Pilot Handbook

U.S. Domestic Controller/Pilot Datalink Communication (CPDLC) Operations

Updated: September 25, 2025

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1. Introduction

The purpose of the guide is to assist pilots with basic concepts and description of En Route CPDLC services within the United States National Airspace System (NAS). While CPDLC avionics systems vary in operation and presentation of CPDLC messages, the examples provided in this document are generic in nature and used for illustrative purposes only. They must not be used in lieu of the guidance or instructions published in the manufacturer's avionics manuals or the FAA-approved Airplane Flight Manual for the operation of a specific CPDLC avionics system.

A companion to this document is a Quick Reference Card (QRC) intended for use in the aircraft to serve as a ready reference for using U.S. En Route CPDLC.

The current version of AC 90-117 furnishes guidance to operators and pilots desiring En Route CPDLC services within the U.S. NAS. Aircraft must be equipped with VHF Data Link (VDL) Mode 2 multi-frequency capability to participate in En Route services. All operators must comply with InFO 23008 and the En Route CPDLC Participation List. The acceptable avionics configurations are listed in the En Route CPDLC Participation List. Part 91 operators do not require a Letter of Authorization for CPDLC operations *within the U.S. domestic airspace*. Pilots of general aviation aircraft should read the "Data Comm notice towards GA Props for En-Route CPDLC Operations" posted on the FAA Data Comm website, which highlights aspects of the airspace operation in relation to service coverage. A graphical depiction of this En Route CPDLC Coverage is also presented later in this document on page 7. Resources to assist new CPDLC operators in obtaining authorization are available on the FAA and L3Harris Corporation websites.

The contents of this document are taken from numerous official FAA sources concerning the Data Comm program in the U.S. NAS. These sources are available on the L3Harris website:

https://www.l3harris.com/datacomm

The FAA Flight Standards Service, Flight Operations Group - Data Communications website:

https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afx/afs/afs400/afs410/datacomm/

The FAA Data Communication Program (DataComm) website:

https://www.faa.gov/air_traffic/technology/DataComm

2. Using CPDLC – Basic Guidance

Key Points:

- **EACH CPDLC CLEARANCE OR MESSAGE SENT BY ATC TO THE AIRCRAFT REQUIRES A RESPONSE.**
- **RESPOND IN TIMELY MANNER, WORKLOAD PERMITTING, WITHOUT UNDUE DELAY**.
- **DO NOT SEND FREE TEXT MESSAGES – Exception with EMERGENCY messages**
- Best practices, for multi-crewed aircraft:
  - Independently & silently review an uplinked CPDLC message sent to the aircraft.
  - Agree on content & intent of CPDLC message.
  - Confirm change & take the action: FMS or Flight Guidance Mode change, etc.
  - Confirm & agree before sending a CPDLC response, report, or request to ATC.
- Responses to a CPDLC messages should be via CPDLC, and responses to voice messages should be via voice.
- If a CPDLC message is unclear or conflicting, clarify with ATC using voice.

Responding to a CPDLC Message

Each CPDLC message sent to the aircraft requires a response. That response should be accomplished in a timely manner, workload permitting, but without undue delay. A response timer is started when the message is first sent to the aircraft. If a pilot's CPDLC response is not received by ATC before this timer expires, the controller is notified. Additional time is provided for CPDLC messages involving the loading of a route into the FMS to allow route crosscheck/verification procedures. A reply of ACCEPT/WILCO, ROGER, or REJECT/UNABLE is required for every CPDLC message.

When to use ACCEPT/WILCO or ROGER

Avionics systems may display either ACCEPT or WILCO for a positive response to the ATC message. Respond with an ACCEPT/WILCO to the CPDLC clearance or advisory when:

- After reviewing the uplinked CPDLC message per SOP's and determining the uplinked CPDLC clearance or advisory is acceptable.
- If loadable route information is included with the CPDLC message:
  - After selecting the LOAD prompt and the FMS indicates the clearance has been successfully loaded, no FMS discontinuities exist, and the loaded route is acceptable per SOP's.
  - Manual entry of a SID along with the SID runway and en route transitions is required when loading the DCL.
  - Manual entry of a STAR and STAR runway transition may be necessary with some FMS systems.

Note: Some CPDLC systems display a "ROGER" in lieu of "ACCEPT" to acknowledge messages that do not involve a clearance or advisories. These messages may be system-generated without the controller's knowledge. Systems that display "ACCEPT" in lieu of "ROGER", when selected by the pilot, send a "ROGER" response to the ground to acknowledge these types of messages.

When to use REJECT/UNABLE

Avionics systems may display either REJECT or UNABLE for a negative response to the ATC message. Respond REJECT/UNABLE to the CPDLC clearance when:

- The uplinked CPDLC clearance is not acceptable.
- The FMS cannot load the route, or it loads only part of the route, and pilot/flight crew are unable to resolve the clearance.
- The FMS indicates inconsistencies or discontinuities with the route modification that are not addressed by en route or terminal charts and that the pilot/flight crew is unable to resolve.
- When SOPs require the pilot/flight crew to obtain a new clearance.

After responding with REJECT/UNABLE, use voice to clarify a clearance due to any confusion concerning clearance intent, loading failures, route discontinuities, inconsistencies or CPDLC system failures. Do not respond using free text.

When to use Standby

Select STANDBY only when a timely response is not practical. For example, when additional time is needed to assess the clearance. **STANDBY should not be a standard response to every uplink, it does not close the CPDLC message**. A CPDLC message is closed when the crew responds ACCEPT/WILCO, ROGER, or REJECT/UNABLE. Selecting STANDBY does not pause or stop the response timer.

When to use FREE TEXT

DO NOT SEND FREE TEXT TO THE GROUND/ATC unless part of an EMERGENCY MESSAGE. The controller working the aircraft **will not** receive a FREE TEXT message sent from the aircraft. See *Chapter 12. Emergency CPDLC Messages* concerning use of FREE TEXT with emergency messages sent to ATC.

Using Pre-formatted REPORTS

Some CPDLC messages sent by ATC to the aircraft require a report back from the aircraft, for example, the CONFIRM ASSIGNED ALTITUDE (CAA) CPDLC message. These reports are pre-defined in the avionics as "REPORTS", and for some avionics, may be pre-filled with information extracted from the FMS or from the aircraft's air data systems. Respond only using these pre-formatted REPORTs. **Do not respond to the ATC CPDLC messages using FREE TEXT or append additional FREE TEXT with your response.**

Unclear or conflicting CPDLC message from ATC

If a CPDLC message is unclear or conflicting, always clarify with ATC using voice and then respond to the CPDLC message to close the message dialog.

3. U.S. En Route CPDLC Deployment

Key Points:

- Only Air Route Traffic Control Centers (ARTCC – e.g., "Washington Center") will provide En Route CPDLC services
- CPDLC services are **not provided** while operating within a Terminal Radar Approach Control (TRACON) (e.g., "Potomac Approach")
- CPDLC is **not used** to issue approach clearances or to issue a frequency change to an air traffic control tower
- All CONUS ARTCC's provide En Route CPDLC and this is identified by a HI & LO IFR En Route chart annotation.
- *Enhanced CPDLC functionality ("Full Services") is planned to be deployed to CONUS ARTCCs beginning late 2025. Pilots operating in ARTCCs that have Full Services enabled may receive clearances via CPDLC that they would not normally receive in other ARTCCs.*
    - *Pilots operating in Full Service ARTCCs are also able to request weather deviations via CPDLC.*
    - *If a weather deviation request is made to an ARTCC without Full Services, the message will be automatically unable'd ("UNABLE. DOWNLINK MESSAGE NOT SUPPORTED") and the pilot notified, and the request should be made via voice.*
- The latest U.S. Domestic En Route CPDLC Site Activation Map is located: https://www.l3harris.com/datacomm. The map will depict which ARTCCs have "Full Services" and which ones do not.

Where En Route Services are Provided

Only Air Route Traffic Control Centers (ARTCC – e.g., "Washington Center") will provide En Route CPDLC services. CPDLC services are not provided while the flight is under control of the Terminal Radar Approach Control (TRACON) (e.g.," Potomac Approach"). If a flight will enter TRACON airspace, and the flight will be under the control of the TRACON before reentering En Route airspace, CPDLC services will not be available until the flight is back under the control of an En Route CPDLC facility. The flight crew will receive a message alerting them that CPDLC operations are suspended once communication is transferred to the TRACON (CPDLC NOT IN USE UNTIL FURTHER NOTIFICATION).

CPDLC services are also provided by KUSA for the airspace served by New York ARTCC surrounding TXKF (L.F. Wade International Airport/Bermuda).

CPDLC services are also provided by KUSA for the airspace served by New York ARTCC for aircraft operating at or above FL310 on airways designated Y485, Y488, Y493, and Y494 within the New York ARTCC WATRS airspace.

In normal operations, if the aircraft is already logged on via CPDLC to an ATC unit, the aircraft will automatically log on to KUSA when appropriate and log on to the next ATC unit prior to exit **without the pilot needing to manually log on.**

Portions near the Cleveland Center (ZOB) & Canadaian border include Canadian airspace that is delegated to ZOB from the Toronto ACU (ZYZ). CPDLC connections between U.S. and Canada are transferred

automatically, **without the pilot needing to manually log on.** Changes to aeronautical charts to reflect these CPDLC logon authorities are in progress.

Full Services Deployment

Certain messages (Weather Deviations, ATC Free Text Advisories, At-Position Direct-to, At-Altitude Direct-to, Published Holding, Non-Published Holding) are only available for use at CONUS ARTCC's with "Full Services." Full Services *is planned to be deployed to CONUS ARTCCs beginning late 2025.*

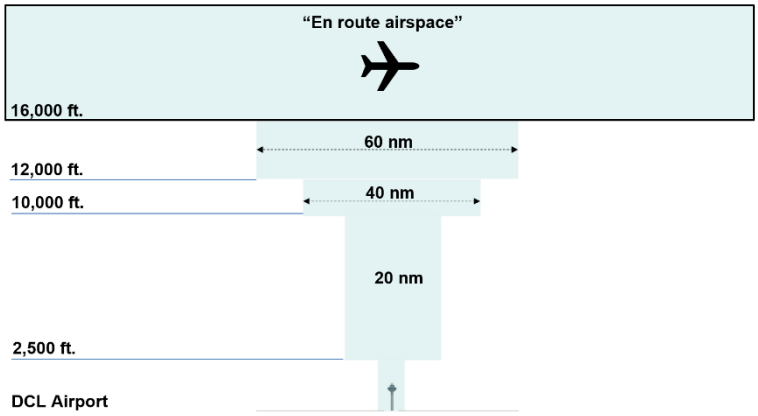
Weather deviations via CPDLC are initated by the pilot utilizing a downlink. If a pilot within an ARTCC that does not have Full Services enabled sends this downlink, an automatic reject response ("*UNABLE. DOWNLINK MESSAGE NOT SUPPORTED"*) will be uplinked and the pilot should revert to voice.

The map on the L3Harris Data Comm website depicts which ARTCCs have Full Services enabled.

A NOTAM will be issued when Full Services is enabled at an ARTCC.

En Route CPDLC Coverage

"En route airspace" is nominally considered 16,000 ft. AGL and above. There may be messages transmitted below this altitude, consisting primarily of connection verification messages departing DCL airports and the final Transfer of Communication (TOC) message to Approach Controls.



Discretion to use CPDLC Services

Using CPDLC is at the controller's discretion. If the controller uses voice to communicate with the aircraft, pilots must respond using voice and not use CPDLC for that exchange. Pilot desiring not to use En Route CPDLC services should not logon to "KUSA", or if the aircraft already has a CPDLC connection, should terminate it.

4. Participating in U.S. Domestic En Route CPDLC – Flight Plan Filing & Flight Planning

Key Points:

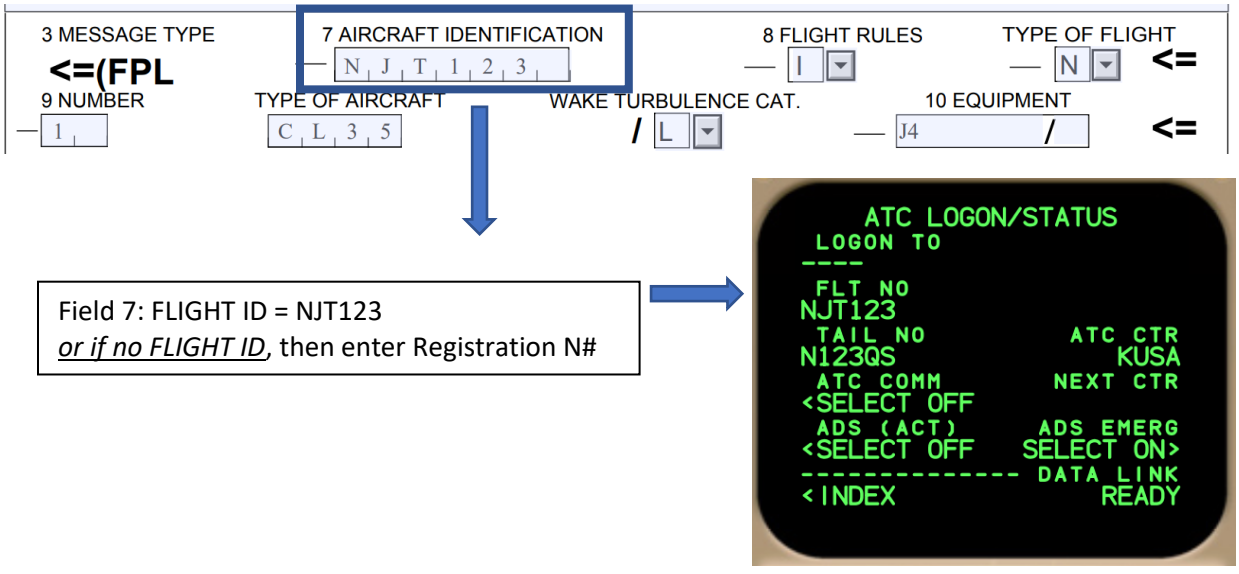
- To signify a desire for U.S. Domestic En Route CPDLC, file the following items in the ICAO Flight Plan:
  - **In Field 7:** When filing a flight plan ensure that the aircraft's FAA/ICAO approved Flight ID is included in Field #7. If no Flight ID applies, flights must use the tail number for Field 7.
  - **In Field 10a:** Include "J4" in Field 10 to indicate VDL Mode 2 Capability
  - **In Field 18**: Include:
    - "DAT/FANSE" or "DAT/FANSER", as applicable (see AC 90-117 for details)
    - "REG/<aircraft registration>" when using an approved Flight ID in Field 7, e.g., "REG/N123HS"
- L3Harris has published a detailed U.S. Domestic CPDLC Flight and Route Planning Guide to support En Route CPDLC available at https://www.l3harris.com/datacomm.

