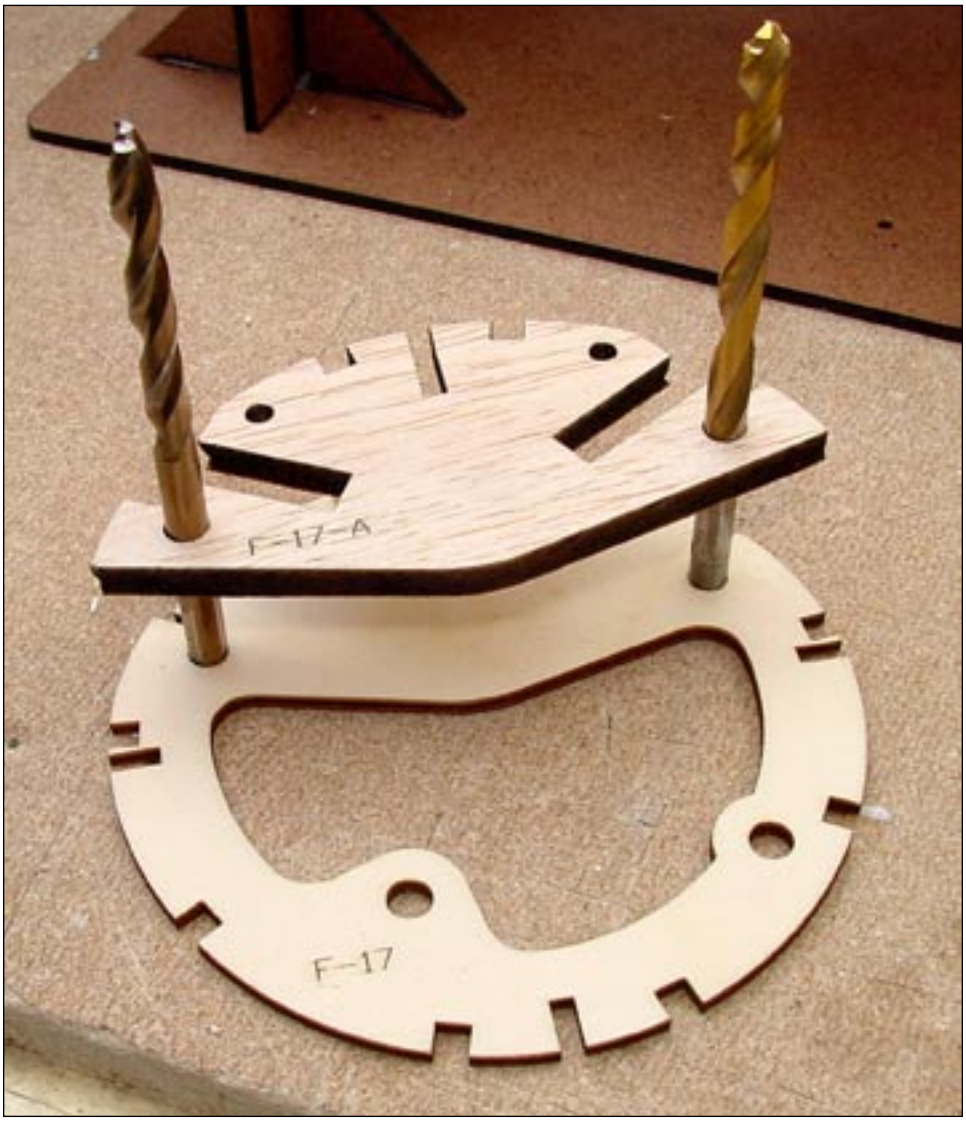
LEAR FAN Fuselage Assembly

Photo 1



Critical alignment of components is made easy utilizing alignment holes as shown above. The slots in F-17-A will engage the stabilizer spars and set the dihedral angle of the stabilizers when installed.

