CHALLENGER 350

BD-100-1A10

EICAS

STUDY GUIDE · CARD SYSTEM

The EICAS is the primary interface between aircraft systems and the flight crew - color-coded alerts, prioritized messages, and a Quiet Dark Cockpit philosophy that keeps the display clean so only what matters commands your attention.

ATA 31 . INDICATING / RECORDING

Section EICAS · Revision: Original

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EICAS CONTENTS

01 FIVE THINGS YOU MUST KNOW

The five highest-value facts for the oral. Memorize numbers cold.

4 AFDs	Adaptive Flight Displays (2 PFD + 2 MFD)
Red / Amber / Cyan / White	EICAS four-tier CAS color priority
80 kts / 400 ft	Takeoff inhibit: ON above 80 kts, OFF at 400 ft AGL
Triple / Single Chime	Warning = triple chime; Caution = single chime
2 hrs	CVR recording capacity (auto overwrite oldest data)

TIP Master the four colors cold: Red = act immediately, Amber = act promptly, Cyan = awareness only, White = system state. Everything else flows from this rule.

02 COLOR LOGIC & QUIET DARK COCKPIT · STUDY CARDS

Challenger 350 uses Quiet Dark Cockpit Philosophy - displays stay quiet and dark under daylight VMC non-icing cruise conditions.

QUIET DARK COCKPIT

When is EICAS quiet and dark?

- Daylight + VMC + non-icing + cruise flight
- Indications remain dark when all four conditions are met
- Any abnormal condition illuminates the affected display

WARNING - RED

What does red mean on the CAS display?

- Warning condition or system limit exceeded
- Requires IMMEDIATE action
- Cannot be cleared or hidden; most warnings: triple chime+ master warning lights flash (exception: CABIN ALTITUDE uses voice alert only, no triple chime)

CAUTION - AMBER

What does amber signify?

- Component/function failed, or no flow/energy/pressure
- Requires PROMPT action
- Single chime; master caution lights flash amber

ADVISORY - CYAN

What does cyan signify?

- Crew awareness required - informational priority
- May indicate automatic system activation
- Loss of redundancy notification; may have associated tone

STATUS - WHITE

What does white indicate?

- Informational only - no aural alert generated
- Indicates manually selected system states
- Displayed below all advisory messages

GREEN / MAGENTA

When do green and magenta appear?

- Green - normal operation for digital values; normal flow in flowlines
- Magenta - invalid or unknown data condition
- Magenta: crew must identify and use alternate data source

03 DISPLAY ARCHITECTURE · STUDY CARDS

Four Adaptive Flight Displays driven by two DCU channels; IAPS card cage in right equipment rack.

4 AFDs

What are the four Adaptive Flight Displays?

- Left PFD - outboard pilot; standard flight instruments
- Left MFD - inboard pilot; engine indications + CAS messages (normal)
- Right MFD - inboard copilot; synoptics + electronic checklist
- Right PFD - outboard copilot; standard flight instruments

DCU CHANNELS

How many DCU channels and what do they process?

- Two channels: A and B
- DCU A and B both collect data from various aircraft systems
- Channel-to-system assignment varies
- Automatic switchover on channel failure; cross-channel data sharing

LEFT MFD - NORMAL

What does the Left MFD display normally?

- Engine indications: N1, ITT, N2, Oil psi/temp, Fuel flow
- Aircraft configuration data
- CAS messages in priority order (Warning at top)

RIGHT MFD - NORMAL

What does the Right MFD display normally?

- Summary Synoptic (default)
- Electronic checklist
- Navigation data when selected by crew

IAPS

What is IAPS and where is it located?

- Integrated Avionics Processor System
- Located in right equipment rack (ICC card cage)
- Two IOCs route all display data via ARINC 429
- No. 1 powers FGC1/FMC/IOC1; No. 2 powers FGC2/FMC/MDC/IOC2

MFD CONTROL PANEL

Where is the MCP and what does it provide?

