

Parachutes Australia

Airforce Reserve Parachute Manual

AIRFORCE RESERVE SIZE: _____

SERIAL NUMBER: _____

DATE OF MANUFACTURE: _____

Manufactured by:

Parachutes Australia

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TABLE OF CONTENTS

TABLE OF CONTENTSi
W A R N I N G !!!
WARRANTY
TEST STANDARD
1.0 COMPATIBILITY
1.0 SUSPENDED WEIGHTS
1.2 RISER COMPATIBILITY
1.3 CONTAINER COMPATIBILITY
20 FLIGHT CHARACTERISTICS
3.0 MAINTENANCE AND REPAIR
3.2 MAINTENANCE (GENERAL)
3.3 DAILY MAINTENANCE
3.4 MINOR REPAIR
3.5 MAJOR REPAIR
3.6 AN ALTERATION
3.7 REPAIR METHODS
3.8 MODIFICATION (RECALL)
3.9 SERVICE LIFE
3.10 STORAGE

4.0	PARTS LIST	;
5.0	ASSEMBLEY INSTRUCTIONS9	,
5.1	ATTACHING TO RISERS9	,
5.2	ATTACHING TOGGLES9)
6.0	INSPECTION INSTRUCTIONS10)
6.1	VISUAL INSPECTION	,
7.0	PACKING INSTRUCTIONS	
8.0	SECONDARY PACKING METHOD27	1

WARNING !!!

RISKS OF SKYDIVING

- Skydiving has caused death and serious injuries.
- Parachutes do not always open properly, due to operator error.
- Skydiving equipment can fail even if all possible precautions are taken by the skydiver.
- Failure to activate the main or reserve parachute (or execute emergency procedures) at a safe altitude, and/or equipment failure can result in serious injury or death.

SKYDIVER RESPONSIBILITES

- Read and strictly follow all operating instructions and all manufacturers' specifications, instructions, advice and requirements for use of the equipment.
- Never attempt to use equipment prepared or assembled by unqualified persons.
- Use only manufacturer recommended compatible components.
- Examine and replace any defective, worn or deteriorated component of the equipment.
- Examine all gear and equipment, including all fittings, buckles, snaps and other fasteners before use of any parachute product.
- Use only those products designed for parachute use.
- Do not exceed recommended or stated forces, speeds or other factors regarding safe use of equipment.
- Read and follow all warning labels, manuals, instructions, training or other experience requirements and recommendations and all recognised parachute use procedures.
- Check and calibrate all altimeters, automatic activation devices (AADs) and other similar equipment before each jump.
- Comply with all product recall notices, mandatory modifications and/or Rigging Advisory Circulars (RACs) relating to the equipment.

FAILURE TO FOLLOW ALL WARNINGS, INSTRUCTIONS AND REQUIRED PROCEDURES MAY RESULT IN SERIOUS INJURY OF DEATH

WARRANTY

PARACHUTES AUSTRALIA expressly warrants that these goods will be free from defects arising from faulty material and workmanship. The liability of Parachutes Australia is limited to the replacement of defective parts found upon examination to be defective in material or workmanship within 21 days of purchase. This warranty does not apply to goods that have:

- a. Not been used in accordance with the express or implied instructions and specifications of Parachutes Australia;
- b. Altered or repaired in any way;
- c. Been subjected to abuse, misuse, abnormal stress or strain, or neglect of any kind;
- d. Become directly or indirectly defective from wear and tear;
- e. Been used after the discovery of any defect or deficiency that has not been rectified by Parachutes Australia after the purchaser has notice of such defect or deficiency.

Parachutes Australia will not accept goods returned without prior arrangement.

TEST STANDARD

The Airforce Ram Air Reserve Parachute Canopy has been tested to the requirements of the Civil Aviation Authority, Civil Air Order 103.18 Equipment Standards – Emergency Parachutes.

To demonstrate compliance with CAO 103.18, the United States Federal Aviation Administration, Technical Standard Order T.S.O - C23 (b) was used as the specification.

