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8.32 OUT OF PRODUCTION HOPPERS

8.32.1 INTRODUCTION

Issue 1 of this supplement has ten pages.

Supplement 7.32 to Maintenance Manual Issue 10 (4 pages) is required to ensure continued airworthiness.

This supplement is applicable to the Colt Cloudhopper and the Cameron Skyhopper.

The original approved text has been abridged to reflect modern ballooning practices.

8.32.1.1 Colt Cloudhopper

The Cloudhopper is a harness balloon, i.e. it does not have a passenger enclosure in the traditional sense. This naturally limits pilot movements and makes accessibility to the various flight systems important and thus study of the following text imperative.

The same fact also emphasises the importance of a proper pre-flight check since, once airborne, the pilot has limited reach to certain parts of the system.

This is not to say that flying the Cloudhopper is that much more complicated or difficult than flying a basket equipped balloon, it only says that this is to most balloonists a totally new concept and that a proper introduction and instruction is necessary.

8.32.2 LIMITATIONS

8.32.2.2 WEATHER

4. Balloons equipped with a Cameron Skyhopper or Colt Cloudhopper chair must not be flown free is surface winds of greater than 8 knots (4 m/sec).

8.32.2.6 SAFETY EQUIPMENT (MINIMUM EQUIPMENT)

3. Deleted

9. Where a balloon is equipped with a Cameron Skyhopper chair a protective helmet and gloves must be worn.

10. **Harness-** The harness must be secure and it is particularly important to make certain that the belts are assembled and worn in the correct manner which is as follows. The two lower belts must be passed over the seat but BELOW THE THIGHS AND BETWEEN THE PILOT'S LEGS to join the other two belts which pass over the shoulders. Ensure that the three quick release buckles are securely clipped into the box.

WARNING: Incorrect assembly can mean that the harness is not full effective.

8.32.2.7 CREW

4. The maximum number of occupants is one.

8.32.2.10 RATES OF CLIMB AND DESCENT

4. The maximum rate of climb and descent for balloons equipped with a Cameron Skyhopper or Colt Cloudhopper chair is 500 ft/min (2.5m/sec).

8.32.2.18 LANDING

1. Where a balloon is equipped with a Cameron Skyhopper chair only rearward facing landings shall be attempted at ground speeds in excess of 5 knots (2.5 m/sec).

8.32.3 EMERGENCY PROCEDURES

8.32.3.12 PILOT LIGHT FAILURE-COLT CLOUDHOPPER

Should the pilot light blow out use the inbuilt igniter to relight it.

If this fails check that the pilot light valve is fully open and then operate the inbuilt igniter again. Should this still fail to relight, bring up the hand held spark lighter and relight it manually.

Should the pilot light fail entirely, e.g. a vapour gas blockage, the main burner can be relit by cracking the blast valve open a small fraction and directly relighting the main jet.

This is not as difficult as it appears since the main jet is located close to the pilot light cup and well within reach with a hand held spark lighter. The inbuilt igniter cannot relight the main burner directly. Try this operation on the ground repeatedly since it is of course much simpler with a bit of practice.

8.32.3.12 EMERGENCY RELEASE IN FLIGHT-COLT CLOUDHOPPER

The height this can be performed at is governed by the minimum altitude necessary for the emergency parachute to open. The parachute manufacturer gives 300 ft (90 m) as this minimum, but this is assuming the pilot is an experienced parachutist. Since the emergency parachute is only intended for flying at higher altitudes (above 1000 ft) it is advisable to make the decision to release above 500 ft (150 m).

Release Procedure;

1. Close all fuel valves (If time permits),

2. Tighten the harness chest strap and leg strap as tight as possible (If time permits),

3. Slide out of the hard seat,

4. Release both Capewells simultaneously by first flipping down the safety covers and then both main releases,

5. Pull the emergency parachute handle straight out with the right hand.

8.32.3.13 EMERGENCY RELEASE DURING LANDING-COLT CLOUDHOPPER

The Cloudhopper does not generate much friction during a drag landing and if the pilot is dragged into danger (e.g. towards a power line) he can release himself from the balloon by operating the Capewells.

