



CHAPTER 3

AURAL AND VISUAL WARNINGS

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CHAPTER 3

AURAL AND VISUAL WARNINGS

GENERAL

The aural and visual warning system provides aural, visual, and/or tactile indications. These indications warn of potentially unsafe operating conditions or airplane configurations, system malfunctions, and non-normal situations. Indications are generated by the following:

- Crew alerting subsystem within the engine indicating and crew alerting system (EICAS)
- Enhanced ground proximity warning system (EGPWS)
- Traffic alert and collision avoidance system (TCAS)
- Altitude alert portion of the air data computer (ADC)
- Stick shaker portion of the stall protection system (SPS)

SYSTEM DESCRIPTION

CREW ALERTING SYSTEM

The crew alerting system (CAS) portion of EICAS continually monitors all airplane systems. If an operationally significant fault occurs on a system, the EICAS displays a crew alerting message in the left (primary) EICAS display unit. In addition to the display messages, some crew alerts are also indicated by aural tones, voice advisories, MASTER WARNING, and MASTER CAUTION lights. The EICAS also illuminates the appropriate switchlight on the system control panel to prompt corrective crew action. All crew alerting system messages are divided into one of four categories: warnings, cautions, advisories, or status.



Warning Messages

Warnings indicate operational or airplane system conditions that require immediate corrective action. They are the most urgent type of crew alerts. They always appear in red at the top of the message stack on the EICAS primary display. A typical warning message is AFCS MSG FAIL. All warnings flash the red MASTER WARNING lights and have an aural alert consisting of a unique tone or a triple-chime plus a voice advisory. Warning messages cannot be removed from view, unless the applicable failure is rectified.

Caution Messages

Cautions indicate operational or airplane system conditions that require prompt corrective action. They are less urgent than warnings. Cautions appear in amber immediately below the warnings in the message stack on the EICAS primary display. A typical caution message is A/SKID INOP. All cautions cause the amber MASTER CAUTION lights to flash and have an aural alert consisting of a single chime. Caution messages can be removed from view after the generators are operating and on line.

Advisory Messages

Advisories are used to show that a safe condition exists. They are set in green at the top of the stack of messages on the EICAS secondary display (status page) messages. A typical advisory message is FLT SPLR DEPLOY. Advisory messages cannot be removed from view, unless the applicable system or switch has been deselected and/or deactivated.

Status Messages

Status messages indicate an abnormal condition exists or a low-priority failure has occurred. They are set in the message stack in white below the advisories. Typical status messages would be CKPT TEMP MAN or BTMU FAIL. Status messages can be removed from view at any time.



WARNING AURAL MESSAGES

Various aural messages call attention to warnings. The ten warning types are shown in Table 3-1.

Table 3-1 AURAL WARNING TYPES

SOUNDS	INDICATIONS	CHAPTER REFERENCES
Warbler	Stall	Stall protection, Chapter 10, "Flight Controls"
Siren	Wind shear	Wind shear and GPWS, Chapter 17, "Navigation"
"Whoop whoop"	GPWS mode 1 or 2 (excessive descent or closure rate)	GPWS, Chapter 17, "Navigation"
Fire bell	Fire warning	Chapter 9, "Fire Protection"
Voice	Voice aural warning	Chapters 2–18
Clacker	- Excessive stabilizer trim movement V_{MO}/M_{MO} exceedance - Airspeed too high for current flap setting	Chapter 10, "Flight Controls"
Horn	Gear not down	Chapter 15, "Landing Gear"
Cavalry charge	Autopilot disconnected	Chapter 4, "Automatic Flight Controls"
Warning (triple chime)	Warning tone that precedes an aircraft system voice advisory	Chapters 2—18
C-chord	Altitude alert	Chapter 11, "Flight Instruments"



An alphabetical list of voice messages is shown in Table 3-2. Codes under the CANCEL column indicate MW for MASTER WARNING and SYS for system.

Table 3-2 VOICE MESSAGES

VOICE MESSAGE	CANCEL	CHAPTER REFERENCE	DISPLAY MESSAGE
“Anti-ice duct”	MW	14	ANTI-ICE DUCT
“APU”	MW	5	APU OVERSPEED, APU OVERTEMP
“Bank angle”	SYS	17	
“Bleed-air duct”	MW	18	L/R 10TH DUCT, L/R 14TH DUCT
“Brakes”	MW	15	BRAKES OVHT
“Cabin pressure”	MW	2	DIFF PRESS, CABIN ALT
“Caution obstacle, caution obstacle”	SYS	17	Obstacle aware- ness caution dis- play on MFDs
“Caution terrain, caution terrain”	SYS	17	Terrain aware- ness caution dis- play on MFDs
“Clear of conflict”	SYS	17	
“Climb, climb, climb”	SYS	17	TCAS resolution advisory on PFD or MFD
“Climb, climb, now”	SYS	17	TCAS resolution advisory on PFD or MFD
“Climb, cross climb”	SYS	17	TCAS resolution advisory on PFD or MFD



Table 3-2 VOICE MESSAGES (Cont)

VOICE MESSAGE	CANCEL	CHAPTER REFERENCE	DISPLAY MESSAGE
“Config trim”	SYS	3	CONFIG AILERON, CONFIG RUDDER, CONFIG STAB
“Config autopilot”	SYS	3	CONFIG AP
“Config brakes”	SYS	3	PARKING BRAKE
“Config flaps”	SYS	3	CONFIG FLAPS
“Config spoiler”	SYS	3	CONFIG SPLRS
“Decision height”	SYS	11	DH (on PFD)
“Descend, cross- ing, descend”	SYS	17	TCAS resolution advisory on PFD or MFD
“Descend, descend, descend”	SYS	17	TCAS resolution advisory on PFD or MFD
“Descend, descend, now”	SYS	17	TCAS resolution advisory on PFD or MFD
“Don’t sink”	SYS	17	
“Door”	MW	1	PASSENGER DOOR
“Engine oil”	MW	18	L (or R) ENG OIL PRESS
“Gear bay overheat”	MW	9	MLG BAY OVHT
“Gear disagree”	MW	15	GEAR DISAGREE
“Glideslope”	SYS	17	



Table 3-2 VOICE MESSAGES (Cont)

VOICE MESSAGE	CANCEL	CHAPTER REFERENCE	DISPLAY MESSAGE
“Increase climb”	SYS	17	TCAS resolution advisory on PFD or MFD
“Increase decent”	SYS	17	TCAS resolution advisory on PFD or MFD
“Jetpipe overheat”	MW	9	L/R JETPIPE OVHT
“Minimums”	SYS	17	
“Minimums, minimums”	SYS	17	
“Monitor vertical speed”	SYS	17	TCAS resolution advisory on PFD or MFD
“Nose door”	MW	15	NOSE DOOR OPEN
“Obstacle, obstacle Whoop whoop, Pull up”	SYS	17	Obstacle awareness warning display on MFDs
“Pull up”	SYS	17	
“Reduce climb”	SYS	17	TCAS resolution advisory on PFD or MFD
“Reduce decent”	SYS	17	TCAS resolution advisory on PFD or MFD
SELCAL	SYS	6	SELCAL HF, SELCAL VHF 1, SELCAL VHF 2, SELCAL VHF 3
“Sink rate”	SYS	17	



Table 3-2 VOICE MESSAGES (Cont)

VOICE MESSAGE	CANCEL	CHAPTER REFERENCE	DISPLAY MESSAGE
"Smoke"	MW	9	SMOKE CARGO
"Terrain"	SYS	17	
"Terrain Pull up"	SYS	17	
"Terrain, terrain Whoop whoop, Pull up"	SYS	17	Terrain awareness warning display on MFDs
"Too low flap"	SYS	17	
"Too low gear"	SYS	17	
"Too low terrain"	SYS	17	
"Traffic, traffic"	SYS	17	TCAS traffic advisory on PFD or MFD
"Wing overheat"	MW	14	WING OVHT
"Wind shear"	SYS	17	WIND SHEAR (on PFD)
"0, 10, 20, ..." (altitude callouts)	SYS	17	
700, 960, 1400, and 2,800 Hz tones	SYS	17	

Communications System Aural Messages

An electronic (high-low tone) chime indicates a flight attendant call or a flight attendant emergency call. Interphone system call tones are described in Chapter 6, "Communications."



A coded call from a ground station is indicated by a “SELCAL” voice advisory, which is announced twice then stops with no preceding chime.

Aural Warning Test

Most aural warnings are exercised as part of their own system test. For all other aural warnings, an AURAL WARN TEST switch is provided on the miscellaneous test panel on the center pedestal. The WARN TEST switch may be set to test each data concentrator unit’s aural output individually. The test sequences through each alert (tone and/or voice message) in priority order.

MASTER WARNING/MASTER CAUTION Switchlights

The two MASTER WARNING switchlights illuminate flashing when any warning occurs. The lights remain on as long as the warning exists. Pushing either MASTER WARNING switchlight extinguishes both MASTER WARNING lights for the duration of that warning and resets the lights for future warnings. Pushing the MASTER WARNING switchlight also silences the aural warnings except for the following cases:

- Stall warbler
- Stabilizer trim clacker
- EGPWS/TCAS (voices and aural)
- AP disconnect cavalry charge
- Overspeed clacker
- Configuration warnings
- Flap clacker
- Gear horn



The two MASTER CAUTION switchlights come on flashing when any caution occurs. Pushing either MASTER CAUTION switchlight extinguishes both MASTER CAUTION lights for the duration of that caution and resets the lights for future cautions. Pushing the MASTER CAUTION switchlight will not silence the following:

- EGPWS and TCAS voice alerts
- Altitude alert (C-chord) aural

Display Messages

Crew alerting messages appear on the EICAS primary and secondary displays to indicate non-normal conditions detected by the EICAS. Messages appear in the crew alerting system table area, arranged by their urgency and order of occurrence.

