α.ctrl

**BUILDER'S MANUAL**

Build Guide

Order parts per the Bill of Materials, I was able to find all the parts on Tayda. Soldering the board components first (resistors, capacitors, chip sockets, etc.) before the panel components will leave you more room to work. The Bill of Materials contains the information needed to match each resistor number to its value. All of the ceramic capacitors are the same value throughout the board. Sockets are suggested for the multiplexers, optocoupler, and the Arduino. The jacks (power barrel jack, MIDI jacks) and the Arduino are soldered to the back side of the circuit board (the side the resistors go on). Pay attention to the silkscreen and you'll be okay.

An Assembled Unit
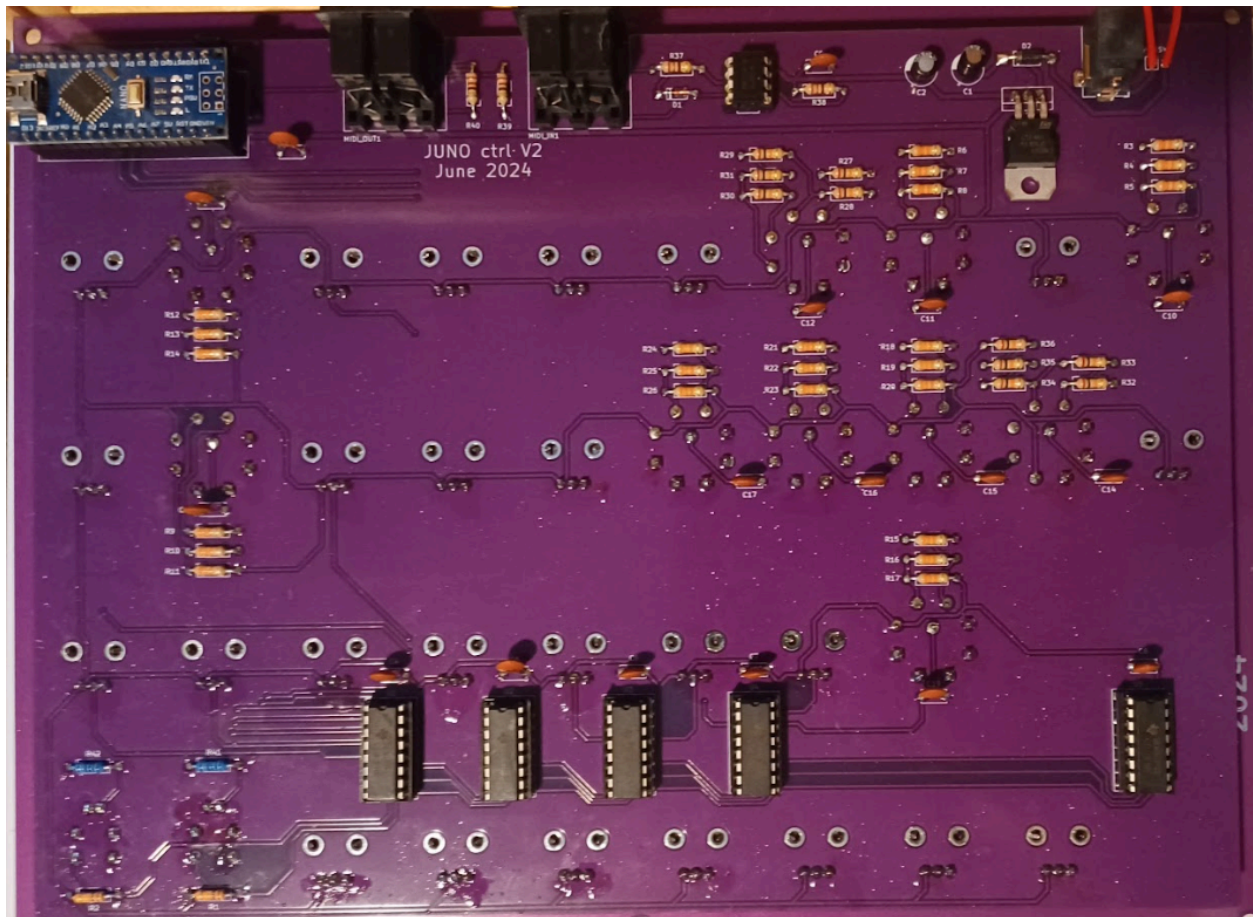
Before soldering panel components, attach the panel with the nuts from the pots & switches. This will ensure that all of the panel parts are aligned. The buttons can be finicky, solder 1 leg and maneuver it as needed with your off hand to get it aligned perfectly.

There are 2 sets of 2 pin jumpers: PWR and PROG. PWR is intended to be shorted with a rocker switch, any sort will do. PROG is necessary to disconnect the serial port from the MIDI circuit when the Arduino is being programmed. **If the Arduino refuses to be programmed, make sure the PROG jumper is not connected!**

PROG

PWR

Speaking of power, the alpha.ctrl is powered by a **9V DC center positive** wall wart. You probably have one of those laying around, right?

Enclosure

I opted to make a case out of some wood, mostly because my 3D printer is too small to make an enclosure this large. If you have a printer large enough, go for it! Mechanical drawings and an stl file are included in the repository.

Modifications

The jumpers can be removed if necessary. PWR can be replaced with a jumper wire, this will mean that the unit is always ON while the barrel jack is inserted. PROG can be replaced with a wire jumper, this means that the Arduino will need to be removed in order to program.

It may be desirable to mount the power and MIDI jacks directly to a separate panel instead of soldering to the circuit board. This could be helpful if you plan to use an alternative style of enclosure. Follow the schematic to determine where the pins should go.

Instead of running the MIDI channel change routine, I considered locating a DIP switch on the back side that would set the MIDI channel. This would, of course, require changes to the code.

Operations

The alpha.ctrl has 3 primary functions: individual parameter change, all parameter change, and MIDI channel change. These functions are the same as in the PG-300 owner's manual.

NOTE: if no parameter changes are detected during operation, confirm that the MIDI EXCLUSIVE setting in the MIDI menu of the Juno is set to ON. **The Juno will not accept parameter change messages if this setting is OFF.**

Individual Parameter Change

Just move a control! The alpha.ctrl sends a Sysex message for each control change on the panel. These controls are the same as the parameter menu on the Juno, except now they're easier to get to. All parameters work the same way they do per the Juno manual.

All Parameter Change

Pressing the Manual button will send the value of every control in its current location. You can think of this as a 'hardware preset' stored outside of the Juno's memory. This control is necessary because the alpha.ctrl only sends a command when a parameter change is detected. If the Manual button is pressed accidentally, this change can be undone by reloading the preset.

MIDI Channel Change

The default MIDI channel of the alpha.ctrl is channel 1. In order to change this, power OFF the alpha.ctrl, set Noise Level and Sub Level as shown per the below table, then power ON the alpha.ctrl while holding the Manual button. The MIDI channel change is confirmed by 2 blinks from the Manual button LED. The channel is now updated and will be recalled every time the alpha.ctrl is powered on until this routine is run again.

MIDI Channel Change Table

		NOISE LEVEL			
		0	1	2	3
SUB LEVEL	0	1	2	3	4
	1	5	6	7	8
	2	9	10	11	12
	3	13	14	15	16