INSTRUCTION MANUAL NO 719 PARACHUTE ASSEMBLY GQ SECURITY TYPE 850 MK 2 MRI GQ 1284

GENERAL INFORMATION MAINTENANCE AND PACKING INSTRUCTIONS

ISSUE 2

DECEMBER 2000

STATEMENT OF INITIAL CERTIFICATION

This manual complies with British Civil Airworthiness Requirements, Section A, Chapter A5-3.

Signed

Date 20 December 2000

CAA Approval No: E13552

NOTE: The above certification does not apply to revisions or amendments made after the date of initial certification by other Approved Organisations. Revisions or amendments made by other Approved Organisations must each be separately certified, and recorded on separate record sheets

AMENDMENT RECORD

1 All amendments to text and Figures of this manual are to be recorded below.

2 All new material inserted by amendment action will be signified by insertion triangles (ie > New Material <) indicating the amended text or Figure.

3 The page holding the amended material will be marked with the Amendment Number in the bottom left hand corner.

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The GQ Security 850 Mk 2 Parachute assembly is approved by the C.A.A. subject to the following performance limitations:

Maximum all up weight	80 kg	95 kg	110 kg
Maximum deployment speed	385 km/h	350 km/h	300 km/h
	207.9 KEAS)	(188.9 KEAS)	(162 KEAS)
Maximum opening altitude	3048 m ASL	3048 m ASL	3048 m ASL
	(10,000 ft ASL)	(10,000 ft ASL)	(10,000 ft ASL)

WARNINGS

YOU CAN SUBSTANTIALLY REDUCE THE RISK BY ENSURING THAT EACH COMPONENT OF THE SYSTEM HAS BEEN ASSEMBLED AND PACKED IN STRICT COMPLIANCE WITH THE MANUFACTURERS INSTRUCTIONS, BY OBTAINING PROPER INSTRUCTION IN THE USE OF THIS SYSTEM, AND BY OPERATING EACH COMPONENT OF THE SYSTEM IN STRICT COMPLIANCE WITH THIS INSTRUCTION MANUAL. HOWEVER, PARACHUTE SYSTEMS SOMETIMES FAIL TO OPERATE EVEN WHEN PROPERLY PACKED AND OPERATED SO THAT YOU RISK SERIOUS INJURY OR DEATH EACH TIME YOU USE THE SYSTEM

NO RESPONSIBILITY WILL BE ACCEPTED BY THE COMPANY FOR INCORRECT FUNCTIONING OF THIS ASSEMBLY:

(1) IF NOT PACKED AS DETAILED IN THIS INSTRUCTION MANUAL

(2) IF ANY UNAUTHORISED MODIFICATIONS HAVE BEEN CARRIED OUT ON ANY PART OF THE ASSEMBLY.

(3) RE-PACKING OF THIS ASSEMBLY MUST BE UNDERTAKEN BY A CERTIFIED FAA RIGGER OR FOREIGN EQUIVALENT

(4) REPAIR OF DAMAGED ASSEMBLIES MUST BE UNDERTAKEN BY EITHER THE MANUFACTURER OR CERTIFIED FAA RIGGER OR FOREIGN EQUIVALENT

United State Patents:

First issued:

Aeroconical® No 3758056

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CHAPTER 1

GENERAL INFORMATION

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INTRODUCTION

1 The GQ Security Type 850 Mk 2 parachute assembly is a lightweight emergency parachute, designed for use in sailplanes, aerobatic aircraft, helicopters and general aviation aircraft.

DESCRIPTION

2 The assembly components are listed in Table 1 and described in the following paragraphs.

TABLE 1 LIST OF COMPONENT PARTS

GQ Drg/Part No	Nomenclature	Qty
MRI GQ 1284	Parachute assembly complete	1
MRI GQ 1283	Container and harness	1
MRI GQ 1293	Canopy, Aeroconical 4.8 m (c/w diaper)	1
GQD 18656	Pilot chute	1
GQD 18716	Connecting line	1
GQD 30223	Ripcord	1
GQD 30200	Closure loop	1
GQD 30133	Kicker plate	1

