

**ANTI-BIRD COLLISION (ABC) LIGHT SYSTEM TO PREVENT
BIRD STRIKE IN AVIATION**

COST - CAUSE - SOLUTION

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Abstract

The Paper briefly describes a pair of special strobe lights to be fitted to aircraft that increase in frequency during take-off. This provides birds with both direction and speed information.

(Keyword - lights)



Ant-Bird Collision (ABC) Light System to prevent Bird Strike in Aviation

Cost - Cause - Solution

The prevention of bird strike in aviation can hardly be described as having been successful in the past. Damage each year in the region of \$ 1 - 2 billion caused by approximately 15,000 bird strike incidents invoicing commercial and military aircraft, without taking into account eastern countries, speaks for itself.

All efforts to keep birds away from airports and their surroundings have proved ineffective as birds adapt themselves quickly to new conditions, especially in the case of airports where there is plenty of space available for their own safety zone, i.e. the distance between bird and source of danger. Bearing this fact in mind, only an aircraft-linked system comes into the question.

Numerous years' study of all relevant documentation has shown that bird strikes can only be avoided when the attention of the birds can be caught, information as the direction and speed (or distance) can be transmitted and habit effects eliminated.

These four factors plus the sun effect are the key towards the prevention of bird strike; biologists and ornithologists agree that birds are visual animals (one calls them also flying eye) with an absolute instinct for an escape route.

Due to the fact that the true dimensional sight is missing, with the exception of the night hunters such as the owl, etc. birds are almost always surprised by fast aircraft. In an emergency, many try to fly a deviation manoeuvre directly into a bright landing light, which they interpret as being the sun with an obstacle-free escape route. This behaviour I call sun-effect. In both cases a collision is inevitable.

A solution is offered in the form of two stroboscope lamps, horizontally mounted approximately 2-20 meters apart on the fuselage or wings, to deliver direction information. Both these flash-lights begin to blink with increasing frequency during taxiing for take-off, whereby an acceleration is simulated and attention increases up to 200 times. Apart from this, the birds are frightened away by the two penetrating stroboscope lights and the sun-effect is eliminated. After landing, the frequency of the flash is reduced, showing a speed reduction. The habit effect is eliminated by this change of rhythm and a continuous asynchronous flashing of ± 100 ms.

That theory and practice coincide has been proved by hundreds of take-offs and landings at airports wellknown for their many birds and in the most adverse conditions. Anti-Bird Collision (ABC) Lights at the same time considerably reduce the increasing risk of collision with other forms of aviation. Therefore an interphase with TCAS (Traffic Collision Avoiding System, commercial), GPS (Global Sat. Positioning System), or IFF (Identification Friend / Foe, military) is highly recommended.

Air safety, economy and ecology are aviation laws according to which the ABC-Light System has been invented

