Laddie's BT-67 is extraordinarily light for its size. A skilled source made the five-blade propellers especially for this project.

Basler Turbo 67

By Laddie Mikulasko

A FEW YEARS ago I saw a picture of a Douglas DC-3 that was powered with three turboprop engines. The aircraft looked cool, so I was inspired to build it as a scale model.

I couldn't find three-views for that version of the airplane, but I did find an Internet site for Basler Turbo Conversions of Oshkosh, Wisconsin. It described a two-engine turboprop-powered version of a DC-3.

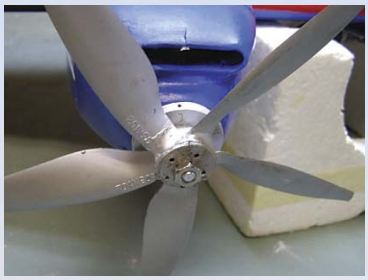
This company modifies standard DC-3 frames for its customers, and then changes the designation to BT-67. Basler replaces the radial engines with Pratt & Whitney PT6A-67R turbines driving five-blade propellers, designs new wingtips, covers ailerons and control surfaces on the tail with aluminum skin, and lengthens the fuselage in front of the wing by 5 feet. In addition, the interior of the aircraft is tailored to suit the customer.

On the Web site I found a small three-view drawing and several photos and finishes. The color scheme I chose is one that the Alfred Wegener Institute of Germany uses on its "Polar 5," to conduct research in the polar regions of the world. It carries all kinds of external equipment on the fuselage and under the wings, and it is equipped with skis.

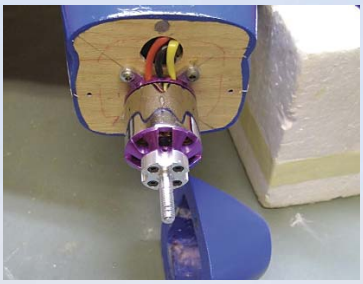
I used the Basler three-views and photos and three-views of the original DC-3 to draw the plans for my design. I kept the outlines as close to scale as possible.

Throughout the course of the project I built two models. The first was from 4mm foam sheets that I bought at a dollar store and finished in the Wegener Institute colors.

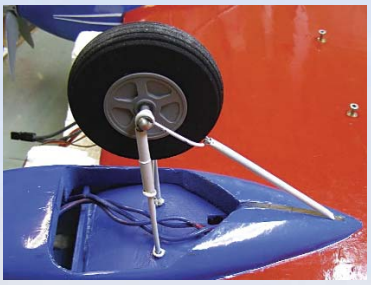
That version flew well, except for a nasty habit of stalling and going into a spin. When I witnessed that



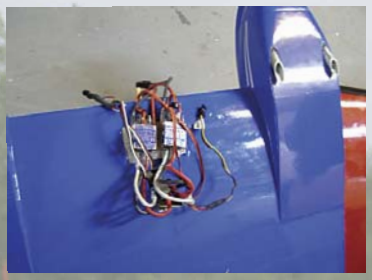
The special propellers require special handling and are not recommended for reproduction according to the AMA Safety Code.



Two magnets in the firewall are embedded to hold the motor cowling in place. The motors shown are equivalent to the AXI 2820/14.

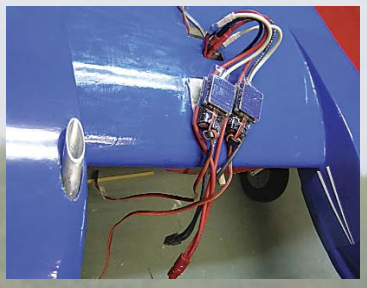


Fixed landing gear made from K&S music wire is simple and light. Robart makes pneumatic versions that could be fitted.



Twin Castle Creations Phoenix Ice Lite 50 controllers are mounted as close as possible to the 3S Li-Poly power system.

