



Single pyro altimeter with an ATTiny 85 microcontroller

Alti Uno Kit operating instructions

Version	date	Author	Comments
1.0	06/03/2014	Boris du Reau	Initial version
1.1	14/04/2014	Boris du Reau	Updated doc

Rocket Type

Micro-max	Model Rocket	Mid power	High power
No	yes	yes	yes

Category

Construction technic	Ground Support	Electronic	Other
		X	X

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ATtiny 85 single output Altimeter “Alti Uno”– kit operating instructions

Goal

The goal of this document is to explain how to use the AltiUno altimeter kit that you just built. The document assumes that you have already installed altimeters in a rocket payload bay.

Before your start

Remember that it is a kit and that you can modify the program and behaviour of your altimeter.

The country where you live might not even allow the use of such device. You have to assume total legal responsibility for any damages or claims including personal injury that results from the use of this device. I shall not be responsible for the above. If you disagree with that, please do not build it or use it.

Related documentation

This document assumes that you have successfully built the Alti Uno kit altimeter and that you have read the kit building instructions. This will not cover things such as flashing the altimeter which will be discussed in another document.

What is apogee detection?

The AltiUno detect flight apogee and fire a pyro charge to eject the parachute. This replaces the motor ejection. This is more precise than the motor ejection which is a pyro delay.



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Choosing the power supply

The kit has been designed to use a 9Volt battery or a lipo battery with a voltage between 7 and 12 volts. If you are using a 9 Volts rechargeable battery make sure that you use a good one.

Using a poor quality battery may result in an ejection failure which could cause a ballistic crash!!!! Remember that when you power on the altimeter it is doing continuity test and beeping which is discharging the battery.

My recommendation would be to use a lipo battery. You can get 9Volts ones but be careful you will need a special charger.

This is the rechargeable battery that I am using. I can do more than 10 flights without recharging. They are about 10 dollars each but trust me it really worth it.



They are also a lot lighter less than 27g

Standard rechargeable battery



Lipo rechargeable battery





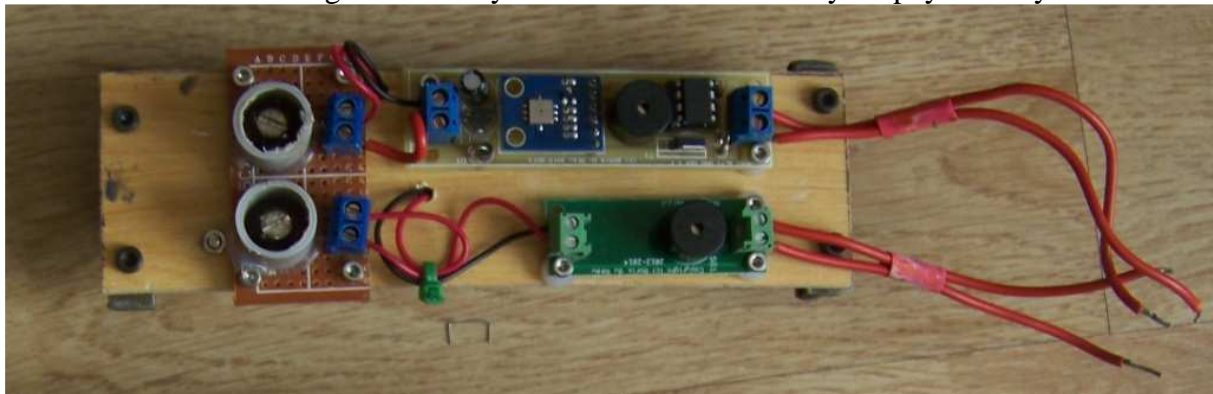
Installing the altimeter in the electronic bay

You need to install and maintain the altimeter using 4 screws inside the electronic bay. I use 3mm allen screw because it has a smaller head.