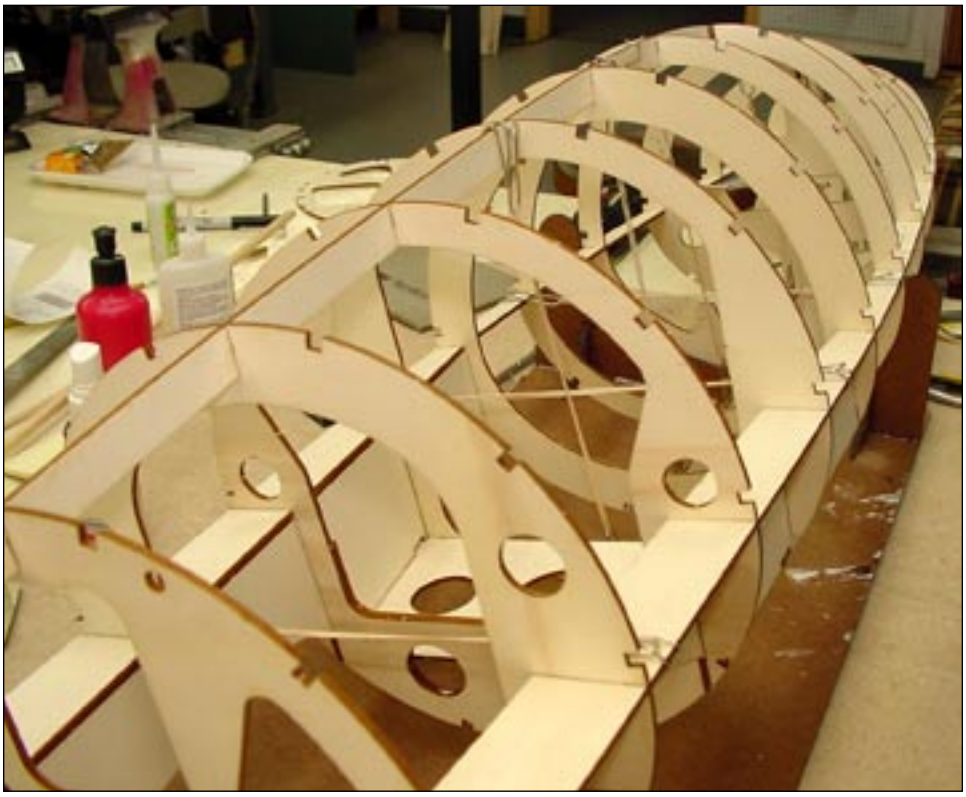
Photo 2

After completing the subassemblies, fuselage assembly begins by positioning the formers in there appropriate slots in one of the longerons. The components are held in place with bungee chords fabricated from rubber bands and large paper clips. This is essential since all internal tabbed components must be installed before any glue is applied.

Photo 3-A

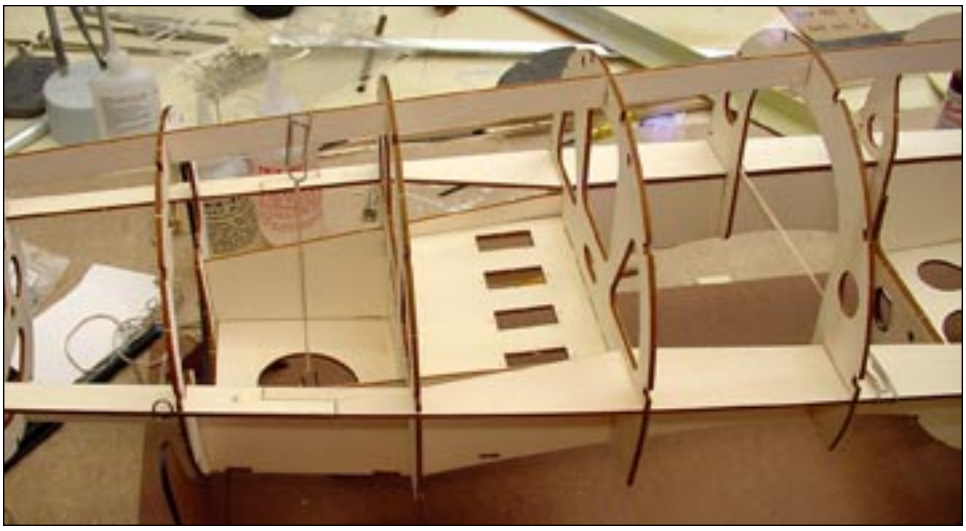
The keels and longhorns are keyed at the front and back to assure all components are square. After gluing, this material is removed to make room for all the linkages, fuel lines, motor mount bolts Etc.. Note the tab on the firewall at the left and the slot in F-17-A on the right. They will set the correct incidence for the stabilizers when installed.

Photo 3



Glueing begins at the center of the fuselage with the wing brace plates. Gussets and triangle stock will help keep track of where you have applied adheasive. All notched and tabbed components must be bottomed in there slots.

Photo 5

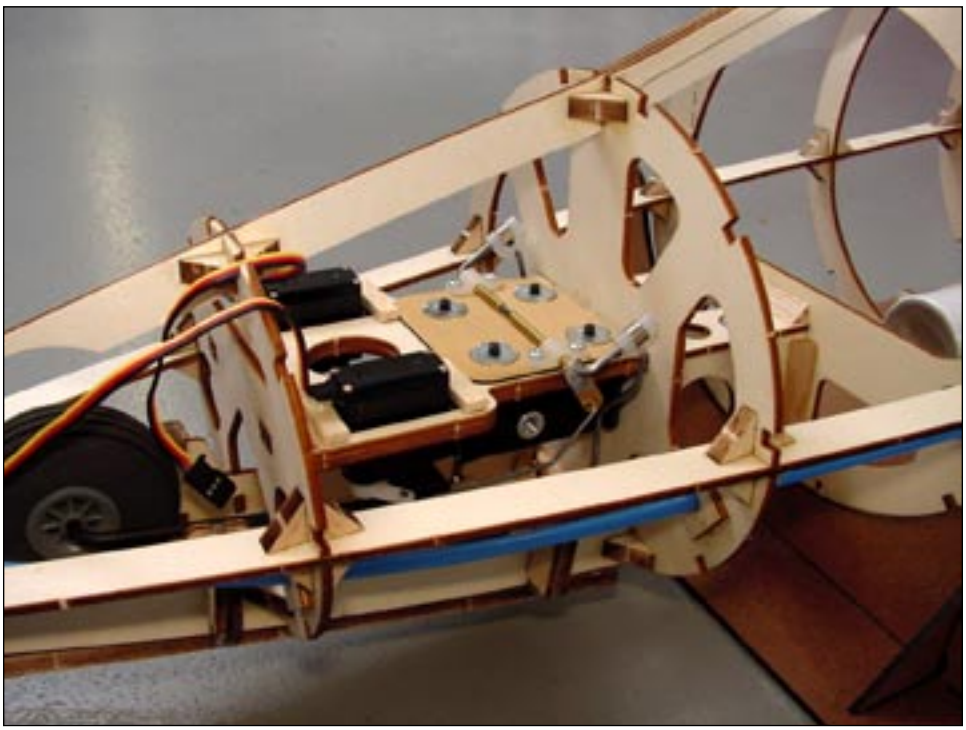


The servo tray and the front and back wing brace plates will secure the the remainder of the fuselage square when glued. Once again, triangle stock is used at the interface of all these components for added strength.

