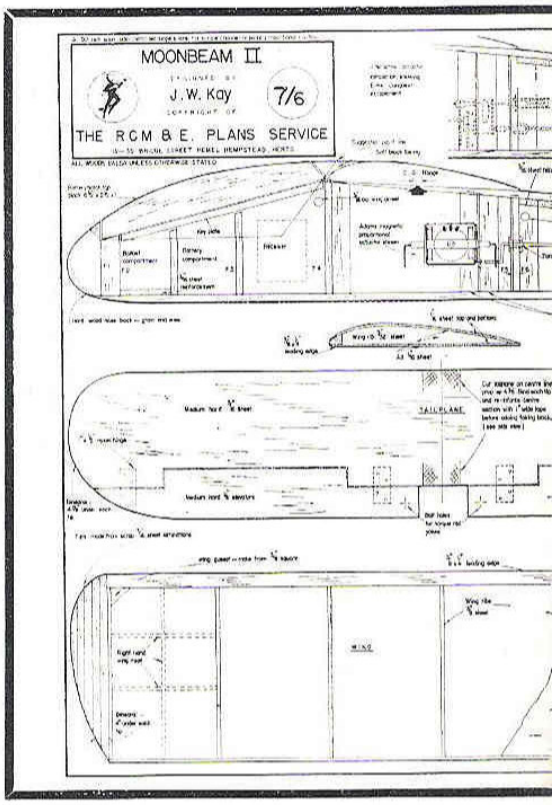
MOONBEAM TWO



A simple 50in. span R/C Slope Soarer with a vee tail, designed for pulse proportional or simple single channel with escapements



BY — *John Kay*

THIS is the second in the series of a simple single channel slope soarer, and using the suggested sequence of instructions the Moonbeam airframe can be completed in a weekend. A Butterfly tail was chosen as it was felt to be the best way to obtain smooth flying using a single surface. The original model was flown with *Derek Olley Fleet* pulse proportional equipment using a double ended "Adams" actuator operated by a transistor switcher. Ballast and batteries are provided by 4.8v 500 DKZ DEAC, and under normal flying conditions no additional ballast is necessary. Ready to fly, the Moonbeam should weigh between 20 oz. and 25 oz.

Although the model was intended to be flown with pulse proportional actuators, such as the "Adams" or converted "Mighty Midget", operating through a torque rod, there is adequate space to fit a normal escapement. For ease of construction the following tools are suggested:

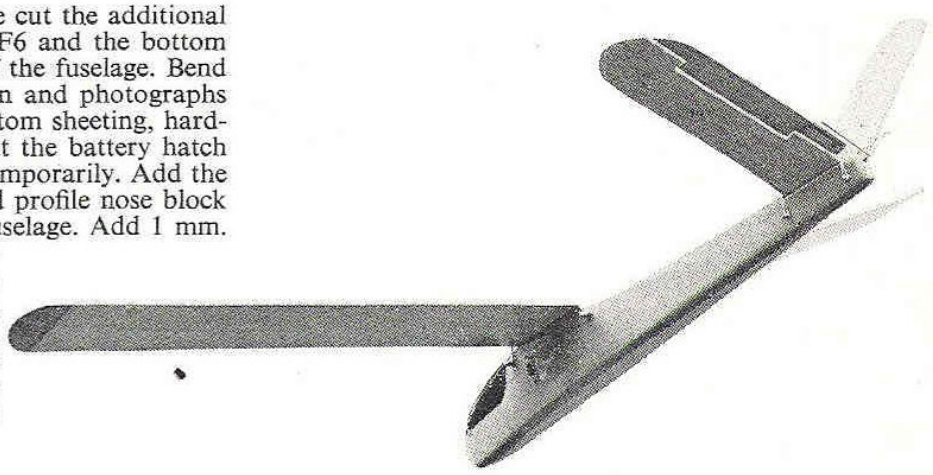
24 in. Steel Straight Edge.
6 in. Engineers' Rule.
3 in. Engineers' Set Square.
Zip Razor Plane.