ICAO Flight Plan:

The aircraft must be equipped with a FANS 1/A or FANS 1/A+ avionics system using VHF Datalink (VDL) Mode 2. To signify a desire to participate in En Route CPDLC in the U.S. NAS, annotate the ICAO Flight Plan with the following entries.

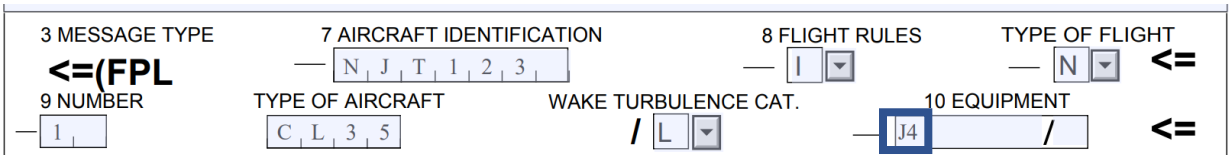
Field 7:

- Enter the aircraft's registration ***or*** the FAA/ICAO approved Flight ID in Field 7
- When filing an approved Flight ID, this Flight ID must be entered into the FANS LOGON page Flight ID field **exactly as filed**
- Do not use IATA (two-character) air carrier flight designations



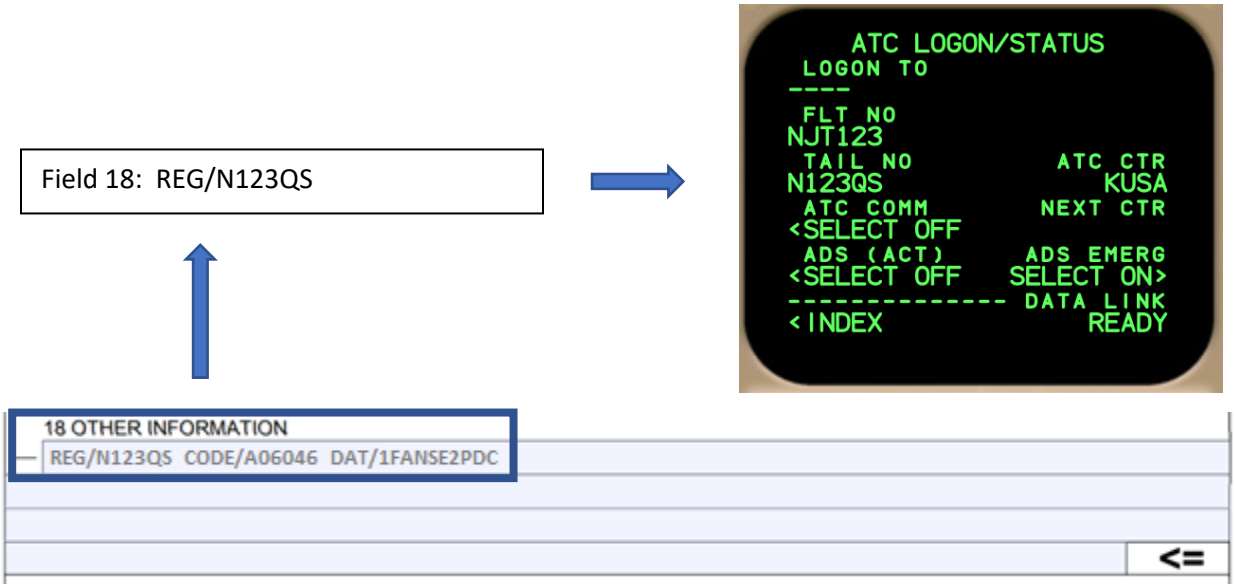
Field 10a:

- File the code "J4" in Field 10a to indicate this capability, this is the only permitted CPDLC media type in the U.S. NAS as per AC 90-117



Field 18:

- **If a Flight ID is entered in Field 7**, ensure that the Registration Number (e.g., N-number) is included in the **REG/** entry within Field 18
- It is important that the registration number in this field correlate with the ADS-B Mode S Address (also known as the ICAO Address) filed for the aircraft in the **CODE/** entry (if these items do not correlate, the CPDLC session will be terminated)
- To participate in U.S. domestic En Route CPDLC, the pilot/operator must file either "**DAT/FANSE**" or "**DAT/FANSER**" in Field 18. Operators should confirm with their OEMs or the En Route CPDLC Participation List found on the FAA's Data Comm website concerning the need to file DAT/FANSER.
    - FANSER Aircraft:
        - DAT/FANSER identifies a small group of aircraft with an FMS that is unable to load a STAR when a route CPDLC message is uplinked to the aircraft or requires landing runway information to load
        - Aircraft not affected by this restriction should file DAT/FANSE
- The registration number must be entered into the FANS LOGON page Flight ID field **exactly as filed**



Departure Clearance (DCL) and Pre-Departure Clearance (PDC)

Operators/pilots who file DAT/**1**FANSE or DAT/**1**FANSER will also receive CPDLC Departure Clearances (DCL) at those airports where DCL is provided. To specify a preference for DCL or PDC clearances, see the L3Harris *U.S. Domestic CPDLC Flight and Route Planning Guide* for filing DAT/ code options.

Flight Planning & Route Planning Considerations

Receiving a clearance via CPDLC DCL requires strict adherence to flight plan route planning and route construction requirement. Route planning tools that significantly improve the chance of obtaining a "cleared as filed" (CAF) clearance are available at the FAA's Air Traffic System Command Center's website under the Route Management Tools:

- https://www.fly.faa.gov/rmt/nfdc_preferred_routes_database.jsp
- https://www.fly.faa.gov/rmt/coded_departure_routes.jsp

There are several important rules that must be followed to receive a clearance via CPDLC. These are:

1. When the need to amend a flight plan arises – remember to cancel the old flight plan then re-file.
2. The first route element after the departure airport cannot be an airway.
3. Filing of an airway must include both an entry and exit point (NAVAID or waypoint).
    a. Flight plans cannot contain airway to airway transitions without a published navigation point in between (e.g., J4.J65 is incorrect; J4.ABI.J65 is correct).
    b. Unnamed airway intersections are not loadable via CPDLC.
    c. A fix-radial-distance (FRD) point may be used to describe a route between NAVAIDs in place of radial-to-radial routing or an unnamed airway junction. (e.g., ..TCH..TCH094074..MTU..).
4. Pilot defined waypoints supporting random RNAV routes are not loadable.
5. Flight plans cannot contain Terminal Enroute Control ("TEC") coded route.
6. On departures, the first route elements must be a fix or a SID/ODP. When using a SID, exit either at the common segment terminal waypoint or transition terminal waypoint.
7. When using a STAR, enter at the first transition waypoint or at the first waypoint on the common route.

Pilots **must avoid filing multiple flight plans** from a departure airport in anticipation of changing conditions or destinations. Doing so negatively impacts the flight plan correlation process and could lead to an invalid clearance being issued to the departing aircraft.

If a flight plan needs to be amended, cancel the old flight plan before re-fling the new flight plan.

Aircraft Change (Tail Swap) Procedures

If a tail swap is necessary, the flight plan with the old aircraft tail number should be canceled and a new flight plan with the new tail number should be filed if the pilot intends to use DCL or En Route CPDLC. The tail number filed in the flight plan needs to exactly match the one used for logon in order for the crew to participate in CPDLC. If the flight crew has already logged into KUSA and subsequently changes aircraft, they must manually logoff before leaving the first aircraft.

If it is not possible to cancel the old flight plan, and the tail swap is coordinated with the local ATC. **DO NOT LOGON TO KUSA OR USE CPDLC FOR THE FLIGHT**.

Additional flight planning information may be found in the *U.S. Domestic CPDLC Flight and Route Planning Guide* to support En Route CPDLC, available at https://www.l3harris.com/datacomm. For questions about participation or filing, contact DCIT@L3Harris.com.

5. Logging on for CPDLC Services

Key Points:

- **Prior to logging on, verify:**
  - That the filed flight plan is loaded in the FMS to include filed SID/ODP and STAR
  - That the registration (tail number) and/or Flight ID, departure airport, and destination airport match what is filed the ICAO flight plan.
- **Log on using "KUSA"**:
  - At DCL airports: At least 30 minutes prior to filed departure time to obtain DCL.
  - At Non DCL airport: At the pilot's discretion; RECOMMENDED to logon on ground.
  - Prior to entry into U.S. airspace if CPDLC is not already in use.
- A successful connection is indicated when the CPDLC display indicates "KUSA" as the CDA or Current/Active Center.
- A valid logon remains even if a CPDLC session has not been established with ATC.
- A logon is required only once per flight unless LOGON REJECTED or RELOGON MESSAGE is displayed.
  - Attempting additional logons will terminate an existing CPDLC session in En Route airspace.
  - Unless you receive a LOGON REJECTED or RELOGON MESSAGE, do not re-logon.

Logon Procedures

Before logging on to KUSA, verify the following flight-specific information is entered into the FMS:

1. The flight plan is loaded into the FMS, including the SID/ODP and STAR.
2. The Flight ID entered into the FMS matches either the aircraft's registration or the Flight ID filed in Field 7 of the flight plan.
3. If logon requires a separate entry of the tail number and when a Flight ID is also used, ensure that the tail number entered is identical to that used in the REG/ field in Item 18 of the filed flight plan.
4. Both departure and destination airports are the same as those filed in the flight plan.

These steps are necessary to ensure that the FAA's CPDLC system can correlate a logon attempt with the IFR flight plan filed for that aircraft. Loading the filed flight plan, including a SID/ODP & STAR if filed, into the FMS prior to logging on at a DCL airport ensures that any ATC route modifications to the filed flight plan can be loaded directly into the FMS using the "Push-to-Load" feature of the system. At airports with DCL service, a logon should be made at least 30 minutes prior to the proposed departure time to receive the IFR clearance.

"KUSA" is the single Data Authority in the U.S. Domestic Airspace. Do not log on using the ARTCC identifier (e.g., KZKC for Kansas City ARTCC).

A pilot can logon to "KUSA" up to four (4) hours prior to the filed departure time or prior to penetrating U.S. airspace if arriving internationally and not using CPDLC service.

DO NOT enter any input into the latency timer or "Max Uplink Delay" field on the ATC logon page when operating in the domestic U.S. If a Max Uplink Delay value remains from CPDLC use in a previous FIR, the

pilot should clear the value after KUSA becomes the CDA or Active Center (i.e., upon entry to KUSA airspace).

Flight crews should wait at least 10 minutes after landing before initiating a new CPDLC logon to ensure that FAA's system will have enough time to clear previous flight information. *Note: Some FANS systems require a manual log-off from KUSA after landing and prior to re-logging on to KUSA. Refer to OEM procedure.*

A logon to "KUSA" can be accomplished using any media (i.e., VDL Mode 2, VDL Mode 0 (POA), SATCOM or HF). This enables logging on when the aircraft is outside the range of VDL Mode 2 ground stations. Therefore, it is highly recommended that pilots log on to "KUSA" while on the ground as part of their normal preflight preparation. There is no need to wait until airborne to log on.

Indications of a successful logon to "KUSA" will vary with FANS equipment:

Normally, a logon to "KUSA" is required only once per flight unless LOGON REJECTED, RELOGON MESSAGE, or similar message is displayed (refer to operating manuals). Attempting additional logons or multiple logon attempts will terminate an existing CPDLC session and establish a new session. Multiple logon attempts can result in a rejection of service.

6. Initiation & Management of a CPDLC Session

Key Points:

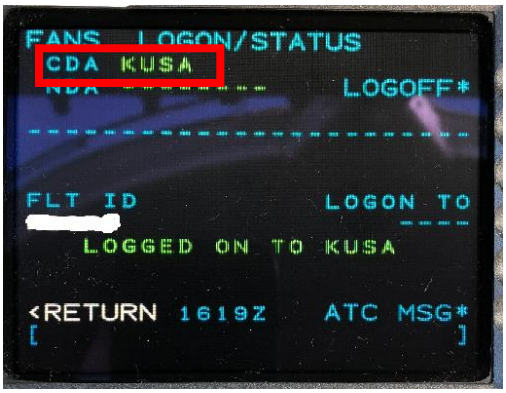
- The establishment of a CPDLC session between the aircraft and ATC is indicated when the Current Data Authority (CDA) or Active Center/Facility shows **"KUSA"**.
- Except when departing a DCL airport, establishment of a CPDLC session is also indicated by receipt of the welcome message:
    - "CONFIRM CPDLC CONTACT WITH KUSA. ROGER/ACCEPT THIS MESSAGE".
    - Respond to this welcome message with ROGER/ACCEPT.
- When departing DCL airports, the CPDLC session will remain active after departure if the aircraft is connected to VDL Mode 2 or VDL Mode 0 (POA) media.
- CPDLC sessions transfer from ARTCC to ARTCC
- CPDLC is not used while under TRACON control, but CDA–Active Center/Facility remains "KUSA".
- A temporary loss of CPDLC connection to the ground may occur – Indications vary by OEM.
    - Verify CDA-Active Center/Facility is still "KUSA", if so, no immediate action is required.
    - **Do not logoff and re-logon to "KUSA".**
    - Follow procedures operator or OEM procedures, if available. Let the aircraft data comm radio and/or ground systems resolve the issue. Await re-connection with the ground.
    - Use voice for ATC communications until reconnection is confirmed.
- Avionics resets/reboots may sever the aircrafts ATC link with the ground while still appearing to be active.

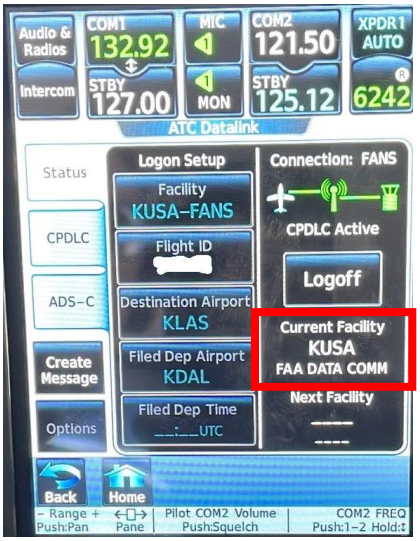
CDA & Activation of En Route CPDLC

Once a successful logon to "KUSA" is accomplished, a CPDLC connection or Current Data Authority (CDA) session may be established. The aircraft must be using VDL Mode 2 or VDL Mode 0 (POA) for CPDLC communication to establish an En Route session. The aircraft must continue using VDL Mode 2 or VDL Mode 0 (POA) to receive ATC-initiated messages, with VDL Mode 2 set as the primary media for en route operations. ATC-initiated messages attempted over SATCOM or HF will fail to be delivered, except for the final TOC concatenated with a CPDLC "End Service" message when transitioning outbound from KUSA into oceanic airspace. Consecutive failed messages may result in the aircraft being temporarily added to the FAA Block List, preventing the use of U.S. domestic En Route CPDLC.

