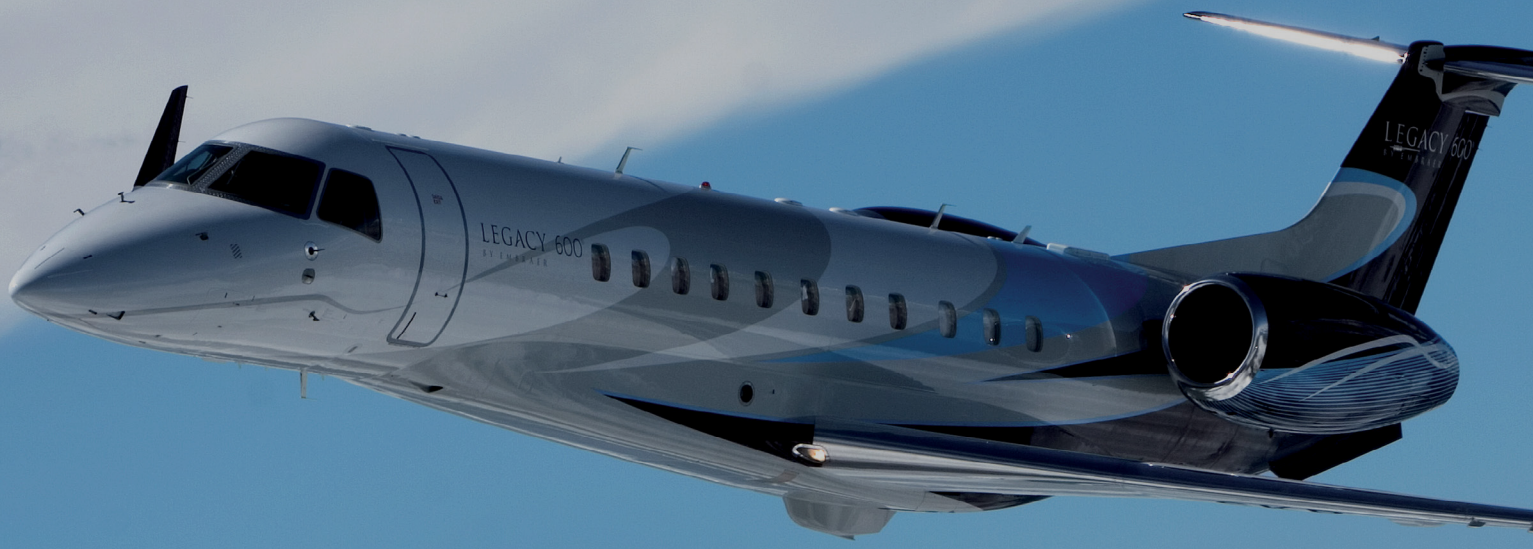
DISCOVER THE BENEFITS OF CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC)

Helping business aviation and commercial air transport flyers reduce travel times, minimize fuel consumption, minimize carbon emissions, and optimize aircraft efficiency



Honeywell

CPDLC REDUCES TRAVEL TIMES AND INCREASES AIRCRAFT EFFICIENCIES

Notwithstanding the impact of the pandemic, over the next two decades global air travel demand is expected to grow by roughly 4.0% per year. Although this is down from an average of 5.3% per year in the 20 years preceding COVID-19, this growth still represents a significant challenge for air space users and Air Navigation Service Providers. The skies above us were already congested and will become further congested as the industry recovers from the effects of COVID-19 enforced travel restrictions. Technology, as ever, has a major role to play in the optimization of the airspace and the safe, efficient, and co-ordinated management of this vital but finite resource. One of these technologies is available today and has already demonstrated significant benefits to both operators and air space service providers. This technology is Controller-Pilot Data Link Communications.

WHAT IS CPDLC?

Controller-Pilot Data Link Communications, more commonly referred to as just CPDLC or Data Comm, consists of text messages transmitted between air traffic controllers and the pilots of aircraft both in the air and on the ground.

