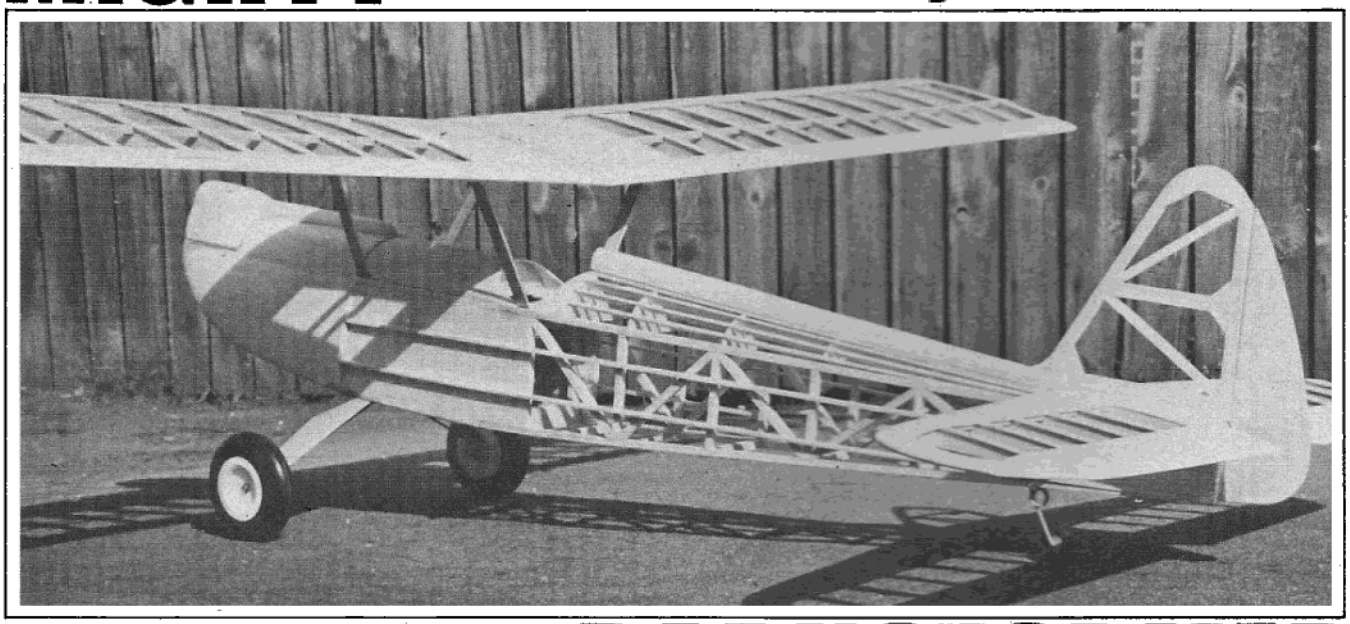
MIGHTY

by DAVE BODDINGTON



BARNSTORMER

I was about to start this article by stating that I have a great fondness for large models but the truth is that I love all sizes of aircraft – from the smallest models to the largest full-size aircraft.

The Barnstormer model presented here is, in fact, the largest of a series of designs using the same basic layout. Smallest of the line is a 38" single channel version for .049 – .08 cu. in. engines, followed by a 52" span design also for single channel. The Barnstormer 72 comes in both parasol wing and bi-plane bypes and, lastly the mighty version presented here.

An extended **Mighty Barnstormer** with a pusher engine mounted above the wing has been built by a television producer in this country for camera carrying purposes. Mounting the engine above the wing was carried out to reduce the risk of vibration being transmitted to the camera, the latter located in the fuselage. Initial test flights show great promise and it is hoped that, with a 16 mm movie camera mounted in place of the present 8 mm one, results will prove good enough to use on television news and magazine programs.

Few sights can be more inspiring to the modeler than that of a large model carrying out a low, slow fly past or a gentle approach and genuine three point landing. The Mighty Barnstormer certainly looks majestic in the air, it has that correct 'sit', if you know what I mean, and one thing I can guarantee, it will certainly draw the crowds! If you do not like to be surrounded by a lot of folks when you are flying a model, then either do not build this model or find some uninhabited area to fly it in. Large size and scale-like appearance always seems to add up to crowd appeal.