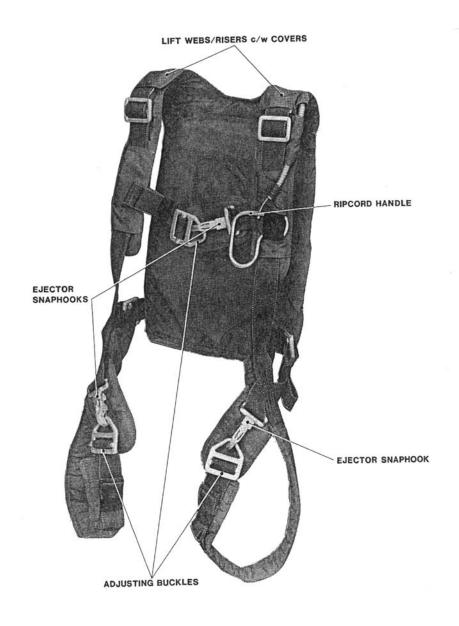


Fig 1 GQ Security Type 850 Mk 2 Parachute Assembly

CANOPY

3 The canopy used in this assembly is the 4.8 m Aeroconical (US Patent 3758056). It has 20 gores and lines and is bias constructed in 1.1 oz nylon ripstop fabric calendered to a porosity of 0-3cfm. The suspension and vent lines are 400 lb tensile strength braided nylon. The canopy is constructed with three mesh covered vents to the rear which provide forward drive and turn control via the rear lift webs.

PILOT CHUTE

4 The pilot chute is a 91 cm diameter, 8 gore, MA1 vane Type, coil spring activated. The spring is rated at 35 lb when compressed to a 25 mm height.

PILOT CHUTE CONNECTING LINE

5 The pilot chute connecting line is constructed of 14 mm, 1500 lb tensile strength tubular nylon webbing and connects the pilot chute to the canopy vent lines.

HARNESS AND LIFT WEBS

6 The harness and integral lift webs are constructed from abrasion resistent 6000 lb tensile strength nylon webbing to MIL-W-27265 Type VII. The V rings, ejector snap hooks and sliding bar adapters conform to military standards.

CONTAINER

7 The container is a conventional slim back Type, constructed in nylon parapack and is 30 cm wide, 44 cm long, with a maximum thickness of 3 cm. The slimness of the container is maintained by the side flap design, which in conjunction with the twin ripcord pins and the single closure loop, which passes completely through the container to retain the pilot parachute in its compressed state.

BACKPAD

8 User comfort is assured by the 12 mm foam padding which is incorporated in the back pad.

OPERATION

9 The GQ Security Type 850 Mk 2 parachute assembly is conventional ripcord operated, pilot chute deployed parachute system.

CLEARING THE AIRCRAFT

10 There are no simple rules for jumping clear of a disabled aircraft. The one basic rule is:

ENSURE THAT YOU ARE ABSOLUTELY CLEAR OF THE AIRCRAFT STRUCTURE BEFORE PULLING THE RIPCORD.

Practice climbing out of your aircraft with your parachute on whilst on the ground. Check out obstructions and items of equipment that may snag you or your parachute, remember to avoid them when an actual emergency arises.

Exit sequence

- 11 Carry out the following sequence of events:
 - 11.1 Release your safety belt and shoulder harness.
 - 11.2 Disconnect or remove headsets, microphones, oxygen.

11.3 Look to the left body panel and locate the ripcord (become familiar with ripcord location on the ground).

Pulling the ripcord

12 Having cleared the aircraft, immediately grasp the ripcord handle with the right hand. With a hard, quick pull, clear the ripcord from its stowage pocket as far as possible. The pilot chute will then be released. Approximately 2 seconds after the ripcord is pulled, the canopy will be fully inflated. You are now in your descent phase.

STEERING

13 The GQ Security Type 850 Mk 2 parachute assembly is fully steerable. Steering is accomplished by pulling down on the rear lift webs. Pulling down on the right rear lift web will cause the canopy to turn right. Conversely, pulling down on the left lift web, the canopy turns left.

LANDING

14 In preparing to land, FACE INTO THE WIND, to reduce your forward speed, for different types of landings proceed as follows:

Normal landing

15 Put your feet together and slightly flex your knees. Land on the balls of your feet, relax and go with the parachute, rolling with the landing. Remove the harness.

High winds

16 Re-emphasize FACE INTO THE WIND to reduce ground speed to a minimum. After landing, if you are able to stand up, run around to the downwind side of the canopy, thus deflating it. If you are unable to stand and are being dragged by the parachute, you should first roll over onto your back so that the container will act as protection. After rolling over, reach up and grasp ONE rigging line and pull it towards you hand over hand until the canopy deflates.

