

Fitting of Anti-Balance Tab on 19M Kestrel Elevators

The anti-balance tab is introduced to the 19M Kestrel glider to reduce the stick forces. This modification is optional.

General

The modification involves the re-working of the trailing edge of both elevators, the addition of a bracket into the trailing edge of the tailplane and the fitting of new trim springs.

This work must be carried out by a competent repair organisation approved by Slingsby Sailplanes or the relevant airworthiness authority.

ProcedureBoth Elevators

1. Remove the six bolts in the elevator attachment bracket and remove the elevators.
2. Trim the trailing edges of both elevators to the line shown in Fig. 1.
3. On the top surface of the elevators mark a line 3" from the trailing edge and remove the gel coat (either with a block and aluminium oxide paper or with an abrasive disc) along the length of the elevators between the trailing edge and the line marked.
4. Build up to the shape shown in Fig. 2, using 150 gm. microballoon mix, making it oversize at first and then grinding down to the correct shape.
5. Grind the lower surface to the profile shown in Fig. 2 and ensure the gel coat is removed to 3" from the trailing edge.

Starboard Elevator Only

6. Trim the trailing edge of the starboard elevator as shown in Fig. 3.

Drill a series of 1/16" dia. holes centrally in the trailing edge at a position about 100mm. from the root to make a slot big enough to insert a hacksaw blade.

Cutting in both directions from the hole form the slot and feather the edges of the lay up in this area as shown in Fig. 3.

7. Degrease a strip of polished aluminium 50mm. x 330mm. x 20swg. and loosely fit it in the slot made at 6. leaving a 20mm. strip sticking out from the trailing edge.

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Both Elevators

8. Lay up the new trailing edge as shown in Fig. 4 and allow to cure. (250 gm. resin mix).
9. Remove the aluminium strip from the starboard elevator and trim the trailing edge of both elevators. (As shown in Fig. 5 for stbd. elevator and Fig. 1 for port elevator).
10. Abrade the inside of the slot prepared for the tab hinge and set the hinge in position using a smear of cotton flock resin mix.
11. Finish the elevators by lightly abrading the newly laid cloth and painting with successive layers of gel coat smoothing down between the layers until a satisfactory finish is obtained.

Tailplane

12. Using a degreased hacksaw blade cut a slot between the starboard root rib and the top skin extending 20mm. back into the jointing material. The slot must not damage the main skin lay up or the root rib, see Fig. 6.
13. Abrade the small glass fibre hinge bracket and assemble the tab, elevator and tailplane.
14. Fill the slot in the tailplane made at 12. with cotton flock mix and insert the hinge bracket. Set all the surfaces at neutral and allow to cure. (Fig. 7 shows a suitable neutral board).

Fin

15. The tailplane is now complete and only requires fitting to the fin. To do this the fairing at the top of the fin must be relieved on the starboard side to give at least 2mm. clearance on the operating rod.
16. The fairing is now smoothed off by filling with either cataloy paste or cotton flock mix, and after smoothing down painted with gel coat.

Trim Springs

17. Remove the instrument panel completely from the aircraft and undo the four countersunk screws holding the pedestal cover onto the pedestal.
18. With the cover removed the trim springs are visible, these must be removed and replaced with the weaker springs.
19. Replace the cover and refit the instrument panel after checking for ease of movement.

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Checking the Installation

20. The installation must now be checked for correct operation and freedom from fouling.

Tab Movement

Up movement of tab = $17^{\circ} \pm 1\frac{1}{2}^{\circ}$ relative to elevator at 15° up
Down " " " = $16^{\circ} \pm 1\frac{1}{2}^{\circ}$ " " " " 15° down

Stick Forces

Stick force with stick fully forward
and trim fully nose up = $7\frac{1}{2}$ lb. \pm 1 lb.

Stick force with stick fully back
and trim fully nose down = 9 lb. \pm 1 lb.

Parts Required

<u>Part</u>	<u>Quantity</u>	<u>Part No.</u>
Anti-balance tab	1	59D-30-14
Tab hinge on tailplane	1	59D-30-15
Tab operating arm	1	59D-30-13
Washers	2	SF122/A
Split Pins	2	SP9/C4
Trim Springs	2	59D-45-101
Glass Cloth (diagonal cut)	8 x 75mm x 1400	92110
Resin	500 gm.	Epikote 162
Hardener	200 gm.	Epikure 113
Microballoons	50 gm.	
Cotton Flock	10 gm.	
Gel Coat	400 gm.	
Hardener	8 gm.	