Warnings are indicated by red messages at the top of the message list. Cautions appear as amber messages below the lowest warning. Advisory messages appear as green messages, and white status messages follow the advisory message. The most recent warning, caution, advisory, or status message appears at the top of its respective group of messages.

A message is automatically removed from EICAS when the associated condition no longer exists. In this case, each message which appeared below the deleted message moves up one line. When a new fault occurs, the new message moves older messages down one line.

Warning messages cannot be paged. If the number of warnings exceed the primary page message number of lines, then only the most recent warning messages display. Warning messages cannot be removed from view unless the applicable failure is rectified.

Caution messages can be paged. The CAS button on the EICAS control panel pages through caution messages. Caution messages can be removed from view by pressing the CAS button, providing both main generators are operating and on line. A MSGS icon then appears, advising the crew that caution messages are out of view.



Providing there is at least one line available on the primary page, the CAS switch can be used to page through caution messages. Advisory messages cannot be removed from view, unless the appropriate system switch is deactivated. Status messages can be paged. The STAT button on the EICAS control panel pages through status messages. Status messages can be removed from view, any time the EICAS system is powered, by pressing the STAT button on the EICAS control panel. A MSGS icon then appears, advising the crew that messages are out of view.

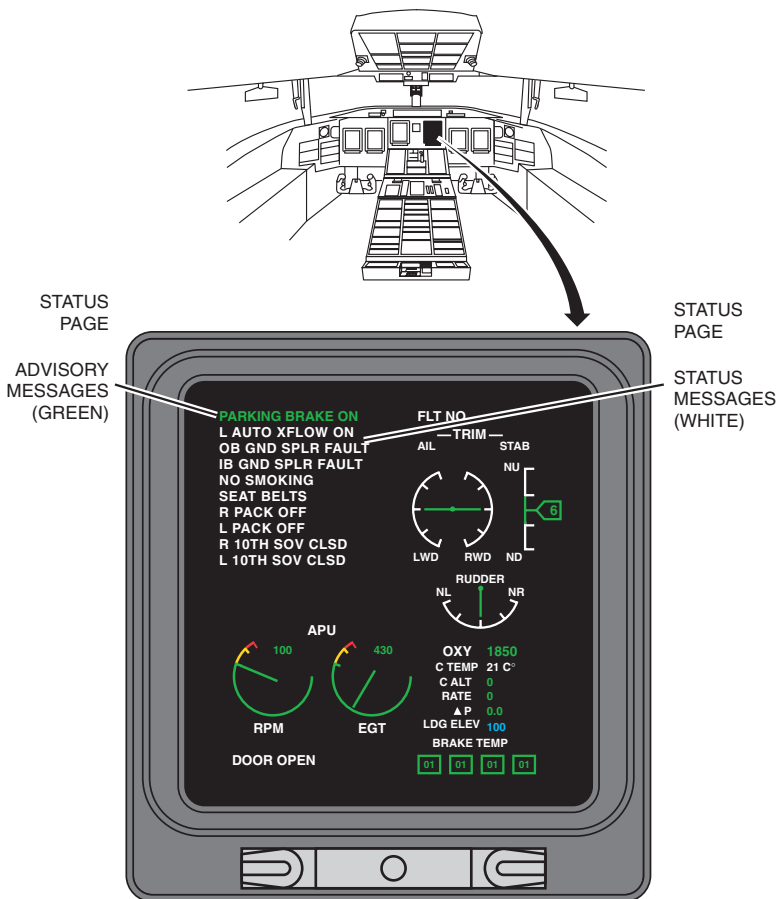


Figure 3-1 EICAS Crew Alerting Messages



A complete list of EFIS (electronic flight instrument system) and EICAS messages is shown in (Table 3-3). In the TYPE column, the codes indicate as follows:

- W—Warning (red)
- C—Caution (amber)
- S—Status (white)
- A—Advisory (green)

Table 3-3 EFIS AND EICAS MESSAGES

MESSAGE	TYPE	CHAPTER REFERENCE
A/SKID INBD	C	15
A/SKID OUTBD	C	15
AC 1 AUTOXFER	C	7
AC 2 AUTOXFER	C	7
AC BUS 1	C	7
AC BUS 2	C	7
AC ESS ALTN	S	7
AC ESS BUS	C	7
AC SERV BUS	C	7
AC UTIL 1 OFF	S	7
AC UTIL 2 OFF	S	7
AC1 AUTOXFER OFF	S	7
AC2 AUTOXFER OFF	S	7
AFCS MSG FAIL	W	4
ANTI-ICE DUCT	W	14



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
AP PITCH TRIM	C	4
AP TRIM IS NU	C	4
AP TRIM IS ND	C	4
AP TRIM IS LWD	C	4
AP TRIM IS RWD	C	4
APR (L ENG)	Green icon	18
APR (R ENG)	Green icon	18
APR ARM	A	18
APR CMD SET	C	18
APR INOP	C	18
APR TEST 1 OK	A	18
APR TEST 2 OK	A	18
APU BATT CHGR	S	7
APU BATT OFF	C	7
APU BLEED ON	C	5
APU BTL LO	C	9
APU ECU FAIL	S	5
APU FAULT	C	5
APU FIRE	W	9
APU FIRE FAIL	C	9
APU GEN OFF	C	7



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
APU GEN OVLD	C	7
APU OIL TEMP	C	5
APU IN BITE	S	5
APU LCV FAIL	C	5
APU LCV OPEN	S	5
APU OIL PRESS	C	5
APU OVERSPEED	W	5
APU OVERTEMP	W	5
APU SOV FAIL	C	5
APU SOV OPEN	C, S	5
APU SOV CLSD	A	5
APU SQUIB 1	A	9
APU SQUIB 2	A	9
APU START	S	5
APU PRESS	C	2
APU PRESS 1 FAIL	S	2
APU PRESS 2 FAIL	S	2
APU XFLOW INHIB	S	12
AV BAY DOOR	C	1
ARINC COOL	C	2
BATTERY BUS	C	7
BLEED MISCONFIG	C	2



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
BRAKE OVHT	W	15
BTMU FAIL	S	15
BULK FUEL TEMP	C	12
CABIN ALT	W, C	2
CABIN PRESS MAN	S	2
CABIN TEMP MAN	S	2
CARGO BTL LO	C	2
CARGO DOOR	C	1
CARGO FAN FAIL	S	2
CARGO OVHT	C	2
CARGO SOV FAIL	S	2
CARGO 1, 2	A	2
CAS MISCOMP	S	3
CKPT COOL FAIL	S	2
CKPT TEMP MAN	S	2
CONFIG AILERON	W	3
CONFIG AP	W	3
CONFIG FLAPS	W	3
CONFIG RUDDER	W	3
CONFIG SPLRS	W	3
CONFIG STAB	W	3
CONT IGNITION	S	18



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
COOL EXHAUST FAIL	S	2
CPAM FAIL	S	2
COWL A/ICE ON	A	14
CPTL ROLL CMD	A	10
DC BUS 1	C	7
DC BUS 2	C	7
DC EMER BUS	C	7
DC ESS BUS	C	7
DC ESS TIE CLSD	S	7
DC SERV BUS	C	7
DC TIE 1 CLSD	S	7
DC TIE 2 CLSD	S	7
DCU1 APR FAIL	S	18
DCU2 APR FAIL	S	18
DCU1 AURAL INOP	S	3
DCU2 AURAL INOP	S	3
DCU1 INOP	S	18
DCU2 INOP	S	18
DIFF PRESS	W	2
DISPLAY COOL	C	2
DUCT MON LOOP A	S	14
DUCT MON LOOP B	S	14



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
DUCK TEST O.K.	A	18
EFIC COMP INOP	C	11
EFIC COMP MON	C	11
EICAS COMP INOP	C	3
ELT ON	C	6
EMER DEPRESS	C	2
EMER LTS OFF	C	16
EMER LTS ON	C	16
EMER PWR ONLY	W	7
ENG BTL 1 LO	C	9
ENG BTL 2 LO	C	9
ENG OVERSP	W	18
ENG TYPE MISCOMP	S	18
ESS TRU 1	C	7
ESS TRU 2	C	7
FD 1 FAIL	S	4
FD 2 FAIL	S	4
FDR ACCEL FAIL	S	3
FDR EVENT	A	3
FDR FAIL	S	3
FLAPS DEGRADED	S	10
FLAPS HALFSPEED	S	10



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
FLAPS FAIL	C	10
FLT SPLT DEPLOY	A, C	10
FLT SPLRS	C	10
FLT SPLRS FAULT	S	10
FLUTTER DAMPER	S	10
FUEL CH 1 FAIL	S	12
FUEL CH 2 FAIL	S	12
FUEL CH 1/2 FAIL	C	12
FUEL IMBALANCE	C	12
GEAR DISAGREE	W	15
GEN 1 OFF	C	7
GEN 1 OVLD	C	7
GEN 2 OFF	C	7
GEN 2 OVLD	C	7
GLD MAN ARM	A	10
GLD MAN DISARM	S	10
GLD NOT ARMED	C	10
GLD UNSAFE	C	10
GND SPLR DEPLOY	A, C	10
GPWS FAIL	S	17
GRAV XFLOW FAIL	S	17
GRAV XFLOW OPEN	A	12



