

an R/C version
of a C/L Classic:

Barnstormer

By Dan Reiss

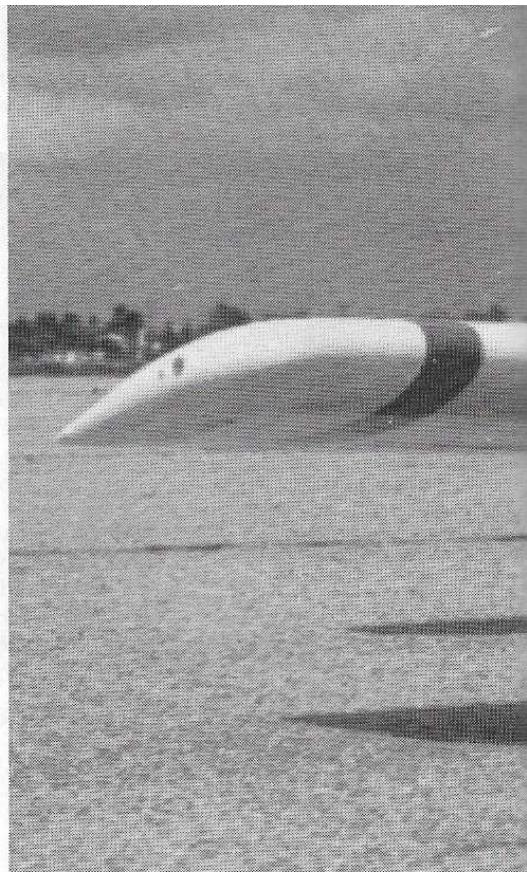
It reigned supreme as a C/L stunter.
Now it gets another chance in R/C.

Conversions of control line models for radio control use is nothing new, the most notable transition being the Top Flite *Nobler*. The *Nobler* had been a very successful model in the U-Control circles for quite some time and went on to continue this success as a popular R/C model.

However, many years prior to the *Nobler's* appearance, there was a model around that absolutely dominated everything in the flying arena. It was the *Trixter Barnstormer*. In the late 1980's it's now hard to imagine that there was a time when there was not only no radio control available but two line U-Control was just in its infancy. Models were just being designed and developed to take advantage of this very sophisticated (for that time) means of control and the *Barnstormer* was one of the first to reach national prominence.

The plane was designed by Lou Andrews and kitted by the Paul K. Guillow Company. It had won a significant number of championships from 1948 to 1951 and was usually powered by Fox 35's. The imports had not invaded our shores yet so Fox enjoyed quite a reign of national popularity. As the *Barnstormer* won, so did Fox. They were an unbeatable pair.

At that time, I was living in a New York City suburb which was surrounded by the Atlantic Ocean on one side and an enormous bay on the other. As I got interested in powered flight I was compelled to exhibit some kind of control over my models. Free flight was out of the question and radio control was still in the hands of a privileged few licensed hams who hand made their own equipment. So into U-Control I went advancing from trainers to intermediate planes until finally I



PHOTOGRAPHY: DAN REISS

was able to master the supreme ultimate model of all times, the *Barnstormer*. Like any good model I had more than one, and at \$5.95 for each kit (steep even for that time), they just had to be good as I bought one to replace the one that I had just got done crashing.

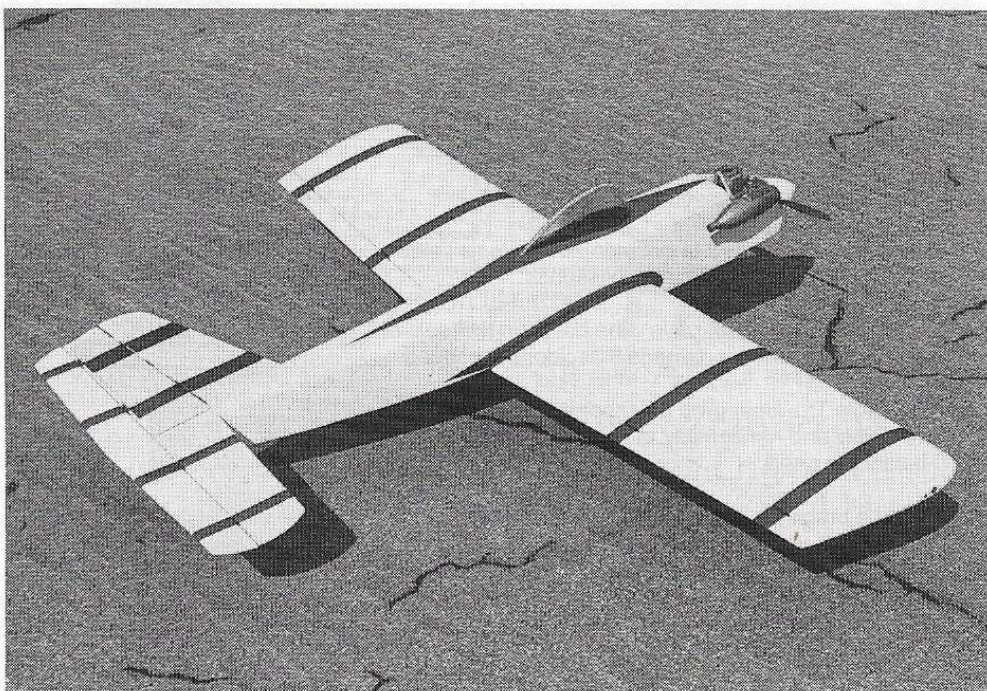
Of course, they were powered by Fox's and I took great pains to fly from grass instead of concrete just to help the engine survive in the event of a crash. I think the engines cost about \$15.00, an enormous sum.

