



# CONSTRUCTION

TEXT & PHOTOS BY PAT TRITLE



The Turbo Beaver is on the ramp ready for the first early morning flight of the day.

## De Havilland Turbo Beaver

### The ultimate bushplane

The Turbo Beaver is a large, light-weight park flyer with good small-field performance. With a 60-inch wingspan, it's rather large as park flyers go, but it handles beautifully in tight places and performs well on small economical brushless power systems. The wings plug in and are retained by rare earth magnets. A hatch provides access to the radio components and battery, and no tools are required to remove or install it. Guidance is 5-channel RC using six sub-micro servos. Construction is primarily balsa and light-weight plastic detail parts. I also offer a laser-cut parts pack and vacuum-formed cowl available from [Patscustom-models.com](http://Patscustom-models.com). For the scratch-builder, the plastic cowl, air scoop and spinner will be available and full-size parts templates are provided on the plans.

#### TAIL SECTION

Build the vertical and horizontal tail assemblies directly over the plans using

the part numbers and wood sizes shown. Shims are used to center the leading and trailing edges on the ribs. When completed, remove the assemblies from the board, sand to shape and dry fit the hinges made from Great Planes Light CA hinge stock. Drill the hole in the rudder and dry fit the toothpick control horn to complete the assembly. I recommend using medium and thin ZAP CA adhesive and Z-Poxy epoxy for the construction.

#### WINGS

Assemble the spars as shown and fit the ribs in place on the spars directly over the plans. Add the balsa leading edge, servo mounts, wing tips, aluminum receiver tubes and flap hinge pockets as shown. The flaps and ailerons are also built directly over the plans. Next, remove the panels from the board and sand to shape. Glue the strut mount plates flush with the bottom of the wing, sand to shape and then fit and secure the strut retainer tubes. Cut the

#### SPECIFICATIONS

**Model:** Turbo Beaver  
**Wingspan:** 60 in.  
**Length:** 41.5 oz.  
**Wing area:** 400 sq. in.  
**Flying weight:** 21.6 oz.  
**Wing loading:** 7.8 oz./sq. ft.  
**Power:** Suppo 2217/9 outrunner w/ 20A speed control ([suppomodel.com](http://suppomodel.com))  
**Propeller:** APC 11 x 5.5E  
**Battery:** 2200mAh 2S Cell Sky LiPo ([commonsenserc.com](http://commonsenserc.com))  
**Channels:** 5 (throttle, elevator, rudder, aileron & flaps)  
**Servo:** Two 9-gram sub-micro (rudder/elevator); four 6-gram sub-micro (aileron/flaps)

flap hinges as shown and dry fit using the depth gauge provided. Dry-fit the aileron hinges and the wings are finished. Add the balsa or blue foam filler to the flap leading edge and sand to shape.

Set up the flap and aileron servos with the control arms in the neutral position. Glue the aileron servos in place using silicone caulk and allow them to dry completely. Make up the flap pushrods per the detail drawings and fit the inboard end into the servo arm and glue the servo in place. After the flaps are covered, fit the outboard end into part FCH and glue it into the flap. The final adjustments will be made during final assembly.



## FUSELAGE

Build the fuselage sides directly over the plans. The side frames are joined beginning at the top of the cabin followed by the lower cabin formers with the landing gear mounts attached. Crack the longerons as shown and add all of the aft formers, including the tail wheel assembly. Then crack the forward longerons and add the firewall and front formers. Tip: to strengthen the longerons, sand the outside of the longerons at the breaks while the CA glue is still wet. Re-glue and sand as many times as needed to fill the void. When soaked with thin CA, the sanding dust gets rock hard and will end up the strongest part in the assembly.

