# PART 6

# GROUND HANDLING

## List of Chapters

# PART 6

# CHAPTER 1 - RIGGING

## Contents

# RIGGING

## Introduction

1. The glider can be assembled by a minimum of 4 suitably trained personnel. Aircrew may be called upon to perform this function. Removal of the components from a transporter and rigging of the glider is described in the following paragraphs. All control rod end fittings, wing root bushes and location pins are to be cleaned and lubricated with grease XG293 (NATO G-395) before assembly. After rigging, all flying controls are to be checked for correct operation and freedom of movement.

**CAUTION**: Post-Mod 003, the addition of canards to the nose of the aircraft results in a potential accident hazard during ground handling operations due to the location of the canard surfaces. Where possible, a tail dolly should be used during ground handling, particularly when operating in wet or slippery conditions.

**Note**: The Safety and Maintenance Notes (AP101G-1001-5A2) are to be complied with throughout the work detailed in this procedure. No specialist tools and equipment are required.

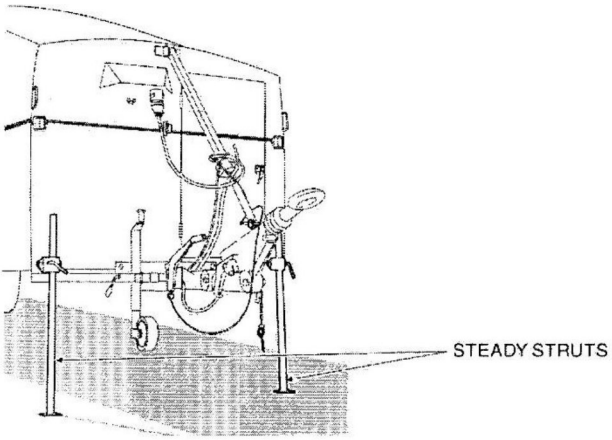
## Preparation for Rigging

2. The front of the transporter must be raised until the rear touches the ground. The two steady struts must then be extended to the ground (Fig 1) and secured.

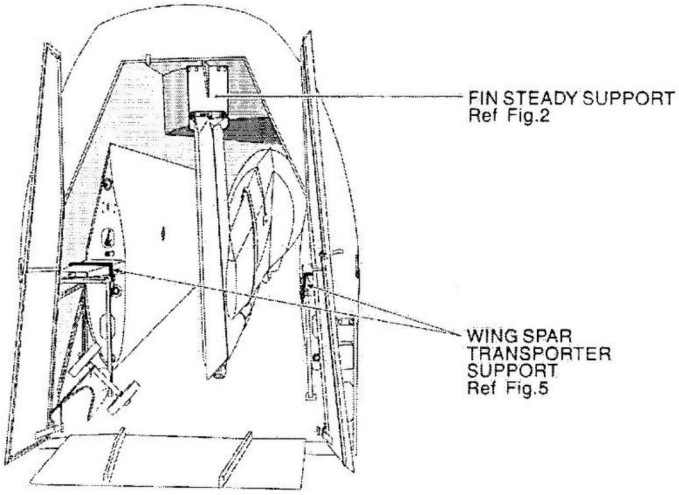
3. The transporter doors must then be locked in the fully open position and the tailgate lowered (Fig 2).

4. The fin steady support is then to be raised (Figs 3 and 4).

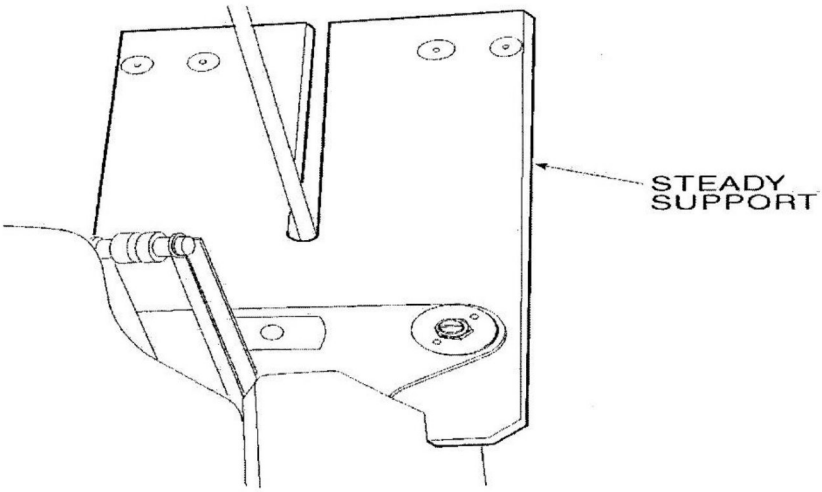
5. The fuselage is then to be unlashed from the floor and withdrawn from the transporter until approximately 1 fuselage length clear. (Fig 5).



