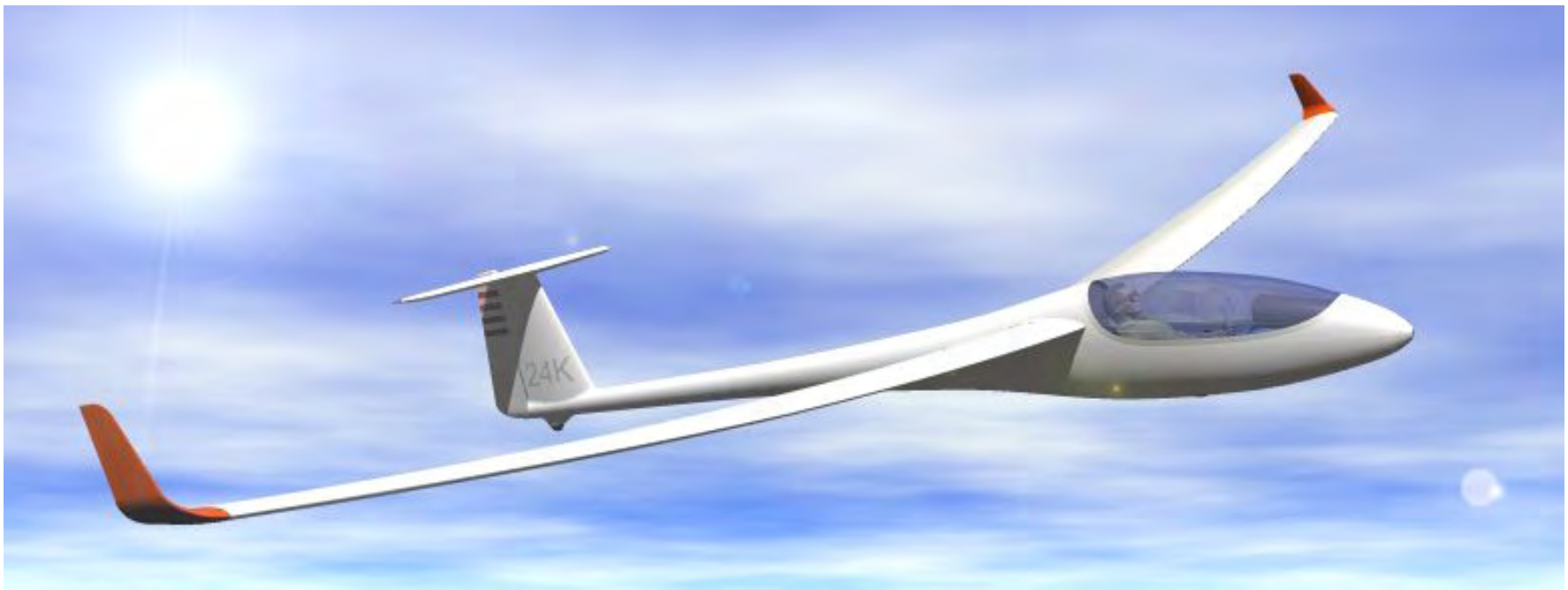
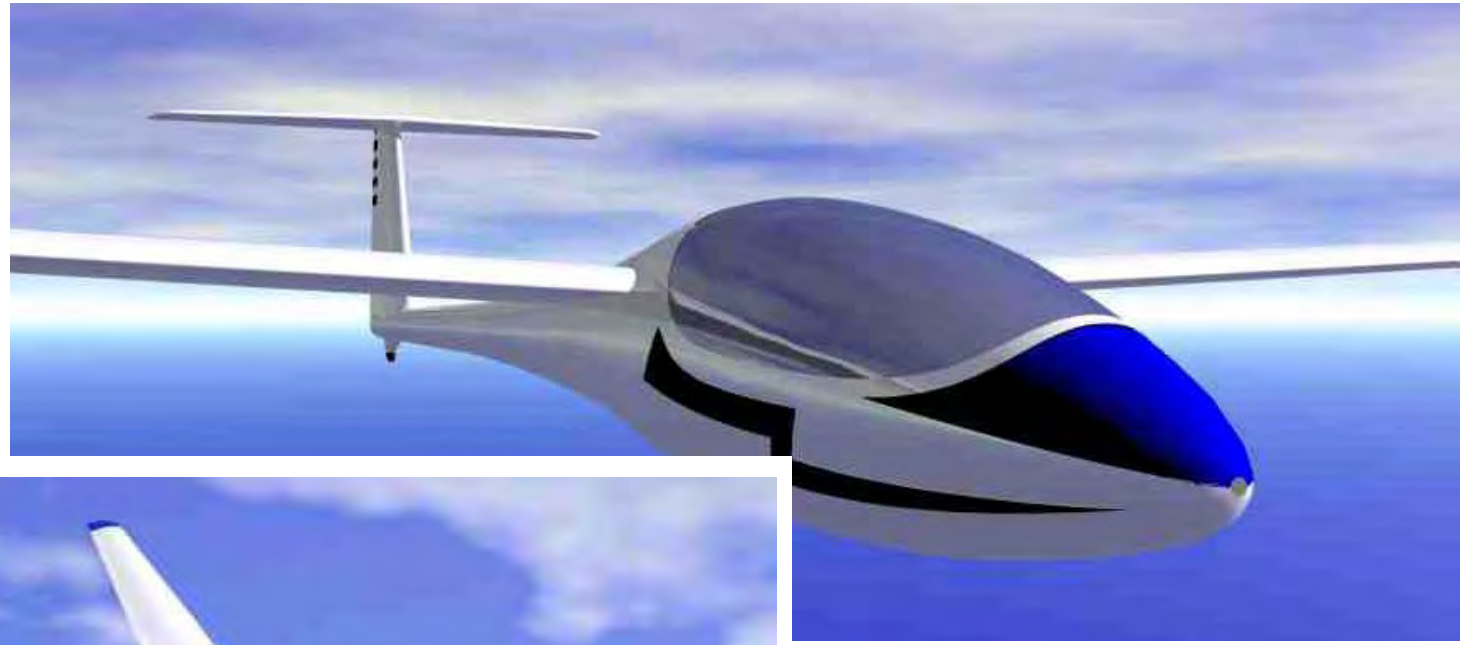
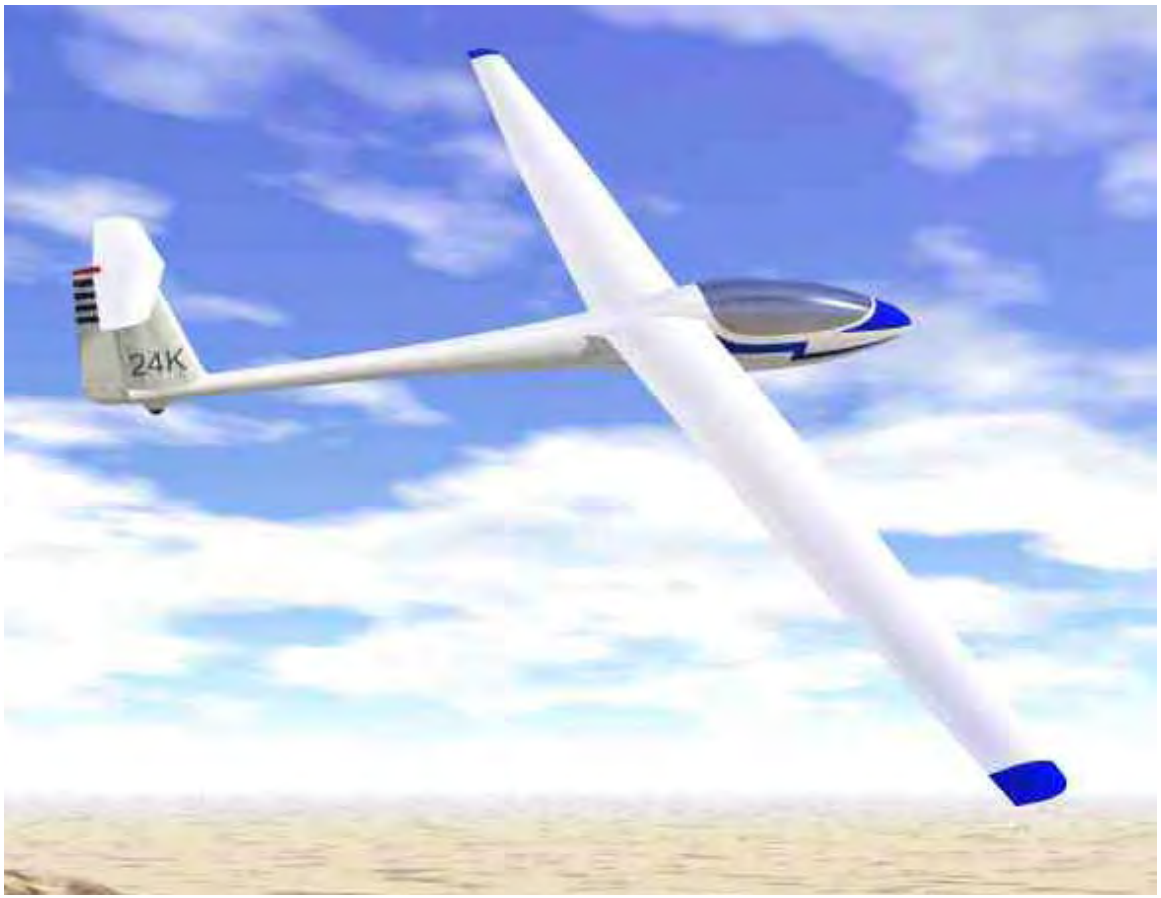

