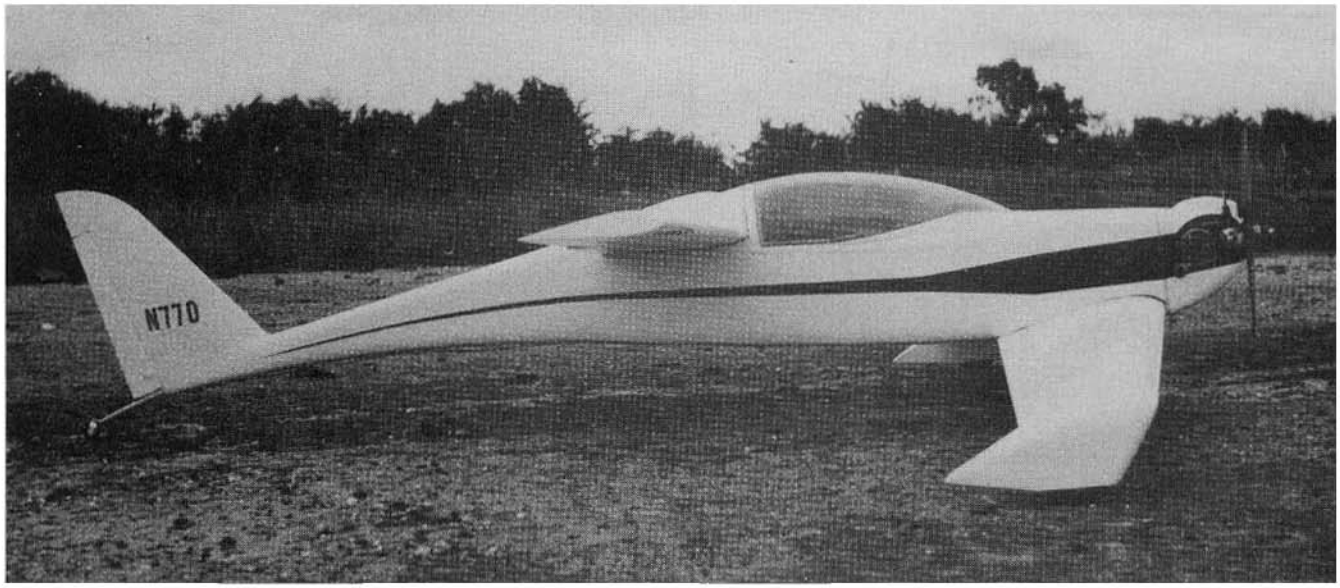


Q.A.C. QUICKIE

Introduction

Once in a while an aircraft comes along which just cries out to be modeled and for me such an aircraft was the Quickie. I chanced upon the design in Flight International Magazine during 1979 and couldn't resist the challenge it presented. One year and two models later I finally got what I wanted — a practical flying scale model of this remarkable aircraft.

I would say that this is one of the best flying models, of any type, that I have built and these qualities must be a tribute to the designer of the real thing, Mr. Burt Rutan. Rutan was commissioned by Tom Jewett and Gene Sheehan to design a high performance, economical, single seat sport aircraft around an 18 hp Onan industrial four stroke engine. With his previous design background of the Vari-Viggan, Vari-Eze and Long-Eze, it was obvious his answer would draw little on conventional design practice and, sure enough, the Quickie (as his brainchild was christened) turned out to be a remarkable piece of original thinking both in appearance and structure.

How about the following specifications — maximum speed 127 mph, stall speed 49 mph, take-off distance 660 ft., 104 mpg at 120 mph and a load capacity of 280 lbs. Remember all this on an 18 hp engine. The structure is cut from blocks of extruded polystyrene foam and covered with fibreglass cloth and epoxy resin. This produces a very strong airframe with a smooth surface finish which cannot rust or warp.