If this is done during the early phases of the landing the balloon may get airborne again for a short while.

If the pilot has a good grip on the ripline he can release the Capewells while holding onto the ripline and once free of the back-pack he can brake the balloon to a stop with the ripline.

8.32.4 NORMAL PROCEDURES

8.32.4.3 PREPARATION AND RIGGING

Warning: The ripline must not be connected to any other part of the back pack. If the ripline is connected to the non-swivel part of the back pack it will wind itself around the system when the pilot swivels during flight.

8.32.4.3.7 Cameron Skyhopper

Assemble the fuel cylinder(s)to the burner and chair assembly. The cylinder mounting plate is clamped to the hinged frame using two 12 mm bolts, washers and wing nuts. The bolts are drilled so that a safety lanyard prevents the bolts from loosening.

Lay the envelope out so that the green protectors (H-Type Envelopes) are on the ground. This will orientate the ripline and load tape no. 1 into the usual position in the upper right hand side.

For convenience, the pear-shaped Maillon rapide links may be kept on the flying wires, as the holes in the lugs on the load ring are large enough to pass the screwgates of the links.

The ripline should be attached to the adjacent Maillon rapide link so that it rotates with the envelope.

8.32.4.3.8 Colt Cloudhopper

8.32.4.3.8.1 Envelope layout and back-pack connection

Caution: The Colt 17A and 21A envelopes are of traditional construction but differ in the lack of continuous nylon load tapes. Since the handling of the envelope must be by the fabric only, caution must be exercised and ground crew properly briefed.

Connect the flying wires to the wire lugs on the swivel ring with the karabiners. Partially fill the envelope with cold air to facilitate an envelope inspection. Hold out the envelope mouth and follow the flying wires around to detect any tangles. Connect the ripline end karabiner to the appropriate wire lug.

Turn the attention to the back-pack and inspect it starting from the top. Try all nuts and bolts with the fingers; any loose fasteners must be tightened before flight. There should however be quite a bit of play around the swivel ring. The swivel ring must rotate freely with minimum effort.

Try out the fuel system by lighting up the pilot light using the inbuilt igniter. Connect all fuel lines and look for leaks. Disconnect the liquid coupling and push on the fuel pressure gauge coupling to read the fuel pressure. Always leave the liquid line disconnected until immediately before flight. This will prevent accidental discharge of propane by inadvertent operation of the blast valve handle.

Check the function of the electronic fuel level warning by turning the full cylinder upside down with the switch in the ON position. This should activate the buzzer and then check that the buzzer is silent when returning the cylinder to the upright position. If the buzzer does not sound, change the battery (situated under the ON/OFF switch) and repeat the test.

Finally, adjust the Capewell links so that they are well away from the shoulder brackets to make the pilot hook up easier.

8.32.4.3.8.2 Adjusting / Fitting the Harness

To adjust the harness to fit the pilot proceed as follows:

1) Thread the harness over the shoulders and do up the chest strap.

2) Run the back/leg strap around the leg and buckle up. Make sure the snap ejector is properly closed by pressing on the lever.

3) Adjust the harness to fit the pilot using the three adjusters provided on the back and the V-ring adjusters on the front.

4) Secure the hard seat to the front D-rings and adjust provisionally.

The harness is now ready for strapping onto the back pack.

Once the balloon is inflated:

5) Adjust the male Capewell releases well out from the shoulder bracket on the back-pack. Take up position as if flying and secure the Capewell locks one by one. If the Capewell does not snap into place immediately, push the male fitting sideways to find its proper location. If the pilot finds these Capewell releases difficult to operate, it is recommended to practice this operation a multitude of times before flight.

6) Adjust into the flying position by pulling hard onto the shoulder adjusting straps. Pull yourself as close as possible to the shoulder brackets.

7) Slide the seat under the body and check the distance between the shoulder and the shoulder bracket. This distance should be 1" to 3" (25 to 75mm). This distance is adjusted with the seat adjuster strap.

