Chapter 5. Flight crew procedures

5.1 Overview

5.1.1 General

5.1.1.1 The operator may be required to obtain an operational authorization by the State of the Operator or State of Registry to use CPDLC and ADS-C services in accordance with paragraph 3.2. This chapter provides guidance on procedures for the flight crew in airspace where data link services are available.

5.1.1.2 These procedures are intended to assist operators in the development of:
   a) Operating procedures and associated documentation; and
   b) Appropriate training programs.

5.1.1.3 Flight crews should be knowledgeable in operating manuals for use of the data link system specific to the aircraft type.

   Note.— Refer to paragraph 3.2.1.3.

5.1.1.4 Flight crews should be knowledgeable in data link operations.

   Note 1.— Refer to Chapter 2 for an overview of data link operations.

   Note 2.— Where applicable, the communication procedures for the provision of CPDLC shall be in line with ICAO Annex 10, Volume II and Volume III, Part I, Chapter 3. CPDLC message element intent and text and associated procedures are, in general, consistent with ICAO Doc 4444 PANS-ATM Chapter 12 – Phraseologies and Chapter 14 – CPDLC.

5.1.2 Operational differences between voice communications and CPDLC

5.1.2.1 Development, testing, and operational experience have highlighted fundamental differences between CPDLC and voice communications. These differences need to be considered when developing or approving flight crew procedures involving the use of CPDLC.

5.1.2.2 For example, when using voice communications, each flight crew member hears an incoming or outgoing ATS transmission. With voice, the natural ability for each flight crew member to understand incoming and outgoing transmissions for their own aircraft has provided a certain level of situational awareness among the flight crew. With CPDLC, flight crew procedures need to ensure that the flight crew has an equivalent level of situational awareness associated with understanding the content and intent of a message in the same way.

5.1.2.3 Each flight crew member (e.g. pilot flying and pilot monitoring) should individually review each CPDLC uplink message prior to responding to and/or executing any clearance, and individually review each CPDLC downlink message prior to transmission.
5.1.2.4 If an operator uses augmented crews, the flight crew carrying out the ‘handover’ briefing should thoroughly brief the ‘changeover’ flight crew or flight crew member on the status of ADS-C and CPDLC connections and messages, including a review of any pertinent uplink and downlink CPDLC messages (e.g. conditional clearances).

5.1.2.5 Uplink messages require special attention to prevent the flight crew from responding to a clearance with **DM 0 WILCO**, but not complying with that clearance. To minimize errors, when responding to a clearance with **DM 0 WILCO**, each flight crew member should read the uplink message individually (silently) before initiating a discussion about whether and how to act on the message. Reading a message individually is a key element to ensuring that each flight crew member does not infer any preconceived intent different from what is intended or appropriate. Use of this method can provide a flight crew with an acceptable level of situational awareness for the intended operations.

5.1.2.6 In a similar manner, each flight crew member should individually review CPDLC downlink messages before the message is sent. Having one flight crew member (e.g. the pilot monitoring) input the message and having a different flight crew member (pilot flying) review the message before it is sent provides an adequate level of situational awareness comparable to or better than voice communication.

5.1.2.7 The flight crew should coordinate uplink and downlink messages using the appropriate flight deck displays. Unless otherwise authorized, the flight crew should not use printer-based information to verify CPDLC messages as printers are not usually intended for this specific purpose.

**Note**.— For aircraft that have CPDLC message printing capabilities, there are constraints associated with the use of the flight deck printer. Printers may not produce an exact copy of the displayed clearance with the required reliability, and should not be used as the primary display for CPDLC. However, in some cases, printed copies may assist the flight crew with clearances and other information that are displayed on more than one page, conditional clearances and crew handover briefings.

5.1.3 When to use voice and when to use CPDLC

5.1.3.1 When operating within airspace beyond the range of DCPC VHF voice communication, CPDLC is available and local ATC procedures do not state otherwise, the flight crew should normally choose CPDLC as the means of communication. The flight crew would use voice as an alternative means of communication (e.g. VHF, HF or SATVOICE direct or via a radio operator). However, in any case, the flight crew will determine the appropriate communication medium to use at any given time.

5.1.3.2 In airspace where both DCPC VHF voice and CPDLC communication services are provided, and local ATC procedures do not state otherwise, the flight crew will determine the communication medium to use at any given time.

**Note**.— **ICAO Doc 4444, paragraph 8.3.2, requires that DCPC be established prior to the provision of ATS surveillance services, unless special circumstances, such as emergencies, dictate otherwise. This does not prevent the use of CPDLC for ATC communications, voice being immediately available for intervention and to address non-routine and time critical situations.**

5.1.3.3 To minimize pilot head down time and potential distractions during critical phases of flight, the flight crew should use voice for ATC communications when operating below 10,000 ft AGL.
5.1.3.4 While the CPDLC message set, as defined in Appendix A, generally provides message elements for common ATC communications, the flight crew may determine voice to be a more appropriate means depending on the circumstances (e.g. some types of non-routine communications).

Note.— Refer to paragraph 5.8 for guidelines on use of voice and data communications in emergency and non-routine situations.

5.1.3.5 During an emergency, the flight crew would normally revert to voice communications. However, the flight crew may use CPDLC for emergency communications if it is either more expedient or if voice contact cannot be established. Refer to paragraph 5.8.2 for guidelines on use.

Note.— For ATN B1 aircraft, emergency message elements are not supported. See Appendix A, paragraph A.4, for a list of emergency message elements.

5.1.3.6 Except as provided in paragraph 5.8.1.2, the flight crew should respond to a CPDLC message via CPDLC, and should respond to a voice message via voice.

Note.— This will lessen the opportunity for messages to get lost, discarded or unanswered between the ATSU and the flight crew and cause unintended consequences.

5.1.3.7 If the intent of an uplink message is uncertain, the flight crew should respond to the uplink message with DM 1 UNABLE and obtain clarification using voice.

Note.— For FANS 1/A aircraft, some uplink messages do not have a DM 1 UNABLE response. On these aircraft, the flight crew should respond with DM 3 ROGER and then obtain clarification via voice.

5.1.3.8 Regardless of whether CPDLC is being used, the flight crew should continuously monitor VHF/HF/UHF guard frequency. In addition, the flight crew should continuously maintain a listening or SELCAL watch on the specified backup or secondary frequency (frequencies). On aircraft capable of two SATCOM channels, one channel may be selected to the phone number for the radio facility assigned to the current ATSU to enable timely voice communications. The second channel may be selected to the company phone number to enable timely voice communications with company dispatch.

5.2 Logon

5.2.1 General

5.2.1.1 A CPDLC connection requires a successfully completed logon procedure before the ATSU can establish a CPDLC connection with the aircraft.

Note.— Refer to paragraph 2.2.1.2 for an overview of the logon procedure.

5.2.1.2 Prior to initiating the logon, the flight crew should verify the following:

a) The aircraft identification provided when initiating the logon exactly matches the aircraft identification (Item 7) of the filed flight plan;

b) The flight plan contains the correct aircraft registration in Item 18 prefixed by REG/;

c) The flight plan contains the correct aircraft address in Item 18 prefixed by CODE/, when required;
d) The flight plan contains the correct departure and destination aerodromes in Items 13 and 16, when required; and

e) The aircraft registration provided when initiating the logon exactly matches the aircraft placard, when the flight crew manually enters the aircraft registration. Refer to Appendix F, paragraph F.1 for aircraft types that require manual entry.

