



CONTROLLER PILOT DATALINK COMMUNICATIONS (CPDLC) IN NATS MANAGED AIRSPACE.

1 Introduction

1.1 This AIC is intended for flight crews and operators wishing to conduct CPDLC operations within the London and Scottish FIRs. It contains information relating to the CPDLC message sets for ATN and FANS equipped aircraft, ATC procedures, CPDLC log-on and connection information and details relating to UK continental airspace where a CPDLC service is available.

1.2 This document also contains a small subset of what are expected to be the most common data link procedures, and the procedures developed to provide a data link service to ATN and FANS equipped aircraft.

1.3 The areas of responsibility for the NATS participating ACCs (London Area Control and Scottish Area Control) are referred to as Data Authorities. A data authority is a defined area where a CPDLC service is provided. The NATS data authorities are defined in Figures 1 and 2. Further information and requirements for CPDLC can be found in UK AIP GEN 1.5 -Section 5.7.

2 CPDLC Airspace

2.1 CPDLC services are available in domestic airspace and are distinct from Oceanic CPDLC procedures. Within the London (EGTT) and Scottish (EGPX) Data Authorities a CPDLC service will be provided at FL 285 and above, the service may be available **FL 195 and above** where possible.

2.2 This **excludes** the London and Manchester TMAs, where a CPDLC service will not be provided.

2.3 Aircraft transiting the Manchester TMA below FL 285 will maintain a log-on with EGPX.

2.4 Upon entering airspace where a logon is maintained but CPDLC is not available, the flight will receive the following CPDLC message:

'CPDLC NOT IN USE'. VOICE ONLY UNTIL NOTIFIED.'

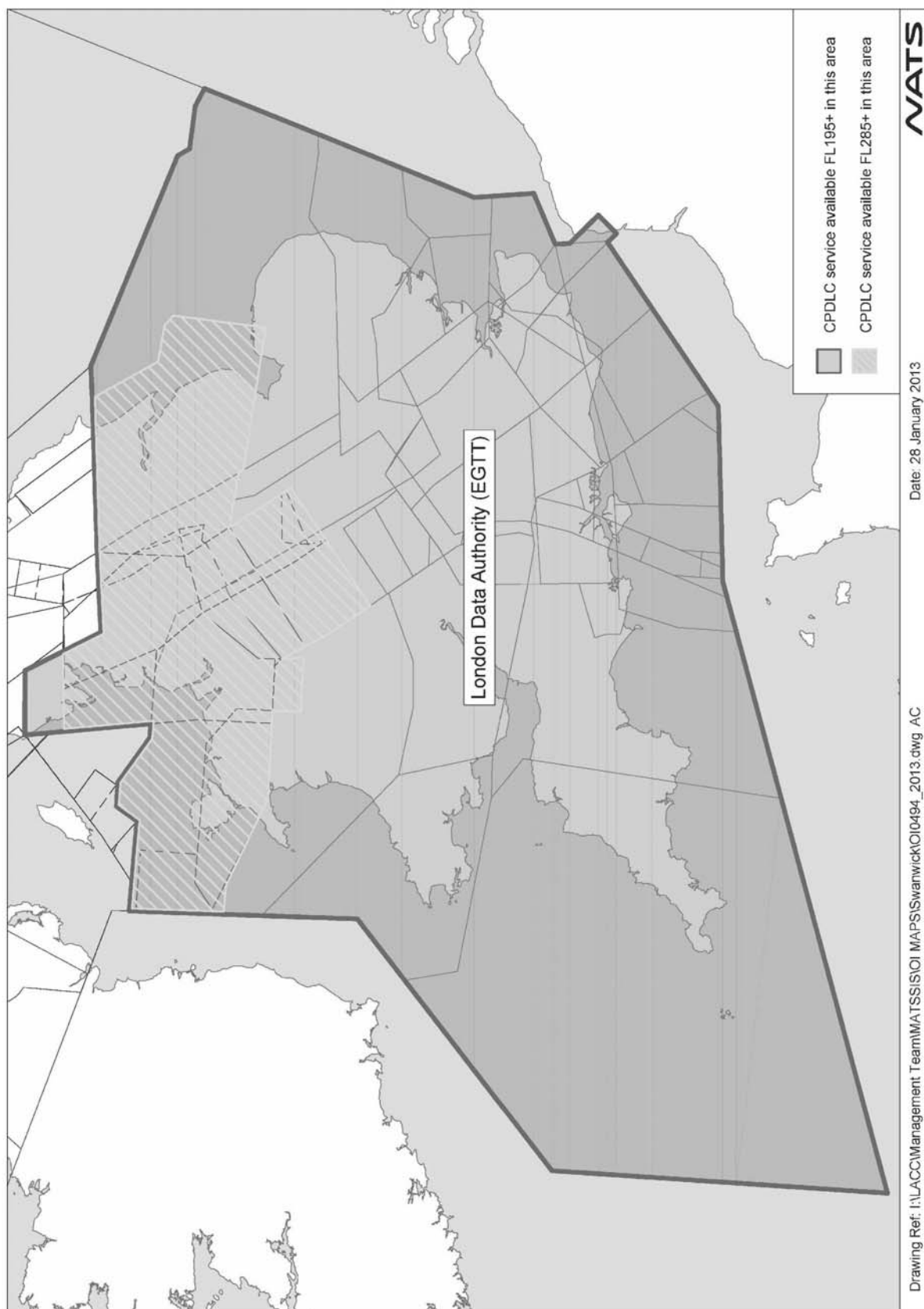
2.6 If the flight crew initiates a downlink message the following response will be received to indicate that no CPDLC service is available:

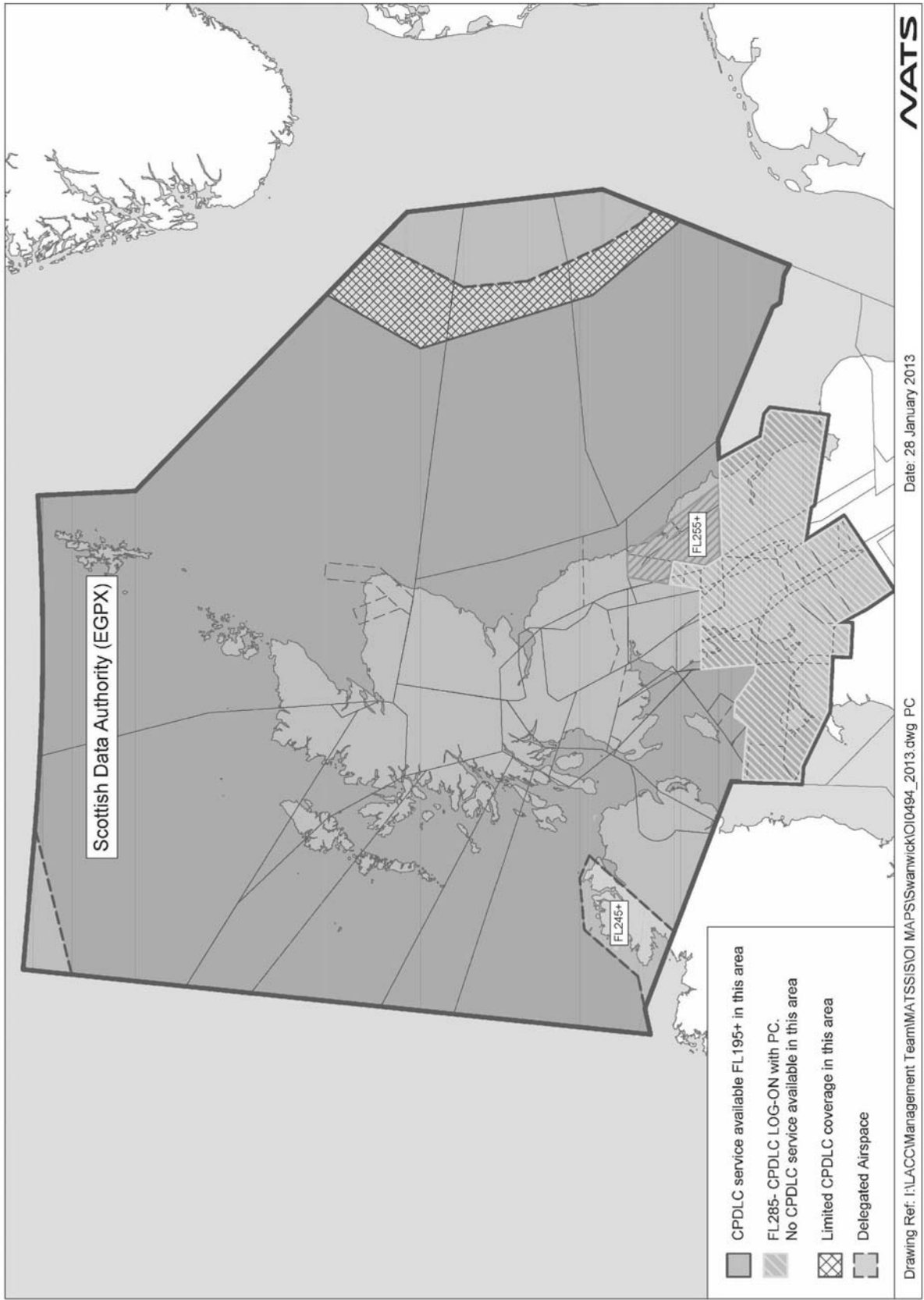
'CPDLC NOT AVAILABLE AT THIS TIME - USE VOICE.'

