

Mycroft's *Pearls of Rocket Wisdom*

(Pearls? Wisdom? gag! cough! chortle! Oh, shut up.)

High Power Level 1 Certification

Thinking about moving up into "more power"?
Well, read on... (but remember, free advice is worth what you pay for it)

KISS (Keep It Simple, Stupid)

Keep it simple, keep it safe. The true purpose of a level 1 certification is to show the NAR and / or TRA that you know what you're doing. A successful certification flight depends on proper knowledge, proper preparation, and a bit o' luck. Proper knowledge depends upon you reading everything that you can find; you can learn a lot from reading Sport Rocketry and Extreme Rocketry magazines as well as taking advantage of all the info on the Internet. Also, a few books have been published recently that cover this subject. Rocket guys are almost invariably helpful; ask questions of the people who have tread this path before you. Proper preparation depends on you successfully applying your hard-won knowledge and using your rocketry common sense. The bit o' luck is up to fni, but if you're well prepared, you don't need *much* luck.

Rocket Selection

Buy a kit. You may be tempted to scratchbuild something, but resist that temptation. No matter what your opinion of yourself, you probably don't know enough yet to attempt a Cert flight on a scratchbuilt rocket. Plus, RSO's tend to be nervous about Cert flights on scratchbuilds. There are many good kits available from companies such as LOC/Precision, Public Missiles, Aerotech, Rocketman, and many more.

Bigger rockets are better. I strongly urge that you buy a 3 or 4 inch diameter rocket. (Resist the urge to use a very small rocket or a very large rocket.) Keep weight in mind; I like cert flights that go up about 1,500 feet. Any flight below 1,000 feet will be slightly dicey; anything much over 2,000 runs an increasing risk of losing the rocket. Look for a rocket with good stability characteristics. My advice is to avoid the short, stubby class of rockets (like the LOC Minie Magg) due to small stability margins. (They can fly fine - just wait until later to try them.)

Sample kits (NOT a comprehensive list).

Smaller: LOC - Forte, Caliber ISP, Hi-Tech H45; PML - Black Brant VB, Quasar, Small Endeavour

Perfect: LOC - EZI-65 (This is what I used.), Expediter, IV, Cyclotron; PML - Ariel, D Region Tomahawk, 1/4 Scale Patriot, AMRAAM 3, Tethys, Miranda, Hydra, Intruder, Matrix; Aerotech Sumo

Bigger: LOC Iroc, PML - Endeavour; AMRAAM 4

Modifications. You may wish to modify your rocket kit - "improve it". This is fine, so long as you do it carefully; each modification should have good reasoning behind it. Some people get paranoid and really reinforce their rocket. Some reinforcement is fine, but don't go overboard. Remember, it all adds weight. Finally, once again, KISS. Leave the fancy stuff (like onboard electronics) for later projects.

Motor Selection

Diameter. Many people use a 29mm or 38mm reloadable Aerotech "Easy Access" motor. Your choice of 29 versus 38 may be forced by the size of your motor mount. (Some PML kits have "Kwik-Switch" mounts to cope with 54, 38, or 29mm motors. Otherwise, you're best off with a rocket that has a 38 or 54mm mount. "You can always adapt down. You can't adapt up") A 38mm casing system allows for a larger selection of reloads over the 29mm system. Another popular alternative is the Pro38 (38mm) brand of high power motors.

Power. Stick with an "H" motor for your Cert flight - leave the I motors for later fun. (Exception - if you have a very large / heavy rocket, a safe flight may require an I motor.) In 29mm, I like the H128 or the H180. In 38mm, I prefer the H123 (this is what I used) or the H242. A computer simulation can help you choose a motor and a delay length. If you are flying a heavier rocket, use a higher thrust motor to give you a better thrust to weight ratio.

Retention. You've just paid quite a bit for that reloadable motor casing. Make sure you build some type of secure motor retention into your rocket; masking tape is no longer appropriate. Ejecting the casing instead of the parachute is a *bad* thing.

One last thing, remember to mark the center of pressure (Cp) location and one caliber's distance forward from the Cp directly on your rocket. That way, the stability can be checked before launch by a simple balance test to locate the center of gravity.

For information on certification requirements and procedures, please visit www.nar.org or www.tripoli.org

The high power motor regulatory situation is in a state of flux. For current info about purchase & storage restrictions, check with your local motor vendor and/or head of your local rocket club.

(This one-page document is obviously not a comprehensive guide to certification or rocketry in general. Mentally insert standard disclaimer here. Author is not responsible for your idiocy, err, mistakes - no matter how extraordinary. Brands and products are listed here solely for example purposes. Said use should not be construed to constitute an endorsement by the author.)