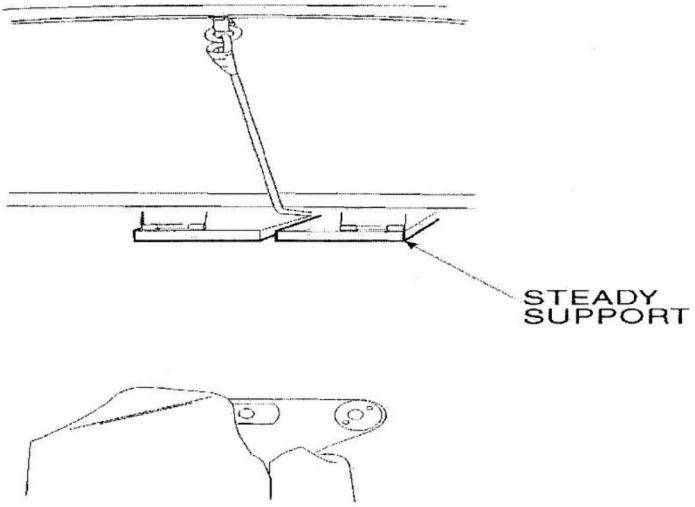

**6 - 1 Fig 1 - Transporter - Steady Struts Extended**



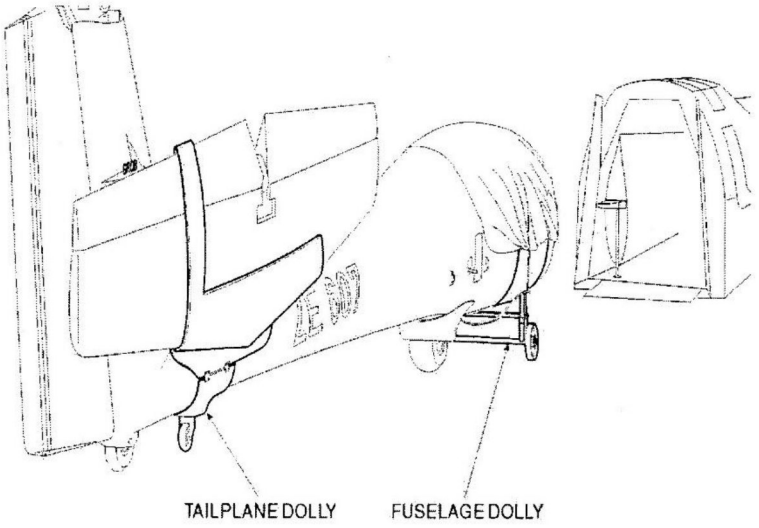

**6 - 1 Fig 2 - Transporter - Doors Open Tailgate Lowered**



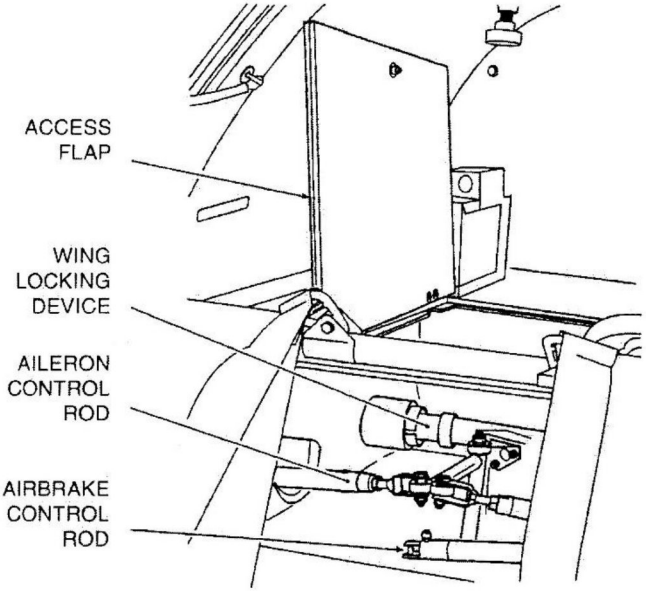

**6 - 1 Fig 3 Steady Support in Position**




**6 - 1 Fig 4 Steady Support Raised**




**6 - 1 Fig 5 Fuselage Removed from Transporter**




**6 - 1 Fig 6 Access to Rear Wing Locks and Flying Controls**

6. The canopy cover, rear canopy and rear headrest are then to be removed.

7. The four rear seat panel fasteners must then be released to permit removal of the centre of the rear seat.

8. The flap behind rear seat must be lifted to gain access to rear wing locking device and control connections (Fig 6).

**Note:** If the aircraft has been prepared for anti-deterioration the actions at para 9a to 9e must be carried out.

9. Polythene and sealing tape is to be removed from the following positions:

   a. Port wing bush (1 off and spigot 4 off).