Control was provided by a thing called a Jim Walker U/Reely. It was made from black plastic and you held it in your hand to control the model. Its featured attraction was that it had an internal drum that was used to store the U/Control wires when not in use and even for flight. There was a handle on it that allowed you to reel in the wires and let them out up to about 60 feet so you could fly in any diameter circle that was desirable. When you were through flying you just cranked on the handle to reel in the wires. Now that was truly hi-tech! I think it cost about \$11.00.

As you can tell from all these high prices I must have been some spoiled kid. Now, almost forty years later, I just had to have another *Barnstormer*. The conversion to R/C was not too difficult especially after I was able to get a set of the old plans. The R/C model is about 10% larger than the original since I had to increase the size of the fuselage a little more to be able to fit my Futaba PCM flight pack. But beyond that the model is a close replica of the original.

Get out the tools

Start with the wing. Cut the foam cores using the templates shown on the plans. Glue on the $\frac{1}{4} \times \frac{1}{2}$ inch balsa trailing edge. Carve and sand it to shape. Use some masking tape over the foam to protect it while you are shaping the balsa. Sheet the wing with $\frac{1}{16}$ inch balsa. After gluing on the wing tips,



Another *Barnstormer* now resides in the author's model "hangar" after an absence of many decades. This time it's an R/C version of the legendary control line model that dominated the 50s competition scene.



carve and sand them to shape. Sand the dihedral joint to the proper angle to yield the dihedral under each wing tip as shown on the plans.

Make a groove along the chord line at the root of each wing panel for the $\frac{1}{4}$ inch diameter wing dowel. Epoxy the wing halves together, leaving that groove as clear as possible. Recess the wing leading edge to receive the $\frac{1}{8}$ inch plywood front wing dowel support. Clear out the hole in the dihedral joint for the wing dowel with a $\frac{1}{4}$ inch drill. Epoxy in the $\frac{1}{4}$ inch diameter wing dowel and the front wing dowel support.

