Taylorcraft BC12

Clarence Gilbert Taylor was a self-taught aeronautical engineer. In 1926 he designed and built a high wing monoplane featuring side by side seating that was appropriately called the Chummy. With his brother Gordon he set up a small manufacturing company, The Taylor Brothers Aircraft Corp. to build aeroplanes at Rochester, New York. The first aircraft to be manufactured was the Chummy, a good aircraft of sound construction and design. The lack of a suitable engine did hamper activities and only two aircraft had been sold by 1928. The loss of his brother in a crash when demonstrating an aircraft resulted in the company relocating to Bradford in Pennsylvania. There were still financial problems and it was at this time that oil tycoon William Thomas Piper became a director of the company. A new design, the E-2 was developed but there was still the problem of a suitable engine to overcome. Taylor must have thought it his lucky day when Continental Motors announced the availability of a lightweight four cylinder horizontally opposed small engine in January 1931. Taylor had to have one to power his new E-2 Cub design but it wasn't until March 1931 that his order was fulfilled. The Taylor Aircraft Co. as the company was now known then began an aggressive marketing campaign and actively sought nationwide dealerships. Sales were slow but the E-2 was selling. In 1935 it was decided to dress-up the E-2 and assistant engineer Walter Corey Jamouneau was given the job. Soon after C.G. Taylor was stricken with an acute case of appendicitis and was rushed to hospital. On his return to work after making a full recovery C.G. was furious to see the modifications that Jamouneau had made to the Cub and sacked him and the design team. In an effort to restore some order W.T. Piper suggested that Taylor should buy out his share of the company or he would buy Taylor's share. Taylor could not come up with that sort of money and he accepted the offer and went off to Alliance in Ohio where he formed a new firm to develop a new Taylorcraft series of aircraft. Taylorcrafts are not as well known as Piper Cubs but in some ways they were a better aircraft. The Taylorcraft equipped with a similar engine will cruise at almost 12 miles per hour faster than the Cub due to its superior aerofoil and reduced drag. The range started in 1936 with the Model A powered with a 40 h.p. Continental. It was replaced by the Model B in 1938 as the BC, BL, BF, powered by the 50h.p. Continental, Lycoming or Franklin engines respectively. In 1939 these models were followed by aircraft bearing the –65 suffixes that denoted 65 h.p. engines. By 1941 there was a 12 suffix instead that indicated a new gross weight of the aircraft of 1,200 lbs, hence the BC12 nomenclature. Post war production in the 1940's introduced the BC12-D, BC12-D-75 and finally the BC12-D-85 with many minor variations.

The model plan is for the BC12–D version but check your photographs before starting construction if you want to use your model for competition purposes. The original model has had a very successful competition record winning the Scottish Nationals and the Clubman event at the British Nationals.

I first became interested in the Taylorcraft BC-12 after reading a series of articles in Wingspan magazine by the late Maurice Brett. Maurice recounted his experiences restoring his full size BC-12 and the article was finished off with some excellent three-view drawings. Using the three views I produced a quarter scale drawing for Gordon Warburton who wanted a competitive competition model. Before starting on the project Gordon did a lot of research and found a full size aircraft at Leicester that appealed to him. We were invited down to Leicester by the owners for a photo and measuring session that proved invaluable.

The drawing is based on G-BREY and if another aircraft is modelled there will be variations, check before starting construction. Earlier BC-12's had a smaller fin and a

larger rudder for example. Construction is not complicated but some experience in producing built up model aircraft airframes is needed.

Fuselage.

