



# Hotair-Airship AS 105 GD

## Supplement

### Night Flight Manual



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### General Information

This Supplement Night Flight Manual and the Supplement Maintenance Manual Night Flight shall be inserted to the basic Flight Manual and the Maintenance Manual.

This supplement under EASA approval 10034439 describes the Lighting System Installation and its use. Information contained herein supplements, or in the case of conflict, supersedes that contained in the basic Flight Manual and Maintenance Manual. For limitations, procedures and performance data not contained in this supplement consult the basic Manuals.

### Supplement and Revision Status

This page will contain all information about the valid pages of this manual when changes and/or supplements are made.

Revision No.:	Replaced pages:	New pages:	Date:	Approval:

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## 1. Technical Description

To enable the AS 105 GD Series Airship to operate at night it has been fitted with some additional certified equipment, namely:

- Instrument lighting
- Landing lights
- Envelope Lighting Units (consist of Combined Navigation- and Anti-Collision Lights)

In addition it is required to carry two strong torches and LED head-lights fixed to the pilots peaked cap.

### 1.1 Cockpit- and Switch Panel Lighting

Instrument- and switch panel lighting is provided by LED's in front of the instruments and are supported by the pilot's LED lights fixed to his peaked cap.



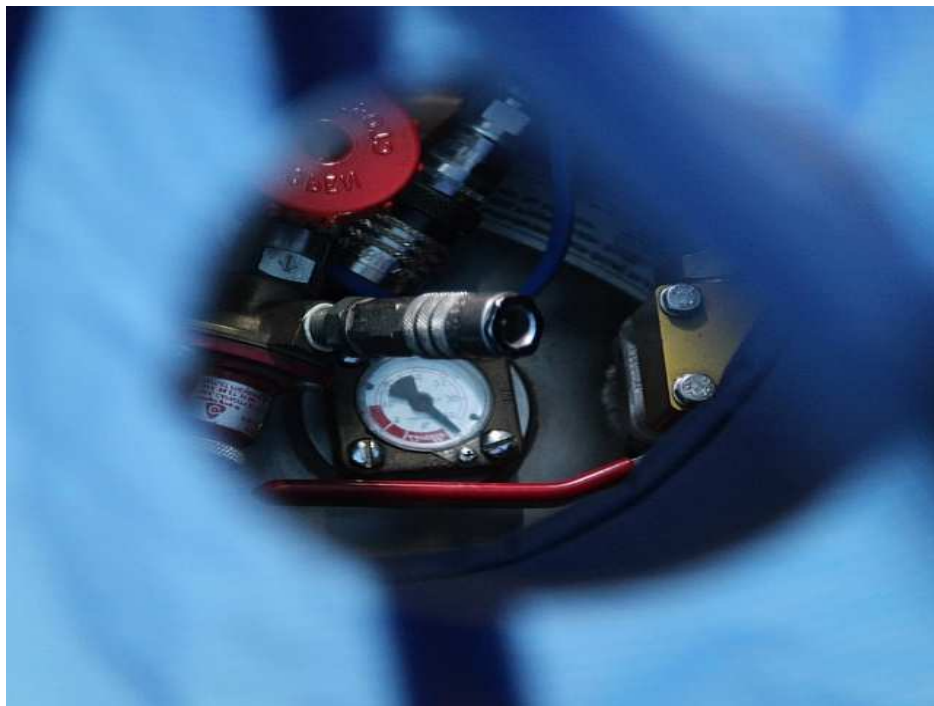
Instrument Panel



Ball Valve Panel Lighting

The Ball valve panel and the adjacent floor is made of less reflecting material. This helps to avoid reflections in the windshield in order not to disturb the pilot's night vision.

## 1.2 Fuel Cell Gauge Lighting



The illuminated propane content gauge viewed through the control mirror

### 1.3 Envelope Lighting Units

One is positioned midship on the left, one midship on the right side of the envelope equator line.



