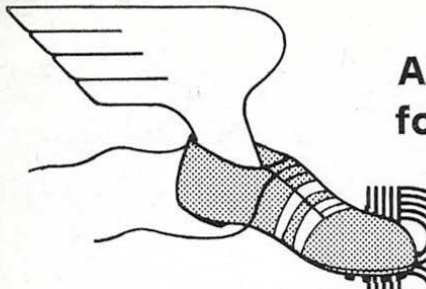


A snappy looking 52½ in. span R/C sportster for 3-4 function radio and .29-.40 cu. in. motors

BOOTLACE

By Ian Peacock

I'D like to open this brief history of the 'Bootlace' by explaining, in some depth, exactly how this aircraft was extensively developed over many years and through several variants. To tell of the extremes of environmental testing and wind tunnel tests which contributed to its design. To list the many top international flyers whose advice was sought and who exhaustingly test flew the model and to list the many national and international contest wins to its credit.

I'd like to, but I can't! ! !

Instead, I should explain the real history of the 'Bootlace'. I have long believed that there exists in the R/C model world, a dearth of 'in between' aircraft that the near novice can use as stepping stones towards the fully fledged aerobatic model. Plenty of basic trainers exist and equally plenty of aerobatic models, and pylon racers etc.—but little in between. Conversations held with a wide range of modellers from all over the country tend to support this view and recently several kits have been introduced on to the market in an attempt to bridge the gap with mixed results. Much work, I feel, is still needed in this area.

This, then, was the thinking which led to the design of the Bootlace; to produce a genuine transitional airframe having the following features:

(1) Relatively simple to build
(2) Easy to fly on either three or four functions
(3) Capable of all basic aerobatics when sensitivity is increased
(4) Attractive to look at.

Now I know that 'beauty is in the eye of the beholder . . .' and that appearance is rated only at No. 4, but most of us would agree that the modeller at the near novice stage would prefer attractive lines to functional appearance. I cannot accept that trainers need to be boxy and that aesthetic lines cannot be part of the design. Similarly most of us accept that the 'average' pylon racer presents an attractive picture. Accordingly the 'image' of the racing aircraft was much in my mind when sketching in the preliminary shapes.

Much of the constructional techniques used were borrowed from other well known designers and readers will notice the Boddington influence in much of the fuselage structure. Flying on three functions presents no problems (leaving out either the rudder control or aileron control) in fact with increased dihedral and a 0.19 cu. in. motor one suspects that it may even fly single channel. By increasing control sensitivity, all the fundamental aerobatic manoeuvres became possible. Rolls, loops, stall turns, inverted flights and spins all come easy to the Bootlace. With a little down trim fed in, hands off inverted flight is possible.

Two prototypes were built, one by me and one by fellow club member Brian Elliott. Brian built from my original drawing (as presented here! ! !) to prove that the flight characteristics were not a fluke and to endeavour to spot any mistakes on the drawing. To my surprise, no errors were found and the second model proved to be as near identical in performance as could be judged. Both models were powered by 0.35 cu. in. motors, Brian's a near new O.S. and mine an aged and near retirement Merco. Again both models featured a veneer covered, foam-cored wing, built for us by that 'laugh a minute double act' Big John Miller and Peter Gardner from Aviette kits (more of which anon!). Traditional wing structure is, however, shown on the drawing and poses no problems in its construction. Wherever possible each part is individually drawn and detailed to avoid confusion and our hypothetical near novice should encounter no difficulty over the construction but a brief guide is offered here as further aid.

Fuselage

Commence the fuselage by cutting two sides (to the arrow marks) from ⅛" medium grade straight grained balsa. Add all the ¼" balsa doubles, stiffeners and gussets working from the nose doubler back to the tailpost. Make sure to produce a 'left' and 'right' handed pair and don't fall into the trap of making two 'left-handed' sides as I once did! ! ! Hold the sides together with adhesive tape and drill the dowel holes at this stage. Cut F1 from 3/16" plywood, F2 from ⅛" plywood and F3 and 3A from ¼" balsa. Assemble F4 from ¼" sheet as shown. Join the fuselage sides with *F2, F3 and F4 only,* pin down to bench, check for squareness and allow to dry. When dry, chamfer tailposts to meet and join sides at the tailpost adding formers F4A, F7, F8 and F9. Fit ¼" x ⅛" spine to rear fuselage top and again check for squareness. Sheet top of rear fuselage with 3/32" balsa. Refer to cross sections shown at formers. When dry add tailplane and fin from ¼" sheet, again checking that they are square. Fill in either side of fin with scrap balsa. Cut elevators from 3/16" sheet and join with wire as shown, cut rudder from 3/16" sheet. Sand entire tail unit to section as detailed and hinge with Micro-Mold or similar commercial hinges. With the rear end finished, add the beech engine bearers, F1 and tank bay floor. Cut and fit the ⅛" paxolin engine plate. Add ⅜" top block to fuselage, carve and sand nose to shape. Cheek cowls may be added at this stage: — carved from soft block. Hollow cheek cowl to clear silencer.

