US Domestic Enroute CPDLC Update

David Mumford
14 May, 2024

Key Points

- **Domestic en-route CPDLC in the US is now available to everyone – the Notam limiting GA/BA participation to approved trial participants has been removed.**

- **To get CPDLC, you've got to have the right avionics and submit a form – the FAA has published a list of aircraft types, which you will need to check to see if you comply.**

Here's a very brief summary. For the full, untarnished info, head to the dedicated FAA site here.

So for a long time, domestic en-route CPDLC in the US was only available to operators of bizav aircraft who were signed up to the FAA trial. That trial has now ended, and as long as your avionics make the grade, you can now make use of this service.

The FAA has published a list with a whole bunch of aircraft types on it.

If your aircraft is highlighted in **yellow** or **green**, you **can get datalink** (as long as you complete and submit the participation form).

If it's highlighted in **red** (or not on the list at all), you **can't get datalink.**

En-Route CPDLC Participation List (Pub v1.3) May 14, 2024

OEM/Aircraft Manufacturer	Aircraft Type	CMU Type	FMS Type	Radio Type	Reason	FPL Filing En Route	Pathway to Compliance	Compliance Date
Boeing	B737	HW MARK II+ v523, or HW MARK II+ v524, or RCI 900-151 Core 16, or RCI 900-151 Core 12, or ATN 505 (Core 12 Equivalent)	GE U14.0	HW VHF-RTA-44D (w/SB 064-50000-2001), or HW VHF-RTA-500, or RCI VHF-2100 (w/5850) or P/N 822-1287-101/180 w/S87 or 822-1287-121 or 141), or RCI VHF-920 (P/N 822-1250-002 w/5816 or 822-1250-020 w/S817), or RCI VHF-2100E (P/N 822-2168-121)	The FMS exhibits the following interop issue behavior: Does Not Properly Process UM117 CONTACT Concatenated with UM161 END SERVICE when there is an OPEN uplink on the flight deck. FMS terminates the session with a DR1 with Pending Message error and sets the UM117 CONTACT to aborted without displaying UM117 to pilot	FANSE	1. Upgrade to GE U14.2 (when available), or 2. Upgrade to GE U14.1, or 3. Downgrade to GE U13, or 4. Downgrade to GE U12, or 5. Downgrade to GE U11	N/A
Boeing	B757 / B767	RCI 900-151 Core 16, or ATN 523 (Core 16 Equivalent), or RCI 900-151 Core 12, or ATN 505 (Core 12 Equivalent)	HW PEG I (3411-HNP-02C-10 or prior) without the procedural mitigation	HW VHF-RTA-44D (w/SB 064-50000-2001), or HW VHF-RTA-500, or RCI VHF-2100 (w/5850) or P/N 822-1287-101/180 w/S87 or 822-1287-121 or 141), or RCI VHF-920 (P/N 822-1250-002 w/5816 or 822-1250-020 w/S817), or RCI VHF-2100E (P/N 822-2168-121)	The FMS exhibits the following interop issue behavior: Ghost Message issue. The FMCs can retain messages from previous sessions and display them when they are not relevant. There is a chime, and response options are available.	FANSER	1. Execute the Procedural Mitigation, or 2. Upgrade to PEG I BP 11 (when available), or 3. Upgrade to PEG II	N/A
Airbus	A220	RC RIU-4010 (Core 12 Equivalent)	RC PLF v8A.2	RCI VHF-4000 (P/N 822-1468-390)	The FMS exhibits the following interop issue behavior: a). UM154 RADAR SERVICES TERMINATED Rejected When Concatenated with UM117 CONTACT. The avionics downlinks a DM62 ERROR unexpectedData + DM67 THIS CONCATENATION NOT SUPPORTED BY THIS AIRCRAFT. The uplink is not displayed to the pilot. b). DM67 Generated After Pilot Acceptance of UM120 Monitor TOC. ERAM auto-rejects DM67s with a UM169 uplink. The pilot will need to respond to each UM169 reject generated by ERAM in response to each avionics-generated DM67 after acceptance of a Monitor TOC. c). DR1 Downlink received prior to WILCO When a UM161 END SERVICE is Concatenated with UM117 CONTACT. ERAM controller displays Red X, Fail Status, abnormal indicator	FANSER	Upgrade to PMRA-8L8.0A3 (when available)	N/A