2.7 Upon entering CPDLC designated airspace the following CPDLC message will be received:

'CPDLC IN USE.'

2.8 Flight Crews should refer to the map of NATS CPDLC Data Authorities (see Figures 1 & 2).





3 NATS CPDLC Service

A LOG-ON address refers to the ICAO designator for a given Data Authority. In the case of the United Kingdom the areas of responsibility are defined within the London and the Scottish FIRs.

The CPDLC LOG-ON address for London Data Authority is **EGTT**.

The CPDLC LOG-ON address for Scottish Data Authority is **EGPX**.

An aircraft may only receive a CPDLC service from a single Data Authority e.g. EGTT or EGPX.

3.1 Aircraft LOG-ON

3.1.1 LOG-ON can be established at any time prior to the entry time for the relevant FIR boundary (EGTT or EGPX). For flights departing aerodromes in the United Kingdom LOG-ON may also be conducted by aircraft on the ground where coverage exists.

3.1.2 NATS is working with Airfield Operators to update Standard Instrument Departure plates. This will advise flight crews of the appropriate CPDLC Data Authority to select prior to departure.

3.1.3 Additional information is contained within the Eurocontrol Flight Crew Guidance document. <http://www.eurocontrol.int/services/link-2000-programme>.

3.2 Required Aircraft LOG-ON parameters

3.2.1 A CPDLC service is only established when **all** the required LOG-ON parameters match those contained in the ICAO flight plan:

For an ATN LOG-ON

Mode-S Aircraft-ID i.e. ICAO [Flight plan item 7] callsign.

Aircraft ID - ICAO 24 bit address, which is mandatory for ATN aircraft.

ICAO Flight plan departure and destination airfields (not IATA codes); these are used to match the flight with the system flight plan stored in the ground system.

For a FANS LOG-ON

Mode-S Aircraft-ID i.e. ICAO [Flight plan item 7] callsign.

Aircraft registration.

ICAO Flight plan departure and destination airfields (not IATA codes); these are used to match the flight with the system flight plan stored in the ground system.

ICAO 24 bit aircraft address is not mandatory, but will be used where available to support the matching of aircraft with the system flight plan stored in the ground system.

Notes:

- Using IATA flight ID, inserting additional leading zeros or spaces will result in a failed LOG-ON.
- Incorrectly filed flight plans or late change of aircraft frame may result in a failed LOG-ON unless the flight plan is updated.
- In order to use the CPDLC services, aircraft operators shall file the respective equipage (J1 for ATN VDL 2 and J3/J4 for FANS) in their flight plan in accordance with Flight Plan 2012 J codes:

J1: CPDLC ATN VDL Mode 2; or

J3: CPDLC FANS 1/A VDL Mode A; or

J4: CPDLC FANS 1/A VDL Mode 2.

- Aircraft must be set to LOG-ON to the correct Data Authority.

For flights granted a CPDLC exemption, the indicator DAT/CPDLCX shall be included in Item 18 of the flight plan.

3.3 Establishing CPDLC Connection

3.3.1 Although an aircraft (ATN or FANS equipped) may be logged-on to a Data Authority, no CPDLC service will be available until a CPDLC connection has been established. The previous Data Authority is required to send a CPDLC END REQUEST/SERVICE message to the aircraft. A CPDLC START/CONNECTION REQUEST must then be sent by the receiving ground system and acknowledged by the airborne system.

3.3.2 On transfer from another CPDLC capable unit, for example Maastricht or Shannon to London or Scottish Data Authority it is essential for the ground system to establish that CPDLC instructions may be used with an individual aircraft, and preferably prior to initial voice contact. This is referred to as establishing **Current Data Authority (CDA)**.

3.3.3 For an ATN Connection

Aircraft equipped with ATN automatically establish CDA with ground systems.