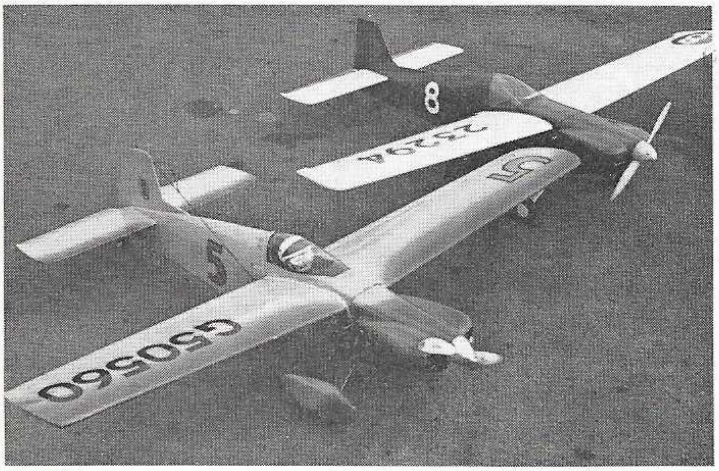
NOTE: This is the best time to fit the R/C gear, following any of the articles published on the subject. My preference is for tube and cables, but whichever technique is used, installation of equipment and controls is considerably eased with *no underside sheeting.* Adjust all control runs to correct length and check all rudder and

elevator movements. Ensure that controls do not foul up inside the fuselage. Remove R/C equipment and add tailwheel. Sheet entire underside of fuselage with $\frac{1}{8}$" sheet ($\frac{1}{8}$" ply at U/C position). Undercarriage is made from 10 s.w.g. dural sheet bent as shown. U/C and wing are rubber banded to 3/16" dural dowels but bolt on units may be used if desired. Fit wheels and carve spats as shown, epoxy spats to U/C legs. (Micro-Mold vac-formed spats could be used if desired.) Finally, sand entire fuselage and tail surfaces with fine garnet paper.

Wing

As mentioned earlier, both prototypes featured foam-cored wings, and arrangements have been made to supply wings to any would-be builder. Wings may be obtained covered or uncovered, joined or un-joined. Dural U/C blanks are also available SAE please to: Aviette Kits, Water Lane, Sherrington, Bucks, stating your requirements, will quickly bring the current prices and deliveries. For the traditionalist amongst us, a conventional wing may be utilised. Start by cutting two $\frac{1}{8}$" med/hard mainspars and two-ply wing rib templates. Using the 'sandwich' method produce two sets of thirteen ribs from quarter grain sheet. Assemble the ribs to the spars 'egg box' fashion and pin down over plan. Add L.E., T.E. and all top sheeting and allow to dry. Remove from plan. Cut $\frac{1}{8}$" ply dihedral brace, soak in water and bend to follow sweep of main spars. Hold in vice or clamps until dry. Slot wing ribs to take brace and, with brace *in situ*, join wings. When dry, make servo box from scrap sheet and add underside T.E., L.E. and centre section sheet. Fit wing tips and all cap strips. Cut and sand ailerons and hinge temporarily in place. Fit aileron torque rods – Micro-Mold adjustable units used in pro-

Models come in all shapes and sizes, and the one you're really interested in knowing all about here is called Pauline!



Build two of everything if you value your flying time – it's not a bad thought, and Bootlace is not so big that you'll break the bank building two, as our author did. Wheel pants are for effect only and could well be left off for flying from rough fields.

totype, and add all T.E. extension pieces from scrap sheet. Sand entire wing smooth with fine garnet paper. Sit wing onto fuselage and add cockpit sides and formers F5 and F6. Sheet over F5 and F6 with 3/32" sheet. Add $\frac{3}{8}$" sheet top and sand cockpit area to blend into front and rear fuselage contours. Trim down suitable commercial canopy to fit.

Finish

Finish is largely a matter of taste and many articles have been written on the subject. This type of model lends itself to plastic film covering, in fact Brian Elliott's model was finished in white "Kwick Cote" on all the flying surfaces and Blue Polyurethane on the fuselage. Mine, however, has a more old fashioned (and perhaps still the best) finish. This consisted of the entire airframe being covered with lightweight 'Modelspan' tissue, doped on, and 3 subsequent coats of clear dope, lightly sanding between coats. Two coats of yellow cellulose were sprayed next and rubbed down with fine wet or dry paper. A fine coat of yellow now sprayed on and red and orange colour trim airbrushed for effect. No masking was employed (except for cockpit) and the effect is quite pleasing. Transfers were added and when completely dry, a spray coat of *RipMax Tufkote* was applied to fuel proof the entire 'plane.