For those of you living in an area that suffers, or enjoys, snow in the Winter, I can thoroughly recommend the fitting of skis to the Mighty Barnstormer. With a low powered .60 engine in the prototype, the 100 yds. or so takeoff on skis was something to behold and the landings, with that soft kiss onto the snow, make the standing about in the cold well worthwhile. Although I have not tried it, I feel sure that she would also be great on floats although, in this case, a .71 to .80 engine would be necessary to cope with the extra drag on takeoff.

For normal flying, a good .60 engine is powerful enough, the relatively low wing loading and clean efficient wing keeps the model airborne at quite low power settings. Despite its large size the Mighty Barnstormer is rugged and will take some

90" OF PURE FLYING PLEASURE FOR THE SUNDAY FLIER. EXTREMELY DOCILE AND EASY TO FLY, IT WILL DRAW THE CROWDS WHEREVER YOU TAKE IT - - - - - - - - -

hard knocks, as was proved on its maiden flight. The prototype 'M.B.' was built by a friend of mine, David Toyer, and he just managed to get it finished in time to take to a 'Fun' meeting at Old Warden Aerodrome. It is, of course, against all recommendations to test fly a new model at any competition meeting, but the temptation was just too great. I checked that all the controls, elevator, rudder and engine, were working and then we fired the engine up. For the first attempt I elected to try a takeoff but she veered to port and rudder correction seemed to have no effect whatsoever and, after retrieving the model, tried a hand launch next time. Again she started turning to port and I gingerly inched on a little right rudder – no effect – more right rudder and even more turn to the left. A semi-cartwheel left the model pretty well undamaged but subsequent checks showed, much to my chagrin, the rudder was coupled up incorrectly. Being a regular contributor to a R/C model magazine, I hate to think the number of times I have implored the readers to check and check again before flying, at least it proved that the advice was right even if I did not take it myself.

CONSTRUCTION

I will try to keep the description of the building as short as possible, but bear in mind that there is always someone who has not built a model with this type of construction before.

Do try to 'pair off' longerons and spars so that each side are of equal density and strength. White glue can be used for all construction except for the metal to wood joints.

The plan specifies an amount of 5/16" balsa and, if this is unavailable, ¼" balsa can be substituted as follows:

Fuselage (1) Top and bottom longerons, ¼" x 3/8"; (2) Uprights and crosspieces, ¼" x 3/8"; (3) Diagonals, ¼" square; (4) Sides, cowl cheeks, infill, etc., ¼" sheet; (Note: Formers F2 – F11 must be modified to suit) (5) Stem posts, 3/16" x ¾", and supports for rear 1/16" sheet, 3/16" x ¼".

Fin and Rudder substitute 3/8" for all 5/16" dimensions.

Wings Main Spars, ¼" x 3/8".

FUSELAGE

Commence by constructing a left-hand and right-hand fuselage side from longerons, uprights, diagonals and sheet lower sides and cowl cheeks. When these are dry, mark and glue into position the 5/8" x 1/2" beech engine bearers, having first drilled them to take the engine plate bolts.

The Mighty Barnstormer - - - it all adds up to a lot of airplane. Would you believe the author has hand launched it?

Drill the ¾" x ½" hardwood strut support crosspieces and glue and screw them to formers F4 and F5. Note that Former F5 is laminated from 1/16" plywood and 3/16" strip. Glue F4 and F5 to the fuselage sides making sure the sides are square, followed, when these are dry, by cross pieces, undercarriage bearers Formers F1-3 and Formers F6-11. Add the sheet infill to the front of the fuselage, the fuel tank floor and the 1/8" x 3/8" rear deck stringers. Pin and glue the bottom sheet, including the 3/16" plywood undercarriage plate, and the 1" cowl bottom block.

For a more attractive fuselage, glue on additional 3/8" cowl side sheets as far back as F4 and then two 3/8" x ¼" hard stringer each side to ¾" or so past Former F11. These stringers are gradually tapered off towards the rear of the fuselage. This additional sheeting and the stringers adds to the strength of the fuselage and it is certainly advisable to include them if ¼" balsa is used in lieu of 5/16" balsa. Mark, drill and bend the cabane struts, starting from the center and work out on each side in turn, and screw and epoxy in position on hardwood bearers.

