Tubbutec JUNO-66

MIDI RETROFIT AND FEATURE EXTENSION FOR ROLAND JUNO-6 AND
JUNO-60

Installation Manual for firmware version v1.0

http://tubbutec.de

Contents

1   Opening the Juno

Important: Before doing any of the steps below unplug the Juno's power chord! To open the Juno front panel remove the four screws on the left and right side of the synth. The panel can now be opened.

2   Desolder the CPU

To install the Juno-66 the original Juno CPU needs to be de-soldered first. It is the 40 pin DIP package on the right side of the lower PCB.
There are various methods to desolder a DIP package:
A solder wig, desoldering pump, a professional vacuum desoldering tool,..
A good result can be obtained by using a hot air gun to heat up the area around the cpu from below the pcb, then lifting off the cpu.
An other, very effective method is to use a side cutter to cut of the CPU's pins, then remove the pins from the holes of the pads. A disadvantage of this method is that if you were to use the cpu again for some reason you would have to replace the pins on it. On the other hand this method works very well and no special tools are necessary.

After removing the CPU, remove any left solder in the holes of the pads.

3 Installing socket and Juno-66

Now that the original CPU is removed, a socket can be installed. Just put the socket in the holes and solder it from below. You can now plug in the Juno-66 as shown in the picture below with the wires on the bottom.

Figure 1: The Juno-66 in its socket

4   Filter and pitch bend control

To install filter and pitch bend control some additional parts need to be
soldered on the back of the left front panel board and the bender board.
To access the bender board remove the four screws below it. The two pic-
tures below show the locations of the parts to add. Orange wire coming
from the Juno-66 board controls the filter, the red wire the pitch bend.
The other three wires are not used.
Please note: The value of 3.3nF displayed in the images has been replaced
by 10nF.
Update: There was an update of the Juno-66 hardware to increase its fil-
ter control range. See: https://tubbutec.de/blog/increased-filter-range-for-
juno-66/. In this version the capacitor has been changed to 100nF.
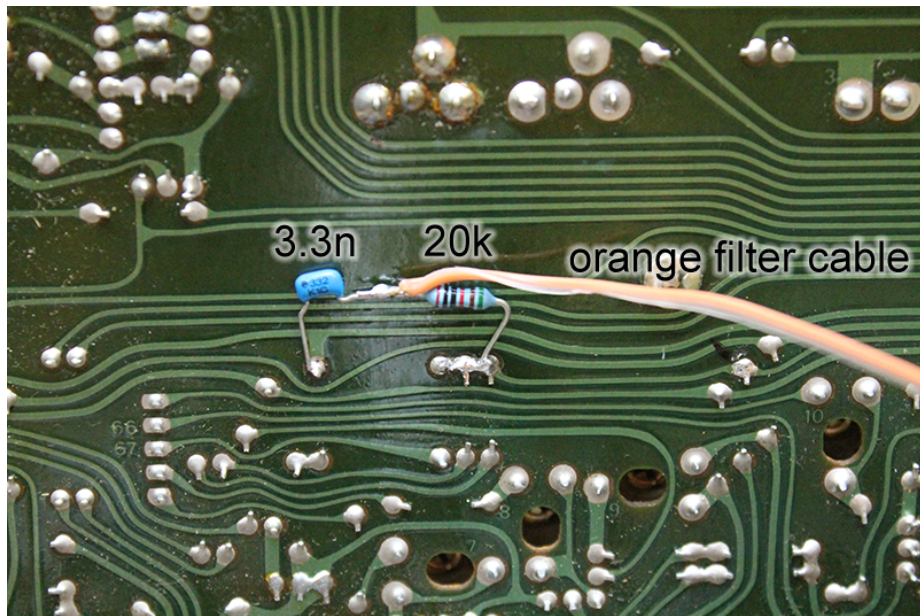

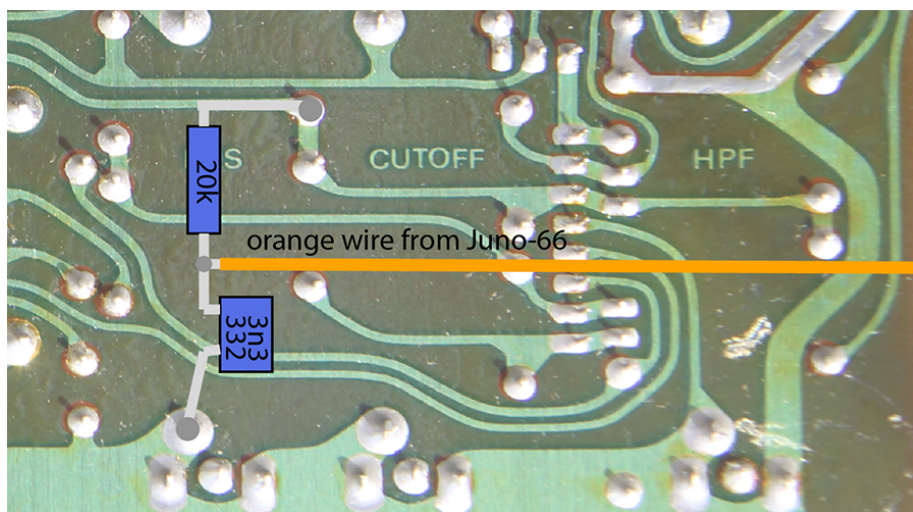Figure 2: Juno-60 filter control parts

Figure 3: Juno-6 filter control parts

4.1 Pitch bend re-calibration

After installing the pitch bend control it needs to be re-calibrated.