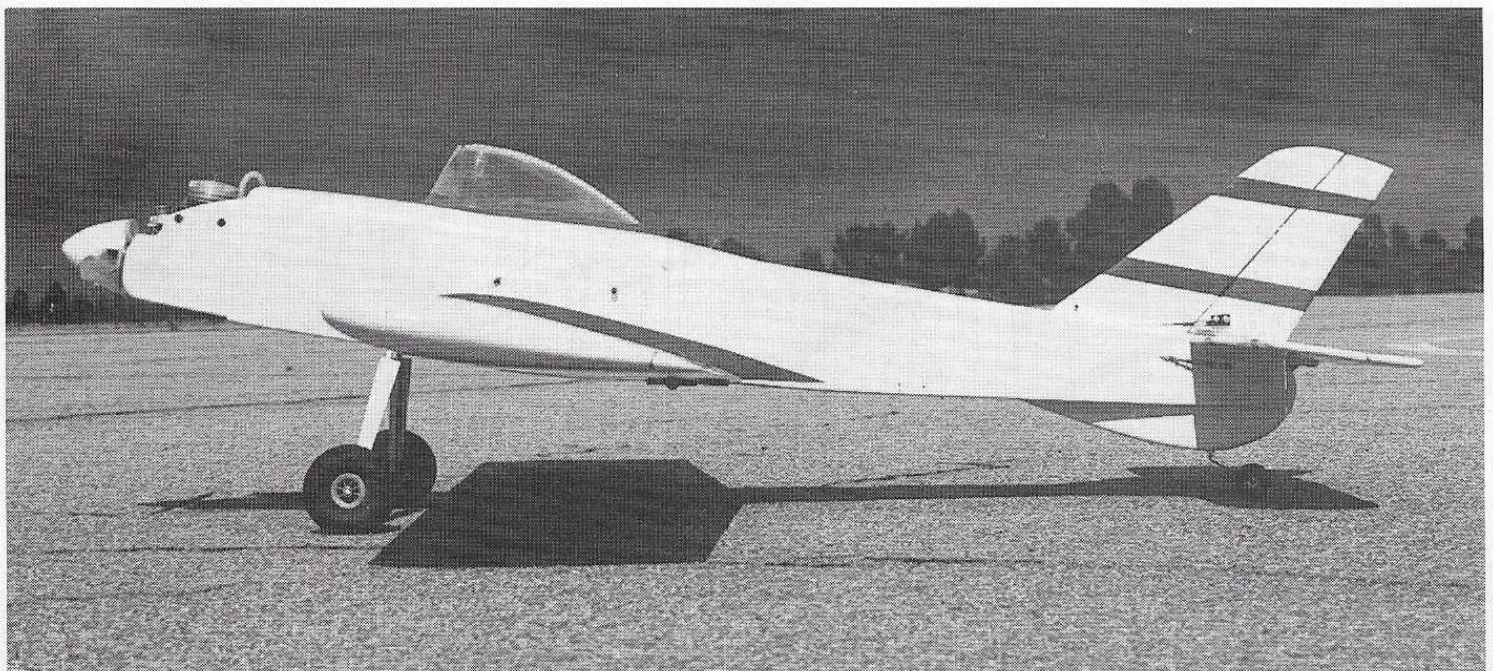
When the epoxy has cured, shape up the

leading edge of the wing and wrap the dihedral joint with four inch fiberglass tape on the top and bottom. Cut out the foam for the aileron servo. Attach the servo tray to the $\frac{1}{8}$ inch plywood servo mount and epoxy the plywood to the foam. Hinge the rough cut aileron blanks to the wing trailing edge. Carve and sand the ailerons to shape and install the DuBro strip aileron linkage.

Cut the fuselage sides from $\frac{1}{4}$ inch sheet balsa. Contact cement the $\frac{1}{8}$ inch SIG Lite Ply doubler to the sides. Epoxy the maple motor mounts in place. Glue on the $\frac{1}{4}$ inch triangular support pieces and epoxy on the wing screw blocks. Cut out F1 from $\frac{1}{4}$ inch

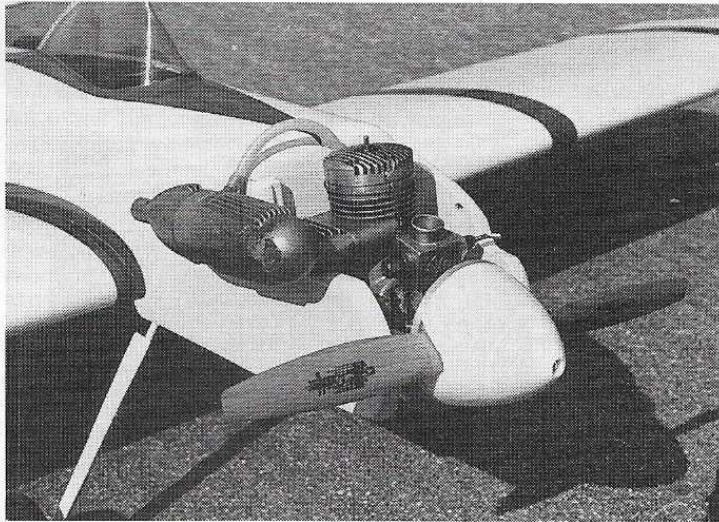
plywood and F2 from $\frac{1}{8}$ inch plywood. Temporarily tack glue the fuselage sides together and drill the motor mounts for the engine you are going to use. The engine mounts are spaced properly for a K&B .61. If you are installing a different engine you will have to modify the engine mounts to account for the different beam width your engine may require.

Epoxy the fuselage sides together and bolt your engine in place. Make sure the fuselage is lined up correctly before the epoxy cures. Epoxy the $\frac{1}{8}$ inch SIG Lite Ply tank floor to the engine mounts. Cut two LG1's from $\frac{1}{8}$ inch plywood and an LG2 from $\frac{3}{16}$ inch ply-

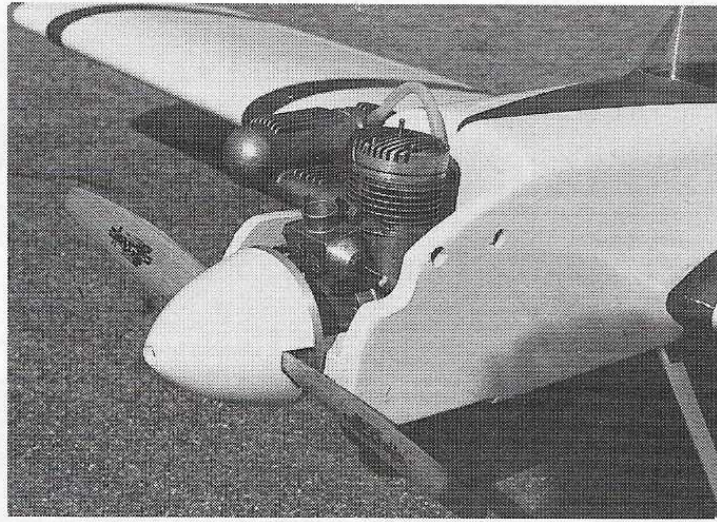


As much as possible, Dan faithfully maintained the profiles of the old C/L *Barnstormer* in the lines of his 10% enlarged R/C version.