HP
AIRCRAFT

Building the HP-24 (Project)

Bob Kuykendall 19 November 2005






24K

HP-24 Project Sailplane

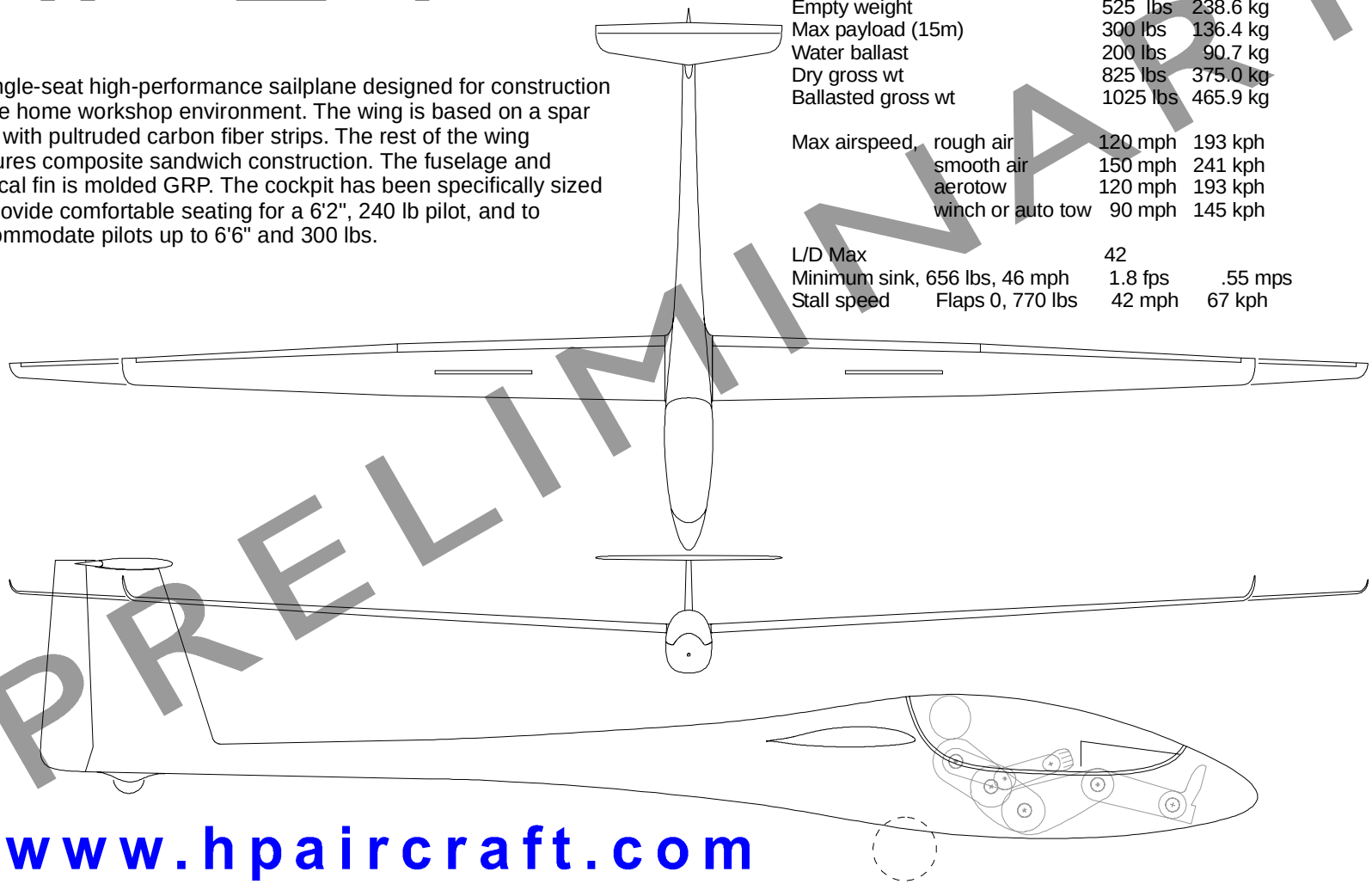
- **High-Performance 15m**
- **Flapped and Unflapped**
- **(Relatively) Low cost**
- **Supplied in quick-build kit**
- **Advanced features:**
  Auto-connect controls
  Optional winglets & 18m extensions
  Front hinge canopy
  Roomy cockpit

