Phoenix Regional Meet - 22, SSS #506

Concept Scale Judging Form

A NAR Sanctioned Regional Contest, 20 March, 2010, Rainbow Valley, Arizona

Contestant Information

Name: _____

NAR Number _____ Division _____ Section: _____

Model Name & Ref: _____

(Include scale, if known.)

Note: CSC is judged under two main rules: 16 & 56. Judges should also be familiar with Rules 1–13 and 53.

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 fictional or seriously proposed but un-flown/un-built rocket. (Rules 56.1)
- ☐ Is not excluded under Rule 56.2.1.
- ☐ Entry is not a Plastic Model Conversion under Rule 55. (Rule 56.3)
- ☐ Meets Substantiation Data requirements as stated in Rule 56.4.

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: 56.4, 56.5.1 and 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: 56.4, 56.5.2 and 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: 56.4, 56.5.3 and 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: 56.4, 56.5.4 and 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 at 0. Add points for successful simulated mission function documented for this prototype.

Rules: 56.5.5 (53.13.1) — Max total score: **200/200**

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

Total Mission #1: ____/200

Total Mission #2: ____/200

General Flight – Start at 100. Deduct points for problems/damage. Flight must be safe & stable to qualify.

Rules: 56.6 and 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:_____

Using the TCC CSC Judging Form

Note: For details on judging and scoring this event, see the comments by Peter Alway, John Pursley, and Jack Hagerty that follow this section. Always's and Pursley's comments refer to Sport Scale (SPSC). Since CSC is based on SPSC, these comments are valid and useful. Hagerty is the "father" of CSC. His article is about judging and flying FFSC which is now called CSC.

Contestant Information:
Fill in the contestant's name, NAR number, competition division, section number/IND/Non-NAR as appropriate. Fill in the prototype's name and the reference such as the name of the book, movie, comic, proposal, etc. Give the scale if the contestant has provided it.

Qualification Checklist:
Each check box lists the rule that requires this item. Check off each item if the entry meets the requirement of the rule. The entry is NOT a qualified entry if ANY box is unchecked.

Static Judging:
Static Judging has four scoring sections: Similarity of Outline; Fins, Color and Markings; Degree of Difficulty; Craftsmanship. Each scoring section on the TCC CSC Judging Form starts with a one line statement regarding judging the section followed by the rule numbers that apply to that section.
The form has a blank for each element that you can score. Each blank is divided by a slash. Enter the number of points you award for each element to the left of the slash. Enter the number of possible points to the right of the slash. Some blanks have a suggested maximum already entered to the right of the slash.

For example (based on Peter Alway's comments):
The maximum score for **Similarity of Outline** is 200 points out of a possible 200 points. This is shown on the form as 200 / 200. That is, the score the entry received followed by a slash and the maximum possible points. There are four major components you will probably need to score for any entry: Nose, Fins, Tubes and Major Details. There is a blank for Other that you can use if you need to. Mentally divide the points among the 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. If you ward full points for the nose cone, the score will be 70 / 70. If you award half of the possible points for the body tubes, the score will be 30 / 60. In any case, you can only award a maximum total of 200 points for Similarity of Outline.

Some of the blanks show suggested maximum scores. One example is Craftsmanship. This element of judging can be broken down into three major components: Construction, Surface preparation, and Finish. Each should probably have an equal number of points. Since the maximum total score for Craftsmanship is 300, each major component already shows 100 as the maximum score for that component. This is only a suggestion. You can cross it out and write you own maximum.

Flight Judging:
Flight Judging is conducted in the same manner as Static Judging. See Peter Alway's comments on awarding mission points. General Flight can score a maximum of 100 points. This should probably be broken down equally into two major components: Flight and Damage. This is a little different in that Flight and Damage points start at a maximum (say 50) and you deduct points from that maximum for flight/recovery problems and for damage the model receives as a result of flying and landing. Thus, if there is no damage, award 50 points.

Total Score:
The Static Judging Score will not change as a result of flying. However, since each contestant can make up to two attempts to achieve a qualified flight, the form has blanks for these possible flight scores. If the contestant makes two flight attempts, add the Flight and Damage points for flight one to get the Total General points for flight #1. Add the Flight and Damage points for flight two to get the Total General points for flight #2. Add the Total Mission points for flight one to the Total General points for flight one to get the Total Flight Score for

flight #1. Do the same for flight two. Pick the highest Total Flight Score and add it to the Total Static Score to determine the Final Score.

Finishing the Paperwork:
Enter the date in the Date field, print your name and NAR number in the Judge's Name field and sign the form in the Judge's Signature field.

Judging NAR Sport Scale
by Peter Alway, NAR 26985 (used by permission)

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 Alway, NAR 26985 (used by permission)

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.

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

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

Winning Sport Scale By The Rules

by John Pursley, NAR 27845 (http://www.accur8.com/)
(used by permission)

The Most Important Rule!

Having judged NAR Sport Scale since its inception (and NAR Scale in the years before and since) I have discovered that one of the biggest weaknesses in a modelers' strategy is that they concentrate so much on the model itself that they tend to ignore the importance of the rules. Understanding the rules is the key to winning Sport Scale. You can build the best model in the world but if it doesn't take advantage of and comply fully with the rules you will have an "also ran" entry that doesn't place as high as it could if you had just made a few simple changes.