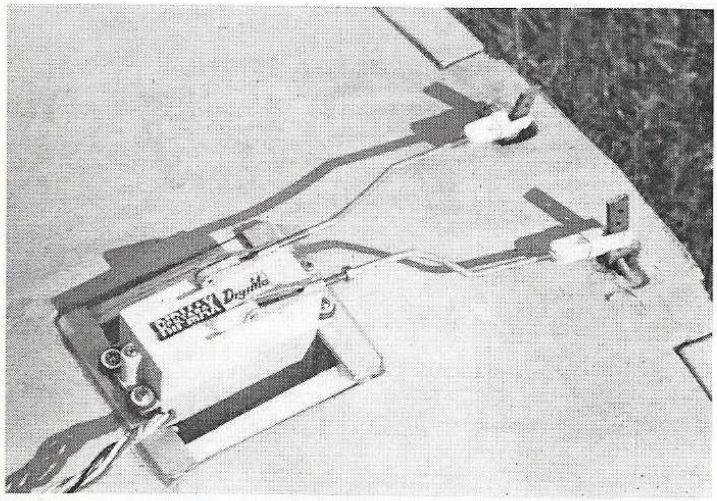
Flying

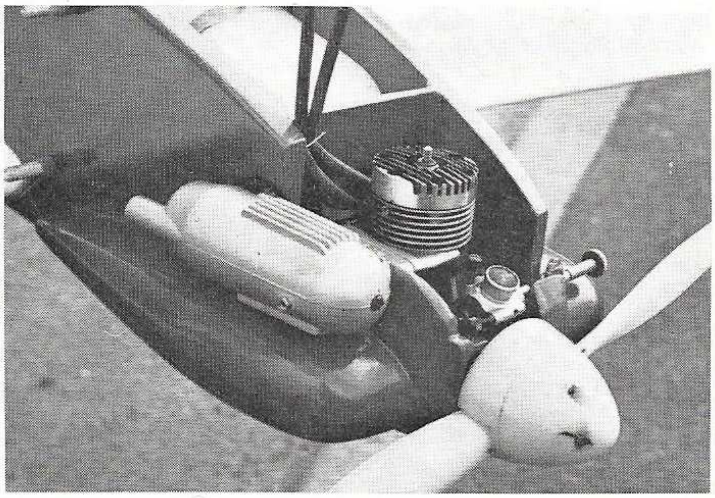
All up weight should be about 4-4¼lb. although up to 5lb. is permissible. Careful selection of timber and careful, light finishing could result in a flying weight as low as 3½lb. Centre of gravity does not appear to be at all critical and may be up to 1" in front of the point shown but it should not be more than ¼" behind.

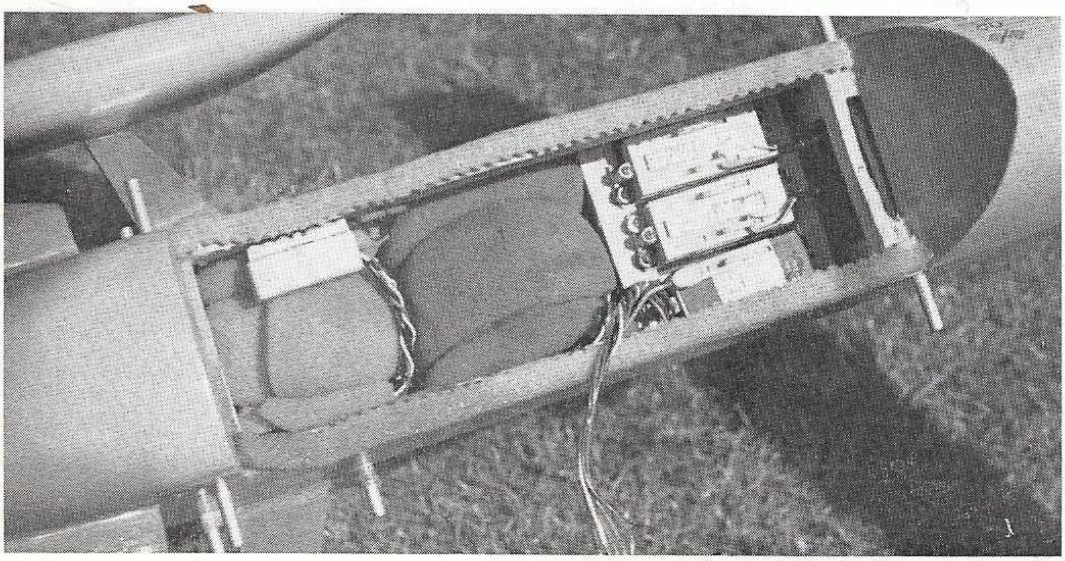
Take-off is quite easy, with only a light touch of rudder needed to stop the tail swinging. Not everybody has the facility of a smooth take-off strip however, and the shoulder winglayout of the Bootlace makes it eminently suited to hand launching. Provided that everything checks out with the drawing, squareness, C of G, thrustline etc. then the Bootlace will fly 'straight off the building board'. So go to it all you fellows who have been bemoaning the lack of intermediate models and punch a few lace holes in the sky.

Finally 'Why Bootlace?'

Well it started out like a 'Shoestring' but did not finish up quite as pretty! ! !







INSTALLATION INFORMATION. Top left: aileron servo mounted on wing underside showing associated linkage to the strip ailerons. Rather drastic kinks in the quick-links are not really the best way, straightest possible runs advisable. Above: nose section showing easily accessible radio installation in fuselage, with receiver and power pack tucked neatly away in foam for protection.