   b. Starboard wing bush (1 off and spigot 4 off).

   c. Fuselage, wing locating bushes (3 off port and 3 off starboard)

   d. Fuselage, tailplane mounting spigots (3 off).

   e. Tailplane mounting bushes (3 off).

**Preparation of Fuselage**

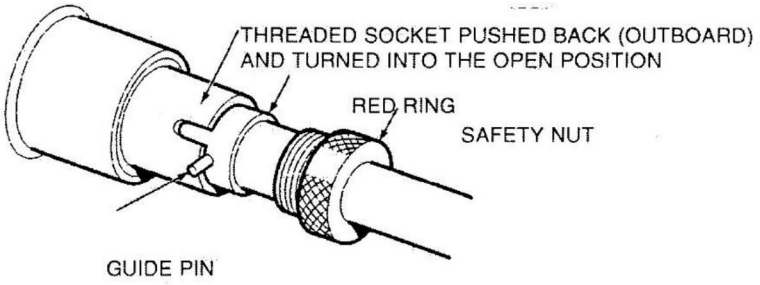
10. The slotted locking sockets (2 off port and 2 off starboard) are to be pushed back (outboard) to the open position and rotated to lock them open. (Fig 7). Then the following actions are to be taken:

   a. Port and starboard airbrake control rods are to be correctly positioned. **Note:** Forward rod pointing STARBOARD, rear rod pointing PORT.

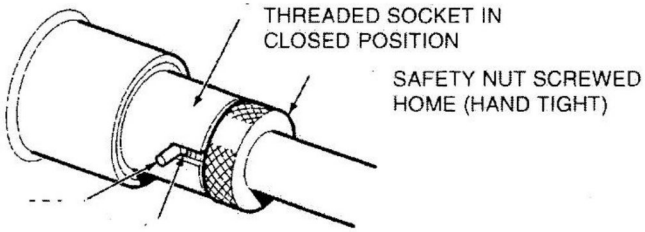
   b. Port and starboard aileron control rods are to be correctly positioned.

   c. Bushes (3 off port, 3 off starboard) are to be lubricated with grease XG293 (NATO G-395).

   d. The harness strap/canopy lanyard is to be positioned such as not to cause obstruction.




**OPEN POSITION**




**CLOSED AND LOCKED POSITION**

**6 - 1 Fig 7 Wing Locking/Unlocking**

### Starboard Wing - Rigging

11. Figs 6 to 10 should be referred to during the wing rigging sequence. The wing bush (1off) and spigot (4 off) are to be lubricated with grease XG293 (NATO G-395). The wing is then to be removed from its stowage and prepared as follows:

a. Wing root dolly to be fitted. Wing/dolly combination to be withdrawn from the transporter.

b. Wing to be positioned ready for rigging.

c. Airbrake control rod to be unlocked. Airbrake to be fully extended. Airbrake outer swivel levers to be checked in light contact with the stop and

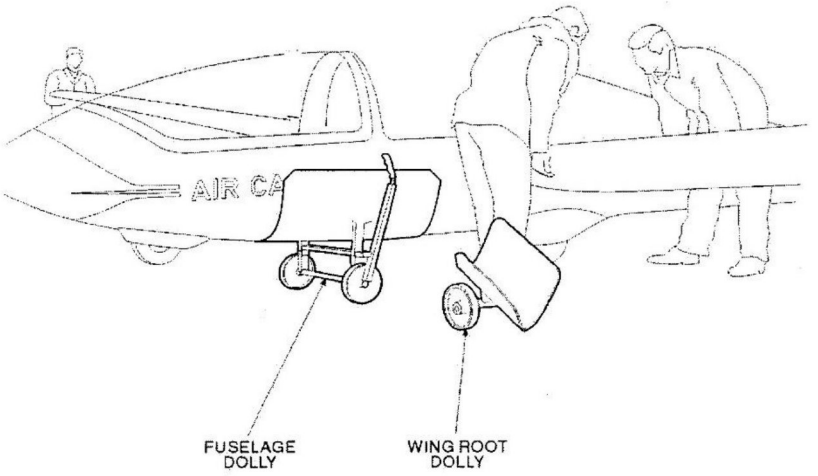
that the airbrake fence lower edge is not less than 5mm below the wing upper skin lower edge.