As a judge, I have found the most important, yet most ignored rule has to do with Rule 53.12.1 which is Similarity of Outline. This one rule is the focus of the competition yet most modelers fail to understand and fully comprehend how important this rule is as well as how to take advantage of it. Following is the full text as it appears in the NAR Pink Book.

> 53.12.1 Similarity of Outline: 200 points.
> The contestant is required to submit data to substantiate his/her model's visual resemblance to the prototype. Minimum allowable data consists of:
>
> (a) A line, tone, or color drawing; or
>
> (b) One or more clear photographs, halftones, or photo-reproductions of the prototype, sufficient to show the outline and general configuration of the prototype modeled.

Any entry not accompanied by the minimum allowable data as listed above shall be disqualified. The Judges may disqualify any entry which, in their opinion, is accompanied by substantiation data of such poor quality as to fail to convey a satisfactory impression of the outline and general configuration of the prototype.

Upon a casual reading, its meaning may seem obvious. However, there are subtleties buried within and "between the lines" that are crucial in improving your chances of a winning entry.

First, you must remember that the judge goes ONLY (or he should!) by the data that you include in your data pack. He may be the most knowledgeable expert in the hobby on your particular prototype but you should always make the assumption that the judge knows absolutely nothing about the vehicle you are modeling.

A very common mistake is to simply photocopy a photo and this is your "data." Since you have built the model, your brain makes the "connection" between the original clear photo and the model you have build and you then begin to view the photocopy as the equivalent to the photo when in fact the photocopy conveys no accurate color information, the true outline of the vehicle is often unclear or obscured by other objects in the picture, or the exaggerated contrast of the copying process obliterates or makes the true nature of the photo impossible or difficult to comprehend. To help avoid this pitfall, you should always work under the assumption that the judge has never seen a photo, drawing, or model of the prototype that are modeling.

Also keep in mind that Similarity of Outline constitutes almost 20% of the total points available...and realistically, when you consider the points that (depending on just how well you do in Craftsmanship and Mission) at the end of judging it's likely to be more like 30% or more of the total actual score. With this in mind, it is easy to see that it is much easier to get a high score with prototypes of very simple shape than with prototypes of complex shape. It is conceivable and likely (if the judge follows the Pink Book rules precisely) that a prototype with a very simple shape such as the Japanese Pencil will garner a much higher score than a prototype of much more complex shape such as a Vostok. There are simply more "shapes" on a Vostok to mess up on than a Pencil that will lower your Similarity of Outline score. So, unless you are sure you can precisely model complex prototypes, you are working against yourself by trying to model complex subjects in an effort

to "wow" the judge. Don't think that you have a good chance of making up for a loss of points by going for "Degree of Difficulty." You don't...because there are only half as many points available for Degree of Difficulty (100). You do the math on this one.

The first sentence of the final paragraph of the Similarity of Outline rule contains the most powerful wording and intent and bears one of only four threats of disqualifications in the wording of the Sport Scale rules in that you must provide a minimum of printed data in the form of at least one line drawing OR one (or more) CLEAR photographs, etc. If you decided to forego drawings and just go with a photo you are running a great risk in that a judge can potentially disqualify you for photographic data this is not of clear sufficiency to adequately determine the outline of the vehicle you are modeling. My recommendation is to go with drawings over photos or, better yet, BOTH drawings and photos.

There is one other important word within this paragraph to which you should pay special attention and be aware of how it can be interpreted and that word is SUBSTANTIATION. The word more than implies that the data itself be accurate and (though it is not specifically stated) should be from an accurate, reliable, or verifiably accurate source. Don't create a drawing based on YOUR interpretation of what the prototype looks like and present that as your data. Don't download a drawing or sketch from the Internet unless that drawing or sketch is verifiably accurate or from an "official" source such as the vehicle manufacturer or user.

Just as important is that any data that you present with your model is actually representative of both your model and the prototype on which your model is based. Don't present data on, say, the last round of the Little Joe II that was flown when your model is representative of the first round. They both are Little Joe vehicles used in the Apollo test programs but they are significantly different. Likewise, make sure the color data represented by the drawing or photo is representative of the color and patterns you have put on your model. Above all, don't "doctor" your data. You may get away with it...but if you get caught, there aren't too many judges that I know who would hesitate to disqualify you on the spot...and believe me, your reputation will suffer right on the spot, too.

One other significant paragraph in the Sport Scale rules actually comes in the paragraphs before those which actually have to do with scoring. Paragraph 53.6 states: "The contestant must supply data to substantiate his/her model's adherence to scale in shape, color, and paint pattern." Note that all of the elements are required and the word "or" is not a part of the paragraph. I think that this should replace the first sentence of the scoring rule (53.12.1) but it is not and leads many modelers to omit one or two of the REQUIRED data elements because most modelers concentrate on reading just those paragraphs that have to do with scoring. Going back to my preference for drawings, it is very easy for a drawing, even one in black-and-white, to contain shape, color, and paint pattern information. Conversely, unless you are providing a good color photograph you are probably only going to get shape and patterns...since photocopies don't convey color (unless, of course, the prototype is exclusively black, white, or some grey shade in between).