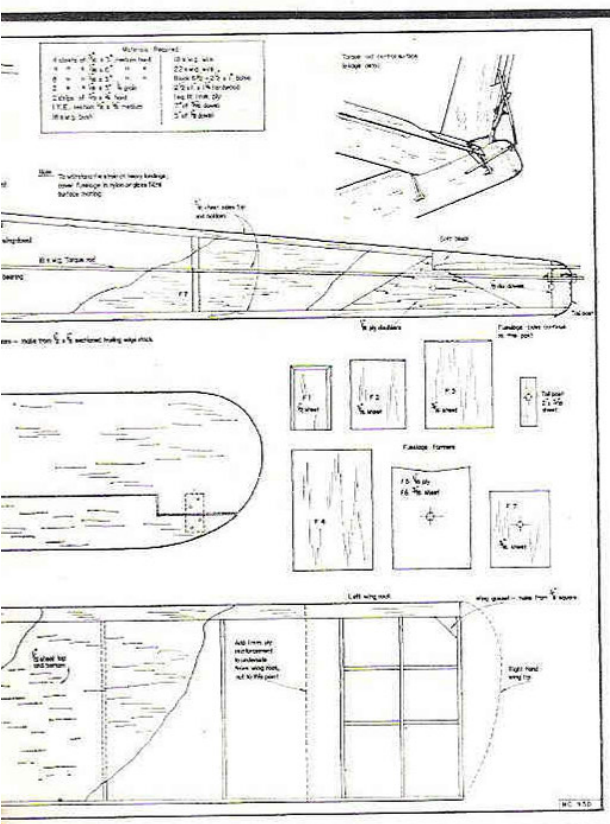
Fuselage

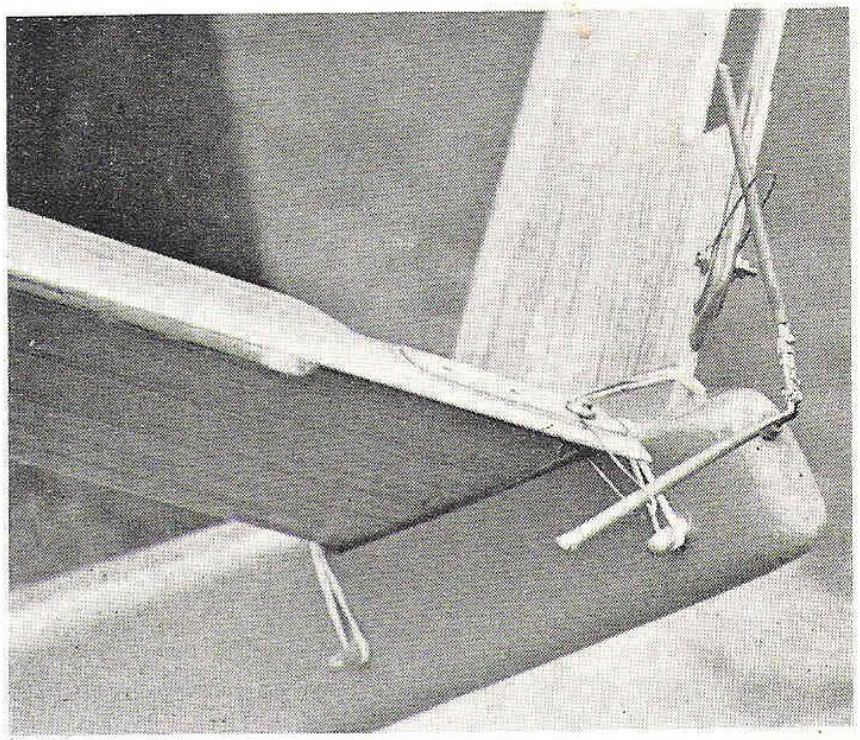
Start by making sure that the edge to be worked from is straight. Mark out the fuselage and the position of all formers using a set square. When the sides are cut out, pin together and sand to ensure accuracy. Add braces, actuator rails and rear ply doublers using impact adhesive. Cut out all formers, drill and fit 18 gauge bush to former F5. Cut off surplus material and keep the remainder as it is used as a rear bearing in the fuselage. Join F5 and F6 together using impact adhesive, and Balsa Cement the formers F4 and F6 to one side of the fuselage. While this is drying, cut out sheet for top and bottom of the fuselage. Join the fuselage sides together and check that top and bottom are square, and when dry add nose and tail blocks together with the remaining

formers F2, F3 and F7. At this stage cut the additional pieces of sheet to fit at the rear of F6 and the bottom of F1. Now fit a bush to the rear of the fuselage. Bend the torque rod as shown on the plan and photographs and fit to fuselage. Add top and bottom sheeting, hardwood nose block and wing rails. Cut the battery hatch section from 1 mm. ply and attach temporarily. Add the balsa block to the battery hatch, and profile nose block together with the underside of the fuselage. Add 1 mm. ply to the underside of the fuselage using contact adhesive. At this stage the fuselage can be rounded.