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
GS CANCEL	S	17
HORN MUTED	S	15
HOT (L ENG)	Red icon	18
HOT (R ENG)	Red icon	18
HYD 1 LO PRESS	C	13
HYD 2 LO PRESS	C	13
HYD 3 LO PRESS	C	13
HYD 1 HI TEMP	C	13
HYD 2 HI TEMP	C	13
HYD 3 HI TEMP	C	13
HYD EDP 1A	C	13
HYD EDP 2A	C	13
HYD PUMP 1B	C	13
HYD PUMP 2B	C	13
HYD PUMP 3A	C	13
HYD PUMP 3B	C	13
HYD SOV 1 OPEN	C	13
HYD SOV 1 CLSD	A	13
HYD SOV S OPEN	C	13
HYD SOV 2 CLSD	A	13
IAPS DEGRADED	S	4
IAPS OVERTEMP	S	4



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
IB BRAKE PRESS	C	15
IB GND SPLR FAULT	S	10
IB GND SPLR	C	10
ICE	A	14
ICE	C	14
ICE DET 1 FAIL	S	14
ICE DET 2 FAIL	S	14
ICE DETECT FAIL	S	14
IDG 1	C	7
IDG 1 DISC	S	7
IDG 2	C	7
IDG 2 DISC	S	7
IGNITION A	A	18
IGNITION B	A	18
IGNITION A/B	S	18
INBD COOL FAIL	S	2
10TH ISOL OPEN	S	18
14TH ISOL OPEN	S	14, 18
L 10TH DUCT	W	18
L 10TH SOV CLSD	S	18
L 10TH ARM OPEN	S	2
L 14TH ARM CLSD	S	14



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
L 14TH DUCT	W	18
L 14TH SOV CLSD	S	18
L AOA HEAT	C	14
L APR ECU FAIL	S	18
L AUTO XFLOW ON	S	12
L COWL A/ICE	C	14
L COWL A/ICE ON	A	14
L EMER DOOR	C	1
L ENG ECU FAIL	S	18
L ENG FIRE	W	9
L ENG MISCOMP	C	18
L ENG OIL PRESS	W	18
L ENG SOV CLSD	A, C	12
L ENG SOV FAIL	C	12
L ENG SOV OPEN	C	12
L ENG SQUIB 1	A	9
L ENG SQUIB 2	A	9
L ENGINE START	S	18
L FIRE FAIL	C	9
L FLT SPLR	C	10
L FUEL FILTER	C	12
L FUEL LO PRESS	C	12



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
L FUEL LO TEMP	C	18
L FUEL PUMP	C	12
L FUEL PUMP ON	A	12
L JET OVHT FAIL	C	9
L JETPIPE OVHT	W	9
L MAIN EJECTOR	C	12
L PACK HI PRESS	C	2
L PACK HI TEMP	C	2
L PACK OFF	S	2
L PITOT HEAT	C	14
L REV ARMED	A	18
L REV UNLOCKED	C	18
L REV UNSAFE	C	18
L SCAV EJECTOR	C	12
L SPOILERON	C	10
L STATIC HEAT	C	14
L WINDOW HEAT	C	14
L WING A/ICE	C	14
L WSHLD HEAT	C	14
L XFER SOV	C	12
L XFLOW ON	S	12
L XFLOW SOV	C	12



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
MACH TRIM	C	10
MAIN BATT CHGR	S	7
MAIN BATT OFF	C	7
MAN XFLOW	S	12
MLG BAY OVHT	W	9
MLG OVHT FAIL	C	9
NO SMOKING	S	15
NO STARTER CUTOUT	C	18
NOSE DOOR OPEN	W	15
OB BRAKE PRESS	C	15
OB GND SPLR FAULT	S	10
OB GND SPLRS	C	10
OVBD COOL	C	2
OVBD COOL FAIL	S	2
OXY LO PRESS	C	8
PARK BRAKE SOV	C	15
PARKING BRAKE	W	15
PARKING BRAKE ON	A	15
PASS OXY ON	C	8
PASSENGER DOOR	W	1
PAX DR LATCH	C	1
PAX DR OUT HNDL	C	1



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
PITOT BASE HEAT	C	14
PTL ROLL CMD	A	10
PROX SYS CHAN	C	15
PROX SYS FAULT	S	15
R 10TH ARM OPEN	S	2
R 10TH DUCT	W	18
R 14TH ARM CLSD	S	14
R 14TH DUCT	W	18
R 10TH SOV CLSD	S	18
R 14TH SOV CLSD	S	18
R AOA HEAT	C	14
R APR ECU FAIL	S	18
R AUTO XFLOW ON	S	12
R COWL A/ICE	C	14
R COWL A/ICE ON	A	14
R EMER DOOR	C	1
E ENG ECU FAIL	S	18
R ENG FIRE	W	9
R ENG MISCOMP	C	18
R ENG OIL PRESS	W	18
R ENG SOV CLSD	A, C	12
R ENG SOV FAIL	C	12



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
R ENG SOV OPEN	C	12
R ENG SQUIB 1	A	9
R ENG SQUIB 2	A	9
R ENGINE START	S	18
R FIRE FAIL	C	9
R FLT SPLR	C	10
R FUEL FILTER	C	12
R FUEL LO PRESS	C	12
R FUEL LO TEMP	C	18
R FUEL PUMP	C	12
R FUEL PUMP ON	A	12
R JET OVHT FAIL	C	9
R JETPIPE OVHT	W	9
R MAIN EJECTOR	C	12
R PACK HI PRESS	C	2
R PACK HI TEMP	C	2
R PACK OFF	S	2
R PITOT HEAT	C	14
R REV ARMED	A	18
R REV UNLOCKED	C	18
R REV UNSAFE	C	18
R SCAV EJECTOR	C	12



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
R SPOILERON	C	10
R STATIC HEAT	C	14
R WINDOW HEAT	C	14
R WING A/ICE	C	14
R WSHLD HEAT	C	14
R XFER SOV	C	12
R XFLOW ON	S	12
R XFLOW SOV	C	12
RAM AIR OPEN	S	2
REV (L ENG)	Green or amber icon	18
REV (R ENG)	Green or amber icon	18
SEAT BELTS	S	15
SELCAL HF	A	6
SELCAL VHF 1	A	6
SELCAL VHF 2	A	6
SELCAL VHF 3	A	6
SERVICE DOOR	C	1
SMOKE CARGO	W	9
SMOKE TOILET	C	9
SPEED REFS INDEP	S	17



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
SPOILERONS	C	10
SPOILERONS FAULT	S	10
SPOILERONS ROLL	S	10
STAB CH1 INOP	S	10
STAB CH2 INOP	S	10
STAB TRIM	C	10
STALL FAIL	C	10
STBY PITOT HEAT	C	14
STEERING INOP	C	15
TAT PROBE HEAT	C	14
TERRAIN FAIL	S	17
TERRAIN NOT AVAIL	S	17
TERRAIN OFF	S	17
T/O CONFIG OK	A	3
VIB (L ENG)	Amber icon	18
VIB (R ENG)	Amber icon	18
WINDSHEAR FAIL	S	17
WING A/ICE OK	A	14
WING A/ICE ON	A	14
WING A/ICE SNSR	C	14
WING/COWL A/I ON	A	14



Table 3-3 EFIS AND EICAS MESSAGES (Cont)

MESSAGE	TYPE	CHAPTER REFERENCE
WING OVHT	W	14
WOW INPUT	C	15
WOW OUTPUT	C	15
WOW OUTPUT FAIL	S	15
XFLOW/APU PUMP	C	12
YAW DAMPER	C	4
YD 1 INOP	S	4
YD 2 INOP	S	4

Inhibits

During the initial takeoff, final takeoff, and landing phases, the data concentrator unit (DCU) will process inhibit logic to minimize spurious or distracting warning or caution messages.

The initial takeoff inhibits are enabled when:

- Left and right engine N_1 is greater than 79%
- Weight on wheels, and
- Airspeed is less than 100 knots

The initial takeoff inhibit is removed when:

- Left and right engine N_1 is less than 67.6%, or
- Airplane is in the final takeoff phase



The final takeoff inhibits are enabled when:

- Left and right engine N_1 is greater than 79%, and
- Airspeed transitions to greater than 100 knots

The final takeoff inhibit is removed when:

- Left and right engine N_1 is less and 67.6%, or
- Radio altitude is greater than 400 feet AGL, or
- 30 seconds after ground to air transition

Landing phase inhibits are enabled when:

- Radio altitude transitions to less than 400 feet AGL, and
- Landing gear is down and locked

The landing phase inhibit is removed when:

- 30 seconds after air to ground transition, or
- Radio altitude is less than 400 feet AGL for 3 seconds

Advisory and Status Information Are Not Inhibited During Takeoff and/or Landing

The following warning messages (Table 3-4), their corresponding switchlights, and their corresponding aural (if applicable) are ***not*** inhibited during takeoff and or landing.



