LINDSTRAND BALLOONS

This Flight Manual has been prepared for the following balloon:

Registration: .....

Serial No.: .....

Volume: .....

Type: .....

Build Standard: .....

I hereby certify that this Flight Manual, as prepared for the above balloon and incorporating the amendments listed, conforms to the build standard of the above balloon at the time of issue of the Certificate of Airworthiness.

Signed: ..... Date: .....
For Lindstrand Balloons
EASA Approval Ref. No. EASA.21J.175

Applicability

This Flight Manual applies to all natural shaped Lindstrand Balloons balloons. For special shaped balloons it must be used in conjunction with the relevant special shape Flight Manual Supplement. For an explanation of the build standard number see Section 1.7.

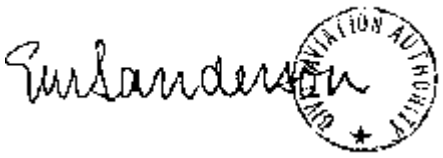
Certification Basis

The certification basis is BCAR 31, Issue 1 and to EASA Certification Specification 31 HB Draft CG9 dated February 2003. This Flight Manual provides information for the operation of Lindstrand Balloons balloons in all operational categories.

APPROVAL STATEMENT

The Civil Aviation Authority of the United Kingdom hereby signifies approval of the data listed in this document. This Flight Manual was first approved on 20 May 1993.

Signed & Sealed



Record of Amendments

No.	Date	Affected Pages	Approval
33	08/05	iii, iv, 3b, 4, 13, 14	Revision No. 33 to AFM, ref. LB HABFM is approved under the authority of DOA number EASA.21J.175.
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35	01/07	iii, iv, 3, 3a, 7a, 9a, 11a	EASA Approval EASA.BA.C.01063, dated 5 February 2007
36	05/07	iii, iv, v, vi, 1, 3b, 4, 12, 15a, 18, S13-1, S14-1	EASA Approval EASA.BA.C.01097, dated 18 June 2007
37	01/08	ii, iii, iv, v, vi, 1, 2, 3, 12, 13, 15b, 15c, 15d, 16, 17, 19, S1A-1.38-1, S15-1	EASA Approval EASA.BA.C.01149, dated 5 June 2008

Amendments

This manual is kept up to date by amendments consisting of looseleaf pages, required to add new information or amend existing information. Pages affected by an amendment and the effective date are shown above. The pages themselves are identified by a change of the issue number at the bottom of each page. The number after the point in the issue number represents the amendment level of that page, eg the page marked Issue 1.4 is at Issue 1, modified by Amendment 4. The checklist of pages indicates the issue level of all pages included in this Flight Manual.

Change of Ownership

If the ownership of this balloon changes, it is important for the new owner to contact Lindstrand Balloons to ensure that they receive Flight Manual Amendments and Supplements, as appropriate. This can be simply achieved by photocopying Page ii of this manual and writing your name and full correspondence address on the reverse side and sending to Lindstrand Balloons.

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FLIGHT MANUAL SUPPLEMENTS

Supplement No.	Title	Tick if Applicable
1	Special Shape Supplement	
2	Superchute Deflation System	
3	Lindstrand Cloudhopper	
4	Removable Cross Partitions	
5	Passenger Protection System	
6	Q-Vent Deflation System	
7	60cm x 90 cm Lightweight Collapsible Basket	
8	LB 48L Envelope	
9	Series 2 Cloudhopper Bottom End	
10	152 x 260 cm Double-T Wheelchair Version Basket	
11	LB 60X	
12	Fire Balloons Operating Instructions	
13	Easy Access Baskets	
14	Basket Occupancy	
15	Ultramagic SA Equipment	

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SECTION 1
OPERATIONAL LIMITATIONS

1.1 Limitations

1.1.1 The balloon must not be flown if it has been modified without the approval of the national airworthiness authority in the state of registration.