ABOUT THE AUTHOR

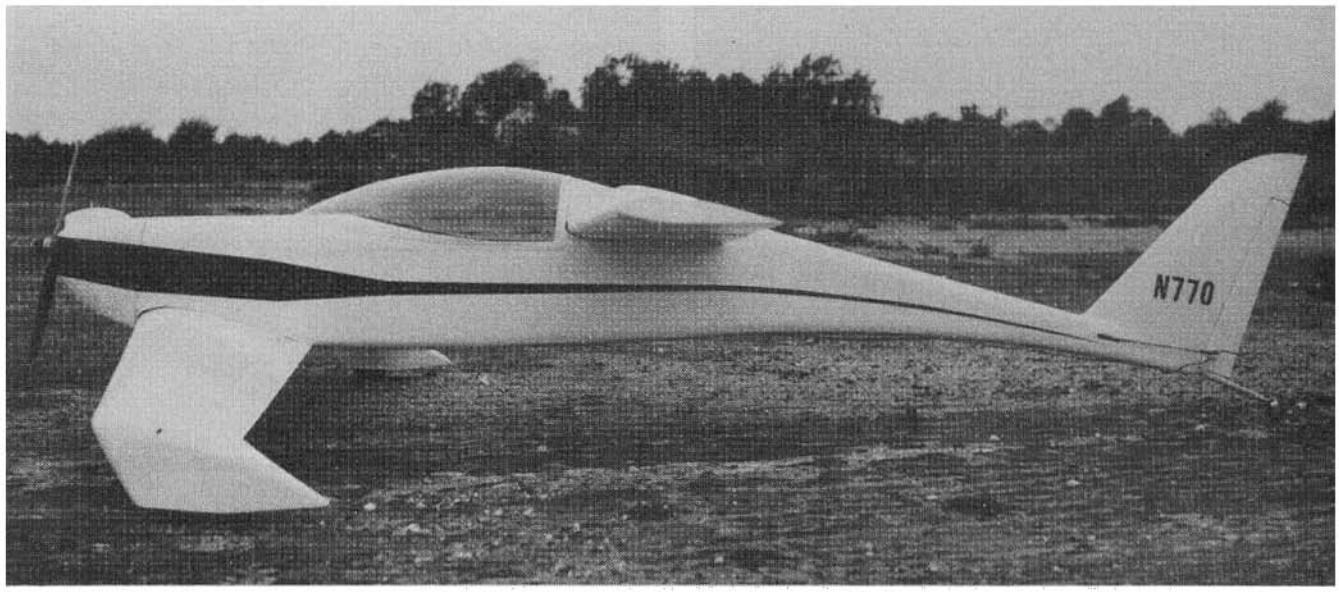
Ray Jennings is 30 years old, married with no children and lives near Belfast, Northern Ireland. He is employed as an Air Traffic Engineer at Belfast Airport and is a member of the Ulster Model Aircraft Club, the largest model club in Ireland. His main interests are competition pattern and scale aircraft, most being built from his own designs. Ray started R/C modeling some 12 years ago with single channel and reed radio equipment and has been continuously involved in the hobby ever since. Quickie is his first construction article to be published.

Having proved this concept, Jewett and Sheehan set up a company to market kits for the airplane. Thus, Quickie Aircraft Corporation came about and to date some 500 kits have been sold and over 50 examples have been completed and flown by homebuilders throughout the world. Perhaps the best description of the Quickie was by Wayne Thoms, writing in Mechanix Illustrated, when he called it "the ultimate adult toy."

So much for the real thing; what about the model. Well, as I said, it took two goes to get my act together due mainly to a complete lack of any information on such an unconventional layout. Realizing this, my first attempt was built quickly and looked it. It's hard to put a great deal of time and effort into a model you are convinced won't fly. I made guesses at wing sections, incidence angles and balance point and, of course, I guessed wrong on everything.

The result of the first flight with this test model was thirty seconds of uncontrollable high speed aerobatics and a pile of pieces. Whilst repairing the mess I came across a drawing showing the C.G. of the full size aircraft and with the model balanced at this position reasonable flights were achieved.