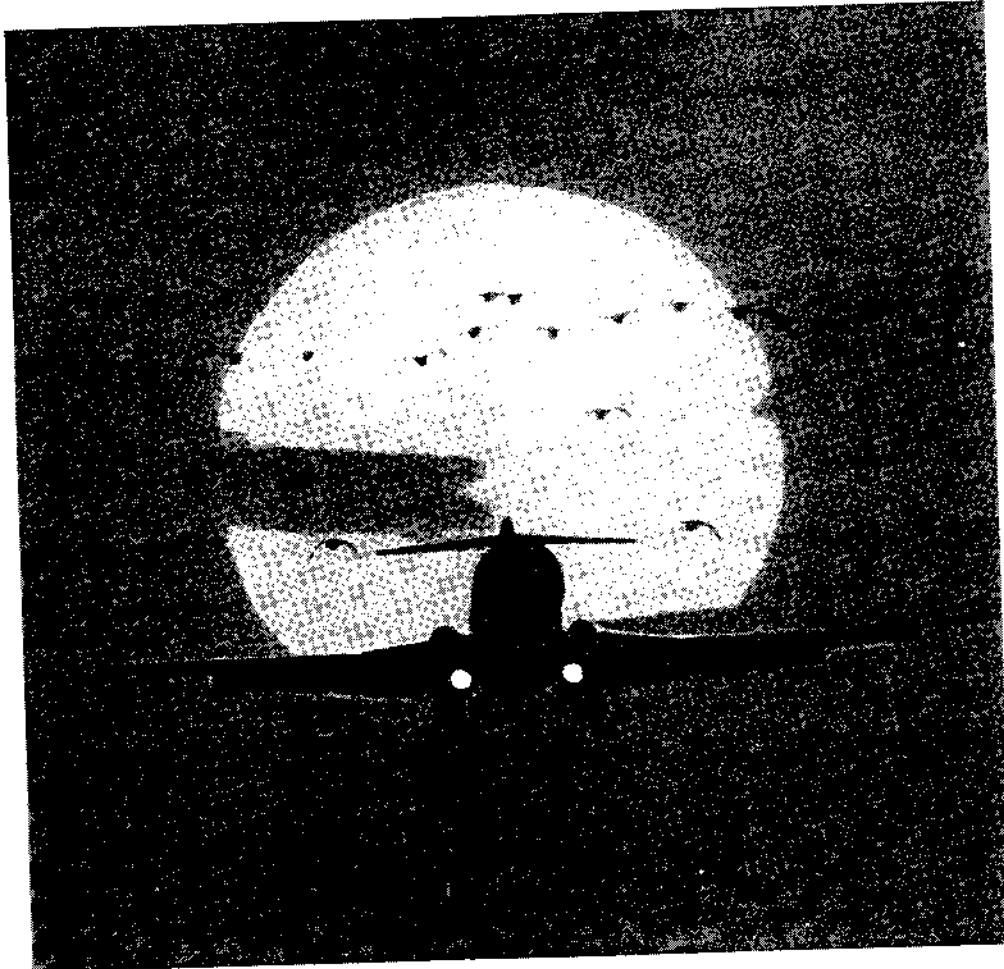
Capt. R. Steffen
Swissair

On a two-year trial basis
Swissair have agreed
Swissair MD80 Aircraft
Anti-Bird Collision Light
After this Test period



Aircraft Equipment

Anti-Bird Collision Light System



On a two-year trial basis, Hella and Swissair have agreed to equip 10 Swissair MD80 Aircraft with Anti-Bird Collision Lights. After this Test period in day-to-day

operation, results will be compared with those of MD80's not equipped with ABC-Lights. Thus Hella and Swissair expect to gather conclusive research data to

be able to document to the industry the capabilities of ABC-Lights regarding the reduction of bird-strike incidents.

1. Description

The Anti-Bird Collision Light System (ABC-Light System) uses Strobe Lights and associated Power Supplies to avoid bird collisions.

The system consists of two ABC-Lights 2LA 003 378-05 and two Power Supplies 8ES 005634-00.

The Anti-Bird Collision Lights are to be arranged on the right and on the left side of the aircraft so that they point forward, parallel to the aircraft's longitudinal axis in the horizontal plane (see figure 1).

In the vertical plane (see figure 2) the lights point downwards between 3 to 10 degrees in order to compensate for the angle of attack during the climb and the descent.

