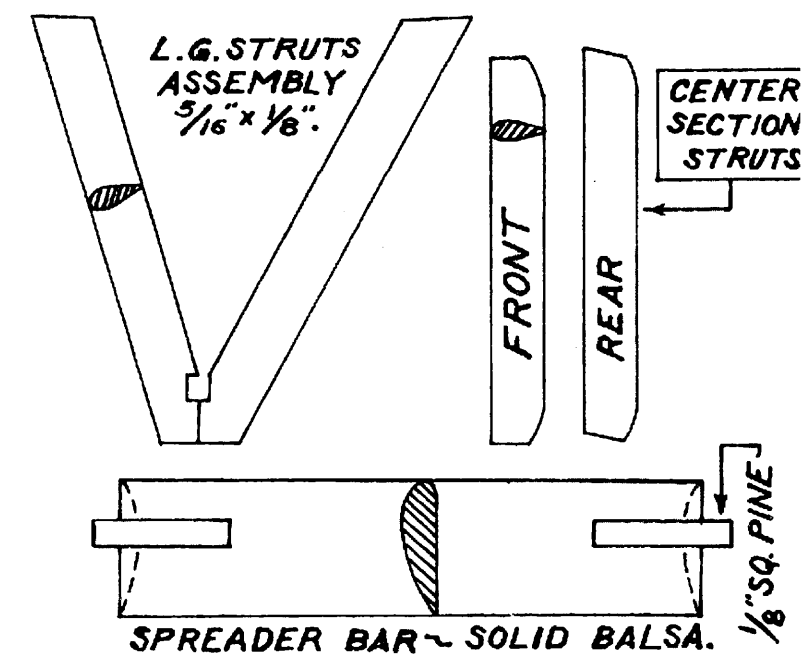
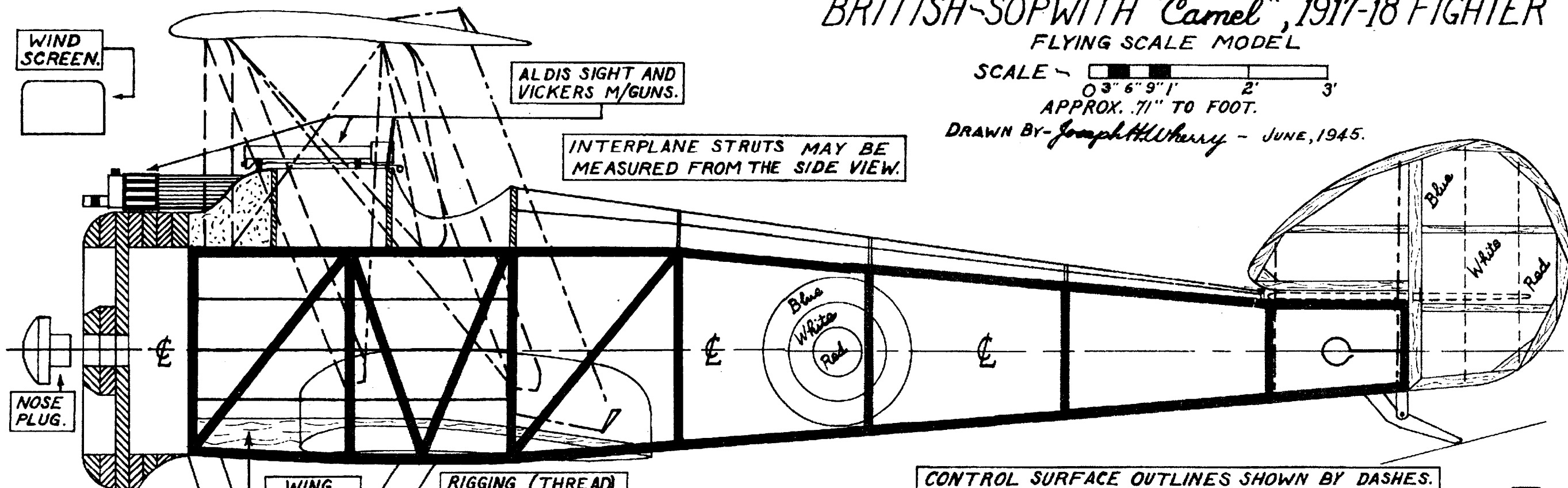