R/C Barnstormer



Dan swears by the old K&B .61 engine and so it was a natural powerplant choice for the replica R/C *Barnstormer* (above left). Note the two "mystery"



holes on the side of the fuselage nose section (above right). They allow Dan straight through access to the muffler fastening screws.

wood. Bend the landing gear from $\frac{3}{16}$ inch diameter piano wire. Epoxy the landing gear around the LG2 and in between the two LG1's. Epoxy this assembly in place. Glue the tail end together.

Place the wing in the wing saddle and sand the wing to the fuselage junction where necessary to get a good fit. Get the wing lined up exactly right. Epoxy the $\frac{3}{8} \times \frac{3}{4}$ inch maple fuselage wing dowel support to the front of LG1. When cured, and with the wing still in position, drill from the bottom of the wing through the screw blocks with a $\frac{5}{32}$ inch drill. Make the entry in from the bottom of the wing very accurately and be sure that you are drilling perpendicular to the bottom of the wing.

Open up the holes in the wing to $\frac{5}{16}$ inch diameter and the holes in the blocks to $\frac{3}{16}$

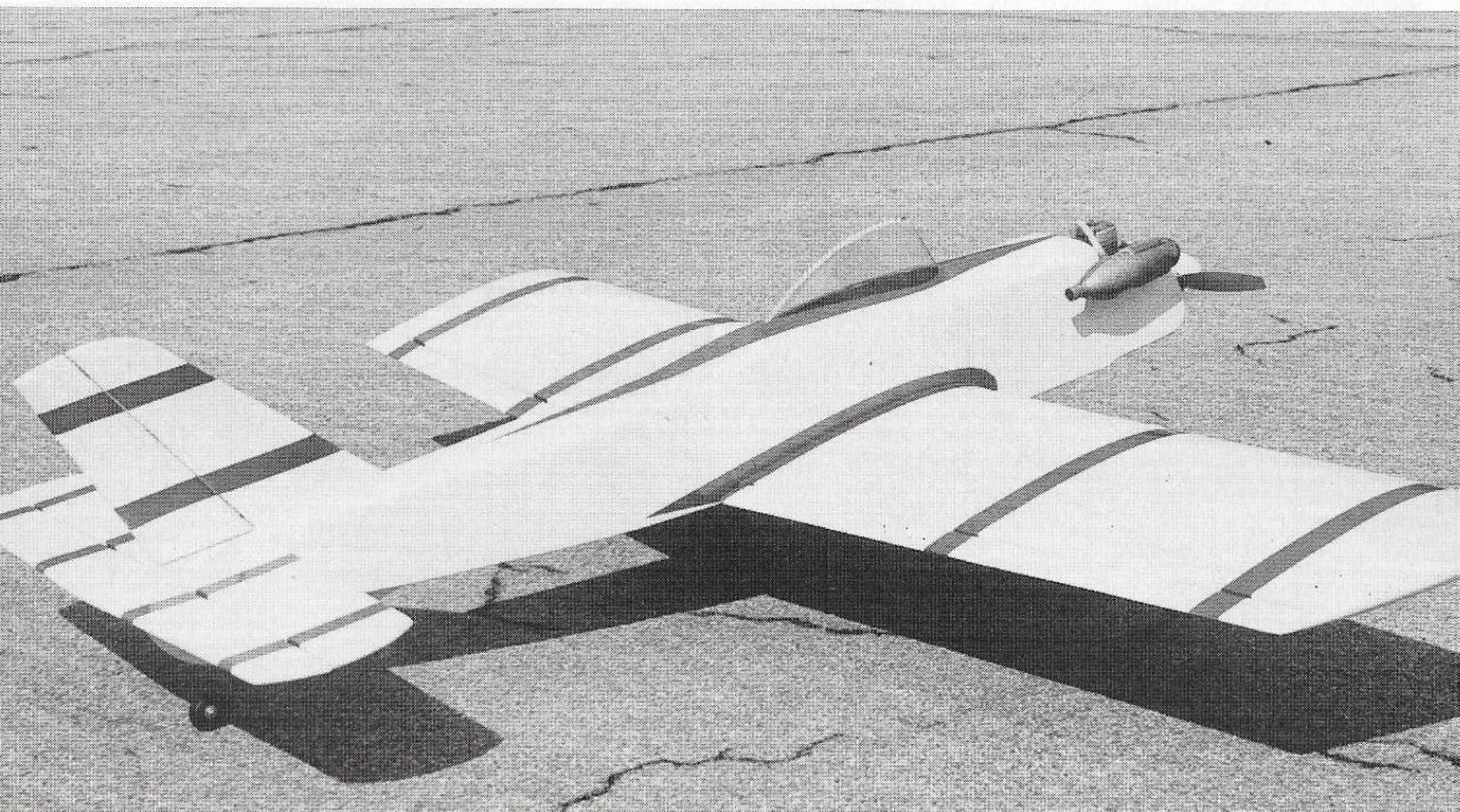
inch. Thread the blocks with a $\frac{1}{4}$ -20 tap. Cut out the wing screw supports from $\frac{1}{8}$ inch plywood and drill a $\frac{1}{4}$ inch diameter hole through them to provide a tight fit around your nylon wing screws.

