Gulf Coast Regional 2004: 23-24 OCT 04

TCC Sport Scale Judging Form: Sport

Contestant Information

Name: _____

NAR Number _____ Division _____ Section: _____

Prototype: _____

(Include the scale of the model, if known. This is not for points, just for information.)

Note: Sport Scale is judged under two main rules: 16 & 53. Judges should also be familiar with Rules 1 – 13.

Qualification Checklist (Entry may not receive points unless all requirements are met.)

- ☐ NAR number, team number, or name on model. (Rule 9.4)
- ☐ Exterior is in flight-ready condition: i.e. dummy nozzles, transparent fins, etc. (Rule 16.5)
- ☐ Resembles a complete, actual rocket, missile or space vehicle that was built. (Rules 53.1, 53.4, 53.7)
- ☐ Meets class size criteria. (Rules 53.2.1, 53.2.2, 53.2.3)
- ☐ Not an amateur rocket or missile unless historically significant. (Rule 53.3)
- ☐ Entry is not a Plastic Model Conversion under Rule 55. (Rule 53.5)
- ☐ Minimum documentation such as a line drawing or photo (Rules 53.6, 53.12.1 Note: This can DQ!)

Static Judging – Don't exceed max total scores. Other numbers are suggestions only. Record points awarded.

Similarity of Outline – Judged from a distance of 40 in (1 meter) against data provided by the contestant.

Rules:	53.1, 53.9, 53.12.1			Max total score:	**200/200**
Nose:	/	Fins:	/	Tubes:	/
Major details:	/	Other:	/	Total Similarity:	**/200**

Finish, Color and Markings – Judged up close, referring to data and notes provided by the contestant.

Rules:	53.12.2			Max total score	200/200
Correct color:	/	Accurate pattern	/	Decals & markings:	/
				Total Finish, Color & Markings:	**/200**

Degree of Difficulty – Judged up close. Plastic parts from kits must be declared in the documentation.

Rules:	53.5, 53.9, 53.12.3			Max total score	**100/100**
Structure:	/40	Detail and painting:	/60	Total Difficulty:	**/100**

Craftsmanship – Judged up close. Includes NAR number and transparent fins.

Rules:	53.12.4			Max total score:	**300/300**
Construction	/100				
Surface preparation:	/100	Finish:	/100	Total Craftsmanship:	**/300**

Total Static Score – Add the above static judging subcategory totals (shaded areas): **/800**

Flight Judging – Don't exceed max/total scores. Other numbers are suggestions only. Record points awarded.

Mission – Start from 0. Add points for successful simulated mission function documented for this prototype.

Rules: 53.13.1 Max total score: **200/200**

Spin, deployment, release: 10, 2 engine cluster: 25 (3=45, 4=65), Glide, 2 stage, working payload: 50, Payload producing reduced data for the judges to review: 50 – 100

Total Mission #1: /200

Total Mission #2: /200

General Flight – Start from 300. Deduct points for problems. Flight must be safe and stable to qualify.

Rules:	16.6, 16.7, 16.8, 53.11, 53.13.2			Max total score:	**100/100**
#1 Flight:	/50	#1 Damage:	/50	Total General flight #1	/100
#2 Flight:	/50	#2 Damage:	/50	Total General flight #2	/100

Flight Score – Add Mission score to General Flight score for each official flight (shaded areas).

Total Flight Score #1 **/300**

Total Flight Score #2 **/300**

Final Score Add Total Static Score to best Total Flight Score. **/1100**

Date:_____

Judge's Name:_____ Judge's Signature:_____

Judging NAR Sport Scale

by Peter Alway

What makes a good scale model?

Most NAR contest events are scored by measurements of time, altitude or distance, but the craftsmanship events require judgment calls. Don't assume they won't be your calls. If you are the only one at a contest without a scale model, you just might be drafted to judge. While the NAR Sporting Code (the "Pink Book") outlines the judging of a model, it is not always helpful in the nitty-gritty of assigning points. The official NAR judging guide predates some rule changes and is sometimes confusing. This article is an aid to those who may face the daunting task of judging Sport Scale (including Giant and Peanut Scale classes), the most common craftsmanship event. My suggestions for assigning points are opinions. Your only obligation is to follow the Pink Book. I suggest that contest directors give this article to judges at their meets, and pass out copies of the short judging form at the end of this article to each contestant. The modeler can fill out the name, NAR number, division, and prototype name, and hand the sheet in with his or her model.