BRITISH-SOPWITH "Camel", 1917-18 FIGHTER

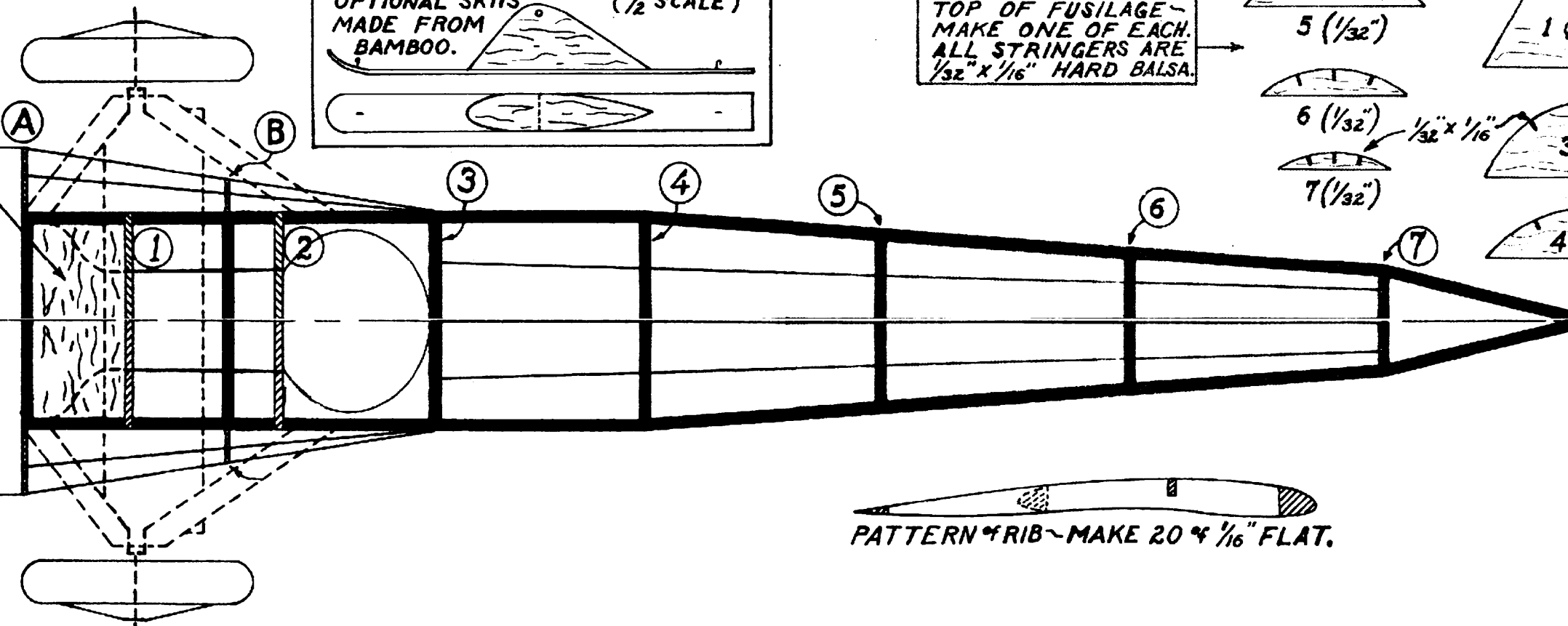
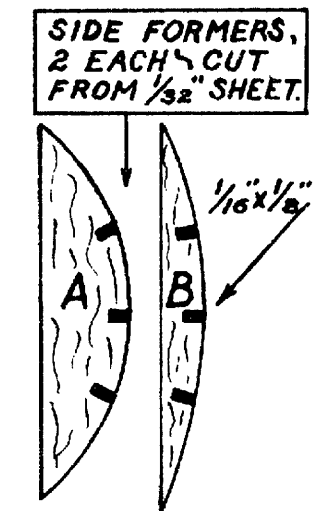