Airbus	A380	ATC CLA 4.1, or ATC CLA 4.2 and ACR S3 without SB23-8020	Honeywell L2.1, or L3	HW RTA 50D (P/N 965-1696-051), or RCI VHF-920 (P/N 822-1250-020 w/S817 or w/S815), or RCI VHF-2100 (P/N 822-1287-121)	ACR S3 without corrective Provider DataBase are more susceptible to VDL Mode 2 A/G handoff and delivery issues	FANSE	Upgrade to ACR S3 w/SB23-8020	N/A
Airbus	A350	ATC CLV 1.3.1, or ATC CLV 1.4 and ACR S4 without SB23-P02S	Honeywell S4, or Honeywell S6, or Honeywell S6A	RCI VHF-2200 (P/N 822-2763050)	ACR S4 without corrective Provider DataBase are more susceptible to VDL Mode 2 A/G handoff and delivery issues	FANSE	Upgrade to ACR S4 w/SB23-P02S	N/A
Bombardier	C160 (Challenger 604)	Universal CMU-1000	RC ProLine 4 with FMS-6000	RC VHF-4000 with: • CPN 822-1468-302 with S8-11, or • CPN 822-1468-303, or • CPN 822-1468-310 with S8-8 or S8-11, or • CPN 822-1468-390	This FMS is not Push To Load capable	N/A	Installation Requires Push To Load	N/A
Boeing	B737	RCI 900-151 Core 12, or ATN 505 (Core 12 Equivalent)	GE U13, or GE U12, or GE U11	HW VHF-RTA-44D (w/SB 064-50000-2001), or HW VHF-RTA-500, or RCI VHF-2100 (w/5850) or P/N 822-1287-101/180 w/S87 or 822-1287-121 or 141), or RCI VHF-920 (P/N 822-1250-002 w/5816 or 822-1250-020 w/S817), or RCI VHF-2100E (P/N 822-2168-121)	1. The FMS exhibits the following interop issue behavior: Issue #1 - GE FMS 5 minute resend behavior. If a pilot initiates a downlink response (WILCO, etc) to an open uplink and the ACARS acknowledgement is never received by the FMS for that response, the uplink remains in an open state and the crew can initiate a response again after 5 minutes. The FMC allows the crew to respond again even if the message made it to destination, because the AK was not received at the FMS. The desired behavior is to not allow the crew the option to resend the response after the initial attempt, and change the uplink to an ABORTED status eventually if AK not received. Issue #2 - um74 & um79 route clearances when the position variable (TO Point) is a duplicate fix in the aircraft's Nav Database, the FMS can incorrectly choose an instance of the dupe fix in the Nav Database that is NOT the instance of the fix on the Active Route based on proximity to Active Route elements. The new revised route would auto LOAD and route the aircraft to the wrong fix. This behavior goes against DO-258a. The FMS should use the instance from the Active Route. 2. Core-12 is more susceptible to VDL Mode 2 A/G handoff and delivery issues 3. These configurations require accumulation of 10,000 operational transactions for evaluation.	FANSE	1. For FMS Issue #1, upgrade to a version that resolves this issue (TBD version, potentially included in U14.2) For FMS Issue #2, upgrade to a version that resolves this issue (TBD version, potentially included in U14.2) 2. For Core-12 and Equivalents, upgrade to: Core 16 for RCI 900-151, or ATN 523 (when available) for the ATN 505 3. Requires that the evaluation of the accumulated 10,000 operational transactions is complete and satisfactory.	For #1, TBD For #2 & #3, TBD