Note.— If a logon request has been initiated with incorrect aircraft identification and aircraft registration, the logon process will fail. The flight crew will need to correct the information and reinitiate the logon request.

5.2.1.3 If any of the information described in paragraph 5.2.1.2 do not match, the flight crew will need to contact AOC or ATC, as appropriate, to resolve the discrepancy.

Note 1: In accordance with ICAO Doc 4444, the aircraft identification is either the:

a) ICAO designator for the aircraft operating agency followed by the flight identification; or

b) aircraft registration.

Note 2.— The aircraft registration entered into the aircraft system can include a hyphen(-), even though the aircraft registration in the flight plan message cannot include a hyphen.

Note 3.— The ATSU correlates the data sent in a logon request message with flight plan data. If the data does not match, the ATSU will reject the logon request.

5.2.1.4 The flight crew should then manually initiate a logon using the logon address, as indicated on aeronautical charts (See Figure 5-1 for example).

Note 1.— Often the logon address is the same as the 4-letter facility designator but in some airspace a different logon address is used. Refer to Appendix E.

Note 2.— Some aircraft (see Appendix F, paragraph F.1) implement FANS 1/A and ATN B1 capabilities as separate systems and do not comply ith ED154A/DO305A. For these aircraft, the flight crew will have to select the appropriate system (FANS 1/A or ATN B1) to initiate the logon.
5.2.1.5 If there are no indications that the logon procedure was unsuccessful, the flight crew can assume that the system is functioning normally and that they will receive a CPDLC connection prior to entry into the next ATSU’s airspace.

5.2.1.6 If an indication that the logon procedure was unsuccessful is received, the flight crew should reconfirm that the logon information is correct per paragraphs 5.2.1.2 and 5.2.1.4 and reinitiate a logon.

*Note*—If the logon information is correct and the logon process fails, see paragraph 5.9.3 for more information.

5.2.1.7 Each time a CPDLC connection is established, the flight crew should ensure the identifier displayed on the aircraft system matches the logon address for the controlling authority.

5.2.1.8 In the event of an unexpected CPDLC disconnect, the flight crew may attempt to reinitiate a logon to resume data link operations.

5.2.1.9 The flight crew may receive a CPDLC free text message from the ATSU or a flight deck indication regarding the use of the message latency monitor on FANS 1/A+ aircraft. When this message is received, the flight crew should respond as described in Table 5-1 and in accordance with procedures for the specific aircraft type.

*Note 1*—Procedures associated with the message latency monitor are applicable only in the European Region and are described in Appendix E, paragraph E.4.3.2.
Note 2.— FANS 1/A aircraft do not support the message latency monitor. Refer to Appendix F, paragraph F.1, for availability of a FANS 1/A+ upgrade on different types of aircraft. Refer to Appendix F, paragraph F.11, for the specifications of the message latency monitor on different types of aircraft.

Table 5-1. Messages and indications regarding use of message latency monitor

<table>
<thead>
<tr>
<th>Instruction to switch message latency monitor off</th>
<th>ATSU</th>
<th>Flight crew</th>
<th>FANS 1/A+ aircraft</th>
<th>Message latency monitor not available</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATSU</strong></td>
<td>UM 169aa CONFIRM MAX UPLINK DELAY VALUE IS NOT SET</td>
<td><strong>Flight crew</strong></td>
<td><strong>FANS 1/A+ aircraft</strong></td>
<td><strong>Message latency monitor not available</strong></td>
</tr>
<tr>
<td></td>
<td><strong>The flight crew should:</strong></td>
<td></td>
<td><strong>The flight crew should respond to the CPDLC [free text] message with DM 3 ROGER.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Confirm that the message latency monitor is off (or not set); and</td>
<td></td>
<td><strong>The flight crew should respond to the CPDLC [free text] message with DM 3 ROGER.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Respond to the uplink [free text] message with DM 3 ROGER.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Instruction to set the maximum uplink delay value

<table>
<thead>
<tr>
<th>ATSU</th>
<th>UM 169w SET MAX UPLINK DELAY VALUE TO [delayed message parameter] SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>where the [delayed message parameter] is an integer value (e.g. 40).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flight crew</th>
<th>FANS 1/A+ aircraft</th>
<th>Message latency monitor not available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>The flight crew should:</strong></td>
<td><strong>The flight crew should respond to the uplink [free text] message with DM 3 ROGER and append the DM 67af TIMER NOT AVAILABLE.</strong></td>
</tr>
<tr>
<td></td>
<td>a) Set the value; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Respond to the uplink message with DM 3 ROGER.</td>
<td></td>
</tr>
</tbody>
</table>

Indication of delayed CPDLC uplink message (Some FANS 1/A+ aircraft only)

<table>
<thead>
<tr>
<th>ATSU/aircraft system</th>
<th>(any CPDLC uplink message displayed with indication of delayed message)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight crew</td>
<td>Some FANS 1/A+ aircraft only</td>
</tr>
<tr>
<td></td>
<td>The flight crew should:</td>
</tr>
<tr>
<td></td>
<td>a) Revert to voice communications to notify the ATSU of the delayed message received and to request clarification of the intent of the CPDLC message (paragraph 5.9.2.2 refers); and</td>
</tr>
<tr>
<td></td>
<td>b) Respond, appropriately, to close the message per the instructions of the controller.</td>
</tr>
</tbody>
</table>
5.2.2 When to log on initially for data link services

5.2.2.1 When operating outside data link airspace, the flight crew should initiate a logon 10 to 25 minutes prior to entry into airspace where data link services are provided.

Note.— When departing an aerodrome close to or within such airspace, this may require the logon to be initiated prior to departure.

5.2.2.2 Where a data link service is only provided in upper airspace and where local procedures do not dictate otherwise, the flight crew should log on to that ATSU in whose airspace a data link service will first be used.

5.2.2.3 When failure of a data link connection is detected, the flight crew should terminate the connection and then initiate a new logon with the current ATSU.

5.2.3 Automatic transfer of CPDLC and ADS-C services between ATSUs

5.2.3.1 Under normal circumstances, the current and next ATSUs automatically transfer CPDLC and ADS-C services. The transfer is seamless to the flight crew.

Note.— The flight crew should not need to reinitiate a logon.

5.2.3.2 The flight crew should promptly respond to CPDLC uplinks to minimize the risk of an open CPDLC uplink message when transferring to the next ATSU.

Note.— If a flight is transferred to a new ATSU with an open CPDLC message, the message status will change to ABORTED. If the flight crew has not yet received a response from the controller, the downlink request will also display the ABORTED status. Refer also to Appendix F, paragraph F.8.

5.2.3.3 Prior to the point at which the current ATSU will transfer CPDLC and/or ADS-C services, the flight crew may receive an instruction to close any open CPDLC messages.

5.2.3.4 When entering the next ATSU’s airspace, the flight crew should confirm the successful transfer from the current ATSU to the next ATSU by observing the change in the active center indication provided by the aircraft system.