One other mistake many modelers make is to use the drawings that the manufacturer of the kit he is using for Sport Scale as substantiation. Though not specifically stated in the Sport Scale rules, drawings included with the kit by the manufacturer of the kit would not be considered "authentic" or satisfy the meaning of "substantiation." An exception might be if the manufacturer included reproductions of drawings from an authentic source (such as from the manufacturer of the real vehicle). Also, it is very common for manufacturers to include photos of their prototype model which show paint pattern or decal placement...these are not photos that can be used to substantiate a model since the photos themselves are of a model. This is the next thing to using the model to substantiate itself...which is not what any of the NAR Scale events are about. Again, an exception might be if the manufacturer included photos of the real prototype.
Considering all of this, it is very easy to see that the quality and useful quantity of the data that you present is just as important as the model itself...something that is often overlooked by the modeler who spends 99.9% of his time on the model and less than the remaining .1% on data with respect to its accuracy, authenticity, and in content of the required minimum elements.

Kits
Don't make the mistake of thinking that because a model is a "kit", even from the most popular of manufacturers, that it is accurate in outline when compared to the real thing. Very frequently manufacturers will make compromises to "scale" kits to make them more reliable and safe (i.e., such as by using larger than scale fins) or out of convenience or pricing (i.e., by using a nosecone from one of their sport kits that is "close"). If your kit model has fins that are too big, build them to the correct size and add more nose weight to compensate. If the nose cone is not right, fabricate your own. You get the idea. Judges are not sympathetic to errors just because they exist in the kit to start with.

Summary

1. Selecting a prototype with a simple shape makes it easier to score more points based on "Similarity of Outline" than complex prototypes.

2. Don't count on making up lost points you loose in Similarity of Outline scoring by gaining points in Degree of Difficulty (only 100) or Flight unless you are exceptionally experienced and plan on successfully pulling off some really killer flight effects.

3. The data you present is MORE important than the model itself...because it is exclusively this data the judges will use in evaluating your model.

4. Don't assume a kit is any better then scratch-building...they often contain compromises that scratch-built models would not have.

The Very First Rule…and Playing the Grey Area
Bear in mind as you read and consider what I have to say is that every scale judge is an individual and it is up to him to interpret the rules when it gets right down to the nitty-gritty. What I am saying is not set in stone and certainly there are some out there who will disagree with me. However, use what you read here as a basis for formulating questions that you might ask of the judges at the next scale meet you attend.

I think there are more discussions and arguments about the very first paragraph of the NAR Sport Scale rules than just about any other in Scale rocketry.

> **53.1 Scope**
>
> Sport Scale Competition comprises three events open to any model rocket that closely resembles an existing or historical guided missile, rocket vehicle, or space vehicle. The purpose of this competition is to produce a flying replica of a real rocket vehicle that exhibits maximum craftsmanship in construction, finish, and flight performance. Sport Scale Competition duffers from Scale Competition (Rule 50) in that the dimensions of the model are not directly measured.

In a nutshell, this rule basically tries to say what a Sport Scale model is…and due to its intentional brevity leaves a lot of room for interpretation. But let's look at the letter of the rule.

The first sentence defines the model as a MODEL ROCKET. 'Nuf said on that one. It states that it should closely resemble an existing or historical guided missile, rocket vehicle, or space vehicle. This is the part that most argument, open interpretation, and disagreement in the event centers on.

Some will want to argue what the word "resembles" really means in the context of the rule. Well, that's kind of like trying to define what the meaning of the word "is" is. But, it is what the heart of the event is about. The more closely and accurately you come to building a model that is identical to (but it can be smaller [usually], the same size [infrequently], or larger [almost never] than) the real thing. I won't dwell further on this. However, the next few words: " existing or historical guided missile, rocket vehicle, or space vehicle" are the real crux of most arguments. Just what is a guided missile, a rocket vehicle, or a space vehicle? The rule, due to the use of the word "or" in the sentences does not mean that your prototype choice has to fit all of these three

categories. It simply means that it should fit at least one of them. Many modelers feel that all three automatically imply that the prototype must be some kind of rocket. If you go by the letter of the rule, only one of the three says anything about "rocket."

Guided Missiles have had solid rockets, liquid rockets, turbojets, and ramjets for power. There have been missiles which use combinations of rockets and jets. Some will argue the rockets are okay but nix the jets. This is not what the rules say. Further…guided missiles have also utilized internal combustion piston engines and propellers, turbojet engines, and even no engines (in the case of gliding missiles). The first recognized guided missile was a rail-launched, piston-powered biplane in World War I. And there have been missiles which are piston powered but are launched by rockets.

Rocket Vehicle is the most vague of the bunch in spite of at first seeming the most obvious. Is the little known liquid rocket powered P-51 a "rocket vehicle"? I'd say so (more because it could and did fly solely under the power of its liquid rocket motor). Is a rocket boosted glide bomb a rocket vehicle? I'd say so. What about the NF-104? Most certainly so. And…here's a stretch…what about a RATO assisted C-130 Hercules cargo plane? Hmmm…. BIG, BIG Stretch coming here…what about the NASA SR-71 which also fired (and got supplemental thrust as a result) a linear aerospike engine strapped to its back? There are many more examples.