3.3.4 For a FANS connection

Aircraft equipped with FANS must receive and respond to a CPDLC message for CDA to be confirmed as established.

3.3.5 Upon receipt of the CDA Downlinked from the aircraft, and satisfaction of required local conditions, the R-ATSU system sends a pre-formatted free text message containing its ICAO facility designation (for example 'EGTT'), facility name and facility function to the aircraft system for display to the flight crew.

3.3.6 The facility designator message will be sent to all aircraft (FANS and ATN equipped). For FANS equipped aircraft this message may be used to establish CDA and flight crews are required to respond to a 'CURRENT ATC UNIT' message with ROGER/STANDBY as applicable.

Message example: 'CURRENT ATC UNIT EGTT, LONDON CENTER'.

Note: Flight crew should not initiate CPDLC requests before this pre-formatted free text message is displayed to the flight crew.

3.3.7 For more information on this process, refer to PANS ATM section 14, PANS OPS, the ICAO GOLD version 2.0, ED154 or Eurocontrol guidance material for ATC and Flight Crews V6.0.

3.4 Transfer of CPDLC between NATS Data Authorities and Adjacent Data Authorities

3.4.1 Where possible NATS ground systems will attempt to automatically nominate the appropriate Next Data Authority (NDA) to continue the CPDLC service. Crews should be aware that this may not always succeed and manual log-on to the Next Data Authority may be required. Aircraft entering NATS airspace that have not had either EGTT or EGPX automatically nominated as the NDA by their current CPDLC data authority should manually log-on to receive a CPDLC service from the London or Scottish Data Authority.

4 CPDLC MESSAGE SET

4.1 Downlink Messages (London and Scottish)

Message Number	Message
DM0	WILCO
DM1	UNABLE
DM2	STANDBY
DM3	ROGER (<i>FANS ONLY</i>)
DM4	AFFIRM (<i>FANS ONLY</i>)
DM5	NEGATIVE (<i>FANS ONLY</i>)
DM6	REQUEST (<i>LEVEL</i>)
DM9	REQUEST CLIMB TO (<i>LEVEL</i>)
DM10	REQUEST DESCENT TO (<i>LEVEL</i>)
DM22	REQUEST DIRECT TO (<i>POSITION</i>)
DM62	ERROR (<i>ERROR INFORMATION</i>)
DM63	NOT CURRENT DATA AUTHORITY
DM64	(<i>FACILITY DESIGNATION</i>) (<i>FANS ONLY</i>)
DM65*	DUE TO WEATHER*
DM66*	DUE TO AIRCRAFT PERFORMANCE*
DM67	(<i>FREETEXT</i>) (<i>FANS ONLY</i>)
DM98	FREETEXT (<i>FOR ADDITIONAL ERROR INFO</i>)
DM99	CURRENT DATA AUTHORITY
DM100	LOGICAL ACKNOWLEDGMENT
DM107	NOT AUTHORISED NEXT DATA AUTHORITY

Note: *DM65 and DM66 can be combined with other Downlinked messages. See ICAO documentation for a complete list of messages that may be concatenated.

Additional Downlink Messages (London Only)

Message Number	Message
DM106	PREFERRED LEVEL (<i>LEVEL</i>) (<i>ATN ONLY</i>)

4.2 Uplink Messages (London and Scottish)

Message Number	Message
UM0	UNABLE
UM1	STANDBY
UM20	CLIMB TO (LEVEL)
UM23	DESCEND TO (LEVEL)
UM29	DESCEND TO REACH (LEVEL) BY (POSITION)
UM74	PROCEED DIRECT TO (POSITION)
UM79	CLEARED TO (POSITION) VIA (ROUTE CLEARANCE)
UM96	CONTINUE PRESENT HEADING
UM106	MAINTAIN (SPEED)
UM108	MAINTAIN (SPEED) OR GREATER
UM109	MAINTAIN (SPEED) OR LESS
UM116	RESUME NORMAL SPEED
UM117	CONTACT (UNIT NAME) (FREQUENCY)
UM157	CHECK STUCK MICROPHONE (FREQUENCY)
UM159	ERROR (ERROR INFORMATION)
UM160	NEXT DATA AUTHORITY
UM162	SERVICE UNAVAILABLE
UM169	(FREETEXT)
UM183	(FREETEXT) for additional error information
UM190	<i>FLY HEADING (DEGREES) (ATN ONLY)</i>
UM196	(FREETEXT)
UM203	(FREETEXT)
UM227	LOGICAL ACKNOWLEDGMENT
UM237	REQUEST AGAIN WITH NEXT UNIT

Additional Uplink Messages (London Only)

Message Number	Message
UM231	STATE PREFERRED LEVEL (<i>ATN ONLY</i>)

Additional Uplink Messages (Scottish only)

Message Number	Message
UM27	CLIMB TO REACH (LEVEL) BY (POSITION)
UM53	CROSS (POSITION) AT OR AFTER (TIME)

5 CPDLC Errors

If a flight crew receives an 'ERROR' response to a downlink message it should not be re-sent as this may generate another 'ERROR', and a possible time-out.