Water landing

17 Since your landing area cannot be pre-determined, it is always a good idea to wear flotation equipment. The type that is gas inflated with a manual overide is recommended. If you cannot successfully steer your canopy away from a water hazard, you should attempt inflation of your flotation equipment high enough to allow for manual inflation should the gas cartridge fail. Your landing position should be as described in para 15. The water may be shallow causing you to strike the bottom so you should be prepared. After landing, disconnect the chest strap and leg straps and slip out of the harness. Swim or paddle on the flotation equipment to the nearest shore.

NOTE

The use of vest type flotation equipment that is worn under the harness is NOT recommended as its inflation under the harness could cause serious injury.

CHAPTER 2

MAINTENANCE

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- 1 Introduction
- 2 Maintenance Notes
- **3 PRE-FLIGHT INSPECTION**
- 4 Examination
- **5 PERIODIC INSPECTION**
- 6 Examination

INTRODUCTION

1 This chapter details pre-flight inspection and periodic maintenance of a GQ Security Type 850 Mk 2 Parachute assembly.

WARNINGS

(1) RE-PACKING OF THIS ASSEMBLY MUST BE UNDERTAKEN BY A CERTIFIED RIGGER.

(2) REPAIR OF DAMAGED ASSEMBLIES MUST BE CARRIED OUT BY THE MANUFACTURER OR A CERTIFIED RIGGER.

MAINTENANCE NOTES

2 The following Maintenance Notes are to be observed:

2.1 The life of the assembly is 15 years from date of manufacture subject to a critical inspection at 10 years.

- 2.2 The recommended re-packing cycle for this assembly is 120 days (four months)
- 2.3 <u>France only</u>. Direction Generale De L'Aviation Civile Letter Reference 2000/03749/SFACT/N.ME dated 19 Juin 2000 authorises that the parachute assembly may be packed for a period of one year under the following conditions:

a The parachute assembly has a Serial Number of 726729 of later, or has been modified by Service Bulletin Number 18052000 version A

Additionally, the parachute assembly must remain in its transportation bag when not in use to protect it from:

- a Physical abuse
- b Sun or ultra violet light
- c Acid and contamination
- d Atmospheric conditions outside the range 15 20 degrees Celsius and a PH range of 15 75 %

PRE-FLIGHT INSPECTION

3 Before carrying out a pre-flight inspection, remove the log card from its pocket and ensure that the assembly is not due for a 120 day re-pack.

EXAMINATION

4 Carry out examination as follows:

4.1 Inspect the Quick Ejector Snap fasteners on the chest and leg straps. Make sure they open and close properly. Remove any debris or foreign objects trapped in the mechanism.

4.2 Inspect the exposed harness webbing for cuts, wear and tear or fraying especially where the webbing is routed through or around the metal fittings.

4.3 Gently ease the ripcord handle in its pocket, making sure that it is free to move. Check that the ripcord cable is free to move in and out of the metal housing (located just above the ripcord handle).

4.4 Peel open the ripcord protection flap on the back of the parachute. RUSTY, BENT or JAMMED ripcord pins are NOT ALLOWED. Carefully ease the cable in and out of the housing, making sure that it is unencumbered in its movements ensure the scarlet locking thread security tie is not broken.

4.5 In the event of the parachute having been contaminated with oil, other petroleum product, water, battery acid or discolouration due to actinic or UV action, it should be placed with a qualified parachute rigger immediately for inspection and/or remedial action.

PERIODIC INSPECTION

5 It is recommended that a periodic inspection is carried out at 120 day intervals.

EXAMINATION

6 Examine the assembly as follows:

6.1 Place the assembly on a clean packing table, then simulate operation by pulling the ripcord.

6.2 Check log card and ensure the assembly overall 15 year life will not expire before the next periodic maintenance.

6.3 Stretch out the assembly at full length and attach the vent lines to the packing table hook.

Canopy

6.4 Examine for contamination, broken stitching, holes and tears.

Rigging lines

6.5 Examine for security of attachment to canopy and links and that they are attached in the correct sequence.

6.6 Ensure uniformity of length.

Pilot chute and connecting line

6.7 Examine for tears, holes, broken stitching and correct attachment to the canopy apex.

6.8 Ensure pilot chute spring is not broken and functions correctly.

Ripcord

6.9 Clean the handle, cables and pins then examine for fraying, kinking and corrosion.

Harness assembly

6.10 Examine webbing for contamination broken stitching and chafing.

6.11 Examine all metal fittings for, distortion, corrosion and security of attachment, operate ejector snap hooks.

Container assembly and back pad

6.12 Examine for contamination, holes, tears and broken stitching. Examine eyelets for distortion and press fasteners for distortion and correct functioning.