Table 3-4 WARNING MESSAGES NOT INHIBITED DURING TAKEOFFS OR LANDINGS

AIRPLANE SYSTEM	WARNING MESSAGE (NOT INHIBITED)	AURAL (NOT INHIBITED)
Air Conditioning and Pressurization	L (R) 10TH DUCT	BLEED AIR DUCT
Aura/Visual Warning System	CONFIG AILERON CONFIG AP CONFIG FLAPS CONFIG RUDDER CONFIG SPLRS CONFIG STAB PARKING BRAKE	CONFIG TRIM CONFIG AUTOPILOT CONFIG FLAPS CONFIG TRIM CONFIG SPOILERS CONFIG TRIM CONFIG BRAKES
Automatic Flight Control System	—	Autopilot cavalry charge Altitude C—chord
Auxiliary Power Unit	APU OVERTEMP	APU
Fire Protection	APU FIRE L (R) ENG FIRE SMOKE CARGO SMOKE TOILET	Firebell Firebell SMOKE SMOKE
Flight Controls	—	Stall Warbler Overspeed Clacker Trim Clacker
Ice and Rain Protection	L(R) 14TH DUCT ANTI-ICE DUCT WING OVERHEAT	BLEED AIR DUCT NOTE: Anti-ice duct inhibited WING OVERHEAT



**Table 3-4 WARNING MESSAGES NOT INHIBITED DURING
TAKEOFFS OR LANDINGS (Cont)**

AIRPLANE SYSTEM	WARNING MESSAGE (NOT INHIBITED)	AURAL (NOT INHIBITED)
Landing Gear	BRAKE OVERHEAT MLG BAY OVHT	BRAKES GEAR BAY OVER- HEAT
Navigation Systems	—	TCAS advisories
Powerplant	ENGINE OVERSPD L (R) JETPIPE OVERHEAT	NOTE: no aural JETPIPE OVERHEAT



The following caution messages (Table 3-5) and their corresponding switchlights (if applicable) are **not** inhibited during takeoff and/or landing.

Table 3-5 CAUTION MESSAGES NOT INHIBITED DURING TAKEOFFS OR LANDINGS

AIRPLANE SYSTEM	CAUTION MESSAGE NOT INHIBITED
Automatic Flight Control System	• AP TRIM IS LWD/RWD/ND/NU • AP PITCH TRIM • YAW DAMPER
Fire protection	• SMOKE TOILET
Flight controls	• FLT SPLR DEPLOY • IB (or OB) GND SPLRS • GLD NOT ARMED • GLD UNSAFE • GND SPLR DEPLOY • L (or R) SPOILERON • SPOILERONS • SPOILERONS ROLL • STAB TRIM • STALL FAIL
Flight instruments	EFIS COMP MON
Hydraulic power	HYD 1 (or 2 or 3) LO PRESS
Ice and Rain Protection	ICE ICE DET FAIL L (R) WING A/ICE
Landing gear	• A/SKID INBD or OUTBD • IB (or OB) BRAKE PRESS • WOW INPUT or OUTPUT
Powerplant	• APR INOP • L (or R) REV UNLOCKED • L (or R) REV UNSAFE



Stall Warning

Warning of an impending stall is provided by independent stall protection systems. Both systems energize in flight and deactivate on the ground through air-to-ground logic. The flight displays indicate an airplane approach-to-stall speed by low-speed cues (red and black checker board) and a $1.27 V_S$ indicator on the primary flight displays (PFDs) airspeed tape.

Stall warnings are provided by a warbler, glareshield STALL lamp illumination, and vibration of both control columns. If the airplane angle-of-attack continues to increase, a stick pusher then pushes the control column forward to prevent further development of a stall. Refer to Chapter 10, “Flight Controls,” and Chapter 11, “Flight Instruments,” for additional data.

Takeoff Configuration Warnings

Takeoff configuration warnings are armed when the airplane is on the ground and both engines are accelerated towards takeoff thrust (N_1 greater than 70%). If the airplane is in a safe takeoff configuration, a T/O CONFIG OK advisory (green) message comes on. The T/O CONFIG OK advisory message goes out upon airplane rotation.

If the airplane is in an unsafe takeoff configuration, configuration aural and warning messages, as well as both MASTER WARNING lights, come on. The systems and conditions in Table 3-6 are checked.

Table 3-6 TAKEOFF CONFIGURATION MESSAGES

CONDITION	VOICE MESSAGE	EICAS MESSAGE
Autopilot engaged	“Config autopilot”	CONFIG AP
Flaps not in takeoff position	“Config flaps”	CONFIG FLAPS
All spoilers not in takeoff position (down)	“Config spoilers”	CONFIG SPLRS



Table 3-6 TAKEOFF CONFIGURATION MESSAGES (Cont)

CONDITION	VOICE MESSAGE	EICAS MESSAGE
Horizontal stabilizers outside of takeoff range (green band)	“Config trim”	CONFIG STAB
Parking brake set (brake valve closed)	“Config brakes”	PARKING BRAKE
Rudder trim outside of takeoff range (trim > $\pm 0.5^\circ$)	“Config trim”	CONFIG RUDDER
Aileron trim outside of takeoff range (trim > $\pm 0.5^\circ$)	“Config trim”	CONFIG AILERONS

All configuration warning indications are canceled when the configuration error is corrected.

Landing Configuration Warnings

The landing gear horn sounds if:

- Any landing gear is not down and locked 2 minutes after ground-to-air transition, and
- Indicated airspeed is less than or equal to 163 knots with one or both thrust levers selected to IDLE, or
- Indicated airspeed is less than or equal to 185 knots with the flaps at less than 5° and one or both thrust levers selected to IDLE

NOTE

The landing gear horn may be muted with one thrust lever at IDLE and the landing gear not in the down and locked position. Refer to Chapter 15, “Landing Gear.”



The “too low gear” aural warning is heard if any landing gear is not down and locked with the radio altitude less than 500-feet AGL and the indicated airspeed less than 190 knots.

The HORN MUTE switch/light on the landing gear control panel provides the means of muting the landing gear horn when the landing gear horn is triggered by one thrust lever at IDLE with the landing gear not in the down and locked position. The landing gear horn cannot be muted when $\geq 30^\circ$ of flap are deployed or both thrust levers at IDLE with the landing gear not in the down and locked position.

The landing gear warning horn is inhibited during takeoff windhear conditions.

Engine Automatic Performance Reserve

The EICAS controls the engine automatic performance reserve (APR) system. APR provides automatic engine failure detection and subsequently increases thrust on the operating engine during takeoff. APR tests are performed through the ENGINE CONTROL PANEL. If the system fails, EICAS displays an APR INOP caution message.

The EICAS displays an APR ARM advisory message when the APR system is armed. The EICAS displays an APR icon (on the N_1 gage portion of engine page display) for the affected engine when a speed differential has been detected. The engine still operating at normal takeoff N_1 has its speed increased by approximately 2% (to a thrust rating of 9,220 pounds). The engine that has the N_1 drop would revert to the N_2 mode and does not follow N_1 commands. The APR ARM advisory message is disabled 5 minutes after engine thrust is selected above 79% N_1 . Refer to Chapter 18, “Power Plant,” for additional data.

Flight Data

The EICAS channels aircraft systems data (including altitude, airspeed, heading, acceleration, and radio communications events) to the flight data recorder (FDR) (Figure 3-2). Part of each EICAS data



concentrator unit (DCU) acts as a digital flight data acquisition unit (DFDAU) and gathers sensor data for transmission to the FDR. DCU1 provides this information under normal conditions, but the system automatically reverts to DCU2 as a source after a DCU1 DFDAU failure.

Each DFDAU and the FDR is fully self-monitoring and provides CAS messages on the secondary display unit. If both DFDAU channels fail, a white FDR FAIL status message displays.

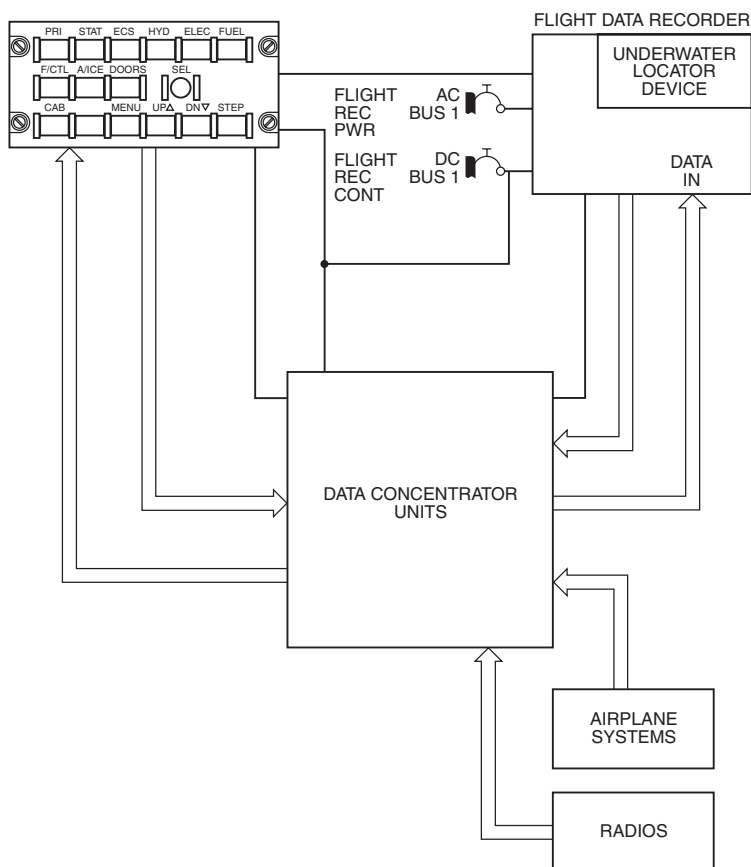


Figure 3-2 Flight Data Recorder System Diagram



The FDR provides a digital record of airplane flight data for the last 25 hours. Late model aircraft will also include a crew force measurement system (CFMS) that will record pilot inputs to flight controls. The FDR has an internal clock, which provides the time reference from which events are recorded. When the airplane power is on, the FDR will operate if any of the following conditions occur: strobe lights on, beacon lights on, or weight-off-wheels. An event can be marked by the pilot by operation of a FDR EVENT button on the miscellaneous test panel on the center pedestal. The FDR includes an acoustic underwater locator beacon (ULB) which activates upon ditching. The ULB radiates a pulsed, acoustic signal (35 to 40 kHz) into the surrounding water upon activation of its water-sensitive switch.