Space Vehicle really leaves the door open. There are space vehicles which have no propulsion at all. What about vehicles like the Lunar Module? I'd say it fits (It also fits the "rocket vehicle" part, but then again, it can be argued that it cannot fly and perform its mission without being launched on top of and might technically be considered a "stage" of the Saturn V…which is the point of yet another Sport Scale rule). What about the Apollo Spacecraft? It does have rocket power and thrusters. It is an autonomous vehicle. But it suffers the same "is it a 'stage' of the Saturn" problem. Hmmm…

Bottom Line
Most modelers, particularly those that want to have some assurance of not being disqualified or having their model "discounted" or "minimized" in the mind's eye of the judge, will play it safe and select prototypes that are obviously rockets in the classic sense in that they tend to be relatively long and slender, usually with fins, and powered by either liquid or solid rockets. You are also safe in extending this to pure rocket aircraft such as the X-1, X-2, X-15 and the like. How far you push it is up to you but be prepared to suffer the "judgment" of the person who is judging your event.

My suggestion is that if you are new or relatively new to Sport Scale, stick with something that is very obviously a "rocket." This is pretty much a common sense thing. They are generally easier to model successfully and to rake in a high number of points. If you want to push the limits and get into "grey areas" of the definitions of what is allowed in the Sport Scale rules then you will probably have other things to consider in addition to trying to convince the judge that your borderline choice fits the rules because chances are that it will also be of a relatively non-rocket shape that is not easily adapted for flight, have asymmetries and compound curves that are hard to model, and push the limits for reliable and safe flight. The question you have to ask yourself is "Is it worth it?" By selecting borderline prototypes you are probably lowering the number of points that you can get due to falling short in Similarity of Outline (the most important rule), Finish, Color and Markings (which are usually complex and hard to do well in borderline prototype choices), Craftsmanship (more complex shapes and number of components works against you here), Mission (you'd probably just skip and not go for those points), and General Flight (yeah…just TRY to get that asymmetric, forward CG creation to fly straight…).

And remember, when it comes to judging, Scale judges have almost as much "say" over your model during static judging as an RSO has on the flying range. He won't take favorably to having his valuable judging time (and he has probably spent HOURS looking at models with more to come) arguing with you whether or not your model fits the Pink Book definition.

Data and Documentation…
It's in the rules more than anything else.
Almost without fail, the weakest part of most Sport Scale entries is in the documentation that the modeler turns in with his model. By the rules, the only data that the judge may critique and evaluate the model by is in the information that the modeler provides yet it is complete or even minimally adequate data that is woefully lacking in many entries. We'll have a look at the rules and cover both required and recommended documentation as set out in the Pink Book rules for Sport Scale as well as any supporting data that the modeler might wish to include to improve his chances for a higher score.

I was fortunate enough to experience Scale model rocket competition before there was such an event as Sport Scale. In NAR Scale competition, even the data pack is scored and it was realized by most that this was an "easy" place to make up points. With Sport Scale, the intentional emphasis was placed on just getting people "into" scale modeling without the burden and overheads that NAR Scale competition involved. Unfortunately, documentation didn't rate a scoring rank when Sport Scale was introduced and people have, unfortunately taken this to mean that data documentation isn't important. This is most certainly a mistaken belief. Even though the data you present is not eligible for points it has an unmistakable influence on the points that you get on you model in a plethora of ways.

Let's look at the way data and its presentation is important to Sport Scale competition as it stands today.

Though there is a brief mention of data in Paragraph 53.5 (Plastic Models and Kits) with respect to documenting the use of parts from kits, the first rule, 53.6 DATA, has a single brief but widely encompassing sentence regarding data.

> **53.6 Data**
>
> The contestant must supply data to substantiate his/her model's adherence to scale in shape, color, and paint pattern.

This sentence stipulates that the "contestant" must provide the data. There is no provision for the judge or anyone else to be familiar with the data or the prototype the modeler has chosen or the model that he has been presented for judging. The implication here is that the data the contestant supplies is the sole source of data that will be used in the judging process.

The word "substantiate" has some deep implications of its own. It generally means to support with proof or evidence or to establish validity and accuracy. Substantiation can be acceptably provided in NAR competition in a variety of ways. By far, the best data that satisfies substantiation requirements would be printed and photographic information from the manufacturer or user of the prototype. Manufacturer's blueprints and plans are like gold as are official photographs. Information from other credible sources such as NASA documents, manuals, and the like is also pretty good. A photo of the real thing is good substantiation (provided it is clear and of such composition as to be directly applicable to determining the characteristics of the prototype being modeled). Also, documentation provided in NAR publications such as NARTS data packs and its current and past publications or publications that the NAR has affiliated with such as *The Model Rocketeer, Model Rocketry, American Spacemodeling,* and *Sport Rocketry* is taken as "official" for the purposes of judging Scale and Sport Scale competition. Also, "credible" sources such as books dealing specifically with or which have sections that deal the subject of the prototype that you are modeling such as encyclopedias, aerospace/military/science trade publications, and commercial publications such as *Rockets of the World*, etc. Recently, there has been a variety of good data in the form of data CDs such as those available from Mike Dorffler and others.