Photo 6

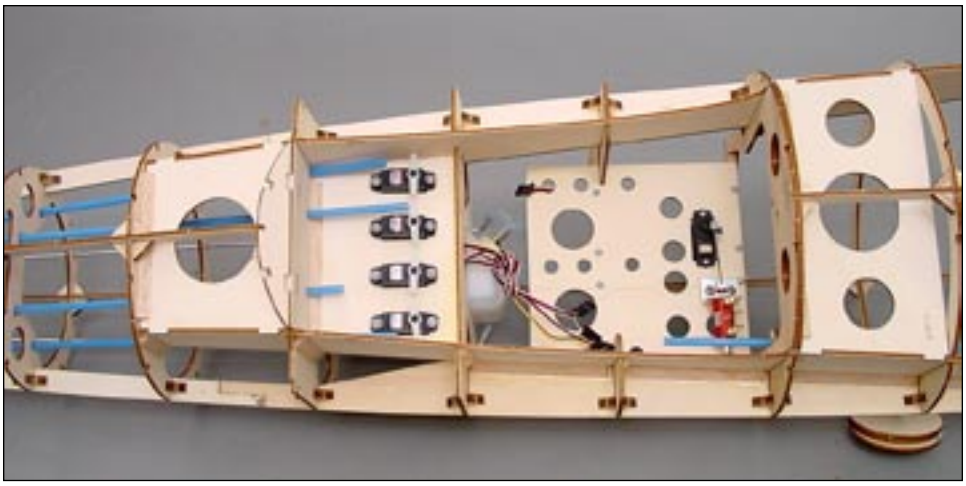
Forward section showing the keel doublers for the windshield center post, landing gear mount and servo tray. Below that the nose gear door braces which will define the door opening and support the door hinges.

Photo 7



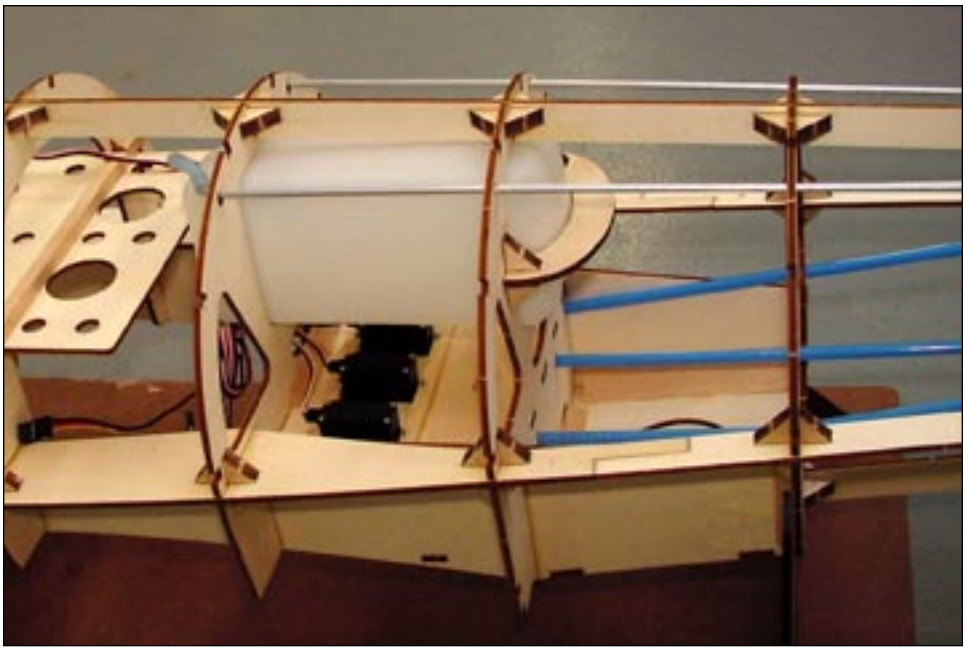
Nose gear assembly containing the gear door and steering servos as well as the door mechanism fabricated from off the shelf components. The balsa nose gear doors installed here were later replaced with doors fabricated from carbon fiber. Installation of these components at this point is easy with unlimited access.