5.2.3.5 When required by local procedures, the flight crew should send DM 48 POSITION REPORT [position report]. Alternatively, the flight crew may be required to respond to a CPDLC message exchange initiated by the ATSU.

Note.— Since FANS 1/A aircraft do not report that the downstream ATSU has become the CDA, the only way to confirm that it has taken place is for the ATSU to receive a CPDLC message from the aircraft (refer to Appendix E).

5.2.4 Transfer voice communications with the CPDLC connection transfer

5.2.4.1 Prior to crossing the boundary, the active center may initiate transfer of voice communications with the CPDLC connection transfer using any of the message elements containing CONTACT or MONITOR. Refer to paragraph 4.2.3 for guidelines on the controller’s use of these message elements.
5.2.4.2 A CONTACT or MONITOR message instructs the flight crew to change to the specified frequency and may include a position or time for when to change to the new frequency.

a) When a MONITOR message is received, the flight crew should change to the specified frequency upon receipt of the instruction or at the specified time or position. The flight crew should not establish voice contact on the frequency.

b) When a CONTACT message is received, the flight crew should change to the specified frequency upon receipt of the instruction or at the specified time or position, and establish voice contact on the frequency.

Note 1.— Some States do not require HF SELCAL checks. If, following a MONITOR instruction, a SELCAL check is specifically required by operator procedures, this will usually be accommodated on the allocated frequency.

Note 2.— If the next ATSU provides CPDLC services, the flight crew should not expect that CPDLC will be terminated or suspended once voice contact is established per receipt of a CONTACT message, unless otherwise advised per paragraph 4.2.4.4.

5.2.4.3 If the ATSU assigns a single HF frequency, the flight crew should select another frequency from the same ‘family’ as a secondary frequency.

Note.— In areas of poor radio coverage, the controller may append UM 238 SECONDARY FREQUENCY [frequency] to specify a secondary frequency.

5.2.5 Exiting CPDLC and ADS-C service areas

5.2.5.1 The flight crew should consult the current ATSU prior to the manual termination of any ADS contract with the aircraft, even if it is suspected to be unnecessary or that its termination has failed.

Note.— ADS contracts are managed (e.g. established and terminated) by ATSUs per paragraph 4.5.3.

5.2.5.2 Approximately 15 minutes after exiting CPDLC and/or ADS-C service areas, the flight crew should ensure there are no active CPDLC or ADS-C connections. Ensuring that connections are not active eliminates the possibility of inadvertent or inappropriate use of the connections, and reduces operating costs and loading of the system.

Note.— Some ATSUs may maintain ADS contracts with an aircraft for a period of time (e.g. 15 minutes) after the aircraft has left the airspace.

5.3 CPDLC – ATS uplink messages

5.3.1 General

5.3.1.1 When a CPDLC uplink is received, each flight crew member (e.g. pilot flying and pilot monitoring) should read the message from the flight deck displays individually to ensure situational awareness is maintained. Once the message has been individually read, the flight crew should then discuss whether to respond to the message with DM 0 WILCO or DM 3 ROGER, as appropriate, or DM 1 UNABLE.
5.3.1.2 When processing an uplink multi-element message, the flight crew should ensure that the entire uplink has been read and understood in the correct sequence prior to responding.

*Note*—A CPDLC multi-element message is one that contains multiple clearances and/or instructions. The display may only show part of a CPDLC multi-element message and require flight crew interaction to see the entire message.

Example:

<table>
<thead>
<tr>
<th>Controller</th>
<th>Flight crew</th>
</tr>
</thead>
<tbody>
<tr>
<td>UM 20 <strong>CLimb TO FL350</strong> or <strong>CLimb TO AND MAINTAIN FL350.</strong></td>
<td><strong>DM 0</strong> WILCO</td>
</tr>
<tr>
<td>UM 128 <strong>REPORT LEAVING FL330.</strong></td>
<td></td>
</tr>
<tr>
<td>UM 129 <strong>REPORT MAINTAINING FL350</strong> or <strong>REPORT LEVEL FL350.</strong></td>
<td></td>
</tr>
</tbody>
</table>

5.3.1.3 If multiple clearances are received in a single message, the flight crew should only respond with **DM 0 WILCO** if all the clearances in the entire message can be complied with.

5.3.1.4 If the flight crew cannot comply with any portion of a multi-element message, the flight crew should respond to the entire message with **DM 1 UNABLE**.

*Note*—The flight crew can only provide a single response to the entire multi-element uplink message. The flight crew cannot respond to individual elements of a multi-element message and should not execute any clearance contained in the message.

5.3.1.5 When an uplink responded to with **DM 0 WILCO** or **DM 3 ROGER**, the flight crew should take appropriate action to comply with the clearance or instruction.

*Note*—Although a **DM 0 WILCO** or **DM 3 ROGER** response technically closes the uplink message, in some cases, other responses may follow to provide additional information, as requested, to operationally close the message.

5.3.1.6 The flight crew should respond to an uplink message with the appropriate response(s), as provided in Appendix A, paragraph A.4.

*Note 1*—The flight crew may need to perform some action before a subsequent CPDLC message can be displayed.

*Note 2*—For ATN-B1 systems, if the ground system does not receive a response within 120 seconds from the time the uplink message was sent, the ATSU will send an ERROR message for display to the flight crew and both the aircraft and ground system close the dialogue.

5.3.1.7 When a message is received containing only free text, or a free text element combined with elements that do not require a response, the flight crew should respond to the message with **DM 3 ROGER** before responding to any query that may be contained in the free text message element.

Example:

<table>
<thead>
<tr>
<th>Controller</th>
<th>Flight crew</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(free text)</em></td>
<td><strong>DM 3</strong> ROGER</td>
</tr>
<tr>
<td>UM 169b <strong>REPORT GROUND SPEED.</strong></td>
<td></td>
</tr>
</tbody>
</table>
5.3.2 Flight crew response times for CPDLC uplink messages

5.3.2.1 System performance requirements have been established to support reduced separation standards. Specific latency times have been allocated to the technical performance, and flight crew and controller response times. Regional/State monitoring agencies analyze actual performance to ensure the technical and operational components of the system meet required standards. For example, to support RCP 240 operations, the flight crew is expected to be able to respond to a CPDLC uplink message within one minute.

5.3.2.2 For an ATN-B1 aircraft, the flight crew should respond to a CPDLC uplink message within 100 seconds to prevent the CPDLC uplink message from automatically timing out.

Note.- ATN-B1 aircraft use a CPDLC message response timer, which is set at 100 seconds upon receipt of the CPDLC uplink message. If the flight crew has not sent a response within this time:

a) the flight crew is no longer provided with any response prompts for the message;

b) the aircraft sends an ERROR message for display to the controller; and

c) the aircraft and ground systems close the dialogue.

5.3.2.3 When a CPDLC uplink message automatically times out, the flight crew should contact ATC by voice.

5.3.2.4 The flight crew should respond to CPDLC messages as soon as practical after they are received. For most messages, the flight crew will have adequate time to read and respond within one minute. However, the flight crew should not be pressured to respond without taking adequate time to fully understand the CPDLC message and to satisfy other higher priority operational demands. If additional time is needed, the flight crew should send a DM 2 STANDBY response.