After a few more changes and a lot more flying I was confident enough to start a new model and this is the one presented here. I incorporated the lessons learned from my first effort plus other changes based on additional information I had managed to gather on the real thing. This time everything turned out exactly right and the flight performance was outstanding. It was fast and smooth, capable of basic aerobatics and had



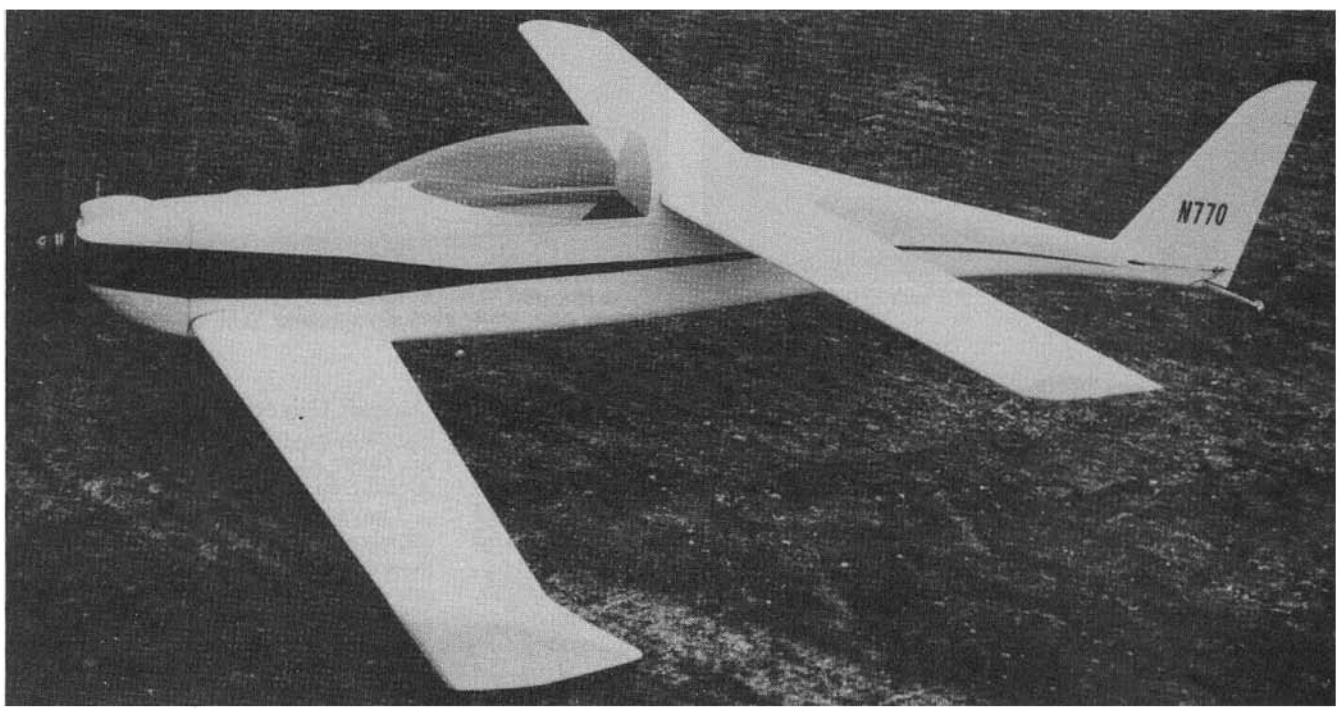
Ray Jenning's exciting sport scale .40 powered Quickie is a real eye grabber wherever it appears at a flying field.

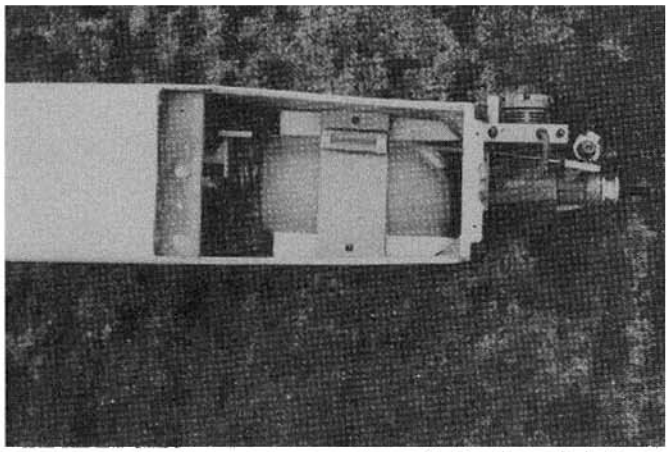
Q.A.C. QUICKIE
Designed By: Ray Jennings
TYPE AIRCRAFT
Sport Scale
WINGSPAN
55 Inches
WING CHORD
6" Avg.
TOTAL WING AREA
330 Sq. In.
WING LOCATION
Shoulder Wing
AIRFOIL
Semi-Symmetrical
WING PLANFORM
Tapered L.E.
DIHEDRAL EACH TIP
1½ Inches