Place the wing on the fuselage again and realign it. Mount the screw supports on the screws as if they were washers. Spread epoxy on the supports and screw the assembly through the wing into the blocks. Check your alignment once again and make sure it is right before the epoxy cures.

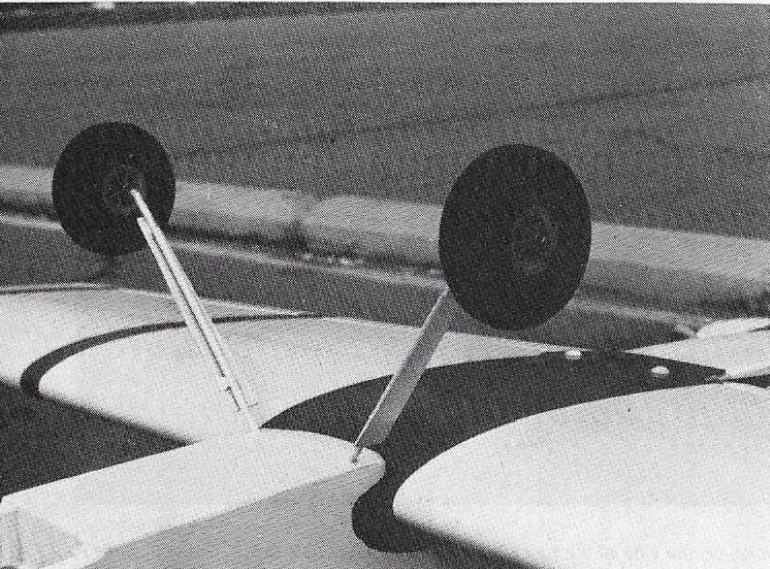
At this stage of the fuselage construction, it is a good time to lay out your radio installation. I used fiberglass arrow shafts for the rudder and elevator pushrods and Sullivan's cable pushrod for the throttle control and their Gold'n pushrod for the steerable tailwheel.

Due to the narrow fuselage and limited space available my entire Futaba PCM flight pack had to fit within the wing saddle area. The battery pack was located right behind the fuel tank. Next in line went the PCM receiver and finally the elevator, rudder and throttle Futaba FP-S130 servos mounted in a FST-21T servo tray. The pushrods to the rudder and tailwheel were both connected to the rudder servo arm. The rudder pushrod has to exit the top of the fuselage while the one for the tail wheel has to come out the side. Put a Kraft 13-ounce fuel tank in place and drill the fuel line holes through the firewall.

Glue on the $\frac{1}{4}$ inch balsa sheet fuselage bottom behind F2 with the grain running crosswise. Assemble the sub-rudder from a piece of $\frac{3}{8} \times \frac{3}{4}$ inch maple epoxied to $\frac{3}{8}$ inch



R/C Barnstormer



With the length of those landing gear (above left), $\frac{3}{16}$ music wire is more appropriate than the more usual $\frac{5}{32}$ wire. The greater diameter offers a little

balsa sheets. Drill through the maple for the brass bushing. Solder a number four washer $\frac{1}{8}$ inch from the end of the bushing. Epoxy the bushing into the maple. Bend the tailwheel wire from $\frac{1}{16}$ inch diameter piano wire. Insert the tailwheel wire into the bushing and make the final 90° bend at the top. Solder a number two washer to the wire at the top and the bottom of the bearing to prevent any vertical movement of the wire.

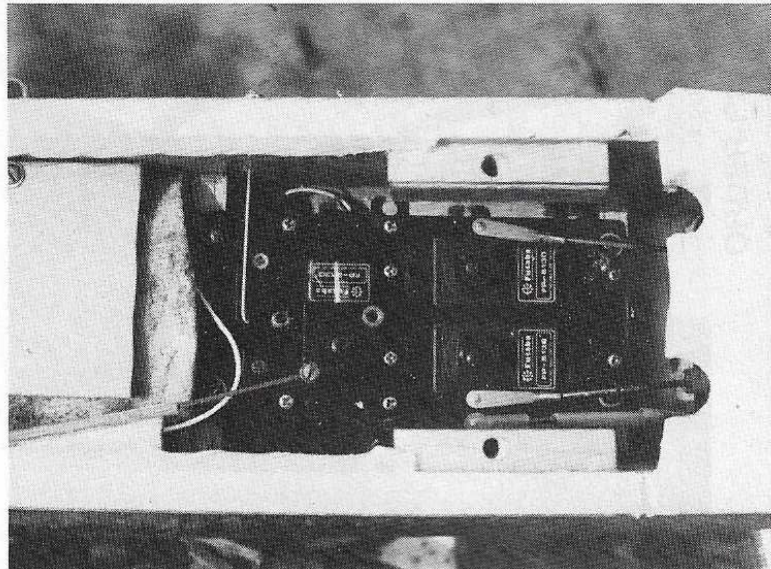
Cut a hole in the bottom of the fuselage for the wire and bushing and slot the side of the fuselage for the 90° bend of the wire. Epoxy the sub-rudder assembly to the bottom of the fuselage. Glue on the fuselage top balsa already slotted for the vertical stabilizer and the small balsa block to complete the sub rudder. Glue on the bottom of the fuselage between F1 and the landing gear assembly. Carve and sand the entire fuselage to shape.

