



ARCTIC TERN

The Interstate S1B2 Arctic Tern is a direct descendant of the Interstate Cadet of fifty years ago. It was being manufactured in Anchorage, Alaska, by Arctic Aircraft Co. as an attractive alternative to that ubiquitous Alaskan bush plane, the Super Cub.

In 1985 the base price of the A.T. with a long list of standard equipment was \$44,000. Approximately thirty-five have been built and some of these were delivered to customers outside Alaska.

The Arctic Tern is equipped with a 150 horsepower Lycoming engine which allows a 117 mph cruise at 75% power, a 1275 fpm climb at a gross weight of 1900 lbs., a stall speed of 35 mph, and an absolute ceiling of 21,000 feet. Empty weight is 988 pounds. This performance makes it a natural choice for a bush pilot.

The Arctic Tern should also interest the scale enthusiast. It looks more like a model than a model, the factory color

A .19-.25 powered Stand-Off Scale bush plane for year-round flying.

By David E. Unruh

schemes are dynamite, and it has very few features that are difficult to duplicate.

This version is 1/8 scale. The first prototype was 3-channel — rudder, elevator, and throttle. It was built by Van Wilson and test flown by Bill Toppa and myself. With a balance point at 30% of wing chord and normal control throws, it was a wild thing and quickly tried to eat a frozen lake. Thanks to the snow cover, damage was very minor. We then moved the battery pack from the rear of the cabin to a position near the fuel tank to give a Center of Gravity at 25% of chord

and reduced the control throws to 3/8" either way (rudder and elevator). It is still high spirited but quite manageable.

The second model built has a slightly enlarged horizontal stabilizer which is shown on the plans along with the original scale outline. This should tame the antics, but I would still advise the first flights be made with a forward C.G. and minimum control deflection. Weight should also be kept under four pounds.

CONSTRUCTION

The complete step by step construction article comes with the full size plans (see page 299 for ordering information).

Flying:

As a starting point, balance the model 2" or less back from the leading edge. Elevator travel should be $\pm 3/8$ " and rudder travel $\pm 1/2$ ".

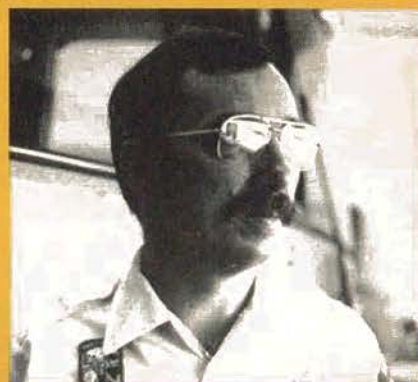
The engine in Van's prototype is a



well worn K & B .19, mounted upright to make tinkering easier. The engine in mine is an Enya .19, cowled in much too tightly for a sport model. A rational approach would be to side mount the engine as I did, but carve a

larger opening in the right side for access.

For an uneventful first flight, the landing gear on a taildragger deserves a little extra consideration. First, the airplane should roll easily and in a



ABOUT THE AUTHOR

Dave Unruh is a 49 year old Fire Department Battalion Chief and Paramedic. He has lived in Alaska since 1951. His first successful R/C model in 1974 was a Sterling Super Cruiser; six foot span, Fox .36, and EK radio. The model still exists, hanging in a friend's house! His primary interest is R/C scale, especially Golden Age, but he enjoys all forms of the hobby. He has been married to Carol for 26 years and they have two grown children.

straight line. A little toe-in is usually helpful but not so much that the wheels bind or the whole plane hops as it rolls forward. The tailwheel strut should be quite tall (as is the strut on the full size). A short strut gives a high static angle of attack that makes airplanes go goofy as they start to lift the tailwheel during the take-off run.