During oceanic operations, if VDL Mode 2 was disabled by the flight crew to enable CPDLC via SATCOM, then the flight crew should ensure that VDL Mode 2 is reactivated prior to entering U.S. Domestic airspace, but no later than upon receiving the KUSA Welcome message.

Once a session is established with the aircraft, the controller can begin exchanging CPDLC messages with the aircraft. An indication that a session has been established is the Current Data Authority (CDA) or Active Center/Facility in the FMS shows "KUSA":



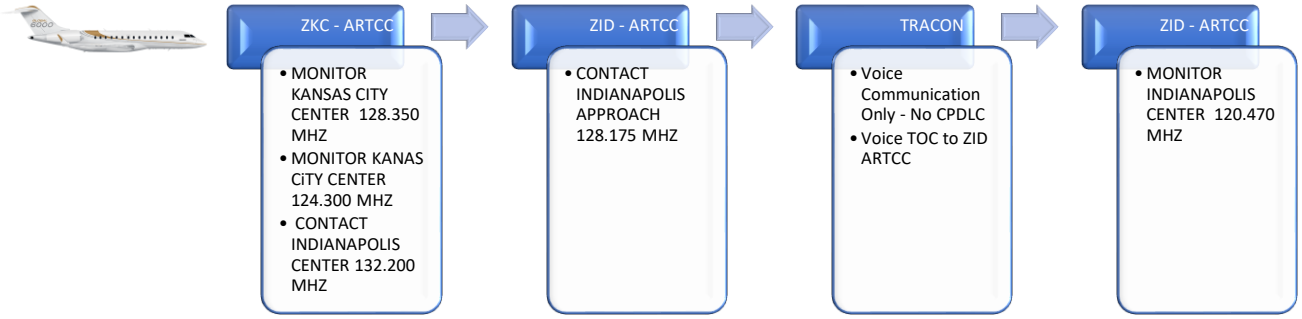


The CDA will remain "KUSA" while operating within U.S. domestic airspace. An active CPDLC session will transfer as the aircraft flies from one ARTCC to another. An active CPDLC session will also transfer as the aircraft flies to or from CONUS neighboring ATC units (including NY Oceanic and Canada) **without the pilot needing to manually log on.**

If the aircraft **is not departing** from a DCL airport and the aircraft has logged on to KUSA, CPDLC messaging may begin once the aircraft receives and acknowledges the welcome message: "CONFIRM CPDLC CONTACT WITH KUSA. ROGER/ACCEPT THIS MESSAGE" and the aircraft has checked in via voice with the controlling ARTCC.

If the aircraft **is departing** from an airport with DCL services, the CDA remains "KUSA" and the ARTCC controller may begin CPDLC messaging once control of the aircraft is transferred to the ARTCC and the aircraft has checked in via voice. In this case, no welcome message is sent to the aircraft since a CPDLC session was established on the ground.

Transfer of Communication (TOC)



As the flight progresses from one ARTCC facility to another ATC facility (e.g., from ZKC to ZID), the controller can elect to send the communication message via CPDLC. A CONTACT CPDLC message is uplinked to the aircraft providing the next facility frequency. The pilot responds "WILCO/ACCEPT" to the CPDLC message, sets the new ATC frequency, then uses standard voice procedures to establish contact with the new controller. If the flight progresses into an ARTCC where CPDLC is not in use, the message: "CPDLC IS NOT IN USE UNTIL FURTHER NOTIFICATION" is also sent to the aircraft. Pilots must ACCEPT/ROGER this message. Additionally, if the pilot downlinks a CPDLC request while in a CPDLC Off region, that request will be automatically responded to with "UNABLE" along with the message "CPDLC NOT IN USE UNTIL FURTHER NOTIFICATION".

When transferring communications from sector to sector within the same ARTCC, the controller can use either a CONTACT message, which is described above, or a MONITOR message. A MONITOR message instructs the flight crew to monitor the next sector's frequency and will also include an instruction to confirm the flight's assigned altitude. For example, the messages a flight deck may receive are "MONITOR KANSAS CENTER 128.250 MHZ" and "CONFIRM ASSIGNED ALTITUDE", as shown below. The pilot responds to both messages using CPDLC. The CONFIRM ASSIGNED ALTIUDE REPORT is used to report **the ATC assigned altitude**, which is then verified against the assigned altitude displayed to the controller. The controller will use voice to address any mismatch.

NOTE: ALL TRANSFER OF COMMUNICATIONS BETWEEN SECTORS AND CENTERS IS BEING ACCOMPLISHED USING THE CONTACT MESSAGE. USE OF THE MONITOR/CONFIRM ASSIGNED ALTITUDE MESSAGES SET IS PLANNED TO BE IMPLEMENTED AT A FUTURE DATE. THE CAPABILITY TO COMMUNICATIONS TRANSFER TO DIFFERENT FREQUENCIES WITHIN THE SAME SECTOR MAY BE ACCOMPLISHED USING THE MONITOR MESSAGE IS EXPECTED IN SEPTEMBER 2025.

ATC may transfer communications between different radio frequencies within the same sector using the MONITOR message. The "CONFIRM ASSIGNED ALTITUDE" message will not be included. Pilots must

WILCO/ACCEPT this message and switch their radio frequency to the new frequency issued. Pilots do not need to check in verbally when this message is used. Pilots may notice that the same controller is working the new frequency provided and this is normal.

The CONTACT CPDLC message will be used to transfer control to a TRACON facility. While under the control of a TRACON, the CDA-Active Center/Facility will remain "KUSA", but CPDLC services are not provided until the aircraft re-enters ARTCC airspace. Any CPDLC messages sent from the aircraft to ATC will receive the response "UNABLE" along with the message "CPDLC NOT IN USE UNTIL FURTHER NOTIFICATION".

Temporary Loss of CPDLC Connection to the Ground

In rare situations, the aircraft may lose its communication connection with the ground stations. This is indicated to the flight crew through a "NO ATC COMM" or similar message – refer to your OEM manual. In this situation, the CPDLC session with ATC remains active and the CDA-Active Center/Facility still displays "KUSA", as shown above. **No immediate action is required**. Follow published aircraft procedures, if provided. Await a re-connection with the ground and use voice for ATC communications until reconnection is confirmed. Most important: **DO NOT LOG OFF AND RE-LOG ON TO "KUSA"**.

Pilots should revert to voice for all communications with ATC. CPDLC messages cannot be sent from the aircraft to the ground and vice versa during a period of loss of CPDLC connectivity with the ground stations. If this loss connection with the ground stations continues for an extended period, the active CPDLC session maybe terminated. If this occurs, the CDA-Active Center/Facility will clear and the logon with "KUSA" is terminated. An "ATC COMM TERMINATED" or similar message may also be displayed. Pilots may now attempt to re-log on to "KUSA".

Note: Avionics resets/reboots may sever the aircrafts ATC link with the ground while still appearing to be active.

7. ATC Clearances and Pilot Requests Using CPDLC

Key Points:

- ATC can use CPDLC to issue common ATC clearances.
  - Respond ACCEPT/WILCO or UNABLE/REJECT
- ATC can request a REPORT from the aircraft.
  - Respond using the pre-formatted REPORT page.
  - **DO NOT** respond using FREE TEXT.
- **DO NOT send request using FREE TEXT**. These will be rejected and are not displayed to the controller unless sent as part of an emergency message.
  - Reference Chapter 12 for full guidance on emergency messages.
- **DO NOT send multiple requests at the same time in one message to ATC**.
- **DO NOT send a second request of the same type (e.g., Altitude, Route, Voice Contact) when you have not received a response to a previous request.**

ATC Clearances

The controller may use CPDLC to send common ATC clearances to the aircraft. The pilot should respond ACCEPT/WILCO or UNABLE/REJECT as appropriate to the CPDLC clearance message.

Do not use FREE TEXT to send comments, inquires, or requests to ATC in response to an CPDLC clearance message. FREE TEXT CPDLC messages sent to ATC are not displayed to the controller and result in the following message being sent to the aircraft:

"MESSAGE NOT DELIVERED. FREE TEXT/DUE TO REASON NOT SUPPORTED. CONTACT ATC OR RESEND REQUEST"

There are only two (2) pre-formatted "Due To" explanation messages that are accepted by the FAA's ground system.

1. "Due To Weather"
2. "Due To Performance"

These may be appended to a REJECT/UNABLE response to an ATC CPDLC clearance or to CPDLC REQUEST (single altitude or direct to fix) message sent by the flight crew to ATC.

Do not append additional FREE TEXT commentary to the CPDLC REJECT/UNABLE response or REQUEST message.

Pilot-Initiated REQUEST Messages Using CPDLC

The pilot may send **the following Pre-formatted REQUEST** messages to ATC using CPDLC:

- REQUEST DIRECT TO [position] – position must be on the current ATC-assigned route.
- REQUEST [altitude]
- REQUEST CLIMB TO [altitude]

- REQUEST DESCENT TO [altitude]
- REQUEST BLOCK [altitude] TO [altitude]
- REQUEST VOICE CONTACT
- EMERGENCY MESSAGES

Using any other pre-formatted REQUEST available through FANS will generate an error message sent to the aircraft. If the request is not covered by one of the four pre-formatted REQUESTs (see above), use voice to make your request.

Send only one request at a time. Do not send multiple requests in the same CPDLC downlink message to ATC (such as Request Direct to ABC and Request Climb to 350). The FAA ground system will respond "UNABLE" to multiple request downlink messages.

Sending ATC a Request with an Open Transfer of Communications Message

If the pilot sends a REQUEST to ATC when an open transfer of communications (CONTACT or MONITOR message) exists, or if ATC has an open pilot REQUEST and then sends a transfer of communication uplink between sectors, the pilot's request remains open and is forwarded to the next sector up to one time. It will not be forwarded again to ensure stale REQUESTS do not remain open.

However, if a pilot REQUEST is open when a transfer of communication uplink message is initiated for transfer to a different ARTCC, (e.g., transfer of control from ZKC to ZID), the ground system cannot forward the message and will respond UNABLE to the request and send the message "REQUEST AGAIN WITH NEXT ATC UNIT"

Multiple Message Elements in a Single Request from the Aircraft

Do not send multiple requests in a single downlink. For example, do not send a REQUEST DESCENT TO FL300 and REQUEST DIRECT TO PVD in the same message to ATC. The FAA ground system will respond UNABLE and send the FREE TEXT message "DOWNLINK MESSAGE NOT SUPPORTED".

All pilot requests should be in the form a single REQUEST message to ATC. For example, the pilot should send a REQUEST DESCENT TO FL300 and then send a separate REQUEST DIRECT TO PVD. ATC can then respond individually to each CPDLC REQUEST message.

ATC Response to a Pilot Request Message

ATC will respond to a pilot-initiated REQUEST message using CPDLC with either a new clearance approving the request or with an UNABLE response if they are not able to approve the request. The flight crew must review any UNABLE message sent by ATC. The crew must also reply ACCEPT/ROGER if there is a FREE TEXT explanation accompanying the UNABLE message explaining why ATC was unable to approve the request.

8. En Route CPDLC Route Messages

Key Points:

- Route clearances that ATC can issue via CPDLC:
  - Direct-to-fix:
    - PROCEED DIRECT TO [position]
  - Re-route to a fix on your cleared route:
    - CLEARED TO [position] VIA [routeclearance]
    - The use of "CLEARED TO" does not amend the clearance limit.
  - Full route clearance:
    - CLEARED [routeclearance]
  - Re-route after the specified AT position:
    - AT [position] CLEARED [routeclearance]
- ARTCC's that have Full Services functionality enabled can also issue the following via CPDLC:
  - Direct-to-fix after the specified AT altitude:
    - AT [altitude] PROCEED DIRECT TO [position]
  - Direct-to-fix after the specified AT position:
    - AT [position] PROCEED DIRECT TO [position]
  - Published Hold:
    - HOLD AT [position] AS PUBLISHED MAINTAIN [altitude] EXPECT FURTHER CLEARANCE AT [time]
  - Non-Published Hold:
    - HOLD AT [position] MAINTAIN [altitude] INBOUND TRACK [degrees] [direction] TURNS [legtype] EXPECT FURTHER CLEARANCE AT [time]
  - Standalone EFC: A revised "EXPECT FURTHER CLEARANCE AT [time]" may also be sent standalone.

Note: The [position] variable in the above messages will always be a position/waypoint on the current route.

- Pilots may only request direct-to a fix if that fix is on their active flight plan.
- Use "Push-to-Load" capability when available to load route clearance sent by ATC into the FMS.
  - Use LOAD or INSERT prompt when available to insert ATC uplinked clearance into the FMS.
    - Manually load SID and SID transition when clearance received via DCL.
    - Manually load STAR and STAR transitions, when instructed (FANSER aircraft).
  - Review new loaded route clearance.
  - If acceptable, activate/execute the route clearance modification in the FM, and then respond with an ACCEPT/WILCO.
  - Respond with a REJECT/UNABLE if you are unable to accept the clearance.
- Performance data (such as winds, alternate airport data)**will be removed** with a route clearance change for the portion of the route that is overwritten by the uplinked clearance. Removal of this data will vary based on aircraft/avionics types. Caution: For route changes in the DCL environment, the clearance may also remove takeoff performance data.

Route Messages & Route Requests

U.S. En Route CPDLC allows a controller to issue a route to an aircraft. Re-routes required for traffic management purposes will include the FREE TEXT message "TRAFFIC MANAGEMENT REROUTE". Flight crew-initiated route change requests are currently limited to a "Direct-To-Fix" request to a waypoint that is on the active flight plan in the FMS and that as part of the current IFR clearance.

Push to Load Function

CPDLC allows certain route messages sent by ATC to be directly loaded into the FMS ("Push-to-Load"), a function that is required to use CPDLC within the U.S. NAS. The flight crew **should use this capability** to minimize the potential for data entry errors when executing clearances involving a loadable route. Pilots should verify that there are no route discontinuities or discrepancies prior to executing a loaded clearance.