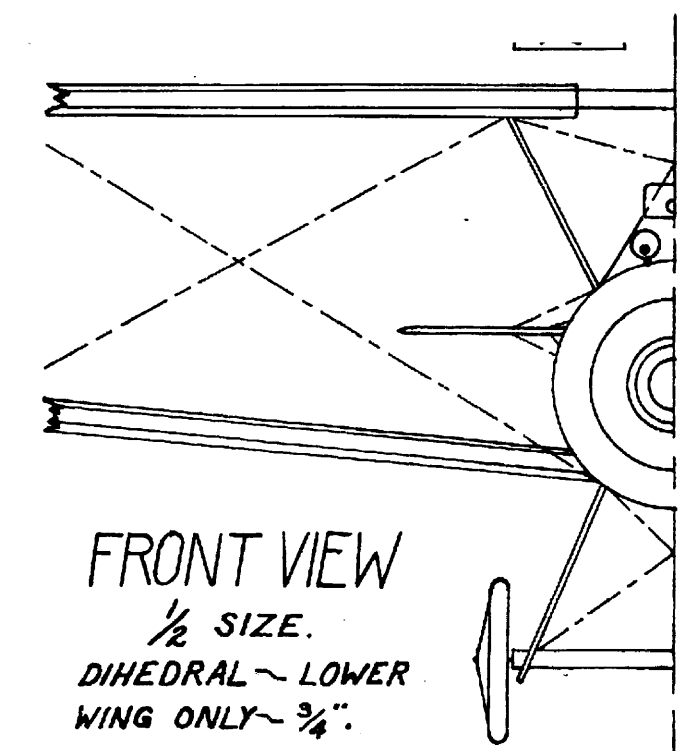
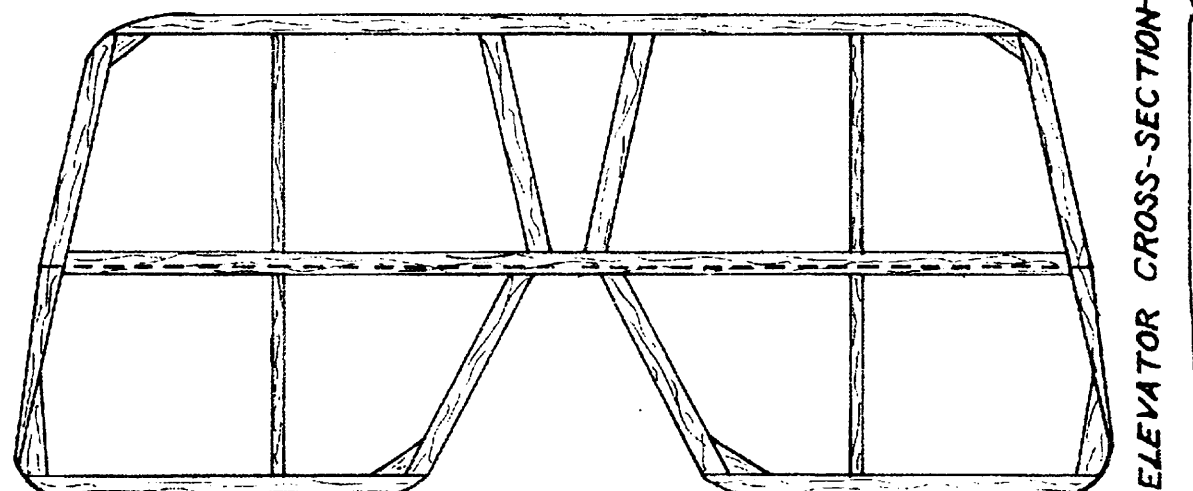
FLYING SCALE MODEL