The important thing to remember is that data should be verifiable from other sources. This is not to say that the judges will go out and actually verify the data that you provide but most scale judges are quite knowledgeable about scale data in general and are quite keen on discerning "good" data from not-so-good by its source and nature.

In this day of computing, there are more sources of data than ever available to the modeler. However, the door is also open to bogus "interpreted" data, doctored data, or data that is more fantasy than fact. It is up to the modeler to adequately research the data he wishes to present to assure that it is accurate and truly representative of the prototype he has chosen.

Nothing beats a good multi-view line drawing from a good source. This is what you and the judge will refer to the most with respect to the outline of the model. Color is usually best illustrated by a good color photograph (a picture is worth a thousand words…) and the paint pattern and markings are generally best represented by a combination of photographs and line drawings. Written descriptions of color and paint pattern are also helpful. But beware of "illustrations" that are generated by an artist who is trying to supplement the text of a publication that has to do with your chosen prototype. Very often the only thing the illustrator has to go by is some other illustration or photo and he/she has not real idea of what it is they are really illustrating.

Data is also mentioned in paragraph 53.7 (Stages) with respect to providing data to prove if your prototype was of a generally muli-staged configuration and you are opting to fly a model without one or more of the stages of the normally configured prototype that the data must support the fact that it also flew in the configuration you are modeling. It is rare that multi-staged vehicle upper stages were ever flown without a booster but there is a limited variety of sounding rockets that DID. Conversely, there are rockets that NEVER flew without a booster but have been popularly modeled without one. The WAC Corporal is one such "popular" prototype that never flew without a booster but came be popularly modeled without one because it was available as a kit without a booster.

The Killer Paragraph and Static Points

The one Section in the Pink Book Sport scale rules that drives home the importance of data is 53.12, Static Points. Subsection 53.12.1 (Similarity of Outline) uses the absolute word "required" and further outlines the minimum data that is required to qualify the model. At its most lenient, the rule is interpreted to say that you MUST provide either a drawing or a photograph and it further goes on to state that if the data you DO provide is not of sufficient quality (implying anything from illegibility to data that is obviously bogus and inauthentic or obviously inaccurate) that the judges may disqualify your entry.

53.12.2 (Finish, Color, and Markings) indicates that the contestant "should" (a rather mild word) submit data substantiating color and markings and goes on to make some suggestions for documentation such as photos, magazine articles, or written descriptions from "reliable" sources including a drawing indicating colors and scheme that can be generated by the modeler (with the implication that this drawing is accurately rendered using recommended substantiating sources).

This section further offers a bit of leniency in that it stipulates that if there is no data substantiating finish, color, and markings that you shall receive no points (but no disqualification). But that's throwing away the potential of a significant portion of 200 easy points!

Summing It Up…

Your Data Pack and its Presentation

Though you can get by with just a single photocopy or line drawing, there's just too much at stake that can be thrown away by not taking an extra hour or two to properly assemble a data pack that the judge will find both complete and easy to use as a reference. In a nutshell, your data pack should contain enough information for someone who knows nothing about the prototype, other than what he finds in the pack, to build from scratch an accurate model of your chosen prototype.

My first recommendation is to collect all of the relevant data to do with your chosen prototype well in advance. Duplicate or copy it to a common format…usually 8 ½ x 11 letter format is the easiest, select the data that will be the most useful in helping to judge the model, and then assemble and bind it into a report cover, binder, or folder. You want to avoid loose pages if you can. I like ring-type binders because these will lay flat and leave the judges' hands free to handle your model or take notes.

I recommend that it contain at least one line drawing with the basic dimensions…and make sure the dimensions are correct. Though Sport Scale does not make direct use of dimensions they lend authenticity to the data. If you generate a drawing on your own, be sure to include the materials that you used to generate the drawing in your data pack. The best thing to do, however, is to utilize drawing sources (such as copies of the original) other than drawings you do yourself. If the drawings contain generic data or data representative of rounds other than yours, you need to make note of this fact on your drawing and perhaps even go further to annotate the relevancy of those parts of the drawing that do apply to your prototype.

A photo or series of photos relevant to the specific prototype you are modeling. These should be neatly labeled and organized. Use a photo album page if the photos are small or if they are clippings or utilize a clear slipcover page (available at any office supply store) for larger photos (or drawings).

As to WHAT data you need, well, that depends on your prototype and the degree to which you have modeled it. Only include data that supports what you have actually modeled. If you show drawings that represent all kinds of panels, hatches, nuts, bolts, and weld lines, then they should be on the model. Conversely, if you put panels, hatches, nuts, bolts, and weld lines on the model, they should be represented in the data. In other words, for maximum points, the data and the model should exactly match. A data pack of a very simple model such as the Japanese Pencil can literally be a single line drawing with color data. Even though the model is not of complex shape, has no markings to speak of, almost no detailing, and very simple coloration and pattern it can score very high because of its simplicity both with respect to the physical model and the data required to accurately and fully document it to the scale judge.