A separate pushrod to the rudder servo controls the steerable tail wheel. Elevator halves are joined with a heavy wire at the hinge line.

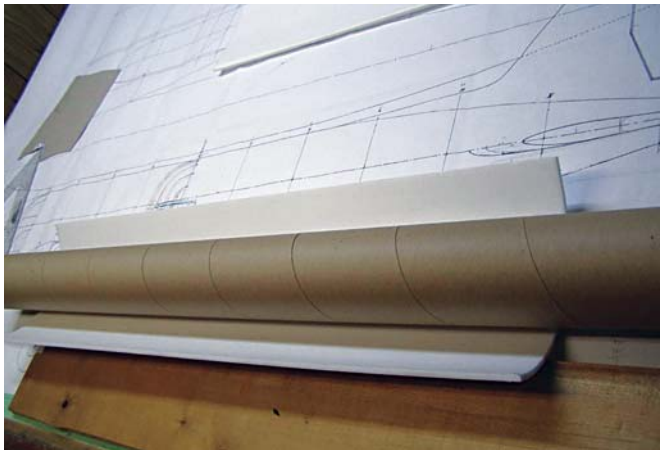


Engine-cowling detail requirements are minimal. Cardboard tubing simulates turbine exhaust. The author used UltraCote to finish the model.

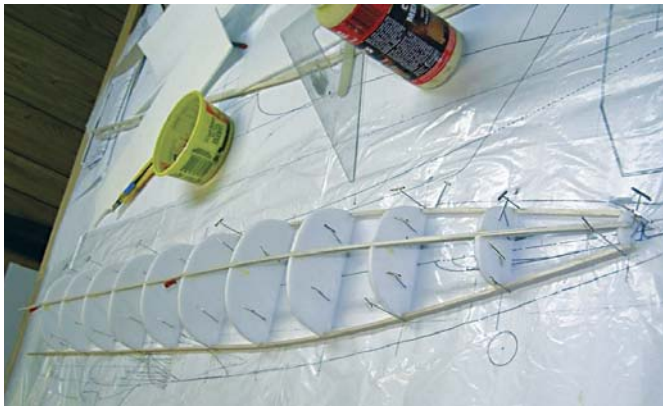
An enhanced version *of a timeless airliner*

Photos by the author

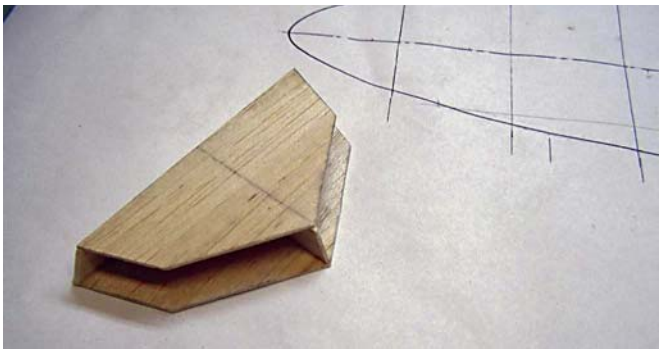
Bottom formers and longerons are shown. Formers at lower stress areas can be made from lighter closed-cell-foam sheet.



A curved fuselage needs curved sheeting. Solid 1/8 balsa sheet used on top and on the side of the fuselage is glued to the formers.