SCALE ~ 0 3" 6" 9" 1' 2' 3'
APPROX. .71" TO FOOT.

DRAWN BY - Joseph H. Wherry - JUNE, 1945.



CONTROL SURFACE OUTLINES SHOWN BY DASHES.

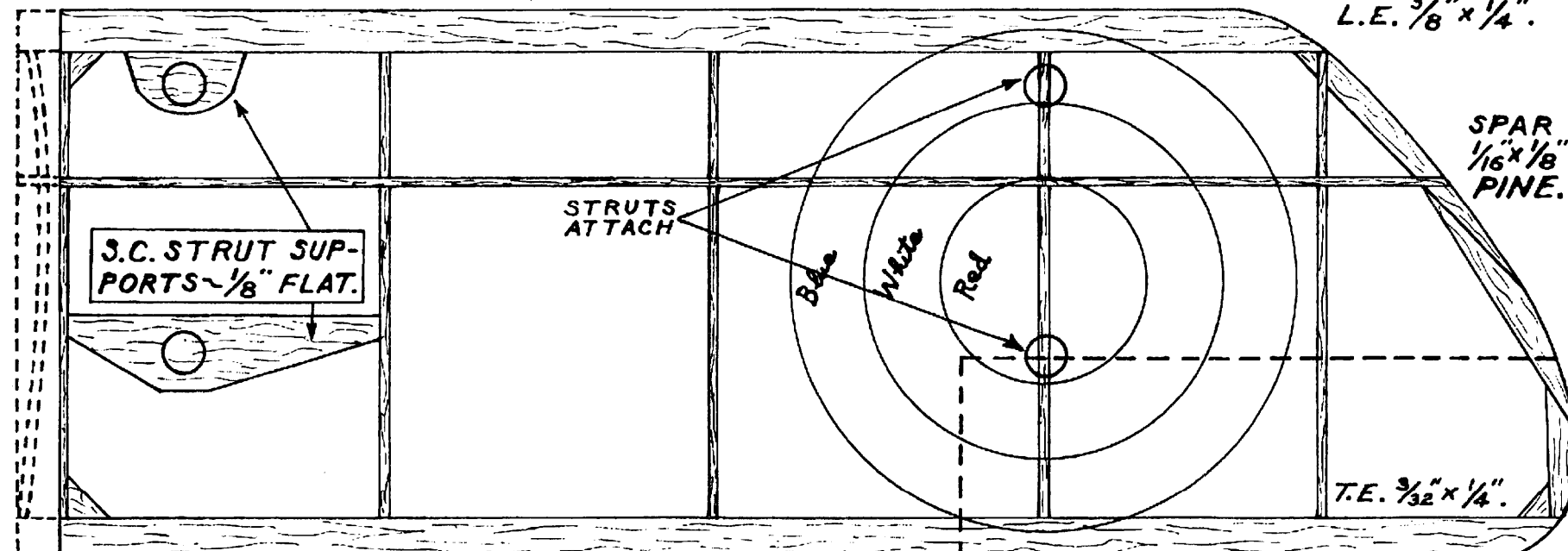
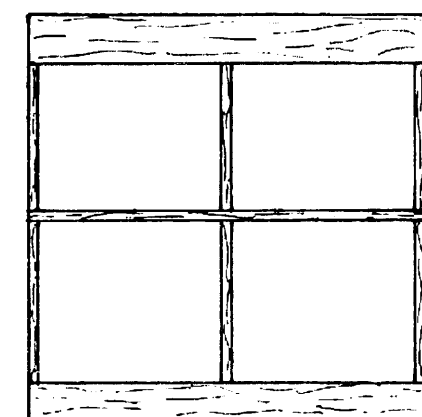
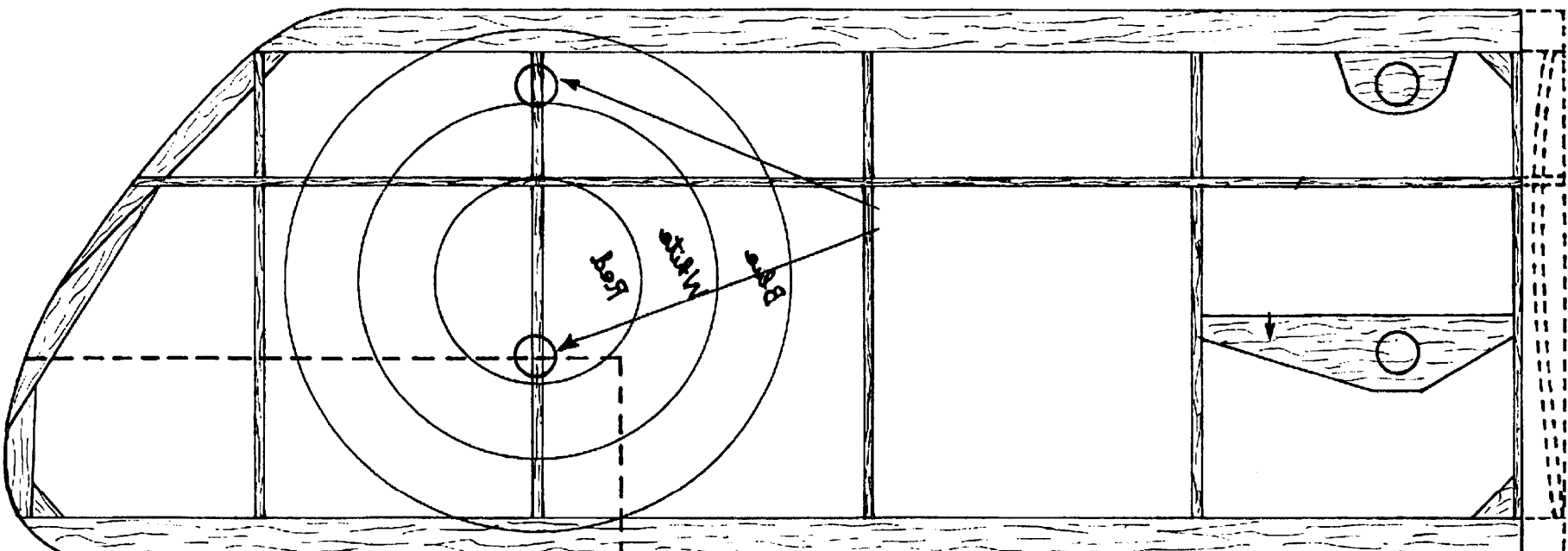


TOP RIGHT WING ~ DOTTED LINE INDICATES LOWER WING.