Finally, drill holes for the tail and wing dowels and aperture for switch, and add the $\frac{3}{16}$ in. sheet to the underside of the battery hatch for location.



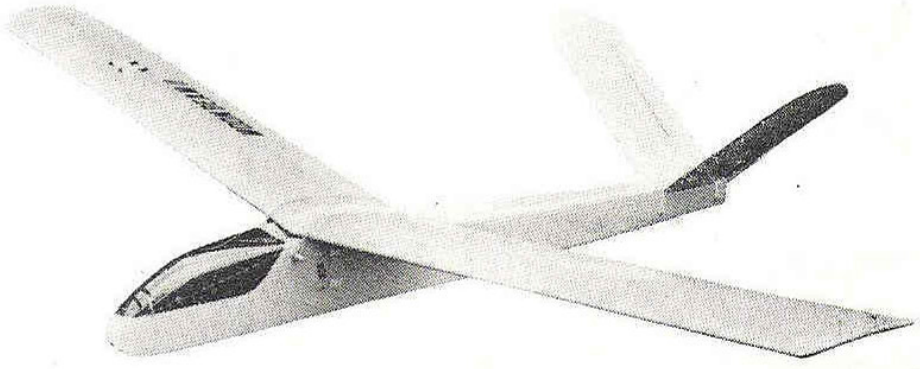


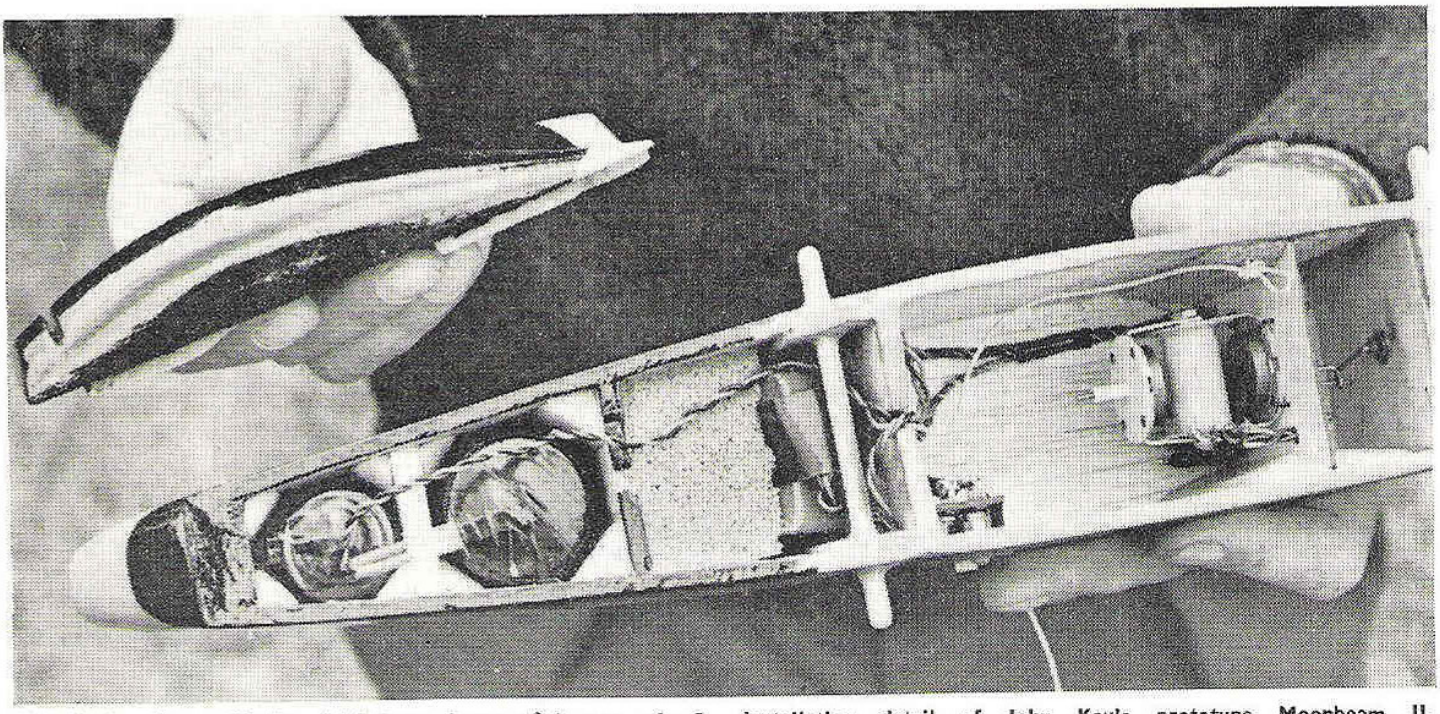


FULL SIZE COPIES OF THE 1/6th SCALE PLAN REPRODUCTION (ABOVE LEFT) ARE AVAILABLE THROUGH R.C.M.&E. PLANS SERVICE AS PLAN RC/938, PRICE 8/- INCLUDING POST.

Wing

The wing is made from medium hard $\frac{1}{16}$ in. sheet. Cut the bottom sheets to size and add $\frac{3}{8} \times \frac{1}{4}$ in. square leading edge, then mark off the rib positions, and central wing stiffeners. Cut ribs from $\frac{1}{8}$ in. sheet (medium hard) and glue with Balsa Cement. When dry, shape leading edge (use zip plane) and bevel trailing edge. Use P.V.A. glue for the top sheeting, and attach in the normal manner, see the Swannee Plan, *Aero Modeller*, January, 1966, for further details. When dry, trim, and before cementing, check centre section, ensuring that the two centre ribs are parallel with the correct 4 in.





Installation detail of John Kay's prototype Moonbeam II. Actuator in this case is an Adams double ended magnetic type for pulse proportional control. Receiver is Derek Olley type. Note placement of batteries well forward to preserve correct C.G. position.

