

B.D.8

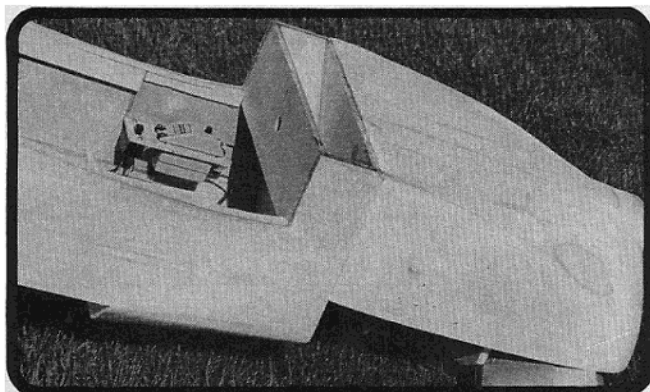
From one of England's top scale designers, Dennis Tapsfield, comes this 68" span, 3½" scale model of Jim Bede's little jewel. A .90 4-stroke will handle it nicely.
By Dennis Tapsfield

For me, one of the most difficult decisions to make is on which full size aircraft to base my next model. I probably have the documentation for several aircraft, all of which I consider to have the right attributes for an R/C model. However, the B.D.8 saga, for me, began when I

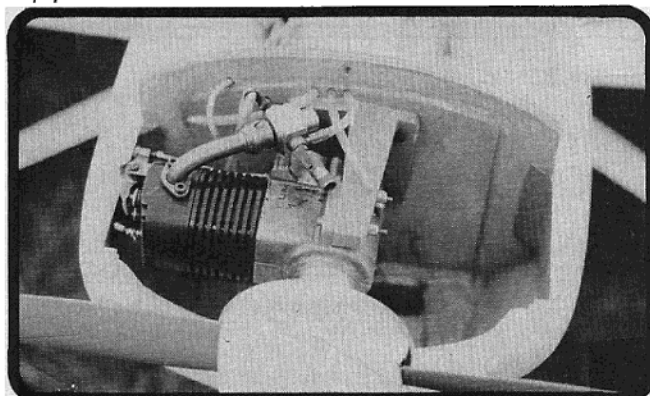
was in Oshkosh in 1980. If you aren't familiar with Oshkosh, it is an airfield about 100 miles north of Milwaukee, Wisconsin, and, during a week in August each year, it is the venue for the most outstanding full sized aircraft convention in the world. In 1980, 9000, yes, nine thousand!

aircraft arrived there, mainly privately owned, and falling into several different categories including veteran, vintage, WW II, replica, etc., etc. A lot of these are parked in fields surrounding the airfield if they are not going to be flown during the
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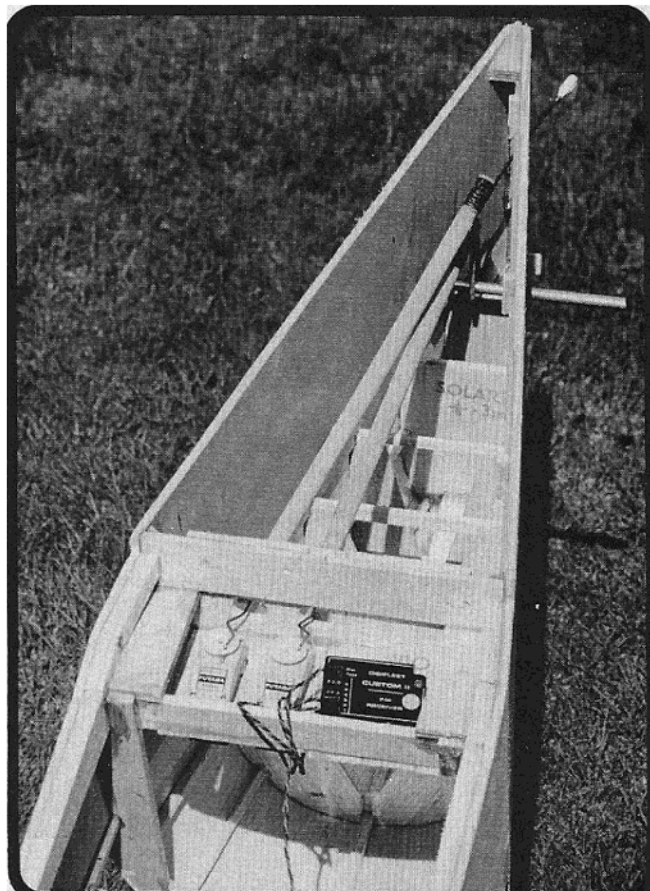