L.E. 3/8" x 1/4".

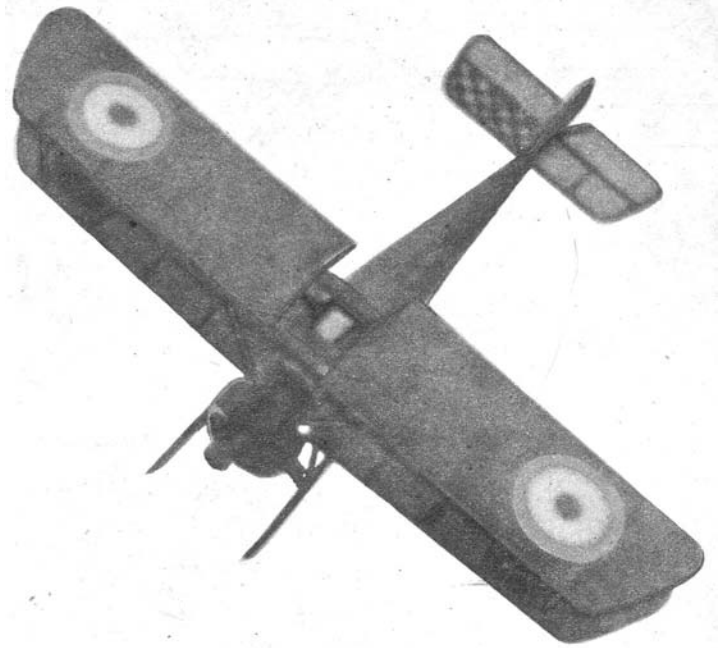
SPAR 1/16" x 1/8" PINE.

T.E. 3/32" x 1/4".

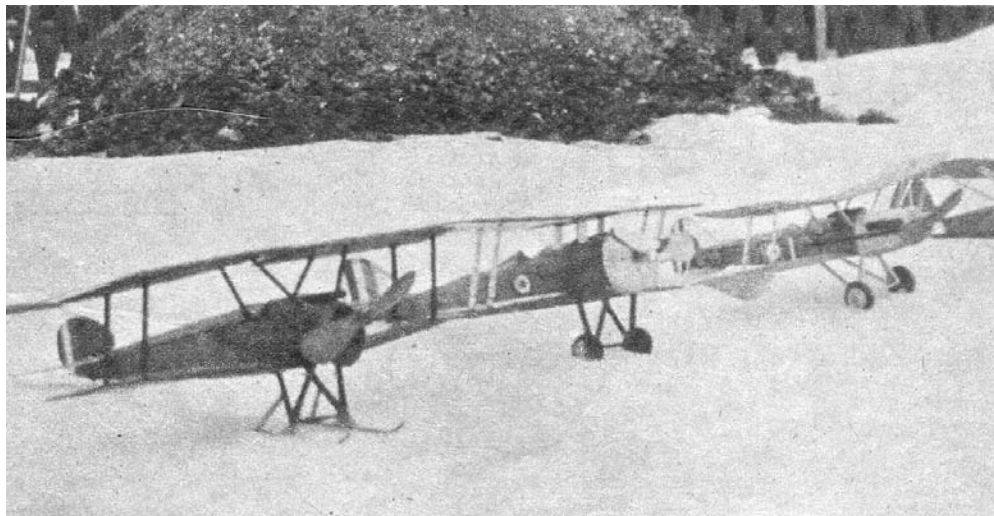


by JOSEPH H. WHERRY

The original model was burned by smoke screen apparatus before finished photos were made, but it proved to be a fine flier



THE GREAT SOPWITH 'CAMEL'



EVERY now and then in all lines of endeavor a truly great event takes place. This is true in aviation as well as in other industries. The event which the author has in mind took place in late 1917 - it was the appearance in squadron strength of the famous Sopwith *Camel* scout fighters over the Western Front.

No sooner had the *Camel* received its baptism of fire than such aces as Collishaw, Little, Frew, MacLaren and others too numerous to mention began to roll up impressive numbers of victories at the expense of Kaiser Wilhelm's Imperial German Air Force. Even the great Baron Manfred von Richthofen had the somewhat disaster-filled distinction of being

shot down over the Australian sector of the British lines by a young Canadian airman, Capt. A. Roy Brown, who finished the war with 13 Jerries to his confirmed credit. Yes, Brown polished off the great Red Knight who had about 82 Allied aerial scalps credited to himself. Richthofen, at the time of his death early in 1918, was flying a Fokker Triplane D.R.1.