Qualification

Before you start judging, be sure the models are qualified for Sport Scale. Many unqualified models can be fixed, re-documented, or, as a last resort, replaced. The competitors-your fellow modelers-will appreciate your efforts to help them get their models up to code before judging.
First check for an NAR number, team number, or name on each model. Hiding places include launch lugs, the backs of engine mounts, and fin trailing edges.

Check for minimum data (drawings or photos). This must include either a photograph or a line drawing that shows the profile of the prototype (the prototype is the original, full-scale "real" rocket that the model represents). Model diagrams from kit instructions and photos of models are not sufficient. You must judge the model against the prototype, not against a kit. If the modeler didn't provide prototype data, ask around-Other modelers may have a reference handy. You will judge the model against the contestant's data only, not against what you or others may know about the prototype. If a modeler's legitimate source has an error, still judge against this source-don't penalize the modeler's for a publication's mistake. And don't reward a modeler for disagreements with his or her data.

The most common "illegal" models are those missing first (booster) stages. Unfortunately, manufacturers have produced kits of the Wac Corporal, IRIS, Aerobee-Hi, Aerobee 300, Aerobee 350, and Black Brant X without their first stages since the beginning of model rocketry. In spite of kit packaging, none of these subjects is a complete, qualified, model without a booster stage-the modeler must substitute a qualified model or slap together a booster before judging. Air-launched missiles need not include the "mother" aircraft.

A Sport Scale prototype must be a rocket, missile, or space vehicle. Jet aircraft are not an allowed. Amateur rockets are not allowed, unless they are of "obvious historical importance," such as the projects of the pre-WWII rocket societies. Citations from non-hobby books and magazines can establish the "obvious historical importance" of amateur efforts.

Conversions of plastic static model kits are not allowed in Sport Scale, but all-plastic kits that were meant to fly are not considered conversions. Parts from plastic kits are allowed, provided the modeler informs the judge.

Peanut and Giant Scale are special classes of Sport scale. Peanut Scale models must be small-either A) no more than 20 mm in diameter, or B) no more than 30 cm tall. Giant scale models must be big-either A) at least 100 mm in diameter, B) at least 100 cm tall, C) consist of clustered tubes with a girth of at least 314 mm (the circumference of a 100 mm tube), or D) be a winged rocket whose span and length add up to at least 100 cm. Some kits include dummy display nozzles that are removed for flight. Others have clear fins that are added for flight. The model must be judged with its exterior as it will appear at launch. Recovery systems and engines need not be installed.

Putting Things in Order

Before you even start judging you will find that the ranking of some of the models is obvious. Go ahead and line up models according to first impressions. Just be ready to change the order as the rules and closer looks indicate. Judge models one category (similarity of outline, finish color, and markings, etc.) at a time, rather than one model at a time. Start with the best model; this will help you judge to a high standard. Double-check the standings in each category and adjust points if necessary to be sure they seem fair to you. Finally, don't be afraid to knock off points for problems you might modestly believe you might have had with your own models. Judge against perfection. No model should get all 800 static points (models that good are saved for the World Championships!), and some should be around 400 or lower. Two models within 50 points should be of similar quality, a spread under 10 points is as good as a tie, once the element of chance in flying comes into play.

If you are concerned that a score under 50% discouraging for young modelers, don't try to concoct another judging standard. Just run off a set of A and B division judging forms with the possible scores whited out; 300 points is more encouraging than 300 out of 800 possible points.