HP-24

A single-seat high-performance sailplane designed for construction in the home workshop environment. The wing is based on a spar built with pultruded carbon fiber strips. The rest of the wing features composite sandwich construction. The fuselage and vertical fin is molded GRP. The cockpit has been specifically sized to provide comfortable seating for a 6'2", 240 lb pilot, and to accommodate pilots up to 6'6" and 300 lbs.

HP-24 Specifications

Span	49.2ft/59ft	15.0 m/18.0 m
Length	22.9 ft	6.98 m
Height	52.1 in	1.22 m
Wing Area	108.0 sq ft	10.02 sq m
Aspect ratio	23.0	
Dihedral	3.1 degrees	
Flaps	-5 to 15 degrees	
Empty weight	525 lbs	238.6 kg
Max payload (15m)	300 lbs	136.4 kg
Water ballast	200 lbs	90.7 kg
Dry gross wt	825 lbs	375.0 kg
Ballasted gross wt	1025 lbs	465.9 kg
Max airspeed, rough air	120 mph	193 kph
smooth air	150 mph	241 kph
aerotow	120 mph	193 kph
winch or auto tow	90 mph	145 kph
L/D Max	42	
Minimum sink, 656 lbs, 46 mph	1.8 fps	.55 mps
Stall speed Flaps 0, 770 lbs	42 mph	67 kph



PRELIMINARY

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HP-24 Project Status

First Article parts

Molds

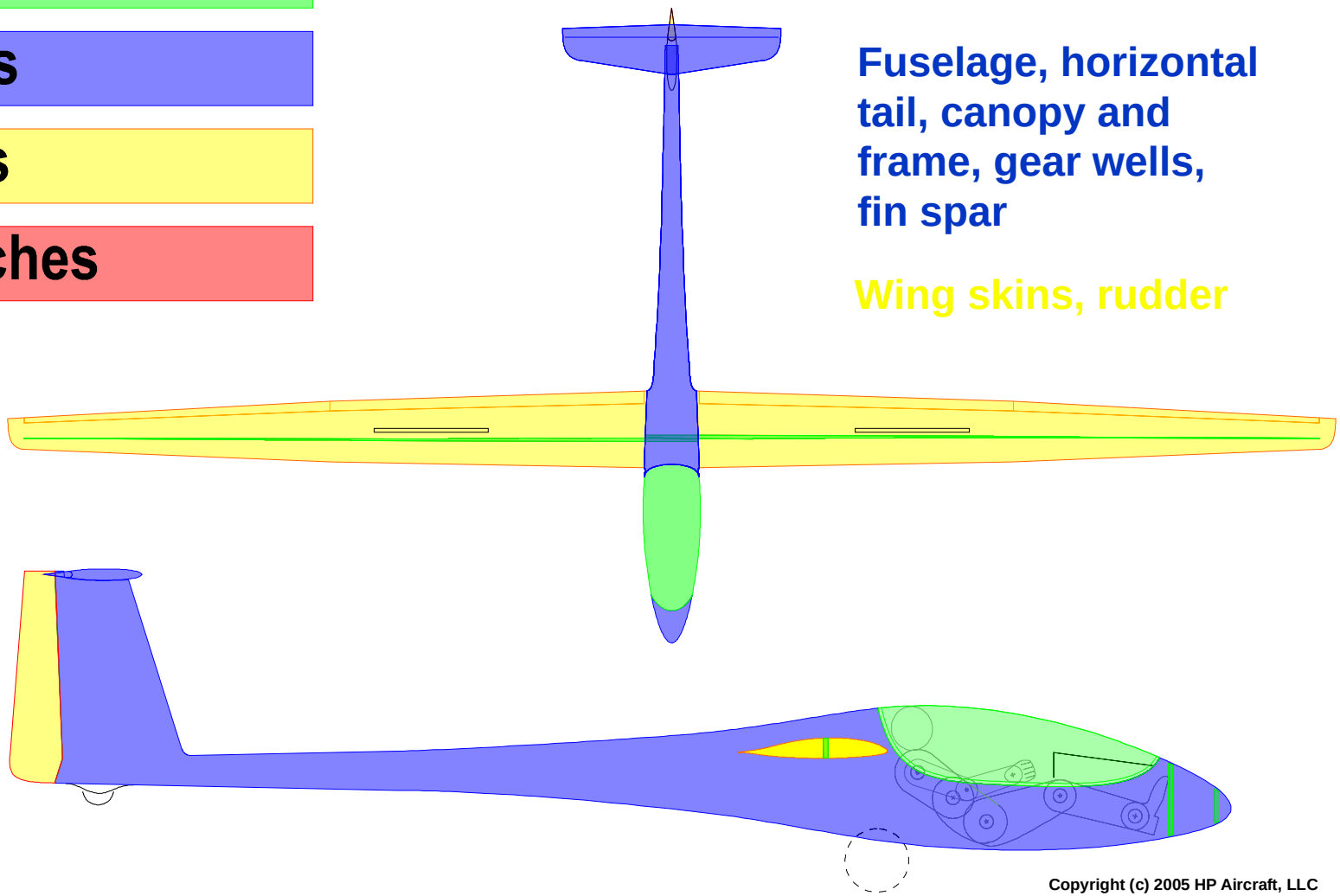
Plugs

Sketches

Canopy, Spars, Bulkheads

Fuselage, horizontal tail, canopy and frame, gear wells, fin spar

Wing skins, rudder



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Project Intent

- **Develop a sailplane kit as a product, not just a one-off unit.**
- **Innovate sparingly – leave the bleeding edge to the big boys.**
- **Favor handling and amenities over performance**
- **Keep costs down – way down.**
- **Keep options open – Indecision is the key to flexibility.**