O.A. FUSELAGE LENGTH
56 Inches
RADIO COMPARTMENT SIZE
Fwd. (L)2¾" x (W)4¼" x (H)3½"
Rear (L)9" x (W)4¼" x (H)4"
CANARD SPAN
46 Inches
CANARD CHORD
6½" (Avg.)
CANARD AREA
300 Sq. In.

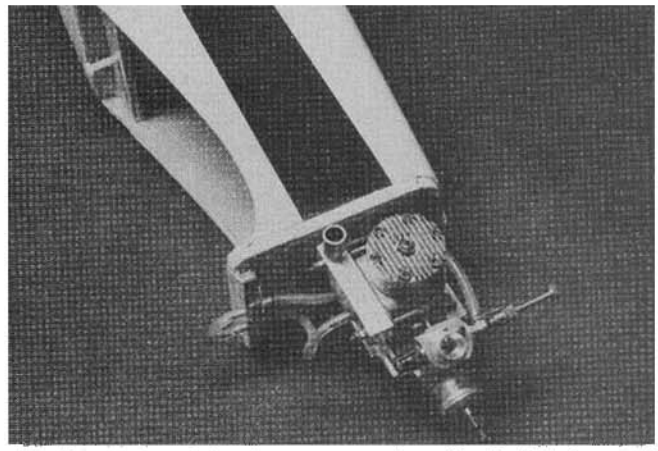
CANARD AIRFOIL SECTION
Semi-Symmetrical
CANARD LOCATION
Forward Fuselage Bottom
VERTICAL FIN HEIGHT
9½ Inches

VERTICAL FIN WIDTH (incl. rudder)
5" (Avg.)
REC. ENGINE SIZE
.40 Cu. In.
FUEL TANK SIZE
8 Oz.
LANDING GEAR
Canard Tip Wheels
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply & Hardwood
Wing ..... Foam, Balsa & Ply
Vert. Fin & Rudder ..... Foam & Balsa
Wt. Ready To Fly ..... 88 Oz.
Wing Loading ..... 20 Oz./Sq. Ft.

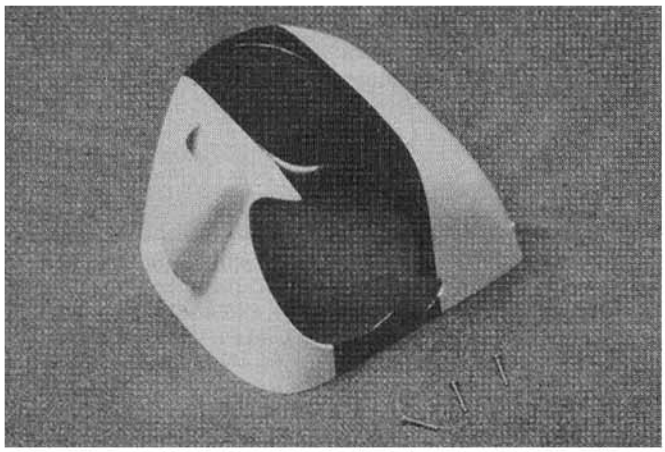




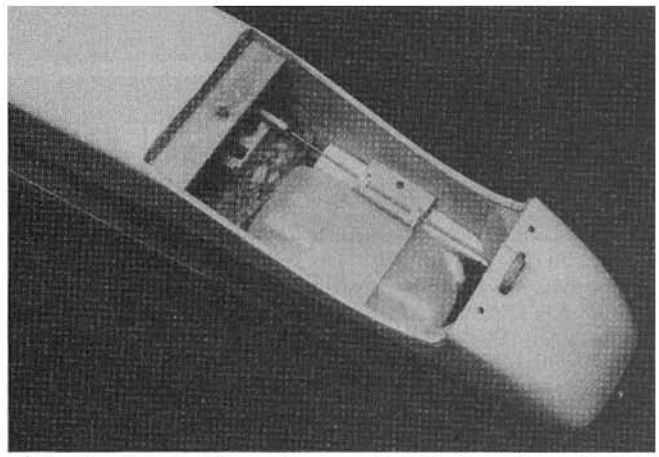
Fuel tank, throttle servo access is available through bottom when canard is removed.