Similarity of Outline (200 Points)

Judge the accuracy of a model's shape from a distance of at least 1 meter (40"). For a reference, scan the contestant's data for a nice simple photo or drawing that shows the rocket's profile. I mentally divide the points among major components. For instance, a simple 4-fins and-a-nose-cone-model would be about 70 points nose cone, 60 points body tube, and 70 points fins. The Javelin, with 3 visible stages, might have 25 points for each of 3 fin sets, 15 for each of 4 tubes, 15 for each of 3 adapters, and 20 for the nose cone. Knock off all points for a component if it is simply the wrong part--say a conical nose that should be an ogive. Give full points if you can't spot any difference between the shape of the model part and the prototype part. You are only allowed to judge accuracy by eye (no measuring), with profile drawing or photo in hand. Look out for nose, body, and transition lengths, relative diameters of tubes, fin shapes, and correct fin location. If there are major details like antennas, conduits, and rocket nozzles, check their size, shape, and location. Deduct points for added non-scale fins that are not transparent. Don't worry about construction quality. Stand back and look at the overall effect, too. Does the shape look right?

Finish, Color, and Markings (200 Points)

Judge the accuracy of the model's color scheme. Find the modeler's color data (color-keyed drawings or color photos) for this section. If there is no color scheme data, give a zero for this section, but don't disqualify the model. If color data is in the form of a B&W photo only, with no color descriptions, assume colors are wrong, but give appropriate points for patterns and markings. I mentally divide the 200 points among correctness of colors, accuracy of paint patterns, and decals, say, 60-70-70. If a model has multiple paint colors but no decals, I might split them 100-100-0. For a model with one color of paint with decals, it might be 50-0-150. See that all colors are the colors they should be, splitting color points among the different paint colors on the model. Give zero for plain wrong (silver vs. brown) colors, and partial points for mismatches. Next look for paint pattern. Are the painted areas and their edges in the correct places? Finally see that decals are correct and correctly placed. Don't worry about neatness of the painting and decals yet.

Degree of Difficulty (100 Points)

First look over any difficulty notes the modeler may have provided. Judge difficulty up close. Apply 40 points to basic structure. Give zero points for a simple four-fins-and-a-nose-cone model (IQSY Tomahawk), 20 for a 2-stage, 2-diameter prototype (Nike-Tomahawk), 30 for a complex 3-stage model (Javelin, Saturn V), 40 for a multi-diameter complex model (Saturn IB, Ariane 44L). Use the remaining 60 to judge complexity of details and painting. You might add a point for every detail part, masked paint edge, decal, and individually applied letter. Give more complicated parts an extra point. Or just line up the models from plain to detailed and pick numbers that seem sensible.

Craftsmanship (300 Points)

Inspect the models close up for quality of construction, surface preparation, and finish. If a model has been damaged in previous flights, consider repairs (or lack of repairs) part of

craftsmanship. Divide the 300 craftsmanship equally among three fundamental categories. Within each category, allot points to components as seems reasonable. Give full points only for perfection. If you can see a flaw in craftsmanship from a safe launch distance, give zero points for that category for that component. Allot 100 points for quality of construction. Are parts cut straight, cleanly and uniformly? Are they glued on straight, cleanly and uniformly? Do parts fit? Are the fins perpendicular to the body tube? Check body tube cuts, roundness of turned parts and rolled paper parts. Do body wraps conform to the body tube? Are there gaps between parts? Are paper parts wrinkled?

Allot 100 points for surface preparation. Perfection here means that you can't tell what the model was made of just by looking. Judge results, not effort. Are all balsa surfaces sanded and sealed? Paint on bare balsa gets zero points for that piece. If a bit of grain shows through, give an intermediate score. Are body spirals filled? Also check for seams on plastic components and paper wraps. Check for any mar or lump that has been painted over. If flaws on a part's surface preparation show from a distance because of a metallic finish, you might deduct all the points for a component, if they hardly show, just deduct a few.

Allot 100 to quality of finish, including paint coverage, masking, and decals. Spread these points among the categories as seems sensible. Is the paint coverage uniform and opaque? Are there visible droplets of spray in the paint surface ("orange peel"), brush marks, or wrinkles? Masking flaws can be the most obvious flaws on a model. Look for uneven edges due to overspray, paint bleeding under masking tape, or hand brushing. If borders between colors are consistently uneven so that they are plainly visible from a safe launch distance, deduct 50 points for masking. Are decals straight? Check decals for visible film. This usually takes the form of "silvering" when decals are applied over a dark matte-finish paint. Honest John kits are notorious for this problem. Is there glue from repairs over the paint?

