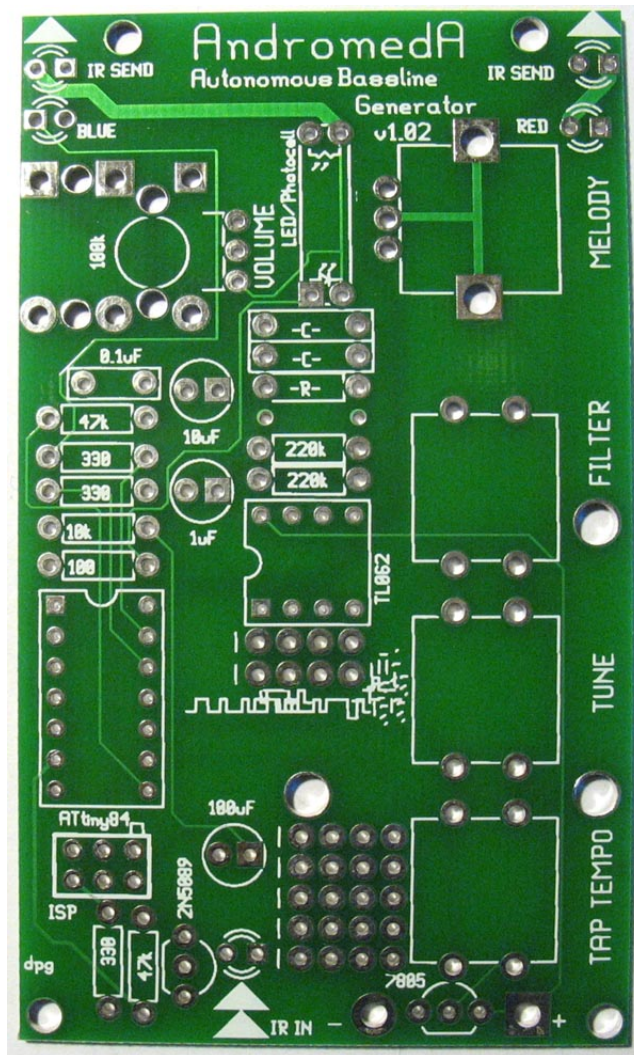# Autonomous Bassline Generator
## Builder's Guide 1.0.2

Step 1: Get comfortable

Look at the graphical parts list, compare the parts you have to the pictures and make sure you can identify every component. Look at the color bands on the resistors. Read the numbers on the other components.

It's also a good idea to spend a moment getting familiar with the PCB, too.

Pull out your tools: soldering iron, solder, flush cutters, maybe needle-nose pliers.

Take a deep breath.... here we go!

Step 2: Resistors
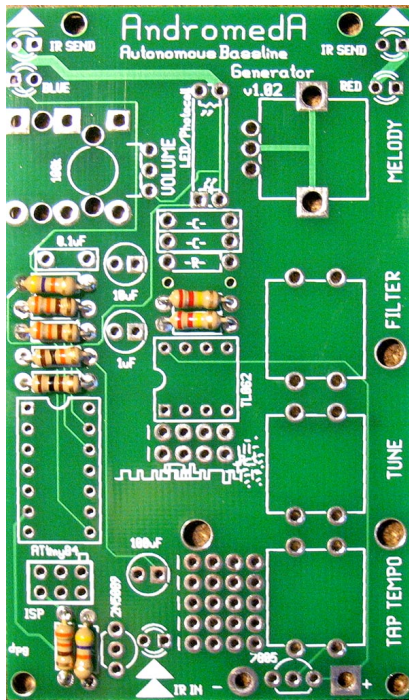
Insert and solder the 10 resistors:

- 100ohm x 1
- 330ohm x 3
- 10k x 1
- 47k x 2
- 220k x 2
- *Optional*:
  - 47k x 1 for "-R-"
  -

Note: the spot marked "-R-" is a tweakable resistor. Changing its value will change the analogue filter. **The easiest thing to do is to install a 47k resistor**. A more advanced approach is to install a socket in the next step and put in a 47k resistor later. Then you can swap out different resistors for different filter sounds. The photos show the advanced (sockets) approach.

Step 3: Sockets
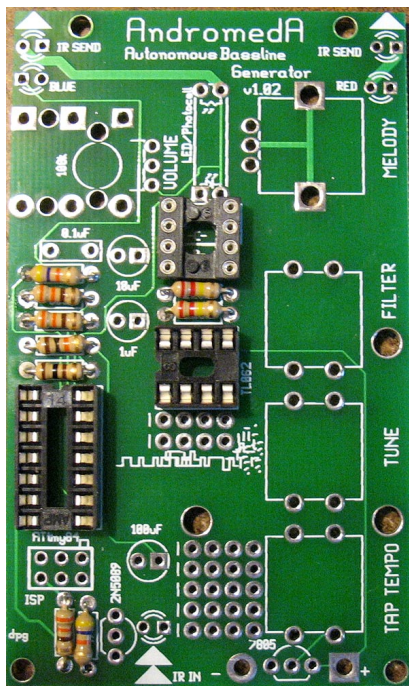
Insert and solder the sockets:

Observe the notch on the socket, and line that up with the printed notch on the PCB.

