

## **TEAM AMERICA MENTORS AND OBSERVERS**

The Team America Rocketry Challenge (TARC) event was developed by the NAR in cooperation with the Aerospace Industries Association (AIA), the trade association that represents the nation's largest aerospace manufacturers in Washington. The Team America event has been endorsed and publicized by NASA, the USAF, the FAA, the Department of Defense, and virtually every teachers' organization in the U.S. Over 3400 teams and 30,000 students entered in TARC's first five years, from all 50 states across the U.S. Both the AIA and the NAR want to use this event to spark interest among secondary school students nationwide in pursuing a career in aerospace. The NAR's agenda is also to solidify our reputation as the nation's premier resource for sport rocketry educational applications and to foster long-term growth of Junior and Leader members. We want to build the next generation of "born again rocketeers" who will fly with us for a couple of years as young people, then rejoin us in 10-15 years as they get established in their careers and have children.

Each team that enters Team America pays a fee (\$90 in TARC 2008), and for this they get the Team Handbook, a NAR-produced DVD on how to build a model rocket, and the contents of the NAR Educator CD-ROM. They must order an accurate electronic pressure-sensing Perfectflite ALT15K/WD Rev2 altimeter from the manufacturer at a special TARC rate, or they can use the ALT15K/WD from prior years if they still have one. Only these two altimeters may be used in qualification flights or at the flyoffs as the basis for a reported score.

**OBSERVERS.** Each team is required, sometime between September and April 8 (exact dates are announced each year), to conduct one (and may conduct up to two) official "qualification flights" in front of an NAR Senior (age 21 or older) member observer who verifies compliance with the event rules (posted on the AIA website [www.rocketcontest.org](http://www.rocketcontest.org)), serves as one of the timers for measuring the flight's duration, reads the altimeter altitude, and inspects the egg post-flight. The team then reports the results of that flight to the AIA offices by an April deadline. Any number of unofficial practice flights is permitted. The observer can be a mentor, or anyone else (including a new NAR member) who is not related to a team member or employed by their school, but **MUST** be an NAR Senior member. The 100 best-scoring teams from these qualification results are invited to a mid-May head-to-head fly-off in the DC area to determine the final TARC winners and award \$60,000 in prize money.

**MENTORS.** We ask that mentor volunteers (who do not have to be NAR members) do all that they can to encourage and support any team member or teacher sponsor who contacts them for advice. This can be done by phone and e-mail for teams that are too far away for easy travel. More detailed mentor guidelines are provided below. Please read the Handbook and rules carefully. PLEASE do not design any team's official entry or help them in the building of it; this is supposed to be a learning experience that the student team members have on their own, without adult participation. It is a contest for students, not their parents, teachers, or mentors.

Please encourage team members to join the NAR. The NAR is offering a special membership deal for Team America: students can join using the "family rate" discount (\$12 off the Junior/Leader membership price of \$25) if their teacher joins as a full-rate Senior member. Like family memberships, only the "full rate" (adult) member gets the magazine. But all get NAR insurance, and all get the NAR New Member Guidebook. Team America teams with a teacher and three or more student NAR members can get launch-owner site insurance from the NAR.

Thanks for "paying forward" and helping to build the next generation of America aerospace professionals and NAR members.

## MENTOR GUIDELINES

It is not required that mentors do all of these things for every team that they mentor. Do what you are comfortable with doing and have time to do. These suggestions for your role with a team are listed in priority order.

1. Make contact with middle or high schools in your area to recruit them to enter TARC by the entry deadline, which is typically late November each year. Once all entries are known, a list of them will be sent to you by the NAR; please try to make contact with schools in your area that have entered and let them know you are available to them for advice and assistance.
2. Tell students where and how to obtain rocket-building supplies, parts, and motors. There are two "official" parts vendors for TARC, Aerospace Specialty Products and Balsa Machining Service, but any parts vendor can be used.
3. Teach students, or point them toward resources to help them learn, such basic model rocket skills as construction, staging, recovery techniques, and clustering. Remember that TARC is not a high-power rocketry event that necessarily needs the advanced materials and technologies of this aspect of sport rocketry! Encourage them to purchase and read Stine's "Handbook of Model Rocketry" -- available at a special rate of \$20 for TARC teams from NAR Technical Services.
4. Advise teams on rocketry safety and help them avoid designs or actions that would be unsafe, or that would violate the NAR Model Rocket Safety Code. Regardless of other guidelines, please intervene with advice if you see a team about to do something that is clearly unsafe.
5. Help students obtain a launch site for their test and qualification flights. This can either be the site of an established and supportive rocket club (NAR or TRA), or at a site arranged by the team with your advice (on field size) and assistance (as a resource to provide information on rocket safety, NAR insurance, and FAA notification procedures).
6. Lend teams launching equipment, point them toward groups that already have such equipment the teams could use, or help them design and build a launch system.
7. If you are a current NAR Senior (age 21 or older) member, and not related to any team member or employed by their school, serve as the official NAR flight observer for teams' local qualification flights. Remember that teams can only make two official qualification flight attempts, and must declare in advance of a flight whether it is such an attempt.
8. If possible and if you wish to do this, provide advice and contacts to teams to assist in their efforts to raise funds to buy their rocketry materials, and/or to finance their trip to DC if they are selected to attend the final flyoff.

Please remember: No one except the student members of a team may participate in the design, construction, or pre-flight prepping of a rocket that the team uses in a qualification flight attempt or as their rocket for the final flyoff.

## **MENTOR SUGGESTIONS**

These are suggestions for your working relationship with any team that you mentor.

1. Encourage teams not to underestimate how much time it will take to design, build, and test-fly a successful, reliable TARC design. They should start their design and building work earlier and plan to have more test flights than they realize. The average successful team in previous years that made it to the flyoffs had made 15-20 practice flights and had numerous crashes, lost rockets, or other unexpected problems in the process.
2. Have teams "walk before running"; encourage them to actually watch the DVD, read the TARC Handbook, and read the "Handbook of Model Rocketry", then build and fly simple one-stage model rockets (without egg payload, initially) before beginning their TARC design. Aerospace Specialty Products makes a special "learner" kit available to TARC teams at a reasonable price for this purpose. Then have the team fly their TARC design without the expensive altimeter until the design is fully proved in test flights.
3. Encourage teams to act as teams, with division of labor and responsibility among the members and no single person doing it all. Logical tasks for individuals would include project manager, flight simulation specialist, payload specialist, launch and ignition specialist, recovery specialist, parts and component ordering specialist, rocket construction technique specialist, etc.
4. Encourage teams to use a rocketry flight simulation program (SpaceCAD or RockSIM) to verify the stability and likely performance of their model before its test flights. It is cheaper to crash a rocket on a computer than on the field!
5. Encourage teams not to make their rockets more complex than necessary. The complexity may produce ideal flight performance on the computer, but it is likely to lead to discouraging reliability problems in flight testing.
6. Help teams understand the importance of designs that reliably achieve straight-up flights; such designs are far less susceptible to unpredictable performance in windy weather (which may occur at the flyoffs) and have far more repeatable altitude performance.
7. Be positive and encouraging to teams when they face difficulties in construction or in flight testing. Point out to them that the previous winners all had failures in the process but learned from them and persevered to final success. Convince them that they can actually do this, and can succeed at making a good, qualifying flight.