SLINGSBY SAILPLANES

TECHNICAL INSTRUCTION No. 52

ADDENDUM 2

Revised Limitations For T.59D Aircraft Fitted

With Antibalance Tab

(Modification No. 9 Incorporated)

C.G. Limits

Fwd. Limit	Unchanged at	11.5" Aft of Datum
Aft Limit		15.83" Aft of Datum

Flight Limitations

<u>Flap Setting</u>	<u>Speed Vne.</u>
+2 and Landing Flap Down	65 Kts.
*0 and Half Landing Flap Down	70 Kts.
+2 Down	70 Kts.
+1 Down	100 Kts.
0	100 Kts.
-1 Up	135 Kts.
-2 Up	135 Kts.
Airbrakes Open	135 Kts.
<u>ROUGH AIR</u>	<u>105 Kts.</u>

* Applicable only if Kestrel modification no. 15 is incorporated.

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TECHNICAL INSTRUCTION No. 52

ADDENDUM 1

Mixing Formulaes

Resin Mix

Epikote 162	100 p.b.w.
Epikure 113	38 p.b.w.

Cotton Flock Mix

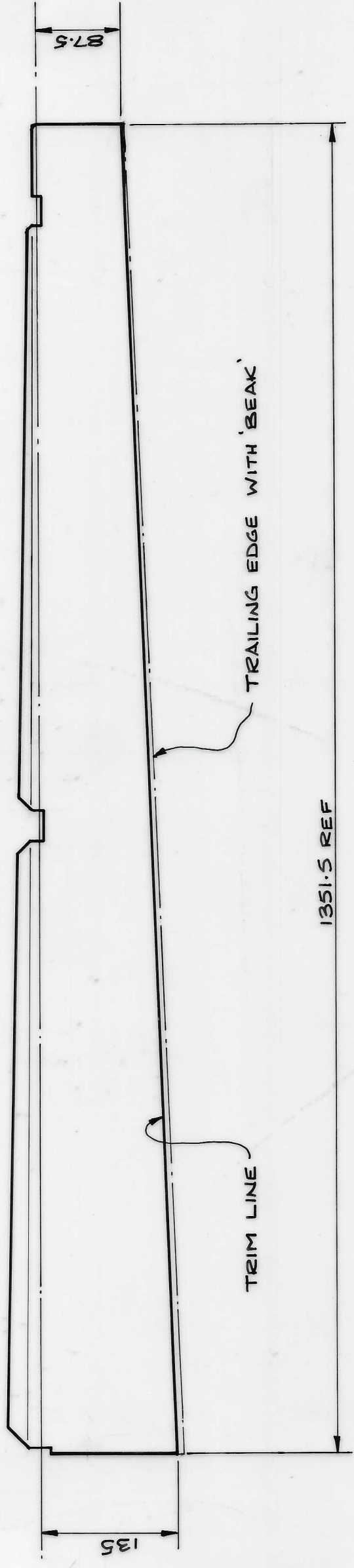
Epikote 162	100 p.b.w.
Epikure 113	38 p.b.w.
Cotton Flock	30-35 p.b.w.

Microballoon Mix

Epikote 162	100 p.b.w.
Epikure 113	38 p.b.w.
Microballoons	35-40 p.b.w.

Gel Coat

Lesonal Gel Coat 03-69120	100 p.b.w.
Lesonal Hardener 7-2051	2 p.b.w.



STARBOARD ELEVATOR DRAWN - PORT ELEVATOR SIMILAR.