**Note**: The following operation is to be carried out with 1 man at the wing tip, 2 men at the wing root and a fourth man acting as a guide.

d. The wing is to be offered to the fuselage and located on mounting spigots (Fig 8).

e. The wing is then to be drawn into the starboard slotted sockets (2 off).

◆ **Note**: *Both* wings must be inserted before being locked by hand-tightening the safety nuts (Figs 9 and 10). ◆



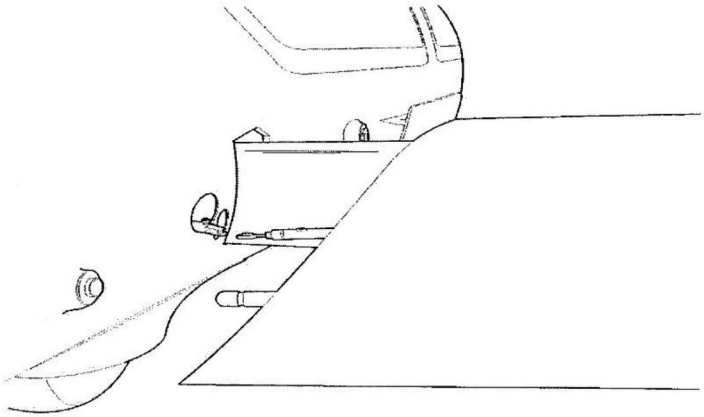

*Note . . .*

*A fourth man would be positioned at the tip of wing being rigged/derigged (in this case the port wing).*

**6 - 1 Fig 8 Supporting the Wing for Rigging/De-rigging**

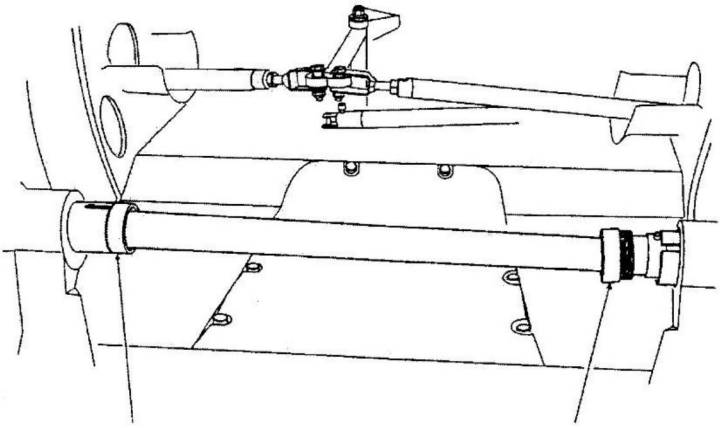
## Port Wing - Rigging

12. Rigging of the port wing is a repeat of the sequence outlined at para 11 and sub-paras 11a to 11e above.



*Note . . .*
*Supporting personnel at wing root removed for clarity*

**6 - 1 Fig 9 Fitting Wing to Fuselage (Starboard)**



RIGHT WING LOCKS
(LOCKED POSITION)

LEFT WING LOCKS
(UNLOCKED POSITION)

**6 - 1 Fig 10 Forward Wing Locks**

**Control Rods**

13. Port and starboard aileron and airbrake control rods are to be connected.

**Supervisory Checks**

14. A supervisory tradesman is to examine all control and structural connections for correct assembly and locking.

**Independent Checks**

15. The ailerons and airbrakes are to be independently checked for correct sense of operation and freedom of travel over the full range of movement.

**Wing Rigging Completion**

16. Upon completion of the wing rigging process the flap behind the rear seat is to be secured and the centre of the rear seat panel refitted and secured with 4 fasteners. The rear headrest and rear canopy are then to be refitted.

