

THE FLEET MODEL 16B

Ever popular with the serious scale modeler are the numerous biplanes of the 1930s. One of the most well known of these was the FLEET 16B primary trainer built by Fleet Aircraft Inc., a subsidiary of Consolidated Aircraft Corp. The Fleet aircraft were classics of biplane construction. Beginning with the Model 1 powered by a 110 hp Warner 5-cylinder radial engine, the Fleets were modified through numerous model changes to the final 16B with a 160 hp Kinner engine, the end result being increased performance in speed and climb.

Much of the information and airframe configuration for the model was taken from the 1935 edition of "Cadet System of Ground School Training" by Lt. Leslie Thorpe. The fuselage frame is built to the same general construction as the original aircraft. Basically, except for the Fleet model F-10-G, almost all models of the Fleet used the 5-cylinder Kinner engine between 110 and 160 hp. The rudder shape varied somewhat from model to model but is most generally seen as shown in our design. The Fleet 16B was used extensively by the RCAF as a trainer during the early 1940s. Many of these aircraft were restored after WWII and found their way into private use.

In Canada the Fleet was called the "FINCH." Early models were ordered by the AAF for service testing but were never purchased in quantities. These were called the PT-6 (Model 7) and were equipped with the Kinner 125 hp engine. The rudder and fuselage rear section profile were noticeably changed and a headrest installed. The original aircraft construction was quite sturdy—tubular steel frame with fabric cover, metal wing ribs and wooden spars. Many Fleets in the Canadian Service were equipped with full cockpit enclosures for cold weather operations.

Our model was originally developed as a .020 free flight but remodeled, so to speak, to take the new Cannon 2-channel block. There are some construction differences between the R/C and Free Flight versions which I will point out from time to time.

FUSELAGE

The fuselage construction is quite conventional being of simple box frame with 1/8" soft balsa nose covering. Build the 2 sides of 1/8" hard balsa strip. If the model is to be R/C—fill in spaces on both sides of fuselage where the control cables will come through to provide support. The covering on the forward part of the fuselage and cockpit area can be 1/16" balsa if the model is for free flight. Fill in the bottom of fuselage between the landing gear struts with

Pilot report by Pat Potega

SCHOOLYARD SCALE FLEET BIPLANE

Art Reiners, designer for R/N Models, presents his version of the famous 1930 biplane sport/trainer.

1/8" medium balsa after the landing gear is in place. Wire for the landing gear is .047" diameter for free flight and 1/16" diameter for R/C.

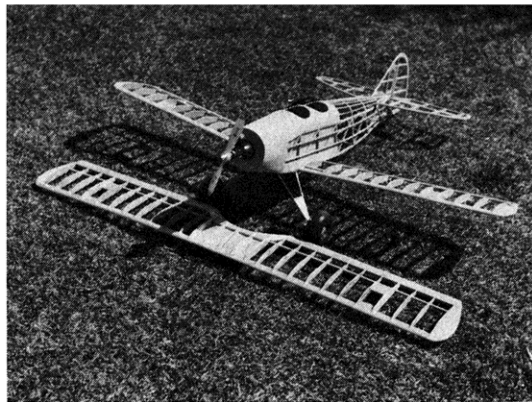
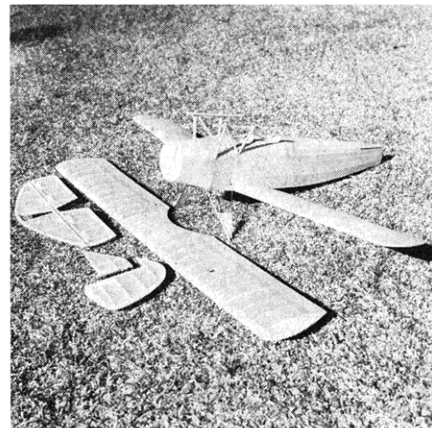
The landing gear struts are soldered together at the axle position. The axle strut was eliminated on our model to provide more flexing for the landing gear. The X-braces on the bottom of the fuselage are all 1/8" square balsa. The formers used on the top of the fuselage are all 3/32" balsa. The stringers of the turtleback section are 1/16" x 1/8" hard balsa except on the center line. This stringer is

1/8" square to provide better support for the rudder/fin.

The nose block can be built of 3/16" balsa sheet backed with a 3/16" plywood firewall for Free Flight or R/C. The VL Products electric motor also fits very well on this model. Cylinders were Williams Bros. 1" scale plastic revised to resemble the K-5 Kinner without the collector ring for the exhaust. The nose block was hollowed out to accept the Cox .020 Tee Dee engine with the top dummy cylinder removed. The windshields were light clear acetate held in place



The Fleet rests on a dirt road in the foothills of Agoura, California, just the kind of pea patch you need for some fun flying.



Basic frame-up of the Fleet with Cox .020 installed.

Component parts after covering. A traditional model?

with stripping tape.