Who We Are

- **Bob Kuykendall – Project principal, designer, financier, project manager**
- **Brad Hill – 3D modeling, composite fabrication, spinoff development**
- **Steve Smith – Non-evil genius; aeronautical and otherwise**
- **Harald Buettner – Molds, first-article parts, and composites common sense**

For more information:

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HP-24 Project Photos:

2001 through 2005

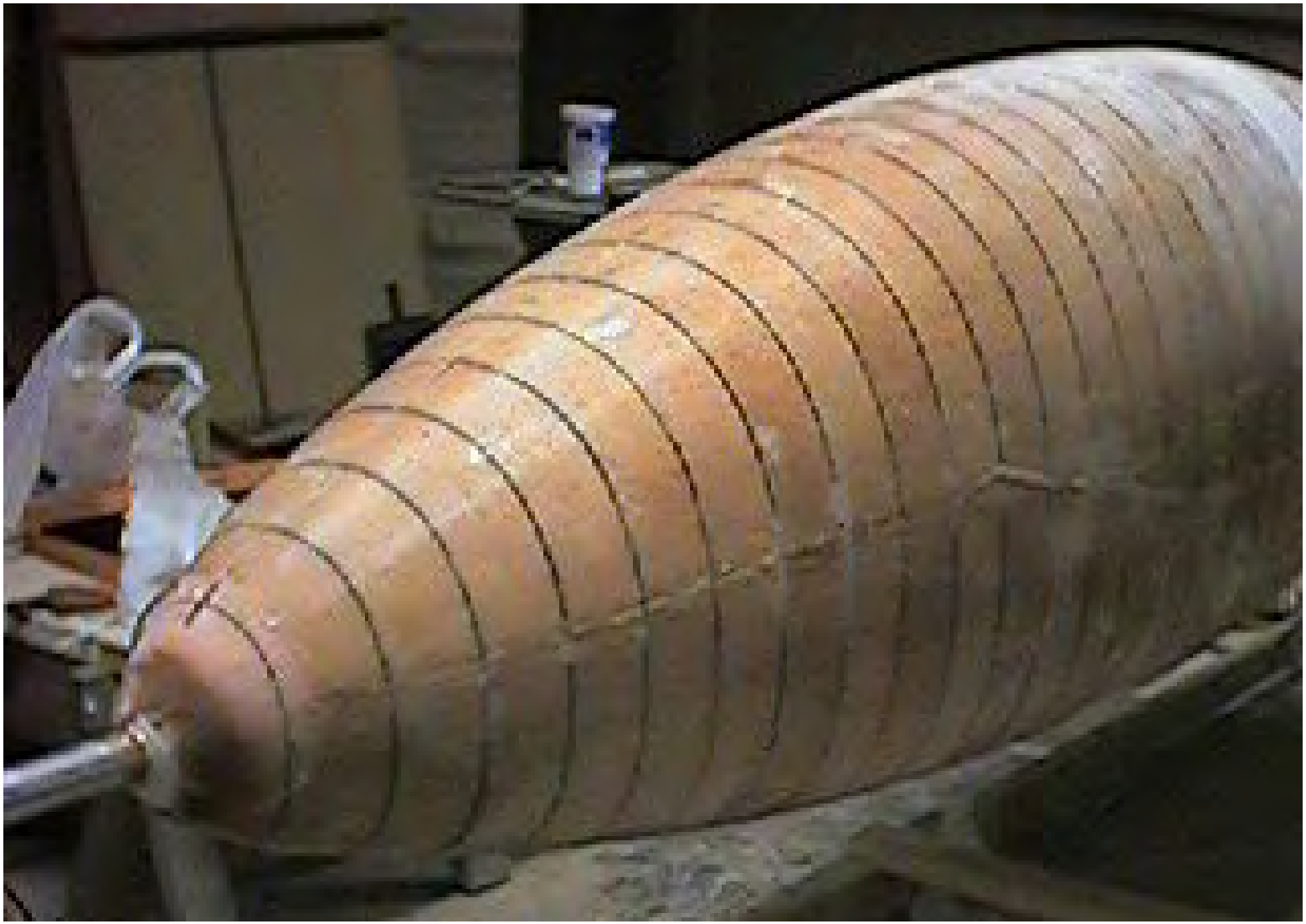
March 2001:
Ordered CNC-cut Masonite fuselage station templates

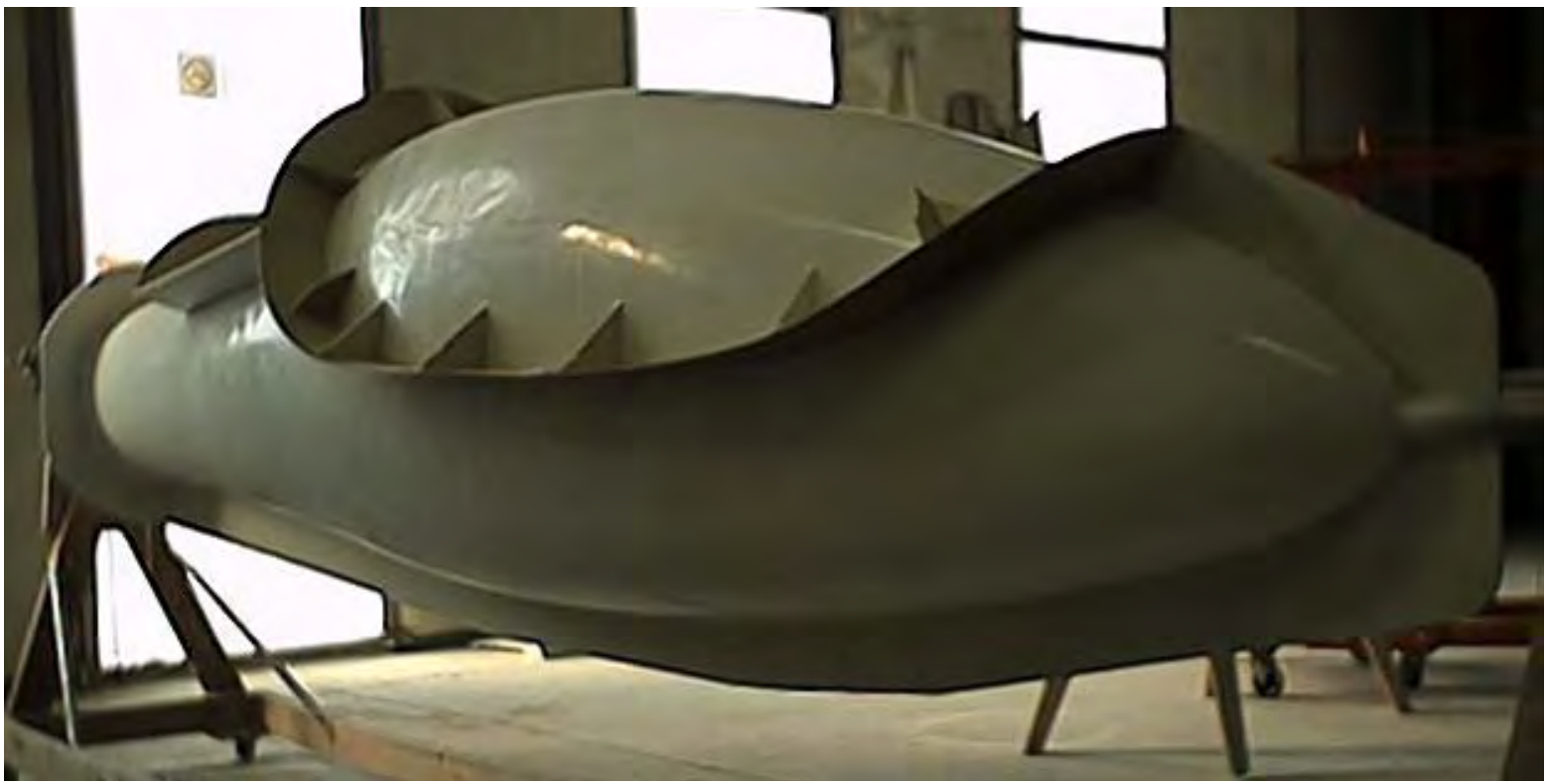
April 2001: Glue templates to 3” thick foam, stack on spindle