- Located on center pedestal
- CAS switch - hide/restore cautions, advisories, status
- CKLST switch - electronic checklist; FRMT - display format
- Synoptic page selection switches

04 ENGINE INDICATIONS · STUDY CARDS

Primary engine parameters on Left MFD; conditional icons appear only when triggered.

PRIMARY ENGINE PARAMS

List the six primary engine parameters.

- N1 speed (%) - analog AND digital display
- ITT (deg C) - analog AND digital display
- N2 speed (%) - digital only
- Oil pressure (psi) - digital only
- Oil temperature (deg C) - digital only
- Fuel flow (lb/hr or kg/hr) - digital only

ANALOG vs DIGITAL

Which params have analog gauges?

- N1 and ITT: both analog gauge AND digital readout
- N2, Oil psi, Oil temp, Fuel flow: digital readout ONLY
- Analog display aids rapid trend detection

REV ICON

When does the REV icon appear?

- Displayed during thrust reverser operation
- Confirms reverser deployment to flight crew
- Disappears when reversers are stowed

VIB ICON

When does VIB appear and what does it mean?

- Displayed when engine vibration exceeds predetermined limits
- NOT normal vibration - indicates an exceedance
- Monitor and follow QRH if persistent

IGN / START ICONS

When are IGN and START icons shown?

- IGN - displayed when an ignitor is operating
- START - displayed during engine start sequence
- Both disappear after start sequence is complete

SYNC/MACH HOLD

When does SYNC/MACH HOLD appear?

- Displayed when SYNC or MACH HOLD mode is crewselected
- Indicates active autothrottle or thrust sync mode
- Confirms pilot-selected function

05

MASTER ALERT LOGIC & INHIBITS · STUDY CARDS

CAS prioritizes by importance then order of occurrence. Inhibits prevent distraction in critical phases.

WARNING PRIORITY

Warning message characteristics?

- Most urgent - immediate action required
- Displayed at TOP of CAS area; CANNOT be cleared or hidden
- Most warnings: triple chime + master warning lights flash RED (exception: CABIN ALTITUDE uses voice alert only — no triple chime)
- Remain visible until problem is resolved

CAUTION PRIORITY

Caution message characteristics?

- Require prompt action - displayed below warnings
- Single chime on initial posting
- Master caution lights flash AMBER
- Can be acknowledged (press master caution switch)

ADVISORY PRIORITY

Advisory message characteristics?

- Crew awareness only - below cautions
- May indicate automatic system activation
- Loss of redundancy notification
- May have associated tone

TAKEOFF INHIBIT

Takeoff inhibit: trigger, release, effect?

- ACTIVATES above 80 knots airspeed
- RELEASES at 400 ft AGL
- Some warning messages, most caution messages, and all advisory messages are inhibited during takeoff and landing.
- Note: Several warnings DO carry TO/LAND inhibit, including APU OVERTEMP, L (R) BATT OVERHEAT, and CABIN ALTITUDE.
- Stored messages post when exiting inhibit envelope

LANDING INHIBIT

Landing inhibit: trigger, release, effect?

- ACTIVATES below 400 ft AGL
- RELEASES below 40 knots
- Selected messages inhibited to reduce approach workload
- Stored messages post when exiting inhibit envelope

CAS SWITCH LOGIC

What does the CAS switch do?

- First press: hides caution/advisory/status; MSGS icon appears
- Second press: restores hidden messages
- New messages appear ABOVE the MSGS icon
- Warning messages CANNOT be hidden by CAS switch

06

AURAL TONES & VOICE ALERTS · STUDY CARDS

All aural warnings are continuous until acknowledged. Gear warning aural is NON-MUTABLE.

TRIPLE CHIME

Which messages trigger the triple chime?

- Most Warning (Red) messages are preceded by a triple chime - triple chime is continuous until master warning switch is pressed
- Master warning lights flash RED simultaneously
- Notable exception: CABIN ALTITUDE warning uses a voice alert only ('CABIN ALTITUDE') with NO triple chime. Per FCOM SFM03-03 p.1.