Photo 8



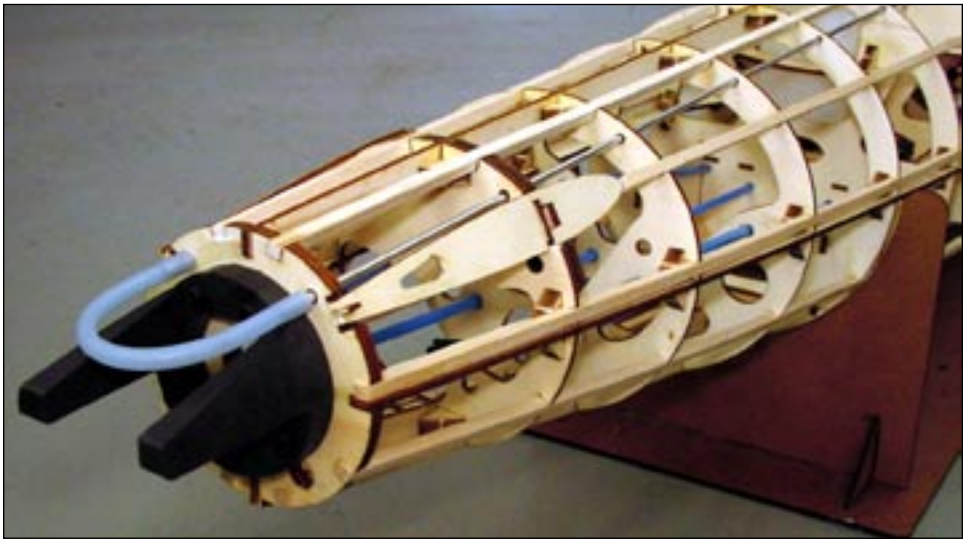
Center section of the fuselage showing many of the components installed. After sheeting, access to the aft portion of the fuselage will be limited, the forward section will be accessible through the wing opening.

Photo 9



Center section from the top showing the fuel tank installation and fuel lines. All Ny-Rod guide tubes are attached with hot melt glue and run in a straight shot between the servos and the torque rod connections.
NOTE: The Nyrod linkage for the elevators has been replaced with carbon fiber tubes and is no longer reccomended.

Photo 10

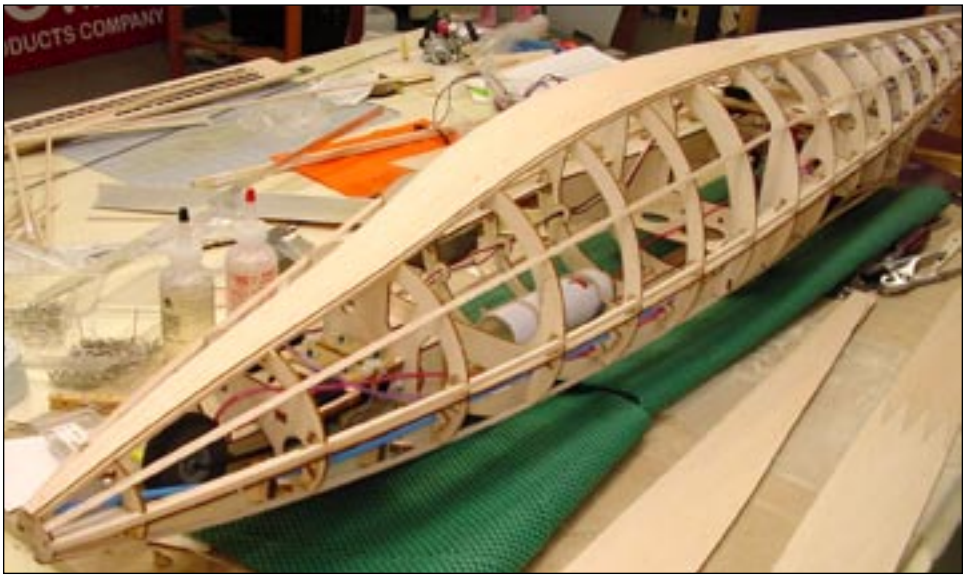


Tail section after adding the stringers and stabilizer and rudder base plates. Fuel tubing is used to seal off the fuel system during construction. Access to the linkage connections is through holes in the firewall under the inverted motor mount. Aileron ball link connections are used on all moveable surfaces back here.

Photo 11

The fuselage is sheeted with 3/32” laser cut balsa strips joined with finger joints shown above. This is the top or 12 O’clock strip and will be the first one installed. Ten of these strips will sheet the entire fuselage.

Photo 12

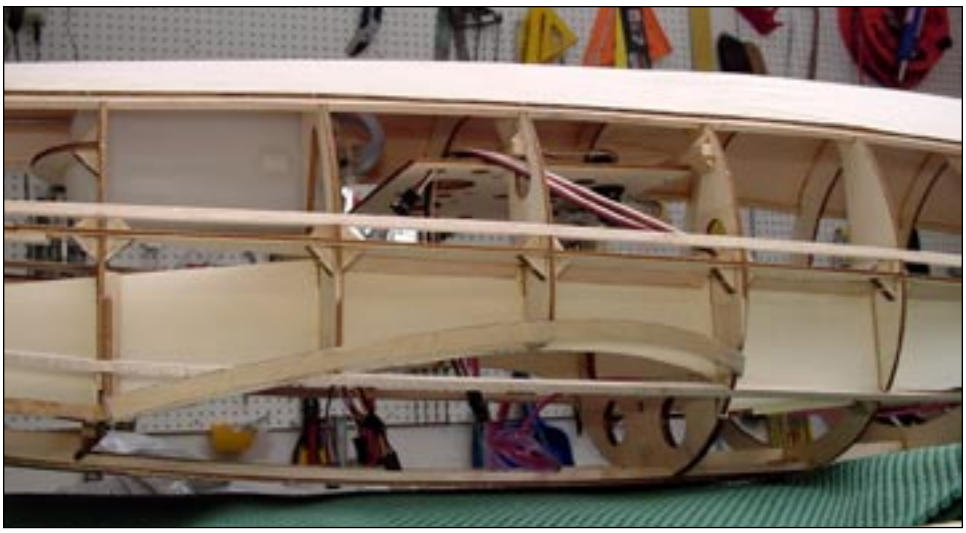


The 12 O'clock and 6 O'clock skins installed. The gear opening and wing opening will initially be sheeted over and opened later.