Kicker plate and closure loop

6.13 Examine kicker, plate for distortion, cracking and burrs.

6.14 Closure loop, examine for fraying

Re-packing

6.15 Re-pack the parachute assembly referring to Chapter 3.

Recording

6.16 Record on log card.

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CHAPTER 3

PACKING INSTRUCTIONS

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- 3 Attaching the connecting line and pilot chute
- 4 Preparing the container and harness
- 5 Preparing the diaper
- 6 Rigging line check
- 7 Folding the canopy
- 8 Closing the diaper and stowing the rigging lines
- 9 Stowing the canopy
- 10 Closing the container

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 Assembly components and packing materials 	

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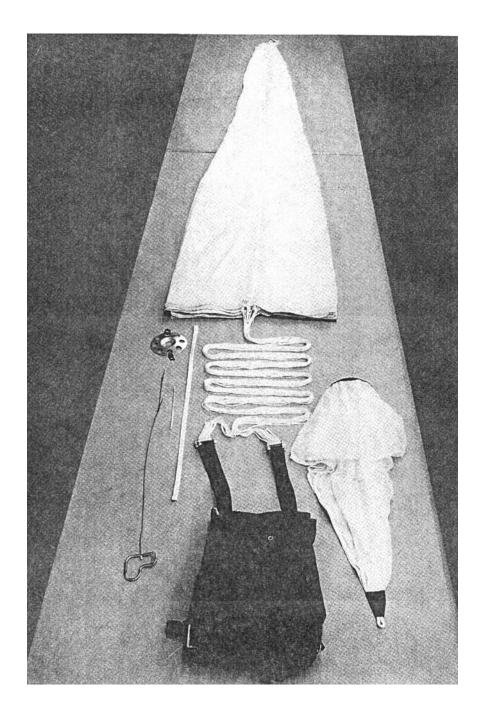


Fig 1 Assembly components

INTRODUCTION

1 This chapter details, assembling of component and packing instructions for a parachute assembly GQ Security Type 850 Mk 2.

WARNING

RE-PACKING THIS ASSEMBLY MUST BE UNDERTAKEN BY A CERTIFIED RIGGER.

ASSEMBLY OF COMPONENTS

2 Should it be necessary to replace any component of the assembly owing to unserviceability, refer to Table 1 for component part numbers and description, Table 1 also details materials require for packing.

TABLE 1 ASSEMBLY COMPONENTS AND PACKING MATERIALS

GQ Drg/Part No	Nomenclature	Qty
MRI GQ 1293	Canopy, Aeroconical 4.8 m (c/w diaper)	1
MRI GQ 1283	Container and harness	1
GQD18656	Pilot chute	1
GQD 18716	Connecting line	1
GQD 30223	Ripcord	1
GQD 30133	Kicker plate	1
GQD 30200	Closure loop	2
GQ D 30727	Elastic band 51 x 13 mm (2 x 0.5 in)	A/R
GQ MS 572	Tape white adhesive 25 mm (1 in)	A/R
GQ MS 462	Loctite superfast 241	A/R
GQ MS 1870	Thread, linen No 18	A/R

ATTACHING THE CONNECTING LINE AND PILOT CHUTE (Fig 2 and 3)

3 To attach the connecting line and pilot chute to the canopy apex, refer to Fig 2 and 3 and proceed as follows:

3.1 Attach the 64 mm (2.5 in) cord loop attached round the apex lines over the packing table hook.

3.2 Arrange the canopy to lay with No 1 gore uppermost, trace No 1 gore main seam tape from the canopy periphery to the apex. Count off lines 1 to 10 and ensure the 64 mm (2.5 in) cord loop is passing round these lines.

3.3 Pass the small loop of the connecting line round the 10 lines then pass the large loop through the small loop (Fig 2) pull up tight to form a larkshead knot.

3.4 Pass the large loop through the pilot chute and then pass the pilot chute through the large loop, pull up tight to form a larkshead knot (Fig 3).



Fig 2 Attaching the connecting line



ONE COMPLETE TURN OF DOUBLED No 18 THREAD NOTE: BLACK THREAD USED FOR CLARITY ONLY

Fig 3 Attaching the pilot chute

3.5 At a point 64 mm (2.5 in) from the pilot chute eye pass a stitch of doubled No 18 linen thread through the connecting line loop, tie off the ends of thread with a reef knot and thumb knot (Fig 3).

