Centralised Warning System
CENTRALISED WARNING SYSTEM

General

The centralised warning system covers the visual and aural signals used to advise the pilot of a particular operating configuration. The operating principles are covered in this section with details of the Central Warning Panel (32 alpha) and the Strip Panel (34 alpha). Other panels, relating to particular systems are covered in the relevant system section.

The visual indicators are electrically operated lights whilst the aural indicators are signals of a given frequency heard in the pilots headset, which always reinforce a given visual signal for a serious malfunction.

The indicating system consists of detectors (micro-switches, proximity switches, pressure switches, and temperature switches etc), integrated electronic printed circuit boards (PCB) and the indicating lights.

There are three Red, two Amber and four Auxiliary system indicating PCBs which are located on racks in the radome bay.

To ensure operation of the indicating system the PCBs are provided with a double electrical power supply. One supply from a Primary bus (2PP6) and the other from a Secondary bus (2PP5) via circuit breakers labelled 'MASTER WARN'.

Indicating Lights

The indicating lights are controlled by Lighting Control Units which are also provided with double power supplies. The control units for the Overhead and Pedestal & Strip indicating lights are both located on the Overhead Panel. Test illumination of both groups of warning lights can be achieved by push buttons on these panels. The indicating lights are divided into different colours as follows -

GREEN & WHITE  These lights indicate normal operation.

AMBER  These lights indicate abnormal operating situations which may reduce the overall operating efficiency of the system.

RED  These lights indicate serious operating dangers and the Pilot must react quickly.

The AURAL Alarm is associated with three of the RED warnings

Levels Of Indicating Lights

There are three levels of indicating lights.

1. Lights which monitor the various functions of a system. They may be normal or abnormal.

2. Lights which monitor the overall operation of a system. These are contained on the Central Warning Panel CWP.

3. ATTENTION GETTERS - These lights are situated on the Instrument Panel directly in front of each pilot and consist of -

   a) Flashing RED  ALARM light which illuminates with any RED light on the CWP.

   b) Steady AMBER  WARN light which comes on with any AMBER light on the CWP.

These Attention Getter lights are contained in push-buttons, which when pressed, cancel the lights and re-sets the system ready for a subsequent warning.
Thus the Attention-Getters direct the pilot to the CWP to check which system is effected and then to the system panel to ascertain which function is defective.

**Note** – Should both **ALARM** and **WARN** lights illuminate together with no other indications, there is a malfunction in the warning system.

There are some Red warning lights on the Instrument Panel, which are themselves first priority signals in that they do not operate the **ALARM** warnings. These are -

![Warning Lights Diagram]

**Aural Warnings**

The aural warnings are controlled by the RED indication PCBs in the radome.

The Aural Alarm gives a different signal for each indication and operates with the following –

1. Engine Fire
2. Nr Above 290 rpm
3. Nr between 200 and 245 rpm

In the case of the ‘Fire’ warning, the Aural Warning will be cancelled when the **ALARM** light is pressed.

The Aural Warning can be switched ON/OFF by means of a two position switch on the 34 alpha panel. When the Audio Alarm is switched OFF, a light **A.WARN** will be illuminated on the CWP to remind the pilot.

**Central Warning Panel (32 Alpha)**

The Amber or Red warning lights on this panel will illuminate with the appropriate ‘Attention-Getter’ should any malfunction occur.

There are two bulbs to each light and these can be checked by pressing the ‘TEST’ button. The illumination can be reduced by depressing the ‘DIM’ button. This button is self-holding in this position and a cross-hatched indicator will appear to remind the Pilot of this selection.

The ‘TEST’ and ‘DIM’ buttons control the indicator lights of **all** the instrument panel warnings, not just the ones on the CWP.

**Power Supplies**

Each indicating caption (e.g. **HYD**) has two power supplies. One for each bulb. One supply from a DC Primary bus and the other from a Secondary bus via circuit breakers marked CWP. Thus should one supply fail the indications will still be lit. When operating from the Primary bus only, a relay in the system enables both bulbs to be supplied.
CWP Warning Light Cancellation

Lights, which monitor a single function, cannot be switched off directly by the pilot and will only extinguish when the fault is rectified. (e.g. COWLS MGB CH SERVO etc.)