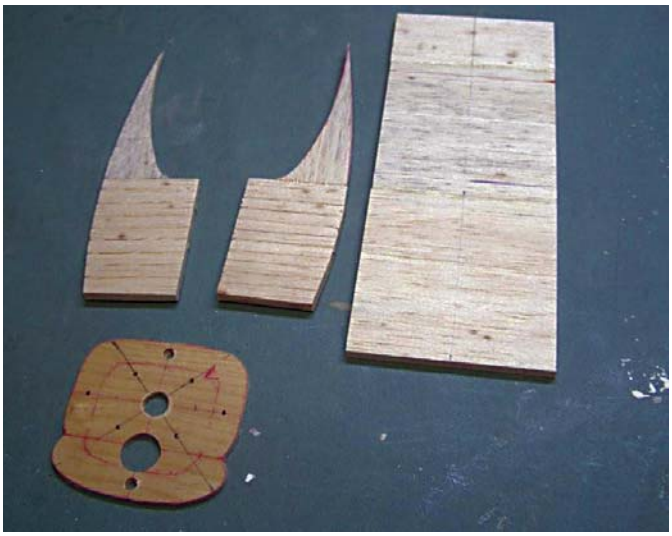


As does the lower half, the fuselage top section and longerons build flat on the table. All formers are foam.



The cockpit frame is a simple build. It will be sandwiched between foam blocks to be carved to shape by hand.

Above: From the dividing line on top and the TE at the bottom, the fuselage is covered with 1/8 x 1/4 balsa planks. The wing fillet base is glued to the fuselage.



Above: Nacelle sides are kerfed. Grain direction of the sheet material is important here.

Right: Assemble nacelle parts with the kind of wood glue that is easy to sand. These should fit the wing sections as tightly as possible.

Right: Right and left lower nacelle portions are made from solid balsa. For symmetry, stack the blocks in halves.

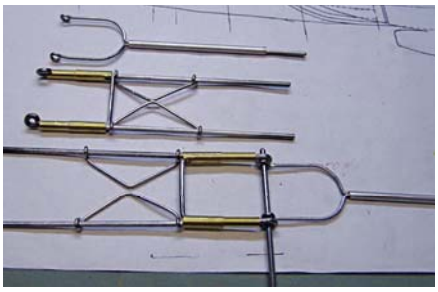
Brian Rutkay posted this photo of the full-scale Polar 5 BT-67 on Airliners.net and gave us permission for reprint.

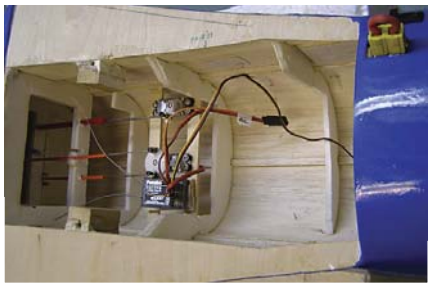
Left: Laddie's version of the Polar 5 makes a pass over the field. It no longer looks like a 75-year-old design.

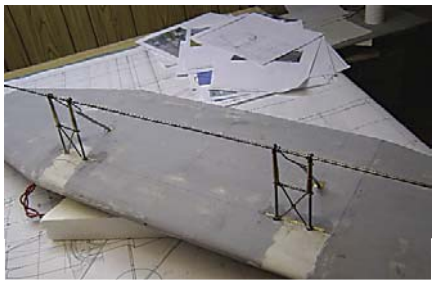
Below left: Landing gear parts can be assembled dry to confirm alignment. They offer a bit of shock absorption.

Below center: Inside the radio compartment you can see the elevator and rudder servos. One control rod from the rudder servo goes to the rudder horn and the other goes to the tail wheel.

Below right: A stretch of solid music wire assures that the final solder of the metal gear is done in a square fashion.