SINGLE CHIME

Which messages trigger a single chime?

- Caution (Amber) messages - single chime on posting
- Also: CABIN CALL / LAV CALL - single chime + Cyan advisory
- Master caution lights flash AMBER

VOICE ALERTS

When do voice alerts supplement the chimes?

- Specific warning conditions supplement visual alert
- CONFIGURATION: triple chime + voice 'CONFIGURATION'
- Gear warning: NON-MUTABLE aural (cannot be silenced by switch)

MASTER W/C SWITCHES

Location and operation of master W/C switches?

- Located on glareshield - dual switches (pilot + copilot)
- Flash RED for warnings; flash AMBER for cautions
- Press to acknowledge: stops flashing and silences audio
- GEAR WARNING aural is NON-MUTABLE even after switch press

AURAL DISABLE SWITCHES

Where and when to use aural disable?

- Located on copilot aft bulkhead
- DCU A and DCU B switches - OFF disables respective DCU aurals
- Both OFF: disables ALL EICAS aurals
- Use ONLY for system malfunction OR as directed by AFM

AFM-DIRECTED DISABLE

Which AFM procedures direct aural disable?

- Gear Up/Unsafe Landing procedure
- Ditching procedure
- Both require aural disable as directed by AFM
- Do not disable aurals for routine crew preference

07 SYNOPTIC PAGES & DISPLAY REVERSION · STUDY CARDS

Six selectable synoptic pages (Summary is the default page); reversion panel on pilot's center pedestal ABOVE the spoiler handle.

6 SELECTABLE SYNOPTIC PAGES

List all synoptic pages.

- Summary (default page on Right MFD - always displayed until crew selects another)
- Selectable: Anti-Ice / ECS / Electrical
- Selectable: Flight Controls / Fuel / Hydraulic
- Selected via FRMT + synoptic buttons on MCP

EICAS REVERSION

EICAS reversion switch positions?

- L MFD - EICAS on Left MFD (normal config)
- R MFD - EICAS transferred to Right MFD (L MFD failed)
- BOTH PFDs - EICAS compressed on both PFDs (both MFDs failed)

PFD/MFD REVERSION

What does PFD REV vs MFD REV do?

- PFD REV: PFD shows compressed flight + EICAS; MFD shuts down
- MFD REV: MFD shows compressed flight + engine info; PFD shuts down
- ·NORM: Standard operation on respective side

ATT/HDG REVERSION

ATT/HDG switch positions and effect?

- 1 - all displays use IRS 1 attitude and heading data
- NORM - on-side IRS (Pilot = IRS 1, Copilot = IRS 2)
- 2 - all displays use IRS 2 attitude and heading data

TUNE REVERSION

Tune reversion switch options?

- NORM - dual tuning via MFDs and CDUs
- MFD ONLY - tuning via MFD controllers only
- CDU ONLY - tuning via CDUs only (primary during display failures)
- COM1 121.50 - emergency: COM1 auto-tuned to 121.50 MHz

AIR DATA REVERSION

Air data reversion switch?

- 1 - all displays receive air data from ADC 1 only
- NORM - each display uses on-side air data
- 2 - all displays receive air data from ADC 2 only
- Panel location: pilot's center pedestal, ABOVE the spoiler handle

REVERSION PANEL - 6 SWITCHES (ABOVE spoiler handle)

- Left Displays: PFD REV / NORM / MFD REV
- EICAS switch: L MFD / BOTH PFDs / R MFD
- Right Displays: MFD REV / NORM / PFD REV
- ATT/HDG: 1 / NORM / 2 (selects IRS source for all displays)
- Tune: COM1 121.50 / MFD ONLY / NORM / CDU ONLY
- Air Data: 1 / NORM / 2 (selects ADC source for all displays)

08 MAINTENANCE & RECORDING SYSTEMS · STUDY CARDS

MDC, CVR, and BITE support maintenance diagnostics; ANNUN tests verify all CAS messages in 15 seconds.