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L3Harris have provided this guidance:

- *Ensure that your avionics are configured to use VDL Mode 2 as the primary media for U.S. Domestic En Route CPDLC. VDLM2 is the only approved media for participation in the domestic U.S.*

- *Ensure that both the 'J4' code in the field 10a equipment field as well as the FANSE (e.g. '1FANSE2PDC') DAT Code in field 18 (other information/DAT) are both included on the flight plan to indicate eligibility for U.S. Domestic En Route CPDLC (see the US Domestic Flight and Planning Guide for more information).*

- *Verify that VHF3/COM3 is set to DATA.*

- *The aircraft registration/tail in field 18 (other information/REG).*

- *If you are still researching your avionics in response to questions from L3Harris, please continue to file for CPDLC-DCL only (FANS) until your verification of eligibility is complete.*

Also, a member has reported that if you're now eligible but tried to log on in the past when you were not eligible, **your aircraft reg might have been placed on a "blocked list".** To get off this list, you need to contact L3Harris, who will forward to the FAA to ask to unblock you (should take less than 24hrs).

Where is CPDLC available in the US?

L3Harris published this updated map on 3 June 2024:
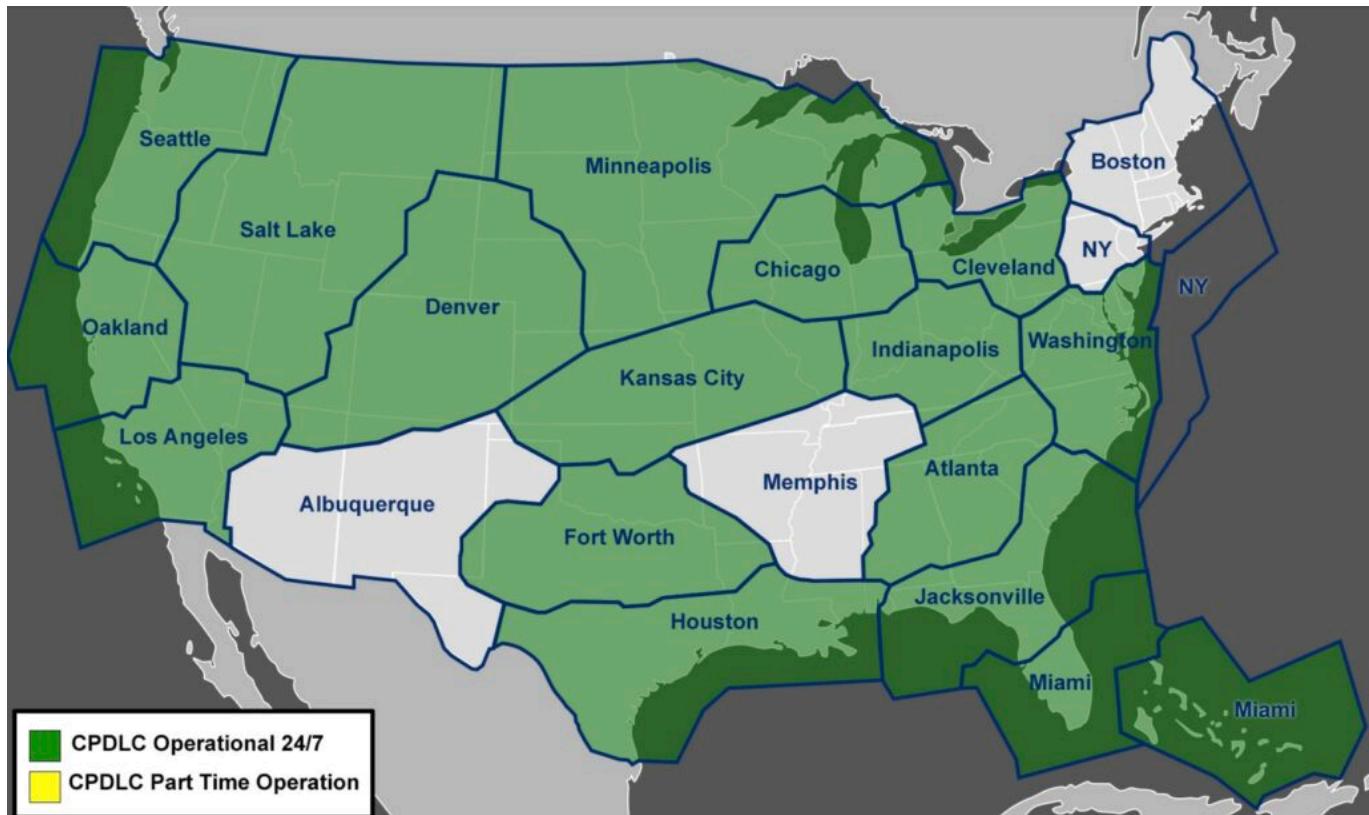
Come on, Albuquerque and Memphis!

So do I need CPDLC now?

No. US domestic datalink is not mandated.

What if I'm flying into the US internationally?