April 2001: Building the Pink Armadillo

April 2001: Sanding the Pink Armadillo

June 2001: Skinning the Armadillo

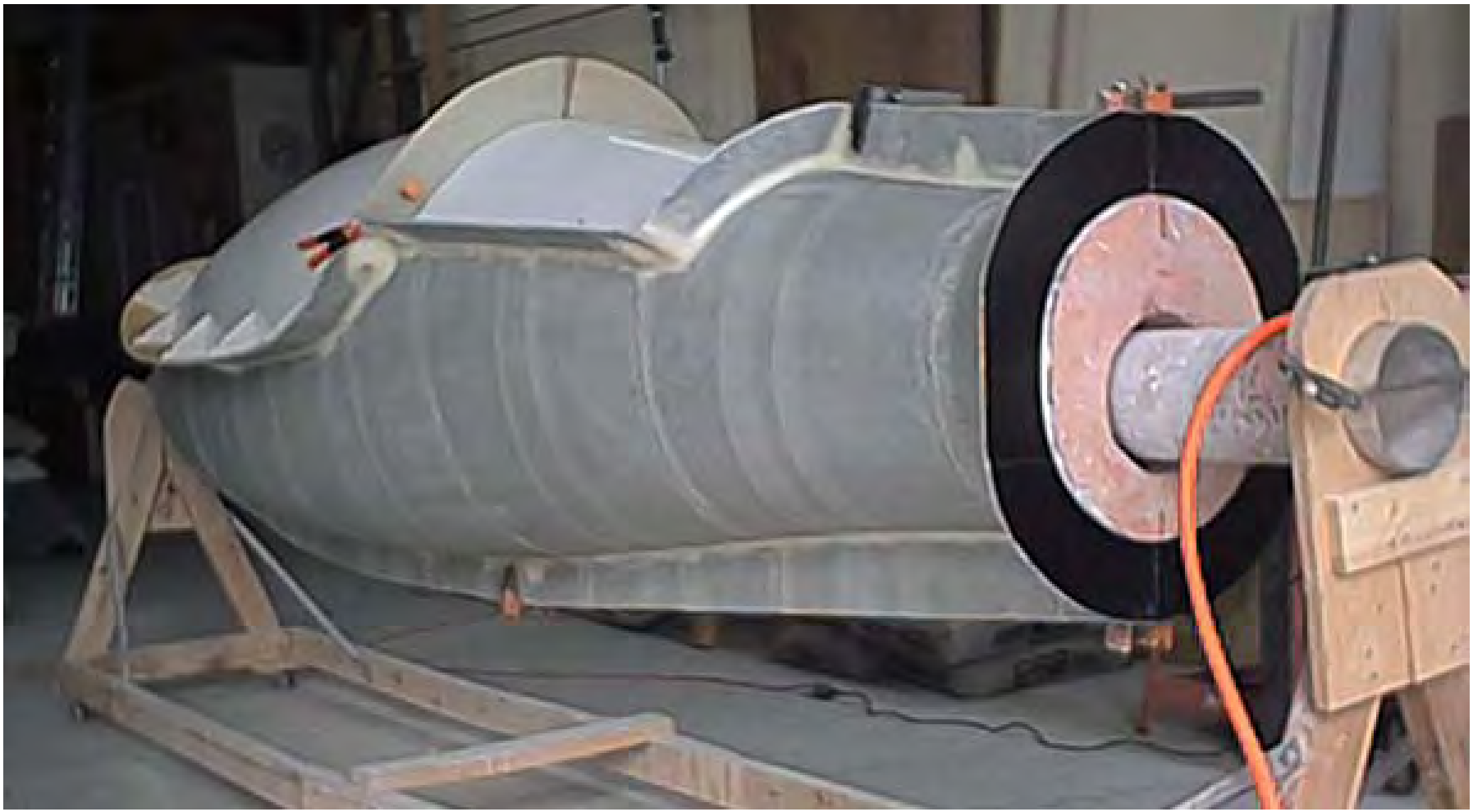




February 2002: Flanging Moby Plug

March 2002: Molding Moby Plug

March 2002: Molding Moby Plug

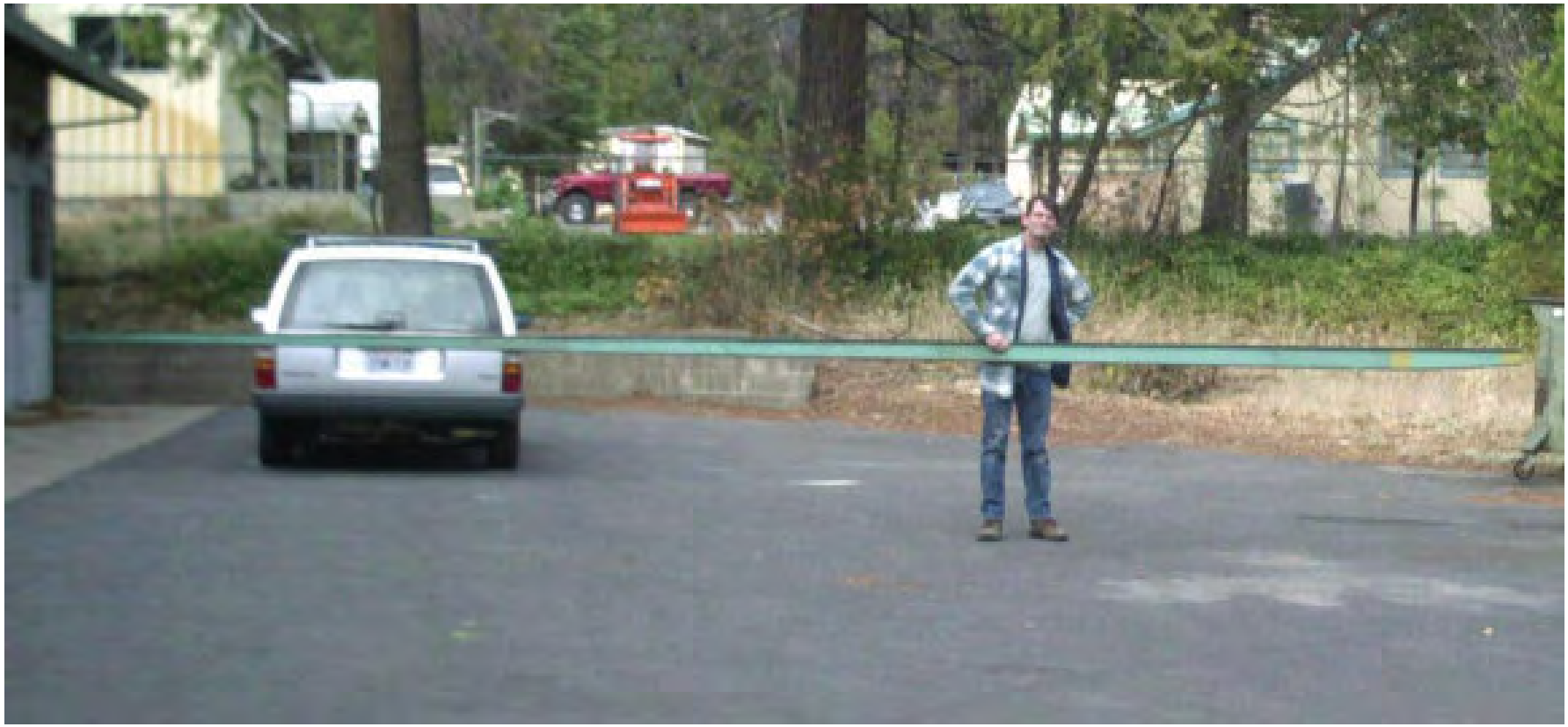


March 2002: Molding Moby Plug

August 2002: Molding the cockpit rail and canopy transparency area

May through August 2002: Making the wing spar plug

November 2002: First wing spar set



March 2003: Something to Sit In

