velcro pad (for mounting)



## Chapter 2 - Installation in the JX-3P

The following items are needed for installation:

- The pre-programmed EPROM
- The Merge Box
- The 10-pole cable (rainbow coloured) with connector

Also needed (not included with the kit):

- A soldering iron.
- Desolder braid, desoldering gun or a solder sucker.
- Other general tools such as screwdrivers, scissors or wire stripper, and pliers.
- A digital multimeter, to inspect for unseen and unwanted shorts.

### Installation steps:

#### Step 1



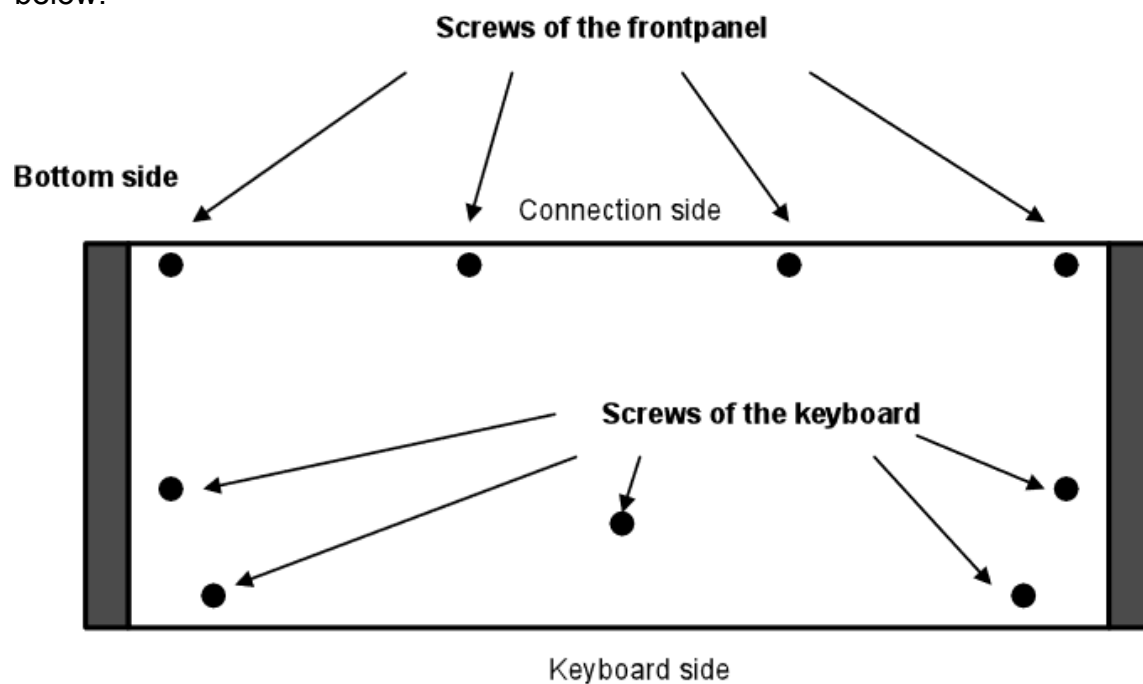
**Disconnect the power plug from the wall socket!**

## Step 2

Place the JX-3P on a soft surface to prevent scratches on the front panel when turning it over.

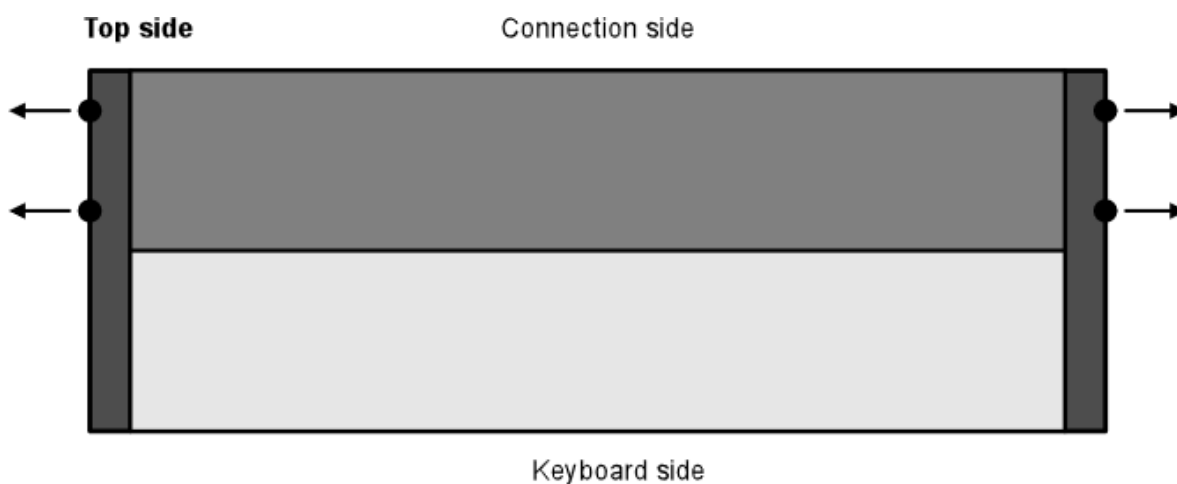
## Step 3

Turn the JX-3P upside down and remove all the screws indicated in the picture below:



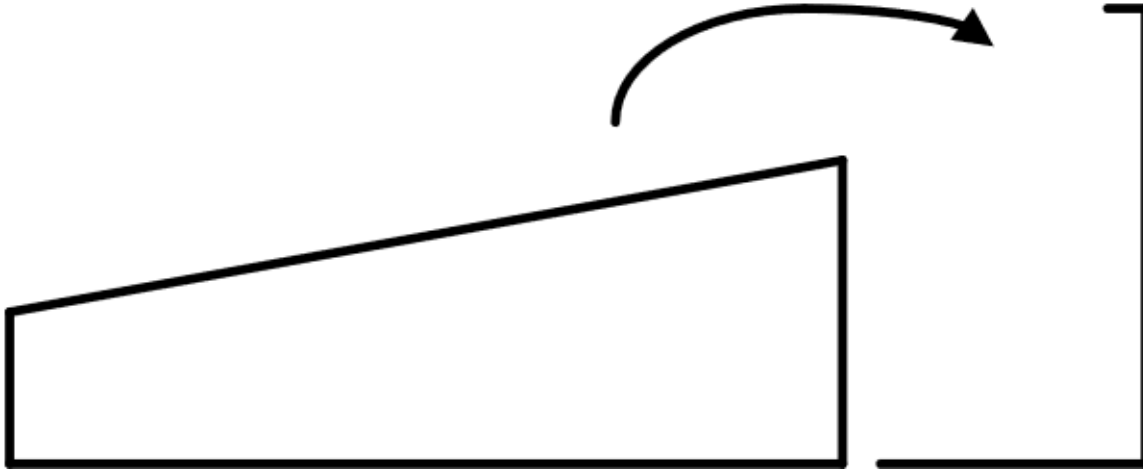
## Step 4

Turn the JX-3P back upside. Be careful while doing this, the keyboard can now move freely and could fall out! Remove the screws on the sides (4 in total). After this the front panel can be opened.