Bottom view showing box for landing gear to bolt into. Throttle servo is mounted along with radio switch. No problem with where to put radio equipment.



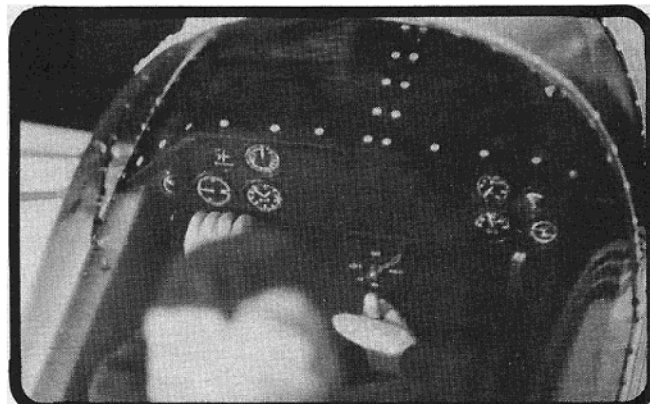
Close-up of Magnum .91 4-stroke installed in Dennis' prototype. There is a good deal of room under that cowling to hide most any engine used.



As shown in this view, rudder and stabilator servos are installed. Again, there is no space problem. Basic construction is very simple.



Three photos of the full size aircraft.



Looking through the canopy at the cockpit interior. The use of vinyl leather to cover various parts can really add to the looks.



Author prepares for another flight as he is about to take-off.

convention, and the owners either camp under the wings, or even inside the aircraft! To be able to walk around, talk to the owners and look at and touch the planes was really something.

Anyway, during the flying on Thursday afternoon, out of the blue, in came this unusual little plane; pretty, with an outstanding trim design, and it really looked like a model. I took a couple of color slides of it, and was determined to try to acquire a 3-view drawing from somewhere so that I could build a model of it! It was to be several months before the drawings appeared in the April 1981 *Aeromodeller*, and set me on the road to building it.

After some thought, I decided that a scale of 3½" to 1' would be about right, since I could buy wheels the right size, 4½", and the cowl would completely hide the engine and silencer. The right size spinner was available and, most important of all, it would fit in the car! The last remaining thing was that the canopy that Howard Blackwell makes for his Robin adapted almost perfectly, so I was all set.

If you are interested in the prospect of building this rather unique airplane, then read on. Note that the prototype had foam wings, fin, rudder, and stabilizer. You can cut your own cores using the templates that are shown on the drawing, or if you can raise a mortgage for the balsa, you can build them up in the traditional way as shown.

CONSTRUCTION

Built-Up Wing:

This has been designed as a simple structure and, being of very low aspect ratio, is not highly stressed. Select your wood with care. Cut out all the ribs, and assemble one wing at a time, by pinning the 1/2" x 1/4" spar on the plan, and setting the ribs on it. Use some packing under the trailing edge to support the ribs, add the leading edge, and the top spars. When this is set, remove it from the plan. Pin down a piece of 3/32" sheet, leaving room for the trailing edge and, using a piece of packing near the main spar, glue the wing to the piece of sheet. Allow this to dry, and continue to build the wings to the drawing, by joining them together before sheeting. Don't forget the aileron snakes (or linkage if you prefer) the hardwood blocks, gussets, etc. Before closing the whole thing up, add the trailing edge, and the wing tips, then carefully cut the ailerons away. Fit the hinges and the horns, and clean up all over. Glue on the 2" bandage in the center, and that should be it.