1.1.2 The balloon must not be flown if there is any damage to the envelope fabric which is above the first 4 m and is larger than 25 mm (1") in any one direction, or closer than 19 mm (3/4") to any load tape. Unrepaired fabric damage in the bottom 4 m of the envelope must not appear on more than six individual panels. No unacceptable damage is permitted to load tapes, suspension system, burners or fuel system components.

1.1.3 Any damage must be repaired in accordance with the instructions contained in the approved Maintenance Manual. All repairs must be noted in the balloon log book and approved by the appropriate authority.

1.1.4 The minimum crew required is one pilot. The pilot must be suitably qualified to conduct the flight.

1.1.5 The fuel for the burner is water-free LPG. Propane is the preferred fuel, but some content of other hydrocarbons is permissible, provided that minimum recommended fuel pressures are maintained throughout the flight.

1.1.6 The balloon should not be flown in meteorological conditions that give rise to erratic and gusty winds, which could cause an increase of 10 knots above the mean wind speed. The maximum surface wind speed for take off and landing is 15 knots.

1.1.7 The balloon must not be flown into contact with power lines.

1.1.8 The maximum rate of climb and descent for all natural shaped envelopes is 5 m/s (1000 ft/min), with the exception of envelopes larger than 12,000 m^3 (424,000 cu.ft.) when the maximum climb and descent rate is limited to 4 m/s (800 ft/min). When in flight, the parachute vent must not be held open for more than 3 seconds. If further venting of hot air is required, the parachute must be allowed to completely reseal before being operated again.

1.1.9 A minimum of one fuel cylinder for each burner coil of the burner assembly to be available on take-off. The fuel cylinders must be capable of supplying uncontaminated vapour to the burner if the particular burner assembly has vapour pilot lights.

1.1.10 The maximum continuous envelope temperature that is permitted is 125ºC (257ºF). The never exceed temperature for the envelope is 127ºC (261ºF).

1.1.11 The maximum weight must never be exceeded (see Section 1.5.1). In addition, the balloon loading must not exceed the figure specified in the universal loading chart in Section 1.5.3.

1.1.12 When conducting night VFR flights, navigation lights which satisfy the national regulations must be used.

1.2 Limitations for UK Passenger Transport Category

The following limitations only apply to balloons which have a UK Certificate of Airworthiness in the Transport Category. However, adherence is strongly recommended for all balloons, provided that this does not create conflict with any particular national requirements.

1.2.1 The balloon must not be flown without the nylon rods to support the burner in place.

1.2.2 The maximum number of passengers permitted is nineteen. The maximum number of occupants that are permitted in one compartment of a basket is six.

1.2.3 Only free flights may be undertaken in this certification category.

1.2.4 The baskets must provide at least one handhold per occupant.

1.2.5 The burner system must be fully duplicated so that no single failure will lead to loss of control of the balloon.

1.3 Limitations to Equipment Interchangeability

1.3.1 Fuel Cylinders

The baskets and burners listed in Sections 1.5 or 1.6 must only be used with the fuel cylinders listed in Tables 4, 7, 10, 13, 16, and 19 which are identified as being suitable for use with all baskets.

1.3.2 If a basket, burner and load frame which have been manufactured by Thunder & Colt Ltd, Cameron Balloons, Sky Balloons Ltd, Fire Balloons GmbH, or Ultramagic SA is required for use with a Lindstrand Balloons manufactured envelope, then the following conditions must be met:

a) The basket, burner and load frame must be manufactured by the same company. If this is not the case the combination of equipment will be subject to a specific approval statement.

b) The combination of basket, burner and load frame must have been previously approved.

c) The type of basket and burner must appear in relevant tables contained in Section 1.6.

1.3.3 The serial numbers of the basket, burners, fuel cylinders, and envelope, must be recorded in the envelope log book, irrespective of the manufacturer. If any of the constituent parts of the balloon system are changed, this change must be recorded and approved (in the envelope log book) by a qualified inspector.

1.4 Limitations for Tethered Flights

1.4.1 The maximum surface wind speed for a tethered flight is 10 knots.

1.4.2 The maximum balloon loading must not exceed 75% of the Maximum Weight of the balloon, shown in Section 1.5.1, or the weight permitted under the ambient conditions, as shown in Section 1.5.3 if this is less than 75% of the Maximum Weight.