Crews should refrain from making technical enquiries on frequency as controllers will not have any further information available.

6 Important Notes

6.1 IF A FLIGHT CREW HAS ANY DOUBT REGARDING THE CONTENT, VALIDITY OR EXECUTION OF A CPDLC MESSAGE THEY MUST REVERT TO VOICE IMMEDIATELY TO CLARIFY THE SITUATION.

6.2 Within UK continental airspace CPDLC is a supplementary means of communication. Voice over R/T remains the primary means of communication.

6.3 Flight crews are reminded that following a change of frequency, there is a requirement to check in by voice prior to the use of CPDLC.

6.4 Flight crews must ensure that upon receiving an uplink message, the CPDLC address corresponds to the unit name to which the flight is in voice communications. (ICAO Annex 11, Chapter 3, Para 3.5.1: 'A controlled flight shall be under the control of only one air traffic control unit at any given time'.)

6.5 Flight crews should ensure upon receiving an UM79 CLEARED TO [position] VIA [route clearance] that the position element is part of the original flight plan to ensure that the onward route is not deleted from the FMS.

6.7 If a CPDLC instruction is **superseded by a voice instruction**, in order to avoid a time-out the flight crew are requested to respond 'UNABLE' to close the original CPDLC dialog and follow the voice instruction.

6.8 Controllers may be required to respond to a downlink request with 'UNABLE' to close the dialogue.

6.9 Flight crew of FANS equipped aircraft are requested to respond promptly to uplinked CPDLC messages due to known network latency issues.

6.10 Due to the potential for FANS message duplication flight crew are requested to report any suspected instances of duplicated CPDLC messages by filing a safety occurrence report.

6.11 Any queries relating to NATS CPDLC operations should be sent to:

CPDLCqueries@nats.co.uk

7 CPDLC R/T Phraseology

Operational Circumstance	Phraseology	Flight Crew Action
Controller uses a voice instruction to correct a CPDLC message	'(Aircraft Callsign) DISREGARD CPDLC (message type) MESSAGE, BREAK (followed by the correct clearance, instruction information or request)'	Crew to disregard a CPDLC message (of that type) that has arrived on the flight deck within the preceding 120 secs or one that arrives within the next 120 secs. If not already responded, crew to respond UNABLE to avoid message time out and unnecessary disconnects.
Delayed message or flight crew has not responded within 120 seconds.	'(Aircraft Callsign) DISREGARD CPDLC (climb/route/clearance, followed by executive instruction to clarify clearance) DISCONNECT CPDLC AND REVERT TO VOICE '	Crew to disregard a CPDLC message that has arrived on the flight deck within the previous 120 seconds and disconnect the CPDLC connection with the Current Data Authority. Crew will be required to LOG-ON manually with the next Data Authority
CPDLC Failure	CALLSIGN/ALL STATIONS CPDLC FAILURE AT (Unit) (followed by the appropriate clearance, instruction information or request)'	Crew shall revert to voice. ATC may require flight crews to clarify clearances.
Resumption of the normal use of CPDLC	'ALL STATIONS RESUME NORMAL CPDLC OPERATIONS'	

8 Appendix 1 - Glossary

ACC	Area Control Centre
ATN	Air Traffic Network
ATSU	Air Traffic Service Unit
CDA	Current Data Authority
CM	Context Management
CPDLC	Controller Pilot Datalink Communications
DA	Data Authority
DLIC	Data Link Initiation Capability
FANS	Future Air Navigation System
FIR	Flight Information Region
FOS	Full Operational Service
HMI	Human Machine Interface
ICAO	International Civil Aviation Organisation
LOS	Limited Operational Service
NDA	Next Data Authority
OACC	Oceanic Area Control Centre
R-ATSU	Receiving Air Traffic Service Unit
SID	Standard Instrument Departure
TMA	Terminal Manoeuvring Area