**Tailplane**

17. Before rigging the tailplane, the mounting spigots are to be cleaned and lubricated with XG293 (NATO G-395) grease.

**Note**: The following operation is to be carried out with 2 men lifting the tailplane and a third man acting as guide.

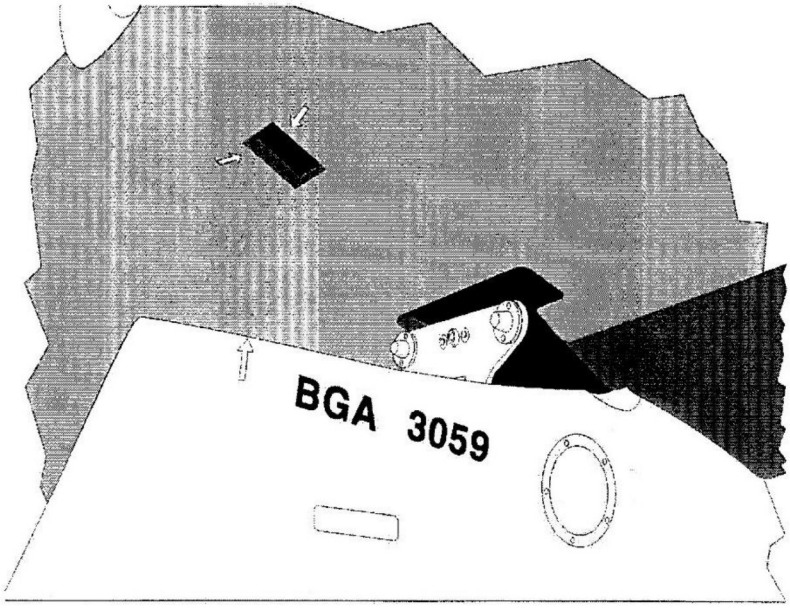
18. The tailplane is to be lifted from the stowage dolly and the panel opened to gain access to the securing bolt which is to be withdrawn to the limit of its outward movement. Then:

a. The tailplane assembly is to be lifted into position.

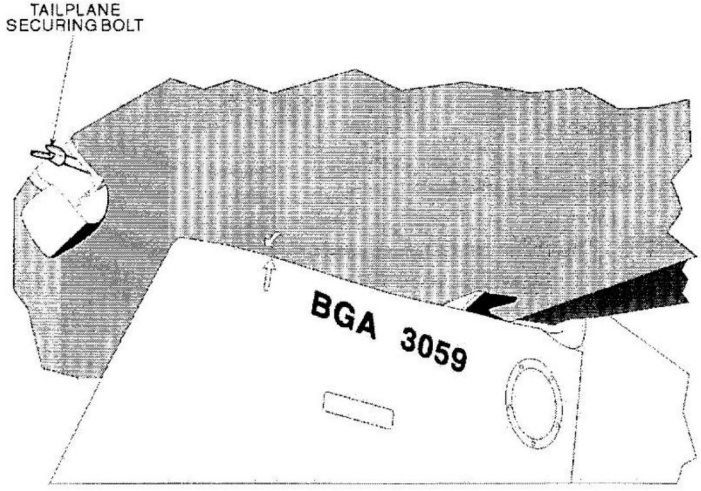
b. The leading edge is to be raised (Fig 11) and the tailplane fed onto the hook and rollers.

c. The leading edge is then to be lowered (Fig 12) and the tailplane pushed rearwards until red arrows are aligned (Fig 13).

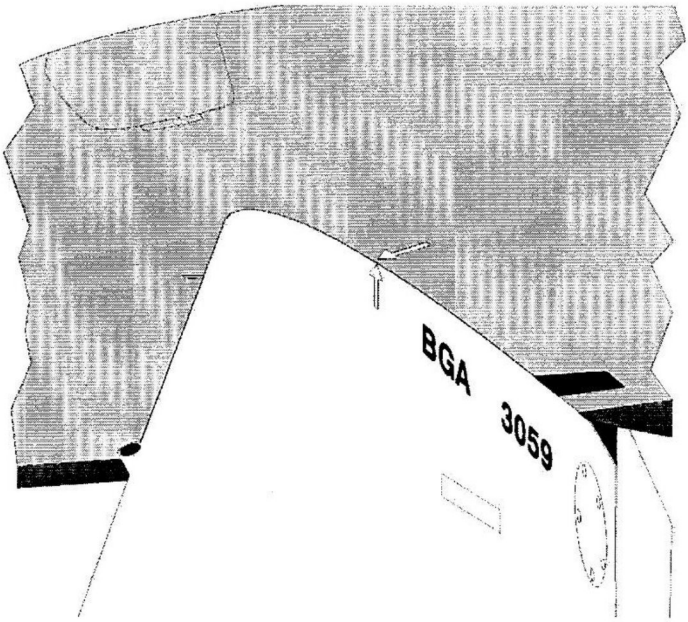
d. The securing bolt is then to be tightened (Fig 12), the wings of the bolt being left in a horizontal position.




