

fleet bipe



Looks just like the real thing, slight dent in leading edge and holddown rubber bands are the only things that give our business-like model away.



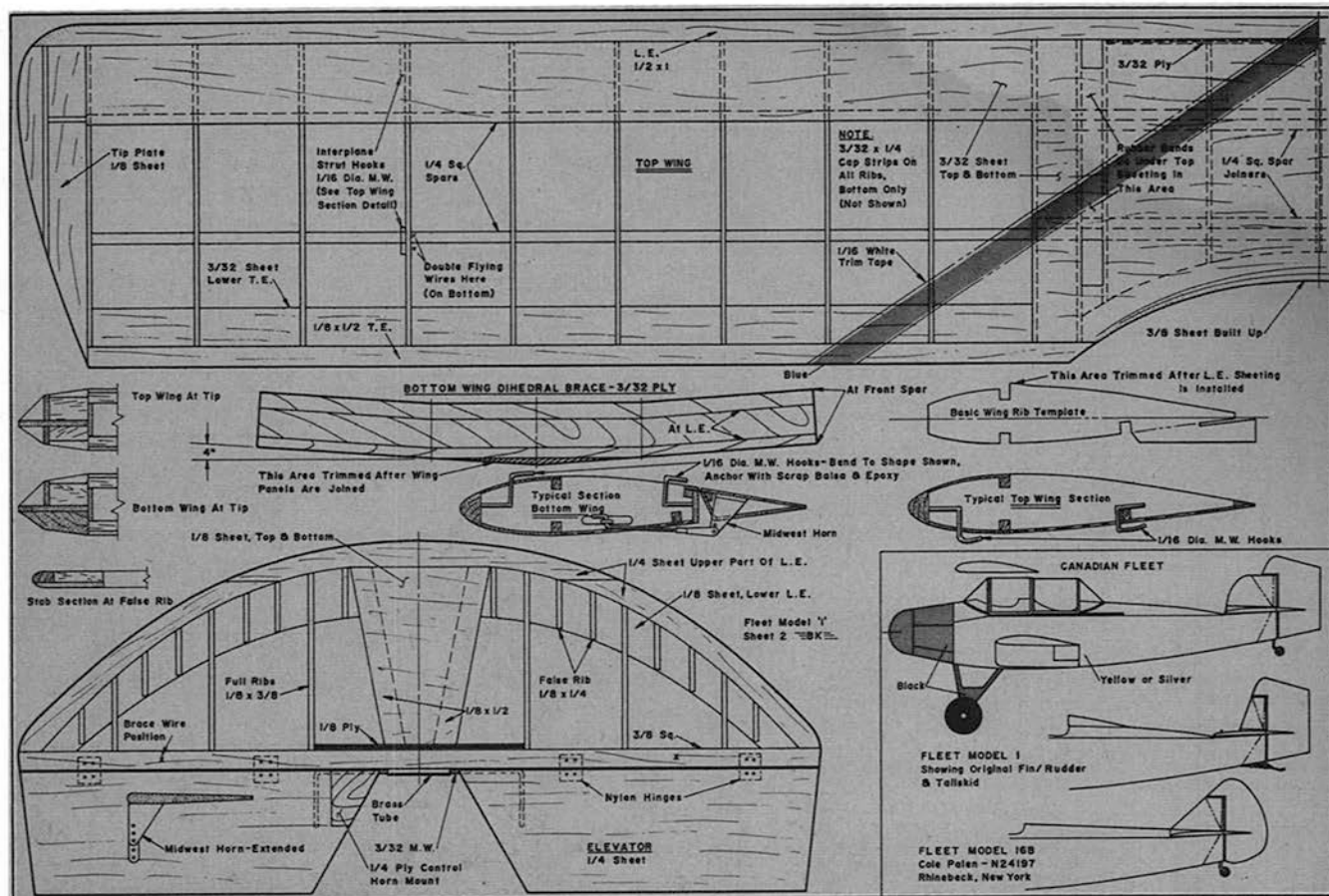
View from the aft end shows the excellent cockpit and exterior details.