1.4.3 The basket of the balloon must not exceed a height of 30 m above ground level when tethering.

1.4.4 Only bulbous shaped (natural shaped) envelopes may be tethered.

1.5 Load Calculations

1.5.1 Maximum Mass

The Maximum Mass (MM) is the figure used in the design and certification of the envelope and this weight must never be exceeded. The Maximum Mass for all Lindstrand Balloons envelope sizes are tabulated below:

TABLE 1 - LINDSTRAND ENVELOPES

Balloon Type		Volume		FAI	Maximum Mass		Envelope Weight	
		cu.m	cu.ft	Class	kg	Lbs	kg	lbs
A-Type	42	1190	42000	AX5	420	924	46	101
A-Type	56	1590	56000	AX6	560	1232	62	136
A-Type	60	1700	60000	AX7	600	1320	65	143
A-Type	69	1950	69000	AX7	690	1518	76	167
A-Type	77	2180	77000	AX7	770	1694	84	185
A-Type	90	2550	90000	AX8	900	1980	99	218
A-Type	105	2970	105000	AX8	1050	2310	115	253
A-Type	120	3400	120000	AX9	1200	2640	132	290
A-Type	150	4250	150000	AX10	1450	3190	165	363
A-Type	180	5100	180000	AX10	1630	3586	176	387
A-Type	210	5950	210000	AX10	1890	4180	209	460
A-Type	240	6800	240000	AX11	1940	4268	242	532
A-Type	260	7362	260000	AX11	2270	4994	259	570
A-Type	310	8780	310000	AX11	2700	5940	291	640
A-Type	317	8976	317000	AX11	2760	6072	300	660
A-Type	330	9344	330000	AX12	2875	6325	305	671
A-Type	360	10194	360000	AX12	3132	6890	348	766
A-Type	400	11327	400000	AX12	3400	7480	350	770
A-Type	425	12034	425000	AX12	3610	7942	400	880

Balloon Type		Volume		FAI	Maximum Mass		Envelope Weight	
		cu.m	cu.ft	Class	Kg	Lbs	kg	lbs
S-Type	210	5950	210000	AX10	1890	4180	263	579
S-Type	260	7362	260000	AX11	2270	4994	331	728
S-Type	317	8976	317000	AX11	2930	6446	382	840

Balloon Type		Volume		FAI	Maximum Mass		Envelope Weight	
		cu.m	cu.ft	Class	Kg	lbs	kg	lbs
B-Type	56	1590	56000	AX6	560	1232	74	163
B-Type	69	1950	69000	AX7	690	1518	82	180
B-Type	77	2180	77000	AX7	770	1694	90	198
B-Type	90	2550	90000	AX8	900	1980	110	242
B-Type	105	2970	105000	AX8	1050	2310	121	266

Balloon Type		Volume		FAI	Maximum Mass		Envelope Weight	
		cu.m	cu.ft	Class	kg	lbs	kg	lbs
C-Type	500	14158	500000	AX13	4250	9350	442	972
C-Type	600	16886	600000	AX14	5100	11220	530	1166

1.6 Equipment Interchangeability

For each size of Lindstrand envelope, there are a range of different sizes of baskets, burners and cylinders which are designed to be used. The scope of fitment for each of these components is shown on tables 1 - 3 inclusive, in Section 1.5. Furthermore, because of the uniformity of interface between the envelope range manufactured by Lindstrand Balloons, and the load frames, basket, burners and cylinders manufactured by Cameron Balloons, Thunder & Colt Ltd, Sky Balloons Ltd, Fire Balloons, and Ultramagic Balloons, a degree of interchangeability exists such that basket, burner and load frames manufactured by these companies, can be used with Lindstrand Balloons manufactured envelopes. It should be noted that if any equipments that are manufactured by any of the above manufacturers are used with Lindstrand manufactured envelopes, then the operating limitations, maintenance schedules and instructions for continued airworthiness which have been published for those equipments must be adhered to. The scope of fitment for each of the components, along with the indicative empty weight is given in the following tables:

1.6.1 Cameron Balloons Equipment

Table 5 - CAMERON BASKETS

BASKET NO.	BASKET SIZE CM	BASKET STYLE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
				KG	LBS
61	112 x 112	Open	42	45	99
62	112 x 124	Open	56 - 69	60	132
63	112 x 147	Open	69 - 120	65	143
64	122 x 157	Open	90 - 120	70	154
65	122 x 189	Open	120 - 150	95	209
66	135 x 195	P	120 - 150	100	220
67	144 x 230	ST	150 - 180	165	363
68	170 x 236	ST	150 - 180	180	396
69	170 x 282	ST	210 - 240	185	407
70	170 x 266	DT	180 - 240	195	429
71	170 x 305	DT	210 - 310	225	495
72	170 x 347	DT	240 - 310	245	539
73	76 x 96 (CB3116)	Mini	31 - 56	45	99
74	Duo Air Chair (CB8340)	Seat	42 - 77	35	77
75	Folding Basket (CB3327)	Open	69 - 105	59	130
76	170 x 360 (CB3040)	DT	240 - 500	350	770
77	CB8320 Hopper	Seat	21 - 35	17	37

Notes

a) The basket dimensions refer to nominal outside dimensions.

b) The empty weight figure is an indicative figure. The actual basket weight is shown in the aircraft log book.

c) Under basket style 'P' stands for one partitioned wall.

TABLE 6 - CAMERON BURNERS

BURNER NO.	BURNER TYPE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
			KG	LBS
51	Mk 4 Single	42 - 90	17	37
52	Mk 4 Double	42 - 180	24	53
53	Mk 4 Super Double	42 - 180	24	53
54	Mk 4 Super Triple	120 - 260	44	97
55	Mk 4 Super Quad	180 - 425	55	121
56	Mk 4 Super Shadow Double	42 - 180	24	53
57	Mk 4 Super Shadow Triple	120 - 317	44	97
58	Mk 4 Super Shadow Quad	180 - 500	55	121
59	Stealth Double	42 - 180	24	53
60	Stealth Triple	120 - 260	45	99
61	Stealth Quad	180 - 500	56	123
62	Shadow Mini Burner	31 - 90	14	31
63	Shadow Single	42 - 90	19	42
64	Sirocco Double	42 - 210	24	53
65	Sirocco Triple	120 - 317	44	97
66	Sirocco Quad	180 - 500	52	115
67	Stealth & Shadow Quad (CB2097-2A)	180 - 500	52	115

TABLE 7 - CAMERON CYLINDERS

CYLINDER TYPE	EMPTY WEIGHT		FUEL CAPACITY		FULL WEIGHT		APPLICABLE BASKET RANGE
	KG	LBS	KG	LBS	KG	LBS	
CB 497	16	35	20	44	36	79	All
CB 599	17	37	22	48	39	85	All
CB 426	22	48	28	61	50	109	All
CB 959	26	57	35	77	61	135	All
CB 2380 (60)	14	31	28	62	42	93	All
CB 2383 (80)	16	35.2	35	77	51	112	All
CB 2385 (40)	12.5	27	20.5	45	33	73	All
CB 2387 (T60)	14	31	26	57	40	88	All
CB 2900 (45)	20	44	23	50	43	94	All
CB 2901 (60)	22	49	30	66	52	115	All
CB 2902 (54)	23	51	27	59	50	132	All
CB 2903 (72)	26	57	36	79	62	137	All
CB 8404	19	42	20	44	39	85	Air Chair Only
CB 250 (Worth.)	14	31	20	44	34	75	All

Notes

a) Under the column "Basket Range", the appearance of the word "All" denotes that the cylinder can be used with all sizes of baskets in all operational categories, regardless of the basket manufacturer, provided the basket size appears in Section 1.5 or 1.6.