Parachutes Australia has the authority to identify the Airforce Ram Air Reserve Parachute Canopy with Civil Aviation Authority CAO 103.18 markings. The Airforce reserve meets the requirements for a Low Speed Category Parachute and is limited to use in aeroplanes up to 150 miles per hour.

1.0 COMPATIBILITY

1.0 SUSPENDED WEIGHTS

The Airforce Reserve Canopy is available in seven (7) sizes.

The manufacturers recommended suspended weight range for each canopy is as follows:

PART NO	SIZE	Suspended Weight Range (lbs/kgs)	
	(ft)	(lbs)	(kgs)
P036R-120/7	120	100-140	45-63
P036R-140/7	140	120-160	55-72
P036R-160/7	160	140-180	64-82
P036R-180/7	180	160-200	73-91
P036R-200/7	200	180-220	82-100
P036R-220/7	220	200-240	91-109
P036R-260/7	260	220-250	100-114

1.2 RISER COMPATIBILITY

- The Airforce Reserve has been designed and tested on Four (4) Riser Installation. It is not approved for Two (2) Riser Installation.
- The Brake Lock Rings should be located on the Rear Risers 100mm (4") below the Riser ends in accordance with APF RAC 207.
- The normal position for the control line Guide Ring is on the back side of the Rear Risers; the top of the Control Ring should be located 100mm from the canopy end of the Riser.
- Risers using velcro to hold the control Toggles in place should use the "Hook" Velcro on the Riser and "Loop" Velcro on the Toggle, the Hook Velcro should be 25mm x 125mm and should start 25mm below the bottom of the Guide Ring, centred under the Ring.

1.3 CONTAINER COMPATIBILITY

- The Airforce Reserve has been designed and tested for Free Bag Deployment only.
- Only those Pack & Harness Assemblies which are suitable for Free Bag Deployed Reserve Canopies should be used.
- The Free Bag & Pack closing procedures of the Pack & Harness manufacturer should be followed.

The following canopy volume/weights have been calculated in accordance with the Parachute Industry Association (PIA) Technical Standards TS 104, also referenced in APF RAC 202.

Part No.	Size (ft)	Volume (cu in)	Weight (lbs)
P036R-120/7	120	248	4.2
P036R-140/7	140	286	4.5
P036R-160/7	160	327	4.8
P036R-180/7	180	365	5.6
P036R-200/7	200	405	6.5
PO36R-220/7	220	468	7.1
P036R-260/7	260	517	7.8

2.0 FLIGHT CHARACTERISTICS

Even if you are familiar with Ram-Air Parachutes, including Parachutes Australia's Canopies, your new Reserve Parachute may handle differently.

In the event of a deployment of your Ram-Air Reserve, check your altitude. If there is sufficient altitude, prepare your canopy for flight as follows.

- First release the brakes by putting your hands through the toggles and pull down toggles simultaneously and vigorously.
- If necessary at this point, the slider may be pumped down by pulling both toggles down to your waist and holding them there for a few seconds and then raising them back up. If any cells are closed this action should open them. You may have to repeat this two or three times.
- Again, perform the above procedures only if there is sufficient altitude. It is better to make a smooth flared landing with collapsed end cells than to land while pumping the toggles to clear them.
- Next look for the best landing area you are sure you can reach. Keep in mind that your reserve may not glide as far as your main parachute. Your opening altitude is probably lower than normal under your reserve.
- The sooner you select the landing area, the more places you will have to chose from.
- Immediately turn toward your intended landing area.
- If there is enough extra altitude after reaching the landing area try some practice flares in the air. Note the control range and how the canopy stalls. It is much better to flare too little than too much. If you flare too much you may stall the canopy and hit the ground unusually hard.
- Set up your final approach to landing higher than normal.
- Avoid turns close to the ground.
- Remember this canopy probably flies very differently than the one you are used to. It may loose a lot more altitude in a turn than you expect.
- Always fly a conservative approach for a first-time landing on any canopy.
- Try to land into the wind. However, it is important to not be turning on landing.