Standard taildragger techniques may bear repeating. Hold the tail down with elevator as you increase the throttle until enough speed has built up to fly the tail. Then release the elevator stick and let the plane build up speed. It may be necessary to hold a little right rudder. Don't be in a hurry to be airborne; it is dangerous not to

INTERSTATE S1B2 ARCTIC TERN

Designed By:

David E. Unruh

TYPE AIRCRAFT

Sport Scale

WINGSPAN

56¼ Inches (w/Hoerner tips)

WING CHORD

8 Inches

TOTAL WING AREA

450 Sq. In.

WING LOCATION

High Wing

AIRFOIL

Semi-Symmetrical

WING PLANFORM

Constant Chord

DIHEDRAL EACH TIP

2 Inches

OVERALL FUSELAGE LENGTH

35 Inches

RADIO COMPARTMENT SIZE

(L) 6¾" x (W) 3¾" x (H) 3"

STABILIZER SPAN

18 Inches

STABILIZER CHORD (incl. elev.)

5½ Inches (Avg.)

STABILIZER AREA

86 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top of Fuselage

VERTICAL FIN HEIGHT

8¾ Inches

VERTICAL FIN WIDTH (incl. rud.)

5¼ Inches (Avg.)

REC. ENGINE SIZE

.19-.25 2-stroke

FUEL TANK SIZE

6 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

3-4

CONTROL FUNCTIONS

Rud., Elev., Throt., Opt. Flaps

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply

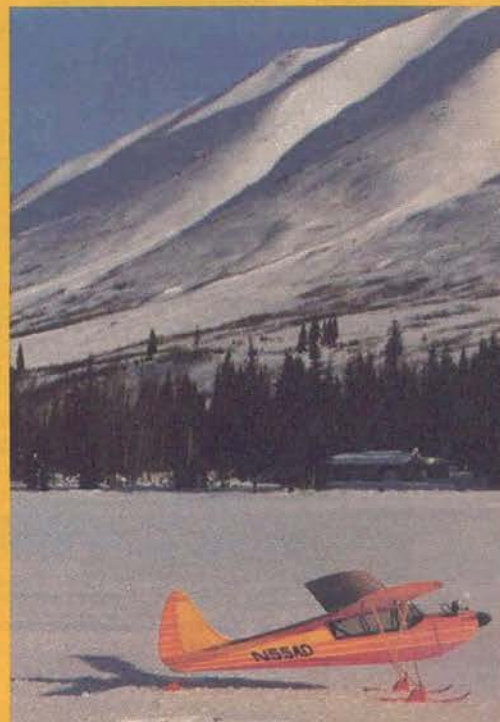
Wing Balsa & Ply

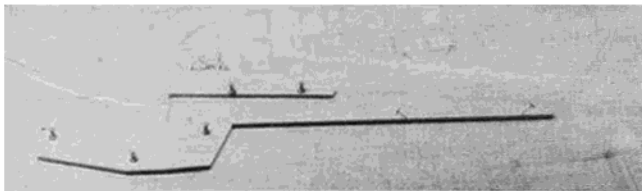
Empennage Balsa

Wt. Ready To Fly 60 Ozs.

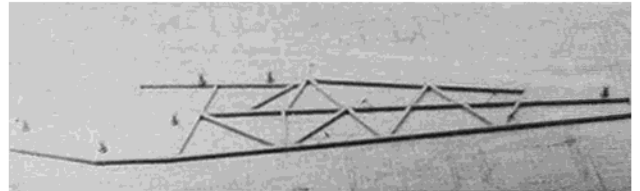
(3 Lb. 12 Oz.)

Wing Loading 20.5 Oz./Sq. Ft.

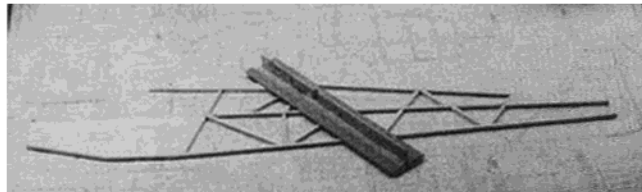




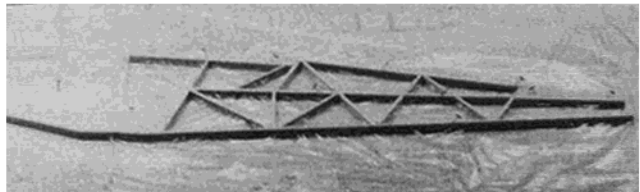
The fuselage side and the wing saddle pinned over the plans.