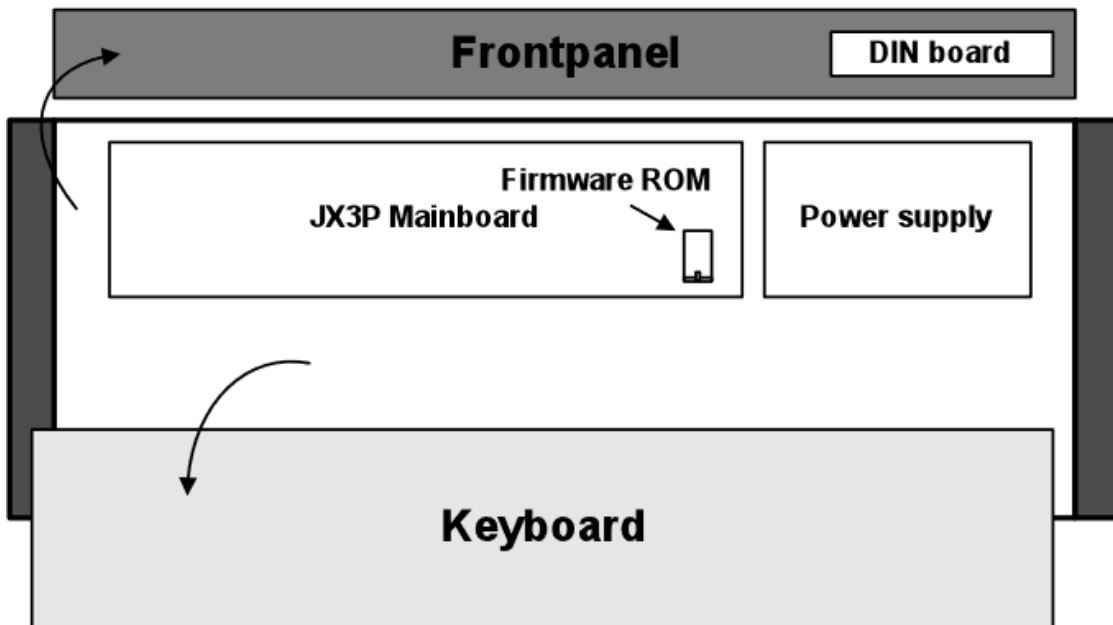


## Step 5

Lift and rotate the front panel backwards (there are no hinges). Make sure to avoid strain/damage on the internal cables while moving it.



Partially remove the keyboard outside the case. You do not have to unplug the cables connected to it, as you only need to move it just enough to reach the firmware EPROM on the mainboard. Avoid touching the power supply (capacitors can still be charged after power is disconnected).



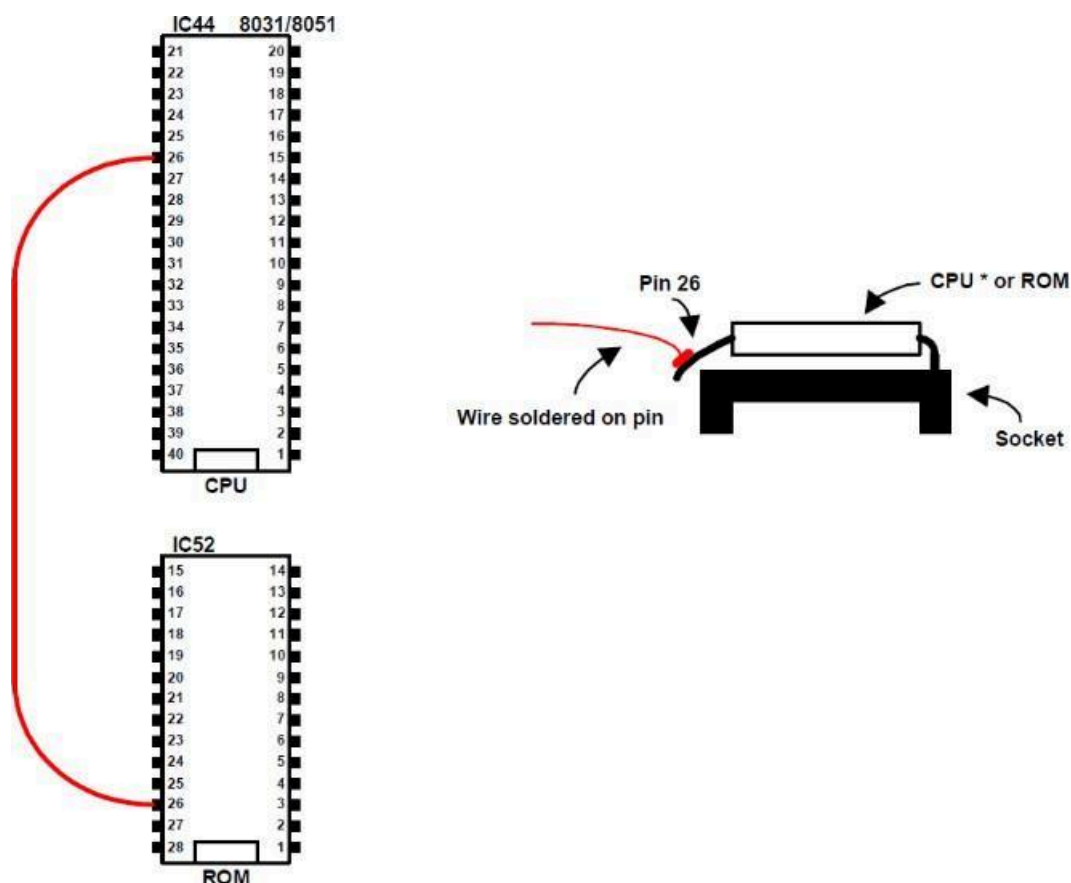
## Step 6 - Installing the New EPROM

You can find the firmware ROM at the lower right side of the main board (IC52). The original IC will be labelled 2764 or 2365 (sometimes covered with a sticker).

If you are uncertain about pin numbering conventions, please look up this information first.