ENGINE INDICATION AND CREW ALERTING SYSTEM

The EICAS (Figure 3-3) consists of the following:

- EICAS primary and secondary displays on the center instrument panel—Used to display information from the sensors onto CRTs
- EICAS control panel on the center pedestal—Used to select EICAS primary and status pages, synoptic pages, menu page, step through CAS cautions, set the flight number, N_1 takeoff settings, and reset fuel used
- Miscellaneous test panel on the center pedestal—Used to perform overspeed, aural warning, and lamp tests, record flight data events, and set indicator lamp light levels
- Display reversion control panels on the captain's and first officer's side panel—Used to send EICAS secondary display data to the captain's or first officer's multifunction displays (MFD) in the reversionary mode
- EICAS switch on the source selection panel—Used to select the display unit and its corresponding preferred source that would continue the functions of both displays

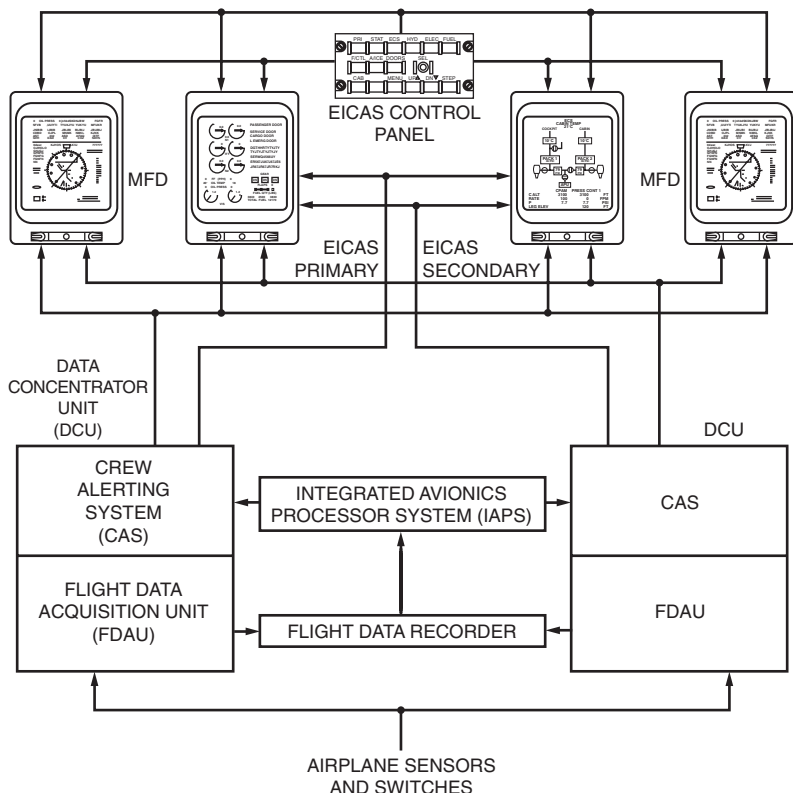


Figure 3-3 EICAS System Diagram

- MASTER WARNING and MASTER CAUTION switchlights on the glareshield
- Lamp driver unit in the avionics bay—Used to test flight compartment annunciator lights and control switchlight operation
- Data concentrator units in the avionics bay—Used to process airplane-sensor data and transmit applicable data to the flight



compartment displays, FDR, and EICAS lamp driver units (DCUs control aural warning system signals)

The EICAS provides the following information to the flight crew:

- Engine indications—Specific engine data such as N_1 and N_2 rpm, engine temperature, fuel flow, engine lubrication, and vibration data
- Systems data such as pressurization data, landing gear position, flap position, fuel tank quantity, and total fuel
- CAS messages
- Surface position indications for flight controls, flaps, and trim (on the secondary display)
- Auxiliary power unit (APU) indications such as APU inlet door state, percent rpm, and exhaust gas temperature (EGT)
- Pressurization system readouts such as cabin and cockpit altitude, altitude rate of change, delta pressure, and landing field elevation
- Oxygen system pressure
- Brake system temperature readouts
- Aircraft systems synoptic pages (via the EICAS control panel)
- Used to change the takeoff N_1 reference speed, insert the present flight number, and reset the fuel used indicator (via the MENU page)

EICAS Primary Display

The left EICAS display (ED1) is the EICAS primary display. When in the normal configuration (EICAS switch on the source selector



panel), ED1 displays the EICAS primary page only and responds to caution paging commands entered at the EICAS control panel.

The EICAS primary page shows the following (Figure 3-4):

- Engine indications—Warnings, cautions, and gage color logic. See Chapter 18 for details.
- Fuel flow readouts (green)—See Chapter 12 for details.
- Oil pressure gages—Oil pressure readouts appear during engine start:
 - Green range—26 to 115 psid
 - Amber range—116 to 140 psid
 - Red range—0 to 25 psid

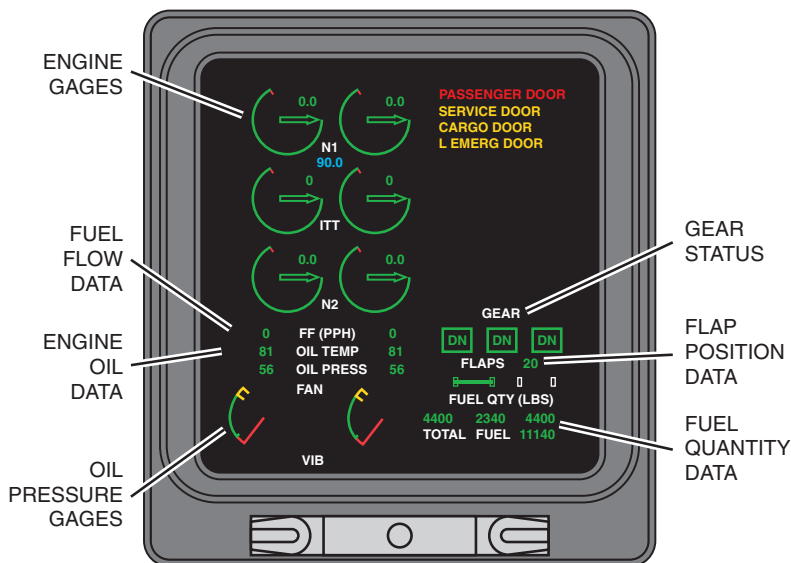


Figure 3-4 EICAS Primary Page



- N_1 vibration gages (not shown)—After both engines are running, the vibration gages appear in place of the oil pressure gages. See Chapter 18 for details.
- Vibration indications are as follows:
 - Green range—0 to 2.6 mils
 - Amber range—> 2.7 mils
- Pressurization data (not shown)—The pressurization data appears in white, above the gear status data, only during manual mode. See Chapter 2 for details.
- Gear status—The gear status data appears as follows:
 - Green—Gear down and locked
 - White—Gear up and locked
 - Amber—Gear in transition
 - Red—Gear unsafe

See Chapter 15 for details.

EICAS Secondary Display

The right EICAS display (ED2) is the EICAS secondary display. When in the normal configuration (EICAS switch on the source selector panel), ED2 displays the EICAS status page (Figure 3-5) and responds to all commands entered at the ECP. The secondary display can present the menu, any of the synoptic pages, and the primary page.

Status Page

FLT NO.—The flight number appears in cyan when the airplane is powered.

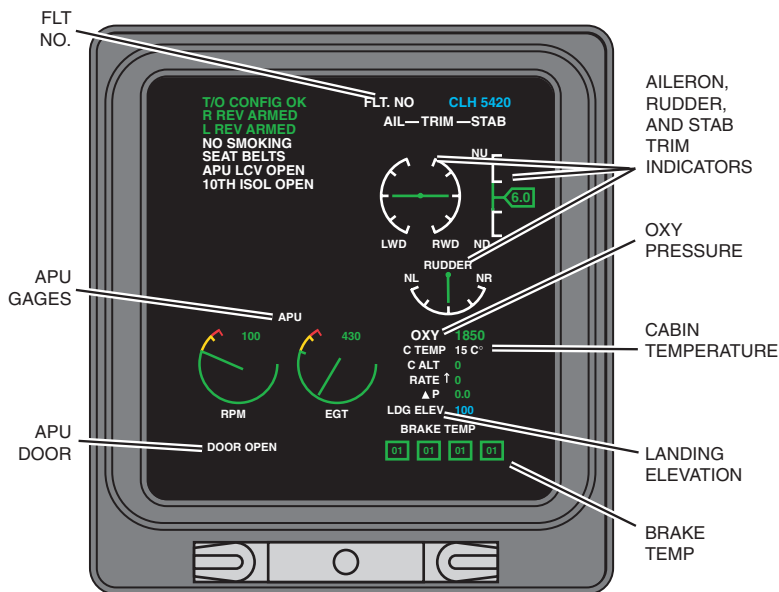


Figure 3-5 EICAS Status Page

APU gages—The APU gages appear when the APU ECU is energized via the APU PWR FUEL SWITCHLIGHT. See Chapter 5 for details.