Radio-control scale at its very best. Exciting looks, exciting performance, adaptable and best of all, easy to build and even easier to fly.

By BILL KING

► My first encounter with this unusual Fleet biplane occurred while I was attending an airshow in 1962. Among the many antiques and homebuilt planes that flew in that day, this one was a standout. Exactly what it was, I didn't know, but it was obvious that this was a plane perfect for modeling. The color scheme was true to Navy fighter planes of the thirties.

Once the crowd had thinned out, my wife turned on the high powered charm and a guard let her through the gate to get some close-up color slides. Although I didn't know it at the time, these were to become an important part of my scale presentation. I later learned that the plane was owned by Dr. Richard Coughlin, a Syracuse, New York, dentist. Dr. Coughlin was very helpful in supplying additional details about his ship, and (Continued on next page)



Fleet Biplane . . . continued

sent along a number of photos which were a real timesaver when building time came around. It turned out that the plane was a Fleet Model I which was finished to simulate a Navy N2Y, one of several planes designed to be carried aboard the airships MACON and AKRON. Major departures from the actual N2Y's is the ring cowl and the lack of the airship hookup gear on the top wing. Although this model looks like, and acts like, a Navy N2Y, it is not. Except for the minor deviations noted later, it is an *exact scale model* of Dr. Coughlin's Fleet Model 1.

The next step was to dig into the background of the Fleet planes. The Fleet Model 1 was granted A. T. C. #122 in May, 1929. It was a product

completed 49 loops, but the judges (probably ancestors of some R/C judges) claimed he lost heading on three loops and refused to allow them.

The U.S. Navy purchased six Fleets for operational use as hook-on aircraft aboard airships. It was a Fleet piloted by Lt. D. Ward Harrigan which completed the first night hookup aboard the airship Los Angeles. The feat was accomplished on September 29, 1931 with crew members holding flashlights to show Harrigan where he was! Harrigan's plane did not even have navigation lights, so he was equipped with a flashlight, too! The N2Y's were later replaced by Curtiss F9C's, but the early successes of the Fleet's encouraged the Navy to continue until the airships themselves met disaster.

With this kind of background I was convinced I had to build one! But plans weren't readily available, it was already January, 1965 and I wanted to enter it in the 1965 Nats. Panic! A visit to the M.A.N. offices solved the problem. Walt Schroder came up with a set of Nye drawings which had appeared in the December, 1935 issue of Model Airplane News. These drawings proved to be ideal for scaling to $2\frac{1}{4}'' = 1'$ and after checking out a few discrepancies with Dr. Coughlin, I was ready to go. If you are the owner of the original plans, the chord should be 45" instead of the 48" shown, and there should be

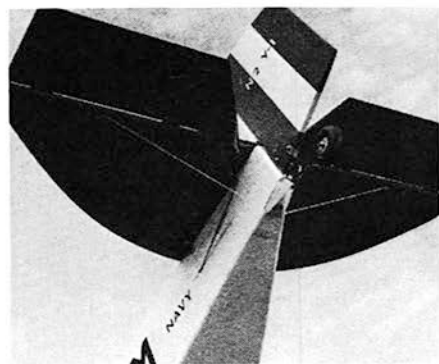


Our suggestion is that you don't try to adjust needle valve with cowl on and engine running.

of Fleet Aircraft, Inc., a division of Consolidated Aircraft Corp. in Buffalo, N.Y. Named for Major Ruben Fleet, this popular biplane was a direct development of the earlier Consolidated PT service-trainer series. Under Consolidated's president, Lawrence D. Bell, later to gain greater fame as founder of Bell Aircraft, production of the Model 1 reached two per day.