1" x 1/8" dural struts can be used instead of ¾" wide and the edges

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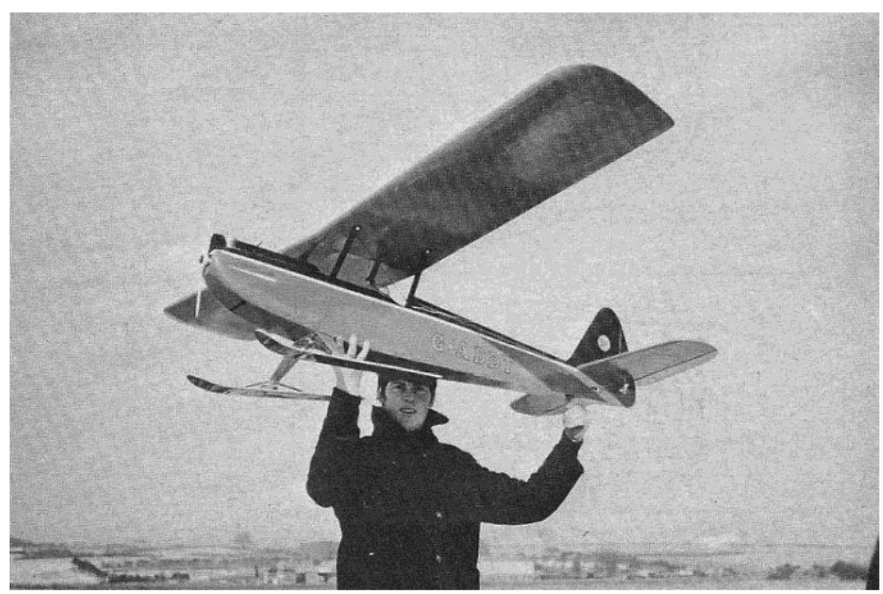
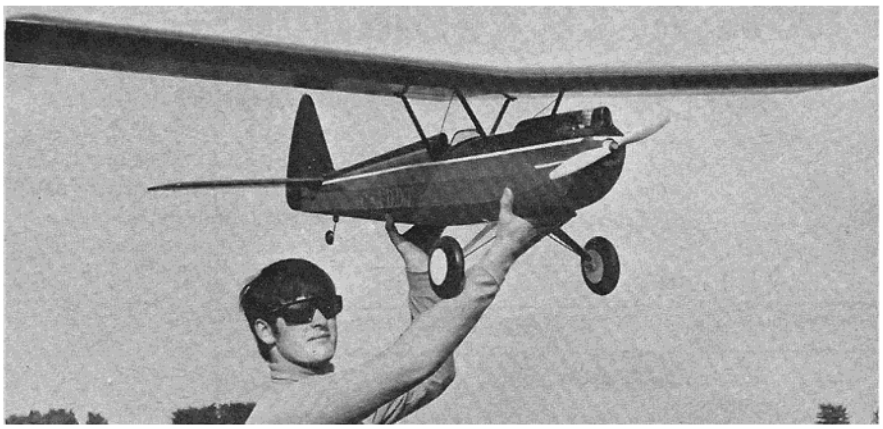
With a low powered .60 the M.B. will takeoff in 100 yards with skis attached.





should be rounded off and emeried smooth. Highly polished dural struts can look most attractive and the shine can be retained by proofing after polishing. Fuel proof the fuel tank bay & install tank. The metal fuel tank shown on the plans is the most convenient type for a non-aerobac, or semi-aerobatic model. It can be made to fit exactly into the space available and, once tested, can be a permanent fixture. That proviso, once tested, is however most important. I have had metal tanks leak from one of the joints and, to reduce this risk, suggest that 1/8" flanges be bent on all edges to be soldered. When the tank is completely soldered, a large capacity soldering iron is essential, clean off **all** the flux and pressure test under water to check for leaks. Copper or brass tube can be used for the filler, vent and feed tubes. Glue top fuselage blocks and 1/16" sheet to rear.

Shape and sand the fuselage to the required contours. The engine and rear dorsal fins should not be added at this stage, it is easier to attach them after the remainder of the fuselage is covered.

WINGS

The wings are constructed in two halves and joined by plywood dihedral braces or left as separate panels and joined by dural dowels sliding into paxolin or dural tubes in the wings. Up to two additional bays can be added to each wing panel without changing the construction.