FIG 1

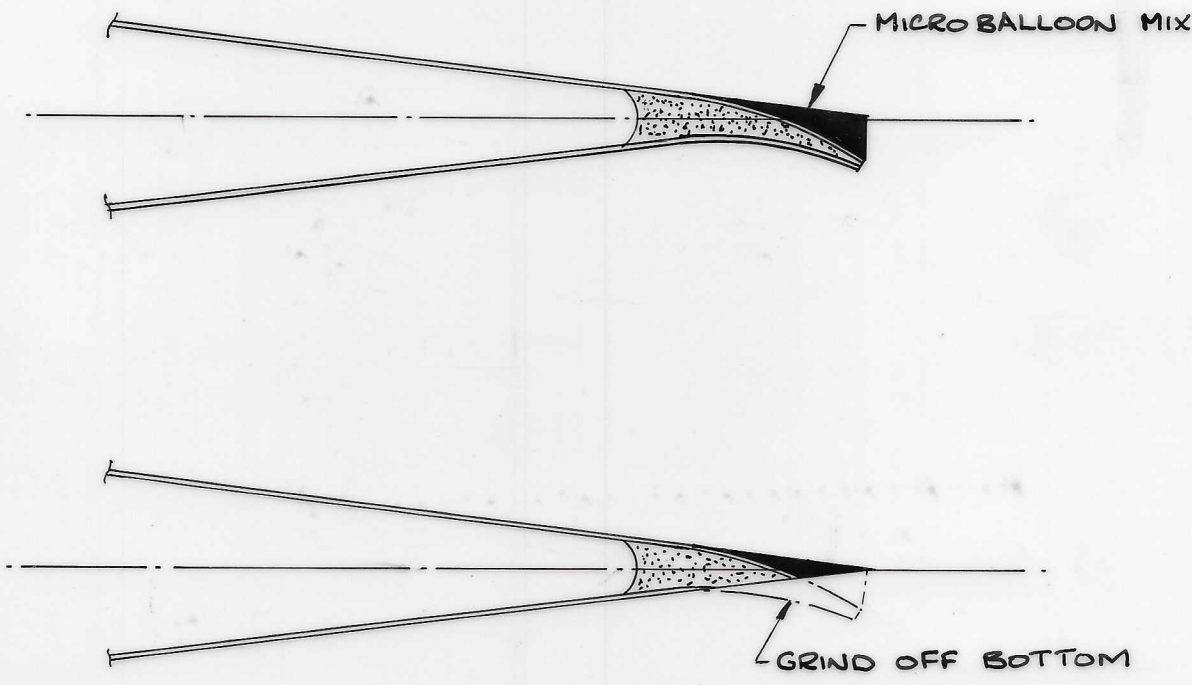


FIG. 2

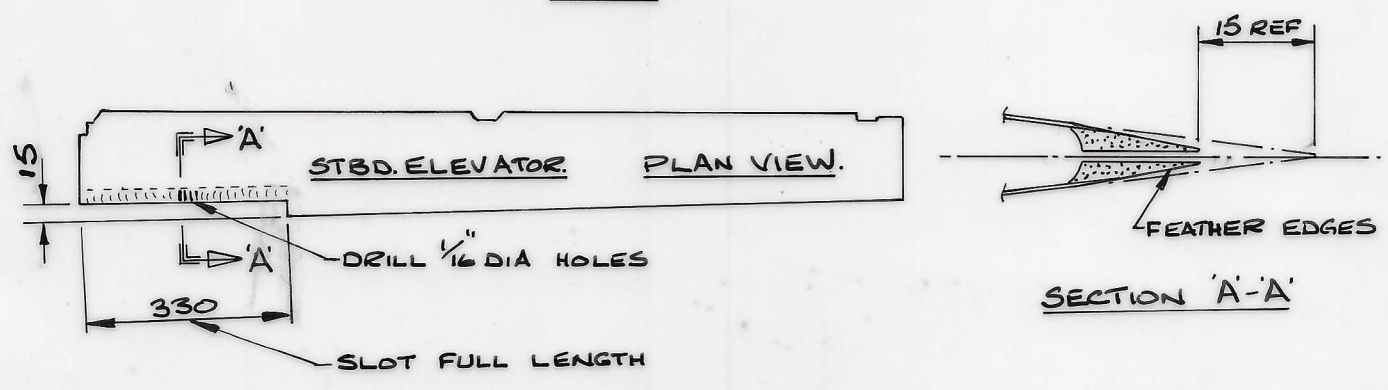


FIG. 3