Note.— For ATN B1 aircraft systems, if the flight crew does not send an operational response within 100 seconds after the DM 2 STANDBY was sent, the CPDLC uplink message will time out (refer to paragraph 5.3.2.3).

5.3.2.5 If a DM 2 STANDBY response has been sent, the flight crew should provide a subsequent closure response to the CPDLC message.

Note 1.— In the case of a DM 2 STANDBY response, the uplink message remains open until the flight crew responds with a DM 0 WILCO or DM 1 UNABLE. If the closure response is not received within a reasonable period of time, the controller is expected to query the flight crew per paragraph 4.3.1.2.

Note 2.— Transmission times for messages may vary for a number of reasons including the type of transmission media, network loading, or the criteria for transitioning from one media to another (e.g. VHF/Satcom). Operational response times may vary depending on workload and complexity of the instruction or clearance.
5.3.3 Conditional clearances

5.3.3.1 Conditional clearances require special attention by the flight crew, particularly for a non-native English speaking flight crew. A conditional clearance is an ATC clearance given to an aircraft with certain conditions or restrictions such as changing a flight level based on a time or place. Conditional clearances add to the operational efficiency of the airspace. Conditional clearances, however, have been associated with a large number of operational errors. Following guidelines provided in paragraphs 5.1.2 and 5.3.1, such as each flight crew member individually reading the uplinked clearances and conducting briefings with augmented crews, should aid in reducing errors.

5.3.3.2 The flight crew should correctly respond to conditional clearances containing “AT” or “BY”, taking into account the intended meaning and any automation features provided by the aircraft systems. Table 5-2 clarifies the intended meaning for conditional clearance message elements. (Refer also to Appendix A, paragraph A.3.)

Table 5-2. Conditional clearance clarification of vertical clearances

<table>
<thead>
<tr>
<th>Message Intent</th>
<th>Message element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction that at the specified time a climb to the specified level is to</td>
<td>UM 21 AT [time] CLIMB TO [level] or AT [time] CLIMB TO AND MAINTAIN [altitude]</td>
</tr>
<tr>
<td>commence and once reached the specified level is to be maintained.</td>
<td></td>
</tr>
<tr>
<td><strong>Note 1.</strong> Instruction that, NOT BEFORE the specified time, a climb</td>
<td></td>
</tr>
<tr>
<td>to the specified level is to commence and, once reached, the specified</td>
<td></td>
</tr>
<tr>
<td>level is to be maintained.</td>
<td></td>
</tr>
<tr>
<td><strong>Note 2.</strong> This message element would be preceded with UM 19</td>
<td></td>
</tr>
<tr>
<td>MAINTAIN [level], to prevent the premature execution of the instruction.</td>
<td></td>
</tr>
<tr>
<td>Instruction that at the specified position a climb to the specified level</td>
<td>UM 22 AT [position] CLIMB TO [level] or AT [position] CLIMB TO AND MAINTAIN [altitude]</td>
</tr>
<tr>
<td>is to commence and once reached the specified level is to be maintained.</td>
<td></td>
</tr>
<tr>
<td><strong>Note 1.</strong> Instruction that, AFTER PASSING the specified position, a climb</td>
<td></td>
</tr>
<tr>
<td>to the specified level is to commence and, once reached, the specified</td>
<td></td>
</tr>
<tr>
<td>level is to be maintained.</td>
<td></td>
</tr>
<tr>
<td><strong>Note 2.</strong> This message element would be preceded with UM 19</td>
<td></td>
</tr>
<tr>
<td>MAINTAIN [level], to prevent the premature execution of the instruction.</td>
<td></td>
</tr>
<tr>
<td>Instruction that at a specified time a descent to a specified level is to</td>
<td>UM 24 AT [time] DESCEND TO [level] or AT [time] DESCREND TO AND MAINTAIN [altitude]</td>
</tr>
<tr>
<td>commence and once reached the specified level is to be maintained.</td>
<td></td>
</tr>
<tr>
<td><strong>Note 1.</strong> Instruction that, NOT BEFORE the specified time, a descent</td>
<td></td>
</tr>
<tr>
<td>to the specified level is to commence and, once reached, the specified level</td>
<td></td>
</tr>
<tr>
<td>is to be maintained.</td>
<td></td>
</tr>
<tr>
<td><strong>Note 2.</strong> This message element would be preceded with UM 19</td>
<td></td>
</tr>
<tr>
<td>MAINTAIN [level], to prevent the premature execution of the instruction.</td>
<td></td>
</tr>
</tbody>
</table>
### Message Intent

Instruction that at the specified position a descent to the specified level is to commence and once reached the specified level is to be maintained.

**Note 1.** — Instruction that, AFTER PASSING the specified position, a descent to the specified level is to commence and, once reached, the specified level is to be maintained.

**Note 2.** — This message element would be preceded with UM 19 MAINTAIN [level], to prevent the premature execution of the instruction.

<table>
<thead>
<tr>
<th>Message element</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>UM 25 AT [position] DESCEND TO [level] or AT [position] DESCEND TO AND</td>
<td>Instruction that at the specified position a descent to the specified level is to commence and once</td>
</tr>
<tr>
<td>MAINTAIN [altitude]</td>
<td>reached the specified level is to be maintained.</td>
</tr>
<tr>
<td>UM 26 CLIMB TO REACH [level] BY [time]</td>
<td>Instruction that a climb is to commence at a rate such that the specified level is reached at or</td>
</tr>
<tr>
<td></td>
<td>before the specified time. When this message element is not concatenated with another vertical</td>
</tr>
<tr>
<td></td>
<td>clearance, the level specified is the assigned level which is to be maintained.</td>
</tr>
<tr>
<td>UM 27 CLIMB TO REACH [level] BY [position]</td>
<td>Instruction that a climb is to commence at a rate such that the specified level is reached</td>
</tr>
<tr>
<td></td>
<td>BEFORE PASSING the specified position.</td>
</tr>
<tr>
<td>UM 28 DESCEND TO REACH [level] BY [time]</td>
<td>Instruction that a descent is to commence at a rate such that the specified level is reached</td>
</tr>
<tr>
<td></td>
<td>NOT LATER THAN the specified time.</td>
</tr>
<tr>
<td>UM 29 DESCEND TO REACH [level] BY [position]</td>
<td>Instruction that a descent is to commence at a rate such that the specified level is reached</td>
</tr>
<tr>
<td></td>
<td>BEFORE PASSING the specified position.</td>
</tr>
</tbody>
</table>

### 5.3.4 “EXPECT” uplink messages

5.3.4.1 “EXPECT” uplink messages are typically received in response to a flight crew request, and, in some cases, when procedurally required per paragraph 4.3.3.
5.3.4.2 When receiving an EXPECT uplink message, the flight crew should respond with DM 3 ROGER, meaning that the message was received and understood.

*Note 1.* — The flight crew should NOT comply with an EXPECT message as if it was a clearance.

*Note 2.* — The FANS 1/A CPDLC message set contains EXPECT uplink message elements that the controller should NOT use because of potential misinterpretation in the event of a total communication failure. Some of these message elements have been reserved by Doc 4444. As a consequence, some "WHEN CAN WE EXPECT" downlink messages are not supported. See Appendix A, paragraph A.3, and Appendix E, paragraph E.7.1.3, for specific message elements that are not supported.

