

FIFTH ANNUAL SUPER LIGHT WEIGHT COMPOSITE WING CONTEST

SAMPE 2009, MAY 19, BALTIMORE MD

The challenge is to build an ultra light composite wing with the highest ratio of applied load to wing weight (P/WT). The contest is open to student teams only.

Wing will be contoured left and right with tapered halves and winglets. Dimensions are approximately 4" x 36". For exact dimensions, see attached drawings. Maximum wing cross section airfoil shapes are shown in the drawings. Left and right halves are the same except winglets make halves symmetrically opposite. Each wing half is planar top and bottom. Combined halves are planar on bottom not the top. No structure will be allowed outside the maximum airfoil envelopes.

A torque will be applied to the winglets and a center load will be applied to the overall wing structure (3 point bending).

There is no weight restriction for the wing.

The maximum allowed deflection will be 2.0 inches as measured by the crosshead motion at center span (where P is applied). Note that the crosshead will be zeroed with no load P or winglet torque applied. The 2 inches is measured from that point.

The wing will be supported on 23 inch centers (same fixture as bridge). The center load will be gradually applied through a 1.0 inch wide load collar at the center of the wing, non-rotating, with vertical movement only. Before the center load is applied, a 40 inch pound moment will be applied to each winglet as shown in the drawings. This torque will be maintained when the center load is applied. Maximum load P is defined as the highest load achieved within the allowed 2.0 inch crosshead deflection or when the winglet fails, whichever is less. No direct horizontal reaction force is allowed against the wing jig or load collar. Wings will be rated based on highest applied load to weight (P/WT) ratio.

Winglet failure is defined as the point when the winglet load ball drops 6 inches from its initial **horizontal** position.

Tolerance checks (Out-of-tolerance wings will not compete.)

1. Edge of left and right wings must be straight, within total tolerance of .25 inch (not +/- .25 inch) for 32 inch span.
2. Bottom of left and right wings combined, must be flat within .25 inch total tolerance for 32 inch span.
3. Top of left and right wings individually, must be flat within .25 inch total

- tolerance for 15 inch span
4. A 0.125 inch dia rod can not fit between the wing and any defined maximum airfoil cross section (at wing root, wing tip, winglet root, and winglet tip)
 5. Winglet jig and load collar must fit without interference.

It is recommended that center 1" of wing be marked for easier locating of wing load collar. It is also recommended that wing be at least 0.050 under size to insure not exceeding maximum size requirements.

Shimming is allowed for winglet block and wing load collar to insure snug fit. Students must supply own shims of any material. Material can not extend beyond block or collar. Material will not be part of the official wing weight.

SAMPE Wing 2009 drawings (2 sheets) are in pdf file format and can be downloaded separately from the website.

CAD igs file format for 3-D wing and jig geometry is available upon request (contact Stan Stawski, stanley.stawski@janicki.com)

Load testing will be conducted on the exhibition floor during the afternoon on Tuesday, May 19. The plan is to weigh then load test the wings after bridge testing is complete. Each wing will be loaded only once. No retests are permitted. A team may submit only one wing for testing per entry fee. Multiple entries are permitted. An identification sticker, provided in the kit, will be fixed to the wing after test and all tested wings will be placed on display at a nearby table.

Materials: Any fiber reinforced composite materials (fiberglass, aramid, carbon fiber, etc. plus resin) can be used for the wing structural members. Boron fiber composites are specifically excluded. The airfoil surface must be only composites (i.e. fiberglass, aramid, carbon fiber, etc. plus resin.) . Also, adhesive, glue, foam, honeycomb, or balsa wood are the only non-composites that can be used. A composite kit of various materials will be supplied (same as bridge kit). Use of materials not included in the kit is permitted, however, any materials included in the kit that do not meet the rules cannot be used.

All student wing entries must be accompanied by a poster to be judged at the show. Maximum poster size will be 22 x 28 inches. General guidelines for poster presentations are available from the Business Office. Entries without posters will not be eligible for prizes. The poster should highlight some material, process and/or design aspect of the wing. Each wing requires a poster. The posters must be submitted by 10 AM Tuesday at the Bridge/Wing Prep room near the conference registration area. The posters will be prominently displayed in the main registration area on Tuesday, Wednesday and Thursday. A committee will judge the posters, based on technical merit. *NOTE: Posters may not be removed until Thursday afternoon. If you want your poster returned but have left early,*

make sure it can be rolled up and please provide an address to the staff.

Multiple prizes will be awarded for the best wings. In addition, prizes for best posters will be given out. All prizes will be awarded at the Wednesday morning student awards breakfast. All participants are invited to attend. Door prizes will be awarded on Tuesday 5 PM in an area close to the exhibition, to be determined. All student participants are eligible.