#### 1.3.1 Position Lights

- A red light radiating midship to the left side of the envelope through an angle of  $110^\circ$  from dead ahead in the horizontal plane and from straight downward to straight upward in the vertical plane
- A green light radiating midship to the right side of the envelope through an angle of  $110^\circ$  from dead ahead in the horizontal plane and from straight downward to straight upward in the vertical plane.

#### 1.3.2 Rear Lights

Two steady white lights radiating backwards ( $2 \times 70^\circ$ ) are positioned on both sides of the envelope midship on the equator line.

#### 1.3.3 Anti-Collision Lights (ACL)

Two ACLs are integrated in the Envelope Lighting Units midship on both sides on the equatorline of the airship envelope. ACLs are white flashing lights radiating from straight downward to straight upward and from bow to stern.

### 1.4 Landing Lights

The landing light consists of two halogen lights in one box mounted outside on the front of the gondola. It is aimed diagonally downwards, but can be adjusted manually before the flight according to pilots requirements. These lights maybe turned on and off independently from other lights and separately from each other.



Landing Lights



## 2. Limitations

### 2.1 Kinds of Operation

The Hot Air Airship AS 105 GD is capable of VFR Night Flight (VMC) with the night lighting kit installed. Additional national requirements for Night VFR flights may apply. It is the pilots responsibility to determine prior to Night VFR flying whether additional national requirements must be obeyed.

### 2.2 Operational Limitations

**Warning: The airship must never be operated in thundery conditions. The airship must never be operated at night with more than 5 kts surface wind.**

- If helium toy-balloons indicate this critical surface wind speed, tether the airship to the ground and wait for the wind eventually to calm down (fasten one of the nose lines to a car, the other one is held by a crewmember).
- If the surface wind speed increases to 12 kts in gusts the envelope must be deflated
- Night Flights are permitted only in visual meteorological conditions (VMC)

### 2.3 Additional Equipment

The following additional equipment is required to be installed and operational:

#### **Installed or available on the Airship (Night VFR Kit Air)**

- Instrument lighting
- Fuel cell gauge lighting
- Landing Lights
- Envelope lighting units (combined NAV/ACL)
- 2 strong halogen torches
- 1 LED head-light (fixed to pilots peaked cap)
- 1 drop line (30 m)

#### **Readily available on the ground (Night VFR Kit Ground)**

- 4 LED ground lights, white, flashing
- 2 strong halogen torches (1 for Crew, 1 to illuminate the Wind Direction Indicator)
- 3 head mounted LED lamps for the ground crew
- 1 wind speed measuring device (e.g. anemometer type)



### **3. Emergency Instructions**

#### **3.1 General**

The flying characteristics of the airship do not change in the dark, but an emergency situation seems more difficult to cope with at night. It is therefore essential to carry two strong torches with good batteries on each flight.

They are very useful if for any reason you have to make an emergency landing away from the field. Making a landing in a dark unknown field is not an easy thing to do and the pilots are therefore urged not to fly in marginal wind conditions. A peaked cap for the pilot with LED's are as well part of the equipment and can be used in flight or on the ground.

Evaluation and preparation of alternative landing sites (free access!) in the direction of the wind as part of the pre-flight planning is highly recommended so that the crew can quickly move there in case of emergency. Particular effort shall be made in identifying obstacles within the range of the flight path (e.g. power lines, chimneys, lakes).

#### **3.2 Generator Failure**

If the generator should fail, a landing should be made as soon as possible. The maximum battery duration after generator failure will be 20 min. It should be noted that some critical systems e.g. the burner blast valves are dependant on electrical power.

The position and anticollision lights have independent power sources and are not affected by generator failures. The minimum working time of the batteries is 4.5 hours.