### 5.3.5 Uplinks containing FMS-loadable data

5.3.5.1 CPDLC allows aircraft systems to be capable of loading route clearance information from CPDLC messages directly into an FMS. The flight crew can use this capability to minimize the potential for data entry errors when executing clearances involving loadable data. It also enables advanced air traffic services supported by data link, such as a re-route or a tailored arrival, as described in Chapter 6, which otherwise may not be possible via voice.

*Note.* — Not all aircraft have the capability to load information from CPDLC message directly into the FMS.

5.3.5.2 If a clearance is received that can be automatically loaded into the FMS, the flight crew should load the clearance into the FMS and review it before responding with DM 0 WILCO.

5.3.5.3 The flight crew should verify that the route modification in the FMS is consistent with the CPDLC route clearance. A discontinuity in a CPDLC route clearance is not necessarily a reason to respond to the clearance with DM 1 UNABLE, as these can be appropriate in some circumstances.

5.3.5.4 The flight crew should respond to the clearance with DM 1 UNABLE when:

a) The FMS indicates that it cannot load the clearance (e.g. partial clearance loaded or unable to load); or

*Note.* — The FMS checks the clearance to ensure it is correctly formatted and compatible with the FMS navigation database.

b) The FMS indicates any inconsistencies or discontinuities with the route modification that are not addressed by AIP (or other appropriate publication) or cannot be resolved by the flight crew.

5.3.5.5 The flight crew should use CPDLC or voice to clarify any clearance that was responded to with DM 1 UNABLE due to any loading failures, route discontinuities or inconsistencies.

5.3.5.6 If the clearance loads successfully and is acceptable, the flight crew may execute an FMS route modification and respond to the clearance with DM 0 WILCO.

*Note.* — The flight crew will ensure the route in the FMC matches the ATC clearance.
5.4 CPDLC – ATS downlink messages

5.4.1 General

5.4.1.1 Downlink messages can only be sent to the ATSU that holds the active CPDLC connection. To provide situational awareness, procedures should ensure that each flight crew member has read each downlink message before it is sent.

5.4.1.2 When the aircraft has an active CPDLC connection with an ATSU, the flight crew should downlink a clearance request only if the flight is in that ATSU’s airspace.

5.4.1.3 The flight crew should use standard downlink message elements to compose and send clearance requests, CPDLC position reports, and other requested reports. Additional qualifying standard message elements, such as **DM 65 DUE TO WEATHER**, should also be used as needed.

*Note.— The use of standard message elements will minimize the risk of input errors, misunderstandings, and confusion, and facilitate use by a non-native English speaking flight crew. The use of standard message elements allows the aircraft and ground systems to automatically process the information in the messages that are exchanged. For example, the flight crew can automatically load clearance information into the FMS and review the clearance, the ground system can automatically update flight plan data for route conformance monitoring, and both aircraft and ground systems can associate responses to messages.*

5.4.1.4 To avoid potential ambiguity, the flight crew should avoid sending multiple clearance requests in a single downlink message. For example, the flight crew should send separate downlink messages for **DM 9 REQUEST CLIMB TO [level]** and **DM 22 REQUEST DIRECT TO [position]** unless there is an operational need to combine them in a single message (i.e. the flight crew does not want to climb unless they can re-route).

5.4.1.5 When a closure response to an open CPDLC downlink message is not received within a reasonable time period, the flight crew should:

a) For a FANS 1/A aircraft, send a query using one of the **Negotiation Requests** messages or a **DM 67** [free text] message rather than resending the downlink message. Alternatively, the flight crew may use voice communication to clarify the status of the open CPDLC downlink message; or

b) For an ATN-B1 aircraft, the flight crew should use voice communication to resolve the operational situation resulting from the timed out CPDLC downlink message.

*Note 1.— A closure response is a response that operationally closes the dialogue. A **UM 1 STANDBY** response to an open CPDLC downlink message does not operationally close the dialogue.*

*Note 2.— The use of a CPDLC free text message by a FANS 1/A aircraft avoids multiple open messages involving the same downlink message.*

*Note 3.— ATN-B1 ground systems will reject duplicate requests and return an ERROR message for display to the flight crew TOO MANY (dialogue type) REQUESTS - EXPECT ONLY ONE REPLY.*

Example:

<table>
<thead>
<tr>
<th>Flight crew</th>
<th><strong>DM 9 REQUEST CLIMB TO FL350</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reasonable period of time has passed</td>
</tr>
</tbody>
</table>
5.4.1.6 If the flight crew receives an indication of non-delivery of a downlink message, they may elect to re-send an identical message within a reasonable amount of time or as required. Alternatively, they may use voice communication to clarify the status of the downlink message.

5.4.2 Free text

5.4.2.1 The flight crew should avoid the use of the free text message element. However, its use may offer a viable solution to enhance operational capability.

Note 1.— The use of standard message elements is intended to reduce the possibility of misinterpretation and ambiguity.

Note 2.— A free text message (such as DM 67k REVISED ETA [position] [time]) does not require a response from the ATSU.

5.4.2.2 Free text messages should be used only when an appropriate standard message element does not exist.

5.4.2.3 When composing a free text message, the flight crew should use standard ATS phraseology and format and avoid nonessential words and phrases. Abbreviations should only be included in free text messages when they form part of standard ICAO phraseology, for example, ETA.

5.4.3 Unsupported messages

5.4.3.1 While ATSUs should provide CPDLC service using the complete message set provided in Appendix A, some ATSUs provide a CPDLC service using a limited message set. The flight crew should be aware of any unsupported downlink message elements that are described in regional or State documentation.

5.4.3.2 If a downlink message, containing a message element that is not supported by the ATSU, is sent, the flight crew will typically receive the uplink message, UM 162 or UM 169a MESSAGE NOT SUPPORTED BY THIS ATS UNIT. If this message is received, the flight crew should respond to the message with DM 3 ROGER and use voice for the communication transaction.

5.4.4 CPDLC reports and confirmation requests

5.4.4.1 The flight crew should respond to CPDLC reports and confirmation requests, when appropriate.

Note 1.— ATSUs may send a CPDLC message that combines a REPORT instruction with a clearance. The flight crew may use automation, procedures, and/or a combination to remind them when to send the reports requested in the CPDLC message.
Example:

| Controller | UM 20 CLIMB TO FL350 or CLIMB TO AND MAINTAIN FL350.  
|            | UM 128 REPORT LEAVING FL330.  
|            | UM 129 REPORT MAINTAINING [level] or REPORT LEVEL FL350.  
| Flight crew | DM 0 WILCO |

Note 2.— The controller may send a CPDLC message to request the flight crew to advise intentions when ADS-C indicates the aircraft has deviated from its cleared route, level or assigned speed (paragraph 4.3.5.2 refers).

5.5 Automatic dependant surveillance – contract (ADS-C)

5.5.1 General

5.5.1.1 ADS-C allows the ATSU to obtain position reports from the aircraft without flight crew action to update the current flight plan, to check conformance and to provide emergency alerting.

Note.— In airspace where ADS-C services are available, the flight crew need not send position reports via voice or CPDLC, except as described in paragraph 5.6.3 or when required by regional supplementary procedures or AIP (or other appropriate publication).