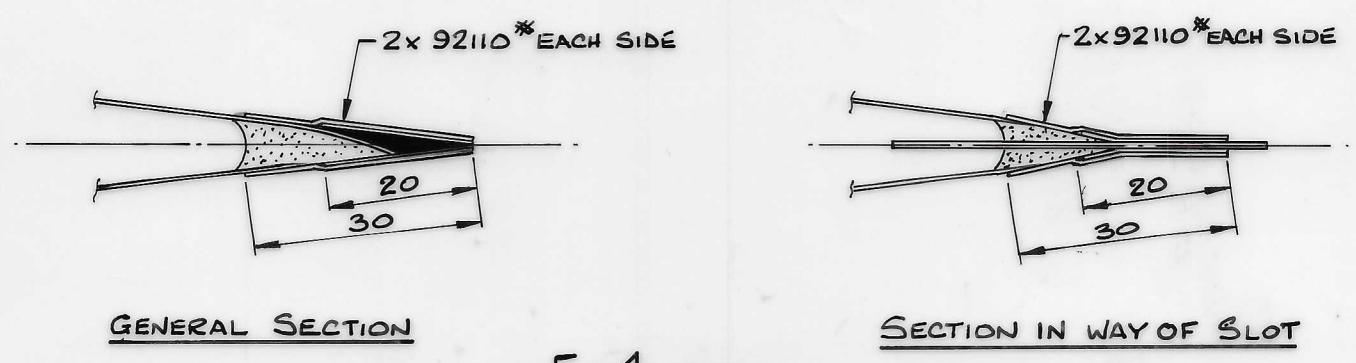


FIG. 4

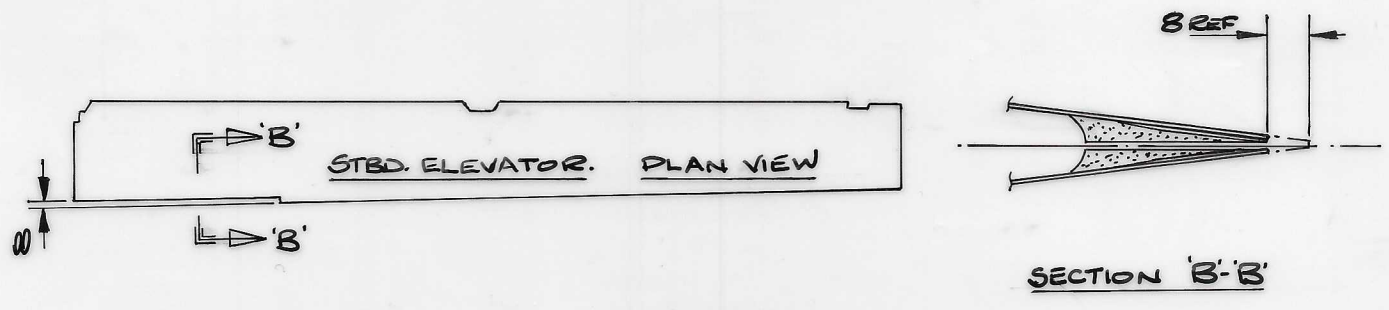
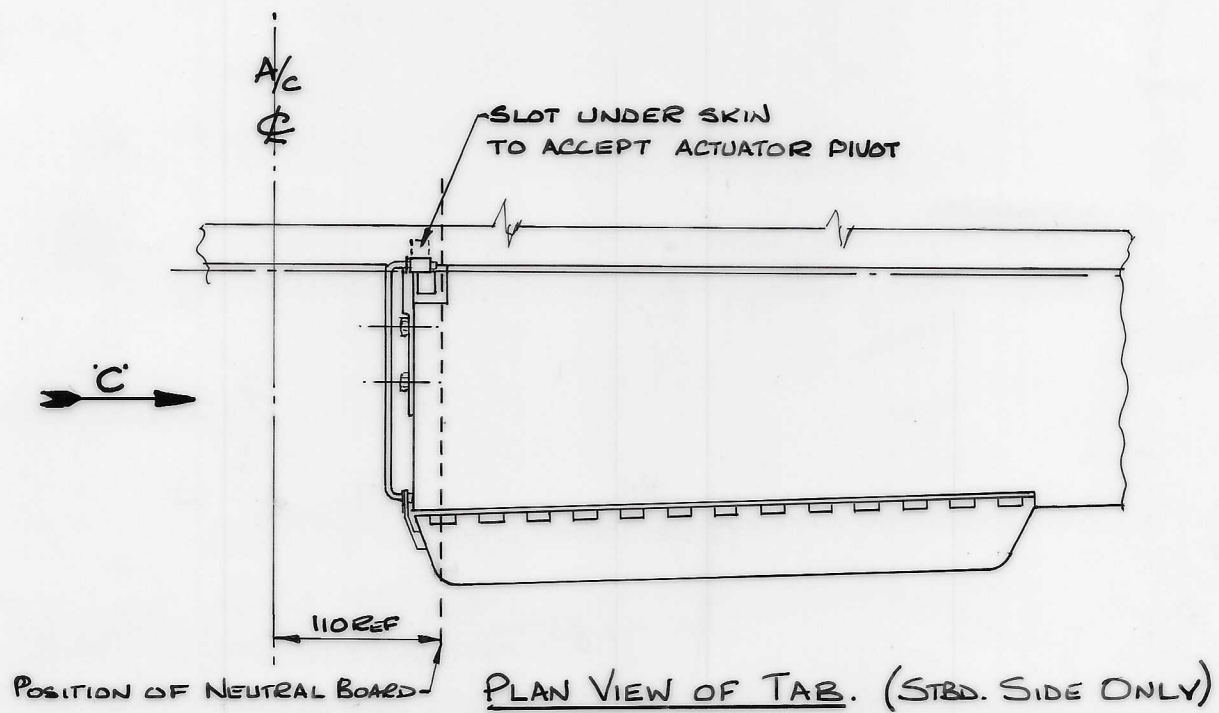