Route Verification Text

Except for a PROCEED DIRECT TO [position] uplink, CPDLC re-route uplinks have a FAA-produced FREE TEXT route string representing the changed portion of the CLEARED ROUTE included in the route clearance message to assist in route and leg verification procedures:

Example route in free text for a Full Route modification:

"----- FOD KG75M DAFLU J70 LVZ LENDY6 KJFK" (Full Reroute)

Example route in free text with additional advisory text to reduce possible pilot confusion with Partial Route modifications:

"LOAD NEW ROUTE – DIRECT RBV LAURN ./. KBOS" (Partial Reroute)

In the event the FAA produced route string exceeds 256 characters, the free text route will be truncated with a "./." with the destination airport as the last piece of information (e.g., J70 LVZ ./. KJFK). **NOTE: THE ROUTE THAT IS LOADED INTO THE FMS IS THE ATC CLEARED ROUTE**. Resolve any discrepancies between this FREE TEXT route string and the route loaded using the LOAD prompt with ATC via voice.

Types of Route Clearances

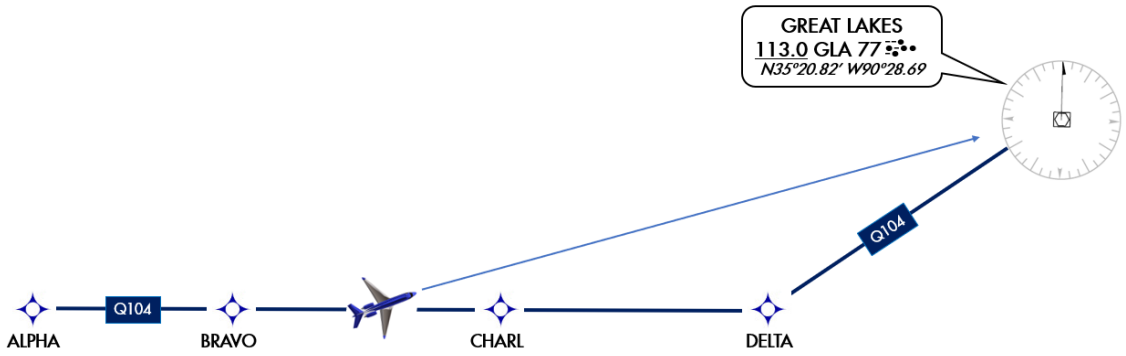
There are eight types of route clearances that may be issued using CPDLC:

1. **PROCEED DIRECT TO [position]** – Clearance to a point (fix, NAVAID, etc.) that is always on the current ATC assigned route. When the [position] is any fix other than the destination, the clearance will include the FREE TEXT CPDLC "REST OF ROUTE UNCHANGED". Pilot action is required to execute the direct-to-fix change within the FMS. The [position] in a Direct-To-Fix uplink must be on the currently cleared route.

   Example:

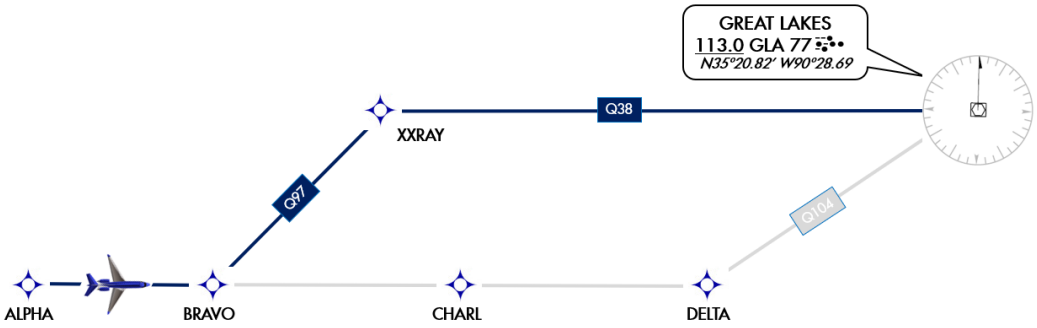
   ATC Uplinks:

   PROCEED DIRECT TO GLA. REST OF ROUTE UNCHANGED.



Note: If a LOAD prompt is available, it should be used. Not all aircraft have the capability to load information from CPDLC message into the FMS e.g., PROCEED DIRECT TO RBV may not be loadable on one airframe where it is loadable on others. See aircraft documentation for additional information.

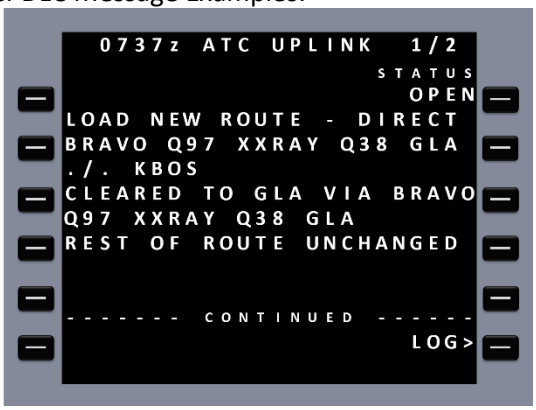
2. **CLEARED TO [position] VIA [route clearance]** – This is a revised route clearance to a position (fix waypoint, or NAVAID) that will always be on the current route and ATC clearance. This CPDLC message will include the following elements:
    - FREE TEXT "LOAD NEW ROUTE - DIRECT [ROUTE FREE TEXT]", and
    - The position ([position]) to which you are re-cleared to (fix, waypoint, or NAVAID),
    - The routing ([route clearance]) you are cleared via to the [position],
    - FREE TEXT "REST OF ROUTE UNCHANGED".

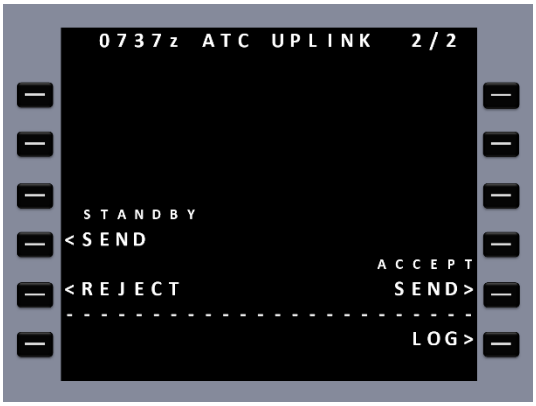


The use of this message does not amend the clearance limit – it only changes the route the aircraft is to take to get to the point already on the route of flight. The rest of the route after the "TO" point is unchanged.

In the figure above, ATC sends the clearance CLEARED TO [GLA] VIA [BRAVO Q97 XXRAY Q38 GLA] to the aircraft using CLEARED TO [position] VIA [route clearance]. There is no discontinuity at BRAVO because the uplink fix [BRAVO] is in the existing cleared, active flight plan loaded in the FMS.

CPDLC Message Examples:





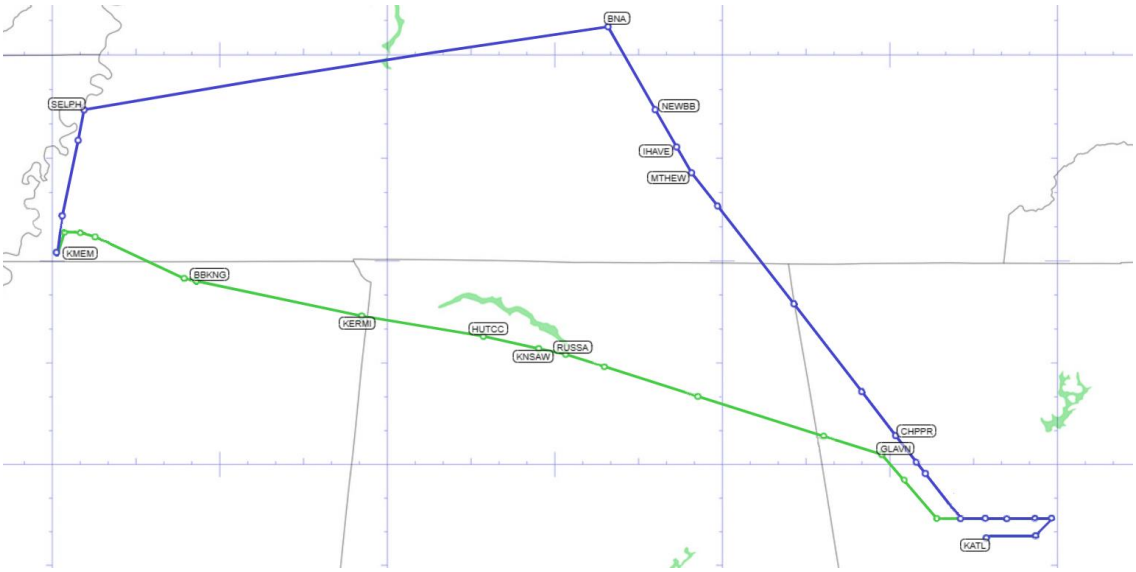
Note: Some systems may display only the message "CLEARED TO [position] VIA ROUTE CLEARANCE" and the pilot must load the route into the FMS to see/verify the modified route or re-clearance via their Nav Display. Other aircraft may display the actual uplinked route received from ATC. FAA's Route Verification Text is intended to help resolve any ambiguity.

Do not confuse a "CLEARED TO [position] VIA [routeclearance]" CPDLC revised route message with a "PROCEED DIRECT TO [position]" CPDLC message. Flight crews have misinterpreted the "CLEARED TO [position] VIA" message as a "direct to" [position] clearance and have executed a "direct to" in the FMS to the "CLEARED TO" waypoint. A "CLEARED TO [position] VIA [routeclearance] message will always include the text "LOAD NEW ROUTE – DIRECT ". **Using the LOAD or INSERT prompt will ensure that the new revised route is loaded into the FMS**.

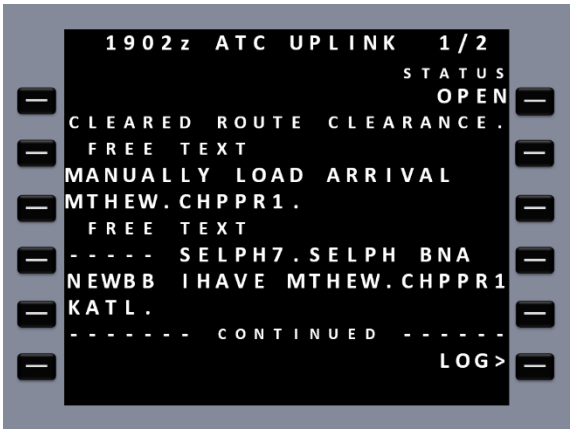
3. **CLEARED [route clearance] –**. This CPDLC route will always include the routing to the destination airport. This uplink is a full route replacement; executing the LOAD or INSERT command will cause the FMS to delete your entire active flight plan from the aircraft to the destination and replace it with the uplinked flight plan. It may also delete performance data, wind, temperature, and alternate airport data. For example:

   Original ATC Clearance: KMEM to KATL:
   BBKNG7 KERMI HUTCC KNSAW RUSSA GLAVN1

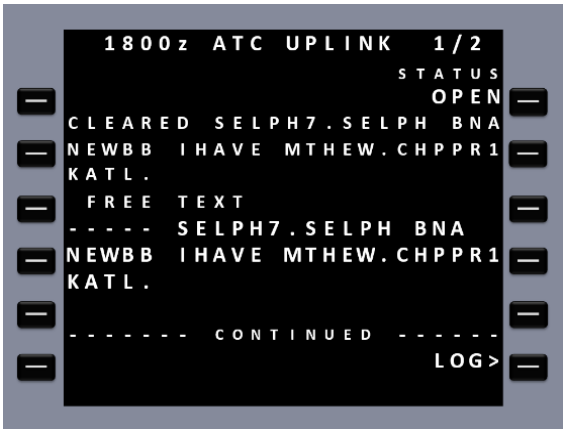
   New ATC Clearance KMEM to KATL:
   SELPH7 SELPH BNA NEWBB IHAVE MTHEW CHPPR1



CPDLC Message Examples (Different Avionics Versions Depicted):



or



Note: Some systems may display only the message "CLEARED ROUTE CLEARANCE" and the pilot must load the route into the FMS to see/verify the new/modified route clearance on the nav display. Other aircraft may display the actual uplinked route received from ATC. FREE TEXT is intended to help resolve any ambiguity.

PILOTS MUST MANUALLY LOAD THESE ROUTE ELEMENTS (exceptions to the "Push-to-Load" functionally):

1. SID and SID transitions received via a DCL clearance.
2. STAR runway-dependent transitions (normally selected by loading the approach)
3. STARs only when prompted by the CPDLC message "MANUALLY LOAD ARRIVAL [STAR Name]" (Aircraft that file "DAT/FANSER" due to known STAR loading issues)

   CLEARED ROUTE CLEARANCE
   MANUALLY LOAD ARRIVAL OMN.HILEY6.
   ----- YAZUU EMJAY J174 ORF ISO J121 CHS J79 OMN.HILEY6 KMIA
4. Depending on avionics - Clearances direct to a fix already on route of flight, including those based on an altitude or position ("AT [ALTITUDE/POSITION] PROCEED DIRECT TO…")
5. Hold Clearances (depends on avionics and type of clearance).

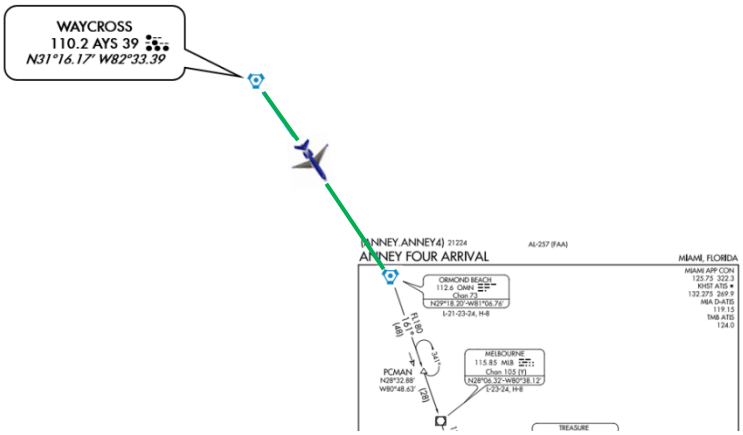
After using the "Push-to-Load" functionality to load CPDLC route clearance, pilots may need to update or re-initialize performance, route wind/temperature data, and airport/alternate data in the FMS.

If an error message (e.g., "INSERT MOD FAIL", "PARTIAL LOAD") is displayed after attempting to load the clearance, this indicates that the route sent has an unresolvable discontinuity, a partial load occurred, or a failure exists within the system. The crew may select STANDBY and attempt to resolve the discontinuity or the loading issue using SOPs. Otherwise, respond REJECT/UNABLE to the CPDLC message sent by ATC and revert to voice.

