

# Construction Notes for the kits by Walter Umland

## Jim VanLoo Profile Chipmunk prototype:

### By Wayne Smith

The laser cutting of all parts is very good. Be sure to finish taking all the parts out and lay them out to familiarize yourself with the construction of this airplane. Since these parts are laser cut, make sure to sand all the "lasered" edges so that your glue joints will be made wood to wood.

**Wing Construction:** The design of the ribs with the built in jig is helpful to those building this Chipmunk. I used angle iron from my building jig to line up the leading and trailing edges while building over the plans. The built in rib jigs did the rest. Glue the 1/16" trailing edge sheeting together using the angle cuts. Glue the bottom and top 1/4" spars together using the plans to determine the correct angle at the center. Glue the 1/4" leading edges together using the plans to determine the correct angle. Slip the bottom sheeting into the ribs as you lay them out over the plans. Install the bottom and top spars into the rib cutouts. Install the leading edge onto the rib cutouts. I used the angle iron and weights to get everything lined up before gluing. Glue everything. Lay the top trailing edge sheeting onto the ribs and glue. Glue on the 1/4" trailing edge using an angle cut to join the two pieces in the middle. Install the 1/16" sheer webbing between the two spars and also between the two 1/16" trailing edge sheeting. Install the bellcrank mounts and bellcrank. Make sure to enlarge the rib holes to allow for free movement of the bellcrank and leadouts. Install the pushrod for the flaps at this time. Install the 1/16" leading edge sheeting and center sheeting. Install the 1/16" cap strips onto the top of the ribs. Turn the wing over and remove the wing jig tabs from the ribs.

Glue the wingtip weight box together. Install as per plans but make sure that the removable hatch is lower than the sheeting so that a scrap piece of 1/8" balsa can be glued to the top of the hatch so that it can be sanded to match the leading edge sheeting.

Install the 1/16" leading edge sheeting and center sheeting to the bottom of the wing. Install the 1/16" cap strips to the bottom of the ribs. Sand the 1/4" trailing edge to match the angle of the trailing edge sheeting. Sand the cap strips and center sheeting to match the leading and trailing edge sheeting.

Put the adjustable leadout guide together and glue into place. Make sure that it adjust easily and then set the leadouts as per the plans.

Glue the wingtip pieces together. Sand the edge of the wingtips and wing where the wingtips are glued to the wing. Glue on the wingtips making sure they are aligned properly. Glue on the 1/8" wingtip ribs. Also glue on the 1/4" stationary tabs on the trailing edge. If you plan on making the outboard tab adjustable, you should make the changes to incorporate this now.

Sand the leading edge and the wing tips. Complete the final sanding of the wing. You can also finish the leadouts at this time with your favorite type of termination.

**Fuselage:** Test fit a ll parts. Glue the fuselage sides together using 30 minute epoxy or the glue of your choice. Weight down the fuselage on a flat surface to insure a straight fuselage. After fuselage is glued and dry, glue the hardwood motor mounts into place. Clamp or weight until dry. Glue the 1/2" balsa block to the rear of the fuselage. Glue the basswood tail wheel mount to the fuselage after drilling and notching for the tailwheel wire. Lay the plywood doublers onto the fuselage and mark the rear of the doublers onto the fuselage side. Lay the 1/2" canopy onto the fuselage and mark the rear where it meets the fuselage. Then mask over these marks and round the top and bottom of the fuselage sides behind these marks. I find this is easier than trying to round everything after the doublers and triplers and canopy are glued on. Round the top of the balsa canopy at this time.

Sand the outboard fuselage plywood doubler at the rear where it meets the fuselage to get a nice, clean transition to the balsa fuselage. Tack glue the inboard plywood doubler to the two 1/4" balsa

triplers. Sand the rear area where it meets the fuselage to get a nice, clean transition to the balsa fuselage. Separate the balsa triplers and the inboard plywood doubler. Glue both the plywood doublers to the fuselage sides using epoxy and clamp or weight until cured. Test fit the motor, drill mounting holes and install blind mounting nuts. you do not need to put offset in the motor. While the motor is mounted install the 1'8" plywood nose ring making sure it is perpendicular to the fuselage and that the 1 3/4" spinner is aligned with the nose ring. Remove the motor.