Generally, three or four pages will be all you need to provide for a well-rounded data pack. However, if you have additional supporting data that can lend authenticity to these pages and photos, you can generally include them as a section of your data pack that is either a separate section in the back of your binder or you may include them in a separate binder. I would recommend that if you do include supporting data that you not include the “kitchen sink” (only include relevant supporting materials) and make notes on your primary data in the first three or four pages of your data pack where to look in the supporting data for additional supporting information.

Above all, don’t alter or “doctor” any data or “enhance” or edit photographs other than perhaps improving contrast. Many judges are quite knowledgeable about specific photos and drawings and can easily discover (or at least have their suspicions aroused) if something doesn’t quite “look right.” Also keep in mind that data that looks too good, particularly if it is “vintage” data from, say, the ‘50’s or ‘60’s, will become suspect in the eye of the judges. Likewise, artificially “aged” data can become equally suspect in its authenticity and accuracy.

I highly recommend you study and understand the NAR Sport Scale rules and put special consideration in what they require with respect to both required and recommended data. Even though, as I said earlier, the data pack gets no points, its completeness, clarity, and presentation can go a long way end helping you earn more points for your model.

NOTE: FFSC was changed to Concept Scale (CSC) in 2009.

Science Fiction! Future Scale

by Jack Hagerty NAR 55105

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It was a surreal sight. In the broad, flat Sonora Desert west of Phoenix, Tom Beach (editor of this august journal) and NAR scale guru, Peter Alway, were standing under a monsoon-clouded sky They were trying, and mostly failing, to sing the theme song from the early '70s cartoon show, Josie and the Pussycats in Outer Space. What could provoke such bizarre behavior? Too much sun? Mental exhaustion from a full week of total immersion rocketry? Neither, as it turns out. The occasion was the first national outing of Science Fiction and Future Sport Scale (official NAR abbreviation is FFSC). The serenade was for NAR Trustee Jennifer Ash-Poole as she hooked up her team's entry the spaceship from said cartoon; but we'll get to that in a bit.

The event is just like regular Sport Scale, except that the prototype has to have never actually flown under rocket power. It can be a fictional, theoretical, or proposed vehicle; but one thing it has to have is documented characteristics. You have to provide your scale data, just like any other Scale event.

FFSC was very successful for its first showing in the big leagues. There were 24 entries spread over the four divisions, with all but two turning in qualified flights. In A Division, Amanda Boadway entered a model of the Thunderstar, an X-Prize contestant from England. Ryan Anthony-Ceres had a version of the Josie spaceship while James Triggs entered a Douglas DC-Y that looked suspiciously like the Quest DC-X kit. Kaitlyn Steele entered an ATK Crew Launch Vehicle, as did her two B-Division siblings, Caroline and Cody. The remaining member of the Steele cartel, A-Divisioner Cassidy, broke ranks and entered a Star Wars X-Wing fighter built from one of her father's NCR kits. The remaining B- Division entry was another version of the Thunderstar by Matt Filler.

In C Division, Russ Anthony entered a small, but very nice rendering of the Athena, from the G. Harry Stine story "The Day the Rocket Blew Up." Bruce Canino had a version of another X-Prize entrant, the Cosmos Mariner Space Plane, built from the Estes kit. Bruno Dipasquale scratch built a very clean version of one of my favorite prototypes, the Myst Island rocket from the computer game of the same name. Adam Elliott had a large model of the A23 from the early '60s Italian film, "Battle of the Worlds", which revealed a property of outer space that none of us knew. Jim Filler entered another X-Prize vehicle, the cute little Gauchito (built from the Estes kit), while Jerry Latham had a version of the X-20 Dyna-Soar that was a modification of the old Estes Titan IIIE kit. Both Chad Ring and Robert Koenn had versions of the Ares V, a proposed cargo vehicle based on Shuttle technology.

There were eight Team entries. Both the Southern Neutron and Bumbling Brothers teams entered different variations of the X-20 Dyna-Soar, while The Flying I-Beam Kids had a very nice interpretation of the Mars Return Rocket from the George Pal film, "Conquest of Space". The Mostly Harmful team entered the Josie rocket mentioned at the beginning and the Pod Bay Doors (which includes NARAM 48 CD Matt Steele) had another X-Wing fighter built from an NCR kit (I guess Matt must have a bunch of those still lying around!). Rounding out the team entries were the Canadian Arrow (another X-Prize entrant based on the German V2) entered by the Round Tuit team, the Mercury Thor (an early proposal for the sub-orbital Mercury flights before they decided on the Redstone as a booster) by the Spanish Inquisition, and a small, but very clean version of the LUNA from the Pal film "Destination Moon" by the Why Us? team.