## 4. Normal Procedures

### 4.1 Site Selection

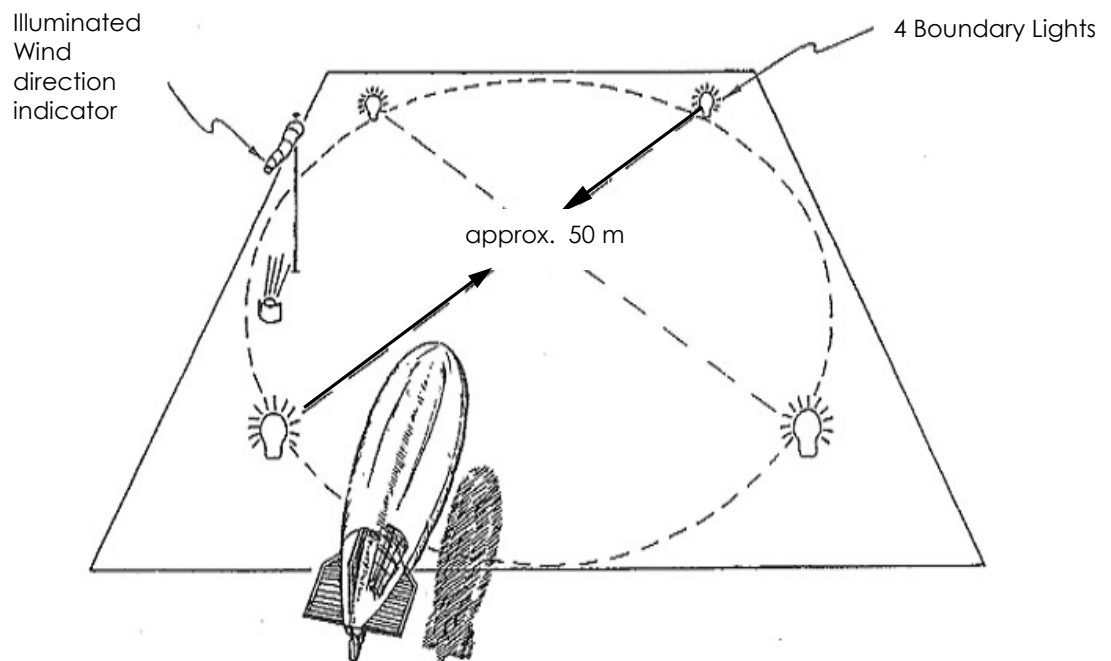
Selecting the most suitable take-off and landing site for night flying is very important. The site needs to be well clear of obstacles such as trees, power lines and buildings. The ground should preferably be grass. Minimum recommended size **for night operations** is a square with **150 m** side length. The site should be free of obstacles (see Flight Manual, Chapter 2, Section 2.4).

### 4.2 Layout and Illumination of the landing area

The illumination of the landing area should be designed in such a way as to mark the boundaries of the field (distance between the lights approx. 50 m) as well as indicate visually the prevailing wind direction on the ground. The boundary lights can be portable battery powered beacons with white lights. Wind direction is indicated by an illuminated wind direction indicator.

Avoid using vehicles as light sources within the landing area as this introduces obstacles and the risk of collision in the last phase of the descent

- Detach trailer from main airship support vehicle to enable the crew to leave the takeoff site as fast as possible on pilots instruction
- The starter key of the airship support vehicle should be always left in the ignition switch
- The crew should be equipped with head-lights to be able to see properly
- Let some helium toy balloons fly and check about the wind speed at altitude by pointing at the balloons with a strong torch (do not use the on-board airship equipment).