Cut out the horizontal stabilizer from $\frac{5}{16}$ inch medium hard balsa sheet and the other portions of the empennage from $\frac{1}{4}$ inch sheet balsa. Sand all the pieces. You will have to taper the trailing edge of the horizontal stabi-

lizer to provide a smooth transition to the thinner elevator. Epoxy the $\frac{1}{8}$ inch plywood horn mounts in a position as dictated by your servo configuration.

Screw the wing on to the fuselage. Epoxy the horizontal stab in place using the wing as your reference, making all the measurements between it and the stab. Epoxy on the $\frac{1}{4}$ inch triangular stab supports. Epoxy the vertical stab into the slotted fuselage top block, checking the alignment constantly before the epoxy cures.

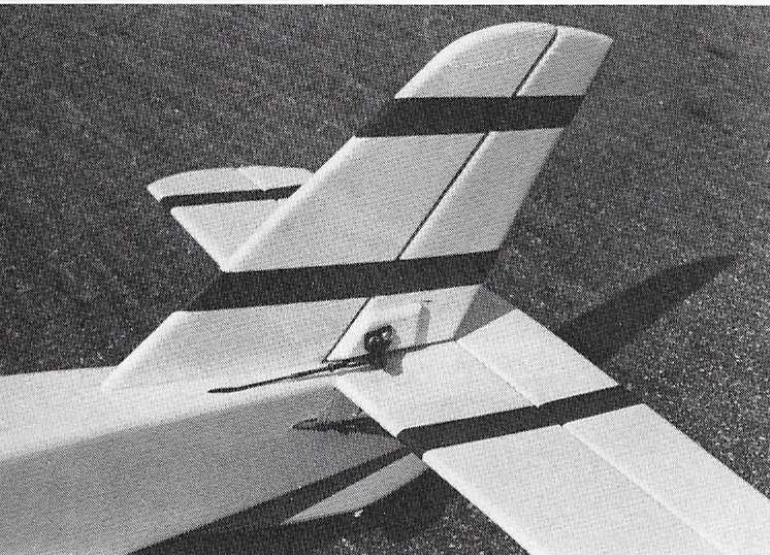
One of the most prominent features of the *Barnstormer* was its canopy and I took great pains to reproduce it exactly as it was shown on the original plans. Cut the flat canopy from .030 inch K&S sheet acetate. Fold the canopy to shape and tape it together. Drill $\frac{1}{16}$ inch holes through the acetate as indicated on the plans. Scuff up the inside surface of the acetate in the area of the holes. Sew the canopy together with heavy thread. Stir up a soft mixture of microballoons and Hobbyoxy II. Carefully apply this mixture to the canopy threads and seal the gap at the



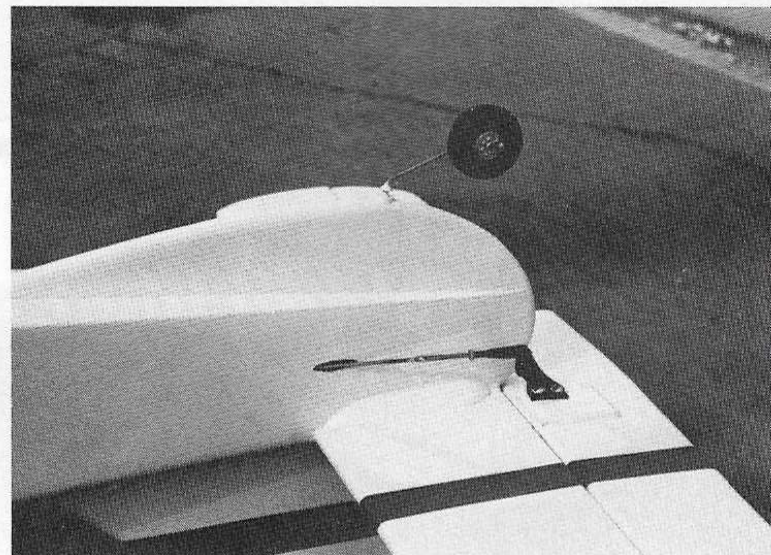
more rigidity. Primary reason for enlarging the plane was to fit the radio gear (above right). Space is adequate but not very roomy.

joint of the sheets and the holes for the thread. Allow the canopy to cure in the inverted position. When cured trim and sand the canopy to its final shape to fit the fuselage top and bond it in place with polyester resin.