Static Judging

The A and B Divisions were judged by Bruno Dipasquale. He was very impressed at the turnout for the first national running of the event, although, as he noted, most of them were of the "four-fins-and-a nosecone" variety. At the end of the static judging he had placed Cassie Steele's X Wing in first place with 630 points, due mostly to the complexity of the prototype and its generally high quality construction. There were a few problems with it matching the data package, though (which I'll cover below in the Team section). Sister Kaitie's CLV was in second place with 590 points followed by Amada Boadway's Thunderstar with 495. Ryan Anthony-Ceres was in fourth place with his Josie spaceship garnering 320 points. Bruno gave it the highest score of the group for similarity of outline but it fell short in complexity and similarity of markings due to the missing blue stripe down the side.

In fifth place was James Triggs's DC-Y model with 150 points. While nicely done, the model missed out on multiple categories. The problem was that it was pretty much a straight build of the Quest DC-X kit using a pre-printed body wrap. Neither the kit's shape, nor the markings on the wrap matched the prototype DC-Y's characteristics as presented in the data package. And using the wrap does away with nearly all of the finish points.

B Division was led by Matt Filler's immaculate Thunderstar with 680 static points followed by a tie between the Steeles' (Cody and Caroline) near-identical CLV models at 475 points each. Bruno was impressed with these models, but noted that all three of the CLV data packets (including Kaitlyn's) were lacking information on how the details were made.

Jim Brower was the judge for C Division and was likewise impressed with the wide range of entries. After the static judging, Bruno Dipasquale's Myst Island Rocket was in first place with 780 points. Jim said that it was a very clean build of a difficult- to-model shape. Chad Ring's Ares V was right behind it with 760 points. With the clustered core and SRBs there was plenty of detail on this well rendered model. There was a drop of 90 points to Jim Filler's Gauchito in third place with 670 points. Judge Jim said that contestant Jim lost most of his points because he detailed the model as shown in the kit instructions instead of the rather different way the data package (the X-Prize web page) presented it.

From there it was another sizable drop to fourth place with Robert Koenns version of the Ares V at 490 points. While looking not that much different to the casual observer than Chad Ring's entry Robert lost major points for the nose cones of the SRBs, which were greatly elongated compared to the prototype data. He had also used textured paint on the propellant tank of the core vehicle to simulate the insulating foam, hut the texture was wildly exaggerated for the scale, so Jim marked it down as a poor paint job. Close on Robert's heels was Russ Anthony's Athena at 480 points. Jim thought it was well constructed hut very simple and the paint job was a little crude with all the stripes and lettering hand-drawn.

Behind Russ was Bruce Canino's Space Plane with 405 points. Jim said it was a competent enough build of the big foam kit, but didn't show enough skill in the detailing and finish. Next was Jerry Latham's rendition of the Dyna-Soar with 300 points. This was Jerry's first time entering a scale event at NARAM. Jim admitted that it was good for a first attempt, but the weaknesses were in similarity of outline. Jerry used the stock Estes Titan IIIE kit as a starting point, and there are significant differences between that booster and the Titan IIIC proposed for Dyna-Soar. Also, Jerry used the all-too-visible fin units that ride in the SRMs rather than trying to make any sort of clear fins (models have to be judged in their ready-to-fly configuration). Finally bringing up the rear was Adam Elliott's A23 at 100 points. The main reason for the low score was that the model was completely unfinished, save for the rocket's number, A23, written on the side and a fin in black marker pen. Adam claims that, according to the film, there is no color in space (!) so he left it as built.

Finally, the Team Division (which I judged) showed a much tighter contest. as you'd expect. After the static judging, the Bumbling Brothers Flying Circus's Titian IIIC/Dyna-Soar was on top with 730 points. Peter Alway's meticulous finish and hand-carved balsa glider were major pluses. Close behind was a tie for second

place between the Mercury-Thor of the Spanish Inquisition, and the Mars Return Rocket from The Flying I-Beam Kids with 715 points each. Both of these were comparatively simple prototypes, but they were exceptionally well constructed and finished with only the tiniest flaws noticed. The FIBK also got some extra craftsmanship points for a very clever removable motor unit that let the cluster of seven 13mm motors be prepped separately prior to insertion at the pad. A notch down was the Titian II/Dyna-Soar from Southern Neutron at 685 points. It was by far the largest of the Dyna-Soar models entered and featured glide recovery of the X-20. The comparatively low score was due to some similarity-of-outline gaffes (there was no detailing at all of the Titan engine area) and some wrinkles in the laminated glider covering.

Just slightly behind the Neutrons was the Canadian Arrow from the Round Tuit team with 675 points. Despite everyone's presumption, this was not the Estes kit. It was scratch built with a special stretched nose cone and tank section (relative to the V2) to give it high similarity-of-outline points. The weak spots in this model were the details in the paint job (a complex pattern that repeats the Canadian maple leaf around the base of the rocket) that showed some bleeding at the red-white border, and some 'battle damage" from previous flights. Dropping 100 points we come to the sixth place entry the X-Wing fighter by the Pod Bay Doors team at 575 points. It really hurt to give this team such a hit for similarity of outline. This was by far the most complex team entry, and it was very well made and finished. The reason it hurt is that the NCR kit is a very authentic version of the movie prop, but the data packet used was a "blueprint" from a modeling magazine that was something of an artist's interpretation of the design. There were dozens of small differences between the model and the drawing, and even though I knew that the model was more faithful to the prototype, I had to judge it against the data provided (this goes for Cassie's A-Division entry as well which used the same drawing).