If the pilots position is adjusted too high up the shoulder brackets will hinder proper arm movements and if the position is too low the pilot's head will be too close to the shoulder brackets.

An emergency parachute can be fitted to the harness. It is clipped onto the front D-rings and deployed with a handle on the right hand side. This parachute is commonly called "chest reserve" and is a 24 feet diameter round canopy of traditional design (military designation T-10 chest reserve).

8.32.4.4 INFLATION

8.32.4.4.3 Colt Cloudhopper

Once the envelope is filled with cold air;

Connect the liquid fuel coupling and ignite the pilot light.

Straddle the cylinder and operate the blast valve with the left hand and steer the back-pack with the right hand.

Note: To ensure proper fuel delivery the shoulder bracket must always be facing downwards when inflating.

Good leather gloves must be worn at all times when inflating and flying.

A crown line will ease the inflation but is not absolutely necessary. If a crown line is used brief the crew member not to exercise too much force in restraining the balloon.

Once the balloon is vertical continue heating till it is hot before hooking up. Here some crew help is necessary to keep the back pack vertical and the flame centred in the envelope mouth.

When the balloon is hot and stable the pilot positions himself under shoulder brackets and hooks up. This is easiest done with pilot standing up and crew should be briefed to absorb all the weight of the balloon until pilot is properly adjusted into the back pack.

With a buoyant balloon make yourself comfortable in the harness and adjust it according to Section 8.32.4.3.8.2.

8.32.4.5 TAKE-OFF

Pre-flight Checks

Operate blast valve and cycle the pilot light valve to check the function of the igniter. Repeat this until both handles can be operated instantly.

Swivel around to check the swivel ring function and check the position of the ripline end.

Check fuel level warning buzzer switch is ON.

Low fuel warning - operate battery test switch (Cameron Skyhopper only).

4.6 CONTROL IN FLIGHT

4.6.9 COLT CLOUDHOPPER

Flying the Cloudhopper is very similar to flying a basket equipped balloon. The swivel gives the pilot the possibility of facing desired direction at all times. However since the available fuel is limited to maximum 20 Kg one should always plan the flight so as to avoid over flying large areas with limited landing space such as towns and forests.

The fuel warning buzzer will indicate when 30% of the fuel remains. At this point landing should be attempted immediately. The remaining flight time after warning will vary considerably depending on outside temperature, height, pilot weight etc. but is normally between 8 and 20 minutes. Once the buzzer has indicated positively its function is fulfiled and it can be switched off by flipping the switch to OFF.

8.32.4.7 LANDING

8.32.4.7.5 LANDING - COLT CLOUDHOPPER

Always face forward (i.e. into the direction of travel) when approaching for landing. Because of the reduced inertia in the Cloudhopper compared with larger balloons, one can sometimes utilise shorter fields and make steeper approaches than normal.

At touchdown, keep legs together and slightly bent imitating the landing position of a parachutist. Absorb the impact gradually to avoid bounce. If the impact is too hard to absorb entirely with the legs the cylinder bottom collar will absorb the remaining energy. If coming in for final landing always turn off the pilot light prior to impact and have a firm grip on the ripline in order not to loose it if a drag follows. When landing in very low wind speed the pilot can walk with the balloon until it has lost momentum.

With increasing wind speed this is impossible and the balloon will drag the pilot along. This usually happens with the tank downwards which gives the pilot some protection. In a drag landing it is imperative never to loose the ripline and to pull the parachute down hard until the balloon has come to a complete stop.

A pair of very sturdy boots is a good help in windy conditions. After landing, the first action is to disconnect the liquid coupling to prevent accidental operation of the blast valve.

8.32.4.7.6 LANDING - CAMERON SKYHOPPER

Rotate the chair to carry out a rearward facing landing. There should be no difficulty in achieving this within about 30 degrees of the direction of travel. The envelope should be deflated immediately to avoid dragging.

8.32.5 WEIGHT CALCULATIONS

No change

8.32.6 BALLOON AND SYSTEMS DESCRIPTION

8.32.6.7 COLT CLOUDHOPPER

8.32.6.7.1 BACK-PACK

The back-pack is made up of burner/swivel unit, shoulder brackets and fuel cylinder. The burner is the typical liquid propane configuration with a vapourising coil and separate pilot light on the bunsen principle.