APU DOOR—The APU DOOR status indicator appears in white.

- DOOR CLSD
- DOOR MID
- DOOR OPEN
- DOOR INHB/CLSD
- DOOR INHB/MID
- DOOR — — — (with amber dashes, see Chapter 5 for details)
- DOOR INHB/OPEN



BRAKE TEMP—The four readouts indicate the current temperature code for the respective brake unit. Temperature codes and the associated temperatures are as follows:

- 00 to 05 (green)—0 to 175°C
- 06 to 10 (white)—176 to 350°C
- 11 to 20 (red)—351 to 665°C and above

Once a brake overheat condition is detected, the brake temperature outline and the readout remains red, regardless of temperature, until the brake temperature monitoring system is reset.

Pressure data—The green cabin pressurization data appears with the pressurization system in manual or automatic mode. See Chapter 2 for details.

OXY data—The oxygen data represents current pressure in the flight compartment oxygen system as follows:

- Green readout— $\geq 1,410$ psi
- Amber readout— $< 1,410$ psi

See Chapter 8 for details.

Flight Controls—Flight control positions are given for the aileron, rudder, and stabilizer trim. See Chapter 10 for details.

Menu Page

The menu page (Figure 3-6) permits flight crew entry of the following.

- Set the N_1 speed references on the engine instruments portion (reference pointer and readout) of the EICAS primary display. At the EICAS primary display, the N_1 references come on when the airplane is on the ground in a landing or takeoff configuration or in the air less than 30 seconds after takeoff.



The N_1 references are removed from the EICAS primary display when the airplane is in flight more than 30 seconds after takeoff.

- Set the current flight number (8-alpha numerics) for display on the status page (EICAS secondary display) to tag flight data in the flight data recorder and tag engine data in the maintenance diagnostics computer.
- Reset the fuel used values to zero (EICAS fuel page).

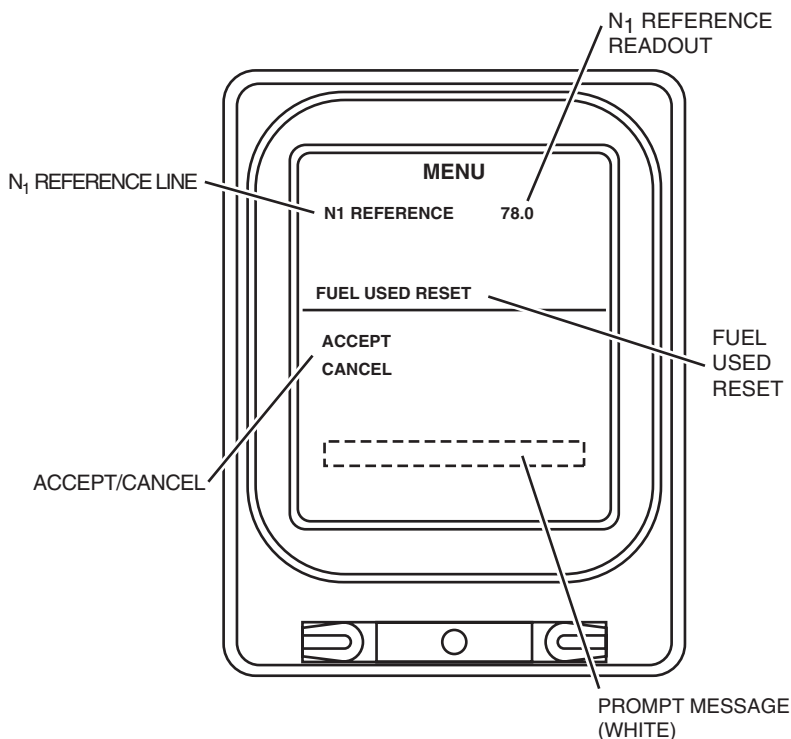


Figure 3-6 EICAS Menu Page



N₁ REFERENCE line—Comes on if FMS failed:

- Accessed through UP/DN keys on EICAS control panel
- Values set by slewing through digits (using UP/DN) and confirming each digit with SEL switch.
- Cursor will go to ACCEPT line and prompt message will appear if entry is not within 76 to 98.5. SEL switch used to confirm entry.
- CANCEL line is used to cancel edit.
- Values entered will be displayed on primary page when conditions are met.

N₁ REFERENCE readout—Comes on if FMS failed

- Green readout—Active and/or preset data that may be displayed on primary page
- Cyan readout—Data being entered
- White readout—Inactive/default data—Readout defaults to last entered data.

NOTE

If FMS is operative, EICAS N₁ REFERENCE bugs and digital readout values are set by the FMS. If the FMS is inoperative, they can be set using the MENU page.



FUEL USED RESET line—Used when FMS failed:

- Accessed through UP/DN keys on EICAS control panel
- Cursor will go to ACCEPT line, and prompt message will appear.
- SEL switch on EICAS control panel is used to confirm selection.
 - CANCEL line is used to cancel change (not reset fuel used).
 - Fuel synoptic page will display reset value.

NOTE

FUEL USED RESET can now be accomplished using the FMS ACT PERF INIT page.

Menu page message area—Messages appear in this area in white when one of the following situations occur:

- At FUEL USED RESET (“ACCEPT” WILL ZERO FUEL USED)
- Incorrectly editing N₁ REFERENCE



Non-Normal Indications

If a fault is detected in one of the EICAS CRTs, the faulty display is blanked. EICAS messages then appear on the operable display. The EICAS does not display an alert if a CRT fails.

To ensure that all engine indications on the primary page can be displayed and have access to CAS, status, and synoptic pages, an EICAS control reversionary mode is available (Figure 3-7). Operating the EICAS reversionary switch on the source selection panel to the operable display position (ED1 or ED2) presents all EICAS information on the operating display.

To ensure timely access to essential display data, the secondary data (status, synoptic, advisory, and status message) can be off-loaded to a MFD position. Operating the PFD/NORM/EICAS switch on the display reversionary panels to EICAS, enables either side's MFD to reconfigure as an EICAS secondary display.

If the EICAS control panel (ECP) fails, the EICAS primary and secondary displays remain as previously set. The PRI, STAT, CAS and STEP switches are not ECP microprocessor controlled and remain operable during an ECP power failure.

Source Selector Panel EICAS Switch

Primary Display (ED1)

NORM—In this switch position, the primary display defaults to the primary (engine) page, and CAS is available on the EICAS control panel (ECP).

ED 1—Using this switch position causes the primary display to default to the primary page and all page functions are available on the ECP. The secondary display (ED 2) goes blank.

Secondary Display (ED2)

NORM—In this switch position, the secondary display defaults to the status page, and all page functions are available on the ECP.

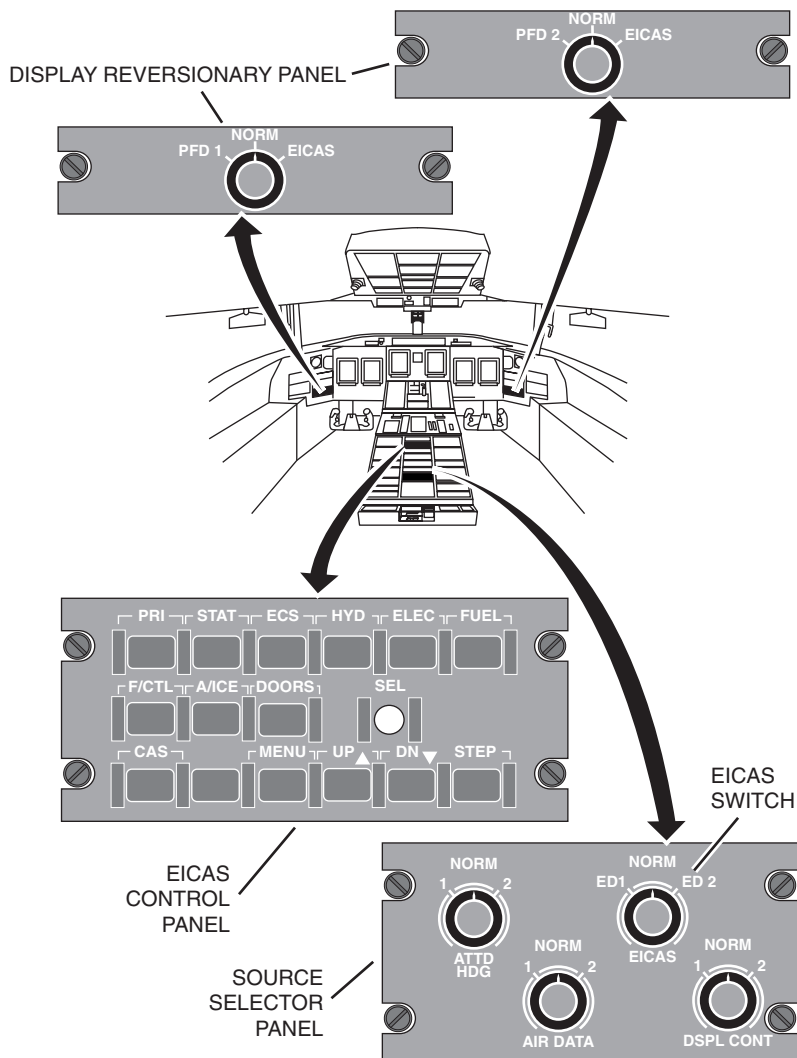


Figure 3-7 EICAS Display Controls



ED 2—Using this switch position causes the secondary display to default to the primary display and all page functions are available on the ECP. The primary display (ED1) goes blank.