The Josie spaceship from the Mostly Harmful team came in 7th at 540 points. It didn't generate very many points for complexity of either the shape or the paint job, and the paint itself was uneven with the transition cone's stripe just free-handed. The basic construction, though, was quite well done. The tail gunner in this division was the Why Us? team's LUNA from "Destination Moon." ft was a very well constructed and finished model based on the plans published in the March/April 1998 issue of "Sport Rocketry". Unfortunately those plans contained many deviations from the prototypes shape to make **it** easier to build, such as a cylindrical center section. The team provided scale data of the "real" prototype from the movie, so they lost many similarity-of-outline points. Also, this was a very simple prototype, and the model was completely devoid of any surface details. The provided scale data showed portholes, hatches and the ladder down the side, any of which would have boosted the score.

Flight Judging

No matter who's ahead in the static judging, the standings can change dramatically with the qualifying flight. In A Division, Cassie Steele's X-Wing had a nice, straight boost, hut fouled its rear-ejection 'chute and it pranged hard, re-kitting itself into the desert floor and devastating its young builder who had spent so many hours on it. Her sister, Kaitlyn, fared better with her CLV with a mostly clean flight and only a few damage points. Still, with Cassie out of the running, she wound up in first place. Amada Boadway got some mission points on her Thunderstar flight, but it wasn't enough to overcome Kaitlyn's lead and she wound up in second. Both Ryan Anthony-Ceres and James Triggs had damage-free 100-point flights leaving them in the same relative positions.

In B Division, Matt Filler picked up some mission points as well on his Thunderstar flight extending his first place lead. Caroline and Cody Steele continued their sibling rivalry by both flying their CLVs to perfect flights, meaning that they remained tied for second place.

In C Division, Bruno Dipasquale flew his Myst rocket out of a tower on a D21, which screamed off to the Mechanical Age Fortress. It was a perfect flight, and he even picked up 10 mission points, so you'd think he'd have had a lock on first place, especially after Chad Ring's Ares V did some skywriting just above the pad on its first flight and was DQ'd. However, for his second flight, Chad fixed the stability issue and loaded up all seven motors (five in the core vehicle and one in each SRB) to garner a boatload of mission points that

leapfrogged him into first place. Jim Filler got a perfect flight out of his Gauchito, but with no mission to help him, he stayed in third place.

Robert Koenn's Ares V suffered the same fate as Chad's on its first flight, but in this case, Robert couldn't patch it back together for a second attempt, knocking him out of the running. This moved Russ Anthony and his Athena up to fourth place, where he stayed after a clean flight with only a handful of damage points for a broken landing foot. Bruce Canino's Space Plane didn't transition to glide mode on its first flight, but the second one was perfect netting him not only the 100 flight points, but an extra 50 for a successful glide. This was good enough for fifth place with 555 points. Jerry Latham got a decent flight out of his Dyna-Soar with only 5 damage points, which was OK with him. He wound up sixth with a final score of 395.

Finally, there was a flash of unpainted paper and balsa as Adam Elliott's A23 took to the sky. He got a few mission points for clustering, and took home 225 points for his efforts.

Closing out FFSC were the Team Division flights. The Bumbling Brothers got a decent flight out of their model, and the mission points for the four motor cluster more than made up for the damage points they got for a broken fin on landing. They walked off the field still in first place for the moment. The Flying I-Beam kids managed to get five of the seven motors on their Mars Return rocket lit, but they too, suffered a broken fin. They ended up just behind the Bumbling Bros. The Spanish Inquisition had a mostly clean flight, but they took a hit on damage when the escape tower on the Mercury capsule was retrieved in about 20 pieces. That moved the Inquisition behind the I-Beam Kids.

Southern Neutron came out of the static judging in fourth place, but they had a very complex mission to declare. It started with the two motor cluster on the booster, then added the Dyna-Soar ejecting into a free-flight glide and finishing up with a telemetry demonstration (a locator beacon). They pulled it off perfectly including a no-damage flight, gaining them 300 points causing them to soar dynamically into first place. The Round Tuit team had a perfect flight causing no further damage to the Arrow and they left in fifth place with 775 points. Note that only 110 points (one good qualifying flight) separated the first five places!

The Pod Bay Doors' X-Wing Fighter suffered a similar fate to Cassi Steele's, but got enough retardation from the "parawad" recovery system for the RSO to declare it a qualified flight. It did break its nose clean off, along with a couple of laser cannon, reducing its flight score to 85, and they wound up with 660 total.

Mostly Harmful's Josie Spaceship turned in an impressive performance, and the soft-hearted (or maybe soft-headed) judge gave them 10 mission points for the pre-flight serenade leaving them with a final score of 650. Finally the LUNA of the Why Us? team performed perfectly although a little wobbly on only three fins at 90°. The judge proved a soft touch once again by awarding three mission points because the model recovered by parachute (you have to be a real George Pal fan to remember that the spaceship was parachute recovery in the movie). This brought their final score to 615 points.

Congratulations to everyone who made the first national outing of F/F Scale a big success!