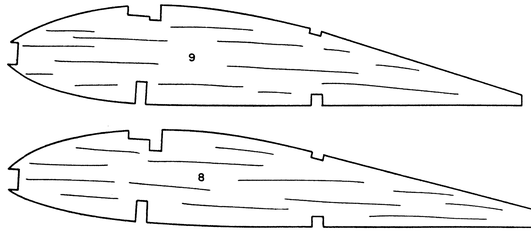
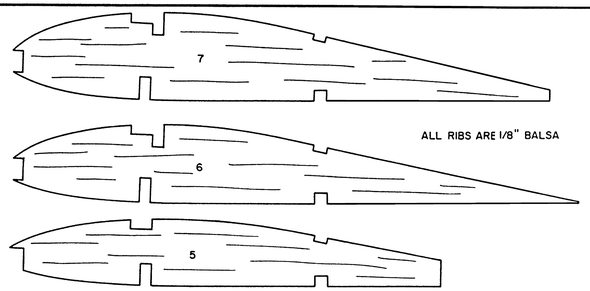
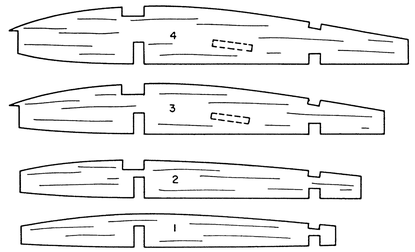
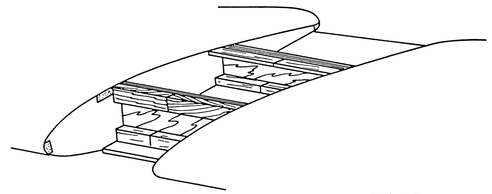
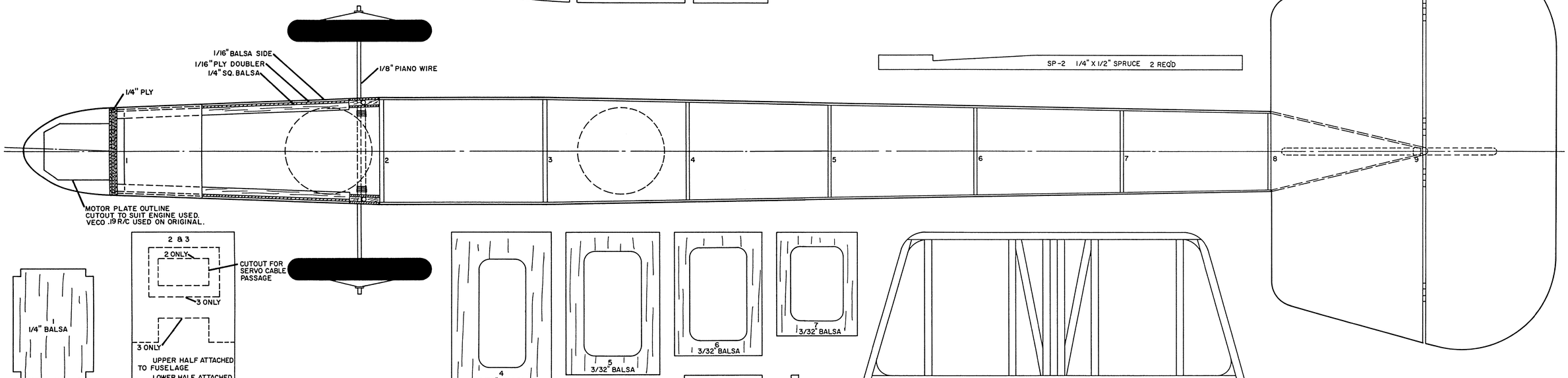