Photo 13

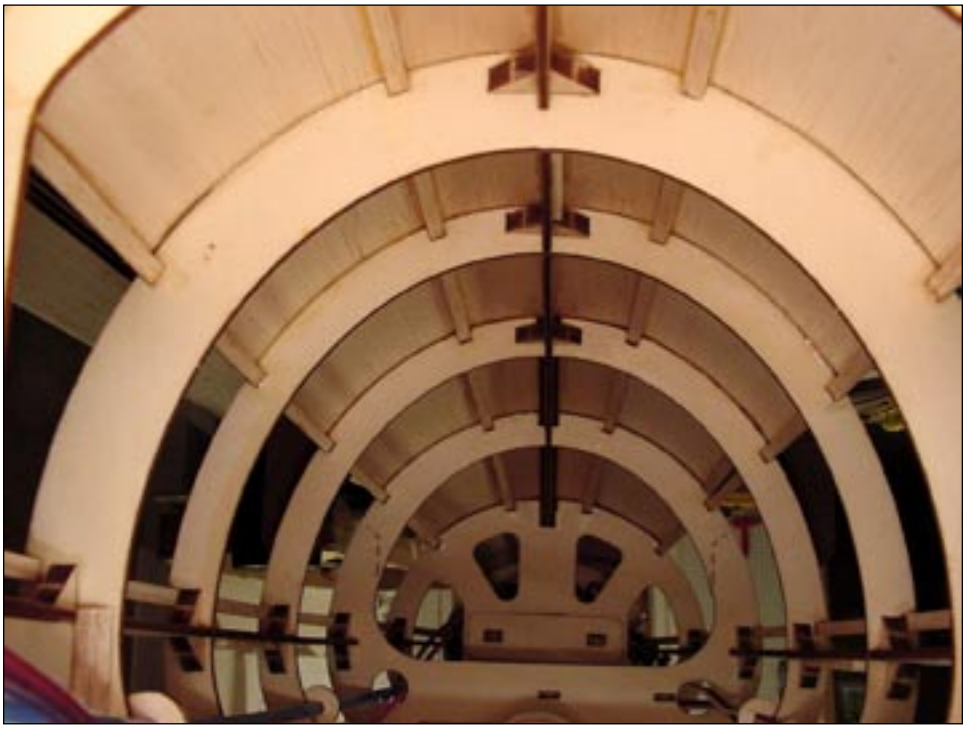
With four skins installed and six to go, the fuselage starts taking shape. This technique worked out well due in large part to the gentile curves of the Lear. As usual when bending wood, you will want to select sheets with the straightest grain.

Photo 14



Side view during the sheeting process. The 1/32” ply wing opening liner is set into the 3/16” stringer and the sheeting is glued to both.

Photo 15



Another view during the sheeting process from the other side of the wood. Thin CA is used at the skin and stringer joints and thick CA is used on the formers. A water and ammonia mixture was used to wet the skins before installing.

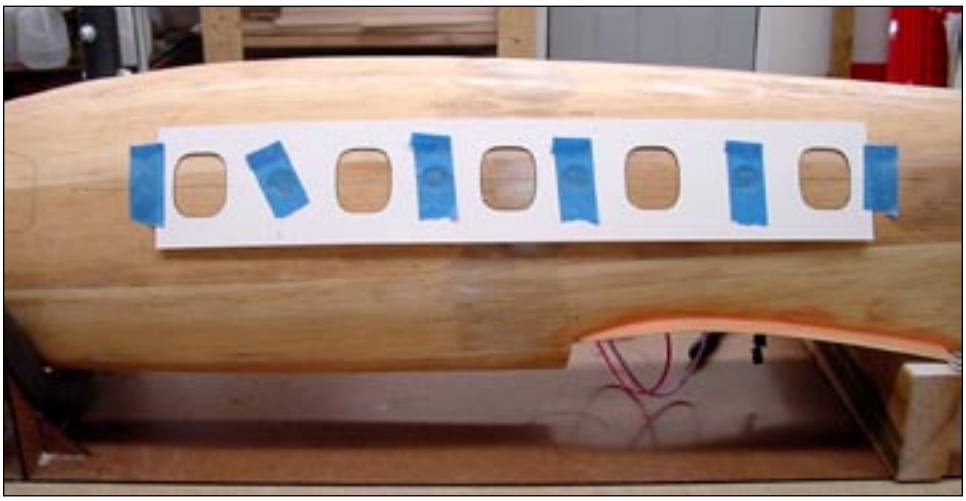
Photo 16

Sheeting completed and spackle applied to fill miner bumps and joints. The skins have been removed from the rudder and stabilizer base plates and the wing opening. A little sanding and it will be ready to glass.