Indicator lights, which monitor several functions of a system, may be cancelled. Either directly by pressing the **WARN** Attention-Getter (where there are no switches in the system) or by switching off the faulty item at its control panel.

Lights cancelled directly by pressing the **WARN** button are – **HYD** **FUEL** and **FIRE D**

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**Figure 1 - Central Warning Panel (32 Alpha)**

<table>
<thead>
<tr>
<th>TEST</th>
<th>ENG CH 1</th>
<th>MGB CH</th>
<th>MGB T</th>
<th>MGB COOL</th>
<th>R.B SAFE</th>
<th>MGB P</th>
<th>ROT BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHUMS</td>
<td>AVAD</td>
<td>FUEL</td>
<td>PWR CAL</td>
<td>DIFF NG</td>
<td>FIRE 1</td>
<td>FIRE 2</td>
<td></td>
</tr>
<tr>
<td>ELT SAFE</td>
<td>AFDS</td>
<td>FIRE D</td>
<td>ELEC</td>
<td>C.P.L.</td>
<td>DC FAIL</td>
<td>BATT</td>
<td></td>
</tr>
<tr>
<td>L/G SIG</td>
<td>L/G CONT</td>
<td>A P</td>
<td>GND REC</td>
<td>HYD</td>
<td>SMOKE</td>
<td>C. FIRE</td>
<td></td>
</tr>
<tr>
<td>W SHLD</td>
<td>PITOTS</td>
<td>A WARN</td>
<td>DOORS</td>
<td>SERVO</td>
<td>DIM</td>
<td>DEICE</td>
<td></td>
</tr>
</tbody>
</table>

**The CWP 32 Alpha Warning Lights and their Meaning**

- **IHUMS** — Fault with the IHUMS system. Consult IHUMS CDU for further details.
- **ELT SAFE** — The ADELT has been disarmed.
- **L/G SIG** — There has been 28V power loss in the landing gear logic indicating circuit.
- **W SHLD** — Anti-icing failure on one or both windscreens. Check 34 Alpha panel.
- **ENG CH1** — Metal particles have been detected in the number 1 engine oil system.
- **ENG CH2** — Metal particles have been detected in the number 2 engine oil system.
- **AVAD** — The AVAD has been tested and not reset. No AVAD audio warnings available.
- **L/G CONT** — Electrical fault in the normal landing gear extension circuit.
- **PITOTS** — Loss of one or both pitot anti-icing. See 34 Alpha panel for more information.
- **MGB CH** — Metal particles have been detected in the MGB chip detector.
- **FUEL** — There is a fault in the fuel system. See fuel panel for further details.
- **FIRE D** — 28V power loss or fire detector fault in left or right hand engine bay.
- **AP** — Electrical fault in autopilot system.
- **COWLS** — One or more cowlings (engine or MGB) open or not properly locked.
- **A WARN** — Audio warnings inhibited. Check switch on 34 Alpha panel.
- **MGB T** — Main warnings inhibited. Check switch on 34 Alpha panel.
- **PWR CAL** — Power calculator failure.
- **THROT** — One or both SSLs not set to automatic governing ‘flight’ position.
- **ELEC** — Electrical power fault. Check over head panel for further indications.
- **GYRO** — Directional or vertical gyro failure. Check overhead panel for further details.
- **GND REC** — External power receptacle open.
- **DOORS** — One of the 6 doors are open. See centre console warning panel for details.
MGB COOL — Oil pressure below 3 bar. Indicates that main pump has failed and oil is now bypassing the cooler. The standby pump is now working. Check gauges for further details.

RB SAFE — Rotor brake safety lever in the braking position.

DIFF NG — Differential Ng of equal to or greater than 2,500 (7½%).

CPL — Autopilot coupler failure.

HYD — Hydraulic system fault. See Hydraulic warning light panel for further information.