October 2003: Assembling inboard wing plug cores

December 2003: Skinning inboard wing plug cores

December 2003: Skinning inboard wing plug cores

February 2004: Assembling outboard wing plug cores

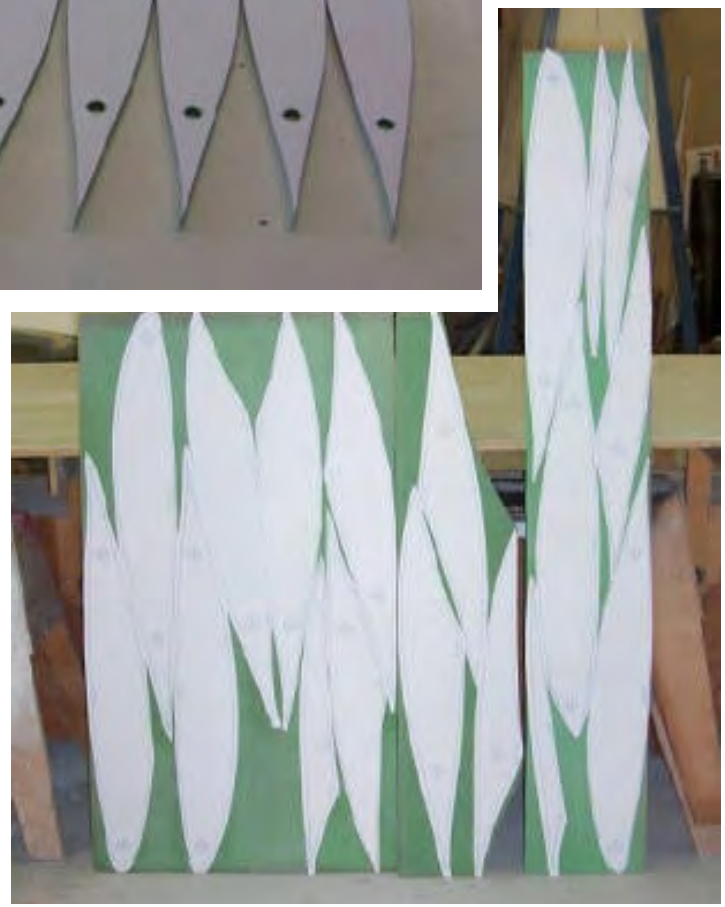
March 2004: South end heads South

March - April 2004: Joining inboard and outboard plug sections

April 2004: Pin the tail on the stubby

May, June 2004: Harald invents the Missing Link

July 2004: We C 'N' Saw the wing fairings



July 2004: Filler the fillets, and paint to hide

August 2004: The whole fuselage (plug)