For ease of transportation one can dissemble the burner/swivel unit from the back pack by undoing the three collar bolts (3 off ½" UNF x 75) using a 19 mm or ¾" A/F spanner.

The fuel lines have quick couplings and are released by pulling the release rings. The ignition wire must also be disconnected.

8.32.6.7.2 PILOT LIGHT SYSTEM

The pilot light system consists of a piezo-electric crystal in the right hand shoulder bracket operated by a thumb button.

There are no batteries or outside power sources in the system. It takes the spark energy from the mechanical compression of the crystal by the pilot's thumb.

An ignition wire goes from the crystal up to the pilot light cup. This wire can be disconnected midway to enable the burner/swivel unit to be dissembled from the back pack. A special spark plug is mounted on the pilot light cup that sparks across the main flame.

This system is maintenance free.

Note: Never operate the ignition button when the system is dissembled since this puts undue strain onto the piezo-electric crystal.

8.32.6.7.3 FUEL LEVEL WARNING SYSTEM

Since the pilot cannot see the standard fuel gauge a warning buzzer is fitted that will indicate when 30% of the fuel remains. This system consists of a microswitch inside the cylinder feeding its signal to a buzzer inside the left hand shoulder bracket. Power is taken from a 9 V dry battery (Duracell MN1604 or equivalent) and the system is activated by a switch on top of the shoulder bracket.

To change the battery, remove the top panel by undoing the two screws at both extreme ends. The buzzer consumes only 15 mA current so one battery will last a considerable time.

8.32.6.7.4 HARNESS

Rather than the traditional basket the Cloudhopper uses a harness to carry the pilot. This harness is of the type used in parachuting but has a hard seat to carry most of the pilot's weight.

The harness is first strapped onto the pilot separately and then linked up with the back pack.

The link between the harness and the back-pack is made by two "Capewell" quick connectors (named after the manufacturer). This link is commonly used in parachuting and allows connection and disconnection in seconds.

The reason behind this system is to provide an instantaneous release from the back pack in an emergency and allow the pilot to inflate the balloon and link up to the back-pack with the minimum of assistance.

The harness also has provision to attach an emergency chest reserve parachute for in flight emergency release.

8.32.6.8 CAMERON SKYHOPPER

The 'Skyhopper' chair (CB717) is constructed from a stainless steel tubular frame to which all structural elements are attached.

The burner together with a ring carrying three screwgates for the flying wires is carried on a thrust bearing at the top end of a vertical tube attached to the seat back tube. This attachment is hinged to facilitate transport and the hinge is locked by the fuel cylinder attachment bolts. The seat itself is suspended from the back-frame tube lower ends on clamped brackets in such a way that it can be adjusted fore and aft relative to the back.

A full harness is fitted.

The fuel cylinder is fitted behind the seat using two 12mm bolts and wing-nuts which lock up the hinge as mentioned above.

A twin cylinder module is available in which case the connecting bracket locates on the bolts in the same way.

A reduced size MK.4 style burner (CB708) including a 'whisper' burner is used with a 'Bonanno-modified' blast valve, cable operated from a twistgrip in the right hand arm, though use of the valve handle in the normal way is possible. The blast valve may be selected to main burner or whisper by means of an adjacent three way valve.

In addition to the usual fuel contents gauge, there is an audible warning (intermittent tone) of low contents at approximately 25% (sounding for a decrement of 5%) and a further one from nominally 10% until 5%. In the case of the twin cylinder version the warning is fitted to the master cylinder only.

8.32.7 BALLOON MAINTENANCE, HANDLING AND CARE

No change

8.32.9 EQUIPMENT LIST

Table 6 - Baskets (Additional)

Basket Category	Drawing Number	Basket Description	Applicable Cylinders	Applicable Burner Frames
A1	CB717	Skyhopper	1	Integral
A1	800501	Cloudhopper	1	Integral

7.32 OUT OF PRODUCTION HOPPERS

7.32.1 GENERAL

No change.