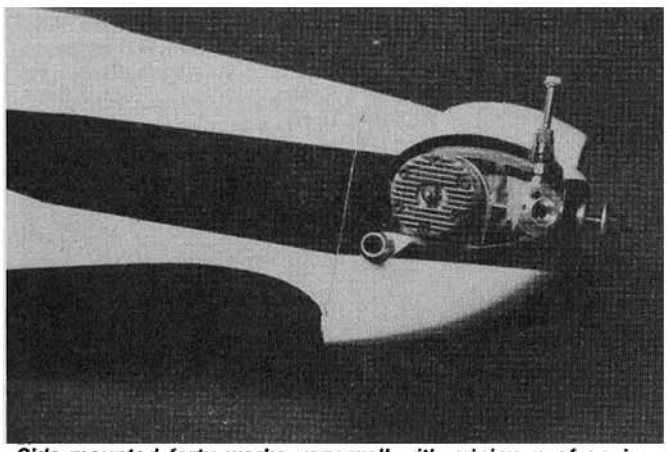
Cowling removed to show very neat engine installation and plumbing arrangement.



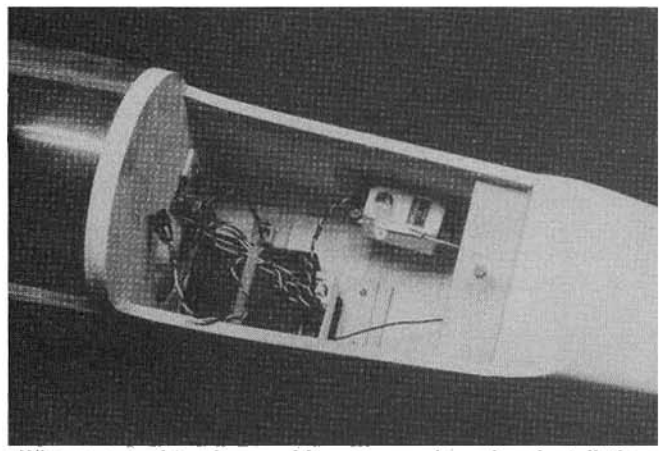
Fiberglass cowl is the best way to do it, however, balsa cowl can be carved and glassed over.



Canard removed with cowl in place. Note fueling tube on bottom of cowl.



Side mounted forty works very well with minimum of engine showing.



Wing removed to show rudder servo and receiver installation. Battery pack under seat. Easy access to all equipment.

ultra safe low speed handling characteristics. Quickie has exceeded all my expectations and I can certainly recommend it to those looking for something different.

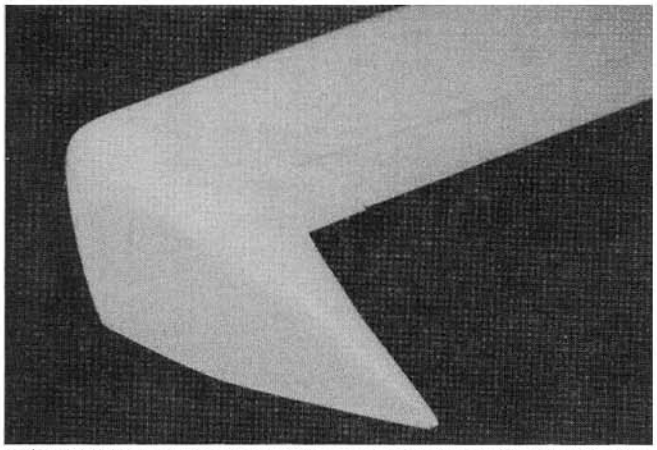
CONSTRUCTION

Before beginning to build any scale model it is always a good idea to gather together as much information on the subject as possible. To help with this I have listed below some sources of documentation for the Quickie:

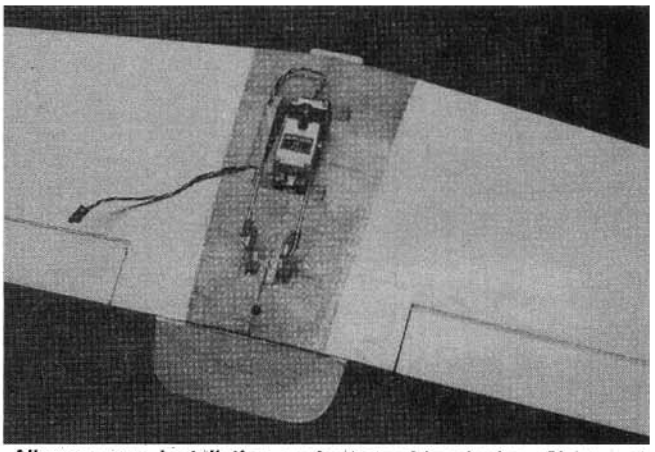
Flight International, week ending 4/14/79, photos and 3-view; Aeroplane Monthly, July 1978, photos; Model Aviation, May 1978, photos and 3-view; Mechanix Illustrated, January 1979, photos; Sport Aviation, October 1978, photos; Aeromodeller, March 1981, photos and 3-views.

The manufacturers, Quickie Aircraft Corporation, will supply an information package for $8.00. Write to them at P.O. Box 786, Mojave, California 92501.

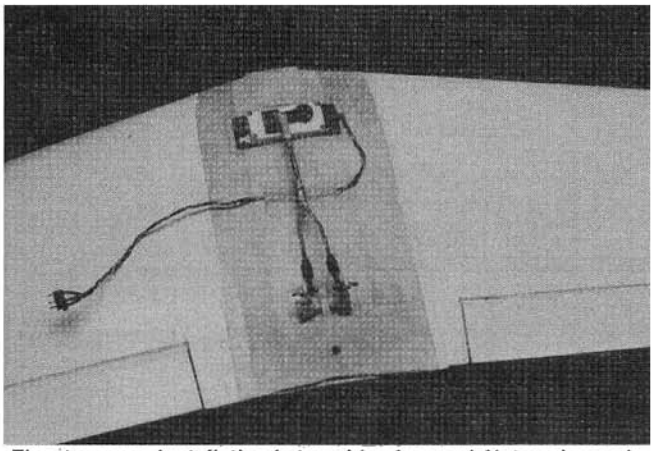
I have tried to keep the construction as straightforward as possible and anyone with a little previous building experience should have no trouble. The original model took about six weeks of spare time work and I am not the world's fastest builder.



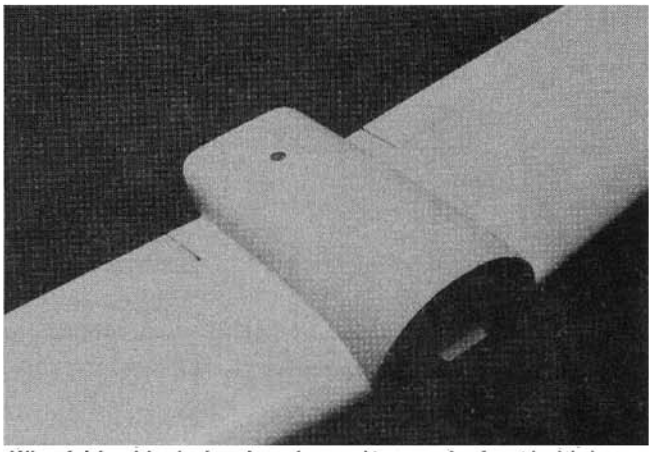
Wheel fairings at the tips of the canard add much class to the Quickie!



Aileron servo installation on bottom side of wing. Short and simple connection.



Elevator servo installation in top side of canard. Note yoke made up which gives individual adjustment to either elevator.



Wing fairing block showing plywood tongue for front hold-down. Rear attaches with single nylon bolt.