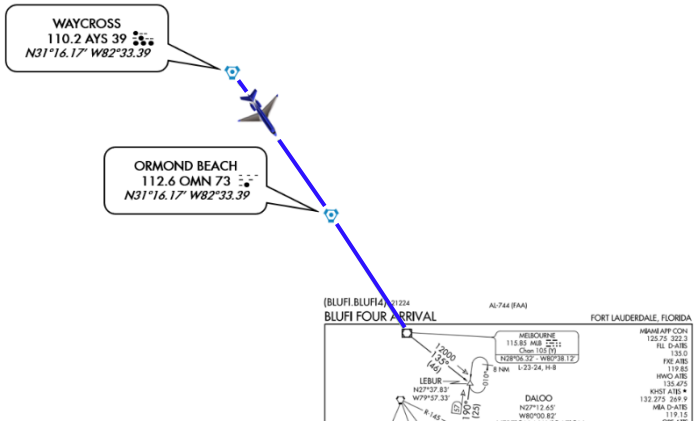
If the fix cleared to in the route clearance is too close to the aircraft's position, or behind the current position, contact ATC via voice for further guidance **before accepting or rejecting the clearance**.

4. **AT [position] CLEARED [routeclearance]** – This clearance will replace everything in the route after the specified AT position with the [routeclearance] contents. It will always include routing to the destination.

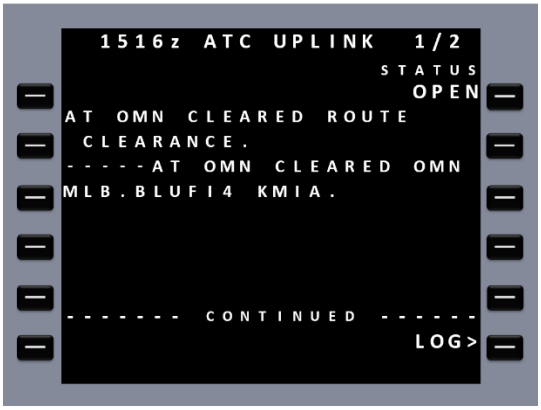
   Original ATC Clearance: KATL to KMIA:
   ATL1 SOONE AYS OMN ANNEY4



Revised ATC Clearance: KATL to KMIA:
ATL1 SOONE AYS OMN MLB BLUFI4



CPDLC Message Example:



5. **AT [altitude] PROCEED DIRECT TO [position]** – Clearance to a point (fix, NAVAID, etc.) always on the current ATC assigned route when the altitude constraint is met. When the [position] is any fix other than the destination, the clearance will include the FREE TEXT CPDLC "REST OF ROUTE UNCHANGED". **Pilot action *is required* to execute the direct-to-fix change within the FMS**. The [position] in an At Altitude Direct-To-Fix uplink must be on the currently cleared route. When the altitude constraint is met, the clearance should be executed.

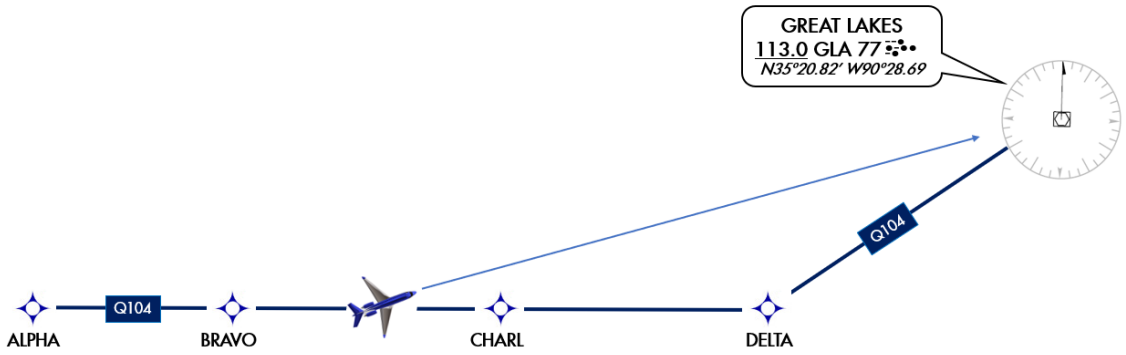
   Note: If a LOAD prompt is available, it should be used. Not all aircraft have the capability to load information from CPDLC message into the FMS. A message may not be loadable on one airframe where it is loadable on others. See aircraft documentation for additional information.

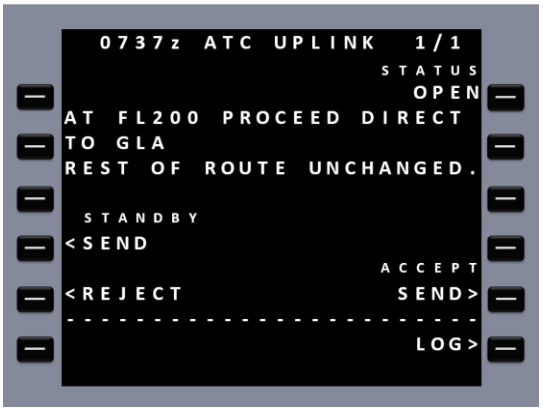
   Example 1:

   The aircraft is at 16,000 with a clearance to climb to FL240.

   ATC Uplinks:

   AT FL200 PROCEED DIRECT TO GLA. REST OF ROUTE UNCHANGED.





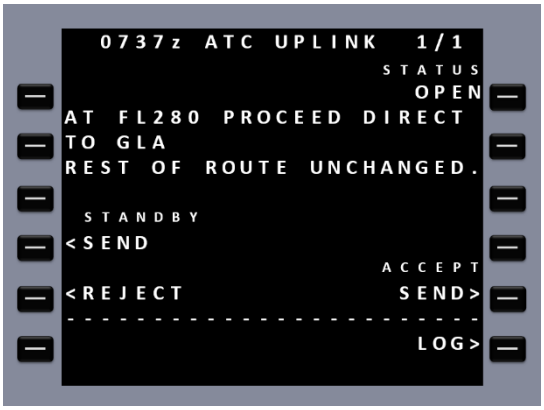
   The pilot is to remain on the cleared route of flight until passing FL200 (on the way to FL240). At FL200, the pilot is to proceed direct to GLA.

   Example 2:

   The aircraft is at FL240 with a clearance to climb to FL280.

ATC Uplinks:

AT FL280 PROCEED DIRECT TO GLA. REST OF ROUTE UNCHANGED.



The pilot is to remain on the cleared route of flight until reaching FL280. At FL280, the pilot is to proceed direct to GLA.

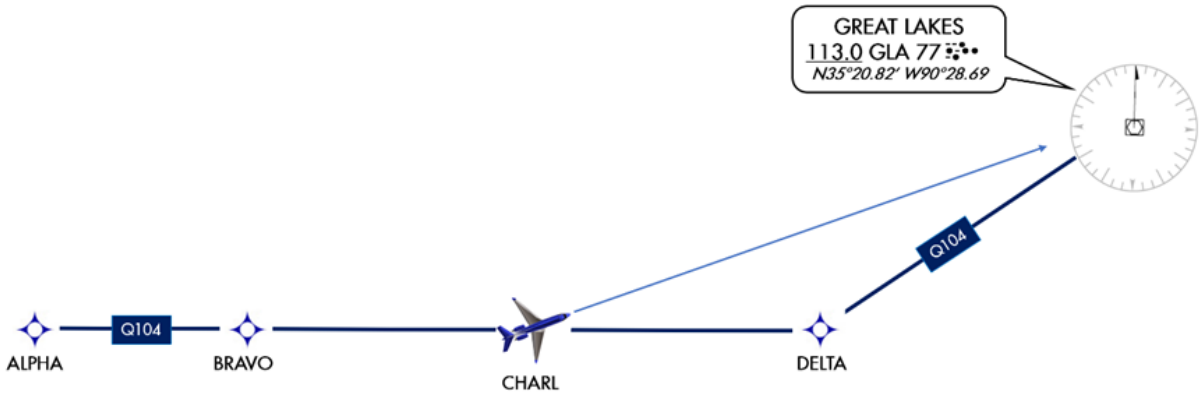
6. **AT [position] PROCEED DIRECT TO [position]** – Clearance to a point (fix, NAVAID, etc.) always on the current ATC assigned route when at a specified position also on the current ATC assigned route. When the [position] is any fix other than the destination, the clearance will include the FREE TEXT CPDLC "REST OF ROUTE UNCHANGED". **Pilot action *may be* required depending on avionics to execute the direct-to-fix change within the FMS**. The [position] in an At Position Direct-To-Fix uplink must be on the currently cleared route. The pilot is to remain on the currently cleared route of flight until the AT [position] point.

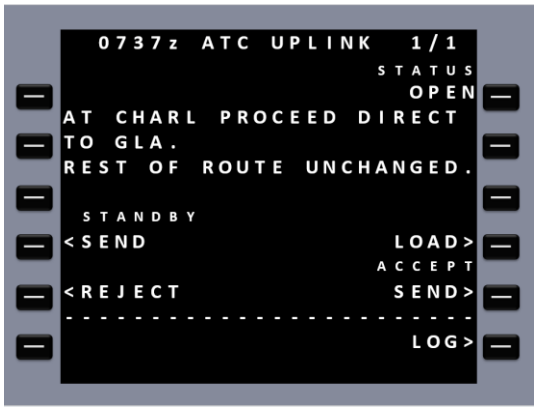
   Note: If a LOAD prompt is available, it should be used. Not all aircraft have the capability to load information from CPDLC message into the FMS. A message may not be loadable on one airframe where it is loadable on others. See aircraft documentation for additional information.

   CPDLC Message Example:

   ATC Uplinks:

   AT CHARL PROCEED DIRECT TO GLA. REST OF ROUTE UNCHANGED.



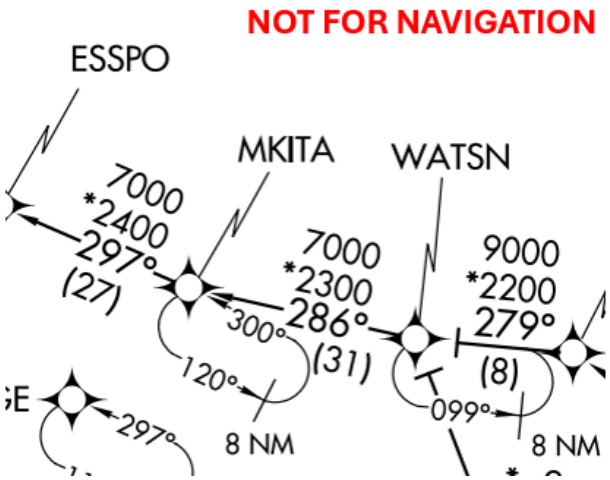


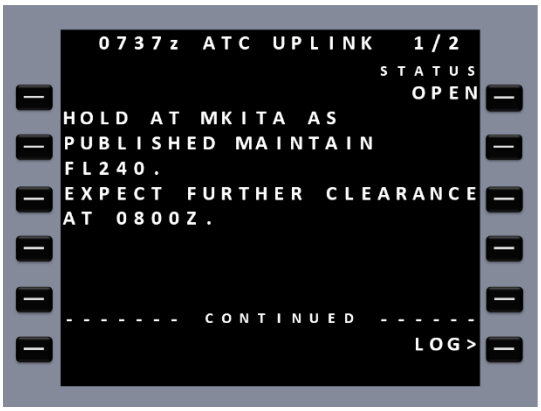
7. **HOLD AT [position] AS PUBLISHED MAINTAIN [altitude] EXPECT FURTHER CLEARANCE AT [time]** – Clearance to hold at a point (fix, NAVAID, etc.) on the current ATC assigned route, as published/charted. It **will** be sent with the current assigned altitude. The aircraft will not automatically report to ATC that it has entered the hold, and pilots should use voice for that report. Any clearance to exit the hold will be completed via voice. A revised EXPECT FURTHER CLEARANCE AT uplink can be sent by itself, regardless of whether the holding clearance was sent via CPDLC.

   Note: If a LOAD prompt is available, it should be used. Not all aircraft have the capability to load information from CPDLC message into the FMS. A message may not be loadable on one airframe where it is loadable on others. See aircraft documentation for additional information.

   CPDLC Message Example:

   ATC Uplinks:
   HOLD AT MKITA AS PUBLISHED MAINTAIN FL240 EXPECT FURTHER CLEARANCE AT 0800Z





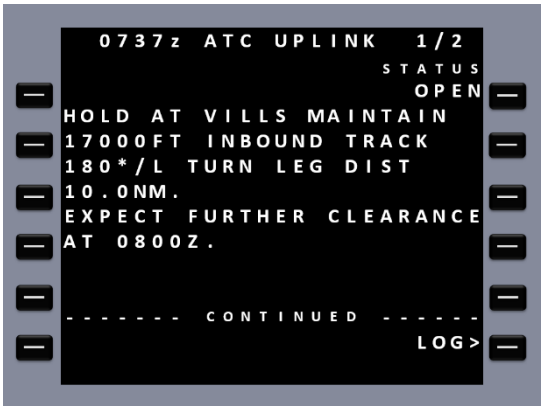
Reminder to report entering the hold via voice consistent with applicable AIM requirements.

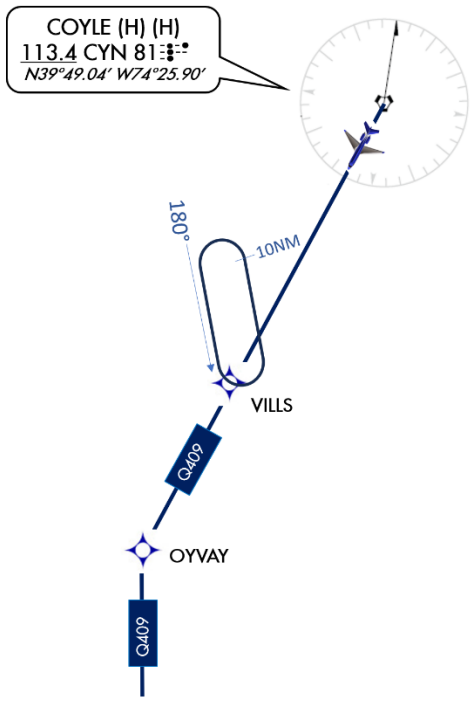
8. **HOLD AT [position] MAINTAIN [altitude] INBOUND TRACK [degrees] [direction] TURNS [legtype] EXPECT FURTHER CLEARANCE AT [time]** – Clearance to hold at a point (fix, NAVAID, etc.) on the current ATC assigned route, using the specified holding pattern. It **will** be sent with the current assigned altitude. The aircraft will not automatically report to ATC that the aircraft has entered the hold, and pilots should use voice for that report. Any clearance to exit the hold will be completed via voice. A revised EXPECT FURTHER CLEARANCE AT uplink can be sent by itself, regardless of whether the holding clearance was sent via CPDLC.