Add all of the stringers and rudder mount base and sand to shape. Build up the landing gear and fit it into the fuselage. Add the file folder paper front and side cabin fairings to complete the basic frame. Next, set up the servo rails and mount the servos. Run in the .032-inch I.D. plastic elevator pushrod tube supported at the front and at least three points in between using the EPG standoffs. Set up

the rudder/tail wheel pull/pull cables and mark the exact exit locations of the cables on the plans. Build up the motor mount, mount the motor and speed control and test for proper rotation, without the

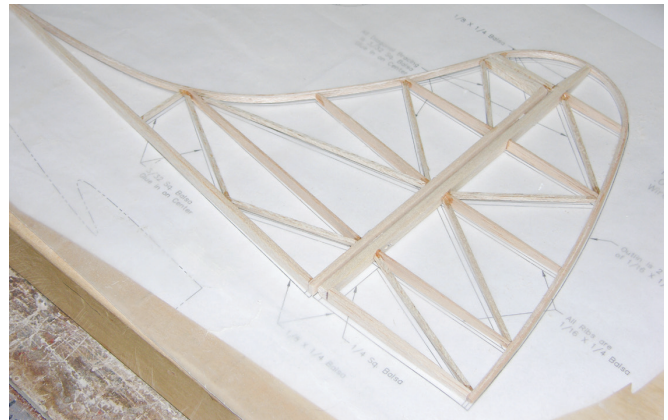
prop of course. Mount the cowl and trim the spinner backplate and cone to fit, but don't glue it together just yet. Finally, make up the tail fill blocks and sand to shape. I also like to sand a scallop into



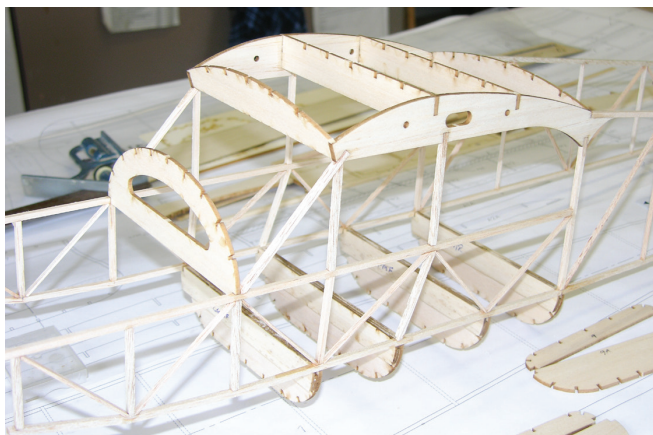
**In flight, the Turbo Beaver is a gentle and docile flyer, and with the large flaps deployed will slow down nicely for flying in and out of those remote fields with their typically small runways.**



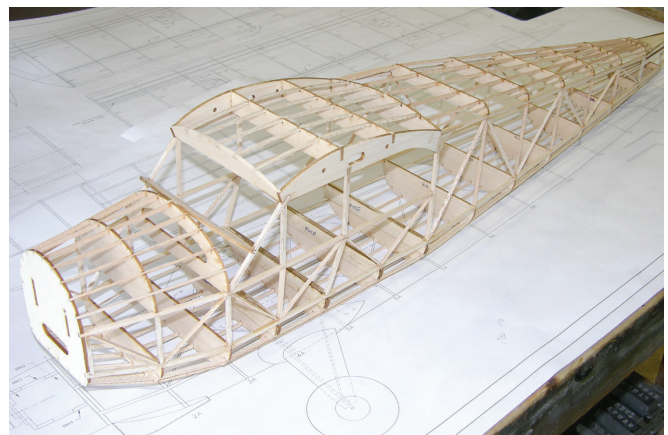
The wing is built up in an eggcrate fashion with the ribs slotted onto the main and rear spars. The servo mounts and other internal components are added after the main assembly is complete.



The vertical fin and rudder assembly features a symmetrical airfoil with the bowed outline. Shims are used during assembly to ensure the outline is centered on the ribs.

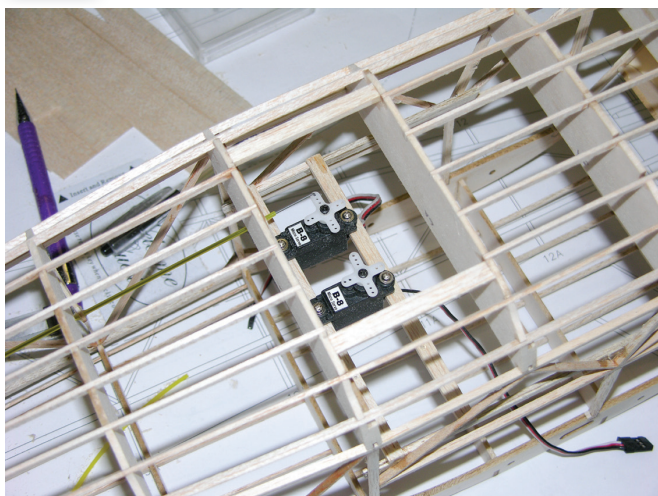


The fuselage sides are joined beginning with the top cabin formers. The side frames are pinned to the board to ensure the assembly starts out square.

