What You'll Need:

·Business Card Synthesizer Kit   · Soldering Iron   · Solder   · Wire Cutters

Polarity doesn't matter
Polarity DOES matter

1
☐ Install Diode

To make assembly easier, we're going to install components from shortest to tallest. This way when you flip the board over to solder them, your work surface will hold them in place. Let's start with the diode.

To prep the leads, hold the body of the diode and bend the two leads 90 degrees.

Insert the diode into the holes marked D1 on the PCB. **Polarity does matter for diodes**, so when you insert it into the board, make sure the black stripe on the diode lines up with the stripe on the silkscreen pattern.
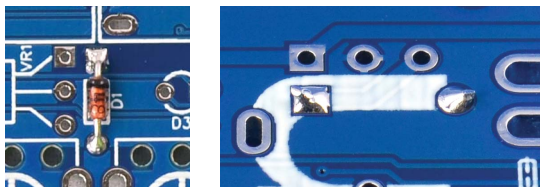
Bend the leads outward underneath the board to hold the diode in place.
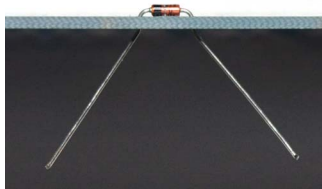
Flip the board over, solder the diode leads, then trim them just above the solder joint.

For a quick soldering tutorial, visit **division-6.com/solder**

Note: For this build, we're going to be clipping the component leads a bit shorter than you may do normally to ensure that the board will fit inside the BC Synth enclosure if desired. Clip the leads as close to the solder joints as you can without cutting into the joints themselves.

2
☐ Install Resistors

Working one value at a time, prep the leads of the resistors like you did with the diode.

Insert the resistors into their proper locations (see BOM). Polarity doesn't matter for resistors, but your board will look neater if you line up all the tolerance bands (gold) the same direction. Bend the leads outward underneath the board to hold the resistors in place.

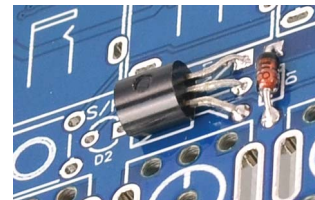Flip the board over, solder the resistor leads, then trim them just above the solder joint.
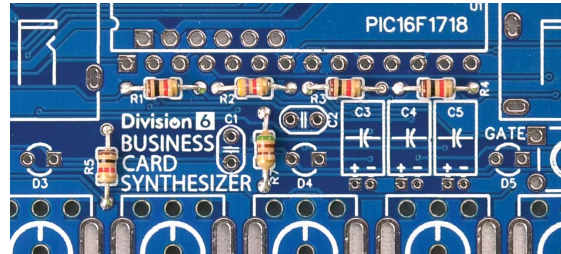
3
☐ Install L4931CZ50 Regulator

Insert VR1 into the board and bend it so that the flat side of the regulator is flat against the PCB. Solder and trim the leads.

4
☐ Install IC

You may have to bend the IC pins inward a little bit to get them to line up with the holes in the PCB. You can do this by placing the chip on its side with one row of pins flat against your work surface. Very carefully hold the body of the chip and rotate it so that all the pins on the one side bend inward slightly. Repeat for the pins on the other side.

Stuff the chip into the board. Note that one end of the IC has a notch in it to indicate which end has pin 1. Make sure to align this notch with the notched end of the silk screen pattern.
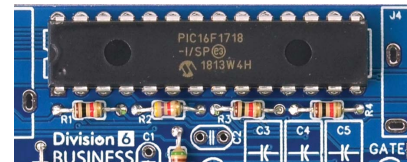
Flip the board over and solder one pin on each corner of the IC. This makes it easy to reposition the part in case it isn't seated all the way down against the board; just reheat the corner pins and adjust the position as necessary.

Once you are happy with the positioning of the chip, solder the remaining pins. **Trim the excess pin length**.

5

☐ Install Electrolytic Capacitors

Pre-bend the leads of the electrolytic capacitors 90 degrees so that the caps will lay flat against the PCB. **Polarity does matter for electrolytics**, so make sure to bend them so that the (-) stripe is lined up with the - (round) hole on the PCB (and is opposite the "+" marking on the silkscreen pattern). Solder the capacitors into place and trim the leads.
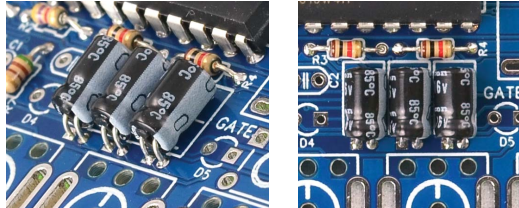
6

☐ Install Ceramic Capacitors

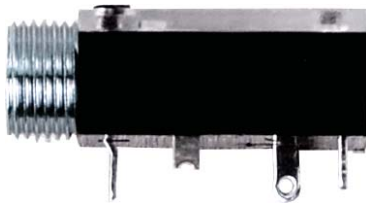Install and solder C1 and C2. Polarity doesn't matter for these capacitors.