Basler Turbo 67

Type: RC Scale

Skill level: Intermediate builder, intermediate pilot

Wingspan: 78 inches

Wing area: 685 square inches

Length: 53 3/8 inches

Weight: 7 pounds

Power: AXI 2820/14 motors, 45- to 50-amp ESCs, 11.1-volt Li-Poly battery

Radio: Four to six channels, two miniservos, two standard servos

Construction: Balsa, plywood, foam

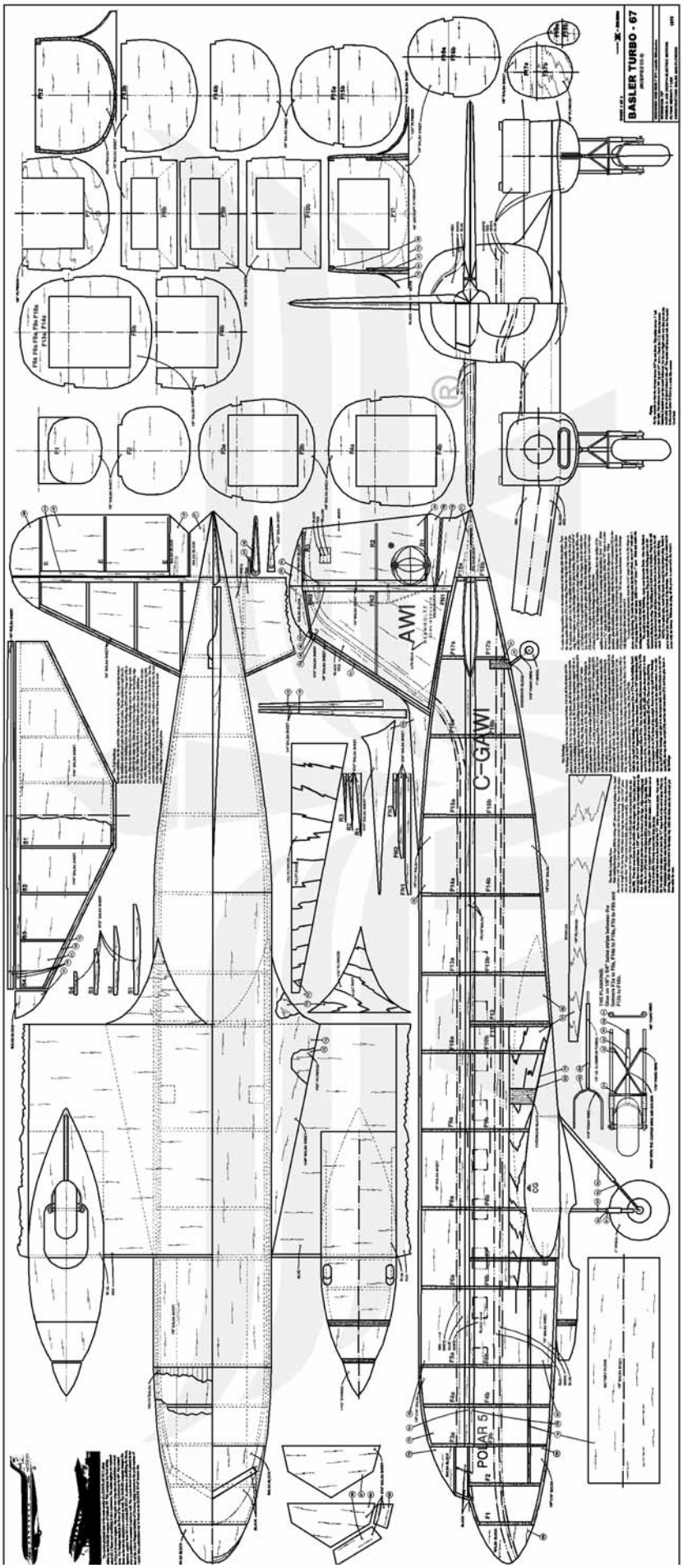
Finish: Heat-shrink film

Other: 1 1/2-inch spinners, 3-inch main wheel, two 9 x 6E propellers

Above: The foam wing is coated with fiberglass and sanded smooth. Then enamel primer is used to fill the grain of the cloth. UltraCote sticks well to the primer.

Laddie with his second prototype, which is an excellent-flying version of the ageless airliner.

Full-Size Plans Available—see page 175



behavior I knew that omitting washout from the wing was a mistake.

I was going to build a new wing. But after some modelers showed interest in building the BT-67 from my plans, I decided to build a new aircraft using balsa and plywood. Many aeromodelers are more familiar with building with balsa and plywood than with foam.