7.32.2 ENVELOPE REPAIRS

No change.

7.32.3 BASKET REPAIRS

No change.

7.32.4 FUEL SYSTEM REPAIRS

7.32.4.12 COLT CLOUDHOPPER BLAST VALVE OVERHAUL

Overhaul the blast valve by replacing all the Teflon seals or, if desired, the valve centre body can be replaced.

To change these Teflon seals only, the centre body of the valve needs to be removed.

To achieve this extract the body connector bolts (use 2 x 7/16" A/F spanners) and slide the body out from between the valve ends. The quickest way is normally to remove all but one of the body connector bolts and with this remaining bolt slackened; the body may be rotated out from its working position using this remaining bolt as a hinge.

WARNING: The ball must be in the open position during this operation since a closed ball protrudes beyond the body cavity and the ball will be damaged against the valve ends when the body is removed or rotated. When the centre valve body is removed, turn valve to half-closed position and hook out the Teflon seals with a finger. Completely close the valve and the ball may be pushed out.

The body connector seals should now be removed. Care must be taken to avoid scratching the machined faces which make contact with the valve body.

To dismantle stem assembly, first remove the handle nut and handle from the stem (use a 9/16" hexagon spanner). Then remove retaining nut (9/16" A/F), disc spring and follower. Withdraw stem through body cavity and remove the lower Teflon stem seal and the two upper Teflon stem seals. Reassemble valve in reverse order using new Teflon seals.

If a torque wrench is available tighten the body connector bolts to 8 lbs/ft, otherwise tighten firm but not excessive by hand.

The tension applied to the retaining nut is important. If fitted too loose there is a risk of stem leakage if the handle is pulled hard downwards when operating. If tightened down too hard there will be excessive wear on the Teflon stem seal and a stiff opening action.

When fitting the retaining nut (9/16" A/F) tighten gradually and operate the valve from fully closed to fully open after each tightening until there is a firm even resistance when operating without undue friction.

7.32.5 INSTRUMENT REPAIRS

No change.

7.32.6 INSPECTION SCHEDULE

7.32.6.13 Burner and Fuel System		
11.	Check the fuel level warning system.	
12.	Check function of selector valve (Skyhopper)	
13.	Check the inbuilt igniter for proper function (Cloudhopper).	

7.32.6.15 Hopper Chairs		
11.	Check the swivel ring for smooth operation.	
12.	Check the frame for signs of cracking and distortion.	
13.	**Harnesses-** Check function of buckles and Capewells. Check webbing for wear, fading or damage. Check attachments are secure and free from wear or damage.	

6.17 INSPECTION CRITERIA / TECHNIQUES

7.32.6.17.3 Burner and Fuel System

Fuel Level Warning System - Check the fuel level warning system by inverting the cylinder to activate it. Should it fail to sound, follow the electric lead from the warning wire boss to the on-off switch. Check for loose wires and install a new battery. If failure remains consult the manufacturer.

Selector Valve (Skyhopper) - Check for leaks and correct operation.

Inbuilt igniter (Cloudhopper) - Check the inbuilt igniter for proper function. Should it fail to spark check the ignition wire lead from the crystal unit to the spark plug. If this fails to activate the igniter then the complete spark generator must be replaced.

7.32.6.17.4 Hopper Chair

Swivel Ring - Check the swivel ring for smooth operation. Swivel through 360° and while the action should be very light look for excessive play.

Frame- Inspect the frame carefully paying particular attention to the condition of the welds. Check for any sign of fracture or unauthorised repairs, particularly if the frame shows signs of distortion.

Harnesses- Check the physical condition of the latch mechanism. Inspect for signs of distortion or wear. Check the operation of the latch. Inspect the webbing straps for signs of wear, cuts, heat damage and UV degradation (UV degradation usually manifests itself as fading of the webbing). If the webbing has any defects it should be replaced.

6.23 TIMED LIFE COMPONENTS

Component	Life Limit
Blast Valve Teflon seals (Cloudhopper).	100 hours of flight

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