   Note: If a LOAD prompt is available, it should be used. Not all aircraft have the capability to load information from CPDLC message into the FMS e.g., a hold may not be loadable on one airframe where it is loadable on others. See aircraft documentation for additional information.

   CPDLC Message Example:

   ATC Uplinks:
   HOLD AT VILLS MAINTAIN 17000FT INBOUND TRACK 180*/L TURN LEG DIST 10.0 NM. EXPECT FURTHER CLEARANCE AT 0800Z.





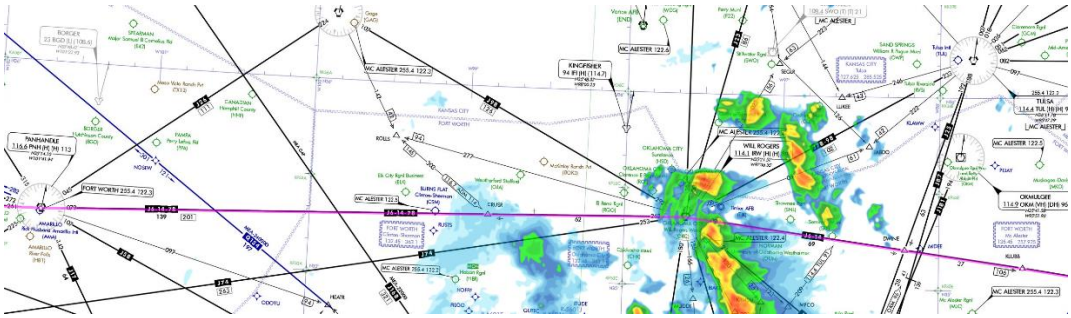
Reminder to report entering the hold via voice consistent with applicable AIM requirements.

Revised Route Messages

Revised route messages are most often sent when it is necessary to re-route the aircraft around constrained airspace (e.g., weather/air traffic) or Special Use Airspace. A revised route may be based on routing points defined by a fix-radial-distance (FRD) from a NAVAID or a LAT/LONG. FRD positions (Place-Bearing-Distance in the FMS) or LAT/LONG positions are included when the controller uses their trackball capability at their station to build the revised route.

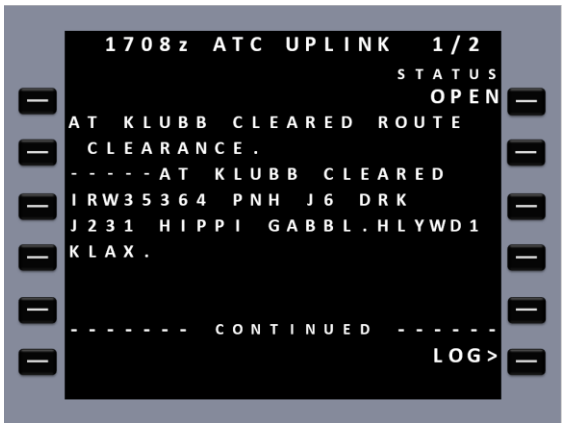
FRD Routing Example:

Original ATC Clearance: KATL to KLAX:
NASSA2 YAALL J14 PNH J6 DRK J231 HIPPI GABBL HLYWD1 KLAX



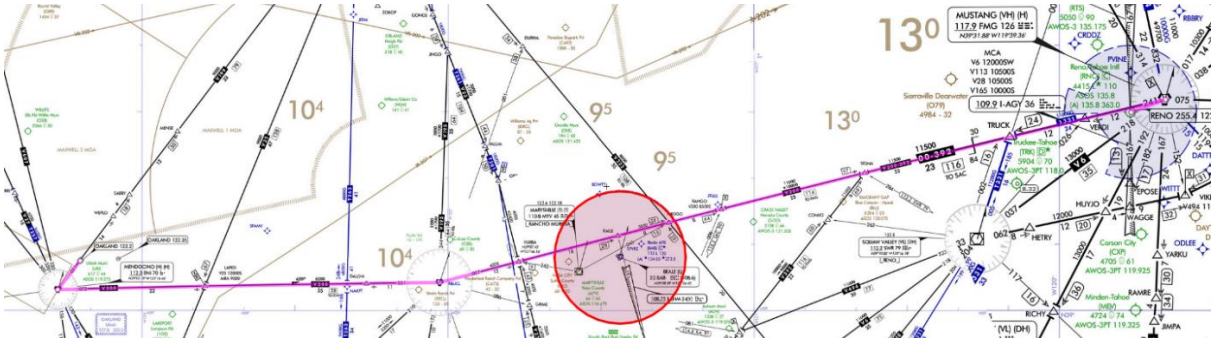
FRD Revised Clearance: The FRD is the IRW 353 Radial at 64 NM:
IRW35364 PNH J6 DRK J231 HIPPI GABBL HLYWD1 KLAX

CPDLC Message Example: AT [position] CLEARED [routeclearance]:

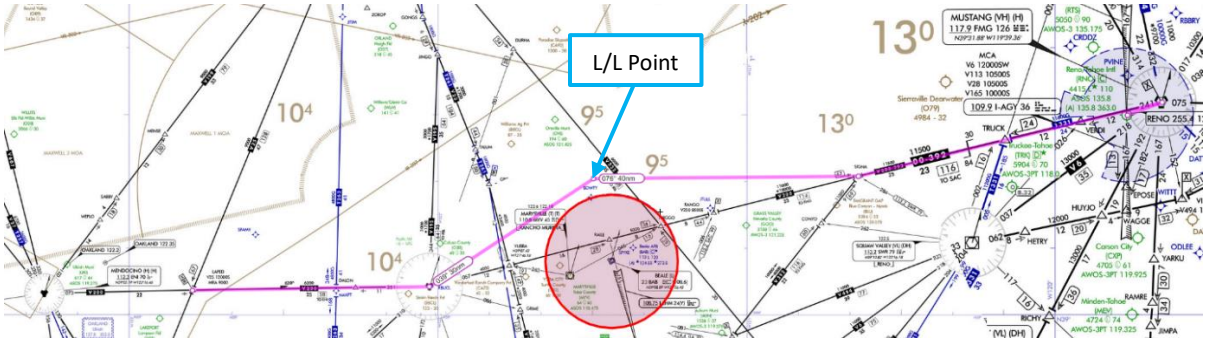


LAT/LONG Routing Example:

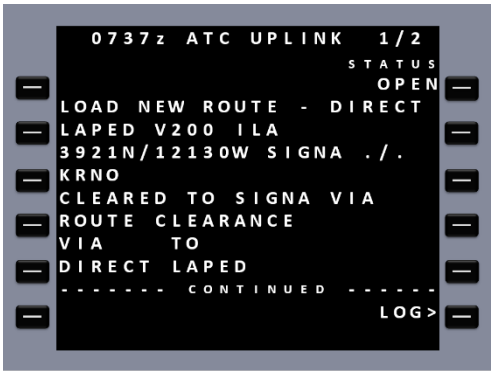
Original ATC Clearance: KUKI to KRNO:
KUKI ENI V200 FMG KRNO

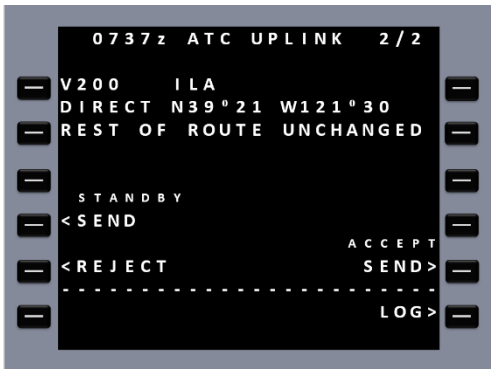


LAT/LONG Revised Clearance: Route around the Beale TFR:
ILA N39°20.64' W121°30.11' SIGNA V200 FMG KRNO



CPDLC Message Example: CLEARED TO [position] VIA [route clearance]:





This capability is a powerful feature of En Route CPDLC in the U.S. NAS. However, its benefit is only realized if flight crews use the LOAD or INSERT (i.e., "Push-to-Load") functionality of the FMS. **Do not attempt to build these revised route clearances in the FMS on your own. Use the LOAD or INSERT function.**

9. En Route CPDLC Altitude & Speed Messages

Key Points:

- Altitude clearances and speed clearances may be issued by ATC via CPDLC.
    - Climb Via & Descend Via clearances are not issued using CPDLC.
    - DCL may include a Climb Via clearance (but recall that SIDs must be manually inserted).
- Pilots may request a single altitude or block altitude.
    - DO NOT use FREE TEXT to request an altitude.
- CPDLC can be used to send the current local altimeter setting and it will be included with any CPDLC altitude uplink containing an altitude below FL180.
- ATC may send a CONFIRM ASSIGNED ALTITUDE (CAA) or CONFIRM SPEED CPDLC message.
    - Pilots must use the REPORT function to send this report.
    - DO NOT respond using FREE TEXT.

Types of Altitude Messages

ATC may send the following CPDLC altitude instructions to an aircraft:

- MAINTAIN [altitude]
- MAINTAIN BLOCK [altitude] TO [altitude]
- CLIMB TO AND MAINTAIN [altitude]
- DESCEND TO AND MAINTAIN [altitude]
- CLIMB AND MAINTAIN BLOCK [altitude] TO [altitude]
- DESCEND TO AND MAINTAIN BLOCK [altitude]
- EXPEDITE CLIMB TO [altitude]
- EXPEDITE DESCENT TO [altitude]
- IMMEDIATELY CLIMB TO [altitude]
- IMMEDIATELY DESCEND TO [altitude]
- CROSS [position] AT AND MAINTAIN [altitude]
- CROSS [position] AT AND MAINTAIN [altitude] AT [speed]

When an altitude clearance uplink is received, flight crews should review the uplinked message using normal CPDLC procedures, and either respond with WILCO, UNABLE, or STANDBY. Except for holding clearances (which contain an altitude), an altimeter will be included with any CPDLC altitude uplink containing an altitude below FL180. Additional information regarding the issuance of altimeters is later in this chapter.

ATC may include “AT PILOTS DISCRETION” to an uplinked altitude message, excluding messages beginning with “IMMEDIATELY” or “EXPEDITE”. CPDLC is not used to issue “IMMEDIATELY” or “EXPEDITE” clearances unless voice communication is not operationally feasible or when voice communications have failed.

ATC will not use CPDLC to issue “Climb Via” or “Descend Via” clearances. Pilots should expect “Climb Via” and “Descend Via” clearances via voice.

When a controller requires a verification of assigned altitude, the controller may send a CONFIRM ASSIGNED ALTITUDE (CAA) request to the aircraft. In response, the flight crew selects the requested REPORT and sends the following message to indicate their assigned altitude, which may be the altitude set in the altitude pre-selector:

- ASSIGNED ALTITUDE [altitude]

DO NOT USE FREE TEXT TO REPORT ASSIGNED ALTITUDE.

Pilots/Flight Crews may send the following CPDLC altitude REQUESTS to ATC:

- REQUEST [altitude]
- REQUEST BLOCK [altitude] TO [altitude]
- REQUEST CLIMB TO [altitude]
- REQUEST DESCENT TO [altitude]

Pilots may append these preformatted message explanations this altitude REQUEST:

- "Due to Weather"
- "Due to Aircraft Performance"

DO NOT USE ANY OTHER PRE-FORMATED MESSAGES OR ADD FREE TEXT TO THE REQUEST. Revert to voice with any other request or explanation.

Types of Speed Messages

ATC may send the following CPDLC speed instructions to an aircraft:

- MAINTAIN [speed]
- MAINTAIN [speed] OR GREATER
- MAINTAIN [speed] OR LESS
- RESUME NORMAL SPEED
- CROSS [position] AT [speed]
- CROSS [position] AT OR LESS THAN [speed]
- CROSS [position] AT OR GREATER THAN [speed]
- CROSS [position] AT AND MAINTAIN [altitude] AT [speed]

When a speed clearance uplink is received, flight crews should review the uplinked message using normal CPDLC procedures, and either respond with WILCO, UNABLE, or STANDBY.

When a controller requires verification of an aircraft's speed, they may uplink a CONFIRM SPEED message to the flight crew. In response, the flight crew selects the requested REPORT and sends the following message to indicate their current speed:

- PRESENT SPEED [speed]

DO NOT USE FREE TEXT TO REPORT SPEED.

Altimeter Issuance

Altitude clearances containing an altitude below FL180 will have an altimeter automatically appended. For aircraft above FL180, the ATC system automatically selects the altimeter setting reporting station ATC has designated for use in the area where aircraft is predicted to descend below FL180. If below FL180, the ATC system selects the reporting station designated for the aircraft's present position.

Holding clearances contain "MAINTAIN [ALTITUDE]," and those clearances will not contain an altimeter even if the altitude is below FL180.

An example of an uplinked altimeter: "DEN LOCAL ALTIMETER. ALTIMETER 30.26IN", where DEN is the altimeter reporting station.

ATC may also manually uplink a separate altimeter and may specifiy a specific altimeter station to be uplinked.

If confusion exists regarding altimeter settings provided or clarification is needed, contact ATC via voice.

In accordance with the AIM (5-3-1), altimeters provided via CPDLC may not be used when conducting instrument approach procedures.

10. En Route CPDLC Weather Deviation & Advisory Messages

Key Points:

- **Weather Deviations:**
  - Voice should be utilized for weather deviations that are of a time critical nature.
  - Pilots operating in ARTCCs that have Full Services functionality enabled can request weather deviations via CPDLC. If an ARTCC does not have Full Services functionality enabled, an "UNABLE. DOWNLINK MESSAGE NOT SUPPORTED" will be sent automatically and the request will not be shown to ATC. Voice must be used to make all weather deviation requests from ARTCC's with Full Services disabled.
  - **Only deviations** from the current route, up to a specified distance, due to weather, can be sent.
    - Pilot downlink: REQUEST WEATHER DEVIATION UP TO [specified distance] [direction] OF ROUTE
    - If ATC can approve the deviation as requested: CLEARED TO DEVIATE UP TO [distance offset] [direction] OF ROUTE WHEN ABLE PROCEED DIRECT TO [position] REST OF ROUTE UNCHANGED REPORT BACK ON ROUTE
    - When proceeding direct to the specified fix according to the issued clearance, pilots should downlink a BACK ON ROUTE report.