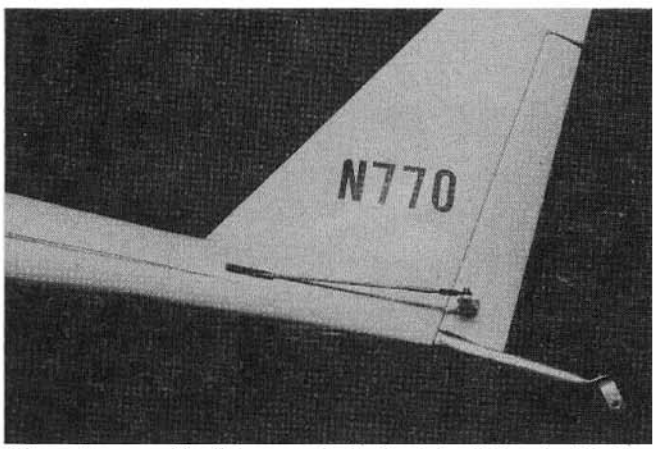
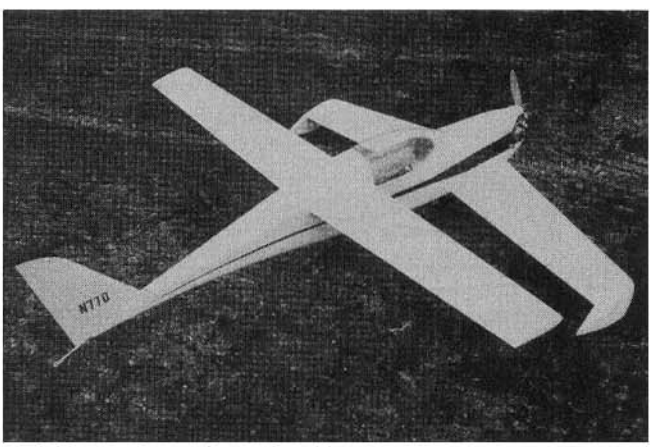


Photo shows rudder linkage and tail wheel detail. Note ball link is used on rudder horn for angled rudder.



Quickie, ready to take to the skies.

Wing and Canard:

Begin by hot wire cutting the foam cores for canard, wing and fin, not forgetting the 1/8" washout at each wing tip. Glue on the 1/16" balsa sheeting, 1/4" leading and trailing edges and sand to correct airfoil sections. Sand the centre sections of the wing and canard to achieve correct dihedral and anhedral respectively. Cut a 6" long slot in each wing half for the full depth 1/4" balsa spar and glue in this one piece spar as the two wing halves are epoxied together. Install ailerons, trailing edges, tips, servo box, wing tongue and centre section bandage. This completes the wing construction.

The canard must have a 1/4" strip removed from each half and this is best done by sliding them through a bandsaw with the panels supported in the foam sleeves from which they were cut. Again, using these sleeves for support, glue in the 1/4" spar and sand flush with top and bottom surfaces. This spar adds great strength to the canard and should not be omitted.

The rest of the canard construction is similar to the wing apart from the wheels and wheel fairings. To construct these, sand the canard tips vertical, bend the two undercarriage

legs from 10 swg wire and bind and epoxy these to the small ply plates. Cut into the underside of each tip and remove sheeting and foam until the plates are a snug fit, then epoxy them in place filling between the plates and bottom with soft balsa. Note there is a 1/16" gap between the tip and the vertical portion of the undercarriage leg to allow later fitting of inner wheel fairing sides. Now permanently fit the wheels and check that they run true with no toe-out, toe-in or camber. Cut and glue the inner wheel fairing sides to the tips followed by the tapered 1" balsa core and, finally, the outer wheel fairing sides. Glue and clamp the sides to follow the core taper and when all is dry, carve and sand to shape. That completes construction of the canard.

Fuselage:

The fuselage has an unusual shape but is of conventional construction. Splice together 1/8" balsa to obtain large enough sheets and cut to outline being especially careful to achieve correct wing and canard incidence angles. Attach the ply doublers, spruce longerons and triangular corners. Observe the age-old advice — you guessed it — make one right and one left side.

The two sides are then joined by F2 and F3, the rear fuselage pulled together and glued, followed by fitting F4. Take care when attaching F1 to maintain the correct thrust line which is 0-0 (no down or side thrust). The top and bottom cross grain sheeting and front top decking complete the basic fuselage which can now be carved and sanded to a nice rounded shape. The piece of 1/64" ply around the cockpit gives a realistic scale thickness to this area. Wing and canard hold-down plates and fairings plus attachment of fin and rudder complete the structure. A single nylon bolt is sufficient to attach each flying surface, yet will shear cleanly in the event of a crash without ripping the fuselage to pieces.

