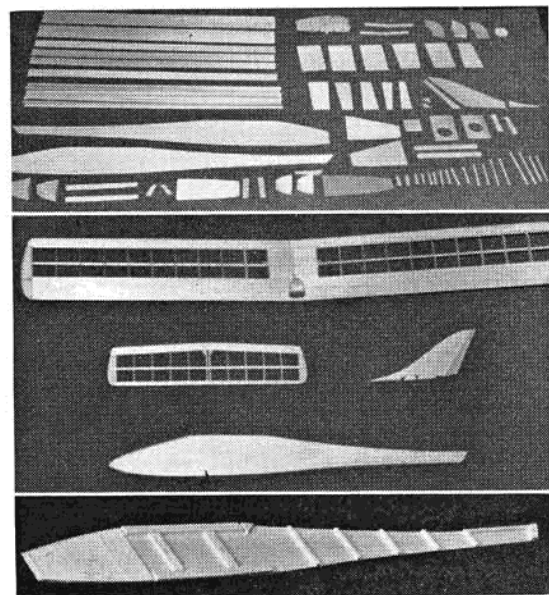


YOUR FULL-SIZE PLAN!
David Boddington's 48 in.



AN APPRENTICE, according to the dictionary, is a learner of a craft. The model presented on this month's free plan is designed to help the modeller achieve just this, to learn the craft of single channel radio control flying. There is no doubt that flying single channel models is a craft and it is something that has to be learnt through patience, and a lot of practice! The Apprentice will help you to become a fully proficient single channel pilot by virtue of its robust structure and easy to operate features.

The design was developed from the Picconini, a 36 in. span, all-sheet model fitted with a Cox .010 engine and Webra Picco magnetic actuator and R/C equipment. Because of the very pleasant flying characteristics of this model it was decided to make a larger version, with the necessary structural modifications, so that it would be suitable for a wider range of R/C equipment. Although the engine is desirable for flying from most fields, the Apprentice can also be flown as a pure glider. So, if you have a slope soaring site handy, or you are fit enough to tow up models on the line, why not make a spare pair of wings for some silent flight. The hook can easily be added under the fuselage. A word of warning here about the size of engines. For the beginner a Cox .020 Pee Wee or Cox TD.020 will give adequate power for learning to fly. With the Cox .049 Babe Bee engine installed, the model is quite fast, this is fine provided you have enough experience in flying and your reactions are good. Make sure the propeller is always well balanced and the engine is running with as little vibration as possible. With the engine mounted on a pylon, as it is in this design, any undue vibration tends to build up due to the flexibility of the pylon. See photographs for general simplicity of structure.

Construction

Although the construction shown is most suitable for the modeller who has only a limited amount of experience

APPRENTICE FOR .020 UP TO .049 ENGINES

in building and flying the more advanced may wish to experiment with other ideas.

For example:

- (1) If each wing is reduced by two bays and the whole of the wing sheeted with 1/16 in. balsa, a fast aerobatic model will result.
- (2) The tailplane may be cut from 1/8 in. medium sheet balsa instead of the built up unit as shown. (Some change of incidence may be found to be necessary).
- (3) A single surface 3/32 in. sheet balsa wing with strip leading and trailing edges but no spar can be employed if desired.

This wing may be tapered towards the tip and washout built in to prevent tip stalling.

The construction as shown on the drawings should not present any difficulties, standard materials and building methods are used. The designer prefers to use PVA glue for construction as this is suitable for all of the assembly including sheeted areas and plywood surfaces. It may take slightly longer to dry than balsa cement but, providing the parts are a good fit in the first place, a strong joint will result.

Choose evenly matched 1/16 in. sheet of medium hard quality for the fuselage sides. Cut out the sides and glue in position all doublers and uprights. The 1/16 in. sheet nose doublers should have their grain running vertically to allow the sides to be curved into Former F1

more easily. Glue F2 and F3 into position on the fuselage sides, temporarily holding the stern ports at the tail together with clothes pegs, making sure everything is 'square'. When dry, add former F1 and glue stern posts together, fixing in position at the same time the winding hook and tube for rudder operating crank. The cardboard tube fitted between formers F1 and F2, is there for two reasons, (a) For additional strength to the nose and (b) as a container for the batteries or DEAC's allowing them to be adjusted fore and aft to obtain the correct C of C position of the model. Do not leave the tube out! If you have any doubt as to where to find a tube, take a look in the roll, you *should* find in the 'little room'. The fuselage is completed by adding the top and bottom sheeting and nose block. Lightly sand the corners of the fuselage although the area around the cabin can be rounded off a little more. As there is no undercarriage with this type of design, the added protection of the 1 mm. plywood on the underside of the nose area is well worth while. If the model is to be used regularly as a slope soarer it may be advisable to take this ply back as far as Former F3.

No special instructions are required for the construction of the **Wings** and **Tailplane** except to emphasise the need for good selection of spar material and accuracy of cutting out all parts. In this way you are less likely to end up with those dreaded enemies of all aeromodellers - warps. Cut the slots for the dihedral braces in the wing panels after they have been constructed either with a razor saw or a very sharp balsa knife. For anyone wishing to fly the Apprentice free flight the dihedral should be increased to 3 in. under *each* wing tip and the dihedral braces must be altered to suit. The **pylon** is simple to make; but be sure that the plywood bulkhead F4 is *securely* glued to the pylon and fairing blocks - epoxy glue is probably the best to use here. Also be sure that the engine bolts are not going to work loose when the nuts are tightened. Secure the heads by solder to a tin plate.

One can never over-emphasise the necessity of building models as light as possible as excess weight will only cause the flight characteristics to deteriorate. However, as with most things in this life, compromises must be made and one compromise that is worthwhile is in using lightweight (2 oz.) nylon for covering. The added strength with this form of covering is more than worth the small additional weight imposed and for slope soarers this is particularly important. Do not, though, add further weight by applying too much coloured dope or paint as decoration. Naturally any of the new covering materials or heavyweight tissue may be used as an alternative.

Equipment and flying

These subjects have been covered in previous *Strictly Simple* articles enough. Sufficient to say now that whatever the equipment used (escapements, motorised servos and pulse actuators are all suitable) it must be 100 per cent foolproof in operation before you can consider installing it. Try to carry out the installation in as neat and workmanlike manner as possible and double check all joints for security.

The model should balance, with or without the engine, on the main spar of the wing: add weight to the nose as required or shift the batteries, packing them with foam plastic. Test glide over the best ground you can find. For powered flight testing, keep the engine revs. down initially or fit the propeller backwards. A last word of advice - seek expert *practical* advice before flying if this is your first R/C model.

May you soon have served *your* apprenticeship in Single Channel Radio control!