**6 - 1 Fig 11 Tailplane with Leading Edge Raised**




**6 - 1 Fig 12 Tailplane in Fully Forward Position** *(arrows not aligned)*




**6 - 1 Fig 13 Tailplane in Position Arrows Aligned** *(BOTH Sides)*

**Tailplane Rigging Completion**

19. Upon completion of the tailplane rigging process the access panel is to be closed and secured.

**Aircraft Rigging Completion**

**CAUTION**: Two men are required to remove the tailplane stowage dolly. The dolly wheel is to be swung clear before removing the tailplane dolly from the fuselage.

**Note**: Due to C of G change with the fuselage dolly fitted it is advisable to remove the fuselage dolly before the tailplane stowage dolly. Before doing so the wings must be manually supported in a horizontal position.

20. The lanyard is to be disconnected from the C of G release unit and the fuselage dolly removed. The tailplane stowage dolly may then be removed.

21. Sealing tape 5F1104319 is to be used to tape over the gaps at the wing/ fuselage joint, the tailplane/fin joint and the tailplane securing bolt access panel.

22. The following actions pertaining to the total energy and pitot tubes are to be taken (Fig 14):

a. Masking tape to be removed from apertures.

b. Security of the collar to the pitot tube is to be ensured.

c. Tubes to be inserted into apertures ensuring that the pitot static probe is in the upper aperture.

d. The secure seating of all tubes is to be confirmed.

e. Tubes to be taped into position.

**Supervisory Checks**

23. A supervisory tradesman is to examine all structural connections for correct assembly and locking.

**Independent Check**

24. The elevator is to be independently checked for correct sense of operation and freedom of movement over its full range.

**Summary of Rigging Procedure**

25. The glider rigging procedure is summarised as follows:

a. Wings level, fuselage dolly secured in UP position.

b. Prepare fuselage. Remove rear canopy, align control rods, unlock airbrakes and wing locking devices. Grease components.

c. Connect wings to fuselage in turn.

d. Connect aileron and airbrake controls.

e. Fit tailplane onto fin and secure.

f. Refit rear canopy.

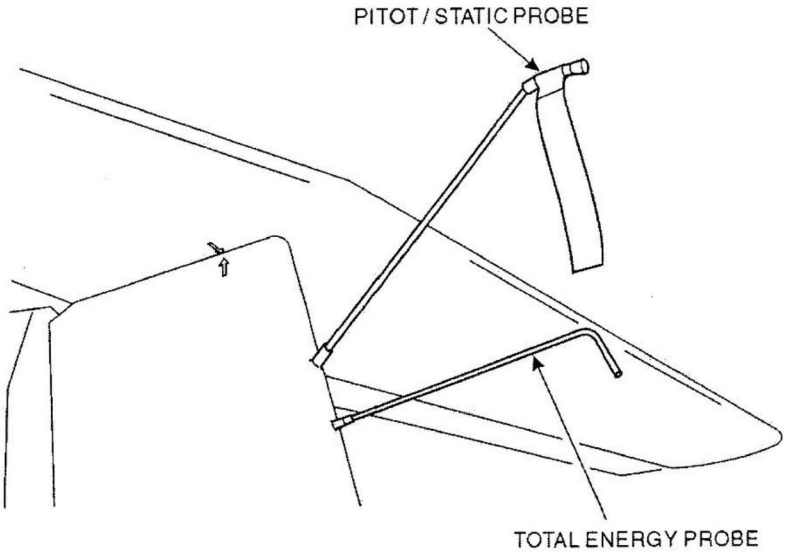
g. Carry out correct assembly, locking, movement and function checks.

h. Carry out independent flying control and structure checks.

i. Tape wing to fuselage joints.

j. Complete documentation.

k. Supervisory and Independent Checks.




**6 - 1 Fig 14 Total Energy and Pitot Tubes**

# PART 6

# CHAPTER 2 - DE-RIGGING

## Contents



### Introduction

1. The glider can be broken down into its main component parts (ie fuselage, wings and tailplane) for ease of transportation, maintenance and storage. If the glider is to be transported in a transporter the canards should be removed. De-rigging the glider and loading the components into a transporter is described in the following paragraphs. During the de-rigging process refer to Part 6 Chapter 1 Figs 1 - 14.

**Note**: The Safety and Maintenance Notes (AP101G-1001-5A2) are to be complied with throughout the work detailed in this procedure. No specialist tools and equipment are required.

### Preparation for De-rigging

2. The front of the transporter must be raised until the rear touches the ground. The 2 steady struts must then be extended to the ground and secured.

3. The transporter doors must then be locked in the fully open position and the tailgate lowered.

**Note**: Due to C of G change with the fuselage dolly fitted it is advisable to fit the tailplane stowage dolly first. Before doing so the wings should be supported manually in a horizontal position.