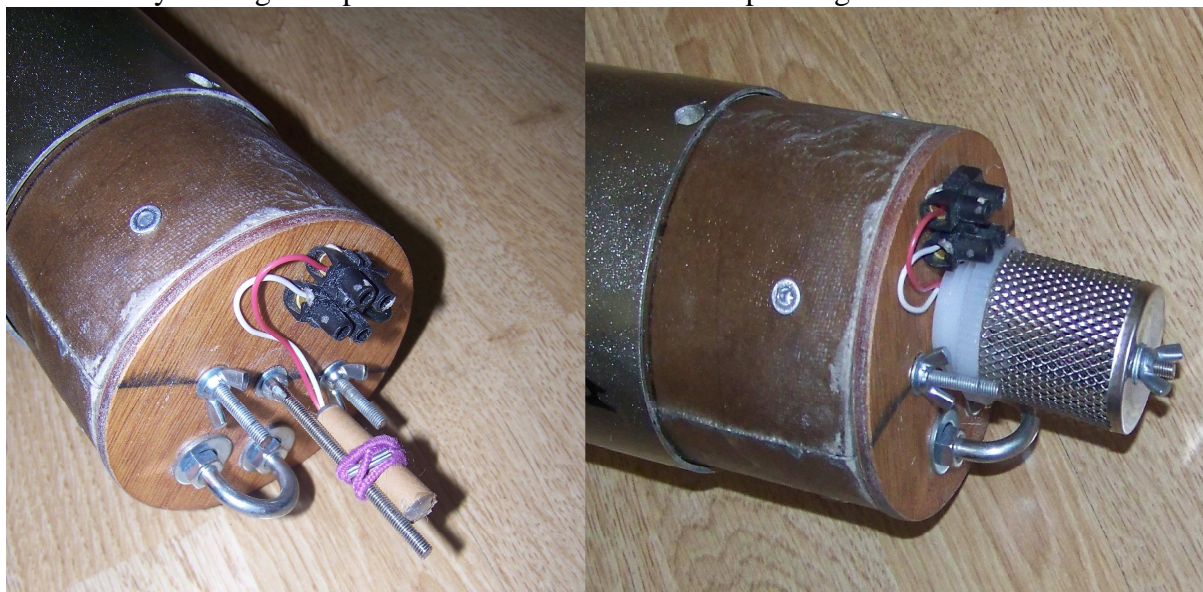
Make sure that the electronic is protected from ejection smokes which are very corrosives and could damage the altimeter board very quickly.

However remember that you have a pressure sensor which needs to measure pressure changes to work out altitude changes... hence you need to drill a hole in your payload bay.





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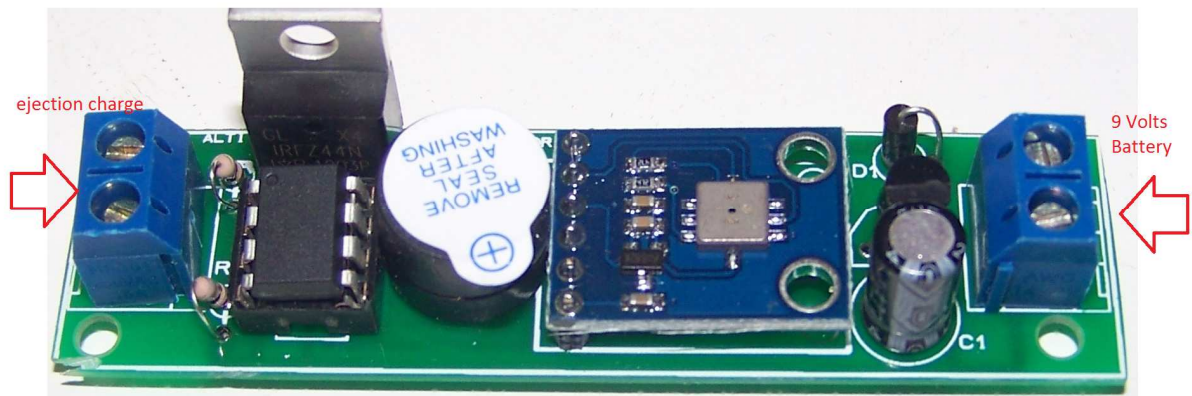


In my rockets what I do is use screw switches to turn on my altimeter so the hole for the screw switch is also used for exchanging pressures.



Double check yours and make sure all components have been correctly positioned. One mistake and the altimeter will not work and the components could be damaged.

Connect the left terminal bloc to the ejection charge that will push out your parachute.
Connect the right terminal bloc to the power supply.



Powering on the altimeter

Now that you have everything installed in your rocket you can turn it on. It will then initiate, beep the version and then continuously beep. Beeps are for the continuity test (ie: to make sure that your electric match is ok); basically if you get a long beep that mean that the circuit is open for your charge. This means that the charge is either not connected or bad. If you get one short beep that means your charge is fine.

The altimeter will continuously beep until lift off is detected. Lift off being reference altitude + 20 meters.

After the altimeter has fired its charge then it will beep the apogee altitude. Beep resolution is 10 meters so it will round up the results.

1 long beep = 100m
1 short beep = 10 m

Note that the altimeter will keep on beeping the altitude of the apogee until it is switch off. It does not save the altitude when powered off.

Testing the altimeter on the ground

As it is a kit obviously unlike any other altimeter than you buy it has not been tested. I suggest that you build a very basic pressure chamber. It will cost you a couple of dollar and you will make sure that your altimeter is working before you fly your rocket.

Should you need additional help do not hesitate to ask, my contact details are on <http://rocket.payload.free.fr/>



AltiUno characteristics

Size in mm	75x20mm
Weight	11.4grams to 13 grams
Number of pyro output	1
Micro controller	ATtiny 85
USB interface connector	no
power supply	6.5V to 12V
Max Output Current	17A or 49A
Pressure sensor	BMP085
Memory	no
Pressure range	300-1100hPa
Altitude range	-500 to 9000m
Kit	yes
Status	lots of flights
Current software version	1.3 (stable)
Front end version	none
Software update	AVR programmer only