CPDLC messages are predominately operational, communicating departure clearances, flight plan changes, re-routes and weather information. In a nutshell, by replacing traditional VHF voice communication, CPDLC simplifies air traffic management tasks, reduces pilot workload and delivers real time benefits and cost saving for all air space users.

Currently there are 1,900 CPDLC equipped and enabled business aviation aircraft in the United States, which is a tiny fraction of the almost 14,000 private jets registered in the US. There are reasons why equipage remains low, which we will cover later, however it is clear that many business jet operators are missing out on the significant benefits of CPDLC.

QUICK FACTS

Air transport has connected the world for more than a century, with over 86.5 Billion passengers having flown since the first commercial service took off in 1914.

CPDLC KEY ADVANTAGES

- Shorter Flights
- Time Saved
- Reduce Emissions
- Reduce Fuel Consumption

CPDLC IN THE REAL WORLD

Aviation is an industry full of acronyms, but what does CPDLC actually mean in the real world? The FAA CPDLC roll-out allows the National Airspace System (NAS) to handle more traffic, reduce flight delays, ensure continued flights during severe weather, route aircraft more efficiently and improve safety, all while reducing operational costs for airspace users spanning business aviation and commercial air transport. There are currently two main applications for Data Comm in the United States today – Departure Clearance and En-Route Services.

DEPARTURE CLEARANCE

Departure Clearance (DCL) is the first major phase of the FAA's Next Gen Data Comm roadmap and started services back in 2016. Currently active at 62 airports across the United States, DCL allows pilots to request and receive departure clearances digitally rather than verbally. The digital clearance procedure is quicker, simpler and less prone to readback errors than standard voice clearance procedures – which further reduces delays.

CPDLC departure clearance services are available at all major international airports and business aviation hubs across the National Airspace System, where queues for take off slots can be significant in good weather conditions – but can become nightmarish in inclement weather conditions.

Pilots will know that getting departure clearance as soon as possible is a priority.

Take Teterboro from example, the busiest business aviation airport in the US. On a Friday afternoon you might expect 20 or 30 business jets to be lining up for departure – with their principals and VIP passengers keen to head home for the weekend. Now as a rule, CPDLC equipped aircraft benefit from speedier departure clearances, simply because it takes less time to clear these aircraft. It's done digitally and at the touch of a button, all without the need for 'read back' dialogue between the controller and pilot. Getting to the front of the take-off queue saves time, money, fuel – and prevents an unhappy principal in the back!

In *Figure 1* below, we compare two early evening flights departing from Boca Raton Airport on 18 November 2018. The CPDLC enabled aircraft using the DLC clearance procedure gets airborne a whole 15-minutes quicker than the rival aircraft which utilizes the legacy VHF or voice procedure.