1.
  - a. If the original firmware ROM (IC52) is socketed:
    - Carefully remove the original firmware ROM from the socket. This is done best with a dedicated IC extractor tool, but with a little care and patience can also be achieved with a small screwdriver and/or pliers.
  - b. If it is soldered directly onto the mainboard:
    - You need to remove the main board, and desolder the IC, then solder an IC socket into this location and place the main board back into the JX-3P. These actions are not further described in this document.
    - *Note: The IC socket is not included in this kit as almost all JX-3Ps (over 9/10) have a socketed EPROM.*
2. Place the new firmware ROM from the kit into the socket at IC52, make sure the bent pin is not making contact with the IC socket.
3.
  - a. If your CPU is socketed, the best way to achieve a good soldering point on the ICs is to remove the CPU, lift pin 26 on the CPU and bend it such that it is like the bent pin on the new firmware ROM. Make sure the bent pin is not making contact with the IC socket, or with pin 25 and pin 27. Put the CPU back into the socket.
  - b. If the CPU is not socketed, you can just solder the wire onto pin 26 as is. Just be careful you don't apply too much heat too close to the CPU for too long and **ensure you check there are no shorts** with pin 25 and pin 27 after soldering.
4. Strip the ends of the provided wire link and solder it between both prepared pins (pin 26 on both ICs), such that you have made the required interconnection. Try to achieve a good connection without applying heat for too long to the IC pin, as this could permanently damage the IC. It is also recommended to keep the wire as short as possible (the one provided is sufficiently short, but you may further trim it), to avoid it picking up unwanted interference.

5. Use a multimeter to ensure there are no shorts with pin 25 and pin 27 on both chips.



**Pay attention to the orientation of pin 1 when inserting the new ROM. Reversed insertion of the IC into the socket could damage the IC and other components in the JX-3P.**

Keep the original firmware ROM in a safe place.

## Step 7 - Modifying the DIN Board

The DIN board is the circuit board inside the JX-3P that carries the MIDI and PG-200 sockets to the outside (rear right) of the instrument.

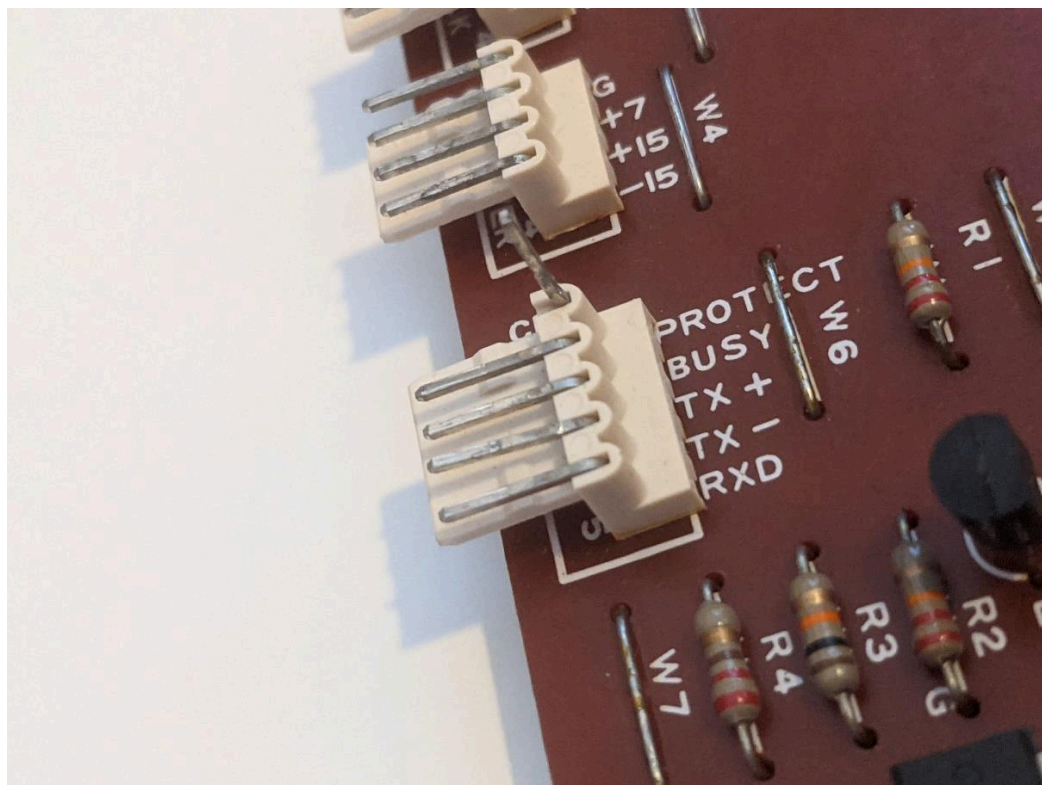
Unscrew the DIN board and disconnect the three internal cables connected to it (CN1 JACK, CN2 POWER and CN3 MAIN). Remember the location of each of these (or label them with a water-resistant marker), so you can put them back correctly after modification of the DIN board.

**Ensure you mark or remember the position of the CN1 and CN2, they are both 4 pin connectors and hence can be interchanged.**

**Connecting CN1 & CN2 backwards will destroy your Merge Box.**

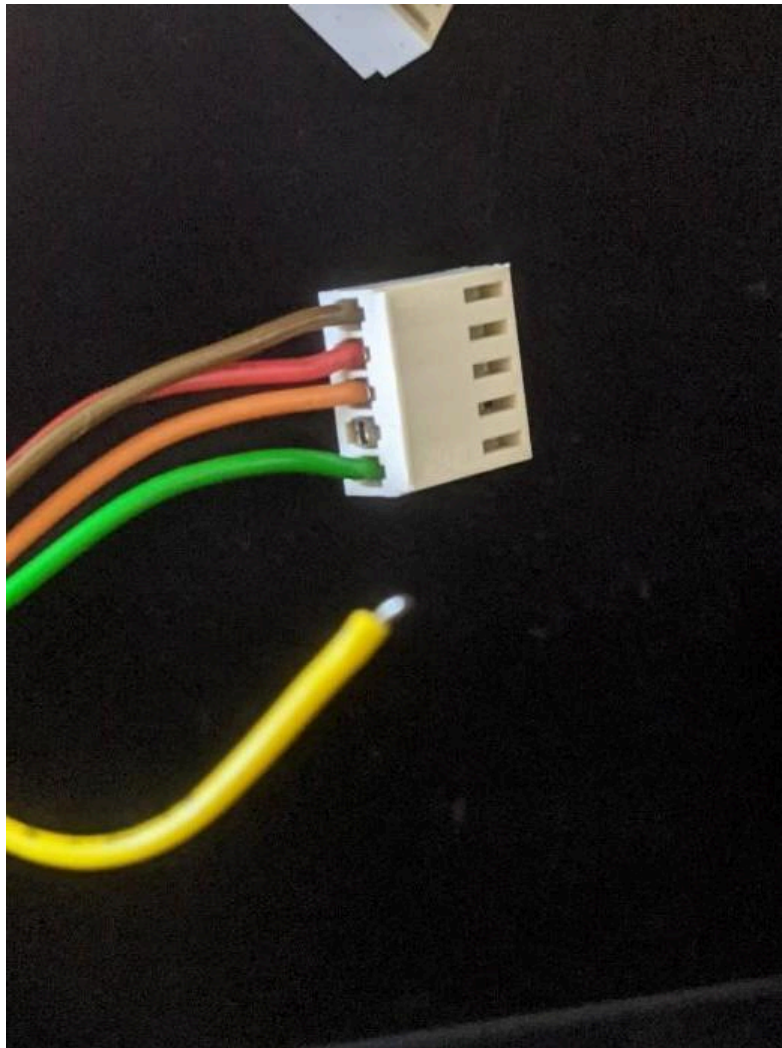
Two different versions of the DIN-board were manufactured for the JX-3P, a version with MIDI THRU and a version without. PCB layouts for both versions can be found below, please refer to the correct one for your JX-3P. The modifications to be performed are the same, but the locations will differ.