Check Your Work

Add up the static points and review your results. Line up the models in order of their total static points. Is the ordering justified, or did you make a mistake?

Before returning the models to the contestants, be sure someone takes group photos of the scale models for the local newsletter (and for Sport Rocketry). Give the modelers a chance to admire each other's work.

Flight Judging

You will need at least one clipboard to hold judging sheets. Each modeler must find you before he or she flies. It is the modeler's responsibility to tell you of any in-flight mission features before the flight (preferably in their data packet as well as on the field), but it is wise to prompt them before the flight. If you don't know for a fact that the mission is appropriate, insist that the modeler document that the prototype performed the model's mission. Not every prototype spins on ascent, and not every sounding rocket released vapor clouds at apogee.

The following guidelines for mission will allow a fair balance of model quality and flight effects. A single mission effect can change the contest standings among good models, but if you did your job in static judging, a poor model with one flight effect will not beat an excellent model. Start from zero for a model that lifts off, deploys a parachute or two, and comes down. Add points for successful in-flight functions if documented as representative of prototype flight: Suggestions for some common missions:

- 2-stage, 50
- 3-stage, 100
- 2-engine cluster, 25
- each additional engine, 20
- deploying components, 10 each
- glide recovery, 50
- scale spin on ascent, 10
- simulated vapor release at ejection, 10
- working payload (transmitter, camera, or smoke generator in nose), 25-50
- payload returning data to judge (e.g. transmitted temperature, developed aerial photo, wind speeds calculated from video of smoke trail), 50-100
- radio control should be judged by effect, not the mere presence of a receiver aboard the model

You can probably equate the difficulty of other effects with one of the above. A simple gimmick that any rocket could perform with a quick field modification (such as special selection of parachutes) may be worth 5 or 10 points. The maximum score of 200 points requires a complex flight with multiple effects. If the mission doesn't happen, there are no mission points.

Before flight, walk to an ideal observing position, with the sun at your back, close enough to see cluster ignition, or distant enough to see staging. Divide general flight into 50 points for the flight itself, and 50 points for damage. Deduct 5 points per misfire. Note deviations from a perfect, beautiful flight. Deduct 5 points for launch tip-off or slightly wadded parachute, or other minor bugs; 25 points for marginal stability, non-deployment of parachute, or loss of parts on boost, or other serious flight problems. Deduct all 50 points for a flight so bad that there is serious doubt that it should be qualified (disqualified flights are the range safety officer's call).

Finally, the modeler must return the model to you to assess damage points. Deduct 5 points for a broken fin, dented nosed cone (shock cord snap-back), paint bubble from ejection heat, or other minor problem; up to 50 for all damage. If the modeler opts (in advance) to catch the model, deduct all 50 points.

Final Results

Add the flight points (if the modeler flies twice, use the score from the best flight) to the static points for the final standings. Check your math, and hand the judging forms to the contest director. Most modelers will accept your judgments graciously, but a few may grumble (usually the parents of A-division modelers). A simple explanation of where the scores come from (and how the pink book allots points to various categories) should leave the contestants more interested in building better models than lynching the judge. By working to prevent disqualifications early in the event, and by confirming to yourself that each category of scores is reasonable, you make Sport Scale a friendly learning experience for modelers and judges alike. And remember, if you bring a Sport Scale model next time, you won't have to judge!

Mission Points

by Peter Always

I wrote the guidelines on the principle that the most complex mission I could think of would max them out. So I think and Ariane 4 with 3 stages, 4 strap-ons, and a 4-cluster first stage would reach the 200 mark.

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Let's see--100 points for 3-stage, 65 for core cluster. strap-ons get 30 each, for 120 points, adding up to over 200

Space shuttle: 2 SRB's plus 3 main engines--85 points, plus glide recovery--50 points, plus SRB and tank sep--30 points, R/C roll program on ascent--10 points, RC heading alignment circle to pre-determined runway--10 points, RC flare maneuver, 10 points, R/C landing gear deploy--10 points.

I'm figuring each R/C event is worth as much as spin on ascent.

Peter Alway