L3Harris have published a guide answering this very question. You can access it here:

Transitioning between data authorities

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.
- If an aircraft has a CPDLC connection established and is entering via a **CPDLC-OFF** En Route Center, the CPDLC session will be terminated. Upon entry to a CPDLC-ON En Route Center, a connection request will be initiated automatically.
- In both scenarios:
  - 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

Exiting U.S. Domestic CPDLC En Route airspace without a connection established

- If an aircraft is exiting U.S. domestic airspace from a **CPDLC-OFF** En Route Center, the CPDLC connection will be terminated automatically soon after entering that CPDLC-Off En Route Center, and the aircraft will exit without a connection.
  - No manual termination required by the flight crew
  - The flight crew may need to perform a logon to the next ATC facility per SOP after connection termination

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For those of you who aren't so familiar with the US, **KUSA is the CPDLC logon code** – and that is the one and only logon code you need, all the way across.

What we know about the US CPDLC trial

OPSGROUP Team
14 May, 2024

There is a CPDLC trial running in the US, but it isn't open for everyone…

General CPDLC stuff

CPDLC is basically a sort of 'text messaging' system that lets ATC contact you, and you contact them.

Combine it with ADS-C and you've got Datalink, which is mandated in a bunch of places like the NAT HLA, Europe and the UK above FL290 etc.

Some other useful info:

- Europe have a logon list. If you want an answer then register.
- **Europe use ATN**, everywhere else uses FANS. If you only have FANS then you can still call yourself 'CPDLC in Europe' if your original **certificate of registration is pre 2018.**
- Just to be clear, the **US requires FANS 1/A.**
- If your airplane is younger than 2014 then the system also needs a **message recording function.**
- **PBCS tracks** need a performance standard of RCP240 (ADS-C is RSP180).

- **AO56** is the LOA to get (or maybe A003).

We actually made A little Opsicle on CPDLC just the other day. It is quite a silly one, but here it is if you want a look:

CPDLC in the US

The US has CPDLC in a bunch of places. It isn't really mandatory yet though. At least not the **domestic en-route CPDLC.** This is the bit they are running a trial for, and they're doing it with **L3Harris.**

The trial is actually, specifically, for the business and general aviation community. The likes of Boeing and Airbus (or rather their avionics configurations) have already been approved.

So, here is the FAA info on it. Or rather, this is the notice talking about **who can participate in the trial.** They released this because a bunch of folk were participating, but their avionics version or configuration wasn't good enough and it was messing up the results.

So how do you know if you've got what it takes?

All the systems are listed on the L3Harris site. If your aircraft type is missing from the Trial List (shown below), this means that operational acceptability hasn't been determined yet for that specific aircraft type. If that's you, you can fill in the form and email it to them at DCIT@L3Harris.com and they will check to see whether you have the spec to participate in the trial.

Aircraft	CMU/Equivalent for MF VDL Mode 2	VDR for MF VDL Mode 2	Minimum FMS version	Minimum FMS version (DCL Only)	FPL Filing (En Route)	
G280	RC RIU-4010/4100: DLCA-6000	RC VHF-4000E: 822-1872-**390**	RC ProLine Fusion 6200 V**3.6** (or later)		RC PLF V**3.6**: 1FANSER	RC PLF V**3.6.1**: 1FANSE
G500 (GA5C) G600 (GA6C) G700 (GA7C) G800 (GA8C)	HW CMF **3.1**	HW EPIC VDR: 7026201-**813 (Mod X)**	HW NG FMS 3.1		1FANSER	
	HW CMF **3.5**		HW NG FMS 1 (Similar to Block 3)		1FANSER	
F900 (A,B,C,EX)	HW Mark II+ Core SW 998-6063-**522** (or later)	HW EPIC VDR: 7026201-**815 (Mod U)**	RC Primus 2000 HW **SPZ-8000**		1FANSE	
Falcon 8X	HW CMF **3.0**	HW EPIC VDR: 7026201-**814 (Mod S)**	HW **EASY III**		1FANSE	
Pilatus PC-24	HW CMF 3.2 (or later)	HW KTR-2280A	HW NG FMS 3.2 (or later)		1FANSER	
Global: 5000(GVFD), 5500, 6000, 6500, 7500	RC RIU-4010/4110: 822-1863-**175/178/179/671/672**	VHF-4000: CPN 822-1468-**210** with **SB-8** CPN 822-1468-**290** CPN 822-1468-**302** with **SB-11** CPN 822-1468-**303** CPN 822-1468-**310** with **SB-8** or **SB-13** CPN 822-1468-**390**	RC ProLine Fusion V**5.1.5** (or later) P/N **810-0163-1B0013** Global 7500 V**2.0.2** (or later) P/N **810-0163-3B0001**	RC ProLine Fusion: All available	1FANSER	
Challenger: 300, 350, 605, 650	RC RIU-4000: 822-1469-**554/602/651/652** RC CMU-4000: 822-1739-**601/603/704**		RC ProLine 21 Advanced: P/N 946-2720-**102/110/130** (or later)		1FANSER	
Embraer: Legacy 450/550 Praetor 500/600	RC RIU-4010: 822-1863-**633-638**	VHF-4000E: CPN 822-1872-**310** with **SB-8** CPN 822-1872-**390**	Embraer Avionics 6.x PLF **810-0163-1E0004 (6.X)**	Embraer Avionics 5.x/6.x PLF 810-0163-1E0003 (5.X) 810-0163-1E0004 (6.X)	1FANSER	
Various (with Universal)	UniLink-**800** SW SCN **31.3** (or later) with External VDR	VHF-4000F: CPN 822-2993-**310** with **SB-9** CPN 822-2993-**390**	SCN **1002.1** (or later)	UniLink-800 or 801 SW SCN 30.1 (or later) for DCL only with SCN 1000.5 (or later)	1FANSE	
	UniLink-**801** SW SCN **31.3** (or later) with Internal VDR	Internal VDR with SCN **10.3** (or later)	SCN 1002.1 (or later)		1FANSE	
Various (with Garmin)	G3000/5000 V**4.5.X, V4.8.X, V5.1.X, V6.2.X** (or later)	GDR-66 (or later)	G3000/5000 V**4.5.X, V4.8.X, V5.1.X, V6.2.X** (or later)		1FANSE	
Not listed?	If your aircraft or configuration is not on this list, please contact your aircraft or equipment manufacturer					