1. Bend the pin labelled “PROTECT” on the DIN board upwards so it is perpendicular to the board.



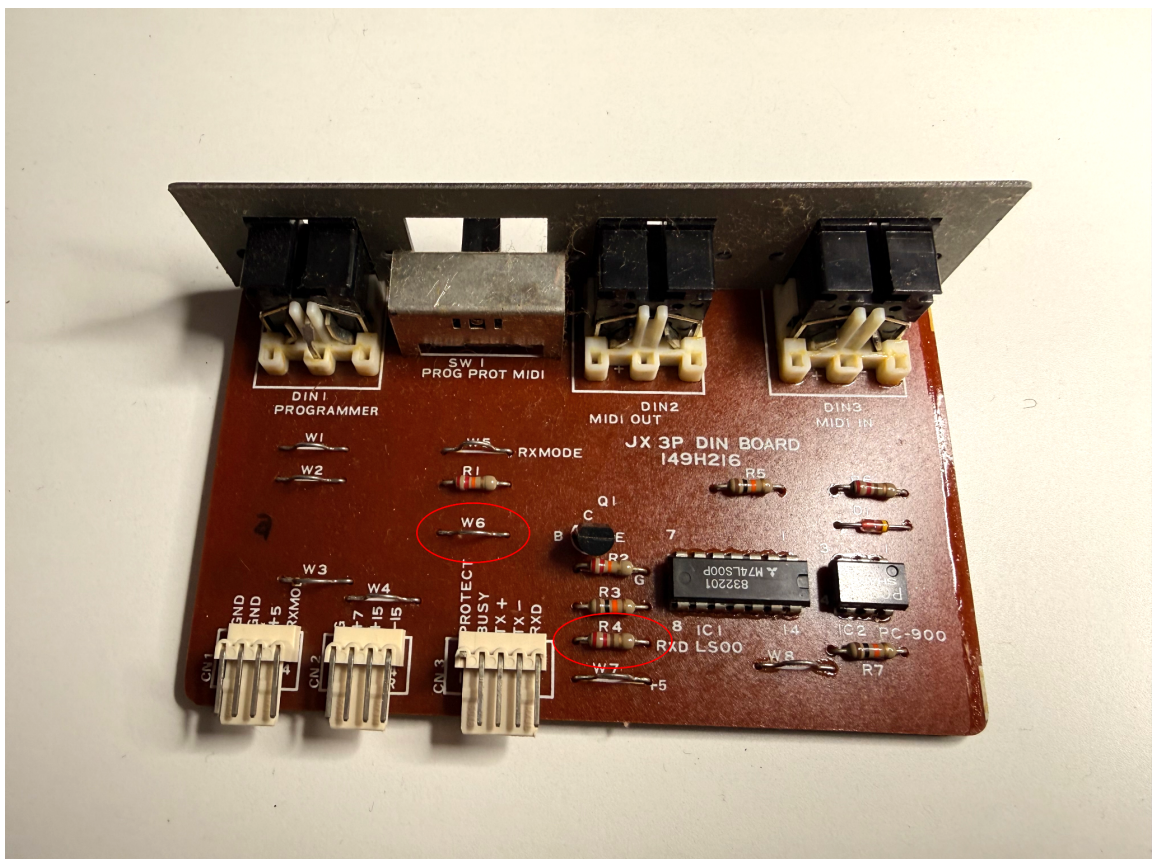
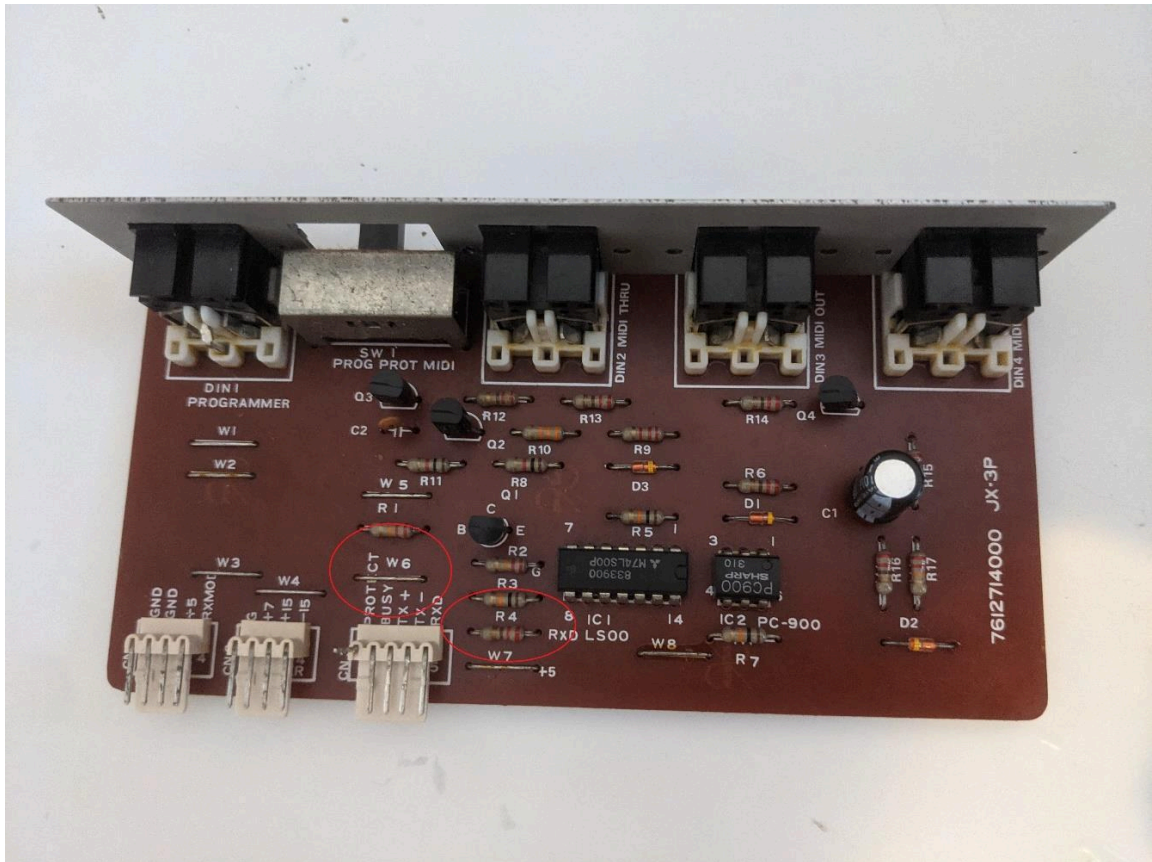


2. Cut and strip or otherwise remove the yellow wire from the 5-pole cable bundle that connects to CN3 (the pin header modified in the previous step).