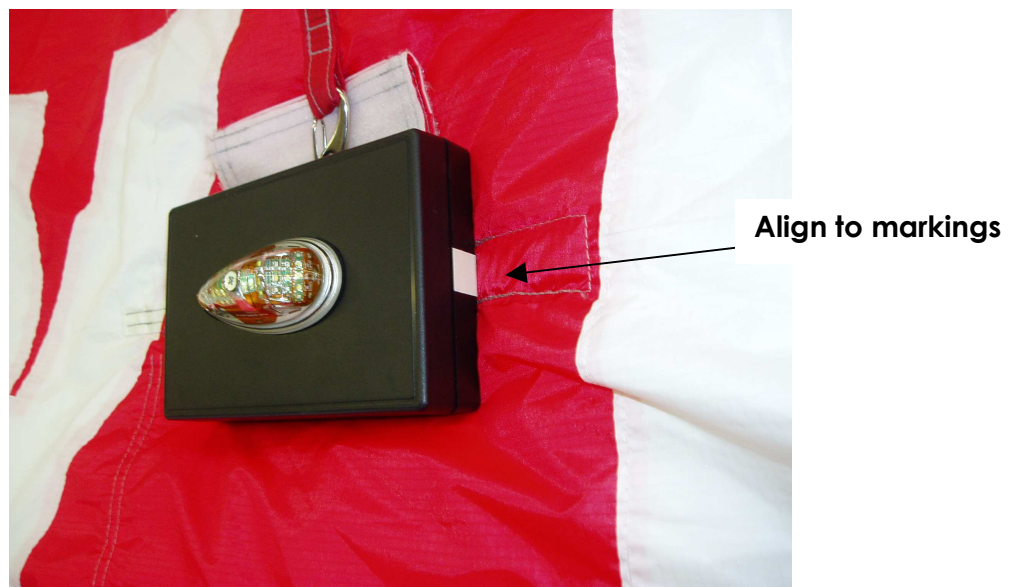
**Recommended minimum Landing area for night operations (150 x 150 m)**

### 4.3 Pre Flight Checks

- The envelope lighting units must be fully charged prior to flight
- Make sure that all lighting equipment on board is serviceable and that the engine starter battery is fully charged.
- Check both hand held torches for function
- Check the pilots peaked cap lights for function
- Ensure that the landing site illumination is operational and the batteries have sufficient charge for intended duration of flight operations
- Check ground-crew-radio for function

### 4.4 Envelope Lighting Units

Attach the lighting units to the envelope mid ship right and left side of the equator. Each light unit is unmistakably marked about its position and can only be attached "correctly" to the envelope.



### 4.5 Inflation

**Note: During inflation with cold air switch on both envelope lighting units. This cannot be done later when the envelope is inflated.**

As soon as the envelope is up and pressurised inspect the internal rigging and rip panel using a strong hand held torch. The envelope must also be inspected from the outside using a strong torch because damage easily recognisable by day might be hard to see at night. Do not use the two onboard torches for this purpose in order not to empty their batteries unnecessarily before flight.

#### 4.6 Pre Take-Off Checks

- Envelope Lighting Units - Check, **ON**
- Anti-Collision Lights - Check, **ON**
- Landing lights - Check, **ON**
- Instrument Lights - Check, **ON**
- Check visibility of fuel cell gauges (in the mirrors)
- Radio – Check contact with Crewchief

#### 4.7 Take-Off

Take off and climb vertically and as close to the site as possible up to the intended cruising height. This is to avoid possible obstacles within the vicinity of the take-off site not easily seen in the darkness.

#### 4.8 Flying

The manoeuvring is identical to that for daytime flying. Navigation can sometimes be more demanding due to lack of identifiable landmarks. An accurately detailed map must be used. Fuel management is always of great importance and pilot and Crewchief are advised to keep a record of the airborne time in relation to propane consumed, to enable the pilot to estimate the duration of each flight. It is important that pilot and ground crew always stay in radio contact with each other.

##### 4.8.1 Burner Glare

The light pulse emitted when burning is to some extent noticeable in the gondola. The glare is reduced by the provision of a peaked cap for the pilot.

#### 4.9 Pre Landing Checks

- Inform the ground crew via radio about your intention
- Overfly the landing site to check for clearance and wind direction for landing
- Check Landing light, **ON**

#### **4.10 Landing**

Be aware that estimation of the actual height to the ground is more difficult at night. The usual day light reference points - if visible at all - might appear different.

- In case of a difficult landing the pilot must be prepared to release the "Drop line" prior to touch down so the crew can catch it
- Stop propulsion engine to minimise the danger of the rotating propeller shortly before touchdown
- Once on the ground establish a secure tether with the noselines

#### **4.11 Post Landing**

If the flight is terminated:

- Deflate envelope and pack

If it is an intermediate landing:

- Refuel
- Start again from section 4.6 in this list of instructions