Here are, just a few of the *Camel's* points of interest: span 28 ft.; length 13 ft. 9 in.; speed about 115 mph, and cruising time 2-1/2 hours. It could climb to 5,000 ft. in 5 minutes, and below 12,500 ft, it was the most maneuverable ship on any front any

time during the war. All of this remarkable performance was accomplished with a 130 hp Clerget Rotary. Later in the war *Camels* were reaching the front equipped with 150 hp Bentley, and finally 230 hp Bentley motors. *Camels* even served the British Royal Navy as shipboard fighters. The decks of the old carrier *Furious* of the Royal Navy echoed to the battle rhythm of the historic *Camels*.

Statistics show that squadrons of the Royal Flying Corps destroyed at least 905 enemy aircraft, while the *Camel* units of the Royal Naval Air Service destroyed over 370 along with one zeppelin and several kite balloons. This gives a grand total of at least 1275 enemy aircraft as having fallen to the tune of guns manned by the young British pilots. This does not count the many victims of *Camels* flown by the Yanks, Belgians and even French; yes, even the latter purchased some *Camels* for their "Chasse" escadrilles. With their two twin Vickers guns (sometimes one Vickers was mounted, supplemented by a Lewis gun over the center section which was uncovered for better visibility), the *Camel* pilots proceeded to whip many times their number of Jerries.

During the 1920's the Sopwith firm underwent a change in organization and emerged as the now famous Hawker Aircraft Co. The established and proven aeronautical design principles remained, however, and the modern Hawker Hurricane, Typhoon, and Tempest fighters of current fame are the direct descendants of the Sopwith *Camel*, *Snipe*, *Dolphin*, etc.

With this background in mind, you can readily see that no modeler's tarmac is complete without one of the greatest fighter planes that ever worried the "Master Race." If the accompanying plans and instructions are followed, you will be rewarded with a model that will be a beauty to behold, and one that will be a thrill to fly.

One word of caution: the author strongly recommends that no accessories such as smoke-screen apparatus be installed. The writer, when he built the model pictured here, was interested in various gadgets. If he had not been in such a hurry to try out such miniature luxuries he might still have had his model *Camel*; at least he would have had a complete set of photographs to remember it by. That smoke-screen gadget, which was actually successful to a certain extent, caused the model to burst into flames after one particularly beautiful takeoff. All the friendly Gremlins on the model flying field could do nothing and the model was destroyed even before the decorative checkerboard design was applied to the

entire tailplane. Just build a good model, fly it in an orthodox manner, and you will avoid learning a lesson the hard way as the author did to his disgust.

The model shown wore skis throughout its short career and it performed spectacularly on snow and ice. Wheels can be easily fitted; however, if you have never had the experience of flying a model with ski gear here is one that will provide many thrills.

FUSELAGE - We begin by building the two sides of 3/32" square medium grade balsa. Note that this basic framework is shown on side and top views by the solid black construction. The two sides are joined together, first at the tail post, then working forward. Crossbraces of the same 3/32" square balsa are placed in like positions at top and bottom of fuselage. While this structure is drying, cut the side formers (two of each) from 1/32" sheet balsa and cement in their proper places. Cut formers 1, 2 and 3 from 1/16" sheet balsa and cement in place on top of the fuselage frame. Now, from 1/32" sheet balsa, cut formers 4, 5, 6 and 7; install in their proper places. All stringers on fuselage sides are of 1/16" x 1/8" hard balsa; stringers on fuselage top aft of the cockpit are 1/32" x 1/16" hard balsa; and the two short stringers which join formers 1 and 2 forward of cockpit are 3/32" square balsa. When all stringers are installed, sand the entire framework to make it as smooth as possible.

The author suggests that a strong grade of bond paper be employed to cover the space between 1 and 2 top formers as well as to form the cockpit. Using small pieces of 3/32" flat soft balsa, fill in the space on each side of fuselage where the wings connect with the fuselage at the lower longeron. This filling in has been noted on the plans as the Wing Support Gusset. With razor blade and sandpaper, work this support gusset down to where it blends in with the side formers and lower longerons. You will find that this makes a very rigid assembly to which the lower wings and the landing gear struts may be easily joined. Insert the rear motor hook of .004 music wire. From soft balsa carve the solid balsa block which fills the space between No. 1 former and the cowling on fuselage top; sand to a smooth shape, cement in place, and sand further so as to cause it to blend in with fuselage.