4. The tailplane dolly is to be fitted to the fuselage first. Then the fuselage dolly is to be connected by lanyard to the C of G release unit after which the raising handle must be secured and locked with the pin.

5. The total energy and pitot tubes are then to be removed and the apertures in the fin blanked off with masking tape.

6. Tape is then to be removed from the following locations:

   a. Wing/fuselage joint.

   b. Tailplane/fin joint.

   c. Tailplane securing bolt access panel.

**Tailplane De-rigging**

7. The tailplane securing bolt access panel must be opened and the winged securing bolt released to the limit of its outward movement.

**Note**: The following step is to be carried out with 2 men lifting the tailplane and a third man acting as a guide.

8. The tailplane must be slid forward until clear of the locating spigot when it can be lifted from the mounting and stowed on the dolly.

**Fuselage De-rigging**

9. The rear canopy and rear headrest must be removed first then the 4 rear seat panel fasteners must be released. The centre of the rear seat must be removed in order to gain access to the forward panel wing locking devices.

10. Access to the rear wing locking devices and control connections is gained by lifting the flap behind the rear seat.

11. The port and starboard airbrake control rods and the port and starboard aileron control rods are then to be disconnected.

**Wing De-rigging**

**CAUTION**: Before wing removal is undertaken both wings must be manually supported at their tips and the wing to be removed supported at leading and trailing edges of wing root rib. The fuselage must also be supported on the fuselage dolly.

12. The 4 wing locking safety nuts are to be unscrewed.

**Port Wing - De-rigging**

13. The 2 slotted locking sockets must be first be pushed back (outboard), twisted right or left to abut the guide pin and then be withdrawn from the fuselage.

**Note**: The next operation is to be carried out with 2 men supporting the wing root and 1 supporting the tip.

14. The wing must be withdrawn from the fuselage then turned, leading edge downward, and fitted into the wing root dolly and wing tip dolly.

15. The airbrake control must be locked IN. The wing is then to be rolled into the transporter for stowage on the right hand side. The wing must be lifted, the root end dolly released and secured with toggle fastener.

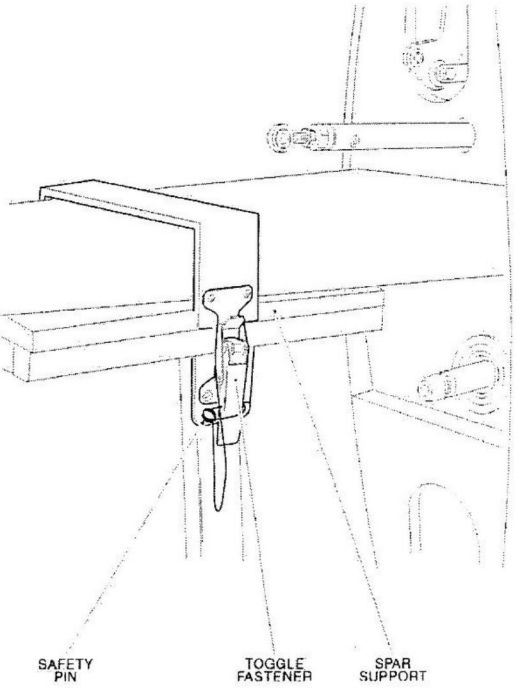
16. The wing spar is then to be stowed on the transporter support and the safety pin fitted (Fig 1).

**Starboard Wing - De-rigging**

17. The procedures detailed in paras 13 to 16 above are to be repeated for the starboard wing which must be stored on the left hand side of the transporter.

**Anti-deterioration**

**Note**: The actions at paras 18 to 20 below are to be carried out if the aircraft is to remain in the de-rigged condition for longer than 7 days. Lubrication is to be with Grease XG293 (NATO G-395). Sealing tape is to be of type 5F1104319.




**6 - 2 Fig 1 Wing Spar Attachments Inside Transporter**

18. The port wing bush (1 off) and spigot (4 off) are to be lubricated then sealed using polythene and sealing tape. The procedure is to be repeated for the starboard wing bush (1 off) and spigot (4 off).

19. The wing locating bushes (3 off port and 3 off starboard) on the fuselage are to be lubricated then sealed using polythene and sealing tape.