3.0 MAINTENANCE AND REPAIR

3.2 MAINTENANCE (GENERAL)

- The responsibility for maintenance and repair of the Parachute lies with an appropriately qualified Parachute Rigger or Packer.
- Any suspected damage from acid, oil, water, chaffing, cuts, burred fittings, wear, sunlight, etc. should be referred to the appropriately rated Rigger (as determined below), or the manufacturer.
- Repairs may only be classified as repairs when they restore the parachute to its original condition.

3.3 DAILY MAINTENANCE

- Daily Maintenance shall mean the replacement of component parts which require assembly only.
- Daily maintenance is within the scope of an APF Packer A.

3.4 MINOR REPAIR

- A minor repair is a repair other than a major repair. For example, changing a rigging line, a basic patch or repairing stitching would be classified as a minor repair.
- All minor repairs are within the scope of an APF Rigger B.

3.5 MAJOR REPAIR

- A major repair is a repair that if improperly accomplished, might appreciably affect strength airworthiness.
- A major repair is within the scope of an APF Rigger A.

3.6 AN ALTERATION

- An alteration is any change in the configuration of any portion of a parachute from its original manufacturer specifications.
- An alteration must only be carried out by the manufacturer or with their written approval.

3.7 REPAIR METHODS

- The only approved method of repair is the re-manufacture of complete factory-like replacement of the damaged area.
- In making the repair, the parachute itself should be used as the model.
- All parts, seams and methods should exactly duplicate the original.
- For repair techniques refer to "The Parachute Manual" author Dan Poynter ISBN 0-915516-35-7, particularly Section 7.0.

3.8 MODIFICATION (RECALL)

A modification order shall be raised by the manufacturer whenever:

- a) A superior part or material becomes available which will improve the parachute's performance and/or reliability; or
- b) A defect becomes evident which requires the parachute to be recalled and modified.

Modification will be distributed through the Australian Parachute Federation Rigging Advisory Circular (RAC) System provided to all current Packers and Riggers.

3.9 SERVICE LIFE

The Airforce Reserve Parachute has a service life of 20 years from the Date of Manufacture stamped on the Parachute Canopy (whether used or in storage), due to the natural degradation of the textiles used for its manufacture.

3.10 STORAGE

The Airforce Reserve Parachute must be stored in dry shade conditions away from excessively high temperature and humidity when not in use.

4.0 PARTS LIST



5.0 ASSEMBLEY INSTRUCTIONS

Your new Parachutes Australia Airforce Reserve canopy must be assembled and packed into your parachute system by a certified Rigger. Before you begin, be sure the risers, toggles, freebag, pilot chute, harness, container and other items are compatible with you Airforce Reserve Canopy and each other.

5.1 ATTACHING TO RISERS

- Remove all grease and dirt from links, using a solvent that will leave no residue.
- Inspect the link carefully. Check for nicks, burrs or any sign of bending or stress.
- Neatly fold risers to the width of the inside of the link.
- Slide the 4 link covers over the link into the rigging lines.
- Slide link onto riser.
- Before tightening the link perform a full line check making absolutely sure that the canopy is straight.
- Now fully tighten the links.
- Place the link covers over the link and hand tack them to the reserve risers to prevent them sliding up the rigging lines.

5.2 ATTACHING TOGGLES

• Route the steering line lower loop through the guide ring on the riser then through the bottom of the grommet in the toggle

• Now slide the loop over the toggle starting at the to end of the toggle. (See the figure below)



6.0 INSPECTION INSTRUCTIONS

6.1 VISUAL INSPECTION

It is best to inspect your reserve in a careful, systematic way. We recommend starting at the top of the canopy and working down to the risers.

The following procedure is recommended:

1) TOP SURFACE

- Spread the canopy out on its bottom surface and inspect the top surface starting at the front of the left end cell.
- Check half of the cell from nose to tail.
- Then check the other half cell going from tail to nose.
- Repeat this pattern until all the cells top surfaces are inspected. Look for rips, stains or failed seams.