Photo 17

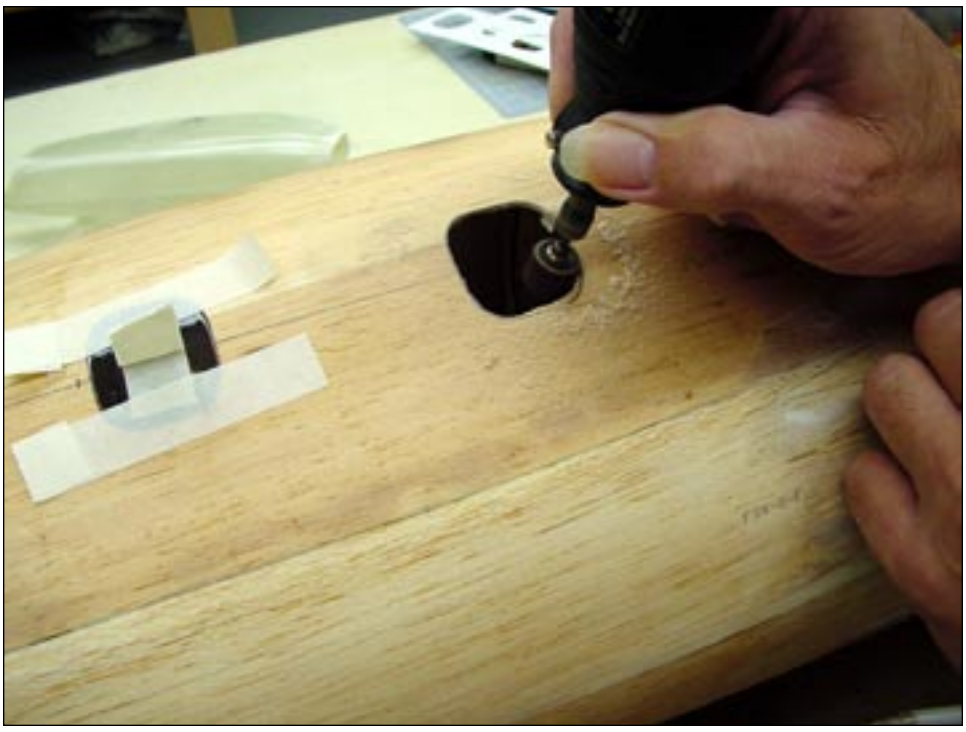
Wing opening showing all that good stuff installed earlier. The 1/32” ply wing fillets will be installed next.

Photo 17



Locating the window openings with the aid of a cardboard template lifted from the side view drawing. Using the template as a guide, the windows are drawn onto the fuselage with a felt tip pen.

Photo 19



A rough opening is cut and then slowly opened up until a good fit with the preformed windows is obtained. The window at the left has been glued in place with Pacer Formula 560 and held flush with the surface of the fuselage with masking tape. A chamfer is back sanded into the stringers until they no longer interfere with the window. It's a lot easier then it sounds.

Photo 20

All window and windshield joints are filled with a generous bead of Pacer Formula 560 glue, here being applied with a syringe. All windows are then masked off with frisket and the joints filled with Sig Epoxolite filler, creating a flush surface.