However, I took only a few pictures while I was building the balsa model. What you see in this article is my experiment using Depron sheet material in place of some of the formers that are normally built from plywood or balsa.

To power the Basler I installed two AXI 2820/14 outrunner motors operating from a pair of 3S 3000 mAh Li-Poly battery packs connected in series. Castle Creations Phoenix Ice Lite 50 ESCs are mounted at the wing center-section, near the batteries. I originally flew the airplane with 9 x 6 propellers.

Flight performance was nice with this setup. I might soon hold trials with three-blade propellers, such as one of the selection from Master Airscrew. For a better scale appearance I made five-blade propellers from five 8 x 4 two-blade APC-E propellers.

I do not encourage anyone to make propellers. It could be dangerous if done improperly. Even when done correctly, I would never use the homemade propellers with glow-powered models because of the vibration.

My propeller experiment was done extraordinarily carefully, to ensure good hub strength, and correct balance of the propeller is paramount. There are many ways to build these propellers wrong, so don't try it unless you're willing to accept the dangers, as I have.

Each motor draws 24 amps to drive these propellers and produces 2.5 pounds of static thrust. The flying weight of the BT-67 is 7.0-7.5 pounds, depending on the weight of the batteries.

I finished my prototypes with UltaCote film covering material. Any finishing method will work.

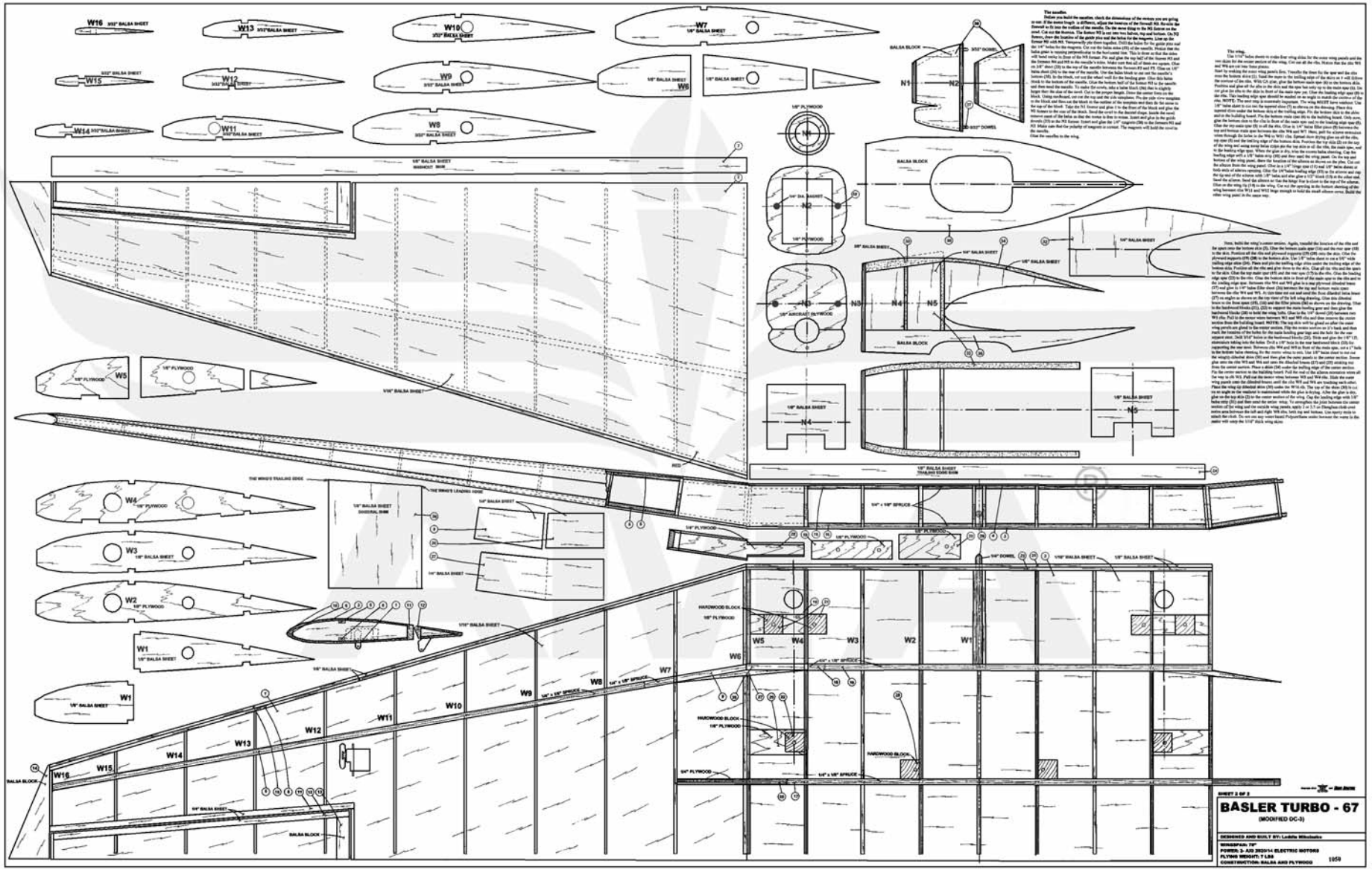
Because the model is electric, you can add panel-line details with a fine-point Sharpie marker to the extent that you want.