5.5.1.2 When using ADS-C services, the flight crew should check to ensure ADS-C is armed prior to initiating a logon with an ATSU.

Note.— The flight crew can switch ADS-C off, which will cancel any ADS-C connections with the aircraft. While ADS-C is disabled, the ground system will not be able to establish an ADS-C connection.

5.5.1.3 Normally, the flight crew should leave ADS-C armed for the entire flight. However, in airspace where ADS-C services are available, if the flight crew switches ADS-C off for any reason, or they receive indication of avionics failure leading to loss of ADS-C service, the flight crew should advise ATC and follow alternative procedures for position reporting per paragraphs 5.6 and 5.9.4.4.

5.5.1.4 In airspace where ADS-C services are not available, the flight crew may switch ADS-C off to cancel inadvertent ADS-C connections. In such cases, the flight crew should ensure that ADS-C is armed when re-entering airspace where ADS-C services are again available.

5.5.1.5 If ADS-C is disabled in an ADS-C environment, the ATSU may send the flight crew an inquiry per paragraph 5.9.4.6.

5.6 Position reporting

5.6.1 General

5.6.1.1 The flight crew should ensure that waypoints are sequenced correctly. If an aircraft passes abeam a waypoint by more than the aircraft FMS waypoint sequencing parameter, the flight crew should sequence the waypoints in the FMS, as appropriate.
Note — As shown in Figure 5-2, when an aircraft passes abeam a waypoint in excess of the defined sequencing parameter (refer to Appendix F, paragraph F.7) for specific aircraft types), the FMS will not sequence the active waypoint. If the flight crew does not sequence the waypoint, incorrect information will be contained in ADS-C reports, CPDLC position reports and FMC waypoint position reports – the next waypoint in these reports will actually be the waypoint that the aircraft has already passed.

![Figure 5-2. Waypoint sequencing anomaly](image)

5.6.1.2 When using CPDLC or FMC WPR to provide position information, the flight crew should use latitudes and longitudes encoded as waypoint names in the ICAO format.

Note 1.— The flight crew should not use the ARINC 424 format.

Note 2.— ARINC 424 describes a 5-character latitude/longitude format for aircraft navigation databases (e.g. 10N40 describes a lat/long of 10N140W). The ATSU will likely reject any downlink message containing waypoint names in the ARINC 424 format.

5.6.2 Position reporting in a non-ADS-C environment

5.6.2.1 When ADS-C is not available, the flight crew should conduct position reporting by voice or CPDLC. When using CPDLC, the flight crew should send DM 48 POSITION REPORT [position report] whenever an ATC waypoint is sequenced, (or passed abeam when offset flight is in progress).

5.6.2.2 When using CPDLC for position reporting, the flight crew should send position reports only at compulsory reporting points and ensure that the position and next position information applies to compulsory reporting points, unless requested otherwise by ATC. The ensuing significant point after the next position may be either a compulsory or non-compulsory reporting point (Refer AIREP form ICAO Doc 4444, Appendix 1).

5.6.3 Position reporting in an ADS-C environment

Note — In an ADS-C environment, the flight crew should not provide position reports or revised waypoint estimates by CPDLC or voice, unless otherwise instructed or under conditions in certain airspace as stipulated in Regional Supplementary Procedures or AIP (or other appropriate publication) (See also Appendix E).
5.6.3.1 If required by regional supplementary procedures or AIP (or other appropriate publication), the flight crew should provide a CPDLC position report when either of the following events occurs:

a) An initial CPDLC connection is established; or

b) The CPDLC connection transfer has been completed (i.e. at the associated boundary entry position).

Note.— Some ANSPs require a single CPDLC position report, even when in an ADS-C environment, to provide the controlling ATSU confirmation that it is the CDA and the only ATSU able to communicate with the aircraft via CPDLC (refer to Appendix E).

5.6.3.2 The flight crew should include only ATC waypoints in cleared segments of the aircraft active flight plan.

Note.— If the flight crew inserts non-ATC waypoints (e.g. mid-points) into the aircraft active flight plan and activates the change, the aircraft system may trigger an ADS-C waypoint change event report at the non-ATC waypoint, or include information about the non-ATC waypoint in the predicted route group, as well as the intermediate and fixed projected intent groups. As a result, the ADS-C report will include information about the non-ATC waypoint, which is not expected by the ATC ground system.

5.6.3.3 The flight crew should maintain the active route in the aircraft system to be the same as the ATC cleared route of flight.

Note.— If the flight crew activates a non-ATC cleared route into the aircraft system, the ADS-C reports will include information that will indicate the aircraft is flying a route that is deviating from the cleared route.

5.6.3.4 When reporting by ADS-C only, the flight crew should include ATC waypoints in the aircraft active flight plan even if they are not compulsory reporting points.

5.6.4 Position reporting using FMC WPR

5.6.4.1 Prior to using FMC WPR for position reporting, the flight crew should verify the aircraft identification (ACID) entered into the system is the same as filed in Item 7 of the flight plan.

5.6.4.2 When FMC waypoint position reports are manually initiated, the flight crew should send the report within 3 minutes of crossing each waypoint. If this cannot be achieved, the FMC WPR should not be triggered, but a voice report made instead.

5.6.4.3 The flight crew may assume that the estimate for the next waypoint, shown on the FMS at the time a waypoint is crossed, is the estimate transmitted to ATC in the FMC waypoint position report. If that estimate subsequently changes by more than 2 minutes, the flight crew should transmit a revised estimate via voice to the ATSU concerned as soon as possible.

Note.— Some regions permit a revised FMC WPR to be transmitted to update a previously notified estimate.

5.6.4.4 The flight crew should avoid inserting non-ATC waypoints (e.g. mid-points) in route segments because non-ATC waypoints may prevent the provision of proper ETA data in the FMS reports required for ATC purposes.
5.6.4.5 If the flight identification portion of the aircraft identification contains an alphabetic character (such as ABC132A or ABC324W, where 132A or 324W is the flight identification) the flight cannot participate in FMC WPR (see paragraph 3.4.1.4 for more information regarding this limitation).

5.7 Weather deviations and offsets

5.7.1 General

5.7.1.1 The flight crew may use CPDLC to request a weather deviation clearance or an offset clearance. The difference between a weather deviation and an offset is portrayed in Figure 5-3.

a) A weather deviation clearance authorizes the flight crew to deviate up to the specified distance at their discretion in the specified direction from the route in the flight plan; and

b) An offset clearance authorizes the flight crew to operate at the specified distance in the specified direction from the route in the flight plan. A clearance is required to deviate from this offset route.

Note.— CPDLC offers more timely coordination of weather deviation clearances. However, the flight crew may deviate due to weather under the provisions of ICAO Doc 4444, paragraph 15.2.3. The extent to which weather deviations are conducted may be a consideration when applying reduced separations, as noted in ICAO Doc 4444, paragraph 5.4.2.6.4.3.

5.7.1.2 Flight crews should use the correct message element when requesting an off-route clearance.

Note.— The difference between a weather deviation and an offset affects how ATC separate aircraft.