Drill 1/8" hole for landing gear through the plywood doublers and motor mount. Test fit and mount using landing gear clips. Mark and cut out the first balsa tripler so that it will clear the landing gear and mounting clip. Plan this cutout so that you will be able to make a landing gear hatch cover using the next balsa tripler. Mark and cut the hatch cover out of the second balsa tripler. Remove the landing gear and glue on the two balsa triplers. Shape the plywood doublers and balsa triplers to shape the nose so that it can have a contour for the spinner. After sanding these, glue on the balsa canopy and then complete the final sanding of the fuselage.

Rudder & Fin: Glue the three 1/4" balsa rudder pieces together but do not glue on the dorsal fin at this time. The inboard side of the rudder needs to be sanded to an airfoil shape. The front of the rudder where it meets the dorsal fin must be sanded to match the 1/8" balsa dorsal fin. You can put a mark on the face of the rudder and sand to this mark. Airfoil the rudder and also round the top edges. Round the top edges of the dorsal fin. Test fit the dorsal fin to the rudder to make sure you have a nice transition from the 1/8" balsa to the airfoiled rudder. Lay the outboard side of the dorsal fin and rudder on a flat surface and glue the dorsal fin to the rudder.

Stab and elevators: Glue the 1/4" front of the stab to the stab. Round the leading edge of the stab only. Round the front and rear of the elevators. Glue the 1/4" balsa counter balances to the elevators. Round the edges of the counter balances to match the trailing edge of the elevators and leading edge of the stab. Install optional 1/64" plywood doublers. Mark and drill holes for your control horn or elevator joiner wire. Cut notch in front of elevators so that the control horn wire is even with the front of the elevators. Cut slots for the hinges in both the rear of the stab and front of the elevators and install hinges but do not glue at this time. Glue the elevator control horn or joiner wire to the trailing edge of the stab.

Flaps: Round the leading and trailing edges of the flaps. Install optional 1/64" plywood doublers. Mark and drill holes for your control horn or flap joiner wire. Cut notch in front of flaps so that the control horn wire is even with the front of the flaps. Cut slots for the hinges in both the trailing edge of the wing and front of the flaps and install hinges but do not glue at this time.

Installation of the wing and stab: Install the motor. Test fit the wing in the wing cutout in the fuselage. (Note: Put the flap control horn or joiner wire into the fuselage cutout but do not glue) Using a square at the trailing edge of the wing and the fuselage, make sure the wing is perpendicular to the fuselage. Mark the fuselage sides on the top of the wing. Test fit the stab and use the square at the trailing edge of the stab to make sure the stab is perpendicular to the fuselage. Mark the fuselage side on the stab. This will give you an alignment mark prior to gluing. At this time you will need to set all of your incidences for the motor, wing and stab so that it can fly with little or no trim. I use my flat building table and three incidence meters for this. Slide the wing into the fuselage so that it meets your alignment marks. Use foam, wood, etc. to support the wing making sure that it is parallel to your flat surface. Use building weights to keep the wing in place. Using a builders square, make sure that the fuselage is vertical to the table. Pin the stab onto the fuselage and also block up from the bottom of the stab so that the stab is parallel to the flat surface. Install the incidence meters on the motor, wing and stab. Block up the fuselage so that the motor incidence is at 0 degrees. The wing and stab should also be at 0 degrees. Adjust until everything is at 0 degrees. (Note: some flyers like to have 1 degree of positive incidence in the stab). When everything is aligned, glue the wing and stab into place. The flap

control horn or joiner wire can now be glued to the trailing edge of the wing. Test fit the dorsal fin and rudder and then glue on making sure that the rudder is perpendicular to the flat surface. This rudder is airfoiled so that no rudder offset is needed. Test fit the flaps and elevators using the hinges and control horns. Put the incidence meters on the wing and flap and the stab and elevator. Adjust to 0 degrees. You can now adjust your pushrods to the proper length so that everything is properly aligned. Round and shape the trailing edge of the flap and elevator fillets. Glue them into place. Remove the plane from the alignment supports. Install fillets of your choice to the wing and stab joint.

Wheel pants and fairings: Glue the wheel pants together as shown. Install pant mounts. Shape wheel pants. Glue fairings onto landing gear using epoxy. Note: the inboard fairing will be shorter than the outboard due to the balsa triplers so cut the fairing to the proper length before gluing. Shape fairings.

Finish: Perform any final sanding and finish the aircraft with your choice of covering. Hinge the flaps and elevators and install pushrods. Install wheels, landing gear, motor, tank, etc. Check the center of gravity and adjust as needed. Enjoy the flying.