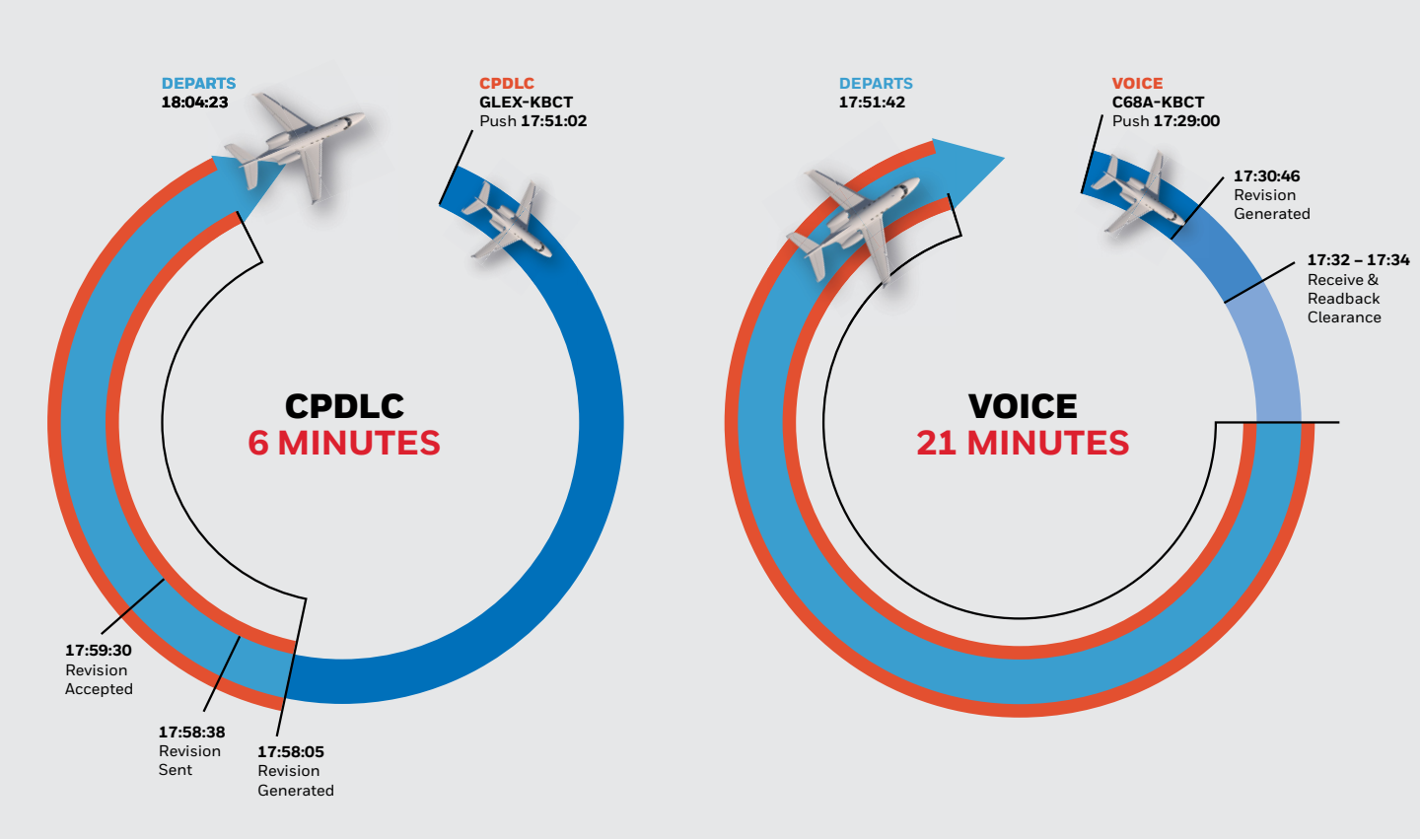


Figure 1 Two flights departing from Boca Raton Airport; the CPDLC enabled aircraft gets airborne a whole 15-minutes quicker.

IN APRIL 2021 ALONE DLC SAVED OVER 45,000 MINUTES OF RADIO TIME ACROSS THE NAS — THAT'S THE EQUIVALENT OF SAVING 5 YEARS!

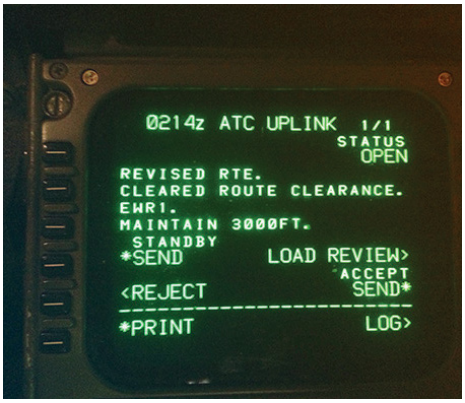
In that time some 200,000 flights were cleared digitally, saving almost 25,000 hours of ground time! Since 2016 the numbers are even more staggering:

>2,550,000
MINUTES OF RADIO TIME SAVED

>9,897,935
FLIGHTS CLEARED

>1,799,905
MINUTES OF AIRSPACE USER TIME SAVED

>220,840,000
KGS OF CO_2 EMISSIONS SAVED
The equivalent of removing 4,500 cars from the road, or planting 125,000 trees!



