





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.
34	04/06	iii, iv, 2, 3, 12, 13, 14, 15	Revision No. 34 to AFM, ref. LB HABFM is approved under the authority of DOA number EASA.21J.175.
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

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

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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	
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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 m³ (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 125°C (257°F). The never exceed temperature for the envelope is 127°C (261°F).
- 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.



1.5.2 Empty Weight

The indicative empty weight for any balloon can be calculated by adding the weights of the individual components of the system. The weights of the differing models of Lindstrand Balloons baskets, burners and cylinders, are given below.

1.5.2.1 Baskets

TABLE 2 - LINDSTRAND BASKETS

BASKET NO.	BASKET SIZE CM	BASKET STYLE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
				KG	LBS
01	110 x 115	Open	42 - 105	69	152
02	110 x 130	Open	56 - 105	75	165
03	110 x 155	Open	69 - 120	88	194
04	100 x 85	Open	21 - 42	50	110
05	98 x 113	Open	42 - 90	61	134
06	100 x 125	Open	42 - 105	68	150
07	100 x 137	Open	56 - 105	70	154
08	122 x 145	Open	77 - 120	91	200
09	96 x 102	Open	42 - 90	55	121
10	125x 125	Open	105 - 120	80	176
11	125x 165	Open	90 - 150	101	222
12	125x 185	ST	90 - 150	158	348
13	125x 205	ST	120 - 180	169	372
14	125x 220	ST	120 - 180	180	396
15	125x 260	DT	120 - 210	207	455
16	125 x 175	Open	90 - 150	110	242
17	125 x 205	P	120 - 180	160	352
20	152 x 205	ST	150 - 210	198	436
21	152 x 240	ST	180 - 240	233	513
22	152 x 270	ST	180 - 310	260	572
23	152 x 260	DT	180 - 310	255	561
24	152 x 300	DT	180 - 400	300	660
25	152 x 350	DT	180 - 400	350	770
26	152 x 390	DT	240 - 500	390	858
27	152 x 430	DT	310 - 500	430	946
28	152 x 300	ST	180 - 350	289	636
29	152 x 325	DT	180 - 350	321	706
30	152 x 280	DT	180 - 310	285	627
31	140 x 270	DT	150 - 310	245	539
32	140 x 300	DT	180 - 350	272	598
33	140 x 390	DT	180 - 500	359	790
34	140 x 240	DT	120 - 240	218	480
35	140 x 240	ST	120 - 240	207	455
36	140 x 270	ST	150 - 310	242	532
37	140 x 340	DT	180 - 350	313	689
39	152 x 280	DP	180 - 310	275	605
40	129 x 247	ST	120 - 210	200	440
41	135 x 285	ST	150 - 310	245	539
45	152 x 550	DT	425 - 600	646	1421
204	170 x 360	DT	240 - 500	342	752
50	152 x 610	DT	500 - 600	684	1505

For notes on the use of the above table, see overleaf.



Notes

- a) The basket dimensions refer to outside dimensions.
- b) ST stands for Single T-Partition and similarly, DT stands for Double T-Partition. P stands for a single partition.
- c) The applicable size range of envelopes includes the sizes given, eg 42 - 90 means any envelope in the range between 42,000 cu.ft and 90,000 cu.ft.
- d) The empty weight figure is an indicative figure for the basket size, including the basket, padding, nylon support rods and covers. It should be noted that the actual basket weight is shown in the aircraft log book for each individual balloon.

1.5.2.2 Burners

TABLE 3 - LINDSTRAND BURNERS

BURNER NO.	BURNER TYPE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
			KG	LBS
1	Jetstream Single	42 - 90	17	37
2	Jetstream Double	42 - 210	22	48
3	Jetstream Double + CLF	120 - 317	25	55
4	Jetstream Triple	120 - 317	31	68
5	Jetstream Triple + CLF	150 - 500	35	77
6	Jetstream Quad	180 - 600	42	92
7	Jetstream Supersingle	42 - 105	18	40
8	Jetstream Series 2 Double	42 - 210	23	51
10	Jetstream Series 2 Triple	120 - 317	32	71
12	Jetstream Series 2 Quad	180 - 500	43	95
13	Jetstream Series 2 Super Quad	500 - 600	77	170

Notes

- a) The applicable size range of envelopes includes the sizes given, in 1,000's cu.ft.

1.5.2.3 Cylinders

TABLE 4 - LINDSTRAND CYLINDERS

CYLINDER TYPE	EMPTY WEIGHT		FUEL CAPACITY		FULL WEIGHT		APPLICABLE BASKET RANGE
	KG	LBS	KG	LBS	KG	LBS	
Mini Worthington	3.6	8	3.4	7.5	7	15.5	All
Worthington	14	31	20	44	34	75	All
V20	14	31	20	44	34	75	All
V30	18	40	30	66	48	106	All
V40	20	44	40	88	60	132	All
H30	17	37	30	66	47	103	152 Width or Larger
H40	19	42	40	88	59	130	152 Width or Larger
H55	25	55	55	121	80	176	152 Width or Larger
T30	10	22	30	66	40	88	All

For notes on the use of the above table, see overleaf.