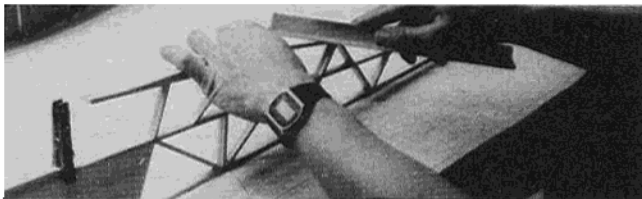
The stringers and cross braces added.



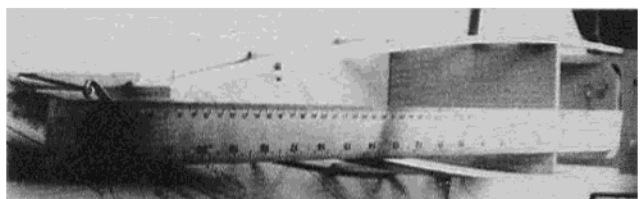
Sanding the sides smooth.



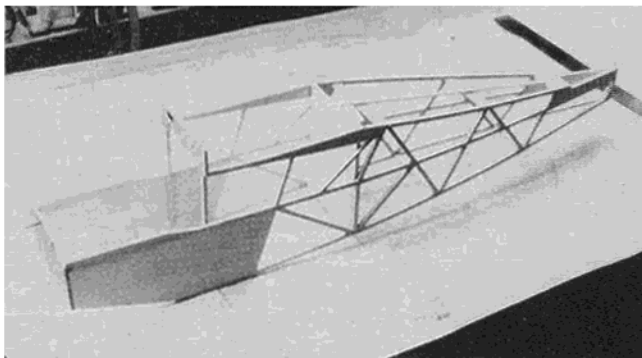
Building the second side over the first.



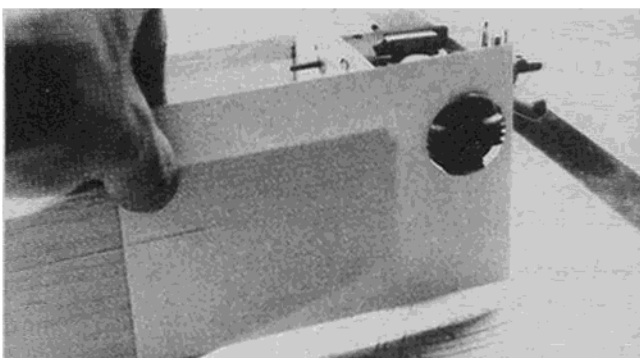
Making the two sides true with a sanding block.



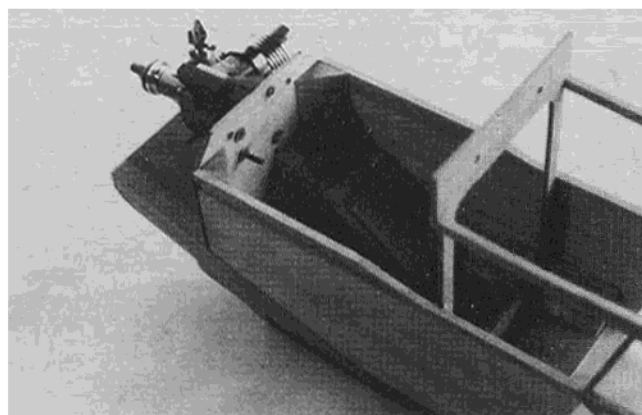
Checking for a true centerline — note the clothespins at the tailpost.



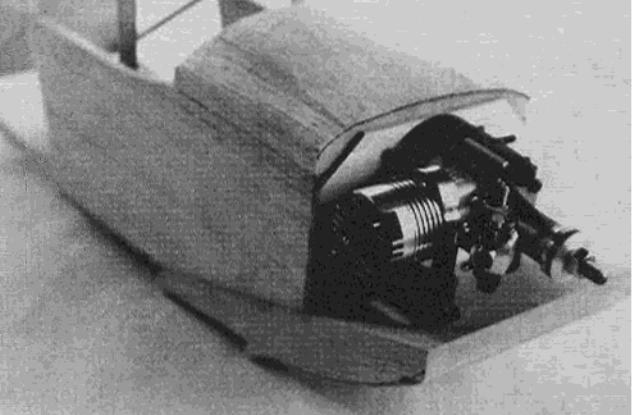
The fuselage sides with bulkheads and firewall installed.