TABLE 16 - FIRE BALLOONS CYLINDERS

CYLINDER TYPE	EMPTY WEIGHT		FUEL CAPACITY		FULL WEIGHT		APPLICABLE BASKET RANGE
	KG	LBS	KG	LBS	KG	LBS	
VA50	14.6	32	21.2	46.5	35.8	78.5	All
VA70	18.6	41.7	30	66.1	48.6	107.8	All

Notes

a) Under the column “applicable basket range” the appearance of the word “all” denotes that the cylinder can be used with all sizes of baskets in all operational categories, regardless of the basket manufacturer, provided the basket size appears in Section 1.5 or 1.6.

1.6.5 Ultramagic SA Equipment

TABLE 17 - ULTRAMAGIC BASKETS

BASKET NO.	BASKET SIZE CM		BASKET STYLE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
					KG	LBS
170	C0	70 x 80	Open	31 - 42	45	99
171	C1	100 x 120	Open	60 - 120	56	123
172	C2	100 x 100	Open	31 - 90	50	110
173	C3	110 x 130	Open	69 - 180	76	167
174	C4	120 x 160	Open	90 - 180	95	209
175	C5	140 x 220	S-T	120 - 240	160	352
176	C6	130 x 180	P	120 - 180	106	233
177	C7	140 x 200	P	120 - 180	122	268
178	C8	150 x 260	DT	180 - 260	175	385
179	C9	160 x 300	DT	210 - 330	250	550
180	C10	115 x 145	Open	60 - 120	85	187
181	C11	170 x 350	DT	210 - 425	340	748
182	C12	160 x 425	DT	300 - 425	360	792

Notes

a) The basket dimensions refer to the nominal dimensions.

b) The empty weight figure is an indicative figure. The actual basket weight is shown in the aircraft log book.

TABLE 18 - ULTRAMAGIC BURNERS

BURNER NO.	BURNER TYPE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
			KG	LBS
160	Mk 2 Simple	31 - 90	14	31
161	Mk 2 Double	56 - 180	19	42
162	Mk 2 Triple	105 - 260	25	55
163	Mk 2 Super Simple	31 - 90	15	33
164	Mk 2 Super Double	56 - 180	21	46
165	Mk 2 Super Triple	105 - 260	28	62
166	Mk 2 Super Quad	180 - 425	36	79
167	Mk 10 Simple	31 - 90	15	33
168	Mk 10 Double	56 - 180	21	46
169	Mk 10 Triple	105 - 260	28	62
170	Mk 10 Quad	180 - 425	35	77
171	Mk 21 Simple	31 - 105	17	37
172	Mk 21 Double	56 - 210	24	53
173	Mk 21 Triple	105 - 310	34	75
174	Mk 21 Quad	180 - 425	43	95
175	BMK-008 Single	31 - 105	11.9	26
176	BMK-008 Double	56 - 210	20.8	46
177	BMK-050 Double	180 - 300	19.9	44
178	BMK-050-Triple	250 - 425	30.1	66
179	BMK-050 Quad	355 - 425	40.8	90

TABLE 19 - ULTRAMAGIC CYLINDERS

CYLINDER TYPE	EMPTY WEIGHT		FUEL CAPACITY		FULL WEIGHT		APPLICABLE BASKET RANGE
	KG	LBS	KG	LBS	KG	LBS	
M20 & M20D	15	33	20	44	35	77	All
M30 & M30D	20	44	30	66	50	110	All
M40 & M40D	24	53	40	88	64	141	All

Notes

a) Under the column “applicable basket range” the appearance of the word “all” denotes that the cylinder can be used with all sizes of baskets in all operational categories, regardless of the basket manufacturer, provided the basket size appears in Section 1.5 or 1.6.

1.7 Build Standards

The Build Standard number is a quick reference number which identifies the various components which make up a particular balloon system

eg, 77A.03.02.0

This reference is comprised of four number groups. The first number group identifies the envelope size and type. In the above example, 77A means a 77,000 cu.ft envelope of the A-type pattern.