Although the wing has a semi-symmetrical section, the rear lower part of the ribs are flat allowing the wing halves to be constructed on a flat building board. Commence by pinning down the lower 1/16" x 2" sheet trailing edge and the ¼" sq. and 5/16" spars (packed up on 3/32" scrap). Glue ribs in position followed by the ¼" sq. and 5/16" sq. top spar and also the ½" x 1" leading edge (packed up on 1/2" and 1/8" scrap).

When the ribs have dried, the top trailing edge and leading edge 3/32" sheeting can be glued and pinned in position. The ¼" balsa tips follow a line from the center of the leading edge to the center of the trailing edge, trimming the rear spar and shaping the rear of the tip to suit.

Remove the wing half from the building board and glue the 1/8" plywood cabane strut fixing plates in position. Screw and epoxy to these plates the anchor nuts (I prefer to use the floating type of anchor nuts – 1/8"-3/16" dia. bolts) to allow a little more latitude when fitting the struts, to receive the strut bolts.

The 1/16" leading edge underside sheeting and capping strips can now be added and also the 3/32" sheet balsa webbing between the upper and lower front spars (grain vertical). Shape the leading edge with a razor plane and sand the whole wing smooth. Construct the opposite wing panel in a similar manner. Cut slots in the first two wing ribs to take the dihedral braces and join the two wing halves together, with braces, propping up the tips to the required amount. (Wing dihedral may be reduced by up to 1" under each tip for models featuring proportional controlled ailerons.)

TAIL SURFACES

Cut the tailplane ribs out by the block method, using the tip and center ribs as the templates. Build the tailplane flat over the plan, pinning down the tips, the main lower and rear spars and 3/16" center sheet. Glue the ribs in position followed by the main top spar, the ½" sheet center doubler and ½" square leading edge.

1/16" sheet leading edge is added as far as the main spar and 3/8" x 1/16" capping strips to the rear of the ribs. Note the slot left for the Fin, this should be the width of the finished Fin. Elevators, Fin and Rudder construction is straightforward.

UNDERCARRIAGE

This can be in the form of a single leaf dural undercarriage providing the dural is sufficiently strong, alternatively a combination of dural (at least 1/8" thick) and music wire should be used.

COVERING AND FINISH

Cut the underside sheeting of the wing away at the position of the cabane strut fixings so that the struts seat direct on to the plywood. Temporarily bolt the wings to the struts and then bend and solder the music wire cross bracing to the cabane struts, checking first that the wings are sitting 'square' on to the fuselage.

The basic structure of the Mighty Barnstormer is strong enough to allow any type of covering to be used although nylon and dope will undoubtedly give a more durable finish. Whatever the type of finish used, be sure to thoroughly fuel proof around the engine bay area. Balsa, fibreglass or A.B.S. plastic wheel pants will improve the looks of the model and are satisfactory when flying from smooth runways or short grass.

The fuselage is large enough to contain any form of radio equipment, reed or proportional, and leaves ample room to get your hands in to fiddle

John Maloney of World Engines, Inc., shows size of M.B. John's not very short, either!

about with plugs, pushrods, etc. With all this room to work in, there is no excuse for anything but the neatest, safest installation – and do not forget to check that the controls all work the right way round!

FLYING

First, a word on controls. With ailerons fitted, it is **essential** to reduce the dihedral to about 1° for each wing. Even with this reduction of dihedral, the ailerons will not give you a vicious bank and if you are the type that prefers everything to go with a snap, crackle and pop, then increase the size of the ailerons. Similarly, it is important to retain the stated dihedral for a rudder only (plus elevator and engine, of course) model and again the rudder can be increased in area for the 'sporty' pilot.

With the model balancing on the lower main spar, and free from warps, flying should not present any problems. Hand launching is quite simple, despite the large size, it just needs a little more muscle power than the average model.

Takeoffs and landings can be achieved from rough grass although this will be helped by using larger airwheels and a more powerful engine. Avoid over-correction on takeoff from smooth runways, a well trimmed model will require very little steering during the takeoff run. Once in the air, the Barnstormer will fly stably, and smoothly, and is free of any aeronautical vices.

May I wish you good 'Barnstorming' in the coming season and start to practice signing your autograph for all the admiring public who will be surrounding you! □

From RCModeler May 1972