- 8-pin IC socket
- 14-pin IC socket
- (optional) 8-pin machined socket for -R-, and -C- x 2. This socket has round pins, not flat "leaf" pins like the other two sockets. It doesn't matter which way the notch in the socket points.

Step 4: Capacitors, Transistors, Photocell
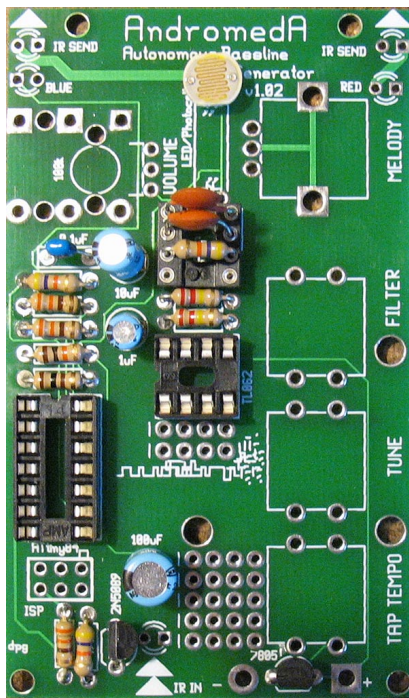
Insert and solder the capacitors, transistor, and photocell::

- 1uF x 1
- 10uF x 1
- 100uF x 1
- 0.1uF x 1
- 0.01uF x 2 (for "-C-", or use the socket. See note)
- 2N089 transistor
- 7805 voltage regulator
- Photocell

Note: For the 1uF, 10uF and 100uF caps, the long lead of the cap is the positive, and it goes in the square hole.

Note: the spots marked "-C-" are tweakable capacitors. Changing their value will change the analogue filter. **The easiest thing to do is to install a 0.01uF capacitor for each**. A more advanced approach is to install two socket holes now and put in 0.01uF caps later. Then you can swap the caps out for different filter sounds.

Step 5: Controls
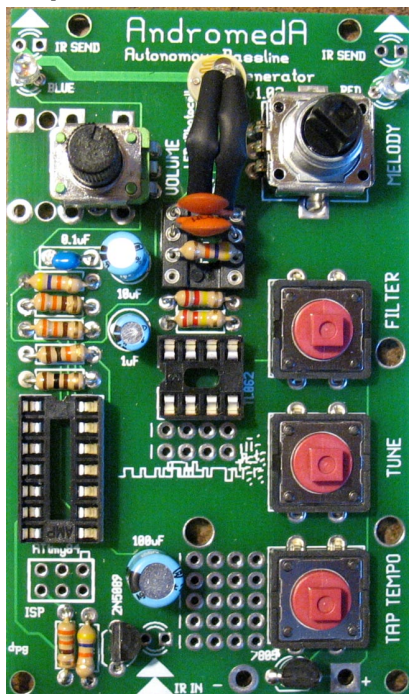
Insert and solder the controls:
- Buttons x 3
- Rotary x 1
- Trim-pot (100k) x 1
- Red LED in the center of board (see note) x 1
- Red LED x 1
- Blue LED x 1

Note: The long lead of the LED is the positive and it goes in the square hole (red and blue LEDs only).

For the red LED in the center of the board: it should stick up enough so that you can bend it over to shine it on the photocell. In the photo, I put heat-shrink tubing on the leads. If you don't have that, you can use electrical tape or paper/masking tape.... or nothing if you're careful!