The tailwheel assembly uses a Perfect 1/2" wheel with 1/8" and 3/32" aluminum tube used to fashion the fork. The main gear uses Trexler 2" air wheels with brass axle bushings. The cut out for the wing should be as snug as possible. One-eighth-inch hardwood dowel can be used to provide hold-downs for the lower wing. Note that the wing sits slightly below the fuselage. The position of the doweling is shown on the drawing. The lower wing can also be attached using plastic screws through the bottom of the wing into a hardwood block in the bottom of the fuselage. This method does make a much cleaner appearing installation. The louvers on the nose of the fuselage are made of soft, thin aluminum sheet attached with epoxy.

TAIL ASSEMBLY

Both the rudder and elevator are made of 1/8" balsa reinforced at points where hinges are used. For R/C we recommend using 1/8" x 3/8" for these stress points. We used small Klett hinges for the R/C model. For free flight, 1/8" square balsa strip is adequate. No moving controls were installed on the free flight version.

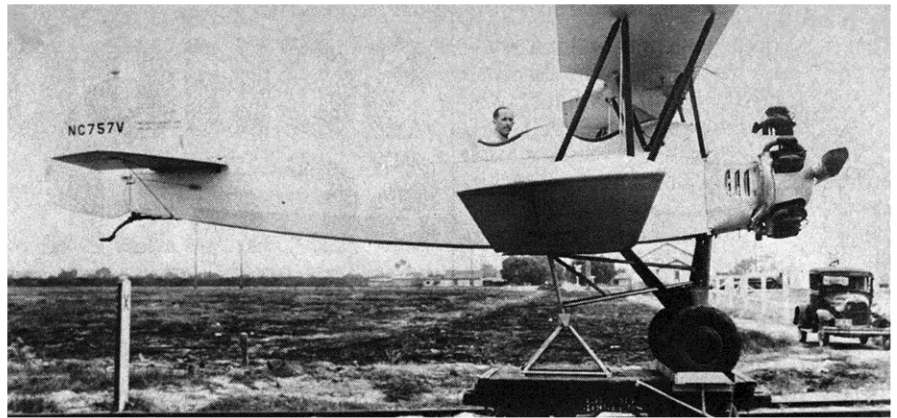
WING ASSEMBLY

The general shape of the top and bottom wings is the same except for the center section. For R/C there is no dihedral on the top wing panel. The spars are one continuous strip, 3/32" x 3/16" hardwood in front and 1/8" square balsa in the rear. The free flight model will not require hardwood due to the lower wing loading.

Begin the top wing by laying out leading and trailing edges (hardwood) and center section curve. The wing is shown with semi-scale rib spacing. I would recommend removing every other rib or making ribs of 1/20" balsa for free flight. A 1/8" sheet balsa filler is used at points where the struts enter the wing.

The struts were made of 1/8" x 3/32" hardwood sanded to an oval shape for streamlining. The center section ribs are the same as the wing panel. Cut the rear of each rib to fit 1/4" thick curve. Taper the C.S. curve to 1/8" to match the trailing edge. All ribs are 1/16" medium balsa.

The lower wing panels are connected at the center to provide a single piece wing with 1" dihedral at each tip. The two butt ribs are 1/8" hard balsa—all other ribs are 1/16". The tip curves on both the upper and lower wings are raised 1/8". The 1/8" filler for strut support is positioned on the top side of the wing instead of on the bottom, as in the case of the top wing. Be sure that the wing is properly placed at the center to fit



Trexler inflatable soft rubber wheels are just the thing for landings on unimproved dirt strips.



This Fleet Biplane is an accurate restoration of a ship in U.S. service. Colors are the same as used on our model with the exception of the red, white and blue tail and national insignia.

the fuselage—the fuselage fits between the two butt ribs snugly. The wing supports used at the center are 1/16" plywood. After all parts are completed and the wing removed from the plan, sand the leading and trailing edges to shape as shown. All spars should be put in at this time. The bottom of the wing is flat and easy to sand and cover.

COVER AND ASSEMBLY

The fuselage on our model was covered with lightweight silkspan and color doped Curtiss blue. Paper was put on wet to match the curve of the fuselage. Rudder and elevator were

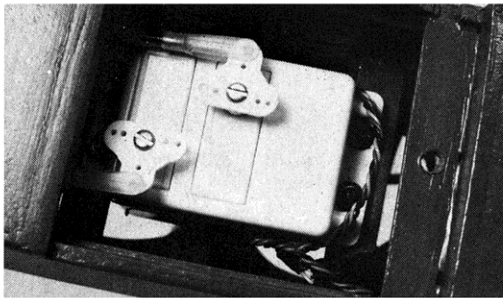
covered with Jap tissue and color doped Cub Yellow. The wings were Jap tissue covered for free flight and lightweight silkspan for R/C and color doped Cub Yellow to match the tail assembly. If the model is going to be a free flight (gas, electric, or rubber powered), I would recommend using Jap colored tissue for all surfaces to reduce weight. The Canadian insignia was made from Monokote circles in red, white, and blue. The lettering was white Monokote or Solar-film.

