

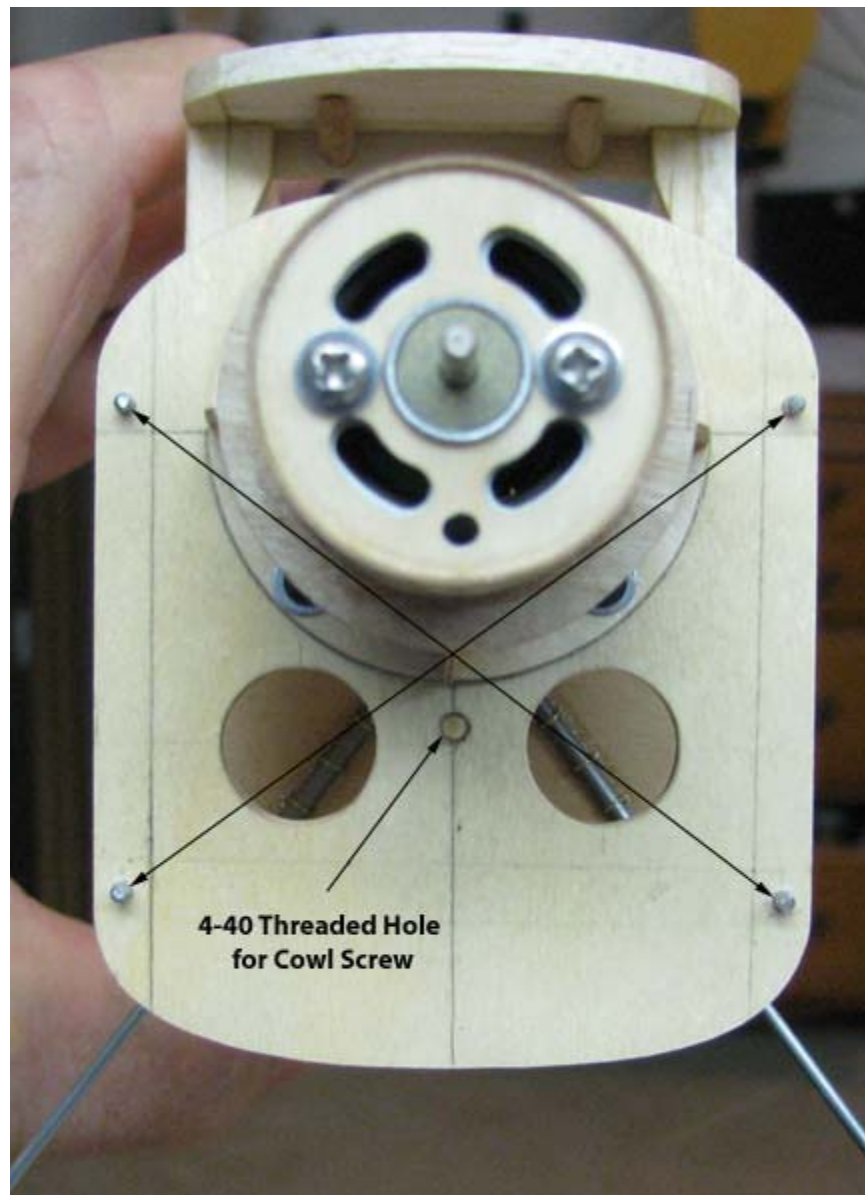
**David Harding**

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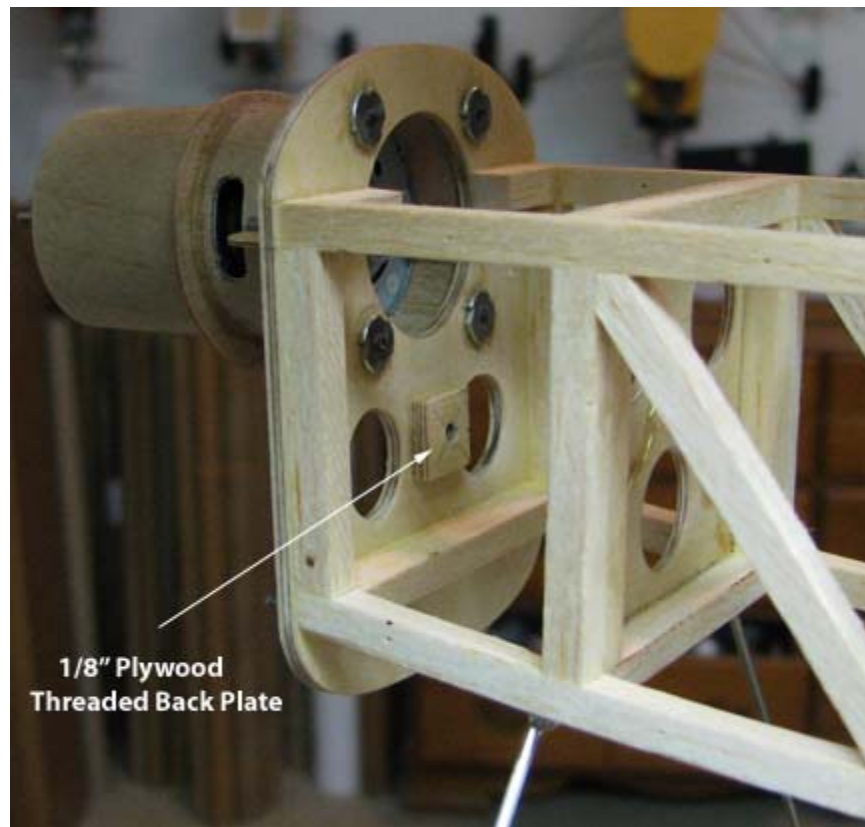
**From:** Tandy C. Walker [tandyw@flash.net]  
**Sent:** Wednesday, February 03, 2010 11:55 AM  
**To:** Undisclosed-Recipient: ;@smtp106.sbc.mail.mud.yahoo.com  
**Subject:** 53 Speed 400 Cloudster - Cowl Retention

*Speed 400 Cloudster Project*

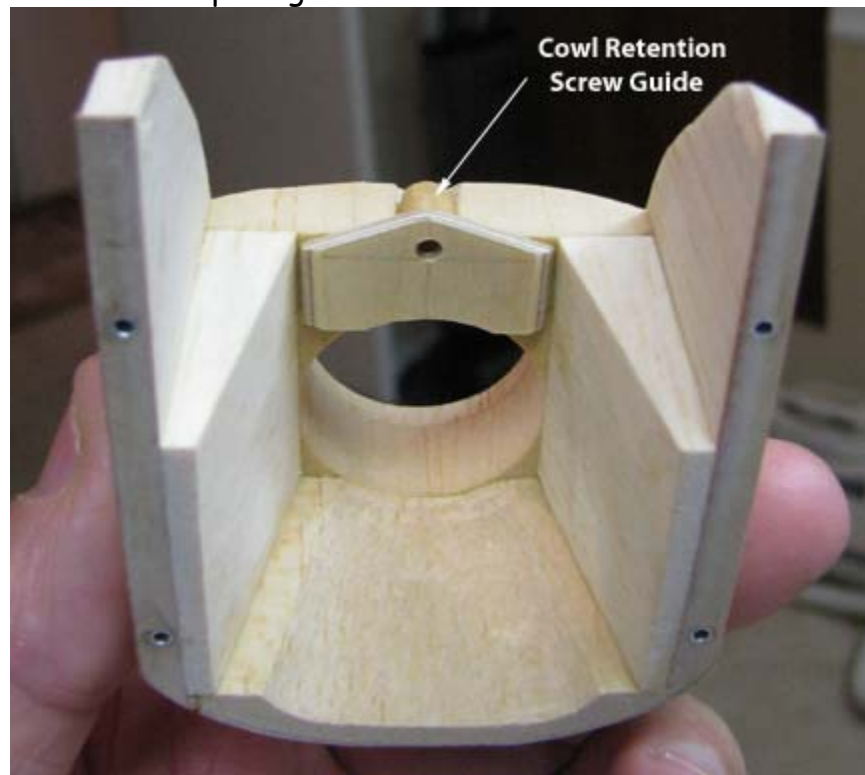
In developing a method for attaching the cowl to the firewall, the simplest approach was taken using a single 4-40 "screw assembly", which will be explained later. For the assembly to be effective, it has to be located so as to apply equal pressure on each of the four cowl alignment pins. The exact center location is defined by the intersection of the two diagonals between the four pins as shown below. However, the threaded hole had to be moved down about a 1/4" so as not to interfere with motor mount.



A small plywood square an 1/8" thick was glued to the back of the firewall to provide additional threads for the cowl screw as shown below. Holes were drilled in the firewall and back plate separately with a No. 43 bit. The shank of the bit was inserted into the firewall and used to align the 1/8" plywood square on the back while the glue dried. Then 4-40 threads were cut through both pieces at the same time.