Figure 5-3. Offset and weather deviation

5.7.2 Weather deviation requests and offsets

5.7.2.1 When requesting a weather deviation or offset clearance, the flight crew should specify the distance off route with respect to the cleared route of the aircraft. If the flight crew has received an off-route clearance and then requests and receives a subsequent off-route clearance, the new clearance supersedes the previous clearance (i.e. only the most recent clearance is valid).
Note.— When an off-route clearance has been received, the flight crew will need to ensure that waypoints are sequenced correctly per paragraph 5.6.1.1.

Example 1: As shown in Figure 5-4, the flight crew requests a weather deviation clearance to operate up to 20NM left of route. The controller issues the appropriate clearance.

<table>
<thead>
<tr>
<th>Flight crew</th>
<th>Controller</th>
<th>Flight crew</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM 27 REQUEST WEATHER DEVIATION UP TO 20NM LEFT OF ROUTE</td>
<td>UM 82 CLEARED TO DEVIATE UP TO 20NM LEFT OF ROUTE</td>
<td>DM 0 WILCO</td>
</tr>
<tr>
<td>UM 127 REPORT BACK ON ROUTE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 5-4. Weather deviation clearance up to 20 NM left of route](image)

Example 2: As shown in Figure 5-5, the flight crew is operating on a weather deviation clearance up to 20 NM left of route and then requests another weather deviation clearance to operate up to a further 30NM left of route. In the clearance request, the flight crew specifies a deviation distance from the cleared route rather than from the current weather deviation clearance. The controller issues the appropriate clearance.

<table>
<thead>
<tr>
<th>Flight crew</th>
<th>Controller</th>
<th>Flight crew</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM 27 REQUEST WEATHER DEVIATION UP TO 50NM LEFT OF ROUTE</td>
<td>UM 82 CLEARED TO DEVIATE UP TO 50NM LEFT OF ROUTE</td>
<td>DM 0 WILCO</td>
</tr>
<tr>
<td>UM 127 REPORT BACK ON ROUTE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example 3: As shown in Figure 5-6, the aircraft then requests a weather deviation clearance to operate 30NM right of route. The controller issues the appropriate clearance. The flight crew expeditiously navigates from one side of route to the other in accordance with the above clearance.

Note — The ATSU applies the appropriate separation standards during the maneuvers.

<table>
<thead>
<tr>
<th>Flight crew</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight crew</td>
<td><strong>DM 27</strong> REQUEST WEATHER DEVIATION UP TO 30NM RIGHT OF ROUTE</td>
</tr>
<tr>
<td>Controller</td>
<td><strong>UM 82</strong> CLEARED TO DEVIATE UP TO 30NM RIGHT OF ROUTE</td>
</tr>
<tr>
<td>Controller</td>
<td><strong>UM 127</strong> REPORT BACK ON ROUTE</td>
</tr>
<tr>
<td>Flight crew</td>
<td><strong>DM 0</strong> WILCO</td>
</tr>
</tbody>
</table>
5.7.3 Deviations either side of route

5.7.3.1 There are a number of valid formats for the CPDLC [direction] variable. A number of aircraft types, however, can only request one direction (left or right) in weather deviation requests. When operating these aircraft types, the flight crew should request a deviation left and right of route using the following procedures:

a) Construct a weather deviation request for a deviation on one side of route using **DM 27 REQUEST WEATHER DEVIATION UP TO [specified distance] [direction] OF ROUTE;** and

b) Append free text **DM 67ac** AND [specified distance] [direction] describing the distance to the other side of route.

Example: The flight crew requests a deviation left and right of route. The controller issues the appropriate clearance.

| Flight crew | **DM 27 REQUEST WEATHER DEVIATION UP TO 20NM LEFT OF ROUTE.**  
DM 67ac AND 20NM RIGHT |
|--------------|---------------------------------------------------------------|
| Controller   | **UM 82 CLEARED TO DEVIATE UP TO 20NM EITHER SIDE OF ROUTE**  
**UM 127 REPORT BACK ON ROUTE** |
| Flight crew  | **DM 0 WILCO**                                                |
5.7.4 Reporting back on route

5.7.4.1 When the flight crew no longer needs the deviation clearance and is back on the cleared route, the flight crew should send a DM 41 BACK ON ROUTE report.

a) If during the weather deviation, the flight crew receives a clearance to proceed direct to a waypoint – and the flight crew responds to the clearance with DM 0 WILCO – the aircraft is considered to be on the cleared route. Therefore, the flight crew should send a DM 41 BACK ON ROUTE report after they execute the “direct to” clearance; and

b) If the aircraft is off route during a weather deviation clearance and proceeding direct to a waypoint on the cleared route, the flight crew should send a DM 41 BACK ON ROUTE report after the aircraft has sequenced the waypoint on the cleared route.

Note.— If a DM 41 BACK ON ROUTE report is received while the aircraft is still off route, the incorrect information provided to ATC may affect the separation standards in use. Alternatively, the flight crew may consider requesting a clearance direct to the waypoint – on receipt of the uplink clearance, the procedure specified in item a) above applies.

5.8 Emergency procedures

5.8.1 General

5.8.1.1 In accordance with established emergency procedures, the ATSU within whose airspace the aircraft is operating remains in control of the flight. If the flight crew takes action contrary to a clearance that the controller has already coordinated with another sector or ATSU and further coordination is not possible in the time available, then the flight crew performs this action under their emergency command authority.

5.8.1.2 The flight crew will use whatever means are appropriate (i.e. CPDLC and/or voice) to communicate during an emergency.

5.8.1.3 During an emergency, the flight crew would normally revert to voice communications. However, the flight crew may use CPDLC for emergency communications if it is either more expedient or if voice contact cannot be established.

Note.— For ATN B1 aircraft, emergency message elements are not supported. See Appendix A, paragraph A.4, for a list of emergency message elements.

5.8.2 CPDLC and ADS-C emergency

5.8.2.1 When using CPDLC to indicate an emergency situation or degraded operations to an ATSU, the flight crew should use the CPDLC emergency downlink message, either DM 56 MAYDAY MAYDAY MAYDAY MAYDAY or DM 55 PAN PAN PAN.

Note 1.— The flight crew may enter PERSONS ON BOARD during preflight preparation, prior to initiating a logon, or prior to sending the emergency message.

Note 2.— The CPDLC emergency downlink message will automatically select the ADS-C function to emergency mode. When a situation prohibits sending a CPDLC emergency message (e.g. in an ADS-C
only environment), the flight crew may activate ADS-C emergency mode directly via ADS-C control functions.

5.8.2.2 If a CPDLC emergency downlink message is inadvertently sent or the emergency situation is resolved, the flight crew should send DM 58 CANCEL EMERGENCY as soon as possible to advise the controller and automatically set the ADS-C emergency mode to off. After sending DM 58 CANCEL EMERGENCY, the flight crew should confirm the status of the flight and their intentions via either voice or CPDLC.

5.8.2.3 To check for inadvertent activation of the ADS-C emergency mode using CPDLC, the controller may send the following CPDLC free text uplink or use equivalent voice phraseology:

| Controller | UM 169ak CONFIRM ADS-C EMERGENCY |

The flight crew should then check the status of the aircraft’s ADS-C emergency mode and if the emergency mode has been activated inadvertently, the flight crew should select ADS-C emergency mode to off and advise the controller either by voice or by the following CPDLC messages.

| Flight crew | DM 3 ROGER, then (free text) |
| | DM 67ab ADS-C RESET |

5.9 Non-routine procedures

5.9.1 General

5.9.1.1 Refer to current ICAO procedures for standards and recommended practices on complete communications failure (CPDLC and voice).