MISCELLANEOUS

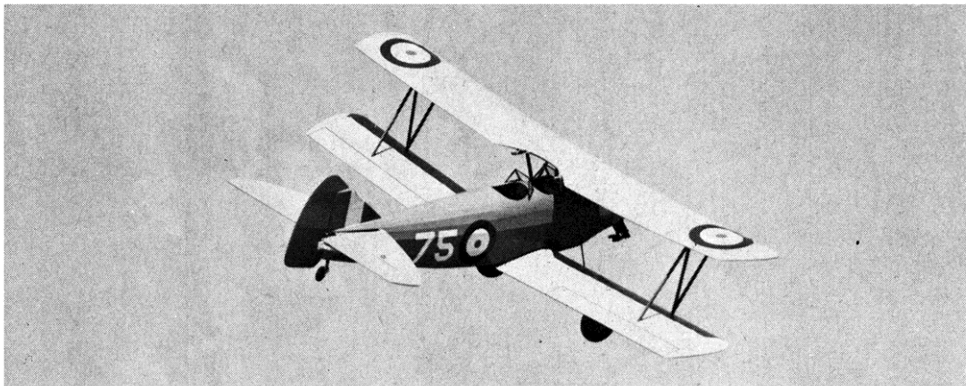
The rigging is quite simple on my model—I left it off. Actually there is



View of an honest-to-goodness Fleet Biplane undergoing a rather strange form of testing. Photo taken in September of 1936.



R/C installation detail, relatively simple and uncluttered.



very little rigging on a Model 16B as can be seen in the pictures and drawing. Suit yourself on whether or not you care to install it.

Aileron controls could be installed if desired on the lower wing only. The outline is shown.

A Cox .020 TD was used for power on our original free flight model and used for the R/C version too. By removing the engine fuel tank and installing the red back plate, a fuel tank can be mounted in the fuselage behind the firewall but do it early in the fuselage construction phase. Run the fuel tube for the engine and the filler pipe for the tank through holes in the firewall and top cowling respectively.

The radio receiver and battery are easily mounted in the fuselage as shown. Hook up the control cable (links) and give it a good checkout for free operation—this model will weigh out between 14 and 17 ounces if carefully built . . . keep the weight down. The free flight model comes up to about 6 oz. maximum, about 8 oz. for VL electric.

I recommend trying ROG flights if possible to check the control response

better. Again, suit yourself on this.

Hope you like these biplanes like I do.

Happy landings.

PILOT REPORT: FLEET BIPE

By Patrick H. Potega

One of the classic nostalgia biplanes of the "Golden '30s" has to be the Fleet. That Kinner radial up front, equi-span wings and bulbous balloon tires just have to equate with aerial beauty. And to miniaturize it, so that it can be displayed on the piano, then flown from the patio, is to make nostalgia come alive.

The full-sized Fleet was a primary trainer. True, the original Kinner 125 hp engine was a notch below the Warners in reliability, but dead-stick landings were part of the program anyway. What was great about the Fleet was that it could safely ground loop, take off cross-controlled, land cross-controlled, fly mis-rigged and, in general, give the student pilot every benefit of the doubt. With the 160 hp Kinner, it was very aerobatic with one cockpit occupied and, of paramount

importance, it would take the kind of abuse only an air cadet could subject it to.

The model varies in flight performance and structural integrity from the prototype. It's not a student pilot airplane. With 222 sq. in. of area, it has a wing loading of 8.9 oz./ft.². With a Cox .020, the power loading is marginal, and a brief respite at the controls will get you into hot water in no time. I'd prefer to see a .049 (probably with the prop on backward to reduce thrust) as the optimum engine. We used the Cannon Super-Mini radio for ultra-light capabilities . . . if you use a "normal" radio, an .049 is probably essential.

the Cannon radio, since it adds a scant

The *Scale R/C Modeler* prototype weighed in at a scant 12.5 ozs. ready to fly. That's a good target weight to shoot for, but it will take a lot of lightweight balsa in the empannage to achieve it. Again, what really helps is the Cannon radio, since it adds a scant 3 ozs. to the all-up weight.

The William Bros. dummy cylinders not only add a lot of eye appeal but, on so small a model, they help by supplying some "functional" nose weight. Without them, the model looks like the Mona Lisa without that famous smile. Naturally, the same holds true for the Top Flite decals.

The test flights were, frankly, most frustrating. The .020 was really singing, but the airframe weight was a bit too much for it. Don't tell the Editor, but I flew it without the radio (controls locked with Scotch tape) and it makes a great free flight with the Tee Dee .020.

Some flights were made with our trusty Cox Q R/C .049 after all the photos were taken, and the model was just right. I like to fly bipes (both big and small) with lots of rudder throw and medium elevator travel. In numbers, about 24° of rudder, either side of neutral, and 15° of elevator the same way.

With only 28" of span, the model is compact enough that I keep it, and all the flight equipment (transmitter, fuel, battery, etc.) in a medium-sized suitcase in the back of the car. At lunch break, I'm ready with an ROG out of the parking lot, some safe flying over an adjacent parking lot; then a landing on the sidewalk. This isn't to sound "showy," it's just that the model is so small that to fly the parameter of a baseball diamond is getting it really out there.

If you like to build (too many stringers and ribs for me) and want an honest .049 powered bipe, I'd recommend the Fleet. It's got snappy performance, very small field capabilities, and is extremely compact for "carry it with you" capabilities. □