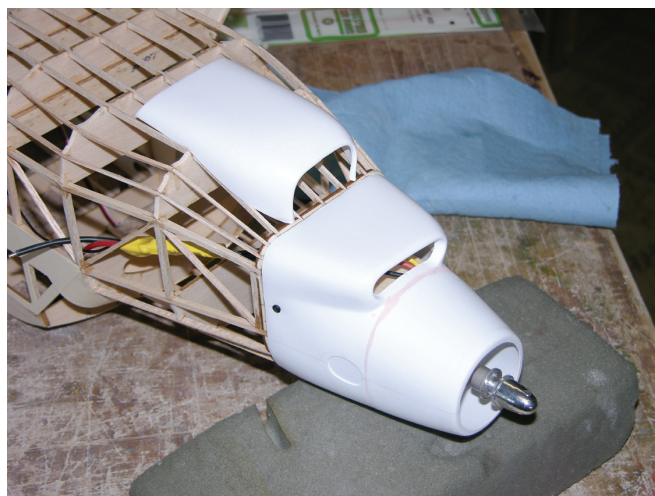


With the tail ends glued together the stringers are glued in place on the top and bottom to fill out the fuselage shape. The formers will be scalloped later to give a smooth finish when the covering is applied.





The rudder and elevator servos are mounted on balsa beams in the cabin area for easy access through the hatch on the bottom of the fuselage. The rudder servo is mounted on center to accommodate the pull/pull rudder and tailwheel cable alignment.



The vacuum-formed cowl is assembled and fitted onto the firewall and mounted with no. 2 sheet metal screws. The seam between the front and rear cowl halves is filled with putty and sanded smooth.

the formers between the stringers for a much smoother finish when covered. Do a final dry run to ensure everything fits and operates properly. Build up the hatch to fit the opening using the detail drawings for reference.

## COVERING AND FINISHING

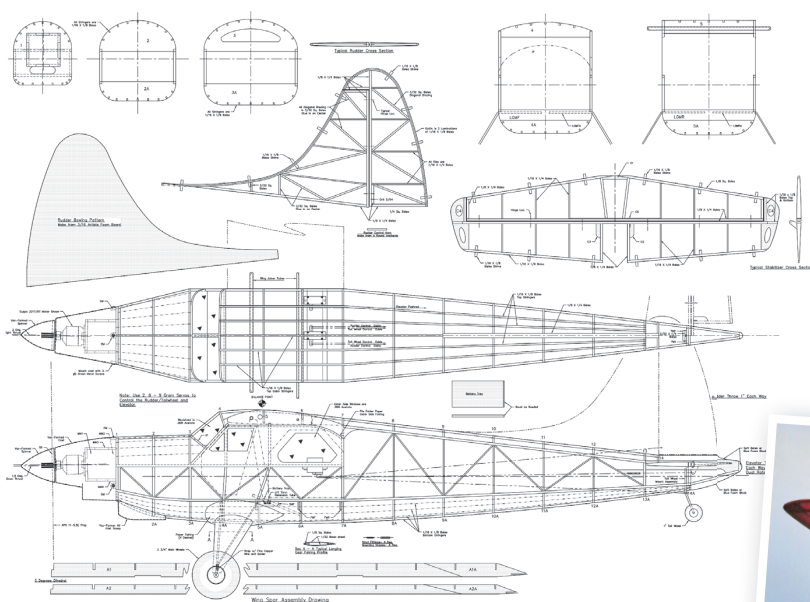
I covered the model using UltraCote Light, though Microlite is also an excellent choice. Avoid using regular UltraCote or MonoKote as they are far too heavy, and their extreme amount of shrink will damage

the relatively light structures. Once covered, the trim can be done by hand, or with custom graphics ordered from Callie Graphics ([callie-graphics.com](http://callie-graphics.com)).