    Note: The [position] variable in the above message will always be a position/waypoint on the current route.
  - **Pilots operating on a weather deviation issued via CPDLC should revert to voice to obtain an amended clearance if a new or additional deviation is required.**
- **Advisory Messages:**
  - ATC may uplink free text advisory messages to aircraft. Every CPDLC message requires a response, including advisory messages, which must be responded to with a ROGER.
  - **DO NOT SEND FREE TEXT MESSAGES – Exception with EMERGENCY messages.**

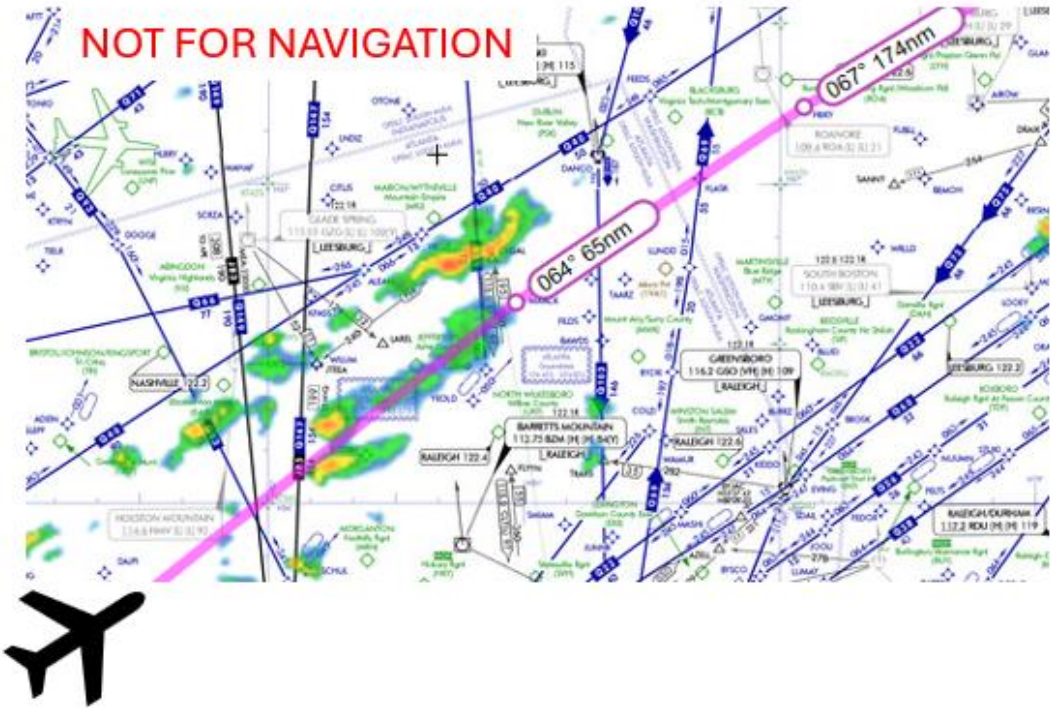
Weather Deviations

Weather deviation requests via CPDLC can only be initiated by the pilot. Refer to specific OEM/operator specific guidance. Refer to Full Services Deployment (Ch. 3) for additional information concerning Full Services deployment in the U.S.

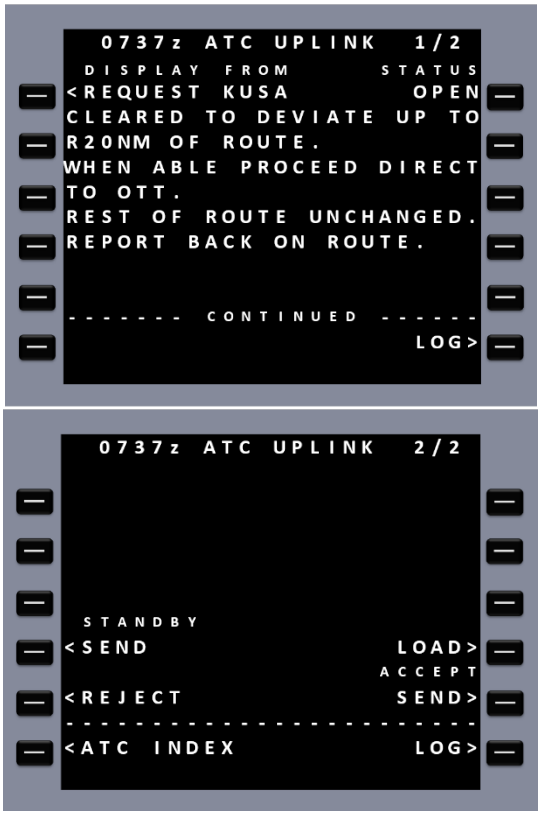
1. The pilot initiates the request by downlinking a REQUEST WEATHER DEVIATION UP TO [specified distance] [direction] OF ROUTE.

Weather deviation requests **must be submitted as distance**. Only left, right, or either left and right deviations are supported. Cardinal direction deviations are not supported.

In this example the crew is cleared WEALL MAACK FRIKY OTT ./. KBOS and requests to deviate due to weather.



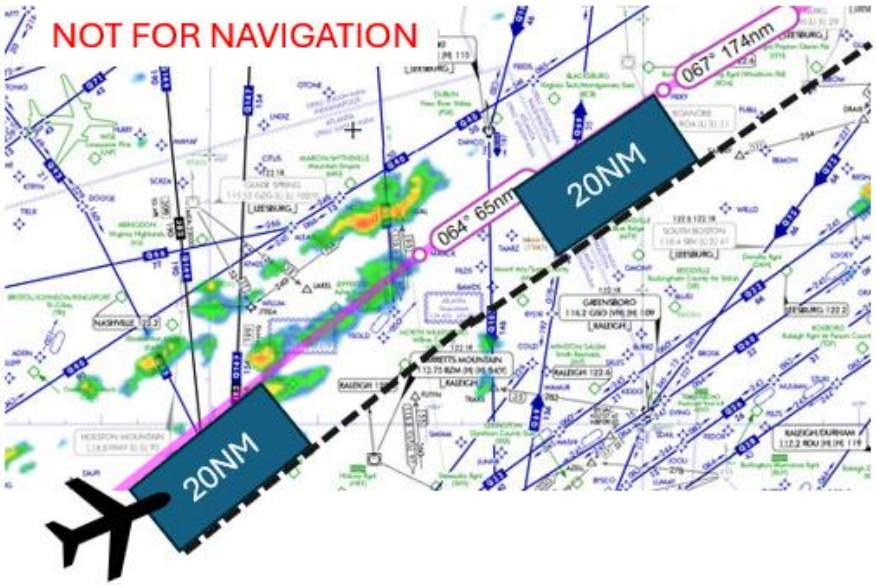
2. If ATC is able to approve the request, they will respond with a CLEARED TO DEVIATE UP TO [distance offset] [direction] OF ROUTE WHEN ABLE PROCEED DIRECT TO [position] REST OF ROUTE UNCHANGED REPORT BACK ON ROUTE
    a. ATC will select a point already on the cleared route of flight for the aircraft to rejoin the route when the deviation is complete.



If ATC is unable to approve the request, they will respond with an UNABLE and revert to voice. Voice should then be used to obtain the necessary deviation.

Note: Pilots should refer to OEM/operator specific guidance for recommendations as to when to execute the uplinked clearance – in order to preserve a reference to the current route of flight from which the deviation is being made.

Approved weather deviations are lateral distances from the cleared route of flight, and a pilot may deviate laterally **up to** the specified distance from the cleared route.



3. Pilots should utilize the BACK ON ROUTE report when proceeding direct to the cleared fix provided in the clearance. This will notify ATC that they are back on course.

   During the deployment of Full Services, if an aircraft downlinks a BACK ON ROUTE report within an ARTCC that does not have Full Services enabled, they will receive a "ROUTE REPORT DOWNLINK NOT RECEIVED. CONTACT ATC" uplink. The pilots must report the completion of the deviation over voice.

   If multiple deviations have been issued over CPDLC without the BACK ON ROUTE report being used, there may be multiple BACK ON ROUTE reports available to be downlinked. Any of the BACK ON ROUTE reports may be utilized to report back on route. Do not include free text in the report.

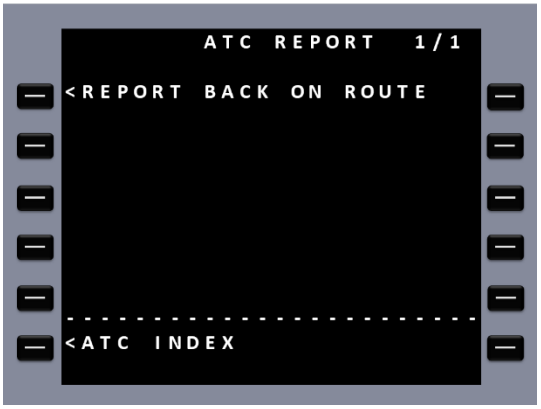
   In the example provided, once the pilots have commenced a turn back direct to OTT, a back on route report should be sent.

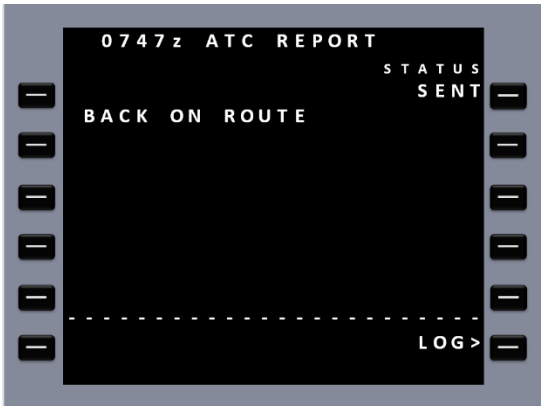
   If the pilot is unable to rejoin the cleared route of flight by the specified point, the pilot must revert to voice and obtain an amended clearance. If an amended clearance is obtained, a pilot may report back on route via either voice or CPDLC.

   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).

   Pilots operating on a weather deviation issued via CPDLC should revert to voice to obtain an amended clearance if a new or additional deviation is required.

Only one back on route report is necessary to be sent.

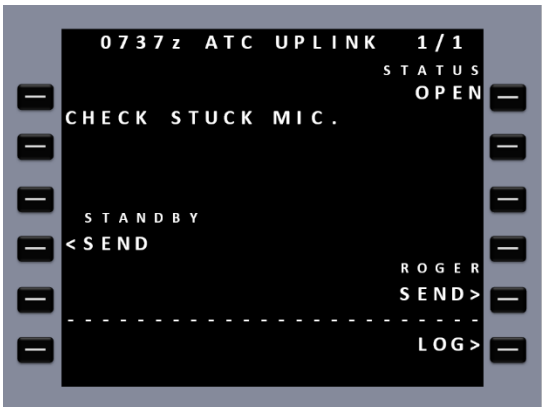




A LOAD prompt may be available. Not all aircraft have the capability to load information from a CPDLC message into the FMS. A message may not be loadable on one airframe where it is loadable on others. See aircraft documentation for additional information, specifically as it relates to weather deviations.

Advisory Messages

ATC may uplink free text advisory messages to pilots. A response of ROGER to these advisories is required. If pilots require clarification or do not understand an advisory message, utilize voice to clarify. Pilots are reminded that they may not include free text in downlinks.



11. Controller Uplink Cancellation

Key Points:

- If ATC must cancel or override a CPDLC clearance issued in error and issue alternate instructions using voice.
- Phraseology:

  DISREGARD CPDLC (type) CLEARANCE (description of clearance) AND SEND AN UNABLE (clearance)

  "American Fifty-Two, disregard CPDLC altitude clearance to flight level three five zero and send an unable. Climb and maintain flight level three one zero."

  "Delta Four Twenty-Three, disregard CPDLC route clearance direct Memphis and send an unable. Cleared direct Nashville, direct Memphis, rest of route unchanged."

- Flight crew must REJECT/UNABLE the CPDLC message sent in error by ATC.

Note: In rare cases, the controller may contact the pilot to disregard/unable an uplinked clearance that has not been received on the flight deck.

12. En Route CPDLC Termination, Transfer, & Log Off

Key Points:

- CPDLC sessions are automatically terminated by the FAA when the flight will no longer need CPDLC services.
- CPDLC sessions are automatically transferred between the U.S. domestic airspace border and international border when CPDLC is used in both airspaces.
- If CPDLC is not in use in the receiving airspace or the aircraft is not eligible for CPDLC services, CPDLC services are terminated at handoff.
- If two or more CPDLC messages are not received by the crew, it is recommended for the crew to terminate the CPDLC session and use voice contact for the remainder of the flight.
    - The pilot may become aware of an undelivered uplink message when ATC contacts the pilot to disregard/unable a clearance that has not been received on the flight deck.

Non-CPDLC Equipped Airspace

Except when operating in TRACON airspace or non-domestic airspace, aircraft are automatically notified if En Route CPDLC is not in use by an ARTCC and the following CPDLC message is sent to the aircraft:

CPDLC NOT IN USE UNTIL FURTHER NOTIFICATION

This notification and the connection termination sent alone ("End Service" message) can be sent over any media. Flight crews have the option to terminate the use of CPDLC by logging off from "KUSA", provided they have accepted/rejected all pending clearances that require a response. This also applies to military aircraft entering Special Use Airspace (SUA).

All accepted CPDLC clearances up to that point remain in force unless ATC issues an amended clearance.

Transitioning between Data Authorities

Logon guidance for aircraft inbound/outbound U.S. domestic airspace is outlined below.

Inbound KUSA

Entering U.S. Domestic CPDLC En Route airspace with a connection from a previous data authority:

- If an aircraft has a CPDLC connection established and is entering via a **CPDLC-ON** En Route Center, an automatic connection handoff will occur between the previous data authority and the CPDLC-ON En Route Center.No manual termination or manual logon action required, but the flight crew must accept the CDA confirmation message for the ground system to confirm the KUSA connection is recognized by the aircraft as its CDA
- If the flight crew does not acknowledge the CDA confirmation after three attempts, the flight crew will have to manually logon to KUSA

Entering U.S. Domestic CPDLC En Route airspace **without** a connection from a previous data authority:

- If the flight crew has not previously logged on during the flight, the flight crew needs to perform a manual logon to KUSA.
    - KUSA session will be established upon reaching a CPDLC-ON En Route Center and accepting the CDA confirmation message

Outbound KUSA

Exiting U.S. Domestic CPDLC En Route airspace with a connection established:

- If an aircraft is exiting U.S. domestic airspace from a **CPDLC-ON** En Route Center, an automatic connection handoff will occur between the CPDLC-ON En Route Center and the next data authority, and the CPDLC connection will be transferred.
    - No manual termination or manual logon action required by the flight crew

Session Termination (Off-Nominal) and FAA's Block List Addition/Removal

In the off-nominal case in which two or more messages are not received by the flight crew, it is recommended that the flight crew terminate the CPDLC session and use voice contact for the remainder of the flight. The flight crew is not required to inform the controller of KUSA session termination.