5.9.2 Voice communications related to data link

5.9.2.1 When CPDLC fails and open messages existed at the time of failure, the flight crew should re-commence any dialogues involving those messages by voice.

5.9.2.2 The flight crew should use the standard voice phraseology under certain conditions as indicated in Table 5-3.

Note.— See paragraph 4.9.2.2 for standard voice phraseology used by the controller or radio operator.

5.9.2.3 Except as provided in Table 5-3 and paragraph 4.9.2.2, voice communication procedures related to data link operations are not standardized among the regions. Refer to Appendix E for any additional voice communication procedures for a specific region.
### Table 5-3. Voice phraseology related to CPDLC

<table>
<thead>
<tr>
<th>Condition</th>
<th>Voice phraseology</th>
</tr>
</thead>
<tbody>
<tr>
<td>To notify ATC of a correction to a CPDLC message. (ICAO Doc 4444)</td>
<td>DISREGARD CPDLC (message type) MESSAGE, BREAK (correct information or request)</td>
</tr>
<tr>
<td>To notify ATC of a single CPDLC message failure. (ICAO Doc 4444)</td>
<td>CPDLC MESSAGE FAILURE (appropriate information or request)</td>
</tr>
<tr>
<td>To notify ATC of an aircraft data link system or CPDLC connection failure. (ICAO Doc 4444)</td>
<td>CPDLC FAILURE (requests/notifications) [Note.— This voice phraseology is included only with the first transmission made for this reason.]</td>
</tr>
<tr>
<td>To advise ATC that the CPDLC connection is being terminated manually and logon procedure is being initiated with the next ATSU. [Note.— No equivalent to ICAO Doc 4444.]</td>
<td>DISCONNECTED CPDLC WITH [facility designation]. LOGGING ON TO [facility designation] [Note.— The facility designation is the ICAO four-character facility code or facility name.]</td>
</tr>
<tr>
<td>To advise ATC that a logon procedure is being initiated following restoration of data link service. [Note.— No equivalent to ICAO Doc 4444.]</td>
<td>LOGGING ON TO [facility designation]</td>
</tr>
<tr>
<td>To advise ATC that a delayed CPDLC uplink has been received and to request clarification of the intent of the CPDLC message. [Note.— No equivalent to ICAO Doc 4444.]</td>
<td>DELAYED CPDLC MESSAGE RECEIVED (requests) [Note.— See paragraph 5.2.1.9 and Appendix F, paragraph F.11 for associated procedures.]</td>
</tr>
</tbody>
</table>

### 5.9.3 Data link initiation failure

5.9.3.1 In the event of a logon failure, the flight crew should confirm the aircraft identification matches the information provided in the FPL and, as appropriate:

a) Make the necessary corrections; and then

b) Re-initiate the logon.

5.9.3.2 If no reason for the failure is evident, the flight crew should:
a) Contact the ATSU by voice to advise of the failure; and
b) Contact AOC to advise of the failure.

Note — The ATSU will attempt to resolve the problem.

5.9.3.3 The flight crew should report log-on failures to the appropriate State/regional monitoring agency in accordance with procedures established by the operator (paragraph 3.2.2 refers).

5.9.4 Data link system failures

5.9.4.1 When operating CPDLC and the aircraft data link system provides an indication of degraded performance resulting from a failure or loss of connectivity, the flight crew should notify the ATSU of the failure as soon as practicable, including:

a) When operating outside of VHF coverage area and the SATCOM data link system fails; and
b) When operating in airspace where ATS surveillance services are provided and the VHF data link system fails.

Note — Timely notification is appropriate to ensure that the ATSU has time to assess the situation and apply a revised separation standard, if necessary.

5.9.4.2 If an automatic transfer of the CPDLC connection does not occur at the boundary, the flight crew should contact the transferring ATSU by sending DM 67j CPDLC TRANSFER FAILURE (or voice equivalent), advising them that the transfer has not occurred.

5.9.4.3 In the event of an aircraft data link system failure, the flight crew should notify the ATSU of the situation using the following voice phraseology:

| Flight crew | CPDLC FAILURE. CONTINUING ON VOICE |
|Controller | ROGER. CONTINUE ON VOICE |

Note — The flight crew continues to use voice until the functionality of the aircraft system can be re-established.

5.9.4.4 When the ATSU provides notification that the CPDLC service has failed or will be shut down, the flight crew should follow the instructions provided in the notification (e.g. disconnect CPDLC and continue on voice until informed by the ATSU that the data link system has resumed normal CPDLC operations).

5.9.4.5 If only the ADS-C service is terminated, then during that time period, the flight crew should conduct position reporting by other means (e.g. CPDLC, if available, or via voice).

5.9.4.6 If the ATSU cannot establish ADS contracts with an aircraft, or if ADS-C reporting from an aircraft ceases, the flight crew may have inadvertently switched ADS-C off. If CPDLC is still available and the flight crew receives the CPDLC message UM 169an CONFIRM ADS-C ARMED (or voice equivalent), they should check to ensure that ADS-C is not switched off and respond to the controller as follows:

| Controller | UM 169an CONFIRM ADS-C ARMED |
5.9.4.7 If the aircraft is operating on a vertical profile that is different from the profile programmed in the FMS, the time estimates in the ADS-C report will be inaccurate. If the flight crew receives the message **UM 169h ADS-C ESTIMATES APPEAR INACCURATE. CHECK FMS**, the flight crew should check the FMS, correct any discrepancy and respond to the CPDLC message with **DM 3 ROGER**.

5.9.5 **Using CPDLC to relay messages**

5.9.5.1 When an ATSU and an aircraft cannot communicate, the controller may use CPDLC or voice to relay messages. When it had been determined to use CPDLC, the controller may first confirm that the CPDLC-capable aircraft is in contact with the subject aircraft. The flight crew should concur that they will act as an intermediary.

5.9.5.2 When using CPDLC to relay messages, the flight crew should:

a) Only respond with **DM 3 ROGER** to CPDLC messages consisting entirely of free text; and

b) Respond with **DM 1 UNABLE** to any CPDLC message containing standard message elements to avoid confusion.

5.9.5.3 After sending **DM 3 ROGER**, the flight crew should only use free text to respond to the controller’s uplink free text message.

Example, using:

a) **UM 169ap RELAY TO** [call sign] [unit name] [text of message to be relayed]; and

b) **DM 67ae RELAY FROM** [call sign] [response parameters]; where.

   1) [call sign] is expressed as the radiotelephony call sign, rather than the ICAO three letter or IATA two letter designator; and

   2) [response parameters] conform to the guidelines provided paragraph 5.4.2.3.

<table>
<thead>
<tr>
<th>Controller</th>
<th><strong>UM 169ap RELAY TO UNITED345 OAKLAND CLEARS UNITED345 CLIMB TO AND MAINTAIN FL340</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight crew</td>
<td><strong>DM 3 ROGER</strong></td>
</tr>
<tr>
<td>Flight crew</td>
<td><strong>DM 67ae RELAY FROM UNITED345 CLIMBING FL340</strong></td>
</tr>
</tbody>
</table>