Display Reversionary Panel

Multifunction Display (MFD 1)

NORM—In this switch position, multifunction display (MFD) 1 defaults to the MFD page (see Figure 3-6).

PFD 1—Using this switch position causes MFD 1 to default to the PFD (primary flight display) mode.

EICAS—In this switch position, MFD 1 display defaults to the EICAS STATUS page and all page functions are available on the ECP.

Multifunction Display (MFD 2)

NORM—In this switch position, multifunction display (MFD) 2 defaults to the MFD page (see Figure 3-6).

PFD 2—Using this switch position causes MFD 2 to default to the PFD mode.

EICAS—In this switch position, MFD 2 display defaults to the EICAS STATUS page and all page functions are available on the ECP.



EICAS Reversionary Modes

The EICAS has a CRT (cathode-ray tube)/page reversionary mode priority system, which enables if a CRT has a power failure. The EICAS CRT/page priority is as follows:

- Primary page with crew alerting system messages
- Status page followed by the synoptics page
- MFD pages

CRT power and display format are shown in Table 3-7. The following symbols and codes apply to the table.

- * = Reversionary switch set to NORM
- Δ = Reversionary switch set to EICAS
- EAD = Engine and crew alerting system display page
- SD = Status synoptic display page



Table 3-7 CRT POWER AND DISPLAY FORMAT

DC POWER TO CRT				FORMT DISPLAYED			
L-MFD	EICAS PRI	EICAS SEC	R-MFD	L-MFD	EICAS PRI	EICAS SEC	R-MFD
ON	ON	ON	ON	L-MFD*/SD Δ	EAD	SD	R-MFD*/SD Δ
ON	ON	ON	OFF	L-MFD*/SD Δ	EAD	SD	OFF
ON	ON	OFF	ON	L-MFD*/SD Δ	EAD	OFF	R-MFD*/SD Δ
ON	OFF	ON	ON	L-MFD*/SD Δ	OFF	EAD	R-MFD*/SD Δ
OFF	ON	ON	ON	OFF	EAD	SD	R-MFD*/SD Δ
ON	ON	OFF	OFF	L-MFD*/SD Δ	EAD	OFF	OFF
ON	OFF	OFF	ON	L-MFD*/EAD	OFF	OFF	R-MFD*/SD Δ
OFF	OFF	ON	ON	OFF	OFF	EAD	R-MFD*/SD Δ
ON	OFF	OFF	OFF	EAD	OFF	OFF	OFF
OFF	OFF	OFF	ON	OFF	OFF	OFF	EAD
OFF	OFF	ON	OFF	OFF	OFF	EAD	OFF
OFF	ON	OFF	OFF	OFF	EAD	OFF	OFF
EAD—Engine and crew alerting system display page SD—Status/synoptics page							



CONTROLS AND INDICATIONS

GLARESHIELD

MASTER CAUTION reset switchlight—The momentary-action switchlights (Figure 3-8) come on amber in conjunction with certain overhead panel lights and EICAS messages. Pushing either switchlight turns both lights out and resets the caution system for subsequent indications.

MASTER WARNING reset switchlight—The momentary-action switchlights come on red in conjunction with red overhead panel lights and EICAS messages. Pushing either switchlight turns both lights out and resets the warning system for subsequent indications.

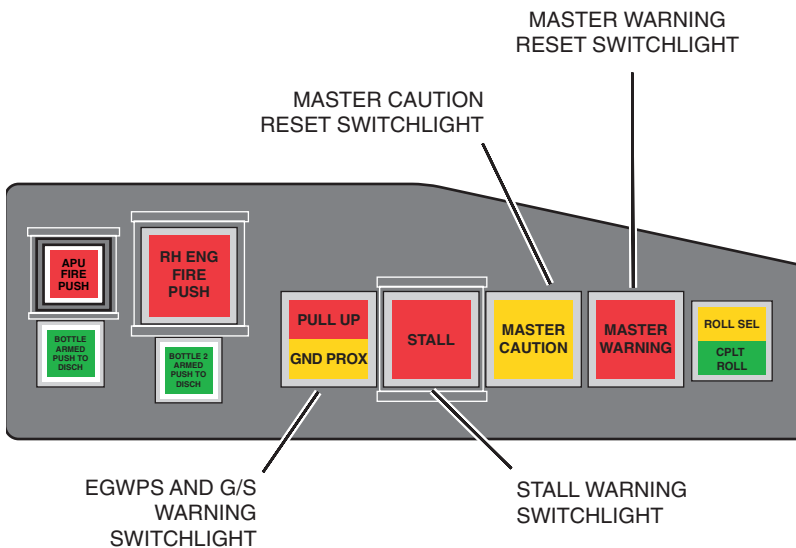


Figure 3-8 Glareshield



STALL warning switchlights—The warning lights flashes red when:

- The AOA reaches the stick pusher trip point.
- The stick pusher is disabled.

PULL UP/GND PROX switchlight (momentary action):

- **PULL UP**—This switchlight segment flashes red during ground proximity **PULL UP** warnings. It will stop flashing when the airplane has recovered from warning envelope.
- **GND PROX**—This switchlight segment flashes amber during ground proximity cautionary alerts. It will stop flashing when the airplane has recovered from the caution envelope.

The switch is also used to initiate EGPWS system test (short/long test on the ground) or to provide the glideslope cancel function when airborne.



GRND PROX PANEL

GRND PROX TERRAIN—When this guarded switch (Figure 3-9) is pressed:

- Inhibits the terrain clearance floor and terrain/obstacle awareness alerting and display functions
- OFF light comes on.

Basic GPWS modes (1–6) and windshear mode (7) remain active when TAAD and TCF are inhibited.

GRND PROX FLAP—When this guarded switch is pressed:

- Mutes TOO LOW FLAPS or TERRAIN aural under certain conditions
- OVRD light comes on.

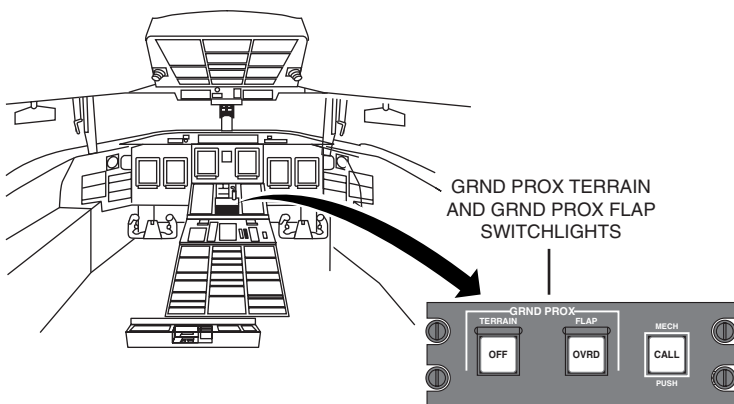


Figure 3-9 GRND PROX TERRAIN and FLAP Switchlights



EICAS CONTROL PANEL

EICAS controls—The EICAS control panel uses the following EICAS display control switches (Figure 3-10):

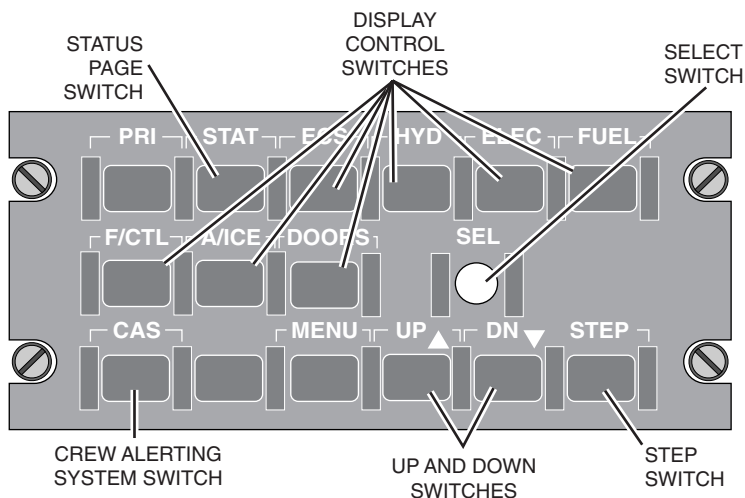


Figure 3-10 EICAS Control Panel

- **STAT page switch**—Pressing the STAT switch pages through the status messages on the secondary display. Status messages can be removed from view any time.
- **Display control switches**—These momentary-action switches control display of the primary, status, menu, and synoptic pages.
- **SEL switch**—Pressing the momentary-action SEL (select) switch activates the item selected. The cursor symbol, alpha-numeric, or numeric item changes color from cyan to green to acknowledge the selection.



- **STEP switch**—Repeatedly pressing the momentary-action STEP switch steps through the systems pages on the secondary display.
- **UP and DN switches**—When pressed on the menu page, the UP and DN momentary-action switches control cursor movement. When pressed at the FLIGHT NUMBER line, it controls the slew rate through 36 alphanumeric characters. When pressed on the takeoff speed bug page, it controls the slew rate through 10 numeric characters.
- **CAS switch**—Pressing this momentary-action switch pages through the caution messages on the primary display. Caution messages can be removed from view, provided both generators are operating and online.