Fixed landing gear keeps the project simple. The aircraft is large enough to accept pneumatic retracts such as those Robart sells to suit the slightly larger Top Flite DC-4/C-47 kit that is available from Great Planes.

The Best Part: The construction steps are part of the drawings, so I will get directly to flying. The step-by-step instructions are also available on the *MA* Web site. See the link on the contents page for this issue.

As with any model, check the CG. Move the motor batteries if needed to get the airplane balanced.

During takeoff, make sure that you let the BT-67 pick up considerable speed before it lifts off. Gain a great deal of height before exploring the flight characteristics.


BASLER TURBO - 67
(MODIFIED DC-3)
SHEET 2 OF 2
DESIGNED AND BUILT BY: Laddie Mikolasko
WINGSPAN: 70"
POWER: 3- AXI 2820/14 ELECTRIC MOTORS
FLYING WEIGHT: 7 LBS
CONSTRUCTION: BALSA AND PLYWOOD
1959
The nacelles.
The wing.
Trim, build the wing's center section. Again, transfer the location of the ribs and
BALSA BLOCK
HARDWOOD BLOCK
BALSA BLOCK

The design presented here—with washout on the wing—flew docilely.

While the aircraft is at a high altitude, slow it down to check how it behaves. The BT-67 will loop and roll, but I hope you fly it in a scalelike manner. Low passes down the runway are a crowd pleaser. As does the full-scale aircraft, this model version will probably fly well from snow if equipped with the proper set of skis.

After your best flight-testing CG positions, remove the wing as if to change batteries. With the fuselage upside-down in the cradle, check the balance point of the fuselage with the motor batteries still inside. Mark the level balance location using a pen on the wing-fillet base or inside the wing saddle.

By doing this, whenever you use a different set of batteries, you can balance the fuselage based on the mark and it will fly great every time. And that way you do not have to bolt and unbolt the wing to locate the correct CG.

Good luck! MA

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Sources:

AXI motors:
Hobby Lobby
(866) 512-1444
www.hobby-lobby.com

UltraCote
Hangar 9
(800) 338-4639
www.hangar9.com

Castle Creations
(913) 390-6939
www.castlecreations.com

Robart
(630) 584-7616
www.robart.com

Model Aviation
www.modelaircraft.org/mag/December11/toc.htm