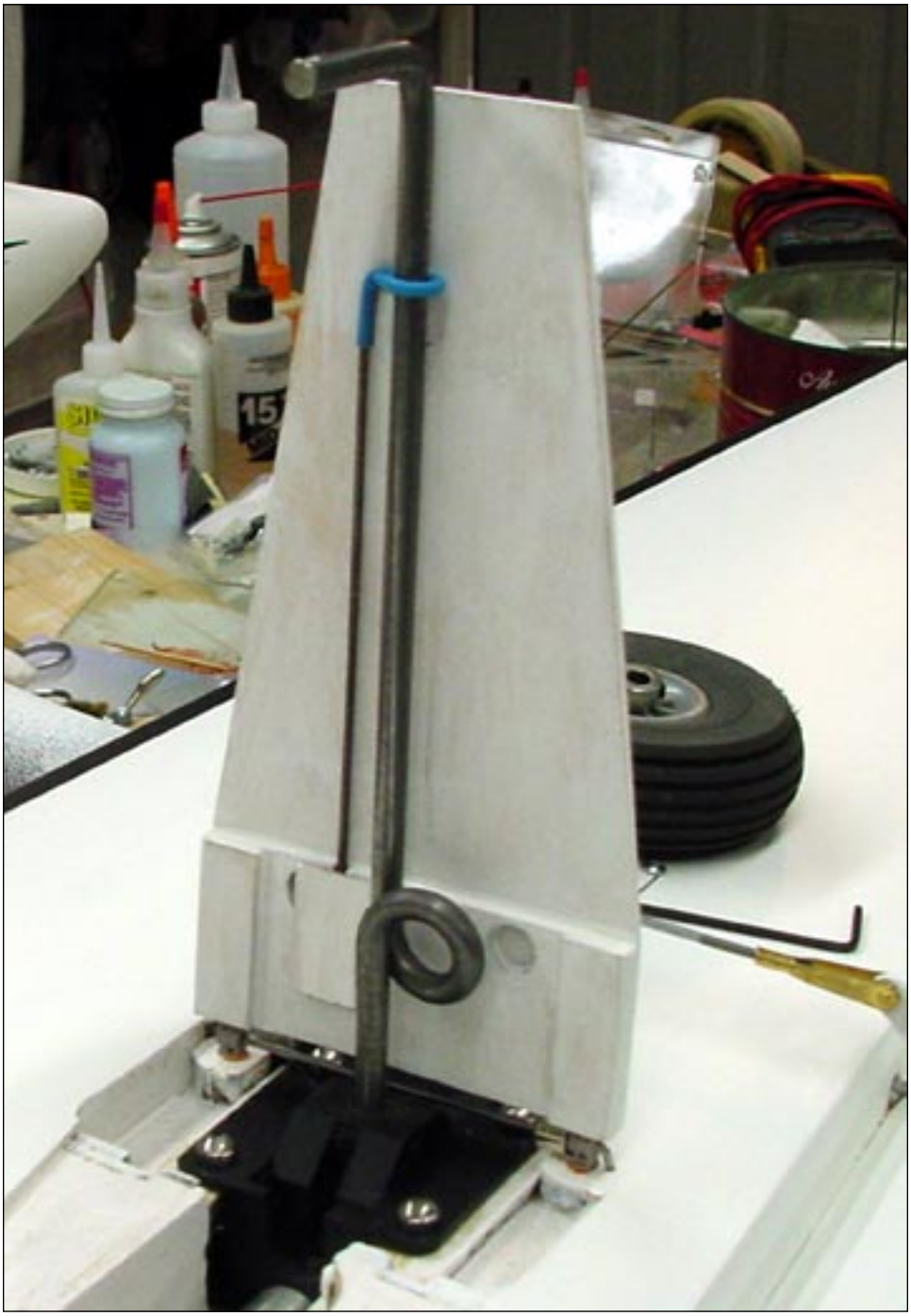
Photo 21

After trimming the fiberglass scoops for a loose fit to the fuselage, a piece of acetate is rolled into a tube and installed to simulate intake and exhaust ducting. The acetate has been painted with silver and flat black paint before rolling it. The foam pieces are used to apply pressure from the inside of the tube until the adhesive has cured.

Photo 25

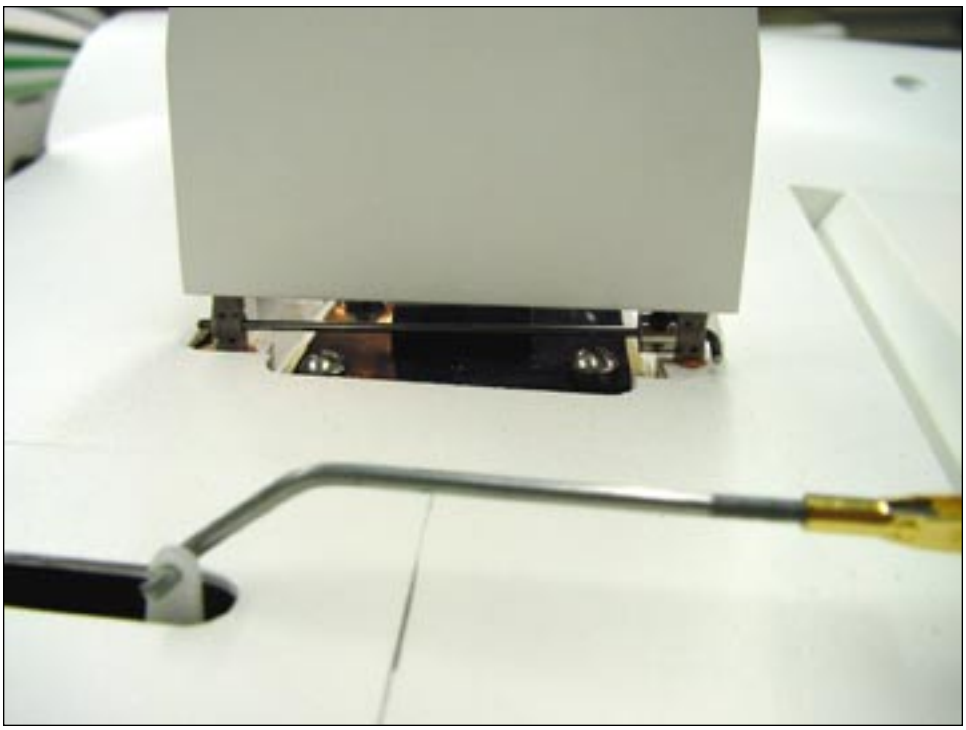
Ready for primer, windows, scoops and the empennage installed. All fillets are made with Sig Epoxolite and are considered a structural component.