PREPARING THE CONTAINER AND HARNESS (Fig 4)

4 To prepare the container and harness, refer to Fig 4 and proceed as follows:

4.1 Arrange the container and harness to lay on the packing table with the open container uppermost and harness to the table.

4.2 Insert the ripcord into its housing, then insert the ripcord handle into the elastic stowage loop ensuring that it is correctly stowed, handle facing towards the ejector snap hook.

4.3 Fit the closure loop to the base of the container as follows:

4.3.1 At the upper end of the container, locate the touch and close fastener securing the container and the backpad. Open the fastener to gain access to the inside of the container base.

4.3.2 Pass one of the ends of the closure loop, up through one of the two eyelets in the base of the container, then pass the other end up through the second eyelet.



Fig 4 Fitting the closure loop

4.3.3 Attach a pull-up cord to each end of the loop. Fig 4 shows the closure loop installed and pull-up cords fitted.

PREPARING THE DIAPER (Fig 5)

5 To prepare the diaper, refer to Fig 5 and proceed as follows:

5.1 Attach 51 x 13 mm (2 x 0.5 in) elastic bands to each of the webbing tape loops (10 total), attach further bands to the left hand and right lower loops as shown in Fig 5. Attach two further bands to the two eyelets ensuring that they are positioned to the side of the flap as shown in Fig 5 and not to the lower edge of the diaper.



Fig 5 Diaper prepared

RIGGING LINE CHECK (Fig 6)

6 To carry out a rigging line check, refer to Fig 6 and proceed as follows:

6.1 Ensure that the rigging lines are free of twists and entanglements then carry out a rigging line check, at the attachment links select lines No 1 and 20 positioned at the inside edge of the upper pair of links and lines No 10 and 11 positioned inside edge at the lower pair of links (Fig 6). Trace all four lines from the links to the canopy periphery and ensure they are running clear.

6.2 Ensure each link securing screw is fully tightened if loose or if the links have been replaced the screw threads are to be treated with Loctite on re-assembly.

<u>Upper left</u>	5	4	3	2	1	20	19	18	17	16	<u>Upper right</u>
<u>link</u>	0	0	0	0	0	0	0	0	0	0	<u>link</u>
Lower left	6	7	8	9	10	11	12	13	14	15	Lower right
link	0	0	0	0	0	0	0	0	0	0	link

NOTES

(1) As viewed looking towards the canopy periphery

(2) Ensure that each link is fitted with the rounded shoulder on the inside edge of each lift web.

Fig 6 Rigging line sequence

FOLDING THE CANOPY (Fig 7, 8 and 9)

7 To fold the canopy refer to Fig 7, 8 and 9 and proceed as follows:

7.1 Separate the gores into their respective half-sets, with No 1 to 10 on the left and No 11 to 20 on the right.

Folding first stage (Fig 7)

7.2 With rigging lines 1 to 10 in the left-hand and 20 to 11 in the right-hand throw the right-hand group of lines over the left-hand. Place No 10 line onto the table and commence folding the right-hand half of the canopy by placing No 11 line onto No 10, continue folding in sequence until all gores are folded with No 20 gore on top. Straighten all the folded gores from the folded periphery to the apex and place shot bags at intervals along the gores to retain the folds in position.

7.3 To fold the left-hand gores, hold the rigging lines of the folded gores Nos 20 to 10 in the right-hand and the group of lines 1 to 9 in the left-hand. Throw the left-hand group over the right-hand group, commence folding the left hand of the canopy by placing No 9 rigging line onto No 10 continue in sequence until all gores have been folded with No 1 gore on top. Straighten the folded gores from periphery to apex and place shot bags at intervals along the gores to retain the folds in position. Fig 7 shows the first stage of folding completed.

Folding second stage (Fig 8 and 9)

7.4 Fold the bottom corner of each half-set upwards and inwards at 45 degrees so that the hem folds are aligned with the central seam, as shown Fig 8.

7.5 Fold the whole length of the right hand half-set inwards to cover the central seam and bring the folded left hand panels across to the right hand outer edge (Fig 9).

CLOSING THE DIAPER AND STOWING THE RIGGING LINES (Fig 10, 11 and 12)

8 To close the diaper and stow the rigging lines, refer to Fig 10, 11 and 12 and proceed as follows:

8.1 Fold over the periphery approximately 152 mm (6 in) and position the grouped rigging lines to run centrally over the diaper closure flap (Fig 10).