Making a template for the hole in the right outer cowling piece — note the thrustline marked on the fuselage side and template.



The front of the fuselage; top block left off to show muffler enclosure — make to suit your engine.



Front of the fuselage with the 1" x 4 1/4" x 3/4" top block and the 1" x 4 1/4" x 7/4" bottom block.

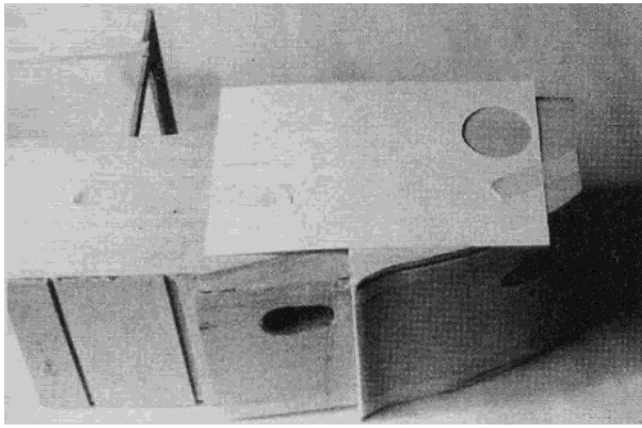
let the airplane fly itself off the runway. Even after lift-off, the plane will not be at cruising speed immediately, so keep your climb-out and initial turn gentle. Once the airplane is "on the step," it will be more forgiving.

For the true bush pilot experience, you should fly your A.T. off skis and

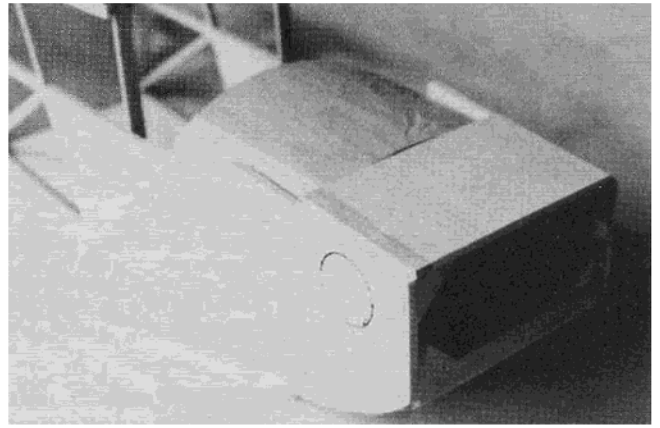
floats. The small Gee Bee size of floats should be perfect, I've had good experience with them on other models of this size. Skis are easily made by laminating 1/16" plywood into an appropriate shape. Scale-like bungee cords usually give trouble; for sport flying I prefer to mount my skis in a semi-rigid manner using wire torque

rods imbedded in the axle trunnion and clipped onto the strut.

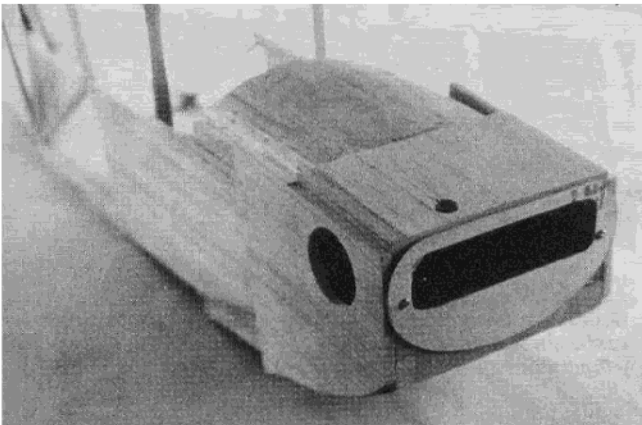
One more thing — since all wood used in this model is 3/16" (at least the major components), it is easily enlarged to 1/6 scale and the spars and longerons then become 1/4", and the wingspan just over 6'. Gets you thinking, doesn't it? □