4.1.1 Calibrating pitch bend offset

The first thing to check is if the pitch changes if you move the DCO slider without moving the bender. Slight pitch changes are normal and can be compensated. If there is a larger pitch change check the added components and make sure you where using the right ones.

To compensate the pitch change set the DCO slider to 10 and send midi pitch bend commands to the Juno-66 until there is no pitch change. You can either use a tuner or move the DCO slider up and down for comparison. After compensating the pitch get into the Juno-66 config menu by pressing KEY TRANSPOSE until the led is blinking, then press the second highest key of the keyboard (see user manual). Press KEY TRANSPOSE again to exit the config menu.

4.1.2 Calibrating pitch bend range

Connect a tuner or frequency counter to the audio output of the Juno. Alternatively you can use a reference tone of 440Hz (from an other synth for example) and eliminate the beating between the Juno output and the
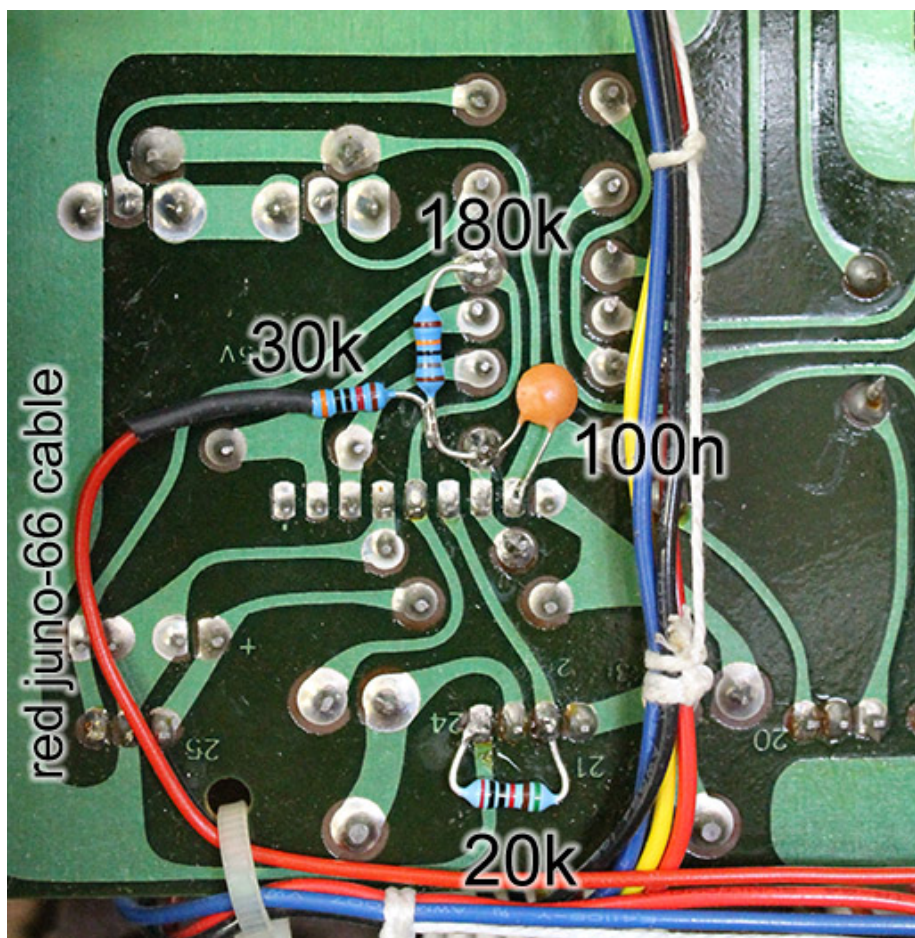
Figure 4: Juno-66 pitch bend control

reference in the steps below. Beating can be detected by ear or by using an oscilloscope in XY mode. Make sure the synth is set to poly mode when doing this.

1. Play A5 and adjust the tune control on the back until the frequency is 440Hz.

2. Set the DCO slider on the bender panel to 10.

3. Press hold and play E5

4. Hold bender lever in leftmost position and adjust VR1 (on top of bender board) for 440Hz.

5. Press hold to switch off sound

6. Press hold again and play D4

7. Hold bender lever in rightmost position and adjust VR2 for 440Hz.

4.2 Brown, Yellow and Green wires

These wires are not used.

5 Installing midi sockets

5.1 Juno-6

You need to drill six holes for the midi connectors: 4x 3.2mm, 2x 14mm. A drill-aid stencil comes with the kit. You can chose any location you like, just make sure the wires can reach there. After drilling install the midi sockets from behind the panel using the screws that come with the kit.
The 14mm holes can be easily drilled with a stepping drill with good looking results.
The connector with two wires attached is midi in, the one with three wires midi out.
There is also a separate metal panel available at Tubbutec that can cover 'ugly'-looking holes.

5.2 Juno-60

If you have a Juno-60 you can replace the existing DCB socket with the two midi sockets. A metal panel that fits into the DCB slot can be purchased at Tubbutec.
Remove the two screws on the left and right side of the DCB connector. You can now remove the connector panel. Eigther cut off the wires or fix the panel somewhere inside the Juno with cable ties. If you decide to do the latter, make sure it can not touch and contacts. We recommend putting it in a plastic bag for that purpose.
Now install the midi connectors on the midi panel ans install it in the DCB

slot using the original screws.

The connector with two wires attached is midi in, the one with three wires midi out.