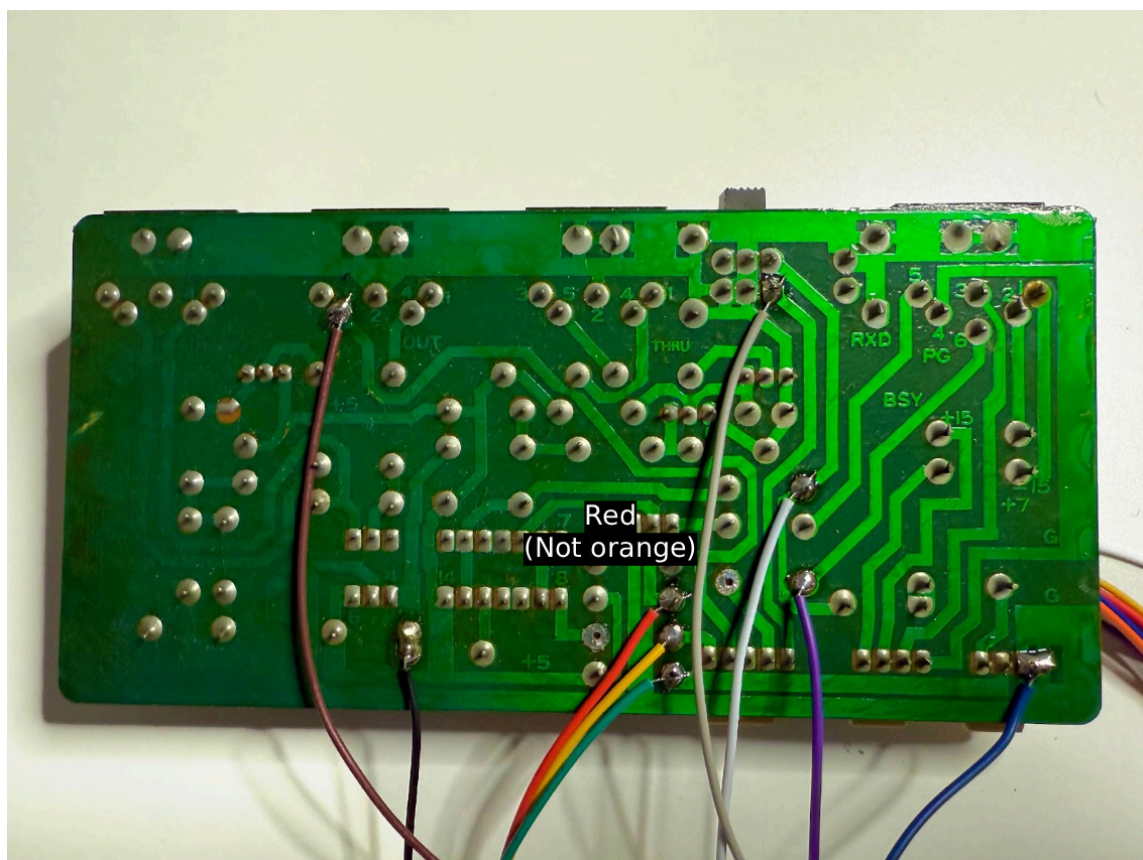
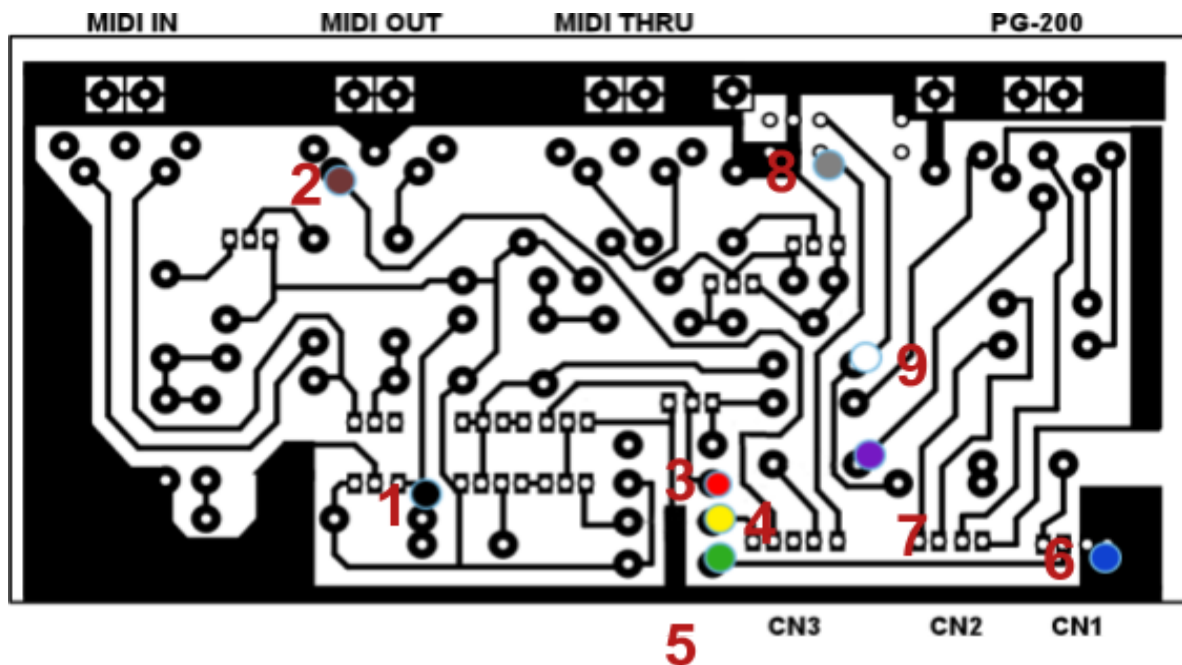