SERVO — Seizing of one or more main or tail servo controls or loss of one cylinder in tail servo.

MGB P — Oil Pressure below 1 bar.

ROT BR — Pressure in the rotor brake system.

FIRE 1 — Fire in left hand engine bay.

ENG P1 — Oil pressure below 1.7 bar in left hand engine.

DC FAIL — Failure of both transformer rectifiers.

ICE D — Ice has been detected or there is a fault with the detector. Refer to ice detector panel.

SMOKE — Smoke has been detected in the cargo bay.

FIRE 2 — Fire in right hand engine bay.

ENG P2 — Oil pressure below 1.7 bar in right hand engine.

BAT T — Battery over heating. Check over head gauge for further details.

AP HT — AP heating system failed or over heating. Temperature possibly above 120°C.

C FIRE — Fire has been detected in the cargo bay.

DEICE — Engine intake heater mat failure. Check overhead switching panel for further information.

Strip Warning Panel (34 Alpha)

This panel, lying below the instrument panel, contains all the switches and warning lights listed below.

The engine warning lights at the right hand side are bounded by yellow lines, which coincide, with the lines around the engine instruments on the instrument panel.

The operation of all switches and lights will be covered in the relevant section of this manual.

Figure 2 – 34 Alpha Panel

1. Emergency battery monitoring and control push-button and switch.
2. LH and RH windscreens anti-icing control switch.
3. Windscreens wiper control switch (speed select)
4. Windscreens wash switch.
5. Aural warning switch.
6. Cargo fire test switch.
7. Load ON/Load OFF sling lights.
8. Servo test button
9. LH and RH pitot anti-icing control switch.
10. No 1 Engine monitoring panels and ventilation control switches.
11. Overspeed test button and associated lights plus starter lights.
12. Power test button.
13. No 2 Engine monitoring panels and ventilation control switches.
The 34 Alpha Warning Lights and their Meaning

Standby Battery **FAIL** — Emergency battery failed or overheating.
Standby Battery **FLOW** — Emergency battery supplying aircraft systems.
WDSCR LH ——— Left hand windscreen anti-icing failure.
WDSCR RH — Right hand windscreen anti-icing failure.
PIT LH ——— Left hand pitot system anti-icing failure.
PIT RH ——— Right hand pitot system anti-icing failure.
ENGINE 1 **BLEED** (white) — Left hand engine bleed valves are open.
ENGINE 1 **OFFSET** (green) — Left hand engine bleed valves are offset.
OVSP 1 ——— Left hand engine free turbine over-speed or inoperative.
GOV 1 ——— Loss of redundancy in left hand engine governor.
OVSPD TEST **FAIL** — On pressing test button. Failure of one Nf over-speed circuit.
OVSPD TEST **NORM** — On pressing test button. Nf over-speed circuit correct.
S1 ——— Left hand engine starter connected.
S2 ——— Right hand engine starter connected.
START **FAIL** — Actuated starter contactor has tripped.
OVSP 2 ——— Right hand engine free turbine over-speed or inoperative.
GOV 2 ——— Loss of redundancy in right hand engine governor.
ENGINE 2 **BLEED** (white) — Right hand engine bleed valves are open.
ENGINE 2 **OFFSET** (green) — Right hand engine bleed valves are offset.

Instrument Panel Warning Lights and their Meaning

ALARM (red) — Indicates that a red warning light has illuminated on the CWP.
WARN (amber) — Indicates that an amber warning light has illuminated on the CWP.
L/G (red) — Landing gear not extended with IAS below 60 kts.
NR MAX (red) — Rotor speed above 290 rpm. Associated with audio alarm.
NR MIN (red) — Rotor speed between 200 and 245 rpm. Associated with audio alarm.
POWER 1 (red) — Active failure of governor or loss of power in the left hand engine.
(Ng difference = 2,500 rpm and Nr below 250 rpm or above 285 rpm.)
POWER 2 (red) — Active failure of governor or loss of power in the right hand engine.
(Ng difference = 2,500 rpm and Nr below 250 rpm or above 285 rpm.)