AnaSonde Blink-E
# Parts List and Assembly Directions

In the foil bag:

- ⟳ **Circuit Board**

- ⟳ **U1: 78L05 voltage regulator**

- ⟳ **U2: PIC12F675 microcontroller**

- ⟳ **X1: 4MHz resonator (3-pin brown device, not direction sensitive)**

- ⟳ **D1: light emitting diode (LED)**

- ⟳ **R1: 620 ohm resistor**

- ⟳ **C1, C2: 0.1 µF capacitor**

- ⟳ **S1: switch**

- ⟳ **9-volt battery snap**

- ⟳ **8-pin socket for U2**

Additional sensors may include:

- ⟳ **LM19 temperature sensor**

- ⟳ **ASDX015A24R pressure sensor (this is loose inside the box)**

- ⟳ **HIH-4000 humidity sensor**

- ⟳ **Other:_____**
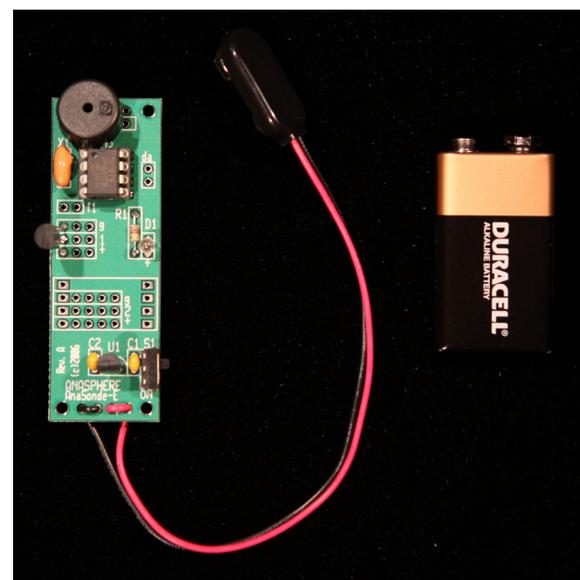
Circuit board assembly:

Note: all components are installed on the component side of the board, which is the side with the white labels. All soldering is done on the solder side (without the labels). You may need to temporarily hold parts in place by gently bending pins or using a small piece of tape prior to soldering them.

1. Install the socket for the 8-pin integrated circuit U2. Orientation is indicated on the socket (notch) and on the board (notch on white outline).

2. Install the resistor R1 and the light emitting diode D1. D1 is direction sensitive – the longer leg should go to the side marked + on the circuit board.

3. Install the 3-pin integrated circuit U1. This is direction sensitive – be certain the flat side of the case matches with the flat side of the outline on the circuit board. Be certain this is a 78L05 (read its label), and not the temperature sensor which comes in a case that looks the same.

4. Install the yellow capacitors C1 and C2. These are not direction sensitive.

5. Install the slide switch S1. Be sure to move it to the off position at this time.

6. Install the brown 3-pin resonator X1.

7. Install the temperature sensor. AnaSonde sensors are installed into the blocks on the board labeled as g1+ and g2+. This notation refers to the connections which are made to the sensors: the "g" section is ground (zero volts), the "1" or "2" refers to where the signal from a device goes, and the "+" refers to the positive 5-volt power supply. Thus, each sensor section supplies ground, 5 volts, and a signal line for a sensor.

The temperature sensor should be installed in channel 1. This sensor has 3 leads, which correspond to +5 volts (pin 1), signal out (pin 2), and ground (pin 3). The following figure illustrates the pinout as viewed from the bottom of the device:

Install the sensor so that pin 1 goes to 5 volts (+), pin 2 to the input (labeled with a channel number), and pin 3 to ground (g). On the AnaSonde-E, this means that the flat side of the case will face the inside of the board if it is board-mounted.

An optional installation method would be to mount the sensor away from the board using either 3 fine wires (28 gauge solid wire works well) or a flat ribbon cable.

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+Vs VOUT GND

BOTTOM VIEW
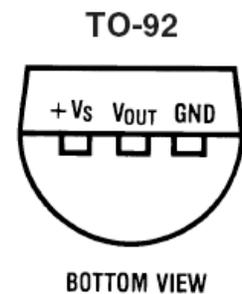
8. Install the 9-volt battery snap. Bring the wires from under the board, through the large holes adjacent to the + and – markings at the bottom of the board, and then solder the wires into the smaller holes adjacent to the + and – markings. The black lead goes to -, the red lead goes to +.

9. Install the 8-pin integrated circuit U2 in the socket. Be sure the little indented dot on the top of U2 (which marks pin 1) is placed closest to the notch in the socket.

This concludes the circuit board assembly. You may now connect a 9-volt battery and test the AnaSonde.

Operating the AnaSonde Blink-E:

After you connect a 9-volt battery and turn the AnaSonde Blink-E on, it will measure temperature using its sensor, compute the temperature in degrees Celsius, and then output that measurement in 1 degree increments as a series of blinks of the LED. It will make a new measurement approximately once every six seconds. Here is the code the AnaSonde Blink-E uses:

Number or sign	LED
1	1 short blink
2	2 short blinks
3	3 short blinks
4	4 short blinks
5	5 short blinks
6	6 short blinks
7	7 short blinks
8	8 short blinks
9	9 short blinks
0	"stutter" (rapid series of very short blinks)
- (minus sign)	1 long blink (for temperatures below zero)

Examples:

If the temperature is 23°C, the AnaSonde will send:
  2 short blinks, pause, 3 short blinks

If the temperature is 30°C, the AnaSonde will send:
  3 short blinks, pause, "stutter"

If the temperature is -5°C, the AnaSonde will send:
  1 long blink, pause, 5 short blinks