2) BOTTOM SURFACE

- Turn the canopy over and spread it out to inspect the bottom surface. Again use the procedure of inspecting half cells as on the top surface.
- Check for rips, stains and failed seams.
- Look very closely at the line attachments even slight damage is cause for rejection in these areas. Line attachments must be completely free of any damage or defects.

3) **RIBS**

- Inspect each rib from leading edge to the trailing edge by looking inside each cell. Pay attention to the line attachment points.
- Lay the canopy out neatly on one side staking each loaded rib on top of the others.
- Check that all lines in each line group are the same length and the trim differential between each line group is correct for this reserve .
- Check the condition of the stabilisers and slider stops on the stabiliser.

4) SUSPENSION LINES

- Check the full length of each line for damage and wear.
- Look for fraying at all cascades and where each line attaches to the connector link.
- Check that all lines are sewn and that the stitching is good.
- Check the continuity and routing of each line.

5) SLIDER

- Be sure the fabric is not torn, that the grommets are undamaged and have no sharp edges and that they are securely attached to the slider.
- Be sure every suspension line and both steering lines pass through the proper grommet on the slider.

6) **RISERS**

- Be sure the barrels of the connector links have not moved.
- The toggles must be installed correctly and must match the guide ring and velcro on the risers.

7.0 PACKING INSTRUCTIONS

STEP 1

• Flake out canopy until all seven T seams (where the non-loaded ribs meet the top skins) are straight from leading edge to trailing edge as shown in the *Figure 1*.



Figure 1

- Be sure the canopy is flaked and straight.
- Grasp the seven T seams at the leading edge in your left hand.
- Grasp the seven T seams directly above the A lines with your right hand.
- Pull tension against the rig to be sure the A lines are straight, and than fold the leading edge back under the canopy so the A-line path is on the far left as you look from canopy top toward the rig. *Figure 2*.





- Hold down the canopy at the A-line path, find the seven T seams directly above the B-line path and fold to the left, placing the B-lines on top of the A lines.
- The material between the A and B lines should now be in a fold to your right of the A and B line paths. *Figure 3 & 4*



Figure 3



Figure 4

- Hold down the canopy at the B-line path and grab the seven T seams directly on top of the C-line path.
- Fold the C lines to the left, past the B-line path as far as possible, then bring them back and lay the C lines on top of the B lines. This results in the canopy fabric between the B and C lines being folding on the left side of the canopy and the C lines are directly on top of the B lines.
- Straighten this fold as necessary. *Figure 5 & 6*



Figure 5



Diagram of the correct way to fold and stack the canopy.



Figure 6

- Take the seven T seams directly above the D-line path and fold to the left placing the D lines on top of the C-line path.
- The material between the C and D lines should be folded to the right of the lines. *Figure 7*



Figure 7

- Hold down the canopy at the D-line path and grasp the tail with your right hand.
- Fold the steering lines to the left past the D-line path and then back so that the canopy fabric between the D and steering lines is folded on the left side of the canopy and the steering lines are directly on top of the D lines.
- Make the second half of this fold on an angle so that there is just enough slack in the steering lines to set the brakes.
- The D lines should stay taut. Figure 8



Figure 8

- Straighten this fold as necessary after setting the brakes.
- Be sure none of the lines are wrapped around a slider stop. Figure 9



Figure 9

STEP 8

• Set the deployment brakes according to the harness and container manufacturer's instructions. *Figure 10*



Figure 10

- Split the tail at the centre cell and half flake the tail so there are five folds on each side from the bottom up.
- Lay the centre cell of tail on top. It should be spread out to the same width as the rest of the folded canopy. *Figure 11 & Figure 12*



Figure 11



Figure 12

- Clear the stabilisers A to B, B to C, and C to D so that they are on each side of the line path and do not cross the centre.
- Look up the lines to all the line attachment points.
- All lines should go up to the attachment points with no canopy fabric between then. *Figure 13*



