MASA's NARTREK Bronze Challenge

Notes on Suitable Rockets

Refresher

You have to make four successful rocket flights to complete the NARTREK Bronze level. (For more info, and to download the Bronze packet, go to http://www.nar.org/nartrek)
You must use rockets that you build! You may build a rocket from a kit, from plans, or from your own design. You may NOT use a rocket that you purchased "ready-to-fly" or a rocket borrowed from another person. You do not have to build brand new rockets for these flights; you may certainly use rockets that you already have.

You may attempt these flights at any time whether at a MASA launch or on your own. You do need a witness to watch and time the duration flights for you. Also, all flights must be "returned" - you have to get the rocket back. To officially submit your completed packet to NARTREK and be awarded the Bronze level, you do need to be a NAR member.

Duration Flights

- 60 second parachute duration flight (B motor or smaller)
- 30 second streamer duration flight (B motor or smaller)

To achieve the required minimum duration times, most people will end up using a B motor (most likely an Estes B6-6). It is certainly possible to reach these times using smaller motors; NAR competitors have far surpassed these duration times using only 1/4A motors! You can definitely do both types of flights using the same rocket - just switch the recovery system between parachute and streamer. However, you may want to make two (or more) identical rockets in case you lose one!
Examples of suitable, readily available kits (you will almost certainly have to replace the kit's parachute or streamer with something a lot larger)
Estes: Alpha, Wizard, Yankee, Viking, Star Dart, Sizzler
Quest: Pip Squeak, Astra
Custom: Fiesta, Freedom, Venture, Redliner
Examples of higher-performance, competition-oriented kits
Qualified Competition Rocketry (QCR): Straight Up, Straight Up I
Aerospace Specialty Products (ASP): 13mm and 18mm kits for parachute or streamer duration

Take a look at the competition section of the NAR web site, you'll find good advice for successful duration flights.

2-Stage Flight (A motors or larger in both stages)

Since the A10-0t booster motor has been discontinued, the minimum altitude 2-stage flight becomes B6-0 to A8-5. (If you still have an A10-0t, you can certainly still use it.)
Examples of suitable, readily available kits
Estes: Echostar, CC Express, Mongoose, Comanche-3
Quest: Zenith II, Navaho
Custom: Aztec, Sam-X (both should have added nose weight)

It is within the realm of reason to use just one rocket for 3 of the flights. Example: one rocketeer built an Alpha, flew it with a parachute, flew it with a streamer, and then flew it with a scratchbuilt lower stage to complete 3 of the 4 Bronze flights. Of course, this only works if you don't lose the rocket along the way. If this interests you, take a look at the smaller 2-stage kits.

Also, the Estes CC Express upper stage could be flown on a D12-7 to complete the D motor flight.

D Motor (or Larger) Flight

The least expensive way to do this flight is with a rocket on an Estes D12 motor.

Examples of suitable, readily available kits

Estes: Blue Ninja, Stormcaster, Mean Machine, Phoenix, Eliminator, Executioner, Black Brant II, Super Nova Payloader, Big Daddy

If the "or larger" part intrigues you, you could certainly fly an appropriate rocket using an E, F or G motor. If you are new to larger rockets and motors, take a look at kits from companies like Aerotech, Public Missiles, LOC/Precision, and many more. Just remember that you can't use high power motors for this flight.

Final Notes

- If you like "one stop shopping", QCR sells a Bronze level rocket kit package for $22. http://www.cybertravelog.com/qcr/
- The rocket kits listed here are only a few examples. There are definitely many more out there!
- If you like building from plans, there are downloadable plans on the NAR website for parachute and streamer duration rockets. http://www.nar.org
- There are also hundreds of old plans on JimZ's web site. You may find a classic design from the past that you like. http://www.dars.org/jimz/rp00.htm

The Future

Once you complete the Bronze level, there's more! If you choose, you can go on to the Silver, Gold, and Advanced levels. Here's a quick glance at the next two levels.

Silver

- Fly a payload-carrying rocket (egg, camera, electronics, standard competition payload)
- Fly a rocket that uses a cluster of 3 (or more) motors
- 30 second glider duration flight (B motor or smaller)
- Build & fly a scale model rocket; have it judged by another person.

Gold

- Design your own model rocket (sport, contest, or payload type); evaluate / simulate / estimate performance and stability
- Build your design.
- Fly your design a minimum of 3 times with each of at least 2 types of motors. Record altitude for each flight. Compute average altitude for each motor type. Using this data, compute actual drag coefficient of your model. Compare actual performance with simulations.
- Submit a photo, all flight data, all calculations and simulation results, a dimensioned drawing, and sufficient information to allow someone else to build your design.