



## Building Micro-Micro-Micro-Maxx Rockets by Bill Orvis, LUNAR #309, NAR #84455

### Building Micro-Micro-Micro-Maxx Rockets

Being very much into the small these days and heeding the economy's hint at being frugal, I decided to design a rocket project that is even smaller than the MicroMaxx. Hard to do; yes? I mean where do you get an engine smaller than a MicroMaxx??? In a box of matches that's where. Here is all that fuel sitting around being used to light camp fires and barbecues when it could be used to make things fly. What a waste.

What could be better? Take a look at a match. Not only does it include fuel, but the body of your rocket as well. All you need to add are fins and a combustion chamber.

I tried to figure out how big an engine this is, so I scraped off the propellant from a single match and tried to weigh it on an ancient scale my Great Grandfather used to use to measure medicines as a veterinarian. The smallest marking on the scale is 0.1 gm and the scale didn't move so I guess we will go with that. An A motor has 3.1 gm of propellant so  $0.1/3.1 = 0.03$ . I don't have any idea what the average thrust is and there is no delay or ejection charge so we will just call this a 0.03A?P.



The Estes Alpha III is an old standby for model rocketry so my new design is modeled after it, at least as much as I can with a rocket made out of a match stick. Figure 1 shows the parts for the Micro-Micro-Micro-Maxx Alpha; a match stick, four fins, and some foil.

### Building the Micro-Micro-Micro-Maxx Alpha



Glue the four fins onto the bottom of the match stick. The fuel goes in the front to get the CG forward. Wrap the tip with foil making a nose cone and combustion chamber. Slip a pin between the foil and match stick to create a nozzle to direct the thrust towards the back. You can direct it towards the front if you want but it will fly better if it is thrusting out the back.

Figure 2 shows the completed rocket that just needs to be painted to be done. Paint it in the colors of an Estes Alpha III and you are done.

### Micro-Micro-Micro-Maxx Launch Pad

As you might expect, the Micro-Micro-Micro-Maxx Alpha will not fit on the standard LUNAR launch pads. In fact, the Micro-Maxx launch pads are still way too big. I built the Micro-Micro-Micro-Maxx Launch pad by bending a paper clip as shown in Figure 3. This holds the rocket in launch position. To launch it, hold a lit match under the nose cone and away it goes.



### Micro-Micro-Micro Future

My next project will be to build an engine with a single grain of rifle powder. I expect LUNAR to host a grain of powder altitude contest.

## Micro-Micro-Micro-Maxx CATO by Bill Orvis, LUNAR #309, NAR #84455

### Micro-Micro-Micro-Maxx CATO

During the first test launch of the Micro-Micro-Micro-Maxx Alpha, we experienced the world's smallest CATO. It appears that the nozzle was too small for the fuel grain used and blew out the forward closure. As you can see in the picture, the 0.03A-P engine has a significant amount of fire coming out the front which is not conducive to a successful flight. We will need to work on enlarging the nozzle or strengthen the forward closure.

*Note the fingers in the picture for scale.*