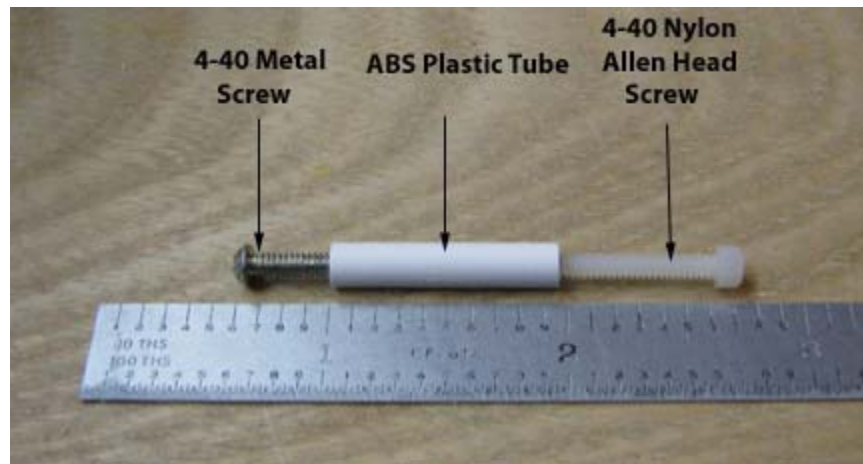
The center of a piece of 3/16" wooden dowel was drilled out for a 4-40 screw to slide through. This was glued to a piece 1/16" plywood and the two in combination were glued to the forward inside face of cowl nose block as shown below. This plywood plate serves as a strong back for the screw to pull against.



As part of the Cloudster's on going weight saving effort, a 4-40 screw assembly referred to above was used for the cowl attachment instead of a long heavier 4-40 metal Allen head screw. The principal element of this assembly is a 1" length of white ABS plastic tubing threaded inside each end with 4-40 threads as shown below.



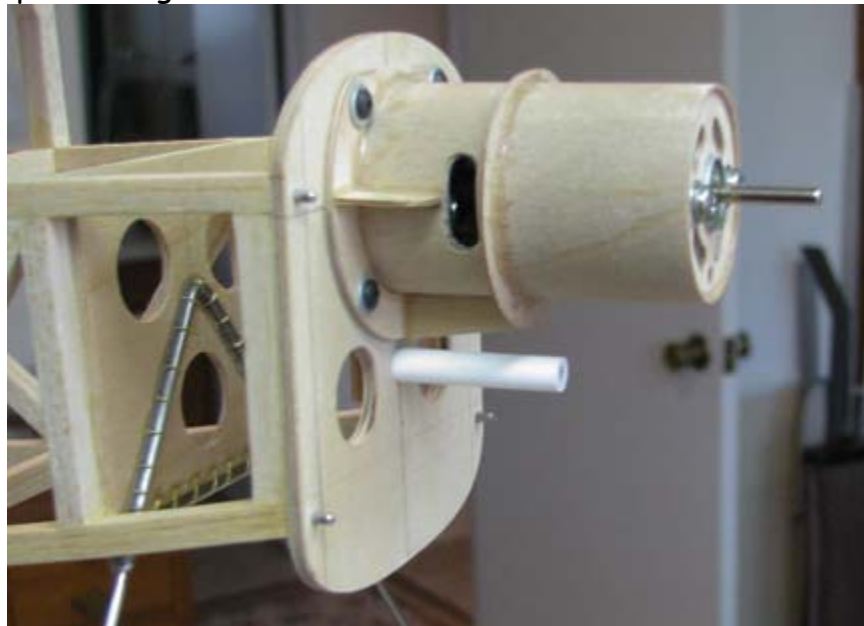
The complete 4-40 screw assembly, which is shown below, is composed of a short 4-40 metal screw, a 1" length of threaded ABS plastic tube, and longer 4-40 Allen head nylon screw. The total weight is something less than one gram because on the AccuLab scale, it reads zero.



The 4-40 metal screw is screwed in from the back side of the firewall as shown below.



The 1" length of threaded ABS plastic tubing is screwed finger tight onto the threads of the metal screw protruding out the front of the firewall as shown below.



This is a view from underneath the unfinished cowl. It shows how the cowl is secured to the firewall by inserting the 4-40 Allen head nylon screw through the cowl retention screw guide (*the drilled out dowel*), screwed into the open end of the threaded ABS plastic tube, and then tightened down, which pulls the cowl down snug onto the front face of the firewall.



I am most pleased with the way this method for attaching the cowl to the firewall worked out. Now the bottom of the cowl has to be blocked in with a large opening left in the front to provide motor cooling air. However, as was said before, carving, sanding, and shaping of the cowl can not be continued until the bottom bulkheads and stringers have been added as well as the curved planking on the top of the fuselage right behind the firewall. This is necessary to fair the lines of the cowl into the lines of the fuselage to form the seamless transition.....Tandy