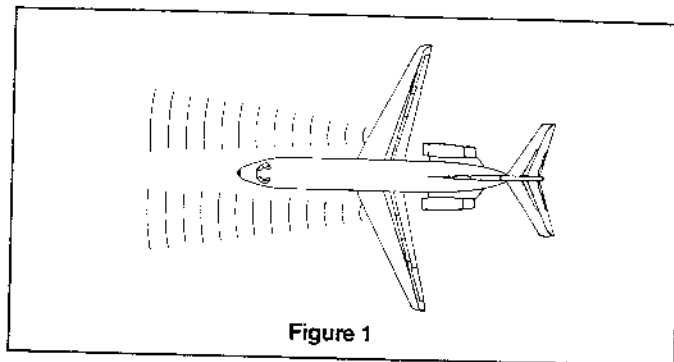


Figure 1

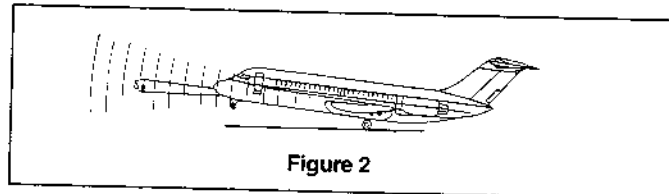
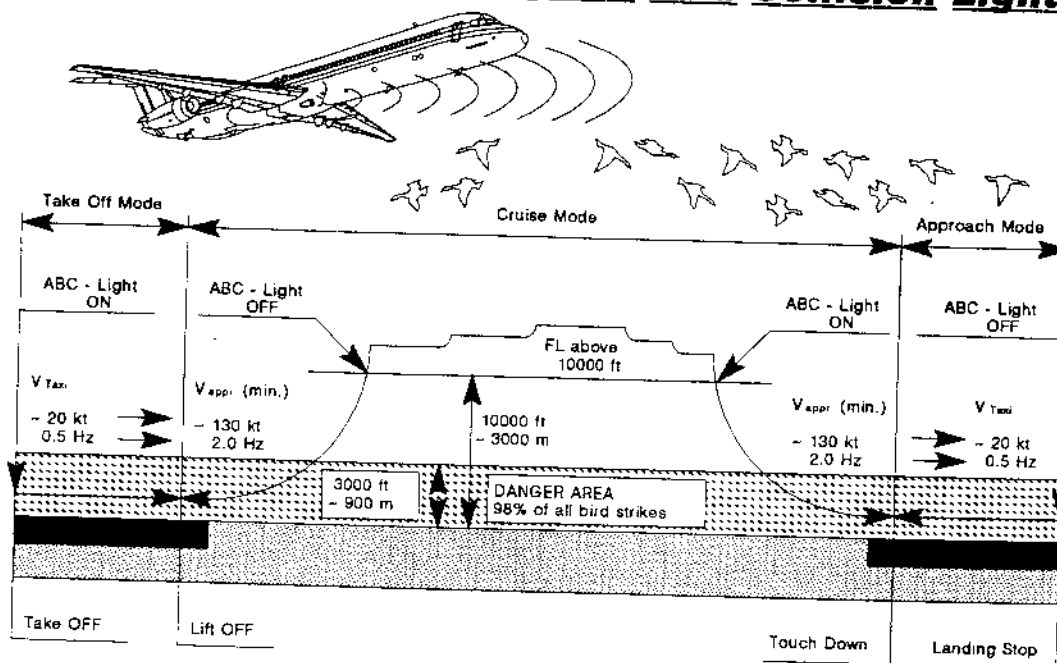
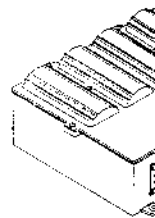


Figure 2

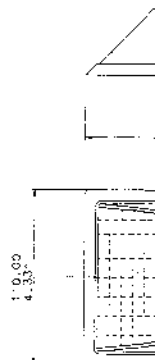
Flight Path Diagram for Anti Bird Collision Light