The second number group represents the type of basket being used, and may be cross-referenced with the basket numbers shown on Tables 2, 5 and 8 in Section 1. In this example, 03 represents a 110 cm x 155 cm size of basket.

The third number group shows which type of burner is being used and this number is cross-referenced to Tables 3, 6 and 9 in Section 1. In this example, 02 shows that a Jetstream Double burner is being used (Table 3).

The fourth number shows any modifications to the original design standard that apply to the overall balloon system. This number is the same as the applicable modification number. If there are no applicable modifications, then 0 is inserted as shown above.

SECTION 2
NORMAL PROCEDURES

2.1 Assembly of the Balloon

Correct assembly of the balloon is achieved either by the used of colour coded items or by identification of unique features. During assembly perform the pre-flight inspections required in the maintenance schedule.

2.1.1 Erecting the Burner

Insert the four nylon rods into the sockets provided on the burner frame. Stand the burner upright on the ground and lift the burner and rods up and over the sockets in the top frame of the basket. Orientation of the burner to the basket should be such that the support rods are straight and that the burner controls can be reached by the pilot, eg the offset type burner must be positioned over the pilot compartment in a T-partition type basket.

The stainless steel flying wires are attached to the burner frame by inserting the eye of the wire into the inverted U-shaped bracket on the burner frame. A carabiner is then passed through the hole in the bracket, through the eye of the wire and out the other side of the bracket. This procedure is repeated at each corner of the burner frame. On larger baskets, two wires are provided at each corner. In this case the second eye is also threaded on to the same carabiner so that it lies closest to the short side of the basket. Great care must be taken to ensure that all carabiners, once fitted in place, are securely closed by screwing the collar so that it covers the join in the gate. Cameron and Ultramagic burner frames are fitted with a plate instead of an inverted U-shaped bracket. In this case, the basket wire thimbles are positioned either side of the plate and the carabiner passed through all three items in the same way.

2.1.2 Installing the Fuel Cylinders

Fuel cylinders are strapped into the baskets. Four universal strap holes are provided for each cylinder in order to retain them in position. If a burner is being used with the balloon which is equipped with vapour type pilot lights, then the correct orientation of the cylinders in the basket must be achieved. During inflation, when the basket is laid onto its side, the cylinder must be orientated so that on all stainless steel upright cylinders, the maxfill valve is lowermost. Worthington aluminium cylinders can be similarly orientated by ensuring that the two round holes in the top collar are facing downwards. The downside of horizontal cylinders is indicated by a green label. If the burner being used is equipped with liquid pilot lights, the orientation of cylinders is not important, provided the cylinders are full for inflation.

2.1.3 Fuel Connections

Ensure that the tank valves and all burner valves are turned off. Attach the quick connectors for the liquid hoses and vapour hoses, if fitted. Check each connection for pressure integrity by turning on each cylinder valve in turn and observe by looking, listening and smelling the connection. If no leak can be detected, open the pilot light valve(s) and light the pilot light. Check that it is operating correctly. Open the liquid valve on the cylinder and open the main blast valve to ensure correct operation of the burner. Operate each function of the burner singly, eg liquid fire and cross over valve. If a hydraulic remote control is fitted, this should be connected and tested. When the hydraulic handle is depressed, the valve on the burner should open fully.

Once the burner test is successfully completed, close the cylinder valves and vent the remaining fuel through the burner. This test should be repeated for each coil of a burner, and each cylinder, to ensure fuel flow.

2.1.4 Rod Covers

Rod covers are fitted over the basket wires and the nylon rods, to provide protection. The liquid hoses, supplying the burners, can be fitted inside the covers or restrained to the outside of the covers for ease of changing the fuel supply during flight.

2.1.5 Passenger Briefing

It is best to conduct much of the passenger briefing at this stage of the preparations for flight, because there is no noise or haste to cause distractions. Items to include are identification of controls and their purpose, how and when to enter and exit the basket, position during flight, what to hold on to, etc.