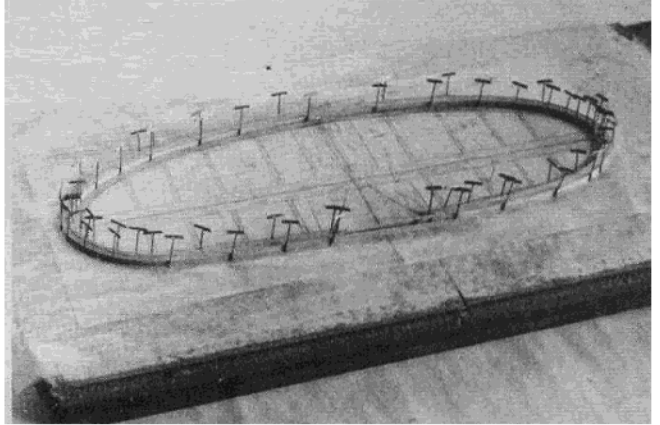
Using the previously made template to mark the engine cutout.



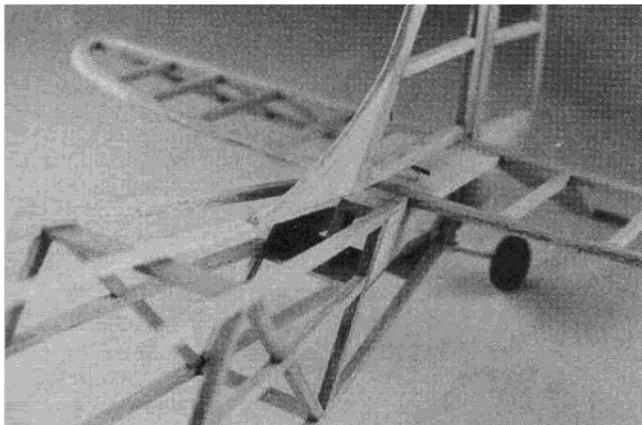
All cowl pieces in place except the nose block.



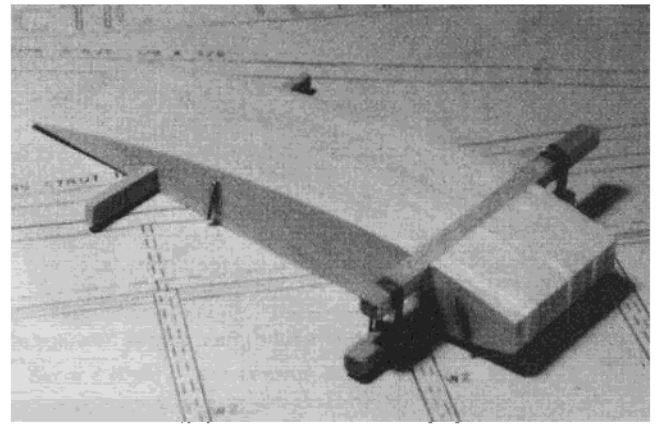
The backing plate for the nose block held in place with 2-56 screws and blind nuts.



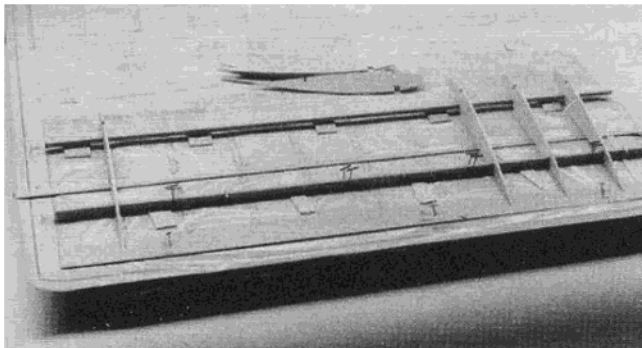
The horizontal stab outline — built-up with 1/16" x 3/16" laminations.



