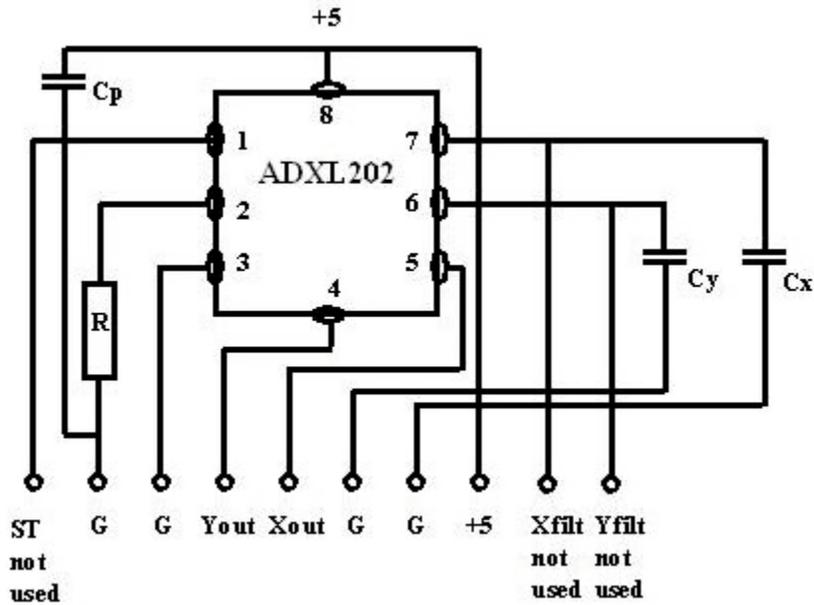


Leaf Accelerometer board assembly 12/28/05
Leafproject.org

WARNING: All the parts are supplied in an anti-static bag, but only the accelerometer is sensitive to static. Use proper precautions. The accelerometer is also sensitive to high g shocks. Dropping it on a hard surface may be a high g shock. Take care.



Note: pin orientation above is the same as the actual board looking down on the top.

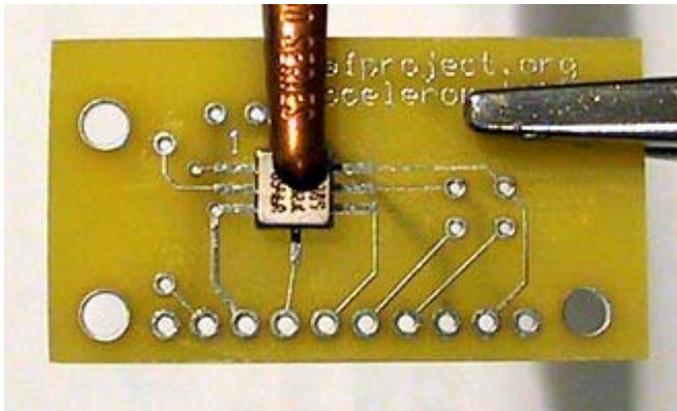
Parts:

1	Accelerometer board		
1	10 pin header	digkey.com	WM6510-ND
1	1.2M resistor	digkey.com	P1.2MBACT-ND
3	0.1 uf cap	digkey.com	399-2127-ND

Assembly:

The circuit board is laid out almost exactly like the wiring diagram above. The most critical component to attach is the accelerometer itself. So, it is best to solder it on first before other components get in the way. Make sure that pads and components are clean.

Place the Accelerometer chip in place over the pads and hold it securely in position. The copper contacts on the sides of the chip should be directly above the pads. One simple method is to use an alligator clip to hold the chip in place. Once clamped you can make small adjustments to get it centered accurately on the pads.



Use a fine tipped soldering iron to heat the pad at the base of one chip contact. Apply solder to the pad area and it should wick under the chip. Raise the tip of the iron up along the chip and you should get a good bridge of solder coming from the pad on the board to the contact on the chip.

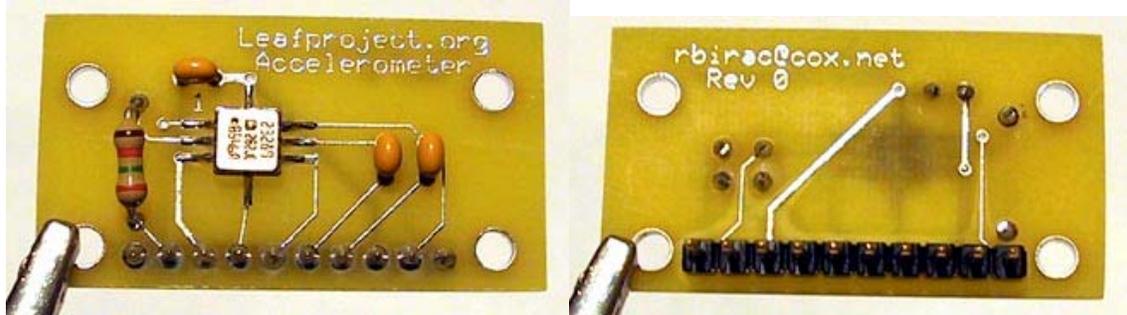
Verify that all chip contacts are still lined up before continuing to solder the other 7 pins.

Solder the three capacitors and the resistor in place.

Solder the 10 pin header strip in place. Solder one pin first and make sure it is straight and perpendicular before soldering the remainder of the pins.

Optionally, use alcohol and a brush to clean up the board, removing solder flux.

The completed board should look like the next two pictures.



Testing:

The board may be tested by itself by applying +5 vdc to the power pin and grounds to the four 'G' pins in the wiring diagram. With the board held horizontally, the Xout and Yout signals should be a square wave of between 30% and 70% duty cycle repeating every 8 to 12 milliseconds. You should see the duty cycles change as you tilt the board front to back and side to side. The actual duty cycle is not very critical as a calibration is done when the robot powers up.

The above test can also be done when the accelerometer board is installed on the microcontroller board and power is applied.

Or the board may be inserted into the microcontroller board and tested using the built in test capability as follows.

Attach a terminal to the microcontroller board serial port at 115Kbaud.

Install normal operating software (if not already installed).

Place the Run/Prog switch in the run position.

Apply power or reset. You should see see the words Processor is running and perhaps some more text.

Hit the ESC key to get the built in test which should present a menu on which an Accelerometer test is an option. Hit the number key associated with that test.

Values for the Lateral and Longitudinal accelerations will print each second. These values will probably be in the range of 5000 to 8000. Tilting the board should cause these numbers to vary.

Hit ESC to exit the test.

For comments or questions, contact Alex Brown rbirac@cox.net