Try to keep the tail end as light as possible!

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balsa where shown. Cut and fit the landing gear plywood blocks and gussets, bolt through as shown. Glue in the fiberglass arrow shaft tubes to enable the retaining screws to be fitted. Glue in the tailwheel mounting block and fit a 1/16" bore nylon tube inside the fuselage for the R.X. antenna, exiting at the tail. Do not sheet the underside until you have fitted the stabilator, rudder, pushrods, and stabilator bell crank.

Rudder and Stabilator:

Build the rudder as shown, and cover with 1/16" sheet. The stab is very simple, just be sure that the tubes/dowels are a good tight fit. Add the tips, and the block L.E. fairing after covering with 1/16" sheet. Glue on the trailing edge and the 1/32" ply root rib.

Landing Gear:

It is essential that the correct specification of material is used for this. Most of us know it as "Duralumin" or "Dural" and the commercial spec is T6 (.125). Anything softer than this will not survive a landing! If the material you propose using can be bent 60° on a 1/4" radius without cracking, you have the wrong stuff! For the axles, two 10 x 32 Allen socket cap screws can be used, or 3/16" Du-Bro steel axles. Mild steel will not do!

Tailwheel:

This looks complicated, but is really easy. The most difficult part is the pivot block which is cut and filed from a small block of aluminum, but the effort is well worthwhile — the result is very realistic. A standard 1¼" diameter wheel is used.

Covering:

I originally intended to cover the model with tissue and paint, but after a lot of thought and in view of the complex trim design, I decided to use heat shrink film. I was pleased that I did so — I really don't think that I could have successfully completed the trim any other way. It was a painstaking business, but the results were most rewarding.

The trims were cut as follows: First, mark out each different "hockey stick" shape on a piece of grease proof or similar paper. Cut out the pieces of film of the right color about 1/2" larger all round (not forgetting to make left and right hand) so that in the event you need four pieces of a particular shape, two pieces will have the face up, two will have the face down. Now — take one piece, tape one end to a flat smooth wooden surface, smooth and stretch to the other end, and tape that. Now, go around the edges at about 3" intervals, with short pieces of tape to hold the piece firmly in place. Do this

with all the pieces of film the same shape, one on top of the other, finishing with the piece of paper with the shape drawn on it. Using a straight-edge wherever possible, with a very sharp razor blade or X-Acto knife, cut right through the sandwich of film and paper. With care, an almost perfect job results. It sounds like a tedious business, but it's worth it in the end.

The trims on the fuselage sides were cut in two sections, the joining of the two being just in front of the stab. The 1/16" wide black trim tape is used to outline the color trim. Do be sure that the film you propose using for the trim adheres properly to the white base film on the model. If the area is well-cleaned with cellulose thinners, and the trim moistened with film solvent, then iron on at the right temperature. Pulling the trim off **must** leave most of its color pigment behind for it to be acceptable, so check this point before starting work!

Canopy:

I was fortunate in being able to buy a canopy that was intended for a Quarter Scale "Robin" which adapted almost perfectly. I'm sure a visit to your model shop will produce something suitable, as the shape is not complex. The windshield is just flat sheet, and the rear portion nothing more than a wrap-over with a bulge in the top.

On Board

Glow Plug Battery:

As a belt and braces type, I decided to mount a 2 AH nicad cell in the nose, since some extra weight was needed there anyway. It is switched in the accepted way, by a micro switch, operated by a cam cut in the periphery of the throttle servo output disc. This is cut in such a way as to switch the glow plug on when the throttle is about two-thirds closed; another benefit is that you do not need an external glo battery. I also made the battery easy to change over, so that it can be changed at the field in seconds. You will also see that there is a larger nicad for the radio, also for nose weight; I strongly object to flying with useless lumps of lead! (*Editor's Note: Great Planes Model Mfg. Co., P.O. Box 721, Urbana, Illinois 61801, has a great unit called "Switch-N-Glo." It is an onboard ignition system that weighs only 3 ounces and is complete with a sub C nicad battery.*)

General:

I had originally intended to fly this model using a standard .61 motor, but as the airframe progressed, it became increasingly evident that a larger motor would be required to fly it! It was at about this time that the "Magnum G.B. 91" four stroke engine

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Fuselage:

Cut out the sides from 1/32" ply, and make up the balsa outsides from 3/16" sheet. Mark the position on both the ply and the balsa where the bend occurs just forward of the wing T.E. Wet the area involved, allow to soak, then bend the sides to the angle shown in the plan view (believe me this is the only way to produce the desired result). Clamp the sides in this position, and allow to dry. Now glue the balsa sides to the plywood sides using an impact adhesive. I use Dunlop Thixofix with great success. Drill the holes for the stab pivots and clearance slots at the rear. Join the sides together with slow setting epoxy



resin, using the formers up to the rear of the cockpit; allow to set. Draw the tail together and sandwich the post between them; it is best to set the fuselage on the building board, and use a square against the fuselage side at the tail end. When this is quite dry, add the deck formers and build up the fin as shown on the plan, and cover with 1/16" sheet. At this stage it is a good idea to fit the stab pivot bearings using the 1/4" ply reinforcing plates inside the fuselage. Make sure that

they are in line and square by putting the 3/8" tube or dowel through and taking measurements. Fair in the stringers and the deck formers, fit the fin and plank the rear deck. Next, add the hardwood stiffeners, build the tank box, adding all the gussets as shown. Block in the nose area as shown. Tack glue the cowl formers in position and plank. Add the side cheek blocks, and the nose block and sand to shape. Ease the cowl off and fill in with



JIM BEDE'S B.D. 8

Designed By:

Dennis Tapsfield

TYPE AIRCRAFT

Stand-Off Scale

WINGSPAN

68 Inches

WING CHORD

17½ Inches

TOTAL WING AREA

1190 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

Symmetrical

WING PLANFORM

Constant Chord

DIHEDRAL EACH TIP

1¼ Inches

O.A. FUSELAGE LENGTH

58¾ Inches

RADIO COMPARTMENT SIZE

Ample

STABILATOR SPAN

28 Inches

STABILATOR CHORD (incl. elev.)

8¾" (Avg.)

STABILATOR AREA

234 Sq. In.

STAB. AIRFOIL SECTION

Symmetrical

STABILATOR LOCATION

Mid Fuselage

VERTICAL FIN HEIGHT

10½ Inches

VERTICAL FIN WIDTH (incl. rud.)

10½" (Avg.)

REC. ENGINE SIZE

.90

FUEL TANK SIZE

16 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rudder, Stabilator, Ailerons & Throttle

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply

Wing Balsa & Ply

Empennage Balsa, Ply & Hardwood

Wt. Ready To Fly 232 Oz.

Wing Loading 28 Oz./Sq. Ft.

**From
RCModeler
Apr. 1983**

became available and, having had such success with an O.S. .60 four stroke, a close inspection of the Magnum made it very clear --- I just had to have one! It arrived at last and I found that the model was just made for it. A tiny notch out of the longeron to clear the rockers, a slight tilt clockwise to give access to the glo plug, and I was there. I've never regretted it --- in flight, the sound of four strokes is a transformation, it even sounds scale! With a 15" x 6" wooden prop, the combination is just right. The model tracks very straight, and gets airborne at what seems to be a relatively low speed. There is no real need to coordinate rudder with aileron, the turns are really neat on ailerons alone: the ground handling is good, and is liable to make you the envy of the nose-over brigade.

Contrary to common belief, the all moving stab has not caused me a moment's trouble and, providing you follow the drawing, it shouldn't cause you any either. Make sure the control movements are as shown on the drawing, and you will be rewarded with a model that is easy to fly, and a real eye catcher to boot. The color scheme is quite authentic, and is a tribute to the owner --- Mike Huffman of Owasso, Oklahoma. Mike says that the trim looked like nothing until he put on the black pin striping --- so don't chicken out on them.

If you choose to build this little beauty, I hope it gives as much pleasure as mine gives me. Happy landings. □