September 2004: Flanging the long plug

October 2004: Fuselage molds Right and Left

October 2004:
Painting the horizontal tail plug

November 2004:
Something to sit in, under glass

December 2004: The first half fuselage attempt

December 2004:
The first half fuselage attempt

March 2005: Flanging and framing the horizontal

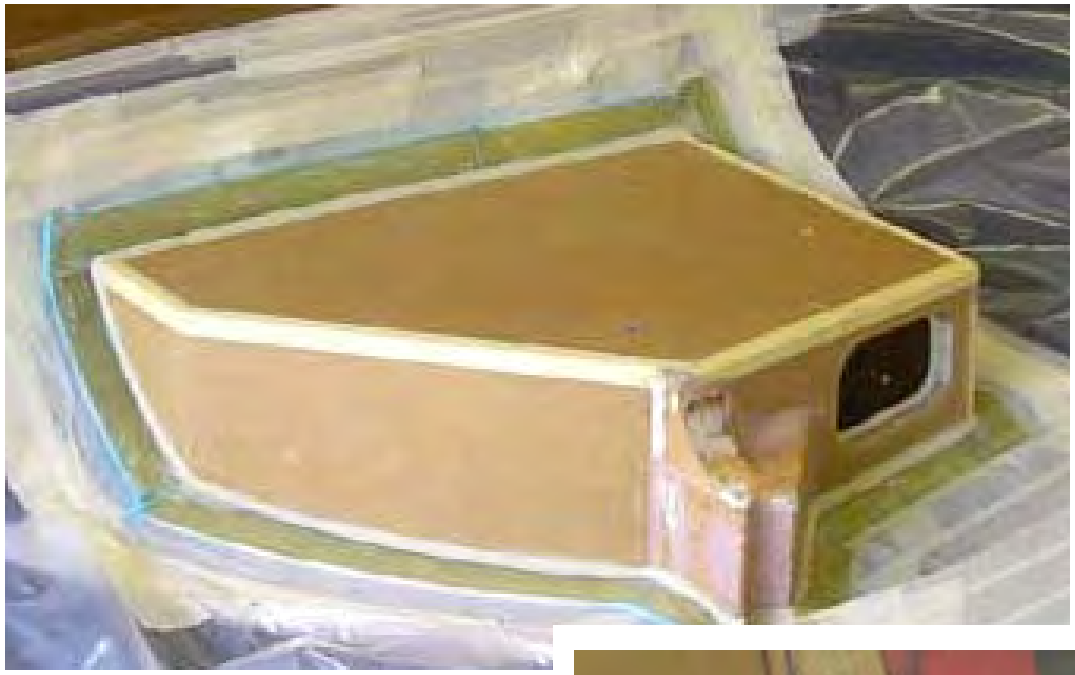
March 2005: Horizontal tail molds done

May 2005: Aligning the wing plugs

May 2005: Aligning the wing plugs

May 2005: Aligning the wing plugs

May 2005: Making the gear box molds



May 2005: Making the gear box molds

May 2005: Making the gear box molds

May 2005: Making the fin spar plug

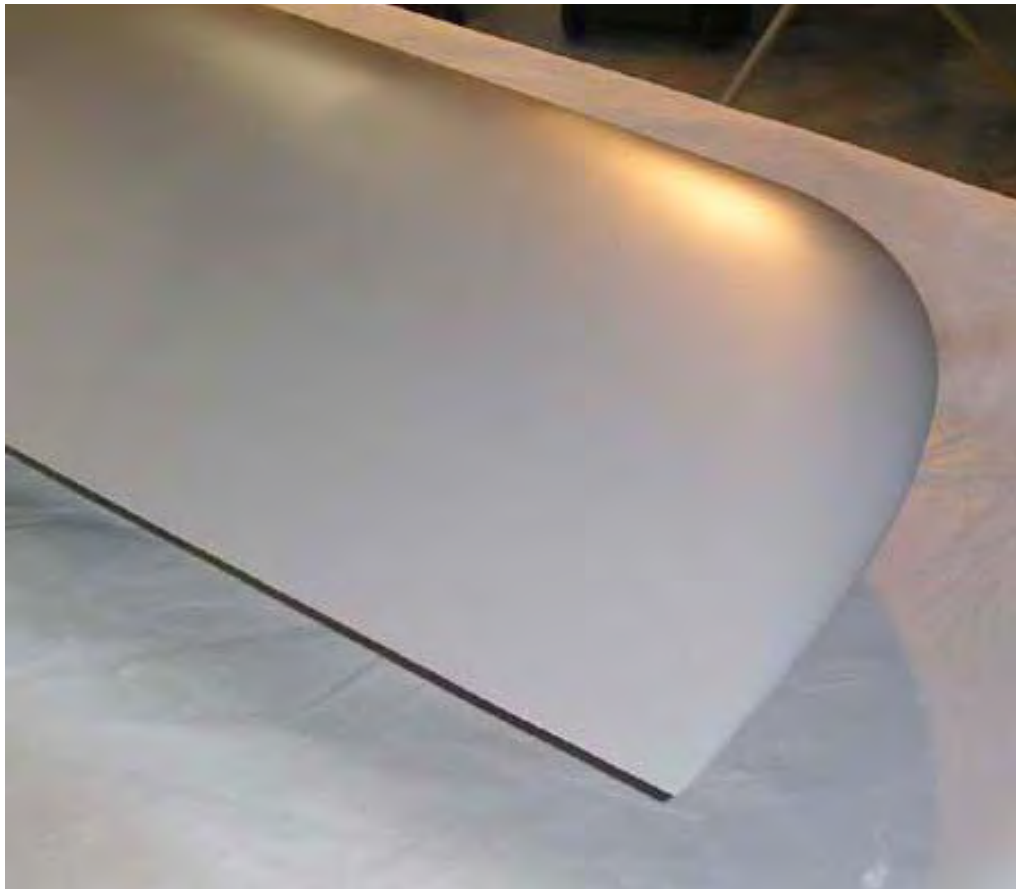
June 2005: Making the fin spar mold

May 2005: Brad starts finishing the wing plugs

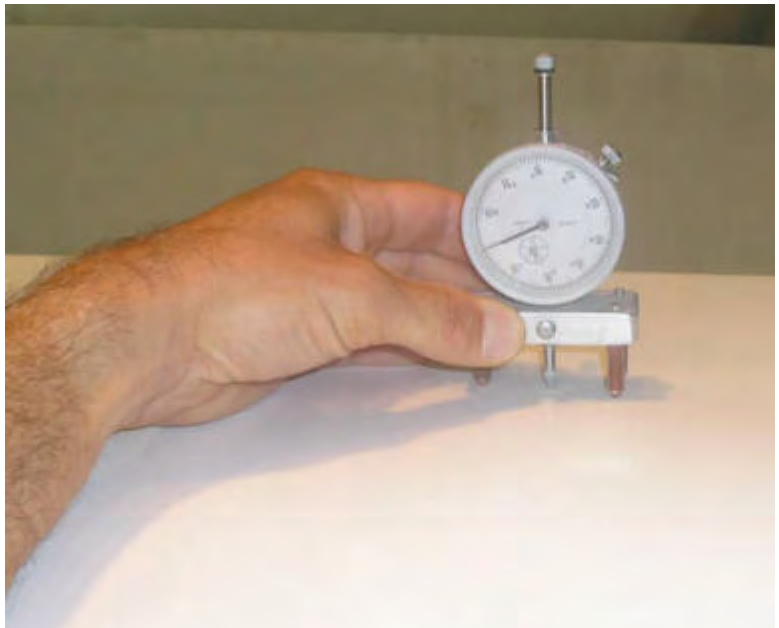
May 2005: Adding the "default wingtips"

