



# ONE DESIGN

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**OF THE INTERNATIONAL AEROBATIC CLUB**

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## **FIRST FLIGHT**

On August 25, 1993 Doug Dodge made the first flight of the prototype One Design. This is really an accomplishment when you realize that this project went from a concept to a flying prototype in 13 months. Jon Staudacher started the wing construction in February '93. Doug Dodge started cutting metal in March '93, and 6 months later we had a successful first flight. The initial flight was very encouraging and a sign of more good things to come. Doug reported that it flew hands off with no changes required for trim. Since then nine different pilots have flown and evaluated the aerobatic performance. The skill level of these pilots has ranged from Sportsman (Decathlon only experienced) pilots up through all categories including two former U.S. Team members. As of this writing nearly all of the 40 hours test time has been flown off and virtually all of it has been aerobatic time.

## **PREDICTIONS VERSUS REAL PERFORMANCE**

The top speed in level flight is 160 Knots indicated. Climb rate has been clocked at 2000 feet per minute. Stall speed is 52 Knots indicated. Roll rate has been timed at 420 degrees per second. This stacks up pretty well with the predictions. The top speed is slightly lower than the predicted 170 KTS however this was the estimated true airspeed. That may account for some of this. Also the propeller may be a little too fine a pitch because the climb rate is actually slightly better than predicted. We are currently running a 74 inch diameter 58 inch pitch metal Sensenich propeller. The stall speed matched the predicted performance right on the money. All of these speeds are indicated airspeeds and the airspeed indicator has not been calibrated yet. The empty weight is 738 pounds. This is 3 pounds less than I estimated and presented at the Oshkosh Forum. This is with starter, battery and full electrical system. The center of gravity is right on... 26% MAC with a 200 pound pilot and 0 fuel. All known sequences including the Unlimited Known have been easily flown. All types of spins and gyroscopic maneuvers have been flown, it appears that they all fairly well match the characteristics we found with the Radio Control model. In a nutshell very docile, very predictable, very honest.

## **PILOT REPORTS**

All reports have been extremely favorable. These are roughly some of the quotes some of the pilots have made:

*"The airplane is very docile and easy to land, you could easily let a Decathlon pilot loose in it - it's a real winner."*

*"It goes around looping maneuvers like it is on rails. - "I did two vertical snaps and easily Hammerheaded. - I got 5 vertical rolls before I fell out of the vertical line. - "From level flight I could easily do 3 vertical rolls. - "From 180 KTS I was able to pull 9g's with an extremely aggressive pull up. - "Hammerheads are just as good as a Pitts SIS, it pivots very well, no lack of rudder or yaw control" "The roll rate is nothing short of phenomenal" "You can stop the rolls at any time, there is never any feeling of inertia, it feels as if there are no wings at all." "Rolling 360's are no problem at all, more like a Pitts than other monoplanes I have flown." "I can't get over how well it performs on 160 HP, I easily flew through the '93 Unlimited Known without diving or excessive loss of altitude. - "Torque rolls are as good as any Pitts. - "It does the great Knife edge spins and Shoulder rolls." "A very honest airplane" -"Flat spins can be recovered by just chopping the power and let go of the stick, opposite rudder isn't necessary, the recovery is instantaneous with no rotation acceleration before stopping. -*

## **MODS AND CHANGES**

After the first flight there were some changes made to fine tune the airplane. These included the addition of aileron aerodynamic counter balances (spades), wing tips, a small leading edge strake, and some changing to the control deflection ratios. We always planned on the spades. The wing tips are more for aesthetics than anything. The strake was added to help reduce the buffet experienced during high g maneuvers. To better harmonize the elevator feel the servo tab deflection ratio was adjusted to make the elevator less sensitive.

## **NATIONALS**

By the time you read this we should have had more pilots fly and evaluate the airplane at the Nationals. This will provide more feedback so that the design can be frozen and final construction plans can be completed.

## **DESIGN FREEZE AND DRAWINGS**

As reported earlier, we anticipate that the construction drawings will be available in early 1994. Rick Dean will be assisting me in this area. Rick is a semi-retired aeronautical engineer and will be a great help. I want to be sure that enough pilots evaluate the aircraft before the design is frozen. Plans are still to sell the drawing through Aircraft Spruce and Specialty. Doug Dodge wants to build more aircraft using the new drawings as we complete them, in order to debug them as we go. If you are interested in getting one of these aircraft please contact Doug Dodge at Acro Specialties (517) 893-0801 for more information.

## **KITS AND COMPONENTS**

As the construction drawings are being completed we will be working with various vendors who can make parts and components available through Aircraft Spruce. I will keep you informed as this effort progresses. We hope that this will reduce the building time and put more aircraft in the air sooner.

## **MORE PRESS**

Dave Gustafson is writing an article for SPORT AVIATION which should appear in the November Issue. Budd Davisson is planning to write a pilot report. Anyone who has ever read some of Budd's pilot reports on aerobatic aircraft knows that they are really great. As a longtime Pitts pilot he knows what he is talking about!

## **TWO PLACE**

I've received a lot of requests to design a two-place version of the One Design. This will have to be a commercial venture, and, of course, completely separate from the One Design class. I think that these plans can be put into motion just as soon as the One Design work is complete and the construction drawings are finished. Currently I'm planning on two versions, side by side and tandem seating arrangements. I will also design a tricycle landing gear version of the side by side airplane. Both variants will be powered with 200 HP engines. These are very ambitious plans and I want to do it right so it will take some time.

## **NATIONALS POSTSCRIPT...**

*by Mike Heuer*

Indeed, One Design did make it to Denison, Texas for the U. S. National Aerobatic Championships. Doug Dodge flew it in for the event and Doug Jardine flew it in Intermediate. Dozens of pilots got the opportunity to fly it and the comments were overwhelmingly positive. Be sure to check with someone in your area if they attended Nationals, because they probably flew the airplane.

We hope for a complete pilot report in SPORT AEROBATICS sometime soon.

*Dan Rihn Long Beach. CA*