2. Wiring Diagram



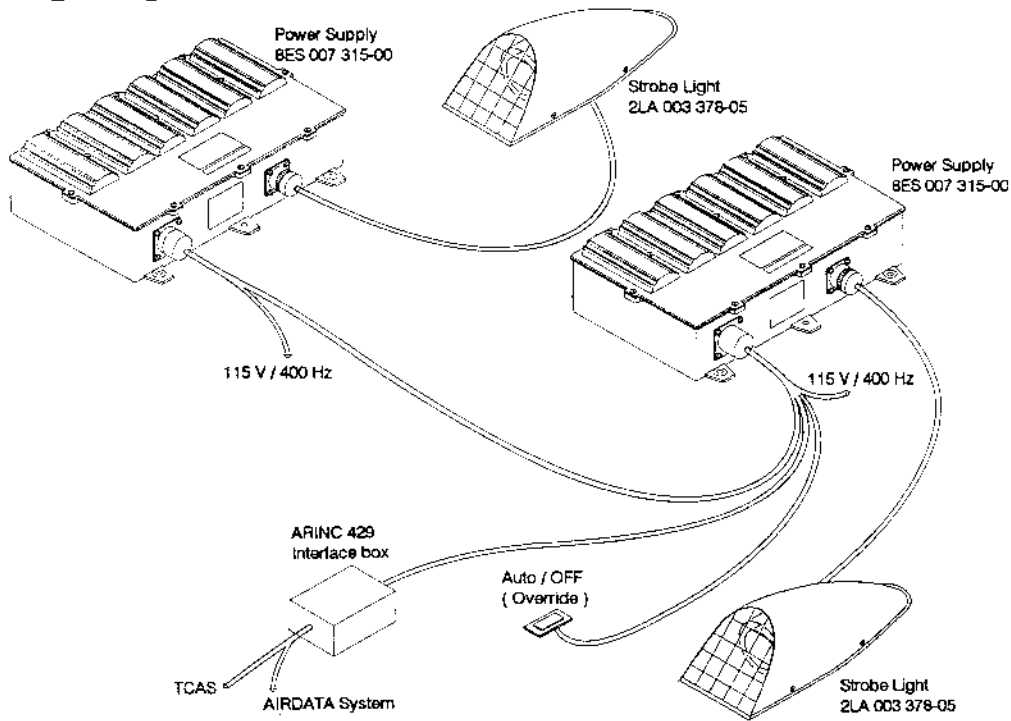
3. Anti-Bird Collision Light



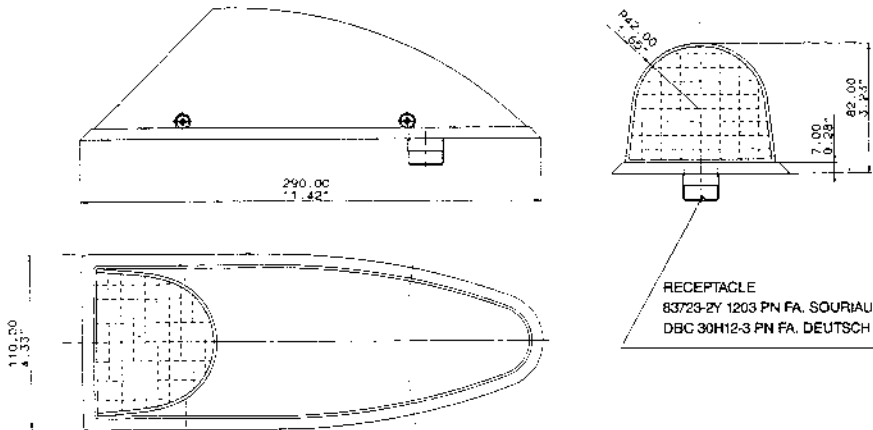
Technical Data

- Power input
- Colour aviation
- Light distribution
- Light distribution
- Light intensity
- Flash rate
- Environmental conditions
- Electromagnetic compatibility
- Weight

2. Wiring Diagram



3. Anti-Bird Collision Light

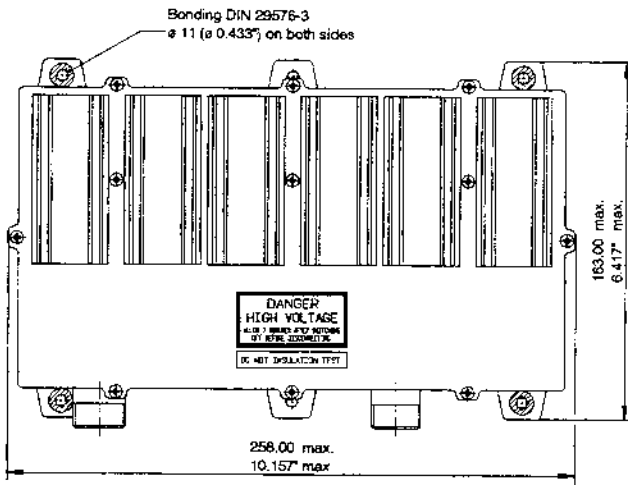
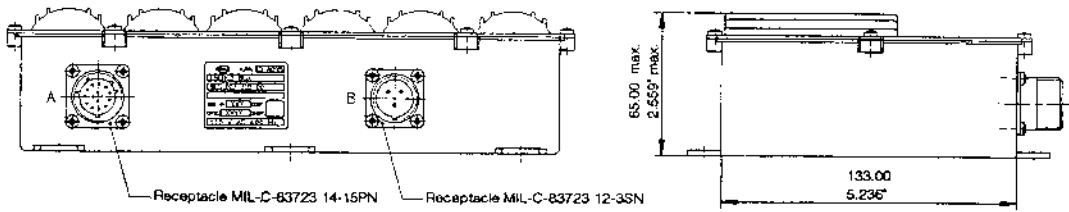


Technical Data

Power input	: 90J max.
Colour aviation white	: MIL-C-25050
Light distribution horizontal	: ± 10 degrees
Light distribution vertical	: ± 10 degrees
Light intensity	: ≥ 5000 cd
Flash rate	: 2Hz max.
Environmental conditions	: RTCA DO 160A
Electromagnetic compatibility	: MIL-STD-461A, 462, 463
Weight	: 0.88 kg 1.94 lbs

4. Power Supply

BIRD STRIKE COMMITTEE



Technical Data

Input voltage	: 115V, 400Hz
Operating current	: T.B.D.
Power per flash	: 90J / 45J
Flash rate	: 1Hz / 2Hz
Total life	: 60 000 h without capacitors
Electromagnetic compatibility	: MIL-STD 461C, 462D, 463A
Environmental conditions	: RTCA DO 160 B/C
Weight	: 2.7 kg max. 5.95 lb max.

New Address from July 01,93
Hella KG Hueck & Co., Dept.: LT-V1, D-59552 Lippstadt

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ANTI-FIELD

Bonn

The paper reports developed by Hell Vultures.

Tests were conducted and those resting

None of the birds the birds with respect against the heavy daylight and temp

(Keywords : Strob