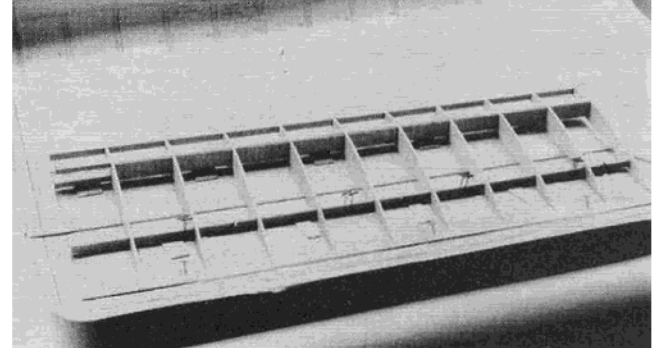
The tail group pinned in place on the fuselage — note leading edge of fin carries through center top stringer to a middle brace.



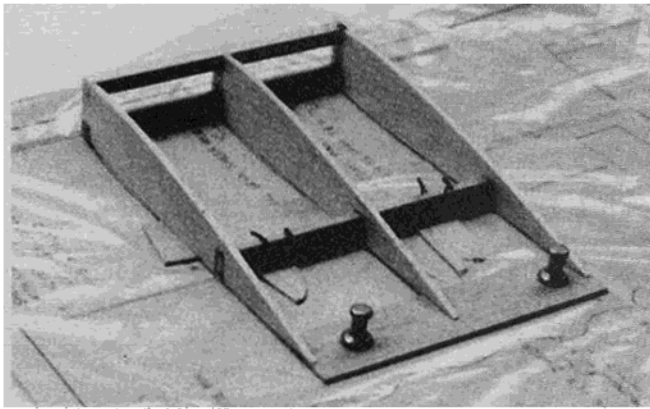
The wing ribs stacked on short pieces of spar stock for sanding.



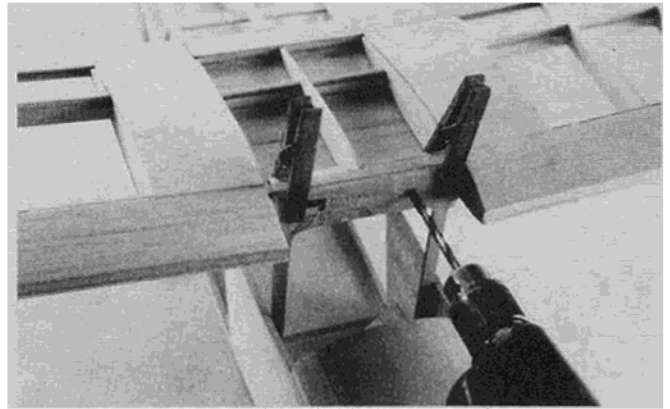
Wing construction starting — note short sections of T.E. stock used to raise lower spar and 1/16" scrap used to raise ribs and rear spar.



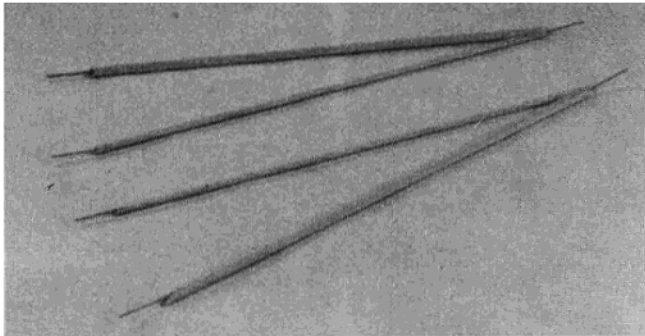
Wing half with all spars, shear webs, L.E., and half of T.E. in place.



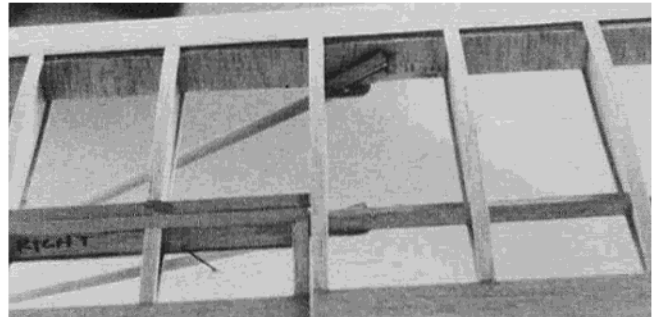
Center section under construction. These ribs are cut off at front spar.



