

AUSTER J5F AIGLET TRAINER

**by Ivan Pettigrew
Construction Notes**

The Auster aircraft company started in England in 1938 for the purpose of building Taylorcraft aircraft under licence. During WWII many aircraft were built and used by the British army for observation work. The Mark 5 Taylorcraft Auster was the last wartime model, being fitted with a Lycoming O-290 engine.

After the war, Auster started building the “J” series of civilian aircraft. They started with the J1 Autocrat which was a three seater plane powered with a 90 HP Cirrus Minor Engine. Next came the four seater J1/B Aiglet which had the 130 HP Gypsy Major Engine. Both the Cirrus Minor and Gypsy Major were four cylinder in line inverted engines.

Most Auster aircraft had a wing span of 36 feet. The J5F Aiglet Trainer was a clipped wing version of the J1/B with a span of 32 feet. It also had deeper ailerons to give a better roll rate, and some other modifications like heavier wing struts so that it could be approved for aerobatics. It could be flown as a general four seater aircraft to a gross weight of 2,200 lb, but for aerobatics, the gross weight was 1,950 lb.

FUSELAGE

This is traditional box type construction. Two sides are built over the shaded sticks shown in the plan. Notice that these do not include the usual cabin area where the wing mounts. This is added later. When joining the two sides together, notice from the drawing of the front view of the fuselage that in the area of the cabin, it is fatter in the middle than at the top or bottom. This means that from the nose block to section “E” the upper longerons are wider apart than the lower ones at the bottom. From there to the tail, the width evens out. Next the 6 inch long hardwood doublers are attached to the inside of the side pieces at D and E. These pieces are tapered like a wedge at each end.

The framework of the cabin is built up of hardwood strips and the sequence for building this area is shown on the plan. No 1 is attached first to the upper part of the tapered doubler at “D” then a similar piece, No 2, at E. No 3 forms the wing mount and should be joined to Nos 1 and 2 with a good glue joint of epoxy glue, or gussets. No 4 is attached next, then the remaining details to build up the wing mount. The challenge in building a model of the Auster is making the cabin area strong enough while not spoiling the characteristic “glass house” look of the cabin. The extra work involved does make for a good looking model. There are hardwood doublers along the bottom longeron where the undercarriage is mounted. It continues fore and aft a small distance to add strength and provide for the optional addition of float mounts. A plywood plate is used

for mounting the undercarriage. Access to the rudder and elevator servos is from the bottom of the fuselage.

TAILPLANE

Notice that the tailplane has a symmetrical airfoil section. This results in a deeper spar which is stronger than it would be if a flat surface was built. It also means that the tail surfaces can be built lighter, and the resulting tail section is less prone to warping. Make the spars first and hinge carefully to get good alignment before proceeding with building the tail surfaces in the usual manner.

WING

A full depth balsa spar runs the length of the wing, with ribs being cut, and glued to the front and back surfaces of the spar. The top and bottom surfaces are then sheeted from the leading edge back to the spar. This makes for a strong, yet light, "D" box. Besides being very strong, a wing built like this is very resistant to twisting. Start construction by cutting out the wing spar from 3/32" balsa. Assemble the full length spar over the plan so that the correct dihedral angle is built in. Next attach the hardwood spars that run part way out the wing. These may be bass or spruce. To start assemble of the wing, pin one half of the spar to the building board with the other half propped up to the correct dihedral angle. Glue the rear part of each rib to the rear surface of the spar, and attach the trailing edge and aileron spar. The front parts of the ribs are next attached. Notice that the leading edge consists of two strips of balsa. At this stage, just glue the first (inner) strip to the nose of each rib. The other half of the wing can now be built by propping up the completed section to the correct dihedral angle. When completed, the sheeting is applied to the lower surface of the wing from the leading edge to the main spar. Notice that the wing is still not torsionally strong, meaning that it can be twisted quite easily. It will become very rigid when the sheeting is applied to the upper surface of the same area. Hence it is very important to have the wing set in the correct position while applying the top sheeting. This is done by weighting the wing panel down on a perfectly flat surface. There is 3/16" washout at the tip at the point indicated on the plans, but washout should only start at the aileron break. Hence the wing should be weighted down on the flat surface from the root to the point where the aileron starts. From there to the tip there is the slight twist that gives the correct washout. When the sheeting has been completed, the remaining outer strip of the leading edge is added and shaped to the correct contour.

GENERAL

Clear mylar as used for overhead transparencies has been found to be good for windshields of models like this. It can also be used for the large overhead window panel in the top of the wing, and the rear window. The flat side windows can be covered with clear transparent monokote. This should be applied before the regular covering. Low temperature film, or mica film, have been found to be best for lightweight airframes such as used in this model.

The Atomic Force motor specified on the plans gives a very sparkling performance. Some builders may have difficulty in getting a 6:1 ratio gearbox. A more economical option is to use a 22 turn Magnetic Mayhem racing car motor with one of the readily available 3.5:1 gearboxes and a 15x10 prop. The Magnetic Mayhem has a slightly longer armature and can than most car motors. This, together with advanced timing, makes it very efficient, and it can be operated on nine or ten cells. However, it comes with two options on the timing, (normal or reverse) and for use with one of the regular single stage gear reductions which reverse the direction of rotation, it is important to use the motor with “reverse” timing.

This model of the Auster is very aerobatic and does not require wing struts. They may be added as an option. It is very versatile model, and the prototype has been flown on wheels, floats and skis.

Good luck building and flying your Auster.

Ivan Pettigrew

SUMMARY

Auster J5F (1997) Scale 1/5.1. Span 75 ins. Wing area 850 sq. ins.
Length 51 ins. Weight 72oz with nine 1900 mAH nicads. Wing loading 12.2 oz/sq.ft.
Eppler 195 airfoil. Magnetic Mayhem motor with 3.5:1 gearbox turns 15 x 10 prop APC-E prop 4,800 RPM at 28 amps on nine cells.