Figure 13

STEP 11

• Pull up the slider by grabbing the tapes around its centre and walking from the connector links to the base of the folded canopy. *Figure 14*



Figure 14

- Grasp the tail at each edge of the centre cell and pull down until even with the lower edge of the folded canopy.
- Raise the centre cell of the tail 6 inches and inspect the D lines and steering lines. Make sure all lines are taut. *Figure 15*



Figure 15

STEP 13

• Dress the centre of the tail by spreading out the top centre panel to the width of the rest of the canopy underneath . *Figure 16*



Figure 16

• Tuck the centre tail panel around the canopy, working from bottom to top and making sure not to cover the leading edge. *Figure 17*



Figure 17

- Kneeling on the lower tail, pull the top of the folded reserve up onto your lap.
- Make sure the seven leading edge openings are exposed and that the tail is not wrapped in front of the opening.
- Lay the canopy back down and redress in preparation for inserting it in its freebag. *Figure 18*



Figure 18

FOLDING THE CANOPY TO PUT IT IN THE BAG

There are several different types of bags being used by various harness and container manufacturers. Parachutes Australia recommends three different folding techniques to prepare the canopy for placement in these bags.

If the rig manufacturer specifies a packing method other than one of those shown, you may follow its instructions.

For one and two pin containers with closing loops on a vertical centre line of the container:

STEP 1

• Fold the bottom of the folded reserve back and on top of itself making approximately a 6 inch S-fold. *Figure 1*



Figure 1

- Kneeling on this fold, carefully part the top half of the canopy into two halves.Starting from the bottom to top and using a kneading motion, mould the halves into two equal ears. Figure 2 & 3



Figure 2



Figure 3

- In the case of a two-pin centre-line configuration, a dimple should also be made between the left and right side line groups below the slider.
- Follow the harness and container manufacturer's instructions for putting the canopy into the bag. *Figure 4 & 5*



Figure 4



Figure 5

For one and two pin containers that require s-folding the canopy into the bag:

- Starting at the bottom of the canopy and working toward the top using a kneading motion, fold the canopy into a tight, narrow roll and redress the tail around so that the data panel is on top and the canopy is the width of the data panel.
- Be sure not to cover up the seven leading edge openings by repeating step 15 shown previously.
- Put the canopy into the bag on its side, following the harness and container manufacturer's instructions. *Figure 1, 2 & 3*



Figure 1







Figure 3

For two-pin containers with the closing loops side by side:

STEP 1

• Fold the bottom of the reserve canopy back onto itself making approximately a 6 inch fold. *Figure 1*



Figure 1

• Make a second S fold on top the previous fold *Figure 2*



Figure 2

- Kneeling on this fold and using a choking motion, make a side to side dimple in the canopy so that half the bulk is above the dimples and half the bulk is below the dimple.
- Parachutes Australia does not recommend the use of a strap to aid in this step. However, if you must use a strap be sure to remove the strap before closing the bag.
- Follow the harness and container manufacturer's instructions for putting the canopy in the bag. *Figure 3*



Figure 3

8.0 ALTERNATIVE PACKING INSTRUCTIONS

These packing instructions are to be read in conjunction with Airforce Reserve parachute Manual A068 assuming the steps to Figure 1 on page 12 are taken and a line configuration check completed.

Packing in the following manner allows the reserve to be split in two halves with mainly the center cell remaining in the middle which is conducive to most "molar" style freebags.

The canopy fabric will fall into the required placement better if the parachute is flaked on its side before proceeding to the stage at *Figure 1*.

Take the left hand front and rear line groups (L) in the left hand and right front and rear groups in the right hand as in *Figure 1*. The lower surface/soft rib junction should be right in the center as marked with the arrow.

Next group all the lines together in one hand and with tension on all the lines place the canopy on the ground.