dihedral under each tip. Add two pieces of 1 mm. ply 5 × 4 in. to the underside of the centre section and build up tips from $\frac{3}{16}$ in. sheet, using impact adhesive. After sanding all over, strengthen the centre section with 1 in. nylon tape.

Tailplane

The tailplane is made from medium grade balsa. Sand all over and hinge the elevators using the nylon sheet 1 × $\frac{1}{2}$ in. pegging in position. This is useful as it eliminates the necessity for a centring spring for the actuator. Cut the tailplane along its centre and re-join, adding 4.7/8 in. dihedral under each tip. Brace the centre section with 1 in. nylon tape. Now fit wing and tail to the fuselage so that the fairings can be finished.

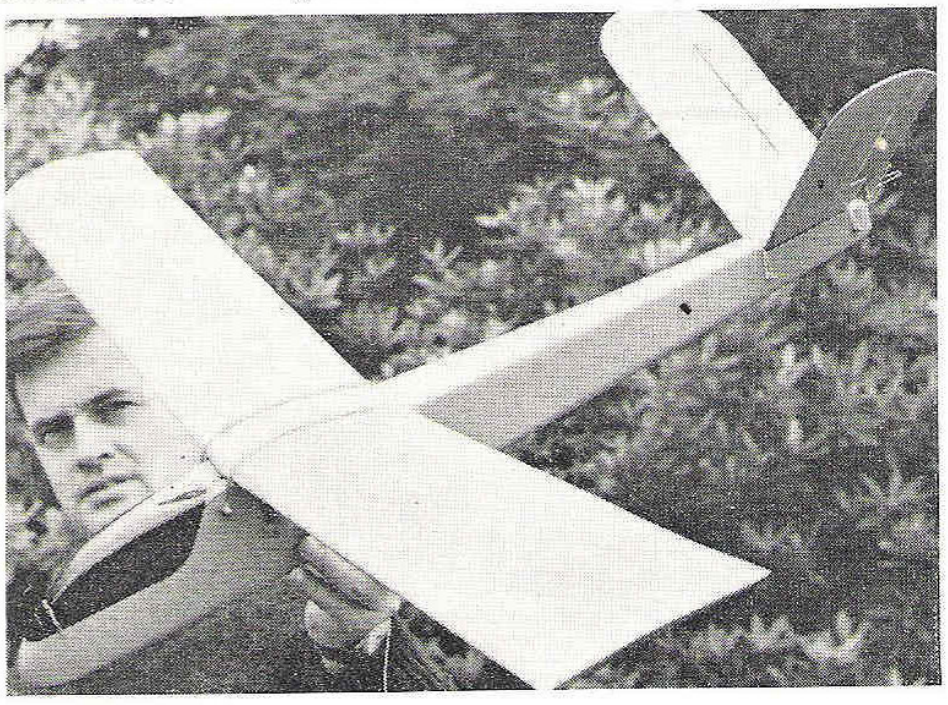
Covering

It is most advisable to cover the fuselage in either nylon or fibre glass surface matting, as in slope soaring, considerable damage can be caused on heavy landings. The flying surfaces are covered with lightweight tissue. At this stage, the linkage for the elevators are finished (see photographs). Bend the torque rod arms so that the elevators are 3/32 in. down in the horizontal position. Check for correct neutral by using high rate pulse, down elevator.