3. Remove W6 and R4 from the DIN board.



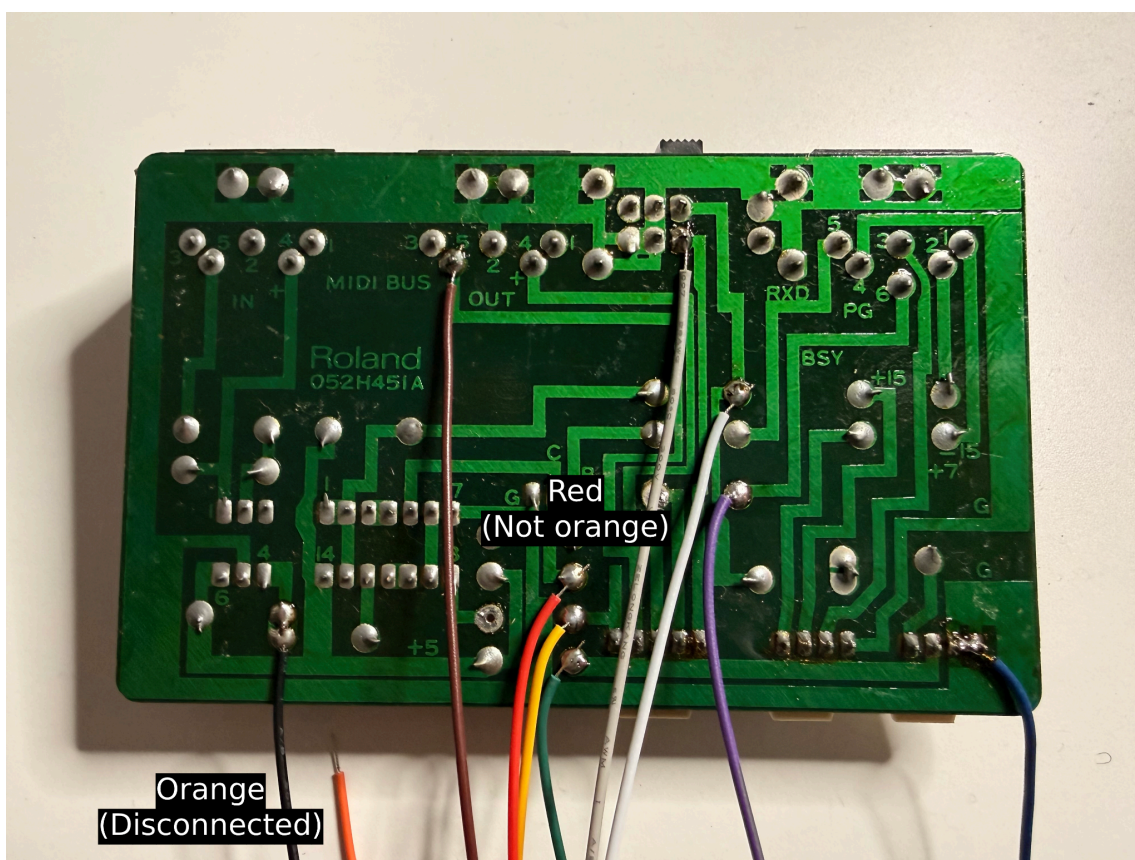
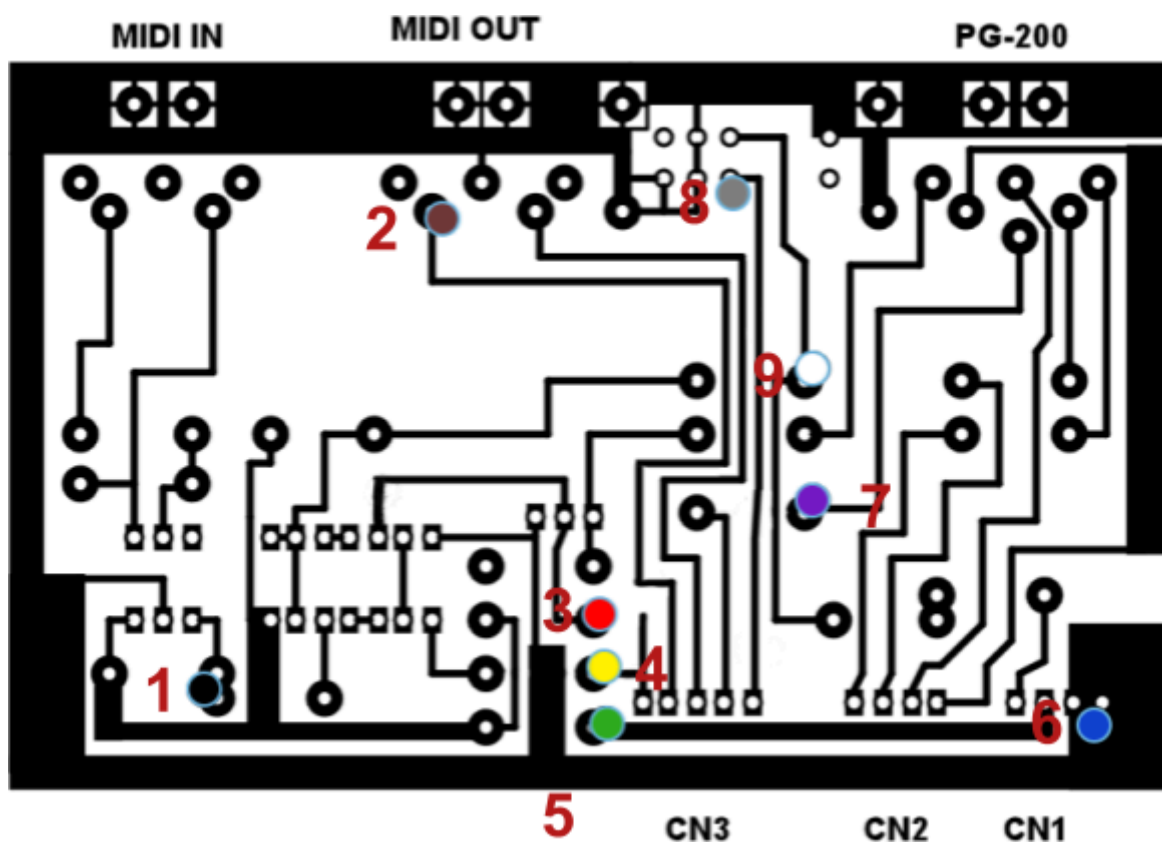
4. Now solder each of the 9 wires of the supplied 10-pole cable bundle (rainbow coloured) at the locations indicated in the PCB layout below:

DIN-Board with MIDI-Thru output

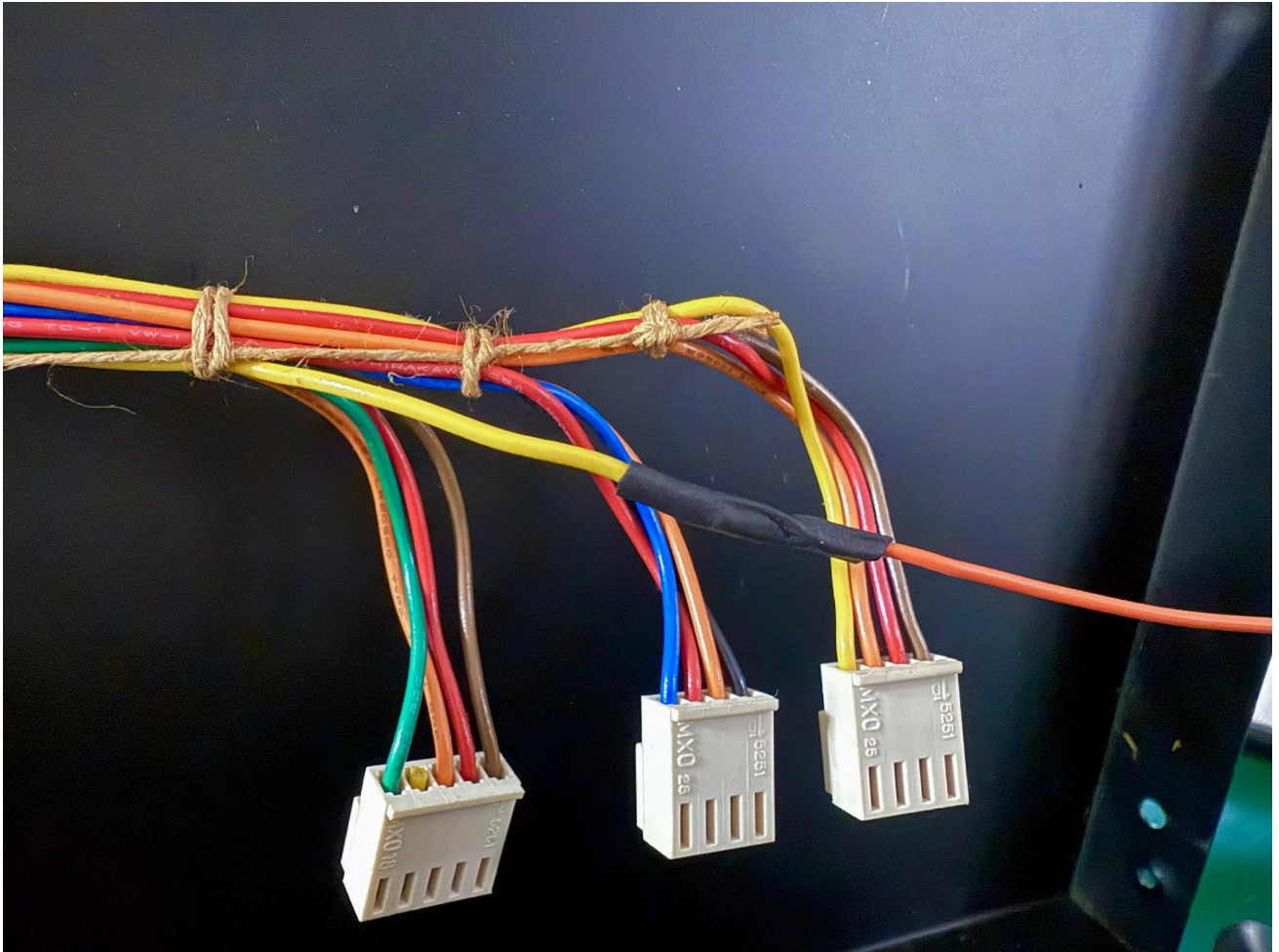




DIN-Board without MIDI-Thru output



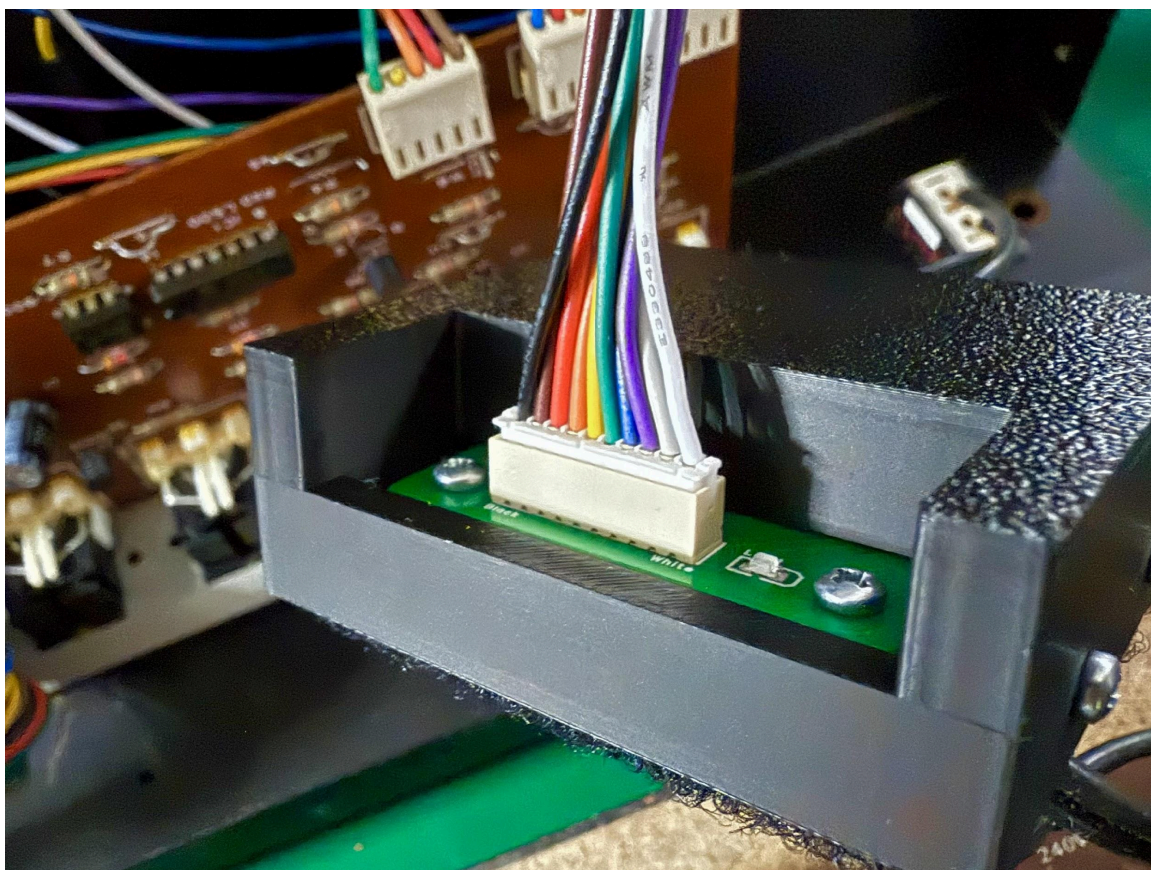
5. Solder the orange cable from the 10-pole cable bundle to the yellow cable that was disconnected from the 5-pole cable bundle in step 2, use heat-shrink wrap or electrical tape to enclose the point of connection.