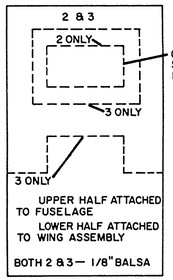
ALL RIBS ARE 1/8" BALSA

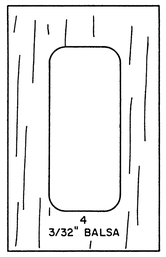


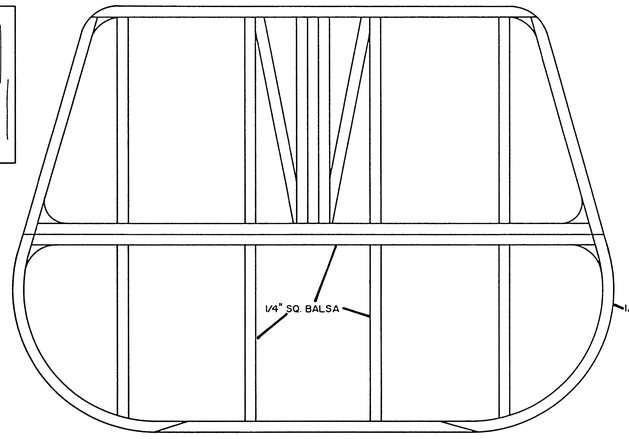


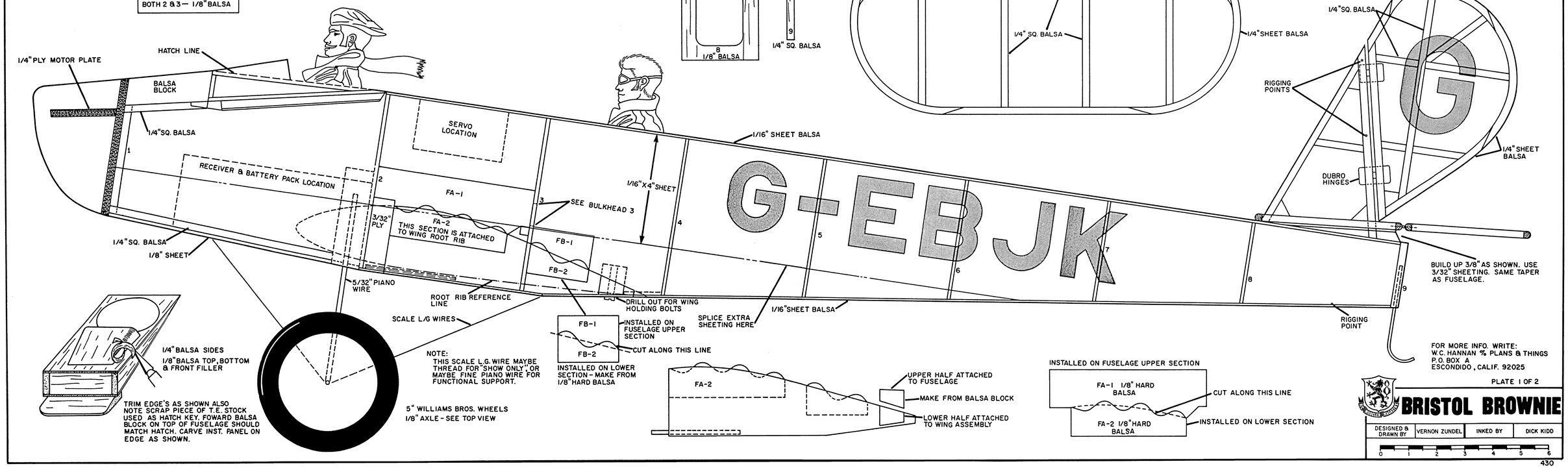


SP-2 1/4" X 1/2" SPRUCE 2 REQ'D









NOTE:
THIS SCALE L.G. WIRE MAYBE THREAD FOR "SHOW ONLY", OR MAYBE FINE PIANO WIRE FOR FUNCTIONAL SUPPORT.

INSTALLED ON LOWER SECTION - MAKE FROM 1/8" HARD BALSA

PLATE 1 OF 2

BRISTOL BROWNIE

DESIGNED & DRAWN BY	VERNON ZUNDEL	INKED BY	DICK KIDD

0 1 2 3 4 5 6

430

FULL SIZE PLANS AVAILABLE — SEE PAGE 71

FULL SIZE PLANS AVAILABLE – SEE PAGE 71

1/16" SHEET BALSA TOP & BOTTOM

1/8" PLY JOINER

WING LOCK & SERVO PLATE – 1/8" PLY

NOTE: ALL RIBS ARE CAP STRIPPED BETWEEN SHEETING (TOP & BOTTOM) WITH 1/16"X1/4" BALSA.