The fuselage is a simple spruce box filled out with formers and stringers. Cover the fuselage side view with thin polythene sheet and build the first side directly over the plan. Leave to dry and then, after removing the pins that held the parts in place, lay another sheet of polythene over the structure. Build a second side directly over the first; the polythene will stop the two from sticking together. Do not forget the 0.4mm plywood biscuits. When the sides are removed from the board sand away any rough areas and make the saw cuts shown on the drawing to help the sides bend to the shape of the plan view. Join the sides with the formers and at the sternpost. Add the crosspieces and diagonal braces to complete the basic box. A simple jig should be made to hold the brass tube wing joiner tube and forward cabin tubes when silver soldering. The engine bearers are spaced to suit a Laser 120/150 but the cowl area can be altered to accommodate most other engine. If a “Flat” or “Vee” twin is used the bearers can be ignored and a mount built out from the standard firewall. This might cause problems when fitting the tank box though. The cowl front can be made from balsa or GRP. The opening part should be from thin aluminium or litho plate. The undercarriage works just like the full size and should be fabricated from thin walled steel tube. Again a simple jig will be required to hold the parts when silver soldering. The bearing brackets for the undercarriage should go right across the fuselage for maximum effectiveness. The doors need to be functional; one of the photographs shows the hinges. The tail wheel fitting can be made from spring steel, piano wire and mild steel with a suitable commercial wheel. Again the photograph gives a good indication of what is needed.

Wings

Cut out all the ribs using a plywood template. Make sure that the holes for the spars are accurate. Build the wings directly over the plan. The starboard wing is drawn in full with the port wing shown chain dotted. Slide all the ribs and riblets onto the spars. Place this assembly over the plan and slide the ribs into the correct position. A packing piece is needed to hold the ribs in the correct position at the trailing edge. With this in place and the ribs and riblets correctly aligned the cyano can be run in. Add the false leading edge, the 1/16 ply trailing edge and laminated tip. Hold them in place with packing pieces. Glue in all the diagonal bracing pieces I think that it is easier to build the complete wing and then cut out the aileron, but that is up to the builder. Note the position of the hinge centre and the use of the extended Robart hinges. The hinges are extended with a tight fitting aluminium tube; there are details on the drawing. Fit the wing joining wires after checking with the brass tubes in the fuselage. It is most important that the wings are rigged at the same angle so take care here and only epoxy them in place when satisfied. The wing sheeting can now be fitted. Finally fit the trailing edge capping and the sheet balsa leading edge. Balsa cement is the best adhesive to use when fitting the leading edge. Shape the leading and trailing edges and complete the fitting of the ailerons. The servos should be fitted permanently into the wing but make sure that everything works properly before covering.

Tail Unit

All the tail unit parts use the core method of construction. 1/16" sheet cores have the ribs added to each side with a laminated outline and dowel spars. If a sport model is being built I would suggest that the ribs be increased in thickness so that the units are ¼" thick rather than the scale 3/16" thickness. The prototype model used dowel for the rear spar on the tailplane and leasing edge on the elevator. It also used scale tube

hinges, again for a sport model, simpler 1/8"x 1/4" spars each side could be used with flap or Robart hinges.

Fittings

The struts are working units and should use good quality fittings adequately held in place. The jury struts could be left off a sport model but they do hold the struts in place when the wings are removed. The bracing wires on the tail unit should not be omitted. They are easy to produce using piano wire and brass tube.

Covering

The original model was covered with Sig Koverall. Solartex would be a good alternative since the model uses an open structure and there would be few problems with the material bubbling in the heat of the sun in summer. I always give my models that are covered in Solartex a coat of clear shrinking dope, but that is up to the builder. The two models were painted in car cellulose paint and then given a coat of two-pack fuel proofer. If a petrol engine is used there is no need to fuel proof.

Flying

The model is of a non-aerobatic aircraft and would normally be limited to course manoeuvres. Both the Taylorcraft models that Gordon Warburton has built from these drawings have performed very well, being easy to fly and looking good in the air. They are also easy to fly at very realistic speeds, an excellent attribute for a competition model.

G-BREY won the Scottish Nationals on two occasions and the Clubman Class event at the British Nationals. The yellow coloured G-BOLB also won the Scottish Nationals and has a very good record in BMFA competitions. G-BREY is at present powered by a Laser 120 with G-BOLB now having a Laser 100. Both models are adequately powered and do not need bigger engines. If you want a high wing light aircraft model that flies really well the Taylorcraft might just be what you are looking for.