## Step 8 - Finishing Up

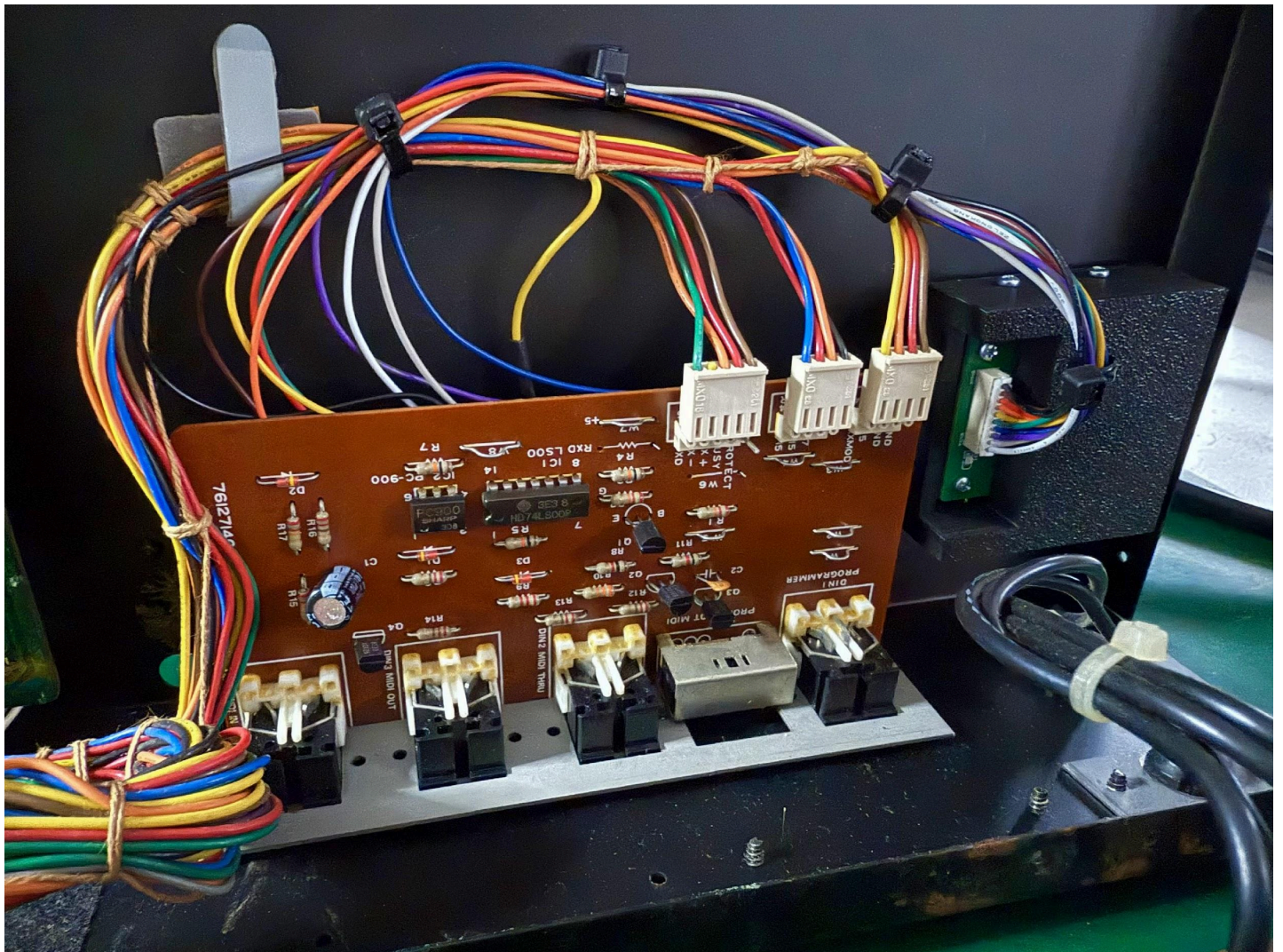
1. Verify that all the connections are done correctly (rechecking now saves you a lot of potential problems later). You can tie the wires together with tape or cable ties (do not coil them). Screw the DIN-board back into place and reattach the three connectors to it.
2. Press the 10-pin cable connector firmly onto the pin header of the merger box (fits only one way).



3. Use the adhesive Velcro pad to mount the merger box on the inside of the front panel next to the DIN board as pictured above. Make sure no parts of it will collide with the JX-3P power supply when the case is closed and try to put it as far towards the back of the case as it will go.
4. Put the keyboard back in place (check bent pins 26 of the ICs are not touching the keyboard frame).
5. Close the JX-3P and put back the screws you have removed.



That's it! You are finished with the installation!



## Chapter 3 - Troubleshooting and FAQ

### Cable Bundle Pinout:

Black – MIDI In

Brown – MIDI Out

Red – PG-200 In

Orange – JX-3P In

Yellow – JX-3P Out

Green – VCC (+5V)

Blue – GND

Purple – PG-200 BUSY

Grey – MIDI CH Select A

White – MIDI CH Select B

### FAQ:

***Q: How do I know that the JX-3P MIDI Upgrade Kit will work in my JX-3P version?***

A: There are two versions of the JX-3P: The non-MIDI-Thru and the MIDI-Thru version. The JX-3P MIDI Upgrade Kit supports both. The kit has been installed in a variety of JX-3P's in the past, in all cases without problems.

***Q: Is it possible to install this kit in an MKS-30 - since it is the rackmount module of the JX-3P?***

A: No, the kit can be only installed in a JX-3P. The internal hardware of the MKS-30 is not compatible with this kit.

***Q: After installing the JX-3P MIDI Upgrade Kit, is it possible to use SysEx to control the JX-3P?***

A: No, the JX-3P MIDI Upgrade Kit uses standard MIDI CC messages rather than SysEx. It is much easier to achieve real-time control with MIDI CCs (compared to SysEx), and many MIDI controllers and sequencers interface more reliably via CCs than via SysEx.

***Q: Unfortunately, I do not have the PG200 programmer. Can I therefore ignore installation of the merger box and only install the new firmware?***

A: All the features of the JX-3P MIDI Upgrade Kit are implemented in the Merge Box. It is the combination of the Merge Box with the new ROM that makes the kit work. Just installing the ROM will not work.

***Q: I have a non-working JX-3P, will this kit bring new life in it?***

A: No, the kit will not 'resurrect' a non-working JX-3P. It must be installed in a working-condition JX-3P.

***Q: Why is the LFO Delay not working when I play a note through MIDI?***

A: This is a classic bug in the original JX-3P firmware, and since the JX-3P MIDI Upgrade Kit acts as a supplement to this firmware, this original bug cannot be corrected. Fortunately, this bug does not occur in velocity mode. But in normal usage it is still there.

***Q: I know that parameters on the PG-200 work at a resolution of 8-bit. Since MIDI usually only utilizes 7 bits, will the resolution of my PG-200 be reduced after installation of the JX-3P MIDI Upgrade Kit?***

A: No, the PG200 still sends parameters into the JX-3P with its original 8-bit resolution. Only parameters sent from the PG-200 to the MIDI-OUT, or parameters received from the MIDI-IN are in 7-bit resolution.

***Q: Help! I have installed the kit and my JX-3P randomly hangs, and after that the LED's are flickering and there is no sound.***

A: This problem is typically caused by an incorrect installation of the firmware ROM. Occasionally the same symptoms play up when the ROM has gone bad, but this rarely happens.

- Check if the bent pins on the ROM and CPU ICs (pin 26 on both) are touching the metal frame of the keyboard.
- It is also possible that these pins aren't bent far enough, such that they are grounded on conductive parts of the IC socket.



- It is also possible that the soldered ends of the wire link between ROM and CPU are making a secondary contact (directly, or via soldering artifacts) with neighbouring pins.
- All the above situations will cause problems and random behaviour