FIG. 5



POSITION ACTUATOR
PIVOT BY SETTING
TAB IN NEUTRAL

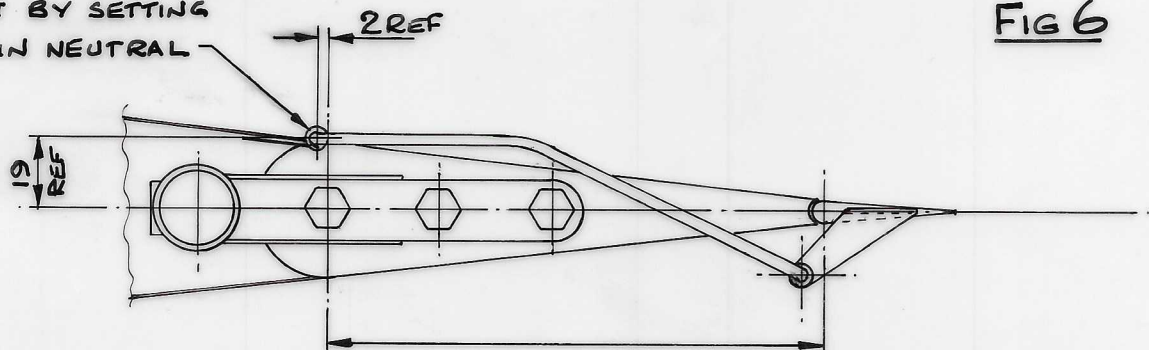
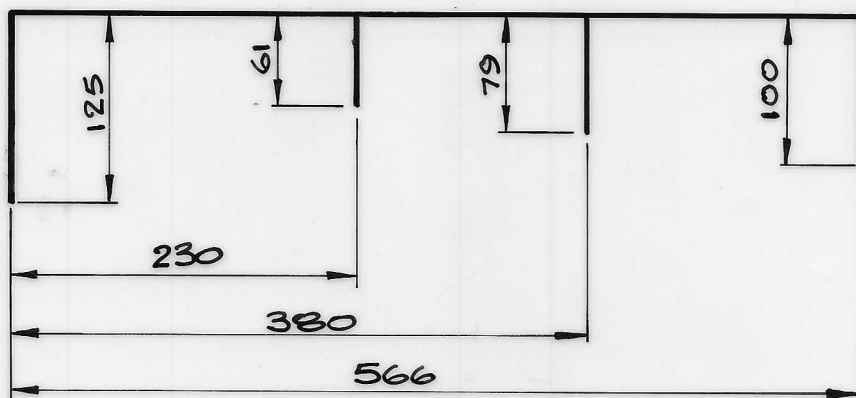


FIG 6

VIEW ON ARROW 'C'



NEUTRAL SETTING BOARD

110 M OUTBOARD OF AIRCRAFT CENTRELINE

FIG 7

NOTE. ALL DIMENSIONS ARE IN MILLIMETRES.