Step 6: Bottom-side stuff
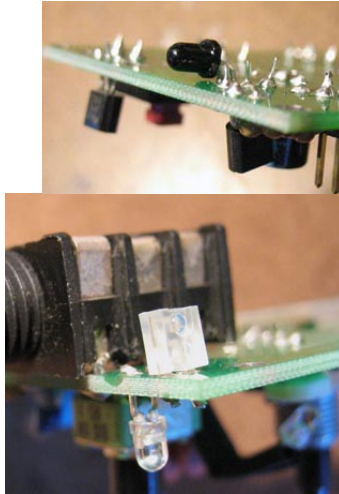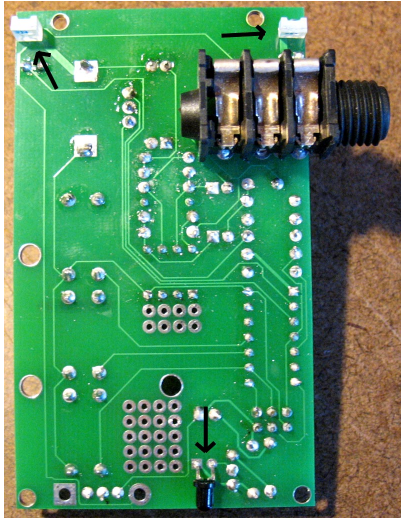
On the bottom side, solder:
- 1/4" audio jack
- IR receiver (the black LED-looking thing)
- IR LED x 2 (box "sidelooker")

Note 1: Snip the leads of the volume trim-pot before soldering the jack. You only have to solder the 3 square pads on the jack, and it's easier to solder some of the pads from the underside of the board.

Note 2: The long lead of the IR receiver goes in the square hole. Bend it over as shown in the photo.

Note 3: Mount the IR LED's so that the "lens" faces outward.

Step 7: Battery Snap
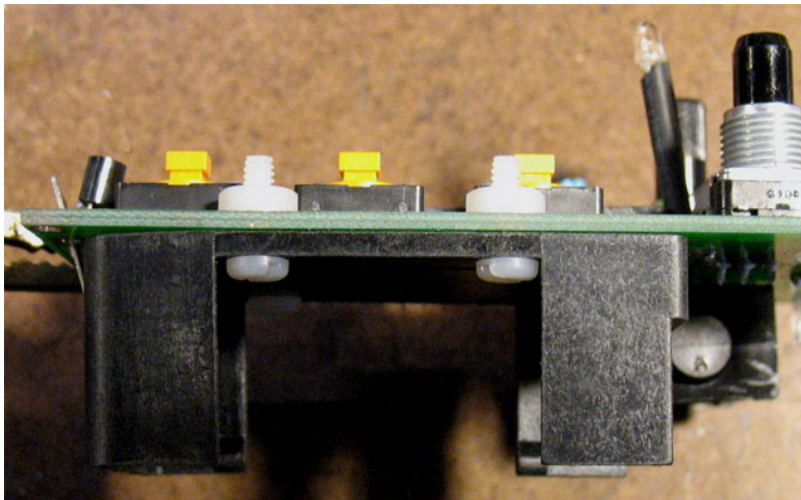
1. Snip all the leads that will fall underneath the battery hodler (the TL062 socket, some nearby resistors/caps, and the three buttons)
2. Insert the the two metal posts of the battery holder into the board **but don't solder it yet!** Make sure it fits more or less flush to the board (if not, then you need to do step 1 again)
3. Line up the mounting holes with the holes on the board (3 holes should line up, the 4th is not needed).
4. Insert screws from the bottom side and fasten with nuts on the top side of the board.
5. *After* tightening the screws, solder the two leads of the battery holder.

Step 8: Standoffs
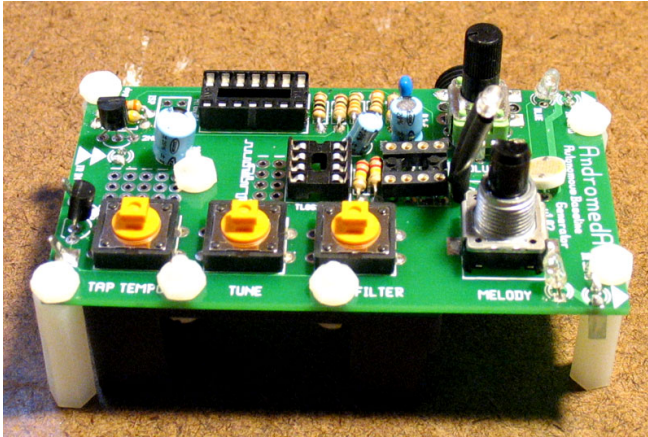
Nylon Legs:

Insert the four nylon legs into each corner hole, and tighten them down with a nut.

Step 9: Final touches

Insert the two ICs:
- The ATtiny84 has a notch on the end that matches the silkscreen "notch" on the PCB (points towards the resistors).
- The TL062 has a dot next to pin 1 that lines up with the "notch" on the PCB (points towards the ATtiny84).

Install the finishing hardware:
- Button caps x 3
- Knob cover x 1

Install the tweakable resistors and caps (if you used sockets in the earlier steps)
- 47k x 1 (or other value between 15k and 470k)
- 0.01uF x 2 (or other value between 4700pF and 0.1uF: 0.033uF is a good one)

You're done!!! Let's jam!