Note: DCIT recommendations for aircraft operating with Data Communications. Individual operator configurations are subject to regulatory approval.

If your aircraft type (system) is not on it, then don't file as capable of en-route CPDLC and don't try and 'participate'.

For those of you who are on it...

Here is a map of current active CPDLC sites:
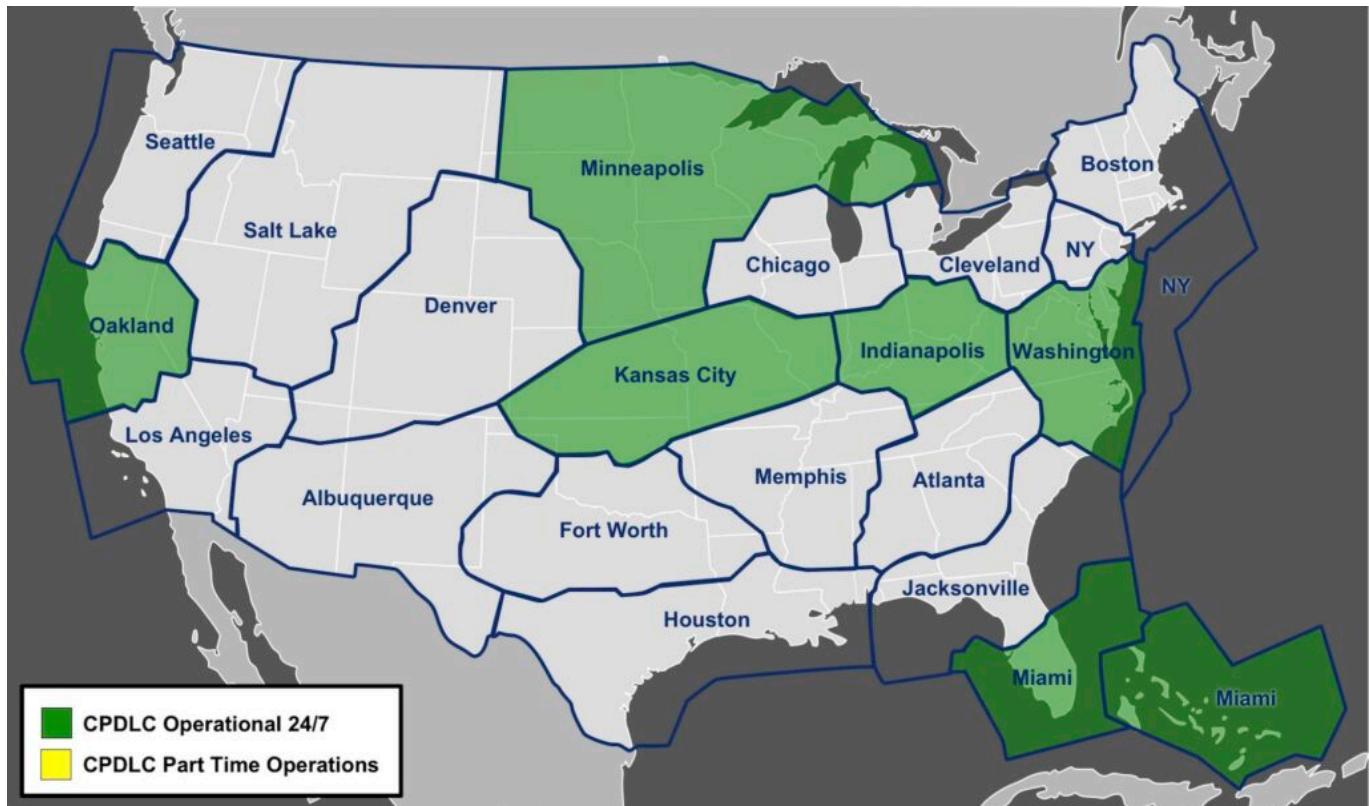
ZID/Indianapolis, ZKC/Kansas City, ZMP/Minneapolis, ZDC/Washington, ZOA/Oakland, and ZMA/Miami en-route control facilities are all up and running 24/7 now.