Now that everything is built, it is time to make it look pretty. Go around the entire ship with lots of sandpaper and microballoons a couple of times until you are sure there is not a rough spot left. Put on two coats of K&B Surfacing Resin, trying to make a little go a long way. Press as much of it as you can into the wood as you spread it out as far as possible. Sand these two coats with 180 aluminum oxide sandpaper. When you are satisfied with the surface you have achieved, spray on a coat of K&B Primer. Sand this with 220 paper. Next, comes the color. This is simple. It is all white, with red trim. I copied the paint scheme as it appeared in a late 40's advertisement in *Model Airplane News*, and I do remember the built-up model pictured in the label on the box the model came in was white with red trim.



You might try lightening up some of the $\frac{1}{4}$ inch sheet balsa tail section control surfaces (above left) to save some of the ballast weight Dan had to put in

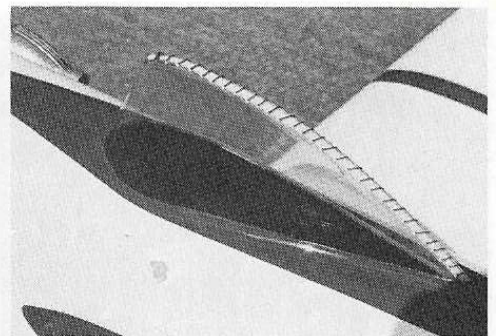
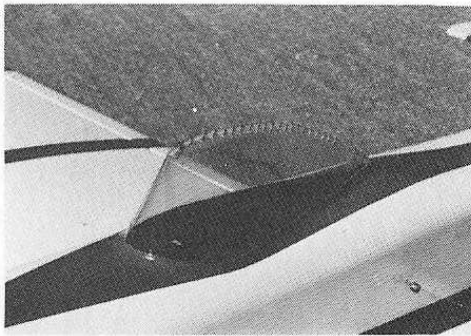


the nose of the plane. The tail wheel goes through the sub-rudder (above right) and will require a separate pushrod to the rudder servo.