1/4" PLY JOINER

WING LOCKS-SEE DETAIL

LEADING EDGE 1/2" SQ. BALSA

1/4" HARD BALSA

UPPER SPAR 1/4"X1/2" BALSA

LOWER SPAR 1/4"X1/2" SPRUCE

SP-2 IS 1/4"X1/2" SPRUCE

RIBS ARE 1/8" BALSA

1/8" PLY BELLCRANK MOUNT

1/16" SHEET BALSA BOTTOM ONLY

LOWER SPAR 1/4" SQ. HARD BALSA

UPPER SPAR 1/8"X1/4" BALSA

CUTOUT FOR LINKAGE

1/4"X1/2" BALSA

1/8" PLY HORN MOUNT

1/4" X 1" TRAILING EDGE STOCK

9 8 7 6 5 4 3 2 1

DIHEDRAL IS 4" UNDER EACH TIP

FOR RUDDER & ELEVATOR ONLY INCREASE ANGLE BY 2"

PLATE 2 OF 2

BRISTOL BROWNIE

DESIGNED & DRAWN BY	VERNON ZUNDEL	INKED BY	DICK KIDD

0 1 2 3 4 5 6

430

BRISTOL BROWNIE

By VERNON ZUNDEL and AL SIGNORINO

The Bristol Brownie was destined to become one of those obscure aircraft that was deleted from the vintage aircraft files. I became aware of its short lived history when I was going through a file of 3 view drawings that I had purchased from W.C. Hannan Graphics in California, under the company name of "Plans & Things" (a very good source of information by the way!) It was the first vintage airplane that I know of that used the adjustable dihedral feature, although not incorporated in this model. The Bristol Brownie, unlike the Blackburn or Demoiselle, is ultra simple for anyone who has ever used an X-acto knife.

First I will present a short and concise history of the Brownie (knick-named) "Jack" by those who flew it.

It was first brought to the concept stage as a racing type aircraft. It was built in England in 1924 and only 3 were completed by the Bristol Company. The model presented (G-EBJK) was the first of the three completed in 1924. The SN's were 6526–6527–6528; the names given to these aircraft by their pilots were "Jack", "Jill" and "Jim". The dimensions of the Brownie were: Span 36'7", Height 6'6", Tare Weight 500 lbs., Max Speed 70 mph, Length 26'3", Wing Area 204 sq. ft., All Up Weight 870 lbs., Range 100 miles.

By this one can see it was a fast little plane in it's day with a minimum of weight. The first flight was made by G-EBJK on the 6th day of August 1924 by Cyril Uwins, then soloed by Barnwell and later flown by both of them together. Barnwell was credited with both the Biconvex wing and the Segmental Ailerons of the Bullfinch type. The original Ailerons were actuated by a single cable against rubber cords but later adapted to a return cable. Two types of wings were used on these aircraft; one wood, the other metal in hopes of higher speed. The first mishap was to G-EBJK on Sept. 5, when T.W. Campbell had the misfortune to foul some telephone wires and made a crash landing on the airfield at Filton where the damage was repaired in time for the air trials at Lympne. Uwins flew G-EBJK and designated it No. 1. G-EBJL was flown by Campbell and designated No. 2, making its first flight on 27 September that year. G-EBJM was also flown by Campbell and designated as No. 3. No. 3 was entered as a single seater with a long range tank and entered the Grosvenor Cup Race. In the main trials Uwins took second place of 500 pounds for the best take off and landings, this being the Duke of Sutherland Prize. Campbell won 3rd with an average speed of 70 mph. In late December of 1925, G-EBJK was considerably modified giving the aircraft a higher speed. The top longerons were altered to a slope, giving the pilot a better view. A larger engine and strut braced landing gear, still with a flexible axle as the only means of springing, were installed and the plane was redesignated Model 91A.