Keep tension on the fabric also by using your other arm as you place the canopy on the ground as shown in *figure 2*.



Figure 1



Figure 2

Locate the left end cell and cells 2 & 3 as shown in figure 3. With tension on the four "A" lines place them on the ground away from the other lines and on top of each other as in figure 4. Fold the 3 cells Back on top of the end cell. Keep the folded edge in a straight line with the "A" lines.



Figure 3



Figure 4

Grasp the end cell and cells 2 & 3 fabric at the soft rib seam line in a straight line above the "B" line attachment point. Reach under the front of the stabilizer and locate the 4 "B" lines that the 3 cells relate to.



Figure 5

Fold the fabric over by placing the "B" lines on top of the "A". Ensure that you fold the excess fabric between the A & B lines outward as shown in figure 6



Figure 6

Take the next fold by counting 3 cells in your left hand (at the soft rib seam again). Take the 4 "C" line attachment points under the stabilizer as shown keeping tension on the fabric and line in the direction of the arrow in Figure 7.



Figure 7

Place the "C" lines on top of the "A" and "B" lines ensure that the excess fabric is placed outside the line groups. Make sure that the line groups are taut. Ref: Figure 8.

Reach under the stabilizer and grasp the 4 "D" lines and the three cells that they relate to. Again keeping the fabric outside the line group place the "D" lines over the other line groups keeping tension on the lines. Refer figures 9 & 10.



Figure 8



Figure 9



Figure 10

The next process is to "Flake" the tail by taking the two outside steering lines and place them over the other line groups folding the excess fabric between the two line groups outward at 90 degrees as shown in Figure 11. The fold is made all the way to the top as shown in Figure 12.



Figure 11

Continue flaking the tail at ¹/₂ cell increments until the center cell is reached as indicated in figure 13. place packing weights where shown to keep the line groups in place and taut.

There is now ¹/₂ of the canopy (3 cells) folded under the packing weights with the center cell right beside the stacked fabric and line groups.

The process so far can be repeated for the other side of the parachute by starting with the three end cells as shown in figure 14.Make sure that the lines are taut and place the 4 "A" lines that relate to the 3 end cells on the ground. Fold them back as shown in figure 15.



Figure 12



Figure 13



Figure 14



Figure 15

As with the other side of the parachute take the B,C & D lines and place them over each other folding the excess fabric outward as shown In figure 16. During this stage it may be necessary to move the left and right stacked line groups closer toward each other or the center. The tail can also be flaked in the same manner as for the other side. This should give the appearance as shown in figure 17. Note that the excess fabric in the center is the center cell only which gives a good layout for molar freebag packing.

From the top of the canopy pull the center seam of the center cell towards the top until it starts to pull tension on the center 2 :"A" lines and form a "V" in the center As shown in figure 18.



Figure 16



Figure 17



Figure 18

The slider can now be taken up to the canopy by grasping the top (Canopy side) in the center and sliding it all the way up the lines until the slider grommets are seated up against the canopy slider stops on the stabilizer as shown in figure 19. The stabilizers can also be folded in towards the center under the slider as shown in figure 20.



Figure 20



Figure 19



Figure 21

The next step is to prepare for the tail of the parachute to be wrapped around the left and right sides of the stacked canopy. Pull the tail down to the level as shown in figure 22. Then kneeling on lower edge of the tail and slider pull center tail fabric out all the way up to the top so that it is as wide as the layers underneath as shown in figures 21 and 22.



Figure 22

The next step is to wrap both the left and right edges of the canopy under and towards the center to the width of the freebag. As not to "bunch" the canopy fabric in towards the center. This is best done by kneeling directly on the center and gradually rolling the fabric under towards the center As shown in figure 23.



Figure 23

Do the same to the other side starting from a position as shown in figure 24 until the shape is achieved as shown in Figure 25.

This shape should be as wide as the freebag width.



Figure 24



Figure 25

1.1.1.1 Please now follow the harness and container manufacturers instructions for folding the parachute to be placed inside the freebag.