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 within the UK Transport Category. 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, and Fire 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 13 - SKY BALLOONS CYLINDERS

CYLINDER TYPE	EMPTY WEIGHT		FUEL CAPACITY		FULL WEIGHT		APPLICABLE BASKET RANGE
	KG	LBS	KG	LBS	KG	LBS	
V30-1000	18	40	30	66	48	106	All
V30-2000	18	40	30	66	48	106	All
V30-3000	18	40	30	66	48	106	All
V30-4000	18	40	30	66	48	106	All

Notes

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

1.6.4 Fire Balloons GmbH Equipment

TABLE 14 - FIRE BALLOONS BASKETS

BASKET NO.	BASKET SIZE CM	BASKET STYLE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
				KG	LBS
141	I/2 (107 x 95)	Open	42 - 69	47	103
142	II/3 (125 x 100)	Open	56 - 90	55	121
143	III/4 (130 x 115)	Open	77 - 105	63	138
144	V/5 (155 x 120)	Open	90 - 120	68	150
145	V-A/5 (155 x 120)	Open	90 - 120	68	150
146	VI/6 (175 x 125)	Open	90 - 150	78	172
147	VII/7 (180 x 140)	S-T	120 - 180	140	308
148	VIII/8 (215 x 140)	S-T	120 - 180	160	352
149	VIII/9 (235 x 140)	D-T	150 x 240	205	451
150	IX/11 (250 x 170)	D-T	180 - 240	245	539
151	X/13 (275 X 175)	D-T	180 - 240	290	638

- a) The applicable size range of envelopes is given in 1,000's of cubic feet.

TABLE 15 - FIRE BALLOONS BURNERS

BURNER NO.	BURNER TYPE	ENVELOPE SIZE RANGE	EMPTY WEIGHT	
			KG	LBS
141	Double FBV	42 - 180	22	48
142	Double FB6	42 - 180	23	51
143	Triple FBV	180 - 310	37	81
144	Triple FB6	180 - 310	39	86
145	Quad FBV	180 - 310	65	143
146	Quad FB6	180 - 310	66	145

- a) The applicable size range of envelopes is given in 1,000's of cubic feet.



2.2.4 Sealing a Combination Rip

The combination rip deflation system has a parachute embedded within a larger velcro rip panel. The parachute is sealed as described above. The rip panel is best sealed by progressing from one end, in panel by panel stages. For each panel two people should stretch both halves of the velcro, and once satisfied with the alignment, push the two halves together firmly. This process is repeated for all the panels of the rip panel. The resulting join is inspected to ensure that there are no wrinkles or puckers. If any are present, the complete process must be repeated. The riplocks are secured from inside the envelope. Care must be taken to ensure that the rip line is fed back through the rip locks, towards the tie off point, so that sufficient slack line exists between each lock. If a rip lock opens during inflation, the balloon must be partially deflated and the riplock secured.

2.2.5 Crown Line

The crown line crew should be instructed to prevent the crown of the balloon from moving side to side during the cold and hot inflation stages. During hot inflation a constant tension should be maintained on the crown line, with the crew slowly walking towards the basket as the balloon inflates. The crown line should not be wrapped around arms or legs, as this can cause severe injury if a gust of wind catches the balloon. Once inflation has been completed, the crown line should be tied off to the basket, on the pilots' instruction.

2.2.6 Envelope Mouth Crew

During the early stages of cold inflation, it is necessary to hold open the envelope mouth to allow the entry of air from the inflation fan. Once the envelope has filled, the mouth should support itself open by internal air pressure, provided a sufficiently large inflation fan is used. In calm conditions, the mouth crew can be dispensed with on hot inflation. In more windy conditions, two people assigned to hold the mouth open may be of assistance. Mouth crew should wear suitable heat protective gloves and clothing. Synthetic materials must not be used.

2.2.7 Hot Inflation

Check that all the control valves on the burner are off. Turn on only one liquid supply from a full fuel tank. Turn on the pilot light and ignite the pilot flame. Inflate the balloon using short bursts of heat. Keep the inflation fan running, directing the flow of air into the centre of the mouth. This practice assists in the mixing of hot air in the envelope and prevents localised "hot spots". Continue heating the envelope air until the envelope is standing upright. Once the balloon is upright, all available crew should lean their weight on the basket. The parachute should be operated to break all the velcro inflation tabs and to check for correct operation. If a second burner is fitted, the pilot light of that burner should be lit and the burner test fired to check for fuel flow.

2.2.8 Pre Take Off Checks

- (a) Crown line attached to basket.
- (b) Parachute tabs pulled and parachute OK.
- (c) Riplocks secure and velcro panel in place.
- (d) No unacceptable damage above first 4 m of fabric.
- (e) Ripline and any control lines secured to basket.
- (f) Flying wires straight and carabiner gates closed.