The Brownie went through a series of changes in the remaining years; metal prop, modified landing gear, shock absorbers, enlarged horn balanced rudder, and redesigned cowling, etc., but the Brownie held it's basic shape. In September of 1926 model 91B was entered in the Daily Mail Contest. Uwins won third prize of 500 pounds and won second in the S.M.M.T. Handicap on September 18. G-EBJM was hired by the London Aeroplane Club in 1927 and entered in many races in its remaining years; it was scrapped in 1930. G-EBJL was similar and was used by Bristol and Wessex Aeroplane Club until they moved in 1930. G-EBJK was less fortunate in that it was alloted to Capt. Barnwell for his personal use and on March 21, 1928 came to it's end on an attempted flight against a strong wind. It was in view for nearly an hour as he battled high winds. When he took off he encountered severe downwash over trees and in spite of full power, crashed on a road. He was unhurt but G-EBJK was a write-off. Although excellently built and engineered, efficient in performance and economical to use, it was expensive to build and not rugged enough to stand up to normal club use. Nor was it cheap to repair and, with the coming of the DeHavilland Moth, the Bristol Brownie was forgotten.

The 2 inch scale Bristol Brownie presented here is another model in my collection of those "magnificent machines" of an era past. At first you would say, "How can it fly with such an unbalanced ratio of horizontal stabilizer to wing area?" At this point, even I cannot explain this! But there will always be some questions unanswered about this type of aircraft in the beginning years of aviation. Probably the long tail moment and forward CG compensated for the small stab. Here again we . . .by we, I mean Al Signorino of the McDonnell RC Club, and myself, decided on a more closed fuselage type construction than we have been building in the past. This gives the builder less construction time and more flying time, while retaining that touch of nostalgia. ("So off we went to the Balsa Store".) It didn't take but a short time to rough a set of drawings with the help of the three view drawing from W.C. Hannan. Our first attempt at the finished drawings showed we

The Bristol 'Brownie' is an excellent "First Scale" subject. It is easy to build and even more docile to fly with its light wing loading.

needed to beef up the entire structure for R/C type flying. This aircraft, using an almost full symmetrical wing, could be further strengthened for contest type flying. Take note at this point that ailerons should be used. Just a straight wing would mean that a considerable amount more dihedral would have to be used, as we found out in our first test flight without ailerons. In comparing our finished drawings to the original sketch we had outlined, the only goof we hadn't made, was which end to put the engine on! The engine was a .19 on all our test flights, and we installed Al Signorino's Controlaire, thinking we would not have enough space for any other type. But at the time of installation we found we had enough room to install twice as many S4A servos as needed, giving the indication of being a versatile machine. We haven't found any reason to date why we should go to a larger engine unless the builder wishes to stunt this plane. But doing this would take away from its original scale type flying. It's my belief that this model could make a very good low wing multi-trainer. It's slow, and turns and banks are flat with no serious wing dipping. Without ailerons it was slow in coming around into the wind. To those modelers who wish to build this model I would like to recommend building it with ailerons.

Being the type of throttle bender I am, and the perpendicular landings I make, I decided on providing the model with certain provisions for "turf plowing". Now this may seem to be the wrong approach to some, but it proved to be most advantageous later on in our test flights, as you will see. I built up the nose of the plane with the idea of competing with, would you believe, the Wabash Cannon Ball? Prior to our sixth flight I had been cleaning around the engine compartment and had changed the needle valve setting slightly. Soon after take off the engine died on a crosswind leg. About this time Al Signorino (our test pilot), knowing he could not make a full pattern into the field, decided to try for the edge of our field. Giving a fair warning to all, he made his attempt; "up came the gale" and into a half roll, vertical half gainer, and vertical landing approach (I could do that good)(Is that hard to learn, Al?). Well anyway, it hit like the proverbial brick! I think six or seven times to be exact! Would you believe that it didn't even scratch the MonoKote? As a matter of fact, we were airborne as soon as we could start the engine and reset the needle valve.

As you will notice we tried to save the builder (and myself) the awesome work in building spoked wheels. The landing gear is composed entirely of 1/8" or 5/32" piano wire and Williams Bros. wheels. The method of attachment may be undesirable to some, but we found it to be most adequate, and easy to build. Instead of the usual rub-

(Continued on page 55)

(continued from page 21)

ber-band shock mounts, or bungy cord method most widely used on models today, and the originals of old, we decided on a torsion effect eliminating all the extra work involved.