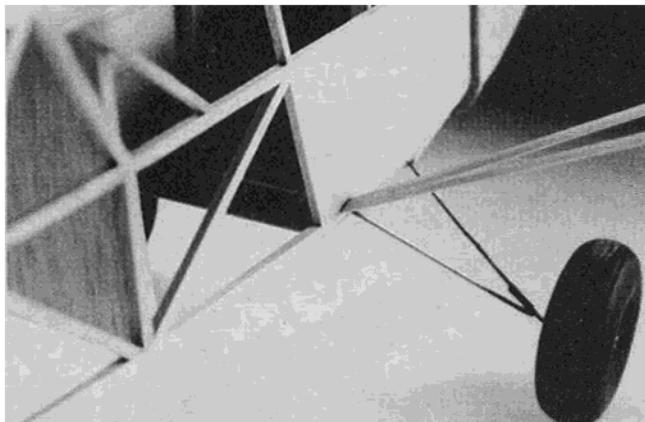
Holes for dowel pins being drilled through cabin bulkhead and wing dihedral brace.



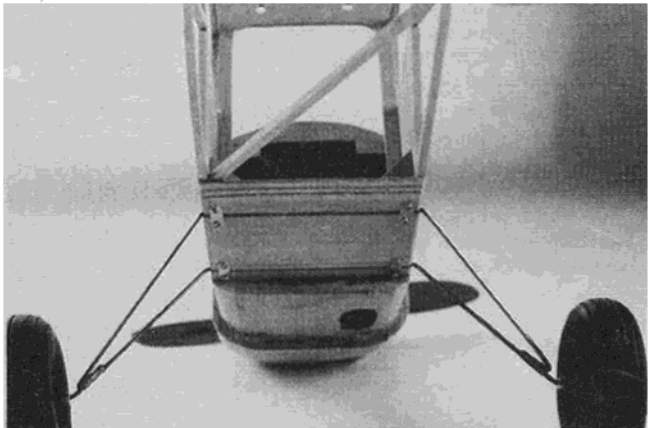
Wing struts.



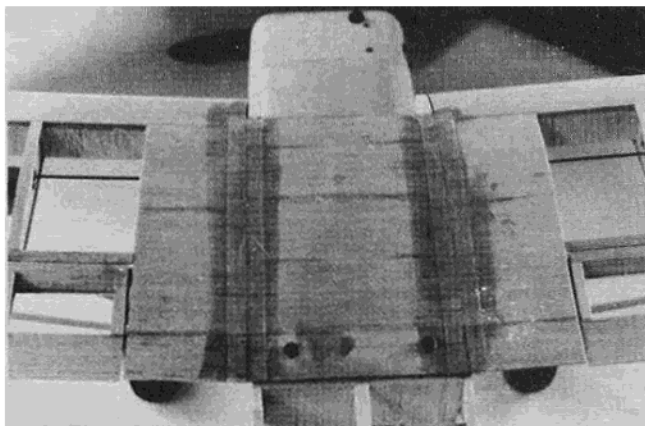
Upper wing strut mounting — 1/16" O.D. aluminum tubes glued to shear web and rear spar, held in position with balsa scrap. This wing has a flap cut out and framed.



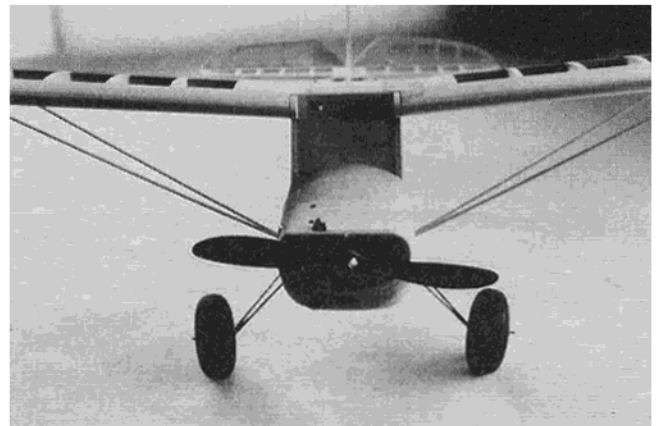
Lower strut mount is an aluminum tube glued across fuselage at floor.