Some instability was found in the earliest models, but changes in the area of the fin and rudder cured the problem. Originally built with a 110 hp Warner "Scarab," some models were fitted with the Kinner K5 100 hp engine and designated Model 2 (A.T.C. #131). Model 10, another variant powered by the D. H. Gypsy Major, was designed primarily for overseas buyers. Model 8 had a wide fuselage designed to accommodate three people. With production rolling, and popularity growing, a Fleet manufacturing facility was established at Fort Erie, Ontario, Canada, and produced a winterized version with an enclosed cockpit. This feature appeared on many R.C.A.F. Fleet Fawns and Canadian civilian Fleet Finches.

One of the early claims to fame of this rugged biplane was a record of 46 consecutive outside loops set by the late Paul Mantz in 1930. Actually Mantz



View showing metal right angle brackets used to attach stabilizer to fuselage, also wire rigging.

12 ribs instead of 13 in each bottom wing panel.

The first step was to make a scale by laying a strip of masking tape over the numerals of an 18" ruler, leaving the graduations on the ruler's edge exposed. The masking tape was then marked off every $3/16''$, which now equals one inch on the full size aircraft. Thus, the dimensions shown on the plans can be measured directly on the model with the ruler. This scale ruler is excellent to give judges so they may verify the model's dimensions.

Let's look at some of the features of the model Fleet. (Continued on page 44)



STEADY



AS



YOU



GO!



Fleet Biplane

(Continued from page 28)

Both wings use the same constant chord and a simple tip shape. This means you have only one basic rib template to contend with. The ailerons are in the lower wing only, simplifying linkage and adjustment. The top wing has 0° dihedral and the bottom wing 4° in each panel. These true angles were used on the model with no stability problems. The true airfoil is a Clark Y-15, but I chose a semi-symmetrical section to improve aerobatic performance. The model will hold an inverted attitude very well and in fact, is a fine performer either upright or inverted. All tail surfaces are strictly scale. With modern proportional control systems, it is a simple matter to hold pressure on the stick to maintain any desired attitude during maneuvers. The true landing gear tread is quite narrow and here I chickened out. The tread is widened on the model, but the plans show the true measurements for the purist. After a few good hard touch-downs, your gear will probably spread out and look the same as mine.

The ring cowl, which adds so much to the flight appearance of the plane, is one of the easiest parts to build. After a little looking around I found the 7" Mirro aluminum pot is nearly perfect. It is only 1/8" undersize, and no one has discovered that yet! This open cowl effectively hides the engine, but allows plenty of cooling and easy access to the throttle and plug. A fine picture of a Fleet appears on the 7/63 cover of M.A.N. This photo shows fine details of the exposed engine, landing gear, and rigging wires.

After the '65 Nationals, in which the Fleet took 8th place, I was able to polish my scale presentation and flying ability, and took 1st in the next four contests I entered. Incidentally, the first flight of this plane took place just three days before I left for Willow Grove, and my first qualifying flight at the Nats was the 4th time it had been in the air. I wasn't nervous, didn't feel anything at all!

The model has survived three emergency landings, also known as disasters. But it has come through each, with little damage. The worst one was the last one when I wiped out my S2 pot-cowl. In each case, the plane was not at fault. It was the victim of a bad nicad cell, a broken elevator pushrod (I overtightened a locknut), and interference from another transmitter on my frequency. This one happened at the end of a low pass and when it rolled over on its back at an altitude of fifteen feet and went in hard, I thought I'd had it, but I was back in the air a week later.

There are no exotic construction techniques used in the Fleet. I stayed with the tried and true methods and found they worked perfectly. The plans, along with the following notes, should tell you all you need to know. Let's get building.

Fuselage: The fuselage sides are made of 3/32" plywood and 3/32" balsa with a simple lap joint near the rear cockpit. The 3/16" sq. balsa strip from the rear cockpit to the L. E. (leading edge) of the stab, and the 1/8" sq. strip from the T. E. (trailing edge) of the lower wing to the tail are placed on the outside of the fuselage sides. These strips add strength and keep the fabric from sagging and touching the fuselage sides. The side stringers are supported by 3/32" x 1/4" strips where they pass over the plywood area.