The fuselage framework is now complete; we need only the cowling to complete this unit. The cowl is formed of seven layers 1/8" medium grade sheet balsa. With a compass, mark the correct size circles and cut out with razor blade or scroll saw. (The radii

can be easily determined from the cross sections shown in side view on Plate 1a.) Note that the third layer from the front is solid except for the small 1/4" diameter hole at center; note also the two smaller circular layers which form a base for the nose plug. When all cowl circles have been shaped, cement together by laminating and allow considerable drying time. When dry, carve and sand to the correct profile. Note that the cowl is irregular in shape on the bottom when viewed from the side. This irregularity allowed for the escape of the hot castor oil laden exhaust fumes of the *Camel's* rotary motor. The author chose to lighten his model by not including a detailed motor inside the cowl; this motor, if like that on the original ship, should revolve. However, if some of you wish to include a detailed motor, you should have no trouble finding details in old issues of this magazine. The cowling is cemented flush to the front of the framework; and with this operation finished our *Camel* fuselage is complete.

EMPENAGE - Both rudder and elevators are easily built directly over the plans on Plate 1b. In the interest of lightness, because this quality is most essential in flying scale models, the author recommends that tail surfaces be constructed of 1/16" flat medium weight balsa. Widths of the various members may be taken from the plans. The tail surfaces of First World War aircraft were generally speaking flat, the only deviation being the very thin trailing edge as shown in the cross section of the elevators. A thorough sanding with very fine sandpaper will do much to further a successful covering job.

WINGS - The only difference between upper and lower wing panels is shown on Plate 2 by means of dotted lines. To make a set of plans for the left wings, merely trace the right wing panel and invert your tracing. The wings are best constructed of medium grade balsa; directly over the plans, the dimensions are noted on the plans with the exception of the tips which are made from 1/16" flat scraps. The author recommends straight grained pine be used for the wing spars; this adds strength to the very thin wing section. Note that two small center section strut supports are installed in the top wing panels flush with the bottom surface of wing. Be certain that you install the two small gussets at the root ribs of each panel.

The center section is also constructed directly over the plans. The ribs are cut from 1/16" sheet balsa as are the main ribs; three are needed. When all wing

panels have been constructed, carve leading and trailing edges to the proper cross sections shown on the rib pattern. Some builders may prefer to shape these parts before they have been cemented to the wing structure; however the author prefers to shape them, after assembly, with a razor blade. When all panels are complete, sand entire structure with fine sandpaper. Most dime stores sell a number of small "emery boards" of the type used by women on their finger nails; you will find these of great use in sanding the completed frames and in preparing them for a smooth covering.

STRUTS - The patterns for the landing gear struts, landing gear spreader bar, and the center section struts are found on Plate 2. The interplane struts can be measured directly from the side view on Plate 1 (since interplane struts are installed vertically, there is no distortion). All struts are cut from 1/8" x 5/16" hard balsa and are streamlined, sanded and clear doped. The spreader bar is made from medium balsa and is 3/16" thick and 11/16" wide. The two 1/8" square pine axle supports are cemented firmly in notches. Streamline the spreader bar as shown and sand well, then follow with a good coat of clear dope.

Realism can now be added to these struts by color, doping them with a brown dope. This will resemble the struts of early combat planes. Likewise, doping the struts before assembling will aid in securing a neat model; doping struts in the vicinity of a good covering job is not conducive to neatness.

COVERING and DOPING - Because most First War *Camels* were of rather dull coloring, the author suggests a khaki or olive drab colored tissue be used. This will give a desirable color, and at the same time will tend to hold down the weight of the finished model. Covering should always be done with the grain of the tissue running the long way of the part being covered. Because of the concave shape of the undersurface of the wings the tissue adhesive should be applied to each rib. One piece of tissue can be used for each side of each wing panel with the exception of the tips which should be covered with a small separate piece. The fuselage is covered with a series of small pieces, and the tail surfaces can easily be covered with one piece to each side. Be certain the covering is neatly cemented around leading and trailing edges, etc., so as to leave no part exposed.

Because of the light construction of the tail surfaces, merely spray lightly with water and watch for signs of warpage. The wings are also sprayed with

water, as is the fuselage, and when dry may be clear doped with a very thin coat. Insignias are best applied before assembling, and may either be painted on by hand or they may be of the popular decal type. Note that the British insignia follows a slightly different pattern from that employed today by the R.A.F.; all circular insignia is exactly the same, top, side and bottom. The rudder is decorated with vertical stripes also of red, white and blue, with blue next to the rudder post. Note that the center section is not covered.