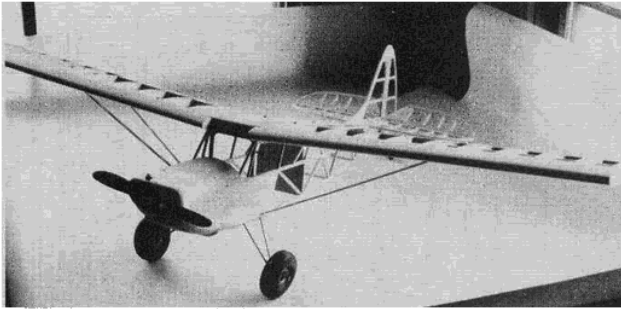
Wire landing gear in place.



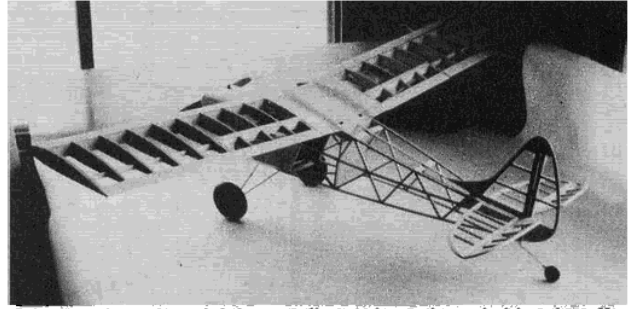
Center section of wing sheeted, joint reinforced with glass tape and epoxy.



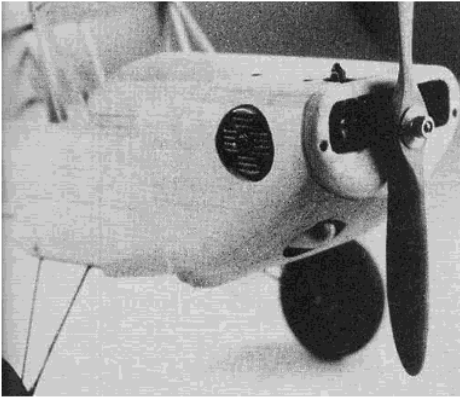
Front view of framed-up model.



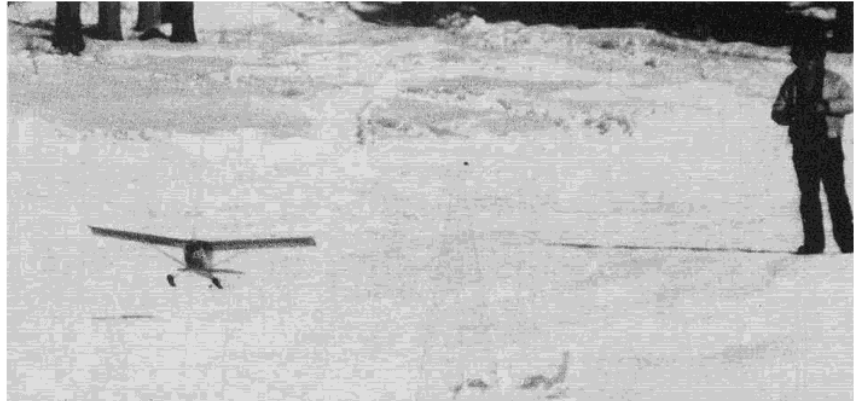
Front 3/4 view of Arctic Tern, ready to cover.



Rear 3/4 view of model. Long tail strut is scale and aids take-off.



Only reliable engines need apply for an installation this tight. Nose block is 3/16" balsa glued to 1/16" ply and held on by 2-56 screws and blind nuts.



First take-off.



First landing.



Second flight — this is more like it!

**From
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