2.1.6 Connection of Envelope

Lay the basket over on to its side with the burners pointing downwind, so that either of the longest basket sides is touching the ground. All baskets should be laid over so that cylinders will be correctly orientated, if necessary. Cameron open baskets should be laid over so that the footstep is uppermost. Thunder & Colt baskets should be laid over so that the basket wire with the red sleeving should be on the right hand side, closest to the ground. It is normal for T-partition baskets to be laid down with the pilot's compartment on the right hand side. Open the envelope bag and remove the mouth of the envelope. This is easily identified because of the nomex fabric. Spread the mouth of the envelope until the red marker is located. This marker signifies the middle point of the downside. This then permits the groups of flying wires to be identified and to be connected up to the respective corners of the burner frame. It is most important to ensure that the wires connected to each carabiner are not crossed, twisted or kinked. If a tethered flight is contemplated, a set of tether rings should be introduced between the carabiner on the load frame and the carabiner on the ends of the flying wires. Ensure that the restraint system is fitted on to either the tether rings or the upper set of carabiners. All the flying wires and the restraint system should be fitted, and the relevant carabiners locked prior to the remainder of the envelope being removed from the bag.

2.2 Inflation Procedure

2.2.1 Laying Out

Remove the remainder of the envelope from the bag by pulling the bag downwind. Fully deploy the crown line, ensuring that it is not wrapped around the overlying tapes. Spread out the envelope, making sure that the envelope is only handled on the load tapes.

2.2.2 Cold Inflation

Position the inflation fan on the left hand side of the basket so that it is directed at the parachute. Start it. Hold both sides of the balloon mouth open to begin the inflation.

2.2.3 Sealing the Parachute

The parachute vent must be retained in position during the inflation stages. This is achieved by pressing the velcro tabs together to hold the edge of the parachute close to the edge of the envelope. Correct alignment between the envelope and parachute is achieved by matching the gore identification labels on the top rim and on the edge of the parachute. Sealing the parachute is most easily achieved when the balloon is inflating.

2.2.8 Pre Take Off Checks (continued)

(g) Pilot light flames strong and stable.
(h) Fuel cylinders secured and sufficient.
(i) Ignition - two sources present.
(j) Fire extinguisher charged, if used.
(k) Instruments present and set, including radios, if used.
(l) Maps for flight path present, if required.
(m) Telephone number for retrieval.
(n) Passengers completely briefed and in the basket.
(o) Maximum weight for conditions not exceeded.
(p) Required documents present and correct.

2.3 Flight Procedures

2.3.1 Take Off

Take off is achieved by increasing the internal temperature of the envelope by repeated use of the burner. The simplest way of establishing whether the lift is sufficient, is to use the traditional "hands off - hands on" method.

2.3.2 In-Flight Control

Balloons possess positive control in only the vertical dimension, by use of the burner to go up and the parachute, or natural cooling to descend.

When operating close to the minimum landing mass shown in Section 1.5.1.1, it should be noted that there is a significant reduction in response from the turning vents.

2.3.3 Changing Fuel Cylinders

The procedure for changing the fuel cylinder which is supplying the burner is as follows:

(a) Close the liquid valve on the empty cylinder.
(b) Open the burner blast valve to vent fuel from the hose.
(c) Disconnect the connector on the liquid hose and transfer to the full cylinder.
(d) Open the liquid valve, relight the pilot light if necessary, and test fire the burner.

2.3.4 Landing

Select a suitable landing site and initiate a descent towards it. Control the descent rate by using the parachute and burner. Immediately before touchdown, turn off the pilot lights and if possible close the liquid valves and vent the fuel lines. Pull the parachute line to begin the deflation process. Keep the parachute open to continue deflating the envelope. When the pilot thinks that the balloon is sufficiently heavy, a crew member can exit the basket and pull the crown line away from the basket. This contributes towards a faster deflation. If the balloon is fitted with a velcro rip system, this is operated in a similar manner, except there is more operating line to pull. If the liquid valves have not yet been turned off, this should now be done and the remaining fuel vented through the burner safely.