7

☐ Install Jacks

Trim the jack pins first. They're a little to long to fit inside the enclosure, but they're kind of tough to cut after soldering. Cut them right about where the hole is in each pin.

Place the jacks in the board and solder them into place.

8

☐ Install LEDs

First note that **polarity does matter** for LEDs. You can see that each LED has a flat side to indicate polarity (lines up with flat side of silkscreen pattern on PCB).
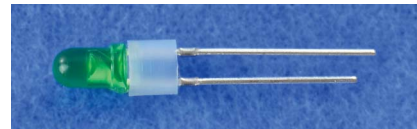
If the flat side is hard to see, the LEDs also have a long and a short pin.
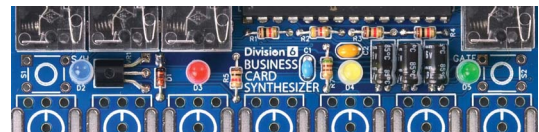
> 💡 FLAT SIDE = SHORT PIN = NEGATIVE (-) = SQUARE PAD ON PCB

Start by sliding an LED spacer onto each LED. This will make it easy to get the LEDs straight and exactly the right height.

It doesn't really matter which order you install the colors, but we had the following scheme in mind:

Insert the LED in the board, making sure that the polarity is correct (!) and that the spacer is flat against the board and the bottom of the LED. Solder, then trim the leads.

9

☐ Install Buttons

Insert the tact switches into the PCB. They fit 2 different ways, and either way is fine. They will snap into place, which makes it easy to flip the board over and solder them. Make sure they are flat and straight as you insert them. Trim the leads once you're finished soldering.
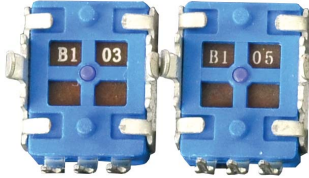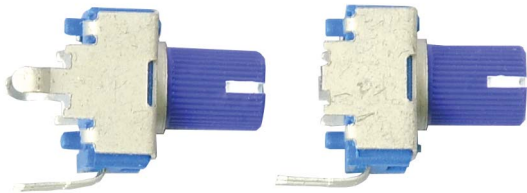
10

☐ Install Pots

Be careful here, because there's one pot that's different from the rest! R21 is 1M (says B105 on the bottom), where all the others are 10k (say B103 on the bottom). You can tell where the odd one goes by the extra-thick outline on the PCB.

Trim the support legs as shown before you install them in the PCB. It's much easier than doing it after you've soldered them in.

Insert the pots into their holes and press them all the way down (they should actually sit lower onto the board than they are designed to). Tack one support leg on each one with a little bit of solder, then eyeball them all to make sure they are nice and lined up with each other. It's much easier to tweak alignment before soldering all the pins, because you can just heat one pin up to reposition the pot. Once they look good, tack down support leg number two on each pot and check again. Once you are satisfied with the alignment, finish soldering the remaining pins and trim them.
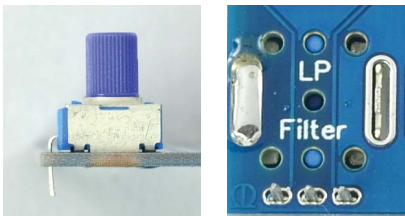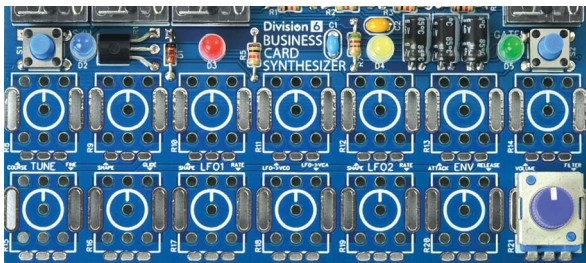
11

☐ Power Up

That's it, you're finished! It's time to test out your handiwork. Connect the synth to power (using an AC adapter, 9V battery, or some source of power you find on your modular synthesizer). The two LFO LEDs should start blinking. Connect the audio output to headphones, an amp, or your modular. Press the gate button and you'll probably hear some sound. In case you don't, here are some tips:

• Make sure the volume knob is turned up.

• Make sure the filter knob is turned up.

• Set the LFO->Pitch and LFO->Amp knobs to their 12:00 positions

• You can lock the gate on by tapping the S&H button while holding the gate button down

💡 Still have problems? Email us at **support@division-6.com!**