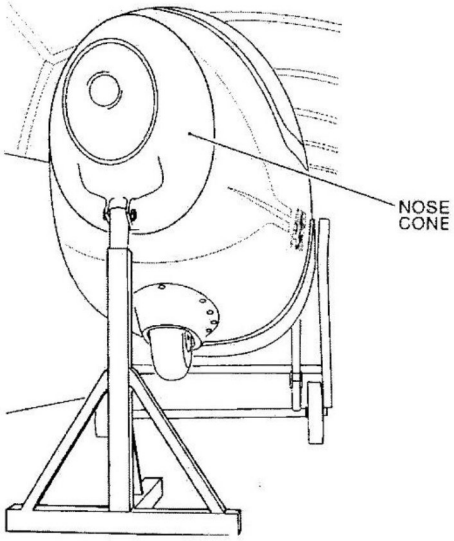
20. In a similar manner the tailplane mounting spigots (3 off) and the tailplane mounting bushes (3 off) are to be lubricated and sealed.

**De-rigging Final Actions**

21. Loose items such as covers and head rests are to be stowed as required in the cockpit.

22. The rear canopy is to be refitted and locked. The canopy cover is to be fitted.

23. The fuselage is then to be rolled into the transporter until it is located in the transporter nose cone. (See Fig 2). The steady support is to be lowered onto the top of the fin then the rear fuselage is to be tied down to the transporter floor.




**6 - 2 Fig 2 Fuselage Located in Transporter-Mounted Nose Cone**

24. Loose equipment is to be stowed and secured as necessary in the transporter. The tailgate is then to be raised and the doors closed. The transporter steady struts are then to be raised to the locked position. The transporter may then be hitched to the towing vehicle and the jockey wheel retracted.

**Documentation**

25. All relevant documentation is to be completed.

**Summary of De-rigging Procedure**

26. The glider de-rigging procedure is summarised as follows:

a. Wings level, fuselage dolly secured in position.

b. Remove tape from wing to fuselage joints.

c. Remove tailplane.

d. Remove rear canopy.

e. Remove wings one at a time and stow in transporter.

f. Refit rear canopy.

g. Position and secure fuselage in transporter.

h. Stow accessories in transporter.

i. Secure transporter.

j. Complete documentation.

# Aircrew Publications Amendment Request

**MOD Form 765X**
**( Revised Sep 04)**

**References** JAP 100A-01 Chapter 8.2

**Originating Unit**

Title/Address

Reference

Date

**Air Publication / Document***

Publication / Document No.

To Amdt / Issue / Revision Date*

Title

Section / Chapter / Page / Paragraph

**Part 1 - Requested Amendment**

(Use continuation sheet(s) if necessary and firmly attach all diagrams etc.)

| Originator's Signature | Rank and Name | Tel No. | Appointment | Date |
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☐ Requested Amendment rejected (see below)

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1. MOD Form 765X has been introduced to maintain a full audit trail of changes to aircrew publications and documents to ensure that both the User Authenticator and Handling Sqn are involved at the earliest opportunity after the form has been raised.

2. MOD Form 765X is to be raised by the individual who observed a deficiency, omission or inaccuracy in the aircrew manual, flight reference cards, mission operating procedure cards, flight test schedule, aircrew land away turn round schedule or operating data manual.

3. When an individual raises a MOD Form 765X (by completing the header detail and Part 1) he should send or fax the form to the User Authenticator, (RAF: STANEVAL; Army: DAAvn- For Avn Stds; RN: Commanding Officer, Naval Flying Standards Flight, RNAS Culdrose or RNAS Yeovilton as appropriate, and, for flight test schedules, pass a copy to OC Eng and Supply Wing (RAF); OC Wksp (Army); or Commanding Officer, Naval Flying Standards Flight, RNAS Culdrose or RNAS Yeovilton as appropriate (RN)).

4. On receipt the User Authenticator should complete Part 2, enter a serial number, comment as appropriate and pass the form to the Integrated Project Team (IPT), and a copy to Handling Sqn, Boscombe Down, SALISBURY, Wilts, SP4 0JE, and one to Group Headquarters (RAF only). OC Eng and Supply Wg (RAF) should provide the address of the IPT for the appropriate aircraft type.

5. The User Authenticator is to keep a register of all MOD Form 765X arisings.

6. The IPT should complete Part 3 of the MOD Form 765X and forward it to Handling Sqn. However, if the publication concerned is the ODM the form should be sent by the IPT for action to QinetiQ Boscombe Down, SALISBURY, Wilts, SP4 0JF.

7. When the change proposed in the F765X is deemed by the UA or IPT to be of an urgent flight safety or operational nature, the IPT can authorize HS by e-mail to proceed with the appropriate amendment action in advance of the completion and signature of Part 3 of the F765X.