May 2005: Fairing in the wing fairing

June 2005: Filling and sanding the wing plugs



June 2005: Filling and sanding the wing plugs

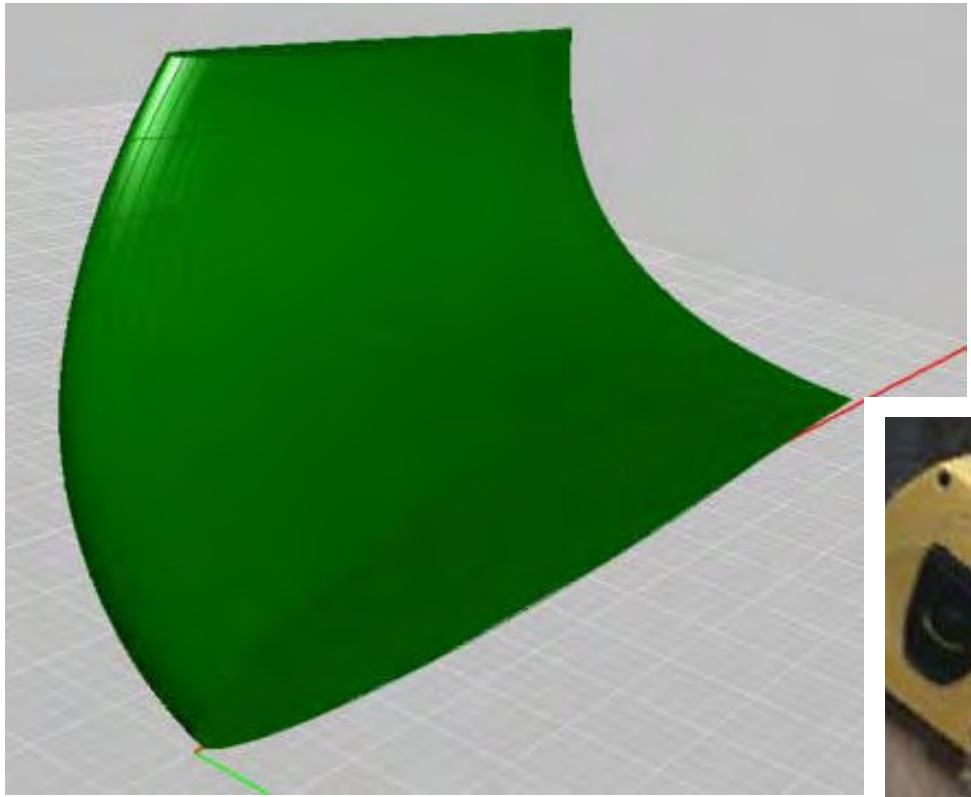


July 2005: Filling and sanding the wing plugs

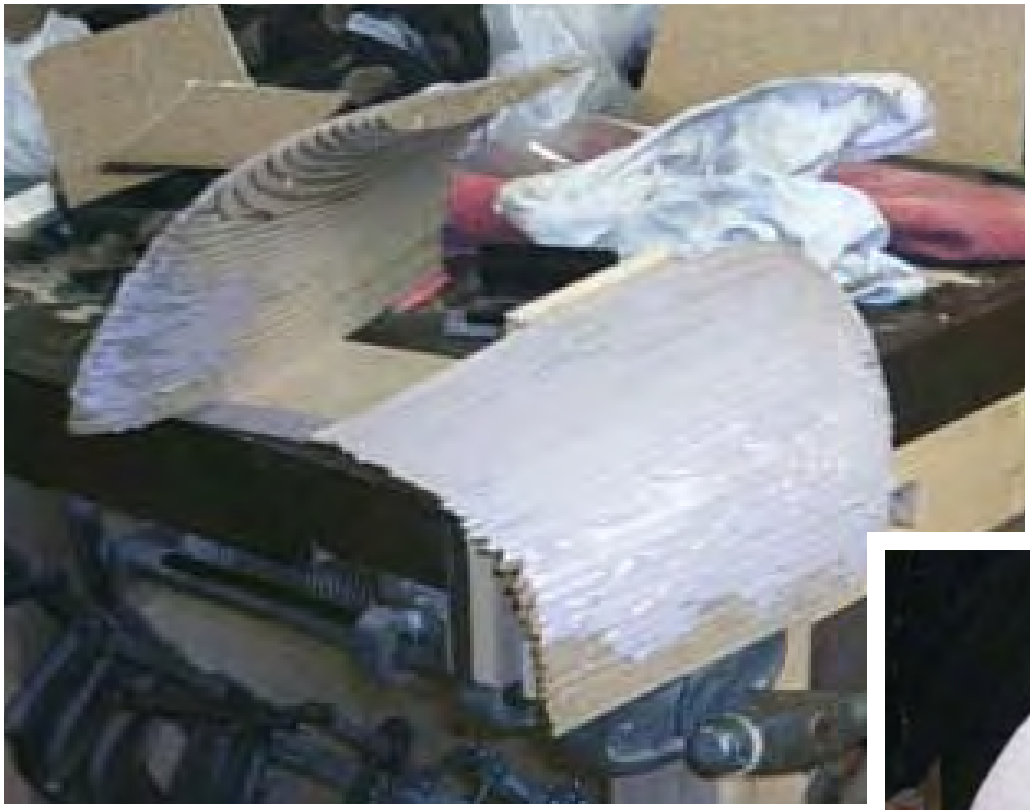
August 2005: Polishing the wing plugs

20/21 August 2005:
Royal Arches route

September 2005:
Control stick platform plug



September 2005:
See ‘n’ saw the winglet transitions



September 2005:
See ‘n’ saw the winglet transitions

October 2005: Welding the wing mold support trusses

October 2005: Welding the wing mold support trusses

Next Steps:

- **Send fuselage molds to Brad Hill (December 2005)**
- **Develop plugs and prototypes for canopy pivot and jettison system (December 2005)**
- **Ready wing plugs for molding (January 2006)**
- **Brad Hill makes three fuselage shell sets (January 2006)**
- **Make wing skin molds (winter/spring 2006)**
- **Make prototype wings 2006**
- **Develop a lot of essential little parts 2006**
- **Build prototype glider TBD**

For more information:

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