Flying

Check the C.G. position, and ensure that it is between $2\frac{1}{4}$ in. and $2\frac{1}{2}$ in. from the leading edge. The model has no vices, and is very smooth with no indication of dropping a wing in turns. When using pulse proportional equipment, Moonbeam II can be made to crab along a ridge in a similar manner to a slope soarer with ailerons, and although only a single surface model, by alteration of the pulse rate up and down elevator can effectively be obtained.

Now the only query is, can Moonbeam be flown in single surface contests?



John Kay displays his cute creation for slope soaring fun. Vee tail is something "different" for the enthusiast to try. Construction is simple, and the model is robust enough to withstand those heavy "into the slope" landings. May be used for escapement operation as well as proportional.

A 50 inch span radio controlled slope soarer for simple channel or pulse proportional control

MOONBEAM II

DESIGNED BY

J.W. Kay

7/6

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THE RCM & E. PLANS SERVICE
15—35 BRIDGE STREET HEMEL HEMPSTEAD, HERTS.

ALL WOODS BALSA UNLESS OTHERWISE STATED

Materials Required

- 4 sheets of 1/16 x 3" medium hard
- 8 " " 1/16 x 6" " "
- 8 " " 1/16 x 3" " "
- 2 " " 1/16 x 3" 1/4 grain
- 2 strips of 3/16 x 1/4 hard
- 1 T.E. section 1/2 x 1/8 medium
- 18 s.w.g. bush
- 18 s.w.g. wire
- 22 s.w.g. wire
- Block 6 1/2 x 2 1/2 x 1" balsa
- 2 1/2 x 1" x 1/4 hardwood
- 1 sq. ft. 1mm. ply
- 7" of 3/16 dowel
- 5" of 1/8 dowel

Alternative actuator installation showing Elmic Conquest escapement

Suggested pouf trim

Soft block fairing

Torque rod control surface linkage detail

Note. To withstand the strain of heavy landings, cover fuselage in nylon or glass fibre surface matting

Battery hatch pin block 6 1/2 x 2 1/2 x 1

C.G. Range

1/16 sheet reinforcement

1/8 dia. wing dowel

1/16 sheet sides top and bottom

Key plate

Ballast compartment F2

Battery compartment F3

Receiver F4

Adams magnetic proportional actuator shown

1/8 dia. wing dowel

18 s.w.g. Torque rod

Torque rod bearing

F5 F6 F7

Soft block

1/8 dia dowels

Tail post

Hard wood nose block — grain end wise

1/16 sheet top and bottom

1/8 x 1/4 leading edge

Wing rib 1/32 sheet

All 1/16 sheet

Brass — make from 1/2 x 1/8 sectioned trailing edge stock

1/8 ply doublers

Fuselage sides continue to this post

F1 1/2 sheet

F2 1/16 sheet

F3 1/16 sheet

Tail post 2" x 3/16 sheet

Fuselage Formers

Medium hard 1/16 sheet

TAILPLANE

Cut tailplane on centre line prop up 4 7/16. Bind each tip and re-inforce centre section with 1" wide tape before adding fairing blocks. (see side view)

1" x 1/2 nylon hinge

Medium hard 1/16 elevators

Dihedral 4 7/16 under each tip

But holes for torque rod yokes

F4

F5 1/16 ply

F6 3/16 sheet

F7 1/16 sheet

Ties made from scrap 1/16 sheet terminations

Wing gusset — make from 1/8 square

1/8 x 1/4 leading edge

Left wing root

Wing gusset — make from 1/8 square

Wing ribs 1/16 sheet

1/16 sheet top and bottom

Add 1mm. ply reinforcement to underside from wing root, out to this point

WING

Right hand wing root

Right hand wing tip

Dihedral — 4" under each tip

RC 938