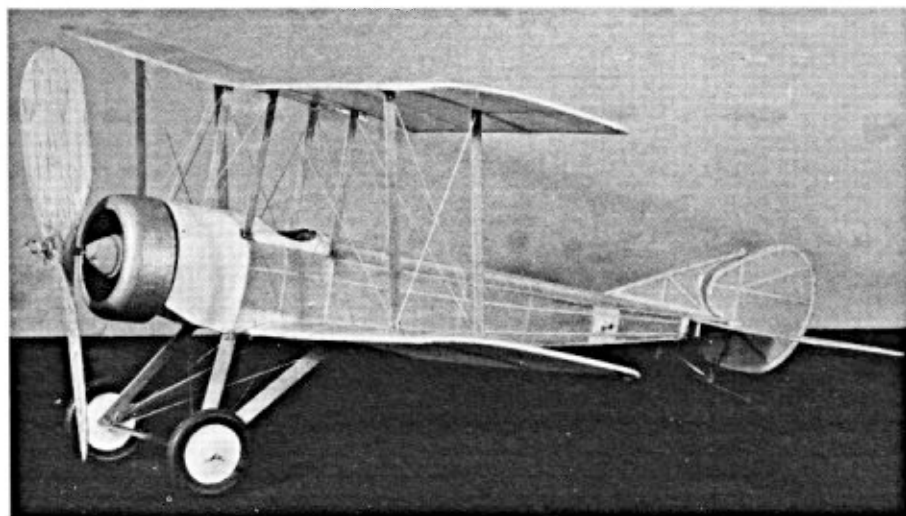


GRAHAME-WHITE 20



By Maj. ED HEYN . . . Here's a biplane with gap-to-chord ratio that won't quit! Lots of effective wing area in 13".



• Claude Grahame-White, one of the pioneers of British aviation, produced his first airplane, the Grahame-White Baby, in 1910. In succeeding years, his organization built many aircraft under license, primarily Morane-Saulnier and Voisin types, and developed several original designs. One of these, the Type 20, seemed to me to be a likely entrant for FAC type WW I combat. Plans and data may be found in Vol. I of "Warplanes of the First World War" series by J.M. Bruce. As no actual dimensions are given to develop a scale, a photographic blow-up of 13 inch wingspan was used.

The Type 20 proved to be easily adjusted and very stable in flight, especially indoors. Construction is quite conventional and should present no problems to those biplane lovers, like myself, who have built a Peanut or two. The author was fortunate in having learned to fly in the latter thirties, and having the opportunity of flying many of the now famous old biplanes. Prior to WW II, I owned a D.H. Gypsy Moth, and even after having flown Uncle Sam's hottest jet fighters while on active duty, I still remember what a fun plane the Moth was to fly.

Note that the basic fuselage frame and the stringers are all of 1/32 sq. basswood, available at model railroad or boat shows. I have used this method on indoor scale ships of up to 18 inch wingspan with no problems of breakage. I feel that the nice visual effect of the thinner section outweighs any very slight difference in weight over balsa strips. Former A, as shown, is of 1/16 sheet, while all other formers are of light 1/32 sheet.

When laying out the side frames, do

not join the longerons aft of the rear vertical member. Later, this will be a slot into which the stabilizer will be inserted. The side stringers extend from "A" to the last vertical member. Fill in between the stringers at the rear peg position. Small doughnuts of 1/64 ply are glued inside to reinforce the peg.

I turned the balsa cowl on a small lathe, but it can be carved and sanded. The cowling blackplate of 1/16 sheet is cut to match former "A", leaving the bottom of the cowl open. A plug on the rear fits into the opening in former "A", which is reinforced with 1/16 by 3/16 on edge behind the opening. The whole cowl assembly with dummy motor and prop removes for winding. Filling in the lower wing mount area, from the lower

longeron to the side stringer, leaves a slight angle which must be matched by a like angle sanded into the lower wing root rib. The bay behind the cowl and the top to the rear of the cockpit, is covered with bond paper and later painted white.

The stabilizer is made in one piece, although the prototype had an all-moving stab which rotated on the rear spar. Indicate this with an ink line. The leading edge of the stab is left free to be adjusted by shims until the best trim is attained. Fine brass wire at the tip of the fin and at the tailpost allows rudder movement for trim. The inner arc of the fin and the rudder outline are laminated. Bamboo, split to approximately 1/64 sq., is used for the tailskid apex. One vee comes from the outer ends of the horizontal tailpost to below the rudder, while the other vee is from the lower longerons back to the rear vee. The tailskid is in the center.

Wing construction is conventional, however, the lower wing root ribs require three pieces each to space the trailing edge away from the fuselage. I covered the entire plane with light weight white tissue. Only the fuselage was given two coats of thin clear dope. The rest, after shrinking with alcohol, was given one thin coat of clear lacquer to minimize warpage. As only the one actual prototype was constructed, no markings show in any photograph, so it is bonus time again. The 1/32 thick basswood wing, cabane, and landing gear struts were stained with Minwax Puritan Pine woodstain. I found that without the gray silk thread rigging, the high mounted top wing was quite weak. So use thread or monofilament for the rigging.

Power for indoor flying is one loop of 1/8 FAI rubber. I haven't fully trimmed this ship for outdoors yet, but you should be able to work up a loop of 3/16. Flight pattern is left-left, with no side or down thrust and very slight rudder offset.

Join the Flying Aces Club, and have fun. Full size plans on centerspread 54 and 55



Since this article was written, this peanut has taken a first place in WWI Combat at Glastonbury. Rudder is sensitive!