Cover all of the individual components, except the top of the wings. Before the tops are covered, you'll need to glue in the flap hinges and set up the pushrods. Add whatever trim is desired using your method of choice.

## FINAL ASSEMBLY

Run in the .025-inch wire elevator pushrod and rudder/tail wheel cables. Z-bends are used at both ends of the pushrod. With the wings in place for reference, slip the elevator into the slot followed by the stabilizer. Glue the hinges in place, then align and glue the stabilizer into the fuselage. Glue the rudder hinges in place and the rudder to the fuselage, and then connect the control cables and elevator



## de Havilland Turbo Beaver | X0915A

Designed by Pat Tritle, the Turbo Beaver is a traditional stick-built model and is intended as a park flyer, though it is somewhat larger than the typical park plane. It has flaps and there are laser-cut wood parts and formed plastic pieces available from the author.

WS: 60 in., Length: 41.5 in., Power: Suppo 2217/9 outrunner; LD: 2; 3 sheets; \$27.95



To order the full-size plan, visit [AirAgeStore.com](http://AirAgeStore.com)





pushrod. Fit and glue the cabin windows, mount the cowl with sheet metal screws, then align and glue the spinner to the backplate with silicone caulk.

Align and glue the flap hinges into the wings using the hinge depth gauge to ensure proper alignment. Feed the pushrod on the flap through the hole in A2, slip the coupler over the pushrod at both ends and glue the flap hinges into the flaps with the bottoms flush with the bottom surface of the wing. With the flaps installed, set up the servo deflection using the radio, and after everything is aligned properly, secure the aluminum pushrod couplers with a drop of thin CA.

Cover the top of the wings, then make up and glue the flap gap covers in place. Glue the aileron hinges in place, then set up the aileron pushrods with a Z-bend at both ends, align the ailerons to the neutral position and glue the control horn in place. Make up the wheel keepers as shown in the detail drawing and mount the wheels. From here you can add all the scale detail you might desire to finish up the model. Then once it's finished, set up the center of gravity at two inches from the wing's leading edge. Set up the control throws as shown on the plans.

## IN THE AIR

The Beaver is a gentle and mild mannered flyer, but it's not a "floater." Landing speed is slow and control is positive even at full flap deflection, however, as the model slows down the controls soften up a bit, so more input is needed to make minor corrections. Even at that, small field performance is excellent, and those



## THE LAST OF THE LINE

Development of the de Havilland Beaver first began in September 1946. It was designed as a purpose-built bush plane, and with a cruise speed of just 143mph it isn't a particularly fast airplane, but it could carry just about anything you could put in it. The Beaver has a 48-foot wingspan, is 30 feet, 3 inches long with an empty weight of 3,000 pounds and a cargo capacity of 2,100 pounds. The Beaver was originally designed for the war surplus 450hp Pratt & Whitney R985 radial engine providing a maximum speed of 158mph. Rate of climb is 1,020 feet per minute, with a service ceiling of 18,000 feet. The Turbo version of the Beaver using the Pratt and Whitney PT6A-34, 650hp engine could carry a 2,450-pound payload, but it's only an upgrade to existing airframes. No new Turbo Beavers were built, and when production ceased in 1967, 1,657 Beavers had been produced.

short-field landings will be a breeze. Then once you have a good positive feel for the flaps, try a few side slips, and maybe even a steep diving approach into the field for a few short field touch-and-go's. I hope you enjoy building and flying your

Turbo Beaver as much as I have. It is big enough to be impressive yet light enough to operate from smaller flying fields. It's fun to fly and looks great both on the ground and in the air. ✈



With the top of the wing covered and the flap gap fairing installed, the flaps are actuated through their full travel to ensure there's no catching or binding.



With all of the cover and trim in place, the cabin windows and windshield are installed. I installed the cabin windows on the inside from the front through the windshield opening. It's a bit tedious that way, but gives a nicer look to the finished model than when the windows are glued on the outside.