MDC FUNCTIONS

What does the MDC record and store?

- Engine parameters and trend monitoring
- Start counts, exceedances, TR deployments
- LRU status information and fault codes
- Access via Right MFD: press A/ICE + ECS + FUEL simultaneously on CCP

PMAT

What is the PMAT and where is it?

- Portable Maintenance Access Terminal
- Located on the aft side of the equipment rack (left avionics rack) near the floor.
- Enables MDC data download for ground maintenance analysis

CVR SPECIFICATIONS

CVR key specifications?

- 2-hour recording capacity - starts on power application
- Crash survivable; protected storage location
- Records: Pilot/Copilot mics (mask, boom/handheld), cockpit area mic, Observer 3rd audio
- Manual erase requires ALL THREE: WOW + parking brake ON + hydraulic system pressurized

CVR RIPS

What is the CVR RIPS?

- Recorder Independent Power Supply
- Records for additional 10 minutes after complete loss of normal aircraft power
- Crash-survivable emergency backup power for CVR

ANNUN / CAS TEST

How is the CAS test performed?

- Press ANNUN A or ANNUN B system test switch for 15 seconds
- Illuminates all panel lights
- Verifies aural warning generation
- Tests master warning and master caution lights

IAPS SINGLE FAILURE

Crew actions for single IAPS channel failure?

- Automatic transfer to operative channel
- Requires MANUAL FD transfer selection
- Tune reversion to CDU ONLY
- Landing altitude source selection required; approach capability may be limited

09 EICAS · CAUTION + ADVISORY

CAUTION MESSAGES

Timely crew awareness/action needed - Single chime

Message	Meaning	Inhibits
L (R) IAPS FAIL	Respective IAPS channel failed - manual FD transfer, CDU only tune	TO/LAND
L (R) GEN FAIL	Generator failed - prompt action required	TO/LAND
L (R) MAIN BUS FAIL	Main bus not powered - critical system loss	TO/LAND
L (R) ESS BUS FAIL	Essential bus not powered	TO/LAND
APU GEN FAIL	APU generator failed	TO/LAND

ADVISORY MESSAGES

Crew awareness required - May have associated tone

Message	Meaning	Inhibits
STBY INST BATT FAULT	Standby battery fault conditions detected	TO/LAND
IAPS FAN FAULT	IAPS cooling fan malfunction - monitor IAPS temperature	TO/LAND
L (R) AUX BUS FAIL	Auxiliary bus not powered, power source available (Advisory/cyan per FCOM)	TO/LAND
L (R) AUX BUS OFF	Auxiliary bus not powered, no power source available	TO/LAND
L (R) ESS BUS OFF	Essential bus serviceable but not currently powered	TO/LAND
CABIN CALL	Cabin call - single chime + this advisory	TO/LAND
LAV CALL	Lavatory call - single chime + this advisory	TO/LAND

10 EICAS · STATUS

STATUS MESSAGES	
Information only - no crew action required	
Message	**Meaning**
L (R) GEN OFF	Generator switch selected OFF - manual inhibit
BUS TIE MAN OPEN	Bus tie manually selected open by crew
APU GEN OFF	APU generator switch selected OFF
L (R) BATT OFF	Battery switch selected OFF by crew

11 QUICK RECALL · NUMBERS GRID

Cover the labels and recite the number; reverse and recite the label. Repeat until automatic.

4 AFDs total	**2** DCU channels	**80 kts** T/O inhibit ON	**400 ft** T/O inhibit OFF
400 ft LDG inhibit ON	**40 kts** LDG inhibit OFF	**3x chime** Warning aural	**1x chime** Caution aural
2 hrs CVR capacity	**10 min** CVR RIPS extension	**15 sec** ANNUN test hold	**6** Selectable synoptic pages
2 IOCs in IAPS	**2** IAPS power supplies	**121.50** Emergency COM1 freq	**WOW+PK BR+HYD** CVR erase (all 3 required)

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