Canopy and Cowl:

Since there are no suitable commercial items available for these parts they will have to be custom made. The method for each is quite straightforward and has been detailed in this and other publications. A fibreglass cowl is well-worth the additional work and gives lots of internal space and smooth cooling airflow in the engine compartment.

I made the small intake on top of the cowl from ABS plastic because I wanted to have a try at moulding this material. It could of course be made from fibreglass and attached to the cowl with small strips of resin and cloth. Canopy moulding is a straightforward process and although this was my first attempt I managed to produce a good one the first time. Carve a large chunk of soft wood to the correct shape and sand smooth. No surface finish is applied. Clear plastic sheet is attached to two wooden runners, heated, and forced down over the mold. Trim carefully and attach to the model with cyano glue.

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Finishing:

After repairing any dents and dings with filler paste, sand the entire structure with fine wet and dry paper used dry and wipe off all the dust. This gives a good basis for any finish you may choose but for strength and durability I would recommend the K & B matched finishing system. This uses 3/4 oz. glass cloth, finishing resin, primer, and epoxy paint; full details are available from K & B.

All Quickies have a basic overall gloss white finish to protect their foam structure from heat absorption, and since there are no panel lines or rivets to worry about, a good scale finish should be easy to obtain. Add fuselage trim lines and registration letters appropriate to the particular version you are building. When all paint has cured, give the model a final polish to bring up the shine. The plans for the full size aircraft emphasize the need for a smooth surface finish, especially on the canard, so the better the finish on your model the better it will fly.

Installation:

In the original model I used a Skyleader FM four channel radio and a Webra Speed .40 engine. A .40 motor is more than adequate so please keep that hot .60 for your next model.

The engine can be installed sideways or inverted, the latter having the advantage of a fully cowled installation but would need some form of fuel pump as the tank must be mounted high to clear the elevator servo in the canard.

Since I didn't have a pumper engine I used the sidewinder set-up. Elevator and ailerons servos mount in the centre sections of the canard and wing respectively, throttle servo in the tank compartment with rudder servo, receiver and battery in the wing opening. This layout helps maintain the balance point without the need for ballast but obviously extension leads are required from the receiver to the motor and elevator servos. Don't forget — up elevator requires a downward deflection of the elevators and down elevator an upward deflection. Set up the linkages to achieve throws of ±1/2" on rudder, ±3/8" on elevators, and ±3/8" on ailerons. Don't hesitate to add ballast to achieve the correct balance point — a heavy model will fly but a tail heavy one won't. The ready to fly weight should be between 5 lbs. and 6 lbs.

Flying:

Now for the interesting bit. Be assured that no matter what doubts you or your flying buddies may have when you arrive at the field with your new creation, you and they are in for a pleasant surprise.

After the usual range check, engine test, Scotch, cigarette and whatever else you can think of to prepare yourself and model, set Quickie into the wind and slowly apply power. Correct any tendency to swing with gentle use of rudder and, when the speed has built up, a touch of elevator will lift her off. On this first flight just fly in big circles at a reasonable height getting the feel of the aircraft and convincing yourself that it is not going to fall out of the sky. You will find Quickie flies fast and groovy with a good deal of stability yet with crisp response to roll and pitch controls.

Let's try a landing. This needs setting up some distance out since the model has a fast and flat gliding angle and takes some time to slow down. Slow speed performance is remarkable with the elevators seeming to act as flaps; this is one model you won't land short with. A reasonable touch down is desirable to avoid damage to the canard which, although strong, is, in effect, the undercarriage of the aircraft and as

such is highly stressed in a bad landing. Subsequent flights will increase your confidence in the design and you will soon be ready to clean up in Stand-Off Scale competition. Incidentally, my own Quickie won the 1980 Irish Nationals Stand-Off Scale event held in very wet and windy conditions. Loops and rolls are no problem and yes, the real thing has been rolled flown by none other than Bob Hoover.

Quickie is an aircraft certain to create interest whenever flown so good luck and have fun with this unusual design. □

From RCModeler June 1982