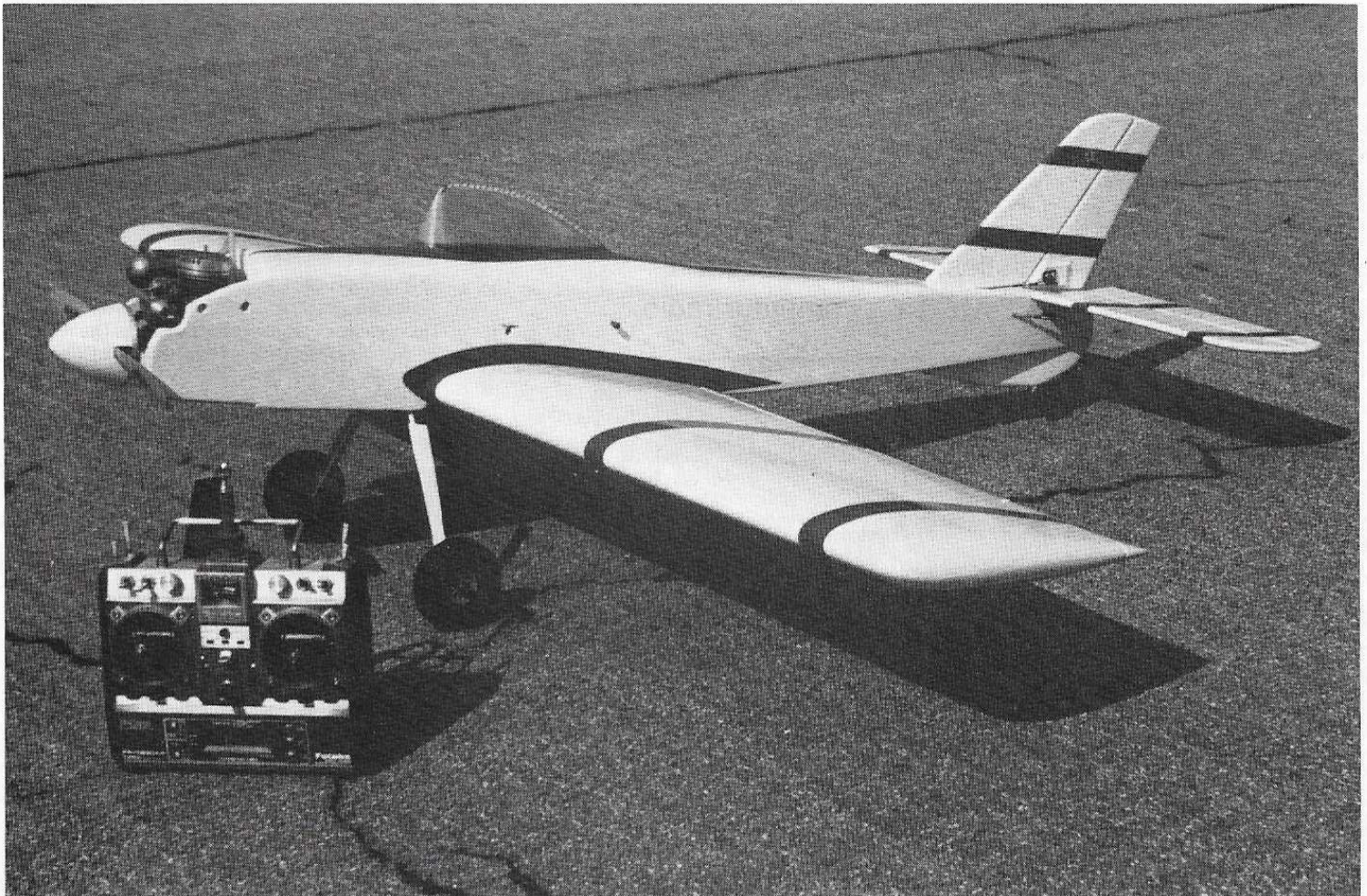
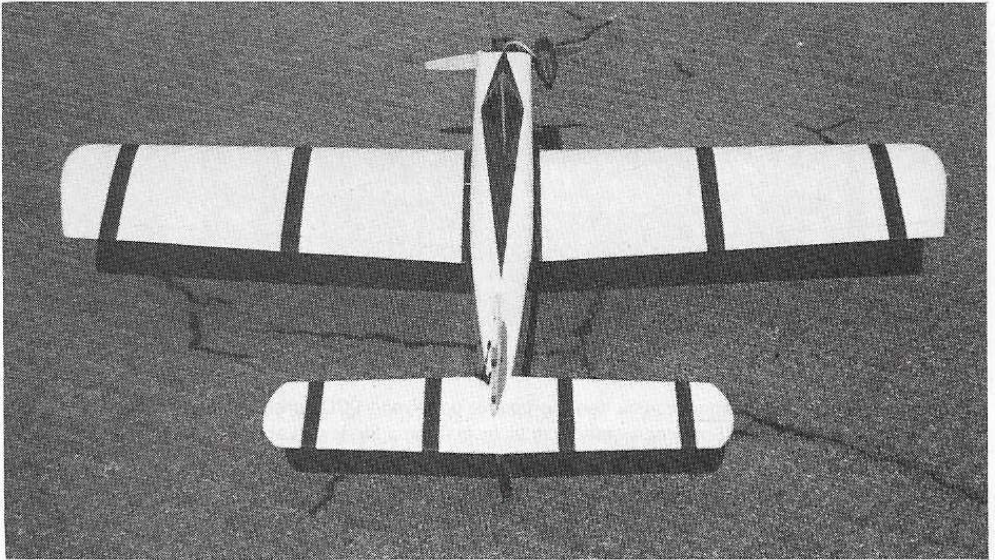
After you have installed your engine, tank and radio be sure to check the center of gravity. I had to epoxy three ounces of lead to the motor mounts just in front of the engine. Do not forget the longitudinal C.G. Add weight to the lighter wing tip or else you are going to wind up with a model that is difficult to trim.

That long, narrow main landing gear does make taxiing a little difficult but this can be dealt with some more concentration on the rudder stick. Taxi the model out to the runway and face her into the wind. Hit the throttle and be ready to get on the rudder as soon as the model starts moving. The K&B .61 supplies more than sufficient power for a model this size and she moves along at a pretty fast pace. A light wing loading makes landings a breeze but it's kind of difficult to avoid scraping a wing tip due to the landing gear. If you find yourself really pulling your tips along the ground glue on small pieces of $\frac{1}{4}$ inch plywood to act as skids.

You can certainly be proud of yourself for resurrecting this historically important model. It is more fun to fly as a radio controlled model than it was control line. Even if the *Barnstormer* wasn't part of your youth it is just a nice model under any condition. I've been in modelling since the early forties and except for my college years and a short stint in the Orient, I've been at it ever since. Although things have changed quite a bit over the years the thrill of it all never diminished. However some have increased somewhat. My Futaba PCM did cost more than that U-Reely. C



Dan took great pains to faithfully recreate the *Barnstormer*, right down to the characteristic canopy (above left). In this shot, the sewed-together spine, filled with an epoxy slurry (above right), is more evident. Dan used the paint scheme (below) from the original advertisements in the late 1940s.



Having flown the original C/L *Barnstormer* when he was a kid, Dan is able to honestly say the R/C version is even more fun.