The only disadvantage in scale landing gear felt on this particular model is that it has a close wheelbase in relation to wing span and, if flown off of a very rough field (like gopher mounds and mole hills) can give you an awful feeling in your stomach, as the plane starts to rock back and forth trying to dig up the grass. The take offs on rough fields must be similar to what must have happened to the originals on take offs!

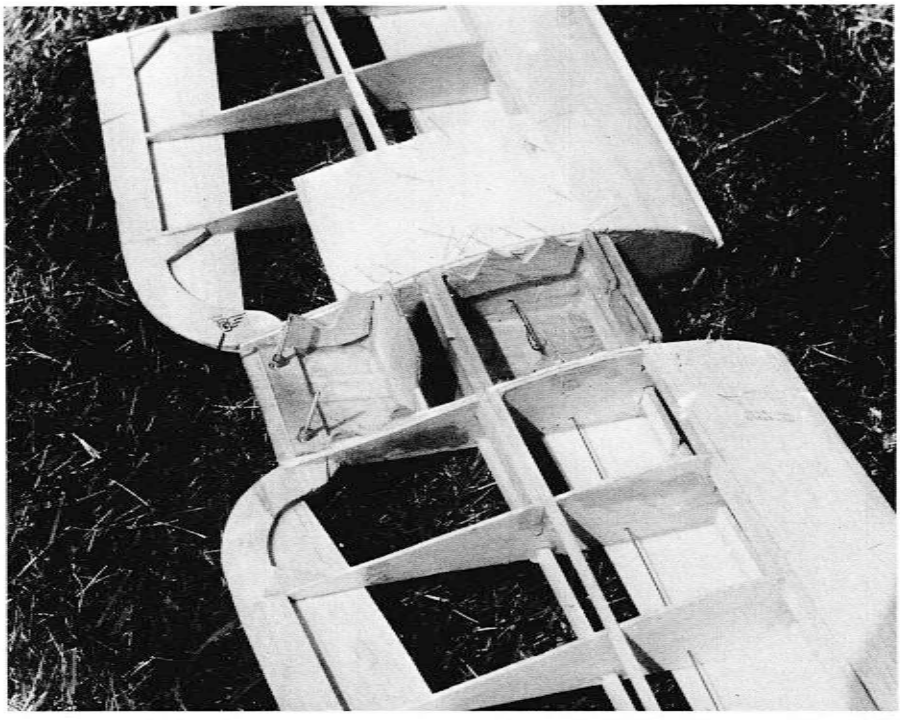
The pilot used was a modified GI-Joe doll and the hat (on backwards) was formed on his head out of Hobbypoxy "Stuff". It's quite simple to use. Just mask off his head, cover with a liberal amount of stuff and let dry, carve and sand to shape (you may have to add a second application to cover any goofs the first time, also to build up the bill of his hat), paint an appropriate color, add side burns, moustach, goatee, and a scarf and you're ready for installation.

The wing area of this 2" scale model is approximately 6 sq. ft. The prototype weighed 5¼ pounds ready to fly giving it a wing loading of approximately 14 oz. per sq. ft. This accounts for the ability of this model to fly well with a .19 and make scale like fly-bys and slow flat landing approaches.

Detailed construction information is not given because the design is straight forward, can be built from the plans, and is not recommended as a beginners first model.

Credit must be given to the members and staff of the McDonnell R/C Club and to W.C. Hannan Graphics for their assistance in detail construction methods and information on this aircraft, which proved most helpful in preparing this construction article.

In a final note I felt it was to aviation's disadvantage that the Bristol Company did not produce more than three Brownies. Had machines like these been more plentiful in the early days of flight no telling where our designs would be today. So, once again, I felt this would be a good selection to present to the modeling fraternity as it never really gained its rightful place in the pioneering days of aviation. Unlike so many others, it's easy to build and fly so don't hesitate. Order a set of plans and have yourself a ball. Once you see it taking off of your favorite grassy field I think you will feel it was all worth while. ●



Close–up of wing center–section.