The nose area is built of 1" or 3/4" balsa blocks except the side blocks which are 3/8" thick. Don't be afraid to use hard blocks on the bottom area. The motor mounts are 1/4" x 1" plywood and the motor plate can be fitted after the nose blocks are roughed into shape. The exact shape of this former will be determined by the thickness of the blocks used.

The cabane struts should be bent with the vice jaws gripping the wire in the area below the bend lines indicated on the plans. If an error is made, and the incidence angle is not quite right, simply cut the rear strut, slip a piece of brass tubing over the wire and solder it into the proper position. The .045" dia. wire for the cabane strut brace is anchored in the hardwood block glued to the back of former F-1. Don't forget the 1/8" ply doubler located below the front cabane wire on former F-1.

The engine cowl is a 7" dia. Mirro aluminum pot. Operate on this with a jeweler's saw and tin snips to get it to size. The cowl mounts are made of .060 aluminum and shaped to the pattern shown on the plans. The ends of the mounts are bent about 90° and held to the cowl with 2/56 machine screws.

The landing gear is bent, soldered and the fairings added. Drilling out the Trexler wheels hubs and recessing the retaining washer gives a scale type hub. Harrison Morgan and Armand Cote came up with the answer to extending the life of Trexler wheels. Use two tires per wheel. The center is cut from one tire which is slipped over the one on the hub to form a tire-tube combination which wears well on macadam runways. The top of the rear landing gear leg has been moved forward from the true scale position so the bottom wing can be made without a cutout in the leading edge.

Wings: Everyone seems to have his own technique for cutting wing ribs, and I'm no exception. First, I make a plywood or aluminum template of the basic rib. Next, I gather the balsa wood needed, a new razor blade, the rib template, and an old drawing board. Armed with this material, I go upstairs and join my wife. I cut ribs, she reads a book, and occasionally I say "yes, dear" or make some other suitable remark to remind her I'm there. I also cover my planes using this technique, and I find it cuts out a lot of static.

The real wing had no leading edge sheeting but had false ribs centered between the full ribs and extending 1' back from the leading edge. I used 3/32 sheeting for strength, but some modelers might prefer to duplicate true scale. The top wing panels are joined in the center section and have no dihedral. The leading edge is

reinforced with a 3/32" plywood brace and the spars have a 1/4" sq. balsa strip next to them. 3/32" sheeting is used on the top and bottom of the center section and 3/32" x 1/4" cap strips are used on the bottom of the other ribs.

The lower wing is joined as if it had only one dihedral joint. After the top sheeting is applied across the flat center section, the wing is removed from the board and the excess wood is trimmed from the plywood dihedral brace. Now the bottom sheeting is applied and the leading edge is formed to final shape.

The ailerons are built into the wing and are cut loose after the construction is completed. The ribs located on the tip formers are 3/32" sheet glued into place and formed after the glue has dried. Wire hooks for the interplane struts are added at this time. The bottom part of the lower wing tips are balsa blocks to take the abuse of an occasionally dragging tip.

Covering and Finishing: After the framework is sanded smooth, Hobbypoxy "Stuff" is applied to all stringers, stab, and wing ribs where the fabric will contact these parts. In scale jobs especially, a good sanding job is important. The "Stuff" is then sanded smooth before covering. If this is done properly, these areas need only to be sanded lightly after covering, eliminating the possibility of sanding through.

Silkspan was used on all the tail components and heavy silk was used on the rest of the model. The wing tips were covered with Silkspan to prevent sagging. Be sure to shrink and dope the Silkspan before the silk is applied over this area, or you'll end up with wrinkles.

Hobbypoxy "Filler" is used on the sheeted and block areas of the fuselage to provide a tough base for the Hobbypoxy paint. Hobbypoxy "Stuff" was used to fill the

balsa grain on the wings and tails because it sands somewhat easier.