The entry form along with a \$40 fee to defray contest costs must be received no later than March 14, 2009.

Send questions to: Stan Stawski, stanley.stawski@janicki.com

SAMPE WING CONTEST 2009

REGISTRATION

Register on line with credit card at www.SAMPE.org

Register by mail: Send with \$40 check payable to NJ SAMPE to:
John Osterndorf, 20 Memorial Ct, #2C, Denville NJ 07834

NAME _____

SHIPPING ADDRESS _____

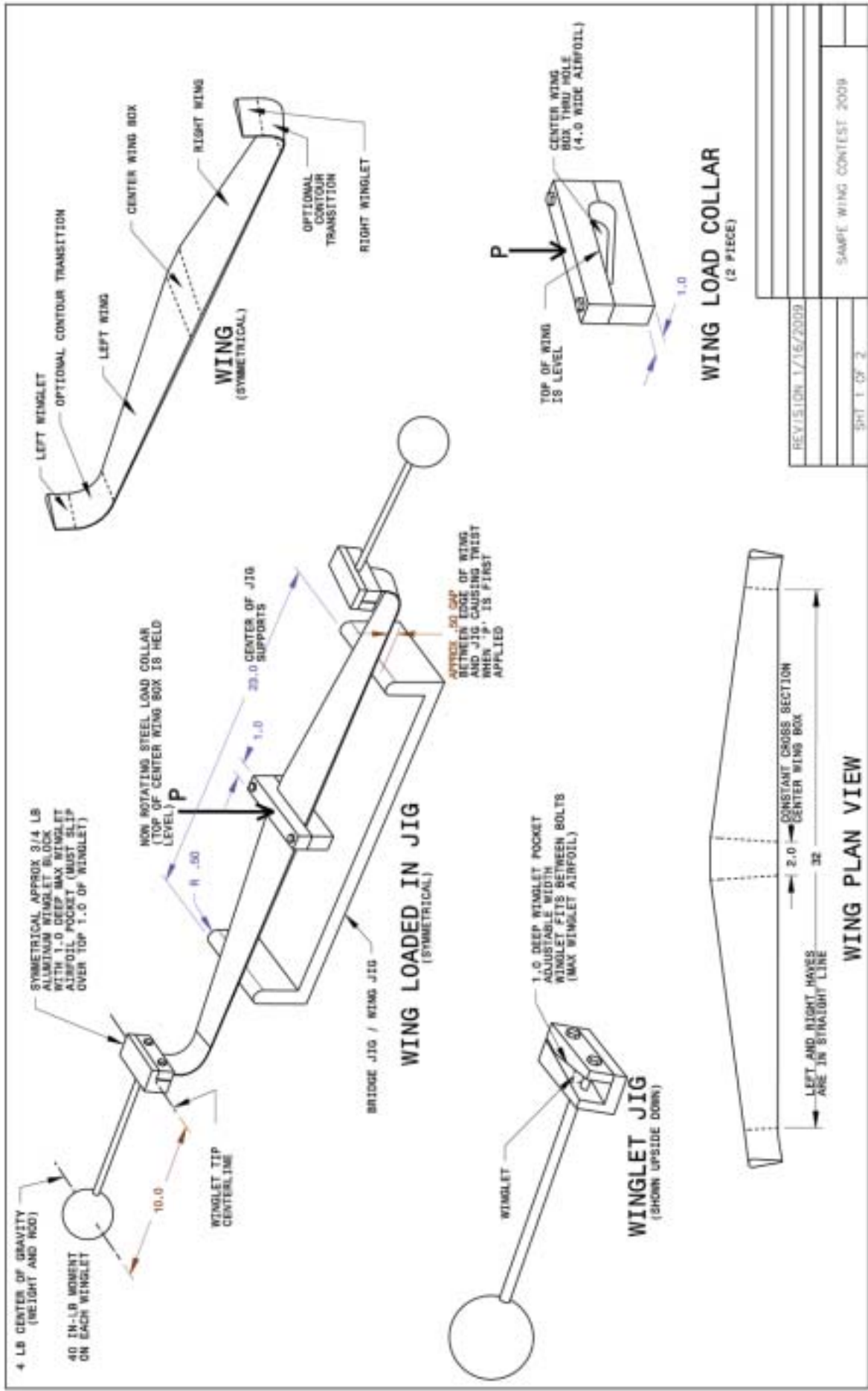
E-MAIL _____

PHONE _____

Student teams:

SCHOOL _____

SCHOOL ADVISOR _____



REV/ISS/OWN 1/15/2009

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