We've so far only found a table showing **61 airports** where **CPDLC DCL services** are currently available:

CPDLC DCL SERVICES AVAILABLE								
KABQ	KATL	KAUS	KBDL	KBNA	KBOS	KBUF	KBUR	KBWI
KCHS	KCLE	KCLT	KCMH	KDAL	KDCA	KDEN	KDFW	KDTW
KEWR	KFLL	KHOU	KHPN	KIAD	KIAH	KIND	KJFK	KLAS
KLAX	KLGA	KMCI	KMCO	KMDW	KMEM	KMIA	KMKE	KMSP
KMSY	KOAK	KONT	KORD	KPDX	KPHL	KPHX	KPIT	KRDU
KRNO	KRSW	KSAN	KSAT	KSDF	KSEA	KSFO	KSJC	KSLC
KSMF	KSNA	KSTL	KTEB	KTPA	KVNY	TJSJ		

U.S. DOMESTIC EN ROUTE CPDLC SERVICES CURRENTLY IN DEPLOYMENT

But we know this is a bit out of date. We've counted 65 airports currently operational including these:

- KJAX/Jacksonville

- KPBI/Palm Beach

- KCVG/Cincinnati/Northern Kentucky

- KADW/Joint Base Andrews

Some stuff on using it

OK, so if you **take-off from an airport that has CPDLC DCL** and which is **in an en-route CPDLC area** then KUSA (because they're who you'll basically be logged onto on the ground) is going to stay active and there is nothing else to do once airborne.

If you take-off logged onto KUSA and **only get into the en-route CPDLC bit later** then again, KUSA stays on and there's nothing more for you to do.

If you take-off logged onto KUSA and then are leaving all CPDLC airspace, it will **auto log off** when it needs to.

For all other scenarios, you probably need to **manually log on** when you reach the place where CPDLC is available.

KUSA is available on the ground in the lower 48 states, San Juan and Puerto Rico.

This info is all available here.

L3Harris are very active in all this and get in touch if they spot any irregularities with aircraft involved in the trial (nice to know they're out there, watching).

Handing over the 'info baton'

So far, all this has been snatched from a bunch of very handy guides that L3Harris publish, so here are the links to those for further info:

- The main L3Harris page on the FAA DataComm stuff

- The CPDLC Pilot Handbook, by L3Harris

- The FAA page on DataComm stuff (not just for this trial, but anywhere they use it)

And if you are an operator in the US with questions about this, then speak to these folk – DCIT@L3Harris.com

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CPDLC Departure Clearance for US Airspace – 22Oct

Declan Selleck
14 May, 2024

Earlier this month we reported about the transition of the United States ATC system to a National Single Data Authority (NSDA). https://ops.group/blog/cpdlc-for-us-airspace-the-implementation-process/

The initial phase of this process is scheduled to start this weekend on 22Oct at 0330Z with a single CPDLC logon ID for domestic US airspace (KUSA) and ATC issuing departure clearances using CPDLC.

You can read more details about Controller-Pilot Data Link Communication–Departure Clearance (CPDLC-DCL), general procedures for logging on/notifying, loading the flight plan, receiving the CPDLC-DCL, responding to the CPDLC-DCL message, and disconnecting/logging off here:

NAS Data Communications Guide