ENROUTE DATA COMM

The second component of the FAA's Next Gen Data Comm roll-out is the automation of En Route messaging. This enables air traffic controllers to provide pilots with frequency handoffs, altitude changes, reroutes and weather updates via text messages rather than by voice while the aircraft is in its cruise phase of flight.

In addition to flight efficiency benefits from streamlined controller/pilot communications, CPDLC enhances air space safety as reroutes are provided in a form that allows for loading directly into the FMS with the push of a button, reducing the risk of typing errors or waypoint confusion.

This "Push to Load" functionality is incorporated into the Flight Management Systems of most of the latest integrated cockpits and literally allows the pilot to update the FMS with the latest information with the touch of a button, (after checking the contents for accuracy) – and a simple WILCO or ROGER response sent back to ATC to confirm. The FMS can then adjust the aircraft's trajectory in compliance with the new route instructions, which reduces pilot workload, increases 'heads-up' time and improve the flight's margin of safety.

The benefits of the En Route services are already apparent. Between March 2019 and April 2021, over 410,000 minutes of comms time was eliminated. Bearing in mind only three active centers (Kansas City, Washington and Indianapolis) were providing the service and the impact of Covid restrictions on flight hours, the savings are extraordinary and offer a glimpse of the future savings once the system is rolled out to all 20 air route traffic control centers across the National Air System.

And it's not only comms time that is saved. Every minute of comms time saved is distance saved, reducing flight time, fuel burn, carbon emissions and money!

A prime example of the benefits of En Route CPLDC was demonstrated on December 21, 2020, when weather was impacting operations across the entire east coast, with particularly severe weather affecting majority of Washington Center (ZDC). As *Figure 2* shows, the CPDLC equipped flight's original flight path from O'Hare International Airport (KORD) to Ronald Reagan Washington National Airport (KDCA) was originally further south.

Air route traffic controllers in the Indianapolis Center (ZID) were busy due to moderate turbulence and lightning, with multiple aircraft requesting lower altitudes and deviations around the severe weather. The Washington Center (ZDC) sector was closed due to thunderstorms. By utilizing CPDLC the controller in the Indianapolis Center was able to issue a flight plan reroute to avoid the adverse weather with no verbal exchange from the flight crew of this aircraft.

CPDLC EN ROUTE ON THIS OCCASION SAVED:

24 Seconds
OF COMMS TIME SAVED

108 NM
DISTANCE SAVED

17 Minutes
TIME SAVED

Figure 2 The CPDLC equipped flight's original flight path was further south.

CPDLC VALUE FOR BUSINESS AVIATION

Business jet owners and operators directly benefit from CPDLC by obtaining best-equipped best-served prioritization from air traffic control. Speedy aircraft movement clearances ensure your aircraft arrives at its destination in as short a time as possible. Reduced flight times drive down costs of fuel and reduce carbon emissions, which is a tangible action business aviation flyers can take to minimize our carbon footprint.

The increasing coverage of CPDLC services across the continental United States, North Atlantic, and Europe makes CPDLC equipage a priority for owners and operators of business jets who place a high value on their time, expect prioritized service from air traffic control, desire the safest air travel experience possible, and seek to minimize environmental impact.

Please visit **myaerospace.com** or contact your Honeywell sales manager or dealer to learn more about what CPDLC can do for you.

"We equipped our 3 Falcon 900EXs with Honeywell's Mark II+ Communications Management Unit to comply with the North Atlantic mandate, but we've enjoyed great benefits in domestic operations as it has enabled us to participate in the FAA NextGen Data Comm program. This allows us to retrieve clearances quickly and accurately and to request altitude changes and weather deviations, which saves time and makes us more efficient. And while using domestic CPDLC we've never missed a frequency change, getting the numbers right every time- with no readback necessary! This new capability has helped in achieving our mission of reaching our destination as quickly and efficiently as possible, while ensuring a safe and comfortable flight." – Lester Coggins, Vice President- Aviation, Villages Equipment Co.

For more information

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Honeywell Aerospace
1944 East Sky Harbor Circle
Phoenix, AZ 85034
aerospace.honeywell.com

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THE FUTURE IS WHAT WE MAKE IT

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