WARNINGS

WARNING LIGHTS
Some of the aircraft systems are actuated by illuminated buttons. These buttons are not illuminated when they are in a normal operating flight condition. If the pilot has commanded the button to a position which requires crew attention, a striped bar is illuminated inside the button. There are some exceptions, such as the windshield heating, the GPU, the ice protection wing and stab, and the APU bleed buttons, which are illuminated under normal operating conditions.

Some systems also provide indicating lights for system status. Further details on such lights are provided in the associated systems description section.

Master warning and caution lights are installed in each pilot glareshield panel. These lights flash when any warning or caution message is presented on the EICAS or generated in the Aural Warning Unit (AWU). Pilots must press the associated light to stop the flashing. Refer to the associated system description to find more information on illuminated buttons and any specific warning light.

EICAS MESSAGES
EICAS messages are presented in the upper right corner of the EICAS display. If the EICAS and MFD simultaneously fail, the RMUs are capable of presenting some messages.

There are three message levels: warning, caution, and advisory:

— Warning messages are red colored and require immediate crew action. Warning messages are always presented on the top of the list and in the same order they were generated.

— Caution messages are amber colored and require immediate crew awareness. They follow warning messages in criticality level and in display presentation.

— Advisory messages are blue and are dedicated to minor failures or system status. Advisory messages are displayed below caution messages. A fourth level is provided for maintenance purposes, but it is not presented to the pilots. It can only be accessed on the ground. Maintenance may request pilots to access this level for troubleshooting purposes.

When a message is generated, it is displayed flashing at the top of the associated group. The Master Warning or Master Caution light must be pressed to stop the flashing. Advisory messages will stop flashing after five seconds.

EICAS MESSAGE PRIORITY LOGIC
If more than one message is simultaneously presented, warning messages will precede caution messages which will in turn precede advisory messages. Up to 15 messages can be displayed at once. An END label is provided after the last message to indicate the end of the message listing. If more than 15 messages are being generated, the EICAS bezel knob can be used to scroll through the remaining messages. A status line is then provided on the 16th line to indicate how many messages are not currently being presented and where they are (above or below the currently presented messages). The END label and the warning messages cannot be scrolled out of the display. Caution and advisory messages will therefore be scrolled in the area left blank by the warning messages. If a new message is generated during scrolling, it will automatically be displayed at the top of the associated message level.
INHIBITION LOGIC
Inhibition logic prevents some messages from being presented during the takeoff and approach/landing phases to avoid causing a nuisance to the pilots. The inhibition logic is as follows:

Takeoff Phase:
The inhibition is valid when the airspeed exceeds \( V_1 - 15 \) knots. The inhibition is deactivated when one of the following conditions is accomplished:

— radio altitude is greater than 400 feet, or
— calibrated airspeed is less than 60 knots, or
— after one minute.

Approach/Landing Phase:
The inhibition is valid below 200 feet radio altitude. The inhibition is deactivated when one of the following conditions is accomplished:

— the aircraft is on the ground for three seconds or more, or
— after one minute.

IC-600 SELF CHECK
The results of both IC-600 computations are continuously compared to check for any inconsistency between both sides. A dedicated amber "CAS MSG" annunciation is presented on both PFDs whenever an inconsistency exists, thus leading to possible unreliable messages.

The IC-600 messages can be individually displayed to compare message validity. IC-600 #1 normally provides the EICAS display image. IC-600 #2’s standby EICAS display is only visible when MFD 2 is selected as an EICAS on the First Officer’s Reversionary Panel.

STALL PROTECTION SYSTEM:
The Stall Protection System (SPS) helps in detecting and preventing aerodynamic stalls.

The SPS is composed of an SPS Computer with two independent channels, the SPS Panel, two AOA vanes, two Stick Shaker Actuators and one Stick Pusher Actuator. To avoid spurious actuation, each SPS channel receives signals from many airplane systems, and compares it to the other channel.

The System provides tactile, visual and aural indications of an impending stall. If pilots do NOT correct the situation, the system also commands a Stick Pusher to lower the pitch attitude thus correcting its Set Point (activation) according to: Airspeed, Icing Condition, Flap and Gear position, and Windshear logic.

To disconnect the system in case of failure, the SPS Panel provides on CUTOUT Button for each Channel.

TRAFFIC AND COLLISION AVOIDANCE SYSTEM (TCAS)
The System is based upon Transponder Signals and provides:

- Visual Warnings,
- Aural Warnings,
- Recommended evasive actions.

The System produces two kinds of Alerts:

- Traffic Advisory (TA).
- Resolution Advisory (RA).
The TCAS computer receives information from Transponders, Radio Altimeters, and Air/Ground signals. Other aircraft transmit their Altitude, Bearing, and Identification. Only intruder aircraft equipped with an operating Transponder can generate Advisories.

TCAS computes predicted paths of each intruder, and determines its threat level, according to Zones of Protection. The speeds of both aircraft are utilized and the size of the Zone of Protection is based upon time. The system includes protections to avoid nuisance warnings. Aircraft below 180 ft. which are about to land he have just taken off, are ignored.

TCAS cannot recommend horizontal evasive actions. Pilots are primarily responsible for the evasive action. This must always be preceded by a very careful evaluation of the situation.

The Caution Area (TA) displays a conflict predicted in 35 seconds to 45 seconds.

The Warning Area (RA) displays a conflict predicted in 20 seconds to 30 seconds.

MFD displays intruders according to threat level by various icons.

1. Icon shape and color indicate specific types of threats.
2. Arrows indicate intruders climbing or descending.
3. Two digit numerical readouts indicate Relative Altitude to your aircraft.
4. Voice message alerts give guidance to de-conflict the aircraft.

PFD Vertical Speed Indicator (VSI) gives visual guidance.

NOTE: Remember -- fly to the GREEN, stay out of the RED.

The System is monitored and options selected using the RMU.

**TCAS VOICE ALERTS:**

**Advisory TA:**
- “TRAFFIC, TRAFFIC "
- “CLEAR OF CONFLICT"

**Preventative RA:**
- “MONITOR VERTICAL SPEED"

**Corrective RAs:**
- “CLIMB"
- ’DESCEND”
- “REDUCE CLimb”
- “REDUCE DESCENT”
- “CLIMB, CROSSING CLIMB”
- “DESCEND, CROSSING DESCEND”
- “INCREASE CLIMB”
- “INCREASE DESCENT”
- “CLIMB, CLIMB NOW”
- “DESCEND, DESCEND NOW”