Photo 22



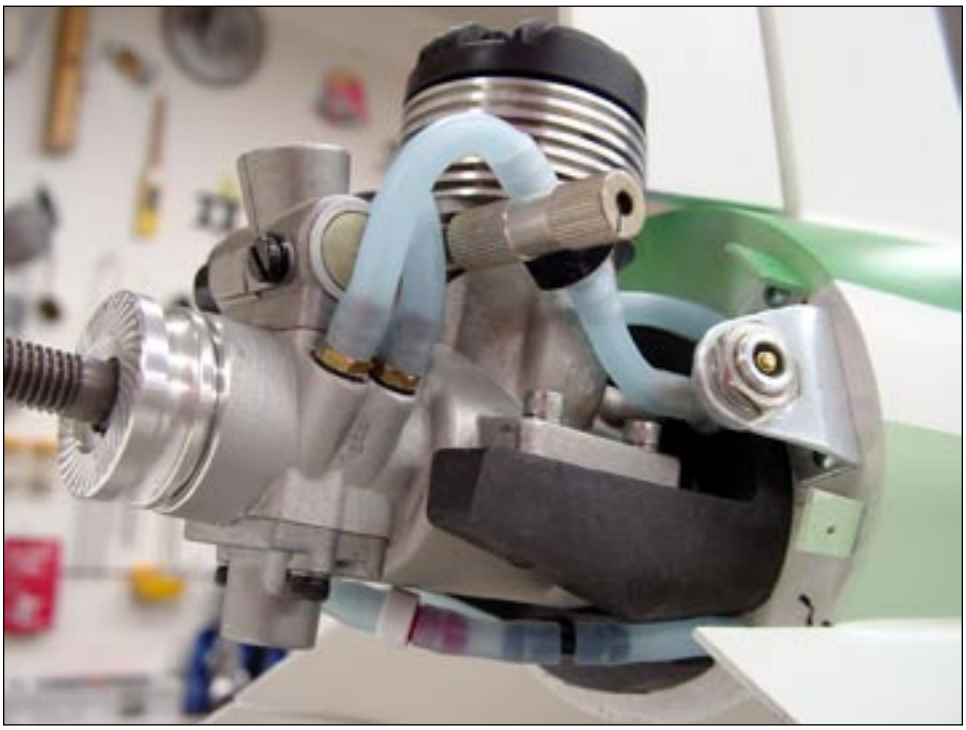
A simple and effective landing gear door follower is fabricated from a piece of 1/16” music wire. The follower is Epoxied to the bottom of the door and the other end loops around the gear leg. The loop is covered with heat shrink tubing to eliminate metal to metal contact.

Photo 23



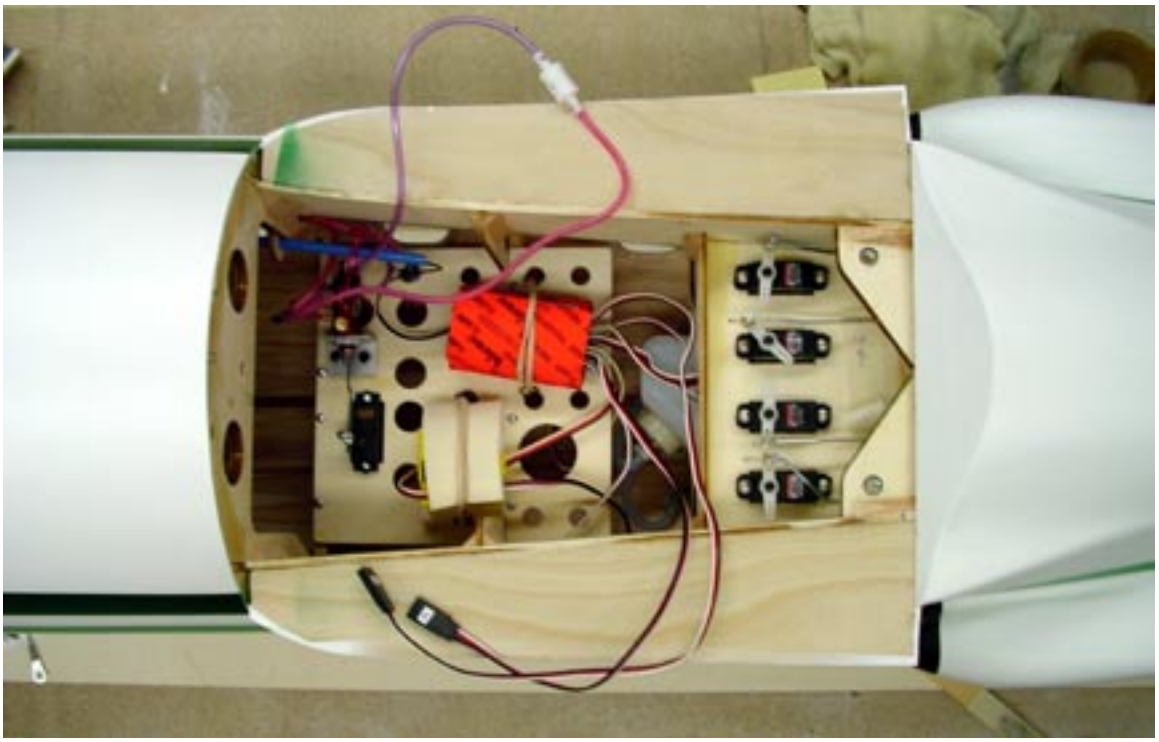
To make the gear doors removable for service access to the gear, the hinge pins are removed and a music wire hinge installed with a 1/16” wheel collar retainer.

Photo 24



The YS 45 installation and all of its plumbing. On the right is the Du-Bro fueler, filter is behind the needle valve. Below (actually above) from the left is the pressure check valve then the tee fitting that connects to the fuel dot. The fuel dot serves to depressurize the fuel circuit and as a vent overflow when filling.

Photo 26



Radio installation clockwise from the top left. Robart pneumatic gear valve, antenna guide tube, Robart pneumatic pressure gauge (visible through window seat 3-A), Hitec receiver, left elevator, throttle, rudder and right elevator servos, Jomar gear door cycler and the gear valve servo. Excess servo leads and Y connectors are stowed below the servo tray.

Phoro 27

On the left is the author and on the right is Lewis Patton, who piloted the first test flights.

THE

LEAR FAN 2100

TOP NOTCH PRODUCTS COMPANY
PO BOX 1051
GOODLETTSVILLE, TN 37070
615-310-5371