NOTE

Warning messages are not paged.

MENU PAGE

Cursor symbols—The cyan cursor symbols (Figure 3-11) (left caret and underline shown) indicate items that can be edited. Positioned by the UP and DN switches, on the EICAS control panel, censored items change color from white to cyan.

NOTE

The SEL switch on the EICAS control panel is used to enable (confirm) the item marked by the cursor. The item then changes color to green (selected).

ACCEPT line—The “ACCEPT” WILL ZERO FUEL USED white status message comes on when the cursor is at the FUEL USED RESET line.



N₁ REFERENCE line—The N₁ REFERENCE OUT OF RANGE white status message comes on when the pilot input is not within 76 to 98.5% N₁. Use when FMS is disabled.

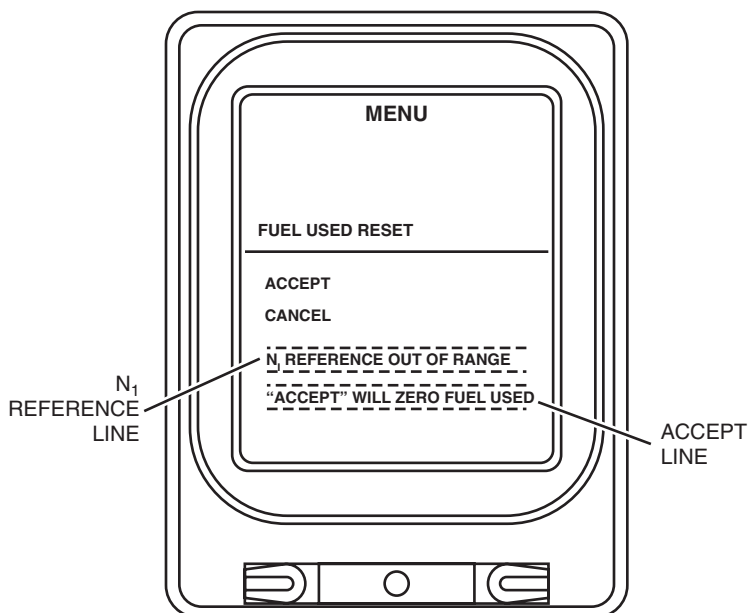


Figure 3-11 MENU Page

NOTE

FUEL USED RESET can now be accomplished using the FMS ACT PERF INIT page.



MISCELLANEOUS TEST PANEL

OVSP TEST switch—The switch positions 1 and 2 test the air data computers, respectively (Figure 3-12).

FDR EVENT switch—Pushing and holding this momentary-action switch for 5 seconds records a time stamp on the FDR.

LAMP TEST switch—The switch positions 1 and 2 test the lamp-drive unit channels, respectively.

AURAL WARN TEST switch—This alternate-action switch has the following positions:

- 1—Tests all aural alerts within the No. 1 data concentrator unit
- OFF—Disables the aural alert test
- 2—Tests all aural alerts within the No. 2 data concentrator unit

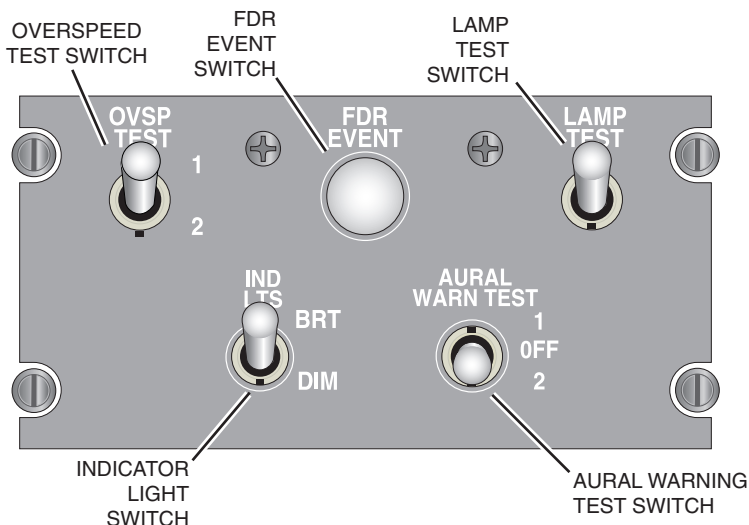


Figure 3-12 Miscellaneous Test Panel



IND LTS switch—This switch sets the indicator light intensity as follows:

- DIM—This position selects the intermediate brightness level for the indicator lights (night operation). The switch has no effect on EFIS or EICAS displays.
- BRT—This position selects the maximum brightness level for the indicator lights (day operation).

AUDIO WARNING PANEL

The audio warning panel, on the first officer's side console (Figure 3-13), is used to determine master DCU for the audio warnings. If a DCU audio warning failure occurs (continuous sound of aural), operating the affected audio warning panel switchlight silences that DCU. The switchlights operate as follows:

Pressed in—The respective DCU is disabled, the DISABLE light illuminates, and the effected DCU 1 (2) INOP white status message appears on the EICAS display.

Pressed out—The respective DCU is enabled, the DISABLE light extinguishes, and the DCU 1 (2) INOP white status message on the EICAS is removed.

EICAS MESSAGE DATA

The following is general information concerning the availability and nature of the EICAS data lines in the message area:

- There are 24 lines available when the pressurization system is in the automatic mode with no flaps or gear selected.



Figure 3-13 Audio Warning Panel



- There are 17 lines available when the pressurization system is in the automatic mode with flaps or gear selected.
- There are 14 lines available when the pressurization system is in the manual mode.
- The last line is reserved for page cueing. The PAGE 1 message appears in amber or white if space is not available on the current page for all messages on the respective display.

AURAL AND VISUAL SYSTEM EICAS MESSAGES

EICAS Primary Display

EICAS COMP INOP—This message appears in amber to indicate the EICAS comparator is inoperative (Figure 3-14).



**Figure 3-14 Aural and Visual Warning System
EICAS Messages—Primary Display**



EICAS Secondary Display

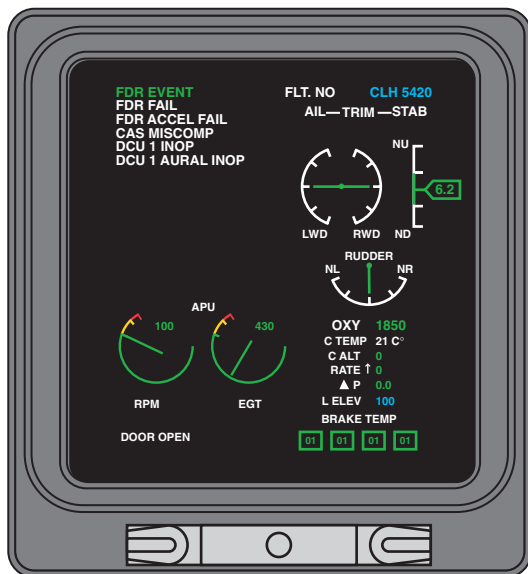
FDR EVENT—The green FDR EVENT advisory message comes on when the FDR EVENT switch is pressed (Figure 3-15).

FDR FAIL—The white FDR FAIL status message indicates an FDR failure.

CAS MISCOMP—The white CAS MISCOMP message indicates a CAS warning, caution, or aural message miscompare.

FDR ACCEL FAIL—The white FDR ACCEL FAIL status message indicates an FDR accelerometer failure.

DCU 1 (2) INOP—This messages appears in white on the status page to indicate a failure in the respective DCU (internal fault or cross-talk fault).



**Figure 3-15 Aural and Visual Warning System
EICAS Messages—Secondary Display**



DCU 1 (2) AURAL INOP—This message appears in white on the status page to indicate a failure in the respective DCU.

CIRCUIT BREAKERS

Table 3-8 provides a power distribution description from the system level to the individual circuit breakers of the aural/visual warning system.

Table 3-8 POWER SUPPLY AND CIRCUIT-BREAKER SUMMARY

SYSTEM	SUB-SYSTEM	CB	BUS BAR	CB PANEL	LOCATION
EICAS Display	Primary display	PRIM DISPL	DC BAT	2	Q6
		PRIM DISPL	DC BUS 1	1	H3
	Secondary display	SEC DISPL	DC BAT	2	Q7
		SEC DISPL	DC BUS 1	1	H4
	EICAS control panel	CONT PNL	DC BAT	2	Q8
	Lamp driver units	EICAS LDU L	DC BUS1	1	H5
Caution and Warning System		EICAS LDU R	DC BAT	2	Q9
	Bright/dim power supplies	BRT/DIM PWR SUP 1, 2	DC BAT	2	Q10–12
			DC BUS 1	1	H6–8



Table 3-8 POWER SUPPLY AND CIRCUIT-BREAKER SUMMARY (Cont)

SYSTEM	SUB-SYSTEM	CB	BUS BAR	CB PANEL	LOCATION
Data Concentrator Unit	DCU 1	EICAS DCU 1 (CH A, CH B)	DC ESS	4	C10–11
			DC BAT	2	Q2–3
	DCU 2	EICAS DCU 2	BAT DIR	5	A6
		EICAS DCU 2 (CH A, CH B)	DC BAT	2	Q4–5
Flight Data Recorder	FDR	FLIGHT REC PWR	AC BUS 1	1	C9
		FLIGHT REC CONT	DC BUS 1	1	K2