If a controller-initiated CPDLC message does not successfully reach the flight deck, the flight crew will be contacted via voice by ATC to disregard/unable the clearance. Receiving a voice contact message of this type is an indicator to the flight crew of possible failed CPDLC message delivery. The flight crew should always clarify via voice if there is any confusion or if they suspect an issue with message delivery.

Multiple consecutive undelivered messages could indicate the aircraft is stuck on alternate media (i.e., SATCOM, HF). VDL Mode 2 is the required primary media for U.S. domestic En Route CPDLC. Operators should consult with their aircraft OEM for any questions regarding media settings.

If an aircraft experiences four consecutive message failures during a flight, the aircraft's en route CPDLC session will be terminated, and it will be temporarily added to the FAA's Block List. The aircraft will be removed from the Block List by FAA Flight Data following their addition, **with no action from the operator required.** The aircraft operator on file with L3Harris will receive an e-mail notification informing them the aircraft was blocked, and a subsequent e-mail is sent by FAA Flight Data following removal from the Block List.

The crew can attempt re-logon to create a new session once it is removed from the Block List; however, if the aircraft is still stuck on alternate media the session will not be established. The Block List applies to the use of en route CPDLC only. Use of CPDLC DCL (Departure Clearances) is not affected while an aircraft is blocked.

For questions about the FAA's Block List, contact DCIT@L3Harris.com.

13. Emergency Messages

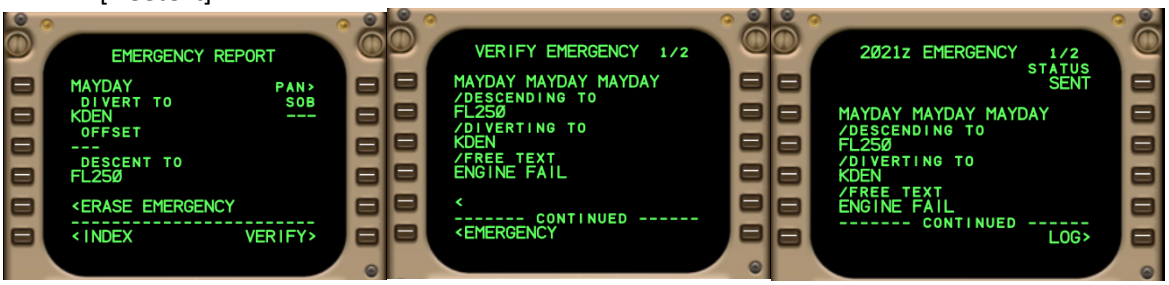
Key Points:

- **VOICE REMAINS PRIMARY FOR EMERGENCY COMMUNICATIONS**
- Pilots can send a CPDLC EMERGENCY REPORT to ATC.
    - FREE TEXT can be used only with EMERGENCY messages, but only as a one-way aircraft to ground link (e.g., in case of loss of VHF voice radio capability).
- ATC will receive the CPDLC EMERGENCY REPORT but will not acknowledge it using CPDLC.
- Pilot and controller will revert to voice to resolve the emergency.
- EMERGENCY messages can be sent while an aircraft is flying through an ARTCC that is not currently CPDLC active.

Emergency CPDLC Messages

The flight crew may send the following EMERGENCY CPDLC messages to ATC:

- PAN PAN
- MAYDAY MAYDAY
- [remainingfuel] OF FUEL REMAINING AND [remainingsouls] SOULS ON BOARD
- CANCEL EMERGENCY
- DIVERTING TO [position] VIA [routeclearance]
- OFFSETTING [distanceoffset] [direction] OF ROUTE
- DESCENDING TO [altitude]
- [freetext]



FREE TEXT is permitted when sending an EMERGENCY REPORT. This is an exception to the general rule and anticipates situations where VHF voice radios may be unusable.

When an emergency downlink is received, the En Route Controller can display and review the emergency message but is not able to acknowledge the emergency downlink via CPDLC. Flight crews can expect voice contact from the controller and both parties should use standard operating procedures to resolve the emergency condition.

If an aircraft is transiting airspace where a CPDLC session is not active, the emergency message will be made available to a supervisor of the En Route facility. In addition, the National CPDLC site will receive an alert that will be provided to the affected facility notifying that an Emergency downlink has been received.

14. Quick Reference Card

Below is the Quick Reference Card (QRC) which is a short and concise document that lists the best practices for using En Route CPDLC. This Quick Reference Card was designed to be referenced on the go, on an iPad or mobile device for pilots. See following two pages.

En Route CPDLC Quick Reference Guide

Flight Plan Requirements

- Verify Reg Number or Flight ID in Item 7
- Include in Item 10a "J4" to indicate VDL Mode 2 capability
- Verify REG/ and CODE/ in Item 18
- Include in Item 18 for En Route CPDLC:
  - DCL and En Route:
    - File "DAT/1FANSE", or "DAT/1FANSER"*
    - May substitute "DAT/1FANSE2PDC" or "DAT/1FANSER2PDC"* for PDC as secondary preference
  - En Route only:
    - File "DAT/FANSE", or "DAT/FANSER"*

**FANSER for aircraft with STAR loading issues*

On CPDLC LOGON STATUS PAGE/MENU

- Verify
  - Registration Number
  - Flight ID
- LOAD Flight Plan:
  - Departure Airport
  - Destination Airport
  - Route
  - SID/ODP & Dept. Runway
  - STAR

Logon for DCL or CPDLC Services

- Log on using "KUSA"
  - DCL Airports: EDT - 30 minutes
  - Other Airports: EDT - 5 minutes

Do not enter any input into the latency timer or "Max Uplink Delay" field. If a value remains from CPDLC use in a previous FIR, the pilot should clear the value upon entry to KUSA airspace.

If network coverage is available, the logon is accepted on the ground. Otherwise, the logon is accepted once airborne and within network coverage.

- Successful log on – CDA/ATC CTR shows "KUSA"
- Do not re-log on if CDA/ATC CTR shows "KUSA"

Initiation & Management of En Route CPDLC Services

- Start of in-flight CPDLC services begins with welcome message:
  "CONFIRM CPDLC CONTACT WITH KUSA.
  ROGER/ACCEPT THIS MESSAGE"
  Except when departing a DCL airport
- Respond to the welcome message with ROGER/ACCEPT.
  CPDLC services transfer from ARTCC to ARTCC
  Suspended while operating in TRACON airspace.

"NO COMM" or "DATALINK LOST"

These indicate a temporary loss of datalink communications with the ground.

- Verify CDA/ACT CTR is still "KUSA".
- If CDA/ACT CTR is "KUSA", no immediate action is required. DO NOT RE-LOGON.
- Follow published aircraft procedures, if available. Await re-connection with the ground. Use voice for ATC communications until reconnection is confirmed.
- If the NO COMM state continues for 16 minutes, then the active CPDLC session will terminate and the CDA will clear.
- If CDA/ACT CTR does not show "KUSA", attempt re-log on. If not successful, contact ATC via voice.

Avionics resets/reboots may sever the aircrafts ATC link with the ground while still appearing to be active.

Recommended Pilot/Flight Crew CPDLC Procedures

- Every CPDLC message sent by ATC requires a response.
- Respond as soon as possible to all CPDLC messages.
- Respond appropriately:
  - ACCEPT/WILCO/ROGER
  - REJECT/UNABLE
  - STANDBY
    - If STANDBY is selected, follow with an ACCEPT/REJECT or WILCO/UNABLE response.
  - Select REPORT
- When appropriate, for multi-crewed aircraft:
  - Independently & silently review an uplinked CPDLC message sent to the aircraft.
  - Agree on content & intent of CPDLC message.
  - Confirm change & take the action: FMS or Flight Guidance Mode change, etc.
  - Confirm & agree before sending a CPDLC response, report, or request to ATC.

ATC CPDLC Reports

- ATC can request a REPORT using CPDLC (e.g., CONFIRM ASSIGNED ALTITUDE, CONFIRM SPEED).
- Respond using the pre-formatted REPORT page.

Pilot Requests Using CPDLC

- Send only these pre-formatted REQUESTS via CPDLC to ATC:
  - REQUEST [altitude]
  - REQUEST BLOCK [altitude] TO [altitude]
  - REQUEST CLIMB TO [altitude]
  - REQUEST DESCENT TO [altitude]
  - REQUEST VOICE CONTACT
  - REQUEST DIRECT TO [position] – *position must be on the current ATC assigned route*
  - REQUEST WEATHER DEVIATION UP TO [distance] [direction] OF ROUTE. – *ONLY for ARTCCs that have Full Services enabled.*
  - EMERGENCY MESSAGES
- DO NOT send any other pre-formatted REQUESTS. *They are not currently supported.*
- Send ONLY ONE REQUEST with each CPDLC message.

CPDLC Route Messages

- Route clearances issue via CPDLC:
  - PROCEED DIRECT TO [position]
    Direct-to-fix
  - CLEARED TO [position] VIA [routeclearance]
    Re-Route to a fix on your current cleared route. Does not amend clearance limit.
  - CLEARED [routeclearance]
    Full Route Clearance – Replaces entire route
  - AT [position] CLEARED [routeclearance]
    Replaces everything after the specified AT position
  - AT [altitude] PROCEED DIRECT TO [position]
  - AT [position] PROCEED DIRECT TO [position]
  - HOLD AT [position] AS PUBLISHED MAINTAIN [altitude] EXPECT FURTHER CLEARANCE AT [time]
  - HOLD AT [position] MAINTAIN [altitude] INBOUND TRACK [degrees] [direction] TURNS [legtype] EXPECT FURTHER CLEARANCE AT [time]
- Load route clearance sent by ATC into the FMS
  - Select LOAD, APPLY, or INSERT new route into the FMS
  - Manually insert Departure Procedures
  - Manually insert Arrival Procedures, when required
- Review new route clearance
  - If acceptable, activate the new route clearance in the FMS, respond ACCEPT/WILCO
  - If not acceptable, respond REJECT/UNABLE

CPDLC Altitude/Speed Messages

- Use CPDLC to request a single altitude or block altitude.
- An altimeter setting will be included with any CPDLC altitude uplink containing an altitude below FL180.
- Respond to a CONFIRM ASSIGNED ALTITUDE or CONFIRM ASSIGNED SPEED request:
  - Select & send REPORT

CPDLC Termination, Transfer, & Log Off

- "CPDLC NOT IN USE UNTIL FURTHER NOTIFICATION"
  - Indicates En Route CPDLC is not in use
  - CDA/ACT CTR remains "KUSA"
  - No CPDLC messages except
  - EMERGENCY REPORTS can be sent
- CPDLC sessions are automatically transferred between the U.S. domestic airspace and international FIR when CPDLC is used in both airspaces.
- If CPDLC is not in use in the receiving FIR, or the aircraft is not eligible for CPDLC services, CPDLC services are terminated at handoff.
- In the off-nominal case in which two or more messages are not received, it is recommended to terminate the CPDLC session and use voice contact for the remainder of the flight.
- An indication of an undelivered message may be a voice contact from ATC to disregard/unable a clearance that has not been received.

CPDLC Advisory Messages

- ATC may send free text to pilots, pilots may only respond with a ROGER/ACCEPT. Do not send free text.

CPDLC Emergency Messages

- VOICE REMAINS PRIMARY FOR EMERGENCY COMMUNICATIONS.
- Pilots may send a CPDLC EMERGENCY REPORT to ATC if voice is not available.
- ATC will receive the CPDLC report but **will not** acknowledge it using CPDLC. ATC will attempt to contact the aircraft via voice.
- FREE TEXT can be used only with EMERGENCY messages, but only as a one-way aircraft to ground link – e.g., in case of loss of VHF voice radio capability.

HELPFUL REMINDERS:

- **NEVER USE FREE TEXT EXCEPT FOR AN EMERGENCY.**
- **VOICE REMAINS PRIMARY FOR EMERGENCY COMMUNICATIONS.**
- **ALWAYS REVERT TO VOICE TO CLARIFY IF THERE IS CONFUSION.**

Terms and Acronyms

Acronym	Definition
ACARS	Aircraft Communications Addressing and Reporting System
ACID	Aircraft Identification (Code)
ACK	Acknowledge
ADAR/PDAR	Adapted Departure-Arrival Route/Preferential Departure-Arrival Route
ADR/PDR	Adapted Departure Route/ Preferential Departure Route
ANSP	Air Navigation Service Provider
AOC	Airline Operations Center
ARTCC	Air Route Traffic Control Centers
ATC	Air Traffic Control
ATOP	Advanced Technologies and Oceanic Procedures
ATS	Air Traffic Services
ATSU	Air Traffic Services Unit
CAA	Confirm Assigned Altitude
CAF	Cleared As Filed
CDA	Current Data Authority
CPDLC	Controller-Pilot Data Link Communication
CSP	Communication Service Provider
DAT	Data Application information
DCIT	Data Comm Implementation Team
DCL	Departure Clearance
DCNS	Data Communications Network Service
DM	Departure Message
DP	Departure Procedure
DPP	Departure Procedure information (SID/Climb via and Climb out)
ERAM	En Route Automation Modernization
ERR	Error Indicator
FAA	Federal Aviation Administration
FANS	Future Air Navigation System
FIR	Flight Information Region
FLID	Flight Identification
FMS	Flight Management System
FPL/FP	Flight Plan
FRC	Full Route Clearance
IATA	International Air Transport Association
IC	Initial Contact
ICAO	International Civil Aviation Organization
ID	Identification
IFR	Instrument Flight Rules
NAS	National Airspace System
NAVAID	Navigational Aid
NDA	Next Data Authority
PDC	Pre-Departure Clearance
POA	Plain Old ACARS
REG	Registration
SATCOM	Satellite Communication
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival Route
STBY	Standby Indicator
TDLS	Tower Data Link System
TFM	Traffic Flow Management
TMU	Traffic Management Unit
TOC	Transfer of Communication
TRACON	Terminal Radar Approach Control
UM	Uplink Message
VDL	VHF Data Link
VHF	Very High Frequency

ICAO Flight Plan Mask