Color Scheme: The fuselage, cowl, and fin are white; the wings, stab, and elevator are orange; the fuselage strip, wing chevron, and cowl band are dark blue. The small lettering is 1/2" Futura Demibold Prestype, is available from art or stationery supply stores. Clear varnish *must* be applied over the Prestype with a small brush to protect them from fuel. The stars came from a Jecto PT-19 kits, 6 1/2" dia., and centered over the interplane strut ribs. The duck head came from a hot-rod decal and is identical to Dr. Coughlin's.

Assembly: The motor is bolted to the motor plate and this unit is bolted to the motor mounts. The cowl unit comes next and is held with hex head sheet metal screws.

The tail is bolted on using elastic lock nuts and four angle fittings from the Midwest nylon accessory package. This makes transportation easier and allows for change in stab settings.

The top wing is attached by sliding a loop of flexible wire through the bottom opening near the leading edge then under the top sheeting and out the bottom opening near the trailing edge. A #64 rubber band is passed halfway through the loop and then the loop of wire is pulled until the two ends of the rubber band are hooked at the rear cabane strut. The loop is pulled forward over the spars so the rubber band can be hooked at the front cabane strut. The openings in the top sheeting are covered with strips of Xerox Multilith Master of a thin aluminum sheet sprayed orange and held on with double stick tape or transparent R. C. Kraft tape. This makes a neat wing attachment without any unsightly rubber bands stretched across the top of the wing.

The interplane struts are made of 1/4" wide elastic tape with 3/32" x 1/4" balsa strips taped inside to prevent strut vibration in flight. Occasionally brighten the struts with a dab of white shoe polish.

Fully assembled, floor model will weigh 8 1/4 lbs or less and this includes 1 1/2 lbs. of radio gear.

Pre-Flight Check and Flying: The pre-flight procedure includes a check of the CG and rigging. The CG should be at position shown or up to 1/2" forward of this point. If you have ever flown or seen a tail-heavy biplane fly, you have witnessed an extremely busy flyer for ten or fifteen seconds and then he could take his time picking up the pieces.

The rigging angles shown on the plans are top wing +1° bottom wing 0° and the stabilizer is +1°. One or two degrees of positive setting in the stab seems to eliminate the need for the large amount of down thrust usually found in biplanes. Also with this set-up, no trim changes are required through the full speed range.

The flying during '65 was done with my reliable Airborne Control Lab proportional unit. I'm changing to the new Controlaire proportional so I can have independent aileron and rudder control and maybe add a bomb drop or eject a pilot with a parachute.

While using the A. C. L. unit, I had to utilize the C.A.R. technique. This required keeping the rudder deflection small to avoid too much yaw while airborne, yet still have enough control during take-off and landing. About 1/2" rudder throw each side of neutral meets both requirements. During take-off hold slight back pressure on the stick to keep the tail wheel on the ground until flying speed is reached and the rudder takes over. Fortunately the plane tracks beautifully, because once it starts down the runway I go into some sort of a trance. I don't recover until the plane

is flying; when reality returns, and I hear myself mumbling, "Don't stall it," "Keep the wings level," etc. The old Fleet won't do a vertical eight and a few other maneuvers but the wing overs, loops, inverted flight, and barrel rolls are crowd pleasers.

Loops are entered from a shallow dive so you have speed enough to avoid falling out at the top.

Barrel rolls require a similar entry and just after you pass the inverted position, start pulling in some up-elevator or you'll get an odd, nose dropping finish which looks like you have flown off the end of a table. I think more stab area would cure this, but it would be non-scale.

The landings should be made with about 1/3 power until almost to the runway. Then the throttle is cut to idle and, just like the real thing, she stops flying and settles softly to the runway. Don't try to stretch the glide by using elevators, use the throttle.

In addition to the people already mentioned, I would like to thank Rusty Nelson for holding his ground while trying to get action pictures and Cole Palen of the Old Rhinebeck Aerodrome for giving me the Oct. 1956 and June 1957 issues of *Antique Airplane News*. Both had fine articles on the Fleet and were an important part of my scale presentation.

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