Fig 7 Folding the canopy : stage 1



Fig 8 Folding the canopy : stage 2

8.2 Fold over the diaper closure flap and ensure that the grouped rigging lines are lifted over the flap and not trapped underneath the flap.

NOTE

When forming the diaper mouthlock and stowing the rigging lines, ensure that the bights of lines protrude through the elastic bands approximately 32 mm (1.25 in) and that the outgoing lines from each stowage band emerges towards the pack and harness.

8.3 Form the diaper mouthlock by first inserting a bight of rigging lines through the top right elastic band (Fig 11), insert a second bight through the top left hand band (Fig 11).

8.4 Continue stowing the lines into the elastic bands until all bands are filled. Ensure that 305 mm (12 in) of lines remains unstowed. Fig 12 shows all the lines stowed.



Fig 9 Canopy folded



Fig 10 Closing the diaper : stage 1



Fig 11 Forming the diaper mouthlock

STOWING THE CANOPY (Fig 13 to 18)

9 To stow the canopy, refer to Fig 13 to 18 and proceed as follows:

9.1 Place the right hand lift webs within the covers located on the pack yoke (Fig 13), then close the cover over the webs and mate the touch and close fastener strips (Fig 14). Repeat the above procedure for the left hand lift webs.

9.2 Lift the diaper over onto the container and position it against the right-hand container wall as shown in Fig 15.

9.3 Form the first fold up to the stowed diaper (Fig 16). The second fold is formed as shown in Fig 17 and is made by positioning the canopy from the top left hand corner down across the container to the bottom left hand corner. The third fold is formed as shown in Fig 17 filling the side of the container nearest the packer. On completion of the third fold, ensure that both pull-up cords are emerging from the centre of the container and that the right-hand closure loop adjacent to the stowed diaper, is to the left of the diaper and not to the side Fig 17.

9.4 Form the final fold, the full length of the container, then finally fold under the apex (Fig 18).

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Fig 12 Diaper closed rigging lines stowed



Fig 13 Lift webs positioned in covers



Fig 14 Lift web covers secured



Fig 15 Lift webs and diaper positioned

CLOSING THE CONTAINER (Fig 19 to 25)

10 To close the container, refer to Fig 19 to 25 and proceed as follows:

10.1 Pass the right-hand pull-up cord through the eyelet attached to the right-hand container flap ensuring that the closure loop remains clear of the diaper, then insert a temporary locking pin through the closure loop (Fig 19).

10.2 Pass the left-hand pull-up cord through the eyelet attached to the left-hand flap, pull up the flap and insert the temporary locking pin (Fig 19).

10.3 Position the kicker plate centrally on the closed flaps as shown in Fig 20 ensuring that the curvature is uppermost.



Fig 16 Stowing the canopy : first fold



Fig 17 Stowing the canopy : second fold

10.4 Coil the connecting line onto the kicker plate, then position the base of the pilot chute onto the coiled connecting line. Fold the pilot chute fabric in 'S' folds onto the connecting line, then compress the pilot chute spring and at the same time tuck in all loose fabric Fig 21.

10.5 Retaining the pilot chute in the compress state, pass the two pull-up cords through the eyelets in the flap farthest from the packer. Pull-up the flap and remove the temporary locking pins then re-insert over the flap eyelets (Fig 22).

10.6 Finally pass the pull-up cords through the eyelets attached to the flap nearest the packer, then pull up the flap, remove the temporary locking pins and re-insert over the flap eyelets (Fig 23).

CAUTION

When finally removing the pull-up cords to ensure that the container closure loops are not seared the following method of removal is necessary:

Pass the pull-up cord under the end of the ripcord pin, then remove the cord. By using this method when the cord is removed it will run against the ripcord pin and not the closure loop.

10.7 Pull-up on the pull-up cord nearest the ripcord housing, then remove the temporary locking pin and fit the inner ripcord pin. pull up on the second pull-up cord and remove the temporary locking pin and insert the outer ripcord pin. Remove both pull-up cords. Finally fold over the ripcord protection flap and mate the touch and close fastener (Fig 25).



Fig 18 Stowing the canopy : final fold



Fig 19 Closing the container : stage 1



Fig 20 Positioning the kicker plate



Fig 21 Pilot chute compressed



Fig 22 Closing the container : stage 2



Fig 23 Container closed



Fig 24 Container closed ripcord pins fitted



Fig 25 Packing completed