ASSEMBLY - First cement the elevators in place on top of the top longeron at rear of fuselage just behind former 7. The rudder is cemented in place flush with the rear vertical fuselage members and directly on top of the elevators. Take care that the tail surfaces are properly aligned and that neither positive nor negative incidence is present in the elevator. By the same token the rudder should exactly parallel the center line of fuselage, bending neither to left nor right.

Now assemble the top wing by cementing the center section in place between the two main panels. Note that no dihedral is present in the top wing.

While the top wing sections are drying firmly, cement the lower wings in place against the wing support gusset. Note by checking the half-size front view on Plate 2 that the lower wings have 3/4" dihedral at each tip. This can be accomplished easily by blocking in place with small boxes or dope bottles.

Install center section struts in their proper place directly on top of the top longerons. It will probably be necessary at this point to cut small notches in the bond paper and balsa fill to accommodate the struts. Once installed, using plenty of cement, and at the proper angle (check angle of installation by holding the top wing assembly in place), these struts will form a firm support.

When center section struts have dried securely, cement top wing in place. Note that all strut positions have been indicated on Plate 2 wing plans with small circles. The interplane struts are next installed. It will be advisable to cut away a very tiny portion of covering at the point where all struts join the wings; a much sturdier joint can be accomplished when cementing to the bare balsa.

The landing gear is now cemented in position. When each strut is securely in place insert the spreader bar and cement firmly. It will be necessary to slightly force the struts apart to permit entry of spreader bar. Since all struts are colored the wheels

can be installed. The author recommends that the axles be 1-1/4" lengths of .004 music wire. Force cement into the drilled holes in the 1/8" square pine axle supports and cement the music wire in place. Wheels may be purchased or they may be built of laminations of 1/8" sheet balsa. In any event they should be equipped with a small washer on each side. Wheels are installed on the axles which are bent upward on the end. The author recommends the bent-up axle; should you desire to make use of the ski gear the wheels are readily exchanged by merely unbending the axle and slipping on the skis. The tail skid is made of pine, glued in place.

With the addition of a nose plug and a propeller carved from the illustrated blank shown half-size on Plate 1a, we find that our *Camel* is indeed nearing completion.

DETAILS and FINISHING - Such details as machine guns and gun sight are made of balsa, doped a dull black and cemented in place. The wind screen is cut from sheet celluloid. The bracing wires are realistic and can be added by threading a needle with a good quality light gray thread and sewing in place. If you desire the wires to be visible in photographs it will be best to use black thread. Indicate control surfaces by thin strips of black tissue or by india ink. Note also the small control horns on the wings; these can be added with scrap balsa and cemented in place on the same rib as are the interplane struts. Note that ailerons are present on both top and bottom wings, and that they are connected with (and actuated in part by) a brace wire. Do not overlook the brace wires on the tail surfaces. All brace wires are clearly indicated on the plans by dot-dash lines.

With these details added, all that remains is to color dope the cowl after making certain it is smooth as silk. The author used red dope on his *Camel's* cowl but any bright color will be attractive. The wheel centers should be color doped also, and the tires doped a dull black.

Now your model is finished; should you desire, when the snows come, to have a bit of rare sport just construct the skis shown half-size in the box on Plate 1a. Bamboo strips are used for the skis; the bamboo should be about 1/32" thick and 1/2" wide. A small candle is utilized for making the bend in the skis. Bamboo held near the flame bends easily. Balsa wood is used to form the streamline base, and a small hole with bushings should be in the base. The tiny hooks on both the skis and the landing gear struts are made of a small gauge music wire for the

purpose of holding rubberbands which function as shock cords for the ski gear. Try this system and you'll be delighted with the results. Believe it or not, *Camels* were used on the Eastern Front both before and after Russia bowed out of the first war, so it is safe to assume that *Camels* did see some use on skis.

Your model, if built according to plans, should balance with very little additional weight in either nose or tail. Three or four loops of 1/8" flat rubber

(well lubricated with a mixture of glycerine and green soap) should be sufficient to give excellent R.O.G. flights.

Above all, work with care, and follow your plans. If you do you'll have an authentic scale model of one of the most famous planes ever to carry the insignia of the R.A.F. The author hopes to present plans and data for the Fokker Triplane, one of the Camel's most famous opponents, in the near future.

Scanned From January 1946
Model Airplane News